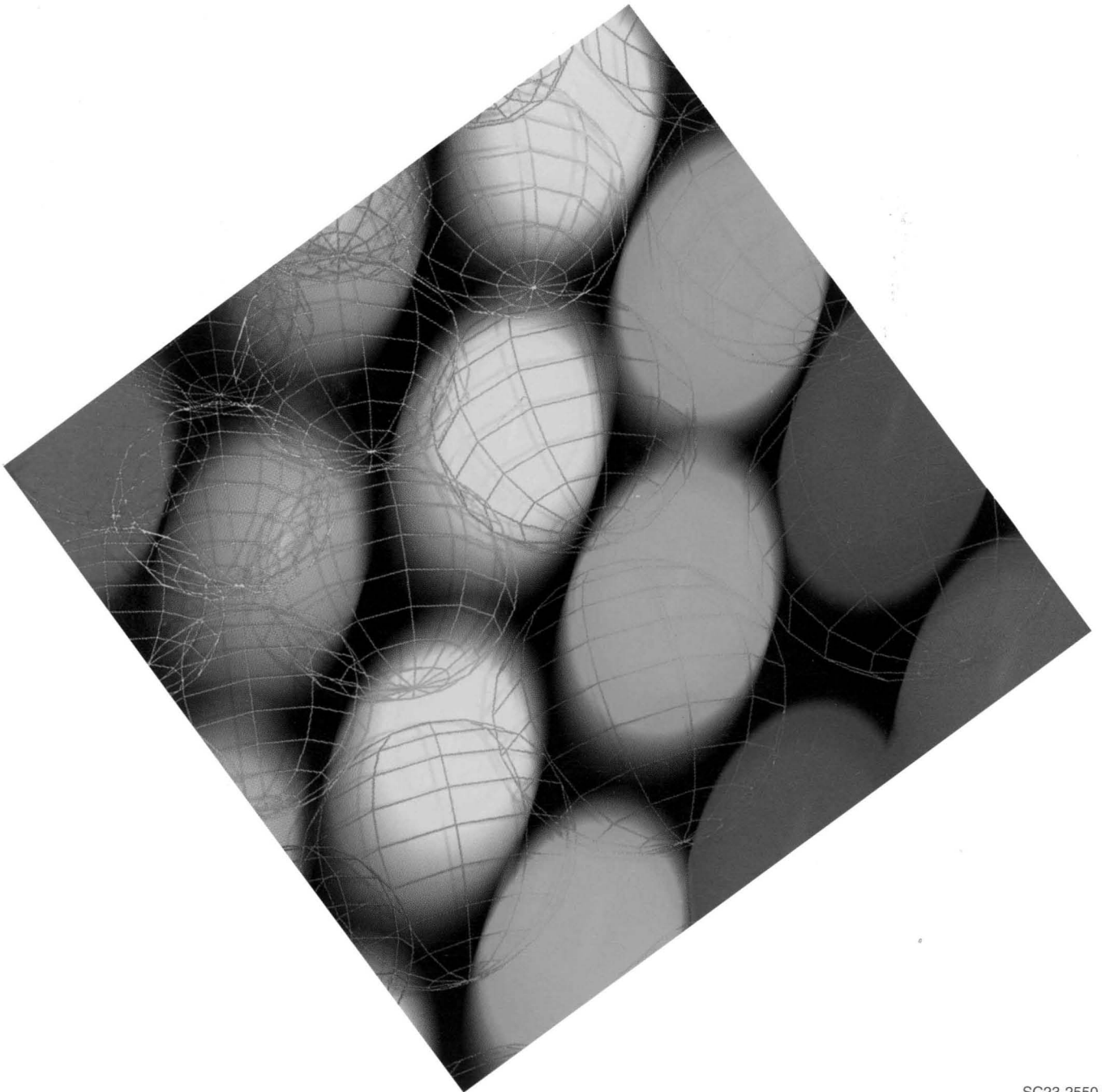


AIX

Installation Guide

Version 4.1



AIX

Installation Guide

Version 4.1

Fifth Edition (October 1996)

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About This Guide

This *AIX Version 4.1 Installation Guide* describes different ways to install AIX Version 4.1 of the AIX Base Operating System (BOS). This guide also describes how to use the applications available for configuring your system and installing additional software.

You only need to use a portion of this Installation Guide to install BOS. "Determining Your Starting Point" on page 1-1 indicates which portions of this guide are necessary to complete different types of installations and how to proceed to perform post-installation tasks, such as configuring and backing up your system and installing additional software.

The information in this book can also be found in the Hypertext Information Base Library Version 1 for AIX. This online documentation is designed for use with the InfoExplorer hypertext retrieval system. The booklet that accompanies the InfoExplorer CD-ROM provides instructions for mounting the CD-ROM.

Who Should Use This Guide

This Installation Guide is intended for customers installing AIX Version 4.1 on *standalone systems*. A standalone system is a machine that can boot (start up) by itself. It may or may not be on a network. If it is on a network, it does not need the assistance of a server to boot.

If you want to manage the installation and configuration of *diskless, dataless*, or standalone systems from a network installation server, refer to the *AIX Version 4.1 Network Installation Management Guide and Reference*. Diskless and dataless systems cannot boot (start up) by themselves. They must use a remote server system to boot. Diskless and dataless systems may have disk drives installed, but they do not boot from them.

If the run-time part of BOS AIX Version 4.1 was preinstalled at the factory, refer to *Startup Instructions for Preinstalled Systems* that came with your system. After you start up your preinstalled system, you may want to refer to portions of this guide to do further configuration.

Overview of Contents

The chapters of this Installation Guide are organized into the following categories. This section summarizes the contents of this guide by chapter within major tasks.

Installing the Base Operating System (BOS) from CD-ROM or Tape

"Installing BOS from CD-ROM or Tape" on page 2-1 describes the different BOS installation procedures you can use depending on the state or operating system level of your system. You can accept default settings and begin the installation immediately, or you can verify or change system settings before beginning the installation.

Other Installation Methods

"Customizing the BOS Install Program" on page 4-1 contains information about the **bosinst.data** file, which system administrators can modify to change the default settings used by the BOS installation program. Customizing the **bosinst.data** file enables you to install BOS without the set of menus that are usually displayed, thus facilitating unattended installations.

“Installing BOS from a System Backup” on page 5-1 describes how to install BOS from a previously created backup copy of your system. Use the procedure in this chapter to restore your own system, if necessary, or to install identical configurations on other machines.

Customizing the Installed System

“Customizing Your Installation” on page 3-1 describes the tasks you may need to perform after you have installed BOS. These tasks include setting the date and time, creating a user account for performing nonadministrative tasks, setting up your local and network environments, installing collections of software, and backing up your system.

Installing and Maintaining Optional Software

“Installing Optional Software and Service Updates” on page 6-1 describes how to install software products and fixes. You may either install an entire software product or those parts of a product that are designed to be installed separately. This chapter also describes how to get information about software products you may want to install.

“Maintaining Optional Software” on page 7-1 describes how to commit and reject updates and remove installed software.

Backing Up Your System

“Backing Up Your System” on page 8-1 describes how to create a backup image of your AIX Version 4.1 system. You can use this backup image to restore your configuration if your system becomes corrupted. You can also use a backup image to duplicate one system’s configuration on other machines by installing the backup image on those machines.

Troubleshooting the Installation

“Troubleshooting” on page 9-1 provides instructions for resolving installation problems.

“Acting on System and Error Messages” on page 10-1 provides information about messages you may receive while performing installation procedures.

Reference Information

“Viewing README Files” on page 11-1 provides instructions for viewing README files that contain late-breaking news about software you may have installed.

“Optional Software Installation and Update Concepts” on page A-1 provides information about the packaging of software products and provides details about install and update functionality. This information is useful but not usually required to complete software installation and update tasks.

“Software Installed Automatically during BOS Install” on page B-1 describes the software that is automatically installed when you install BOS.

“Compatibility between AIX Version 3.2 and AIX Version 4.1” on page C-1 provides information about application compatibility between AIX Version 3.2 and AIX Version 4.1.

Migrating from AIX Version 3.2 on page D-1 provides information about things to consider before migrating to AIX Version 4.1.

“Glossary” on page X-1 defines terms used in this guide.

“Related Information” on page X-7 lists additional documentation on topics related to the concepts and procedures discussed in this guide.

Summary of Changes

This section discusses the following elements of AIX Version 4.1 installation that differ from previous versions of AIX.

BOS Installation

The installation of the Base Operating System is customized to the state of your system. The installation interface offers recommended default settings, which, if you accept them, reduce the amount of information you need to provide to the installation program. The installation menus are translated for eight languages. If you use a graphical display to install, the AIXwindows environment is automatically installed. You can customize the installation and bypass installation prompts by editing a data file read by the installation program.

System Backup

Following are some of the new features available when you back up your system:

- Preservation of system-defined paging space
- Ability to shrink the file systems to minimum-used size when a system is reinstalled
- Ability to back up and restore user volume groups separately, as well as back up and restore the full system
- Ability to exclude specified files and directories from the system backup

Software Migration

A migration installation path allows you to move from AIX Version 3.2 to AIX Version 4.1, while keeping customized configuration information and installed optional software. Any configuration files that cannot be migrated will be saved in a specific directory. System messages will inform you of the location of the saved files. Information will also be stored in the system installation log in `/var/adm/ras/devinst.log`.

“Installing BOS from CD-ROM or Tape” on page 2-1 describes the BOS installation migration path. “Installing Optional Software and Service Updates” on page 6-1 provides information about the migration of optional software. An InfoExplorer database provides special migration instructions that may exist for the individual software products you want to install. “Installing Optional Software and Service Updates” on page 6-1 contains instructions for installing and accessing this database.

“Compatibility between AIX Version 3.2 and AIX Version 4.1” discusses compatibility between the two release levels and lists the compatibility software for machines running mixed levels of AIX.

Software Licensing

AIX Version 4.1 introduced a software license management system that allows an application to operate in compliance with the terms and conditions of its license agreement. To obtain a license password, contact your point of sale.

The iFOR/LS documentation provides information for system administrators who need to set up and manage a network license server. A network license server enables users to run software governed by a license that is shared by the systems in a network.

Software Packaging

Three types of units comprise the Base Operating System and optional software products:

- A *licensed program* is a purchasable product. The Base Operating System (BOS) is an example of a licensed program.
- A licensed program may be made up of *packages*. In some cases, the licensed program and the package may be the same, or a licensed program may have numerous packages. **bos.net** is an example of a package that is part of the BOS licensed program.
- A *fileset* is an installable unit within a package. **bos.net.tcp.client** is a fileset in the **bos.net** package.

Optional software may be organized into *bundles*, which are groups of products that are suited for a particular use. For example, a client bundle provides client AIX functionality with minimum disk utilization. For more information about bundles, see “Installing Optional Software and Service Updates” on page 6-1. An InfoExplorer database describes the filesets and packages that comprise individual software products.

User Interfaces

User interfaces provide a simplified means of performing installation and configuration tasks. These interfaces are:

- *Installation Assistant*, which facilitates performing a set of configuration tasks after BOS is installed on the system. “Customizing Your Installation” on page 3-1 describes the Installation Assistant application.
- *Easy Install*, which provides the simplest way of installing software bundles. “Installing Optional Software and Service Updates” on page 6-1 describes the Easy Install application.
- *Install and Update Software*, which provides additional software installation functionality, including installing individual software packages and filesets. “Installing Optional Software and Service Updates” on page 6-1 describes the Install and Update application.
- *Maintain Installed Software*, which allows you to commit software updates that are applied to your system, reject software updates, and remove installed software. “Maintaining Optional Software” on page 7-1 describes the Maintain Installed Software application.

Optional Software Installation

AIX Version 4.1 provides functions for installing optional software, including removing installed software and previewing the software installation.

The remove function (sometimes referred to as deinstall) allows you to remove an optional software product that has been previously installed on your system. Removing software differs from rejecting software in several ways:

- The remove function is independent of the installation state, while software must be in the applied state for reject.
- You can remove product filesets but not individual updates.
- The remove function attempts to delete all traces of the product fileset.

“Maintaining Optional Software” on page , provides more information about removing software from your system.

The preview function allows you to preview the results of installing software before the installation has actually begun. Information provided by the preview function includes:

- Whether the software you are installing passed its preinstallation checks
- Which (if any) requisite software will be installed along with the software you are installing
- Estimates on how much file system space is needed by the software you are installing

Network Installation Management

Network Installation Management (NIM) enables you to centrally manage the installation of BOS and optional software on diskless, dataless, and standalone systems within the same environment.

See the *AIX Version 4.1 Network Installation Management Guide and Reference* for information about managing network installations.

Highlighting

This book uses the following highlighting conventions:

Bold	Identifies commands, key words, files, directories, and other items whose names are predefined by the system.
<i>Italics</i>	Identifies parameters whose actual names or values are to be supplied by the user. Italics are also used to <i>emphasize</i> an important word or phrase or to identify a term when it is being defined.
Monospace	Identifies information you should actually type, as well as examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, and messages from the system.

Sample Screens

Many chapters in this book contain *sample screens*, which help verify that you reached the correct step. Not all screen depictions, however, are identical to what you see on your display screen. The degree of variance between a sample screen and your display screen depends on your system configuration, but the sample screens should be *similar* to what you see on your display screen.

ISO 9000

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Corequisite Publications

The following documents, if they apply to your installation, supplement this book:

- Documentation for installation and update media is shipped with each new release of AIX. These documents discuss updates provided by the new release, and include last minute information you should be aware of before beginning the installation.
- *AIX Version 3.2 Installation Guide*, order number SC23-2341. Describes how to create a backup copy of an AIX Version 3.2 system.

Related Publications

The following publications contain additional information related to the installation and management of AIX Version 4.1:

- Hypertext Information Base Library Version 1 for AIX. Once BOS is installed, you can install this complete hypertext library from CD-ROM.
- *AIX Version 4.1 iFOR/LS System Management Guide*, order number SC23-2665.
- *AIX Version 4 System Management Guide: Operating System and Devices*, order number SC23-2525.
- *AIX Version 4 System Management Guide: Communications and Networks*, order number SC23-2526.
- *AIX Version 4.1 Network Installation Management Guide and Reference*, order number SC23-2627.
- *AIX Version 4 Commands Reference* (six volumes), order number SBOF-1851.
- *AIX Version 4 Problem Solving Guide and Reference*, order number SC23-2606.
- *AIX Version 4 Messages Guide and Reference* order number SC23-2641.
- *AIX Version 4 Files Reference*, order number SC23-2512.
- *AIX Version 4 General Programming Concepts: Writing and Debugging Programs*, order number SC23-2533.

Other useful publications:

- *AIX and Related Products Documentation Overview*, order number SC23-2456.
- *AIX Version 4 Topic Index and Glossary*, order number SC23-2513.
- *AIX Version 4 System User's Guide: Operating System and Devices*, order number SC23-2544.
- *AIX Version 4 System User's Guide: Communications and Networks*, order number SC23-2545.
- *AIX Version 4 Getting Started*, order number SC23-2527.
- *AIX Version 4 Quick Reference*, order number SC23-2529.
- *POWERstation and POWERserver Common Diagnostics Information Manual*, order number SA23-2765.

Ordering Publications

You can order publications from your sales representative or from your point of sale. To order additional copies of this book, use order number SC23-2550.

Use *AIX and Related Products Documentation Overview* for information on related publications and how to obtain them. The *AIX and Related Products Documentation Overview* is available:

- On the World Wide Web. Using your web browser, go to the IBM Home Page by opening the following URL:

<http://www.ibm.com/>

On the IBM Home Page, search on "*AIX and Related Products Documentation Overview*" to access the publication.

- In the Hypertext Information Base Library Version 1 for AIX. This online documentation is designed for use with the InfoExplorer hypertext retrieval system.
- As a hardcopy publication; use order number SC23-2456.

Chapter 1. Determining Your Starting Point

This installation guide assumes that all of the required hardware is already installed on your system. The procedures in this guide identify prerequisite tasks or conditions that must be met before performing the procedures.

This section helps you determine how to proceed in completing installation tasks. Installation conditions are listed, followed by the chapters you need to consult. You may want to use procedures in chapters other than those in the following list. This section suggests a minimal path through the *Installation Guide*.

Installing BOS on a New Machine

If you are installing BOS on a new machine, follow these steps:

1. Go to “Installing BOS from CD-ROM or Tape” on page 2-1.
2. Continue with “Customizing Your Installation” on page 3-1.

Upgrading to Version 4.1 from an Earlier Version

Before upgrading your system, look at the *AIX Release Notes* to see if any installation instructions became available after this book was published.

You need to follow different instructions for upgrading your system depending on the current level of the AIX operating system that is installed on your system. You can enter the following command to determine your current operating system level:

```
oslevel
```

Depending on what level operating system is currently installed on your system, continue with the appropriate subsection “Upgrading from AIX Version 4.1.1 or Later” or “Upgrading from an AIX Version Earlier than Version 4.1.1.”

Upgrading from AIX Version 4.1.1 or Later

If your system is currently installed with AIX Version 4.1.1 or later, you can upgrade your system to AIX Version 4.1.5 by using the following procedure.

Note: Do not use this procedure to migrate an AIX Version 4.2, 4.1.0, 3.2, or 3.1 system to AIX Version 4.1.5.

1. Back up your system by following the instructions in “Backing Up Your System” on page 8-1 in this guide.
2. To avoid problems during installation, place the system in a dormant state by making sure that all users are logged off and by stopping all applications. If applications are left running, unpredictable results may occur and some updates may not be applied.
3. Update the **installp** command before you update your system to AIX Version 4.1.5.
 - If you are updating your system from tape media, insert Volume 1 of the tape into the tape drive and run the following command from the command line (where *rmtX* is the name of your tape drive, for example, *rmt0*):

```
installp -acgNXd/dev/rmtX bos.rte.install 4.1.5.0
```


- If you are updating your system from CD-ROM media, perform the following steps:
 - a. Create a temporary file system by running the following command from the command line (where *cdX* is the name of your CD-ROM device, for example, *cd0*):

```
crfs -v cdrfs -d /dev/cdX -m /CD -p ro
```

- b. Insert the CD into the CD-ROM drive. (If you have multiple CDs to install, insert Volume 1.)
- c. Mount the file system that you created, update the **installp** command, and remove the temporary file system. Enter the following on the command line to complete these tasks:

```
mount /CD
installp -acgNXd/CD/usr/sys/inst.images bos.rte.install
4.1.5.0
umount /CD
rmfs /CD
```

4. Update the rest of your system by entering the following command:

```
smit update_all
```

Note: When updating your system with product media (media that allows you to install AIX Version 4.1.5 from scratch) use the **smit update_all** command and accept the default menu values.

5. If you are updating your system from CD-ROM media and you have multiple CDs to install, insert the next CD and repeat step 4.
6. After applying this update, reboot your system using the following command:

```
shutdown -rF
```

Upgrading from an AIX Version Earlier than Version 4.1.1

If your system is currently installed with AIX Version 4.1.0 or any level of AIX Versions 3.2, or 3.1, you can upgrade your system to AIX Version 4.1.5 by using the following procedure.

Note: Do not use this procedure to migrate an AIX Version 4.1.1, 4.1.2, 4.1.3, 4.1.4, or 4.2 system to AIX Version 4.1.5.

1. Back up your system.
 - a. To back up an AIX Version 4.1.0 system, follow the instructions in “Backing Up Your System” on page 8-1 in this guide.
 - b. To back up an AIX Version 3.2 system, follow the instructions in the *AIX Version 3.2 Installation Guide*.
 - c. To back up an AIX Version 3.1 system, follow the instructions in the *Installation Guide for Version 3*.
2. Go to “Installing BOS from CD-ROM or Tape” on page 2-1.
3. Go to “Customizing Your Installation” on page 3-1.

Installing Optional Software

If you have already installed AIX Version 4.1, and you only want to install optional software products or service updates:

- Go to “Installing Optional Software and Service Updates” on page 6-1 to install either bundles of software or individual software packages and filesets.

OR

Go to “Customizing Your Installation” on page 3-1 to install bundles of software using the *Easy Install* interface.

- You may also need to perform some of the tasks described in “Maintaining Optional Software” on page 7-1. For detailed information about software packaging and software installation functions, refer to the “Optional Software Installation and Update Concepts” on page A-1.

Customizing the BOS Install Program

If you have already installed a machine with AIX Version 4.1, and you want to customize the **bosinst.data** file to set installation parameters for installing other machines, follow these steps:

1. Go to “Customizing the BOS Install Program” on page 4-1.
2. Back up the machines you want to install with customized installation parameters.
3. Go to “Customizing Your Installation” on page 3-1 if the installed system requires further configuration.

Installing BOS from a System Backup

If you are installing from a backup image you made of your system, follow these steps:

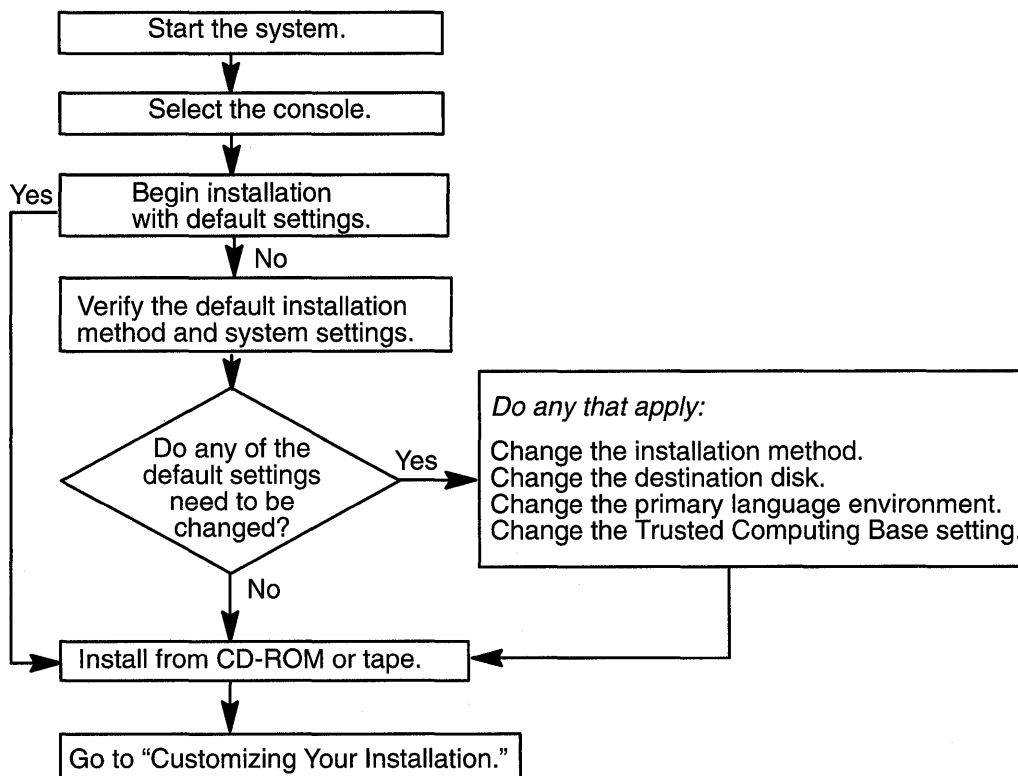
1. Go to “Installing BOS from a System Backup” on page 5-1.
2. Go to “Customizing Your Installation” on page 3-1 if the installed system requires further configuration.

Chapter 2. Installing BOS from CD-ROM or Tape

This chapter describes the installation methods and procedures for installing AIX Version 4.1 of the AIX Base Operating System (BOS) from CD-ROM or tape.

Flowchart for BOS Installation from CD-ROM or Tape

This flowchart outlines the steps required to install BOS from CD-ROM or tape.



Installing the Base Operating System

The basic steps for installing the Base Operating System are summarized below. Detailed procedures for performing these steps are included in this chapter. The procedures in this chapter contain illustrations of the online screens used during installation. These illustrations are provided as examples only. The actual online screens may be somewhat different in appearance.

1. Prerequisites on page 2-2
2. Start the System on page 2-3
3. Verify the Default Installation and System Settings on page 2-7
4. Change the Installation Method on page 2-8, if needed
5. Change the Destination Disk on page 2-12, if needed
6. Change the Primary Language Environment on page 2-14, if needed

7. Change the Trusted Computing Base setting on page 2-16, if needed
8. Install from CD-ROM or Tape on page 2-5

Press the Reset button on the system unit if you need to cancel the installation once it is in progress. If you cancel an installation, you must start from the beginning of the installation process to continue installing the system.

Prerequisites

Before installing the Base Operating System, complete the following prerequisites:

- All hardware must already be connected, including any external devices, such as tape and CD-ROM drives. If you need instructions, refer to the hardware documentation that accompanied your system.
- Obtain the system key for the lock (if present) on your system unit.
- Locate your installation CD-ROMs or tapes. You may have multiple volumes of CD-ROMs or tapes.
- If you need to determine whether a display adapter is installed, consult the “About Your Machine” document shipped with the system. This document contains a list of the factory hardware that came with your system.
- Refer to the documentation that came with the product installation media if you have not already done so.
- If other users have access to your system, make sure they are logged off before you begin the installation.
- If AIX Version 3.2 is currently installed and you want to use the Migration Installation method to install AIX Version 4.1, ensure that the root user has a primary authentication method of SYSTEM. To check the value, enter:

```
lsuser -a auth1 root
```

To change the value, enter:

```
chuser auth1=SYSTEM root
```

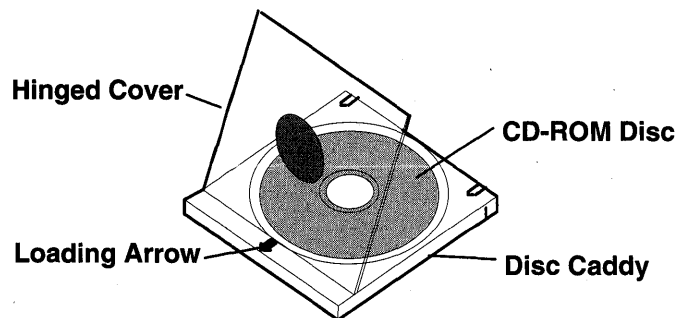
For information about the Migration Installation method, see “Installation Methods” on page 2-9.

- If the system you are installing contains data, create or locate a backup of the system:
 - If AIX Version 3.2 is currently installed, refer to the *AIX Version 3.2 Installation Guide* for instructions on how to create a backup copy of your Version 3.2 system. After you have created a backup of your system, continue with “To Start the System.”
 - If AIX Version 3.1 is currently installed, refer to the *Installation Guide for Version 3* for instructions on how to create a backup copy of your Version 3.1 system. After you have created a backup of your system, continue with “To Start the System.”
 - If you are reinstalling AIX Version 4.1, refer to “Backing Up Your System” on page 8-1. After you have created a backup of your system, continue with “To Start the System.”
- If the system you are installing will communicate with other systems and access their resources, determine the following information: network interface, IP address, hostname, and route to the network. Contact your system administrator for the correct information for your system.

To Start the System

Use this procedure to start your machine:

1. If you have a new system or your system is turned off, skip to step 2. If the system is already turned on, do the following to insert the installation media into the appropriate drive and then shut down the system:
 - a. Log in as root user.
 - b. Insert Volume 1 the installation media into the tape or CD-ROM drive. (If you are installing from CD-ROM, you may have only one CD-ROM to install.) Some CD-ROM drives have a removable disc caddy, while others have a sliding drawer. If the CD-ROM drive on your system has a sliding drawer, place the CD-ROM in the drawer and push the drawer in. If the CD-ROM drive on your system does not have a sliding drawer, insert the CD-ROM into the disc caddy and then insert the caddy into the CD-ROM drive.



- c. Enter the following command:

```
shutdown -F
```

The `Halt completed ...` message is displayed when the shutdown process completes.

