

**IBM Advanced Interactive Executive
AIX/370
Installing and Customizing the
Operating System
Version 1.2.1**

Document Number SC23-2066-01

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AIX/370

Installing and Customizing the
Operating System

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AIX/370 Installing and Customizing the Operating System
Edition Notice

Edition Notice

Third Edition (March 1991)

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AIX/370 Installing and Customizing the Operating System

About This Book

About This Book

This book shows you how to install the IBM Advanced Interactive Executive Operating System for the System/370, hereafter referred to as AIX/370, and its accompanying programs. It also shows you how to customize the operating system to suit your specific needs.

Subtopics

Who Should Read This Book

What You Should Know

How to Use This Book

Related Publications

Other Publications

AIX/370 Installing and Customizing the Operating System

Who Should Read This Book

Who Should Read This Book

This book is written for anyone who is planning to install AIX/370, the installer of the system, or the administrator of the system.

AIX/370 Installing and Customizing the Operating System

What You Should Know

What You Should Know

Before you install AIX/370, review the *AIX/370 Planning Guide* and the *AIX/370 Administration Guide*. The *AIX/370 Planning Guide* gives you a general orientation to and specific instruction in planning the installation and maintenance of AIX/370. The *AIX/370 Administration Guide* describes some of the configuration options available with AIX/370.

AIX/370 Installing and Customizing the Operating System

How to Use This Book

How to Use This Book

This book contains seven chapters. We suggest that you read Chapter 1, "Introducing the AIX/370 Operating System" in its entirety to familiarize yourself with the functions and capabilities of AIX/370. Next, read Chapter 2 which tells you how to install the base operating system. Then, depending on how you plan to define and customize the system to fit your specific situation, read the remaining chapters in any order you want.

This book also includes five appendixes. These appendixes contain supplementary information that you may find helpful as you install the system. A glossary of terms is also included.

Japanese Language Support: If Japanese Language Support is provided with your system, all input required during the install and update processes must still be entered in English. Instances where English input is required as well as any other differences from the base system (supporting US-English and European locales) are pointed out in relevant sections of this book.

Subtopics

FRONT_2.3.1 Quick-Reference Boxes

FRONT_2.3.2 Highlighting

AIX/370 Installing and Customizing the Operating System Quick-Reference Boxes

Quick-Reference Boxes

Most of the chapters have the same basic structure. For each major task, you find a brief discussion of the task and a quick-reference box containing the steps for performing that task. For some tasks, additional examples and explanations are given under the heading, "In Detail".

Typically, a quick-reference box contains no examples, sample screens, or additional information. It serves only as a reference or a reminder of the basic steps. It does not replace the information in the "In Detail" section. Here is an example:

```
+--- To Request Devices -----+
|
| 1. Log in to the system.
|
| 2. At the system prompt, type devices and press Enter. The DEVICE
|    CUSTOMIZING COMMANDS screen is displayed.
|
+-----+
```

AIX/370 Installing and Customizing the Operating System Highlighting

Highlighting

This book uses different type styles to distinguish among certain kinds of information. General information is printed in standard type style (the style used for this sentence). The following type styles indicate other types of information:

Type Style	Description
<i>Italics</i>	Variables appear in <i>italic</i> type.
Bold	Files, path names, commands, flags, and keywords appear in bold type.
<i>Bold Italics</i>	New terms introduced in the text appear in <i>bold italic</i> type and are defined in the glossary.
Monospace	Text that you type or that shows on your display screen appears in monospace type.

AIX/370 Installing and Customizing the Operating System Related Publications

Related Publications

For additional information, you may want to refer to the following publications:

AIX Commands Reference, SC23-2292 (Vol. 1) and SC23-2184 (Vol. 2), lists and describes the AIX/370 and AIX PS/2 Operating System commands.

AIX Guide to Multibyte Character Set (MBCS) Support, GC23-2333, explains the basic concepts of AIX Multibyte character set support and refers to other AIX books that contain more detailed information.

AIX Messages Reference, SC23-2294, lists messages displayed by the AIX Operating System and explains how to respond to them.

AIX Programming Tools and Interfaces, SC23-2304, describes the programming environment of the AIX Operating System and includes information about operating system tools that are used to develop, compile, and debug programs.

AIX TCP/IP User's Guide, SC23-2309, describes the features of TCP/IP and shows how to install and customize the program. It includes reference information on TCP/IP commands that are used to transfer files, manage the network, and log into remote systems.

AIX Technical Reference, SC23-2300 (Vol. 1) and SC23-2301 (Vol. 2), describes the system calls and subroutines a programmer uses to write application programs. This book also provides information about the AIX Operating System file system, special files, miscellaneous files, and the writing of device drivers.

AIX PS/2 General Information, GC23-2055, describes the AIX PS/2 Operating System's functions and capabilities and the product's position in the AIX family of products.

AIX PS/2 Keyboard Description and Character Reference, SC23-2037, describes the characters and keyboards supported by the AIX PS/2 Operating System. This book also provides information on keyboard position codes, keyboard states, control code points, code-sequence processing, and non-spacing character sequences.

AIX PS/2 Text Formatting Guide, SC23-2044, describes the text formatting utilities available on the PS/2 and shows how to format text with NROFF and TROFF. This book also shows how to use the **vi** editor to create, revise, and store files.

AIX/370 Administration Guide, SC23-2088, describes such administrative tasks as updating the file system, backing up files, and fine-tuning and monitoring the performance of the operating system.

AIX/370 Diagnosis Guide, SC23-2090, describes procedures and tools that can be used to define and categorize symptoms of problems that may occur during daily operation.

AIX/370 General Information, GC23-2062, describes the functions and capabilities of AIX/370 and its position in the AIX family of products.

AIX/370 Planning Guide, GC23-2065, describes the functions and

AIX/370 Installing and Customizing the Operating System Related Publications

capabilities of the AIX/370 Operating System and lists the requirements for all supported hardware and software. This book also includes information to assist with planning for installation and customization of the operating system.

Installing and Customizing the AIX PS/2 Operating System, SC23-2290, provides step-by-step instructions for installing the AIX PS/2 Operating System and related programs. This book also shows how to customize the operating system to suit the user's specific needs and work environment.

Managing the AIX Operating System, SC23-2293, describes such system-management tasks as adding and deleting user IDs, creating and mounting file systems, backing up the system, repairing file system damage, and setting up an electronic mail system and other networking facilities.

Using the AIX Operating System, SC23-2291, shows the beginning user how to use AIX Operating System commands to do such basic tasks as log in and out of the system, display and print files, and set and change passwords. It includes information for intermediate to advanced users about how to use communication and networking facilities and write shell procedures.

AIX/370 Installing and Customizing the Operating System
Other Publications

Other Publications

Besides the AIX/370 and AIX PS/2 documentation, the following IBM publications may be of interest:

VM/SP General Information, GC20-1838

VM/XA SP General Information, GC23-0362.

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Chapter 1. Introducing the AIX/370 Operating System

1.0 Chapter 1. Introducing the AIX/370 Operating System

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1.2 About This Chapter

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1.1 CONTENTS

AIX/370 Installing and Customizing the Operating System

About This Chapter

1.2 About This Chapter

This chapter describes the following items for you as you prepare to install the AIX/370 Operating System:

The AIX/370 Operating System and its function

TCF considerations in AIX/370 installatio

Use of consoles and workstations

AIX/370 Installing and Customizing the Operating System

Introducing AIX/370

1.3 Introducing AIX/370

The AIX/370 Operating System is a version of IBM's Advanced Interactive Executive (AIX) for the System/370 processors. AIX/370 enables multiple user sessions, with each user being allowed to execute many programs simultaneously.

After installing VM, you can install AIX/370 as a guest operating system. The AIX/370 Operating System gives you access to system programs that handle processing, scheduling, storage, file systems, and printing. Additional operating system features provide a variety of options to extend the function and capabilities of your system including support for additional device types, communications and networking capabilities, and so on.

AIX/370 consists of these programs:

The Base Operating System for the AIX/37

The AIX/386 Base Operating System for PS/2 TCF cluster site(s) including the following components:

Applications Development Toolkit (ADT)

C

DOS Server

INed and INmail/INnet/INftp (separately installable)

Learn

On-line manual pages

TCP/IP

Text Formatting System

X-Windows

The Licensed Program Products (LPPs) available for AIX/370 include:

Engineering Scientific Subroutine Library (ESSL)

Network File Service (NFS)

Optimization Subroutine Library (OSL)

VS Fortra

There are two alternate delivery media for AIX/370 binaries, LPPs, and source code:

9-track magnetic tapes(s) @ 6250 BPI or 1600 BP

3480 tape cartridge

The number of tapes used in the installation process will vary depending on the media.

AIX/370 Installing and Customizing the Operating System
Introducing AIX/370

Japanese Language Support: If Japanese Language Support is provided with your AIX operating system, it is integrated into AIX. The Multibyte Character Set (MBCS) encoding system, which allows Japanese users to interact with their AIX system primarily in Japanese, is not an LPP.

AIX/370 Installing and Customizing the Operating System

Installing Clusters

1.4 Installing Clusters

The installation of an AIX/370 cluster is the sequenced installation of a set of AIX/370 and AIX PS/2 cluster sites with Transparent Computing Facility (TCF). There are a number of configuration decisions that must be made prior to starting the process.

1. Select a 370 VM machine for the primary site that will maintain the primary copy of the (replicated) root file system.
2. Determine the names and cluster site numbers for all sites.
3. For the remaining machines (secondary sites), decide which of the machines will maintain backbone copies of the (replicated) root file system, which machines will maintain secondary copies of the (replicated) root file systems, and which will store each LPP to be installed.

The overall process involves two main steps:

1. Install the AIX/370 system on the machine selected to maintain the primary copy of the (replicated) root. See Chapter 2, "Installing the Base Operating System on an AIX/370 Site" for details. Install the additional packages you desire to have available within the cluster. This includes installing the base package for AIX PS/2. See Chapter 3, "Installing Additional Software Packages" for details.
2. Install AIX/370 on each of the remaining machines using the installation procedure for AIX PS/2 (see Chapter 4, "Installing a PS/2 TCF Cluster Site") or AIX/370 (see Chapter 5, "Installing a 370 TCF Cluster Site").

Subtopics

- 1.4.1 Transparent Computing Facility (TCF)
- 1.4.2 Heterogeneous Clusters
- 1.4.3 The Installation Environment

AIX/370 Installing and Customizing the Operating System

Transparent Computing Facility (TCF)

1.4.1 Transparent Computing Facility (TCF)

The Transparent Computing Facility (TCF) provides the environment for combining one or more AIX/370 computers or PS/2 computers into a cluster connected on a **Local Area Network** or **LAN**. The TCF cluster appears as a single machine to users accessing cluster resources and acts as a single computer system when communicating outside the cluster.

The cluster has a **replicated root** file system which contains key common files and directories for basic system operation. The replicated root file system provides key common files and directories for basic system operation. Almost all system binaries and program libraries are in the replicated root file system.

Each root file system has a designated **primary copy** that resides on the primary site in the cluster. This primary copy is the only root file system copy that can be updated.

The read-only **backbone copies** of the replicated root file system reside on secondary sites in the cluster. Changes are *automatically* made to the backbone copy and all secondary copies of the root file system from the primary copy. This guarantees that root file updates are kept consistent on all sites within the cluster.

Secondary sites in the cluster may contain secondary copies of the root file system. These secondary copies usually contain only a subset of the files and directories in the primary copy of the root file system. These files and directories are determined by the needs of the people using the site.

AIX/370 Installing and Customizing the Operating System

Heterogeneous Clusters

1.4.2 Heterogeneous Clusters

The heterogeneous cluster includes an AIX/370 computer serving as the primary site and secondary sites which may include System/370 or PS/2 computers. Figure 1-1 shows a heterogeneous cluster.

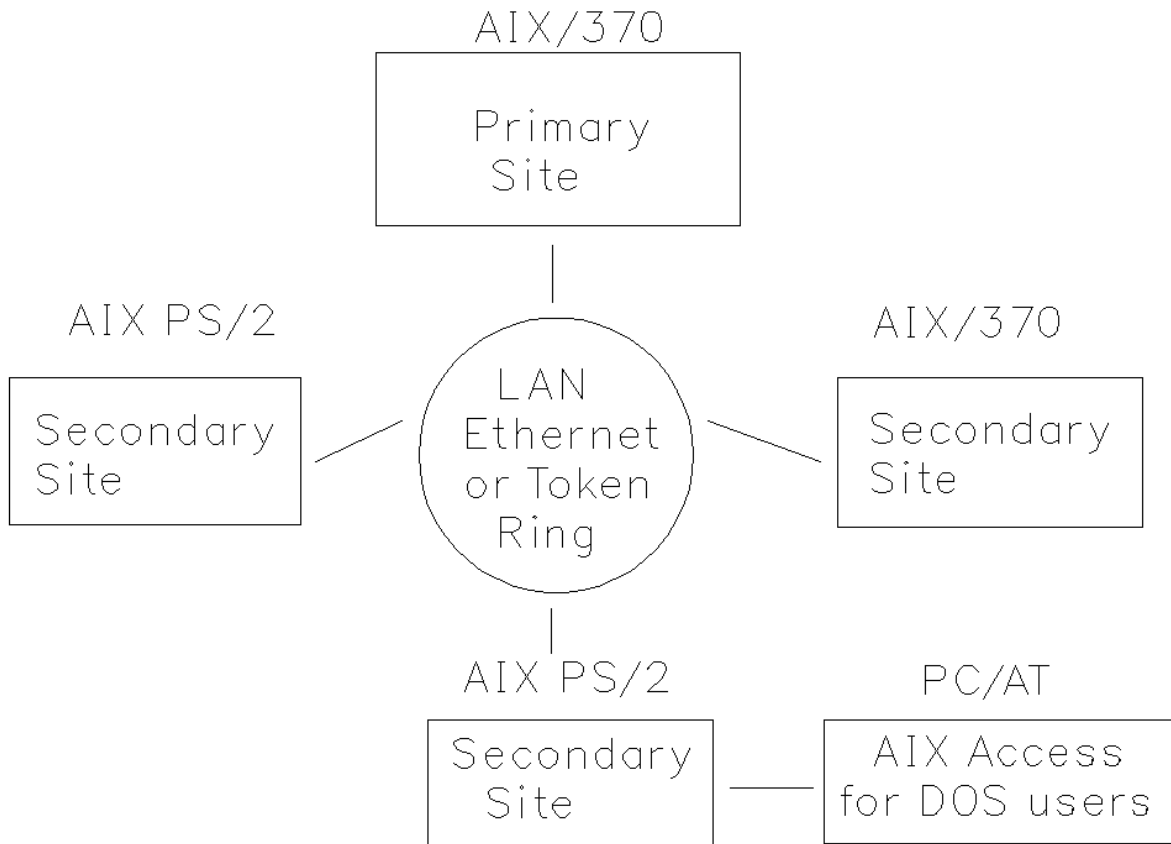


Figure 1-1. AIX/370 Heterogeneous Cluster

AIX/370 Installing and Customizing the Operating System

The Installation Environment

1.4.3 The Installation Environment

When the system is completely installed, AIX/370 will operate in either the 370 mode or the 370XA mode appropriate for the physical machine. Figure 1-2 is an overview of the consoles and workstations you use during installation of an AIX/370 cluster site. The consoles and workstations each accept different commands and execute different functions. During the installation of AIX/370, you enter commands and receive messages at the VM/CP workstation or the 370 console.

Note: The **AIX/370 console** and the **VM/CP workstation** are the same workstation. The normal boot sequence for AIX/370 is to log the appropriate (AIX/370) virtual machine into CMS (at this point the workstation is a VM/CP/CMS workstation) and then run a script to initialize AIX/370. When the script is run the workstation then becomes the AIX/370 console as well as remaining the virtual machine console in VM/CP terms.

AIX/370 Installing and Customizing the Operating System
The Installation Environment

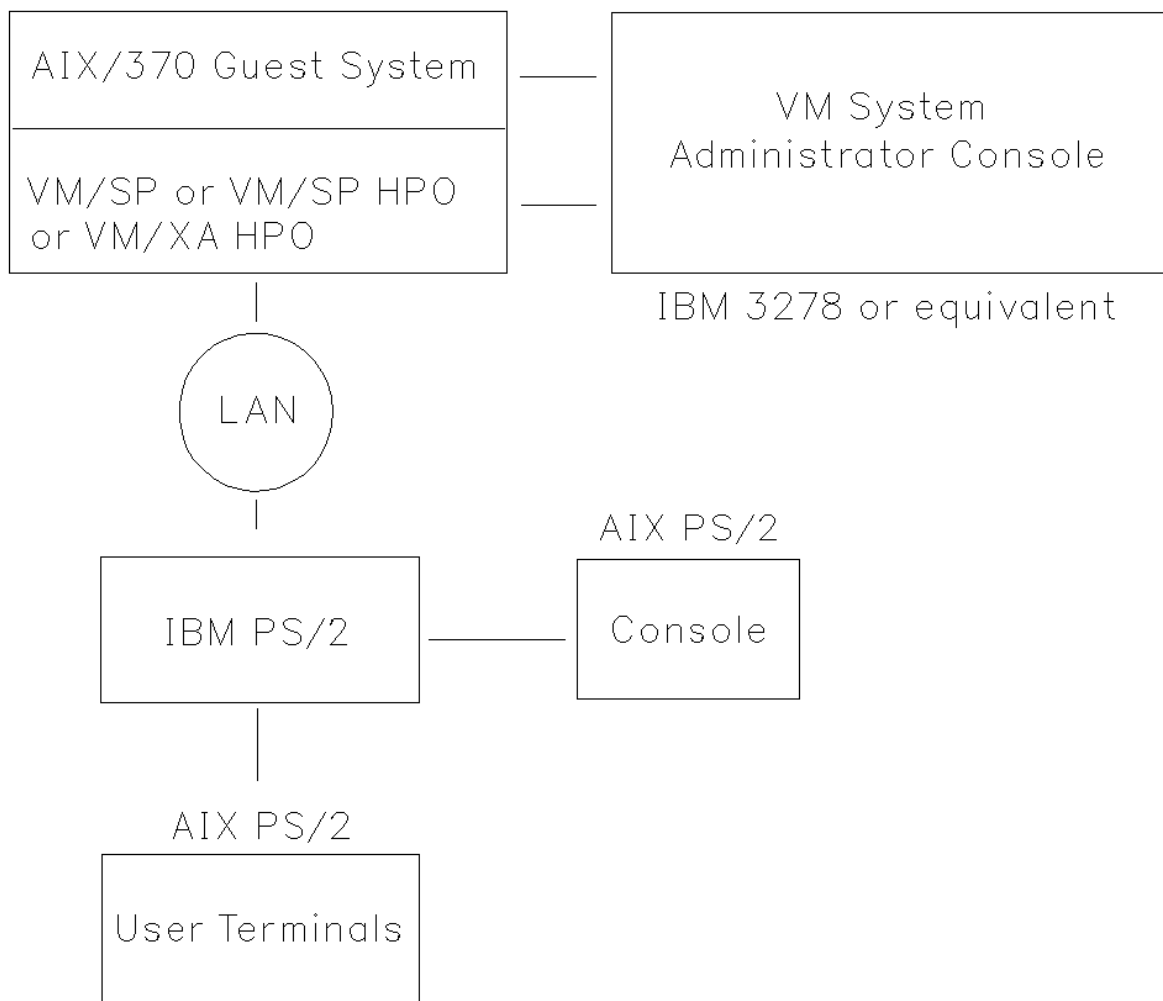


Figure 1-2. Consoles and Workstations for Installing AIX/370

Subtopics

- 1.4.3.1 The AIX/370 Console (VM/CP Workstation)
- 1.4.3.2 The VM Operator Console
- 1.4.3.3 The AIX PS/2 User Workstation

AIX/370 Installing and Customizing the Operating System

The AIX/370 Console (VM/CP Workstation)

1.4.3.1 The AIX/370 Console (VM/CP Workstation)

Use the console to install the AIX/370 guest system. At the console, enter all AIX/370 system installation commands. Most system administration functions, other than base installation, can be done on a PS/2 workstation. In this case, you can run the AIX/370 console disconnected. To reconnect the console or to enter system administration commands, log back into the virtual machine.

Use the VM/CP workstation to sign on (login) to the VM userid under which the AIX/370 guest system is to run. Here you initialize the AIX/370 system and control spooled devices (for example, close a spooled printer).

At the VM/CP workstation, you can enter all CP and CMS (when CMS is running) commands that are supported by VM; after AIX/370 has been initialized, you can continue to use CP commands.

AIX/370 Installing and Customizing the Operating System
The VM Operator Console

1.4.3.2 The VM Operator Console

This is the system console for the VM Operating System.

AIX/370 Installing and Customizing the Operating System

The AIX PS/2 User Workstation

1.4.3.3 The AIX PS/2 User Workstation

One or more of these workstations are for end users to do productive work. When AIX/370 is up and running in a TCF cluster with AIX PS/2 cluster sites, the workstation(s) accept AIX/370 user commands. These workstations are connected by way of a Local Area Network (LAN).

AIX/370 Installing and Customizing the Operating System

Customizing Your System

1.5 Customizing Your System

As you install the AIX/370 Operating System, the system automatically configures your system with the basic hardware components (system unit, display, keyboard). By adding other hardware components (for example, additional printers) and changing the defaults, you are customizing your system.

When you customize your system, you describe (to the system) the devices and programs for a particular data processing system. You have the options of using IBM-supplied defaults or of tailoring information about devices, minidisks, programs, users, and system values to suit your own needs. You can customize your system as you install the AIX/370 Operating System or any time thereafter.

You use two basic commands to customize your system: **devices** and **minidisks**.

1. With **devices**, you can add predefined devices to your system, delete devices already attached to your system, and display or change device information describing your system. Chapter 7, "Using the devices Command," explains how to use the **devices** command.
2. With **minidisks**, you organize the storage space on your VM minidisk. You can add minidisks to subdivide space on your VM minidisk. You also can delete minidisks from your disk or change the choices for minidisk characteristics. Chapter 8, "Using the minidisks Command," explains how to use the **minidisks** command.

Planning minidisk space requirements, covered in the *AIX/370 Planning Guide*, is an important part of customizing your system.

AIX/370 Installing and Customizing the Operating System

Backing Up Your AIX/370 Operating System

1.6 Backing Up Your AIX/370 Operating System

After you have installed the Base Operating System, and any additional operating system programs or licensed programs, you should make backup copies of all your minidisks. Having backup tapes helps protect you against possible loss of programs and files.

One backup procedure would be to do a VM/SP DDR of the appropriate disks. See *Managing the AIX Operating System* for more information about backup procedures and security concerns.

AIX/370 Installing and Customizing the Operating System
Chapter 2. Installing the Base Operating System on an AIX/370 Site

2.0 Chapter 2. Installing the Base Operating System on an AIX/370 Site

Subtopics

2.1 CONTENTS

2.2 About This Chapter

2.3 What You Need

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2.5 Preparing VM for the Installation of AIX/370

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AIX/370 Installing and Customizing the Operating System
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2.1 CONTENTS

AIX/370 Installing and Customizing the Operating System

About This Chapter

2.2 About This Chapter

This chapter explains how to install or reinstall the AIX Operating System file systems on a single AIX site. Adding other sites to the cluster is explained in Chapter 3.

AIX/370 Installing and Customizing the Operating System What You Need

2.3 What You Need

1. The *AIX/370 Planning Guide* provides information on the minimum machine configurations and supported hardware. Consult the *AIX/370 Planning Guide* to determine what processor, DASD space and additional devices are required for a minimum AIX configuration.
2. The AIX/370 Installation Package consists of

these instructions

Base Installation Tapes 1 and 2

370 INMN LPP Tape (INed and INmail/INnet/INftp)

PS/2 Basic Operating System Tape

PS/2 LPP Tape

Network File System Tape.
3. A list of LPPs to be installed on each site in the cluster.

AIX/370 Installing and Customizing the Operating System

What You Will Be Doing

2.4 What You Will Be Doing

Using the interactive Installation/Maintenance program, you will install the AIX/370 Operating System on your machine. This process consists of four steps which will be covered in detail later:

Preparing VM for the Installation of AIX/370.

The system administrator must set up VM before you can install AIX/370.

Installing the Installation/Maintenance System.

The Installation/Maintenance tape contains all the programs required by the kernel to perform the installation of AIX/370 onto your System/370.

The Installation/Maintenance program will set up the VM minidisk in preparation for the installation of the Operating System software from the Operating System tapes.

Japanese Language Support: If Japanese Language Support is provided with your system, all input required during the installation process must be entered in English. All the information which appears on your screen to guide you through installing the Installation/Maintenance program (including menus, questions, messages, warnings, and reminders) is also in English.

Installing AIX/370.

The Installation/Maintenance program will continue the installation of the Operating System and ask you to mount the appropriate tapes on the proper drive.

After Installing AIX/370.

You will be able to select the language type you desire and determine how you want to exit the Installation/Maintenance program by either exiting to a single-user mode or shutting down the system.

You will also be able to install Licensed Program Products from subsequent tapes.

AIX/370 Installing and Customizing the Operating System

Preparing VM for the Installation of AIX/370

2.5 Preparing VM for the Installation of AIX/370

Before installing AIX/370 you will install the VM operating system, prepare VM for the local area network (LAN) feature, and prepare VM for running AIX/370 as a guest operating system.

Subtopics

2.5.1 Addressing Devices During Installation

2.5.2 Loading the CMS Installation Scripts

AIX/370 Installing and Customizing the Operating System

Addressing Devices During Installation

2.5.1 Addressing Devices During Installation

During the installation process, you *must* use the physical device addresses listed in Table 2-1, if you have these devices. You do not need to define all of these addresses.

Device Type	Device Class	Address
AIX/370 Console		500
Tape Unit	.	181 and 380 during installation
8232 LAN Channel Station for Ethernet or Token Ring		160, 161
9370 Integrated LAN Adapter (Ethernet)		100, 101, 102, 103
9370 Integrated LAN Adapter (Token Ring)		120, 121, 122, 123
FBA DASD	9370 and 3370	340, 341, 342, 343, 344, 345
CKD DASD	3380 and 3390	390, 391, 392, 393, 394, 395
Channel-to-channel or virtual CTC adapter		140

Complete the following procedures:

1. **Install VM**

For information on installing VM, refer to the appropriate IBM VM Installation Guide.

2. **Prepare VM for LAN Feature**

A LAN Feature or CTC adapter is required for AIX/370 to communicate with other AIX sites.

Ensure that the correct VM service level is installed.

Ensure that VM has been correctly configured for the LAN interface you have installed. Consult the appropriate documentation for the LAN attachment.

3. **Prepare VM for AIX/370**

Before you actually can install AIX/370, the following has to be done:

Know the size and placement of minidisks. See the *AIX/370*

AIX/370 Installing and Customizing the Operating System

Addressing Devices During Installation

Planning Guide for this information.

Generate, in DMKRIO, all devices needed by AIX/370 for VM/SP.

Generate, in HCPRIO, all devices needed by AIX/370 for VM/XA.

Define a user identifier (VM login id or virtual machine name), for example, AIX370. For the system volume(s), allocate sufficient DASD space either by dedicating the appropriate drives or by defining VM minidisk(s) of the appropriate sizes.

See the *AIX/370 Planning Guide* for more details.

Special V=R Considerations: Because CMS is gened to load at a higher address than the V=R guest's memory, you must regen CMS to be loaded at a higher address than the V=R guest. For example, if a V=R guest is at 8M, load CMS at 7M for that system.

AIX/370 Installing and Customizing the Operating System

Loading the CMS Installation Scripts

2.5.2 Loading the CMS Installation Scripts

After you have completed the installation of VM on your machine and have created the virtual machine (VM account) to run AIX/370, the next step is to load the CMS files which will be used during the installation of AIX/370. It is assumed that you have created the AIX/370 (or your selected name) virtual machine and provided it sufficient CMS minidisk space to load these materials.

Perform the following steps:

1. Make sure the system operator has the AIX/370 product tapes.
2. Login to the AIX/370 account. At the VM/CMS banner type:

```
your account name <Enter>
your password     <Enter>
                  <PA2>
```

An example of an account name might be AIX370.

Warning: If this is the first time you login, you may have to format your A disk. Formatting will destroy all data currently on the drive.

3. Type: **sys clear** <Enter>

Note: To avoid accidental reformatting, we recommend that you detach all DASD devices which will NOT be used during the installation process. For example:

```
DETACH 391
DETACH 392
DETACH 393
```

4. For an XA system only, type: **set mach 370** to set the machine type.
5. Type: **ipl cms**.
6. Attach a tape on address 181. **ATTach** is a privileged VM command. The user must have the proper authority. The command format is:

```
ATT xxx AIX370 181
```

where the **xxx** is the device address of the tape drive, and **AIX370** is the VM userid of the virtual machine on which AIX/370 is running.

7. Mount tape number one, the AIX/370 Base Operating System tape, volume 1 of 2.
8. Then type: **VMFPLC2 LOAD** <Enter>

Note: No devices may be attached at virtual machine addresses 181 and 390 on the machine you are using for installation. If the tape is already defined at a different virtual address, type: **DEFINE vaddr 181**. The command **QUERY TAPE** can be used to display which tapes are already defined. The virtual address of a tape on this virtual machine may be the same as the virtual address of a different tape on a different virtual machine.

The VM system administrator has now loaded the scripts and programs from

AIX/370 Installing and Customizing the Operating System

Loading the CMS Installation Scripts

CMS that you will use to install your system.

You will then be able to complete the following to install AIX/370.

AIX/370 Installing and Customizing the Operating System

Installing the AIX/370 Installation/Maintenance System

2.6 Installing the AIX/370 Installation/Maintenance System

The next step is to load the Installation/Maintenance System onto a VM minidisk.

The Installation/Maintenance system will be used for the life of the system. It is a critical component of the installation process and is also used to recover from problems during the administration of AIX/370.

To install the Installation/Maintenance System:

1. You need at least 2 VM minidisks or dedicated DASD to install an AIX/370 system. One is used to store the Installation/Maintenance (I/M) system and the other is used to store the Base Operating System (IPL). It is not recommended that a dedicated volume be allocated for the I/M system disk as this is a large waste of resources. The following table shows the addresses and minimum sizes of DASD space required for the I/M and IPL systems.

Device Type	I/M System Address	I/M System Requirement	IPL System Address	IPL System Requirement
CKD 3380	390	27 cylinders	391	250 cylinders
CKD 3390	390	23 cylinders	391	208 cylinders
FBA	340	32000 blocks	341	300000 blocks

Note: CKD 3380 devices have 614,400 Bytes per cylinder.

