

AIX Version 4.2

Installation Guide

AX2INSA/IS1

First Edition (March 1997)

This edition of the *Installation Guide* applies to AIX 4.2 and to all subsequent releases of this product until otherwise indicated in new releases or technical newsletters.

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Contents

Chapter 1. About This Guide	1-1
Who Should Use This Guide	1-2
Overview of Contents	1-3
Document Conventions	1-5
Highlighting	1-5
Sample Screens	1-5
Standards	1-6
ISO 9000	1-6
AIX Support for the X/Open UNIX95 Specification (also known as Spec1170) ..	1-6
Other Key Sources of Installation Information	1-7
Related Publications	1-7
Ordering Publications	1-7
Chapter 2. Determining Your Starting Point	2-1
Customizing a Preinstalled System	2-2
Installing BOS on a New Machine	2-3
Upgrading to AIX 4.2 from an Earlier Version	2-4
Installing Optional Software	2-5
Customizing the BOS Install Program	2-6
Making a System Backup	2-7
Installing BOS from a System Backup	2-8
Chapter 3. Installing BOS from CD-ROM or Tape	3-1
Flowchart for BOS Installation from CD-ROM or Tape	3-2
Run-time BOS Installation Methods	3-3
New and Complete Overwrite Installation	3-3
Migration Installation	3-3
Preservation Installation	3-4
Preparing for the Run-time BOS Installation	3-5
Prerequisites	3-5
Setting ASCII Terminal Options	3-5
Communications Options	3-5
Keyboard and Display Options	3-6
Starting the System	3-6
The System Is Not Running AIX	3-6
The System is Running AIX	3-7
Identifying System Console and Installation Language	3-8
Installing with Default System Settings	3-10
Verifying the Default Installation and System Settings	3-11
Installing with Modified System Settings	3-12
Changing the Installation Method (Preservation or Migration Only)	3-12
Overview	3-12
Procedure	3-12

Changing the Destination Disk	3-13
For a New and Complete Overwrite Installation	3-14
For a Preservation or Migration Installation	3-15
Changing the Primary Language Environment	3-15
Changing the Trusted Computing Base Setting	3-17
Completing the Run-time BOS Installation	3-18
Preservation and New and Complete Installation	3-18
Migration Installation	3-18
Chapter 4. Customizing Your Installation	4-1
Gathering the Required Information	4-2
TCP/IP Minimum Configuration and Startup Worksheet	4-2
Updating the Host List Worksheet	4-3
Mounting Remote File Systems Worksheet	4-4
Determining the Required Bundles	4-5
Server Bundles	4-5
Client Bundles	4-5
Using the Installation Assistant	4-6
Flowchart for Installation Assistant Tasks	4-7
Completing the Customization Using the Installation Assistant	4-8
Installing InfoExplorer Databases	4-10
Configuring ISA Devices	4-11
Configuring the Ethernet Adapter Medium	4-12
Switching Cables	4-12
Setting Ethernet Cable Type	4-12
Using Specialized Media Types	4-12
Determining the Ethernet Packet Transmission/Reception Port	4-13
Configuring an Additional Graphics Adapter	4-14
Prerequisites	4-14
Installing the Driver Software	4-14
Reconfiguring the Desktop Environment	4-14
Rebooting the System	4-15
Configuration Tasks for Series E Systems	4-16
Configuring sa2 and sa3 Serial I/O Ports	4-16
Configuring ttys	4-16
Configuring Serial Printers	4-17
Where Do I Go Next?	4-19
Chapter 5. Customizing BOS Installation Program	5-1
Introduction to Customizing the BOS Install Program	5-2
bosint.data File	5-2
image.data File	5-2
preserve.list File	5-2
Using a Customized bosinst.data File	5-3
Creating the Customized File for Use with a Backup Tape	5-3
Creating the Customized File for Use with Bootable Tapes	5-3
Creating the Customized File for Use with a Client File	5-4
Creating the Customized File for Use with a Supplementary Diskette	5-4

bosinst.data File Stanza Descriptions	5-6
control_flow Stanza	5-6
target_disk_data Stanza	5-8
locale Stanza	5-9
Example bosinst.data Files	5-10
mksysb Backup Restoration	5-10
Nonprompted Installation	5-11
Chapter 6. Installing Optional Software	6-1
Introduction to Installing Software and Service Updates	6-2
Optional Software and Service Updates	6-2
Software Licensing	6-2
Migrating Software to AIX Version 4.2	6-2
Viewing Individual Software Information in InfoExplorer	6-3
Flowchart for Installing Optional Software and Service Updates	6-4
Prerequisites for Installing Optional Software	6-5
Overview	6-5
Procedure	6-5
Using SMIT To Install Optional Software and Service Updates	6-7
SMIT Installation Paths	6-7
Custom SMIT Install Options	6-7
Getting Help on Using SMIT	6-8
Accessing SMIT Installation Menus	6-9
Installing Bundles of Software (Easy Install)	6-9
Installing Software and Service Updates (Custom Install)	6-11
Reviewing Message Logs	6-13
Using a VSM Application To Install Optional Software and Service Updates	6-15
Using Easy Install	6-15
Using Install and Update Software Manager	6-17
Where Do I Go Next?	6-19
Chapter 7. Maintaining Optional Software	7-1
Introduction to Software Maintenance	7-2
Maintaining Software Using SMIT	7-2
Maintaining Software using a VSM Application	7-2
Committing Service Updates	7-3
Overview	7-3
Procedure	7-3
Rejecting Service Updates	7-5
Overview	7-5
Procedure	7-5
Removing Software Filesets	7-6
Overview	7-6
Procedure	7-6
Cleaning Up Optional Software and Service Updates	7-7
Overview	7-7
Automatic and Manual Cleanups	7-7
The Cleanup Process	7-7
The Cleanup Process Flowchart	7-8

Cleaning Up Software Procedures	7-8
Cleaning Up Software Using SMIT	7-8
Cleaning Up Software Using a VMS Applicaton	7-9
Chapter 8. Backing Up Your System	8-1
Introduction to Backing Up Your System	8-2
Configuring before the Backup	8-2
Source and Target Configurations	8-2
Device Configurations	8-2
Passwords and Network Addresses Configuration	8-3
Mounting and Unmounting File Systems	8-3
Completing the Prerequisites for Making a Backup	8-4
Backing Up the Root Volume Group	8-5
Backing Up a User Volume Group	8-8
Verifying a Backup Tape	8-9
Chapter 9. Installing BOS from a System Backup	9-1
Introduction to Backup Installations	9-2
Backup Installation Process	9-2
Restoring a Backup Image	9-2
Setup Considerations	9-3
Flowchart for Backup Installations	9-4
Installing BOS from a System Backup	9-5
Prerequisites	9-5
Setting ASCII Terminal Options	9-5
Communications Options	9-5
Keyboard and Display Options	9-6
Starting the System	9-6
The System Is Not Running AIX	9-6
The System is Running AIX	9-7
Identifying System Console and Installation Language	9-8
Using a Nonprompted Installation	9-9
Using a Prompted Installation	9-10
Where Do I Go Next?	9-13
Chapter 10. Troubleshooting	10-1
Booting from a Tape or CD-ROM Drive	10-2
Beginning the Boot	10-2
The System Is Not Running AIX	10-2
The System is Running AIX	10-3
Accessing a System That Does Not Boot	10-4
Prerequisites	10-4
Setting ASCII Terminal Options	10-4
Communications Options	10-4
Keyboard and Display Options	10-5
Accessing the System	10-5
Troubleshooting an Installation from a System Backup	10-9
Bootup Failure	10-9
Booting from the Product CD-ROM	10-9
Booting from the Product Tape	10-9
Source and Target Differences	10-10

Suggestions for Reported Problems	10-10
Troubleshooting a Full /usr File System	10-11
Resetting the Firmware Default Settings	10-12
Resetting Default Options in PPCBug Firmware	10-12
Resetting Default Options in PowerPC Open Firmware	10-12
Accessing Menu Options in the Firmware	10-13
Assigning IRQ Levels for ISA Cards	10-14
Disabling DEC Ethernet Checksum Validation	10-15
Viewing BOS Installation Logs	10-16
Using the snap Problem Determination Tool	10-17
Disk Space Requirements	10-17
Output Directory	10-17
Execution Permissions	10-17
Cleanup	10-17
Options	10-17
View the Usage Instructions	10-18
Chapter 11. Acting on System and Error Messages	11-1
Chapter 12. README Files	12-1
Viewing the README Files	12-2
Appendix A. Optional Software Installation Concepts	A-1
Packaging of Software Products	A-2
Software Product Organization	A-3
Software Product Identification	A-5
Installing and Running Hardware Diagnostics	A-6
Applying, Committing, Rejecting, and Removing Software Products and Updates	A-7
Apply Action (for Service Updates)	A-7
Commit Action (for Service Updates)	A-7
Reject Action (for Service Updates)	A-7
Remove Action (for Software Products)	A-8
Error Messages and Output from the installp Command	A-9
Reinstalling a Software Product	A-11
Creating Installation Images on a Hard Disk	A-12
Updating Software	A-13
Explanation of Requisites and Dependents	A-14
Appendix B. Software Installed Automatically During BOS Installation	B-1
Overview of Automatically Installed Software	B-2
Listing the Installed Software	B-2
Viewing Optional Software Information	B-2
Base Operating System (BOS) Licensed Program	B-3
AIXwindows (X11) Licensed Program	B-4
Index	X-1

Chapter 1. About This Guide

The *AIX Version 4.2 Installation Guide* describes different ways to install Version 4.2 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 the *Installation Guide* to install BOS. Chapter 2, “Determining Your Starting Point” on page 2-1 helps you determine how to proceed in completing installation tasks. It suggests a minimal path through the *Installation Guide*. However, you may want to use additional procedures described in other chapters of this book.

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

The *Installation Guide* is intended for customers installing AIX 4.2 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 *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 4.2 was preinstalled at the factory, 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.

Category	Description
Installing the Base Operating System (BOS) from CD-ROM or Tape	<p>describes the different BOS installation procedures you can use depending on the state or operating system level of your system</p> <p>You can accept default settings and begin the installation immediately, or you can verify or change system settings before beginning the installation.</p>
Customizing the Installed System	<p>describes the tasks you may need to perform after you have installed BOS</p> <p>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.</p>
Customizing the Installation Method	<p>contains information about the bosinst.data file, that system administrators can modify to change the default settings used by the BOS installation program</p> <p>Customizing the bosinst.data file enables you to install BOS without the set of menus that are usually displayed, thus facilitating unattended installations.</p>
Installing and Maintaining Optional Software	<p>Chapter 6“Installing Optional Software and Service Updates” 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.</p> <p>Chapter 7, “Maintaining Optional Software” on page 7-1 describes how to commit and reject updates and remove installed software.</p>
Backing Up Your System	<p>Chapter 8, “Backing Up Your System” describes how to create a backup image of your AIX 4.2 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.</p> <p>Chapter 9“Installing BOS from a System Backup” 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.</p>

Category	Description
Troubleshooting the Installation	<p>Chapter 10, "Troubleshooting" provides instructions for resolving installation problems.</p> <p>Chapter 11, "Acting on System and Error Messages" provides information about messages you may receive while performing installation procedures.</p>
Reference Information	<p>Chapter 12, "Viewing README Files" provides instructions for viewing README files that contain late-breaking news about software you may have installed.</p> <p>Appendix A, "Optional Software Installation and Update Concepts" 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.</p> <p>Appendix B, "Software Installed Automatically during BOS Install" describes the software that is automatically installed when you install BOS.</p>

Document Conventions

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*. These screens 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. However, the sample screens should be *similar* to what you see on your display screen.

Standards

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

AIX Support for the X/Open UNIX95 Specification (also known as Spec1170)

Beginning with AIX 4.2, the operating system is designed to support the X/Open UNIX95 Specification (also known as Spec1170) for portability of UNIX-based operating systems. Many interfaces have been added or enhanced to meet this specification. Beginning with Version 4.2, AIX is even more open and portable for applications.

At the same time, compatibility with previous AIX releases is preserved. This is accomplished by the creation of a new environment variable, which can be used to set the system environment on a per-system, per-user, or per-process basis.

To determine the proper way to develop a UNIX95-portable application, you may need to refer to the X/Open UNIX95 Specification (also known as Spec1170). You can obtain this specification on a CD-ROM by ordering the printed copy of *Commands Reference* or by ordering *Go Solo: How to Implement and Go Solo with the Single Unix Specification* a book that includes the X/Open UNIX95 Specification (also known as Spec1170) on a CD-ROM.

Other Key Sources of Installation Information

Related Publications

The following publications supplement and contain additional information related to the installation and management of AIX 4.2:

- 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 4.1 Installation Guide* describes how to create a backup copy of an AIX 4.1 system.
- *Hypertext Information Base Library Version 1 for AIX*. Once BOS is installed, you can install this complete hypertext library from CD-ROM.
- *System Management Guide: Operating System and Devices*
- *System Management Guide: Communications and Networks*
- *Network Installation Management Guide and Reference*
- *Commands Reference* (six volumes)
- *Problem Solving Guide and Reference*
- *Files Reference*
- *Messages Guide and Reference*
- *General Programming Concepts: Writing and Debugging Programs*

Other useful publications:

- *AIX and Related Products Documentation Overview*
- *Topic Index and Glossary*
- *System User's Guide: Operating System and Devices*
- *System User's Guide: Communications and Networks*
- *Getting Started*
- *Quick Reference*

Ordering Publications

You can order publications from your sales representative or from your point of sale.

If you received a printed copy of *Documentation Overview* with your system, use that book for information on related publications and for instructions on ordering them.

Chapter 2. Determining Your Starting Point

The *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*.

This chapter discusses these topics:

- “Customizing a Preinstalled System,” on page 2-2
- “Installing BOS on a New Machine,” on page 2-3
- “Upgrading to AIX 4.2 from an Earlier Version,” on page 2-4
- “Installing Optional Software,” on page 2-5
- “Customizing the BOS Install Program,” on page 2-6
- “Making a System Backup,” on page 2-7
- “Installing BOS from a System Backup,” on page 2-8

Customizing a Preinstalled System

If you received a system that was preinstalled at the factory, follow these steps:

1. Turn on the system.
2. When prompted to do so, identify your system console.
3. Continue with Chapter 4, “Customizing Your Installation” on page 4-1.

Installing BOS on a New Machine

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

1. Go to Chapter 3, “Installing BOS from CD-ROM or Tape” on page 3-1.
2. Continue with Chapter 4, “Customizing Your Installation” on page 4-1.

Upgrading to AIX 4.2 from an Earlier Version

If you are installing AIX 4.2 on a machine that has AIX already installed, follow these steps:

3. Back up your system.

To back up an AIX 4.1, system follow the instructions in the *AIX 4.1 Installation Guide*.

4. Go to Chapter 3, “Installing BOS from CD-ROM or Tape” on page 3-1.
5. Go to Chapter 4, “Customizing Your Installation” on page 4-1.

Installing Optional Software

If you have already installed AIX 4.2, and you only want to install optional software products or service updates:

- Go to Chapter 6, “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 Chapter 4, “Customizing Your Installation” on page 4-1 to install bundles of software using the *Easy Install* interface.

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

Customizing the BOS Install Program

If you have already installed a machine with AIX 4.2, and you want to customize the **bosinst.data** file to set installation parameters for installing other machines, follow these steps:

1. Go to Chapter 5, “Customizing the BOS Install Program” on page 5-1.
2. Back up the machines you want to install with customized installation parameters.

For instructions on backing up your system, refer to Chapter 8, “Making a System Backup” on page 8-1 .

3. Go to Chapter 4, “Customizing Your Installation” on page 4-1 if the installed system requires further configuration.

Making a System Backup

If you have already installed a machine with AIX 4.2, and you want to make a backup image of your system, go to Chapter 8, “Making a System Backup” on page 8-1.

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 Chapter 9, “Installing BOS from a System Backup” on page 9-1.
2. Go to Chapter 4, “Customizing Your Installation” on page 4-1 if the installed system requires further configuration.

