Honeywell

Application Module^{X} System Administration

AX11-200

Total Plant

Honeywell

Application Module^{X}

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About This Publication

This publication is intended to support the Application Module^{X} System Administrator in performing the initial configuration and subsequent administration of the Application Module^{X}. It is intended to supplement, but not replace, the HP-UX documentation that is available on CD-ROM.

This publication replaces publications AX11-400 and AX11-500. It supports A^{X}M release R200, and TDC 3000^{X} releases R430 and later, and R500.

Table of Contents

Tables

Tables

Acronyms

A^XM	Application Module^X (Application Module with Extensions)
DAT	Digital Audio Tape
LAN	Local Area Network
LCN	Local Control Network
PIN	Plant Information Network
SAM	System Administration Manager
TDC	Total Distributed Control
US	Universal Station
U^XS	Universal Station^X (Universal Station with Extensions)
WSI	Workstation Interface

References

Publication Title	Publication Number	Binder Title	Binder Number
Application Module^{X} Service	AX13-410/510	Application Module^{X}	TDC 2094/3094
Application Module^{X} Troubleshooting	AX13-200	Application Module^{X}	TDC 2094/3094
Application Module^{X} User Guide	AX09-200	Application Module^{X}	TDC 2094/3094
Application Module^{X} Customer Release Guide	AX04-200	Application Module^{X}	TDC 2094/3094

Hewlett-Packard CD-ROM Documentation — Especially the following manuals:

A Beginner's Guide to HP-UX

Shells: User's Guide

The Ultimate Guide to the Vi and Ex Editors

How HP-UX Works: Concepts for the System Administrator

System Administration Tasks

Administering ARPA Services

Section 1 – Introduction

1.1 Overview

What is the Application Module^X?

The Application Module^X (A^{X}M) is a major component of Honeywell's **TotalPlant** Open Solutions. It uses a dual-processor architecture to provide the reliability, security, and process orientation of the Application Module, augmented by a powerful coprocessor based on the Hewlett-Packard PA-RISC processor running the HP-UX operating system. The coprocessor provides an open environment for development and execution of custom control applications provided by Honeywell, by customers, and by 3rd-party sources.

Levels of System Administration

The Application Module^X can be used in different ways, each requiring a different level of System Administration support. It can function as a "black box" controller—preloaded at the factory with one or more applications that start automatically when the system is installed and powered up (or that are initiated from CL programs). In this configuration, a minimum of System Administration may be required. At the other extreme, the A^{X}M can function as a component of a complex, networked, multi-user development environment. Here, the System Administration tasks will be much more complex and will require considerably more expertise.

Scope of this manual

This manual is intended to supplement rather than duplicate material that is available in the Hewlett-Packard CD-ROM documentation. It is not intended to be a standalone system administration manual—it should be used in conjunction with the HP documentation. This manual will provide information that is specific to the A^{X}M, as well as information about basic HP-UX system administration tasks that will help you get started.

1.2 Duties and Skills of a System Administrator

Duties of a System Administrator

A System Administrator is normally responsible for installing, configuring, and maintaining:

- Operating system software (HP-UX for the A^{X}M)
- Applications software
- Networking software
- Peripherals
- License software

Other duties include:

- Managing user accounts
- Managing and protecting the file system
- Managing system security
- Troubleshooting when strange things occur
- Training others in the use of the system

Additional duties

The System Administrator may be responsible for the administration of more than one system.

In some cases, the System Administrator may also be the Network Administrator.

Prerequisite skills

There are basic skills that you should have before attempting to administer an HP-UX system. The following list identifies some of the things that you should be able to do:

- Log in and out of your system
- Move about the HP-UX directory tree (change directories)
- Distinguish between “absolute” and “relative” path names
- Edit files using one of the HP-UX editors
- Display the contents of files using the `cat` or `more` command
- Search for text in files using the `grep` command
- Move, copy, and remove files and directories
- Use at least one of the HP-UX shells (such as sh, csh, ksh)
- Display manual reference pages using the `man` command
- Access CD-ROM documentation
- Use a DAT tape drive

1.3 Where to Learn More

Honeywell training courses

Honeywell Automation College has the following training course available:

- Application Module^{X} Administration and Implementation

For information about this course, call Automation College at 1-800-852-3211.

Honeywell CBT courses

Honeywell Automation College has a number of UNIX and LAN Computer Based Training (CBT) courses available. These can be purchased or leased, individually or bundled. They are available in single-user versions or at discounted rates for multiple-user versions.

The following courses would be appropriate for an A^{X}M System Administrator:

- Integrated Computing Courses
  - Data Communications Essentials
  - Client/Server Model*
  - Client/Server Technologies
- LANs and WANs Courses
  - LAN Operations
  - Bridges, Routers, and Gateways
  - Management and Security
- TCP/IP & OSI Standards Courses
  - TCP/IP for UNIX*
- Operating Systems and Programming Courses
  - UNIX Awareness
  - UNIX Fundamentals*
  - UNIX Editors
  - System Administration System V

The three courses marked with "*" (or equivalent experience) are required prerequisites for the Application Module^{X} Administration and Implementation course.

For information about these CBT courses, call Automation College at 1-800-852-3211.

Continued on next page

1.3 Where to Learn More, Continued

HP CD-ROM manuals

Hewlett-Packard CD-ROM documentation can be accessed on the AXM or UXS (if equipped with the optional CD-ROM drive, or on workstations and other compatible Plant Information Network (PIN) devices. For example, the Honeywell model MP-AMXST1 AXM System Administration and Development Station includes an HP workstation, CD-ROM, and DAT drive. The CD-ROM documentation contains over 200 manuals that cover HP-UX and the various applications (editors, compilers, networking software, and other tools) that are bundled with your HP-UX system. Even the most experienced UNIX System Administrator will want to refer to these manuals for information about features that are unique to HP-UX (for example, SAM—the System Administration Management tool).

For the less experienced user, we strongly recommend the following five manuals for initial study:

- *A Beginner's Guide to HP-UX*
- *Shells: User's Guide*
- *The Ultimate Guide to the Vi and Ex Editors*
- *How HP-UX Works: Concepts for the System Administrator*
- *System Administration Tasks*

Continued on next page

1.3 Where to Learn More, Continued

Online version of the *HP-UX Reference*

The online version of the *HP-UX Reference* is a powerful and fast way to access information. It is particularly useful when you are in a terminal session and need information about a command. The *HP-UX Reference* is also available in the CD-ROM documentation. The online version is often referred to as the "manual pages" and is accessed with the `man` command.

For example, if you want information about the list command `ls`, you would enter the command:

```
man  ls
```

To learn about the `man` command, enter the command:

```
man  man
```

The `man` command automatically pipes (sends its output to) the `more` command so that when there is more than one screen of information available, you use the space bar key to scroll through the information screen-by-screen.

You could also learn about the `man` command by looking it up in the CD-ROM version of the *HP-UX Reference.* It is in Vol 1: Section 1.

You can also get information about certain files. For example:

```
man  hosts.equiv
```

will give you information about the contents and use of the file hosts.equiv.

Limitations of the `man` command

While the `man` command is handy for a quick online reference, it does not replace the full CD–ROM documentation set. The CD-ROM set is far more complete. Application developers and system administrators will find that the CD-ROM set is an invaluable resource.

Section 2 – Initial System Setup

2.1 Overview

What will be covered

This section covers the setup, configuration, and testing steps that you need to perform in order to prepare your system for running applications, for optionally developing applications, and for performing system administration tasks. The section is divided in two parts:

- System Administration Station Setup
- A^{X}M Setup

System administration strategy

The expert user may prefer to perform system administration tasks in the traditional way—by issuing commands from the command line and using an editor to modify system configuration files. However, we recommend the use of the System Administration Manager (SAM)—a tool provided by Hewlett-Packard that simplifies many common system administration tasks.

System administration tasks can be performed from a local console terminal on the A^{X}M, or by logging in from a remote device on the PIN. SAM will run in either environment, but it is more friendly when run from an X window. Therefore, the system administration procedures covered in this manual assume that the user will log in to the A^{X}M from a remote device on the PIN (for example, a U^{X}S or HP workstation). This device will be referred to as the System Administration Station.

If the A^{X}M does not have the optional local Digital Audio Tape (DAT) or other removable-media drive, system administration tasks that require a drive, such as backups, restores, software upgrades, and new software installations, will make use of the drive on the System Administration Station.

Initial configuration of networking

You must use the console port on the A^{X}M to configure networking. After networking is set up, further system administration tasks can be performed over the network.

The A^{X}M console terminal can be a VT 100 compatible terminal, or a device such as a PC running VT 100 emulation. It can also be a U^{X}S or HP 712/60 workstation running Kermit communications software. The procedure in this section assumes that a serial port on the System Administration Station (or terminal) is connected to the console port on the A^{X}M. Refer to the *Application Module^{X} Service* manual for details.

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ATTENTION

ATTENTION—The following “ground rules” apply in using the procedure tables in this manual:

- The user logs in as “root” when performing any procedures in the manual.
- Procedures in Section 2 are to be performed in order unless otherwise specified.
- When a procedure specifies “Enter the command:” followed by text to be entered, enter the information indicated and then press the [ENTER] key.

2.2 System Administration Station Setup

Overview

This subsection covers the setup of the System Administration Station—the device from which you will perform system administration tasks on the AXM. After initial configuration, you may also use this station to develop AXM application programs. The station can be one of the following:

- The model MP-AMXST1 AXM System Administration and Development Station—an HP 712-60 workstation that includes a DAT drive and CD-ROM drive.
- A UXS
- Other workstation

Preparation for set_parms

Certain network-related parameters must be configured before network operation is possible. Your AXM system includes a script, /etc/set_parms, which you will run, and which will prompt you for the required information and will automatically make the necessary changes to the various configuration files. If your System Administration Station has not already been set up for networking, you will have to do so. You can use set_parms if the station is running HP-UX.

ATTENTION

ATTENTION—Before running set_parms, you should have available all of the required information listed below for the options you are going to configure. Your Network Administrator will supply the information.

The System Administration Station and the AXM (as well as all systems connected to the network) must have unique hostnames and Internet Protocol (IP) addresses. To avoid duplicate names or addresses, enter the following commands from another device on the network before you run set_parms on the AXM or System Administration Station.

```
nslookup hostname
nslookup address
```

where *hostname* and *address* are the IP hostname and address that you plan to use for the AXM. Repeat the commands for the System Administration Station if you are configuring it at the same time. You should get messages similar to the following if the hostnames and addresses are unique (the actual text depends on your network configuration.).

*** No address information is available for "*hostname*"
*** No hostname information is available for "*address*"

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2.2 System Administration Station Setup, Continued

Information required for set_parms

The `set_parms` script allows you to set:

- Time zone and current time and date
- System hostname and Internet Protocol (IP) address
- Root password, if not already set
- Be a font client (not recommended for A^{X}M)

In addition, you should configure other optional networking parameters if they apply to your installation:

- Subnet mask
- Default Network Gateway
  - Gateway hostname
  - Gateway network (IP) address
- Berkley Internet Domain Name Server (BIND)
  - Local domain name
  - BIND server hostname
  - BIND server network (IP) address

ATTENTION

After you start set_parms, it will inform you that you require certain networking parameters and ask you if you want to continue. If you answer "n" for no, HP-UX will shut down and halt. You can restart by cycling the power, or you can use the WSI Restart schematic (see subsection 3.2) from any US or U^{X}S. If you use the schematic, you do not have to cycle power, and therefore do not have to shut down the AM.

Continued on next page

set_parms options

If you execute `set_parms` with no arguments, you will have the opportunity to configure all of the parameters listed above. This is how you should run set_parms the first time.

There are other options that allow you to configure only certain options. These may be run at a later time to add or change specific parameters.

`set_parms`	`hostname`	Lets you alter the hostname and network (IP) address
`set_parms`	`time`	Lets you set/change time zone and current date/time
`set_parms`	`time_only`	Lets you set/change current date/time
`set_parms`	`font_client`	Lets you configure to be a font client

Connect cables

Table 2-1 Procedure to Connect A^{X}M Cables

Step	Action
1	Power down the A^{X}M if it is not already powered down. Connect the serial communications cable from the A^{X}M console terminal port to the serial port on the System Administration Station. This procedure is covered in the *A^{X}M Service* manual. Note: On an R100 U^{X}S, this connection is to J2 on the WSI I/O board. On an R200 U^{X}S, this connection is to J1 on the WSI2 I/O board.
2	Connect the A^{X}M to the PIN (ethernet). This procedure is covered in the *A^{X}M Service* manual. Note: The PIN may be as simple as a point-to-point connection from one A^{X}M to one U^{X}S or workstation.
3	Verify that the Shutdown switch on the left edge of the A^{X}M WSI2 board is toggled to the right position (RUN).
4	Power up the A^{X}M and the System Administration Station.

Continued on next page

Configure networking

If your System Administration Station is new and has not been configured for networking, do so now. If the station is running HP-UX, you can do this by using the procedure in Table 2-2 to run set_parms. If the station is not on HP-UX, refer to the documentation for the station and set up the date, time, timezone, Internet hostname and address, root password, and, if required, gateway and/or name server configuration.

Table 2-2 Running set_parms on an HP-UX Station

Step	Action
1	Log onto the System Administration Station as root. If this is the first time that you have logged on, it will automatically start the set_parms procedure. If not, and if the station needs to be set up for networking, enter the command: `set_parms`
2	Respond to the prompts and supply the required information.
3	Enter the command: `reboot -q`
4	After the reboot has completed, log in as root and enter the root password
5	Use the following commands to test the network configuration: `ifconfig lan0` Shows Internet address `hostname` Shows Internet hostname `netstat -r` Shows routing tables

Continued on next page

2.2 System Administration Station Setup, Continued

Set up /etc/hosts and /.rhosts files

The following procedure sets up two configuration files in the System Administration Station. In the /etc/hosts file, it adds the Internet address, hostname, and alias names of the A^{X}M. In the /.rhosts file, it adds the full hostname of the A^{X}M, which enables the A^{X}M to use the DAT drive on the System Administration Station (it allows a remote shell without password for root).