CKD 3390 devices have 737,280 Bytes per cylinder.

FBA devices have 512 Bytes each.

The installation process will verify minimum configurations later.

2. Make sure that Distribution Tape 1 is mounted and ready on the attached tape drive.
3. Type:

ldimsys

A panel like the following displays providing information on your system environment.

```
LDIMSYS for AIX/370 Version: 1.2.1
(C) Copyright IBM Corporation 1990
```


AIX/370 Installing and Customizing the Operating System
Installing the AIX/370 Installation/Maintenance System

If errors were detected type,

quit

to resolve the errors and rerun the LDIMSYS program as explained in step 3.

6. When you have sufficient VM minidisks allocated for AIX/370, a full list of AIX/370 Filesystem disks detected is displayed on the main panel.

If all disks can not be displayed at once on the main panel, you may type

more

as many times as needed to see all filesystem disks.

Filesystem disks preceded by an * (asterisk) are marked to be formatted at the time the I/M System is installed. Only CKD type minidisks need to be formatted before use with AIX/370. By default, only the I/M and IPL disks are marked for formatting. If you have other CKD filesystem disks that are being added for use with AIX/370 for the first time, mark them to be formatted by typing

mark **vaddr**

where *vaddr* is a list of disk addresses to be formatted (Ex. "mark 392 393" marks the 392 and 393 disks for formatting).

7. To install the I/M system from tape, type:

install

to check the environment for errors. If no errors are detected, all marked disks are formatted and the I/M system is copied from tape to the I/M disk.

8. If no errors have been reported, your I/M system is now installed and the following message displays:

You may now Boot the AIX/370 Installation/Maintenance System

You now have the following choices:

To run the I/M system to continue with the installation, type:

boot

To stop at this time and continue installation later, type:

quit

and to resume later in CMS type:

aixmaint

AIX/370 Installing and Customizing the Operating System

Installing the AIX/370 Installation/Maintenance System

When you use **boot** or **aixmaint**, the AIX/370 Install/Maintenance system begins running. The screen shows copyright messages, messages about system memory, and devices that are located and initialized by the AIX/370 system as it boots.

Subtopics

2.6.1 Accessing the Installation Options Menu

AIX/370 Installing and Customizing the Operating System

Accessing the Installation Options Menu

2.6.1 Accessing the Installation Options Menu

The loading of the kernel will take a few seconds. You will see information ending with copyright and date information.

Hit Ctrl/C to restart Ctrl/Y to re-enter line Return default

*****START OF QUESTIONS*****

Installation options

1. Perform initial installation of a new site.
2. Add this previously installed site to an existing TCF cluster.
3. Perform maintenance on a previously installed system.

Select installation option:

Type **1** and press **Enter** to inform the kernel that you are using the Installation/Maintenance system volume. The system will display:

```
TCF protocol version #
TCF cluster id0.0.0:0.0
LARP version #
INIT: dependent site -- NOT CHECKING ROOT
INIT: using/generic -- NOT CHECKING LOCAL GENERIC SITE
INIT: SINGLE USER MODE
```

Give the root password for maintenance (single user) mode:

During the initial installation on a site, no password is necessary. Press **Enter**.

Respond with the root password when this is not an initial installation.

At the **<generic>>** prompt type

```
/etc/maint
```

and press **Enter** if you are installing a primary site.

If you are installing a secondary site when the **<generic>>** prompt appears, type

```
/etc/maint -s
```

and press **Enter**.

Note: The -s option only affects the default system file sizes, but does not change the installation procedure.

You can expect to see the following message at this point:

```
MASTER BOOT RECORD (MBR) BAD
```

This is only a cautionary message. You can go on to the installation.

AIX/370 Installing and Customizing the Operating System

Installing AIX/370

2.7 Installing AIX/370

After the system loads the programs, you will see SYSTEM MANAGEMENT.

```
+-----+
|
|                                     SYSTEM MANAGEMENT
|
|      ID  Item
|
|      1   Install AIX
|
|      2   Use Maintenance Commands
|
|      3   Start the Standalone Shell
|
|      4   End System Management
|
|
|      To SELECT an Item, type its ID and press Enter: 1
|
|      IBM AIX/370 Version 1.00
|      (c) Copyright IBM Corp. 1985, 1989
|
+-----+
```

To install AIX, type **1** and press **Enter**.

The SYSTEM MANAGEMENT menu lists four options from which you can choose:

Install AIX. This option takes you to the CONFIGURE INITIAL SIT menu. After answering site related questions on this menu, you will see the INSTALL AND CUSTOMIZE AIX/370 menu. You can do the following:

- Install the Operating System with current choices
- Show current and recommended choices
- Change current choices and install the Operating System.

Use Maintenance Commands

The **Use Maintenance Commands** option provides tools to maintain the system and to solve problems.

For information on using these commands, see *Managing the AIX Operating System*.

Start the Standalone Shell. Choosing this option starts the Standalone Shell from which you can issue any of the commands contained on the Installation/Maintenance tape. See *Managing the AIX Operating System* for a list of those commands.

End System Management. This option allows you to choose the method of running the AIX/370 Operating System. The choices are:

- Item 1 - Normal shutdown/startup
- Item 2 - Exit to system

AIX/370 Installing and Customizing the Operating System

Installing AIX/370

Subtopics

- 2.7.1 Configuring the Initial Site
- 2.7.2 Customizing Minidisks

AIX/370 Installing and Customizing the Operating System

Configuring the Initial Site

Local File System

Certain system utilities and system log files reside in a **local** file system. This file system is usually named based on the site name. Note that the site name has a "/" preceding it to form the file system name. The default name changes with the changed site name. However, those who wish to choose another name without changing the site name may do so by selecting option 4.

Full Site Name

The Full Site Name field is a purely informational field which may be modified. By default it is set to "Site 1", but it could be renamed to refer to the location or purpose of the site.

For example:

Executive Suite Site #1.

Cluster ID

The *cluster id* can be any valid Internet Protocol (IP) address, but by convention, use the IP address of the primary site. This number is the same for all sites in that cluster. For example, **a.b.c.d** (enter as a decimal number or hex number; use an x before the number to indicate format in hex). Default value is zero.

You will need this number when installing dependent TCF sites. For further information about IP addresses, see the *AIX TCP/IP User's Guide*.

To update site data, select option 1, **Install with these Options** and press **Enter**.

AIX/370 Installing and Customizing the Operating System
Customizing Minidisks

ID	Item	Fixed Disk	Blocks	Files
1	/ul	0	12000	1200
2	/aix370	0	15000	1500
3	/ (root)	0	115000	7500 *
4	page	0	40000	--
5	dump	0	24000	--
6	/aix370/tmp	0	8000	400

7 Install AIX and cause the current choices to take effect.

To CANCEL and go back to the INSTALL AND CUSTOMIZE AIX/370 menu, press F3.

* 7500 files is the correct number of files for a TCF cluster with only the minimum required PS/2 LPPs. 12,000 is recommended for TCF clusters with all PS/2 LPPs installed.

Your menu will resemble this one. The minidisk **/aix370** is the **/<sitename>** and the **/aix370/tmp** is the **/<sitename>/tmp** if you changed the site name on the previous menu. The local file system should be installed on fixed disk 0.

For additional information and calculating the number of blocks or files for each minidisk, see Chapter 6 of the *AIX/370 Planning Guide*.

The number of blocks and files chosen for the / (root) partition will also be allocated in the / (root) partition for every site in the cluster, including PS/2 sites.

Select the number of the minidisk you want to change. Follow the prompts and supply information to change the choices for each minidisk. A separate screen appears for each of these three items (for each minidisk):

Number of the VM minidisk on which you want the minidisk (this screen appears only when there is more than one VM minidisk)

Number of blocks to allocate for the minidis

Maximum number of files for the minidisk (does not appear for the dump and swap minidisks).

CHANGE CURRENT CHOICES OF A MINIDISK

Increase the number of blocks for the "/(root)" minidisk

Current Choice	Recommended Choice	Possible Choices
----------------	--------------------	------------------

AIX/370 Installing and Customizing the Operating System
Customizing Minidisks

Number of blocks	115000	115000	230000
------------------	--------	--------	--------

To CANCEL and go back to the CHANGE CURRENT CHOICES AND INSTALL menu, press F3.

To CHANGE current choices, type new choice and press ENTER.

Notes:

1. When allocating blocks and the maximum number of files for the root file system, consider which LPPs will later be installed. Refer to Chapter 2 of the *AIX PS/2 Installing and Customizing the Operating System* manual for requirements of PS/2 Base Operating System and LPPs.

The following conversion information will help you allocate block sizes in your file system.

1 cylinder = 1200 FBA blocks = 600 k bytes
1 FBA block = 512 bytes
1 AIX block = 1024 bytes

2. As a general rule, allocate 10% of the available space for inodes. Remember that if you increase the number of inodes, you are reducing the available file space.
3. The number listed under **Possible Choices** is the maximum number of blocks available on the fixed disk. (Fixed disk 0 is 391, and fixed disk 1 is 392). Do not add a number of blocks to the amount under **Current Choice** that will total more than the maximum number of blocks available.

Warning: Do not exceed the maximum number of blocks. The installation fails and you must go back and select a number that can be included within the maximum.

After making all your changes and returning to the menu that shows all choices for the minidisks, type **7**, and press **Enter** to make the changes take effect.

While the minidisks and filesystems are being created, a new screen appears.

CHANGE CURRENT CHOICES AND INSTALL

AIX/370 Installing and Customizing the Operating System Customizing Minidisks

```
installing AIX/370...
- building minidisk /u1 (12000 blks) on device ID#3
- building minidisk /aix370 (15000 blks) on device ID#4
- building minidisk / (root) (115000 blks) on device ID#5
- building minidisk page (40000 blks) on device ID#6
- building minidisk dump (24000 blks) on device ID#7
- building minidisk /aix370/tmp (8000 blks) on device ID#8

- making /u1 filesystem (12000 blks: 1998 files) on device ID#3
- making /aix370 filesystem (15000 blks: 1500 files) on device ID#4
- making / (root) filesystem (115000 blks: 7500 files) on device ID#5
- making /aix370/tmp filesystem (8000 blks: 1331 files) on device ID#8
```

The **ID#s** in this screen are examples, and may not be what you see. The numbers in parenthesis are the major and minor numbers for the minidisk.

After the last file system has been built, the screen will clear and display:

```
installing /
linstall: using default fstore mask "all"
```

Note: If any errors occur during this step, the following will be displayed:

```
ERRORS have occurred.
```

Refer to the *AIX Operating System Messages Reference* for error descriptions.

Press **Enter** to continue.

For each minidisk, the screen will clear and display:

```
Installing /aix
```

The screen will then display:

```
ldminit the kernel with file /t/(sitename)
```

Press **Enter** to continue.

Subtopics

2.7.2.1 For 1600 BPI tape

2.7.2.2 For 6250 BPI tape or 3480 cartridge

AIX/370 Installing and Customizing the Operating System For 1600 BPI tape

2.7.2.1 For 1600 BPI tape

After you press **Enter**, the screen will go blank for a moment and then display:

Restoring primary copy of the root file system

Mount the Installation tape and
press ENTER to continue or type SKIP to skip this step:

You will have to change tapes.

Mount AIX/370 Operating System Tape 2 and press **Enter**.

The tapes are numbered and should ONLY be mounted in ascending numerical order. Failure to do so will result in a failed installation.

After each tape there will be a wait with a blank screen. When the first tape in a set has been read in, the following prompt will appear:

Please mount volume xx on /dev/rmt0rh
...and press Enter to continue

'xx' will be the number of the next tape in the set to insert, and when all the tapes have been read in, you will see the screen display:

Press Enter to refresh the screen.

It is possible that you may see messages such as **File exists** or **linked to** These are to be expected. Remove your tape and press Enter.

AIX/370 Installing and Customizing the Operating System

For 6250 BPI tape or 3480 cartridge

2.7.2.2 For 6250 BPI tape or 3480 cartridge

After you press **Enter**, the screen will go blank for a moment and then display:

Restoring primary copy of the root file system

Mount the Installation tape and
press ENTER to continue or type SKIP to skip this step:

If you are installing from a 6250 BPI tape or 3480 cartridge, mount the second BOS tape, press **Enter** and the installation will proceed. The screen clears and loading takes in excess of 30 minutes depending on processor capability and tape size. The screen fills with dots as the tape loads.

AIX/370 Installing and Customizing the Operating System
After Installing AIX/370

SELECT LANGUAGE MENU

Select the language to be used.

ID	Item		
1	Use the current/default language.	9	German
2	Canadian (French)	10	Icelandic
3	Danish	11	Italian
4	Dutch	12	Japanese
5	English (U.K.)	13	Norwegian
6	English (U.S.)	14	Portugese
7	Finnish	15	Spanish
8	French	16	Swedish

To SELECT an Item, type its ID and press Enter: 1

Type the number of the language you wish to use, and press Enter.

Note: If you are doing the initial installation or a re-installation (not a merge), the default language (item 1) is U.S. English. If you are doing a merge, the current/default language is whatever language you last chose. If you did not previously choose a language, the current/default language will again be U.S. English.

After a moment you will be told that the:

Post installation processing is completed. To start your system return to the SYSTEM MANAGEMENT menu and select the End System Management item.
Boot the installed AIX/370 system from DASD at virtual address 341 (391)
To RETURN to the SYSTEM MANAGEMENT menu, press Enter.

Press Enter. The SYSTEM MANAGEMENT menu will return.

SYSTEM MANAGEMENT

ID	Item
1	Install AIX
2	Use Maintenance Commands

AIX/370 Installing and Customizing the Operating System
After Installing AIX/370

- 3 Start the Standalone Shell
- 4 End System Management

To SELECT an Item, type its ID and press Enter: 1

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Select option '4', **End System Management**. You will see:

END SYSTEM MANAGEMENT

Choose the method of exit from maint

ID Item

- 1 Shut down.
Shut down the maint system, drop into CP
and allow booting of the installed system.
- 2 Exit to the maint system.
Return to the maint system shell.

To CANCEL and go back to the SYSTEM MANAGEMENT menu, press F3.

To SELECT an item, type its ID and press Enter:

If you receive a message indicating that the programs did not load successfully, refer to the *AIX Operating System Messages Reference* for suggested actions.

To select item 1, type 1 and press **Enter**.

You will see messages:

syncing disks ...

When you see the message:

Loading a wait PSW (Use CP to re-ipl)

AIX/370 Installing and Customizing the Operating System After Installing AIX/370

the system is shut down.

Subtopics

2.8.1 Rebooting the System

2.8.2 Logging Off the AIX/370 Operating System

AIX/370 Installing and Customizing the Operating System

Rebooting the System

2.8.1 Rebooting the System

To boot the installed system, complete the following steps:

1. Press the (**PA1**) to enter CP READ. This may be **Alt dup** on your keyboard.

2. For FBA boot the installed system by typing:

```
ipl 341 clear
```

For CKD boot the installed system by typing:

```
ipl 391 clear
```

This boots your new site from the DASD address on which you have just installed the base AIX/370 operating system kernel.

Messages display and end with the following prompt:

```
INIT: SINGLE USER MODE
```

```
Do you want to enter maintenance (single-user) mode? (n)
```

Type **yes** and press **Enter**

```
Give root password for maintenance (single-user) mode:
```

Press **Enter**

Do not enter a password for initial installation. The prompt containing your site name appears.

```
<sitename <1>#
```

You may bring the system to multi-user mode by typing **init 2** at the prompt or begin installing Licensed Program Products (LPPs) on this site.

You may alter the way the system starts up by editing the **/etc/inittab** file. The **level** attribute of the **idef** stanza in **/etc/inittab** controls whether the system stops in single-user mode or proceeds automatically to multi-user mode on system startup. The **level** attribute may be set to one of the following values:

s Stop at single-user mode (default value)

2 Go straight to multi-user mode

If you have PS/2s to install as secondary sites, the first program to install on the primary site is the PS/2 Base Operating System. To install from tape, refer to Chapter 3, "Installing Additional Software Packages" and "The MasterInstall Program." Use the **MasterInstall** utility from the 370 console and follow the prompts.

AIX/370 Installing and Customizing the Operating System

Logging Off the AIX/370 Operating System

2.8.2 Logging Off the AIX/370 Operating System

You can log out of the system in three ways:

Press **Ctrl D** (-D on the 3270 console) to log out of AIX and leave the console connected and show a login prompt.

Disconnect from the 3270 console and leave the console available for other users.

1. Be sure that the **\$** or **#** prompt is displayed on the screen.
2. Press **F3**.

Warning: If the 3270 console is disconnected it may cause problems during reboot.

Log out of AIX/370 and stop the virtual machine

1. Be sure that the **\$** or **#** prompt is displayed on the screen.
2. Type **shutdown**. Then press **Enter**.
3. All users are now informed of the impending shutdown. To proceed with the shutdown, type **y** and press **Enter** when prompted.
4. Log off the virtual machine.

AIX/370 Installing and Customizing the Operating System

Chapter 3. Installing Additional Software Packages

3.0 Chapter 3. Installing Additional Software Packages

Subtopics

3.1 CONTENTS

3.2 About This Chapter

3.3 Selecting Additional Programs

3.4 Preparing For Additional Program Installation

3.5 Installing Additional Programs

AIX/370 Installing and Customizing the Operating System
CONTENTS

3.1 CONTENTS

AIX/370 Installing and Customizing the Operating System

About This Chapter

3.2 About This Chapter

This chapter explains how to install additional licensed program products (LPPs), after installing the AIX/370 Operating System. It explains how to install these programs using **MasterInstall**:

PS/2 Base Operating System

PS/2 LPP

INed and INmail/INnet/INft

It explains how to install these programs using **installp**:

Network File System (NFS)

VS FORTRA

Engineering and Scientific Subroutine Library (ESSL)

Optimization Subroutine Library (OSL)

AIX/370 Installing and Customizing the Operating System

Selecting Additional Programs

3.3 Selecting Additional Programs

The programs described below are available for the AIX/370 Operating System. Both installation commands, **MasterInstall** and **installp**, are covered in this chapter.

Subtopics

3.3.1 AIX PS/2 BOS

3.3.2 AIX PS/2 LPPs

3.3.3 INmail/INnet/INftp (Inmn370)

3.3.4 Network File System (NFS)

3.3.5 FORTRAN

3.3.6 Optimization Subroutine Library (OSL)

3.3.7 Engineering and Scientific Subroutine Library (ESSL)

AIX/370 Installing and Customizing the Operating System

AIX PS/2 BOS

3.3.1 AIX PS/2 BOS

The PS/2 Base Operating System (BOS) must be installed on the AIX/370 primary site before PS/2s may be installed on secondary sites in the cluster. The BOS is available on 1600 or 6250 BPI tape or on 3480 cartridge. The 1600 BPI tape must be installed using the **installp** command, and the 6250 BPI tape and 3480 cartridge must be installed using the **MasterInstall** program.

AIX/370 Installing and Customizing the Operating System

AIX PS/2 LPPs

3.3.2 AIX PS/2 LPPs

The AIX PS/2 LPPs supplied by IBM are available on tape for installation by **MasterInstall**. Other LPPs for the PS/2 which are not supplied on tape may be installed from diskettes using the **installp** program on a PS/2 secondary site. See the *Installing and Customizing the AIX PS/2 Operating System (SC23-2027-1)* for further information.

Install the AIX PS/2 LPPs for the PS/2 on the primary site before installing any PS/2 secondary sites. GSL is the only exception and requires an installed PS/2 site on a cluster.

AIX/370 Installing and Customizing the Operating System

INmail/INnet/INftp (Inmn370)

3.3.3 INmail/INnet/INftp (Inmn370)

The Interactive Systems mail and network package is separately installable from a tape using the **MasterInstall** program described in Chapter 2, "Installing the Base Operating System on an AIX/370 Site." See the *AIX PS/2 INmail/INnet/INftp User's Guide (SC23-2076)* for a description of INmail, INnet and ftp.

Note: INmail is not compatible with the UNIX mail system. You should not install this package unless you plan to use INmail instead of the already installed mail system.

AIX/370 Installing and Customizing the Operating System

Network File System (NFS)

3.3.4 Network File System (NFS)

The Network File System (NFS) provides a cluster of AIX/370 and AIX/PS2 systems (or a single system) access to files stored on a different cluster (or system). It also provides access to files stored on other IBM or non-IBM systems that support NFS, and allows these systems to access files on the cluster (or system).

Use **installp** when installing NFS on your machine.

AIX/370 Installing and Customizing the Operating System FORTRAN

3.3.5 FORTRAN

VS FORTRAN provides a compiler for the FORTRAN language and libraries and other files to allow development of programs in the FORTRAN language.

Use **installp** when installing VS FORTRAN on your machine.

AIX/370 Installing and Customizing the Operating System

Optimization Subroutine Library (OSL)

3.3.6 Optimization Subroutine Library (OSL)

OSL is a high-performance library of mathematical programming algorithms and functions providing alternative solution and performance options for use with application programs that solve optimization problems. OSL extends the size and type of problem that may be solved. It consists of subroutines that are callable from FORTRAN, and when under the control of MVS and VM operating systems, C, APL2, and PL/1. OSL is modular and can be used at different levels: high-level routines to solve a general problem or low-level routines to build a tailored algorithm for a particular type of problem.

AIX/370 Installing and Customizing the Operating System Engineering and Scientific Subroutine Library (ESSL)

3.3.7 Engineering and Scientific Subroutine Library (ESSL)

The Engineering and Scientific Subroutine Library (ESSL) provides a range of mathematical functions for many different types of engineering and scientific applications. VS FORTRAN is required for using ESSL. Examples of some of these applications areas are:

- StrucFluid Dynamics Analysis
- CompComputationalmTechniques
- MatheNuclear Engineering
- DynaSeismictAnalysislation
- ReserQuantitativegAnalysis
- Time ElectroniclCircuit Design

Use **installp** when installing ESSL on your machine.

AIX/370 Installing and Customizing the Operating System

Preparing For Additional Program Installation

3.4 Preparing For Additional Program Installation

Prior to the installation of any additional programs, the following preparatory work needs to be done:

Decide Which LPPs to Store on Each Site

Because each secondary cluster site can have varying disk storage capacities, you need to decide in advance which program products will be stored in the root file system on each machine.

The following table shows the disk requirements for all components and licensed program products. The AIX PS/2 Base Operating System and TCP/IP components are mandatory and must be stored on each replicated root file system on a PS/2.

The base operating system requirements (in 1K blocks) are:

Program Name	/root	/aixps2
Base System Program	15,000	2,200
Asynchronous Terminal Emulation	275	0
DOS Server	750	75
Graphic Subroutine Library	3,300	0
CD ROM	250	0
Learn	2,400	

The Licensed Program disk space requirements are:

Program Name	/root	/aixps2
Extensions		
Administrative Support	375	0
Extended User Support	1,140	0
Games	375	0
Mail, Sendmail	325	70
Man Pages	8,500	0
Message Handler	3,275	0
Samples	325	0
Basic Networking Utilities	2,200	900
Application Development Toolkit		
SCCS	600	0
Application Development Support Tools	10,700	0
DOS Merge	1,130	100

AIX/370 Installing and Customizing the Operating System

Preparing For Additional Program Installation

TCP/IP	1,500	100
Text Formatting System (TFS)	1,900	0
X.25	1,000	0
Network File System (NFS)	525	0
Transparent Computing Facility (TCF)	500	60
INed	2,450	0
INmail/INnet/INftp	800	0
Usability	2,700	0
X-Windows		
X-Windows	9,600	
X-Windows Samples	5,500	0
X-Windows Japanese Language Support	7,600	0
IAA	125	60
AIX Windows		
AIX Windows	2,400	0
AIX Windows Desktop	3,500	20
Workstation Host Interface Program	3,200	0
C compiler	750	0
Extended C compiler	1,225	0
VS FORTRAN	800	0
VS Pascal	700	0
VS Cobol		

Determine the Size of the Secondary Root File System

Based on the storage requirements of each of the components in Chapter 2 of the *AIX PS/2 Installing and Customizing the Operating System* manual you must decide which LPPs will be stored in the replicated root on each of your secondary sites. Adding together the requirements for all selected components gives you the approximate storage requirements for your local replicated roots. Be sure to include the storage requirements for the Base Operating System and TCP/IP in your calculations. An additional 10% should be added to this figure to provide a "buffer" of free space in your root file systems, for future updates.

Determine LPP Storage

Your AIX/370 system comes with a default set of **fstore** values that determine the files to be stored on each site in a system replicated file system. Each file installed into the replicated root has an **fstore** value associated with it. See the *AIX/370 Administration Guide* for more information on **fstore**.

AIX/370 Installing and Customizing the Operating System

Preparing For Additional Program Installation

The following list of **fstore** options is provided with a standard AIX/370 installation:

030000000000:primary	(stored only on primary and backbone sites, and only used during installation)
020000000000:0:none	(stored only on primary and backbone sites)
027777777777:cluster	(stored on all sites, but only used during installation)
037777777777:0:all	(stored on all sites)
000000000007:0:i370	(stored on all 370 sites)
000000007000:0:i386	(stored on all 386 sites)

Note: **Fstore** values can be customized for each LPP that is installed in the cluster. This will allow installing any given PS/2 LPP on only one PS/2 or a selected number of PS/2 cluster sites. It also allows PS/2 cluster sites with limited resources to be part of the same TCF cluster as PS/2s and 370s with more disk resources. See chapter 2 of the *Installing and Customizing the AIX PS/2 Operating System* for more information.

Customize LPP Storage

If your cluster is relatively homogeneous with respect to disk capacities of each machine of a particular type (for example, all of your PS/2s have 314 MB drives, and all of your 370s have 600 cylinders of DASD), you may wish to use the default set of **fstore** values provided. In this case, simply assign one of the above default values to each LPP when installing.

Fstore customization provides a very high degree of flexibility in designating LPP storage locations, and is particularly well-suited to clusters with varying disk capacities on machines of the same type (some PS/2's with 70MB drives, some with 314MB drives, and so on).

Refer to Chapter 6, "Customizing the TCF Cluster" for a description of customizing **fstore** values for LPP storage.

Japanese Language Support: Even if Japanese Language Support is provided with your system and you selected a Japanese locale while installing the I/M system, all information which appears on your screen to guide you will be in English. Also, all input required when installing LPPs (with **MasterInstall** or **installp** or when updating LPPs with **updatep**) must be in English. For details on the types of information which must always be expressed in 7-bit ASCII regardless of the locale selected (such as login IDs, passwords, site names, and so on), see the *Guide to Multibyte Character Set (MBCS) Support*.

AIX/370 Installing and Customizing the Operating System

Installing Additional Programs

3.5 Installing Additional Programs

After installing AIX/370, you can install LPPs using the **MasterInstall** command. The installation process described below is essentially the same for each of the programs. You may see some variation in the wording and messages on the screen, but the steps are very similar.

During the installation, if an error message displays on the screen, see *AIX Operating System Messages Reference* for details.

Subtopics

- 3.5.1 The MasterInstall Program
- 3.5.2 The installp Command
- 3.5.3 History Files
- 3.5.4 Updating LPPs

AIX/370 Installing and Customizing the Operating System
The MasterInstall Program

full pathname of an alternate directory. Then press ENTER --> /cs.tmp

000-123

Warning: Before you continue, you must minimize other activity on the system. Under no circumstances should you allow more than one session of any of the service tools (installp, updatep, or uninst) to run at the same time. Failure to do so may result in damage to the LPP(s) being serviced and to the history files. Do you want to continue with this command?

Type **y** and press **Enter**. You will see:

Please mount volume 1 on /tmp//? tmp.100053.0
... and press Enter to continue

Mount the tape and press **Enter**. You will see:

files restored: 1

The program "Async Terminal Emulator"
will be installed.

Do you want to do this? (y or n)

Type **y** and press **Enter**. You will see:

files restored: 1

Please choose the fstore you would like the installed/updated files
to be given from the list below:

FSTORE VALUES.

None	(primary and backbone systems only)
primary	
i386	(all 386's, primary, backbones and secondary)
i370	(all 370's, primary, backbones and secondary)
all	(all processors, primary, secondary, or backbone)
cluster	
asis	(leave fstore unchanged)

Type quit to cancel installation/update.

Please enter your choice followed by a return now

(No explanation is provided by these programs)

Enter your choice and press **Enter**. You will see:

AIX/370 Installing and Customizing the Operating System
The MasterInstall Program

IBM AIX PS/2 Asynchronous Terminal Emulation Program.

Version 1.1 (c) Copyright International Business Machines Corp. 1988.

Licensed Material Program Property of IBM - All rights reserved.

PS/2 and AIX are trademarks of IBM.

Please mount volume 1 on /tmp//? tmp. 100053.0
... and press Enter to continue

The tape is already mounted. Press **Enter**. You will see a list of files,
and then:

files restored:14

Program "Async Terminal Emulation" is now installed.

Saving /usr/lpp/ate to 'usr/lpp.save/1/ate'
Done at Thur Sep 28 12:08=02 1990
48 blocks on 1 volume(s)

This series of screens will repeat for all the programs you chose to
install. After you have finished the last LPP, you will see:

The following sites are available:
aix370

Please enter site/name followed by the desire execution time
You can enter "all" to choose all sites and "now" for immediate executi
(Stop for break)

Answer **all now**.

Then you will see:

Please mount volume 1 on /usr/lib/qproc.queue/1/bac
... and press Enter to continue.

And finally:

MasterInstall:rewinding tape.

Warning: The MasterInstall program can overwrite user configuration files.

AIX/370 Installing and Customizing the Operating System

The installp Command

3.5.2 The *installp* Command

To install an additional program using **installp**, follow these basic steps:

- +--- To Install an Additional Program -----+
1. Log in as superuser or as a member of the system group.
 2. Make sure that no one else is using the system and that no user programs are running. Use the **clusterstop** command.
 3. Type **init 3** to initialize the system in single-user mode.
 4. Type **installp -d /dev/rmt0**. Then press **Enter**.
 5. When prompted to do so, load the appropriate tape.
 6. Follow the prompts to install the additional program. As various files are restored from the tape, they may be listed on the screen. If a program has components that can be installed separately, a menu will let you select the components you want to install.
 7. In some cases, the system may restart at this point. If so, a message will advise you.
- +-----+

Subtopics

3.5.2.1 In Detail

3.5.2.2 Handling User Configurable Files

AIX/370 Installing and Customizing the Operating System In Detail

3.5.2.1 In Detail

1. Log into the system as root.
2. Insert the distribution diskette into the diskette drive and make sure it locks in place.