Chapter 3. Installing BOS from CD-ROM or Tape

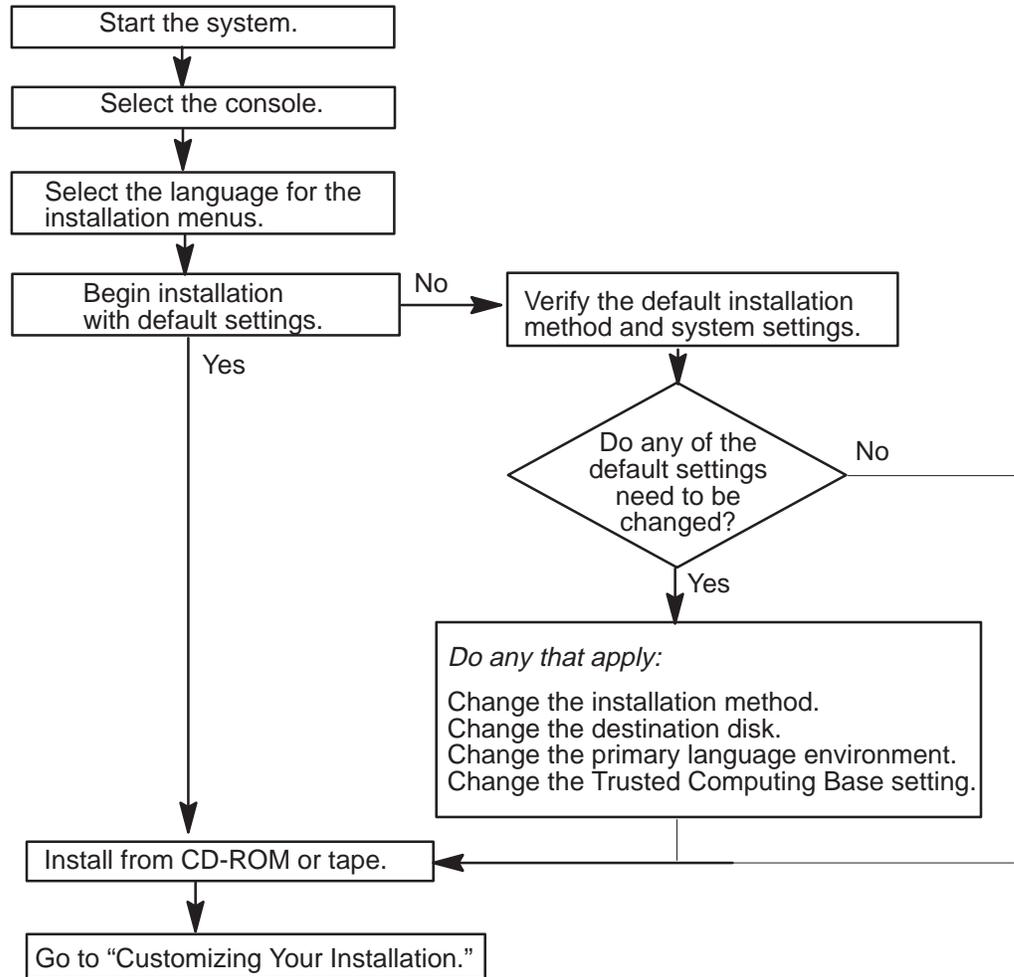
This chapter describes the installation methods and procedures for installing AIX 4.2 of the Base Operating System (BOS) from CD-ROM or tape.

This chapter includes the following sections:

- Flowchart for BOS Installation from CD-ROM or Tape, on page 3-2
- “Run-time BOS Installation Methods,” on page 3-3
- “Preparing for the Run-time BOS Installation,” on page 3-5
- “Installing with Default System Settings,” on page 3-10
- “Verifying the Default Installation and System Settings,” on page 3-11
- “Installing with Modified System Settings,” on page 3-12
- “Completing the Run-time BOS Installation,” on page 3-18

Flowchart for BOS Installation from CD-ROM or Tape

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



Run-time BOS Installation Methods

Follow the procedures in this chapter to install the run-time BOS. After completing these procedures, refer to Chapter 3, Customizing Your Installation, for information on the tasks you need to complete after you install the BOS.

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 4.2.

Migration Install

This is the default setting for a machine installed with Version 4.1.

This section describes AIX 4.2 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 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 the **New and Complete Overwrite**. Instead, use the **Migration** installation. (The **Migration** installation is available only for 4.1 machines.)

Migration Installation

Use this installation method to upgrade AIX 4.1 to AIX 4.2 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 4.1 machines.

During a **Migration** installation, the installation process determines the optional software products that need to be installed on AIX 4.2 or AIX 4.1 software that exists on the system and has been replaced by new software in AIX 4.2 is installed at the AIX 4.2 level.

To complete the **Migration** installation, you need to have at least 8MB of free disk space. 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** is 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 need to create additional disk space on the machine you want to install.

Refer to Chapter 6, “Installing Optional Software and Service Updates” on page 6-1 for more information about installing software bundles and migrating or installing optional software products. Chapter 7, “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. On an AIX 4.1 or later 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 Chapter 4, “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.

Preparing for the Run-time BOS Installation

Prerequisites

Before installing the BOS, complete the following prerequisites:

- Connect all hardware, including any external devices, such as tape and CD-ROM drives. If you need instructions, refer to the hardware documentation that accompanied your system.
- Locate your installation CD-ROMs or tapes. If you are installing from CD-ROM, you should have two volumes. If you are installing from tape, you should have one or more volumes.
- 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 the system you are installing contains data, create or locate a backup of the system:
 - If AIX 4.1 is currently installed, refer to the *AIX Version 4.1 Installation Guide* for instructions on how to create a backup copy of your Version 4.1 system. After you have created a backup of your system, continue with “Starting the System.”
 - If you are reinstalling AIX 4.2, refer to Chapter 8, “Backing Up Your System” on page 8-1. After you have created a backup of your system, continue with “Starting the System on page 3-6.”
- 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.

Setting ASCII Terminal Options

If you are using an ASCII terminal set the communications and keyboard options as shown below.

Communications Options

Set This Option...	To This Value...
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

Keyboard and Display Options

Set This Option...	To This Value...
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

Refer to your hardware documentation for information about how to set these options.

Starting the System

To begin your BOS installation, follow the steps that pertain to the current state of your system:

- “The System Is Not Running AIX,” below
- “The System Is Running AIX,” on page 3-7

The System Is Not Running AIX

If your system is not running AIX, follow these steps:

1. Turn on all attached external devices, such as terminals, CD-ROM drives, tape drives, monitors, and external disk drives. Turning on the external devices first is necessary so that the system unit can identify them during the startup (boot) process.
2. Power your system on.
3. Insert Volume 1 of the installation media into the tape or CD-ROM drive. Remove any other tapes, CD-ROMs, or floppy disks from all attached devices because they may interfere with the autoboot sequence.

Note: You may experience any of the follow tape drive/CD-ROM problems:

- You may find that on specific hardware, the tape drive door does 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 4.2 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 opens.
 - 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.
4. If you are using a serial tty console, refer to “Setting ASCII Terminal Options,” on page 3-5 for required communications and keyboard settings.
 5. Power cycle the system by turning it off and turning it on again.
 6. Proceed according to the version of your firmware:

PPC Bug Firmware	<p>After the self tests have completed, press the Esc key once when you see this message:</p> <pre>NVRAM Boot List about to Begin... Press <ESC> to Bypass, <SPC> to Continue</pre>
PowerPC Open Firmware	<ol style="list-style-type: none"> a. After the automatic self tests have completed, press any key when you see this message: <pre>Type any key to interrupt automatic startup</pre> The system then goes to the PowerPC Open Firmware Main Menu. b. At the Main Menu, select the Boot an Operating System menu. The Boot an Operating System menu window appears. c. Select the Perform auto-scan Boot Operation menu option from the Boot an Operating System window.

7. The system begins to boot from the installation medium.
8. Go on to “Identifying System Console and Installation Language” on page 3-8.

The System is Running AIX

If your system is running AIX, follow these steps:

1. Log in as root.
2. Turn on all attached external devices, such as terminals, CD-ROM drives, tape drives, monitors, and external disk drives.
3. Insert Volume 1 of the installation media into the tape or CD-ROM drive. Remove any other tapes, CD-ROMs, or floppy disks from all attached devices because they may interfere with the autoboot sequence.

Note: You may experience any of the follow tape drive/CD-ROM problems:

- You may find that on specific hardware, the tape drive door does 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 4.2 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 opens.
- 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.

4. Reboot the system by entering:

```
shutdown -Fr
```

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.

5. The system begins to boot from the installation medium.

6. Go on to “Identifying System Console and Installation Language” on page 3-8.

Identifying System Console and Installation Language

To identify the system console and installation language:

1. When prompted to do so, identify your system console.

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.

2. 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.

3. 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:

4. Continue the installation process with the procedures most suitable for your needs:
- “Installing with Default System Settings” on page 3-10
 - “Installing with Modified System Settings” on page 3-12

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

Installing with Default System Settings

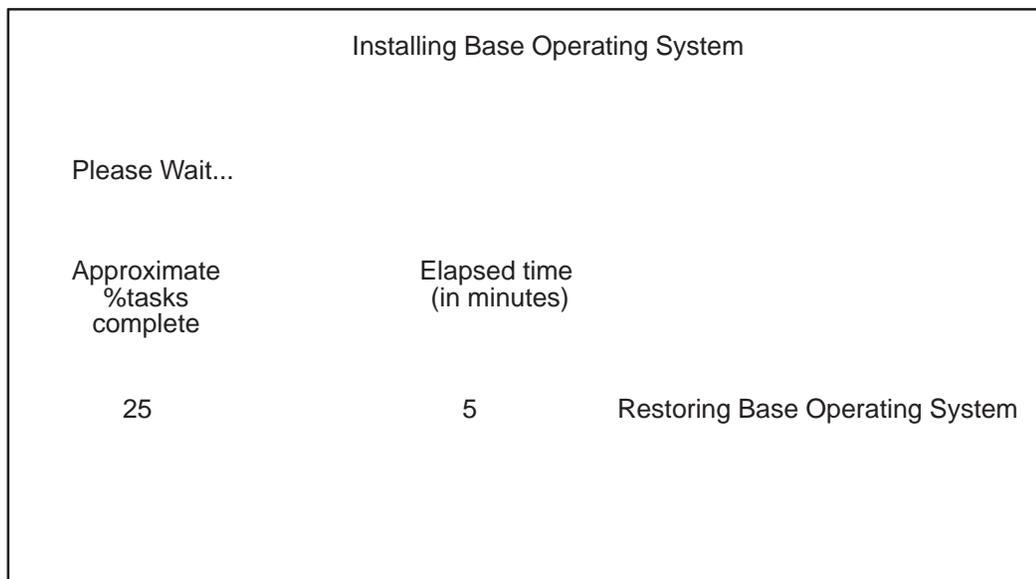
You must complete the procedures in “Determining the State of Your System” on page 2-7 before completing the procedures below. After you have prepared the system for installation, the system begins booting from the installation medium. To install the BOS with default system settings, follow these steps:

1. To continue the installation using default settings, type 1 and confirm.

If you want to verify the default settings, refer to the procedures in “Verifying the Default Installation and System Settings,” on page 3-11 to view the settings.

2. When the **Installation Warning** screen is displayed, press Enter to continue.

When installation begins, the **Installing Base Operating System** screen is displayed:



3. To complete the installation procedures, refer to “Completing the Run-time BOS Installation” on page 3-18.

Verifying the Default Installation and System Settings

To verify the default installation and system settings;

1. To continue the installation using modified settings, type 2 and confirm.

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.

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.....Englishh (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.

2. Verify the default installation settings, check the default settings on the screen above.
3. Do you want to change a setting?
 - If *not*, continue the installation by typing 0 and Enter.
 - If you want to change the installation method (preservation or migration only) go to page 3-12.
 - If you want to change the destination disk go to page 3-13.
 - If you want to change the primary language environment go to page 3-15.
 - If you want to change the trusted computing base setting go to page 3-17.
4. To complete the installation procedures, refer to “Completing the Run-time BOS Installation” on page 3-18.

Installing with Modified System Settings

Changing the Installation Method (Preservation or Migration Only)

Overview

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 BOS.

/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.

Procedure

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 and Complete Overwrite**, then this installation method cannot be changed.

Refer to “Run-time Installation Methods” on page 3-3 for more information.

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 “Changing the Destination Disk” on page 3-13. Otherwise, return to the **Installation and Settings** screen by pressing Enter and continue with one of the following:

- “Changing the Primary Language Environment,” on page 3-15.
- “Changing the Trusted Computing Base Setting,” on page 3-17.
- “Completing the Run-time BOS Installation,” on page 3-18.

Changing 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.

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 and 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**.

4. Continue with one of the following:
 - "Changing the Primary Language Environment," on page 3-15.
 - "Changing the Trusted Computing Base Setting," on page 3-17.
 - "Completing the Run-time BOS Installation," on page 3-18.

For a Preservation or Migration Installation

Use the following procedure to change the destination disk or root volume group when installing AIX 4.2.

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            00-11-80-0         200
      2  3.1   hdisk2            00-12-06-          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 4.2 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 is destroyed during BOS installation.

3. Continue with one of the following:
 - “Changing the Primary Language Environment,” on page 3-15.
 - “Changing the Trusted Computing Base Setting,” on page 3-17.
 - “Completing the Run-time BOS Installation,” on page 3-18.

Changing 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 *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)	C (POSIX)
2 Arabic (ISO)	English (United States)	Arabic (ISO)
3 Arabic (PC)	English (United States)	Arabic (PC)
4 Bulgarian	English (United States)	Bulgarian
5 Croatian	English (United States)	Croatian
6 Czech	English (United States)	Czech
7 Danish	English (United States)	Danish
8 Dutch (Belgium)	Dutch (Belgium)	Dutch (Belgium)
9 Dutch	English (United States)	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:
 - “Changing the Trusted Computing Base Setting” on page 3-17.
 - “Completing the Run-time BOS Installation” on page 3-18.
 - 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:
 - “Changing the Trusted Computing Base Setting,” on page 3-17.
 - “Completing the Run-time BOS Installation,” on page 3-18.

Changing 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. The TCB setting cannot be enabled later. However, the TCB setting can be disabled later. When TCB is not installed, installation time is reduced.

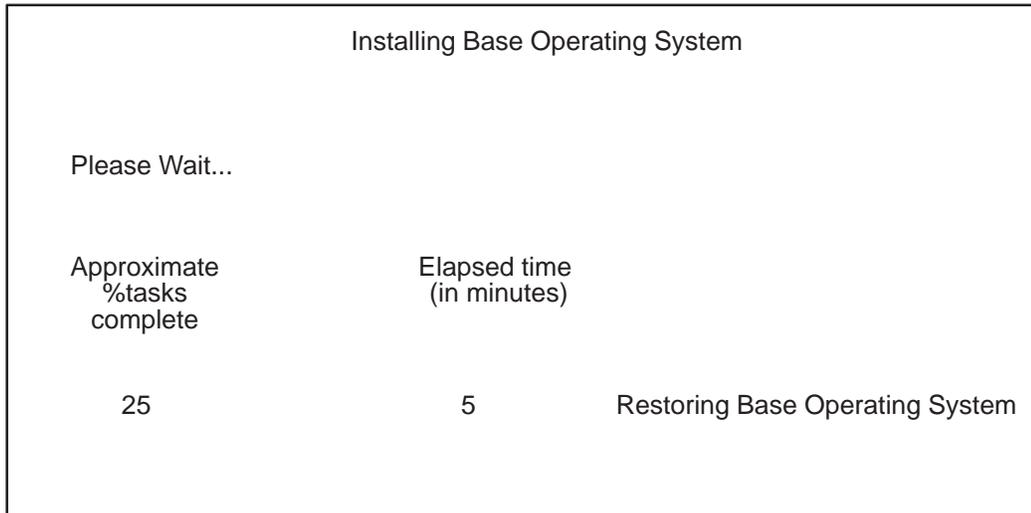
1. To change the setting for installing TCB to **yes**, enter 3. Entering 3 again changes the setting back to **no**.
 - Note:** When migrating from AIX 4.1, the install menu TCB setting is ignored. The TCB setting of the installed system is the same as on the AIX 4.1 system.
2. Continue with “Completing the Run-time BOS Installation” on page 3-18.

Completing the Run-time BOS Installation

Preservation and New and Complete Installation

1. Enter 0 on the **Installation and Settings** menu to begin the installation process.

The **Installing Base Operating System** screen is displayed.



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.

2. Go to Chapter 4, "Customizing Your Installation" on page 4-1 and complete the post-installation tasks.
3. If you are installing from CD-ROM, after you complete the post-installation tasks, refer to Chapter 6, "Installing Optional Software and Service Updates" on page 6-1 for instructions on installing the software on Volume 2 of the CD-ROM.

Migration Installation

1. Enter 0 on the **Installation and Settings** menu to begin the installation process.

The **Installing Base Operating System** screen is displayed.

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 4.2 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

2. Enter your selection from the **Migration Confirmation** screen.

The installation status screen is redisplayed.

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

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.

3. If you are installing from CD-ROM, insert Volume 2 of the CD-ROM and enter the command:

```
smit update_all
```

This completes the migration for software you may have installed on your system that is shipped on Volume 2 of the CD-ROM. Refer to Chapter 6, "Installing Optional Software and Service Updates" on page 6-1 for more information.

Chapter 4. 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 runs 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.