Table 2-3 System Administration Station Network Configuration

Step	Action

1	If your network uses a name server, it is not necessary to perform this step. Skip to step 2. Your Network Administrator will tell you if your network uses a name server.
	
	Using the editor of your choice, add the following line to the file /etc/hosts:
	`address hostname alias1 alias2`
	where *address* is the Internet (IP) address of the A^{X}M, and *hostname* is the full Internet (IP) hostname of the A^{X}M. This can be followed by one or more alias names by which the host can also be known. For example:
	`163.145.190.45 axm1.iac.honeywell.com axm1`

2	Using the editor, add the following line to the file /.rhosts (you may be creating this file):
	`hostname`
	where *hostname* is the full internet (IP) hostname (not an alias) of the A^{X}M. For example:
	`axm1.iac.honeywell.com`
	
	Note: If your A^{X}M has a local DAT drive, and if you will not be using the system administration as a netdist server to update A^{X}M software, you may skip this step. If you are not sure, we recommend that you perform the step.

2.3 A^XM Setup

Overview

This subsection covers the configuration of the A^XM. This involves the following steps:

- Set up the System Administration Station for VT-100 emulation on its serial port
- Log into the A^XM on the console port and set up basic configuration (uses the set_parms script)
- Configure the Internet (IP) names and addresses of the System Administration Station and any other stations with which the A^XM will communicate (uses SAM to modify the file /etc/hosts)
- Configure the services that remote hosts will be allowed to perform when they log into the A^XM (uses SAM to modify the file /etc/adm/inetd.sec)
- Configure the A^XM personality load based on the LCN processor type

ATTENTION

ATTENTION—Do not load the AM node personality until you have completed the following A^XM setup procedures. You must set up networking and reboot HP-UX before loading the AM. If you follow the procedures in Section 2 in the order given, you should not have any difficulties.

Dumb terminal procedure

Use the following procedure if you are using a “dumb terminal” as the A^XM console terminal.

Table 2-4 Setting up a Dumb Terminal

Step	Action
1	Refer to the terminal documentation and set up the terminal for VT100 emulation.
2	Set up the following communication parameters: 9600 baud 8 data bits, 1 stop bit, no parity
3	Go to the procedure “Console Login Procedure” (Table 2-9)

Continued on next page

2.3 AXM Setup, Continued

UXS procedure (R100)

Use the following procedure if you are using an R100 UXS to serve as the AXM console. The serial connection is covered in the *AXM Service* manual. The printer serial port on the UXS is used.

Table 2-5 Starting VT100 Emulation on an R100 UXS

Step	Action

1	Enter the command:
	`kermit -l /dev/lp0 -b 9600 -c`
	(`l` is the letter ell)
	
	Note: If you do not have the file /dev/lp0, you can create it with the following command:
	`mknod /dev/lp0 c 1 0x050004`

2	Go to the procedure “Console Login Procedure” (Table 2-9)

Continued on next page

UXS procedure (R200)

Use the following procedure if you are using an R200 UXS to serve as the AXM console. The serial connection is covered in the *AXM Service* manual. The console serial port on the UXS is used. Before you can run Kermit on the console port of the UXS, you must stop the console process. When you have finished with Kermit, you should restart the console process (this step is covered later in Table 2-14).

Table 2-6 Starting VT100 Emulation on an R200 UXS

Step	Action
1	First find the Process Identification Number (PID) of the console process. Enter the command: `ps -ef | grep console`
2	You should see a line of the form: `root nnn...../etc/getty -h console console` *nnn* is the PID—record it here _____
3	Enter the command: `kill -STOP nnn` using the PID for *nnn*.
4	Invoke Kermit with the command: `kermit -l /dev/console -b 9600 -c` (`l` is the letter ell)
5	Go to the procedure “Console Login Procedure” (Table 2-9) NOTE: After you have completed the configuration using Kermit, you will be instructed (in Table 2-14) to enter a command that will restore the console process on this UXS.

Continued on next page

HP 712/60 workstation procedure

Use the following procedure if you are using the serial port on the Honeywell MP-AMXST1 (HP 712/60 workstation) for the A^XM console.

Table 2-7 Starting VT100 Emulation on a HP 712/60

Step	Action
1	Enter the command: `kermit`
2	Enter the command: `set line /dev/tty00`
3	Enter the command: `set baud 9600`
4	Enter the command: `log session` *`pathname`* where *`pathname`* is a file path of your choice for a session log file (for example, `/tmp/session.log`) Note: Do not skip this step, even if you don't need a log. On the 712/60, Kermit has a tendency to hang if the session is not logged.
5	Enter the command: `connect`
6	Go to the procedure "Console Login Procedure" (Table 2-9)

Continued on next page

PC procedure

Use the following procedure if you are using a PC with Windows 3.1 for the A^XM console terminal.

Table 2-8 Starting VT100 Emulation on a PC

Step	Action
1	Double-click on the Accessories icon
2	Double-click on the Terminal icon
3	Pull down the Settings menu and select Terminal Emulation Select DEC VT100 (ANSI) Click OK
4	Pull down the Settings menu and select Terminal Preferences • Under CR->CR/LF, ensure **neither** box is selected • Under Columns, ensure 80 is selected • At the bottom, ensure Show Scroll Bars is **not** selected and ensure Use Function, Arrow, and Ctrl Keys for Windows is **not** selected (very important) Click OK
5	Pull down the Settings menu and select Communications • Select COM1 • Select 9600 • Select 8 data bits • Select 1 stop bit • Select Parity None • Select Flow Control None • Parity Check and Carrier Detect should **not** be selected Click OK
6	Maximize the window
7	If you wish to save your configuration settings, pull down the File menu, select Save As, enter a filename, and click OK. The next time you enter the terminal emulation program, pull down the File menu and select Open. This will automatically restore your settings.

Continued on next page

Console Log in Procedure

Table 2-9 Console Login Procedure

Step	Action
1	If the AXM is not powered on, turn power on now (you can watch the bootup process) Note: Be sure that the toggle switch on the left side of the WSI2 board is in the right (RUN) position.
2	Press [ENTER]—you should receive the login prompt from the AXM
3	Log in as root (no password will be required)
4	You will see the line: TERM=(VT100) Enter one of the following: `hpterm` [ENTER] if you are at a HP 712/60 `xterm` [ENTER] if you are at a UXS [ENTER] if you are at a PC or a dumb terminal

Run set_parms on the AXM

Table 2-10 Running set_parms on the AXM

Step	Action
1	Refer to subsection 2.2 in this manual and note the information that will be required to run set_parms. Have this information ready.
2	Enter the command: set_parms
3	Respond to the prompts and enter the required information
4	When set_parms is done, enter the command: `reboot -q` Note: Do not skip this step—the networking configuration will not take effect unless the system is rebooted, and later steps require it
5	Log in as root and enter the root password
6	Use the following commands to test the network configuration: `ifconfig lan0` Shows Internet address `hostname` Shows Internet hostname

Continued on next page

Configure other hosts

In this procedure, you will use SAM to modify the file `/etc/hosts`, entering in the Internet (IP) addresses, names, and alias names of other stations on the network with which the AXM will communicate.

NOTE: If your network uses a name server, it is not necessary to perform this procedure. Have your network administrator configure the AXM and the System Administration Station in the server, and skip to the next procedure, "Procedure to Configure Remote Host Permissions."

Table 2-11 Identify Other Hosts in /etc/hosts

Step	Action
1	Enter the command: `sam` To select a menu item in the steps that follow, use the arrow keys to highlight the item, then press [ENTER]
2	Select: Networking/Communications
3	Select: System-to-System Connectivity
4	Select: Internet Connectivity
5	Tab to the menu bar
6	Use the arrow key to select Actions, and then press [ENTER]
7	Select: Add
8	Enter the System Administration Station Internet address, hostname, and, if desired, alias names
9	Tab to OK and press [ENTER]
10	Repeat steps 5-9 for each additional network device with which the AXM will communicate
11	Tab to OK and press [ENTER]
12	Tab to the menu bar
13	Press [ENTER] to select the File menu
14	Select: Exit
15	Tab to Exit SAM and press [ENTER]

Continued on next page

Configure remote host permissions

The file `/usr/adm/inetd.sec` allows you to allow or deny specific services to individual users or groups of users. Workstations are normally shipped with all of the permissions set to "allow"—minimum security. The A^XM, however, is shipped with all permissions set to "deny"—maximum security. You must change the permissions to "allow" for those remote users and services that you wish to grant access. In this procedure, you will use SAM to configure the file `/usr/adm/inetd.sec` to configure these permissions.

Table 2-12 Procedure to Configure Remote Host Permissions

Step	Action
1	Enter the command: `sam`
2	Select: Networking/Communications
3	Select: Security
4	Select: Internet Services
5	With the arrow key, position cursor at **telnet Remote Login** and press [ENTER] to highlight the line
6	Tab to the menu bar
7	Use arrow key to select Actions, then press [ENTER]
8	Select Modify
9	Use arrow key to select desired permission—Honeywell recommends Selected-Allowed—press [ENTER]
10	For System and/or Network, enter the System Administration Station hostname (full hostname, not an alias)
11	Tab to Add and press [ENTER] (adds the hostname and permission to the list)
12	Repeat Steps 9-11 for every additional host that you want to be able to remote login to the A^XM
13	Tab to OK and press [ENTER]
14	Repeat steps 5-13 for each of these other services: shell, login, ftp, exec, and echo
15	Tab to the menu bar
16	Press [ENTER] to select the File menu
17	Select: Exit
18	Tab to Exit SAM and press [ENTER]

Continued on next page

Check access to the System Administration Station

For procedures that involve a tape drive, if the AXM does not have a local DAT drive, it will access the DAT drive of the System Administration Station. To do this, the backup, restore, tar, and update utilities will do a remote shell (remsh) to the System Administration Station. In order to work properly, the station must not prompt for a password. This is accomplished by entering the full AXM hostname in the file /.rhosts in the System Administration Station, which you did in subsection 2.2. The following procedure tests that this setup is correct.

Table 2-13 Testing Access to the System Administration Station

Step	Action
1	If your AXM has a local DAT drive and you did not enter the AXM hostname in the /.rhosts file in the System Administration Station while setting up the station in subsection 2.2, skip this procedure and go to the next topic, "Select AM processor type."
2	You are still logged on the AXM as root. Enter the command: `rlogin` *`station_name`* where *station_name* is the Internet (IP) hostname for the System Administration Station.
3	If the login is successful, you will get a command line prompt from the remote without having to enter a password.
4	Enter the command: `exit` to break the connection.

Select AM processor type

If the processor on the AM-side of your AXM is a K2LCN or HMPU, skip to the procedure "End console session." If your processor is a K4LCN (applies to R500 or later), enter the following two commands to convert the personality type to K4LCN (the second command is typed on one line with a space after "axmk"):

```
rm -f /etc/opt/TDC_Open/common/personality.config

ln -s /opt/TDC_Open/common/newconfig/personality.config.axmk
      /etc/opt/TDC_Open/common/personality.config
```

If at a later time you need to convert back from a K4LCN to an HMPU or K2LCN, enter the following two commands:

```
rm -f /etc/opt/TDC_Open/common/personality.config

ln -s /opt/TDC_Open/common/newconfig/personality.config.axm
      /etc/opt/TDC_Open/common/personality.config
```

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End console session

Table 2-14 Procedure to End Console Session

Step	Action
1	Reboot the A^XM by entering the command: `reboot -q`
2	If you were using Kermit, disconnect the Kermit connection by pressing: [CTRL] and [\] together, and then [c] and then exit Kermit by entering the command: `exit`
3	If you were using an R200 U^XS as the console terminal, enter the following command in order to restore the console process on the U^XS: `kill -CONT` *nnn* using the PID for *nnn* that you recorded in Table 2-5.

Continued on next page

Test networking

This completes the networking configuration steps for the System Administration Station and the AXM. The following procedure performs some simple checks to ensure that networking works correctly.

Table 2-15 Procedure to Test Networking

Step	Action
1	Go to the System Administration Station and log on. Enter the command: `nslookup` *`axmname`* where *axmname* is the IP hostname of the AXM. This command should return the IP hostname and address of the AXM.
2	Enter the command: `nslookup` *`axmaddress`* where *axmaddress* is the IP address of the AXM. This command should also return the IP hostname and address of the AXM.

3	Enter the command:
	`/etc/ping` *`axmname`*
	where *axmname* is the IP hostname of the AXM.
	This should result in a continuous series of lines similar to:
	`64 bytes from axmaddress : icmp_seq=1 time=2. ms`
	`64 bytes from axmaddress : icmp_seq=2 time=2. ms`
	`64 bytes from axmaddress : icmp_seq=3 time=2. ms`
	`64 bytes from axmaddress : icmp_seq=4 time=2. ms`
	`.....`
	where *axmaddress* is the IP address of the AXM.
	To stop the test, press [CTRL] and [c] together.

2.4 Creating a New Node

Overview

If your A^{X}M is a new LCN node (as opposed to an existing AM that is being upgraded to an A^{X}M), there are some special procedures that you must follow to configure the node on the LCN and create a checkpoint on the HM. If your A^{X}M is an upgrade to an existing AM, you can go directly to subsection 3.3 and follow the procedures to configure external load modules and load the AM personality.