3. Type:

```
# installp -d /dev/rfd0h
```

The system responds:

```
000-123 Before you continue, you must make sure there is no other
activity on the system. You should have just restarted the system
and no other terminals should be enabled. Refer to the AIX
Operating System Messages Reference manual for more information.
```

```
Do you want to continue with this command? (y or n)
```

4. Type:

```
y
```

The system responds:

```
Please mount volume 1 on /dev/rfd0
```

5. Confirm that the distribution diskette is in the diskette drive and press **Enter**.

The system responds:

```
files restored: 1
```

```
—
The program LPP_NAME will be installed
```

```
Do you want to do this? (y/n)
```

where *LPP_NAME* is the name of the LPP you are installing.

6. Type:

```
y
```

to install the LPP. The system responds with the number of files restored and a copyright message. The following message is displayed.

```
Please mount volume 1 on /dev/rfd0
press Enter to continue.
```

7. Confirm that the distribution diskette is in the diskette drive and press **Enter**.

The system displays the names of the files as they are copied from the distribution diskette. When all the files are copied, the following messages are displayed:

```
files restored: nn
```

AIX/370 Installing and Customizing the Operating System In Detail

— Program **LPP_NAME** is now installed

At this point, the system displays messages specific to the LPP you are installing. The system may also display prompts requesting configuration information for the LPP. These prompts should be self-explanatory, and you should answer them as they appear. If you need more information about these prompts, refer to the documentation for the LPP you are installing.

When you finish entering configuration information, the system may need to rebuild the kernel. If necessary, this kernel rebuild will happen automatically.

Warning: Do not interrupt the rebuild process. When the kernel is rebuilt, the system reboots to enable the new kernel.

AIX/370 Installing and Customizing the Operating System

Handling User Configurable Files

3.5.2.2 Handling User Configurable Files

During installation of LPPs you must save any files that you do not want overwritten. During updates, **updatep** safeguards protect user files.

When there is an update to a user configurable file during installation, the files will be renamed. They will be renamed as new or old depending on how important the contents of the file are to your system.

By *renaming new*, you want the original file to remain as is. The updated, new file will be put on your system with the extension **.new.<lpp-id>**. For example, **/etc/passwd** will remain the same, and the file **/etc/passwd.new.opsys** will be created. It is your responsibility to merge the changes into your original file, or have this done by a system administrator.

By *renaming old*, there will be little change to the original file, so it will be replaced. The old file will then be renamed with the extension **.old.<lpp-id>** and the new file will replace it. For example, **/etc/rc.tcpip** will be updated during installation and the old file will be renamed **/etc/rc.tcpip.old.tcp**. If there is a problem with the new file you have a backup.

AIX/370 Installing and Customizing the Operating System

History Files

3.5.3 History Files

A separate history file is maintained for each component from the Operating System Extensions LPP. For example, a separate history file is maintained for Sendmail and Message Handler.

For additional information about history files, see *Managing the AIX Operating System*.

AIX/370 Installing and Customizing the Operating System

Updating LPPs

3.5.4 *Updating LPPs*

To apply updates to any LPPs or to the Base Operating System you will use the **updatep** command. Refer to the AIX manual *Managing the Operating System* for details.

AIX/370 Installing and Customizing the Operating System

Chapter 4. Installing a PS/2 TCF Cluster Site

4.0 Chapter 4. *Installing a PS/2 TCF Cluster Site*

Subtopics

- 4.1 CONTENTS
- 4.2 About This Chapter
- 4.3 What You Need
- 4.4 What You Will Be Doing
- 4.5 Setting Up Your PS/2 for Installation
- 4.6 Performing a Remote Boot on a PS/2
- 4.7 Generating a New Kernel

AIX/370 Installing and Customizing the Operating System
CONTENTS

4.1 CONTENTS

AIX/370 Installing and Customizing the Operating System

About This Chapter

4.2 About This Chapter

This chapter describes the procedures for adding PS/2 sites to a cluster. Before installing PS/2 cluster sites, the primary site must be installed and operational. The primary site is the site from which the root file system is to be propagated. The secondary site joins the primary and uses propagation to get the current contents of the root file system from the primary site. The primary site must have, at minimum, the root, the primary site's **local**, a kernel for the secondary, and the scripts **clm** and **newsite**.

The AIX PS/2 BOS must have been installed on the primary site before the installation of any PS/2 secondary sites is possible.

AIX/370 Installing and Customizing the Operating System What You Need

4.3 *What You Need*

An AIX/370 primary site installed as described in Chapter 2, "Installing the Base Operating System on an AIX/370 Site."

A list of site and file system names, minidisk sizes and addresses and network information for the cluster site you are installing.

A list indicating the LPPs which will be installed on each site and the corresponding **fstore** value (see Chapter 3, "Installing Additional Software Packages").

AIX/370 Installing and Customizing the Operating System

What You Will Be Doing

4.4 What You Will Be Doing

Using the AIX PS/2 Boot, Installation and Maintenance Diskettes, you will install AIX software on your PS/2 site. This process consists of the following steps:

Setting up your PS/2 for installatio

Running the **clm** (cluster maintenance) program on the primary site

Coming up as a Dependent Sit

Running the **newsite** program on the dependent site.

You have to bring up your PS/2 as a dependent site in order to propagate the root file system from the primary to the new site. When a site is dependent, it means that the system is booted without accessing any data on its disk. All system files (such as **/etc/init** and **/bin/sh**) are provided through the network. The dependent site kernel is generic because it has not been configured for any particular machine. You can bring up and propagate several new sites concurrently.

AIX/370 Installing and Customizing the Operating System
Setting Up Your PS/2 for Installation

All Rights Reserved

PS/2 and AIX are trademarks of International Business Machines Corp.

If this is the first time you are installing AIX on this site, you will see:

IBM AIX PS/2 Operating System
Version 1.2.1
NVRAM CONFIGURATION

AIX PS/2 requires that a few system configuration parameters be recorded in non-volatile memory (NVRAM). Your NVRAM does not contain this information.

It will be necessary for you to provide the required information before proceeding to boot the AIX kernel.

Press any key to continue...

If AIX has been previously installed, skip to "Copying the Install and Maintenance Diskettes" in topic 4.5.1.

Press any key on the keyboard and the installation process will continue with the screen on the next page.

If you wish to make any changes in your selections in the next several menus, there will be a second chance in "Copying the Install and Maintenance Diskettes" in topic 4.5.1.

SELECT KEYBOARD LANGUAGE

Belgian	LatinAmer
Canadian	Norwegian
Danish	Portugese
Dutch	Spanish
French	Swedish
German	Swiss Fren

AIX/370 Installing and Customizing the Operating System
Setting Up Your PS/2 for Installation

Icelandic	Swiss Germ
Italian	UK (English)
Japanese	US (English)

Use the cursor keys to select the desired item.
Press Enter to confirm your selection and continue.
Press F3 to cancel this selection.

Choose your keyboard language and press **Enter**.

The next screen to appear asks for information about the model number of the display you are using. Check the base of the front of your display for this number.

SELECT MONITOR TYPE

VGA w/7544	(13 inch color display)
VGA w/7554	(19 inch color display)
VGA w/8503	(12 inch monochrome display)
VGA w/8507	(19 inch monochrome display)
VGA w/8512	(14 inch color display)
VGA w/8513	(12 inch color display)
VGA w/8514	(16 inch color display)
VGA w/8515	(14 inch color display)
8514A w/8503	(12 inch monochrome display)
8514A w/8507	(19 inch monochrome display)
8514A w/8512	(14 inch color display)
8514A w/8513	(12 inch color display)
8514A w/8514	(16 inch color display)
8514A w/8515	(14 inch color display)

Use the cursor keys to select the desired item.
Press Enter to confirm your selection and continue.
Press F3 to cancel this selection.

Note: The hardware connected determines the monitor options on you site.

Choose your display and press **Enter**. The next screen will prompt for the timezone.

TIMEZONE

AIX/370 Installing and Customizing the Operating System
Setting Up Your PS/2 for Installation

(GMT)	Greenwich England	(GMT + 12)	New Zealand
(GMT - 1)	Azores, Cape Verde	(GMT + 11)	Solomon Islands
(GMT - 2)	Falkland Islands	(GMT + 10)	Eastern Australia
(GMT - 3)	Greenland, East Brazil	(GMT + 9)	Japan, Korea
(GMT - 4)	Central Brazil	(GMT + 8)	Western Australia
(GMT - 5)	Eastern U.S., Columbia	(GMT + 7)	Thailand
(GMT - 6)	Central U.S., Honduras	(GMT + 6)	Tashkent USSR
(GMT - 7)	Mountain U.S.	(GMT + 5)	Pakistan
(GMT - 8)	Pacific U.S.	(GMT + 4)	Gorki USSR, Oman
(GMT - 9)	Yukon	(GMT + 3)	Turkey, Saudi Arabia
(GMT - 10)	Alaska, Hawaii	(GMT + 2)	Finland, South Africa
(GMT - 11)	Bering Straits	(GMT + 1)	Norway, France

Use the cursor keys to select the desired item.
Press Enter to confirm your selection and continue.
Press F3 to cancel this selection.

Choose your timezone and press **Enter**.

You will then be asked:

Do you observe daylight savings time?

Press the **Space** bar to indicate yes or no and press **Enter**.

If you answer **yes**, the system asks for **Daylight Savings Timezone Name**

If you answer **no**, you are asked for the **Standard Timezone Name**. Select your timezone name and press **Enter**.

The next screen will prompt you for a language.

SELECT NLS TRANSLATION LANGUAGE

Canadian
Danish
Dutch
Finnish
French
German
Italian
Japanese
Icelandic
Norwegian
Portuguese
Spanish
Swedish
UK English
US English

Use the cursor keys to select the desired item.
Press Enter to confirm your selection and continue.

AIX/370 Installing and Customizing the Operating System
Setting Up Your PS/2 for Installation

Press F3 to cancel this selection.

Select the language you want to use and press **Enter**.

The next screen asks you for your machine name. For some licensed programs such as TCP/IP or TCF, your computer must have a unique name.

SELECT MACHINE NAME

Enter Machine Name: **aixps2**

Type the requested information into the highlighted field.
Press Enter to confirm your selection and continue.
Press F3 to cancel this selection.

Enter a unique name that is the same as the site name that will be used for this machine. The maximum length of the name is 8 characters.

Note: Record this name for use later in the installation.

This name is used internally to establish various file identifiers. When certain product functions are used, for example in TCP/IP communications, each system will require a unique name to function correctly.

Use the **aixps2** machine name which is the default entered if you do not enter a machine name. You can only use the default name for one machine in the cluster.

Subtopics

- 4.5.1 Copying the Install and Maintenance Diskettes
- 4.5.2 Installing Minidisks
- 4.5.3 Running the clm Program
- 4.5.4 Configuring TCP/IP
- 4.5.5 Coming up as a Dependent Site
- 4.5.6 Running newsite
- 4.5.7 Coming Up as a Secondary Site

AIX/370 Installing and Customizing the Operating System
Copying the Install and Maintenance Diskettes

AIX PS/2 INSTALLATION

To install AIX, insert installation diskette and press Enter.

- OR -

To perform system maintenance, insert the Maintenance diskette and press Ent

Check to make sure the diskette is write-enabled before using.

Note: The Installation and Maintenance diskettes must be write-enabled. Slide the black tab in the corner portion of the diskettes up so that you cannot see through the hole.

At this point, insert the write-enabled Installation diskette and press **Enter**. The loading of the kernel will take a few seconds. You should now see:

IBM AIX PS/2 Version 1.2.1

Using diskette as root device...

Available user Memory: xxx pages (0xnxxx bytes)

INIT: generic site-- NOT CHECKING ROOT

And then a new menu will appear.

SYSTEM INSTALLATION

Install and Customize AIX

End Installation

AIX/370 Installing and Customizing the Operating System
Copying the Install and Maintenance Diskettes

Hit <SPACE> to toggle items; <ENTER> to select.

This menu lists two options: Select the first, **Install and Customize AIX**, and press **Enter**.

AIX/370 Installing and Customizing the Operating System
Installing Minidisks

4.5.2 Installing Minidisks

After the message **Getting disk drive parameters...**, a new menu will appear and look like this:

```
+-----+
|
|                                     INSTALL A NEW VERSION OF AIX
|
|      Select a method of installation
|
|          Install a NEW AIX System. All AIX type minidisks
|          will be deleted.
|
|          Replace your Current Version of AIX with the New
|          Version.  AIX system minidisks will be deleted.
|          All user created AIX minidisks as well as
|          all non-AIX minidisks and DOS partitions will remain
|          intact.
|
|          Hit <SPACE> to toggle items; <ENTER> to select
|          or F3 to return to the previous menu.
|
+-----+
```

Choose **Install a NEW AIX System** and press **Enter**.

Note: You can use option 2 if you are installing over a previous AIX installation.

Then you will be asked if you want to continue.

The following window appears:

```
+-----+
|
|          The installation method you have selected will
|          result in the deletion of all AIX minidisks.
|          Do you wish to proceed (y/n)?
|
+-----+
```

Type a **y** and press **Enter**.

Then you may see the following if you have previously installed AIX on this PS/2.

```
Removing all AIX minidisks ...
Deleting ...
/dev/hd6
/dev/hd5
/dev/hd4
/dev/hd3
```


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Installing Minidisks

Hit <SPACE> to toggle items; <ENTER> to select
or F3 to return to the previous menu.

You may need to increase the number of blocks in the /u file system. To do so, select option 3, **Change Current Choices and Install**, and press **Enter**.

CHANGE CURRENT CHOICES AND INSTALL

Select a minidisk to change, or install AIX

	Disk	Blocks	Files
/u	0	9788	978
/aixps	0	7995	799
/	0	42000	4200
page	0	4000	0
dump	0	4000	0
/aixps/tmp	0	5798	579

**Install the Operating System and cause the
current choices to take effect.**

Hit <SPACE> to toggle items; <ENTER> to select
or F3 to return to the previous menu.

If you want to change any of these items, toggle to the minidisk and press **Enter**. You will see the following windows, displaying the /u minidisk as an example. (The first window appears only if you have more than one fixed disk).

Change the fixed disk where the "/u" minidisk
will be stored; valid choices are (0,1): _

AIX/370 Installing and Customizing the Operating System

Installing Minidisks

```
+-----+
|
| Change the number of blocks for the "/u" minidisk.
| Enter 0 or a value in the range (16-NNNNNN): _
| (Default: 9284)
|
+-----+
```

```
+-----+
|
| Change the number of files for the "/u" minidisk.
| Enter a value (0-NNNNNN): _
| (Default: NNNNNN)
|
+-----+
```

In these windows, the value **NNNNNN** will vary depending on the size of your disk drive(s) or on what value you select for your minidisk.

Note: Disk blocks for the root file system should be set following the space requirements determined earlier for this site. See Chapter 3, "Installing Additional Software Packages."

The value for the maximum number of files in the root file system is irrelevant here, since it will be replaced, so that it equals that of the primary root file system, when you run **newsite**.

After making all your changes move cursor to **Install the Operating System and cause the current choices to take effect**.

Press **Enter**. You will see:

```
Installation of AIX will take several minutes.
```

```
To CANCEL and go back to the INSTALL AND CUSTOMIZE AIX menu, press F3
```

```
To INSTALL AIX, press Enter.
```

At first you will see:

```
CREATING MINIDISKS AND FILESYSTEMS
```

The values for your system may differ, depending on the system's fixed disks. After all the minidisks and file systems have been created, the screen will look like this:

```
+-----+
|
|          CREATING MINIDISKS AND FILESYSTEMS
|
| Installing AIX...
|   - building minidisk /u (10000 blks) on ID#1
|   - building minidisk /aixps2 (8000 blks) on ID#2
|
+-----+
```

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Installing Minidisks

- building minidisk / (root) (39000 blks) on ID#3
 - building minidisk page (4000 blks) on ID#4
 - building minidisk dump (4000 blks) on ID#5
 - building minidisk /aixps2/tmp (6000 blks) on ID#6
-
- making /u filesystem (10000 blks: 2500 files) on ID#1
 - making /aixps2 filesystem (8000 blks: 1500 files) on ID#2
 - making / (root) filesystem (39000 blks: 5000 files) on ID#3
 - making /aixps2/tmp filesystem (6000 blks: 1000 files) on ID#6

The **ID#s** in this screen are examples, and may not be what you see.

Note: From this screen record the following items:

The minidisk id of the **/sitename**, **page** and **dump** minidisks.

The size of the **page** minidisk.

After the last file system has been built, the screen will clear and display:

FIRST STAGE INSTALLATION

Installation of the mini system will take several minutes.

Installing mini-root, please wait ...

Installing mini-local, please wait ...

updating /etc/system

Linking devices.

Updating global information file /etc/fsmmap.

Completing first stage installation.

Then you will see:

AIX/370 Installing and Customizing the Operating System
Installing Minidisks

+-----
INSTALLATION OF THE MINI SYSTEM IS COMPLETE

The system is now ready to reboot.
After you receive the "System Halted" message
remove the Installation Diskette
and insert Boot Diskette 1.

After you have switched the diskettes
press Enter to reboot the system.

Refer to the "Installing and Customizing the AIX Operating System" manual
for further instructions.

System halted, you may turn the power off now.
Type Enter to Reboot:

+-----
Continue with the next section "Running the clm Program."

AIX/370 Installing and Customizing the Operating System

Running the clm Program

4.5.3 Running the clm Program

You must go to the primary site and execute the cluster maintenance (**clm**) script before installing a secondary site as a member of the cluster.

On the primary site console type:

```
/generic/clm
```

and press **Enter**.

The **clm** script will ask a series of questions which are described in the table below. The files affected are listed in Appendix C, "The clm, newsite and linstall Programs."

Table 4-1. Running the clm (cluster maintenance) program	
Prompt	Explanation
Site number?	Enter the number of the site to be added. (For example, 7).
Site CPU type (i386, i370, xa370)?	Enter the CPU type of the new machine.
Site model (default: PS/2 Model 80)?	Enter the model type of the new machine.
Site description (default: PS/2 Model 80)?	Enter a short site description. The site description may be an additional short description of the site such as its purpose or location (':' is not a valid character).
Site name as specified during single site installation (default: aixps2)?	Enter the machine name given in Setting Up Your PS/2 for Installation
Full pathname of local file system mount point (default: /sitename)?	Enter the mount point to use for the local file system.
Internet Protocol address?	Enter the IP address for the new machine.
Minor number of the local file system? (default: 2)	Enter the ID # that you saw when creating minidisks and filesystems. If your local file system is on a second hard disk, the correct number will probably be 102.
Please check carefully: is everything correct? (default: yes)?	If all your answers are correct, type y and press Enter Otherwise, type n and press Enter .

Note: If you select a site name or number which already exists in the **/etc/site** file or IP address which exists in the **/etc/hosts** file, you will be informed of this condition during the processing. You will be asked whether you wish to replace any previously created

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Running the clm Program

entries or files.

Normally you would select the defaults to these questions. The following messages are similar to the ones which would be seen if you had selected a site name which had previously existed. The responses to the questions are the default responses.

```
Modifying /etc/site file ...
Site name/number exist:
Site: /generic:generic:Generic:Generic Site:
```

The existing **/etc/site** entry is displayed here.

```
Replace (default: yes)?
```

Press **Enter**.

Warning: If you select no, make sure the data in the file is accurate before trying to continue to the next stage of installation.

```
Modifying /etc/hosts file ...
IP address exist: (xxx.xxx.xx.xx sitename)
Replace (default: yes)?
```

Press **Enter**.

```
Entry replaced
Making special file /generic/dev/sitename ...

Making LOCAL mount point ...
Directory / local mountpoint exists, remove and recreate (default no)?
```

Press **Enter**.

```
Making /u sitename mount point ...
Directory exists, remove and recreate (default: no)?
```

Press **Enter**.

AIX/370 Installing and Customizing the Operating System

Configuring TCP/IP

4.5.4 Configuring TCP/IP

You must configure the network device on the primary site so that the primary site will initialize the device and create routes to other sites in the cluster. Complete the following steps on the primary site console:

1. Edit the file `/etc/rc.tcpip.local`.
2. Search for the line containing the string `/etc/ifconfig`.

This line should look similar to the following:

```
/etc/ifconfig net0 $SITE # default to Pegasus board
```

Note: The `$SITE` variable in this line is for the case where the IP host name is the same as the AIX site name. If these names are not the same, or if the site has more than one IP interface, replace the `$SITE` with the correct IP host name for the interface.

3. Change this line, if necessary, so that it is correct for the type of network you are using.

The string following `/etc/ifconfig` should read as follows:

1. If you are using Ethernet on a PS/2, this string should be `net0`. In this case, the line should read:

```
/etc/ifconfig net0 $SITE
```

2. If you are using Token-Ring on a PS/2, this string should be `tk0`:

```
/etc/ifconfig tk0 $SITE
```

3. If you are using a 9370 integrated Ethernet adapter on a 370, this string should be `ce0`:

```
/etc/ifconfig ce0 $SITE
```

4. If you are using a 9370 integrated Token-Ring adapter on a 370, this string should be `il0`:

```
/etc/ifconfig il0 $SITE
```

5. If you are using an 8232 LAN channel station Ethernet adapter on a 370, this string should be `lcsAe0`:

```
/etc/ifconfig lcsAae0 $SITE
```

6. If you are using an 8232 LAN channel station Token-Ring adapter on a 370, this string should be `lcsAt0`:

```
/etc/ifconfig lcsAt0 $SITE
```

7. If you are using an X.25 adapter on a PS/2, this string should be:

```
/etc/ifconfig xip0 $SITE
```

You might want to change the comment at the end of the line to reflect whether you are using ethernet or token-ring. Once you have made these

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Configuring TCP/IP

changes, you should run the **devices** to add the network device that you want to use. TCF kernels are distributed with network devices preconfigured and some pty devices are also included. To use TCP/IP, you must set up at least one pty device.

To start devices, you must first be logged in as a member of the system group or you must have superuser authority. The # prompt appears when you are logged in as a superuser. The \$ prompt appears when you are logged in as a system or regular user.

AIX/370 Installing and Customizing the Operating System

Coming up as a Dependent Site

4.5.5 Coming up as a Dependent Site

Note: Before bringing up the primary site in multi-user mode, you must edit the `/etc/rc.tcpip` file on the primary site to configure the network devices. The primary site will then initialize its network device and create routes to the other sites in the cluster (see the "Configuring TCP/IP" section in Chapter 2 of *AIX Operating System TCP/IP User's Guide*).

On the site you are installing, remove the Installation diskette, insert Boot Diskette 1, and press Enter. A copyright notice displays, then you should see:

```
-----  
IBM AIX PS/2 Bootstrap  
Version 1.2.1
```

```
Boot from Diskettes  
Boot from Hard Disk  
Boot from Ethernet  
Boot from Token Ring  
Boot DOS  
Set Keyboard Language  
Set Monitor Type  
Set Timezone  
Set Machine Name  
Set NLS Translation Language  
Copy Diskette  
Stand-alone Backup  
Stand-alone Restore
```

```
Use the cursor keys to select the desired item.  
Press Enter to confirm your selection and continue.  
Press F3 to change this selection.
```

```
-----  
Choose the Boot from Diskettes option. If you already have one or more PS/2s installed on the network (ethernet or token ring) you can boot from that interface instead of from diskettes.
```

Next you will see a familiar screen, and will need to make several changes. Three prompts appear, one at a time. You will accept the default value for the first, but select other values for the second and third.

```
-----  
LOAD A SYSTEM FROM THE DISKETTE
```

```
Module to be loaded:          unix.gen
```

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Coming up as a Dependent Site

Type the requested information in the highlighted field.
Press Enter to confirm your selection and continue.
Press F3 to cancel this selection.

Press **Enter** to accept the default value, **unix.gen**, for the module to be loaded.

Then you will see the second prompt. Press the **Space** bar to toggle the single value to **Dependent**.

It will look like this:

System Mode Dependent

Press **Enter**. You will see the third prompt.

Warning: The **NO** at this prompt must be changed to a **YES**. Press the **Space** bar to change the answer to yes, and it will look like this:

Run system from fixed disk: Yes

Press **Enter**.

Then the system displays the following:

```
Loading sec 0 (.bss) at 0xxxxxxx, length yyyyyy bytes
yyyyyy bytes cleared
Loading sec 1 (.data) at 0xxxxxxx, length yyyyyy bytes
yyyyyy bytes loaded
Loading sec 2 (.text) at 0xxxxxxx, length yyyyyy bytes
yyyyyy bytes loaded
```

And then:

Please insert Boot diskette number 2; press any key when ready.

Insert Boot Diskette 2 and press any key.

You will see the following:

----- Start of Questions -----

Installation Options:

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Coming up as a Dependent Site

- 1 Perform initial installation of a new site
- 2 Add this previously installed site to an existing TCF cluster
- 3 Perform maintenance on a previously installed system

Select Installation Option

Select option 2, and follow the prompts.

Note: You may see the following error message after you restart the installation:

Error adding route. Route already exists.

You have restarted the installation due to a routing error. Your site must be rebooted to correct this condition. Re-verify your routing information before continuing.

At this point, the system asks questions to establish communication with the primary site. The questions asked are summarized in Table 4-2.

The table shows the questions asked when your PS/2 has one interface (ethernet or token ring). When your PS/2 has both interfaces, the Internet Protocol address question is asked for each interface. Enter the IP address for the interface you are going to use for propagation, and press **Enter** for the interface you are not using. The interface corresponds to the primary site's configured interface.

Warning: Do not provide IP addresses for more than one interface.

-----+-----	
Table 4-2. Bringing up a PS2 as a dependent site in a TCF cluster	
Prompt	Explanation
+-----+-----	
What is the source internet address for net0 (a.b.c.d)? (default skip configuration for this device).	Enter the IP (Internet Protocol) address of this site. Net0 indicates an ethernet card. Tk0 indicates a token ring card. Select a unique IP address appropriate to the primary site. For example, if the primary site IP address is 130.200.4.1, an appropriate secondary site address would be 130.200.4.2 if that number is not already being used.
What is the internet subnetmask for net0? (default 255.255.0.0).	Enter the Internet Subnetmask for net0, which must match the primary site. If you did not change values on the primary site, the default value is appropriate.
Do any routes need to be added? (default no).	No (This depends on if there is a gateway between the PS/2 and the primary host).
Enter TCF Cluster Site Number	Enter the site number you gave to this site when you ran clm for this machine on the cluster's primary site.
+-----+-----	

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Coming up as a Dependent Site

Enter TCF Cluster ID (default 0.0.0.0).	Enter the cluster id in decimal.
Use 1s filled or 0s filled broadcasts for TCF (default 1).	Specify the host portion of the broadcast address as either 0 or 1, based on the primary's broadcast address.
Enter pipe gfs	Enter the gfs of the primary site local file system. Use the command rdf /primary_site_name on the primary site to determine the gfs of the local .
Enter paging device (hex)? (default find from minidisk).	Enter the major and minor device numbers of the paging device in the form X00YY. X is the major number in hexadecimal. YY is the minor number whose 3 most significant bits are the drive number, and whose 5 least significant bits are the minidisk ID number previously displayed on the CREATING MINIDISKS AND FILESYSTEMS screen (it's generally 4). For example, for drive 0, minidisk 4, YY=04, and for drive 1, minidisk 4, YY=24.
Enter core dump device (hex).	Enter 70000. (This means there is no dump device. If there is a dump device, enter 30005 or 30000 plus the ID number for the dump minidisk.)
Enter dumplo (default 0 decimal).	For dumplo enter 0.

After the questions are answered you see:

```
***** End of Questions *****
```

then the following messages display:

```
pipe (2/135), root (2/135), swap (3/4), dump (7/0)
TCF Protocol version 68
TCF cluster ID 0.0.0.0
LARP version 3
procstartup: found independent site 1
INIT: dependent site - NOT CHECKING ROOT
INIT: Using /generic - NOT CHECKING LOCAL
INIT: SINGLE USER MODE
```

```
GENERIC SITE
Give root password for maintenance single user mode

<sitename>>#
```

Note: The password requested is the password assigned to primary site.
If there is no root password on the primary site, press **Enter**.

The **clm** program must complete running on the primary site before running **newsite** on the PS/2 secondary site.

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Coming up as a Dependent Site

At this time, the site is dependent and the script **newsite** can be executed to change the site to become a secondary site after rebooting.

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Running newsite

If the site is to be a backbone, the next two **fstore** questions are skipped:

Default fstore value is: i386

Other available fstore values are below...

```
none
primary
i370
xa370
cluster
all
```

Type in the new **fstore** value or press **Enter** to keep the i386 value. These values may differ if you customized the **/etc/fstore** file.

Site from which to propagate root file system (default: fafnir)?

Press **Enter** to choose the default.

The following messages appear:

```
Converting LOCAL file system ...
old site 1. new site 6.
71 inodes changed
done.
```

```
Changing gfs of LOCAL file system ...
FSDB 5.7, file system on /generic/dev/aixps2
FSIZE = 2250, ISIZE = 1000
GFS = 14, GFSPACK = 1
Global file system number = 14
done.
```

```
Checking LOCAL file system consistency ...
/generic/dev//aixps2: gfs 14, pk 1: 178 files 27 blocks 1846 free
done.
```

```
mount: No entry in /etc/filesystems has global filesystems number 14 pack nu
done.
```

```
Getting gfs for tmp
Checkpointing ...1
Getting gfs for /u
FSDB 5.7, file system on /dev/hd1
FSIZE = 1000, ISIZE = 800
GFS = 33, GFSPACK = 1
Global file system number = 33
FSDB 5.7, file system on /dev/hd6
FSIZE = 1250, ISIZE = 1000
GFS = 26, GFSPACK = 1
Global file system number = 26
done.
Checkpointing ...2
Making root file system ...
```

Messages describing file system mounting appear followed by:

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Running newsite

```
Checkpointing ...3
Propagating root file system ...
Updating gfs 1
target: aixps2 [6]    low water mark: 201
host:   fafnir [1]   low water mark: 790800
/etc/comlist: host device name=/dev/chd00035

....1....2....3....4....5....6....7....8....9..... 1000 inodes
....1....2....3....4....5....6....7....8....9..... 2000 inodes
....1....2....3....4....5....6....7....8....9..... 3000 inodes
....1....2....3....4....5....6....7....8....9..... 4000 inodes
....1....2....3....4....5....6....7....8....9..... 5000 inodes
....1....2....3....4....5....6....7....8....9..... 6000 inodes
....1....2....3....4....5....6....7....8....9..... 7000 inodes
....1....2....3....4....5....6....7....8....9..... 8000 inodes
....1....2....3....4....5....6....7....8....9..... 9000 inodes
....1....2....3....4....5....6....7....8....9..... 9984 inodes
```

Note: The total number of inodes propagated is the same number as in the / (root) on the primary site.