You need to change these settings using the Installation Assistant. You must also provide system and network information if you want to communicate with other systems. Use the worksheets provided in this chapter to do this. Finally, you need to perform some additional customization tasks such as, installing InfoExplorer databases and configuring printers.

This chapter includes:

- “Gathering the Required Information,” on page 4-2
- “Determining the Required Bundles,” on page 4-5
- “Using the Installation Assistant,” on page 4-6
- “Flowchart for Installation Assistant Tasks,” on page
- “Completing the Customization Using the Installation Assistant,” on page 4-7
- “Installing InfoExplorer Databases,” on page 4-8
- “Configuring ISA Devices,” on page 4-11
- “Configuring the Ethernet Adapter Medium,” on page 4-12
- “Configuring an Additional Graphics Adapter,” on page 4-14
- “Configuration Tasks for Series E Systems,” on page 4-16
- “Where Do I Go Next,” on page 4-19

Gathering the Required Information

Use the worksheets on the following pages to gather the information needed for configuring network communications.

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

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** _____

Determining the Required Bundles

How you plan to use your system determines the software bundles that you need to install.

Note: If your system was preinstalled in the factory, you may not have to install any additional bundles. For example, server systems have already been installed with the Server bundle and client systems have already been installed with the Client bundle. Use the **lspp -L** command to determine what software filesets were preinstalled on your system.

To install the required bundles, use the **Install Software Applications** option in the Installation Assistant. Refer to Chapter 6, "Installing Optional Software and Service Updates" on page 6-1 .

Note: None of the bundles listed above includes the entire set of InfoExplorer databases or the manual pages. Refer to "Installing InfoExplorer Databases" on page 4-8 for more information.

Server Bundles

Use the table below to determine the software bundles you need to install on your system.

If your system...	Install this bundle...
was installed from an ASCII terminal and you want to use an integrated graphics display in the X-Window environment	Graphics_Startup
is used as a multi-user server	Server
should provide access to the COSE Common Desktop Environment (implemented as AIXwindows Desktop in AIX 4.1)	Personal Productivity (Pers_Prod)
is used for software development activities	Application Development (App_Dev)

Client Bundles

Use the table below to determine the software bundles you need to install on your system.

If your system...	Install this bundle...
was installed from an ASCII terminal and you want to use an integrated graphics display in the X-Window environment	Graphics_Startup
should provide access to the COSE Common Desktop Environment (implemented as AIXwindows desktop in AIX 4.1)	Personal Productivity (Pers_Prod)
is used for software development activities	Application Development (App_Dev)

Using the Installation Assistant

The Installation Assistant enables you to customize your system.

You must have root user authority to use Installation Assistant.

1. To start the Installation Assistant, select one of the following options:

- If you have newly installed the BOS, the system reboots when installation is complete and starts the Installation Assistant.

Note: The Installation Assistant may not start if your:

- Your system was installed by a network installation server.
- Your system was installed using a system backup image.
- Your BOS installation was customized.
- You selected Migration Installation from AIX Version 4.1.

- If your system was preinstalled at the factory, the system starts the Installation Assistant when you boot for the first time.
- If you need to access the Installation Assistant after exiting and logging in to AIX, enter the following command at the AIX system prompt:

```
install_assist
```

- To access the graphical interface, select its icon from the AIX Common Desktop Environment. See *Getting Started* for more information about how to access the graphical interface.

2. 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.

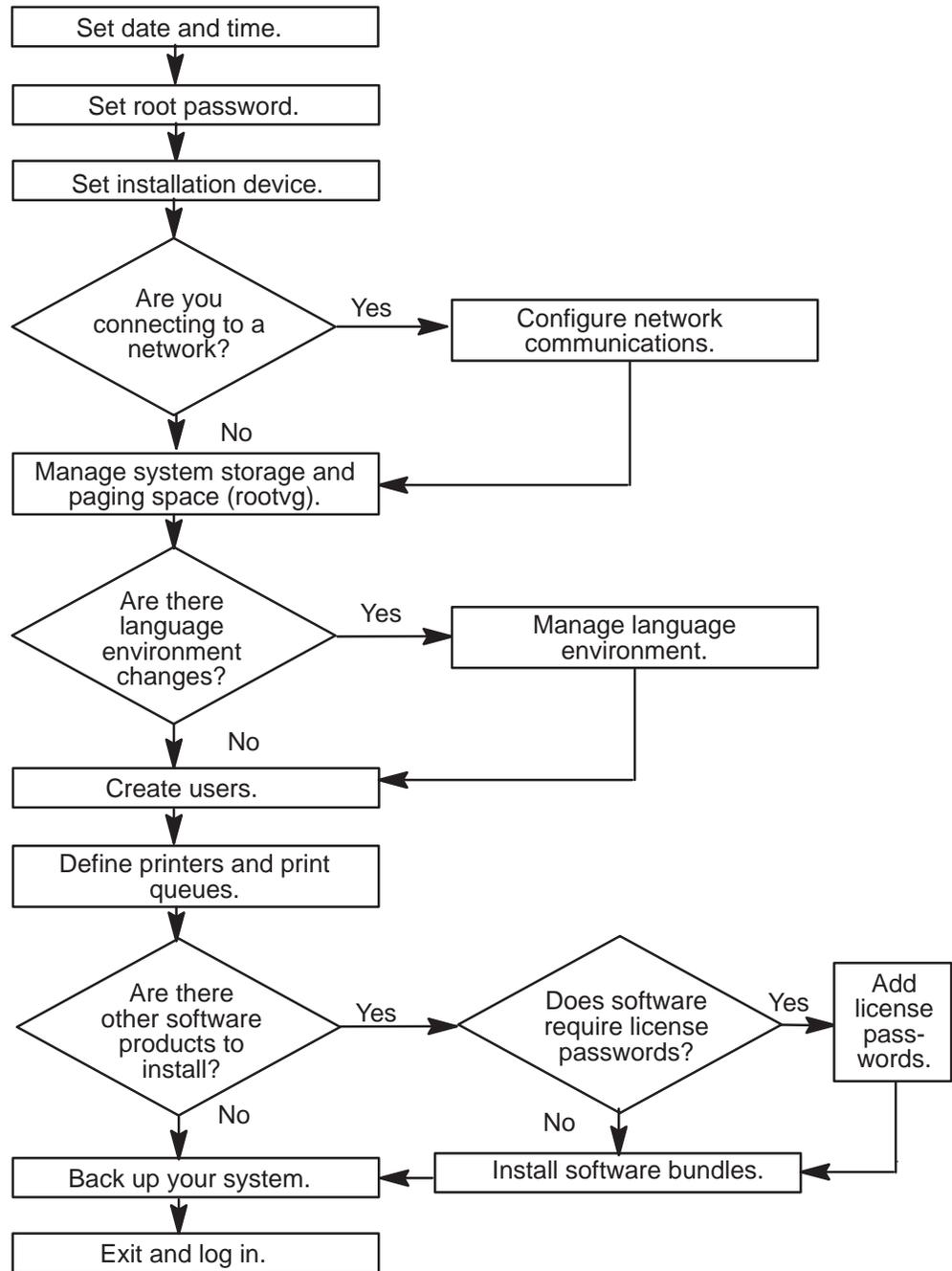
The Installation Assistant is displayed on your system console.

3. Go on to “Completing Customization Using the Installation Assistant” on page 4-7 to finish the customization of your system using the Installation Assistant.

Note: Instructions in this chapter assume that you are using an ASCII interface.

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.



Completing the Customization Using the Installation Assistant

Complete all customization tasks that apply to your newly installed system. Complete the customization tasks in the order the Installation Assistant lists them

Note: 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.

1. Set the system date and time for your time zone.
2. Set a root user account password to restrict access to system resources.
3. 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.
4. Set your system to communicate with other systems and access their resources. Use the worksheets beginning on page 4-2 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 *System Management Guide: Communications and Networks*.

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

Note: If you do not check this, installation of additional software may fail due to low paging space.

6. Change the primary language environment or add a secondary language environment.
7. Create user accounts.
8. Configure your printer and add print queues for local printers and remote print servers.
9. Import any existing volume groups.
10. Install additional software and add license passwords, if required, to enable the software to run.

You may want to add additional software bundles. Refer to “Determining the Required Bundles” on page 4-5 for information on the bundles you should install.

For information on installing other applications, refer to Chapter 6, “Installing Optional Software and Service Updates” on page 6-1 .

If you need to configure the system to serve license passwords, refer to the *iFOR/LS System Management Guide*.

11. Back up the system.

For information on making backups without using the Installation Assistant, refer to Chapter 8, “Making a System Backup” on page 8-1.

12. Exit Installation Assistant and log in to the system.

Note: If you do not exit the Installation Assistant using the **Tasks Completed–Exit to AIX Login** option, your system does not create adequate swap space.

If your machine was preinstalled at the factory, a message displays asking you to wait; it takes a few minutes before the login prompt displays.

13. Log in to the system.

Once you have exited the Installation Assistant, all customization tasks except **Exit** display the next time you use Installation Assistant.

Installing InfoExplorer Databases

After you install the bundles you need, you may want to install the InfoExplorer databases.

Note: Systems preinstalled in the factory have the InfoExplorer databases installed.

Use the procedures in this section to install the databases.

1. Enter `smit install_latest` at the system prompt to access the **Install Software Products at Latest Level** screen.
2. Enter the input device name (usually `/dev/cd0`) in the **INPUT device / directory for software** field.

The **Install Software Products at Latest Level** screen is displayed.

3. In the **SOFTWARE to install** column, enter the following:

```
bos.info.en_US
```

4. Confirm the other settings on this menu, and then press Enter.
5. When the system displays a message asking you if you are sure you want to begin the installation, press Enter again to begin the installation.

Note: In order to use the graphical version of InfoExplorer, you must install the **Graphics_Startup** and **Pers_Prod** bundles.

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

Configuring ISA Devices

If your system has ISA adapter cards, you must install the device software required for your system to recognize the cards. Use the procedures in this section for installing the device software.

1. Enter `smit devinst_isa` at the system prompt.

The **Install Additional Device Software** screen is displayed.

2. Enter the name of the device that contains the ISA adapter software.

A **Software to install** field is displayed.

3. Enter `devices.isa` in the **Software to install** field.

The **Command Status** screen is displayed after the software is installed.

4. If prompted, reboot the system.

Configuring the Ethernet Adapter Medium

The default **Interface Media Type** for networking adapters is **Auto Detection**. When the system package is installed, this setting enables the system to automatically detect the type of medium in use.

Note: It is possible for autosensing to take up to 3.5 seconds. This may occur if the error rate is momentarily very high or if the cable is unplugged. In these instances the autosense occurs at the interrupt level of the ethernet and interrupts are inhibited for the duration of the autosense. While these occurrences should be infrequent and tolerable in most cases, if your applications require real-time or near real-time response, do not leave `Auto Detect` as the configuration. Instead, manually configure the adapter interface for the correct network type.

Note: Znyx ZX312 Adapters (10MB/s, 3 media) have a switch that sets either AUI or BNC as the interface medium type. Auto detection can only sense the one in use.

Switching Cables

If you remove the cables from one type of interface medium and attach them to another type, your system does not recognize the correct medium type. You need to trigger a media reconfiguration in order for your system to recognize the correct medium type. (This reconfiguration should take less than 30 seconds to complete.) Pinging another machine in the network is one method of triggering this media reconfiguration.

Setting Ethernet Cable Type

Ethernet cable type can be set and changed via SMIT at any time. You do not have to complete `chdev` and do a reboot.

You can use any of the options below to change your Ethernet cable type:

- Enter `smit tcpip` to invoke the SMIT panel of the TCP/IP network interface.
The cable types are `tp`, `dix`, and `bnc`, where `tp` = UTP, `dix` = AUI, and `bnc` = BNC.
Setting cable type via the above **tcpip** panel carries a global meaning. For a paired ethernet configuration, it sets the cable type of both of its two member physical devices. In particular, it sets attribute **bnc_select** of this logical device, and attribute **interface_type** of its two member devices all to the same cable type.
- Enter `smit ethernet` to invoke the ethernet SMIT panel. This panel allows you to change the **cable type** of a single physical ethernet device. If there is a conflict, the cable type of a physical ethernet device takes precedence over that of its logical ethernet device.

Using Specialized Media Types

If both ends of the link (the hub and the local adapter) are Nway capable then full-duplex configuration is automatic. However, if either end of your link is not Nway capable, you must manually configure full-duplex operation. In addition, if your system uses a 10BaseT hub that does not support link testing or uses a full-duplex 10BaseT or 100BaseTX hub, it does not automatically configure the correct media type. Finally some AUI implementations are difficult to autosense. It may be necessary for you to manually configure AUI ports.

You need to manually configure these media types as described in the procedure below:

1. Enter `smit eadap` at the system prompt to access the SMIT **Adapter** screen.

2. Select **Change/Show Characteristics of an Ethernet Adapter** from the **Adapter** screen. An **Ethernet Adapter** screen displays.
3. Select the appropriate Ethernet adapter from the screen. The **Change/Show Characteristics of an Ethernet Adapter** screen displays.
4. Move the cursor to **Interface media type** and select the appropriate media type (**10BaseT Link Test Disabled**, **10BaseT Full Duplex**, or **100BaseTX Full Duplex**).
5. Move the cursor to **Apply change to DATABASE only** and change the selection to **yes**.
6. Press Enter to apply the changes.
7. Reboot the system to implement the changes.

Determining the Ethernet Packet Transmission/Reception Port

The port used for packet transmission/reception depends on which Ethernet media types a board supports and which of the ports have cables attached. Refer to the table below to determine which port is used for packet transmission/reception on various board configurations.

If a board has these ports...	And cables are attached to these ports...	The board defaults to transmit/receive packets on this port...
AUI, BNC, Twisted Pair	none	Twisted Pair
AUI, BNC, Twisted Pair	all	Twisted Pair
AUI, BNC, Twisted Pair	AUI, BNC	BNC
10BaseT, 100BaseTX	none	100BaseTX
10BaseT, 100BaseTX	both	100BaseTX

Configuring an Additional Graphics Adapter

The RISC PC system provides a Cirrus graphics adapter on the CPU board. You can add other graphic adapters to the system. This section provides the procedures for configuring your system to run with an additional graphics adapter.

Prerequisites

The procedures in this section assume that you have installed a new graphics adapter card in your system.

If your system only has one monitor, leave the monitor plugged into the built-in Cirrus adapter after installing the new graphics adapter.

Note: If the new graphics adapter is a Diamond ViperPro card with no monitor plugged into it, you do not see output from the firmware. However, the system should still boot correctly.

Installing the Driver Software

After you have installed the new graphics adapter, follow these steps to install the required device driver software:

1. Power on and boot the system.
2. Place the Base Operating System CD-ROM in the system drive.
3. Enter `smit cfgmgr` at the system prompt to access the **Install/Configure Devices Added After IPL** screen.
4. Enter the input device name (usually `/dev/cd0`) in the **INPUT device / directory for software** field.
5. Press Enter to install the device driver software from the Base Operating System CD-ROM.
6. Exit SMIT.
7. If you want to continue using the Cirrus adapter in addition to the new adapter, complete the procedure in Chapter 5, "Customizing the BOS Install Program" on page 5-1. Otherwise, continue with the procedures in "Reconfiguring the Desktop Environment."

Reconfiguring the Desktop Environment

Follow these steps to configure your system to use the new graphics adapter card for the default display:

1. Type the **lsdisp** command at the system prompt to determine the name of the new display (`gga0`, for example).
2. If you are using the desktop environment, you need to edit the `/usr/dt/config/Xservers` file. Change the line:

```
:0 Local local@console /usr/lpp/X11/defaults/xserverr -T\  
-force :0
```

to the following:

```
:0 Local local@console /usr/lpp/X11/defaults/xserverrc -P11\  
newdisplayname -T -force :0
```

where *newdisplayname* is the name of the new display, as determined above.

Rebooting the System

Follow these steps to complete the installation and reconfiguration process:

1. Shut down the system using the following command:

```
shutdown -F
```

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

2. If the system only has one monitor, unplug it from the Cirrus adapter and plug it into the new adapter card now.
3. Reboot the system.
4. As the system boots, you may be prompted to define the system console.

Configuration Tasks for Series E Systems

Series E systems users need to complete these configuration tasks:

- “Configuring sa2 and sa3 Serial I/O Ports” on page 4-16
- “Configuring ttys” on page 4-16
- “Configuring Serial Printers” on page 4-17

Configuring sa2 and sa3 Serial I/O Ports

The third and fourth serial I/O ports of the Series E can support a variety of communications protocols. Support for the asynchronous protocol is standard. Support for other protocols can be purchased separately.

When configuring serial I/O ports **sa2** and **sa3**, you should first set the modes for the ports, and then configure them. The default mode for the two serial I/O ports is `asynchronous`. If you connect asynchronous devices such as ttys or printers, you must configure the tty ports (refer to “Configuring ttys” on page 4-16 or printers (refer to “Configuring Serial Printers” on page 4-17).

