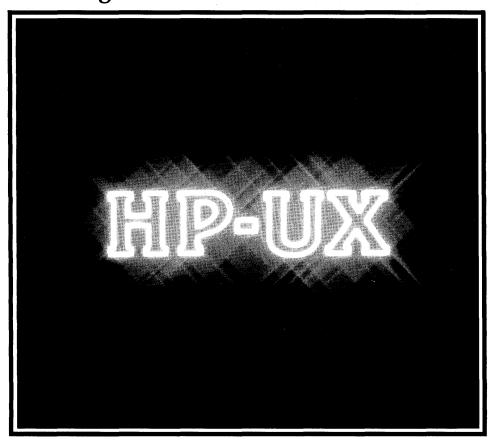HP 9000 Series 300 Computers

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Installing HP-UX

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Installing HP-UX

HP 9000 Series 300 Computers

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Contents

1

Introducing Series 300 7.0 HP-UX Installation

This manual explains how to install release 7.0 of the HP-UX operating system. The following table answers questions you might have before you begin.

Questions	Answers
Where do I get prerequisite information?	See these sections in chapter 1:
	"Install, Update, ... " Helps you confirm wanting to install HP-UX (as opposed to updating or reconfiguring).
	"An Overview of HP-UX Subsystems" A table shows some major subsystems of the operating system.
	"What Are Partitions and Filesets?" Explains relationships among these entities and how the installation moves files from a tape onto a disk so that you have a file system.
	"Before You Install" Lists the requirements for beginning an installation.
How do I install HP-UX?	Chapter 2 describes each step and menu in the installation process.
What do I do after the installation?	Chapter 3 describes how to log into the system and provides suggestions for reconfiguring and customizing.

Install, Update, Configure, or Reconfigure

Read this section if you are uncertain about whether to install, update, or configure HP-UX. The table on the facing page explains these tasks and when you perform them.

Task	Description and Application
Install	Install HP-UX when you have one of the following situations: ■ A new hardware system and you want to run release 7.0 of HP-UX. □ Use this manual. ■ An existing system has an operating system that is HP-UX release 6.2 or earlier, and you want to run release 7.0 of HP-UX. □ Use this manual. □ Must be **superuser** (logged in as `root`).
Update	You have HP-UX release 6.5 and need to update to the 7.0 release, *or* you installed the 7.0 release and need to add software to it. ■ Must be superuser. ■ See *HP-UX System Administration Tasks Manual*.
Configure	After installing HP-UX, you **configure** (customize) the system: ■ Must be superuser. ■ See *HP-UX System Administration Tasks Manual*. ■ See the documentation for devices and software related to what you configure.
Reconfigure	After installing HP-UX, you reconfigure when adding a new device or user and altering HP-UX so it accommodates the device or user. ■ Must be superuser. ■ See the *HP-UX System Administration Tasks Manual*.

An Overview of HP-UX Subsystems

Read this section for an overview of a few HP-UX subsystems. Generally, the subsystems listed are software products that run on the HP-UX platform.

The table on the facing page lists some major subsystems, describes them briefly, and suggests which documentation to consult for more information. As you study the table and read the next section—which discusses partitions, filesets, and the HP-UX file system—you will realize that HP-UX consists of layers of software that you obtain from the tape.

Subsystem	Description	Getting Information
AXE (Core)	The Application Execution Environment contains the kernel, shells, vi editor, and tools for system administration.	*Application Execution User's Manual*
PE	A programming environment that includes utilities, libraries, communications packages, C compiler, control of HP Windows/9000.	All manuals—except *Application Execution User's Manual.* You might refer to *Finding HP-UX Information* (Series 300).
X11 Windows	Provides the X11 windowing system.	*Using the X Window System*
Starbase	A library of graphics routines that let you write graphics programs using C, FORTRAN, LISP, or Pascal.	*A Beginner's Guide to Using Starbase*
GKS	A superset to Starbase that provides an industry-standard interface to Starbase.	*HP-GKS User's Manual*
DGL/AGP	Computer graphics packages for 2- and 3-dimensional graphics programs. AGP is built upon and communicates through DGL.	*DGL Programmer's Manual* and *AGP Programmer's Manual*
Languages	Includes FORTRAN 77, Pascal, Lisp, Prolog, and Ada.	*Finding HP-UX Information* (Series 300)
NS-ARPA	Provides Network File Transfer and myriad networking services (e.g., ftp, rlogin, rcp, telnet).	*Using Network Services* and *Using ARPA Services*
NFS	Network File Services. Provides transparent access to remote network file systems.	*Using and Administering NFS Services*
BASIC/UX	Hewlett-Packard BASIC environment; the BASIC interpreter and part of the BASIC Workstation operating system that runs "on top of" HP-UX.	*BASIC/UX* documentation set

What Are Partitions and Filesets?

