HP-UX 10.2 Software

Installation Guide

Installation Guide

r d i

Please contact RDI Computer at:

RDI Computer Corporation
2300 Faraday Avenue
Carlsbad, CA 92008
Phone (760) 929-0992
FAX (760) 929-9702
email: info@rdi.com
http://www.rdi.com

For RDI Customer Service:
2308 Faraday Avenue
Carlsbad, CA 92008
7:00 AM to 6:00 PM PST
Phone 1-800-734-7030
or (760) 929-0992
FAX (760) 931-5981
email: support@rdi.com

Table of Contents

Installing HP-UX 10.20

Notes

HP-UX   Installing HP-UX 10.20

This guide steps through the RDI installation of the HP-UX 10.20 operating system. For consistency and reliability, this guide uses the character-based HP-UX installation program. The installation screens in this guide are shown *for example only*.

Installation Instructions

If there is existing data on your workstation, back it up before beginning this procedure.

Note: HP-UX 10.20 is installed via the HP-UX *Install and Core OS* CD-ROM. If you do not have this CD-ROM, a copy can be purchased through RDI. QIC tape media and QIC tape drives are not supported under HP-UX release 10.20.

1. Attach a CD-ROM drive to the SCSI port on your workstation. Power-on both the work-station and the CD-ROM drive. Load the HP-UX 10.20 CD into the CD-ROM drive.

   The system starts to boot up and displays the Main Menu.

```
--------------------Main Menu----------------------------
Command                          Description
---------------                  ----------------
BOot [PRI|ALT]<path>]            Boot from specified path
PAth [PRI|ALT][<path>]           Display or modify a path
SEArch [DIsplay|IPL][<path>]     Search for boot devices
COnfiguration menu[<command>]    Access Configuration menu/commands
INformation menu[<command>]      Access Information menu/commands
RDI [<command>]                  Access RDI-specific menu/commands
SERvice menu[<command>]          Access Service menu/commands
DIsplay                          Redisplay the current menu
HElp [<menu>|<command>]          Display help for menu or command
RESET                            Restart the system
---------------
Main menu: Enter command or menu>
```

Figure 1 System Main Menu

The uppercase letters in the command menu show the minimum characters needed to launch a system command.

2. Type **Search** and press the ENTER key to have the system search for bootable devices.

   The system displays a list of bootable devices similar to the one shown here.

```
========================================================================
Searching for potential boot device.
This may take several minutes.

To discontinue, press any key.

Path Number          Device Path        Device Type
-----------          -----------        -----------
P0                   SESCSI.6.0         PLEXTOR CD-ROM PX-4XCS
P1                   SESCSI.0.0         ADTX AXSITS2532R 014C

Main Menu: Enter command or menu>
========================================================================
```

Figure 2 Select System Boot Device

3. Type **boot p***n* where "*n*" is the Path Number of the CD-ROM containing the HP-UX CD, and press the ENTER key to boot the workstation from the CD-ROM.

You can also specify the selected device by device path. For example, to select device P1 as the boot device, type the Device Path **SESCSI.6.0** and press the ENTER key.

Example:

boot SESCSI.6.0

boot P0

Each command attempts to boot the **Device Type** located at **Path Number** P1.

The system boots and displays various system messages.

This process may require several minutes for the system to boot.

Note: The PrecisionBook's SCSI targeting is factory preset to targets 0, 1, and 2. These targets correspond to the three PrecisionBook internal device bays. DO NOT set your external SCSI CD-ROM to one of these targets or your system may not boot and you will not be able to install HP-UX from your attached CD-ROM.

Some HP CD-ROMs are factory preset to use SCSI ID 2. If you cannot change the SCSI ID of the external CD-ROM, remove the internal PrecisionBook device currently assigned SCSI ID 2 and restart the HP-UX installation process.

Note: If the following message prompt appears during the boot process, type "n" and press the ENTER key to continue the boot process:

```
Interact with IPL (Y or N)?> n
```

Note: If necessary, you can abort the installation process at this point, by turning the system *off* and starting over.

The installation program continues and searches for input-output (I/O) devices. It then prompts you to set a language mapping for your system. This may take several minutes depending on system speed and installed I/O devices.

4. Select a language mapping by typing the appropriate language mapping number and pressing the ENTER key, e.g. **45** for PS2_DIN_US_English.

5. Press the ENTER key again to accept your language mapping selection and continue the installation process or enter another language mapping number as appropriate.