If you want to use another protocol, or if you have changed to another protocol and wish to change back to **asynchronous**, you need to set the modes of the ports by following these steps:

1. Enter `smit` at the system prompt to access the **System Management** screen.
2. Select **Devices** on the **System Management** screen.
The **Devices** screen is displayed.
3. From the **Devices** screen, select the **SCC Serial Adapters** option.
4. From the **SCC Serial Adapters** screen, select the **Change/Show Attributes of an SCC Serial Port** option.
5. Select **sa2** or **sa3** from the **Logical Name** screen.
The **Change/Show SCC Port Attributes** is displayed.
6. Confirm that the **Protocol Mode** field is set to **async**, then press Enter to set the port mode.

Configuring ttys

Two types of ttys are supported on the built-in serial I/O controller in the Series E. To configure a tty for the first time on the built-in serial ports, perform these steps:

1. Type `smit` at the system prompt to access the **System Management** screen.
2. Select **Devices** on the **System Management** screen.
The **Devices** screen is displayed.
3. From the **Devices** screen, select the **TTY** option.
4. From the **TTY** screen, select the **Add a TTY** option.
A screen is displayed with a list of tty types.
5. On the **TTY Type** screen, select the entry **tty rs232 Asynchronous Terminal**.
6. From the **Parent Adapter** screen, select the parent adapter of the tty you want to configure.

The parent adapter you choose should correspond to the name of the port you plugged the device into on the back of your system. The table below provides the list of adapters and their corresponding ports.

Parent Adapter	Name of Corresponding Port
sa0	sa0/com1
sa1	sa1/com2
async0	sa2/com3
async1	sa3/com4

7. From the **Add a TTY** screen, indicate the port number to which you want to connect a terminal, as follows:
 - a. When SMIT prompts you to choose the port number to which the terminal is connected, use the **List** option to see the available port numbers.
Only one port number is displayed.
 - b. Press Enter to accept this choice.
8. Move the cursor to the **Enable LOGIN** option and use the Tab key to cycle through the choices from **disable** to **enable**. (Or select the **List** button to see the available option and then select enable on a graphical SMIT interface).
9. Change any other configuration values you wish.
10. Press Enter to configure the tty.

Configuring Serial Printers

Two types of serial printers are supported on the built-in serial I/O controller in the Series E. To configure a printer for the first time on the built-in serial ports, perform the following steps:

1. Enter `smit pdp` at the system prompt to access the SMIT **Printer/Plotter Devices** screen.
2. Select **Add a Printer/Plotter on the Printer/Plotter Devices** screen.
A **Single Select List** window is displayed, listing printer/plotter interfaces.
3. Select the **Other Serial Printer** option.
Another **Single Select List** window is displayed, listing printer/plotter interfaces.
4. Select the appropriate printer type. For example, `rs232` is a standard RS232 printer plugged into ports **sa0** and **sa1**. `rs232.scc` is a standard printer plugged into ports **sa2** and **sa3**.

Note: The difference between `rs232` and `rss232.scc` is in the serial I/O chip that is controlling the port. There is no difference in the types of printers that can be connected.

After you indicate the desired printer type, another **Single Select List** window is displayed, listing parent adapters.

5. Select the parent adapter of the printer you want to configure. The parent adapter you choose should correspond to the name of the port you plugged the device into on the back of your system.

6. Indicate the port number to which you want to connect the printer.
 - If the printer is plugged into **sa0** or **sa1**, SMIT figures out the port number for you.
 - If you choose to connect to the printer to **sa2** or **sa3**, SMIT prompts you to choose the port number of the printer it is connected to. Press Esc-4 to see a list of options. Choose the port number (**com3** or **com4**) that corresponds to the port number of the printer it is connected to.
7. Change any other configuration values you want.
8. Press Enter to choose the printer.

Depending on the type of printer you are configuring, you may not be able to set all of the printer attributes in the **xprintm** application.

Use SMIT to change the remaining attributes. Follow these steps:

1. Enter `smit chpq` at the system prompt to access the **SMIT Print Queue to Change/Show** window.
2. Enter the name of the print queue whose attributes you wish to change/set, and then press Enter to select this print queue.

The type of menu screen displayed depends on the type of printer you selected.

3. Use the menu displayed to select and modify the printer attributes you wish to set/change.
4. Press Enter to apply the changes.
5. Reboot the system to implement the changes.

Where Do I Go Next?

Refer to the table below to determine where you should go next:

For Information on...	Refer to...
late-breaking information that may include information on the configuration process and installed software	README files For information on how to view README files, refer to Chapter 12, "Viewing README Files" on page 12-1.
installing software from CD-ROM Volume 2	Chapter 6, "Installing Optional Software and Service Updates" on page 6-1
installing optional software	Chapter 6, "Installing Optional Software and Service Updates" on page 6-1.
how to mount the InfoExplorer hypertext library	the booklet that accompanied your InfoExplorer CD-ROM

Chapter 5. Customizing BOS Installation 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.

This chapter includes:

- “Introduction to Customizing the BOS Install Program,” on page 5-2
- “Using a Customized **bosinst.data** File,” on page 5-3
- “**bosinst.data** File Stanza Descriptions,” on page 5-6
- “Example **bosinst.data** Files,” on page 5-10

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 Chapter 4, “Customizing Your Installation” on page 4-1 for more information about Installation Assistant.

For subsequent installations, you can change many aspects of the default BOS install program by editing the various installation files.

bosint.data File

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.

By modifying the **bosint.data** file, you can:

- customize the program to install BOS without menus by specifying no prompts
- bypass the Installation Assistant and start your own configuration script
- 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.

image.data File

You can also modify another installation file, **image.data**, and use it 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 *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.

preserve.list File

You can also use the instructions in this chapter to create a supplemental diskette containing a modified **preserve.list** file, that is used during a Preservation Installation. For more information about the **preserve.list** file, see “Installation Methods” on page 3-3.

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 5-6 and “Example `bosinst.data` Files” on page 5-10 for information about the contents of the file and examples of edited files.

Creating the Customized File for Use with a Backup Tape

Customize the `bosinst.data` file and create a backup image of the system:

1. Change your directory, with the `cd` command, to the `/var/adm/ras` directory.
2. 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.
3. Edit the `bosinst.data` file with an ASCII editor. Refer to the stanza descriptions, starting on page 5-6, for more information about variables and values.
4. Copy the edited file to the root directory:

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

5. Back up the system, using either the `mksysb` command or the System Management Interface Tool (SMIT).

Refer to Chapter 8, “Backing Up Your System” on page 8-1 for more information.

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

Creating the Customized File for Use with Bootable Tapes

Following is the procedure for creating a bootable tape, that you might use to maintain your AIX Version 4.2 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.

Customize the `bosinst.data` file and create a bootable tape:

1. Create the `/bosinst.data` file, by entering:

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

or enter:

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

2. Create the `/image.data` file, by entering:

```
mkszfile
```

Note: This file also 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.

Creating the Customized File for Use with 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 Version 4.2 Network Installation Management Guide and Reference* for more information about how to use the **bosinst.data** file as a resource in network installations.

Creating the Customized File for Use with a Supplementary Diskette

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

To create and use a diskette containing the edited **bosinst.data** file, follow these steps:

1. Change your directory, with the **cd** command, to the **/var/adm/ras** directory.
2. 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.
3. Edit the **bosinst.data** file with an ASCII editor. Refer to the stanza descriptions starting on page 5-6 for more information about variables and values.
4. Create an ASCII file named **signature** that contains the word **data**.
5. Back up the edited **bosinst.data** file and the new **signature** file to a diskette using the following command:

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

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
```

6. Put the diskette in the diskette drive of the target machine you are installing.

7. Boot the target machine from an install medium (tape, CD-ROM, or network) and install AIX.

The BOS installation program uses 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, that 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 3-3 for more information about installation methods.

The default method of installation is **migrate** if AIX 3.2 or 4.1 is on the machine. The default is **preserve** if AIX 3.1 or 4.2 is on the machine. If no AIX exists, the default method is **overwrite**.

PROMPT

Specifies whether the installation program uses menus from which you make 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 overwrites 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_root** 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 the 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 installs 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 installs 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.

SIZE_MB Specifies the formatted size of the disk, in megabytes, where the program installs 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.

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 *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 6. Installing Optional Software

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.

This chapter includes:

- “Introduction to Installing Software and Service Updates,” on page 6-2
- “Flowchart for Installing Optional Software and Service Updates,” on page 6-4
- “Prerequisites for Installing Optional Software,” on page 6-5
- “Using SMIT to Install Optional Software and Service Updates,” on page 6-7
- “Using a VSM Application to Install Optional Software and Service Updates,” on page 6-15
- “Where Do I Go Next,” on page 6-19

Introduction to Installing Software and Service Updates

Optional Software and Service Updates

After the BOS is installed, you may want to install optional software or service updates. This chapter discusses software installation and service update application, but does not discuss committing service updates after installation.

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 as well as information on committing, rejecting, and removing software after installation, see Appendix A, “Optional Software Installation and Update Concepts” on page A-1.

For information on cleaning up after an interrupted software installation, refer to Chapter 6, “Cleaning Up Optional Software and Service Updates” on page 7-7.

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 are not able to run this software, however, until you have obtained the license.

Migrating Software to AIX Version 4.2

If you are migrating AIX Version 4.1 programs and there is a newer level of a previously installed fileset on the installation media, a BOS **Migration** installation attempts to install the newer level. Any previously installed products that can be run on BOS Version 4.2 are not 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.

Viewing Individual Software Information in InfoExplorer

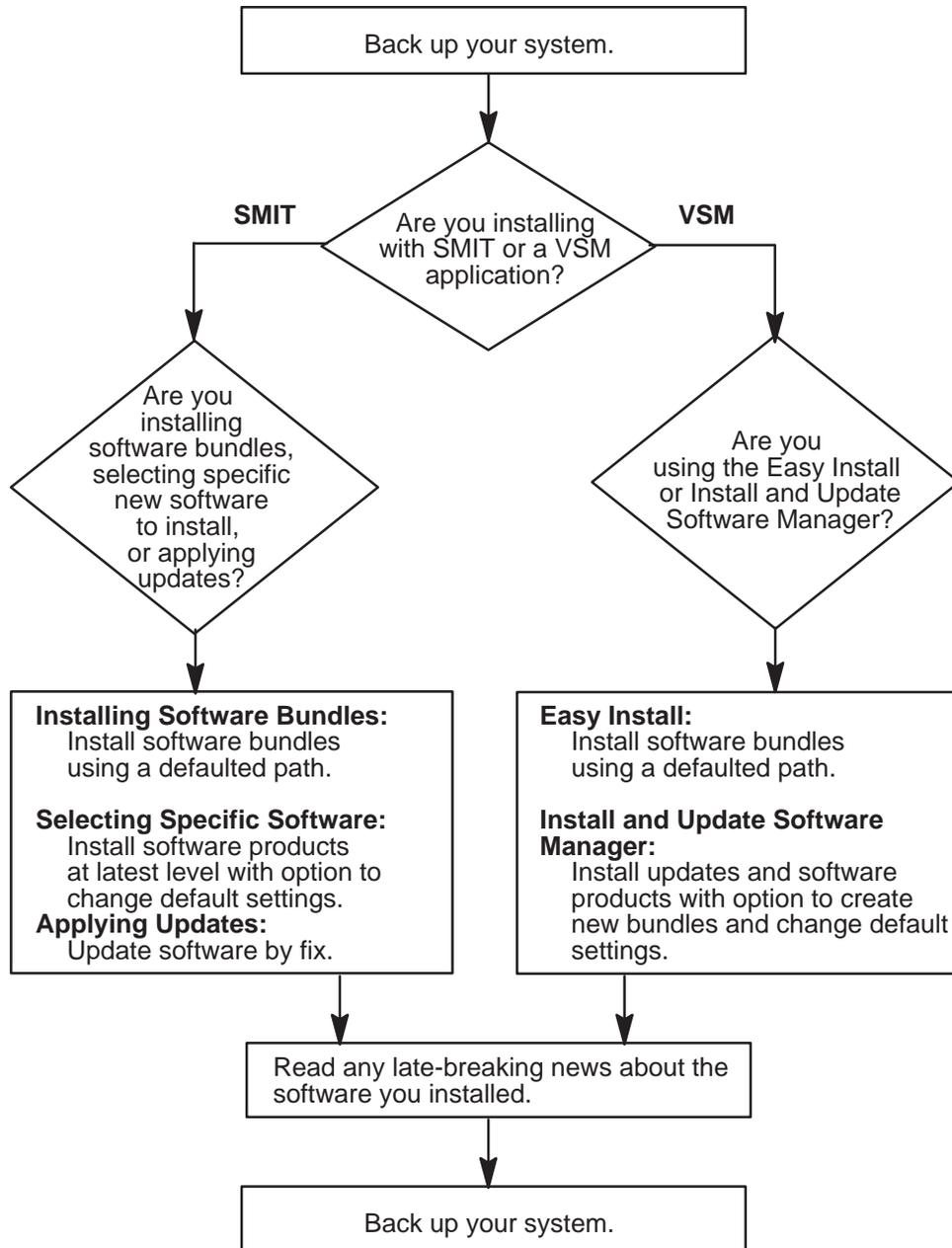
Information about individual software products is available in InfoExplorer and is not included in this book. To view the software products information:

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

Flowchart for Installing Optional Software and Service Updates

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



Prerequisites for Installing Optional Software

Overview

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 *General Programming Concepts: Writing and Debugging Programs*.

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).

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 updates or remove previously installed software, go to Chapter 7, “Maintaining Optional Software” on page 7-1.
- If you are using a network installation server, refer to the *AIX Version 4.2 Network Installation Management Guide and Reference*.

Procedure

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

1. Install BOS AIX Version 4.2 on your system. If BOS is not yet installed on your system, go to Chapter 3, “Installing BOS from CD-ROM or Tape” on page 3-1, or if you are installing over a network, refer to the *AIX Version 4.2 Network Installation Management Guide and Reference*.
2. If you are installing service updates and do not have a current backup of your system, use the procedures in Chapter 8, “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.sysmgt.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
```

3. Log in as root user if you have not already done so.
4. 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) creates a temporary mount point for the CD-ROM.

5. 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.

6. 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 6-7 or To Install Optional Software and Service Updates with a Visual System Management (VSM) Application "To Install Optional Software and Service Updates with a Visual System Management (VSM) Application" on page 6-15.

Using SMIT To Install Optional Software and Service Updates

SMIT Installation Paths

This procedure describes how to use SMIT to install optional software and service updates. There are three installation paths available in SMIT: Bundles (easy install), Selective Install and Update, and Fixes:

Bundles Using the **Install Software Bundle (Easy Install)** path, you only need to specify the input device and bundle that you are installing. You can also preview a bundle install to see what software is installed and how much space is required in the file system to install the bundle.

Selective Install and Update

Using **Install and Update**, you can choose specific software to install, apply or commit updates, and preview the install to see what software is installed and how much space is required in the file system to install the software.

Fixes Using the **Update Software by Fix (APAR)** menu you can install a specific a fix to a problem. This menu allows you to list all service fixes on the media and select a fix to install. You can also preview the installation to see what software is updated and how much space is required in the file system to apply the fix.

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 7-7.

Custom SMIT Install Options

This table describes the options that are available under the **Custom Install** path:

Option	Description
Install and Update from LATEST Available Software	installs one or more of the optional software products that exist on the installation media If any updates exist for these products, they are also installed. Individual updates are displayed for software that you currently have installed.
Update Installed Software to Latest Level (Update All)	updates your currently installed software to the latest level You can use this option to update currently installed software to a maintenance level or apply all updates to currently installed software from a selective fix media.

Option	Description
Install and Update Software by Package Name (includes devices and printers)	installs software by package name This option first displays a list of the products available on the media, for example printers, communications and devices. When you select a product, a list of packages for the product you selected is displayed. You can then select one or more software packages to install.
Install Software Bundle (Easy Install)	installs a collection (bundle) of software products
Update Software by Fix (APAR)	installs one or more of the fileset updates that exist on the installation media, including all messages and locales
Install and Update From ALL Available Software	installs all the optional software products and updates that exist on the installation media

Getting 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. 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.