The subsystems on HP-UX define a high-level subdivision of the HP-UX operating system. Partitions, filesets, and files define progressively finer, more detailed subdivisions.

A **partition** is a logical grouping of filesets; a **fileset** is a logical grouping of **files.** Some filesets contain hundreds of files; some contain only a few files. A **product** (for example, the X11 Window System) is a logical grouping of filesets and/or partitions.

Installing HP-UX is a process of loading thousands of files (grouped as partitions and filesets) from a tape onto your destination disk. When the files are transferred from the tape to your disk, the files are deposited on the disk in a hierarchical structure that is *unrelated* to the original partition/fileset groupings on the tape.

See Appendix A for a description of the partitions and filesets contained on the install tape.

Before You Install . . .

1. Obtain the tape cartridge for release 7.0 of HP-UX. This tape is labeled as follows:

   ```
            HP9000 Series 300 HP-UX  INSTALL TAPE
         Release 0700, VUF A.B7.00, INSTALL format
                              DC600 Cart 1 of 1
   ```

2. Have a properly configured and tested hardware system as follows:

Computer	Series 300, Model 318, 319, 320, 330, 332, 340, 350, 360, 370, or 375 (Model 310 is no longer supported).
Disk drive	At least one hard disk drive (for example, an HP 7958 or HP 7937/7936) with:

   - approximately 80 Mbytes minimum disk space.
   - at least 130 Mbytes recommended for a workstation.
   - at least 300 Mbytes recommended for a cluster server.

Tape drive	A tape drive that uses an HP Certified Data Cartridge (for example, an HP 9144).
RAM	At least 4 Mbytes; 8 Mbytes recommended. For a cluster server, at least 8 Mbytes; 16 Mbytes recommended.

   For more information on a properly configured system, see available hardware configuration manuals and data sheets, such as the *HP9000 Series 300 Hardware Configuration Guide*.

3. When you finish Steps 1 and 2, above, go on to Chapter 2. A typical installation takes 4 to 6 hours, depending on how much software you load.

2

Installing the HP-UX Operating System

The information in this chapter assumes you read Chapter 1, and have met the system requirements.

Beginning the installation implies compliance with licensing requirements. You should have read the *HP Software Product License Agreement and Limited Warranty* and any other licensing requirements included with your system and software.

Here is a brief overview of the installation process:

- During the installation process, you work through a series of menus that provide options or ask questions. To help you avoid problems, the steps in this chapter recommend certain options and decisions.

- After the installation, complete tasks such as adding users, configuring the printers, and setting up networking.

- A typical installation takes 4 to 6 hours. For most of this time, the system loads filesets. During these times, you can leave the system unattended (except for changing tapes).

Go on to Step 1 when you are ready.

Step 1: Getting Your System Ready

The following table describes what you must do to get your system ready for an installation:

Type of System	Your Actions and Requirements
New hardware No operating system	Turn OFF your computer and all peripherals.
Old operating system (HP-UX 6.2 or older)	1. Become superuser (login as `root`) if the old system is HP-UX. 2. Back up any files you want saved (for example, use `tar` to archive them to a tape; see *tar*(1) in the *HP-UX Reference*). For an existing HP-UX system, at least backup `/users` (all pre-existing data on the disk will be overwritten by the installation process). 3. Make printouts of all your customized files (for example, `/etc/rc`, `/etc/passwd`, `/etc/hosts.local`), so you can easily restore the customizations on the new system. (You could collect the files in a special directory, use `tar` to make a tape archive, and restore them later, making adjustments that accommodate the new release.) 4. Shut down the system as specified in its documentation. For an existing HP-UX system, you could use: `/etc/shutdown -h` 5. When the shutdown is complete, turn OFF the computer and all peripherals.

Go on to Step 2.