Your choice will be stored in the file
`/etc/kbdlang`.

The installation program continues and displays the installation Welcome screen.

```
            Welcome to the HP-UX installation process!

Use the <tab> and/or arrow keys to navigate through the following menus,
and use the <return> key to select an item. If the menu items are not
clear, select the "Help" item for more information.



                    [    Install HP-UX    ]
                    [ Run a Revovery Shell ]
                    [   Cancel and Reboot   ]
                    [    Advanced Options   ]
                    [ Read Sys-Admin Message ]

                         [   Help   ]


```

Figure 3 Select Install HP-UX

6. Select the **Install HP-UX** option from the Welcome screen and press the ENTER key to continue.

    The system continues the installation process. If you are not booting your system from a network, you will receive the following system message.

```
If you plan to use a network software depot to load the operating
system, you will need to enable networking at this time.

Would you like to enable networking now? [n]
```

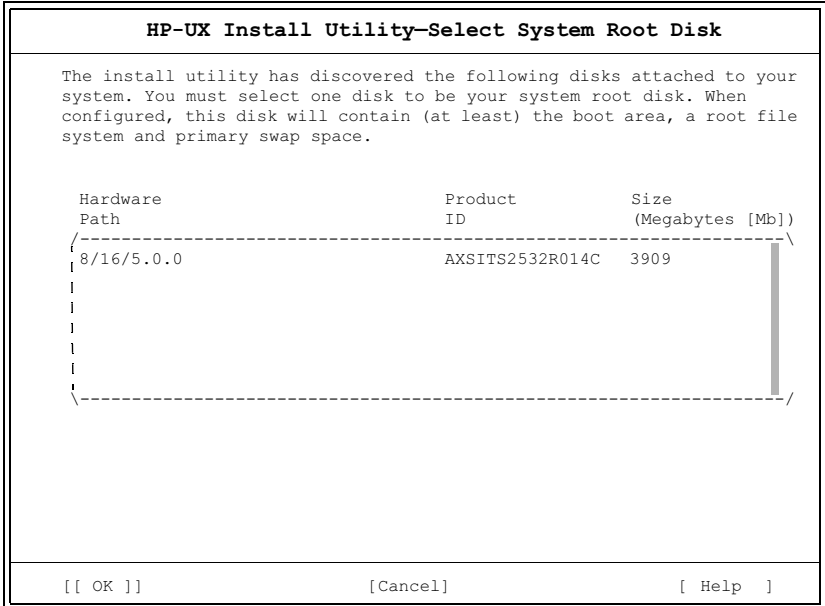7. Type "**n**" to continue installing HP-UX from your local CD-ROM.

Selecting the Root Disk

If your system has more than one target disk, the
Select System Root Disk screen will display. Select the
target disk on which you want to install HP-UX.

Note: If you have only one target disk, proceed to
the next section, "Selecting a Whole-System
Configuration," on page 6.

```
┌─────────────────────────────────────────────────────────────────────┐
│            HP-UX Install Utility—Select System Root Disk              │
│                                                                       │
│   The install utility has discovered the following disks attached to your│
│   system. You must select one disk to be your system root disk. When  │
│   configured, this disk will contain (at least) the boot area, a root file│
│   system and primary swap space.                                      │
│                                                                       │
│    Hardware                        Product        Size                │
│    Path                            ID             (Megabytes [Mb])     │
│   /-------------------------------------------------------------------\│
│   | 8/16/5.0.0                     AXSITS2532R014C  3909              │ │
│   |                                                                  │ │
│   |                                                                  │ │
│   |                                                                  │ │
│   |                                                                  │ │
│   |                                                                  │ │
│   \-------------------------------------------------------------------/│
│                                                                       │
│                                                                       │
│                                                                       │
│                                                                       │
│    [[ OK ]]                  [Cancel]                    [ Help  ]     │
└─────────────────────────────────────────────────────────────────────┘
```
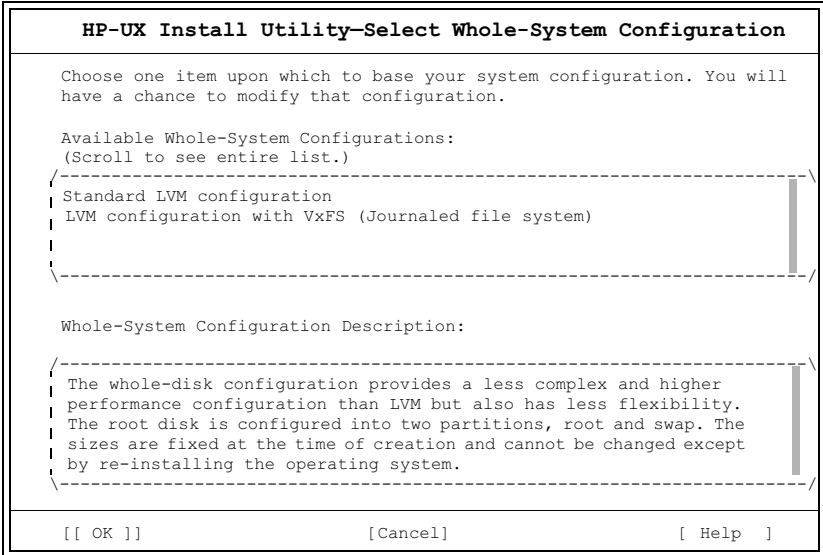
Figure 4 Select System Root Disk