Note: On some models, the **shutdown** command turns off the power to the system unit. It does not, however, automatically flip the power switch to the Off (0) position.
 - d. Flip the system unit power switch to the Off (0) position when the shutdown process is complete.
 2. Turn the system key (if present) to the Service position.
 3. Turn on all attached external devices, such as terminals, CD-ROM drives, tape drives, monitors, and external disk drives. Do not turn the system unit on until step 6. Turning on the external devices first is necessary so that the system unit can identify them during the startup (boot) process.
 4. If you have not already inserted the installation media into the tape or CD-ROM drive, do so now. (If you have multiple volumes of installation media, insert Volume 1.) Some CD-ROM drives have a removable disc caddy, while others have a sliding drawer. If the CD-ROM drive on your system has a sliding drawer, place the CD-ROM in the drawer and push the drawer in. If the CD-ROM drive on your system does not have a sliding

drawer, insert the CD-ROM into the disc caddy and then insert the caddy into the CD-ROM drive.

Notes:

- You may find that on specific hardware, the tape drive door will not open while the system unit is turned off. If you have trouble opening the tape drive door during installation, use the following procedure:
 - a. Turn the system unit on.
 - b. Insert the AIX Version 4.1 installation tape. (Insert Volume 1 if you received more than one volume.)
 - c. Turn the system unit off and wait for 30 seconds.
 - On some models that have a door to the tape drive, there may be a waiting period of up to three minutes before the tape drive door opens after you have pressed the button to open the tape drive. Some models also require that the button for the tape drive door be held in the depressed position for a few seconds before the tape drive door will open.
 - On some models, the eject button must be pressed for at least 2 seconds in order to eject a CD-ROM that is already in the disc caddy.
5. If you are not using an ASCII terminal, skip to step 6. If you are using an ASCII terminal, set the communications options as follows:
- Line Speed (baud rate) = 9600
 - Word Length (bits per character) = 8
 - Parity = no (none)
 - Number of Stop Bits = 1
 - Interface = RS-232C (or RS-422A)
 - Line Control = IPRTS
- Set the keyboard and display options as follows:
- Screen = normal
 - Row and Column = 24x80
 - Scroll = jump
 - Auto LF (line feed) = off
 - Line Wrap = on
 - Forcing Insert = line (or both)
 - Tab = field
 - Operating Mode = echo
 - Turnaround Character = CR
 - Enter = return
 - Return = new line
 - New Line = CR
 - Send = page
 - Insert Character = space
- Note:** If your terminal is an IBM 3151, 3161, or 3164, press the Ctrl+Setup keys to display the Setup Menu and follow the on-screen instructions to set these options. If you are using some other ASCII terminal, refer to the appropriate documents for information about how to set these options. Some terminals have different option names and settings than those listed here.
6. Turn the system unit power switch from Off (0) to On (1). The system begins booting from the installation media. If your system is booting from tape, it is normal for the tape to move back and forth. After several minutes, the three-digit LED displays c31.

If you have more than one console, each terminal and direct-attached display device (or console) may display a screen that directs you to press a key to identify your system console. A different key is specified for each terminal displaying this screen. If this screen is displayed, then press the specified key on the device to be used as the system console. The system console is the keyboard and display device used for installation and system administration. Press a key on only one console.

7. A screen is displayed that prompts you to select an installation language. Follow the directions on this screen to select the language in which the installation instructions will be displayed.
8. The Welcome to the Base Operating System Installation and Maintenance screen is displayed.

```

Welcome to Base Operating System
Installation and Maintenance

Type the number of your choice and press Enter.

 1 Start Installation Now with Default Settings
 2 Change/Show Installation Settings and Install
 3 Start Maintenance Mode for System Recovery

88 Help ?

Choice:
```

- To begin the installation immediately, type 1 and press Enter.

After prompting for confirmation, the Installation process begins. Continue with the next section, "To Install from CD-ROM or Tape."

- To confirm or change the installation and system settings that have been set for this machine, type 2 and press Enter.

The Installation and Settings screen is displayed. Continue with "To Verify the Default Installation and System Settings" on page 2-7.

You can select 88 to display help on this or any subsequent installation screen.

To Install from CD-ROM or Tape

If you chose to confirm or change installation and system settings, enter 0 on the Installation and Settings menu to begin the installation process.

If the system key is present and is not already in the Normal position, turn the system key to the Normal position when you are prompted with the message:

Turn the system key to the NORMAL position.

The Installing Base Operating System screen is displayed.

Installing Base Operating System		
Please Wait...		
Approximate %tasks complete	Elapsed time (in minutes)	
25	5	Restoring Base Operating System

If you selected Migration Installation, after a few minutes, the Migration Confirmation screen is displayed.

Note: To skip the Migration Confirmation screen, press Enter when the Installing Base Operating System screen displays.

The Migration Confirmation screen enables you to do the following:

- List the software on your system that is incompatible with AIX Version 4.1 and that will be installed at the new level.
- Reboot the system without completing the migration. This selection cancels the installation.
- Continue with the installation.

After you enter a selection from the Migration Confirmation screen, the installation status screen is redisplayed.

As the installation progresses, the numbers in the Approximate percent complete and Elapsed time fields increment to indicate the installation status. After the base run-time environment is installed, status information about other software that is being installed is displayed. After the installation is complete, the system automatically reboots.

Where Do I Go Next?

The type of install you are doing and the type of media you are installing from determines what you do next:

- If you are installing from tape and you are doing either a preservation install or a complete-overwrite install:
Go to "Customizing Your Installation" on page 3-1 and complete the post-installation tasks.
- If you are installing from tape and you are doing a migration install:
Go to "Customizing Your Installation" on page 3-1 and complete the post-installation tasks. If you received multiple tape volumes, the system prompts you to insert the next tape to complete the migration install for software you have installed on your system.

- If you are installing from CD-ROM and you are doing either a preservation install or a complete-overwrite install:

Go to “Customizing Your Installation” on page 3-1 and complete the post-installation tasks. After you complete the post-installation tasks, refer to “Installing Optional Software and Service Updates” on page 6-1 for instructions on installing additional software on the current CD-ROM volume and on any other CD-ROM volumes that you may have.

- If you are installing from CD-ROM and you are doing a migration install:

Go to “Customizing Your Installation” on page 3-1 and complete the post-installation tasks. If you have multiple CD-ROMs to install, after you complete the post-installation tasks, insert Volume 2 of the CD-ROM and enter the command:

```
smit update_all
```

This will complete the migration install for software you have installed on your system that is shipped on Volume 2 of the CD-ROM. Refer to “Installing Optional Software and Service Updates” on page 6-1 for more information.

To Verify the Default Installation and System Settings

The Installation and Settings screen displays the default installation settings for your machine. The default settings are determined by the state of your system. For example, the default installation method for a new machine is different from the default installation method for a machine that has an earlier version of AIX installed. Usually, you can use the default settings for your installation.

If you want to change the default installation method, be sure to read “To Change the Installation Method” on page 2-8.

The default installation method is based on the following:

New and Complete Overwrite This is the only possible installation method for a new machine.

Preservation Install This is the default setting for a machine installed with Version 3.1 or a version higher or equal to Version 4.1.1.

Migration Install This is the default setting for a machine installed with Version 3.2 or 4.1.0.

The default settings for a new machine with a standard U.S. keyboard are shown in the following screen.

```
Installation and Settings

Either type 0 and press Enter to install with current settings, or type
the number of the setting you want to change and press Enter.

1 System Settings
  Method of Installation.....New and Complete Overwrite
  Disk Where You Want to Install.....hdisk0

2 Primary Language Environment Settings (AFTER Install):
  Cultural Convention.....English (United States)
  Language.....English (United States)
  Keyboard.....English (United States)

3 Install Trusted Computing Base.....no
>>> 0 Install with the settings listed above.

88 Help ?          † -----
99 Previous Menu   † Warning: Base Operating System Installation will
                   † destroy or impair recovery of ALL data on the
                   † destination disk hdisk0.
>>> Choice [0]:
```

Attention: Do *not* select the **0** option on the Installation and Settings screen until you have either verified the default settings or changed them to the correct settings. Selecting the **0** option on this screen begins the installation process.

To verify the default installation settings, check the default settings on the Installation and Settings screen.

- If the default settings do not need to be changed, type **0** and press Enter to confirm that these settings are correct. Skip the rest of this procedure and go to “To Install from CD-ROM or Tape” on page 2-5.
- If the default settings need to be changed, continue with one of the following:
 - To Change the Installation Method (Preservation or Migration Only) on page 2-8.
 - To Change the Destination Disk on page 2-12.
 - To Change the Primary Language Environment on page 2-14.
 - To Change the Trusted Computing Base Setting on page 2-16.

To Change the Installation Method (Preservation or Migration Only)

This section describes the different installation methods and the procedure for changing the default setting. The following terms are used in this section:

Volume Group A single hard disk or group of hard disks on your system.

Root Volume Group (rootvg)

A volume group containing the Base Operating System.

/usr

A file system containing files and programs that can be shared among machines. Some of the directories included in the **/usr** file system are: **/usr/bin**, which contains ordinary commands and shell scripts; **/usr/lib**, which contains architecture-independent libraries; **/usr/lpp**, which contains optionally installed software.

/tmp	A file system providing a temporary shared storage location for files.
/var	A file system containing files that are variable on a per-client basis, such as spool and mail files.
/	The root file system contains files that have machine-specific configuration data.

Installation Methods

This section describes AIX Version 4.1 installation methods.

- **New and Complete Overwrite Installation.** Use this method if:
 - You have a new machine. In this case the hard disk or disks on which you are installing BOS are *empty*. This is the only possible installation method for a new machine.
 - You want to completely overwrite an existing version of BOS that is installed on your system. Be sure to back up your system before doing a New and Complete Overwrite installation. You may want to use the New and Complete Overwrite installation when:
 - You want to install onto a hard disk that contains an existing root volume group that you wish to completely overwrite. For example, this might occur if your root volume group has become corrupted.
 - You want to reassign your hard disks. For example, assume you have four hard disks belonging to one root volume group, and you want to separate these disks into two volume groups. You might first do a Complete Overwrite installation and select the first disk as the installation destination. This disk would become the new root volume group. You could then use System Management Interface Tool (SMIT) to combine the remaining disks into a second (nonroot) volume group. The result would be two separate volume groups. All of the operating system files would be in the root volume group, and you could store user data in the second volume group. The advantage is that you can update or reinstall the operating system without affecting the user's data.

Attention: The New and Complete Overwrite installation overwrites all data on the selected destination disk. This means that after the installation is complete, you will have to manually configure your system using SMIT, the command line, or the Installation Assistant application. If you want to preserve your system configuration and you do *not* need to completely overwrite your root volume group, do *not* use Complete Overwrite. Instead, use the Migration installation. (The Migration installation is only available for AIX Version 3.2 machines.)

- **Migration Installation.** Use this installation method to upgrade AIX Version 3.2 to a version higher or equal to Version 4.1.1 and to upgrade Version 4.1.0 to higher versions of 4.1 while preserving the existing root volume group. This method preserves all file systems except **/tmp**, as well as the root volume group, logical volumes and system configuration files. Migration is the default installation method for AIX Version 3.2 and higher level machines.

During a Migration installation, the installation process determines which optional software products need to be installed on AIX Version 4.1. AIX Version 3.2 software that exists on the system and has been replaced by new software in AIX Version 4.1 is installed at the AIX Version 4.1 level. All files in **/usr/lib/drivers**, **/usr/lib/microcode**, **/usr/lib/methods** and **/dev** are removed from the system, so software support for non-AIX device drivers must be reinstalled. Non-AIX software products remain on the system. They are expected to function if they conform to the binary compatibility

conditions described in “Compatibility between AIX Version 3.2 and AIX Version 4.1” on page C-1.

The following software products are removed from the migrated system:

- AIXwindows Interface Composer
- Remote Customer Services
- AIXwindows Development Environment
- Display PostScript functionality from AIXwindows Run-Time Environment Extensions
- Performance Tools functionality from Extended Commands

In most cases, user configuration files from the previous version of a product are saved when the new version is installed during a Migration installation.

To complete the Migration Installation from AIX Version 3.2 to AIX Version 4.1, you need to have at least 8MB of free disk space. To ensure that you have sufficient free space, it is recommended that you remove the machine’s logical dump device before beginning the installation. Complete the following steps as root user:

1. To display the name of the current dump device, enter:

```
sysdumpdev -L
```

The primary dump device is usually /dev/hd7.

2. Display the names of paging devices. Enter:

```
lspv -a
```

The paging device is usually /dev/hd6.

3. Change the primary dump device to one of the paging devices listed. If the paging space is /dev/hd6, you would enter:

```
sysdumpdev -p /dev/hd6 -P
```

4. Remove the dump device. Enter:

```
rmlv -f hd7
```

If there is insufficient space to complete the Migration Installation during the BOS installation process, a message similar to the following is displayed at the end of the installation:

```
An error occurred while migrating packages.  
Some packages have not been installed.  
Please see /var/adm/ras/devinst.log for details or perform an  
overwrite or preservation install.
```

If space limitations prevent the migration of all software that is usually automatically migrated, the installation program attempts to install the software that is usually installed for a Preservation of Overwrite installation. If there is still not enough disk space available, the minimum set of software required to support the use of the system is installed.

If there is not enough space to migrate all of the usually migrated software, a collection of software called a Migration Bundle will be available when you install additional software later. If the minimum set of software is installed, or if the installation is not performed from a graphics console, a Graphics_Startup Bundle is created. Before installing either of these bundles, you will need to create additional disk space on the machine you want to install. Refer to “Installing Optional Software and Service Updates” on page 6-1 for more information about installing software bundles and for information on migrating or installing

optional software products. "Maintaining Optional Software" on page 7-1 describes how to remove software from the system to free up disk space.

- **Preservation Installation.** Use this installation method when a version of BOS is installed on your system and you want to preserve the user data in the root volume group. However, this method overwrites the **/usr**, **/tmp**, **/var**, and **/** (root) file systems by default, so any user data in these directories is lost. System configuration must be done after doing a Preservation installation.

The **/etc/preserve.list** file contains a list of system files to be copied and saved during a preservation BOS installation. The **/etc/filesystems** file is listed by default. Add the full path names of any additional files that you want to save during the Preservation Installation to the **preserve.list** file. You need to create the **/etc/preserve.list** file on an AIX Version 3.1 machine. On an AIX Version 4.1 system, edit the file that exists on your system.

You can modify the **preserve.list** file and copy it to a diskette to be used during BOS installation. For information about creating a supplemental diskette, see "Customizing the BOS Install Program" on page 4-1. If a **preserve.list** file exists on diskette, the installation program uses this information instead of the default file on the installation media or a user-created file on the system you are installing. If no diskette data exists, the installation program uses the **preserve.list** file you created on the system you are installing. Lastly, the program uses the **preserve.list** file on the installation media if no other file is found.

In addition to the amount of disk space required for BOS installation, be sure you have sufficient disk space in the **/tmp** file system to store the files listed in the **etc/preserve.list** file

To Change the Installation Method

Use the following procedure to change the default installation method if your default installation method is either the Preservation or the Migration installation. If your default installation method is New or Complete Overwrite, then this installation method cannot be changed.

1. Enter 1 to select the System Settings option. The Change Method of Installation screen is displayed.

Change Method of Installation

Type the number of the installation method and press Enter.

1 New and Complete Overwrite
Overwrites EVERYTHING on the disk selected for installation. Warning: Only use this method if the disk is totally empty or if there is nothing on the disk you want to preserve.

2 Preservation Install
Preserves SOME of the existing data on the disk selected for installation. Warning: This method overwrites the usr (/usr), variable (/var), temporary (/tmp), and root (/) file systems. Other product (applications) files and configuration data will be destroyed.

>>> 3 Migration Install
Upgrades the Base Operating System to current release. Other product (applications) files and configuration data are saved.

88 Help ?
99 Previous Menu

>>> Choice [3]:

2. Enter the number indicating the installation method you want to use. The Change Disks Where You Want to Install screen is displayed.

If you need to change the default installation disk, continue with "To Change the Destination Disk" on page 2-12. Otherwise, return to the Installation and Settings screen by pressing Enter and continue with one of the following:

- To Change the Primary Language Environment on page 2-14.
- To Change the Trusted Computing Base Setting on page 2-16.
- To Install from CD-ROM or Tape on page 2-5.

To Change the Destination Disk

The Change Disks Where You Want to Install screen allows you to change the hard disk where BOS will be installed. The location codes of the hard disks are displayed in the Location Code column of the Change Disks Where You Want to Install screen. The format for the location code for a direct-attached disk is: *AA-BB* where *AA* is 00 (zero) and *BB* is the slot number for the hard disk. The format for the location codes for all other hard disks is described in "Location Codes," in *POWERstation and POWERserver Common Diagnostics Information Manual*, order number SA23-2765.

Note: You may wish to keep a record of the location code for the destination disk. In the future, you can use this location code to identify which disk contains the root volume group in order to do system maintenance.

For a New or Complete Overwrite Installation

Use the following procedure to change the destination disk when performing a new or Complete Overwrite installation:

1. If necessary, enter option 1 to select `System Settings` on the Installation and Settings screen. The Change Disk(s) Where You Want to Install screen is displayed.

Change Disk(s) Where You Want to Install

Type one or more numbers for the disk(s) to be used for installation and press Enter. To cancel a choice, type the corresponding number and press Enter. At least one bootable disk must be selected. The current choice is indicated by >>>.

	Name	Location Code	Size (MB)	VG Status	Bootable
1	hdisk0	00-01-00-0,0	305	rootvg	yes
2	hdisk1	00-01-00-1,0	305	rootvg	no

>>>0 Continue with choices indicated above

66 Disks not known to Base Operating System Installation

88 Help ?

99 Previous Menu

>>> Choice [0]:

2. Type the number, but do not press Enter, for each disk you choose. Type the number of a selected disk to deselect it. You can select more than one disk.

You can also specify a supplemental disk by entering 66 (type 66 and press the Enter key) for the **Disks not known to Base Operating System Installation** option. This option opens a new menu that prompts for a device support diskette for the supplemental disk. A supplemental device diskette is only needed when the device will not configure with the generic SCSI or bus attached device drivers. BOS installation configures the system for the disk and then returns to the Change Disk(s) Where You Want to Install screen.

3. Press the Enter key when you finish selecting disks.

After you have selected one or more installation disks, the Installation and Settings Screen is displayed with the selected disks or the newly configured disk listed under `System Settings`.

Continue with one of the following:

- To Change the Primary Language Environment on page 2-14.
- To Change the Trusted Computing Base Setting on page 2-16.
- To Install from CD-ROM or Tape on page 2-5.

For a Preservation or Migration Installation

Use the following procedure to change the destination disk or root volume group when installing AIX Version 4.1 on a Version 3.1 or 3.2 machine.

1. If necessary, display the Change Disks Where You Want to Install screen by doing the following:
 - If the Installation and Settings screen is displayed, then enter option 1 to select the System Settings option.
 - If the Change Method of Installation screen is displayed, then either select an installation method or keep the default method and press Enter.

```
Change Disks Where You Want to Install

Type the number of the disks to be used for the installation and press Enter.

      Level  Disks in Rootvg  Location Code  Size (MB)
>>>  1  3.2    hdisk0        00-11-80-00    200
      2  3.1    hdisk2        00-12-06-00    80
      hdisk1    00-11-05-00    120

88 Help ?
99 Previous Menu

>>> Choice [1]:
```

2. Enter the number indicating the root volume group where you want to install AIX Version 4.1 on the Change Disks Where You Want to Install screen. After you have selected a root volume group, the Installation and Settings screen is displayed.

Attention: It is extremely important to select the correct root volume group because some of the existing data in the destination root volume group will be destroyed during BOS installation.

Continue with one of the following:

- To Change the Primary Language Environment on page 2-14.
- To Change the Trusted Computing Base Setting on page 2-16.
- To Install from CD-ROM or Tape on page 2-5.

To Change the Primary Language Environment

The Set Primary Language Environment screen allows you to change the language environment used to display text and messages after BOS installation. The Cultural Convention field determines the way numeric, monetary, and time characters are displayed.

The Language field determines the language used to display text and system messages. The environments that are available depend on the type of keyboard you are using.

Note: Changes to the primary language environment do not take effect until after BOS is installed and your system is rebooted. The Latin-1 countries (U. S., Canada, Western Europe) and Japan are supported by two code sets. The default code set for the Latin-1 countries is ISO8859-1, and for Japan the default code set is IBM-932. For information about changing language environments and code sets after installation, refer to "Understanding Locale" and "Changing Your Locale" in *AIX Version 4 System Management Guide: Operating System and Devices*. These articles provide information on identifying language conventions and on using the **Manage Language Environment** menu option of the System Management Interface Tool (SMIT) to change your language environment and code set after installation.

Use the following procedure to change the language environment:

1. Enter 2 on the Installation and Settings screen to select the **Primary Language Environment Settings** option. The Set Primary Language Environment screen is displayed.

Set Primary Language Environment		
Type the number for the Cultural Convention (such as date, time, and money), Language, and Keyboard for this system and press Enter, or type 25 and press Enter to create your own combination.		
Cultural Convention	Language	Keyboard
1	C (POSIX)	C (POSIX)
2	Arabic (ISO)	Arabic (ISO)
3	Arabic (PC)	Arabic (PC)
4	Bulgarian	Bulgarian
5	Croatian	Croatian
6	Czech	Czech
7	Danish	Danish
8	Dutch (Belgium)	Dutch (Belgium)
9	Dutch	Dutch
>>> 10	MORE CHOICES	
88	Help ?	
99	Previous Menu	
>>>	Choice [10]:	

2. View the options listed on the Set Primary Language Environment screen. The full list of options may be displayed on more than one screen. Select the **MORE CHOICES** option to view the next screen. Most of the options are a predefined combination of cultural convention, language, and keyboard. There is, however, an option for defining your own combination of cultural convention, language, and keyboard.

3. Select an option on the Set Primary Language Environment screen.
 - If you selected a predefined option, then the Installation and Settings screen is displayed. Skip the rest of this procedure and continue with one of the following:
 - “To Change the Trusted Computing Base Setting” on page 2-16.
 - “To Install from CD-ROM or Tape” on page 2-5.
 - If you selected the option to define your own combination of cultural convention, language and keyboard, then the Set Primary Cultural Convention screen is displayed.
4. Enter the number indicating the cultural convention required on the Set Primary Cultural Convention screen. The Set Primary Language screen is displayed.
5. Enter the number indicating the primary language required. The program displays the Set Keyboard screen.
6. Enter the number indicating the keyboard attached to the system. The Installation and Settings menu is displayed again, reflecting your changes.
7. Continue with one of the following:
 - “To Change the Trusted Computing Base Setting” on page 2-16.
 - “To Install from CD-ROM or Tape” on page 2-5.

To Change the Trusted Computing Base Setting

When you install the Trusted Computing Base (TCB), the trusted path, the trusted shell, and system integrity checking are installed. The trusted path protects your system in case a program is masquerading as the program you want to use. The trusted path tries to ensure that the programs you run are trusted programs.

If you want to enable the TCB setting, you must do so now. You cannot enable the TCB setting later, but you can disable the TCB setting later. When TCB is not installed, installation time is reduced.

To change the setting for installing TCB to **yes**, enter 3. Entering 3 again changes the setting back to **no**.

Continue with “To Install from CD-ROM or Tape” on page 2-5.

Chapter 3. Customizing Your Installation

This chapter provides an overview of tasks you may need to perform after installing the Base Operating System (BOS).

After installing BOS, the operating system will run with default settings: one user (root), the date and time set for where the system was manufactured, and other very general settings. You probably want to change some or all of these settings. Also, you must provide system and network information if you want to communicate with other systems.

The newly installed BOS reboots and starts Installation Assistant, which guides you through completing customization tasks. When you use Installation Assistant immediately after BOS installation, only the tasks that apply to your type of installation display. Once you have exited Installation Assistant through the Tasks Completed-Exit to AIX Login task, all customization tasks except Exit will display the next time you use Installation Assistant.

The graphical interface for Installation Assistant provides step-by-step instructions for completing each customization task. You can also access online help that explains why you would perform each task. For example, much of the processing on a system uses the date and time; therefore, you need to be sure the date and time are set correctly. You also must set up network communications if your system needs to access other systems in a networked environment. If you are familiar with the tasks listed, you can bypass the explanation and instructions and move directly from task to task.

Complete the tasks in the order that Installation Assistant lists them. It is helpful to complete all customization tasks before you use your system. After you exit Installation Assistant, you can log in to your system.

You must have root user authority to use Installation Assistant. To access Installation Assistant later, enter the following command:

```
install_assist
```

To access the graphical interface, you can also select its icon from the AIX Common Desktop Environment. See "Using AIX Common Desktop Environment" in *AIX Version 4 Getting Started* for more information about how to access the graphical interface.

Notes:

1. If your terminal type is not set, the first menu displayed by the ASCII Installation Assistant requires you to enter your terminal type (tty). If you enter an invalid terminal type, this menu redisplay until a valid type is entered.

If you enter a valid terminal type that does not match your terminal, the next screen displayed may be unreadable. In this case, press the break key sequence to return to the Set Terminal Type screen. For most terminal types, the break key sequence is Ctrl-C.
2. If your system was installed by a network installation server, Installation Assistant may not display when the BOS installation program completes.

If your system was installed using a system backup image, or if your BOS installation was customized, or if you selected Migration Installation from AIX Version 4.1, Installation Assistant may not display when the BOS installation program completes.

3. In general, the Installation Assistant does not contain the tasks needed to configure your machine as a server. If you need to configure your system to serve a certain resource, refer to the documentation pertaining to that resource.

Customization Tasks

Complete all customization tasks that apply to your newly installed system.

- Set the system date and time for your time zone.
- Set a root user account password to restrict access to system resources.
- Confirm or change the device you use to install additional software. The device may be a CD-ROM, tape drive, diskette drive, or a local or remote directory.
- Set your system to communicate with other systems and access their resources. Use the worksheets beginning on page 3-5 to gather information necessary to configure network communications. Contact your system and network administrators for the correct information for your system.

If you need to configure your machine as an NFS server, refer to "NFS Installation and Configuration" in *AIX Version 4 System Management Guide: Communications and Networks*.

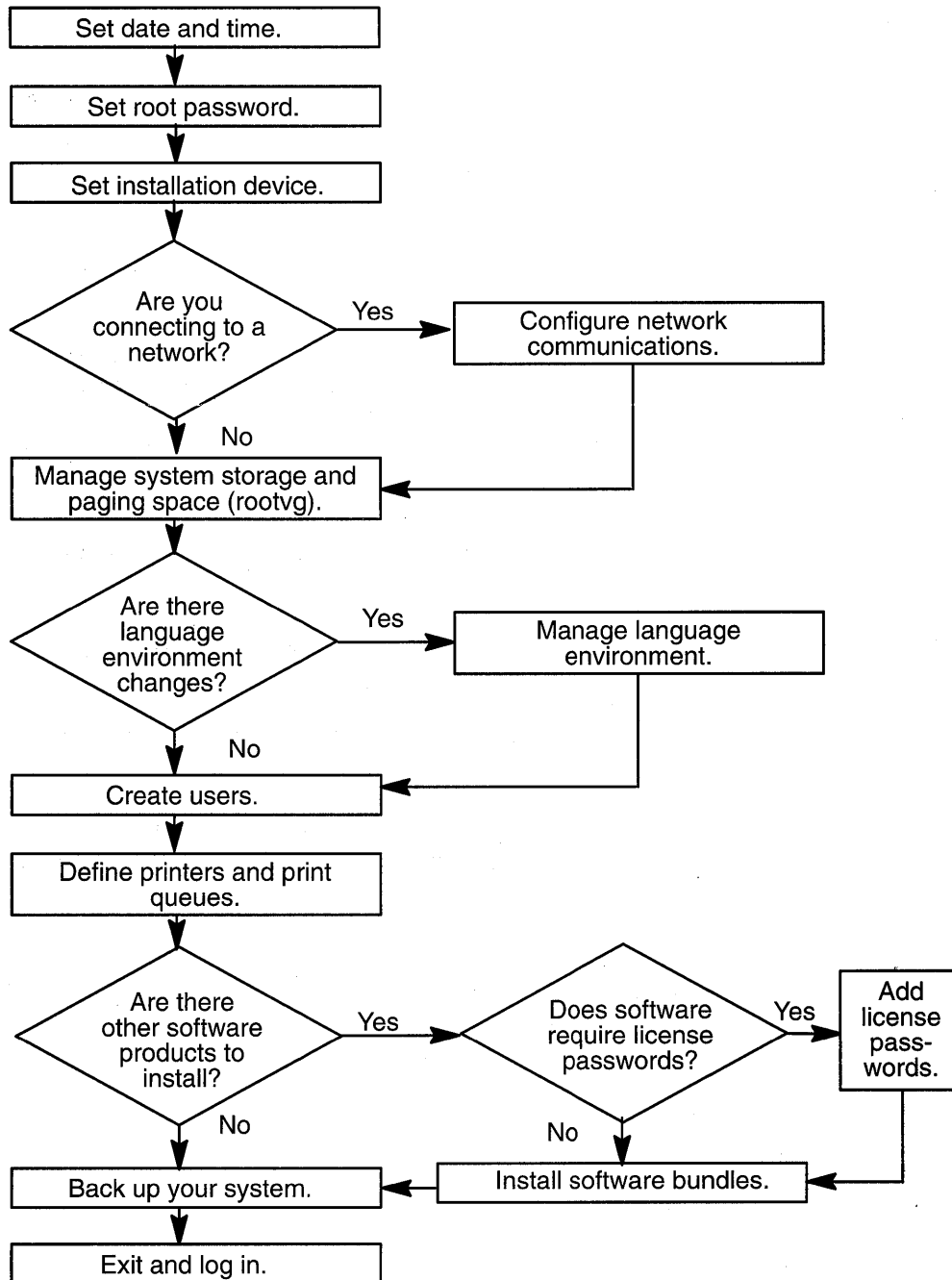
- Check the system storage and paging space needed to install and use additional software applications.