Step 2: Inserting the Release 7.0 HP-UX Install Tape

1. Turn ON the tape drive that will contain the 7.0 HP-UX install tape.

   - If the tape drive is built into the disk drive, turning on the disk drive turns on both the tape and disk drives.

   - The tape drive is called the **source device** later when you see the installation menus.

2. Turn ON the disk drive you plan to use as the startup (boot) disk for HP-UX.

   - This drive is called the **destination device** later when you see the installation menus.

   - Eventually, you can **mount** (connect) additional disk drives that HP-UX can use, but they are not important now because installation deals with only one disk.

3. Wait until the drive warms up (no red or orange lights on; the green light is steady).

4. Ensure that the protect switch on the HP-UX cartridge tape points to SAFE or PROTECT. Then insert the HP-UX cartridge tape in the tape drive, and wait until the busy light stays OFF (about 2 to 5 minutes).

Go on to Step 3.

Step 3: Loading the Installation Software

1. The tape is in the tape drive and the disk drive is ON. Now, turn ON the:

   a. Expander (if present)
   b. Terminal or monitor (if it has its own switch)

2. Leave other peripheral devices OFF until the installation is complete.

3. Turn ON the computer, and hold down the space bar until you see `Keyboard` displayed on the left side of the display.

4. Release the space bar and wait. In a moment, a list of the available systems displays on the upper right.

   If you do not see this list, check that your destination disk is set at bus address 0 and that the tape drive is *not* set at bus address 0. Also check that the cables are properly configured to the source device. Turn OFF the computer, and start again at Step 3, above.

   a. A **new** system displays something like this:

   ```
   : HP9144 TAPE, 700, 1, 0    The model number (e.g., 9144) should indicate
   1H SYSHPUX                   your tape drive.
   ```

   b. An **existing** HP-UX system displays something like this:

   ```
   : HP7958, 701, 0, 0          Current operating system on destination disk
   1H SYSHPUX
   1D SYSDEBUG
   1B SYSBCKUP
   : HP9144 TAPE, 700, 1, 0     The install tape
   2H SYSHPUX
   ```

5. Type the characters preceding the system shown for the tape (if you have a graphics monitor, do *not* shift for a capital "H" and do *not* press $\boxed{\text{Return}}$). For example:

1H *for the new system ("a"), in the example opposite*
2H *for the existing system ("b"), in the example opposite*

The tape drive's busy light comes on, and you will soon see some messages (messages will differ differ depending on your configuration):

```
CONSOLE is ITE
 ...
Root device major is 0, minor is 0xe0010, root site is 0
```

Go on to Step 4.

Step 4: Interpreting the Welcome Screen

In a few minutes you see the Welcome Screen, which provides an overview of the installation process:

```
Welcome to HP-UX install.  There are basically 4 steps to install-
ing HP-UX, which this and other utilities will lead you through.
:

Press "Return" when you're ready to proceed ... >
```

Read the overview carefully. Note which keys perform what function (these keys will not work until you proceed to the next step):

■ Arrow keys (▲, ▼, ▶, ◀): Use to highlight menu items.

■ "Select Item": Use to select the highlighted menu item.
("Select Item" is one of several labels along the bottom of menus throughout the installation process. These labels correspond to **function keys** on the top row of your keyboard—(f1), (f2), ... (f8). The "Select Item" function key will always be (f4).)

■ (Return): Same as "Select Item" function key. Also use after entering values you have typed at the keyboard.

Go on to Step 5.

Step 5: Select the Destination Device

You should see the Destination Menu, below (if you do not see this menu, something is wrong. Unload the install tape from the tape drive, remove the tape, turn everything OFF, and start the process again):

```
          HP-UX INSTALLATION UTILITY -- DESTINATION MENU


    Select one of the following disks (name and system location) ...
    :
    :

                Select   Bus    Unit    Vol
    Disk         Code    Addr    Num     Num
    ---------------------------------------------
    :
    :



    Search Again
    Other disk


---------------------------------------------------------------------------
     |          |     | Select |      |          |          | | Exit
     |          |     |  Item  |      |          |          | |Install
---------------------------------------------------------------------------
```

Selecting the Destination

The Destination Menu lists all connected disks, including the disk's select code, bus address, unit number, and volume number. From the Destination Menu, select the **destination disk** (that is, the disk on which you want to install HP-UX) as follows:

1. Using the arrow keys, move the highlight bar until you've highlighted the name of the disk that will be the destination disk.