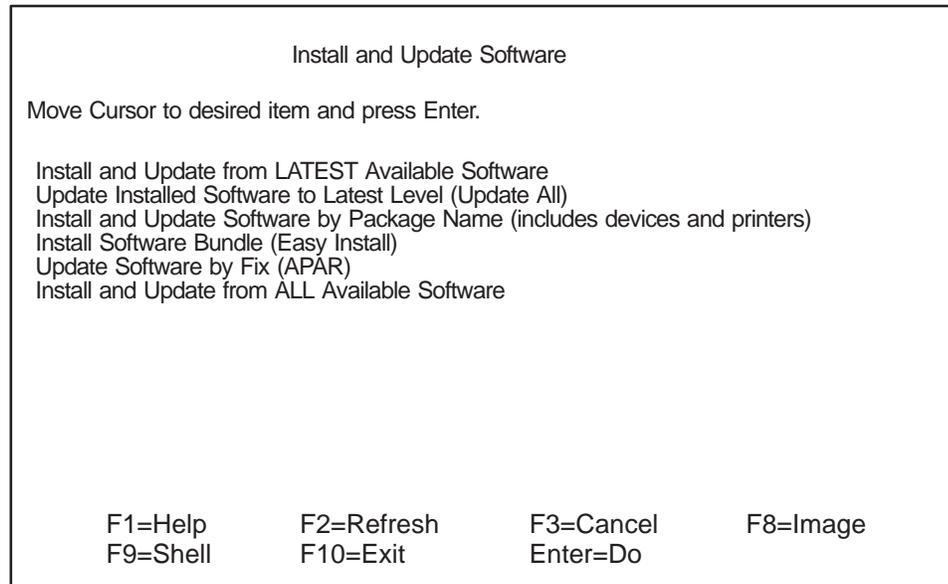
Accessing SMIT Installation Menus

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



Installing Bundles of Software (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 the 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 6-8.

Use the following procedure to install the bundle contents:

1. Use the arrow keys to highlight the **Install Software Bundle (Easy Install)** option from the **Install and Update Software** screen and press Enter.

The **Install Software Bundle (Easy Install)** screen is displayed:

Install Software Bundle (Easy Install)			
Type or select values in entry fields. Press Enter AFTER making all desired changes.			
		[Entry Fields]	
* INPUT device / directory for software	.	App-Dev	
* BUNDLE		[_all_licensed]	+
* SOFTWARE to install		no	+
PREVIEW only? (install operation will NOT occur)		yes	+
COMMIT software updates?		no	+
SAVE Replaced Files?		yes	+
AUTOMATICALLY install requisite software?		yes	+
EXTEND file systems if space needed?		no	+
VERIFY install and check file sizes?		yes	+
Include corresponding LANGUAGE filesets?		no	+
DETAILED output?			
F1=Help	F2=Refresh	F3=Cancel	F4=List
F5=Reset	F6=Command	F7=Edit	F8=Image
F9=Shell	F10=Exit	Enter=Do	

- 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).

- 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 **Bundle** field is now displayed below the **INPUT device/directory for software** field.

- The **Bundle** field is highlighted. Press the F4 key to display a list of bundles to be installed.
- Select a bundle from the list and press Enter. The bundle you selected is now displayed in the new entry field.
- 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.

Note: If you are installing from tape, it may be several minutes before the contents of the bundle are displayed or installed.

- Confirm your selections to continue with the installation.

As the installation progresses, status messages are written on the screen display. A log is kept of the installation activities.

For information on using these logs, refer to "Reviewing Message Logs" on page 6-13.

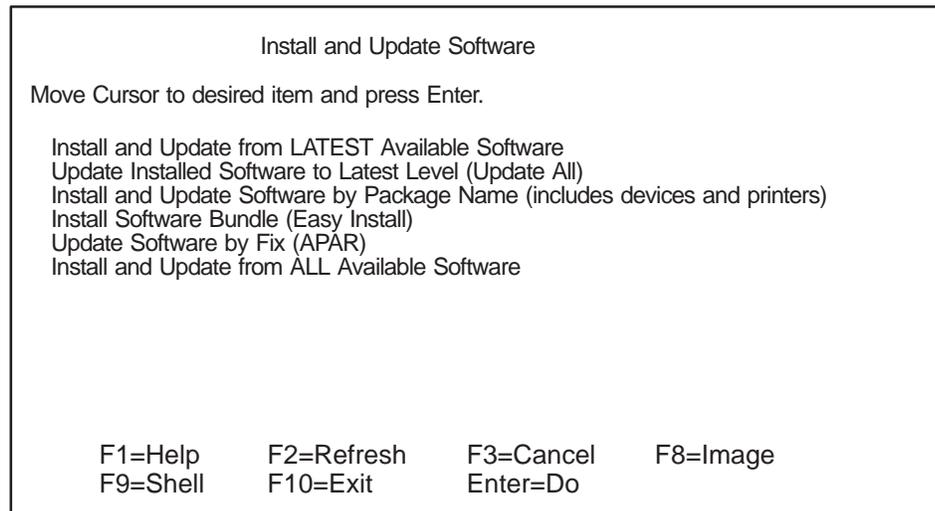
Installing Software and Service Updates (Custom Install)

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 and Update Software** screen. The SMIT screens that you use vary depending on the option you choose to update your system.

If you are not familiar with the SMIT interface and want help on using SMIT, see "To Get Help on Using SMIT" on page 6-8.

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

1. Select the **Install and Update Software** option from the **Software Installation and Maintenance** screen and press Enter. The **Install and Update Software** screen is displayed.



2. Select the **Install and Update from LATEST Available Software** option from the **Install and Update Software** 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 and Update from LATEST Available Software			
Type or select values in entry fields. Press Enter AFTER making all desired changes.			
	[Entry Fields]		
* INPUT device / directory for software	/usr/sys/inst.images		
* SOFTWARE to install	[_all_latest]		+
PREVIEW only? (install operation will NOT occur)	no		+
COMMIT software updates?	yes		+
SAVE replaced files?	no		+
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 filesets?	yes		+
DETAILED output?	no		+
F1=Help	F2=Refresh	F3=Cancel	F4=List
F5=Reset	F6=Command	F7=Edit	F8=Image
F9=Shell	F10=Exit	Enter=Do	

5. The default setting for the **SOFTWARE to Install** menu options is **_all_latest**, that installs all the software on the media, except devices and printers. Or **select _all_licensed** for the **SOFTWARE to Install** menu option, that installs all the software for which you have a license or for which no license is required (this is the default option on the **Install Software Bundle (Easy Install)** menu).

- 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.
- To scroll through the list use the Page Up and Page Down keys or the arrow keys .
- 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. The option that appears on this screen depends on the option you selected from the **Install and Update from LATEST Available Software** screen.

SOFTWARE to install	[_all_latest]
BUNDLE	[_all_licensed]
SOFTWARE to update	[_update_all]

[_update_all] applies only the updates 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.

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

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**.

Note: The elements selected for **Include corresponding LANGUAGE filesets?** are the elements that are used in the main SMIT and VSM install applications. The values for these elements are stored in the file `/var/adm/ras/bosinst.data`. If you want different messages and locales installed when installing additional software or bundles of software, edit the `/var/adm/ras/bosinst.data` file and change the values of the locale stanza.

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.

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 does not actually occur. In this case, repeat this procedure with the preview function set to **no** when you want to install the software.

Reviewing Message Logs

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. A preview install always finishes with an **OK** status.

For information about error messages, refer to "Error Messages and Output from the installp Command" on page A-9.

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.
4. 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 the software products or service updates that 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 the 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 Chapter 11, "Acting on System and Error Messages" on page 11-1 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 7-7.
 - e. When all software has been installed successfully, continue with the next step.
5. 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 continue installing the software product or service update from tape or diskette.
6. Press F10 to exit SMIT.
7. Remove the installation media from the drive.
8. Reboot your system when a message directs you to do so. To reboot your system, enter:


```
shutdown -Fr
```

Using a VSM Application To Install Optional Software and Service Updates

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

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 Chapter 7, "Maintaining Optional Software" on page 7-1.

Note: 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 7-7.

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.

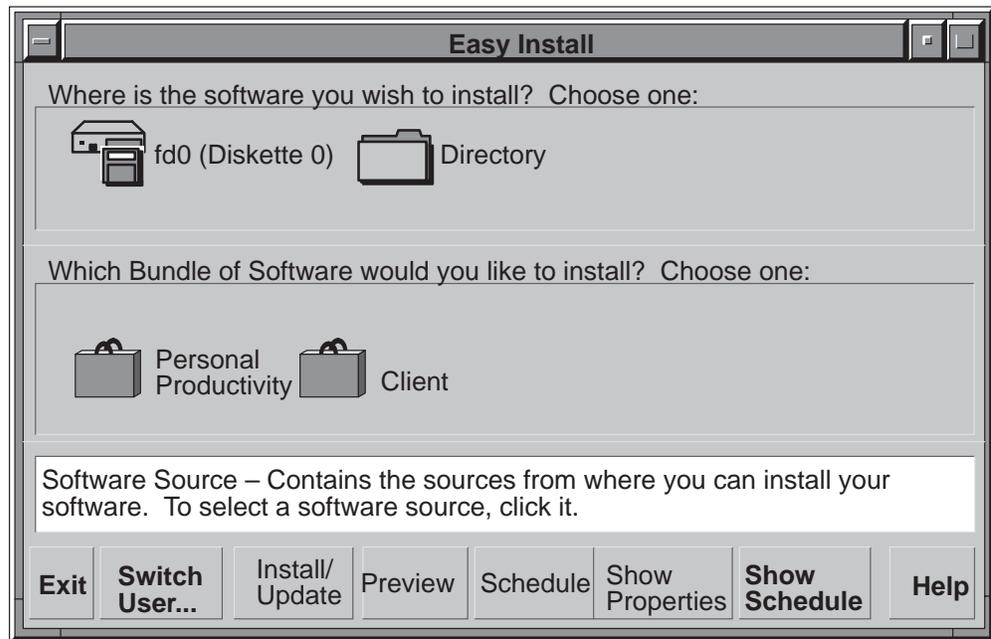
Using Easy Install

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 the software bundle to install (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.

To invoke Easy Install:

```
xinstallm -ez
```

The following figure shows the Easy Install application:



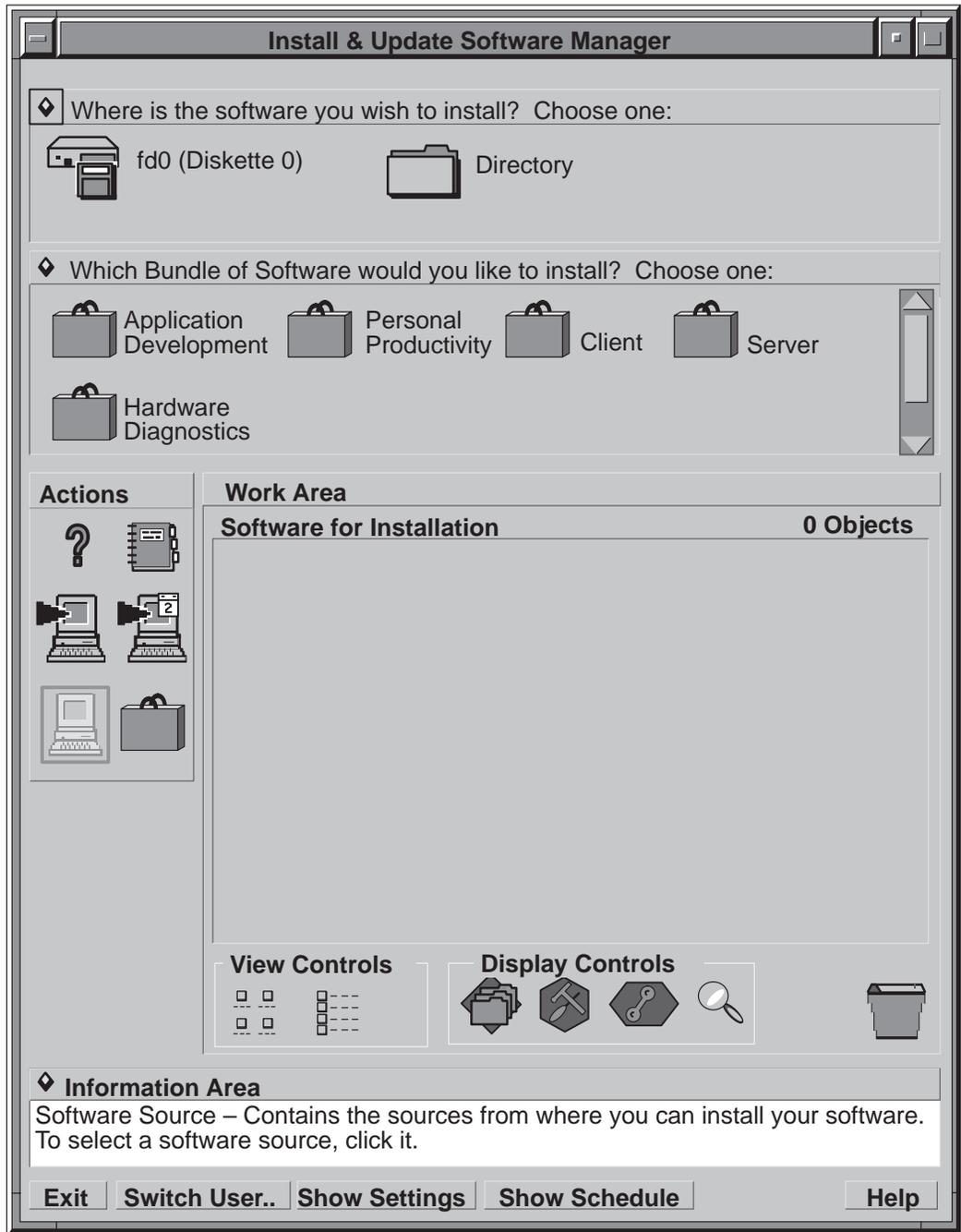
Using Install and Update Software Manager

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 are not able to run this software until you acquire the license for it.

To invoke Install and Update Software Manager:

```
xinstallm
```

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



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 Chapter 12, “Viewing README Files” on page 12-1.
- You may want to create a new backup of your system. Refer to Chapter 8, “Backing Up Your System” on page 8-1 or Chapter 4, “Customizing Your Installation” on page 4-1,.

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.

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

This chapter includes:

- “Introduction to Software Maintenance,” on page 7-2
- “Committing Service Updates,” on page 7-3
- “Rejecting Service Updates,” on page 7-5
- “Removing Software Filesets,” on page 7-6
- “Cleaning Up Optional Software and Service Updates,” on page 7-7

Introduction to Software Maintenance

Maintaining Software Using SMIT

The SMIT interface allows you to commit, reject, remove, and cleanup service updates and fileset. This chapter details the procedure for committing software updates. The same procedure can be used for rejecting service updates and removing software filesets. The SMIT screens that you use vary depending on the action you are performing.

Maintaining Software using a VSM Application

The graphical interface provides access to the Visual System Management Maintain Installed Software 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
```

The Maintain Installed Software application illustrates in a graphical format the relationships among

- products
- packages
- filesets
- maintenance levels
- updates

The application enables you to select software and perform maintenance functions, such as committing and rejecting service updates and removing and verifying software. In addition this application provides a way for you to clean up software after an interrupted installation of software other than the Base Operating System.

You must have root authority to use this application.

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

Committing Service Updates

Overview

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 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
```

Procedure

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

Note: You can also perform this procedure using a VMS application. For additional information refer to "Maintaining Information Using a VSM Application" on page 7-2.

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. Select one of the following choices:
 - **All Service Updates** to 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.
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 does not actually occur. In this case, repeat this procedure with the preview function set to **No** when you want to commit the software.

Rejecting Service Updates

Overview

If 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.

Procedure

To reject service updates, use the following command:

```
smit install_reject
```

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

Note: You can also perform this procedure using a VMS application. For additional information refer to “Maintaining Information Using a VSM Application” on page 7-2.

Removing Software Filesets

Overview

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.

Procedure

To remove software filesets, use the following command:

```
smit install_remove
```

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

Note: You can also perform this procedure using a VMS application. For additional information refer to “Maintaining Information Using a VSM Application” on page 7-2.

Cleaning Up Optional Software and Service Updates

Overview

If something should go wrong during the software installation so that the installation is prematurely canceled or interrupted, a *cleanup* must be run.

This section 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 **lslpp** command with the **-I** option indicates the state of the software products on the system.

Automatic and Manual Cleanups

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
- 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 Appendix A, “Optional Software Installation and Update Concepts” on page A-1.