What will be covered

The procedures that will be covered here are:

- Install NCF backup media
- Check external load modules on the HM and install, if necessary
- Configure the A^{X}M node on the LCN
- Allocate user memory
- Configure external load modules
- Load standard AM personality from the HM along with a null checkpoint from floppy or cartridge
- Checkpoint the AM
- Shut down the AM
- Load AM personality from the coprocessor hard drive

ATTENTION

ATTENTION—Perform the following procedures in sequence.

Prepare NCF backup media

Table 2-16 Procedure to Prepare NCF Backup Media

Step	Action
1	At a US or U^{X}S, insert a current NCF backup cartridge or floppy (must have a volume/directory &ASY)
2	From the Engineering Main Menu, select SUPPORT UTILITIES
3	Select MODIFY VOLUME PATHS
4	Set the NCF Backup Path to the NCF backup media pathname: $Fx>&ASY> (x = drive number)

Continued on next page

ATTENTION

In the next procedure, you will install AMCL06 on the History Module. There are different versions of AMCL06 for different LCN releases. These versions are identified as AMCL06, AMCL06_1, AMCL06_2, and so forth. Refer to Table 4-1 in the *Application Module^{X} Customer Release Guide* to determine the correct version to use.

Installation on History Module

Table 2-17 Installing External Load Modules on the HM

Step	Action
1	Using the Command Processor of the Engineering or Universal personality, determine if the directories &CUS and &CLX exist on the History Module: `LSV NET` (lists volumes on the network)

2	If the directories exist, verify that the directory &CUS contains the files AMCL06.LO and XACCES.LO, and that the directory &CLX contains the file AMCL06.SF:
	
	`LS NET>&CUS`
	`LS NET>&CLX`

3	If either or both directories do not exist, use the Create Directory command to create the missing directory or directories on the History Module: `CD NET>vol>&CUS` (vol is an existing volume on the HM) `CD NET>vol>&CLX`

4	If you had to create the directories or if they did not contain the required files, copy the files from the Application Module Personality cartridge (&C3)(x = the removable media drive number):
	
	`CP $Fx>&CUS>AMCL06.LO NET>CUS>AMCL06.LO`
	(use the correct version for AMCL06 in the above command)
	`CP $Fx>&CUS>XACCES.LO NET>CUS>XACCES.LO`
	`CP $Fx>&CLX>AMCL06.SF NET>CLX>AMCL06.SF`

Continued on next page

Configure the A^{X}M on the LCN

Table 2-18 Procedure to Configure the A^{X}M on the LCN

Step	Action
1	From the Engineering Personality Main Menu, select LCN NODES
2	An LCN Node Configuration display will appear with a target for each node possible on the LCN. Verify that the configuration is in the ON-LINE mode in the upper right corner of the display. Select the target for the node number of the A^{X}M that you wish to configure (you may need to use the Page Forward key to display the target for the desired A^{X}M).
3	Because you are configuring a new node, a screen will appear for you to select the desired node type. Select APPLICATION MODULE
4	Note: In the steps that follow, do not press [ENTER] until instructed
5	Leave REDUNDANT MEMBER NODE ID at 0, and leave STARTUP MODE at COLD
6	Move the cursor to the box for entry of units to be assigned to the A^{X}M.
7	Enter the units separated by spaces
8	Page forward to Page 2 of the configuration screen and enter the user memory allocation information. We suggest the following: • # BACKGROUND CL TASKS—10 • CONCURRENT DATA ACCESSES FROM BACKGROUND CL—4 • BACKGROUND TASK STACK SIZE—15000 • CVB SIZE FOR FAST & SLOW POINT PROCESSORS—(use default of 2000 or see AM Implementation Guidelines for information on how to calculate) • REDUNDANCY BUFFER INCREASE—0 • INCLUDE INTERNET POINT PROCESSOR—select YES if this A^{X}M will access points on another LCN through a Network Gateway • If you entered YES above, you will be prompted for CVB SIZE FOR IPP—(use default of 2000 or see AM Implementation Guidelines for information on how to calculate) • USER MEMORY RESERVED—0

Continued on next page

Configure the A^{X}M on the LCN, continued

Table 2-18 Procedure to Configure the A^{X}M on the LCN, continued

Step	Action
9	Page forward to Page 3
10	In the first box in the "NAME" column, enter the correct version of AMCL06 (this module is required)—see the *A^{X}M Customer Release Guide* to identify the correct version of AMCL06 to enter (for example, `AMCL06_1`)
11	Move to the adjacent box in the "PERS" column and add the personality type `AMO`
12	If you are going to configure XACCES, enter its name `XACCES` and its personality `AMO` in the next pair of boxes. **NOTE:** Installing XACCES has significant security implications—refer to subsection 3.3 in this manual and to Section 2 of the *Application Module^X User Guide* for more information.
13	If you are going to require other external load modules, you may configure them in the same manner at this time (the standard external load modules are covered in appendices C-I in the *CL/AM Reference Manual*)
14	If you have LCN software release R431 (or later) or R500, skip this step and go to step 15. Record and save the value in the box labeled ADDITIONAL MODULE MEMORY (WORDS), and then enter 318464 if the box is empty, or add 318464 to the value already there. This extra 318464 words of memory is for R430 **ONLY**. When you subsequently upgrade to R431 or later, you must remove this extra memory.
15	When you have completed entering the desired modules, and the additional module memory if required, press [ENTER]
16	An advisory message may appear: "TO CHANGE AN EXISTING NODE, IT MUST BE DELETED AND THEN REBUILT"—press [CANCEL] to clear it
17	Press [CTL][F1] to check the new NCF, and press [CTL][F2] to install the new NCF
18	Return to the Engineering Personality Main Menu. A message will appear at the bottom of the display indicating the successful completion of the NCF installation.

Continued on next page

ATTENTION

ATTENTION—The remaining procedures in this section are required only if:

- You are adding a new node, or
- You are upgrading an existing AM to an A^{X}M **and** you have increased processor memory size (for example, from a K2LCN-4 to a K2LCN-8)

If you are upgrading an existing AM and are not changing the memory size, go to subsection 3.4 of this publication, “Loading the AM Personality,” read the material there, and perform the procedure to load the AM.

Continued on next page

Determine checkpoint volume requirements

Table 2-19 Procedure to Determine Checkpoint Volume Requirements

Step	Action
1	In this step, you will determine the HM node pair that has the AM checkpoints. Using the Command Processor, enter the command: `LSV NET` Scan the result and find the volume: &5nn—nn will be the node pair (for example, &501—the node pair is 01)
2	Calculate the checkpoint volume size requirement (see Table 7-9 in the *Engineer's Reference Manual* for the procedure to make this calculation)
3	Calculate the number of files (see Table 3-14 Line 51 of *Network Form Instructions* for the procedure to make this calculation)

Configure checkpoint volume on the HM

Table 2-20 Procedure to Configure HM Checkpoint Volume

Step	Action
1	From the Engineering Personality Main Menu, select VOLUME CONFIGURATION
2	Select the HM node pair that contains the AM checkpoints (determined in Step 1 of the previous procedure)
3	Select CHECKPOINT
4	If you are adding a new node, move to the first blank row of entry boxes and add the Node Number, Volume Size (from Step 2 of the previous procedure), and the Number of Files (from Step 3 of the previous procedure)
5	If you are upgrading an existing node, find the entries for that node and enter the new values for Volume Size and Number of Files
6	Press [CTL][F1] to check and [CTL][F2] to install the configuration
7	Backup, initialize, and restore the HM (backup and restore are covered in subsection 2.4 of the *Engineer's Reference Manual*, and initialization is covered in Tasks 14 and 15 in the *System Startup Guide*)

Continued on next page

Load AM personality with null checkpoint

This procedure loads the standard AM personality from the HM together with a null checkpoint from removable media.

Table 2-21 Procedure to Load AM Personality and Null Checkpoint

Step	Action
1	Insert the floppy labeled “Startup AM Checkpoint” Volume ID &AMC, or the cartridge labeled &C6, in a removable media drive (this is the AM null checkpoint)
2	Press the [SYS STATS] button
3	Select APPLICATION MODULES
4	Select the desired AM node
5	Select LOAD DUMP
6	Select MANUAL LOAD
7	Select COLD LOAD
8	For PGM SOURCE, select DEFAULT SOURCE
9	Select EXECUTE COMMAND
10	For DATA SOURCE, select ALTERNATE SOURCE
11	Select the drive that has the floppy or cartridge containing the null checkpoint
12	Select EXECUTE COMMAND
13	Press [ENTER] to execute
14	When the load is complete and the node status is OK, continue with the next procedure without changing screens

Continued on next page

Checkpoint the AM

This procedure creates a checkpoint for the new AM node on the HM.

Table 2-22 Procedure to Checkpoint the New AM

Step	Action
1	Select SAVE DATA
2	Select DEFAULT SOURCE
3	Select EXECUTE COMMAND
4	The STATUS column on the AM display shows SAVE
5	When the save is complete and the AM status shows OK, continue with the next procedure without changing screens

Shutdown node

You must shut down the AM (which is now loaded with standard AM personality) in preparation for the load of the AXM personality.

Table 2-23 Procedure to Shut Down the New AM

Step	Action
1	Select SHUT DOWN
2	Press [ENTER] to execute
3	Repeat Steps 1 and 2 to do a second shutdown

Reload other nodes

If your AXM is a new node, you must shut down and reload all US and UXS nodes from which you will access the AXM. This will make the AXM visible to them.

Load the AM from the coprocessor hard drive

From now on you will load the AXM node personality from the coprocessor hard drive using the AUTOLOAD NET function. This personality contains the functionality to communicate with the coprocessor.

Go to subsection 3.4 of this publication, “Loading the AM Personality,” read the material there, and perform the procedure to load the AM. Note: If you loaded the AM prior to configuring networking (set_parms), you must reload the node.

Section 3 – Application Module^{X} Operations

3.1 Overview

What will be covered

This section covers the basic functions that are required to operate an A^{X}M. The following topics will be covered:

- Bootloading the Coprocessor with HP-UX
- Configuring AM External Load Modules
- Loading the AM Personality
- Shutting Down HP-UX

3.2 Bootloading the Coprocessor with HP-UX

Two methods will be covered

There are two basic ways to cause a bootload of the coprocessor when it is shut down and halted:

- Cycle power
- Use the WSI Restart Schematic at a US or UXS

Cycle power

Note: The following procedure will kill the AM and require that you reload its personality. If this is undesirable, use the WSI Restart Schematic method instead of cycling power.

Table 3-1 Bootloading HP-UX by Cycling Power

Step	Action
1	If the AM has personality loaded, perform the following from a US or UXS: • Press the [SYS STATS] button • Select APPLICATION MODULES • Select the desired AM node • Select SHUT/ DOWN • Press the [ENTER] key Repeat these steps a second time if you wish to avoid communications error messages in your logs.
2	When the AM shutdown is complete, turn off the power to the Five-Slot or Ten-Slot Module.
3	Wait approximately 10 seconds and then turn power back on.
4	HP-UX will boot automatically. If you are not monitoring the boot on a console terminal, you can wait for the yellow indicator on the coprocessor board to turn on, indicating that the boot is complete.
5	Load the AM-side personality.

Continued on next page

WSI Restart Schematic

Assuming that the coprocessor is down, the following procedure will reset the coprocessor causing a reboot of HP-UX without requiring a reload of the AM personality.

Table 3-2 Bootloading the Coprocessor from a Schematic

Step	Action
1	Perform the following from a US or UXS: Press the [SYS STATS] button
2	Select APPLICATION MODULES
3	Select the desired AXM node
4	Select STATUS DETAIL
5	Page forward to Page 2. The coprocessor status will be given; for example: WS INTERFACE WARNING
6	Select this status and then select VIEW OBJECT DETAIL
7	Assuming that the status is WARNING, select the TOUCH HERE TO RESTART WSI target and then press the [ENTER] key

3.3 Configuring AM External Load Modules

ATTENTION

ATTENTION—The discussion included here is useful regardless of whether you are adding a new A^{X}M node or upgrading an existing AM to an A^{X}M.

Use the procedures here if you are upgrading an existing AM to an A^{X}M.

If you are adding a new A^{X}M node on the LCN, it is more straightforward to configure the external load modules in the process of creating the new node. If your A^{X}M is a new node, perform the initial setup procedures in Section 2 and the procedures in subsection 2.4, "Creating a New Node," which include configuring external load modules while configuring the node.

Overview

Prior to loading the AM personality, which is the next topic, you should make the NCF changes to configure any external load modules that you want included in the personality load. Refer to the *CL/AM Reference Manual*, Appendices C-I, for the various modules that can be loaded.

Modules covered here

Two modules are specific to the Application Module^{X}, and these will be covered briefly here. They are:

- AMCL06—Application Module^{X} CL Runtime Extensions (covered in Appendix I of the *CL/AM Reference Manual*)
- XACCES—A module which, if loaded, enables the READWRIT option in the global X-access switch, allowing non-CL-initiated X-side applications to write LCN data if the global X-access switch is set to the READWRIT state (additional information is available in the *Application Module^{X} User Guide*.)

Function of AMCL06

This external load module contains the CL runtime extensions that allow an AM/CL program (running in an A^{X}M) to:

- Initiate, activate, and terminate X-side applications
- Monitor the status of the application initiation queue
- Change the state of the global X-access switch

This module is required and must be loaded or the AM-side of the A^{X}M will crash during startup.