2. Press either "Select Item" (f4) or Return.

The Destination Disk Is Not Listed

If you do not see your destination disk listed on the menu, make sure the disk is connected properly and turned on. Then follow these steps:

1. Select the "Search Again" option.

2. If you still don't see your destination disk listed on the Destination Menu, select the "Other disk" option.

3. Type in the correct information:

   - Major number (0 for HP-IB/CS80 disks; 7 for SCSI disks)

   - Select code (set on the interface card connected to the disk; usually 14 for high speed HP-IB or SCSI, or 7 for standard HP-IB)

   - Bus address (set on the disk with DIP switches or a rotary switch; usually 0)

   - Unit number (usually 0)

   - Volume number (usually 0)

4. Press (Return). You should see your destination device listed on the Destination Menu. Use the arrow keys to highlight the disk, and press "Select Item".

Installing onto a Used Disk

If you are installing 7.0 HP-UX onto a disk that contains a previous version of HP-UX, the program issues the following message as a safety check to prevent users from accidentally overwriting an existing system:

```
Note: There appears to be an HP-UX system already on this disk.
Press [Return] to continue.
```

At this point, you must continue (press (Return)). If you do not want to install HP-UX on this disk, you can exit install from the menu that follows.

Go on to Step 6.

Step 6: Continue the Program or Alter Parameters

After you select a destination device, you see the Main Menu, below. This
menu lets you continue the installation, change the destination device, or
change file system parameters. You also can exit the program; however, if you
decide to exit at this point, you will have to reboot your system and start over.

The three subsections on this and the facing page describe the Main Menu
options. Read these sections, and proceed accordingly.

```
              HP-UX INSTALLATION UTILITY -- MAIN MENU

              Major    Select   Bus      Unit     Volume
              Number   Code     Address  Number   Number    Model

   Source:       4       14       0        0        0       Tape
   Destination:  0        7       5        0        0       HP 7959

      If the destination device shown above is correct and you
      do not want to modify file system parameters (normally the
      case), select the "CONTINUE" option below.

                            Description

            CONTINUE installation process ...
            Change DESTINATION device ...
            Change FILESYSTEM parameters ...
   ------------------------------------------------------------------
      |        |       | Select |      |        |        | | Exit
      |        |       |  Item  |      |        |        | |Install
   ------------------------------------------------------------------
```

CONTINUE installation process . . .

Select this option if you are satisfied with the current destination and file
system parameters and want to continue the installation. Use the arrow keys to
highlight this option, and press "Select Item" or (Return). Proceed to
Step 7.

Change DESTINATION device ...

Select this option if you are not satisfied with the current destination. To change to a different destination device, proceed as follows:

1. Use the arrow keys to highlight this option:

    `Change DESTINATION device ...`

2. Press "Select Item", which returns you to the Destination Menu. Follow the instructions in "Step 5: Select the Destination Device." From this menu, you also can return to the Main Menu ((f2)) or you can exit install ((f8)).

Change FILESYSTEM parameters ...

The installation process initializes the file system (the disk) using default parameters suitable for most HP-UX use. Do not change the values for file system parameters unless you have expert knowledge of HP-UX and know why you need to change them.

If you do need to change the parameters, proceed as follows:

1. Use the arrow keys to highlight this option:

    `Change FILESYSTEM parameters ...`

2. Press "Select Item", which brings up the Filesystem Parameters Menu. To change file system parameters, follow these steps:

    a. Use the arrow keys to highlight the parameter you want to change. (Typically, the only parameter you might need to change is "swap space"; see the following page for a discussion of swap space.)

    b. Type the new parameter value; the value appears at the bottom of your display for verification.

    c. Press (Return) to verify the value you just typed. *Changes are immediate.*

    d. When you have changed all necessary file system parameters, press "Done" ((f4)). You will return to the Main Menu, illustrated on the facing page.

Go on to Step 7.

Step 7: Verifying Swap Space

When you continue from the Main Menu, you see the following menu:

```
                    Swap space verification

   The current swap space is xxxxx blocks (1 block = 512 bytes)
   Is this correct? (Enter y or n) >> _
```

Swap space is space on the disk that is reserved for operating system use. The swap space, together with file system space, make up the disk capacity. Thus, if you increase your swap space, you decrease your file system space (and vice versa).