Attention: You may not have enough paging space if you terminate the Installation Assistant with Task Not Complete.

- Change the primary language environment or add a secondary language environment.
- Create user accounts.
- Configure your printer and add print queues for local printers and remote print servers.
- Import any existing volume groups.
- Install additional software and add license passwords, if required, to enable the software to run. If you need to configure the system to serve license passwords, refer to the iFOR/LS documentation.
- Back up the system.
- Exit Installation Assistant and log in to the system.

Flowchart for Installation Assistant Tasks

The following flowchart shows all the tasks in the Installation Assistant task list. The content of the list of tasks that is displayed immediately after BOS installation depends on the method of installation.



Where Do I Go Next?

To learn about late-breaking information that may include information on the configuration process and installed software, you can refer to README files. For information on how to view README files, refer to "Viewing README Files" on page 11-1.

If you are installing from CD-ROM, refer to "Installing Optional Software and Service Updates" on page 6-1 for information on installing software from CD-ROM Volume 2.

For more information on installing optional software, refer to "Installing Optional Software and Service Updates" on page 6-1.

For information on how to mount the InfoExplorer hypertext library, refer to the booklet that accompanied your InfoExplorer CD-ROM.

TCP/IP Minimum Configuration and Startup Worksheet

System Name: _____

Network Administrator: _____

Date: _____

YOUR SYSTEM:

A. Network Interface: _____
Standard Ethernet, IEEE 802.3 Ethernet, or Token-Ring

B. Host Name: _____
Name of your system

C. Internet Address: _____
Address on the Internet. Do not write in leading zeroes.
For example, do not write 002.020.120.010; instead, write 2.20.120.10

D. Subnet Mask: _____
Required if your network uses mask addresses

E. Name Server Internet Address: _____
Required if your network uses a name server

F. Name Server Domain Name: _____
Required if your network uses a name server

G. Default Gateway Internet Address: _____
Required if your network uses a gateway

H. Ring Speed: (4 or 16) _____
Required for Token-Ring

I. Cable Type: (bnc or dix) _____
Required for Ethernet

Updating the Host List Worksheet

Network Administrator: _____

Date: _____

- For each system you want to communicate with in the network, write the system's host name and Internet address. Each host name and Internet address must be unique. Do not enter the leading zeroes in an Internet address. For example, for the Internet address 002.020.120.010 write 2.20.120.10.
- An alias is an optional synonym for the host name.
- Comments are optional notes for your reference.

Host Name	Internet Address	Aliases	Comments

Mounting Remote File Systems Worksheet

System Name: _____

System Administrator: _____

Date: _____

YOUR SYSTEM:

A. Full Path Name of Mount Point: _____
Mount point for server file system

B. Full Path Name of Remote Directory: _____
Path on the server

C. Host Name where Remote Directory Resides: _____
Host name of server

D. **Mount Now** _____ **Add to /etc/filesystems** _____ or **Both** _____
both makes the file system available each time the system starts

E. **/etc/filesystems** Mount Directory on System Restart: **yes** _____ **no** _____
yes makes the file system available each time the system starts

F. Mode for this NFS File System: **read-only** _____ **read-write** _____

Chapter 4. Customizing the BOS Install Program

This chapter describes how to customize subsequent installations once AIX is installed. The steps involve editing the **bosinst.data** file and using it with your installation media.

Introduction to Customizing the BOS Install Program

The first time you install AIX, the Base Operating System (BOS) installation program presents menus from which you must choose setup options. This initial installation also automatically starts a post-installation configuration program, the Installation Assistant. Refer to "Customizing Your Installation" on page 3-1 for more information about Installation Assistant.

For subsequent installations, you can change many aspects of the default BOS install program by editing the **bosinst.data** file. For example, by specifying no prompts, you can customize the program to install BOS without menus. You can also customize BOS installation to bypass the Installation Assistant and start your own configuration script. You can use the **bosinst.data** file to replicate one set of installation settings on other machines. For example, system administrators can create a **bosinst.data** file with settings that can be used to install all the machines they support that have the same configuration.

Notes:

1. Another installation file, **image.data**, can also be modified and used during BOS installation. The **image.data** file contains information describing the image installed during the BOS installation process. This information includes the sizes, names, maps, and mount points of logical volumes and file systems in the root volume group. The installation program also takes input from the **image.data** file regarding defaults for the machine being installed. See *AIX Version 4 Files Reference* for a description of the **image.data** file. The procedure for using the **bosinst.data** file to customize BOS installation can also be used for the **image.data** file. The modified files can be used together to override BOS installation defaults.
2. You can also use the instructions in this chapter to create a supplemental diskette containing a modified **preserve.list** file, which is used during a Preservation Installation. For more information about the **preserve.list** file, see "Installation Methods" on page 2-9.

The **bosinst.data** file directs the actions of the BOS installation program. The file resides in the **/var/adm/ras** directory on the installed machine only, and it is not accessible on the commercial tape or the CD-ROM on which you received AIX.

The **bosinst.data** file contains stanzas with variables set to default values. Each variable is on a new line, in the *Variable=Value* form. A blank line separates each stanza. The information in these stanzas informs the installation program about such things as the method and type of installation, the disks in the machine, and the language used. By editing the file with an ASCII text editor, you can substitute new values for the default variables.

Using a Customized **bosinst.data** File

You must install the Base Operating System (BOS) before you can access and modify the default **bosinst.data** file. Once you have installed BOS, retrieve and edit the file like any other ASCII file. Use one of the following procedures:

- Customize the **bosinst.data** file, then create a backup image of the system to use in subsequent installations from a backup tape.
- Customize a **bosinst.data** file for each client you want to install via the network.
- Customize the **bosinst.data** file, then copy the modified file to a diskette that supplements your installation medium, either tape or CD-ROM.

Refer to “**bosinst.data** File Stanza Descriptions” on page 4-3 and “Example **bosinst.data** Files” on page 4-6 for information about the contents of the file and examples of edited files.

To Create and Use a Backup Tape

1. Customize the **bosinst.data** file:
 - a. Change your directory, with the **cd** command, to the **/var/adm/ras** directory.
 - b. Copy the **/var/adm/ras/bosinst.data** file to a new name, such as **bosinst.data.orig**. This step preserves the original **bosinst.data** file.
 - c. Edit the **bosinst.data** file with an ASCII editor. Refer to the stanza descriptions, starting on page 4-3, for more information about variables and values.
 - d. Copy the edited file to the root directory:

```
cp /var/adm/ras/bosinst.data /bosinst.data
```

2. Create a backup image of the system:

Back up the system, using either the **mksysb** command or the System Management Interface Tool (SMIT). Refer to “Backing Up Your System” on page 8-1 for more information.

BOS installations from this backup will behave according to your customized **bosinst.data** file.

To Create and Use a Client File

Create one customized **bosinst.data** file for each client and, using the Network Installation Manager (NIM), define the files as NIM resources. Refer to *AIX Network Installation Management Guide and Reference* for more information about how to use the **bosinst.data** file as a resource in network installations.

To Create and Use a Supplementary Diskette

This procedure describes how to create the supplementary diskette and use it in future installations:

1. Customize the **bosinst.data** file:
 - a. Change your directory, with the **cd** command, to the **/var/adm/ras** directory.
 - b. Copy the **/var/adm/ras/bosinst.data** file to a new name, such as **bosinst.data.orig**. This step preserves the original **bosinst.data** file.

- c. Edit the **bosinst.data** file with an ASCII editor. Refer to the stanza descriptions, starting on page 4-3, for more information about variables and values.
 - d. Create an ASCII file consisting of one word:


```
data
```
 - e. Save the new ASCII file, naming it **signature**.
2. Create the diskette and use it for installation:
- a. Back up the edited **bosinst.data** file and the new **signature** file to diskette with the following command:


```
ls ./bosinst.data ./signature | backup -iqv
```

OR

If you create a bundle file named `mybundle`, back up the edited **bosinst.data** file, the new **signature** file, and the bundle file to diskette with the following command:

```
ls ./bosinst.data ./signature ./mybundle | backup -iqv
```
 - b. Put the diskette in the diskette drive of the target machine you are installing.
 - c. Boot the target machine from an install medium (tape, CD-ROM, or network) and install AIX.

The BOS installation program will use the diskette file, rather than the default **bosinst.data** file shipped with the installation media.

bosinst.data File Stanza Descriptions

This section describes the contents of the **bosinst.data** file. Two example files follow the stanza descriptions.

control_flow Stanza

The `control_flow` stanza contains variables that control the way the installation program works:

CONSOLE Specifies the full path name of the device you want to use as the console. This value is blank in the default **bosinst.data** file because the file specifies a prompted installation, which requires you to press a key to identify your console. (Instructions for which key to press are displayed on the screen.) If you change the **PROMPT** variable to **no**, you must specify a console here.

INSTALL_METHOD

Specifies a method of installation: **migrate**, **preserve**, or **overwrite**. The default value is initially blank. The installation program assigns a value, depending on which version of AIX was previously installed. See "Installation Methods" on page 2-9 for more information about installation methods.

The default method of installation is **migrate** if AIX 3.2 or 4.1.0 is on the machine. The default is **preserve** if AIX 3.1 or 4.1.1 or greater is on the machine. If no AIX exists, the default method is **overwrite**.

PROMPT Specifies whether the installation program uses menus from which you makes choices. The possible values are **yes** (default) and **no**.

Note: You must fill in values for all variables in the locale stanza if you set the **PROMPT** variable to **no**. Similarly, if **PROMPT** equals **no**, you must supply values for all variables in the control_flow stanza, with two exceptions: the **ERROR_EXIT** and **CUSTOMIZATION_FILE** variables, which are optional.

Attention: Fill in values for all variables in the target_disk_data stanza if you set the **PROMPT** variable to **no**. The BOS installation program assigns target disks for blank variables. You can lose data if the install program assigns a disk where you store data.

EXISTING_SYSTEM_OVERWRITE

Confirms that the install program will overwrite existing files. This variable is applicable only for a nonprompted overwrite installation. The possible values are **no** (default) and **yes**.

If the installation program detects an existing volume group when **PROMPT** is set to **no** and **EXISTING_SYSTEM_OVERWRITE** is set to **no**, an error message instructs you to set installation parameters.

INSTALL_X_IF_ADAPTER

Installs AIXwindows. The possible values are:

yes (default)	Install AIXwindows if the selected console is a graphics terminal
no	Do not install AIXwindows
all	Always install AIXwindows.

RUN_STARTUP

Starts the Installation Assistant on first boot after the BOS installation completes. The possible values are **yes** (default) and **no**.

BOS starts either the ASCII or the graphical version of Installation Assistant, depending on the type of display adapter in the machine.

RM_INST_ROOTS

Removes all files and directories in the **/usr/lpp*/inst_roots** directories. The possible values are **no** (default) and **yes**.

The **/usr/lpp/bos/inst_roots** directories must remain if the machine will be used as a network server. You can, to save disk space, set this value to **yes** if the machine will not be a network server.

ERROR_EXIT Starts an executable program if an error occurs in the installation program. The default value is blank, which signals BOS installation to use a command that is shipped on the installation media. The command starts an error message routine when the installation program halts due to an error. As an alternative to the default, you can enter the path name of your own script or command for a customized error routine.

CUSTOMIZATION_FILE

Specifies the path name of a customization file you create. The default value is blank. The customization file is a script that starts immediately after the installation program concludes.

TCB Specifies whether you want to install the Trusted Computing Base (TCB). When you install the TCB, the trusted path, the trusted shell, and system

integrity checking are installed. The TCB must be installed and initialized when the operating system is installed. The TCB cannot be installed later. By not installing the TCB, installation time is reduced. The possible values are **no** (default) and **yes**.

INSTALL_TYPE

Specifies what software to install on the machine. The values are **full** (full-function configuration), **client** (client configuration), and **personal** (personal workstation configuration). The **full** configuration includes all the software in **client** and **personal**. Change **full** to **client** or **personal** if you want to install one of these subsets of the full-function configuration.

The default setting depends on the software configuration that you purchased. For example, if the installed machine has a full-function (server) configuration, the setting will be **full**. You should not change the default setting.

BUNDLES

Specifies what software bundles to install. Type the full path name of each bundle file. Be sure there is sufficient disk space and paging space on the target machine for the software you specify in the **BUNDLES** variable.

This list of bundle file names is limited to 139 bytes. If your list of bundle file names is longer than 139 bytes, use the **cat** command to combine the bundle files into a single custom bundle file and enter the name of your custom bundle file in this field.

If you are installing from CD-ROM or using a network installation server, specify the full path name of each bundle file as follows:

```
/SPOT/usr/sys/inst.data/sys_bundles/BundleFileName
```

If you are installing from tape, to specify system-defined bundles on the product media, use the full path name of each bundle file as follows:

```
/usr/sys/inst.data/sys_bundles/BundleFileName
```

If you are using a **bosinst.data** diskette to define your own bundle files, specify the full path name of each bundle file as follows:

```
././DirectoryName/BundleFileName. For example, if you put a bundle file named mybundle in the root directory, the full path name would be ././mybundle.
```

If you are using Preservation Installation, create bundle files before you start installation. Create the files in **/home** and specify the full path name of each bundle file as follows:

```
/home/BundleFileName
```

target_disk_data Stanza

The **target_disk_data** stanza contains variables for disks in the machine where the program will install BOS. The default **bosinst.data** file has one **target_disk_data** stanza, but you can add new stanzas to install BOS on multiple disks, one stanza for each disk.

The installation program determines a target disk by checking the variables in hierarchical order. For example, if the **LOCATION** variable specifies a location code, the program installs BOS on that disk, regardless of the remaining variables.

If you accept the default values, which are blank, the installation program chooses a target disk based on the initial hardware query.

Attention: You can lose data if you leave the variables blank in a nonprompted installation.

LOCATION Specifies a location code for the disk where the program will install BOS. The default value is blank. If you do not specify a value, the installation program assigns a value based on the next two variables. “Vital Product Data and Location Codes” in *POWERstation and POWERserver Common Diagnostics Information Manual* provides information about the format of location codes.

SIZE_MB Specifies the formatted size of the disk, in megabytes, where the program will install BOS. The default value is blank. You can specify the size of your target disk by typing the number of megabytes available on the formatted disk. Also, you can type `largest` if you want to use the largest disk (that has not already been selected) found by the installation program.

Note: Use the `bootinfo -s hdiskname` command to find the correct formatted size to use in this variable. Another method is to use a number that is 95 percent of the total disk size. You cannot use alpha characters, such as *MB* or *megabytes*, when specifying a numerical size.

HDISKNAME Specifies the path name of the target disk. The default value is blank. To name a target disk, use the *hdiskname* format, where *hdiskname* is the device name of your disk (for example, **hdisk0**).

locale Stanza

The locale stanza contains variables for the primary language the installed machine will use. Refer to “Understanding Locales” in *AIX Version 4 System Management Guide: Operating System and Devices* for a list of languages and the format to use when editing variables.

BOSINST_LANG

Specifies the language the installation program uses for prompts, menus, and error messages. The default value is blank.

CULTURAL_CONVENTION

Specifies the primary locale to install. The default value is blank.

MESSAGES Specifies the locale for messages catalogs to install. The default value is blank.

KEYBOARD Specifies the keyboard map to install. The default value is blank.

Example bosinst.data Files

These example **bosinst.data** files show edits you might make for the following kinds of installations:

- mksysb Backup Restoration
- Nonprompted Installation

The depicted values illustrate formatting only and do not apply to your installation.

mksysb Backup Restoration

```
control_flow:
  CONSOLE=
  INSTALL_METHOD = overwrite
  PROMPT = yes
  EXISTING_SYSTEM_OVERWRITE = yes
  INSTALL_X_IF_ADAPTER = no
  RUN_STARTUP = no
  RM_INST_ROOTS = no
  ERROR_EXIT =
  CUSTOMIZATION_FILE =
  TCB =
  INSTALL_TYPE = full
  BUNDLES =

target_disk_data:
  LOCATION = 00-00-0S-00
  SIZE_MB =
  HDISKNAME =

target_disk_data:
  LOCATION = 00-00-0S-01
  SIZE_MB =
  HDISKNAME =

locale
  BOSINST_LANG = en_US
  CULTURAL_CONVENTION = en_US
  MESSAGES = en_US
  KEYBOARD = en_US
```

Nonprompted Installation

```
control_flow:
  CONSOLE = /dev/lft0
  INSTALL_METHOD = preserve
  PROMPT = no
  EXISTING_SYSTEM_OVERWRITE = yes
  INSTALL_X_IF_ADAPTER = yes
  RUN_STARTUP = yes
  RM_INST_ROOTS = no
  ERROR_EXIT =
  CUSTOMIZATION_FILE =
  TCB =
  INSTALL_TYPE = full
  BUNDLES =

target_disk_data:
  LOCATION =
  SIZE_MB = largest
  HDISKNAME =

locale
  BOSINST_LANG = da_DK
  CULTURAL_CONVENTION = da_DK
  MESSAGES = C
  KEYBOARD = da_DK
```

Chapter 5. Installing BOS from a System Backup

This chapter describes how to install the Base Operating System (BOS) from a backup image of a previously installed system.

Introduction to Backup Installations

You can install a system from a backup image that is stored either on tape or in a file. This chapter describes the procedure for installing a backup image stored on tape. To install a backup stored in a directory on your network installation server, refer to *AIX Network Installation Management Guide and Reference*.

Typical uses for a backup are to:

- Restore a corrupted system.
- Install and configure software on one system, then duplicate that installation on other systems.

This discussion refers to *source system* and *target system*. The source system is the system from which you created the backup copy; the target system is the system on which you are installing the backup copy.

Installing a system from backup reduces, and often eliminates, repetitive installation and configuration tasks. For example, a backup installation can copy optional software installed on the source system, in addition to the basic operating system. The backup image also transfers many user configuration settings.

An installation from backup operates in either prompted or nonprompted mode, depending on conditions set in the **bosinst.data** file and on compatibility between the backup image and the installed machine. See “Customizing the BOS Installation Program” on page 4-1 for information on how to modify the **bosinst.data** file to preset installation parameters when you create a system backup.

The procedure in this chapter requires the backup copy to be created using AIX Version 4.1. AIX provides different ways to create backups: either the SMIT Backup the System menu or the command line, using the **mksysb -i TargetDevice** command. See “Backing Up Your System” on page 8-1 for more information about the System Management Interface Tool (SMIT) method.

During the installation of the backup, the system checks to see if the target system has enough disk space to create all the logical volumes that are stored on the backup. If there is not enough disk space, the system prompts you to choose more destination hard disks. When file systems are created on the target system, they are the same size as they were on the source.

After the installation completes, the Object Data Manager (ODM) and **/dev** directory on the target system are reconfigured. The installation modifies device attributes for all files beginning with ‘Cu’ in the **/etc/objrepos** directory on the target system. The installation also deletes and recreates all files in the target **/dev** directory.

Setup Considerations

Consider altering passwords and network addresses if you use a backup to make master copies of a source system. Copying passwords from the source to a target system can create security problems. Also, if network addresses are copied to a target system, duplicate

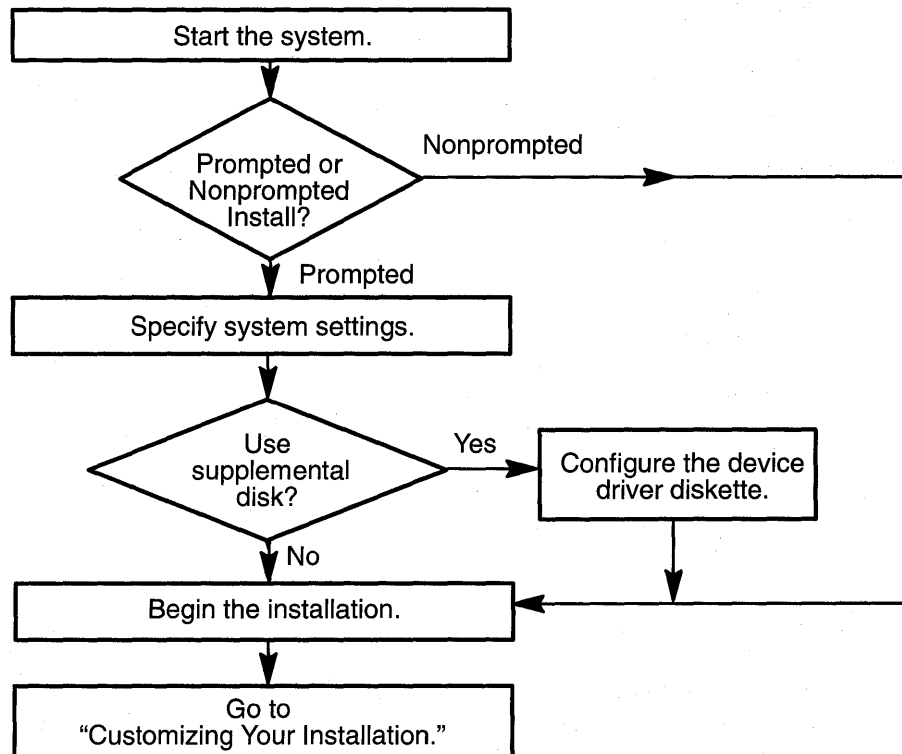
addresses can disrupt network communications. See "Source and Target Differences" on page 9-7 for more information.

Use the following techniques if you do not want certain information saved on your target system:

- Use a backup image that was created before the source system was configured with this information.
- Manually modify this information on the target system immediately after installing the backup image.

Flowchart for Backup Installations

The flowchart outlines basic steps to install the Base Operating System (BOS) from backup.



To Install BOS from a System Backup

This section details the procedure for installing BOS from a system backup.

Prerequisites

The following conditions should be met before beginning the procedure:

- All hardware must already be installed, including external devices, such as tape and CD-ROM drives.
- Obtain the system key for the lock (if present) on your system unit.

- Obtain your system backup image:

Tape

BOS tapes, created in one of two ways:

- Using the SMIT Backup the System menu

OR

- From the command line, using the **mksysb -i Target** command.

Network

The path to your backup image file. Refer to *AIX Network Installation Management Guide and Reference* for information about installing a backup across a network.

To Start the System

Use this procedure to start your machine:

1. Skip to step 2 if you have a new system or your system is turned off. If the system is already turned on, do the following to put the backup tape in the tape drive and then shut down the system:
 - a. Log in as root user.
 - b. Put the backup tape in the drive.
 - c. Enter the following command:

```
shutdown -F
```

The `Halt completed ...` message appears when the shutdown process completes.

Note: On some models, the **shutdown** command turns off the power to the system unit. It does not, however, automatically turn the power switch to the Off position.
 - d. Turn the system unit power switch to the Off (0) position when the shutdown process completes.
2. Turn the system key (if present) to the Service position.
3. Turn on all attached external devices, such as terminals, CD-ROM drives, tape drives, monitors, and external disk drives. Do not turn the system unit on until step 6. Turning on the external devices first is necessary so that the system unit can identify them during the startup (boot) process.
4. If you have not already put the backup tape in the drive, do so now.

Notes:

- You may find that on specific hardware the tape drive door will not open while the system unit is turned off. If you have trouble opening the tape drive door during installation, use the following procedure:
 - a. Turn the system unit on.
 - b. Put the tape in the drive.
 - c. Turn the system unit off and wait 30 seconds.
- On some models that have a door to the tape drive, there may be a waiting period of up to three minutes before the tape drive door opens after you have pressed the button to open the tape drive. Some models also require that the button for the tape drive door be held in the pressed position for a few seconds before the tape drive door will open.

5. If you are not using an ASCII terminal, skip to step 6. If you are using an ASCII terminal, set the communications options as follows:

- Line Speed (baud rate) = 9600
- Word Length (bits per character) = 8
- Parity = no (none)
- Number of Stop Bits = 1
- Interface = RS-232C (or RS-422A)
- Line Control = IPRTS

Set the keyboard and display options as follows:

- Screen = normal
- Row and Column = 24x80
- Scroll = jump
- Auto LF (line feed) = off
- Line Wrap = on
- Forcing Insert = line (or both)
- Tab = field
- Operating Mode = echo
- Turnaround Character = CR
- Enter = return
- Return = new line
- New Line = CR
- Send = page
- Insert Character = space

Note: If your terminal is an IBM 3151, 3161, or 3164, press the Ctrl+Setup keys to display the Setup Menu and follow the on-screen instructions to set these options. If you are using some other ASCII terminal, refer to the appropriate documents for information about how to set these options. Some terminals have different option names and settings than those listed here.

6. Turn the system unit power switch from the Off (0) to the On (1) position. The system begins booting from the backup tape, which might move back and forth, or the CD-ROM.

Note: You can boot from production media (tape or CD-ROM) if your backup tape fails to boot. The initial Welcome screen includes an option to enter a maintenance mode in which you can continue the installation from your backup tape. Refer to "Troubleshooting an Installation from a System Backup" on page 9-7 for more information.

After several minutes, c31 is displayed in the LED.

7. Choose the system console, if necessary.

If you have more than one console on your machine, each terminal and direct-attached display device may present a screen that instructs you to press a key to identify your system console. If these screens appear, press the specified key on the device you choose for your system console. (The system console is the keyboard and display device used for installation and system administration.) Press a key on only one console.

However, if the **bosinst.data** file lists a valid display device for the **CONSOLE** variable, you do not manually choose a system console. Read "Customizing the BOS Install Program" on page 4-1 for more information about the **bosinst.data** file.

8. The type of screen that appears next depends on whether you are attempting a prompted or nonprompted installation. Go to one of the following sections:
 - “Nonprompted Installation” on page 5-5 if the backup image is configured to install automatically, without having to respond to the installation program.

OR

- “Prompted Installation” on page 5-6 if you need to use menu prompts to install the backup image. Use these instructions also if a nonprompted installation halts and the Welcome to Base Operating System Installation and Maintenance screen appears.

Nonprompted Installation

A successful nonprompted installation requires no further instructions because the installation is automatic. The sequence of events follows:

1. The first BOS installation screen appears on the monitor. This screen is untitled and blank, except for a zero digit in the bottom left corner.

The screen pauses for five to 10 seconds before the next screen appears. If you wish, you can use the short pause to interrupt the automatic installation and start a prompted session. Do this by typing three 000 (zeros) at the terminal. The installation will continue in a prompted mode.

Note: The nonprompted installation stops and prints the Welcome to Base Operating System Installation and Maintenance screen if the backup image holds configuration information incompatible with the machine you are installing. For example, if the image specifies a target disk that does not match what is in the machine, BOS installation starts a prompted session in which you can modify the installation.