Continued on next page

Discussion

The global X-access switch controls when an X-side application can write LCN data. It is implemented by a Processor Status Data Point (PSDP) parameter called $XACCESS which has three possible states:

- READONLY—The X-side can read but cannot write LCN data (default)
- RW_LCN_I—The X-side can read LCN data, but can write LCN data only from applications that are initiated by CL on the LCN-side
- READWRIT—The X-side can read and write LCN data from CL-initiated and non-CL-initiated applications (this state cannot be set by any means unless the external load module XACCES is loaded)

The state of the global X-access switch can be changed:

- From the keyboard with Engineer access
- From an LCN-side CL program (using a call available in AMCL06—the global X-access switch cannot be changed by a normal CL write to a parameter).
- An X-side application cannot change the global X-access switch; however, a configuration file **xaccess.cfg** on the X-side provides the restart value for the switch. The xaccess.cfg file is modifiable by the tool **xaccess** if the user has execute permission on the tool and read/write permission on the configuration file.

In all cases, the READWRIT state cannot be set unless the XACCES external load module is loaded in the AM-side.

ATTENTION

ATTENTION—$XACCESS is not a checkpointed parameter. When the A^{X}M node personality is loaded, the restart state of $XACCESS is determined solely by a value encrypted in the X-side file xaccess.cfg. (The X-side must be running for the A^{X}M node personality to load.) If the X-side is restarted while the node personality is running, state of $XACCESS is not affected—it will remain in its current state.

Function of XACCES

XACCES, by its presence or absence, allows or disallows writes of LCN data from non-CL-initiated X-side applications. This is accomplished as follows:

- If XACCES is loaded, the READWRIT state of the global X-access switch can be set by an Engineer from the keyboard, or by a CL call. When the READWRIT state is set, non-CL-initiated applications are allowed to write LCN data.
- If XACCES is not loaded, the READWRIT state cannot be set, and therefore non-CL-initiated applications cannot write LCN data.

Continued on next page

ATTENTION

In the next procedure, you will install AMCL06 on the History Module. There are different versions of AMCL06 for different LCN releases. These versions are identified as AMCL06, AMCL06_1, AMCL06_2, and so forth. Refer to Table 4-1 in the *Application Module^{X} Customer Release Guide* to determine the correct version to use.

Installation on History Module

Table 3-3 Installing External Load Modules on the HM

Step	Action
1	Using the Command Processor of the Engineering or Universal personality, determine if the directories &CUS and &CLX exist on the History Module: `LSV NET` (lists volumes on the network)

2	If the directories exist, verify that the directory &CUS contains the files AMCL06.LO and XACCES.LO, and that the directory &CLX contains the file AMCL06.SF:
	
	`LS NET>&CUS`
	`LS NET>&CLX`

3	If either or both directories do not exist, use the Create Directory command to create the missing directory or directories on the History Module: `CD NET>vol>&CUS` (vol is an existing volume on the HM) `CD NET>vol>&CLX`

4	If you had to create the directories or if they did not contain the required files, copy the files from the Application Module Personality cartridge (&C3)(x = the removable media drive number):
	
	`CP $Fx>&CUS>AMCL06.LO NET>CUS>AMCL06.LO`
	(use the correct version for AMCL06 in the above command)
	`CP $Fx>&CUS>XACCES.LO NET>CUS>XACCES.LO`
	`CP $Fx>&CLX>AMCL06.SF NET>CLX>AMCL06.SF`

Continued on next page

Configure the NCF

Table 3-4 Configuring External Load Modules in the NCF

Step	Action
1	At a US or U^{X}S, install an NCF backup floppy or cartridge.
2	From the Engineering Main Menu, select SUPPORT UTILITIES.
3	Select MODIFY VOLUME PATHS.
4	Set the NCF Backup Path to the NCF backup media pathname: $Fx>&ASY> (x = drive number)
5	Press [ENTER]
6	From the Engineering Personality Main Menu, select LCN NODES.
7	A display will appear with a target for each node possible on the LCN. Verify that the configuration is in the ON-LINE mode in the upper right corner of the display. Select the target for the node number of the A^{X}M that you wish to configure (you may need to use the Page Forward key to display the target for the desired A^{X}M).
8	Select the MODIFY NODE target.
9	Page forward to Page 3 and in the first box in the "NAME" column, enter the correct version of AMCL06 (this module is required)—see the *A^{X}M Customer Release Guide* to identify the correct version of AMCL06 to enter (for example, AMCL06_1). Move to the adjacent box in the "PERS" column and add the personality type AMO. If you are going to install XACCES, enter its name, XACCES, and personality type, AMO. If you are installing any other optional external load modules, you may enter their names and personality type AMO in exactly the same manner at this time.
10	If you have LCN software release R430, record and save the value in the box labeled ADDITIONAL MODULE MEMORY (WORDS), and then enter 318464 if the box is empty, or add 318464 to the value already there. This extra 318464 words of memory is for R430 **ONLY**. If you are upgrading to R431 or later, restore the value in this box to the original value that existed before the extra 318464 words were added.
11	Press the [ENTER] key.

Continued on next page

3.3 Loading the AM Personality

Configure the NCF, continued

Table 3-4 Configuring External Load Modules in the NCF, continued

12	Press [CTL][F1] to check the new NCF, and press [CTL][F2] to install the new NCF.
13	Press the [ENTER] key to confirm the install.
14	Return to the Engineering Personality Main Menu. A message will appear at the bottom of the display indicating the successful completion of the NCF installation.
15	Load the A^{X}M node personality. The load will include AMCL06 (and XACCES, if configured).

3.4 Loading the AM Personality

ATTENTION

ATTENTION—If you are creating a new node on your LCN (as opposed to upgrading an existing AM to an A^{X}M), you must load standard AM personality from the HM together with a null checkpoint from removable media, then checkpoint the AM, and then shut it down. These steps must be performed before loading the personality as covered here.

If your A^{X}M is a new node, first perform the initial setup procedures in Section 2, including the procedures in subsection 2.4, that cover the creation of a null checkpoint on the HM.

Overview

You must use the AUTOLOAD NET function to load the A^{X}M personality in the LCN-side of an A^{X}M. The AUTOLOAD LOCAL and the MANUAL load functions cause the AM-side to load the standard AM software which will not interact with the coprocessor.

ATTENTION

ATTENTION—You must configure networking and reboot the coprocessor (see subsection 2.3) prior to loading the AM personality. If you loaded the AM prior to configuring networking and rebooting the coprocessor, you must reload the AM after these procedures are performed.

ATTENTION

ATTENTION—The coprocessor must be up and running HP-UX in order for the AM-side to complete the process of loading the AM personality. If you initiate the load before the coprocessor completes its bootload, the standard AM personality will be loaded.

In the procedure that follows (Table 3-5), if the node status does not transition to READY or OK within approximately 5 minutes, HP-UX is probably not functional. Check the status detail as described in Table 3-5. If the WS INTERFACE status is WARNING, it indicates that the AM is not able to communicate with the coprocessor or that a licensing problem exists.

If the AM is not loaded, and the coprocessor is down, and you must load AM software to begin process control applications that can run independent of the coprocessor, you can do a MANUAL load. This will load the standard AM personality from the History Module. When the coprocessor is operational again, you will have to shut down and reload the node using AUTOLOAD NET to bring in the personality from the coprocessor hard drive. Then the AM-side and X-side will be able to communicate with each other.

Continued on next page

Performing the load

Perform the following procedure from a US or U^{X}S:

Table 3-5 Procedure to Load AM Personality

Step	Action
1	Press the [SYS STATS] button.
2	Select APPLICATION MODULES.
3	Select the desired AM node.
4	Select LOAD/ DUMP.
5	Select AUTOLOAD NET.
6	The display will show the current default startup mode that is configured in the NCF (COLD, WARM, HOT, or NO POINT PROCESS). This is the startup mode that will be used unless you decide to override it. If you are satisfied with this mode, go to Step 8.
7	If you wish to override the default startup mode, select OVERRIDE DEFAULT. The targets HOT LOAD, WARM LOAD, COLD LOAD and NO POINT PROCESS will appear. Select the desired mode. This will override the NCF default startup mode, but only for this load.
8	Press [ENTER].
9	If you observe the load from the US or U^{X}S display, you will see the STATUS go through the following states: • POWER ON • QUALIFIED • LOCAL LOAD • NET LOAD • READY • WARNING—if it remains in this state for a long period of time, check the coprocessor status (WS INTERFACE on page 2 of the Status Detail display) • OK You will also see the TYPE change from AM to A^{X}M.

For more information

For more information, refer to the *A^{X}M Troubleshooting* manual. It contains a more detailed description of the load process.

3.5 Shutting Down HP-UX

CAUTION

CAUTION—Never stop (shut down) HP-UX by using the power switch. This practice can corrupt the file system.

ATTENTION

ATTENTION—If you do a complete shutdown and halt of HP-UX, be aware that you will have to power down the node (killing the AM-side) in order to reboot HP-UX. If you only need to go to single-user mode to perform system administration activities, use the shutdown command without the halt (-h) option and then use the reboot command when you have completed your administration tasks (see the procedure in "Partial shutdown" below).

Who can shut down HP–UX

Normally, only the system administrator or a designated superuser should shut down the system. Shutdown authority is determined by the contents of the file `/etc/shutdown.allow`. You can designate which users are authorized to run shutdown by listing those users in the file. If the file is empty, only the superuser has shutdown authority. If the superuser login (usually root) is not listed in the file and the file is not empty, the superuser will not have shutdown authority. If the file is not empty, only those users listed will have shutdown authority.

Partial vs. total shutdown

Two procedures are described:

- Partial shutdown—takes the system to single user mode, from which it can be subsequently rebooted without cycling power.
- Total shutdown—causes HP-UX to stop. Reloading requires using the Restart Schematic (See Table 3-2) or turning power off and back on.

Use the partial shutdown procedure whenever possible as an alternative to a total shutdown. It will put the system in single-user mode, shutting down all processes that are not necessary for the single-user. From this mode, you can perform system administration tasks that would be inappropriate or risky if the system were in full operation (for example, a hard disk backup). The system can be rebooted later with the reboot command and you will not need to cycle power or use the Restart Schematic.

Note: While in the single-user mode, you can only access the system through the console terminal. Refer to the Honeywell publication *Application Module^{X} Service* for details on how to connect a console terminal.

Continued on next page

Partial Shutdown

Table 3-6 Procedure for a Partial Shutdown of HP-UX

Step	Action
1	Log on as root or use the `su` command to assume the root identity (the root password is required).
2	Change to the root directory if not already there: `cd /`
3	Use the shutdown command: `shutdown` *n* where *n* is the grace period time in seconds—the time delay until the system actually shuts down. Logged on users are warned of the impending shutdown by messages. If no grace period is specified, the default is 60 seconds. Using a value of zero results in the system shutting down immediately.
4	HP-UX will go to the single-user mode. When you have completed your administration tasks, use the reboot command and the system will start up: `reboot`

Continued on next page

Total shutdown

Note: This procedure will require you to turn power off and back on to reboot HP-UX, which will kill the AM-side and require reload of its personality.

Table 3-7 Procedure for a Total Shutdown of HP-UX

Step	Action
1	Log on as root, or use the `su` command to assume the root identity (the root password is required).
2	Change to the root directory if not already there: `cd /`
3	Use the shutdown command: `shutdown -h` *n* where *n* is the grace period time in seconds—the time delay until the system actually shuts down. The -h option causes the system to halt at the end of the shutdown process. In order to reboot, you will have to cycle power. Logged on users are warned of the impending shutdown by messages. If no grace period is specified, the default is 60 seconds. Using a value of zero results in the system shutting down immediately.

For more information

You can customize the command line shutdown process. For more information, refer to Chapter 3 of the Hewlett-Packard manual *System Administration Tasks*, which covers starting and stopping HP-UX.

Using SAM for shutdown

You can use SAM to do the full (halt) shutdown or partial (single-user) shutdown. Using the procedure in subsection 4.1, invoke SAM and then select Routine Tasks, and then select Shutdown.

Continued on next page

3.5 Shutting Down HP-UX, Continued

Shutdown from a US or U^{X}S schematic

You can shut down the coprocessor from a system schematic. Use the procedure in the following table to access the schematic.

Table 3-8 Shutting Down the Coprocessor from a Schematic

Step	Action
1	Perform the following from a US or U^{X}S: Press the [SYS STATS] button
2	Select APPLICATION MODULES
3	Select the desired A^{X}M node
4	Select STATUS DETAIL
5	Page forward to Page 2. The coprocessor status will be given; for example: WS INTERFACE OK
6	Select this status and then select VIEW OBJECT DETAIL
7	Assuming that the status is OK, select the TOUCH HERE TO SHUTDOWN WSI target and press [ENTER]

Section 4 – Basic System Administration Tasks

4.1 Starting a System Administration Session

Starting SAM

The procedures in Sections 4 and 5 assume that you are at the System Administration Station—a UXS or workstation on the PIN, and that you are logged into the System Administration Station as root. Use the following procedure each time you start SAM.

Table 4-1 Procedure to Start SAM

Step	Action
1	Log on the System Administration Station as root and enter the root password

2	Set the TERM environment variable to hpterm (if it isn't already)
	
	If you are running the Bourne or Korn shell, the commands are:
	`TERM=hpterm`
	`export TERM`
	If you are running the C shell, the command is:
	`setenv TERM hpterm`
	
	Note: You can use xterm if you prefer, but you will have to enter xterm in response to the prompt in step 6.

3	Enter the command: `xhost +`*`axmname`* where *axmname* is the Internet hostname for the AXM
4	Enter the command: `rlogin `*`axmname`* where *axmname* is the Internet hostname for the AXM
5	Enter the root password
6	When prompt "TERM = (hp)" appears, press the enter key
7	Enter the command: `sam -display `*`hostname`*`:0.0` where *hostname* is the System Administration Station hostname

Running SAM from the console device

You can run SAM from the AXM console terminal, but you will have to use the vt100 TERM environment. SAM is not as friendly to use in this environment. You must use the tab and arrow keys to navigate, instead of using the mouse. SAM displays on-screen directions when it is started in the vt100 TERM environment.