With the 7.0 release, *you can easily add swap space any time after the installation* (see the *System Administration Tasks Manual*); however, if you allocate more swap space now, you cannot easily *deallocate* that extra swap later, and use it for file system space. In most cases, then, the default value (*xxxxx*) is adequate—simply enter Ⓨ, and go to Step 8.

If you want to provide for more swap space now, find your case below and take the corresponding action; however, remember that it is difficult to *decrease* the amount of swap space if you set it up in this way:

AXE System For a standalone AXE system on which you plan to run a few applications, the default value is adequate. Enter (Y).

Typical Workstation For a workstation on which you plan to run, for example, the X11 Window System and subsystems such as The SoftPC, networking, and BASIC-UX, the default value is adequate. Enter (Y).

If you plan to run large, complex applications, examine the documentation for the applications, and enter a swap space value that will accommodate the applications.

Cluster Server A cluster server needs a disk that provides approximately 300 Mbytes of file system space. And, depending on the applications you decide to run, you could need 20 Mbytes (40,000 512-byte blocks) of swap space for each cnode installed on the system (the X11 Window System, for example, needs this much swap space). Remember that as you increase swap space, you decrease file system space.

Entering (Y) moves you to Step 8; entering (N) gives you another chance to specify the swap space.

Step 8: Verifying the Destination Device

You see the following information:

```
                    Destination device verification


        Destination Device:  ...
        -------------------------------------------------------
```

```
    WARNING!  If you continue with the installation ...
```

Following the information you see a question:

```
    Do you wish to continue? (Enter y or n) >> _
```

Pressing Ⓝ returns you to the Main Menu, which gives you a chance to alter previous decisions.

Pressing Ⓨ means you are satisfied with the destination and the file system parameters (including swap space). You will not have another chance to change these values after you press Ⓨ. To install the system, you eventually need to continue to Step 9.

Step 9: Initializing the Destination Disk

Again, you get to make a decision.

You see the following information:

```
                    Initializing destination disk

   Before loading HP-UX ...
```

Following the information you see a question:

```
   Do you want to initialize your destination disk? (Enter y or n) >> _
```

Take one of the following actions:

- Press (Y) if you have any of the following conditions:

  □ The destination disk has never been used.

  □ You know or suspect the disk is corrupt.

  □ You have used the disk for some time and want the disk hardware to re-format and initialize the disk and media.

- Otherwise, press (N) and go to Step 10.

If you enter (Y), you get the following display:

```
          HP-UX INSTALLATION UTILITY -- EXECUTION TRACE
It will be about yyyy before any input is required.    yyyy varies according to
Initializing destination disk.                          your disk
```

When the initialization is complete, go on to Step 10. Otherwise, go to Step 10 now.

Step 10: Loading Partitions Containing Filesets

Regardless of whether you initialized your disk, you see the following
information ten minutes to an hour later:

```
Making file system on destination device.
Mounting destination device.
Making directory:  /dev
  ...
```

The system then reboots. After it reboots, the following message is displayed:

```
            HP-UX INSTALLATION UTILITY -- EXECUTION TRACE

Copying /bin/cpio
Copying /bin/mkdir
  ...
```

About twenty minutes later, you see this message:

```
        You are now ready for the next stage in the install process,
        loading HP-UX filesets onto your disk.  Please unload the
        tape currently in the tape drive and put the first tape of
        the set entitled "HP9000 Series 300 HP-UX ... UPDATE format"
        into the drive.

        Press [Return] after loading the HP-UX tape; you will have
        to wait for the busy light to go out before performing any
        actions in the next menu.
```

Load the tape, press (Return), and wait for the busy light to remain out, as
indicated in the message, above. Then, the following menu displays:

```
Install                        Main Menu

        Highlight an item and then press "Return" or Select Item".
        To refresh the screen, press CTRL-L.

        From Tape Device to Local System

        Source:  /dev/update.src                 Destination: /

                  Load Everything from Source Media ->
                  Install Only a Minimum System ->
                  View or Select Individual Partitions ->

                  How to Use Install
   -----------------------------------------------------------------------
   Help  |        | Shell | Select |       |       |       |       |
         |        |       |  Item  |       |       |       |       |
   -----------------------------------------------------------------------
```

The menu options are explained on the following page....