2. The Installing Base Operating System screen appears next.

Installing Base Operating System		
Please turn the system key to the NORMAL Position.		
Please wait..		
Approximate % tasks complete	Elapsed Time (in minutes)	
20	15	Restoring Base Operating System

This second screen signals the start of the BOS installation, reporting the rate of completion and duration.

The Please turn the system key to the NORMAL Position message appears on this screen if the key is not already in the Normal position. You can turn the key at any time while the screen is showing. The installation continues regardless of the key position.

3. The system reboots when the installation completes.

The reboot is automatic if the system key (if present) is in the Normal position. Otherwise, another screen directs you, at the end of the installation, to turn the key to Normal and press Enter. The system reboots, in this case, when you press the Enter key.

Prompted Installation

The Welcome to the Base Operating System Installation and Maintenance screen is the first screen to appear for prompted installations. This and subsequent BOS installation screens provide help text, which you can view by entering 88.

```

Welcome to Base Operating System
Installation and Maintenance

Type the number of your choice and press Enter.

1 Start Install Now with Default Settings
2 Change/Show Installation Settings and Install
3 Start Maintenance Mode for System Recovery

88 Help ?
Choice:
```

1. Choose the **Change/Show Installation Settings and Install** option.

The System Backup Installation and Settings screen appears.

```

System Backup Installation and Settings

Either type 0 and press Enter to install with current settings, or type
the number of the setting you want to change and press Enter.

Setting:                               Current Choice(s):
1 Disk(s) Where You Want to Install..... hdisk0...
  Use Maps..... Yes
2 Shrink File Systems..... Yes

>>> 0 Install with the settings listed above.

88 Help ?
99 Previous Menu

>>> Choice: 0
```

This screen shows current settings for the system. An ellipsis follows the disk listed in the first line if there is more than one disk selected.

2. Either accept the settings or change them. For more information on using map files, see "Backing Up Your System" on page 8-1.

To accept the settings and begin the installation, skip to step 8.

To change the settings, continue with step 3.

3. Enter 1 in the System Backup Installation and Settings screen to specify disks where you want to install the backup image. The Change Disk(s) Where You Want to Install screen appears.

```
Change Disk(s) Where You Want to Install

Type one or more numbers for the disk(s) to be used for installation and press
Enter. To cancel a choice, type the corresponding number and press Enter. At
least one bootable disk must be selected. The current choice is indicated by >>>.

      Name      Location Code  Size (MB)  VG Status  Bootable  Maps
>>> 1 hdisk0    00-00-0S-0,0  80         rootvg    yes       yes
      2 hdisk1    00-01-00-1,0  60         not in VG  yes       no

>>> 0 Continue with choices indicated above.

66 Disks not known to Base Operating System Installation

88 Help ?
99 Previous Menu

>>> Choice [0]:
```

This screen lists all available disks on which you can install the system backup image. The >>> (three greater-than signs) mark each selected disk.

4. Type the number and press Enter for each disk you choose. Type the number and press Enter of a selected disk to deselect it. You can select more than one disk.

You can also specify a supplemental disk by entering 66 (type 66 and press the Enter key) for the **Disks not known to Base Operating System Installation** option. This option opens a new menu that prompts for a device support diskette for the supplemental disk. BOS installation configures the system for the disk and then returns to the Change Disk(s) Where You Want to Install screen.

5. Press the Enter key when you finish selecting disks.

The screen that appears next depends on whether *all* the selected disks have map files available:

- If one or more selected disks have no maps, BOS installation returns directly to the System Backup Installation and Settings screen. Skip to step 7.
- If all selected disks have maps, the Change Use Maps Status screen appears, where you choose either to use or not use the maps for installation. Continue with step 6.

To preserve the placement of files during a future restoration of the backup, you can create map files before backing up a system. Map files, stored in the **/tmp/vgdata/rootvg**

directory, match the physical partitions on a drive to its logical partitions. Create map files either with the SMIT Backup the System menu or the **mkszfile** command, or specify the **-m** option when you run the **mksysb** command.

For more information about map files, see "Using Map Files for Precise Allocation" in *AIX Version 4 System Management Guide: Operating System and Devices*.

6. Enter either 1 or 2 in the Change Use Maps Status screen to specify whether the installation program is to use maps.

When you complete this choice, BOS installation returns to the System Backup Installation and Settings screen.

7. Decide whether BOS installation is to shrink file systems on the disks where you install the system. When you choose this option, the logical volumes and file systems within a volume group are recreated to the minimum size required to contain the data. This reduces wasted free space in a file system.

File systems on your backup image might be larger than required for the installed files. Press the 2 key to toggle the **Shrink File Systems** option between **Yes** and **No** in the System Backup Installation and Settings screen. The default setting is **No**.

Note: Shrinking the file system will disable the use of maps.

8. Enter 0 to accept the settings in the System Backup Installation and Settings screen.

The Installing Base Operating System screen appears, reporting the rate of completion and duration. Step 2 on page 5-5 shows an example depiction of this screen.

The Please turn the system key to the NORMAL Position message appears on this screen if the key is not already in the Normal position. You can turn the key at any time while the screen is showing. The installation continues regardless of the key position.

An untitled screen temporarily replaces the Installing Base Operating System screen if you specified a supplemental disk in step 4 on page 5-7. This screen pops up about halfway through the installation, instructing you to again put the device-support diskette in the drive and press the Enter key. BOS installation reconfigures the supplemental disk, then returns to the Installing Base Operating System screen, which continues to report the progress of the installation.

The system reboots automatically when the installation completes.

The reboot is automatic if the system key (if present) is in the Normal position. Otherwise, a new screen directs you, at the end of the installation, to turn the key to Normal and press Enter. The system reboots, in this case, when you press the Enter key.

Where Do I Go Next?

In new installations, a post-installation configuration program, the *Installation Assistant*, starts automatically when BOS installation reboots the system. Whether this configuration program starts following your backup installation depends on settings in your backup image:

- If the **bosinst.data** file in your backup image specifies a customization script, the Installation Assistant does not start. The script, which takes the place of the Installation Assistant, configures your system before the BOS installation program reboots.
- If the system on which your backup image was made has not been configured with the Installation Assistant, the Installation Assistant starts immediately following the BOS installation reboot.

- If the system on which your backup image was made has already been configured with the Installation Assistant, the system prompt appears immediately following the BOS installation reboot. The Installation Assistant does not start.

Go to “Customizing Your Installation” on page 3-1 to configure the installed machine with optional software, network communications, user accounts, and other settings.

If the Installation Assistant does not start automatically, and you do not want to configure the machine, the installation from backup is complete.

Chapter 6. Installing Optional Software and Service Updates

This chapter describes how to install optional software and service updates onto standalone systems using the System Management Interface Tool (SMIT) or one of two Visual System Management (VSM) applications.

Introduction to Installing Software and Service Updates

After the Base Operating System (BOS) is installed, you may want to install optional software or service updates. This chapter discusses software installation and applying service updates, but does not discuss committing service updates after installation. For information on committing, rejecting, and removing software after installation, refer to “Maintaining Optional Software” on page 7-1 and “Optional Software Installation and Update Concepts” on page A-1.

For information on cleaning up after an interrupted software installation, refer to “Cleaning Up Optional Software and Service Updates” on page 9-8.

“Compatibility between AIX Version 3.2 and AIX Version 4.1” on page C-1 discusses compatibility between the two release levels and lists the compatibility software for machines running mixed levels of AIX. It is recommended that you install this compatibility software if you did not perform a Migration Installation.

Information about individual software products is available in InfoExplorer and is not included in this book. To view the software products information:

1. Install the Package Installation Database for Current Media software package (**pkg_gd**) using the instructions in this chapter.
2. Enter the following command:

```
info -l lp_info
```

To view information about individual InfoExplorer databases, click the **Search** option from the first screen that is displayed (the List of Licensed Programs screen), and search for Base System InfoExplorer Databases. Check to see if there is migration information for the databases you want to install.

Optionally installed software includes the following:

Optional Software Products. An *optional software product* is software that is not automatically installed on your system when you install BOS.

Service Updates. A *service update* is software that corrects a defect in or adds new function to the BOS or an optional software product.

Service updates are organized by *filesets*. Filesets are sets of files that are part of the same optional software product. Some products, such as InfoExplorer, are not organized as fileset updates. Such products can only be updated by installing a newer version.

For more information on updating software, see “Optional Software Installation and Update Concepts” on page A-1.

Installing and Running Hardware Diagnostics

If your system is not equipped with a CD-ROM drive, install the hardware diagnostics bundle from your installation media to enable concurrent hardware diagnostics.

If your system is equipped with a CD-ROM drive, use the **diag** command to run concurrent diagnostics from the diagnostics CD-ROM. Run diagnostics in the standalone mode by booting from the diagnostics CD-ROM.

Software Licensing

Software is selected for installation if it is in the bundle you choose and on the installation media. Normally, software requiring a license is only selected if you have the license for that software. The SMIT Custom Install and the VSM Install and Update Software Manager applications do, however, allow you to install software requiring a license even if you do not have a license. You will not be able to run this software, however, until you have obtained the license.

Software Packaging

Software products include those shipped with AIX and those purchased separately. Each software product can contain separately installable units. The following explains how software products are organized:

Licensed Program

A licensed program is a complete software product including all packages associated with that licensed program. For example, **bos** (the Base Operating System) is a licensed program.

Package

A group of separately installable units that provide a set of related functions. For example, **bos.net** is a package.

Fileset

An individually installable option. Filesets provide a specific function. For example, **bos.net.tcp.nfs 4.1.0.0** is a fileset.

Fileset Update An individually installable update. Fileset updates either enhance or correct a defect in a previously installed fileset. For example, **bos.net.tcp.nfs 4.1.0.3** is a fileset update.

Bundle

A collection of packages or individual filesets that suit a specific purpose, such as providing personal productivity software or software for a client machine in a network environment. A set of bundles is provided with BOS which contain a specific set of optional software. You can, however, create your own bundle by using the Install and Update Software Manager desktop application. These applications provide a list of individually installable filesets from the different packages. You can select the filesets you want installed whether or not they belong to the same package group. A bundle may include several licensed programs or parts of several licensed programs.

InfoExplorer databases are not automatically installed when you install BOS or a predefined bundle. Install the individual InfoExplorer databases you require, using the instructions in this chapter, before or after installing bundles.

The following are examples of the predefined bundles:

- *Client Bundle*. A collection of commonly installed software packages for single-user machines running AIX in a standalone or networked client environment. This bundle minimizes disk utilization by only installing

software required for a single-user machine rather than installing server code and the other software available on the installation media.

- *Server Bundle*. A collection of software packages for machines running AIX in a multiuser standalone or networked environment. This bundle emphasizes functionality over disk utilization.
- *Personal Productivity Bundle*. A collection of software packages used for graphical desktop systems running AIX and personal computer (PC) applications.
- *Application Development Bundle*. A collection of software packages used for developing application programs.
- *Hardware Diagnostic Bundle*. A collection of software packages that provides hardware diagnostic tools.
- *Graphics_Startup Bundle*. A collection of software packages that provides support of graphical environments. Graphical support may be automatically installed on some systems during BOS installation. See “Software Installed Automatically during BOS Installation” on page B-1 for more information.

The following bundles only appear in the Maintain Installed Software VSM application:

- *All Licensed Bundle*. A collection of software packages that includes all the software on the installation media for which you have a license.
- *Update Bundle*. One or more fileset updates.
- *Maintenance Level Bundle*. A collection of software packages that updates your system to the latest level.

The following bundle only appears if there was not enough disk space available to complete a Migration Installation during the BOS installation process:

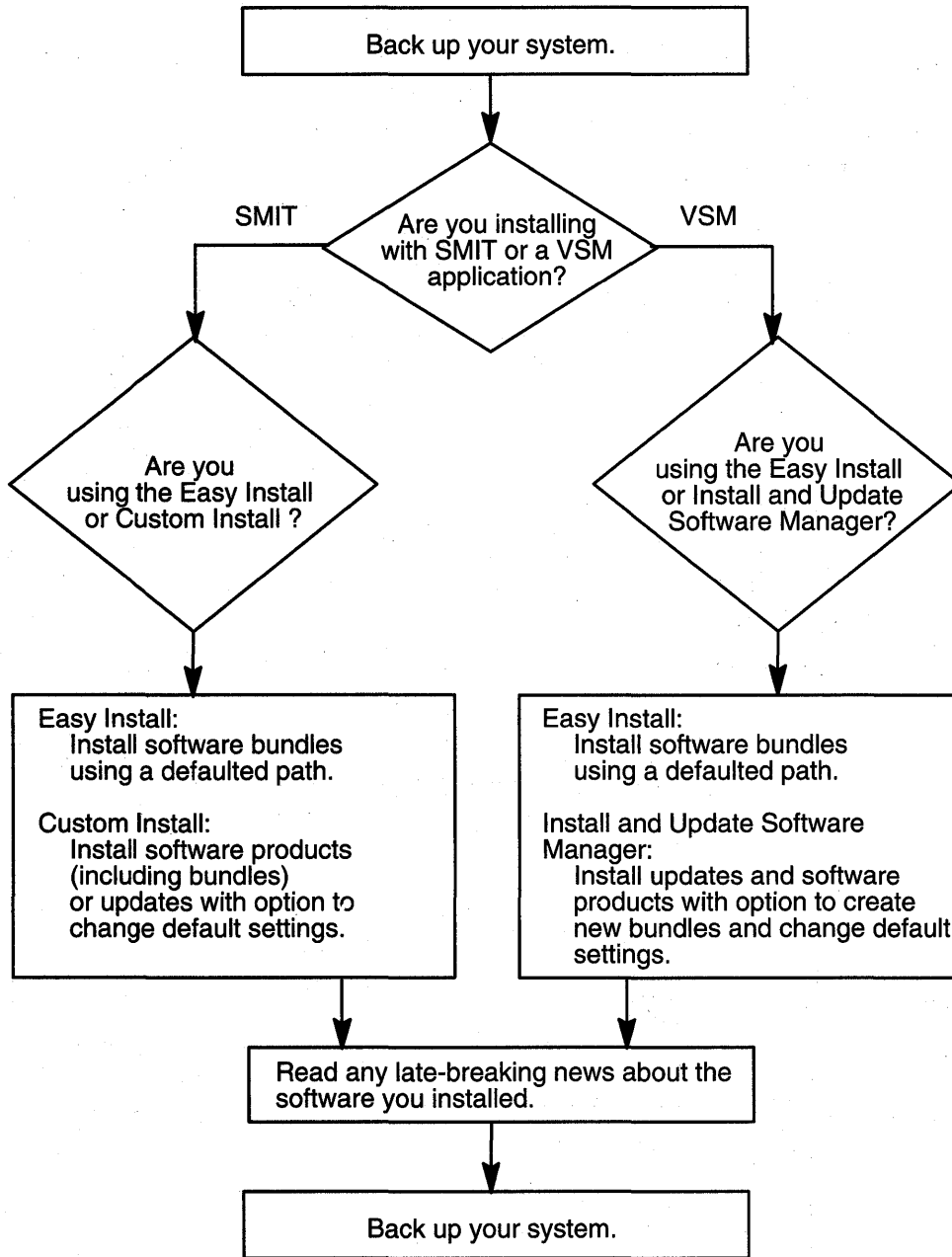
- *Migration Bundle*. A collection of migration software packages. Install this bundle if you want to complete the Migration Installation. You may also need to install the *Graphics_Startup Bundle*. See “Migration Installation” on page 2-9 for more information.

Migrating Software to AIX Version 4.1

A BOS Migration Installation only migrates those optional software products that do not run on BOS Version 4.1. Any previously installed products that can be run on BOS Version 4.1 will not be altered during the Migration Installation. In cases where a BOS Migration Installation does “migrate” a product, it does so by running the **installp** command to install the latest version of that product at the base level. After installation, the product is in the committed state, and the previous version of the product is deleted from the system. When the latest base level of a product is installed (whether it is installed by the user or through a Migration Installation), the user configuration files from the previous version of the product are saved. In some cases you may need to compare the previous configuration files with the new ones and resolve any differences.

Flowchart for Installing Optional Software and Service Updates

The flowchart outlines steps for installing optional software and service updates.



To Install Optional Software and Service Updates

After completing the prerequisites in this section, you need to decide whether to install software with the SMIT or one of the Visual System Management applications with the graphical interface. Descriptions of both types of applications are included in this section.

Before you install optional software and service updates, refer to the specific instructions that accompany your installation media. If you ever need to reinstall your system, be sure to refer to the installation media instructions.

Note: Vendors who want information about how to develop software products that are to be installed using the **installp** command should refer to “Software Product Packaging” in *AIX Version 4 General Programming Concepts: Writing and Debugging Programs*.

Determine Your Starting Point

If either of the following conditions apply to you, go to the referenced item; otherwise, continue with the procedures in this chapter.

- If you need to commit or remove previously installed software, go to the chapter “Maintaining Optional Software” on page 7-1.
- If you are using a network installation server, refer to *AIX Network Installation Management Guide and Reference*.

Prerequisites

Before installing optional software or service updates, complete the following prerequisites:

1. BOS AIX Version 4.1 must be installed on your system. If BOS is not yet installed on your system, go to “Installing BOS from CD-ROM or Tape” on page 2-1, or if you are installing over a network, refer to *AIX Network Installation Management Guide and Reference*.
2. The software you are installing is available on either CD-ROM, tape, or diskette, or it is located in a directory on your system (for example, the **/usr/sys/inst.images** directory).
3. If you are installing service updates and do not have a current backup of your system, use the procedures in “Backing Up Your System” on page 8-1 or the Installation Assistant application to create one. To create a system backup, you must have the backup fileset (**bos.sysmgmt.sysbr**) installed on your system. If you back up your system using the Installation Assistant application, then the backup fileset will be automatically installed for you. To access Installation Assistant, select its icon from your desktop for the graphical interface or enter the following at the command line prompt:

```
install_assist
```

To access the SMIT interface:

```
smit assist
```

4. Log in as root user if you have not already done so.
5. If you are installing from CD-ROM and currently have a mounted InfoExplorer CD-ROM in the same CD-ROM drive that you want to install from, do the following:

- a. Determine if the InfoExplorer process is running. Enter:

```
ps -ef | grep info
```

If the `info` process is found, enter:

```
kill process_id
```

where *process_id* is the number associated with the `info` process.

- b. Use the **umount** command to unmount the CD-ROM. For example, if you currently have InfoExplorer mounted from a CD-ROM, you would enter:

```
umount /usr/lpp/info/Language
```

where *Language* is the name of the language you are using.

- c. Press the eject button on the CD-ROM drive for at least two seconds to eject the InfoExplorer CD-ROM.

If you install from CD-ROM, then the installation application that you use (SMIT or one of the VSM applications) will create a temporary mount point for the CD-ROM.

6. If you are using CD-ROM, tapes, or diskettes, insert the media that contains the optional software or service updates into the appropriate drive. Some CD-ROM drives have a removable disc caddy, while others have a sliding drawer. If the CD-ROM drive on your system has a sliding drawer, place the CD-ROM in the drawer and push the drawer in. If the CD-ROM drive on your system does not have a sliding drawer, insert the CD-ROM into the disc caddy and then insert the caddy into the CD-ROM drive.
7. Based on whether you are installing with SMIT or one of the VSM applications, continue with either "To Install Optional Software and Service Updates with SMIT" on page 6-6 or "To Install Optional Software and Service Updates with a Visual System Management (VSM) Application" on page 6-13.

To Install Optional Software and Service Updates with SMIT

This procedure describes how to use SMIT to install optional software and service updates. There are two installation paths available in SMIT: the Easy Install path and the Custom Install path.

Easy Install Using the Easy Install path, you only need to specify the input device and which bundle you are installing. The SMIT Easy Install allows you to view the contents of a bundle, but you will not be able to preview the installation, or do any of the other more advanced options that are available through Custom Install. The Easy Install path only installs the software for which you have a license. This path automatically commits any software updates you are installing.

Custom Install The SMIT Custom Install allows more advanced functions such as previewing the installation, choosing to apply but not commit software updates, and so forth. You can specify the software for which you do not have a license to be installed; however, you will not be able to run this software until you acquire the license.

Note: Should a problem occur during the installation of optional software that causes the installation process to halt abnormally, you may have to complete a *cleanup* procedure to remove the partially installed software from the system before attempting to reinstall it. If the system instructs you to do a cleanup, go to "Cleaning Up Optional Software and Service Updates" on page 9-8.

To Get Help on Using SMIT

If you are not familiar with the SMIT interface and want help on using SMIT, complete the following steps:

1. At the command line prompt, enter:

```
smit
```
2. Select the **Using SMIT (information only)** option and press Enter. The General Help screen is displayed.

3. If you working in a non-graphical environment, use the following keys to view the information:
 - Home shows the start of the message list.
 - End shows the bottom line of text.
 - Page Down shows the next screen of text.
 - Page Up shows the previous screen of text.
 - The Up and Down Arrow keys move through the message list line by line.

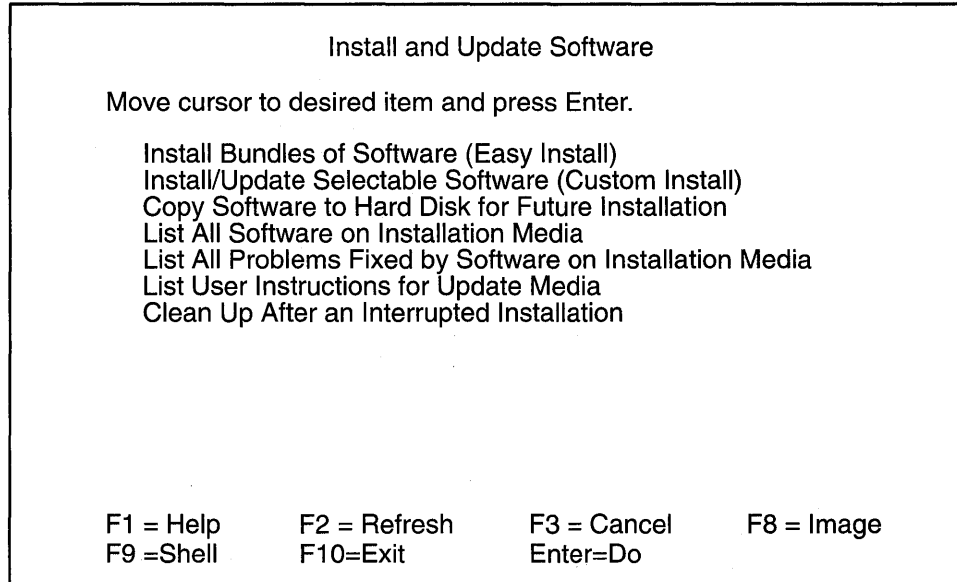
To Access SMIT Installation Menus

At the system prompt, enter:

```
smit install_update
```

(or `smit -C install_update` in the AIXwindows environment)

The SMIT application opens with the Install and Update Software screen displayed. From this screen, you can choose whether to continue along the Easy Install or Custom Install path.



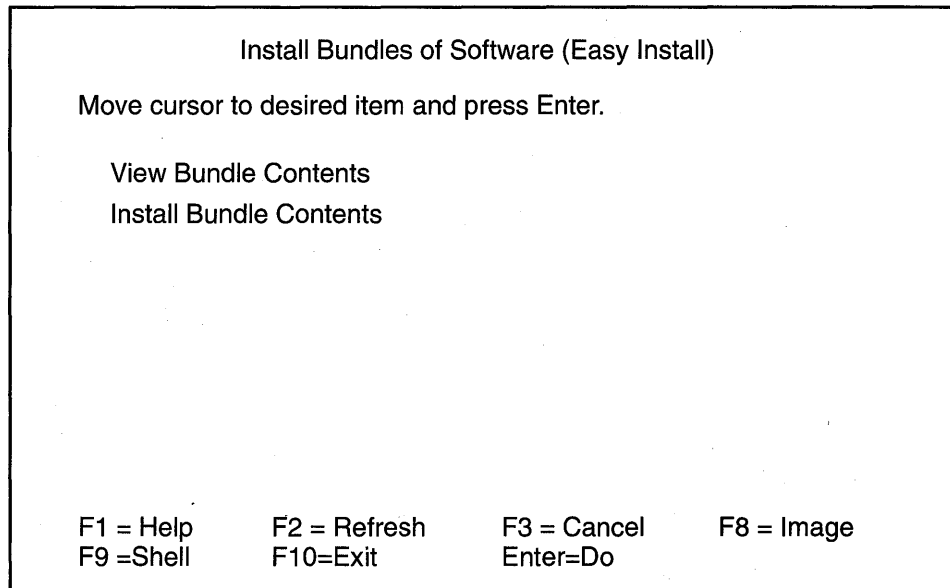
To Install Software and Service Updates with Easy Install

This section details the procedure for installing the bundle contents. The same procedure can be followed for viewing the bundle contents. The SMIT screens that you use vary depending on which option you choose.

If you are not familiar with the SMIT interface and want help on using SMIT, see "To Get Help on Using SMIT" on page 6-6.

Use the following procedure to install the bundle contents:

1. Use the arrow keys to highlight the **Install Bundles of Software (Easy Install)** option from the Install and Update Software screen and press Enter. The Install Bundles of Software (Easy Install) screen is displayed.



2. Select the **Install Bundle Contents** from the Install Bundles of Software (Easy Install) screen and press Enter. After the option is selected, a screen asking you to specify the input device or directory is displayed.
3. The **INPUT device/directory for software** option is highlighted. Press the F4 key to display a list of the available input devices or directories. The input *device* is the tape, diskette, or CD-ROM drive that you are using to install the software. The input *directory* is the directory on your system containing software for installation (for example, the **/usr/sys/inst.images** directory).
4. Select an input device or directory and press Enter. The device or directory you selected is now displayed in the INPUT device/directory for software entry field.

Note: If you are installing from CD-ROM, the CD-ROM device must be mounted to a CD-ROM file system. SMIT automatically creates this mount point for you. If you install from the command line using the **installp** command, however, you must specify the directory on which the CD-ROM is mounted with the **-d** option of the **installp** command.
5. The **Bundle to install** field is now displayed below the INPUT device/directory for software field.
 - a. The **Bundle to install** field is highlighted. Press the F4 key to display a list of bundles to be installed.
 - b. Select a bundle from the list and press Enter. The bundle you selected is now displayed in the new entry field.
6. Press Enter to begin the installation process. After pressing Enter, an ARE YOU SURE? pop-up message is displayed to confirm that you want to continue with the installation.

Notes:

1. If you are installing from tape, it may be several minutes before the contents of the bundle are displayed or installed.
2. If you have multiple CDs to install and you receive a message stating that some filesets were not found, insert the next CD and retry installing the bundle.

To Install Software and Service Updates with Custom Install

This section details the procedure for installing software products at the latest level. The same procedure can be followed for the other options listed in the Install/Update Selectable Software (Custom Install) screen in step 1 of the following procedure. The SMIT screens that you use vary depending on which option you choose to update your system.

- The **Install Software Products at Latest Level** option installs one or more of the optional software products that exist on the installation media. If any updates exist for these products, they will also be installed.

Note: You can not list device, printer, message, or locale filesets using the **Install Software Products at Latest Level** SMIT menu. Although some of the filesets listed through the **Install Software Products at Latest Level** menu automatically install associated device, printer, message, and locale filesets, you must use other SMIT menus in order to explicitly install device, printer, message, and locale filesets.

- The **Install Bundles of Software** option installs a collection of software products.
- The **Update Maintenance Levels of Software** option installs one or more of the maintenance levels that exist on the installation media. A maintenance level is an update that contains all the fixes since the last release of AIX.
- The **Install Fileset Updates by Fix** option installs one or more of the fileset updates that exist on the installation media.
- The **Install Additional Printer/Plotter Software** option installs printer and plotter software that exists on the installation media.
- The **Install Additional Device Software** option installs device software that exists on the installation media.
- The **Install/Update From All Available Software** option enables you to select for installation from all the optional software products, maintenance levels, and updates that exist on the installation media.