4.2 Backups and Restores

Backup procedure with remote DAT

Use the following procedure if your A^{X}M does not have a locally-connected DAT drive. Note: The System Administration Station must have a properly configured `/.rhosts` file—see subsection 2.2, Table 2-3.

Table 4-2 A^{X}M Backup with Remote DAT

Step	Action
1	Place backup tape to be written in the system administration device DAT drive
2	Log into the A^{X}M and invoke SAM as covered in Table 4-1
3	Select: Backup and Recovery
4	Select: Backup Devices
5	A message will be displayed that begins with the sentence “No valid backup devices were found during the hardware scan.” Click OK.
6	On the menu bar, pull down the Actions menu
7	Select: Use Remote Backup Device
8	Select: Backup Files Interactively
9	Select: Specify Remote Backup Device
10	Select the Remote System Name entry box and enter the Internet (IP) hostname of the System Administration Station
11	Select the device File entry box and enter the filename of the tape device file: `/dev/rmt/0m` (zero, not the letter “oh”)
12	Click: OK
13	Select: Select Backup Scope
14	Select: Entire System, or Select: Selected Files and enter desired filenames to be included and/or excluded
15	Click: OK

Continued on next page

Backup procedure with remote DAT, continued

Table 4-2 A^{X}M Backup with Remote DAT, continued

16	Select: Set Additional Parameters
17	Make the Create Index Log depressed if you want a log, or raised if you don't
18	Click: OK
19	Click: OK
20	When prompted "Do you want to proceed," click: Yes
21	When the process has completed, press [ENTER] to continue
22	On the menu bar, pull down the File menu and select: Exit
23	Click: Exit SAM

Continued on next page

Backup procedure with local DAT

Use the following procedure if your A^XM has a locally-connected DAT drive.

Table 4-3 A^XM Backup with Local DAT

Step	Action
1	Place backup tape to be written in the A^XM DAT drive
2	Log into the A^XM and invoke SAM as covered in Table 4-1
3	Select: Backup and Recovery
4	Select: Backup Devices
5	Click the mouse to select the line: `2.0.1.1.0  2.0 GB DDS Tape Drive (DAT)`
6	On the menu bar, pull down the Actions menu
7	Select: Back Up Files Interactively
8	Select: Select Backup Scope
9	Select: Entire System, or Select: Selected Files and enter desired filenames to be included and/or excluded
10	Click: OK
11	Select: Set Additional Parameters
12	Make the Create Index Log depressed if you want a log, or raised if you don't
13	Click: OK
14	Click: OK
15	When prompted "Do you want to proceed," click: Yes
16	If prompted again "Do you want to proceed," click: Yes
17	When the process has completed, press [ENTER] to continue
18	On the menu bar, pull down the File menu and select: Exit
19	Click: Exit SAM

Continued on next page

Restore procedure with remote DAT

Use the following procedure if your AXM does not have a locally-connected DAT drive. Note: The System Administration Station must have a properly configured `/.rhosts` file—see subsection 2.2, Table 2-3.

Table 4-4 AXM Restore with Remote DAT

Step	Action
1	Place backup tape to be read in the system administration device DAT drive
2	Log into the AXM and invoke SAM as covered in Table 4-1
3	Select: Backup and Recovery
4	Select: Backup Devices
5	A message will be displayed that begins with the sentence “No valid backup devices were found during the hardware scan.” Click: OK .
6	On the menu bar, pull down the Actions menu
7	Select: Use Remote Backup Device
8	Select: Recover Files or Directories
9	Select: Specify Remote Backup Device
10	Select the Remote System Name entry box and enter the Internet (IP) hostname of the System Administration Station
11	Select the device File entry box and enter the filename of the tape device file: `/dev/rmt/0m` (zero, not the letter “oh”)
12	Click: OK
13	Select: Select Recovery Scope
14	Select: Entire System, or Select: Selected Files and enter desired filenames to be included and/or excluded
15	Click: OK
16	Click: OK
17	When prompted “Do you want to proceed,” click: Yes
18	When the restore has completed, press [ENTER] to continue
19	On the menu bar, pull down the File menu and select: Exit
20	Click: Exit SAM

Continued on next page

Restore Procedure with local DAT

Use the following procedure if your AXM has a locally-connected DAT drive.

Table 4-5 AXM Restore with Local DAT

Step	Action
1	Place backup tape to be read in the AXM DAT drive
2	Log into the AXM and invoke SAM as covered in Table 4-1
3	Select: Backup and Recovery
4	Select: Backup Devices
5	Click the mouse to select the line: `2.0.1.1.0  2.0 GB DDS Tape Drive (DAT)`
6	On the menu bar, pull down the Actions menu
7	Select: Recover Files or Directories
8	Select: Select Recovery Scope
9	Select: Entire System, or Select: Selected Files and enter desired filenames to be included and/or excluded
10	Click: OK
11	Click: OK
12	When prompted “Do you want to proceed,” click: Yes
13	When the restore has completed, press [ENTER] to continue
14	On the menu bar, pull down the File menu and select: Exit
15	Click: Exit SAM

4.3 Adding and Removing Users

Adding a user

Table 4-6 Procedure to Add a User

Step	Action
1	Log into the AXM and invoke SAM as covered in Table 4-1
2	Select: Users and Groups
3	Select: Users
4	On the menu bar, pull down the Actions menu
5	Select: Add
6	Enter the user's Login Name
7	For User Identity (UID), use the default supplied by SAM
8	Click on the Home Directory data entry box—SAM will create a default path by concatenating "/users/" and the Login Name
9	Click on the entry box for Primary Group Name and change the default supplied by SAM to: `axm`
10	Use defaults for Start-up Program and Login Environment, or make desired changes
11	Enter optional information, if desired
12	Click: OK
13	Enter a password for the user, if desired. If you enter one, you will be prompted to re-enter it for confirmation
14	Click: OK
15	On the menu bar, pull down the File menu
16	Select: Exit
17	Click: Exit SAM

Continued on next page

Deleting a user

Table 4-7 Procedure to Remove a User

Step	Action
1	Log into the AXM and invoke SAM as covered in Table 4-1
2	Select: Users and Groups
3	Select: Users
4	Select (highlight) the user you wish to remove
5	On the menu bar, pull down the Actions menu
6	Select: Remove
7	Select the desired disposition of user's files and directories.
8	Click: OK
9	When asked if you want to continue, click: Yes
10	Click: OK (long advisory message)
11	On the menu bar, pull down the File menu
12	Select: Exit
13	Click: Exit SAM

4.4 Adjusting Swap Space

Overview

The AXM is shipped from the factory configured with 90 MB of coprocessor device swap space. This is considered appropriate for a 32 MB coprocessor. If you ordered your AXM with 64, 128, or 256 MB of coprocessor memory, or if you purchased and installed a memory upgrade to 64, 128, or 256 MB, you should increase the swap space. This procedure covers adding file system swap space. If you prefer to increase the amount of device swap space, refer to the references specified below.

Disk size considerations

If you have 64 MB of memory and a 525 MB disk, you may wish to consider adding a second disk drive or upgrading to a 1 or 2 GB drive. The additional swap space would fit on a single primary 525 MB drive, but there would not be much space available for applications and optional software. For example, if you load OpenDDA and two compilers, and add the recommended 70 MB of file system swap space, you will have about 50 MB left over.

If you have 128 or 256 MB of memory and a 525 MB disk, you must add a second drive or upgrade to a 1 or 2 GB drive.

For more information

For additional information on swap space, refer to the HP manuals *System Administration Tasks* and *How HP-UX Works: Concepts for the System Administrator*.

Continued on next page

Swap space procedure

Table 4-8 Procedure to Configure Additional Swap Space

Step	Action
1	Log into the AXM and invoke SAM as covered in Table 4-1
2	Select: Disks and File Systems
3	Select: Swap
4	From the menu bar, pull down the Actions menu
5	Select: Add File System Swap
6	Select the line containing the name of the file system in which you want to configure the file system swap space
7	Select the data entry box for Minimum Swap and enter one of the following values: `70000` for a 64 MB coprocessor, or `230000` for a 128 MB or 256 MB coprocessor Note: The swap space values are in 1 KB blocks.
8	Select the data entry box for Maximum Swap and enter the same value that you entered in the previous step
9	Verify that the buttons for **Now** and **At Every System Boot** are depressed
10	Click: OK
11	You may get a note indicating that the swap space has been successfully added—click: OK
12	On the menu bar, pull down the File menu
13	Select: Exit
14	Click: Exit SAM

4.5 Adding a Second Disk Drive

Install the physical drive

Refer to the *Application Module^{X} Service* manual for the procedure to install the new drive. Be sure to pin it properly. The second drive must be pinned for SCSI address 5. After the physical drive has been installed and the system powered up and bootloaded, perform the following procedure to add the drive to the software configuration.

CAUTION

HP-UX 9.05 Patches tape R95073, or later, must be installed on the current primary drive in order to recognize a 1.2 GB Seagate drive, or any 2 GB drive. Refer to Section 5 of this manual for software installation procedures.

Configuration procedure

Table 4-9 Procedure to Configure a Second Disk Drive

Step	Action
1	Load the HP-UX 9.05 Patches tape, if necessary
2	Log into the A^{X}M and invoke SAM as covered in Table 4-1
3	Select: Disks and File Systems
4	Select: CD-ROM, Floppy, and Hard Disks
5	Select the line that corresponds to the disk that you are adding—it will say “unused” in the Use column
6	From the menu bar, pull down the Actions menu
7	Select: Add a Hard Disk Drive
8	Select: Set Disk Usage and Options
9	Select the Mount Directory input field
10	Enter the name of your new disk (the name must begin with a “/”), for example: `/disk2`
11	Select the Create New File System button (so that it is depressed)
12	Verify that the Use Long File Names button is depressed
13	DO NOT depress the Copy Bootstrap Program button
14	Click: OK You will be returned to the Add a Hard Disk Drive menu

Continued on next page

Configuration procedure, continued

Table 4-9 Procedure to Configure a Second Disk Drive, continued

15	If you get a confirmation window asking you if you want to proceed with creating a new file system, select YES
16	Select OK The process will take approximately 30 minutes for a 525 MB drive
17	From the menu bar, pull down the File menu
18	Select: Exit
19	Click: Exit SAM

4.6 Adding a CD-ROM Drive

Install the drive

Install the CD-ROM drive using the upgrade kit instructions that accompanied the drive. Be sure to pin it properly. The *Application Module^{X} Service* manual also has information on the pinning and cabling of the CD-ROM drive. After the drive has been installed and the A^{X}M powered up and bootloaded, perform the following two procedures to add the drive to the software configuration.

Configuration procedure

Table 4-10 Procedure to Configure a CD-ROM Drive

Step	Action
1	Insert the HP-UX CD-ROM in the drive.
2	Log into the A^{X}M and invoke SAM as covered in Table 4-1
3	Select: Disks and File Systems
4	Select: CD-ROM, Floppy, and Hard Disks
5	Select the line: `2.0.1.2.0 unused.....SCSI CD-ROM drive`
6	From the menu bar, pull down the Actions menu
7	Select: Add a Hard Disk Drive
8	Select: Set Disk Usage and Options
9	Select the Mount Directory input field
10	Enter the following: `/cdrom`
11	Click: OK You will be returned to the Add a Hard Disk Drive menu
12	When asked if the CD-ROM file system has a cdfs file system, Click: Yes
13	Select OK The “unused” field (see Step 5) changes to “cdfs” when the process completes
14	From the menu bar, pull down the File menu
15	Select: Exit
16	Click: Exit SAM and then continue with the following procedure

Continued on next page

4.6 Adding a CD-ROM Drive, Continued

Installation procedure

Table 4-11 Procedure to Install CD-ROM Software

Step	Action
1	Enter the command: `/etc/update`
2	Select: Change Source or Destination
3	Select: From Tape Device to Local System (Note: Do NOT select: From CD-ROM (directory) to Local System
4	Tab to the Source field and enter the following: `/cdrom/UXINSTAL/LROM800.8`
5	Click: Done
6	Select: Select all Filesets on the Source Media
7	Select: Start Loading Now
8	When asked “Start loading filesets now? Enter: “y”
9	When the load has completed, you will see some instructions on the screen, followed by a command line prompt. Following the directions on the screen, go to the end of the file */tmp/update.log* and look in the entries for the proper date and time for error messages or a message indicating filesets were successfully loaded. You may want to use the command `tail -50 /tmp/update.log | more` which will give you the last 50 lines of the file. You may have to experiment with the number of lines.

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4.6 Adding a CD-ROM Drive, Continued

Modify `/etc/rc`

Add the line shown in bold in the example below to the `hfsmount()` function in the file `/etc/rc`. This will cause the CD ROM to be automatically mounted when the system boots (otherwise you have to mount it manually each time).

```
hfsmount()
{
        # create /etc/mnttab with valid root entry
        /etc/mount -u

        # enable quotas on the root file system
        # (others are enabled by mount)
        [ -f /quotas -a -x /etc/quotaon ] && /etc/quotaon -v /

        # Mount the HFS volumes listed in /etc/checklist:
        /etc/mount -a -t hfs -v
         /etc/mount -a -t cdfs -v

        # (NFS volumes are mounted via net_start() function)

        # Preen quota statistics
        [ -x /etc/quotacheck ] && echo checking quotas && /etc/quotacheck -aP
  }
```

Removing the CD-ROM disk

Before removing the CD-ROM disk from the drive, enter the command:

```
umount  /cdrom
```

Then press the button on the front of the drive and the disk will eject automatically.

Inserting a CD-ROM disk

After inserting a CD-ROM disk in the drive, enter the command:

```
mount  /cdrom
```

Continued on next page

Accessing the CD-ROM

Use the following procedure to access the CD-ROM from the System Administration Station or from another X Windows device on the PIN.