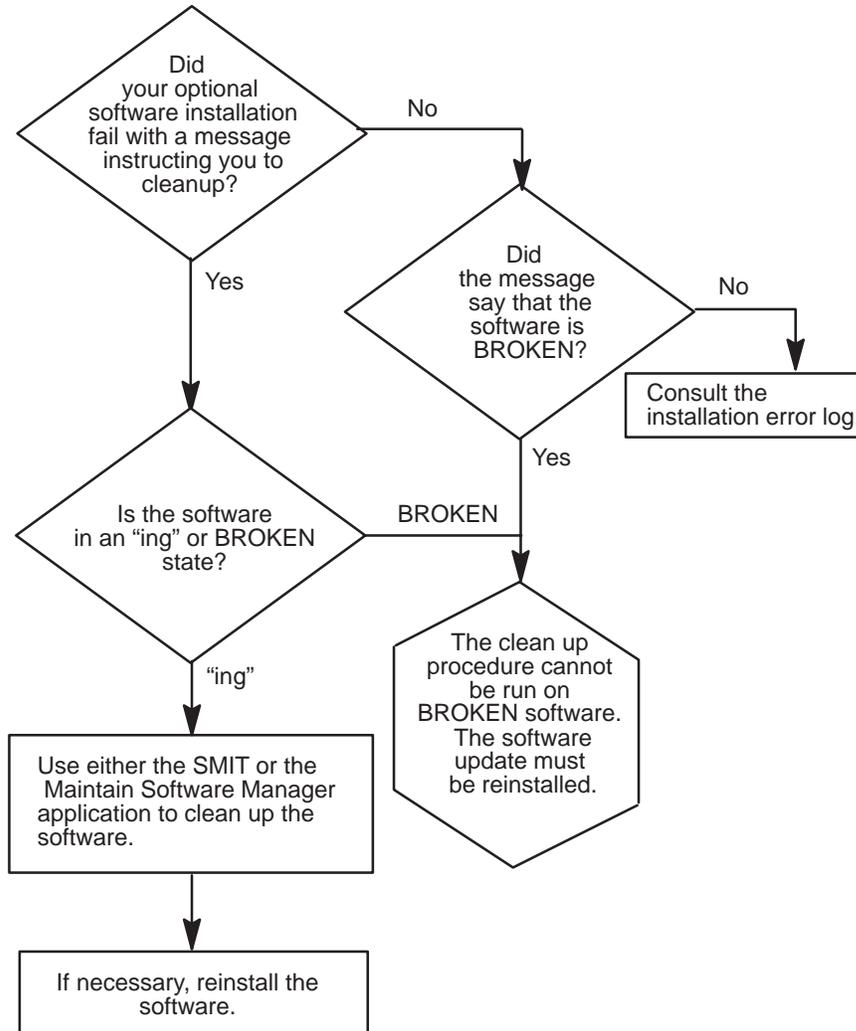
The Cleanup Process

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.

Note: This procedure applies only to the installation of optional software products. If your AIX Version 4.2 Base Operating System installation was unsuccessful, go to “Accessing a System That Will Not Boot” on page 10-4.

The Cleanup Process Flowchart

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



Cleaning Up Software Procedures

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.

Cleaning Up Software Using 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.

Cleaning Up Software Using a VMS Applicaton

If the installation you are performing with a Visual System Management (VSM) application (Easy Install or Install or Update Software Manager) fails, follow this procedure:

1. Attempt to restart the installation.

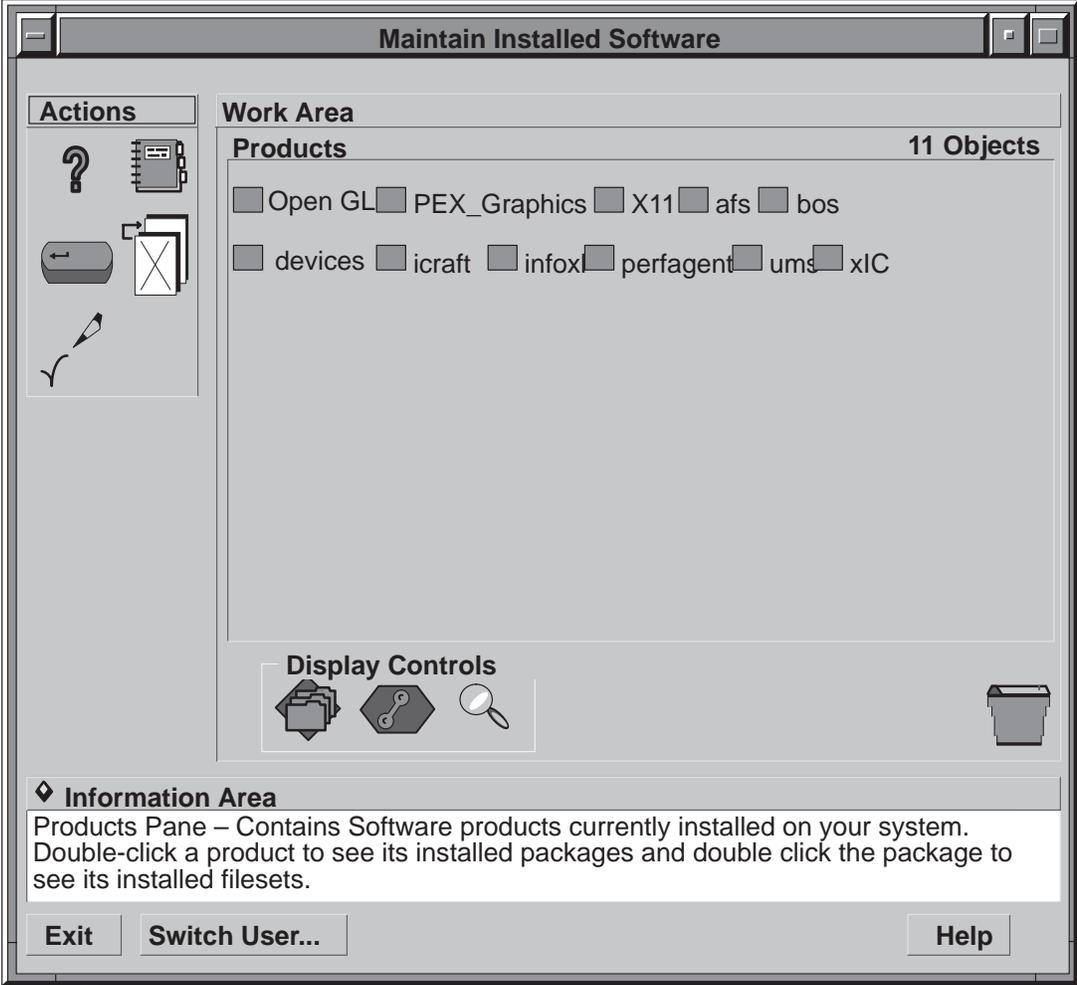
A pop-up window displays, indicating that the software needs to be cleaned up.

2. After performing the cleanup operation, restart the installation process.

See *Getting Started* for information about how to access the desktop and how to work with VSM applications.

For additional information refer to “Maintaining Information Using a VSM Application” on page 7-2 .

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 , for more information. When you back up your system using Installation Assistant, the required **bos.sysmgmt.sysbr** fileset is automatically installed.

This chapter includes:

- “Introduction to Backing Up Your System,” on page 8-2
- “Completing the Prerequisites for Making a Backup,” on page 8-4
- “Backing Up the Root Volume Group,” on page 8-5
- “Backing Up a User Volume Group,” on page 8-8
- “Verifying a Backup Tape,” on page 8-9

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

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).

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

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, refer to Chapter 5, “Customizing the BOS Install Program” on page 5-1.

Source and Target Configurations

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.

If you want the source and target to be identical, configure the source system before creating a backup image of it. However, if you plan to use a backup image for installing differently configured target systems, create the image *before* configuring the source system, or set the **RECOVER_DEVICES** variable to **no** in the **bosinst.data** file. Refer to Chapter 5, “Customizing the BOS Install Program” on page 5-1 for more information about the **bosinst.data** file.

Device Configurations

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

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

the target system from a product media, then use the **mksysb** tape to install the target system. Any additional device support required on the target system is automatically installed after the **mksysb** image is restored.

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.

Passwords and Network Addresses Configuration

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.

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 use the **/etc/exclude.rootvg** file to list files you do not want backed up. See “Backing Up Your System” in the *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 are backed up twice. This duplication might exceed the number of files a file system can hold. This can cause a future installation of the backup image to fail.

Completing the Prerequisites for Making a Backup

Before backing up your system, ensure you have met all of the following 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 “Backing Up the Root Volume Group” on page 8-5 or “Backing Up a User Volume Group” on page 8-8.

If the **lslpp** command does not list the **sysbr** fileset, install it before continuing with the backup procedure. Refer to “Installing Software and Service Updates with Custom Install” on page 6-11 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.

Backing 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=+24000 /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	[]	+/ +
Create MAP files?	no	+
EXCLUDE files?	no	+
List files as they are backed up?	no	+
Generate new /image.data file?	yes	+
EXPAND /tmp if needed?	no	+
(Applies only to bootable tape)		
Disable software packing of backup?	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=Reset	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 *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 want each file listed as it is backed up, press the Tab key once to change the default value of **List files as they are backed up?** to **yes**. Otherwise, you will see a percentage-completed progress message while the backup is created.
10. The **image.data** file contains information about the sizes of all the file systems and logical volumes in your rootvg. If you modified the **image.data** file and don't want a new file created, press the Tab key once to set the value to **no** for **Generate new /image.data file?**
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 the tape drive you are using provides packing (or compression), set the **Disable software packing of backup?** field to **yes**.
13. 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.
14. 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.
15. 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**.

16. Press F10 to exit SMIT when the backup completes.
17. If you chose tape as the backup medium, remove the last tape and label it. Write-protect the backup tapes.
18. Record any backed up root and user passwords. Remember, these passwords are 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.

Backing 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:

1. 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.
2. 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.

Verifying 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 tape device name in the **DEVICE or FILE** field, or accept the value given.
3. Either type the number of blocks to read for your tape device in the **Number of BLOCKS** field, or leave it blank to accept the system default.
4. Press the Enter key.

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

Chapter 9. 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.

This chapter includes:

- “Introduction to Backup Installations” on page 9-2
- “Flowchart for Backup Installations” on page 9-4
- “Installing BOS from a System Backup” on page 9-5
- “Where Do I Go Next,” on page 9-13

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 4.2 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 it 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.

Backup Installation Process

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 Chapter 4, “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 4.2. 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 Chapter 8, “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.

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 are the same size as they were on the source system, unless you set the **SHRINK** variable to **yes** in the **image.data** file before making the backup image. An exception is the **/tmp** directory. This directory can be increased to allocate enough space for the **bosboot** command. For information about setting variables, refer to the **image.data** file in *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

Setup Considerations

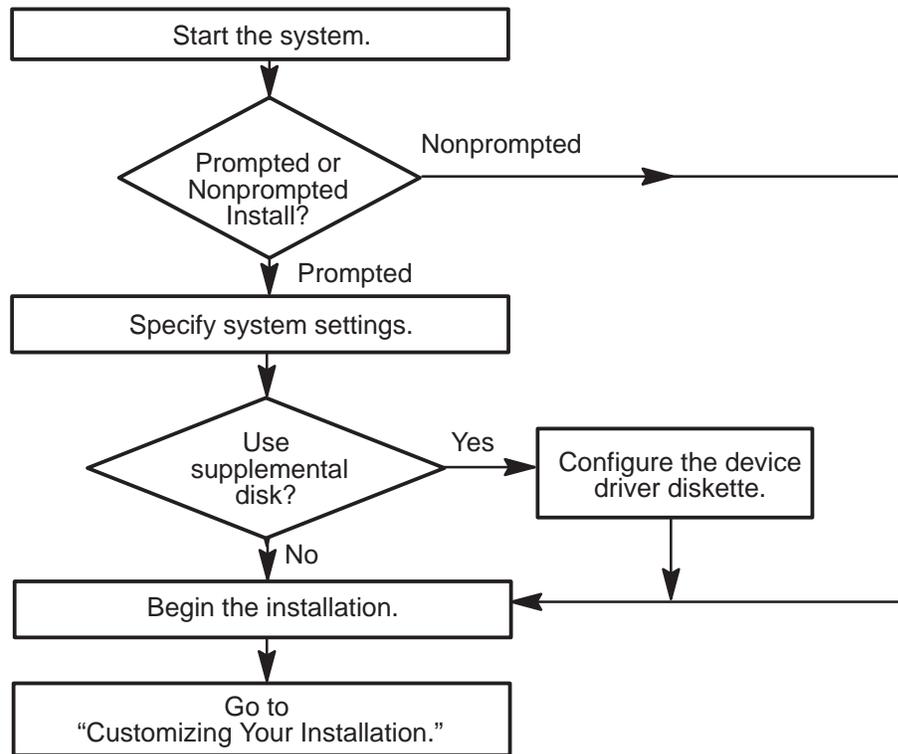
Consider altering passwords and network addresses if you use a backup to make master copies of a source system. Copying passwords from the source to a target system can create security problems. Also, if network addresses are copied to a target system, duplicate addresses can disrupt network communications. See “Source and Target Differences” on page 10-10 for more information.

Use these 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.



Installing 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 4.2 Network Installation Management Guide and Reference* for information about installing a backup across a network.

Setting ASCII Terminal Options

If you are using an ASCII terminal set the communications and keyboard options as shown below.

Communications Options

Set This Option...	To This Value...
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

Keyboard and Display Options

Set This Option...	To This Value...
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

Refer to your hardware documentation for information about how to set these options.

Starting the System

To begin your BOS installation, follow the steps that pertain to the current state of your system:

- “The System Is Not Running AIX” below
- “The System is Running AIX” on page 9-7

The System Is Not Running AIX

If your system is not running AIX, follow these steps:

1. 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 . Turning on the external devices first is necessary so that the system unit can identify them during the startup (boot) process.
2. Power your system on.
3. Put the backup tape in the drive.

Note: You may experience any of the follow tape drive/CD-ROM problems:

- 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 BOS backup installation tape (insert Volume 1 if you created 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.
4. If you are using a serial tty console, refer to “Setting ASCII Terminal Options” for required communications and keyboard settings.
 5. Power cycle the system by turning it off and turning it on again.
 6. Proceed according to the version of your firmware:

PPC Bug Firmware	<p>After the self tests have completed, press the Esc key once when you see this message:</p> <pre>NVRAM Boot List about to Begin... Press <ESC> to Bypass, <SPC> to Continue</pre>
PowerPC Open Firmware	<ol style="list-style-type: none"> a. After the automatic self tests have completed, press any key when you see this message: <pre>Type any key to interrupt automatic startup</pre> The system then goes to the PowerPC Open Firmware Main Menu. b. At the Main Menu, select the Boot an Operating System menu. The Boot an Operating System menu window appears. c. Select the Perform auto-scan Boot Operation menu option from the Boot an Operating System window.

7. The system begins to boot from the installation medium.
8. Go on to “Identifying System Console and Installation Language” on page 9-8.

The System is Running AIX

If your system is running AIX, follow these steps:

1. Log in as root.
2. Turn on all attached external devices, such as terminals, CD-ROM drives, tape drives, monitors, and external disk drives.
3. Put the backup tape in the drive.

Note: You may experience any of the follow tape drive/CD-ROM problems:

- 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 BOS backup installation tape (insert Volume 1 if you created 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.
4. Reboot the system by entering:

```
shutdown -Fr
```

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.
 5. The system begins to boot from the installation medium.
 6. Go on to “Identifying System Console and Installation Language” on page 9-8 .

Identifying System Console and Installation Language

1. When prompted to do so, identify your system console.

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.

However, if the **bosinst.data** file lists a valid display device for the **CONSOLE** variable, you do not manually choose a system console. Read Chapter 5, “Customizing the BOS Install Program” on page 5-1 for more information about the **bosinst.data** file.
2. 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:
 - “Using a Nonprompted Installation” on page 9-9 if the backup image is configured to install automatically, without having to respond to the installation program.

OR

 - “Using a Prompted Installation” on page 9-10 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.

Using a Nonprompted Installation

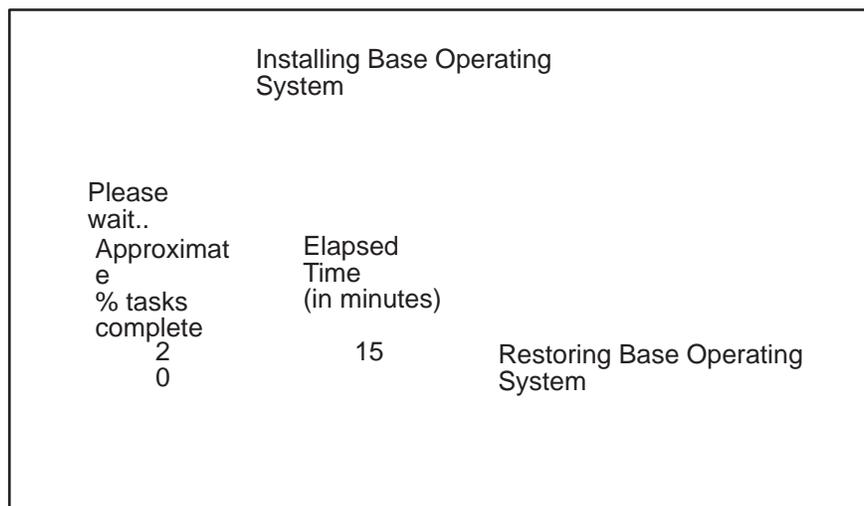
A successful nonprompted installation requires no further instructions because the installation is automatic. The sequence of events follows:

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.