If you are not familiar with the SMIT interface and want help on using SMIT, see “To Get Help on Using SMIT” on page 6-6.

Use the following procedure to install software products at the latest level:

1. Select the **Install/Update Selectable Software (Custom Install)** option from the Install and Update Software screen and press Enter. The Install/Update Selectable Software (Custom Install) screen is displayed.

Install/Update Selectable Software (Custom Install)

Move cursor to desired item and press Enter.

Install Software Products at Latest Level
Install Bundles of Software
Install Maintenance Levels of Software
Install Fileset Updates by Fix
Install Additional Printer/Plotter Software
Install Additional Device Software
Install/Update From All Available Software

F1 = Help
F9 =Shell

F2 = Refresh
F10=Exit

F3 = Cancel
Enter=Do

F8 = Image

2. Select the **Install Software Products at LATEST Level** option from the Install/Update Selectable Software (Custom Install) screen and press Enter. After the option is selected, a screen asking you to specify the input device or directory is displayed.
3. The **INPUT device/directory for software** option will be highlighted. Press the F4 key to display a list of the available input devices or directories. The input device is the tape, diskette, or CD-ROM drive that you are using to install the software. The input directory is the directory on your system containing software for installation (for example, the **/usr/sys/inst.images** directory).
4. Select an input device or directory and press Enter. The device or directory you selected is now displayed in the INPUT device/directory for software entry field.

Note: If you are installing from CD-ROM, the CD-ROM device must be mounted to a CD-ROM file system. SMIT automatically creates this mount point for you. If you install from the command line using the **installp** command, however, you must specify the directory on which the CD-ROM is mounted with the **-d** option of the **installp** command.

The screen that is displayed next lists the different installation options.

Install Software Products at Latest Level

Type or select a value for the entry field. Press Enter AFTER making all desired changes.

	[Entry Fields]
INPUT device/directory for software	[/dev/rmt0.1]+
SOFTWARE to install	[all_licensed]+
PREVIEW only? (install operation will NOT occur)	no +
COMMIT software updates?	yes +
SAVE replaced files?	no +
ALTERNATE Save Directory	[] +
AUTOMATICALLY install requisite software?	yes +
EXTEND file systems if space needed?	yes +
OVERWRITE same or newer versions?	no +
VERIFY install and check file sizes?	no +
INCLUDE corresponding LANGUAGE packages?	yes +
DETAILED output?	no +

F1 = Help	F2 = Refresh	F3 = Cancel	F4 = List
F5 = Undo	F6 = Command	F7=Edit	F8 = Image
F9 =Shell	F10=Exit	Enter=Do	

5. The default setting for the **SOFTWARE to install** menu option is **all_licensed**, which installs all the software for which you have a license or for which no license is required. If you delete **all-licensed** and leave the **SOFTWARE to install** menu option blank when you install bundles of software, the bundle contents will be installed regardless of licensing.

To display a list of software products from which you can selectively install, press the F4 key to display a list of available software products or bundles. Use the Page Up and Page Down keys or the arrow keys to scroll through the list. To select one or more items, highlight the item and press the F7 key. A greater-than (>) symbol is displayed next to the selected item. To deselect a previously selected item, move the cursor to highlight that item again and press the F7 key again.

Note: The screen containing the default settings can include one of the following options. Which option appears on this screen depends on which option you selected from the Install/Update Selectable Software (Custom Install) screen.

SOFTWARE to install	[all_licensed]
BUNDLE CONTENTS to install	[all_licensed]
SOFTWARE to update	[all_updates] or [all_maintenance]

[all_updates] and **[all_maintenance]** apply only the updates or maintenance levels for software that is installed on your system.

If you are installing a maintenance level, it should be committed in order to receive all fixes issued since the base level release. If your disk space is limited, you can save space in the **/usr** and **root** file systems by not saving replaced files.

6. Verify whether you want to keep or change the remaining default installation settings. Use the SMIT online help for each field to determine if you want to use the default setting. To change the settings with a **yes** or **no** value, highlight the field and use the Tab key to toggle **yes** or **no**.

If you wish to preview the results of the installation before actually installing the software, highlight the **PREVIEW only? (install operation will NOT occur)** field and change the setting to a **yes** value. The preview information indicates any software that is requisite to software you are installing.

Note: If you are installing from tape, it may take several minutes to display a listing of the tape's contents after using the F4 key.

7. Press Enter when you are satisfied with all the settings on this screen. The ARE YOU SURE? pop-up message is displayed to confirm that you want to continue with the installation.

If you set the preview function to **yes**, then installation will not actually occur. In this case, repeat this procedure with the preview function set to **no** when you want to install the software.

8. If you have multiple CDs to install, insert the next CD, press F3 to go to the previous screen, and return to step 5 to install the information on the next CD.

Completing the Installation and Reading the Status Messages

This section describes the system's activity and actions required of you after the installation process has begun.

1. When you press Enter to start the installation, the COMMAND STATUS screen is displayed.

A series of messages are displayed as the installation proceeds. The amount of time the installation takes varies depending on your system and the software you are installing and updating.

Note: The system may prompt you, with a message similar to the following, to insert the next tape or diskette:

```
Mount volume 2 on /dev/rmt0.
```

```
Press the Enter key to continue.
```

When this message is displayed, insert the specified tape or diskette and press Enter.

When the installation finishes, the Command: status field on the COMMAND STATUS screen changes to **OK** or **failed**. **OK** means the installation ran to completion, though some filesets may not have installed successfully. The **failed** status means that not everything you requested was installed.

For information about error messages, refer to "Error Messages and Output from the installp Command" on page A-3.

2. When the installation halts or finishes, the screen returns to the top of the list of messages that are displayed during installation. You can review the message list as described in the next step, or you can exit SMIT and review the **smit.log** file. (**/smit.log** or **/home/user_id/smit.log**)
3. Review the message list for error messages and software products or service updates that may not have been successfully installed. Use the following keys to review the system message list:
 - Home shows the start of the message list.
 - End shows the bottom line of text.

- Page Down shows the next screen of text.
- Page Up shows the previous screen of text.
- The Up and Down Arrow keys move through the message list line by line.

Use the following procedure to correct any errors in the installation:

- a. Look at the pre- and post-installation summaries at the end of the message list to see whether any installation failure occurred.
 - b. Use the message list to determine problems and find which software products or service updates were involved. For example, space limits may have been exceeded or the requisites may not have been met for some software. The system lists how much extra space is needed and which requisite software products or service updates to install.
 - c. Any product that is marked as FAILED, BROKEN, or CANCELLED must be reinstalled. You do not need to reinstall any service update or software product that was marked as SUCCESS in the Installp Summary report. If you need to perform the installation again, change installation settings as appropriate. For example, if requisites were missing, set AUTOMATICALLY install requisite software? to **yes**. If there was not enough space to complete the installation, set EXTEND file systems if space needed? to **yes**.

If you need to perform the installation again and you have more than one tape or diskette, remove the tape or diskette from the drive, press F10 to exit SMIT, and return to "Prerequisites" on page 6-5. See "Acting on System and Error Messages" on page 10-1 for information about **bosboot** command errors that may occur while the install program is running, and about recovery procedures for these errors.
 - d. If the installation was interrupted (for example, a power failure), you may need to use the cleanup procedure before continuing. Press F10 to exit SMIT and refer to "Cleaning Up Optional Software and Service Updates" on page 9-8.
 - e. When all software has been installed successfully, continue with the next step.
4. If you have additional software to install that is on a different CD-ROM, tape, or diskette, do the following:
 - a. Remove the CD-ROM, tape, or diskette from the drive.
 - b. Insert the CD-ROM, tape, or diskette for the software you are installing into the drive.
 - c. Press F3 to return to the previous screen and install the additional software.
 5. Press F10 to exit SMIT.
 6. Remove the installation media from the drive.
 7. Reboot your system when a message directs you to do so. To reboot your system, enter:


```
shutdown -Fr
```

To Install Optional Software and Service Updates with a VSM Application

The graphical interface provides access to two Visual System Management (VSM) applications for installing optional software and service updates. You must have root authority to install software with these applications. Select the applications from your desktop or enter one of the following commands from AIXwindows or the AIX Common Desktop Environment:

To invoke Easy Install:

```
xinstallm -ez
```

To invoke Install and Update Software Manager:

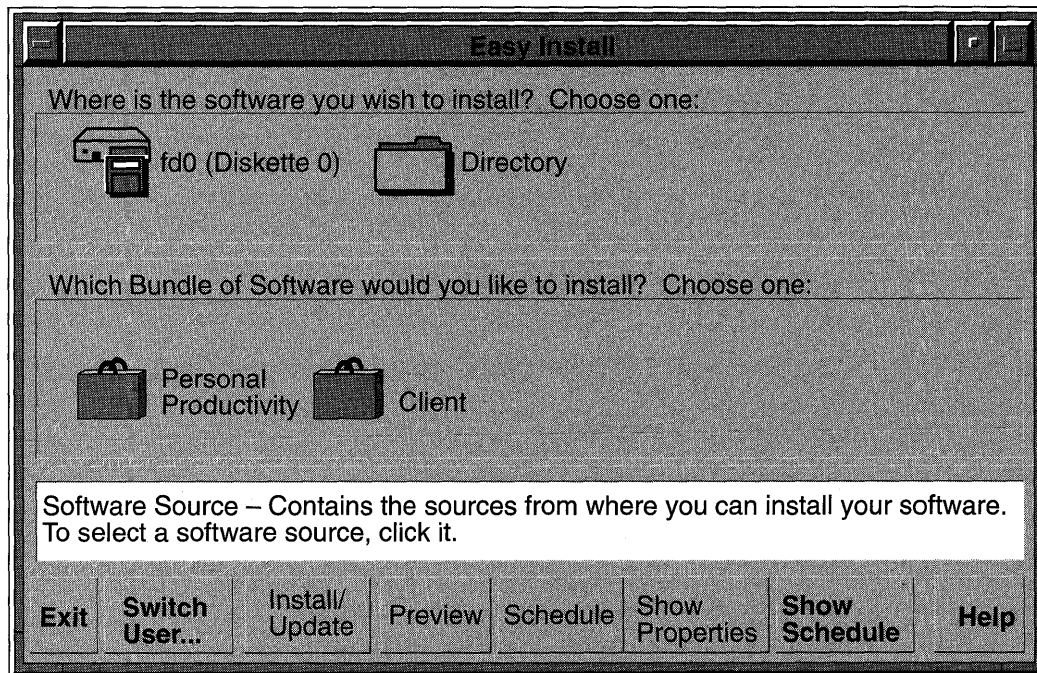
```
xinstallm
```

See “Using the Visual System Management Applications” in *AIX Version 4 Getting Started* for information about how to access the graphical interface and how to work with VSM applications.

Note: When installing from CD-ROM, VSM applications install software from the current CD-ROM only. If you want to install a product that resides on multiple CDs, you must perform installation tasks for each CD. VSM will not prompt you to insert and install each CD.

Easy Install The Easy Install application provides a means of installing a software bundle that requires minimal decision-making. Selecting how the software bundle is to be installed (from a tape or directory, for example) and which software bundle is to be installed (the client or server bundle, for example) are the basic decisions required by this application. This application is intended for users whose software needs are met by an existing bundle. This application only installs the software for which you have a license or that does not require a license. The software is committed at the same time it is installed without saving the previous version of the software.

The following figure shows the Easy Install application:

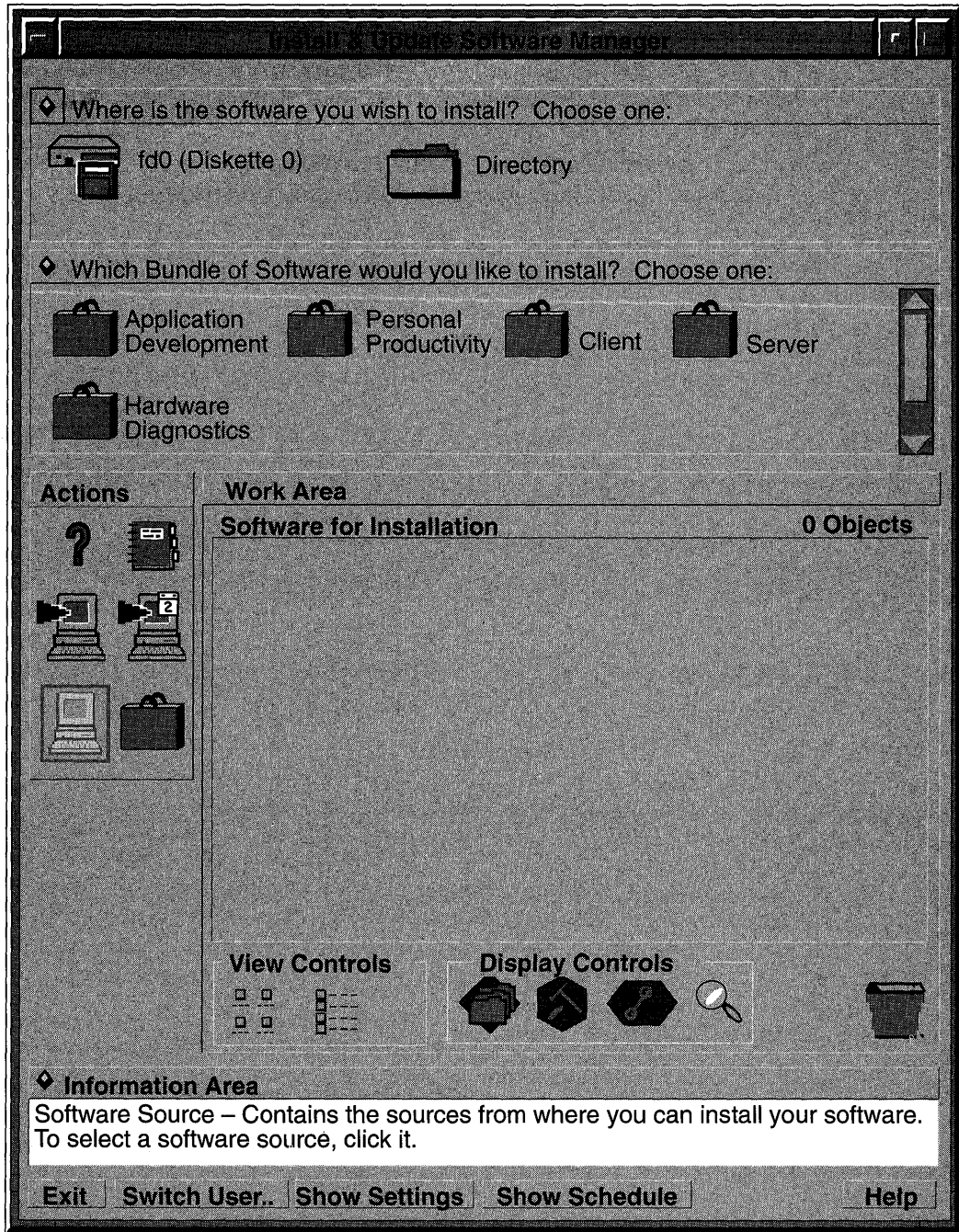


Install and Update Software Manager

The Install and Update Software Manager application allows you to install software as well as to change the system’s default install settings and specify other options. For example, you can choose whether to commit a software update while installing it. This application also allows you to create your own bundle for installation by selecting software packages and filesets from different bundles and the installation media. By default, the Install and

Update Software Manager application applies any software updates you are installing but does not commit them. You can, however, change this default setting and have software updates committed during installation. (Base software applications are always committed. If a previous version of the software is installed, it cannot be saved.) Using this application, you can also specify that software for which you do not have a license be installed, although you won't be able to run this software until you acquire the license for it.

The following figure shows the Install and Update Software Manager application:



Should a problem occur during the installation of optional software that interrupts the installation process, you may have to perform a cleanup procedure to remove the partially installed software from the system before attempting to reinstall it. If the system instructs you to do a cleanup, go to “Cleaning Up Optional Software and Service Updates” on page 9-8.

Neither the Easy Install nor the Install and Update Software Manager application allows you to remove a software fileset or to commit or reject an applied update. To perform these tasks using a VSM application, refer to “Maintaining Optional Software” on page 7-1.

Where Do I Go Next?

The installation of optional software and service updates is now complete. You may want to do two more things before using your system:

- The software you installed may contain README files with late-breaking news. For information on how to view README files, refer to “Viewing README Files” on page 11-1.
- You may want to create a new backup of your system. Refer to “Backing Up Your System” on page 8-1 or “Customizing Your Installation” on page 3-1.

Chapter 7. Maintaining Optional Software

This chapter describes how to commit previously installed service updates, reject uncommitted service updates, and remove a software option from the system. You can use either the System Management Interface Tool (SMIT) or a Visual System Management (VSM) application to perform these tasks.

Introduction to Software Maintenance

If the service update was not committed during installation, then you need to commit it after installation once you have decided that you will not be returning to the previous version of the software. Committing the updated version of the service update deletes all previous versions from the system and recovers the disk space that was used to store the previous version. When you are sure that you want to keep the updated version of the software, you should commit it. By freeing up disk space, it is faster and easier to process any new updates you apply at a later date. Before installing a new set of updates, you may want to consider committing any previous updates that have not yet been committed.

If, however, you decide to return to the previous version of the software, you must *reject* the updated version that was installed. Rejecting a service update deletes the update from the system and returns the system to its former state. A service update can only be rejected if it has not yet been committed. Once committed, there is no way to delete an update except by removing the entire fileset.

When you install a base level fileset, it is automatically committed during installation. If you want to delete a fileset, it must be *removed* (as opposed to rejected) from the system. A fileset is always removed with all of its updates. The Base Operating System (**bos.rte**) cannot be removed, and certain other products cannot be removed if the software is in use. For example, the **devices.scsi.disk** fileset cannot be removed from a standalone system, because it controls the disk on the system.

If something should go wrong during the software installation so that the installation is prematurely canceled or interrupted, a *cleanup* must be run. Detailed information and the procedure for cleaning up software are included in "Cleaning Up Optional Software and Service Updates" on page 9-8.

For more information about commit, reject, and remove, refer to "Optional Software Installation and Update Concepts" on page A-1.

Maintaining Optional Software and Service Updates with SMIT

This chapter details the procedure for committing software updates. The same procedure can be followed for rejecting service updates and removing software filesets. The SMIT screens that you use vary depending on which action you are performing on the software.

To reject service updates, use the following command:

```
smit install_reject
```

(or `smit -C install_reject` in the AIXwindows environment)

To remove software filesets, use the following command :

```
smit install_remove
```

(or `smit -C install_remove` in the AIXwindows environment)

If you are not familiar with the SMIT interface and want help on using SMIT, see "To Get Help on Using SMIT" on page 6-6.

To Commit Service Updates

If you already committed the installed service update using the **Apply/Commit** option of the Install and Update Software Manager application, you do not need to commit the service update again.

Note: You can determine the software products installed on your system by entering the following at the command line:

```
lslpp -L
```

Use the following procedure to commit service updates that are in the applied state.

1. Log in as root user if you have not already done so.
2. Enter the following SMIT command:

```
smit install_commit
```

(or `smit -C install_commit` in the AIXwindows environment)

The Commit Applied Software Updates (Remove Saved Files) screen is displayed.

Commit Applied Software Updates (Remove Saved Files)			
Type or select values in entry fields. Press Enter AFTER making all desired changes.			
[Entry Fields]			
* SOFTWARE name	[all]		+
PREVIEW only? (commit operation will NOT occur)	no		+
COMMIT requisites?	yes		+
DETAILED output?	no		+
F1 = Help	F2 = Refresh	F3 = Cancel	F4 = List
F5 = Undo	F6 = Command	F7 = Edit	F8 = Image
F9 = Shell	F10 = Exit	Enter = Do	

3. Are you committing all uncommitted service updates or only selected service updates?

All Service Updates

Verify that the SOFTWARE name entry field is set to **all** and continue with step 4.

Selected Service Updates

Press the F4 key with the SOFTWARE name field highlighted to display a list of applied, but not committed, software updates. The SOFTWARE name screen pops up over the previous screen.

Select the update to be committed by highlighting it and pressing the F7 key. The > (greater-than) symbol is displayed next to each item you select. To deselect an item, highlight the item again and press F7 again.

Press Enter when you are finished selecting the software to be committed. The Commit Applied Software Updates (Remove Saved Files) screen is displayed again.

Note: If you are rejecting service updates or removing software filesets, you must select software from a list.

4. Verify the default settings in the remaining fields of the Commit Applied Software Updates (Remove Saved Files) screen. Use the SMIT online help for each field to determine if you want to use the default setting. To change the settings with a **yes** or **no** value, highlight the field and use the Tab key to toggle **yes** or **no**.

In particular, you may want to preview the results of the commit action before actually committing the software. The preview information indicates any requisite software that will be committed with your update if you have set the **COMMIT requisites?** option to **Yes**. Requisite software is software that is required by an update when the update is installed.

5. Press Enter when you are satisfied with all the settings on this screen. The ARE YOU SURE? message pops up over the previous screen. If you set the preview function to **Yes**, then commit will not actually occur. In this case, repeat this procedure with the preview function set to **No** when you want to commit the software.

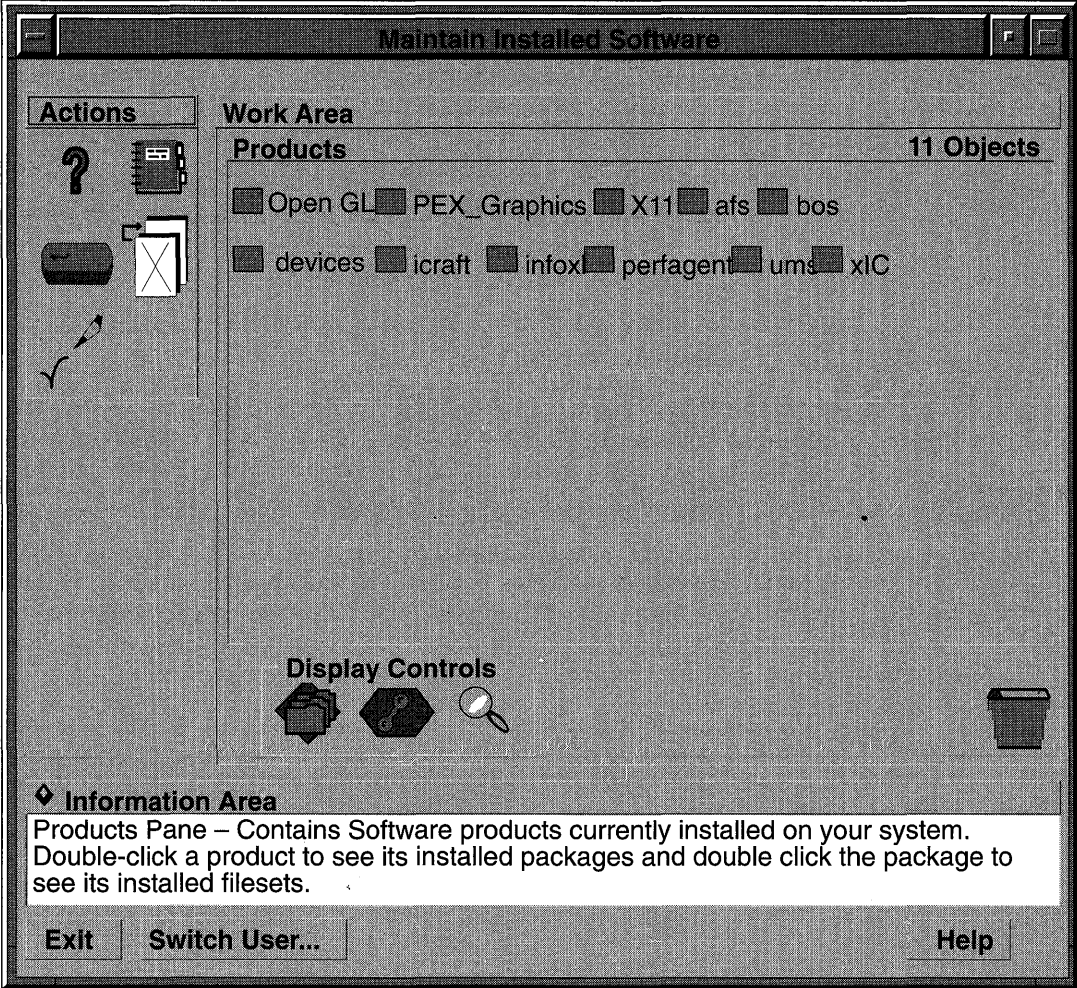
Maintaining Optional Software and Service Updates with a Visual System Management Application

The graphical interface provides access to the Visual System Management Maintain Installed Software application. The Maintain Installed Software application illustrates the relationships among products, packages, filesets, maintenance levels, and updates in a graphical format. The application enables you to select software and perform maintenance functions, such as committing and rejecting service updates and removing and verifying software. You must have root authority to use this application. You can select the application from your desktop, or you can enter the following command from AIXwindows or the AIX Common Desktop Environment:

```
xmaintm
```

See *AIX Version 4 Getting Started* for information about how to access the graphical interface and how to work with VSM applications.

The following figure shows the Maintain Installed Software application:



Chapter 8. Backing Up Your System

This chapter describes using the System Management Interface Tool (SMIT) to create and verify a bootable backup copy, or *image*, of your root volume group. This chapter also describes how to make separate backup copies of user volume groups.

You can also use Installation Assistant to back up your system. Refer to “Customizing Your Installation” on page 3-1 for more information. When you back up your system using Installation Assistant, the required **bos.sysmgmt.sysbr** fileset is automatically installed.

Introduction to Backing Up Your System

A backup image serves two purposes. One is to have a working copy of your system in case your system becomes corrupted. The other is to transfer installed and configured software from one system to others. You can use the SMIT Back Up the System menu to make a backup image of the root volume group. Use the SMIT Save a Volume Group menu to make a backup image of user volume groups.

The *root volume group* is a hard disk, or group of disks, containing start up files, BOS, configuration information, and any optional software products. A *user volume group* (also called *nonroot volume group*) typically contains data files and application software.

The SMIT Back Up the System menu uses the **mksysb** command to create a backup image, stored either on tape or in a file. If you choose tape, the backup program by default writes a *boot image* to the tape, which makes it suitable for installing.

Configuring before the Backup

The source system is the system from which you created the backup copy. The target system is the system on which you are installing the backup copy.

Configure the source system before creating a backup image of it if you want the source and target to be identical. If, however, you plan to use a backup image for installing other, differently configured target systems, create the image *before* configuring the source system.

The installation program automatically installs only the device support required for the hardware configuration of the installed machine. Therefore, if you are using a system backup to install other machines, you may need to install additional devices on the source system before making the backup image and using this backup image to install one or more target systems.

To install additional device support on the source system, use the Install Additional Device Software SMIT menu option.

- If there is sufficient disk space on the source and target systems, install all device support. After installing the target system, you can selectively remove the device support not needed by the target.
- If there is limited disk space on the source and target systems, selectively install the device support required for the target machines.

For information on installing optional software, see “Installing Optional Software and Service Updates” on page 6-1.

Refer to “Customizing the BOS Install Program” on page 4-1 for information about how to set installation parameters to enable you to bypass menu prompts when you install the target machine from a system backup.

If you install the backup image on other systems, you might not, for security reasons, want passwords and network addresses copied to the target systems. Also, copying network addresses to a target system creates duplicate addresses that can disrupt network communications.

Using the SMIT backup menu lets you preserve configuration information, thus avoiding some of the configuring tasks normally required after restoring a system backup. A backup preserves the configuration if:

- The target system has the same hardware configuration as the source system.

AND

- The target has enough disk space to hold the backup image.

A backup transfers the following configurations from the source system to the target system:

- Paging space information
- Logical volume information
- rootvg volume group information
- Placement of logical partitions (if the Create Map Files field is set to **yes** in the SMIT menu).

Mounting and Unmounting File Systems

The procedure in this chapter backs up only mounted file systems in the root volume group. You must, therefore, mount all file systems you want to back up before starting. Similarly, you must unmount file systems you do *not* want backed up, or you must use the **/etc/exclude.rootvg** file to list files you do not want backed up. See “Backing Up Your System” in the *AIX Version 4 System Management Guide: Operating System and Devices* for more information.