Table 4-12 Procedure to Access the AXM CD-ROM

Step	Action
1	Log on the System Administration Station as root and enter the root password

2	Set the TERM environment variable to hpterm (if it isn't already)
	
	If you are running the Bourne or Korn shell, the commands are:
	`TERM=hpterm`
	`export TERM`
	If you are running the C shell, the command is:
	`setenv TERM hpterm`
	
	Note: You can use xterm if you prefer, but you will have to enter xterm in response to the prompt in step 6.

3	Enter the command: `xhost +`*`axmname`* where *axmname* is the Internet hostname for the AXM
4	Enter the command: `rlogin` *`axmname`* where *axmname* is the Internet hostname for the AXM
5	Enter the root password
6	When prompt "TERM = (hp)" appears, press the enter key
7	Enter the command: `lrom -display` *`hostname`*`:0.0` where *hostname* is the System Administration Station hostname

4.7 Upgrading the Primary Drive

Overview

This set of procedures is to be used when you have ordered a primary drive upgrade (from 525 MB to 1.2 GB or 2 GB). When you receive the new drive, it will be formatted but will not include software. The objective of these procedures is to transfer the information from your current primary hard drive to the new, larger hard drive.

Method

The general steps that will be followed are:

- Change the system configuration so that your optional 2nd drive (if you have one) will not be mounted when the system reboots
- Remove the optional 2nd drive and store it temporarily
- Install the new drive in the optional 2nd drive location (pinned for SCSI address 4)
- Using SAM, add the new disk to the system, adding a new file system and configuring device swap in the process
- Copy the files from your current primary drive to the new drive
- Delete the new drive (SCSI address 4) from its own */etc/checklist* file
- Remove and repin the new drive for SCSI address 6
- Remove the old primary drive and install the new drive in its place
- Reinstall the optional 2nd and configure it

Continued on next page

Configuring device swap space

There are two types of swap space that are of interest.

- Device swap space—a certain partition of the disk is allocated to swap space and is not available for the file system. This is the highest performance type of swap space.
- File system swap space—uses the file system for swap space.

Honeywell ships each AXM with 98306 bytes of **device** swap space configured on the primary hard drive. This amount is satisfactory for 32 MB of memory. Subsection 4.4 of this manual contains a procedure to add **file system** swap space for systems with 64 MB or 128 MB of memory.

In a later procedure, you will be asked to specify the amount of swap space to allocate on the new drive. This will be **device** swap space. Since this is the fastest type of swap space, we recommend that you take advantage of this opportunity to configure all of your swap space requirements with **device** swap space. To do this, specify your swap space as specified below (numbers displayed may differ slightly—select the nearest value). Note: These are suggested values.

For 1.2 GB Primary:

- If you have 32 MB of memory, select 98306 KB of device swap
- If you have 64 MB of memory, select 153634 KB of device swap
- If you have 128 MB or 256 MB of memory, select 307268 KB of device swap

For 2 GB Primary:

- If you have 32 MB of memory, select 98304 KB of device swap
- If you have 64 MB of memory, select 180224 KB of device swap
- If you have 128 MB or 256 MB of memory, select 256000 KB of device swap

Determining amount of memory

You can determine the amount of memory on your system with the command:

```
dmesg
```

Checking swap

If you modify the amount of device swap, you may want to review your swap space after you complete the primary drive upgrade. You may want to reduce the amount of file system swap to compensate for increased device swap. To view the swap configuration on your system, invoke SAM and then select Disks and File Systems followed by Swap. Device swap is indicated as “dev” and file system swap is indicated by “fs.”

Continued on next page

Preparation and tools required

- Refer to Section 5 in the A^XM Service manual and familiarize yourself with the locations of the primary and optional 2nd drives.
- Locate the pinning diagram for the manufacturer and model number of your new drive.
- Assemble the following tools:
  - ESD grounding kit, including wrist strap and work surface
  - 6 mm and 8 mm Metric Nut Drivers
  - Phillips #1 screwdriver

ATTENTION

HP-UX 9.05 Patch Tape R950731, or later, must be installed on the current primary drive in order to recognize a 1.2 GB Seagate drive, or any 2 GB drive. Before proceeding, load these patches on the primary drive, if required, and not already loaded.

Deconfigure the optional 2nd drive

Perform this procedure only if you have an optional 2nd hard drive on your A^XM. If you do not have an optional 2nd drive, go to the next procedure.

Table 4-13 Deconfigure the Optional 2nd Hard Drive

Step	Action
1	Log onto the A^XM and and invoke SAM as covered in Table 4-1
2	Select: Disks and File Systems
3	Select: Local File Systems
4	Highlight the line that corresponds to your optional 2nd drive—it will contain "/dev/dsk/c201d5s0"
5	Record the mount directory for this device (shown in the left column) Mount Directory: _____
6	Pull down the Actions menu and select: Modify
7	In the Mount Box, turn off the option: At Every System Boot
8	Click: OK
9	In response to the message "Successfully modified the local file system" Click: OK
10	Pull down the file menu and select: Exit
11	Click: Exit SAM

Continued on next page

CAUTION

In the following procedures, you will be removing, repinning, and replacing disk drives. Be sure to use an ESD wrist strap and properly grounded work surface. Refer to the *AXM Service* manual for assembly/disassembly instructions, drive locations, and pinning diagrams.

Load software on the new drive

Table 4-14 Load Software on the New Drive

Step	Action
1	Shut down the AXM node
2	Shut down HP-UX with the command: `reboot -h`
3	Power down the node and remove the hard disk tray (refer to the *AXM Service* manual)
4	Remove the optional 2nd drive if there is one, and store it temporarily
5	Referring to the pinning diagrams in the *AXM Service* manual, pin the new drive for SCSI address 4 (use the diagram that corresponds to the manufacturer and model number of your new drive) To set address 4, pin as follows: • Install a jumper at the 2^2 position • Remove jumpers if present from positions 2^1 and 2^0 (save any jumpers removed)
6	Install the new drive in the optional 2nd drive position and connect the cables
7	Install the disk tray and power up the node
8	Log in again and invoke SAM
9	Select: Disks and File Systems
10	Select: CD-ROM, Floppy, and Hard Drives
11	Highlight the line with “2.0.1.4.0”
12	Pull down the Actions menu and select: Add a Hard Disk Drive
13	Select: Set Disk Usage and Options
14	Under “Use Disk for:” pull down the File System menu and select: File System and Swap

Continued on next page

Load software on the new drive, continued

Table 4-14 Load Software on the New Drive, continued

15	In the Mount Directory window, enter: `/newdisk`
16	Select the following option: • Create new file system
17	Select the following options: • Use long file names • Copy bootstrap program
18	In the Disk Space Allocation window, highlight the desired device swap space from the list in the left column labeled Swap (see the discussion under "**Configuring swap space**" earlier in this subsection)
19	After highlighting the desired device swap space, click: OK
20	If you get the prompt: "Do you want to create a new file system" select: Yes
21	Click: OK
22	Pull down the File menu and select: Exit
23	Click: Exit SAM
24	Now copy the files from the current primary drive to the new drive using the command: `find / -depth -xdev | cpio -pdux /newdisk` If you get messages indicating that sockets were not backed up, ignore them.
25	Using the editor of your choice, edit the file `/newdisk/etc/checklist` Delete the two lines in this file containing "/dev/dsk/c201d4s0"
26	Enter the command: `reboot -h`
27	Power down the node and remove the disk tray
28	Remove the old primary drive

Continued on next page

Load software on the new drive, continued

Table 4-14 Load Software on the New Drive, continued

29	Referring to the pinning diagrams in the *AXM Service* manual, repin the new drive for SCSI address 6 (use the diagram that corresponds to the manufacturer and model number of your new drive) To do this, you will be adding a jumper in the position 2^1 (position 2^2 already has a jumper and position 2^0 has no jumper)
30	Install the new drive in the primary drive location
31	If you removed an optional 2nd drive in step 4 of the previous procedure (Table 4-13), reinstall that drive in the optional 2nd drive position
32	Reinstall the drive tray and power up the node
33	Load the AXM node personality after HP-UX boots

Reconfigure the optional 2nd drive

Perform this procedure only if you had an optional 2nd drive on the system.

Table 4-15 Reconfigure the Optional 2nd Drive

Step	Action
1	Log onto the AXM and invoke SAM
2	Select: Disks and File Systems
3	Select: CD-ROM, Floppy, and Hard Disks
4	Highlight the line that corresponds to your optional 2nd drive—it will contain "/dev/dsk/c201d5s0"
5	Pull down the Actions menu and select: Add a Hard Disk Drive
6	Select: Set Disk Usage and Options
7	In the Mount Directory window, enter the mount directory name that you recorded in an earlier procedure
8	Click: OK
9	Pull down the File menu and select: Exit
10	Click: Exit SAM

Check swap space

Follow this procedure to verify that you have configured the amount and type of swap space that you want.

Table 4-16 Procedure to Check Swap Space Configuration

Step	Action
1	Log onto the AXM (if necessary) and invoke SAM
2	Select: Disks and File Systems
3	Select: Swap
4	Note the swap space that is configured as indicated on the display: • File system swap space will be indicated by the type “fs” • Device swap space will be indicated by the type “dev”
5	Pull down the File menu and select: Exit
6	Click: Exit SAM
7	If you have configured sufficient **device** swap space to cover all your swap requirements, and you need to delete **file system** swap space that is no longer required, edit the file `/etc/checklist` and delete the line containing “swapfs”

4.8 Upgrading the Secondary Drive

Overview

This procedure is used when you upgrade a secondary hard drive (for example, from 525 MB to 1.2 GB or 2 GB).

CAUTION

In the following procedure, you will be handling disk drives. Be sure to use an ESD wrist strap and properly grounded work surface. Refer to the *AXM Service* manual for assembly/disassembly instructions, drive locations, and pinning diagrams.

ATTENTION

HP-UX 9.05 Patch Tape R950731, or later, must be installed on the primary drive in order to recognize a 1.2 GB Seagate drive, or any 2 GB drive.

Secondary drive upgrade procedure

Table 4-17 Procedure to Upgrade the Secondary Drive

Step	Action
1	Log onto the AXM as root from the System Administration Station as described in Table 4-1, steps 1 and 2.
2	Load the HP-UX 9.05 Patches tape, if not already loaded. Software loading procedures are covered in Section 5.
3	Determine the mount directory for the existing secondary drive by entering the command: `/etc/mount` The secondary mount directory is the first entry on the line that contains the string `/dev/dsk/c201d5s0`. The mount directory name begins with the "/" character. Record the name here: _____
4	Perform a backup of the secondary drive using SAM as covered in subsection 4.2 of this manual. Under "Select Backup Scope," choose "Selected Files" and in the "Included" section, add the name of the mount directory from above (including the "/" character).
5	When the backup of the secondary drive is complete, shut down the AM side and shut down HP-UX (subsection 3.5).
6	Power down the node.
7	Pin the new secondary drive for SCSI address 5.
8	Remove the old secondary drive and install the new secondary drive.

Continued on next page

Secondary drive upgrade procedure, continued

Table 4-17 Procedure to Upgrade the Secondary Drive, continued

9	Power on the node and log in as root.
10	Install the required filesets from the HP-UX Patches tape, if not already installed.
11	Invoke SAM.
12	Select: Disks and File Systems
13	Select: CD-ROM, Floppy, and Hard Disks
14	Highlight the new drive that you added as the secondary drive (the Hardware Path will be identified as 2.0.1.5.0).
15	Select: Set Disk Usage and Options
16	In the menu bar labeled “Use disk for,” choose File System.
17	For Mount Directory, enter the name determined in step 2.
18	Select: Create a new file system
19	Select: Use long file names
20	Select OK. When the addition finishes, select OK.
21	Exit SAM
22	Using a procedure from subsection 4.2, restore the data from the backup tape to the new secondary drive.

23	After the restore, do:
	`cd <mount directory>`
	`ll`
	where <mount directory> is the directory from step 2

24	The directories and files that were on the original secondary drive should be on the new drive.

4.9 Loading a New Primary Drive (Remote DAT)

Overview

This procedure allows you to load a blank, formatted AXM primary hard drive from a server on the network. The server must have a DAT drive. It can be a UXS, another AXM, or an HP workstation that is running HP-UX.

When you will use this procedure

You will use this procedure:

- When you are replacing a failed AXM primary hard drive, and
- You do not have a DAT drive locally attached to the AXM, and
- Your new drive does not have software preloaded by Honeywell

Information that you will need

You will need to know the host names and IP addresses of the AXM and the server. Also, the software installation procedure automatically invokes the `set_parms` script, and you will need to reenter all other parameters that you entered when you set up the system (see "Information required for set_parms" in subsection 2.2 of this manual).

Tapes that you will need

You will need the following DAT tapes:

- HP-UX software distribution tape (AXM version)
- Your most recent backup tape
- Distribution tapes for any software that is not included on your backup tape—for example:
  - HP-UX 9.05 Patches
  - Optional HP-UX 9.05 Patches
  - License Manager
  - OpenDDA
  - Fortran and/or C compilers
  - AXM node personality

Continued on next page

Initial console procedure

Table 4-18 Initial Procedure from A^{X}M Console

Step	Action
1	Install the replacement primary drive pinned for SCSI address 6.
2	Connect a console device to the console port of the A^{X}M. The console device can be a VT100, a U^{X}S, an HP workstation, or a PC. The cabling procedure is covered in Section 6 of the *A^{X}M Service* manual.
3	If your console device requires terminal emulation software (such as Kermit on a U^{X}S or workstation, or the Windows terminal emulation function on a PC), start the software. The procedures for the different devices are covered in subsection 2.3 of the *A^{X}M System Administration* manual.
4	Begin a bootload of the A^{X}M by powering up.
5	Use the ESC key to halt the boot process. You can continue hitting the ESC key until the boot process halts. Note: If your console device does not have the ESC key, try holding down the CTRL key and hitting the LEFT BRACKET key.
6	Enter `6 <Return>` to select: Hardware Information
7	Enter `1 <Return>` to select: I/O ASIC
8	Look for the following information: `LAN  080009 - xxxxxx` Write down the last six digits. (Example: 0AFC5D) _____
9	Enter `0 <Return>` to select: Previous Menu
10	Enter `0 <Return>` to select: Previous Menu
11	Leave the console in this state, as you will come back to it later.