As the propagation of the site concludes, the following messages appear:

```
Propagation successfully completed.
done.
```

```
Making misc directories ...
done.
```

```
Copying a new kernel ...
done.
```

```
Reconfiguring the kernel ...
```

```
Copying an inittab ...
```

The multi-site phase of the installation is now completed.

You can now remove the diskette in the drive at site **\$sitename**. Type **/etc/reboot** at the site's console to reboot it. **\$sitename** is a newsite variable containing the name of the PS/2 site being installed.

Note: Remember to remove any diskettes from the machine.

This completes the AIX PS/2 secondary site installation.

After completing installation of a dependent site, the **/etc/hosts** and **/etc/sites** files contain information on the assigned internet address and site name of the PS/2.

If you repeat running **newsite** on a site, messages display informing you that these files already exist. When asked if you wish to delete or replace these files, reply **y** (yes) in both cases so that the new values you have entered at the **newsite** prompts are recorded for the site.

AIX/370 Installing and Customizing the Operating System

Coming Up as a Secondary Site

4.5.7 Coming Up as a Secondary Site

After the installation has been completed, the system may be rebooted, and will join the cluster as an independent site.

AIX/370 Installing and Customizing the Operating System
Performing a Remote Boot on a PS/2

4.6 Performing a Remote Boot on a PS/2

Subtopics

4.6.1 Introduction

4.6.2 Before Performing a Remote Boot

4.6.3 Remote Boot Procedures

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Introduction

4.6.1 Introduction

Performing a remote boot provides the capability of rebooting a site using a kernel loaded from another site on the network. The protocol used to perform the transfer of an AIX kernel is the Trivial File Transfer Program (TFTP). There are two possible network options: Ethernet and Token Ring.

The site is brought up on the network as dependent. The site being rebooted is called the *local site* and the site providing the kernel is called the *host machine*. The remote boot program is included on the boot diskettes.

AIX/370 Installing and Customizing the Operating System Before Performing a Remote Boot

4.6.2 Before Performing a Remote Boot

The procedures below describe what you should do before attempting a remote boot in the dependent system mode.

1. Search the **/etc/hosts** file to determine the remote and local internet protocol (IP) addresses for the Ethernet or Token Ring network type you have.

For example:

```
Remote site internet protocol address: 130.200.11.6  
Local site internet protocol address: 130.200.100.7
```

2. Check that your host machine is running in multi-user mode. To check, enter **ps -e** and look for a running process called **inetd**. This program will start up the **/etc/tftpd** file to transfer the kernel.

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Remote Boot Procedures

|
|
|
+-----

This screen is an example.

After you have selected all the correct information, press **Enter**.

At this point, the generic kernel **unix.ps2** will be loaded from the host to the local system. Messages similar to the following will appear on the screen:

```
loading sec 0 at 0x100000, length 204784 bytes
204784 bytes cleared
Loading sec 1 at 0 ...
```

The messages will continue until the remote boot is completed.

AIX/370 Installing and Customizing the Operating System

Generating a New Kernel

4.7 Generating a New Kernel

Some system modifications require you to generate a new kernel. For example, if you modify *system parameters* or add a new class of device drivers to your system, you must generate a new kernel. This section describes the procedure for generating a new kernel and provides general information about system parameters. See the **master** file format in the *AIX Operating System Technical Reference* for further information.

Note: Generating a new kernel is not a routine procedure. You may never need to perform it.

As distributed, the AIX Operating System kernel should support a reasonable mix of applications on a basic system. Many of the more common configuration changes (such as, adding new terminals or printers) can be handled without building a new kernel. If, however, you need to change resource allocations within the kernel or you need to support new peripherals that require drivers that are not distributed with the basic system, you must configure and generate a new kernel.

The basic steps in this process are:

1. If you are adding a new device, install the new hardware in your machine (For an AIX/370 system you must also attach and dedicate that device for the AIX virtual machine).
2. Run the `devices` command as described in *Using the Devices Command* chapter.

or:

1. If system resources allocations are to be changed, determine which system parameters you want to change and what values you would like them to have.
2. Make the necessary changes to the AIX Operating System `/etc/system` files.
3. Build a new kernel using `/usr/sys/newkernel`.
4. Install the new kernel as experimental.
5. Reboot the system, running the new experimental kernel, and test it thoroughly.
6. If the testing is successful, install the new kernel as your standard kernel.

Most of the system definition information is contained in the files `/etc/master` and `/etc/system`. The master file contains stanzas that describe the available device drivers and parameter values that are configured into your particular system.

To modify system parameters, you must define new values for the parameters in the `/etc/system` file. Only those system parameters defined in the `/etc/master` file that contain the **patchaddr** or **softcfg** keywords may be modified and a new kernel built, using the **newkernel** command. Modifying any system parameters that do not contain the **patchaddr** or **softcfg** keywords requires a C compiler and a customized kernel build procedure. Since all system parameters that are intended for tuning by the user

AIX/370 Installing and Customizing the Operating System

Generating a New Kernel

contain these keywords, the **newkernel** command is normally used to build a new kernel. The **newkernel** command is also used to build a kernel when adding device drivers. See the *AIX Operating System Commands Reference* for information on this command.

The format and contents of these files are described in the *AIX Operating System Technical Reference*.

Subtopics

- 4.7.1 The newkernel Command
- 4.7.2 Loading and Testing an Experimental Kernel
- 4.7.3 Making a New Kernel the Standard Kernel
- 4.7.4 TCF Requirements
- 4.7.5 Deleting Old Kernels

AIX/370 Installing and Customizing the Operating System

The newkernel Command

4.7.1 The newkernel Command

The building of new kernels is done by the **newkernel** command. In order to build a new kernel, type the following sequence of commands:

```
cd /usr/sys
/usr/sys/newkernel
```

and wait for the build to complete. If it is successful, the new kernel is in one of the following directories, depending on the type of system on which it is being installed: **/tmp/sysgen.B370**, **/tmp/sysgen.XA370** or **/tmp/sysgen.386**. By default, the **newkernel** command does not copy the new kernel into the base directory of the **<LOCAL>** file system (**/sitename** directory). For more information about the **newkernel** command, see **newkernel** in *AIX Operating System Commands Reference*.

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Loading and Testing an Experimental Kernel

4.7.2 Loading and Testing an Experimental Kernel

All new kernels should be thoroughly tested before they are installed as the standard system even if the changes made were trivial. Significant problems with reconfigured kernels are rare, but the consequences of such problems can be catastrophic. Because of this, it is a good idea to make sure that you have current backups of your major file systems before you attempt to test a new kernel.

Because of the danger that a new kernel might not work, new kernels should never be installed as `/sitename/unix.std`. Rather, they should be copied into the local file system with an experimental name and booted as non-standard kernels. If the new kernel does not work, you can still get back to the previous (good) kernel by just rebooting the standard system.

AIX/370 Installing and Customizing the Operating System

Making a New Kernel the Standard Kernel

4.7.3 Making a New Kernel the Standard Kernel

There are two aspects of the standard system:

/unix--the name of the load module that system utilities examine to get a symbol table for the running kernel. Programs like **ps** need the symbol table to locate the process table and other important data structures within the kernel. Usually, **/unix** is a symbolic link to **/sitename/unix**.

/sitename/unix.std--the name of the load module that is loaded by default when the machine is rebooted.

It is a good idea to retain several old kernels in case of problems with new functions. It is also a good practice to keep **sitename/unix** and **/sitename/unix.std** as links to the standard kernel but to let each kernel keep its original name (for example, **unix14**). This makes it easier to determine which kernel is which when you are trying to decide what kernel to go back to or what kernel to delete.

If you maintain **/sitename/unix** and **/sitename/unix.std** as links, the proper procedure for installing a new kernel (**unix14**, for example) as standard is:

```
cd /sitename          # go to LOCAL file system

rm unix.std.old       # delete previous old kernel
mv unix.std unix.std.old # make current kernel the old one
ln unix14 unix.std    # make new kernel the current one

rm unix               # delete old symbol table link
ln unix14 unix        # link in new kernel for symbol table
```

It is best to save a link to the previous kernel as **/sitename/unix.std.old**. This makes it easier to get back to that kernel in an emergency. If you find that the new kernel has problems, you can explicitly load **unix.std.old** and get back to the previous system. Of course, you can load any kernel if you can remember (or find out) its name.

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TCF Requirements

4.7.4 TCF Requirements

If your system has TCF installed, you will first need to ensure that your site has joined the TCF cluster and that the primary cluster site is also present before running the newkernel command. The primary site must be present to read the system libraries and create the new kernel.

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Deleting Old Kernels

4.7.5 *Deleting Old Kernels*

Each AIX kernel is a fairly large load module, and you may find that you cannot maintain a large number of kernels on your **<LOCAL>** file system. If you find yourself running low on that file system, you should check to see if there are any old kernels that should be deleted.

* Change status:

*

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Chapter 5. Installing a 370 TCF Cluster Site

5.0 Chapter 5. Installing a 370 TCF Cluster Site

Subtopics

5.1 CONTENTS

5.2 About This Chapter

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5.4 What You Will Be Doing

5.5 Installing a Secondary Site

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5.1 CONTENTS

AIX/370 Installing and Customizing the Operating System

About This Chapter

5.2 About This Chapter

This chapter describes the procedures for merging additional sites into a cluster. A site can be brought up as a secondary site after it is installed as a single site (see Chapter 2, "Installing the Base Operating System on an AIX/370 Site"), and after the primary site is installed and is operational. The primary site is the site from which the root file system is to be propagated. The secondary site joins the primary and uses propagation to get the current contents of the root file system from the primary site. The primary site must have, at minimum, the root, the primary site's **local**, a kernel for the secondary, and run the **clm** and **newsite** scripts.

Japanese Language Support: Even if Japanese Language Support is provided with your system and you selected a Japanese locale while installing your AIX/370 primary site, all information which appears on your screen to guide you through installing a secondary AIX/370 site will be in English. For details on the types of information which must always be expressed in 7-bit ASCII regardless of the locale selected (such as login IDs, passwords, site names, and so on), see the *Guide to Multibyte Character Set (MBCS) Support*.

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What You Need

5.3 *What You Need*

An AIX/370 primary site installed as described in Chapter

A list of site and file system names, minidisk size and addresses, an network information for the cluster site you are installing.

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What You Will Be Doing

5.4 What You Will Be Doing

Loading and running the Install/Maintenance progra

Defining the filesystem

Running **/generic/clm** on the primary site

Establishing communication with the primary sit

Running **/generic/newsite** on the dependent site

Rebooting the AIX/370 machine as a cluster site

You have to bring up your AIX/370 as a dependent site in order to propagate the root file system to the new site. The dependent site kernel is dependent because it has not been configured for any particular machine. You can bring up and propagate several new sites concurrently.

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Installing a Secondary Site

5.5 *Installing a Secondary Site*

To install a 370 as a secondary site on an existing TCF cluster, take the following steps:

Install AIX on your 370 primary site as described in Chapter 2

Establish a communication line between the primary and secondary site (VCTC and CTC, Ethernet or Token Ring).

Re-initialize (IPL) the Installation/Maintenance disk

You install a secondary AIX/370 site from tape if the machine is on a different VM host machine than the AIX/370 primary site.

You may install a secondary AIX/370 site on the same VM host with a previously installed AIX/370 site by linking the secondary site to the primary site's 390 disk.

Subtopics

5.5.1 Modifying CTCa Addresses for Secondary AIX/370 Sites

5.5.2 Running the clm Program

5.5.3 Coming up as a Dependent Site

5.5.4 Coming Up as a Secondary Site

AIX/370 Installing and Customizing the Operating System

Modifying CTCa Addresses for Secondary AIX/370 Sites

5.5.1 Modifying CTCa Addresses for Secondary AIX/370 Sites

When configuring CTC/VCTC sites in a TCF cluster, if the only network interface is CTC or VCTC, then the AIX/370 site should never be the active site or the lowest numbered site. The highest available site number should always be used for the CTC/VCTC site.

When installing a secondary AIX/370 guest on the same 3090 machine as the primary AIX/370, the default CTCa address for the interface may be defined in the VM directory. If it is not so defined, the procedure may be done manually.

For VM/XA

```
**** DEFINE CTCa your_side_virtual_address other_userid
```

For VM/SP

```
**** DEFINE CTCa your_side_virtual_address
```

This version of the software may require the CTCa to be redefined since the default addresses for the CTC devices for both the XA and SP kernels have changed from (180 - 19e) to (140 - 15e).

To redefine a CTC at 14x when AIX is running with CTC attached at 18x, use the **CP** command:

```
DEFINE 18x 14x
```

After defining the address on either machine use the **CP COUPLE** command by typing:

To complete the interface in AIX, use the **ifconfig** command to establish primary and secondary Internet Protocol (IP) addresses by typing:

```
ifconfig vctc0 primary_ip_address secondary_ip_address
```

Select Internet Protocol addresses that do not conflict with addresses being used on other interfaces such as ethernet.

When you boot the Installation/Maintenance system, you will see copyright information followed by:

```
Available User Memory: nnn pages (0xnnnnn bytes)
```

```
(Hit Ctrl/C to restart Ctrl/X to re-enter line or Return for default)
```

```
----- Start of Questions -----
```

```
Installation Options:
```

- 1 Perform initial installation of a new site
- 2 Add this previously installed site to an existing TCF cluster
- 3 Perform maintenance on a previously installed system

```
Select Installation Option (default: 1)
```

If option 1 is necessary, refer to Chapter 2, "Installing the Base Operating System on an AIX/370 Site" in topic 2.0 and follow the instructions until you have completed the CHANGE CURRENT CHOICES AND INSTALL menu. Then you will have an option:

AIX/370 Installing and Customizing the Operating System
Modifying CTCa Addresses for Secondary AIX/370 Sites

Restoring primary copy of the root file system
Mount the Installation tape and
press ENTER to continue or type SKIP to skip this step.

Type **SKIP** and press **Enter**.

Once the site is installed, you are ready to add this previously installed site to an existing TCF cluster. Select option **2** and press **Enter**.

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Running the clm Program

5.5.2 Running the clm Program

You must execute the cluster maintenance (**clm**) program from the primary site before installing a secondary site as a member of the cluster. The **clm** script will ask a series of questions which are described in the table below. The files affected are listed in Appendix C, "The clm, newsite and linstall Programs."

On the primary site console type

```
/generic/clm
```

and press **Enter**.

You will be asked a series of questions, summarized in the following table.

Table 5-1. Running the clm (cluster maintenance) program	
Prompt	Explanation
Site number?	Enter the number of the site to be added. (For example, 7).
Site CPU type (i386, i370, xa370)?	Enter the CPU type of the new machine.
Site Model (default: 9370)?	Enter the model type of the new machine.
Site description (default: 9370)?	Enter a short site description. The site description may be an additional short description of the site such as its purpose or location (':' is not a valid character).
Site name as specified during single site installation (default: aix370)?	Enter the new machine name given in installing your System 370.
Full pathname of local filesystem mount point (default: /sitename)?	Enter the mount point to use for the local file system.
Internet Protocol address?	Enter the IP address for the new machine.
Disk type. (default CKD)	Enter the disk type.
Minidisk ID# of the local system? 34	Enter the minor number of the local device.
Please check carefully: is everything correct?	If all your answers are correct, type y and press Enter . Otherwise, type n and press Enter .

Note: If you select a site name or number which already exists in the **/etc/site** file or IP address which exists in the **/etc/hosts** file,

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Running the clm Program

you will be informed of this condition during the processing. You will be asked whether you wish to replace any previously created entries or files.

Normally you would select the defaults to these questions. The following messages are similar to the ones which would be seen if you had selected a site name which had previously existed. The responses to the questions are the default responses.

```
Modifying /etc/site file ...
Site name/number exist:
```

The existing **/etc/site** entry is displayed here.

```
Delete/replace (default: yes)?
```

Press **Enter**.

```
Modifying /etc/hosts file ...
IP address exist: (xxx.xxx.xx.xx sitename)
Replace (default: yes)?
```

Press **Enter**.

```
Entry replaced
Making special file /generic/dev/sitename ...
```

```
Making LOCAL mount point ...
Directory / local mountpoint exists, remove and recreate (default no)?
```

Press **Enter**.

```
Making /u sitename mount point ...
Directory exists, remove and recreate (default: no)?
```

Press **Enter**.

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Coming up as a Dependent Site

5.5.3 Coming up as a Dependent Site

The primary site must be started and in multi-user mode. To do so, type **init 2** and press **Enter** on the console for the primary site.

On the console of the secondary site, a copyright notice appears and the following screen appears.

```
(Hit Ctrl/C to restart Ctrl/X to re-enter line or Return for default)
----- Start of Questions -----
```

Installation Options:

- 1 Perform initial installation of a new site
- 2 Add this previously installed site to an existing TCF cluster
- 3 Perform maintenance on a previously installed system

Select Installation Option

Select option 2, and follow the prompts.

At this point, the system asks questions to establish communication with the primary site. The questions asked are summarized in Table 5-2.

The table shows the questions asked when your AIX/370 has one interface (ethernet or token ring). When your AIX/370 has both interfaces, the Internet Protocol address question is asked for each interface. Enter the IP address for the interface you are going to use for propagation, and press **Enter** for the interface you are not using.

Warning: Do not provide IP addresses for more than one interface.

Table 5-2. Bringing up an AIX/370 as a dependent site in a TCF cluster	
Prompt	Explanation
What is the source internet address for lcsAt0 (a.b.c.d)?	Enter a unique IP (Internet Protocol) address for this site. For example, if the primary site IP address is 130.200.4.1, an appropriate secondary site address would be 130.200.4.2 if that number is not already being used. Note: The adapter in the question is a sample. An lcsAt0 indicates a token ring adapter for an IBM 8232, and ceti0 indicates an integrated 9370 Ethernet Adapter. There may be others.
What is the internet subnetmask for lcsAt0? (default 255.255.0.0).	Enter the Internet Subnetmask for this site, which must match the primary site. If you did not change values on the primary site, the default value is appropriate.
Do any routes need to be added?	No

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Coming up as a Dependent Site

Enter TCF Cluster Site Number.	Enter the site number you gave to this site when you ran clm for this machine on the cluster's primary site.
Enter TCF Cluster ID (default 0.0.0.0).	Enter the cluster id in decimal.
Use 1s filled or 0s is filled broadcasts for TCF (default 1).	Specify the host portion of the broadcast address as either 0 or 1, based on the primary's broadcast address.
Enter local file system gfs number.	Enter the gfs of the primary site local file system. Use the command rdf /primary site name on the primary site to determine the gfs of the local .

After the questions are answered, you see,

```
***** End of Questions *****
```

then the following messages display:

```
procstartup: found independent site 1
INIT: using/ -- NOT CHECKING ROOT
INIT: dependent site -- NOT CHECKING LOCAL
devnm:/:File or working directory is unavailable
devnum:/generic:File or working directory is unavailable
INIT: SINGLE USER MODE
GENERIC SITE
Give root password for maintenance single user mode
<sitename>>#
```

Note: The password requested is the password assigned to primary site. If there is no root password on the primary site, press **Enter**.

At this time, the site is dependent and the script **newsite** can be executed to convert the site so that after the next reboot it comes up as a secondary site.

The **clm** program must complete running on the primary site before running **/generic/newsite** on the AIX/370 secondary site.

Subtopics

5.5.3.1 Running newsite

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Running newsite

```
Converting LOCAL file system ...
old site 1. new site 6.
71 inodes changed
done.
```

```
Changing gfs of LOCAL file system ...
FSDB 5.7, file system on /generic/dev/aix370
FSIZE = 2250, ISIZE = 1000
GFS = 14, GFSPACK = 1
Global file system number = 14
done.
```

```
Checking LOCAL file system consistency ...
/generic/dev//aix370: gfs 14, pk 1: 342 files 1067 blocks 1056 free
done.
```

```
mount: No entry in /etc/filesystems has global filesystems number 14 pack
number 1 done.
```

```
Getting gfs for tmp
Checkpointing ...1
Getting gfs for /u6
FSDB 5.7, file system on /dev/hd1
FSIZE = 1000, ISIZE = 800
GFS = 33, GFSPACK = 1
Global file system number = 33
FSDB 5.7, file system on /dev/hd6
FSIZE = 1250, ISIZE = 1000
GFS = 26, GFSPACK = 1
Global file system number = 26
done.
Checkpointing ...2
Making root file system ...
```

Messages describing file system mounting appear followed by:

```
Checkpointing ...3
Propagating root file system ...
Updating gfs 1
target: aixps2 [6] low water mark: 201
host: fafnir [1] low water mark: 790800
/etc/comlist: host device name=/dev/chd00035

....1....2....3....4....5....6....7....8....9..... 1000 inodes
....1....2....3....4....5....6....7....8....9..... 2000 inodes
....1....2....3....4....5....6....7....8....9..... 3000 inodes
....1....2....3....4....5....6....7....8....9..... 4000 inodes
....1....2....3....4....5....6....7....8....9..... 5000 inodes
....1....2....3....4....5....6....7....8....9..... 6000 inodes
....1....2....3....4....5....6....7....8....9..... 7000 inodes
....1....2....3....4....5....6....7....8....9..... 8000 inodes
....1....2....3....4....5....6....7....8....9..... 9000 inodes
....1....2....3....4....5....6....7....8....9..... 9984 inodes
```

Note: The total number of inodes propagated varies with each installation.

As the propagation of the site concludes, the following messages appear:

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Running newsite

Propagation successfully completed.
done.

Making misc directories ...
done.

Copying a new kernel ...
done.

Reconfiguring the kernel ...

Copying an inittab ...

The multi-site phase of the installation is now completed.
You can now reboot.

After completing installation of a dependent site, the **/etc/hosts** and **/etc/site** files contain information on the assigned internet address and site name of the new site.

If you repeat running **/generic/newsite** on a site, messages display informing you that these files already exist. When asked if you wish to delete or replace these files, reply **y** (yes) in both cases so that the new values you have entered at the **newsite** prompts are recorded for the site.

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Coming Up as a Secondary Site

5.5.4 Coming Up as a Secondary Site

After the installation has been completed, the system should be rebooted, and will join the cluster as a secondary site.

AIX/370 Installing and Customizing the Operating System

Chapter 6. Customizing the TCF Cluster

6.0 Chapter 6. Customizing the TCF Cluster

Subtopics

6.1 CONTENTS

6.2 About This Chapter

6.3 Setting Up LPP Propagation

6.4 Setting Up Complex Clusters

6.5 Network Topology Requirements

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6.1 CONTENTS

AIX/370 Installing and Customizing the Operating System

About This Chapter

6.2 About This Chapter

This chapter explains how to customize your cluster site to allow for differences in configurations. This will allow you to use your file system space more efficiently.

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Setting Up LPP Propagation

6.3 Setting Up LPP Propagation

The following sections describe how to plan an **fstore** scheme to meet the requirements of your particular cluster. Before choosing to customize your LPP storage, bear in mind that with flexibility also comes some degree of complexity. *Any customization of fstores should be carefully thought out before being implemented.*

Subtopics

6.3.1 Defining fstore Values

6.3.2 Customizing fstore Values: Example

6.3.3 File System fstore Bitmasks

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Defining fstore Values

6.3.1 Defining fstore Values

You must define a unique **fstore** value (bitmask) (in `/etc/fstore`) for each LPP or group of LPPs that you want to identify separately for storing on different machines. This type of **fstore** value is a *file fstore*.

Additionally, you need to define an **fstore** value or *site fstore* to represent each combination of LPPs that will be stored on a secondary site.

fstore Value Convention: A file **fstore** value can represent either one LPP or a group of LPPs. A file **fstore** value should consist of a single bit in the **fstore** bitmask field. This bit should be unique, and should conform some kind of cluster-wide convention. A recommended convention is as follows:

Bits	Used For
0	reserved for "opsys370"
1-2	reserved
3-8	370 files and sites
9	reserved for "opsys386"
10-11	reserved
12-30	386 files and sites
31	reserved for "none"

The "opsys" bits are reserved for the mandatory BOS LPP files for each respective machine type. In many cases, you'll want to cluster certain LPPs together (X11 and X11Smpl, for example), using a single bit to represent them. In these cases, it won't be necessary to have a unique **fstore** for every LPP.

Remember, any time that you foresee a need to *uniquely* identify a particular LPP in order to designate on which sites it will be stored, you should define an **fstore** value (bit) for it.

For stand-alone users, the **fstore** options are provided in case the user wishes to convert his site into a TCF primary site at a later date.

For TCF installers, *none* is the best option to use if disk space is highly inconsistent across the cluster.

When installing LPPs on your cluster, you are asked whether or not you wish to set **fstores** for that LPP. Any **fstores** on that LPP with the value **all**, **asis** or **none** cannot be customized at the time of installation. To allow you to build LPPs with these **fstore** values, and also allow you to customize them, there are two other **fstore** values. These are **cluster** and **primary**.

These **fstore** values function exactly like **all** and **none** respectively,

AIX/370 Installing and Customizing the Operating System
Defining fstore Values

except that they are modifiable during installation.

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Customizing fstore Values: Example

6.3.2 Customizing fstore Values: Example

Assume you have a TCF cluster of 8 sites and you plan to install the following LPPs on the cluster:

```
Operating System Extensions (ext)
Application Development Toolkit (adt)
DOS Merge (merge)
X-Windows (X11)
X-Windows Samples (X11Smpl)
C Compiler (cc)
```

Also suppose that because of storage limitations and application considerations, you want to store these LPPs in the following configuration:

```
Site 1: (primary) Everything will be stored here.
Site 2: ext, adt, X11, X11Smpl, cc
Site 3: merge
Site 4: adt, cc
Site 5: ext, X11
Site 6: adt
Site 7: adt, cc
Site 8: ext, X11
```

Prior to installation of any of these LPPs, you must define a unique **fstore** value for each, and add it to **/etc/fstore**. For example:

```
020000000000:0:none          (should never be changed)
037777777777:0:all          (should never be changed)
000000000777:0:i370
000000000001:0:opsys370
017777777000:0:i386
000000001000:0:opsys386
000000010000:0:ext386
000000020000:0:adt386
000000040000:0:X11386
000000100000:0:X11Smpl386
000000200000:0:merge386
000000400000:0:cc386
```

Note that **fstore** values are expressed as octal bit-masks, and that each LPP uses exactly one bit in its **fstore** mask. In this way, you can use up to 19 bits for unique AIX PS/2 LPPs, and 6 bits for unique AIX/370 LPPs. Now, when each LPP is installed, enter the appropriate symbolic **fstore** value.

Notice also, that the i370 and i386 **fstore** masks have been expanded to encompass all LPP file **fstore** bits for each machine type, respectively. This will not conflict with files installed using the default **fstore** values.

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File System **fstore** Bitmasks

6.3.3 File System **fstore** Bitmasks

As mentioned above, site **fstores** represent combinations of LPPs to be stored on the various sites. The site **fstore** value is stored in the superblock of each replicated root file system.

In the example cluster, there are 7 sites that have 5 different configurations, excluding the primary. According to the desired configurations and the file **fstore** values that have been defined, the following site **fstores** should be added to the **/etc/fstore** file:

```
000000571000:0:SITETYPE1 (For site 2: ext, adt, X11, X11Smpl, cc)
000000201000:0:SITETYPE2 (For site 3: merge only)
000000421000:0:SITETYPE3 (For sites 4,7: adt, cc)
000000051000:0:SITETYPE4 (For sites 5,8: ext, X11)
000000021000:0:SITETYPE5 (For site 6: adt only)
```

Note: Comments in parenthesis should not be included in the **fstore** file.

Each of these site **fstores** is merely a bit-wise *or* of the *opsys386* **fstore** bit and each of its component LPP **fstore** bits. Remember that *every* replicated root file system must have either the *opsys386* or *opsys370*: **fstore** bit turned on (for AIX/PS2 and AIX/370 sites, respectively) in the **fstore** field of its superblock.

When **/generic/newsite** is run for each site, the appropriate symbolic site **fstore** value (SITETYPE x) can be given in response to the **newsite** prompt.

Now you can proceed with the installation of all LPPs and additional cluster sites.

Note: Because the PS/2 BOS LPP includes the file **/etc/fstore**, any customization of the **/etc/fstore** file must be done *after* installation of this LPP, or your changes will be overwritten. For this reason, it is suggested that the PS/2 BOS LPP be the first LPP to be installed. Also, note that files in the PS/2 BOS LPP are installed with an **fstore** value of 7000. This is why bits 10 and 11 are reserved in our example **fstore** masks.

Also be aware that once a (site) **fstore** value has been associated with a file system and files have been propagated to it, it is not possible to change that **fstore** value in order to include either more or fewer LPPs in that file system. The only way that this can be accomplished is for the file system to be remade and completely repropagated. Therefore, give careful consideration to file system sizes and **fstore** values prior to actual installation.

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Setting Up Complex Clusters

6.4 *Setting Up Complex Clusters*

A complex TCF cluster is formed by joining one or more physical networks having a maximum of thirty-one sites via one or more gateway machines which has interfaces to connect physical networks together.

The simplest TCF cluster consists of sites on only one physical network, while the most complex cluster could have thirty one sites from thirty one physical networks. If you are planning to install a complex cluster, you must know the following:

The gateway site IP address

The network portion of the IP address for the network to be added

The number of metrics, or hops, from the source machine to the destination machine.

Subtopics

6.4.1 Customizing Your Startup Files for Complex Clusters

6.4.2 Configuring a Complex Cluster

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Customizing Your Startup Files for Complex Clusters

6.4.1 Customizing Your Startup Files for Complex Clusters

Whenever an AIX/370 site is booted, it executes a series of startup scripts as part of the installation procedure. However, the **/etc/rc.tcpip** and **<LOCAL> /rc.tcpip.local** files may need to be modified for complex clusters which contain two or more physical networks.

The **/etc/rc.tcpip** file configures the network devices for all sites in a cluster. The network devices configured in **/etc/rc.tcpip** are considered the default devices. In a complex cluster, you may be using other network device types for some machines in the network. For these sites, you will need to create a **<LOCAL>/rc.tcpip.local** startup script. As the pathname reflects, this belongs in the *local* directory of each nonstandard site. This file is a script to configure the network device(s) and add routes that deviate from your standard site configuration.

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Configuring a Complex Cluster

6.4.2 Configuring a Complex Cluster

When configuring a complex cluster, you may use Internet Protocol class B addressing in the form (A.B.C.D) where the first two numbers (A.B.) are the network address, the next number (C.) is the subnet number for Ethernet or Token-Ring, and the final number (D) is the site number. The following examples illustrate how to configure a complex cluster of 6 sites with the following topology:

Ethernet		Token-ring	
Sitename	site addr	Sitename	site addr
uno	130.200.1.1		
dos	130.200.1.2	cinco	130.201.2.2
tres	130.200.1.3	seis	130.201.2.3
cuatro	130.200.1.4 (gateway)	cuatro	130.200.1.4

Since site cuatro is on both networks, it serves as the gateway in this cluster.