This backup procedure backs up files twice if a local directory is mounted over another local directory in the same file system. For example, if you mount **/tmp** over **/usr/tmp**, the files in the **/tmp** directory will be backed up twice. This duplication might exceed the number of files a file system can hold, which can cause a future installation of the backup image to fail.

Restoring a Backup Image

When installing the backup image, the system checks whether the target system has enough disk space to create all the logical volumes stored on the backup. If there is enough space, the entire backup is recovered. Otherwise, the installation halts and the system prompts you to choose more destination hard disks.

File systems created on the target system will be the same size as they were on the source system, unless the **SHRINK** variable was set to **yes** in the **image.data** file before the backup image was made. An exception is the **/tmp** directory, which can be increased to allocate enough space for the **bosboot** command. For information about setting variables, refer to the **image.data** file in *AIX Version 4 Files Reference*.

When it finishes installing the backup image, the installation program reconfigures the Object Data Manager (ODM) on the target system. If the target system does not have

exactly the same hardware configuration as the source system, the program may modify device attributes in the following target system files:

- All files in `/etc/objrepos` beginning with `Cu`
- All files in the `/dev` directory

For more information about installing (or *restoring*) a backup image, see “Installing BOS from a System Backup” on page 5-1.

To Back Up Your System

This section provides instructions for backing up your system, including how to back up the root volume group, verify a backup tape, and back up a user volume group.

Note: Data integrity of the archive may be compromised if a file is modified during system backup. Keep system activity at a minimum during the system backup procedure.

Complete the Prerequisites

- All hardware must already be installed, including external devices, such as tape and CD-ROM drives.
- The **sysbr** fileset in the BOS System Management Tools and Applications software package must be installed. Enter the following command to determine if the **sysbr** fileset is installed on your system:

```
lslpp -l bos.sysmgt.sysbr
```

If your system has the **sysbr** fileset installed, continue with either “To Back Up the Root Volume Group” on page 8-3 or “To Back Up a User Volume Group” on page 8-6.

If the **lslpp** command does not list the **sysbr** fileset, install it before continuing with the backup procedure. Refer to “To Install Software and Service Updates with Custom Install” on page 6-9 for instructions, or enter the following command:

```
installp -agqXd device bos.sysmgt.sysbr
```

where *device* is the location of the software; for example, `/dev/rmt0` for tape drive.

To Back Up the Root Volume Group

Use this procedure to create a system backup, stored either on a tape or in a file. To boot from a system backup, the backup image must be stored on a tape.

1. Log in as root user.
2. Mount all file systems you want to back up. Refer to the **mount** command for details.

Note: The **mksysb** command does not back up file systems mounted across an NFS network.

3. Unmount any local directories that are mounted over another local directory.
4. Make at least 8.8MB of free disk space available in the `/tmp` directory. The **mksysb** command requires this working space for the duration of the backup.

Use the **df** command, which reports in units of 512-byte blocks, to determine the free space in the `/tmp` directory. Use the **chfs** command to change the size of the file system, if necessary.

For example, the following command adds 12MB of disk space to the **/tmp** directory of a system with 4MB partitions:

```
chfs -a size=+18022 /tmp
```

5. Enter the following SMIT command:

```
smit mksysb
```

(or `smit -C mksysb` in the AIXwindows environment)

The Back Up the System screen appears, highlighting the **Backup DEVICE or File** field.

Back Up the System

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

[Entry Fields]

WARNING: Execution of the mksysb command will result
in the loss of all material previously stored on
the selected output medium. This command
backs up only rootvg volume group.

*Backup DEVICE or File	[/dev/rmt0]
Create MAP files?	no
EXCLUDE files?	no
Make BOOTABLE backup? (Applies only to tape)	yes
EXPAND /tmp if needed (Applies only to bootable tape)	no
Number of BLOCKS to write in a single output (Leave blank to use a system default)	[]

F1 = Help	F2 = Refresh	F3 = Cancel	F4 = List
F5 = Undo	F6 = Command	F7=Edit	F8 = Image
F9 =Shell	F10=Exit	Enter=Do	

6. Decide which medium you will use to store the backup and select the **Back Up DEVICE or FILE** field. If you want to create a bootable backup, the medium must be tape. Depending on the medium you chose, follow the appropriate step below:

TAPE Press the F4 key to list available tape devices and highlight the device name.

FILE Enter a full path and file name in the entry field.

7. If you want to create map files, select the **Create Map Files** field and press the Tab key once to change the default value to **yes**.

Map files match the physical partitions on a drive to its logical partitions. When installing from a backup image, the BOS installation program uses map files to position the logical volumes on the target drive in the same partitions they were on in the source system. If you do not create map files, the installation program relies on the Logical Volume Manager (LVM) to determine placement for the logical volumes. For more information, see "Using Map Files for Precise Allocation" in *AIX Version 4 System Management Guide: Operating System and Devices*.

8. If you want to exclude certain files from the backup, create the `/etc/exclude.rootvg` file, with an ASCII editor, and enter the patterns of file names that you do not want included in your system backup image. The patterns in this file are input to the pattern matching conventions of the `grep` command to determine which files will be excluded from the backup. If you want to exclude files listed in the `/etc/exclude.rootvg` file, select the Exclude Files field and press the Tab key once to change the default value to **yes**.
9. If you chose file as the backup medium, skip to step 13. If you chose tape as the backup medium, continue with step 10.
10. If you want to make a bootable backup, which includes system startup and installation programs, leave default value of **yes**. If you do not want the tape to be bootable, press the Tab key once to change the default value to **no**.
11. If you chose to create a bootable tape and you want to expand the system's `/tmp` file system (if required by the backup program), press the Tab key once to change the value for **Expand /tmp if needed?** to **yes**.
12. If you chose tape as the backup medium, select the **Number of BLOCKS to write in a single output** field and enter the number of blocks to write for the tape device used to create the backup image, or leave the field blank to accept the system default.
13. If you chose file as the backup medium, press the Enter key. If you chose tape as the backup medium, insert the first blank backup tape into the drive and press the Enter key.
14. The COMMAND STATUS screen appears, showing status messages while the system makes the backup image.

If you chose tape as the backup medium, the system may prompt you to insert the next tape during the backup by displaying a message similar to the following:


```
Mount next Volume on /dev/rmt0 and type return.
```


If this message appears, remove the tape and label it, including the BOS version number. Then insert another tape and press Enter.

When the backup process finishes, the COMMAND: field changes to **OK**.
15. Press F10 to exit SMIT when the backup completes.
16. If you chose tape as the backup medium, remove the last tape and label it. Write-protect the backup tapes.
17. Record any backed up root and user passwords. Remember, these passwords will be active if you use the backup to either restore this system or install another system.

You have created the backup of your root volume group (rootvg). If you created bootable tapes, these tapes can be used to start your system if for some reason you cannot boot from hard disks.

To Verify a Backup Tape

Use this procedure to list the contents of a **mksysb** backup tape. The contents list verifies most of the information on the tape, but does not verify that the tape can be booted for installations. The only way to verify that the boot image on a **mksysb** tape functions properly is by booting from the tape.

1. Enter the following SMIT command:

```
smit lsmksysb
```

(or `smit -C lsmksysb` in the AIXwindows environment)

The List Files in a System Image screen appears.

Note: Do not press the Enter key until you finish providing values in the entry fields.

2. Either type the number of blocks to read for your tape device in the first field, or leave it blank to accept the system default.
3. Either type the tape device name in the second field, or accept the value given.
4. Press the Enter key.

The COMMAND STATUS screen appears, listing the contents of the backup tape.

To Back Up a User Volume Group

Back up user volume groups, to images different than root volume group images, with the following SMIT command:

```
smit savevg
```

(or `smit -C savevg` in the AIXwindows environment)

The Save a Volume Group screen appears. Use the steps for backing up the root volume group as a guide for backing up user volume groups, with the following exception: If you want to exclude files in a user volume group from the backup image, create a file named **/etc/exclude.volume_group_name**, where *volume_group_name* is the name of the volume group you want to backup. Then edit **/etc/exclude.volume_group_name** and enter the patterns of file names that you do not want included in your backup image. The patterns in this file are input to the pattern matching conventions of the **grep** command to determine which files will be excluded from the backup.

Chapter 9. Troubleshooting

This chapter suggests solutions for typical installation problems. Refer to “Acting on System and Error Messages” on page 10-1 and *AIX Version 4 Messages Guide and Reference* for information about error messages that appear during an installation.

Creating Bootable Tapes

Following is the procedure for creating a bootable tape, which you might use to maintain your AIX Version 4.1 Base Operating System (BOS). The tape works only with a copy of BOS that is the same version as the BOS used to create them. Earlier versions of BOS required bootable diskettes. To create bootable diskettes for an earlier version, refer to the documentation for that version.

1. To create the **/bosinst.data** file, enter:

```
cp /var/adm/ras/bosinst.data /bosinst.data
```

or enter:

```
cp /usr/lpp/bosinst/bosinst.template /bosinst.data
```

2. To create the **/image.data** file, enter:

```
mkszfile
```

Note: This file is created by the **mksysb** command.

3. Put a tape in the drive.
4. Make sure the Tape Device Block size is set to 512.

To check the Tape Device Block size, enter:

```
tctl -f /dev/rmt TapeDriveName status
```

where *rmt TapeDriveName* is the name of the tape drive you are using (for example, *rmt0*).

To change the Tape Device Block size, enter:

```
chdev -l rmt TapeDriveName -a block_size=512
```

5. Make sure the tape is rewound. To rewind the tape, enter:

```
tctl -f /dev/rmt TapeDriveName rewind
```

6. To create the boot image on the tape, enter:

```
bosboot -ad /dev/rmt TapeDriveName.1
```

7. To create the BOS Install/Maintenance image on the tape, enter:

```
mkinsttape /dev/rmt TapeDriveName.1
```

8. If the Tape Device Block size was changed in step 2, be sure to set it back to its previous size. To change the Tape Device Block size, enter:

```
chdev -l rmt TapeDriveName -a block_size=BlockSize
```

where *BlockSize* is the previous Tape Device Block size.

Accessing a System That Will Not Boot

The procedure in this section describes how to access a system that will not boot from the hard disk. Read "Troubleshooting Installation from a System Backup" on page 9-7 for instructions if a **mksysb** backup tape fails to boot.

This procedure enables you to get a system prompt so that you may attempt to recover data from the system or perform corrective action that will enable the system to boot from the hard disk.

Notes:

1. This procedure is intended only for experienced users who have knowledge of how to boot or recover data from a system that is unable to boot from the hard disk. Most users should not attempt this procedure but instead should follow local problem-reporting procedures.
2. This procedure is not intended for users who have just completed a New Installation, because the system will not contain data that needs to be recovered. If you are unable to boot from the hard disk after completing a New Installation, follow your local problem-reporting procedures.

The following steps summarize the procedure for accessing a system that will not boot.

1. Boot the system from the BOS CD-ROM or stacked bootable system installation tape. (If BOS resides on multiple CD-ROM volumes, boot the system from volume 1.)
2. Select maintenance options.
3. Recover data or perform corrective action using the system prompt.

Prerequisites

- Your system cannot be booted from the hard disk.
- All hardware is installed.
- AIX Version 4.1 Base Operating System (BOS) is installed.
- Your system unit is set to Off.
- Obtain the system key for the key lock (if present) on your system unit.

To Access the System

Use this procedure if you are unable to boot from the hard disk. The beginning of this procedure is similar to the one you used to install the Base Operating System. You will, however, be using the maintenance screens instead of the installation screens to complete this procedure. The maintenance screen illustrations in this procedure are provided as examples only. The actual online screens may be somewhat different in appearance.

1. Turn the system key (if present) to the Service position.
2. Turn on all attached external devices, such as terminals, CD-ROM drives, tape drives, monitors, and external disk drives *before* turning on the system unit. Do not turn the system unit on until step 5. Turning on the external devices first is necessary so that the system unit can identify them during the startup (boot) process.
 - If you are booting from a network device, refer to *AIX Network Installation Management Guide and Reference*.
 - If you are not booting from a network device, go to Step 3.

3. Insert the installation media into the tape or CD-ROM drive. If you received multiple volumes of installation media, insert volume 1. Some CD-ROM drives have a removable disc caddy, while others have a sliding drawer. If the CD-ROM drive on your system has a sliding drawer, place the CD-ROM in the drawer and push the drawer in. If the CD-ROM drive on your system does not have a sliding drawer, insert the CD-ROM into the disc caddy and then insert the caddy into the CD-ROM drive.

Notes:

- You may find that on specific hardware, the tape drive door will not open while the system unit is turned off. If you have trouble opening the tape drive door during installation, use the following procedure:
 - a. Turn the system unit on.
 - b. Insert the AIX Version 4.1 BOS tape. (If you received multiple volumes, insert volume 1.)
 - c. Turn the system unit off and wait 30 seconds.
 - On some models that have a door to the tape drive, there may be a waiting period of up to three minutes before the tape drive door opens after you have pressed the button to open the tape drive. Some models also require that the button for the tape drive door be held in the pressed position for a few seconds before the tape drive door will open.
 - On some models, the eject button must be pressed for at least 2 seconds to eject a CD-ROM that is already in the disc caddy.
4. If you are not using an ASCII terminal, skip to step 5. If you are using an ASCII terminal, set the communications options as follows:

Set the keyboard and display options as follows:

- Screen = Normal
- Row and Column = 24x80
- Scroll = jump
- Auto LF (line feed) = off
- Line Wrap = on
- Forcing Insert = line (or both)
- Tab = field
- Operating Mode = echo
- Turnaround Character = CR
- Enter = return
- Return = new line

- New Line = CR
- Send = page
- Insert Character = space

Note: If your terminal is an IBM 3151, 3161, or 3164, press the Ctrl+Setup keys to display the Setup Menu and follow the on-screen instructions to set these options. If you are using some other ASCII terminal, refer to the appropriate documents for information about how to set these options. Some terminals have different option names and settings than those listed here.

5. Turn the system unit power switch to the On position. The system begins booting from the installation media. If your system is booting from tape, it is normal for the tape to move back and forth. After several minutes, c31 is displayed in the LED.

If you have more than one console, each terminal and direct-attach display device (or console) may display a screen that directs you to press a key to identify your system console. A different key is specified for each terminal displaying this screen. If this screen is displayed, then press the specified key on the device to be used as the system console. The system console is the keyboard and display device used for installation and system administration. Press a key on only one console.

6. Enter option 3 to select **Start Maintenance Mode for System Recovery** from the Welcome to the Base Operating System Installation and Maintenance screen when it is displayed.

Note: If you customized the **bosinst.data** file in your installation media to specify a nonprompted installation, the installation and maintenance screens will not be displayed. The system will instead reboot from the installation media using the settings already defined in the **bosinst.data** file. To access the installation and maintenance screens, you need to override the nonprompted mode. An opportunity to do this occurs when three zeros are displayed on the screen. When you observe the three zeros, enter 000 (zeros) at the terminal.

```

Welcome to Base Operating System
Installation and Maintenance

Type the number of your choice and press Enter.

1 Start Install Now with Default Settings
2 Change/Show Installation Settings and Install
3 Start Maintenance Mode for System Recovery

88 Help ?
Choice:
```

You can select 88 to display help on this or any subsequent screen.

After you have selected the **Start Maintenance Mode for System Recovery** option, the Maintenance screen is displayed.

```
Maintenance

Type the number of your choice and press Enter.

>>> 1 Access a Root Volume Group
      2 Copy a System Dump to Removable Media
      3 Access Advanced Maintenance Functions
      4 Install from a System Backup

      88 Help ?
      99 Previous Menu

>>> Choice [1]:
```

7. Select option **1, Access a Root Volume Group**, from the Maintenance screen. The Warning screen is displayed.
8. Read through the information displayed on the Warning screen. When you are ready to continue, type **0** and press Enter. The Access a Root Volume Group screen is displayed.

```
Access a Root Volume Group

Type the number for a volume group to display logical volume information
and press Enter.

1) Volume Group 00002433a01d4c83 contains these disks:
   hdisk3 670 00-07-00-10      hdisk4 670 00-07-00-20
   hdisk5 670 00-07-00-30

2) Volume Group 00002433c9a746ca contains these disks:
   hdisk0 857 00-08-00-10

3) Volume Group 000024339e3f1037 contains these disks:
   hdisk1 857 00-08-00-00

4) Volume Group 00002433c880188a contains these disks:
   hdisk2 670 00-07-00-00

>>> Choice [3]:
```

9. Select the option for the root volume group whose logical volume information you want to display. The Access a Root Volume Group screen lists all of the volume groups (root and otherwise) on your system. After entering your selection, the Volume Group Information screen is displayed.

Volume Group Information

Volume Group ID 000024339e3f1037 includes the following logical volumes:

hd6	hd5	hd7	hd8	hd4	hd
hd9var	hd3	afs_cache	fslv00		

Type the number of your choice and press Enter.

- 1 Access this Volume Group and start a shell.
- 2 Access this Volume Group and start a shell before mounting file systems.

99 Previous Menu

>>> Choice [99]:

Note: Reviewing the disk and location code information on the Volume Group Information screen enables you to determine whether the volume group you selected was the root volume group. You can return to the Access a Root Volume Group screen if the choice you made was not the root volume group. If you have not chosen a root volume group, you will not be able to continue beyond the Volume Group Information screen.

10. Select one of the options from the Volume Group Information screen and press Enter. Each option does the following:

Choice 1 **Access this volume group and start a shell.** Selecting this choice imports and activates the volume group and mounts the file systems for this root volume group before providing you with a shell and a system prompt.

Choice 2 **Access this volume group and start a shell before mounting file systems.** Selecting this choice imports and activates the volume group and provides you with a shell and system prompt before mounting the file systems for this root volume group.

Choice 99 Entering 99 returns you to the Access a Root Volume Group screen.

After either choice 1 or 2 is selected and processed, a shell and system prompt are displayed.

11. Take appropriate measures to recover data or take action (such as using the **bosboot** command) to enable the system to boot normally.

Troubleshooting an Installation from a System Backup

This section describes solutions for common problems when installing from a system image created with the **mksysb** command.

Bootup Failure

If a backup tape fails to boot, you can still install using a **mksysb** image stored on the tape.

Boot the machine from the AIX product media, then install the backup from Maintenance mode. (If you received multiple volumes of AIX product media, boot the machine from volume 1.) Refer to “Installing BOS from CD-ROM or Tape” on page 2-1 for instructions on booting from product media. Follow the instructions to the point when the Welcome to the Base Operating System Installation and Maintenance screen is displayed.

Complete the following steps when the Welcome screen is displayed:

1. Choose the **Start Maintenance Mode for System Recovery** option.

The Maintenance screen is displayed.

2. Choose the **Install from a System Backup** option.

The Choose Tape Drive screen is displayed.

3. Choose the drive containing the backup tape.

The system reads the tape and begins the installation.

Note: Some systems do not support booting from tape. If your system does not support booting from tape, you will receive a message stating that tape boot is not supported on your system.

4. If you are booting from the product CD, do not remove the CD from the CD-ROM drive.
5. Return to step 7 on page 5-4 in “Installing BOS from a System Backup” and continue the instructions for installing the backup.

Note: The **Use Maps** option is not supported in Maintenance Mode. The section “Prompted Installation” on page 5-6 includes a description of the use of maps on disks selected in the System Backup Installation and Settings screen.

Source and Target Differences

Consider the differences in the source and target systems when planning an installation from a **mksysb** backup.

The original system image made with the **mksysb** command might not match your present configuration. For example, if you changed devices after backing up your system, the original source image does not have the correct device drivers for the target system. Avoid system inequalities such as different communication adapters, TTY attributes, and printer attributes. If you are using the Common Desktop Environment (CDE) on the target system, make all configuration changes, then shutdown and reboot the system before you start CDE.

The same suggestion applies when using a backup image to install additional systems. First configure the source system with drivers required for the target, then create the backup.

Suggestions for Reported Problems

The following troubleshooting tips apply to reported problems with installations from a **mksysb** image:

- Check that you have sufficient free blocks in the file systems to write temporary files.
- Check that each file system has at least 500 blocks free when the **mksysb** backup image is made. The system will need some work space in each file system when installing from a **mksysb** backup image.
- Check that you are using the correct tape type for the density setting selected.
- Check that the tape is *not* write protected.
- Clean the tape drive at the recommended intervals and use only approved data-grade tapes (not video tapes for 8 mm).
- 7206 4-mm Digital Audio Tape (DAT) tape drives use only DAT tapes marked with the Dataphone Digital Services (DDS) symbol. Any other DAT tapes (for example, voice grade) will not work.
- Check the **/smit.log** file for any errors from SMIT.
- Check that your **mksysb** backup image contains an **image.data** file. If you create the **mksysb** backup image through SMIT, it is done automatically. If you run **mksysb** from the command line, you must either run the **mkszfile** command first, or use the **-i** flag with the **mksysb** command.

Cleaning Up Optional Software and Service Updates

This procedure describes how to clean up after an interrupted installation of optional software products. The cleanup procedure attempts to delete software products that were partially installed or that have been left in an “ing” state. For example, if your attempt to install a service update was not successful, the update may be in the “applying” rather than the “applied” state. The “ing” states (applying, committing, rejecting, removing) indicate that the action you were attempting did not complete successfully. The output of the **lspp** command with the **-l** option indicates the state of the software products on the system.

The cleanup procedure attempts to revert the product to its previous state. For example, if you are cleaning up an update that is in the committing state, the cleanup procedure attempts to return the update to the applied state. If you have a product in the committing state or an update in the applying state, then the cleanup procedure attempts to delete the failed installation and restore the previous version of the product (if there is one). In this case, the previous version of the product becomes the active version. If the previous version of the product cannot be restored, then the software product enters the BROKEN state. If the cleanup procedure has deleted the product or if the product is in the BROKEN state, you can attempt to reinstall the software. Any product that was already in the BROKEN state cannot be cleaned up; it can only be reinstalled or removed.

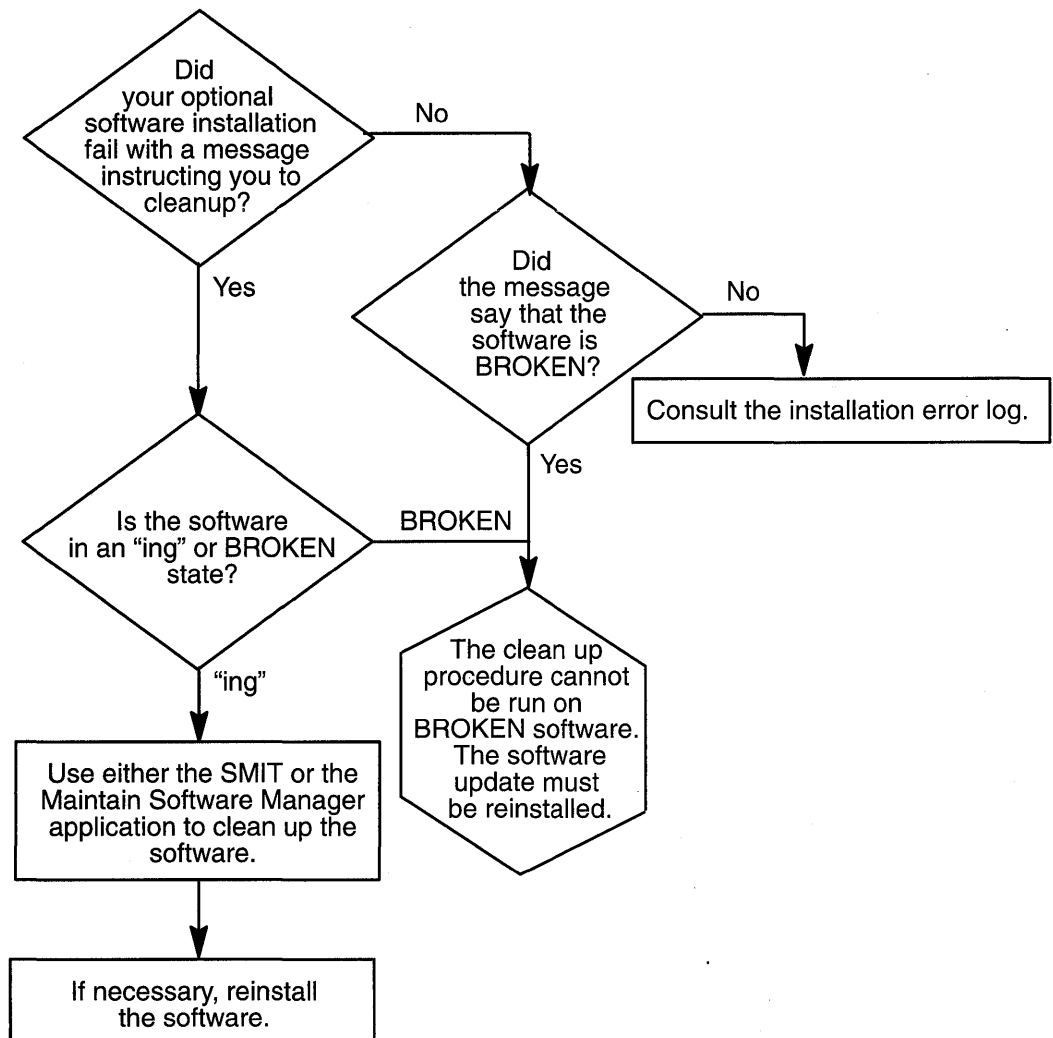
The system automatically performs a cleanup when an installation cannot be completed because of a failure or interruption. Normally, the only condition under which you may have to use the cleanup procedure described in this section is if the system shuts down or loses power during an installation or if the installation process terminates abnormally. Occasionally, you will be prompted to reboot (restart) the system after running the cleanup procedure.

For more information on the cleanup process and the output from the **installp** command (which includes the different software states), refer to "Optional Software Installation and Update Concepts" on page A-1.

Note: This procedure applies only to the installation of optional software products. If your AIX Version 4.1 Base Operating System installation was unsuccessful, go to "Accessing a System That Will Not Boot" on page 9-2.

This section contains a procedure for cleaning up software with the System Management Interface Tool (SMIT) and information about cleaning up software with the Maintain Software Manager graphical interface. The **installp -C** command can also be used to clean up software.

The following flowchart outlines the cleanup procedure for a failed optional software installation.



To Clean Up Software with SMIT

This procedure describes how to clean up your system after an unsuccessful installation of software other than the Base Operating System. Perform this procedure if the system instructed you to perform a cleanup when you attempted to install optional software.

1. Log in as root user.
2. Enter the following SMIT command:

```
smit install_update
```

(or `smit -C install_update` in the AIXwindows environment)

The Install and Update Software screen is displayed.

3. Select the **Clean Up After a Failed Installation** option. The system performs the following tasks:

- Attempts to delete software products that were partially installed.
- Attempts to revert to the previous version of any deleted products.

If the system successfully reverts to the previous version, it becomes the currently active version. If this cannot be done, then the software product is marked as **BROKEN**.

The COMMAND STATUS screen is displayed.

4. When the Command: status field changes to **OK** in the upper-left corner of the screen, you have two choices:
 - If the cleanup process completes successfully, you can attempt to reinstall the software.
 - If you get a message indicating that no products were found that could be cleaned up, then you may have executed the cleanup procedure when it was not needed. Try your installation again. If you get a message indicating that you need to clean up a failed installation, contact your point of sale for assistance.

To Clean Up Software with a VSM Application

If the installation you are performing with a Visual System Management (VSM) application (Easy Install or Install or Update Software Manager) fails, attempt to restart the installation. A pop-up window displays, indicating that the software needs to be cleaned up. After performing the cleanup operation, restart the installation process. See *AIX Version 4 Getting Started* for information about how to access the desktop and how to work with VSM applications.