Continued on next page

Load A^{X}M HP-UX software on the server

Table 4-19 Procedure to Load Server Software

Step	Action
1	Perform the following steps at the device you have chosen to be the net distribution server.
2	Using the editor of your choice, delete or comment out source line entries in the file `/netdist/MAIN.pkg`. If you are concerned about disk space on the server, you may want to delete any unnecessary software from the directory `/netdist/700` and delete the corresponding source lines in the file `/netdist/MAIN.pkg`. For more information, please refer to the discussion at the beginning of subsection 5.2 of this manual.
3	Follow the procedure in subsection 5.2 of this manual to prepare a net distribution server using the `updist` command. Load the A^{X}M HP-UX Software tape.

4	Check to see if the `netdistd` daemon is running with the command:
	
	`ps -ef | grep netdistd`
	
	If it is not, start it with the command:
	
	`netdistd -l`

Continued on next page

Prepare the server

Table 4-20 Procedure to Prepare the Server

Step	Action
1	Perform the following steps at the device you have chosen to be the net distribution server.
2	Log onto the server as root if not already logged on.
3	Invoke SAM.
4	Select: Networking/Communications
5	Select: Device Connectivity
6	Select: Boot Protocol
7	Pull down the Actions menu and select: Add
8	In the form that appears, enter the Internet node name of the AXM that you will be loading.
9	Fill in the Internet address of the AXM (if you are running on a name server system, it will be filled in automatically)
10	Fill in the Subnet Mask (example: 255.255.255.0)
11	Enter the Station Address `080009xxxxxx` where `xxxxxx` is the number that you obtained earlier
12	Enter the bootfile name `/usr/lib/uxinstlf.700`
13	Select: OK You will be returned to the Device Connectivity window
14	If you get the following message: "`Unable to stat file /usr/tftpdir//usr/lib/uxinstlf.700 no such file or directory (error=2) Do you want to use it anyway?`" Select: Yes
15	Pull down the File menu and select: Exit Note: If you get a message about enabling the Bootp server, select: Yes
16	Select: Exit Sam
17	Go back to the console of the AXM that you are loading.

Continued on next page

Load A^{X}M HP-UX software

Perform this procedure at the A^{X}M that you are loading.

Table 4-21 Load A^{X}M HP-UX Software from the Server

Step	Action
1	Enter 1 and then press <Return> to select: Boot from a Device
2	Enter the number of the menu choice beginning with "LAN" and containing the IP address of the server that you just set up. Then press <Return>. This loads a minimum kernel from the server.
3	When the minimum kernel is installed, you will get a message indicating that EISA configuration has completed. In response to the accompanying prompt, press any key to continue.
4	You will get a screen listing the four installation steps for HP-UX. Read the screen and then press any key to continue.
5	You will be given a list of five items of information that you will be required to provide. Read the information and then press any key to continue.
6	A Network Configuration Menu will come up. Using the up/down arrow keys to navigate through the list of items, enter the information requested. Use 2106 for the port number. When done, enter CTRL-X.
7	You will get a menu of options regarding selecting a device for the root disk. Select the device that has a Bus Addr of 6.
8	If you get a WARNING that there may already be an HP-UX system installed on the disk, press any key to continue.
9	You will be asked if you want the root filesystem to allow long filenames. Enter y.
10	On the next menu, enter 1 to select: Continue Installation Process.
11	You will be asked to enter root disk swap space. Follow the instructions and enter the desired swap space. This is device swap space (as opposed to file system swap space.) See subsection 4.7, the topic "Configuring device swap space" for guidelines on the amount of space to configure. Enter CTRL-X after you have entered the data, and again after the system adjusts the value.
12	You will get a message indicating that continuing the installation process will destroy the contents of the disk. Enter y to indicate that you want to continue.
13	The installation process will build the file system and then reboot on the minimum kernel. Wait for this automatic process to complete.

Continued on next page

Load A^XM HP-UX software, continued

Table 4-21 Load A^XM HP-UX Software from the Server, continued

14	Press <enter> to select "`PS2_DIN_US_English`" unless you want to specify another language. If so, use the space bar to scroll through the choices and then press <Enter> when the desired choice is displayed on the bottom line.
15	The `update` program will automatically be invoked. Choose the option: Select all Filesets on the Source Media.
16	Choose the option: Select all Filesets on the Source Media.
17	When prompted, select: Start Loading Now.
18	If you get a WARNING message, record it and then press the space bar to continue.
19	When prompted "`Start loading filesets now? (y or n)`, enter `y`.
20	When the load completes, the process will automatically rebuild the kernel and reboot the system. It will then automatically invoke the `/etc/set_parms` script.
21	Refer to subsections 2.2 and 2.3 and enter the data requested by the `/etc/set_parms` script.
22	At the conclusion of the `/etc/set_parms` script, log in as root.

Continued on next page

Load remaining software

The following steps load the remaining software from your backup tape and from distribution tapes as required. The DAT drive on a remote system is used. This may be the same system that was used as the net distribution server. The remote system whose DAT drive is used is referred to as the System Administration Station in the following procedure.

Table 4-22 Load Remaining Software

1	Review Table 2-3 and perform the two steps at the System Administration Station if they have not been performed previously. These steps make the required additions to the files `/etc/hosts` and `/.rhosts` in the System Administration Station so that it can communicate properly with the A^{X}M you are loading.
2	At the A^{X}M you are loading, use the procedure in Table 2-11 to add the IP hostname and address of the System Administration Station to the A^{X}M file `/etc/hosts`.
3	At the A^{X}M you are loading, use the procedure in Table 2-12 to add telnet Remote Login permission for the System Administration Station (modifies the file `/usr/adm/inetd.sec`).
4	Using the Restore Procedure for Remote DAT from subsection 4.2, use SAM to restore from your backup tape. Choose the following options: Under Recovery Scope, choose: All Files on Media. Under Set Additional Parameters, choose: Overwrite Newer Files, and leave other choices at their defaults.
5	Using the `updist` and `update` procedures covered in subsections 5.2 and 5.3, load all of the software that is not included on your backup tape. The recommended order is: • Compilers (must be loaded before the Optional HP-UX patches) • HP-UX 9.05 Patches • Optional HP-UX 9.05 Patches (select only the desired patches) • License Installation and Administration • A^{X}M Personality • OpenDDA If your backup tape was a full backup, you do not need to perform this step.
6	After all software is restored or reloaded, reboot the system: `reboot -q`

4.10 Loading a New Primary Drive (Local DAT)

Overview

This procedure allows you to load a blank, formatted A^{X}M primary hard drive from the DAT drive on the A^{X}M.

When you will use this procedure

You will use this procedure:

- When you are replacing a failed A^{X}M primary hard drive, and
- You have a DAT drive locally attached to the A^{X}M, and
- Your new drive does not have software preloaded by Honeywell

Information that you will need

The software installation procedure automatically invokes the `set_parms` script, and you will need to reenter all other parameters that you entered when you set up the system, including the hostname and IP address (see "Information required for set_parms" in subsection 2.2 of this manual).

Tapes that you will need

You will need the following DAT tapes:

- HP-UX software distribution tape (A^{X}M version)
- Your most recent backup tape
- Distribution tapes for any software that is not included on your backup tape—for example:
  - HP-UX 9.05 patches
  - Optional HP-UX 9.05 patches
  - License Manager
  - OpenDDA
  - Fortran and/or C compilers
  - A^{X}M node personality

Continued on next page

4.10 Loading a New Primary Drive (Local DAT), Continued

Loading procedure

Table 4-23 Loading Procedure Using Local DAT

Step	Action
1	Install the replacement primary drive pinned for SCSI address 6.
2	Connect a console device to the console port of the AXM. The console device can be a VT100, a UXS, an HP workstation, or a PC. The cabling procedure is covered in Section 6 of the *AXM Service* manual.
3	If your console device requires terminal emulation software (such as Kermit on a UXS or workstation, or the Windows terminal emulation function on a PC), start the software. The procedures for the different devices are covered in subsection 2.3 of the *AXM System Administration* manual.
4	Begin a bootload of the AXM by powering up.
5	Use the ESC key to halt the boot process. You can continue hitting the ESC key until the boot process halts. Note: If your console device does not have the ESC key, try holding down the CTRL key and hitting the LEFT BRACKET key.
6	Put the HP-UX Install tape in the DAT drive.
7	When the drive stops blinking, enter `1 <Return>` to select: Boot from a Device.
8	When the scan of potential boot devices is complete, select the menu option number that indicates `SCSI.1.0 ...` and then press <Return>. (This will bring in a minimum kernel from the install tape.)
9	When the minimum kernel is installed, you will get a message indicating that EISA configuration has completed. In response to the accompanying prompt, press any key to continue.
10	You will get a screen listing the four installation steps for HP-UX. Read the screen and then press any key to continue.
11	You will get a menu of options regarding selecting a device for the root disk. Select the device that has a Bus Addr of 6.
12	If you get a WARNING that there may already be an HP-UX system installed on the disk, press any key to continue.
13	You will be asked if you want the root filesystem to allow long filenames. Enter `y`.
14	On the next menu, enter 1 to select: Continue Installation Process.

Continued on next page

Loading procedure, continued

Table 4-23 Loading Procedure Using Local DAT, continued

15	You will be asked to enter root disk swap space. Follow the instructions and enter the desired swap space. This is device swap space (as opposed to file system swap space.) See subsection 4.7, the topic "Configuring device swap space" for guidelines on the amount of space to configure. Enter CTRL-X after you have entered the data, and again after the system adjusts the value.
16	You will get a message indicating that continuing the installation process will destroy the contents of the disk. Enter `y` to indicate that you want to continue.
17	The installation process will build the file system and then reboot on the minimum kernel. Wait for this automatic process to complete.
18	Press <Enter> to select "`PS2_DIN_US_English`" unless you want to specify another language. If so, use the space bar to scroll through the choices and then press <Enter> when the desired choice is displayed on the bottom line.
19	When you get the following message: "`Ensure that the install media unit has been removed and an update media unit is online and prepared for reading`" remove the HP-UX Install tape from the DAT drive, insert the AXM HP-UX Software tape, and then press <Return>. (This automatically invokes the Update program.)
20	Choose the option: Select all Filesets on the Source Media.
21	When prompted, select: Start Loading Now.
22	If you get a WARNING message, record it and then press the space bar to continue.
23	When prompted "`Start loading filesets now? (y or n)`, enter `y`.

Continued on next page

Loading procedure , continued

Table 4-23 Loading Procedure Using Local DAT, continued

24	When the load completes, the process will automatically rebuild the kernel and reboot the system. It will then automatically invoke the `/etc/set_parms` script.
25	Refer to subsections 2.2 and 2.3 and enter the data requested by the `/etc/set_parms` script.
26	At the conclusion of the `/etc/set_parms` script, log in as root.
27	Using the Restore Procedure for Local DAT from subsection 4.2, use SAM to restore from your backup tape. Choose the following options: Under Recovery Scope, choose: All Files on Media. Under Set Additional Parameters, choose: Overwrite Newer Files, and leave other choices at their defaults.
28	Using the `update` procedure covered in subsection 5.4, load all of the software that is not included on your backup tape. The recommended order is: • Compilers (must be loaded before the Optional HP-UX patches) • HP-UX 9.05 Patches • Optional HP-UX 9.05 Patches (select only the desired patches) • License Installation and Administration • AXM Personality • OpenDDA If your backup tape was a full backup, you do not need to perform this step.
29	After all software is restored or reloaded, reboot the system: `reboot -q`

Section 5 – Installing and Updating Software

5.1 Overview

Scope

This section covers procedures to update system software, install new application software, and update existing application software. The procedures in subsections 5.2, 5.3, and 5.4 are for Honeywell-supplied software distributed on Digital Data Storage (DDS) media in the Hewlett-Packard Update format. The procedure in subsection 5.5 is for tape in the Tar format.

Update-format strategy

If the A^{X}M does not have a local Digital Audio Tape (DAT) drive, the update-format software to be installed or updated will be loaded onto a network distribution server (the system administration device or another U^{X}S or HP workstation) that has a DAT drive. All or part of the software on the tape may be loaded, depending on what you wish to install or update in the A^{X}M. The software is loaded into a directory /netdist. You may install or update software in more than one A^{X}M from the server, and you may also install or update U^{X}S stations if the software is applicable.

After setting up the network distribution server, you will go to each A^{X}M (and each U^{X}S, if appropriate) and install or update the software over the network from the server (using the command *update*).

This strategy allows maximum security to be configured in the A^{X}M because it is not necessary for a remote device to log into the A^{X}M.

ATTENTION

ATTENTION—The server must have sufficient disk space to accommodate the distribution software. For a full system software update, this could be as much as 150 MB.

Tar-format strategy

Tar-format tapes will be loaded directly, using the tape drive on the System Administration Station, or a local DAT drive on the A^{X}M if present.

5.2 Prepare the Server Using *Updist*

Overview

The *updist* command is used to prepare a device to be a server. The user selects filesets from the distribution media and these are loaded into a directory */netdist* in the server. Then a daemon *netdistd* is started, which must be running in the server in order for other devices to update from the server.