Selecting Options from the Main Menu

Option	How to Use the Option
Load Everything ...	Loads all partitions on the source tape. ■ The easiest and safest way to continue. ■ If you do not need some filesets, you can use `sysrm` to remove them after installation (see *sysrm*(1M) in the *HP-UX Reference*).
Install Only a Minimum System ...	Loads only a minimum bootable system. This system consists of these filesets: `UX_CORE`, `TOOL`, `KERN_BLD`, `PROG_MIN`, and `C_MIN`. The minimum system is intended as an aid in selection: these are filesets that you MUST load; you will almost certainly want to load others as well.
View or Select ...	Lets you see—and select or de-select—a list of the partitions available on the source tape. After making selections, you can start processing.
How to Use Install	Explains navigation and item selection.

Loading the partitions starts a 2- to 6-hour process that loads the partitions you've selected. You probably will need to change tapes during the installation process. While the program loads filesets, the display shows messages related to the process, for example:

```
Loading files from fileset "UX_CORE".
    ...
```

When the process completes, go on to Step 11.

Step 11: Congratulations! You Installed HP-UX

When the install finishes loading the partitions, the system reboots, does some cleanup work, starts some processes, and provides a login prompt. On the display you will see:

```
login:
```

This prompt is an invitation to begin using release 7.0 of the HP-UX operating system. You have some configuration work to do, so go on to Chapter 3.

3

Initial Configuration of HP-UX

This chapter assumes you worked through Chapter 2 and see the first login prompt:

    login:

Proceed as follows:

1. Log in as superuser by typing the following command (no space between root and (Return)):

        root (Return)

2. Answer the questions about line length (you'll probably enter 80 or 128) and height (enter the number at the top of your display—for example, 24 or 46).

3. You get this prompt:

        #_

   The prompt means you have superuser status on the newly installed operating system. Superuser capability means you can create, modify, or delete any file on the system. Use extreme caution.

The following section lists some tasks you should complete right away. For you to perform these and other tasks, see the *HP-UX System Administration Tasks Manual.*

Tasks to Complete after Installation

Once you've installed the operating system, you can start providing for your users. You need to complete the following tasks right away:

1. Review /tmp/update.log.

2. If you started the install with an old operating system (HP-UX 6.2 or earlier), restore any files you saved before you began the installation.

3. Add users to the system by running /usr/bin/sam.

4. If the system is to be a cluster server, use /usr/bin/sam to convert it to a cluster server and add cnodes.

For information on restoring files, adding users, and converting the system to a cluster server, see the *System Administration Tasks Manual*.

Depending on the software you loaded, you may also need to complete these tasks:

1. Configure networking and applications. You might have loaded them during the installation process, or you might need to load them separately using /etc/update. For configuration details, refer to the documentation for those subsystems. For information on /etc/update, see the *System Administration Tasks Manual*.

2. Configure the system for the X11 windowing system if you loaded it during installation (see *Installing X on the Series 300*).

3. Install peripherals (see *Installing Peripherals*).

Regarding these tasks, you might have various questions:

- Where do I get related information?
- How do I administer an HP-UX system?
- What constitutes efficient use of an HP-UX system?
- How do I backup the system and support users?

The manuals for system administration and for particular applications or subsystems will help answer most of these questions. For the documentation to help you manage and use HP-UX, see the manual *Finding HP-UX Information* (Series 300).

A

HP-UX Partitions and Filesets

The HP-UX tape for release 7.0 packages the files for the HP-UX file system into filesets. The filesets are logically grouped into partitions.

This appendix lists the filesets and corresponding partitions on the tape. During installation, you might want to examine the lists to get an overall picture of the relationships among filesets and partitions. If you need to delete some filesets after the installation, the lists can help you see dependencies, sizes, and so on.

Work through the following pages according to your needs and interests. The first section shows AXE (**A**pplication Execution **E**nvironment), which is the core subsystem of HP-UX. The second section shows PE (**P**rogramming **E**nvironment), which provides the commands and tools necessary for programming functionality.

Note	The fileset and partition listing is contained in the *Read Me before Installing* document and in the *System Administration Tasks Manual*.

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