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

3. The system reboots when the installation completes.

Using a 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, that 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 Chapter 8, "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 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 *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 disables 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 9-9 shows an example depiction of this screen.

An untitled screen temporarily replaces the **Installing Base Operating System** screen if you specified a supplemental disk in step 4 on page 9-11. 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.

9. The system reboots automatically when the installation completes.

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 **RUN_STARTUP=no** the Installation Assistant does not start.
- 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 Chapter 4, “Customizing Your Installation” on page 4-1 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 10. Troubleshooting

This chapter suggests solutions for typical installation problems. Refer to Chapter 11, “Acting on System and Error Messages” on page 11-1 and *Messages Guide and Reference* for information about error messages that appear during an installation.

This chapter includes:

- “Booting from a Tape or CD-ROM Drive,” on page 10-2
- “Accessing a System That Does Not Boot,” on page 10-4
- “Troubleshooting an Installation from a System Backup,” on page 10-9
- “Troubleshooting a Full /usr File System,” on page 10-11
- “Resetting the Firmware Default Settings,” on page 10-12
- “Assigning IRQ Levels for ISA Cards,” on page 10-14
- “Disabling DEC Ethernet Checksum Validation,” on page 10-15
- “Viewing BOS Installation Logs,” on page 10-16
- “Using the snap Problem Determination Tool,” on page 10-17

Booting from a Tape or CD-ROM Drive

Once the BOS is installed on your system, the hard disk is the default boot device. If you want to boot the system from a tape or CD-ROM, follow the procedures in this section.

Beginning the Boot

To begin to boot your system from a tape or CD-ROM, follow the steps that pertain to the current state of your system:

- “The System Is Not Running AIX,” below
- “The System is Running AIX,” on page 10-3

The System Is Not Running AIX

If your system is not running AIX, follow these steps:

1. Power on all attached external devices, such as terminals and monitors.
2. Power your system on.
3. Insert the boot medium into the appropriate device drive. Remove any other tapes, CD-ROMs, or floppy disks from all attached devices because they may interfere with the autoboot sequence.

Notes: You may have any of the following tape drive/CD-ROM problems:

- You may find that on specific hardware, the tape drive door does 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 4.2 BOS tape (insert Volume 1 if you received more than one volume).
 - 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. Power cycle the system by turning it off and turning it on again.

- Proceed according to the version of your firmware:

<p>PPC Bug Firmware</p>	<p>After the self tests have completed, press the Esc key once when you see this message:</p> <p>NVRAM Boot List about to Begin... Press <ESC> to Bypass , <SPC> to Continue</p>
<p>PowerPC Open Firmware</p>	<p>a. After the automatic self tests have completed, press any key when you see this message:</p> <p>Type any key to interrupt automatic startup</p> <p>The system then goes to the PowerPC Open Firmware Main Menu.</p> <p>b. At the Main Menu, select the Boot an Operating System menu. The Boot an Operating System menu window appears.</p> <p>c. Select the Perform auto-scan Boot Operation menu option from the Boot an Operating System window.</p>

- The system begins to boot from the boot medium.

The System is Running AIX

If your system is running AIX, follow these steps:

- Log in as root.
- Insert the boot medium into the appropriate device drive. Remove any other tapes, CD-ROMs, or floppy disks from all attached devices because they may interfere with the autoboot sequence.
- Reboot the system by entering:


```
shutdown -Fr
```
- The system begins to boot from the installation medium.

Accessing a System That Does Not Boot

The procedure in this section describes how to access a system that does not boot from the hard disk. Read “Troubleshooting Installation from a System Backup” on page 10-9 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 does 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 does not boot.

1. Boot the system from Volume 1 of the BOS CD-ROM or bootable backup installation tape.
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 4.2 Base Operating System (BOS) is installed.
- Your system unit is set to Off.

Setting ASCII Terminal Options

If you are using an ASCII terminal set the communications and keyboard options as shown below.

Communications Options

Set This Option...	To This Value...
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

Keyboard and Display Options

Set This Option...	To This Value...
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

Refer to your hardware documentation for information about how to set these options.

Accessing 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 BOS. 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. Complete the procedures in the section "Booting from a Tape or CD-ROM Drive" on page 10-2 and continue to step 2 below.
2. Insert Volume 1 of the installation media into the tape or CD-ROM drive.
3. If you are using a serial tty console, refer to "Setting ASCII Terminal Options" for required communications and keyboard settings.

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.

4. 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]:
```

5. Select option 1, **Access a Root Volume Group**, from the **Maintenance** screen. The **Warning** screen is displayed.
6. 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]:
```

7. 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 are not able to continue beyond the **Volume Group Information** screen.

8. 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.

9. 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 Volume 1 of the AIX product media, then install the backup from Maintenance mode. Refer to Chapter 3, “Installing BOS from CD-ROM or Tape” on page 3-1 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.

Booting from the Product CD-ROM

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.

4. Do not remove the CD from the CD-ROM drive.

The system reads the kernel and device support required on the target system from the CD.

5. Return to “Identifying System Console and Installation Language” on page 9-8 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 9-10 includes a description of the use of maps on disks selected in the **System Backup Installation and Settings** screen.

Booting from the Product Tape

1. Create a diskette that contains a **.signature** file that contains the characters **'data'** and a **./bosinst.data** file with **SWITCH_TO_PRODUCT_TAPE = yes** in the **control_flow** stanza. See Chapter 5, “Customizing the BOS Install Program” on page 5-1 for information on creating these files.

2. Insert the diskette that you created in Step 1 into the diskette drive.

3. Boot the system from Volume 1 of the product tape.

4. Choose the **Start Maintenance Mode for System Recovery** option when the Welcome screen is displayed.

The **Maintenance** screen is displayed.

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

6. Remove the product tape from the tape drive and insert the **mksysb** tape.

The **Choose Tape Drive** screen is displayed.

7. Choose the drive containing the backup tape.

The system reads the tape and begins the installation.

Note: The system prompts you to remove the **mksysb** tape and insert the product tape after the **mksysb** backup has been restored.

8. Return to “Identifying System Console and Installation Language” on page 9-8 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 9-10 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 the SMIT “backup the system” process.
- 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.

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 Version 4.2 Network Installation Management Guide and Reference*.
- Remove software that you do not need. See Chapter 7, “Maintaining Optional Software” on page 7-1.

Resetting the Firmware Default Settings

If you make changes to the firmware settings and experience system problems, you may want to reset the settings to the defaults.

Resetting Default Options in PPCBug Firmware

Use the procedure in this section to reset the firmware default settings on a system running PPCBug firmware.

1. Reboot the system. When you are prompted to abort the autoboot, press Esc.

The system displays the firmware menu.

2. To enter the system debugger, type `3` and confirm.
3. At the firmware prompt, type `env;d` and confirm.

The system displays the following message:

```
Update Non-Volatile RAM (Y/N)
```

4. To save the default settings type `Y` and confirm. If you type `N`, the system uses the default settings for this reboot, however they are not be saved.

The system displays the following message:

```
Reset Local System (CPU) (Y/N)
```

5. If you want to reboot the system with the default settings, type `Y` and confirm.
6. If you want to return to the firmware prompt, type `N` and confirm.

Resetting Default Options in PowerPC Open Firmware

Use the procedure in this section to reset the firmware default settings on a system running PowerPC Open Firmware.

1. Reboot the system. When you are prompted to abort the automatic startup, press any key.

The system displays the firmware menu.

2. At the **Main Menu**, select the **Administrative Options...** menu option.

The **Administrative Options...** menu window appears on your screen.

3. Select the **Modify the Configuration Settings...** menu option from the **Administrative Options...** window.

The **Modify the Configuration Settings...** menu window appears on your screen.

4. Select the **Restore Default Environment Settings** menu option from the **Modify the Configuration Settings...** window.

The system prompts for confirmation that you want to reset the NVRAM variables.

5. Select `Yes` or type `Y` to confirm that you want to reset the default NVRAM environment variable settings.

The system resets the firmware environment variables to their default settings.

Accessing Menu Options in the Firmware

You are given the option during the boot process to bypass selftests and autoboot. If you bypass these parts of the boot process, the firmware menu is displayed.

Select the appropriate action from the menu displayed. Any time you are presented with the firmware prompt, you can use the **menu** command to access default options.

Assigning IRQ Levels for ISA Cards

If you install an ISA card into a RISC PC and the system does not boot, one possible cause may be the conflict of Interrupt Request (IRQ) levels.

According to the ISA bus specification, interrupt lines cannot be shared among devices. Every ISA device must be assigned an IRQ level that does not conflict with any other ISA or PCI device.

You need to determine which IRQ levels are currently unassigned and then assign one of these to the ISA card, as described in the following procedure:

1. Power down the system.
2. Remove the ISA card.
3. Power on and boot the system.
4. Use the following command to list the interrupt levels for each device on your machine:

```
lsresource -l bus0 -a
```

You may want to refer to the manual page for **lsresource** for information on the output of this command.

5. From the list, choose all ISA and PCI devices in the **Defined** state, and execute the following command for each:

```
lsattr -El device_name
```

where *device_name* is the name of the hardware device.

A **bus_intr_lvl** entry is displayed, showing the bus interrupt (IRQ) level assigned to the device.

6. Select an unused IRQ level for the ISA card you removed.
(Typically, IRQ levels IRQ5, IRQ7, IRQ14, and IRQ15 are available on RISC PC systems.)
7. Shut down and power off the system.
8. Reinstall the ISA card you removed earlier.
9. Power on and boot the system.

Set the device IRQ level for the ISA card according to the instructions in the information that accompanied the ISA board.

Disabling DEC Ethernet Checksum Validation

If you have a DEC PCI card installed and are unable to configure networking, you may need to disable checksum validation for the card. You must check the system error log to confirm this is the reason for your problem.

Use the following procedure to check the system error log and toggle the checksum validation option:

1. Use the **errpt** command to access the system error log.

If the system error log shows an Ethernet adapter CRC checksum failure, complete the remaining steps in this procedure.

2. Type `smit eadap` at the system prompt to access the `SMIT Adapter` screen.
3. Select **Change/Show Characteristics of an Ethernet Adapter** from the **Adapter** screen.

An **Ethernet Adapter** pop-up screen is displayed. Acknowledge the message.

The **Change/Show Characteristics of an Ethernet Adapter** screen is displayed.

4. Move the cursor to **CRC validation of ethernet address** and use the Tab key to toggle this selection to `no`.
5. Apply the changes.
6. Reboot the system to implement the change.

Viewing BOS Installation 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 7-7 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.

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
```

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 11. Acting on System and Error Messages

This section lists messages that can appear during the installation of AIX Version 4.2. 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 10-11.

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 4.1.

Explanation An BOS installation method of `migration` was specified in the `bosinst.data` file, but the existing volume group is at level 4.2.

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>

Explanation:

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 menus 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.

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.

0512-0016 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:

- **/** 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 **/tmp/targetrgs** 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 /tmp/targetrgs
```

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.

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 12. 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.

Viewing the README Files

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. 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.

5. Press the Enter key when the copyright screen appears.
6. 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.

7. Enter `q` at the `:` (colon) prompt to exit the README file.

Appendix A. Optional Software Installation Concepts

This section supplements the procedures described in Chapter 6, “Installing Optional Software and Service Updates” on page 6-1. Understanding the concepts in this appendix may assist you in installing optional software products and service updates on your system.

This appendix includes:

- “Packaging of Software Products,” on page A-2
- “Software Product Organization,” on page A-3
- “Software Product Identification,” on page A-5
- “Installing and Running Hardware Diagnostics,” on page A-6
- “Applying, Committing, Rejecting and Removing Software Products and Updates,” on page A-7
- “Error Messages and Output from the installp Command,” on page A-9
- “Reinstalling a Software Product,” on page A-11
- “Creating Installation Images on a Hard Disk,” on page A-12
- “Updating Software,” on page A-13
- “Explanation of Requisites and Dependents,” on page A-14

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 *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 4.2. 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 Organization

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 that contains 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. Refer to "Customizing Your System on page" for more information on installing InfoExplorer databases.

The following are examples of the predefined bundles:

Bundle	Description
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.

Bundle	Description
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 Appendix B, "Software Installed Automatically during BOS Installation" on page B-1 for more information.

The following bundles only appear in the Easy Install Software VSM application:

Bundle	Description
All Licensed Bundle	A collection of software packages that includes all the software on the installation media for which you have a license.
All Update Bundle	One or more fileset updates.

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 3-3 for more information.

Software Product Identification

The product name and level number identify a software product. The level of a software product in AIX Version 4.2 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 4.1.4.0 is a later level than 4.1.3.4).

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.

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.sysmgmt.smit                   4.1.0.0         USR              APPLY           SUCCESS  
bos.sysmgmt.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 4.2 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

This appendix describes the software that is automatically installed during the BOS Installation.

This chapter discusses these topics:

- “Overview of Automatically Installed Software,” on page B-2
- “Base Operating System (BOS) Licensed Program,” on page B-3
- “AIXwindows (X11) Licensed Program,” on page B-4

Overview of Automatically Installed Software

The BOS installation program first installs the Base Operating System Runtime (**bos.rte**) image. Then the BOS installation program 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.

Listing the Installed Software

To list all the software installed on your system, enter the following command:

```
lslpp -L | pg
```

Viewing Optional Software Information

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 Chapter 6, "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

Index

Symbols

/ file system
 definition of, 3-12
 messages, 11-8
 root part, A-2
 saving space, 6-12
/dev, after installing from system backup, 9-2
/dev directory, 9-3
/dev/ipldevice file, 11-6
/etc/exclude.rootvg file, 8-6
/etc/objrepos directory, after installing from system backup, 9-2, 9-3
/etc/objrepos/devs file, 11-8
/tmp file system
 definition of, 3-12
 free space in, 8-5
 messages, 11-5, 11-8
 size during installation from backup, 9-2
/tmp/disk.image file, 11-5
/tmp/ibmsupt directory, 10-17, 10-18
/tmp/unix file, 11-5
/tmp/vgdata/rootvg directory, 9-11
/usr file system
 definition of, 3-12
 messages, 11-5, 11-8
 saving space, 6-12
 troubleshooting when full, 10-11
 user part, A-2
/usr/share file system, A-2
/usr/sys/inst.images file, A-12
/var file system, definition of, 3-12

A

accessing an unbootable system, 10-4
AIXwindows licensed program, B-4
American Standard Code for Information Interchange. *See* ASCII
applying optional software
 definition of, A-7
 description, 6-2
ASCII Installation Assistant
 See also Installation Assistant
 introduction to tasks, 4-1
ASCII terminals
 setting communications options, 3-5, 9-5, 10-4
 setting display and keyboard options, 3-6, 9-6, 10-5

B

backup image, 9-2–9-3
backup, of system
 See also installing BOS from system backup
 configuring source system, 8-2–8-3
 introduction, 8-2
 mounting and unmounting file systems, 8-3–8-10
 procedure
 prerequisites, 8-4
 root volume group, 8-5
 verifying backup, user volume group, 8-8
 verifying backup tape, 8-9
 restoring, 9-2–9-3
Base Operating System licensed program. *See* BOS licensed program
booting the system
 problems with, 10-4
 See also bosboot, troubleshooting; error messages
 procedure, 3-6, 9-6
BOS installation
 CD-ROM, from. *See* installing BOS from CD-ROM or tape
 customizing, 2-6
 migrating software products, 6-2
 software installed during, B-1
 system backup, from, 9-1–9-11
 tape, from. *See* installing BOS from CD-ROM or tape
BOS licensed program, B-3
BOS maintenance mode, accessing, 10-4
bosboot
 creating tapes, 5-3
 troubleshooting, 11-5, 11-7
 device problems, 11-6
 space problems, 11-5
bosinst.data file
 description, 5-2–5-5
 examples of, 5-10–5-11
 procedure for using, 5-3
 prompted mode, with, 10-6
 storage on diskette, 5-4
bundles
 See also software products
 definition of, A-3
 determining required, 4-5
 examples of, A-3
 installing, 4-5
 on preinstalled systems, 4-5
 types
 client, 4-5
 server, 4-5