The following excerpt of `/etc/rc.tcpip` will show how standard sites with one ethernet device are configured.

```
#
# This file initializes the site independent portions of the IP interface
#
# $SITE && $LOCAL are exported in Singl2multi.
#
if [ -x $LOCAL/rc.tcpip.local ] # Needs site specific initialization
then
    /bin/sh $LOCAL/rc.tcpip.local > /dev/syscon 2>.*
else
    if i386; then
        /etc/ifconfig net0 $SITE #
    elif u370; then
        # Default to LCS and/or CETI, whichever can be found
        /etc/ifconfig lc0 $SITE
    fi
fi
```

The following example is a `<LOCAL>/rc.tcpip.local` for sites with only a Token-Ring adaptor (sites cinco and seis).

Note: *sitename* will be replaced by the actual names of these sites.

```
#
# This file initializes sites with ONLY a token-ring adaptor
#
/etc/ifconfig tk0 sitename
```

The following example is the `<LOCAL>/rc.tcpip.local` for the gateway site (cuatro):

```
#
# This file initializes the gateway site.
#
/etc/ifconfig net0 cuatro
/etc/ifconfig tk0 cuatro-tkr
```

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Network Topology Requirements

6.5 Network Topology Requirements

To provide Internet Protocol forwarding between sites in different physical networks via gateway machines, the following requirements must be met:

Each site must have a unique address in the form A.B.C.D

All gateway machines must implement the IP protocol standard particularly the IP route record and IP source route options.

The path between two sites in the cluster can include only two gateway machines.

The round-trip packet time between two cluster sites averages 200 ms and should not exceed 300 ms. Greater numbers may work, but the stated amounts do work.

The number of gateways between the same two IP subnetworks should not exceed 4 although this number of gateways may be artificially low.

False sitedowns may be declared, if multiple concurrent failure occur. Sometimes this type of failure will resolve, but all instances of false sitedowns may not be corrected. This type of failure includes:

- Hardware failure of cluster machines
- Software failure of cluster machines
- LAN failures such as cable problems, transceiver failures, and related media problems.

Subtopics

6.5.1 Non-Cooperating Gateways

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Non-Cooperating Gateways

6.5.1 Non-Cooperating Gateways

A gateway that is labeled **cooperating** is one which belongs to a cluster (for example, is an AIX site in the cluster), while a **non-cooperating** gateway is a machine which is not part of the cluster (and may or may not be running AIX). TCF places some restrictions on which commercial gateway products to use for non-cooperating gateways.

TCF was designed to work in conjunction with Internet Protocol (IP). IP has an option called **route-record** which, when activated, will record the path that a packet has taken from source to destination. Other vendors who sell commercial gateways may not have conformed to the U.S. government specifications (refer to RFC 791, September 1981 and DoD MIL-STD-1777) for processing packets with this option (which IBM has done). As a result, some non-cooperating gateways may fail when presented with a packet which has the **route-record** option turned on.

If the gateway is a system running some other implementation of UNIX, that gateway may fail to forward the TCF packets or it may fail to operate altogether, due to software errors in older systems. Furthermore, other (non-AIX) UNIX systems operating on the same Local Area Network may experience difficulties when it receives these packets, even though it does not have to forward them.

AIX/370 Installing and Customizing the Operating System

Chapter 7. Using the devices Command

7.0 Chapter 7. Using the devices Command

Subtopics

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CONTENTS

7.1 CONTENTS

AIX/370 Installing and Customizing the Operating System

About This Chapter

7.2 About This Chapter

This chapter explains how to customize your IBM AIX/370 System by using the **devices** command to:

Add devices to your system

Change information about devices in your system

Delete devices from your system

This chapter also explains how you can display information about devices in your system. By following the steps to add or delete devices or to change information about devices, you can customize your system with IBM-defined devices. Customizing with devices not defined or supported by IBM may require extra steps and extra information.

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Using Devices to Customize Your System

7.3 Using Devices to Customize Your System

After installing the AIX/370 Operating System, you should be ready to begin using your system. You may, however, want to add some of the optional devices supported by IBM. To do so, you use the **devices** command. With the **devices** command, you can also remove devices from your system, and display and change information about devices.

Adding devices, removing them, and changing the information that describes them are ways that you customize your system. If you are using IBM-supported devices, you can customize your system with standardized procedures. If the devices are not IBM-supported, you may need to take extra steps to customize your system. You should also recognize that while the **devices** command does the processing required to configure devices into your system, the device must be properly set up, including attachment within the VM environment.

Before you begin using the **devices** command, read the following sections to learn how to supply the information **devices** will request from you. This chapter contains several examples of using the **devices** command. You should be able to find an example similar to the task that you want to do. Following the example closely should guide you in doing your own task.

Japanese Language Support: If Japanese Language Support is provided with your system and you selected a Japanese locale while installing your AIX/370, all the information which appears on your screen, related to using the **devices** command will be in Japanese. However, all input required as you use **devices** must still be entered in English. For details on types of information which must always be expressed in English regardless of locale selected (such as login IDs, passwords, site names, system directory names, and so on), see the *Guide to Multibyte Character Set (MBCS) Support*.

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IBM-Defined Devices

7.4 IBM-Defined Devices

In addition to the IBM-defined standard devices that were configured automatically as part of your Operating System, you can add many other IBM-defined devices to your system.

The following chart describes representative devices supported by IBM:

The Device Class is the name for the category (for example, terminal or printer).

The Device Type is the name that identifies the device

The Device Description provides you with information about the device type.

Table 7-1. IBM Defined Devices		
Device Class	Device Type	Description
lan	ceti	9370 Integrated Ethernet LAN Adapter
lan	ethernet	Ethernet Device Driver (3Com)
lan	ilans	9370 Integrated Token-Ring LAN Adapter
lan	lcs	lcs LAN Device
lan	ctc	Channel-to-channel Adapter
printer	lp	1403, 3203, 3211, 4245 printers
printer	5575/F02	Japanese line printer
ptydev	ttyp	Pseudo TTY devices
ptydev	ttyn	Network TTY devices
spool	punch	2540 Punch
spool	reader	2540 Reader
tape	3410	Magnetic Tape Unit models 1, 2, 3
tape	3420	Magnetic Tape Unit models 4, 5, 6, 7, 8
tape	3430	Magnetic Tape Unit
tape	3480	Magnetic Tape Subsystem
tape	8809	Magnetic Tape Unit models 1A, 2, 3

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IBM-Defined Devices

disk	FBA	DASD FBA Type, incl. 9332, 9335, 3370
disk	CKD	DASD CKD Type, incl. 3380
ttydev	TTY	A PS/2 used as a terminal (TTY device)

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Customization Files

7.5 Customization Files

Your system uses two types of files in customization activities: configuration files and device-dependent information files. These files contain information about the IBM-supported devices and about the devices installed in your system. The **devices** command keeps these files updated as you add a printer, for instance, or change some of the device information.

After you have installed the AIX/370 Operating System and the additional programs described in Chapter 5, "Installing a 370 TCF Cluster Site," and after you have customized your system by adding devices, back up your files to prevent the loss of valuable information. See *Managing the AIX Operating System* for details.

A description of the configuration files and the device-dependent information files follows.

Subtopics

7.5.1 Configuration Files

7.5.2 Device-Dependent Information Files

AIX/370 Installing and Customizing the Operating System Configuration Files

7.5.1 Configuration Files

The following files contain information about your system configuration:

/etc/master -- A hidden directory whose i386 and i370 components contain configuration information about IBM-supported devices for the system, including AIX/370 device drivers.

/etc/predefined -- A hidden directory whose i386 and i370 components contain configuration information about IBM-supported devices for the system, but does not contain device driver information.

/etc/system -- Contains configuration information about IBM-supported devices currently configured in your system. This file is similar in format to the **/etc/predefined** file. (The **/etc/system** is symbolically linked to **/local/system**.)

/etc/ddi -- A directory that contains device-dependent information; the number and types of files in this directory depend upon the options and programs installed. (The **/etc/ddi** is symbolically linked to **/local/ddi**. See the next section for more information on these files.)

/etc/configstatus -- A file that contains a list of all devices the **devices** command has configured on the site. (The **/etc/configstatus** file is symbolically linked to **local/configstatus**.)

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Device-Dependent Information Files

7.5.2 Device-Dependent Information Files

Device-dependent information files contain information describing a particular device. For example, a printer's device-dependent information includes such items as port address (where the device is attached), color (whether the printer has color), left and right margin settings, and so on. You can change some of these items, but not all of them. For instance, while you cannot change the color characteristic of a printer, you can change the margin settings. Some devices have no information that can be changed.

As you use **devices**, you will notice that the **showdev** command shows you all the device information for a particular device. The **add** and **change** commands show only the device information that you can change.

The device-dependent information files are contained in the **/etc/ddi** directory. For example, the device-dependent information file for the pseudo-terminal is **/etc/ddi/pty**.

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Starting and Exiting Devices

7.6.1 Starting and Exiting Devices

To start **devices**, you must first be logged in as a member of the system group or you must have superuser authority. The **#** prompt appears when you are logged in as superuser. The **\$** prompt appears when you are logged in as a system or regular user. After the system prompt, type **devices** and press **Enter**. See *Managing the AIX Operating System* for information about devices.

Warning: You must not run more than one devices session on a site at one time.

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Using Abbreviated Commands

7.6.2 Using Abbreviated Commands

To reduce the number of keystrokes you must enter, you can abbreviate the **devices** commands, the device class, device type and port fields, and the yes/no responses. Simply type the letters that uniquely identify the desired command, device, or response. For the **add**, **change**, and **delete** commands, you can type a single letter or multiple letters, as in: **a**, **ad**, or the full **add**. Or you can type **c**, **ch**, **cha**, and so on for **change**.

However, for the **showall** and **showdev** commands, you must type at least **showa** or **showd** to identify the desired command.

Whenever you are asked to type **yes** or **no**, you can type **y** or **n**.

If you already know the device class and device type for the device you want to add, change, delete, or show, you can enter valid abbreviations for the command, the device class, and the device type. For example, **a pr 3262** adds a 3262 printer. To add a tty or streaming tape device, type an **a tt tty** for tty or **a ta tape** for tape. Entering these three items means that you can bypass the lists of device classes and device types.

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Handling Errors

7.6.3 Handling Errors

If you should supply an incorrect response while responding to **devices** prompts, you will be asked again to supply correct information. If you are unable to supply correct information and want to go back to the DEVICE CUSTOMIZING COMMANDS screen, press **F3**.

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Understanding the Devices Commands

7.7 Understanding the Devices Commands

The five **devices** commands are:

add

change

delete

showall

showdev.

When you type **devices** after the system prompt and press **Enter**, the DEVICE CUSTOMIZING COMMANDS screen appears.

Each time you want to use a **devices** command, you must begin with this screen.

```
+-----+
|
|                                     DEVICE CUSTOMIZING COMMANDS
|
|   Devices commands are:
|
|   Command  Description
|
|   add      Add a new device
|   change   Change information about an existing device
|   delete   Delete an existing device
|   showall  Show general information about all existing devices
|   showdev  Show detailed information about an existing device
|
|   To EXIT the devices command, press F3.
|   To USE a devices command, type the Command and press Enter.
|
|   >
|
+-----+
```

The following sections provide information on each command. In this chapter, you will also find examples of the use of each command.

Subtopics

- 7.7.1 Adding Devices
- 7.7.2 Changing Device Information
- 7.7.3 Deleting Devices
- 7.7.4 Showing Device Information

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Adding Devices

7.7.1 Adding Devices

With the **add** command, you can do these tasks:

Add IBM-defined devices to your system

Add an unsupported printer to your system

Note: When the virtual device address is greater than **NCHANN** plus **NSUPCH**, then **NCHANN** needs to be increased accordingly.

See the **master** file entry in the *AIX Technical Reference, Vol. 2* for more information.

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Changing Device Information

7.7.2 Changing Device Information

The **/etc/ddi** (device class) files contain information about your system devices. Each time you add a device, you can see information about the device in the **/etc/ddi** file for that device class. While you may find most default settings or choices acceptable, you may also want to change some settings.

With the **change** command, you can display any device settings that can be changed.

Note: If you use the **change** option of the **devices** command to change any of the settings for your system devices and you notice that your requested changes are not implemented, then re-initialize the system after issuing the **shutdown** command.

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Deleting Devices

7.7.3 *Deleting Devices*

You can use the **delete** command to delete almost any device in your system. You can physically remove the device either before or after you delete it from your system configuration. You cannot delete a device while it is actively in use. For instance, you cannot delete a printer while it is printing or a tty device while it is enabled.

Should you have to remove a device for adjustments or repairs, you do not have to delete it from the system. You can re-attach the device and continue to use it as before.

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Showing Device Information

7.7.4 Showing Device Information

With the **showall** and **showdev** commands, you can display the following:

A list of all devices configured in your system. (Type **showall**, and press **Enter**.)

A list of all devices of a particular class. (Type **showdev** and the device class, as in: **showdev printer**).

Device-dependent information for a device. (Type **showdev** and the device class and name, as in: **showdev printer lp0**).

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Using the Devices Commands

7.8 Using the Devices Commands

The rest of this chapter shows examples of how you can use the **devices** commands. In each case, the box contains steps that apply to any device. If you are familiar with **devices**, you can use the boxed information as a reminder of the steps involved.

Under the "In Detail" sections, you will find specific examples of using **add**, **change**, **delete**, **showall**, and **showdev**. In addition, you will see the information that displays on the screen, along with an explanation of what the prompts mean and how to answer them.

The first step when using **devices** is to request the DEVICE CUSTOMIZING COMMANDS screen. This list shows you the available options.

```
+--- To Request Devices -----+
|
| 1. Log in to the system.
|
| 2. After the system prompt, type devices, and press Enter to see the
|    DEVICE CUSTOMIZING COMMANDS screen.
|
| Now you can select the command you want to enter. See the examples
| that follow for specific steps.
|
+-----+
```

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Displaying All Devices In Your System

7.9 Displaying All Devices In Your System

To see a list of all the devices that currently are part of your system, use the **showall** command.

+--- To Display a List of All Devices -----+

1. On the DEVICE CUSTOMIZING COMMANDS screen, type **showall**. Press **Enter**.

```
> showall
```

2. To return to the DEVICE CUSTOMIZING COMMANDS screen after seeing the list of devices, press **F3**. To print a copy of the list (if your printer is configured and working), press **F4**.

You will see a list of devices similar to the following one. If your system has more devices than one screen can contain, you will see a prompt to continue to the next screen. Go to the next screen by scrolling. Use the **Page Up** key to move to a previous screen and the **Page Down** key to move to a following screen.

The following devices are configured in your system.

Name	Type	Class	Port
lp0	printer	spool	Printer
lp1	printer	spool	Printer
rdr0	reader	spool	Card Reader
rdr1	reader	spool	Card Reader
rdr2	reader	spool	Card Reader
pun0	punch	spool	Card Punch
pun1	punch	spool	Card Punch
pun2	punch	spool	Card Punch
rmt0	tape	tape	IBM Tape Drive
rmt1	tape	tape	IBM Tape Drive
ttyp0	tty	ptydev	Asynchronous Pseudo-Term

To SEE additional items in the list, use the Page Down or Page Up keys.
To RETURN to the list of commands, press Enter.
To PRINT this list of devices, press F4.

```
>
```

If your printer is configured and working, you can print the list of devices on the screen by pressing **F4**.

A summary report is also written to the file **/tmp/CONFIGREPORT** that

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Displaying All Devices In Your System

contains the information on each screen, where you have pressed **F4** during a devices session.

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Displaying Information About Specific Devices

7.10 Displaying Information About Specific Devices

To see information about specific devices in your system, use the **showdev** command.

+--- To Display Information About Specific Devices -----+

1. On the DEVICE CUSTOMIZING COMMANDS screen, type **showdev** to display a list of device classes currently configured in your system.

```
> showdev
```

2. To see information about a specific device, type the name of the device class. Press **Enter**. For instance, if you want to see information about a printer, type **spool**.

```
> spool
```

You can combine both steps by typing **showdev spool**.

3. Type the name of a specific device from the list of devices configured in your system. For instance, type the name of a specific printer, such as **lp0**. Then press **Enter** to see the information. If you have a printer that is configured and working, you can print a copy of the list of device information by pressing **F4**.
4. To return to the DEVICE CUSTOMIZING COMMANDS screen, press **F3**.

After you enter the **showdev** command and the name of the device you want to see information about, a list of device names similar to the following appears:

The following devices are available.

Device Name	Description
lp0	Virtual Printer
lp1	Virtual Printer
rdr0	Virtual Reader
rdr1	Virtual Reader
rdr2	Virtual Reader
pun0	Virtual Punch
pun1	Virtual Punch
pun2	Virtual Punch

To RETURN to the list of commands, press F3.

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Displaying Information About Specific Devices

To CHOOSE from the list, type the Device Name and press Enter.

>lp1

After you type the name of the device about which you want information, that information appears.

Name	Description	Current Choice	Possible Choices
class	print spool class	a	
cont	printer cont status	nocont	
hold	printer hold status	nohold	
copy	number of copies	1	
form	type of paper	standard	
to	system		

To RETURN to the list of commands, press Enter.

To PRINT this device information, press F4.

>

If your printer is configured and working, you can print the list of devices on the screen by pressing **F4**.

A summary report is also written to the file `/aix370/tmp/CONFIGREPORT` that contains the information on each screen, where you have pressed **F4** during a devices session.

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Adding Devices to Your System

7.11 Adding Devices to Your System

To add a device to your system, you use the **add** command. Several examples are included in this section to help you better understand the procedures. These examples include:

Adding an IBM-defined device with default

Adding an IBM-defined device and changing device informatio

Adding an unsupported printer

Remember, these are typical examples. The lists of device classes, device types, and ports that you see on your screen may not be exactly the same as those shown in the examples. But the basic procedures are very similar. You need only follow the numbered steps for the example most like the task that you want to perform.

Subtopics

7.11.1 Example: Adding an IBM-Defined Device With Defaults

7.11.2 In Detail

7.11.3 Example: Adding An Asynchronous Pseudo-terminal

7.11.4 In Detail

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Example: Adding an IBM-Defined Device With Defaults

7.11.1 Example: Adding an IBM-Defined Device With Defaults

This first example shows how to add an IBM-defined device to a serial or parallel port. Because it is an IBM-defined device, you may not need to change any of the settings (device-dependent information).

+--- To Add an IBM-Defined Device -----+

1. On the DEVICE CUSTOMIZING COMMANDS screen, type **a** to select the **add** command. Then press **Enter**.
2. Type the name of the device class. Then press **Enter**.
3. Type the name of the device type. Then press **Enter**.
4. Type the name of the address where you want to add the device. Then press **Enter**.
5. If requested to do so, supply the requested information for the port or address. Then press **Enter**.
6. Indicate whether you want to display or change predefined device information (printer settings, for example).
7. Verify that you want to add the device by pressing **Enter**.
8. After you receive a message indicating that the device has been added, press **Enter** to return to the DEVICE CUSTOMIZING COMMANDS screen.

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7.11.2 In Detail

The following example shows you how to add an IBM virtual printer to your system:

1. On the DEVICE CUSTOMIZING COMMANDS screen, type **a** to select the **add** command. Then press **Enter**.

```
> a
```

2. From the list of device classes, type **spool** as the device class, and press **Enter**.

```
+-----+
|
|       The following device classes are available.
|
|       Device Class      Description
|
|       spool             IBM Virtual Spooled Device
|       tape              Tape Device
|       ptydev            Pseudo-Terminal
|       lan               Local Area Network
|       disk              Fixed Block Architecture DASD Device
|
|       To CANCEL and return to the list of commands, press F3.
|       To CHOOSE from the list, type the Device Class and press Enter.
|
|       > spool
|
+-----+
```

3. The list of printers that is displayed for your system may not exactly match the example shown below. From the list of printers, type **lp** as the name of the printer, and press **Enter**. Remember, if you have all of the information you need, you can combine these steps by typing **a pr sp lp**.

```
+-----+
|
|       The following devices are available.
|
|       Device Type      Description
|
|       lp               IBM Virtual Printer
|       rdr              IBM Virtual Reader
|       pun              IBM Virtual Punch
|
+-----+
```


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To CANCEL and return to the list of commands, press F3.
To CHOOSE from the list, type the Device Type and press Enter.

> lp

-
4. Type the address at which the virtual printer is to be attached. Then press **Enter**, and you will see:

This Device Requires a Configuration Address.
To CANCEL and return to the list of commands, press F3.

Enter Device Address:

> 2e

5. Press **Enter** to accept predefined information. Unless you want to change printer characteristics (such as margin, page length, and so on), all of the device information needed by the system is already set up for you.

Change any of the following information that does not match your system configuration.

Name	Description	Current Choice	Possible Choices
class	print spool class	a	
copy	number of copies	1	

To CANCEL and return to the list of commands, press F3.
To CHANGE a current choice, type the Name followed by your new choice (example: lpi 6) and press Enter.
To COMMIT the changes you have made, press Enter.
>

-
6. Press **Enter** to add the printer or press **F3** to cancel the request.

To CANCEL adding the device, press F3.

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To ADD the device with the current information,
press Enter.

>

7. After you receive a message indicating that the printer has been added, press **Enter** to return to the DEVICE CUSTOMIZING COMMANDS screen.

The device was added to the system.

```
Device Name: lp2
Device Type: lp
Device Class: printer
```

To RETURN to the list of commands, press Enter.

The system has assigned a new name to the device. This is the name to use when you issue the **print** command for this device.

Note: The first printer you add is the default printer. If you add additional printers, the order of the printers in the print queue is determined by the order of stanzas in **/etc/qconfig**.

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Example: Adding An Asynchronous Pseudo-terminal

7.11.3 Example: Adding An Asynchronous Pseudo-terminal

Follow these steps to add an asynchronous pseudo-terminal (an IBM-defined device) to your system.

+--- To Add an IBM-Defined Device -----+

1. On the DEVICE CUSTOMIZING COMMANDS screen, type **a** to select the **add** command. Then press **Enter**.
2. Type the name of the device class. Then press **Enter**.
3. From the list of devices that you can add, type the name of the device type. Then press **Enter**.
4. Type the name of the adapter to which you want to add the device. Then press **Enter**.
5. If requested to do so, supply the requested information for the adapter. Then press **Enter**.
6. Type **n** and press **Enter** if you do not want to show and change settings for the device.
7. To verify that you want to add the device, press **Enter**.
8. After receiving a message indicating that the device has been added, press **Enter** to return to the DEVICE CUSTOMIZING COMMANDS screen.

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To CANCEL and return to the list of commands, press F3.
To CHOOSE from the list, type the Device Type and press Enter.

```
> ttyp
```

4. Supply the following information unless the default values in **Current Choice** suit your needs. In this example, the current choice is the VT100 terminal.

Change any of the following information that does not match your system configuration.

Name	Description	Current Choice	Possible Choice
tt	Terminal Type	ibm3151	vt100,vt220,ibm3151,...
ae	Automatic Enable	true	true,false,share,delay
bpc	Bits Per Channel	8	5,6,7,8
pt	Parity Type	none	even,odd,mark,space,none
ixp	Include Xon/Xoff Protocol	true	true,false
xscan	Enable scan code terminal	true	true,false
dvam	Device Attachment Method	0	0= local,1= remote (modem)
nosb	Number of Stop Bits	1	1,1.5,2
elevel	Enable level for terminal	1,4	one or more of 0-6,a,b,c
rts	Receive/Transmit Speed	9600	300,1200,4800,9600 etc.
cycle	Cyclic Speed Setting Support	true	
aa	Automatic Answering	false	true,false
pro	Protocol	dtr	dtr,dc

To CANCEL and return to the list of commands, press F3.
To CHANGE a current choice, type the Name followed by your new choice (example: lpi 6) and press Enter.
To ADD This device with the current choices, press Enter.

```
>
```

5. If you want to change any of the device settings, type **y** and press **Enter**.

Notes:

- a. The modification options you see on your screen may not match those shown above. In many cases, the list you see will be

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smaller. After you press **Enter** you will see a screen which asks if you want to make any further changes. If you respond **yes** to this question you will be shown a screen that presents the whole list shown above.

Which modification options appear on the first screen is controlled by:

```
/etc/ddi/tty.kaf      for built in and dual async adapters  
  
/etc/ddi/rtyt.kaf    for the artic adapter.
```

The options listed as *required = true* will show on the first screen. Those listed as *required = false* will only show on the second screen. You can reconfigure these selections to suit your needs.

- b. In using these two screens, keep in mind that when you are finished the device settings must match the way the terminal is actually set (parity, bits per second, receive/transmit speed, and so on). See the **ddi** file format page in the *AIX Operating System Technical Reference, Volume 2* for further explanation of terminal parameters.
- c. The **devices** command only allows one speed setting to be specified for each terminal line. To specify multiple values to be cycled through (e.g., to support a variable speed modem), you should enter one speed now and then later edit the **/etc/ports** file (see the **ports** file format page in the *AIX Operating System Technical Reference, Volume 2*).

All device information for this device has been set
for you.
Do you wish to show or change this information?

```
yes  
no
```

To CANCEL and return to the list of commands, press F3.
To CHOOSE, type yes or no and press Enter.

```
> no
```

AIX/370 Installing and Customizing the Operating System In Detail

+-----

6. Verify that you want to add the terminal with the changes you have made by pressing **Enter**. Or, to cancel the request to add the device, press **F3**.

To CANCEL adding the device, press F3.

To ADD the device with the current information, press Enter.

>

7. After receiving a message indicating that the terminal has been added, press **Enter** to return to the DEVICE CUSTOMIZING COMMANDS screen.

The device was added to the system.

Device Name: pseudo tty device

Device Type: pty

Device Class: ptydev

To RETURN to the list of commands, press Enter.

Note: To use the tty, the corresponding stanza in `/etc/inittab` must contain the keywords **action = respawn** and a signal must be sent to inform the **INIT** process of the change. To do this, type **penable tty0** after the system prompt. Then press **Enter**.

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Changing Information about System Devices

7.12 Changing Information about System Devices

The **change** command lets you change settings for a device already installed in your system. You may want to change the settings (device information) for a device in your system. For instance, you may want to change the margin settings for printing documents.

The following example shows how to change settings for a typical device. (The lists of device types and device classes shown in the example may not be exactly the same as those you see on your screen.)

```
+--- To Change Device Information -----+
|
| 1. On the DEVICE CUSTOMIZING COMMANDS screen, type c if you want to
|    change device information. Then press Enter.
|
| 2. From the list of available devices, type the device class for
|    which you want to change information. Then press Enter.
|
| 3. From the list of device names, type the name of the device for
|    which you want to change information. Then press Enter.
|
| 4. Follow the prompts to change the settings displayed on the screen.
|
| 5. Verify that you want to commit the device information by pressing
|    Enter.
|
| 6. After receiving a message indicating that the device information
|    has changed, press Enter to return to the DEVICE CUSTOMIZING
|    COMMANDS screen.
|
+-----+
```

Subtopics

7.12.1 In Detail

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7.12.1 In Detail

The following example shows how you change information about a printer in the system:

1. On the DEVICE CUSTOMIZING COMMANDS screen, type **c** to choose the **change** command. Then press **Enter**.
2. From the list of available device classes, type **spool** as the device class for which you want to change information. Then press **Enter**.

The following device classes are available.

Device Class	Description
spool	IBM Virtual Printer
ptydev	Pseudo-Terminal

To CANCEL and return to the list of commands, press F3.
To CHOOSE from the list, type the Device Class and press Enter.

> spool

3. From the list of available devices, type in **lp1** as the name of the printer for which you want to change information. Then press **Enter**.

The following devices are available.

Device Name	Description
lp0	IBM Virtual Printer
lp1	IBM Virtual Printer
rdr0	IBM Virtual Reader
rdr1	IBM Virtual Reader
rdr2	IBM Virtual Reader
pun0	IBM Virtual Punch
pun1	IBM Virtual Punch

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pun2 IBM Virtual Punch

To RETURN to the list of commands, press F3.
To CHOOSE from the list, type the Device Name and press Enter.

>lp1

4. When the list of settings for printer *lp1* displays, make the changes that you want. Type the name of the setting, followed by a space and the new choice (which must be one of the choices in the "Possible Choices" column). For example, to change the spool class to b, type **class b**, then press **Enter**.

Make changes and press **Enter** until you have changed all settings that you want to change.

Name	Description	Current Choice	Possible Choices
class	print spool class	a	
cont	printer cont status	nocont	
hold	printer hold status	nohold	
copy	number of copies	1	
form	type of paper	standard	
to	system		

To CANCEL and return to the list of commands, press F3.
To CHANGE a current choice, type the Name followed by your new choice (example: *lpi 6*) and press Enter
To COMMIT the changes you have made, press Enter.

>

5. Verify (by pressing **Enter**) that the changed choices are accurate and that you want the changes to take effect. To cancel the changes, press **F3**.

To CANCEL changing the device, press F3.
To CAUSE the current choices to take effect, press Enter.

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>

6. You will see a message indicating that the device information has been changed. Press **Enter** to return to the DEVICE CUSTOMIZING COMMANDS screen.

The device information was changed.

Device Name: lp1
Device Type: printer
Device Class: spool

To RETURN to the list of commands, press Enter.

>

Note: If you use the **change** option of the **devices** command to change any of the settings for your system devices and you notice that your requested changes are not implemented, then perform a re-initialize of the system after issuing the **shutdown** command.

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Deleting Devices from the System

7.13 Deleting Devices from the System

When you decide that you no longer need a certain printer or other device in the system, you must delete that device from the system configuration. To delete a device, you use the **delete** command.

The following steps show you how to delete a typical device from your system:

- +--- To Delete a Device -----+
|
| 1. From the DEVICE CUSTOMIZING COMMANDS screen, type **delete**. Then
| press **Enter**.
|
| 2. From the list of device classes, type in one of the choices. Then
| press **Enter**.
|
| 3. From the list of devices, type the name of the device you want to
| delete. Then press **Enter**.
|
| 4. To verify that you want to delete the device, press **Enter**.
|
| 5. After you receive a message telling you that the device has been
| deleted, press **Enter** to return to the DEVICE CUSTOMIZING COMMANDS
| screen.
|
| **Note:** See the appropriate setup information for instructions on
| physically removing the device you have just deleted from
| your system.
|
+-----+

Subtopics

7.13.1 In Detail

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7.13.1 In Detail

The following example shows how to delete a device from your system. In this example, you are deleting the printer lp0.