Troubleshooting a Full /usr File System

To free up space in a full **/usr** file system, complete one or more of the following tasks:

- Enter `installp -c all` to commit all updates and free up space in the **/usr** file system.
- If the system is not a Network Installation Management (NIM) system serving a Shared Product Object Tree (SPOT), enter `/usr/lib/instl/inurid -r` to remove client information for **root** file system installations. For information about NIM and SPOTs, see *AIX Network Installation Management Guide and Reference*.
- Remove software that you do not need. See "Maintaining Optional Software" on page 7-1.

Viewing BOS Install Logs

Information saved in BOS installation log files may help you determine the cause of installation problems. To view BOS installation log files, enter `cd /var/adm/ras` and view the `bosinst.log`, `bosmenus.log`, and `devinst.log` files in this directory.

Using the snap Problem Determination Tool

The `snap` command assists you in compiling system configuration information quickly and easily. Once this information is compiled, you can view it and compress it for downloading to diskette or tape or for remote transmission. You may be asked by support specialists to execute the `snap` command to help them accurately identify your system problem.

Disk Space Requirements

Approximately 8 MB of temporary disk space is required when executing *all* of the `snap` options on an average system. If only one or two options are chosen, the disk space required will be substantially less, depending on the option. The program automatically checks for free space in the `/tmp/ibmsupt` directory or the directory specified with the `-d` flag. If there is not enough space, you will have to expand the file system. You can suppress this check for free space by using the `-N` option.

Output Directory

The default directory for the output from the `snap` command is `/tmp/ibmsupt`. If you desire to name an optional directory, use the `-d` option with the path of the desired output directory. Each execution of the `snap` command appends to previously created files. See "Cleaning Up Optional Software and Service Updates" on page 9-8 for instructions on cleaning up the files.

Execution Permissions

Only root has execute permissions for this command.

Cleanup

The cleanup option, `-r`, should be used to remove the information saved by the `snap` command and to retrieve disk space.

Options

The main options of the `snap` command are:

- `-g` Gathers the output of the `lspp -L` command. Support specialists use the output to re-create your operating system environment if other problem determination techniques fail. The output is stored in `/tmp/ibmsupt/general/lspp.L`. Also, the `-g` flag gathers general system information and outputs it to `/tmp/ibmsupt/general/general.snap`.
- `-D` Gathers dump and `/unix` (assumes dump device to be `/dev/hd7`).
- `-a` Gathers information for all of the groups.

-c Creates a compressed tar image of all files in the **/tmp/ibmsupt** directory tree (or other output directory).

Note: Other information that is not gathered by the **snap** command can be copied to the **snap** directory tree before executing the **tar/compress** option.

For example, you may be asked by the support specialist to provide a test case that demonstrates the problem. The test case should be copied to the **/tmp/ibmsupt** directory. When the **-c** option of the **snap** command is executed, the test case will be included.

-o Creates a tar file and downloads it to removable media.

-v Displays the output of the commands executed by the **snap** command.

Before executing the **snap -c** or **snap -o** commands, any additional information required by the Support Center should be copied to the **/tmp/ibmsupt/testcase** directory (or an alternate directory).

The **snap -c** and **snap -o** commands are mutually exclusive. Do not execute both during the same problem-determination session. The **snap -c** command should be used to transmit information electronically. The **snap -o** command should be used to transmit information on a removable output device.

To View the Usage Instructions

For instructions on how to gather information on selected groups (kernel, printer, SNA, NFS, TCP/IP, security, async, language, and file system), enter the **snap** command, with no options, at the system prompt:

```
snap
```

Recovery

If you think a command started by the **snap** command is suspended due to an inaccessible server, first press Ctrl+C. Then enter one of the following commands:

Enter For no action; return to current operation.

s To attempt to kill current operation.

q To quit **snap**.

Chapter 10. Acting on System and Error Messages

This section lists messages that can appear during the installation of AIX Version 4.1. Information about each message is organized in the following manner:

System Message	The system message is displayed in bold type.
Explanation	Describes what is likely to have caused the system message to be displayed.
System Action	Describes what the system does after the message is displayed.
User Action	Suggests a possible resolution to the problem suggested by the system message.

0516-404 allocp: Not enough resources available to fulfill allocation. Either not enough free partitions or not enough physical volumes to keep strictness. Try again with different allocation characteristics.

0516-788: extendlv: Unable to extend logical volume

0503-008 installp: There is not enough free disk space in file system /usr (506935 more 512-byte blocks are required.) An attempt to extend this file system was unsuccessful. Make more space available, then retry this operation.

Explanation There is not enough space to complete the installation.

System Action The installation cannot begin until the problem is resolved.

User Action

- Select fewer filesets than the number originally selected for installation.
- Extend the root volume group to another disk. Enter:

```
extendvg rootvg hdiskNumber
```

where *Number* is the number of the specified disk.
- Remove user-defined file systems to free up space in the **rootvg** file system.
- Follow the instructions in "Troubleshooting a Full /usr File System" on page 9-10.

BOS Install: After saving all the data from the previous system into /tmp, it was discovered that there will not be enough free space in /tmp to make the boot image. Please reboot in normal mode and increase the size of /tmp or reduce the number of files to save as listed in the /etc/preserve.list file.

Explanation During a preservation install, files listed in **/etc/preserve.list** were copied to **/tmp**. After doing so, there was not enough room in **/tmp** to create the boot image.

System Action Installation cannot continue.

User Action Reboot in normal mode and increase the size of **/tmp** or reduce the number of files to be saved.

BOS Install: You chose to create logical volumes mapped exactly as they were on the previous disks, but there are no map files specified in the image.data file.

Explanation On system backup restore, **EXACT_FIT = yes** was specified in the **image.data** file, but no map files were specified in the **image.data** file.

System Action No prompt mode is terminated, the user is prompted.

User Action Run the **mkszfile** with the **-m** option before creating the system backup tape.

or

Do not specify **EXACT_FIT = yes** in the **image.data** file.

BOS Install: Could not create boot image.

Explanation The **bosboot** command failed.

System Action The boot image was not created.

User Action Check the **/var/adm/ras/devinst.log** file for errors.

The bosinst.data file does not specify any bootable disks.

Explanation The **bosinst.data** file does not specify any bootable disks.

System Action No-prompt mode is terminated, and the user is prompted.

User Action When the system prompts, select bootable disks to install on.

or

Add a bootable disk to the **bosinst.data** file **target_disk_data** stanzas.

The bosinst.data file specified doing a migration install, but there is no existing root volume group of level 3.2 or greater.

Explanation An BOS installation method of **migration** was specified in the **bosinst.data** file, but the existing volume group is at level 3.1.

System Action This error only occurs during a nonprompted BOS installation. The installation menus are displayed.

User Action Respond to the menu prompts to complete the installation.

The bosinst.data file specified doing either a migration or a preservation install, but there is no existing root volume group.

Explanation A BOS installation method of **migration** or **preserve** was specified in the **bosinst.data** file, but no root volume group was found.

System Action This error only occurs during a nonprompted BOS installation. The installation menus are displayed.

User Action Respond to the menu prompts to complete the installation.

The data file did not specify enough disk space to contain the operating system.

Explanation No-prompt mode was specified, and there were not enough disks specified in the **bosinst.data** file to hold the operating system.

System Action No-prompt mode is terminated, the user is prompted.

User Action When the system prompts, select disks to install on.
or
Add more **target_disk_data** stanzas to **bosinst.data** file.

Duplicate lv_data stanzas specified in the image.data file. The installation cannot continue because data may be lost.

Explanation An **lv_data** stanza was duplicated in the **image.data** file.

System Action Installation cannot continue.

User Action Correct the problem and try the installation again.

Duplicate fs_data stanzas specified in the image.data file. The installation cannot continue because data may be lost.

Explanation An **fs_data** stanza was duplicated in the **image.data** file.

System Action Installation cannot continue.

User Action Correct the problem and try the installation again.

The following disks failed the preliminary diagnostic tests: <disk name>

bosset: No hard disks can be accessed.

Explanation The listed disks failed pretest.

System Action The system initiated a diagnostic pretest on the specified disk.

User Action Run full diagnostics on the specified disks.

Disks specified in bosinst.data do not define a root volume group.

Explanation No-prompt mode was specified, and the install method was set to **preserve** or **migrate**, and the disks specified in **bosinst.data** do not define a root volume group.

System Action No-prompt mode is terminated, and the user is prompted.

User Action When the system prompts, select a root volume group to install on.
or
Specify disks in the **bosinst.data** file that define a root volume group.

Encountered an unrecoverable error.

Explanation The menu subsystem encountered an unrecoverable error.

System Action The menu is restarted.

User Action None

The image.data file contains no vg_data stanza for rootvg. The installation cannot continue.

Explanation The **image.data** file is incomplete.

System Action Installation cannot continue.

User Action Use the default **image.data** file supplied with product media.

image.data has invalid logical volume data. Cannot continue.

Explanation The system could not parse the logical volume data stanzas in the **image.data** file.

System Action Installation cannot continue.

User Action Use the default **image.data** file supplied with product media.

image.data has invalid file system data. Cannot continue.

Explanation The system detected invalid file system data stanzas in the **image.data** file.

System Action Installation cannot continue.

User Action Use the default **image.data** file supplied with product media.

0516-366 putlvodm: Volume group rootvg is locked. Try again.

0516-788: extendlv: Unable to extend logical volume.

0503-008 installp: There is not enough free disk space in file system /usr (506935 more 512-byte blocks are required.) An attempt to extend this file system was unsuccessful. Make more space available, then retry this operation.

Explanation You interrupted the installation of your optional software.

System Action Sometimes, when an installation is interrupted, the system locks the root volume group.

User Action You must unlock the root volume group. Then attempt the installation procedure again.

To unlock a root volume group:

1. Be sure you have logged in as root.
2. Enter `chvg -u rootvg`
3. Enter `smit_install` and attempt to install your optional software products again.

**installp: An error occurred during bosboot processing.
Please correct the problem and rerun.**

0301-52 bosboot: not enough file space to create: /tmp/disk.image.

OR

0301-152 bosboot: not enough file space to create: /tmp/unix.

Explanation The **bosboot** command was unable to finish processing because of insufficient space in **/tmp**.

System Action The bosboot process is interrupted. The error message, the amount of disk space required, and the available disk space are displayed. The disk space required indicates the number of 1024KB blocks required.

User Action Free up space in the **/tmp** file system or extend the **/tmp** file system. Continue or restart the installation process.

To resize the **/tmp** file system and complete the installation:

1. Note the error message preceding this one. Either the message `bosboot verification starting` or `bosboot process starting` will precede this message.
2. Change directories to **/tmp**. List the files and determine which can be deleted. If there is sufficient space available, go to step 6. If you need to expand **/tmp**, continue this procedure.
3. Enter `smit chfs`
4. Select the **/tmp** file system from the displayed list.
5. Add the additional block space required. The **smit chfs** command requires disk space to be defined in 512KB blocks. Double the required disk space displayed in the system message.
6. If the message `installp: An error occurred during bosboot processing` was displayed after the message `bosboot verification starting`, rerun the installation procedure.

OR

If the message `installp: An error occurred during bosboot processing` was displayed after the message `bosboot process starting`, enter `installp -C`. Continue the installation process.

**installp: An error occurred during bosboot processing.
Please correct the problem and rerun.**

301-155 bosboot: Invalid or no boot device specified.

Explanation An invalid device is specified with the **bosboot -d** command. The **bosboot** command was unable to finish processing because it could not locate the required boot device. The **installp** command calls the **bosboot** command with **/dev/ipldevice**. If this error does occur, it is probably because **/dev/ipldevice** does not exist. **/dev/ipldevice** is a link to the boot disk.

System Action The bosboot process is interrupted.

User Action Determine if the link to the boot device is missing or incorrect, correct the error and complete the installation process.

To identify the boot device and complete the installation:

1. To identify the boot disk, enter `lslv -m hd5`. The boot disk name is displayed.
2. Create a link between the boot device indicated and the `/dev/ipldevice` file. Enter:

```
ln /dev/boot_device_name /dev/ipldevice
```

(An example of `boot_device_name` is `rhdisk0`.)

OR

3. If the message `installp: An error occurred during bosboot processing was displayed after the message bosboot verification starting`, rerun the installation procedure.

OR

If the message `installp: An error occurred during bosboot processing was displayed after the message bosboot process starting`, enter `installp -C`. Continue the installation process.

Invalid table of contents.

Explanation The installation of the operating system from a stacked tape (a bootable tape with multiple software images) was unable to verify the validity of the tape TOC. A valid TOC has a numeric string in the following format: `single_digit_number 12_digit_number single_digit_number` as the first entry in the TOC. For example, `1 042309235291 1` is a valid TOC header. The TOC records the tape position installable images. Without a valid TOC, the installation process cannot locate and install installable images.

System Action The installation process returns to the System Settings menu.

User Action Recreate your tape with a valid table of contents or contact your point of sale for assistance. If you have another system installed, access InfoExplorer for an explanation of how to recreate your tape.

The media contains an image designed for installing the base operating system.

Explanation You have chosen Install the operating system from media that was created with the `'smit install_assist'` or `'mksysb'` command. However, the media you are installing from contains a BOS image. A **mksysb** image is an installable backup (backup format) of a root volume group. This type of image can be created via the **smit install_assist** command or the **mksysb** command. Options 1 and 2 on the second installation menu determine the installation type. Consequently, the installation media must contain the corresponding image type (**mksysb** or BOS).

System Action Installation cannot begin until the problem is resolved.

User Action You have several options:

- Provide a **mksysb** image and continue with installation.
OR
- Return to the Main Installation menu, select the option to install the operating system from factory media (option 1), and continue with the installation.
OR
- Follow your local problem-reporting procedures.

The media contains an image designed for installing a mksysb image.

Explanation You have chosen `Install the operating system from factory media`, but the media contains an image that is an installable backup (**tar** format) of a root volume group. This type of image is created with the **smit startup** or the **mksysb** commands. Options 1 and 2 on the main installation menu determine the installation type. Consequently the installation media must contain the corresponding image type (**mksysb** or **BOS**).

System Action The install process has returned to the Current System Settings menu.

User Action You have several options:

- Provide a **BOS** image and continue with installation.
OR
- Return to the Main Installation menu, select the option to install a **mksysb** image (option 2), and continue with the installation.
OR
- Follow your local problem reporting procedures.

Missing image.data file. The tape does not contain a valid install image.

Explanation The system could not find an **image.data** file.

System Action Installation cannot continue.

User Action The most likely cause of this error is the tape is bad. Try a different tape.

0512-004 mksysb: The /.fs.size file does not exist. System backup canceled.

Explanation Either the `/` or `/tmp` file system is not large enough, or the **mksysb** command was run from a command line without first running the **mkszfile** command.

System Action The **mksysb** command did not find the **/.fs.size** file.

User Action Enter the **mkszfile** command, then enter the **mksysb** command again.

0512-0016 mksysb: Attempt to create a bootable tape failed: bosboot -d /dev/device -a failed with return code xxx.

OR

0512-0016 mksysb: Attempt to create a bootable tape failed: mkinsttape /dev/device failed with return code xxx.

Explanation The xxx return code indicates the error:

- | | |
|----------|---|
| 5 OR 1 | Not enough space in one or more of three file systems: <ul style="list-style-type: none">• / must have at least 500 1KB blocks.• /tmp must have at least 7400 1KB blocks.• /usr must have at least 4000 1KB blocks. |
| 11 | Defective tape. |
| 42 or 45 | Either the /usr/lib/boot/unix file is corrupted (may be 0 length) or the link to /unix is missing. |
| 48 | Cannot write to the tape drive or cannot read /dev/blv. This is probably caused by an incorrect density setting for the tape drive. It could also be caused by either a hardware problem with the tape drive or by dirty heads on the drive. |

System Action The **mksysb** command failed to make a bootable tape.

User Action The return code xxx indicates the action required:

- | | |
|----------|---|
| 5 OR 1 | Check the /, /tmp, and /usr file systems and create more space as required. |
| 11 | Replace the defective tape. |
| 42 or 45 | Either restore the /usr/lib/boot/unix file from the original tape or create the missing link. |
| 48 | Check the tape drive settings and clean the heads. |

No disks are available.

Explanation No hard disks are configured on the system. Consequently, the only functioning menu option is the maintenance option. The devices that the configuration process was able to locate are listed in the /etc/objrepos/devs file.

System Action Installation cannot begin until the problem is resolved.

User Action You have several options:

- View the devices file from the maintenance shell by typing the following command:

```
cat /etc/objrepos/devs
```

OR

- Turn the system off and check the following on systems with SCSI devices:
 - Check all SCSI devices to ensure that all SCSI addresses are unique.
 - Make sure the SCSI cards are properly terminated.
 - If external SCSI devices are in use, make sure that the SCSI chain is terminated and that the devices are turned on.
 - Check the SCSI cabling and connections.
 - Reboot and attempt the install again.

OR

- Turn the system off and check the following on systems with IDE devices:
 - Check all IDE devices to ensure that all IDE master and slave settings are unique per controller. If only one IDE device is connected to a controller, it must be set to master. If an ATA device (disk) and an ATAPI device (CD-ROM or tape) are connected to the same controller, the ATA device must be set to the master device and the ATAPI device must be set as the slave device.
 - Check the IDE cabling and connections.
 - Reboot and attempt the install again.

OR

- Boot from the diagnostics tape or CD-ROM and check the hard disks.

OR

- Follow your local problem-reporting procedures.

No entry for bos.rte in the table of contents.

Explanation The installation of the operating system from a stacked tape (a bootable tape with multiple software images) was unable to locate an entry for a BOS image in the tape TOC. Without a BOS entry in the TOC, the installation process cannot locate and install the BOS image.

System Action The installation process returns to the Current System Settings menu.

User Action Ensure that the BOS image on the stacked tape is in the same position as listed in the table of contents. Otherwise, contact your point of sale for assistance.

There are no disks on this system which can be booted.

Explanation The system could not find any bootable disks on the system.

System Action Installation cannot continue.

User Action Some third-party disks are not bootable. If a disk should be bootable but is not, run diagnostics.

You chose to install only onto disks which are not contained in a volume group, but there are not enough of those disks to contain the mksysb image.

Explanation The EXISTING_SYSTEM_OVERWRITE field in **bosinst.data** was set to no, and prompt was set to no, and there were not enough disks on the system which had no volume group on them.

System Action No-prompt mode is terminated, the user is prompted.

User Action If you want the system to select which disks to install on, set EXISTING_SYSTEM_OVERWRITE in the **bosisnt.data** file to **yes**.

OR

When the system prompts, select disks to install on.

Chapter 11. Viewing README Files

This chapter describes how to view README files, which contain information not included in other documentation. The Base Operating System (BOS) includes a README file. Each software product may also have its own README file with new information specific to that product. After you install BOS, view these files to learn important changes before using your system.

Use the following procedure to view the README files for Base Operating System (BOS) software and optional software products:

1. Log in as root user if you have not already done so.
2. Enter the following command at the system prompt:

```
cd /usr/lpp
```

3. Enter:

```
ls */*README*
```

The system lists README files for each software product installed on your system.

4. Access and exit specific README files by doing the following steps:

- a. Enter the following command to view a README file for a specific software product:

```
pg xxx/README
```

In this example, *xxx* is the directory name associated with a particular software product.

- b. Press the Enter key when the copyright screen appears.
- c. Press the following keys or key combinations to scroll through the README file:

To page down

Press Enter.

To page up

Type the minus (-) key, then Enter.

To move forward *x* pages

Type the plus (+) key and number of pages, then Enter.

For example, to move forward five pages, type +5 and press Enter.

To move backward *x* pages

Type the minus (-) key and number of pages, then Enter.

For example, to move backward five pages, type -5 and press Enter.

- d. Enter `q` at the `:` (colon) prompt to exit the README file.

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Appendix A. Optional Software Installation and Update Concepts

This section supplements the procedures described in “Optional Software and Service Updates Installation” on page 6-1. Understanding the concepts in this appendix may assist you in installing optional software products and service updates on your system.

Packaging of Software Products

Note: Application developers who want to develop software packages to be installed using the **installp** command should refer to “Software Product Packaging” in *AIX Version 4 General Programming Concepts: Writing and Debugging Programs*.

The “packaging” of software products is divided into three categories: products, packages, and filesets. A product may be composed of several packages, which in turn are composed of different filesets. A product may be installed in its entirety, or only certain packages or filesets for the product may be installed. The installation packaging of a software product is divided in this way because many software products are large and have many pieces that can be used independently of each other. Dividing a product into separately installable filesets allows you to install only those filesets you need. You may prefer to install all the filesets included in a package or the entire product, or you may want to install only selected filesets, especially if you have limited hard disk space on your system.

The installation packaging of each fileset in a product may have been divided into three parts: the **usr**, **root**, and **share** parts. Although this can add further complexity to the understanding of the packaging, this parceling of a software product is necessary for the product to be used by diskless and dataless clients in AIX Version 4.1. These functions allow a product to be installed on one machine (called the server) and then be used remotely by other machines on a network (called the clients).

- usr part** The **usr** part of a software product contains the part of the product that can be shared by machines that have the same hardware architecture. Most of the software that is part of a product usually falls into this category.
- In a standard system, the **usr** parts of products are stored in the **/usr** file tree. For example, the **ls** command would be in the **/usr/bin/ls** file.
- root part** The **root** part of a software product contains the part of the product that cannot be shared. In a client/server environment, these are the files for which there must be a unique copy for each client of a server. Most of the **root** software is associated with the configuration of the machine or product.
- In a standard system, the **root** parts of a product are stored in the **root (/)** file tree. The **/etc/objrepos** directory contains the **root** part of an installable software product.
- share part** The **share** part of a software product contains the part of the product that can be shared among machines, even if they have different hardware architectures. This would include nonexecutable text or data files. For example, the **share** part of a product might contain documentation written in ASCII text or data files containing special fonts.

In a standard system, the share parts of products are usually stored in the **/usr/share** file tree. For example, a dictionary database might be stored in the **/usr/share/dict/words** file.

The share part of a product is optional because many products may not have any files that can be shared among different hardware platforms. The share part of a product is always packaged in a separately installable package. Every product has a **usr** part. The root part of a product is optional because many products may not have any files that need to be specific to each individual machine. The **usr** and root parts of a product are packaged together in the same installable package.

Software Product Identification

The product name and level number identify a software product. The level of a software product in AIX Version 4.1 is defined as *vv.rr.mmmm.ffff*, where:

- *vv* is a numeric field of 1 to 2 digits that identifies the version number.
- *rr* is a numeric field of 1 to 2 digits that identifies the release number.
- *mmmm* is a numeric field of 1 to 4 digits that identifies the modification level.
- *ffff* is a numeric field of 1 to 4 digits that identifies the fix level.

For example, 04.01.0000.0000 is a software product level number, and 04.01.0001.0032 is a software product update level. It is not necessary to include the leading zeroes in the version, release, modification level, and fix level fields of the level. Level 04.01.0000.0000 can also be written as 4.1.0.0.

The *vv.rr.mmmm.ffff* part of the level field is what is checked to find if the level being installed is later than that on the system. These fields increase for each subsequent release of a product. The higher precedence of the four fields goes from left to right (that is, level 4.2.0.0 is a later level than 4.1.3.4).

Applying, Committing, Rejecting, and Removing Software Products and Updates

During and after its installation, there are four major actions that can be taken with optional software products and service updates. Optional software and service updates can be applied, committed, rejected, and removed. Whether a particular action can be taken depends on whether the action is being applied to the entire software product or only a service update on which actions have previously been taken. These actions can be performed using either the System Management Interface Tool (SMIT) or two applications that have a graphical interface: the Easy Install application, and the Install and Update Software Manager application. The following sections describe these actions.

Apply Action (for Service Updates)

When you install a service update, it is in the applied state. When you install or “apply” an update, the former version of that software product is saved in the **/usr/lpp/PackageName** directory so that if you want to return to the former version, you can do so without having to reinstall it. If you do not want to use the default save directory, you can specify another one using the SMIT Custom Install path or the Install and Update Software Manager application.

Only service updates can be in the applied state after installation. If you are installing an entire software product rather than just an update, then the software product is in the committed state after installation. In this case, the previous version of the software product is not saved, because you cannot have two versions installed.

If you want to install a service update or software product from the command line, use the **installp -a** command to only apply the update, or use the **installp -a -c** command to apply and commit the update or software product.

Commit Action (for Service Updates)

When you install a software product, it is put into the committed state. Committing a software update removes the previous version of the product from the system to conserve disk space. Once a software product or update has been committed, it cannot be deleted from the system except by removing the entire software product (the base level product and all of its updates).

Although applying and committing a service update are considered separate actions, both can be accomplished while installing the update. If you are using the SMIT Easy Install path or the Easy Install application, the service update is automatically applied and committed during installation. The default action of the SMIT Custom Install path and the Install and Update Software Manager application is also to apply and commit the service update during installation, although this default can be changed to only apply the update. From the command line, you can use the **installp -a -c** command to apply and commit an update.

Applied service updates can also be committed after installation. The SMIT **List All Applied but Not Committed Software** menu option (or the **installp -s** command) provides a list of all service updates in the applied state. Use the SMIT Custom Install path or the Install and Update Software Manager application to commit previously applied service updates.

Reject Action (for Service Updates)

When you reject an applied service update, the update's files are removed from the system and the previous version of the software is restored. Only service updates in the applied state can be rejected. Use the SMIT Custom Install path or the Install and Update Software Manager application to reject applied service updates.

Remove Action (for Software Products)

When you remove a software product, the product's files are removed from the system and the Software Vital Product Data information is changed to indicate that the product is removed. The remove process also attempts to restore the system's configuration to its previous state, although this is dependent on the product and may not always be complete. Once a product is removed, there will no longer be a version of that product running on the system. Use the SMIT Custom Install path or the Install and Update Software Manager application to remove software products. Any requisite software (software that is dependent on the product you are removing) will also be removed, unless it is required by other software on your system.

Error Messages and Output from the installp Command

When the **installp** command is run from the SMIT installation menus, the Command Status screen shows **Command: OK** if all of the installations that are attempted by the command are successful. It shows **Command: Failed** if any of the attempted installations fail. These messages are generated when the **installp** return codes are zero and nonzero, respectively.

Note that a **Command: OK** message does not mean that all products in the input list for **installp** were installed. A **Command: Failed** message means that the installation of at least one product was started but did not complete. If a product's installation is never started, the **Command: OK** message may be displayed even though the product is not installed. However, other error messages may be displayed for products for which the installation cannot be started. Errors that can cause a product installation not to be started

include errors such as the necessary requisites not being installed, the specified product being missing from the installation media, or the product already being installed at the specified level.

As well as displaying error messages from the **installp** command, the Command Status screen also displays many informational messages from **installp** on the progress of the product installations. The output from the **installp** command can be quite long, and it is recommended that the output be sent to a file when **installp** is run from the command line. When run from the SMIT installation menus, the output from **installp** is stored in the **smit.log** file. If you used the **su** command to become the root user, then the **smit.log** file is in the home directory.

A summary report is given at the end of the installation process. This report lists the status of each of the product installations that was attempted. For those products that could not be installed or whose installation failed, you can search for the cause in the detailed messages that appear during the installation process.

The output from the **installp** command contains both a preinstallation and post-installation summary. To determine if there were any products for which the installation could not begin, check the messages in the preinstallation summary. This information shows a statistic for those products for which installation was not attempted due to missing requisite software or other requisite problems. Once preinstallation checking is complete, you will see a message similar to The following software products will be applied: (this message varies depending on the installation action that is taken).

The error messages in the preinstallation and post-installation summaries reveal the installation status of all products included in the input list. If any failures are noted in these summaries, search on "FAIL" in the **installp** command's output to locate where the source of the failure is documented.

An example summary report is given below, along with the command that produced it.

```
# installp -acd/usr/sys/inst.images sx25.rte
```

Installation Summary

Name	Level	Part	Event	Result
bos.net.tcp.client	4.1.0.0	USR	APPLY	SUCCESS
bos.net.tcp.client	4.1.0.0	ROOT	APPLY	SUCCESS
bos.sysmgt.smit	4.1.0.0	USR	APPLY	SUCCESS
bos.sysmgt.loginlic	4.1.0.0	USR	APPLY	SUCCESS

The summary report that identifies the software that was acted upon gives the following information:

- Product fileset name
- Fix ID (if applicable)
- Update ID (if applicable)
- Product part
- Requested action (Event)
- Result of the action
- Resultant state of the product fileset

The Event column of the summary report identifies the action that has been requested of the **installp** command. The following values may be found in this column:

Event	Definition
APPLY	An attempt was made to apply the specified fileset.
COMMIT	An attempt was made to commit the specified fileset.
REJECT	An attempt was made to reject the specified fileset.
CLEANUP	An attempt was made to perform cleanup for the specified fileset.