C

- CD-ROM, installing BOS from. *See* installing BOS from CD-ROM or tape
- cleaning up failed software installation, 7-7
- client, bundle, 4-5
- commands, installp
 - See also* error messages
 - description of output, A-9
 - example output, A-9
- committing service updates
 - definition of, A-7
 - description, 7-1
 - introduction, 6-2
 - procedure, 7-3
- communications, setting options for ASCII terminals, 3-5, 9-5, 10-4
- Complete Overwrite installation, definition of, 3-3
- configuration, system. *See* customization, system
- configuring installation
 - determining bundles, 4-5
 - installing InfoExplorer, 4-10
 - using Installation Assistant, 4-6
- corequisite software, explanation of, A-14
- customization, system
 - access remote resources, 4-8
 - add license passwords, 4-8
 - back up the system, 4-8
 - change language environment, 4-8
 - configure printer, 4-8
 - create user accounts, 4-8
 - date and time, 4-8
 - exit and log in, 4-8
 - flowchart, 4-7
 - install optional software, 4-8
 - introduction to, 4-1
 - list of tasks, 4-8
 - set root password, 4-8
 - worksheets
 - file systems, mounting remote, 4-4
 - host name and address, 4-3
 - TCP/IP configuration and startup, 4-2
- customizing BOS installation
 - bosinst.data file, 5-2–5-6
 - procedure, 5-3

D

- data recovery
 - introduction, 10-4
 - procedure, 10-5
 - when system will not boot, 10-4
 - default installation method, using, 3-10
 - dependent software, explanation of, A-14
 - directories
 - /dev, 9-3
 - /etc/objrepos, 9-3
 - /tmp/ibmsupt directory, 10-17
 - /tmp/vgdata/rootvg, 9-11
 - disk, specifying for BOS installation
 - CD-ROM or tape, 3-13
 - system backup, 9-11
 - disk space
 - messages, 11-5
 - snap command requirements, 10-17
 - disks, hard (fixed). *See* hard disks
 - displays, setting options for ASCII terminals, 3-6, 9-6, 10-5
- ## E
- environment, changing language, 3-15
 - error conditions, 10-1
 - error messages
 - attempt to create bootable tape failed, 11-7
 - check available disk space, 11-5
 - error occurred during bosboot, 11-5, 11-6
 - format, 11-1
 - hard disks not accessed, 11-4
 - hard disks not configured, 11-4
 - installp command output, A-9
 - example of, A-9
 - invalid or no boot device specified, 11-6
 - invalid table of contents, 11-7
 - media contains an image designed for installing BOS, 11-7
 - no disks are available, 11-8
 - not enough file space to create:
 - /tmp/disk.image, 11-5
 - not enough file space to create: /tmp/unix, 11-5
 - unable to expand file system /usr, 11-5
 - error recovery, 10-1–10-18

F

file systems

- /
 - definition of, 3-12
 - messages, 11-8
 - root part, A-2
 - saving space, 6-12
- /tmp, 9-2
 - definition of, 3-12
 - free space in, 8-5
 - messages, 11-5, 11-8
- /usr
 - definition of, 3-12
 - messages, 11-5, 11-8
 - saving space, 6-12
 - troubleshooting when full, 10-11
 - usr part, A-2
- /usr/share, A-2
- /var, definition of, 3-12
- mounting and unmounting, 8-3
- mounting remote (worksheet), 4-4

files

- /dev/ipldevice, 11-6
- /etc/exclude.rootvg, 8-6
- /etc/objrepos/devs, 11-8
- /tmp/disk.image, 11-5
- /tmp/unix, 11-5
- /usr/sys/inst.images, A-12
- bosinst.data
 - examples of, 5-10–5-11
 - explanation of, 5-2–5-5
 - introduction, 5-1
 - procedure for using, 5-3
 - prompted mode, with, 10-6
- image.data, 5-2, 9-2
- map, 9-11
- README, viewing, 12-1

filesets

- See also* software products
- definition of, A-3
- on preinstalled systems, 4-5
- software products. *See* software products

firmware, 10-12

fixed disks. *See* hard disks

flowcharts

- BOS installation, 3-2
- BOS installation from system backup, 9-4
- cleaning up failed software installation, 7-8
- customizing the system, 4-7
- installing optional software, 6-4
- installing service updates, 6-4

G

graphical user interface, Easy Install, prerequisites, 6-5

graphical user interfaces

- Easy Install, description of, 6-15
- Install and Update Software Manager, description of, 6-17
- Installation Assistant, introduction to tasks, 4-1
- Maintain Software Manager, description. *See* installing optional software

GUIs. *See* graphical user interfaces

H

hard disks

- See also* disk space
- creating installation image for, A-12
- installing from system backup, 9-2
- location codes of, 3-13
- specifying for CD-ROM or tape installation, 3-13
- specifying for system backup installation, 9-11
- unaccessible, 11-4
- unconfigured, 11-4, 11-8
- host name and address (worksheet), 4-3

I

image.data file, 5-2, 9-2

images, creating for installation, A-12

InfoExplorer

- installing, 4-10
- on preinstalled systems, 4-10

install

- from earlier version, 2-4
- new machine, 2-3
- optional software, 2-5

installation, changing to prompted mode, 9-9

installation (BOS)

- See also* installing BOS from CD-ROM or tape
- customizing with the bosinst.data file, 5-1–5-7
- software installed during, B-1

Installation Assistant

- introduction to tasks, 4-1
- overview, 4-6

installation images, creating on hard disk, A-12

installation methods

- See also* installing BOS from CD-ROM or tape
- definition of, 3-12
- specifying, 3-12

I (Continued)

installation screens (BOS)

- Change Disk(s) Where You Want to Install, 9-11

- Installation and Settings, 3-11

- Installing Base Operating System, 3-18, 9-9

- specifying installation language, 3-8

- specifying system console, 3-8, 9-8

- System Backup Installation and Settings (BOS), 9-10

- Welcome to Base Operating System and Maintenance (BOS), 9-10

installation starting point, 2-1

- installation, nonprompted, specifying with the bosinst.data file, 5-2

installing BOS from CD-ROM

- preparing the system, 10-2

- using default system settings, 3-10–3-11

installing BOS from CD-ROM or tape

- customizing the installation, 5-1

- default system settings, 3-11

- flowchart of, 3-2

- methods defined, 3-12

- procedure

 - booting (starting) the system, 3-6, 9-6

 - changing language environment, 3-15

 - initiating the installation, 3-18

 - prerequisites for, 3-5

 - specifying destination disk, 3-13

 - specifying installation method, 3-12

 - verifying system settings, 3-11

- tape table of contents, 11-7

- troubleshooting, 11-1–11-10

installing BOS from system backup

- flowchart of, 9-4

- introduction to, 9-2

- procedure, 9-5

- resolving reported problems, 10-10

- source system, 9-2–9-3, 10-10

- target system, 9-2–9-3, 10-10

- troubleshooting, 10-9, 11-7

installing InfoExplorer, 4-10

installing optional software

- See also* maintaining optional software;

- optional software, concepts defined

- applying, 6-2, A-7

- cleaning up failed installation, 7-7

- committing, 6-2, A-7

- dependents, explanation of, A-14

- flowchart, 6-4

- installp command output, A-9

 - example of, A-9

- introduction to, 6-2

- migration, 6-2

- prerequisites, 6-5

- procedure (graphical interface), 6-15

- procedure (SMIT), 6-7

 - accessing SMIT, 6-9

 - Custom Install path, 6-11

 - Easy Install path, 6-9

 - status messages, 6-13

- reinstalling, A-11

- rejecting, 6-2, A-7

- removing, 6-2, A-8

- requisites, explanation of, A-14

- selection criteria, 6-2

- software licenses, 6-2

- software packaging, A-3

- status messages (SMIT), 6-13

- troubleshooting, 7-7, 11-5

- updates, explanation of, A-13

- installing service updates. *See* installing optional software

installp command

- See also* error messages

- description of output, A-9

- example output, A-9

introduction to guide

- publications

 - corequisite, 1-7

 - ordering additional copies, 1-7

 - screens, explanation of examples, 1-5

K

- keyboards, setting options for ASCII terminals, 3-6, 9-6, 10-5

L

- language environment, changing, 3-15

- licensed programs, 6-3

 - AIXwindows, B-4

 - Base Operating System, B-3

 - BOS, B-3

 - bos, B-2

 - definition of, A-3

 - installing, 6-1

 - migration of, 6-2

 - packaging of, A-3

 - selection criteria for installation, 6-2

 - updating. *See* installing optional software

 - X11, B-2, B-4

- licenses, software, function of, 6-2

- locale. *See* language environment

- location codes, of the hard disk, 3-13

- logical volumes, accessing, 10-4

 - introduction, 10-4

 - procedure, 10-5

- lspp -L command, determining preinstalled filesets, 4-5

M

- Maintain Software Manager
 - description, 7-2
 - procedural overview, 7-2
- maintaining, service updates. *See* maintaining optional software
- maintaining optional software
 - See also* optional software, concepts defined
 - applying, A-7
 - committing, 7-1, A-7
 - concepts defined, A-7
 - introduction to, 7-1
 - procedural overview (vsm), 7-2
 - rejecting, 7-1, A-7
 - removing, 7-1, A-8
- maintenance mode, accessing (BOS), 10-4
- map files, 9-11
- menus. *See* screens
- messages, system and error. *See* error messages
- Migration installation, definition of, 3-3
- mksysb
 - installation from. *See* installing BOS from system backup
 - resolving reported problems, 10-10
 - troubleshooting installation from, 10-9
- monitors, setting options for ASCII terminals, 3-6, 9-6, 10-5

N

- New installation, definition of, 3-3
- nonprompted installation, customizing for, 5-1
- nonprompted mode, overriding, 9-9, 10-6
- nonroot volume group, definition of. *See* user volume group

O

- optional software, 6-3
 - See also* software products; software products and service updates
 - cleaning up failed installation of
 - introduction, 7-7
 - procedure (SMIT), 7-8
 - concepts defined, A-1–A-14
 - definition of, 6-2
 - installation of. *See* installing optional software
 - maintenance of. *See* maintaining optional software
- optional software, packaging of. *See* software packaging
- options
 - language environment, 3-15
 - nonprompted installation, specifying with the bosinst.data file, 5-2
 - prompted installation, changing to, 9-9
 - setting communications (ASCII), 3-5, 9-5, 10-4
 - setting display (ASCII), 3-6, 9-6, 10-5
 - setting monitor (ASCII), 3-6, 9-6, 10-5
 - software products. *See* software products

- specifying installation disk (BOS)
 - CD-ROM or tape, 3-13
 - system backup, 9-11
- specifying installation language, 3-8
- specifying installation method (BOS), 3-12
- specifying system console, 3-8, 9-8
- system configuration. *See* customization, system

P

- package, definition of, A-3
- paging space, 4-8
- pkg_gd, 6-3
- preinstalled systems
 - customization
 - starting point, 2-2
 - tasks, 4-6
 - filesets on, 4-5
 - installing bundles, 4-5
 - installing InfoExplorer, 4-10
- prerequisite software, explanation of, A-14
- Preservation installation, definition of, 3-4
- problems, recovering from, 10-1
- procedures
 - accessing BOS maintenance, 10-5
 - cleaning up failed software installation (SMIT), 7-8
 - committing service updates (SMIT). *See* installing optional software
 - creating bosboot tapes, 5-3
 - customizing BOS installation, 5-3
 - identifying boot device, 11-6
 - installing BOS from system backup. *See* installing BOS from system backup
 - maintaining optional software (graphical). *See* installing optional software
 - resizing /tmp, 11-5
 - root volume group, backing up, 8-5
 - troubleshooting a mksysb installation, 10-9, 10-10
 - troubleshooting full /usr file system, 10-11
 - unlocking the root volume group, 11-5
 - user volume group, backing up, 8-8
 - verifying backup tape, 8-9
 - viewing README files, 12-1
- product identification, optional software, A-5
- product information, 6-3
- prompted mode, changing to (BOS), 9-9, 10-6

R

- README files, viewing, 12-1
- recovery, 10-1–10-18
- reinstalling optional software, A-11
- rejecting optional software
 - definition of, A-7
 - introduction, 6-2
- rejecting software, description, 7-1
- removing optional software
 - definition of, A-8
 - introduction, 6-2
- removing software, description, 7-1
- requisite software, explanation of, A-14
- root volume group (rootvg)
 - backing up, 8-5
 - definition of, 3-12, 8-2
 - unlocking, 11-5
- rootvg. *See* root volume group

S

screens

- Access a Root Volume Group (BOS), 10-7
- Change Disk(s) Where You Want to Install (BOS), 9-11
- Commit Applied Software Updates (Remove Saved Files) (SMIT), 7-3
- Install Bundles of Software (Easy Install) (SMIT), 6-10
- Install/Update Selectable Software (Custom Install) (SMIT), 6-11
- Install/Update Software at Latest Level (SMIT), 6-11, 6-12
- Installation and Settings (BOS), 3-11
- Installing Base Operating System (BOS), 3-18, 9-9
- Maintenance (BOS), 10-6
- System Backup Installation and Settings, 9-10
- Volume Group Information (BOS), 10-7
- Welcome to Base Operating System and Maintenance, 9-10
- Welcome to Base Operating System Installation and Maintenance (BOS), 10-6

screens, explanation of examples, 1-5

server, bundle, 4-5

service updates

- See also* software products
- committing, A-7
- committing (SMIT), 7-3
- explanation of, A-13
- rejecting, A-7
- removing, A-8

SMIT, help, 6-8

SMIT interfaces

- Custom Install path
 - description of, 6-7
 - procedure, 6-11
- Easy Install path
 - description of, 6-7

prerequisites, 6-5

procedure, 6-9

Installation Assistant, 4-1

SMIT procedures

- cleaning up a failed software installation, 7-8
- committing service updates, 7-3
- installing optional software, 6-7
 - Custom Install, options, 6-7

snap command

- compiling configuration information, 10-17
- options used with, 10-17

software

- committing (SMIT), 7-3
- installed with BOS, B-1

software bundles

- See also* software products
- definition of, A-3
- examples of, A-3

software filesets, definition of, A-3

software licenses, function of, 6-2

software packages. *See* software products

software packaging, A-2

- root part, A-2
- share part, A-2
- user part, A-2

software products

- applying, A-7
- bundle, definition of, A-3
- bundle, examples of, A-3
- committing, A-7
- concepts defined, A-1–A-14
- fileset, definition of, A-3
- identification of, A-5
- installation of. *See* installing optional software
- licensed program, definition of, A-3
- maintenance of. *See* installing optional software
- migration of, 6-2
- package, definition of, A-3
- packaging of, A-3
- rejecting, A-7
- removing, A-8
- selection criteria for installation, 6-2

software, optional

- See also* software products
- definition of, 6-2
- dependents, explanation of, A-14
- installation of. *See* installing optional software
- maintenance of. *See* installing optional software
- reinstalling, A-11
- requisites, explanation of, A-14
- updates, explanation of, A-13

source system, 9-2–9-3

troubleshooting, 10-10

S (Continued)

starting the system. *See* booting the system system

- booting (starting). *See* booting the system
- configuring. *See* customization, system
- system backup. *See* backup, of system; installing BOS from system backup
- system backup, BOS installation from. *See* installing BOS from system backup
- system configuration. *See* customization, system
- System Management Interface Tool. *See* SMIT
- system messages. *See* error messages
- system settings
 - changing during BOS installation, 3-12–3-17
 - defaults for installing BOS, 3-11

T

tape

- creating bootable, troubleshooting, 11-7
- installing BOS from. *See* installing BOS from CD-ROM or tape
- table of contents, 11-7

target disk

- specifying for CD-ROM or tape installation, 3-13
- specifying for system backup installation, 9-11

target system, 9-2–9-3

- troubleshooting, 10-10

TCB, 3-17

TCP/IP, configuration and startup (worksheet), 4-2

terminal type, setting, 4-6

terminals (ASCII), setting communications options, 3-5, 9-5, 10-4

Transmission Control Protocol/Internet Protocol. *See* TCP/IP

troubleshooting

- See also* error messages
- boot problems, 10-4
 - introduction, 10-4
 - procedure, 10-5
- bootable tapes, creating, 5-3
- cleaning up failed optional software installation
 - introduction, 7-7
 - procedure (SMIT), 7-8
- configuration information, compiling, 10-17

- firmware, 10-12
- full /usr file system, 10-11
- installation from system backup (mksysb), 10-9
 - resolving reported problems, 10-10
- introduction, 10-1
- nonprompted mode, overriding, 10-6
- problem determination (snap), 10-17
- prompted mode, changing to, 10-6
- trusted computing base, 3-17

U

updates, service

- explanation of, 6-2
- installation of. *See* installing optional software
- maintenance of. *See* installing optional software

updating optional software, overview, A-13

user volume group

- backing up, 8-8
- definition of, 8-2

V

visual system management, Maintain Software Manager, procedural overview. *See* installing optional software

volume groups

- accessing, 10-4
 - introduction, 10-4
 - procedure, 10-5
- backing up, 8-5, 8-8
- definition of, 3-12
- nonroot, 8-2
- root, 8-2, 11-5
- user, 8-2

W

worksheets

- file systems, mounting remote, 4-4
- host name and address, 4-3
- TCP/IP configuration and startup, 4-2

X

X11 licensed program, B-4

X11 LP, B-2