1. On the DEVICE CUSTOMIZING COMMANDS screen, type **delete**. Then press **Enter**.
2. From the list of device classes, type **spool** as the name of the device class you want to delete. Then press **Enter**.

The following device classes are available.

Device Class	Description
spool	IBM Virtual Spooled Device
tape	Tape Device
ptydev	Pseudo-Terminal
lan	Local Area Network
disk	Fixed Block Architecture DASD Device

To CANCEL and return to the list of commands, press F3.
To CHOOSE from the list, type the Device Class and press Enter.

> spool

3. From the list of printers available to be deleted, type **lp0** as the name of the printer you want to delete from the system. Then press **Enter**.

The following devices are available.

Device Name	Description
lp0	IBM Virtual Printer
lp1	IBM Virtual Printer
rdr0	IBM Virtual Reader
rdr1	IBM Virtual Reader
rdr2	IBM Virtual Reader
pun0	IBM Virtual Punch

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```
| pun1                IBM Virtual Punch  
| pun2                IBM Virtual Punch
```

```
| To RETURN to the list of commands, press F3.  
| To CHOOSE from the list, type the Device Name and press Enter.
```

```
| >lp0
```

-
4. Verify that you want to delete the printer by pressing **Enter**.

To CANCEL deleting the device, press F3.

To DELETE the device, press Enter.

>

5. After you receive a message telling you that the printer has been deleted, press **Enter** to return to the DEVICE CUSTOMIZING COMMANDS screen.

The device was deleted from the system.

```
Device Name: lp0  
Device Type: printer  
Device Class: spool
```

To RETURN to the list of commands, press Enter.

AIX/370 Installing and Customizing the Operating System

Chapter 8. Using the minidisks Command

8.0 Chapter 8. Using the minidisks Command

Subtopics

8.1 CONTENTS

8.2 About This Chapter

8.3 Learning About Minidisks

8.4 Using the Minidisks Command

8.5 Using Minidisks Commands

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CONTENTS

8.1 CONTENTS

AIX/370 Installing and Customizing the Operating System

About This Chapter

8.2 About This Chapter

This chapter explains how you can create AIX minidisks (divisions) on your system VM minidisks to contain specific pieces of information necessary for your system to function. AIX minidisks are subdivisions of VM minidisks. Refer to the appropriate VM documentation for information on setting up and using VM minidisks.

This chapter also contains instructions for changing the mount attributes of an existing AIX/370 minidisk and for re-accessing AIX/370 minidisks created with the **minidisks** command (necessary if you reinstall the AIX/370 Operating System using the replace option).

Note: The **minidisks** command works only for creating or changing user-defined minidisks, not system-created minidisks such as **/(root)**, **/aix370**, and so on. For system minidisks, use the commands available on the Installation/Maintenance tape. These commands are described in *Managing the AIX Operating System*.

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Learning About Minidisks

8.3 Learning About Minidisks

Your IBM AIX/370 system has one or more internal fixed disks (VM minidisks). A VM minidisk can be divided into separate areas called AIX minidisks. Each contains information used by the system, and the various minidisks can be different sizes.

A maximum of 64 minidisks can be configured at one time across your system with a limit of 32 minidisks per disk. At this point, you already have several minidisks on your system.

The Operating System minidisks, which include / (root), **/aix370**, **/aix370/tmp**, **/usitename**, page and dump, were created when you installed the AIX/370 Operating System.

If you need no more than these minidisks, you can use your system without ever using the **minidisks** command. If you need to change these minidisks or create others, then you must use the **minidisks** command discussed in this chapter.

Available free space cannot be used until you create a minidisk from it. You can use the **minidisks** command to create a different minidisk from each area of free space.

If you have added a second VM minidisk after installing the AIX/370 Operating System, this disk will be one large area of free space. You can create one minidisk for the entire fixed disk or divide it into several minidisks.

Japanese Language Support: If Japanese Language Support is provided with your system and you selected a Japanese locale while installing your AIX/370 operating system, then all the information which appears on your screen, related to using the **minidisks** command will be in Japanese. However, all input required as you use **minidisks** must still be entered in English. For details on types of information which must always be expressed in English regardless of locale selected (such as login IDs, passwords, site names, system directory names, and so on), see the *Guide to Multibyte Character Set (MBCS) Support*.

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Using the Minidisks Command

8.4 Using the Minidisks Command

Now that you better understand the relationship of minidisks to the VM minidisks in your system, you can prepare to use the **minidisks** commands (**show**, **add**, **delete**, and **change**). The following sections describe how to use the **minidisks** commands.

Subtopics

8.4.1 Starting and Exiting Minidisks

8.4.2 Using Abbreviated Commands

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Using Abbreviated Commands

8.4.2 *Using Abbreviated Commands*

To save time, you can abbreviate the **minidisks** commands by typing only the first letter for each command. That is, type **s** for **show**, **a** for **add**, **d** for **delete**, or **c** for **change**. You can also type **y** for **yes** and **n** for **no**. You must spell out in full all minidisk names, directory names, and fixed-disk names.

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8.5 Using Minidisks Commands

The four **minidisks** commands are:

- show**
- add**
- delete**
- change.**

The following sections provide information on each command, and you will find examples of how to use each command later in this chapter.

Subtopics

- 8.5.1 Showing Minidisk Information and Planning Ahead
- 8.5.2 Adding Minidisks
- 8.5.3 Deleting Minidisks
- 8.5.4 Changing Mount Attributes

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Showing Minidisk Information and Planning Ahead

8.5.1 Showing Minidisk Information and Planning Ahead

The **show** command lists all minidisks and areas of free space for all disks configured in your system. Any external disks that are not powered on and configured will be displayed. Also, while you are using the **minidisks** commands, you can see this information by pressing the **F2** key. A line on the screen identifies those times when that information is available.

In the following example, **fhd00001** is the AIX/370 Operating System / (root) file system minidisk, and **fhd00002** is a minidisk that has been created on free space similar to the remaining area of free space on **fhd00000**. The minidisk **fhd00002** is mounted at IPL time on the directory **/aix370/f00**, with read-write access.

If you are planning to create a minidisk, record the number of blocks of the free space area to be partitioned.

All free space is reported in terms of 1024-byte blocks, and most minidisks have an internal block size of 4096 bytes.

```
+-----+
|
|          VM Minidisk fhd0000 has the following minidisks:
|
|          Name          MD   GFS    Pack Minidisk    Number    Mount       R/W
|          Name          ID   Number Num   Type         Blocks    Directory   Stat
|
|          fhd00001      1    2     1    AIX/370      10000     /           R/W
|          fhd00002      2    1     2    AIX/370      37000     /aix370/f00 R/W
|
|
|          To CONTINUE, press Enter.
|
|          >
|
+-----+
```

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Adding Minidisks

8.5.2 Adding Minidisks

Once you decide to add a minidisk, you select **add** from the list of **minidisks** commands. When a line on the screen indicates that you can do so, you can press **F2** to see where the free space is and how large it is. At other times, you can use the **show** command to see this information.

After you enter the **add** command, you must answer a series of questions to help you provide the needed information for the system to add the minidisk. For example, you will be asked to provide the block size, the location on the disk, and other information. These are items that you should have recorded while using the **show** command.

Note: The **add** command will not recognize external disks that are not powered-on and configured.

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Deleting Minidisks

8.5.3 *Deleting Minidisks*

Once you enter the **delete** command, you will be asked to enter the name of the minidisk you want to delete. Then you will see information about the minidisk and be asked to verify that you want to delete that minidisk.

Warning: When you delete a minidisk, any files on that minidisk are likely to be lost. Be certain to copy any files you want to keep. Otherwise, you can lose valuable information. See *Managing the AIX Operating System* for information about guidelines for backing up your files.

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Changing Mount Attributes

8.5.4 Changing Mount Attributes

With the **change** command, you can make the following changes to AIX/370 minidisks:

- Change the directory on which a minidisk is mounted
- Change whether the minidisk is automatically mounted after it is configured.
- Change whether the minidisk is mounted read-only or read-write

See *Managing the AIX Operating System* for more information on these topics.

After you enter the **change** command, you will be asked to answer several questions to guide you through steps to change the settings for the minidisk.

Subtopics

- 8.5.4.1 Example: Using the minidisks Command
- 8.5.4.2 In Detail
- 8.5.4.3 Example: Displaying Minidisk Information
- 8.5.4.4 In Detail
- 8.5.4.5 Example: Adding an AIX/370 Minidisk
- 8.5.4.6 In Detail
- 8.5.4.7 In Detail
- 8.5.4.8 Example: Deleting a Minidisk
- 8.5.4.9 In Detail
- 8.5.4.10 Example: Changing Minidisk Mount Attributes
- 8.5.4.11 In Detail

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Example: Using the minidisks Command

8.5.4.1 Example: Using the minidisks Command

The rest of this chapter presents several examples to show you how to use the **minidisks** commands. In each case, the box contains steps for the use of the command. If you are somewhat familiar with **minidisks**, you might use the boxed information as a reminder of the steps involved.

Under "In Detail" is information that displays on the screen, along with an explanation of what the prompts mean and how to respond to them.

The first step when using **minidisks** is to request the list of **minidisks** commands. This list shows you the available options.

```
+--- To Request Minidisks -----+
|
| 1. After the $ or # prompt, type minidisks.
|
| 2. Press Enter.
|
+-----+
```

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8.5.4.2 In Detail

1. After the **\$** or **#** prompt, type **minidisks**.

```
# minidisks
```

2. Press **Enter** to see the MINIDISK CUSTOMIZING COMMANDS screen.

```
-----+-----  
MINIDISK CUSTOMIZING COMMANDS
```

```
Minidisks commands are:
```

```
Command  Description
```

```
add      Create a new minidisk  
change   Change mount characteristics of an existing minidisk  
delete   Delete an existing minidisk  
show     Show minidisk information
```

```
To EXIT the minidisks command, press F3.
```

```
To USE a minidisks command, type the command and press Enter.
```

```
>
```

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Example: Displaying Minidisk Information

8.5.4.3 Example: Displaying Minidisk Information

To display information about existing minidisks, select **show** from the **minidisks** commands screen.

```
+--- To Display Minidisk Information -----+
|
| 1. On the MINIDISK CUSTOMIZING COMMANDS screen, type show (or s) to
|    see information about minidisks. Press Enter.
|
|    > show
|
| Remember that as you use the add, change, or delete commands, you
| can display information about disks by pressing F2.
|
| 2. To return to the MINIDISK CUSTOMIZING COMMANDS screen, press
|    Enter.
|
+-----+
```


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To better understand this information, you may want to review the information about minidisks at the beginning of this chapter.

If you have a printer configured and running, you can print the information you see on the screen by pressing **F4**. A summary report is also written to the file `/aix370/tmp/CONFIGREPORT` that contains the information on each show screen, where **F4** has been pressed during the **minidisks** session.

After you have completed adding or deleting a minidisk, use the **mdrc** command after rebooting in order to create the stanzas needed in the configuration files. See the *AIX Operating System Commands Reference* for an explanation of the **mdrc** command.

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Example: Adding an AIX/370 Minidisk

8.5.4.5 Example: Adding an AIX/370 Minidisk

To add an AIX/370 minidisk to the system and specify characteristics for that minidisk, select **add** from the **minidisks** list. Follow these instructions:

- +--- To Add an AIX/370 Minidisk--Part 1 -----+
|
| 1. On the MINIDISK CUSTOMIZING COMMANDS screen, type **add** (or **a**).
| Then press **Enter**.
|
| 2. Type the full path name of the directory on which the minidisk is
| to be mounted. Press **Enter**.
|
| 3. Indicate whether you want the minidisk mounted after it is
| configured, and press **Enter**.
|
| 4. Indicate whether you want the minidisk to be read-only or
| read-write. Press **Enter**.
|
| 5. If you want file systems to be replicated, type **y** and press **Enter**.
| If you do not want replicated file systems, type **n**, press **Enter**,
| and go to Part 2.
|
| 6. The user replication prompt is then displayed. If you want to
| make replication choices, type **yes** and press **Enter**. If you want
| the program to replicate the file system, type **no** and press **Enter**,
| and go to Part 2.
|
| 7. The primary site file system screen is then displayed. If you do
| not want your site to be a primary site file system, enter no and
| then press **Enter**. If you do want it to be a primary site file
| system, enter yes, press **Enter**, and go to Part 2.
|
| 8. The backbone screen is then displayed. If you do not want your
| site to be a backbone site, enter no and then press **Enter**. If you
| do want it to be a backbone site, enter yes, press **Return**, and go
| to Part 2.
|
| 9. The i370 fstore screen is then displayed. If you want your file
| system to have the i370 fstore set, enter yes and press **Enter**. If
| you do not want your file system to have the i370 fstore set,
| enter no and press **Enter**.
|
| Then go on to "To Add an AIX/370 Minidisk--Part 2" in
| topic 8.5.4.6.
|
+-----+

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To choose a permission, type the name and press Enter.

```
> rw
```

The minidisk can be mounted with either read-only or read-write access. With read-only access, you can read files without changing them. If you choose the read-write option, you can both read and write to the files on your minidisk.

When a stanza in `/etc/fsmmap` identifies the mount point you select as replicated, you are not asked if your file system is to be replicated. The question on user-replicated choices appears first.

5. If you want a replicated file system, type **yes** and then press **Enter**. If you do not, type **no**, and press **Enter**, and go to step 7.

Do you want your file system to be replicated? (y/n)

A file system that is replicated can have full or partial copies of itself on other sites in the cluster. This replication allows cluster sites to run independently while presenting a uniform view to all users. A replicated file system contains files and directories that are automatically copied to many or all sites in the cluster and are not specific to any one cluster site. The root file system is a good example of a system replicated file system. The root file system contains files critical to the normal operation of all sites in the cluster.

6. If you have decided on a replicated file system, the user replication prompt displays. Type **y** and press **Enter** if you want to make file replication choices. If you want the program to replicate the file system, type **n**, press **Enter**, and go to step 7.

Do you want the file system to be user replicated (y/n)?

7. The primary site file system prompt is then displayed. If you do not want your site to be a primary site file system, enter no and press **Enter**. If you do want it to be a primary site file system, enter yes, press **Enter** and go to step 7.

Do you want your file system to be the primary site? (y/n)

Replicated system and user file systems must have a primary copy, and may have other copies (backbone and secondary) of the file system. For each replicated file system there must be one copy that is

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designated as the primary copy. Updates to any file in a file system can only occur when the primary copy is available for modification.

8. The backbone prompt is then displayed. If you do not want your site to be a backbone site, enter no and then press **Enter**. If you do want it to be a backbone site, enter yes, press **Return**, and go to step 7.

Do you want your file system to be a backbone copy? (y/n)

The backbone copy is an exact copy of the primary copy. The user always has read-only access to the backbone copy. It is useful as a backup version to the primary copy.

Any number of backbone copies can be created.

9. The i370 fstore screen is then displayed. If you want your file system to have the i370 fstore set, enter yes and press **Enter**. If you do not want your file system to have the i370 fstore set, enter no and press **Enter**.

Do you want your file system to have the i370 fstore set? (y/n)

The fstore values are used for determining if a secondary file system copy will get a modified file from the primary copy. Refer to the *Administration Guide* for details.

+--- To Add an AIX/370 Minidisk--Part 2 -----+

1. After the > prompt, establish the size of the minidisk by typing the number of 1024-byte blocks. Press **Enter**.
2. When the > prompt returns, type the number of inodes in this file system, and press **Enter**. The prompt does not appear if the file system is replicated and the number of inodes can be set from a copy of this file system stored on another site.
3. Choose the disk where the new minidisk will be located. Type in the disk name, and press **Enter**.
4. Review the settings for the new minidisk, and follow directions on the screen to cancel the creation of the minidisk or to create the new minidisk.
5. If the mount directory does not exist, use the **mkdir** command to create it.
6. For an existing minidisk, mount it before you use it. Type: **mount /u/minidisk**. Then press **Enter**.

+-----+

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```
fhd00000  
fhd00032
```

Type the VM minidisk on which to create this minidisk and press Enter.

To SHOW minidisk information in requested blocksize, press F2.

```
> fhd00000
```

There may not be enough free space for a minidisk of the size you have requested on each disk in the list. If you do select a VM minidisk without adequate space for your minidisk, you will see an error message and then a summary screen from which you can select a different VM minidisk or number of blocks.

4. Now you will see a screen summarizing the current choices and any choices you may have indicated that you want to make. You have the option of canceling the creation of this minidisk or creating the new minidisk with the current choices. The following example assumes that the number of blocks will be changed to 50000:

```
Minidisk name:  fhd00009  
Minidisk location:  end  
Directory:  /u/anydir  
Automatic Mount:  yes  
Read Permission:  read/write
```

To CANCEL creation of this minidisk, press F3.
To CREATE this minidisk with the current choices, press Enter.
To SHOW minidisk information, press F2.

```
> nob 50000
```

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|
|
|
+-----

When you press **Enter** the minidisk is added to the system. For large minidisks, this process may take a few minutes. During this time, the minidisk is being defined and the **lost+found** directory is created.

If you receive a "special processing" error message while the minidisk is being added, see "The MasterInstall Program" in topic 3.5.1 for error recovery procedures.

5. If the mount directory does not exist, use the **mkdir** command to create it. For more details on **mkdir**, see *AIX Operating System Commands Reference*.
6. The system displays a message confirming the addition of the new minidisk, then returns to the list of **minidisks** commands.

The minidisk has been successfully created. The minidisk name is fhd00009.

To CONTINUE, press Enter.

Note: The directory **/u/anydir** must exist before you try to mount the minidisk for the first time.

If the directory **/u/anydir** does not exist, you must exit **minidisks** and type:

```
mkdir /u/anydir (Press Enter)
```

These steps will create the directory **/u/anydir**. See *Managing the AIX Operating System* for more information on creating new file systems.

Mount the minidisk before you use it the first time. To do this, type:
mount /u/anydir. Then press **Enter**.

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Example: Deleting a Minidisk

8.5.4.8 Example: Deleting a Minidisk

To delete a minidisk, select the **delete** option from the list of **minidisks** commands.

Note: Be certain to copy any files that you want to save before you delete the minidisk. See *Managing the AIX Operating System* for information on copying files.

- +--- **To Delete a Minidisk** -----+
1. On the MINIDISK CUSTOMIZING COMMANDS screen, type **delete**, and press **Enter**.
 2. After the > prompt, type the name of the minidisk you want to delete. Press **Enter**.
 3. On the summary screen, verify that you want to delete the minidisk by pressing **Enter**. To cancel the deletion process, press **F3**.
- +

AIX/370 Installing and Customizing the Operating System

Example: Changing Minidisk Mount Attributes

8.5.4.10 Example: Changing Minidisk Mount Attributes

To change the mount attributes for an existing AIX/370 minidisk, select **change** from the list of **minidisks** commands.

The mount attributes (automount, permissions, and so on) usually are set so that existing minidisks are automatically mounted each time you start up the system. However, if you want to change the attributes of one or more minidisks so that they are not automatically loaded at startup time, you can do so with the **change** command.

To change mount attributes, follow these steps:

- ```
+--- To Change Mount Attributes -----+
|
| 1. On the MINIDISK CUSTOMIZING COMMANDS screen, type change. Press
| Enter.
|
| 2. After the > prompt, type the name of the minidisk you want to
| change. Press Enter.
|
| 3. After the > prompt, type yes or no to indicate whether you want to
| change the directory on which the minidisk is mounted. Then press
| Enter.
|
| 4. Type yes or no to indicate whether you want to change the
| automatic mount status of the minidisk. Then press Enter.
|
| 5. Type yes or no to indicate whether you want to change the
| read/write status of the minidisk. Then press Enter.
|
| 6. On the summary screen, press Enter to change the mount attributes
| or press F3 to cancel the mount process.
|
+-----+
```



**AIX/370 Installing and Customizing the Operating System**  
In Detail

To CANCEL changing the mount characteristics, press F3.  
To CAUSE the mount characteristics to take effect,  
press Enter.

>

## AIX/370 Installing and Customizing the Operating System

### Appendix A. Special Processing for Devices

#### A.0 Appendix A. *Special Processing for Devices*

While adding or deleting certain devices, you may receive a message that *special processing* has failed. Special processing automatically makes appropriate changes in the files when a printer, a tty, a pty device, a floating point unit, or other device is either added to or deleted from the system configuration through the **devices** command.

When a system user has inadvertently edited certain files, a message on the display screen may indicate that processing has failed. Then you must edit the files to make the necessary changes. The **devices** command has already added the device to the system, but that device is not usable until you make changes in the files. For directions on editing files, see the *Managing the AIX Operating System* and *AIX INned* manuals.

#### Subtopics

##### A.1 Devices

## AIX/370 Installing and Customizing the Operating System Devices

### *A.1 Devices*

Should you receive a message that special processing for devices has failed, read the following sections to determine what action to take.

#### Subtopics

A.1.1 Printer

A.1.2 pty

A.1.3 Tape

## AIX/370 Installing and Customizing the Operating System Printer

### A.1.1 Printer

When a printer is added, a new print queue (with the same name as the printer) is created. For example, the first printer added to the system is assigned the name **lp0**, and the queue associated with that printer is also assigned the name **lp0**. You can print jobs on the printer by using the command **print lp0 filename**. This printer/queue association is established by updating the **/etc/qconfig** file. In addition, the special processing routine issues the **print -rr** command to activate the new print queue. (When the printer is deleted through the **devices** command, the queue is also deleted.) For more information on the format of the **/etc/qconfig** file, see *AIX Operating System Technical Reference*.

When special processing fails, take these actions to add or delete a printer.

#### Subtopics

A.1.1.1 Adding a Printer

A.1.1.2 Deleting a Printer

## AIX/370 Installing and Customizing the Operating System

### Adding a Printer

#### A.1.1.1 Adding a Printer

Edit the `/etc/qconfig` file to add a new queue for the printer. You must add two stanzas to the file, one for the queue and one for the printer. For example, add the following stanzas to the `/etc/qconfig` file to add a printer:

```
lp0:
 argname = lp0
 device = dlp0

dlp0:
 file = /dev/lp0
 backend = /usr/lpd/piobe -pname=name -device=dname
 -profile=/etc/ddi/dfilename -statusfile
```

where,

*name* is the name of lp#.

*dname* is the ddi stanza name. You can find this name by looking at the lp0 stanza in the `/etc/system` file and getting the value of the keyword `use`.

*dfilename* is the ddi file name. You can find this name by looking at the lp0 stanza in the `/etc/system` file and getting the value of the `ddi_file` keyword.

Add the following stanzas to the `/etc/qconfig` file to add a plotter:

```
lp1:
 argname = lp1
 device = dlp1

dlp1:
 file = /dev/lp1
 backend = /usr/lpd/piobe -statusfile -pname=name -plot
```

## AIX/370 Installing and Customizing the Operating System

### Deleting a Printer

#### *A.1.1.2 Deleting a Printer*

Edit the **/etc/qconfig** file to delete the queue associated with the plotter or printer that you deleted. You must delete two stanzas from **/etc/qconfig**, the queue stanza and the device stanza. For example, delete stanzas `lp0` and `dlp0` from the **/etc/qconfig** file.



## AIX/370 Installing and Customizing the Operating System

### pty

#### A.1.2 pty

When a new pty device is added, a new entry is made in the **/etc/systems** file for the controller side (ptc) of the pty device and the server side (pts) of the device. Special processing involves only the controller side (ptc). When a pty device is deleted with the **devices** command, the special processing routine removes the ptc entry from **/etc/system**.

When a new pty device is added to the system and the **logger** keyword is set to **true**, a new entry is made in the **/etc/ports** file for the pty device. Information about the terminal type, parity type, bits per character, number of stop bits, herald, location, and choice of whether the pty is to be automatically enabled during system start is copied from the device information file to the new entry in **/etc/ports**. The new entry sets the pty's characteristics when the pty device is enabled. When the pty is deleted through the **devices** command, the entry in **/etc/ports** is also deleted. For information about the format of the **/etc/ports** file, see *AIX Operating System Technical Reference*.

To perform special processing when adding or deleting a pty device, take the following actions.

#### Subtopics

A.1.2.1 Adding a pty Device

A.1.2.2 Deleting a pty Device

## AIX/370 Installing and Customizing the Operating System

### Adding a pty Device

#### A.1.2.1 Adding a pty Device

Edit the `/etc/system` file to add a new entry for the controller side of the pty device. You may also have to add an entry in `/etc/ports` for the device. You must add one stanza to the `/etc/system` file. For example, if `pts0` is added to the system but special processing fails, add the following stanza to the `/etc/system` file:

```
ptc0:
 driver = uptc
 minor = c0
 modes = rw-rw-rw-
```

Note that the **minor** keyword value is **c** followed by the pty number.

Each pty device has a stanza associated with that device in the `/etc/ddi/pty` file. Each stanza contains a **logger** keyword. If the **logger** keyword is not present in the pty device's stanza, the pty device uses the **logger** keyword from the default stanza.

If **logger = true** for the pty device, you must edit the `/etc/ports` file, adding a new stanza for the pty device. For example, if `pts0` is added to the system but special processing fails and **logger = true**, add the following stanza to `/etc/ports`:

```
/dev/pts0 :
 loc = "pts0"
 term = tt
 parity = pt
 enabled = true/false
 logmodes = (see below)
 herald = "IBM AIX/370
 AIX/370 Operating System
 \r\nxxxXxxxx(c)
 Copyright IBM Corp. 1985,1989\r\n
 (/dev/pts0)\r\nlogin:"
```

where:

*term* is the terminal type that was specified when the pty was added with **devices**. It is the value entered for the keyword **tt**.

*parity* is the parity specified when you added the pty device with the **devices** command. Its corresponding value in the ddi file is "pt," shown on the left below. The value on the right is in the `/etc/ports` file. The values map as follows:

```
pt even --> parity even
pt odd --> parity odd
pt none --> parity none
pt space --> parity space
pt mark --> parity mark
```

*enabled* refers to whether you want the terminal functional when you start the system. Choose either true or false. If you choose false, you must use the **penable** command to enable the terminal.

*logmodes* consists of three parts: **echoe+CSNSTOP**. These parts are defined as follows:

- **echoe+** is part of all logmodes for a pty device.

## AIX/370 Installing and Customizing the Operating System

### Adding a pty Device

- **CSN** is determined by the **bpc** value in the device's ddi stanza:  
  
    bpc = 5 --> cs5  
    bpc = 6 --> cs6  
    bpc = 7 --> cs7  
    bpc = 8 --> cs8
- **STOP** is determined by the **nosb** value in the device's ddi stanza:  
  
    nosb = 1 --> -cstopb  
    nosb = 1.5 --> -cstopb  
    nosb = 2 --> +cstopb

For example, a pty device with **bpc = 8** and **nosb = 2** has **logmodes = echoe+cs8+cstopb**.

## AIX/370 Installing and Customizing the Operating System

### Deleting a pty Device

#### A.1.2.2 *Deleting a pty Device*

Edit the **/etc/system** file to delete the ptc stanza associated with the pty device. You must delete one stanza from **/etc/system**. If there is a corresponding entry in **/etc/ports** for the entry you deleted from **/etc/system**, edit **/etc/ports** to delete the corresponding entry. For example, if pts3 is deleted from the system but special processing fails, delete stanza ptc3 from the **/etc/system** file and delete stanza pts3 from **/etc/ports**.

## AIX/370 Installing and Customizing the Operating System Tape

### A.1.3 Tape

When a streaming tape drive is added to the system through the **devices** command, the default dump device becomes the tape device. This is accomplished by changing the **backupdev** and **backuplen** keywords in the **/etc/filesystems** file to be the values for tape. The **backupdev** keyword value is set to **/dev/rmt0**, and the **backuplen** keyword value is set to **2700**. When the streaming tape drive is deleted from the system configuration, the values are changed back to the tape values. The keyword **backupdev** is set to **/dev/rmt0rh** and **backuplen** is set to **2400**.

When special processing fails, take these actions when adding or deleting a tape.

#### Subtopics

A.1.3.1 Adding a Tape

A.1.3.2 Deleting a Tape

## AIX/370 Installing and Customizing the Operating System

### Adding a Tape

#### A.1.3.1 *Adding a Tape*

Edit the `/etc/filesystems` file to change two keywords in the default stanza:

```
default:
 backupdev = /dev/rmt0
 backuplen = 2700
```

Ignore other keywords in the default stanzas.

## AIX/370 Installing and Customizing the Operating System

### Deleting a Tape

#### A.1.3.2 *Deleting a Tape*

Edit the `/etc/filesystems` file to change two keywords in the default stanza:

```
default:
 backupdev = /dev/rmt0rh
 backuplen = 2400
```

Ignore other keywords in the default stanzas.

# AIX/370 Installing and Customizing the Operating System

## Appendix B. Using the AIX/370 Console

### *B.0 Appendix B. Using the AIX/370 Console*

With this appendix, you can use a System/370 3278 console when installing and customizing AIX/370.

You can use the console in a VM mode when starting AIX/370. But during normal operation, enter all operator commands from an IBM PS/2 attached to the LAN.

#### Subtopics

B.1 Control Sequences

B.2 Key Mapping

B.3 Identifying Special Keys

B.4 Keys



## AIX/370 Installing and Customizing the Operating System Control Sequences

### *B.1 Control Sequences*

When typing control sequences that use the letters A through Z, type ^ (caret) followed by the letter.

Enter commands as upper case letters. For example:

**shift u** up

**shift d** down

**shift q** quit

Cursor up and Cursor down will not work on a 3270 terminal.