The Result column of the summary report gives the result of **installp** performing the requested action. It can have the following values:

Result	Definition
SUCCESS	Specified action succeeded.
FAILED	Specified action failed.
CANCELLED	Although preinstallation checking passed for the specified fileset, it was necessary to cancel the specified action before it was begun. Interrupting the installation process with Ctrl-C can sometimes cause a cancelled action, although, in general, a Ctrl-C interrupt causes unpredictable results. The cancelled installation of an update can be attempted again later in the installation process if a new installp program is being installed.

Note: CANCELLED is also displayed if you are installing an **installp** fix.

Reinstalling a Software Product

If you attempt to install the product level of a software product that is already installed on the system, then you are reinstalling the product. A product can be reinstalled at the same, earlier, or later level (level refers to the version and release of the product). If you are reinstalling a product at the same or earlier level, then you must use the force option. If you are installing from the command line, use the **installp** command with the **-F** option. If you must use the force option, enter the **smit install_selectable_all** command and choose only those product filesets you want to install. You can only select the base level of a product because updates cannot be installed during a forced installation. After completing the forced reinstallation of a product, you can update the product by entering SMIT with the **smit install_fileset** command. If you are reinstalling a product at a later version, then enter SMIT with the **smit install_latest** command (without specifying the forced option) and the updates will also be installed.

Creating Installation Images on a Hard Disk

Installable image files (or installation packages) can be copied to the disk for use in future installations. These image files will be copied from your installation media (tape or diskette) to a directory on the disk so that they may be installed later using the disk directory as the input device. These files will be copied to a default directory named **/usr/sys/inst.images**. The image files within the disk directory will be named *prodname.part.level* where *prodname* is the name of the software product or update, *part* is *usr* for the *usr* and root parts of a product or *shr* for share parts, and *level* is the complete version number of the product.

Updating Software

Software that is distributed to fix a problem in a product is called an *update*. The SMIT menu Install/Update Selectable Software (Custom Install) is used to install updates. Updates are also installed with the **installp** command.

If you choose to apply the updates during installation (rather than committing them at installation time), you can still reject those updates later. If a particular update is causing problems on your system, you can reject that update without having to reject all the other updates that you installed. Once you are convinced that the updates cause no problems, you may want to commit those updates to retrieve the disk space that is used to save the previous levels of that software.

All software products have a version number and a release number that identify the release level of the product. In addition to this, product updates are assigned a modification level number and a fix level number to identify the level of the update.

Each AIX Version 4.1-formatted update package has a unique *mod* and *fix* level associated with it. The mod and fix level becomes a part of the product level for each software product fileset that is part of the update package. If the situation occurs where the fix for one problem spans across filesets, then a separate mod and fix ID is assigned to each fileset update package.

Following is an example of a fileset and a fileset update:

bos.net.tcp.client 4.1.0.0 is a fileset. **bos.net.tcp.client 4.1.0.1** is an update to that fileset. If another fileset update, **bos.net.tcp.client 4.1.0.2**, is generated, this update will contain all the fixes that were in the **bos.net.tcp.client 4.1.0.1**. If a cumulative AIX update is generated, the mod level of the fileset will increment, resulting in **bos.net.tcp.client 4.1.1.0**, which would contain all previous fixes.

Explanation of Requisites and Dependents

A *prerequisite* software product or update is one that must be installed before another specified product or update can be installed. A *corequisite* product or update is one that must be installed at the same time as another specified product or update. If you want to know more details about *requisites*, see the **ckprereq** command.

From any of the SMIT installation menus, you should answer **yes** to the question, "Automatically install PREREQUISITE software?" to have requisites automatically installed. From the command line, the **-g** flag of **installp** automatically installs any requisites for the software you are installing. When you attempt to install products or updates for which requisite software has not been installed, you receive an error message indicating that certain requisite software must first be installed. If you want to see what requisites will be installed, use the preview option. You may want to specify detailed output with the preview option to see the complete information.

Before a software update can be committed, all updates that are requisites of the specified product or update must also be committed. Committing these requisites must be done from the command line by using the **-g** flag with the **installp** command.

A dependent software product or update is one that requires the specified product or update to be installed before it can be installed. Before a version of a software product can be removed, all products or updates that are dependent upon the specified product or update must also be rejected or removed. From the SMIT menu Reject Applied Updates (Use Previous Version), answer **yes** to the question "REJECT versions that depend on above

version?" to have requisites automatically rejected. From the menu Remove Applied Software Products, answer **yes** to the question "Automatically remove DEPENDENT software?" From the command line, use the **-g** flag or **installp**.

Note: Any software updates dependent on another update that is eligible to be rejected should always be in the applied, not the committed, state. The action of rejecting software updates changes the currently active version of that software product on the system. You should use extreme *caution* when automatically rejecting dependent updates because that action could change the currently active version of some product that you might prefer not to be altered. It is recommended that you preview the reject process beforehand to see the list of requisites that will also be rejected. When you attempt to reject software that has dependents that are not also being rejected (with the command line list or automatic inclusion), you receive an error message indicating what dependent software must first be rejected. Using the **-g** flag with the **installp** command attempts to reject this software for you.

Appendix B. Software Installed Automatically during BOS Installation

The BOS installation program first installs the Base Operating System Runtime (**bos.rte**) image, then installs a set of filesets taken from packages in two LPs:

- Base Operating System (**bos**). The disk space required to install this software is 59MB, plus at least 32MB of paging space.
- AIXwindows (**X11**). The disk space required to install this software is 101MB, plus at least 32MB of paging space.

The installation program automatically installs required message filesets and devices filesets, according to the language you choose and the hardware configuration of the installed machine.

To list all the software installed on your system, enter the following command:

```
lslpp -L | pg
```

To view information about additional software that can be optionally installed, complete the following steps:

1. Install the **pkg_gd** InfoExplorer database using the instructions in “Installing Optional Software and Service Updates” on page 6-1.
2. To access the database, enter:

```
info -l lp_info
```

Base Operating System (BOS) Licensed Program

The following list includes only **bos** filesets that the installation program automatically installs:

- ASCII System Management Interface Tool (SMIT)
- Client Support for iFOR/LS
- Client Support for TCP/IP
- Support for the following terminal types:
 - ibm3101
 - ibm3151
 - ibm3161
 - ibm3162
 - ibm3163
 - ibm3164
 - lft
 - sun
 - tvi912
 - tvi920
 - tvi925
 - tvi950
 - vs100
 - vt100
 - vt320
 - vt330

- vt340
- wyse30
- wyse50
- wyse60
- wyse100
- wyse350

AIXwindows (X11) Licensed Program

This list includes only **X11** filesets that the installation program automatically installs.

The installation program automatically installs the following products only if the installed machine has a graphics adapter as the console. These products may be installed later by selecting the Graphical Support bundle in one of the software installation applications.

- AIXwindows
 - X11 Libraries
 - Runtime Environment
 - Motif Runtime Environment
 - Motif Window Manager
 - aixterm Client Compatibility
 - Display PostScript Copyright
 - Default Fonts
- The following graphical system management applications:
 - Installation Assistant
 - Graphical SMIT
 - Visual System Management
- Language-Specific Locale Support
- Desktop Runtime Libraries
- Desktop Helps

Appendix C. Compatibility between AIX Version 3.2 and AIX Version 4.1

All AIX applications based on AIX Version 3.2 and for use with POWER, POWER/2, and POWERPC-based models, will run compatibly on AIX Version 4.1 without recompilation for those same models. The only exceptions to this statement are applications using:

- Unsupported own loadable kernel extensions
- Certain High Function Terminal control interfaces
- X11R3 input device interfaces
- CIO LAN device driver interface
- SCSI device configuration methods (IHVs)
- nlist() interface
- DCE threads

or applications compiled using POWER2- or PowerPC-specific compiler options, but executed on models other than POWER2 or PowerPC.

Any program that must run in all environments (POWER, POWER2, and PowerPC models 601 and higher) must be compiled using the common mode of the compiler. Programs compiled to exploit POWER2 technology must be run on POWER2-based processors. Existing code need not be recompiled to run.

Applications created on a system using AIX Version 4.1 may not function reliably on a system using AIX Version 3.

Applications must have been created using the AIX shared libraries for these statements to apply.

A system using AIX Version 3.2 can operate as a server system for client machines using AIX Version 4.1 with the following exceptions:

- Network installation of AIX Version 4.1 clients
- Service SNA or X.25 to AIX Version 4.1 clients
- Service HCON to AIX Version 4.1 clients
- Service CGE extensions of PEX and PEX-PHIGS
- Use AIX Version 4.1 client installation formats

Note: With new packaging of AIX Version 4.1, some AIX Version 3 functions are no longer part of the base operating system, but can be ordered as separate licensed programs.

Font servers may be required on the AIX Version 4.1 clients to reliably handle AIXwindows between server and client.

A system using AIX Version 4.1 may operate as a server system for client machines using AIX Version 3.2 or greater as long as the necessary compatibility options are installed. All statements about binary compatibility apply in this case. AIX Version 4.1 applications may not execute reliably on AIX Version 3 systems using remote network mounts of AIX Version 4.1 file system.

AIX Version 4.1 Installation and Compatibility with AIX Version 3.2.5

Users installing AIX Version 4.1 who are concerned about binary compatibility with AIX Version 3.2 should install the compatibility filesets offered on the installation media. These filesets offer commands, library versions, symbolic links and other items that, when added to the system, make it look more like a AIX Version 3.2 system from an application point of view.

While some of these filesets increase disk requirements (substantially, in the case of the AIXwindows X11R3 and R4 compatibility packages) and contain obsolete function, the compatibility filesets increase portability in an environment with machines running mixed levels of AIX. Installing the compatibility filesets is highly recommended.

If you performed a Migration Installation, you do not need to install these filesets.

Filesets are included for:

- Base operating system commands
- Base operating system libraries
- Base operating system curses/termcap
- Base operating system networking
- Base operating system directories/files (symlinks)
- Messages
- X11R3
- X11R4
- X11 fonts

Use the instructions in "Optional Software and Service Updates" on page 6-1 to install these filesets. The filesets are listed with **compat** in the name. For example, the **bos.compat.cmds** fileset contains the base operating system compatibility commands, and the **X11.compat.lib.X11R3** fileset contains the AIXwindows X11R3 compatibility libraries.

Appendix D. Migrating from AIX Version 3.2

This section lists things to consider before migrating to AIX Version 4.1:

- User and Group Definitions
- Migrating Network Software

User and Group Definitions

For the migration and preservation processes to function correctly, all system users and groups that were defined in the **/etc/group** and **/etc/passwd** files in the original AIX distribution must be redefined.

The following is a list of the minimum that should exist in the **/etc/passwd** and **/etc/group** files before installing, updating, or migrating to AIX Version 4.1.

Group Definitions

/etc/passwd	/etc/group
root:!:0:0:/:bin/Ksh	system:!:0:root
daemon:!:1:1:/:etc:	staff:!:1:
bin:!:2:2:/:bin:	bin:!:2:root,bin
sys:!:3:3:/:usr/sys:	sys:!:3:root,bin,sys
adm:!:4:4:/:var/adm:	adm:!:4:bin,adm
uucp:!:5:5:/:usr/lib/uucp:	uucp:!:5:uucp
guest:!:100:100:/:home/guest	mail:!:6:
nobody:!:4294967294:4294967294:/:	security:!:7:root
lpd:!:9:4294967294:/:	cron:!:8:root
	printq:!:9:
	audit:!:10:root
	ecs:!:28:
	nobody:!:4294967294:nobody,lpd
	usr:!:100:guest

Migrating Network Software

The following must be considered when migrating network software from AIX Version 3.2:

Migrating TCP/IP from Version 3.2

Configuration files are saved in **/lpp/save.config/etc**. The file from the previous release is named **filename.old**, and the shipped file is named **filename.new**. For example, when **/etc/rc.tcpip** is migrated:

/etc/rc.tcpip

is upgraded and your configuration information is saved.

/lpp/save.config/etc/rc.tcpip.old	is the original rc.tcpip file (with your configuration changes).
/lpp/save.config/etc/rc.tcpip.new	is the version shipped with your latest level of AIX (without your configuration changes).

The following files are migrated:

- **/etc/rc.net**
- **/etc/rc.bsdnet**
- **/etc/services**

All the services previously defined are kept. The AIX Version 4.1 **/etc/services** file contains all the defined services from the Request for Comment (RFC) and Internet Engineer Task Force (IETF) standards document. Where a conflict exists between a service you have previously defined and a globally defined service (from an RFC), your service will be kept and the official one commented out.

- **/etc/inetd.conf**
- **/etc/rc.tcpip**
- **/etc/bootptab**
- **/etc/3270.keys**
- **/etc/3270keys.hft**

In most cases, your TCP/IP configuration will migrate without problems. If you have made substantial changes to any of the preceding files, be sure everything you changed still works after migration is complete.

Migrating NFS and NIS from Version 3.2

The **/etc/rc.nfs** and **/var/yp/Makefile** files are not migrated. The old files are saved in **/lpp/save.config/etc/rc.nfs** and **/lpp/save.config/var/yp/Makefile**. You must configure your Network Information Service (NIS) domain name before an NIS client will work.

For NIS servers, the NIS databases are unchanged. You must reconfigure the NIS domain and restore any changes you previously made to **rc.nfs** and the **Makefile** because **rc.nfs** and **Makefile** get replaced. The old files are saved in **/lpp/save.config** with their corresponding path names. The user and group information is retained because the **passwd** and **group** files are not changed in a migration install.

Migrating XStations from Version 3.2

The **/etc/bootptab** file is migrated during migration installation.

Glossary

/usr file system. Contains files and programs necessary for operating the machine.

/tmp file system. A shared storage location for files.

/var file system. Contains files that are variable on a per-client basis, such as spool and mail files.

/ file system. The root file system; contains files that contain machine-specific configuration data.

A

APAR. Authorized program analysis report. A report of a problem caused by a suspected defect in a current, unaltered release of a program.

apply. When a service update is installed or *applied*, it enters the applied state and becomes the currently active version of the software. When an update is in the applied state, the previous version of the update is stored in a special save directory. This allows you to restore the previous version, if necessary, without having to reinstall it.

Software that has been applied to the system can be either *committed* or *rejected*. The **installp -s** command can be used to get a list of applied products and updates that are available to be either committed or rejected. See also *commit* and *reject*.

B

boot device. The device that assigns the fixed disk within the root volume group that will contain the startup (boot) image.

BOS. The base operating system (BOS) is the collection of programs that controls the resources and the operations of the computer system.

bosinst.data. The file that controls the actions of the BOS installation program.

bundle. A collection of software products available for installation.

C

CD-ROM. High-capacity, read-only memory in the form of an optically read compact disc.

clean up. The clean up procedure instructs the system to attempt to remove software products that were partially installed. The system also attempts to revert to the previous version of the removed product. If the system successfully reverts to the previous version, it becomes the currently active version. If this cannot be done, then the software product is marked as broken. After the clean up procedure is complete, you can attempt to install the software again.

client. In a distributed file system environment, a system that is dependent on a server to provide it with programs or access to programs.

commit. When you commit software, you are making a commitment to that version of the software product. When you commit a product, the saved files from all previous versions of the software product are removed from the system, thereby making it impossible to return to a previous version of the software product. In SMIT, software can be committed at the time of installation by setting the COMMIT software? question to **yes** (or by using the **-ac** flags with the **installp** command). Note that committing already applied software does not change the currently active version of the software product. It merely removes saved files for the previous version of the software product.

The rejection of the installation level of the product does *not* have the same meaning as the rejection of updates to the product. Once you commit a new version of a product, you must reinstall the previous version if you want to use that version again. Compare to *apply* and contrast with *reject* and *remove*.

complete overwrite installation. Use this method to completely overwrite an existing version of the Base Operating System (BOS) that is installed on

your system. This procedure may impair recovery of data or destroy all existing data on your hard drives. Be sure to back up your system before doing a complete overwrite installation.

configure. To describe to a system the devices, optional features, and program products installed on a system.

console device. During the installation of the Base Operating System (BOS), the system console is the display device at the system on which you are installing the software.

corequisite. A product or update that must be installed concurrently with another specified product or update.

D

daemon. A program that runs in the background, unattended, to perform a standard service. Some daemons trigger automatically to perform their task and others operate on a timed or periodic basis.

dataless. A workstation without local file systems or local boot images that accesses some of its resources remotely. Dataless clients use a local disk used for paging and dump devices.

dependent. A software product that requires another product or update to be installed *before* or *at the same time* it is installed. Contrast with *prerequisite*.

destination disk. The disk to which you are installing.

directory. A type of file containing the names and controlling information for other files or other directories.

diskless. A workstation without local file systems or local boot images that accesses some of its resources remotely. Diskless clients boot remotely from a diskless server and use the server for remote paging.

display. A computer output screen on which visual information is displayed.

display device. See *display*.

E

Easy Install. An application used to install optional software or service updates in the form of software bundles.

environment. (1) The settings for shell variables and paths that are set when the user logs in. These variables can be modified later by the user. (2) A named collection of logical and physical resources used to support the performance of a function.

environment variable. (1) A variable that describes the operating environment of the process. Common environment variables describe the home directory, command search path, the terminal in use, and the current time zone (the **HOME**, **PATH**, **TERM**, and **TZ** variables, respectively). (2) A variable that is included in the current software environment and is therefore available to any called program that requests it.

F

file. The collection of related data that is stored and retrieved by an assigned name.

file system. The collection of files and file management structures on a physical or logical mass storage device, such as a diskette or minidisk.

fileset. An individually installable option or update. Options provide specific function and updates correct an error in, or enhance, a previously installed option.

file tree. The complete directory and file structure of a particular node, starting at the root directory. A file tree contains all local and remote mounts performed on directories and files.

fixed disk. See hard disk.

full path name. The name of any directory or file expressed as a string of directories and files beginning with the root directory. See *path name*.

G

graphical interface. A type of computer interface consisting of a visual metaphor of a real-world scene, often a desktop. Within that scene are icons, representing actual objects, that the user can access and manipulate with a pointing device.

H

hard disk. (1) A flat, circular, nonremoveable plate with a magnetizable surface layer on which data can be stored by magnetic recording. A rigid magnetic disk used in a fixed-disk drive. (2) The term fixed disk is also used loosely in the industry for boards and cartridges containing microchips or bubble memory that simulate the operations of a fixed-disk drive.

Note: The term hard disk is also used loosely in the industry for boards and cartridges containing microchips or bubble memory that simulate the operations of a hard disk drive.

hardware. The physical equipment of computing and computer-directed activities. The physical components of a computer system. Contrast with *software*.

host. (1) The primary or controlling computer in a communications network that has an Internet address. A host with multiple network interfaces may have multiple Internet addresses associated with it. (2) A computer attached to a network.

host name. The Internet address of a machine in the network. Also known as the host ID.

hypertext. A way of presenting information online with connections between one piece of information and another. These connections are called hypertext links. Thousands of these hypertext links enable you to explore additional or related information throughout the online documentation. See also *hypertext link*.

hypertext link. A connection between one piece of information and another. In the graphics interface, the link is displayed in a rectangular box. In the ASCII interface, it is displayed as underlined text. When you select one of these links, you are routed

to the target piece of information, which displays on the screen.

I

icon. A picture or graphical representation of an object on a display screen to which a user can point with a device, such as a mouse, to select a particular operation or perform a certain action.

initial program load (IPL). (1) The initialization procedure that causes an operating system to commence operation. (2) The process by which a configuration image is loaded into storage at the beginning of a work day or after a system malfunction. (3) The process of loading system programs and preparing a system to run jobs.

input device. The device that is the source of the software you are installing. The input device can be a tape drive, CD-ROM drive, diskette drive, or a directory.

Installation Assistant. An application used to perform system configuration tasks.

installation image. An installation image contains a copy of the software you are installing in backup format, as well as copies of other files the system needs to install the software product.

Internet (IP) address. The numbering system used in TCP/IP internetwork communications to specify a particular network or a particular host on that network with which to communicate. Internet addresses are commonly denoted in dotted decimal form.

IPL. See initial program load.

L

license password. The key that allows a software product to be used.

licensed program. (1) A software program that remains the property of the manufacturer, for which customers pay a license fee. (2) A separately priced program and its associated materials that bear a copyright and are offered to customers under the terms and conditions of a licensing agreement.

locale. A subset of a user's environment that defines conventions for a specified culture, such as time formatting, and character classification, conversion, and collation.

logical partition. One to three physical partitions. The number of logical partitions in a logical volume is variable.

logical volume. A collection of physical partitions organized into logical partitions all contained in a single volume group. Logical volumes are expandable and can span several physical volumes in a volume group.

M

maintenance level update. The service updates (fixes and enhancements) that are necessary to upgrade the Base Operating System (BOS) or an optional software product to the current release level.

migration installation. An installation method for upgrading AIX to a later release while preserving the existing root volume group. This method preserves the `/usr`, `/tmp`, `/var`, and `/` (root) file systems, as well as the root volume group, logical volumes, and system configuration files.

monitor. (1) A device that observes and verifies operations of a data processing system. (2) Synonym for *display*.

mount. To make a file system accessible.

N

name server. A host that provides name resolution for a network. Name servers translate symbolic names assigned to networks and hosts into the efficient Internet addresses used by machines.

Network Installation Management (NIM). An environment that provides installation and configuration of software within a network interface.

new installation. Use this method when the hard disk or disks you are installing the Base Operating System (BOS) onto are *empty*. A hard disk is considered empty if it does not contain any data or if it contains some data, but the data is not in a volume group.

NFS. Network File System is a distributed file system that enables users to access files and

directories located on remote computers and treat those files and directories as if they were local. NFS is independent of machine types, operating systems, and network architectures through the use of remote procedure calls (RPC).

NIM. See Network Installation Management.

O

ODM. The Object Data Manager (ODM) is a data manager intended for the storage of system data.

option. An installable unit of a software package. Software product options are separately installable units that can operate independently from other options of that software package.

optional software. Also referred to as *optional software products*. Software that is *not* automatically installed on your system when you install the Base Operating System (BOS). Optional software can be products packaged and sold with BOS. Optional software can also be separately purchased software products that are specially ordered and not sold as part of BOS. In either case, BOS must be installed on your system before you can install optional software.

P

package. An installable unit of a software product. Software product packages are separately installable units that can operate independently from other packages of that software product.

paging. (1) The action of transferring instructions, data, or both between real storage and external page storage. (2) Moving data between memory and a mass storage device as the data is needed.

path name. A file name specifying all directories leading to the file.

physical volume. The portion of a single unit of storage accessible to a single read/write mechanism, for example, a drum, a disk pack, or part of a disk storage module.

PMP. A preventive maintenance package (PMP) is a maintenance level update for your system. A PMP includes updates for the Base Operating System (BOS) and for each optional software product that is installed on your system.

PMR. A Problem Management Record (PMR) is a number assigned by a support center to a reported problem.

preinstalled. Software that is installed by the manufacturer and ready to use.

prerequisite. A software product or a service update that must be installed *before* another software product or service update is installed. If you attempt to install software products or service updates without the required prerequisite software, a system message displays the names of required prerequisite software. Contrast with *dependent*.

preservation installation. Use this installation method when a previous version of the Base Operating System (BOS) is installed on your system and you want to preserve the user data in the root volume group. However, this method overwrites the */usr*, */tmp*, */var*, and */* (root) file systems, so any user data in these directories is lost. System configuration will have to be done after doing a preservation installation.

primary language. The primary locale you want your system to use for screen information.

product. A software product is made up of software packages that are separately installable.

R

reboot. To reinitialize the execution of a program by repeating the initial program load (IPL) operation.

reject. When you reject an applied service update, the update's files are deleted and the software vital product data (SWVPD) information is changed to indicate that the update is no longer on the system. The previous version of the software, if there is one, is restored and becomes the active version of the software. See *apply* and *commit*.

remove. When you remove a software option, the option and all of its applied or committed updates are deleted from the system. The software vital product data (SWVPD) information is changed to indicate that the option has been removed from the system. Depending on the option, system configuration information is also cleaned up,

although this is not always complete. If a previous version, release, or level of the option is on the system, the system will not restore the previous version. Only an option with its updates can be removed. Updates cannot be removed by themselves.

requisite. A software product or a service update that must be installed with another software product or service update. If you attempt to install software products or service updates without the required software, a system message displays the names of required software.

root user authority. The unrestricted ability to access and modify any part of the operating system, usually the user who manages the system.

root volume group (rootvg). A volume group containing the Base Operating System (BOS).

S

server. On a network, the computer that contains the data or provides the facilities to be accessed by other computers on the network.

service update. Software that either corrects a defect in or adds an enhancement to the Base Operating System (BOS) or an optional software product.

SMIT. The System Management Interface Tool (SMIT) is a facility that provides menus and dialog support for performing system management tasks.

software. Programs, procedures, rules, and any associated documentation pertaining to the operation of a system. Contrast with *hardware*.

source. A system, a program within a system, or a device that makes a request to a target. Contrast with *target*.

special file. Used in the operating system to provide an interface to input/output devices. There is at least one special file for each device connected to the computer. Contrast with *directory* and *file*.

stacked tape. A bootable tape with multiple software images.

T

target. A system, a program within a system, or a device that interprets, rejects, or satisfies, and replies to requests received from a source. Contrast with *source*.

TCP/IP. Transmission Control Protocol/Internet Protocol. A communications subsystem that allows you to set up local area and wide area networks.

U

Universal Coordinated Time (UCT). The new standard term for worldwide time-telling that has the same meaning as Greenwich Mean Time.

update. See *service update*.

upgrade. Software that fixes a defect in a previously released software product.

V

verify. The verify procedure instructs the system to verify the software you are installing. The system confirms that your software files are the correct length and contain the correct number of digits and characters. If any errors are reported, it might be necessary to install the software product again. The verification process can add a significant amount of time to the installation process.

Visual System Management (VSM). A graphical interface that allows you to perform installation and system management tasks through direct manipulation of icons.

volume group. A single hard disk or group of hard disks on your system.

Related Information

This section lists titles that provide more information about concepts and procedures covered in *AIX Version 4.1 Installation Guide*.

“Getting Started (InfoExplorer Windows)” and “Getting Started (InfoExplorer ASCII)” in *AIX Version 4 Getting Started* describe how to begin using InfoExplorer.

“Backup Files and Storage Media Overview” in *AIX Version 4 System User’s Guide: Operating System and Devices* explains different methods of backing up using various types of backup media, restoring system backups, and guidelines for backup policies.

“System Management Interface Tool (SMIT) Overview” in *AIX Version 4 System Management Guide: Operating System and Devices* explains the structure, main menus, and tasks that are done with SMIT.

“File Systems Overview” in *AIX Version 4 System Management Guide: Operating System and Devices* provides information on file system types and management.

“Logical Volume Storage Overview” in *AIX Version 4 System Management Guide: Operating System and Devices* provides information about the Logical Volume Manager and how logical volumes, physical volumes, and volume groups work together.

“Mounting Overview” in *AIX Version 4 System Management Guide: Operating System and Devices* provides information on mounting files and directories, mount points, and automatic mounts.

“Transmission Control Protocol/Internet Protocol Overview” in *AIX Version 4 System Management Guide: Communications and Networks* explains the basic functions of TCP/IP, including Internet.

“Network File System (NFS) Overview for System Management” in *AIX Version 4 System Management Guide: Communications and Networks* discusses NFS daemons, commands, files, network services, and implementation.

AIX Version 4 Problem Solving Guide and Reference discusses ways to investigate, define, and fix system problems.

The following commands in *AIX Version 4 Commands Reference*:

installp, lppchk, lspp, mksysb, backup, ls, smit.

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