The procedure covered here assumes you are working from the command line in a terminal window of a UXS or HP workstation. If you are using a UXS for a server, you can use this procedure or use the standard menus that are provided with the UXS. See the *Universal StationX System Administration* manual.

Selecting filesets and partitions

The *updist* and *update* commands load units called "filesets" that are groups of related files. One or more filesets can be further grouped into logical "partitions." You choose the filesets and partitions you wish to load. The *update* command, which will be covered later, loads the filesets from the server into the system to be updated. It maintains a list of the filesets loaded in the directory /etc/filesets.

The *updist* main menu lets you select the filesets and partitions to be loaded into the server. This will be covered in the procedure.

ATTENTION

Refer to the Release Letter, Customer Release Guide, and/or other documentation supplied with the software to determine which filesets to load. There are situations where loading all filesets can cause problems.

Removing filesets from the server

In order to conserve disk space, you may want to remove filesets from the server after an update or prior to a new update. The *updist* command loads the filesets into the directory */netdist/700* (it may also load filesets into */netdist/300* if your update media contains versions for both HP 300 and 700 series computers). For each fileset loaded, *updist* also creates a source line entry in the main package definition file */netdist/MAIN.pkg*. The daemon *netdistd* uses this file during the update process. Therefore, when removing files from the */netdist/700* directory, you must also remove the corresponding source statements from */netdist/MAIN.pkg*. Since a fileset involves a tree of directories and files, use the *-r* option with the remove command. For example:

```
rm -r /netdist/700/*
```

will remove all files and directories in */netdist/700*.

Where to learn more

For more information, refer to the man pages for *netdistd* and *update*. (The man pages for *update* also cover *updist*.)

Continued on next page

Updist procedure

Table 5-1 describes the procedure to set up a HP-UX device on the network to be a network distribution server using *updist*.

Table 5-1 Setting up a Network Distribution Server

Step	Action
1	Install the distribution tape in the DAT drive of the server. (If there is more than one tape in the distribution, install one of them.)
2	Log in as root and enter the root password.

3	Determine if the netdist daemon is running and kill it if it is, as follows:
	
	Enter the command:
	`ps -ef | grep netdistd`
	If you get a line of the form:
	`root` *nnn* `..... netdistd ..`
	then enter the command:
	`kill` *nnn*
	(*nnn* is the Process Identification Number (PID))

4	Verify that the directories /netdist and /netdist/700 exist, and if not, create them:
	`mkdir /netdist`
	`mkdir /netdist/700`

5	Enter the command: `updist`

6	If you get an error message suggesting that you delete the file */update.lock* and retry, do so:
	`rm /update.lock`
	`updist`

7	The Main Menu will come up. If this is your first time using the *updist* command, we suggest that you select **How to Use Updist** and read the help information. Verify that **Source:** is Tape Device /dev/update.src, (or /dev/rmt/0m), and that **Destination:** is Local System /netdist. If either is not correct, Select **Change Source or Destination**, select **From Tape to Local System**, tab to the field that is incorrect, make the necessary corrections, and click Done.

Continued on next page

Updist procedure, continued

Table 5-1 Setting up a Network Distribution Server, continued

Step	Action
8	Refer to the Release Letter, Customer Release Guide, and/or other documentation supplied with the software to determine which filesets to load. Select the filesets that you wish to load in the server distribution directory */netdist*. (The tape drive must have a tape loaded or you will get an error.) You have three choices: **Select all Filesets on the Source Media**—All partitions and filesets on the source media will be loaded into the */netdist* directory. **Select Only Filesets Currently on Your System**—If you select this option, when you later update a destination device from the server, you will load only those filesets that are listed on both the source media and in the */etc/filesets* directory in the destination system. **Select/View Partitions and Filesets**—Lets you view and select specific partitions and filesets to be loaded from the media. Note: If */netdist* does not exist, you will be asked if you want to create it. Answer "y".
9	If you get a message indicating that the filesets on the media can be loaded for more than one HP computer series, enter "7" to specify Series 700.
10	Perform this step only if you chose the third option above, **Select/View Partitions and Filesets**. You will be presented with a list of partitions. To select all of the filesets in a partition, move the cursor over the "n" in the "Selected" column and type "y". To select some of the filesets in a partition, position the cursor as before, but do **not** change the "n" to "y". Instead, click on the "View Filesets" button. You will be presented with a list of filesets in the partition. Select the fileset or filesets by changing "n" to "y". When you have completed your selection, click on the "Partit'n Screen" button. This will return you to the partition menu. The "n" in the "Selected" column will have changed to "p", which indicates that some, but not all, of the filesets in the partition have been selected. When you have selected all of the partitions and filesets you wish to load, click "Done."
11	If you get an error message indicating that a directory in /netdist cannot be opened, press the space bar and *updis*t will create the necessary directory.
12	Select: Start Loading.

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Updist procedure, continued

Table 5-1 Setting up a Network Distribution Server, continued

13	When asked “Start loading filesets now?” answer “y”. The tape drive will start blinking. The load could take several minutes to an hour or more depending on the number of filesets.
14	When the load has completed, you will see some instructions on the screen, followed by a command line prompt. Following the directions on the screen, go to the end of the file */tmp/update.log* and look in the entries for the proper date and time for error messages or a message indicating filesets were successfully loaded. You may want to use the command `tail -50 /tmp/update.log | more` which will give you the last 50 lines of the file. You may have to experiment with the number of lines.
15	If you have additional tapes, repeat steps 4-13 until all tapes are loaded.

16	Check the file /etc/services for the line that identifies the netdist service port:
	`grep netdist /etc/services`
	
	If the line:
	
	`netdist 2106/tcp #update(1m) network ...`
	does not exist, edit the file and insert the above line at the end of the file.

17	Enter the command: `netdistd -l` This starts the netdist daemon. The `-l` option appends log information to the default log file (/usr/adm/netdist.log).

5.3 Install or Update Files from a Server Using *Update*

Overview

The *update* command is used to:

- Update HP-UX system software
- Update LCN software (AM personality)
- Install application software
- Update application software

In the procedure covered here, the A^{X}M System Administrator, updates A^{X}M software using filesets from a net distribution server.

Update Procedure

Table 5-2 describes the procedure to update A^{X}M software using a net distribution (Netdist) server. This procedure can be initiated from the Netdist server or from the System Administration and Development Station if it is not the server.

Table 5-2 Updating the A^{X}M from a Netdist Server

Step	Action
1	Enter the command: `rlogin` *`axmname`* `-l root` where *axmname* is the Internet hostname of the A^{X}M.
2	Enter the A^{X}M root password.
3	When prompt “TERM = (hp)” appears, press the enter key
4	Enter the command: `update` The Main Menu will be displayed.
5	Select: Change Source or Destination
6	Select: From Netdist Server to Local System
7	Enter the IP hostname of the net distribution server (a valid alias is OK)
8	Click: Done

Continued on next page

Procedure, continued

Table 5-2 Updating the AXM from a Netdist Server, continued

9	Refer to the Release Letter, Customer Release Guide, and/or other documentation supplied with the software to determine which filesets to load. Select the filesets to be loaded from the server (you have three choices): **Select all Filesets on the Source Media**—All partitions and filesets on the server will be loaded. **Select Only Filesets Currently on Your System**—If you select this option, you will load only those filesets that are listed in the */etc/filesets* directory in the destination system. **Select/View Partitions and Filesets**—Lets you view and select specific partitions and filesets to be loaded from the server.
10	Perform this step only if you chose the third option above, **Select/View Partitions and Filesets**. You will be presented with a list of partitions. To select all of the filesets in a partition, move the cursor over the "n" in the "Selected" column and type "y". To select some of the filesets in a partition, position the cursor as before, but do **not** change the "n" to "y". Instead, click on the "View Filesets" button. You will be presented with a list of filesets in the partition. Select the fileset or filesets by changing "n" to "y". When you have completed your selection, click on the "Partit'n Screen" button. This will return you to the partition menu. The "n" in the "Selected" column will have changed to "p", which indicates that some, but not all, of the filesets in the partition have been selected. When you have selected all of the partitions and filesets you wish to load, click "Done."
11	Select: Start Loading Now
12	When asked "Start loading filesets now?" answer "y". The load could take several minutes to an hour or more depending on the number of filesets. A screen comes up monitoring the status of the load.
13	When the load has completed, you will see some instructions on the screen, followed by a command line prompt. Following the directions on the screen, go to the end of the file */tmp/update.log* and look in the entries for the proper date and time for error messages or a message indicating filesets were successfully loaded. You may want to use the command `tail -50 /tmp/update.log | more` which will give you the last 50 lines of the file. You may have to experiment with the number of lines.
14	Reboot the system by entering the command: `reboot -q`

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ATTENTION

ATTENTION—You may get one or more warning messages during or after the update. One example is:

```
WARNING: The media does not contain any license level
filesets.  This will cause the system to have the lowest
terminal login limit possible.
```

This message means that the user license for the software being installed is not for multiple users.

Another example is:

```
WARNING: Kernel rebuild and system reboot is required.
Would you like more information? (y or n)
```

Answer “y” and follow any instructions or suggestions given.

It is impractical to list all possible messages here—messages will vary with different types of software and from release-to-release. The two above are intended as examples.

5.4 Install or Update Files from a Local DAT

Overview

If you have a local DAT drive connected to your AXM, you can install and update software using that drive instead of using a server. (The server is convenient if you are updating a number of devices with the same software.) In this procedure, you will use the *update* command, but you will specify the local DAT drive as the source, rather than a netdist server.

Procedure

Table 5-3 Procedure to Load Software from a Local DAT

Step	Action
1	From a UXS or workstation on the net, log into the AXM as root and enter the root password
2	Enter the command: *update* The Main menu will be displayed
3	Select: Change Source or Destination
4	Select: From Tape Device to Local System
5	Press [RETURN] in response to the question: `Create or change the address of /dev/update.src (y or n) n`
6	In the “Source” entry box, change the entry to: `/dev/rmt/0m` (zero, not the letter “oh”)
7	In the “Destination” entry box, leave the entry at the default ‘/’
8	Click: Done

Continued on next page

5.4 Install or Update Files from a Local DAT, Continued

Procedure, continued

Table 5-3 Procedure to Load Software from a Local DAT, continued

9	Refer to the Release Letter, Customer Release Guide, and/or other documentation supplied with the software to determine which filesets to load. Select the filesets to be loaded from the source media (you have three choices): **Select all Filesets on the Source Media**—All partitions and filesets on the source media will be loaded. **Select Only Filesets Currently on Your System**—If you select this option, you will load only those filesets that are listed in the */etc/filesets* directory in the destination system (they must also be included on the source media) . **Select/View Partitions and Filesets**—Lets you view and select specific partitions and filesets to be loaded from the source media.
10	Perform this step only if you chose the third option above, **Select/View Partitions and Filesets**. You will be presented with a list of partitions. To select all of the filesets in a partition, move the cursor over the “n” in the “Selected” column and type “y”. To select some of the filesets in a partition, position the cursor as before, but do **not** change the “n” to “y”. Instead, click on the “View Filesets” button. You will be presented with a list of filesets in the partition. Select the fileset or filesets by changing “n” to “y”. When you have completed your selection, click on the “Partit’n Screen” button. This will return you to the partition menu. The “n” in the “Selected” column will have changed to “p”, which indicates that some, but not all, of the filesets in the partition have been selected. When you have selected all of the partitions and filesets you wish to load, click “Done.”
11	Select: Start Loading Now
12	When asked “Start loading filesets now?” answer “y”. The load could take several minutes to an hour or more depending on the number of filesets. A screen comes up monitoring the status of the load.
13	When the load has completed, you will see some instructions on the screen, followed by a command line prompt. Following the directions on the screen, go to the end of the file */tmp/update.log* and look in the entries for the proper date and time for error messages or a message indicating filesets were successfully loaded. You may want to use the command `tail -50 /tmp/update.log | more` which will give you the last 50 lines of the file. You may have to experiment with the number of lines.
14	Reboot the system by entering the command: `reboot -q`

5.5 Loading from a Tar-Format Tape

Overview

Tar-format tapes will generally be for installation or update of third-party application software. They will probably come with installation instructions; however, these instructions may need to be modified when using a remote tape drive.

Installation procedure with remote DAT

Use this procedure if your AXM does not have a local DAT drive.

Table 5-4 Installing Software from a Tar-Format Tape (Remote DAT)

Step	Action
1	Insert the tape in the System Administration Station DAT drive
2	Do an rlogin to the AXM as root from the System Administration Station.
3	Follow the instructions supplied with the tape relating to creating and/or changing to the directory where the software will be installed.
4	Enter the command: `remsh` *`host`* `dd if=/dev/rmt/0m bs=10k | tar xf -` where *host* is the Internet hostname of the System Administration Station. Do not overlook the minus sign (-) at the end of the command—it is required.
5	It may take as much as 5 minutes for the tape to load. When the load completes, the prompt will return to the screen.
6	Follow the instructions that were supplied with the tape for installation of the software.

Installation procedure with local DAT

Use this procedure if your AXM has a local DAT drive.

Table 5-5 Installing Software from a Tar-Format Tape (Local DAT)

Step	Action
1	Insert the tape in the AXM DAT drive
2	Do an rlogin to the AXM as root from the System Administration Station.
3	Follow the instructions supplied with the tape relating to creating and/or changing to the directory where the software will be installed.
4	Enter the command: `tar -xv`
5	It may take as much as 5 minutes for the tape to load. When the load completes, the prompt will return to the screen.
6	Follow the instructions that were supplied with the tape for installation of the software.

Index

Index

R

S

T

U, V

W

X, Y, Z

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