## **AIX/370 Installing and Customizing the Operating System**

### **Identifying Special Keys**

#### *B.3 Identifying Special Keys*

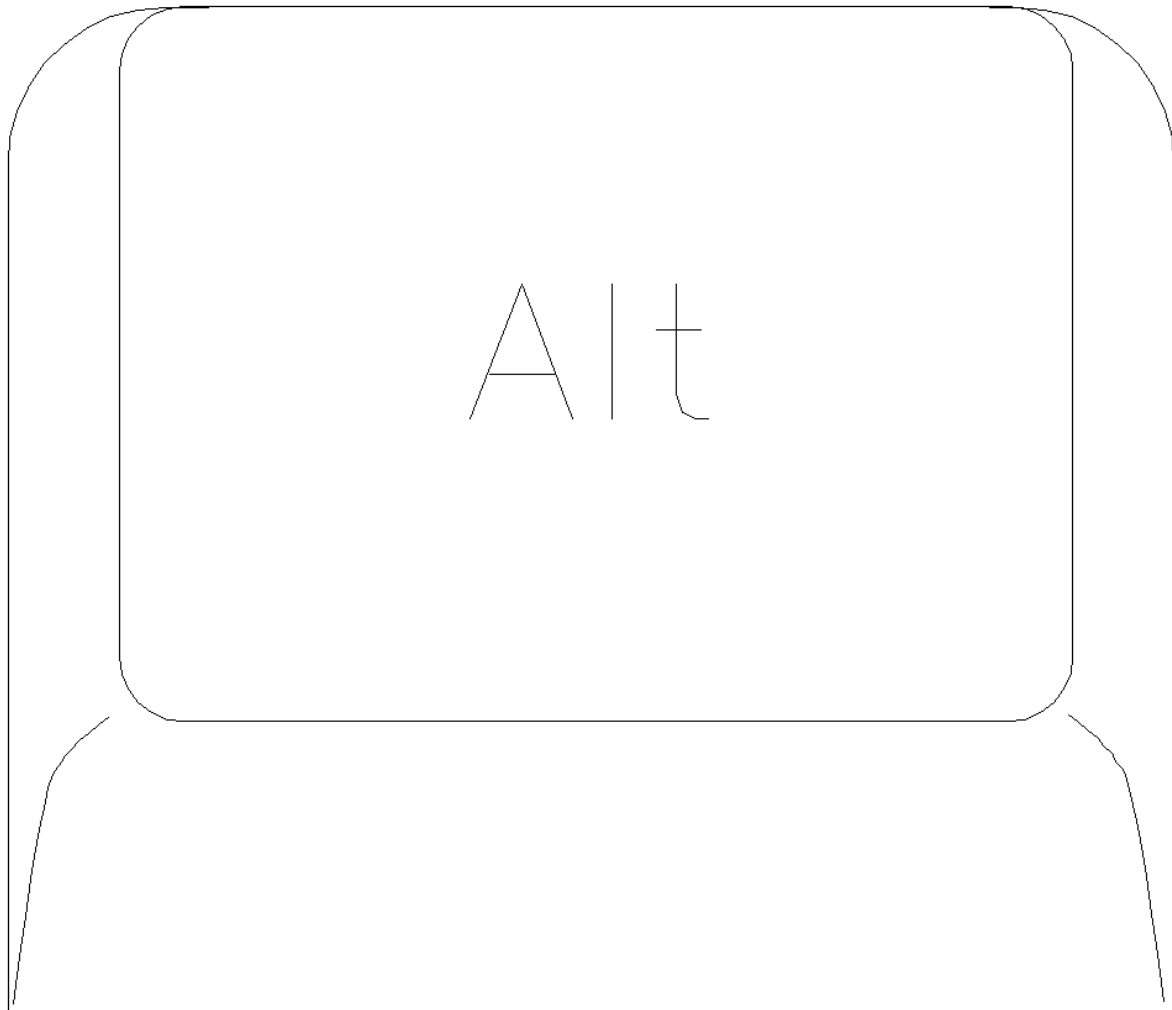
To install the AIX/370 Operating System, you will use the keyboard of a 3270-type terminal. The discussion below outlines significant keys.

## AIX/370 Installing and Customizing the Operating System Keys

### B.4 Keys

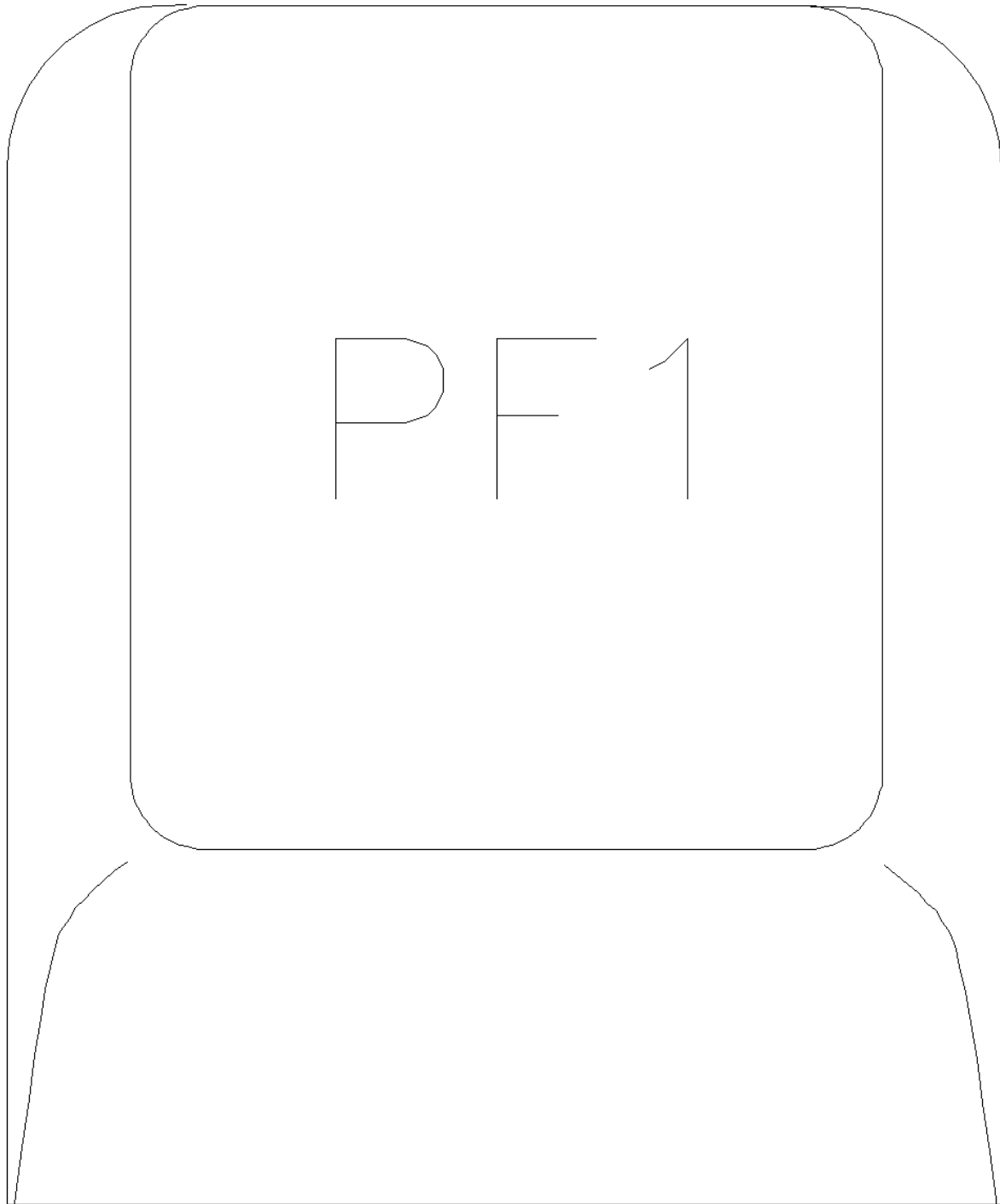
As you install the AIX/370 Operating System, you will use the keys on the virtual machine console. The keys you will use most often are described next. Locate them on your keyboard. If necessary, see the *VM Guide to Operations* for a full description of all of the keys on your keyboard.

| <b>Engraving</b> | <b>Function</b>  | <b>What It Does</b>                                                                              |
|------------------|------------------|--------------------------------------------------------------------------------------------------|
| PICTURE 3        | <b>Enter</b>     | Sends information or commands from the input line to the AIX/370 system, followed by a new line. |
|                  | <b>Alternate</b> | Works with other keys to perform various functions.                                              |



**PF1**

Displays a menu of the AIX  
function key definitions.



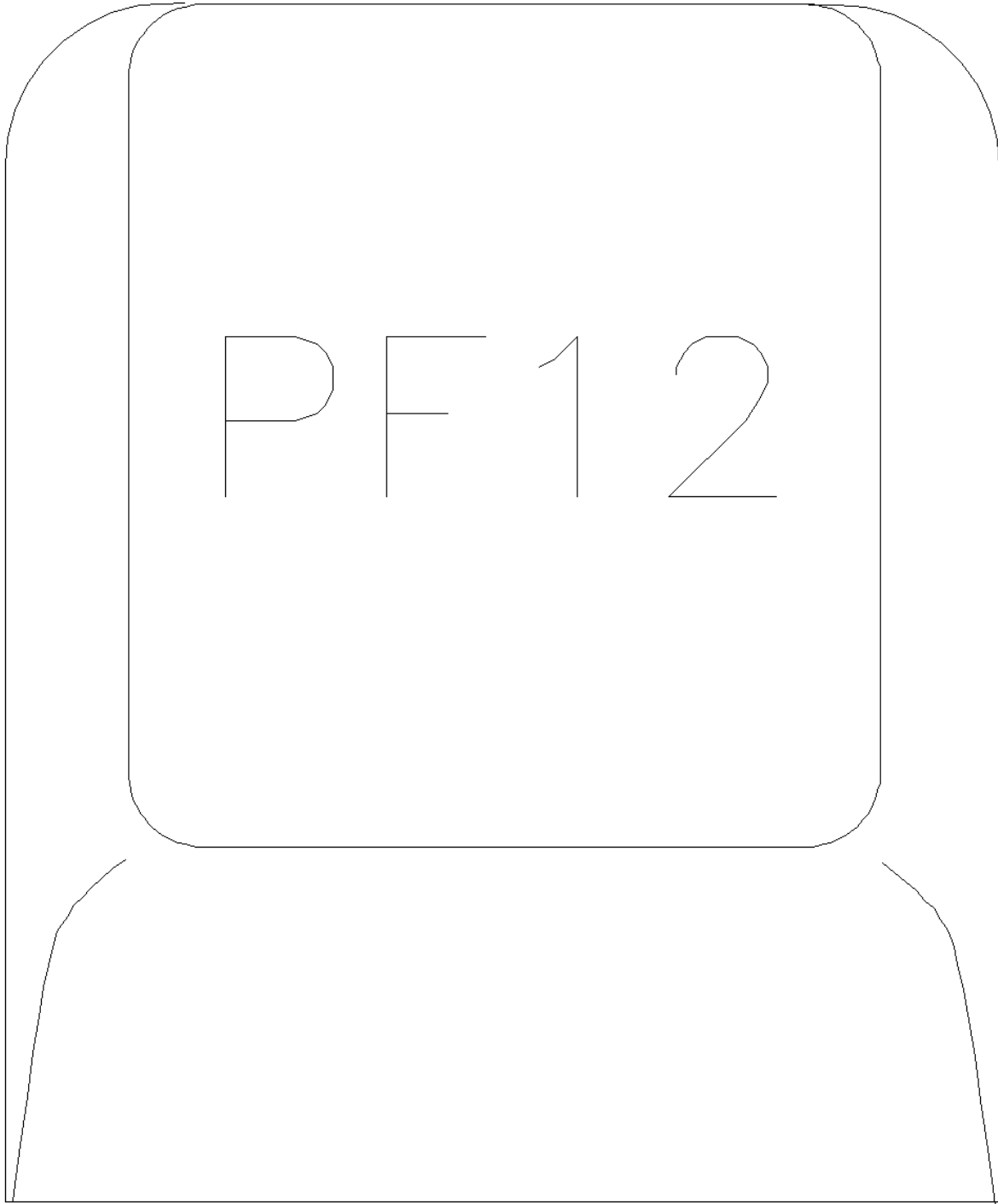
PICTURE 6

**Quit**

Cancels a particular action during full-screen installation program. When not in full-screen mode, PF3 disconnects the virtual terminal.

**PF12**

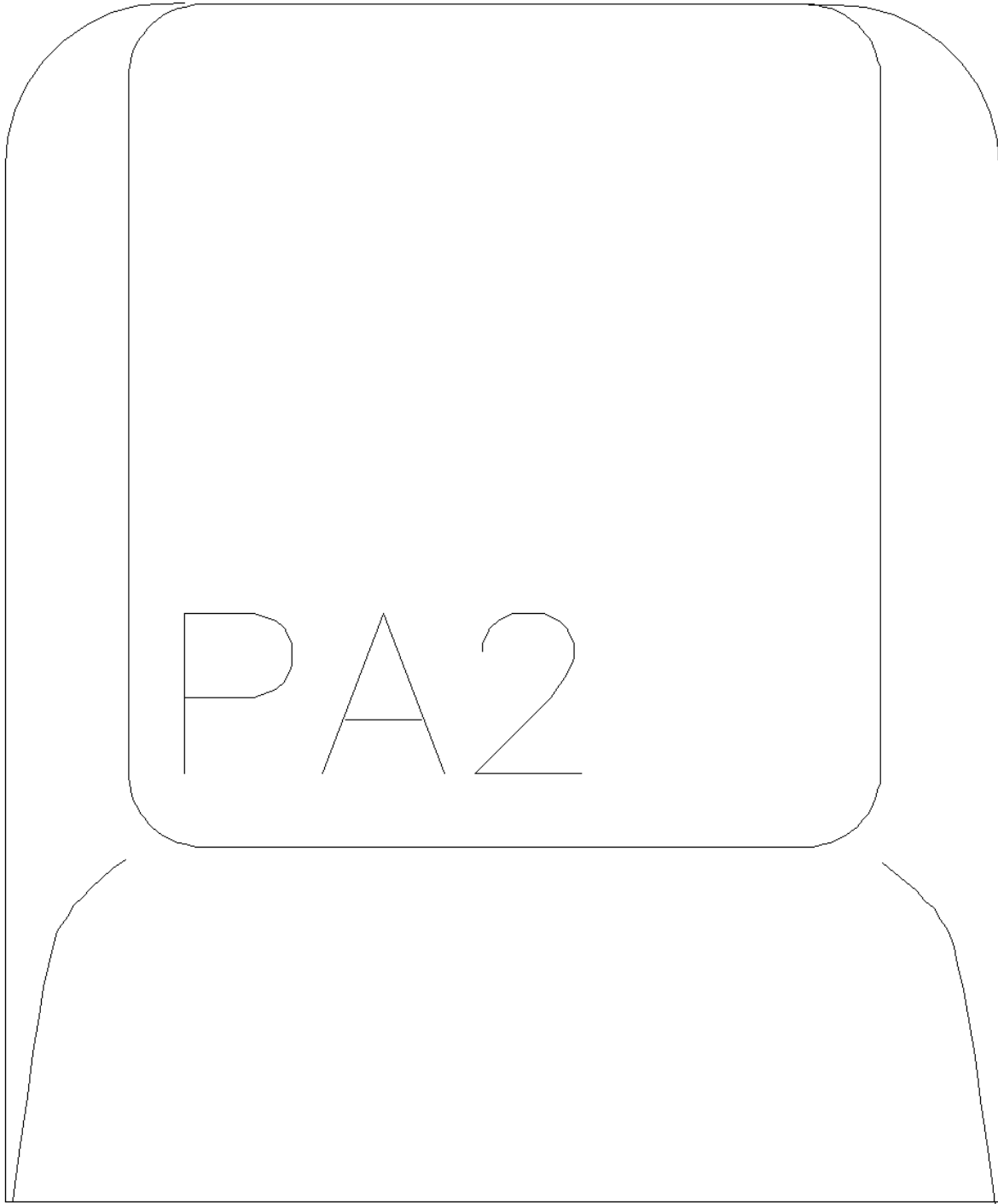
Sends information or commands into the AIX/370 system. No new line is sent.



**PA2**

Clears the screen when *more* or *holding* appears in the bottom of the screen.

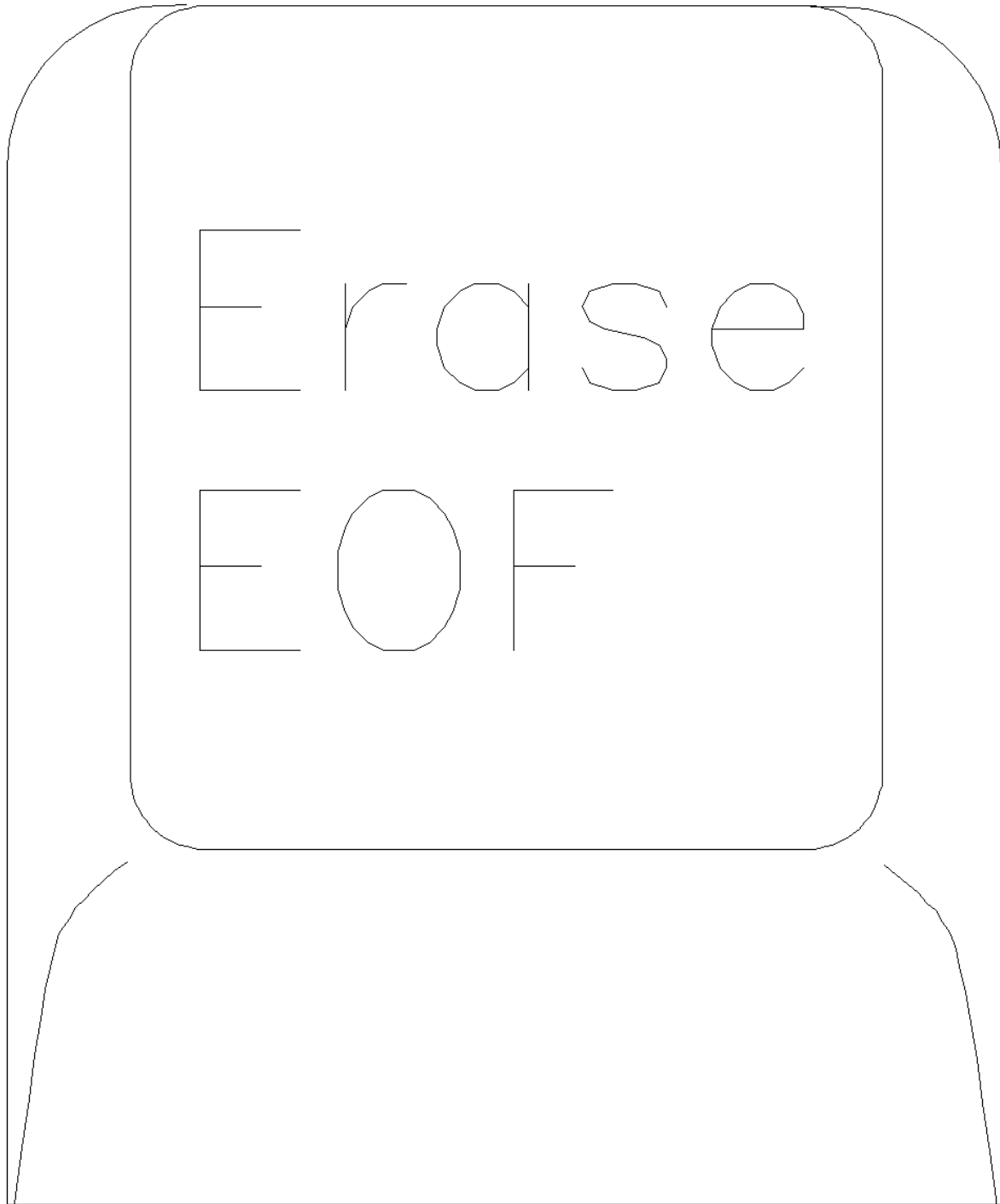
**AIX/370 Installing and Customizing the Operating System**  
Keys



**Erase EOF**

Erase characters to right of  
cursor.





PICTURE 10

**Cursor Left** Moves the cursor horizontally to the left across the screen. This key functions locally only, prior to sending the command line with enter.

PICTURE 11

**Cursor Right** Moves the cursor horizontally to the right across the screen. This key functions locally only, prior to sending the command

## AIX/370 Installing and Customizing the Operating System

### Keys

line with enter.

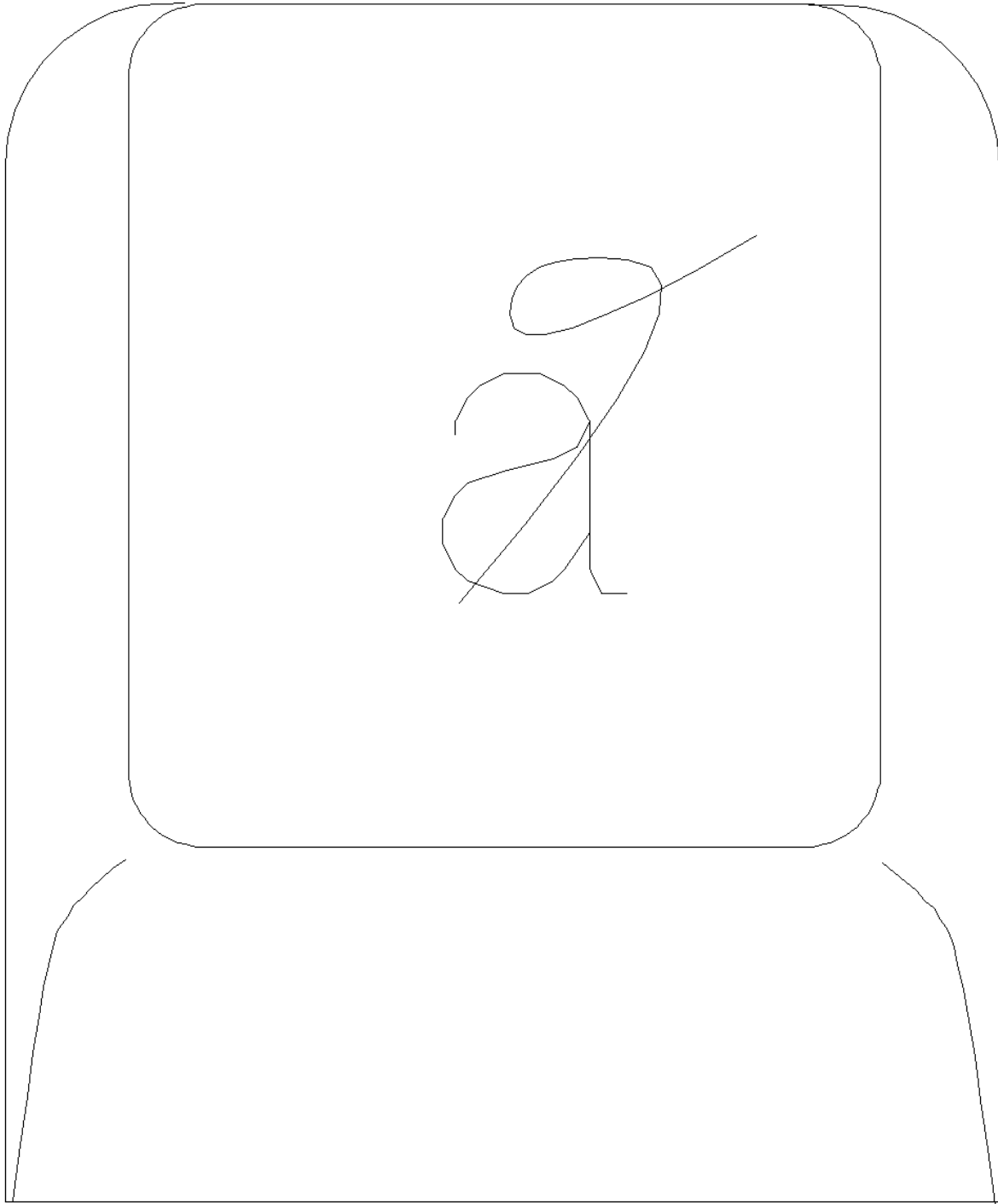
PICTURE 12

#### **Insert**

Puts the terminal into an insert mode. The characters subsequently typed are inserted and all characters to the right of the cursor are shifted to the right.

#### **Delete**

Erases the character where the cursor is positioned on the input line.



**Reset**

Removes the terminal from the insert mode and clears the error indicator from the bottom of the screen.

PICTURE 14

## **AIX/370 Installing and Customizing the Operating System**

### **Appendix C. The clm, newsite and linstall Programs**

#### *C.0 Appendix C. The clm, newsite and linstall Programs*

This appendix lists all of the tasks performed by running the **clm**, **newsite** and **linstall** commands during the installation process.

#### Subtopics

C.1 The clm Program

C.2 The newsite Program

C.3 linstall

## AIX/370 Installing and Customizing the Operating System

### The clm Program

#### C.1 The clm Program

Updates the site file with a new site entry `/etc/site`).

Updates the hosts file with the new site's IP entry `/etc/hosts`).

Creates a mount point for the new site's **local** filesystem (`mkdir`).

Changes the mode for the new site's **local** filesystem (`chmod`).

Changes the **fstore** for the new site's **local** filesystem (`chfstore`).

Creates a mount point for the new site's user filesystem `mkdir`).

Changes the mode for the new site's user filesystem `chmod`).

Changes the **fstore** for the new site's user filesystem (`chfstore`).

Creates the **local** special file `/generic/dev/local` (`mknod`).

## AIX/370 Installing and Customizing the Operating System

### The newsite Program

#### C.2 The newsite Program

Modifies the site file `/etc/site`).

Modifies the hosts file `/etc/hosts`).

Makes a replicated root file system `mkfs`).

Checks the consistency of the root file system `fsck`).

Assigns pack number and a unique `gfs` number to the root file system.

Mounts the root file system (`on /`).

Propagates the root file system `primrec`).

Keeps the root file system up to date `recmstr`).

Converts the `local` file system to have the site name (`rdevcvt`).

Checks the consistency of the `local` file system (`fsck`).

Creates the `local` file system mount point (`mkdir`)

Changes the mode of the `local` file system mount point (`chmod`).

Mounts the `local` file system (`mount`).

Makes miscellaneous spool directories `mkdir`).

Copies a kernel onto `unix.std` (`/generic/unix.ps2`).

Assigns proper ownership `sys`) and permissions (`644`) to the kernel.

Links `unix.std` to `unix` (`ln`).

Assigns pack and `gfs` numbers (`fsdb`).

Changes the mode of the user file system mount point `chmod`).

Changes the `fstore` of the `/user` file system mount point to all (`chfstore`).

Reconfigures the kernel with `os.config` (`/usr/sys/bin/ldmunit`).

Reconfigures the kernel with `/etc/net.config` (`/usr/sys/bin/ldmunit`).

Modifies the `filesystems` file (`/generic/local/filesystems`).

Modifies the `fsmap` (`/etc/fsmap`).

Assigns a unique `gfs` to the `/local` file system (`fsdb`).

Assigns a unique `gfs` to the `/local/tmp` file system (`fsdb`).

Assigns a unique `gfs` to the `/u/sitename` file system (`fsdb`).

### *C.3 linstall*

**linstall** is used by the installation process to install the base operating system onto the target machine.

It is run in the shell scripts **.post.386.sh** and **.post.370.sh**, depending on the machine. It is also used to create empty files in the local of the machine. **linstall** is run in **newsite.bkend**.

# AIX/370 Installing and Customizing the Operating System

## Appendix D. Installing the RSCS Driver

### D.0 Appendix D. Installing the RSCS Driver

The RSCS driver for AIX/370 which is distributed with AIX/370 is available in source and text format in the directory called `/usr/lib/RSCS`. These are the file names for each release:

| RSCS REL # | Source Name     | Module Type         | Purpose                |
|------------|-----------------|---------------------|------------------------|
| 1.3        | dmtvix.source   | assembler<br>source | driver                 |
|            | dmtvix.text     | text module         |                        |
| 2.1        | dmtvix2.source  | assembler<br>source | driver                 |
|            | dmtvix2.text    | text module         |                        |
|            | dmtequ2.source  | assembler<br>source | link protocol<br>table |
|            | dmtequ2.text    | text module         |                        |
| 2.2        | dmtvix22.source | assembler<br>source | driver                 |
|            | dmtvix22.text   | text module         |                        |
|            | dmtequ22.source | assembler<br>source | link protocol<br>table |
|            | dmtequ22.text   | text module         |                        |

An overview of the steps to install the driver and the steps to customize RSCS for AIX/370 are provided below. Some of the file names and their contents may differ from your system, but these differences are pointed out in the more detailed description of the installation and customization procedures.

**Note:** Protect the old RSCS versions of the source and text files.

#### Subtopics

D.1 Overview of RSCS Driver Installation

D.2 Customizing RSCS For AIX/370

D.3 Installing RSCS Driver

D.4 Customizing RSCS for AIX/370



## AIX/370 Installing and Customizing the Operating System

### Overview of RSCS Driver Installation

#### *D.1 Overview of RSCS Driver Installation*

1. Send the appropriate driver to the MAINT VM machine.
2. Log on as MAINT, receive the source and text files.
  - a. Compare DMTEQU source with the module in RSCS.
  - b. If the only difference between the RSCS module and the new AIX/370 version of DMTEQU is the line where DMTVIX is declared, replace the module in RSCS with the new module from AIX.
  - c. If the RSCS module has been modified to support RSCS communications with other machines types (example, S/3X), then the RSCS module will be modified to reflect the new AIX/370 driver. The module in RSCS has the definitions for all the other machines in your system.
    - 1) The control file will indicate what modifications to make.
    - 2) Make the changes to the DMTEQU module.
    - 3) Reassemble DMTEQU.
3. If DMTEQU has NOT been reassembled, and it is part of your RSCS system, rename it to DMTEQU TXTxxx filemode.
4. Modify RSCS LOADLIST to include DMTVIX.
5. Rebuild RSCS LOADLIB and copy it to the RSCS system disk.

## AIX/370 Installing and Customizing the Operating System

### Customizing RSCS For AIX/370

#### D.2 Customizing RSCS For AIX/370

1. Add a virtual channel-to-channel adapter (CTCA) to the RSCS VM machine.
2. Add a link to the RSCS CONFIG file.
  - a. Locate the FILEDEF CONFIG DISK command in the PROFILE GCS file.
  - b. Add the LINK command to RSCS CONFIG file.
3. Add the appropriate routing information in the RSCS CONFIG file.
4. Restart RSCS to activate the new driver.

In addition to the source and text files mentioned previously, the following files will also be modified or created:

Braces indicate optional modifications:

| FILENAME | FILETYPE | DESCRIPTION    | NEW/MODIFIED |
|----------|----------|----------------|--------------|
| RSCSV2   | CNTRL    | Control file   | modified     |
| DMTEQU   | xxx      | Source update  | new          |
|          |          | module         |              |
| MODAIX   | xxx      | Temp source    | new          |
|          |          | file (added    |              |
|          |          | to DMTEQU xxx) |              |
| DMTEQU   | TXTxxx   | text file      | new          |
| RSCS     | LKEDCTRL | Loadlist       | modified     |
| RSCS     | LOADLIB  | load library   | new          |
| RSCS     | CONFIG   | RSCS           |              |
|          |          | configuration  | modified     |
| PROFILE  | GCS      | system profile | modified     |

## AIX/370 Installing and Customizing the Operating System

### Installing RSCS Driver

#### D.3 Installing RSCS Driver

1. Send the RSCS modules from AIX/370:  
The syntax for a source file is:

```
uvcp -f80 /usr/lib/RSCS/dmtvix22.source -d maint
uvcp -f80 /usr/lib/RSCS/dmtequ22.source -d maint
```

The syntax for a text file is:

```
uvcp -b -f80 /usr/lib/RSCS/dmtvix22.text -d maint
uvcp -b -f80 /usr/lib/RSCS/dmtequ22.text -d maint
```

-f80 is for the transfer in fixed record format, 80 bytes long (the default is variable and could cause trouble).  
-d is the VM userid that will receive the file.  
-b is the binary flag - the file will not be translated. The text file contains the binary code of the driver.

2. Logon in VM as MAINT, and receive the source and text files: Use rdrlst to list your reader files. Receive the files from the rdrlst line.

For source files:

```
RECEIVE / DMTVIX22 ASSEMBLE A
RECEIVE / DMTEQU22 ASSEMBLE A
```

For text files:

```
RECEIVE / DMTVIX22 TEXT A
RECEIVE / DMTEQU22 TEXT A
```

The filemode A is arbitrary and dependent on your system.

- a. Compare source modules: AIX against RSCS.
- b. If you need to update DMTEQU to be able to communicate with other machine types, perform the modifications in step C.1-3 below. If not, replace the old RSCS module with the new AIX/370 module and go to 3 (Renaming DMTEQU).
- c. Perform the following modifications if necessary:
  - 1) The name of the control file can be found in the RSCS loadlist, RSCS LKEDCTRL, and should match the %CONTROL parameter. The filetype is CNTRL. This file (RSCSV2 CNTRL, or something like it) should look like:

```
TEXT MACS DMTMACV2 CSISP VTAMAC DMKSP DMSSP CMSLIB
188R2 AUX188R2
S3X AUXS3X
```

The third line indicates that when DMTEQU ASSEMBLE is assembled using this control file, the assembler will look for a source update file with the same filename but filetype of S3X (i.e., DMTEQU S3X). It also indicates that the text file created by the assembler will have TXTS3X as the filetype and

## AIX/370 Installing and Customizing the Operating System

### Installing RSCS Driver

search for files with TXTS3X filetype during linkedit. If the file does not appear as above, and the DMTEQU file is needed for your system, add the third line to the control file. The S3X in both positions on the line can be whatever three characters suit your needs, such as S3X, AIX, etc., so long as they are consistent.

- 2) Make changes to the DMTEQU module. Create a file (MODAIX S3X, for example) to hold the modifications for the AIX driver. It should look like the following:

```
DC CL8'S3X ',CL8'DMTVAB ',V(DMTVABEP),AL1(0)
DC CL8'VIX ',CL8'DMTVIX ',V(DMTVIXEP),AL1(LNET),AL3(0)
```

The second line is the definition for the DMTVIX driver. Lines such as the first will have to be added for every other machine that RSCS will communicate with. If RSCS will not be communicating with any other AIX/370 machine, you can omit lines of the first type. To easily create the DMTEQU S3X file referenced above, you xedit the file in the following way:

```
X DMTEQU ASSEMBLE C (CTL RSCSV2
```

As DMTEQU S3X has not been created, xedit will create it for you. You only do a GET MODAIX at the place you want the update to take place in the file DMTEQU ASSEMBLE. The following shows the file after the GET (new lines are indicated by ">"):

```
.
.
.
DMTEQU S3X A1 F 80 ...
* LINE AND SESSION DRIVER EQUATES
 DC CL8'NJE ',CL8'DMTNET ',V(DMTNETEP),AL1(0)
 DC CL8'RJE ',CL8'DMTNPT ',V(DMTVABEP),AL1(0)
 DC CL8'MRJE ',CL8'DMTSML ',V(DMTVABEP),AL1(0)
 DC CL8'3270P ',CL8'DMTRPT ',V(DMTVABEP),AL1(0)
> DC CL8'S3X ',CL8'DMTVAB ',V(DMTVABEP),AL1(0)
> DC CL8'VIX ',CL8'DMTVIX ',V(DMTVIXEP),AL1(LNET),AL3
 DC CL8'SNANJE ',CL8'DMTSNE ',V(DMTSNEEP),AL1(LNET),AL3
 DC CL8'SNA3270P',CL8'DMTSPT ',V(DMTSPTEP),AL1(LNET),AL3
* RSCS SYSTEM TASK EQUATES
DMTEQUIRE DC CL8' ',CL8'RSCS ',V(DMTREXEP),AL1(0)
DMTEQUAX DC CL8' ',CL8'DMTAXM ',V(DMTAXM),AL1(0)
DMTEQUEX DC CL8' ',CL8'DMTEXE ',V(DMTEXE),AL1(0)
.
.
.
```

Now type in FILE, and press ENTER. The file DMTEQU S3X is created with the following content:

```
DMTEQU S3X A1 F 80 ...
./ I 00095000 01/0
 DC CL8'S3X ',CL8'DMTVAB ',V(DMTVABEP),AL1(0)
 DC CL8'VIX ',CL8'DMTVIX ',V(DMTVIXEP),AL1(LNET),AL3
```

- 3) Reassemble DMTEQU:  
You can now assemble DMTEQU and see that DMTEQU S3X is

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### Installing RSCS Driver

automatically called and DMTEQU TXTS3X created. In order to accomplish this, type in the following command:

```
VMFASM DMTEQU RSCSV2
```

This is the output from the command:

```
DMSUPD178I Updating DMTEQU ASSEMBLE A1
DMSUPD178I Applying DMTEQU S3X A1
.
.
.
DMSWAM1907I Assembling DMTEQU

ASSEMBLER (XF) DONE
NO STATEMENTS FLAGGED IN THIS ASSEMBLY
DMSWAM1909I DMTEQU TXTS3X A created
Ready; T=3.73/7.01 15:02:02
```

3. Rename DMTEQU if it has not been re-assembled:  
If DMTEQU has not been re-assembled, and you just received it in your rdrlist as DMTEQU TEXT A, rename it using the following command:

```
RENAME DMTEQU TEXT A = TXTxxx =
```

The xxx indicates the three characters specified in the control file (see step 2.C.1.).

4. Update your RSCS installation:  
Locate the RSCS linkedit control file of your installation. The filename is arbitrary, but the file type must be LKEDCTRL. Add the following line to this file before the INCLUDE DMTEND (new lines are indicated by ">"):

```
.
.
.
INCLUDE DMTNET
INCLUDE DMTNPT
INCLUDE DMTSML
INCLUDE DMTRPT
INCLUDE DMTSNE
INCLUDE DMTSPT
> INCLUDE DMTVIX
INCLUDE DMTEND
ENTRY DMTMANEP
NAME DMTMAN
.
.
.
```

5. Create a new RSCS load module and copy it to the RSCS minidisk:  
Create the RSCS loadlib according to the specifications in RSCS LKEDCTRL and RSCSV2 CNTRL:

```
VMFLKED RSCS
```

Copy the loadlib to the RSCS minidisk with the following command:

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COPY RSCS LOADLIB A = = G

## AIX/370 Installing and Customizing the Operating System

### Customizing RSCS for AIX/370

#### D.4 Customizing RSCS for AIX/370

1. Add CTCA to VM machine:

Add a DEFINE statement and a START to the PROFILE GCS file. You need to add one CTCA device for each AIX/370 machine defined. Add the START command(s) anywhere after the RSCS INIT command. In this example, three devices will be added (new lines are indicated by ">"), relating to three different machines defined:

```
PROFILE GCS H1 V 130...
/* */
trace r
'CP SET IMSG OFF'
'CP SET EMSG ON'
'CP SPOOL CONSOLE START'
>'CP DEF CTCA 600'
>'CP DEF CTCA 601'
>'CP DEF CTCA 602'
/*'ACC 298 G'*/
/* */
'GLOBAL LOADLIB RSCS EXITLIB'
'FILEDEF CONFIG DISK RSCS CONFIG *'
'LOADCMD RSCS DMTMAN'
/* */
'RSCS INIT'
if rc ^= 0 then exit rc
/* */
'RSCS NETWORK START APPLID SP6TEST1 RETRY 10'
/* */
'RSCS START WTSCSL4'
>'RSCS START AIX370'
>'RSCS START AIX370V'
>'RSCS START AIX3'
exit
```

The virtual address (600, 601, and 602 in this case) is arbitrary but should be unique for the RSCS virtual machine. Instead of using DEFINE commands in PROFILE GCS, the virtual CTCA can be created by adding a SPECIAL statement to the VM directory for the RSCS machine:

```
SPECIAL 600 CTCA
SPECIAL 601 CTCA
SPECIAL 602 CTCA
```

2. Adding the Link information:

a. Locate the FILEDEF CONFIG DISK command:

The name of the RSCS configuration file can be found in the PROFILE GCS file as a parameter to the FILEDEF CONFIG DISK command:

```
FILEDEF CONFIG DISK RSCS CONFIG *
```

(RSCS CONFIG in this example).

b. Add a link command to the RSCS CONFIG file:

This command activates the AIX/370 RSCS driver:

```
* ----- RSCS LINK FOR AIX/370 COMMUNICATION -----
```

## AIX/370 Installing and Customizing the Operating System

### Customizing RSCS for AIX/370

| * |        | LINK    | VIRT | SPOOL   | KEEP  | QUEUE |     |        |  |
|---|--------|---------|------|---------|-------|-------|-----|--------|--|
| * | LINKID | TYPE    | ADDR | * CLASS | SLOTS | TYPE  | DP  | LUNAME |  |
| * | -----  | ----    | ---- | -       | ----- | ----- | --- | -----  |  |
|   | LINK   | AIX370  | VIX  | 600     | * *   | 2     | PRI | * *    |  |
|   | LINK   | AIX370V | VIX  | 601     | * *   | 2     | PRI | * *    |  |
|   | LINK   | AIX3    | VIX  | 602     | * *   | 2     | PRI | * *    |  |

#### 3. Add routing information:

Routing information is needed for non-SNA connection between systems. The ROUTE command in the RSCS CONFIG file will give RSCS the routes to follow to reach other RSCS systems. Figure D-1 illustrates the connections between other RSCS machines and an AIX370 machine:

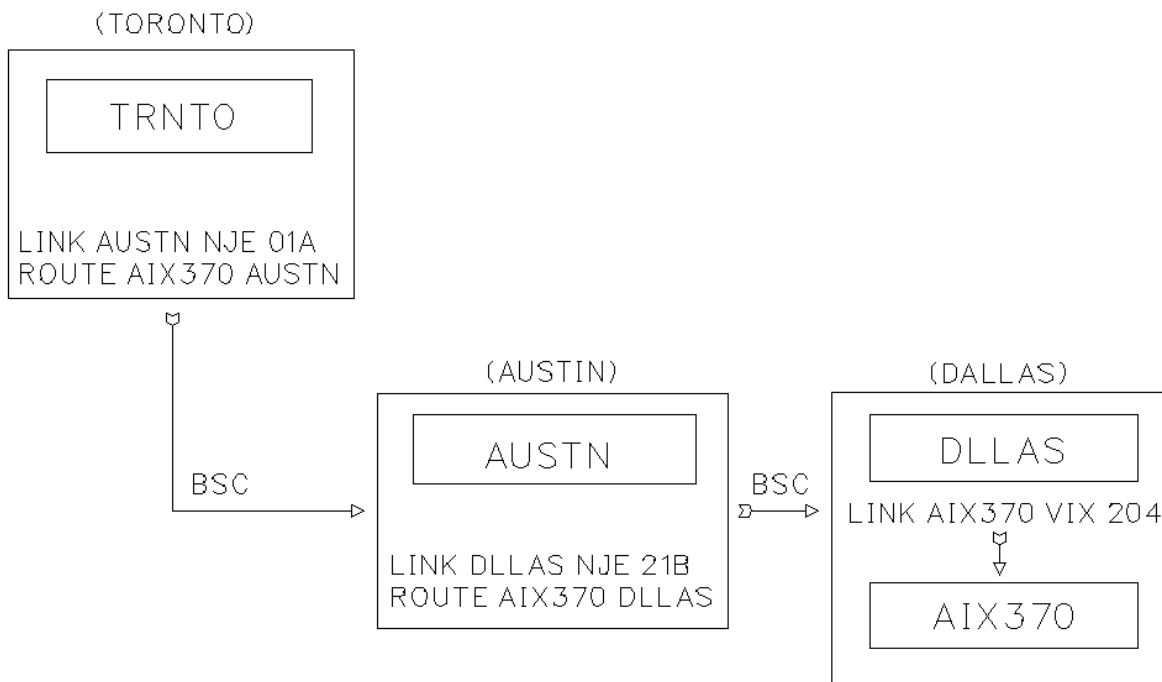


Figure D-1. Example of Route Connections

The ROUTE command in Toronto (machine name - TRNTO) is directing the files to machine AIX/370 in Dallas (DLLAS) through the Austin machine, AUSTN. The ROUTE command in Austin (AUSTN) is directing them to Dallas (DLLAS), which has the LINK command to AIX/370.

If you have the VS RSCS facility installed, you must install a user-exit routine in RSCS Version 2 Release 3 to make certain the correct RSCS nodeid and AIX userid are listed in the tag information of spool files. The proper origin addresses are necessary for data security and for programs such as PROFS.

**ACTION REQUIRED:** The following sample program shows the minimum required. You may need to make changes to this sample program if you have customized your RSCS environment.

#### Module Description

Exit 2 routine to alter origin nodeid/userid for files from AIX/370

The purpose of this exit is to allow NJE to properly resolve the origin



## AIX/370 Installing and Customizing the Operating System

### Customizing RSCS for AIX/370

nodeid/userid of an AIX user who sends a file into the RSCS network. AIX/370 punches all files to RSCS from the guest virtual machine, with the origin nodeid/userid in the SFBLK being the nodeid of the VM host and the userid of the AIX/370 guest machine. The actual AIX/370 userid that sent the file is stored by AIX/370 in the DIST field. While DMSDDL properly reflects the AIX nodeid/userid in its headers, the tag information reflects the SFBLK. This exit routine alters the TAG element to reflect the "correct" AIX nodeid/userid. Userid's of the AIX/370 guests are hard-coded.

Description : Examines the contents of TAGINVM to determine if the file is from an AIX/370 guest. If so, TAGINVM is moved into TAGINLOC, and TAGDIST is moved into TAGINVM. The original TAGINLOC is dropped.

**Note:** This exit is provided as a sample of how to resolve the problem of AIX/370 node and userid resolution. It MUST be customized for individual site requirements. This exit was written to the specifications of RSCS 2.3 exit point 2.

#### Register usage

R0 = Not used  
 R1 = Input PLIST  
 R2 = TAG element base

```
AIXX02 RMOD
AIXX02EP RENTRY RENT=YES,SAVAREA=PREALLOC,
 ARGS=(@CVT,@TAG,@EMPTY)
```

```
 L R2,@TAG Address of tag element
 USING TAG,R2
```

Here we begin the test of the origin.

```
 TM TAGFLAG5,TAGSAF Is this an S&F file?
 BNZ EXIT0 Yes - don't bother checking
```

In the following line, the XXXXXXXX must be changed to the userid of the AIX/370 guest.

```
 CLC TAGINVM(8),=C'XXXXXXX' Is this from an AIX/370 guest?
 BE AIXFIX Yes, go shuffle the TAG.
 B EXIT0 No matches... get outta here
```

Here is where we alter the TAG information for AIX/370 origin files.

```
AIXFIX EQU
 MVC TAGINLOC,BLANKS Clear origin node
 MVC TAGINLOC,TAGINVM Make AIX/370 vmid the origin node
 MVC TAGINVM,BLANKS Clear origin vmid
 MVC TAGINVM,TAGDIST Set AIX userid as origin user
 B EXIT0 All done here.
EXIT0 EQU
 LA R15,0
 REXIT RC=(15) Return to RSCS
 DS 0D
BLANKS DC CL8' '
 CVT
```

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### Customizing RSCS for AIX/370

TAG  
END

This approach requires no modification to RSCS, using standard RSCS exit point number 2 (spool file accept exit) in DMTAXM and the exit code which is link-edited and loaded in the RSCS virtual machine. The exit code is turned on via an RSCS configuration file entry which tells RSCS that exit 2 should be active, and points RSCS to the entry point name of the exit code.

Not all files coming into RSCS will be processed by exit 2, because RSCS prevents exit 2 from being called, if RSCS is *reordering* its file queue at the time the new file arrives in the reader.

## AIX/370 Installing and Customizing the Operating System

### Appendix E. User Configurable Files

#### *E.0 Appendix E. User Configurable Files*

The installation media contains files that are commonly modified after installation to customize the system to your specific needs. When the system is re-installed for any reason, these files will be overwritten, eliminating the effect of the customizing changes that had been made.

Before re-installing the system, you should make copies of the files in the following list. After the re-installation is completed, you will need to reapply your customizations to these files. These files preceded by asterisks are files which have been changed in some way between AIX 1.2 and AIX 1.2.1 or which are updated by the re-installation process. You will need to reapply any changes to these files carefully. The remaining files can be safely restored from the copies you save before the re-installation.

```
/.profile
/etc/3270.keys
/etc/INsites
/etc/MOTD
* /etc/atdumps
* /etc/cc.cfg@/i370
* /etc/cc.cfg@/i386
* /etc/checkall
* /etc/dosenv.def
* /etc/ethmap
/etc/exports
* /etc/filesystems -> <LOCAL>/filesystems
/etc/filters
* /etc/fsmap
* /etc/fssel
* /etc/fstore
/etc/gateways
* /etc/group
/etc/hosts
* /etc/hosts.equiv
* /etc/inetd.conf
* /etc/inetd.security
* /etc/init.dir/Auxconsole
/etc/init.dir/B2s.i386
* /etc/init.dir/Boot2singl
/etc/init.dir/Multi2singl
/etc/init.dir/S2m.B370
/etc/init.dir/S2m.XA370
* /etc/init.dir/Singl2multi
* /etc/inittab -> <LOCAL>/inittab
/etc/make.cfg
* /etc/map3270
* /etc/net.config
/etc/netparams -> <LOCAL>/netparams
/etc/networks
* /etc/nfsfilesystems
/etc/ogroup
/etc/opasswd
* /etc/passwd
/etc/profile
/etc/protocols
* /etc/qconfig
/etc/rasconf
* /etc/rc.csh
* /etc/rc.nfs
```

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Appendix E. User Configurable Files

```
* /etc/rc.sh
/etc/rc.sendmail
/etc/rc.pci
* /etc/rc.tcpi
* /etc/remote
/etc/rc.x25
/etc/resolv.conf
/etc/rpc
/etc/servers
/etc/shells
* /etc/site
/etc/sitegroup
* /etc/state
* /etc/subnetnums
/etc/syslog.conf
* /etc/system -> <LOCAL>/system
/etc/termcap
/etc/uucpsites
* /etc/yp/Makefile
* /etc/yp/ypinit
* /usr/adm/daily
/usr/adm/def.profile
/usr/adm/def.login
/usr/adm/monthly
/usr/adm/newuser.sys
* /usr/adm/newuser.usr
/usr/adm/sendmail/aliases
* /usr/adm/sendmail/sendmail.cf
/usr/adm/user.cfile
/usr/adm/uucp/Myname
/usr/adm/uucp/Devices
/usr/adm/uucp/Dialcodes
/usr/adm/uucp/Dialers
/usr/adm/uucp/Maxuuscheds
/usr/adm/uucp/Maxuuxqts
* /usr/adm/uucp/Permissions
/usr/adm/uucp/Poll
/usr/adm/uucp/Spools
/usr/adm/uucp/Systems
* /usr/adm/weekly
* /usr/lib/terminfo/*/*
<LOCAL>/adm/cron/*.{allow,deny}
<LOCAL>/spool/cron/crontabs/*
*<LOCAL>/MOTD
```

**Note:** Files marked <LOCAL> are unique to every site in a cluster, i.e., there is a file with the referenced name on every machine in the cluster. Each of the copies from every machine must be backed up prior to re-installing the system.

# AIX/370 Installing and Customizing the Operating System

## Glossary

### BACK\_1 Glossary

**adapter.** An electronic part used to connect two unlike parts or machines.

**allocate.** To assign a resource, such as a disk file or a tape file, to perform a specific task.

**append.** The action that causes data to be added to the end of existing data.

**application.** (1) A particular task, such as inventory control or accounts receivable. (2) A program or group of programs that apply to a particular business area, such as the Inventory Control or the Accounts Receivable application.

**application program.** A program used to perform an application or part of an application.

**backup copy.** A copy, usually of a file or group of files, that is kept in case the original file or files are unintentionally changed or destroyed.

**backup diskette.** A diskette containing information copied from a fixed disk or from another diskette. It is used in case the original information becomes unusable.

**backup tape.** A tape containing information copied from disks or another tape. It is used in case the original information is unintentionally destroyed.

**Base System Program.** That part of the AIX/370 Operating System that contains operating system files and data. The AIX/370 Operating System consists of the Base System Program, which contains the Operating System files.

**block.** (1) A group of records that is recorded or processed as a unit. Same as *physical record* (2) In data communication, a group of records that is recorded, processed, or sent as a unit. (3) A physical block in AIX is 4096 bytes long. (4) A logical block in AIX/370 and AIX PS/2 is 1024 bytes. (5) A logical block in AIX/RT is 512 bytes.

**boot.** To prepare a computer system for operation by loading an operating system. Sometimes referred to as IPL (Initial Program Load).

**bootstrap.** A small program that loads larger programs during system initialization.

**BPI.** Bits per inch.

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**byte.** The amount of storage required to represent one character; a byte is 8 bits.

**cancel.** To end a task before it is completed.

**character set.** (1) A finite set of different characters that is complete for a given purpose, for example, the character set in ISO Standard 646, "7-bit Coded Character Set for Information Processing Interchange". (2) An ordered set of unique representations called characters; for example, the 26 letters of the English alphabet, Boolean 0 and 1, the set of symbols in the Morse code, and the 128 ASCII characters. (3) A defined collection of characters. (4) All the valid characters for a programming language or for a computer system. (5) A group of characters used for a specific reason, for example, the set of characters a printer can print.

**client.** A system that is dependent on a server to provide it with program and/or access to programs.

**cluster.** A *cluster* is a group of AIX/370 and AIX PS/2 systems running the Transparent Computing Facility (TCF) and communicating over a local area network (LAN). A cluster can function as a single system that presents a consistent interface and set of resources to users anywhere in the group.

**command.** A request to perform an operation or run a program. There can be options associated with a command, the resulting character string is a single command.

**configuration.** The group of machines, devices and programs that make up a computer system.

**console.** (1) The main AIX display station. (2) A device name associated with the main AIX display station.

**cursor.** A movable symbol (such as an underline) on a display, usually used to indicate to the operator where to type the next character.

**customize.** To describe (to the system) the devices, programs, users, and user defaults for a particular data processing system.

**DASD.** Direct Access Storage Device.

**default.** A value that is used when no alternative is specified by the operator.

**device.** An electrical or electronic machine that is designed for a specific purpose and that attaches to your computer; for example, a printer, plotter, or disk drive.

## AIX/370 Installing and Customizing the Operating System Glossary

**device driver.** A program that operates a specific device, such as a printer, disk drive, or display.

**diagnostic.** Pertaining to the detection and isolation of an error.

**diskette.** A thin, flexible magnetic plate that is permanently sealed in a protective cover. It can be used to store information copied from a fixed disk or another diskette.

**display screen.** The part of the display device that displays information visually.

**DOS.** Disk Operating System.

**dump.** (1) To copy the contents of all or part of storage, usually to an output device. (2) Data that has been dumped.

**emulation.** Imitation; for example, when one computer imitates the characteristics of another computer.

**enable.** To make functional.

**ESSL.** Engineering and Scientific Subroutine Library.

**Ethernet.** A physical medium through which computers in the same or different clusters can communicate and share files.

**file.** A collection of related data that is stored and retrieved by an assigned name.

**file name.** The name used by a program to identify a file.

**filename.** In DOS, that portion of the file name that precedes the extension.

**file system.** A collection of files and directories stored on logical and physical devices (such as disks) and logically organized in a hierarchical fashion.

**fixed disk.** A storage device made of one or more flat, circular plates with magnetic surfaces on which information can be stored.

**floating point.** In the AIX/370, a way of representing real numbers (that

## AIX/370 Installing and Customizing the Operating System Glossary

is, values with fractions or decimals) in 32 bits or 64 bits. Floating-point representation is useful to describe very small or very large numbers.

**font.** A family or assortment of characters of a given size and style.

**format.** (1) A defined arrangement of such things as characters, fields and lines, usually used for displays, printouts or files. (2) The pattern which determines how data is recorded.

**gfs.** Global file system.

**hardware.** The equipment, as opposed to the programming, of a system.

**history file.** A file containing a log of system actions and operator responses.

**INed.** A full screen editor that also features windows.

**initial program load (IPL).** The process of loading the system programs and preparing the system to run jobs.

**initialize.** To set counters, switches, addresses or contents of storage to zero or other starting values at the beginning of, or at prescribed points in, the operation of a computer routine.

**inode.** The internal structure for managing files in the system. Inodes contain all of the information pertaining to the node, type, owner, and location of a file. A table of inodes is stored near the beginning of a file system.

**interface (n).** A shared boundary between two or more entities. An interface might be a hardware component to link two devices together, or it might be a portion of storage or registers accessed by two or more computer programs.

**IPL.** Initial Program Load.

**keyboard.** An input device consisting of various keys allowing the user to input data, control cursor and pointer locations, and to control the user/work station dialogue.

**keyword.** One of the predefined words of a programming language; a reserved word.

**kilobyte.** 1024 bytes.



## AIX/370 Installing and Customizing the Operating System Glossary

**LAN.** Local Area Network.

**Licensed Program Product (LPP).** Software programs that remain the property of the manufacturer, for which customers pay a license fee.

**local area network (LAN).** A physical medium that allows computers in the same or different clusters to communicate and share files. Ethernet and Token-Ring are two examples of a LAN.

**<LOCAL> file system.** The part of the root file system hierarchy comprising system directories and files (such as the /etc/motd "message of the day" file) defined uniquely on a particular computer in the cluster. These files are not replicated.

**log in.** To begin a session at a display station.

**log out.** To end a session at a display station.

**Megabyte (MB).** Megabyte (1,048,576 bytes).

**memory.** Storage on electronic memory such as random access memory, read only memory, or registers. See *storage*.

**message.** Information displayed about an error or system condition that may or may not require a user response.

**minidisk.** A logical division of a fixed disk.

**minidisk (AIX).** A logical subdivision of a fixed disk.

**minidisk (VM).** A logical subdivision of a VM minidisk that has its own virtual device address.

**modem.** A device that converts data from the computer to a signal that can be transmitted to a communications line and converts the signal received to data for the computer.

**network.** A collection of products connected by communication lines for information exchange between locations.

**Network File System (NFS).** A licensed program that allows you to share files with other computers in one or more networks that have a variety of machine types and operating systems. You can mount file systems located on network servers and use remote files as if they were on your

## AIX/370 Installing and Customizing the Operating System Glossary

workstations by creating file trees that are independent of the file systems.

**operating system.** The programs and procedures designed to cause a computer to function, enabling the user to interact with the system.

**page space.** The area on a fixed disk that temporarily stores instructions or data currently being run.

**paging.** The action of transferring instructions, data, or both between real storage and external page storage.

**parameter.** Information that the user supplies to a panel, command, or function.

**primary copy.** Each replicated file system has a copy designated as the *primary copy*, which is the copy that may be modified. It resides on the *primary site* and its purpose is to guarantee that file updates are kept consistent.

**primary site.** The cluster site that maintains the primary copy of a replicated file system.

**prompt.** A displayed request for information or operator action.

**protocol.** In data communications, the rules for transferring data.

**queue.** A line or list formed by items waiting to be processed.

**replicated root file system.** The replicated root file system is a file system with key common files and directories for basic system operation. Almost all system binaries, programs and libraries are in the replicated root file system. Other user and system file systems (like the local file system) are mounted on top of directories in the replicated root file system.

**root.** (1) Another name sometimes used for superuser. (2) The main file system to which others are appended.

**root directory.** The top level of a tree-structured directory system.

**screen.** See *display screen*.

**secondary copy.** A read-only copy of the primary copy of a replicated file system. Files in the secondary copy are automatically modified or deleted when the corresponding file in the primary copy is modified or deleted.

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New files added to the primary copy will be automatically added to the secondary copy only if the appropriate **fstore** value has been set.

**secondary site.** The secondary site maintains the secondary copy of a replicated file system.

**sector.** (1) An area on a disk track or a tape track reserved for recording information. (2) The smallest amount of information that can be written to or read from a disk or tape during a single read or write operation.

**server.** A system that contains most of the data files or programs that the client reads.

**site name.** A method of referring to a machine by a specific name.

**software.** Programs.

**stanza.** A group of lines in a file that together have a common function. Stanzas are usually separated by blank lines, and each stanza has a name.

**storage.** In contrast to memory, the saving of information on physical devices such as VM minidisk or tape. See *memory*.

**store.** To place information in memory or onto a tape, VM minidisk, or tape so that it is available for retrieval and updating.

**subroutine.** (1) A sequenced set of statements that may be used in one or more computer programs and at one or more points in a computer program. (2) A routine that can be part of another routine.

**system.** The computer and its associated devices and programs.

**system administrator.** The person at a computer installation who designs, controls, and manages the use of the computer system.

**system unit.** The part of the system that contains the processing unit and the disk drives.

**tape.** A thin, flexible magnetic strip used to store information.

**tape drive.** The mechanism used to read and write information on tapes.

**Transparent Computing Facility (TCF).** A facility that automatically allows for data, process, name, location and semantic transparency.

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### Glossary

Process transparency is the ability to execute and control tasks on any cluster site, no matter where the user program is currently executing. A TCF LPP is required to obtain support.

**TCF cluster.** A group of computers operating under the AIX Operating System and using the Transparent Computing Facility (TCF).

**TCF/IP.** Transmission Control Protocol/Internet Protocol.

**Token-Ring network.** A network that uses a ring topology, in which tokens are passed in the circuit from node to node. A node ready to send can capture the token and insert data for transmission.

**virtual machine.** (1) A functional simulation of a computer and its associated devices. Each virtual machine is controlled by a suitable operating system (for example, conversational monitor system). VM/370 controls concurrent execution of multiple virtual machines on a single System/370. (2) In VM, a functional equivalent of either a System/370 computing system or a System/370-Extended Architecture computing system. Each virtual machine is controlled by an operating system. VM controls concurrent execution of multiple virtual machines on a single system.

**workstation.** A device that includes a keyboard from which an operator can send information to the system and a display screen on which an operator can see the information sent to or received from the computer.

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