1. Select a root disk from the displayed list.

2. Press the TAB key to select **OK** and press
   the ENTER key to choose the selected root
   disk and continue the installation process.

   *The system displays the Select Whole-System Con-
   figuration screen.*

Selecting a Whole-System Configuration

Use the Select Whole System Configuration screen to select the file system configuration you desire. The available options for whole-system configuration include:

· LVM (Logical Volume Manager)

· LVM with VxFS (Journaled File System)

```
       HP-UX Install Utility—Select Whole-System Configuration

 Choose one item upon which to base your system configuration. You will
 have a chance to modify that configuration.

 Available Whole-System Configurations:
 (Scroll to see entire list.)
/-----------------------------------------------------------------------\
| Standard LVM configuration                                            |
| LVM configuration with VxFS (Journaled file system)                   |
|                                                                       |
|                                                                       |
\-----------------------------------------------------------------------/

 Whole-System Configuration Description:

/-----------------------------------------------------------------------\
| The whole-disk configuration provides a less complex and higher       |
| performance configuration than LVM but also has less flexibility.     |
| The root disk is configured into two partitions, root and swap. The   |
| sizes are fixed at the time of creation and cannot be changed except  |
| by re-installing the operating system.                                |
\-----------------------------------------------------------------------/

 [[ OK ]]                    [Cancel]                    [ Help  ]
```

Figure 5 Select Whole-System Configuration

| *Note:* | An LVM configuration requires separate logical volumes to contain at least **/, /stand, /opt, /home,** and the system's primary swap. This configuration enables additional configuration options and system flexibility. |

1. Select a configuration from the displayed list.

As you highlight a configuration, descriptive text appears at the bottom of the configuration screen. You can scroll through this text to learn more about the selected configuration.

2.   Press the TAB key to select **OK**, then press the ENTER key to choose a configuration and continue the installation process.

HP-UX 10.20 Installation

Selecting a Basic Configuration

Use this screen to view or modify your basic system configuration. The screen shown in "Selecting a Whole-System Configuration," on page 6, displays a typical LVM configuration. While at this screen you can view and adjust basic system configuration settings. You can also select a software language and make a locale setting for your system. Locale settings determine language-environment conventions such as time and monetary conventions in software messaging.

For more information on setting software language and locale parameters, see *Localized System Configuration Overview* (HP Part No. B3782-90095). If you intend to configure multiple disks into the root volume group,

ensure that the **Make Volatile Dirs Separate**
selection is set to **True**. This allows the root file system
to expand as needed and allows the volumes to spread
across more than the root disk.

```
          HP-UX Install Utility—Basic Configuration

  You may modify the following basic configuration parameters. Press OK to
  save your changes.

  Primary Swap Size               [256 Mb->]
  Secondary Swap Size             [None->]
  Software Selection              [CDE Runtime Environment->]
  Software Language               [English->]
  Locale Setting                  [default (C)->]
  File system file name length    [Long->]
  /home Configuration             [Minimal->]
  How many disks in root group    [One->]
  Make volatile dirs separate     [True->]
  Create /export volume           [False->]



  [[ OK ]]                    [Cancel]                      [ Help  ]
```

Figure 6 Basic Configuration

1. View and/or modify your system's basic configura-
   tion.

Note: You can display a mini-menu of parameters
for each configuration item. Highlight the
item of interest and press the ENTER key.
Use your arrow keys to highlight selections
on the mini-menus and press the ENTER
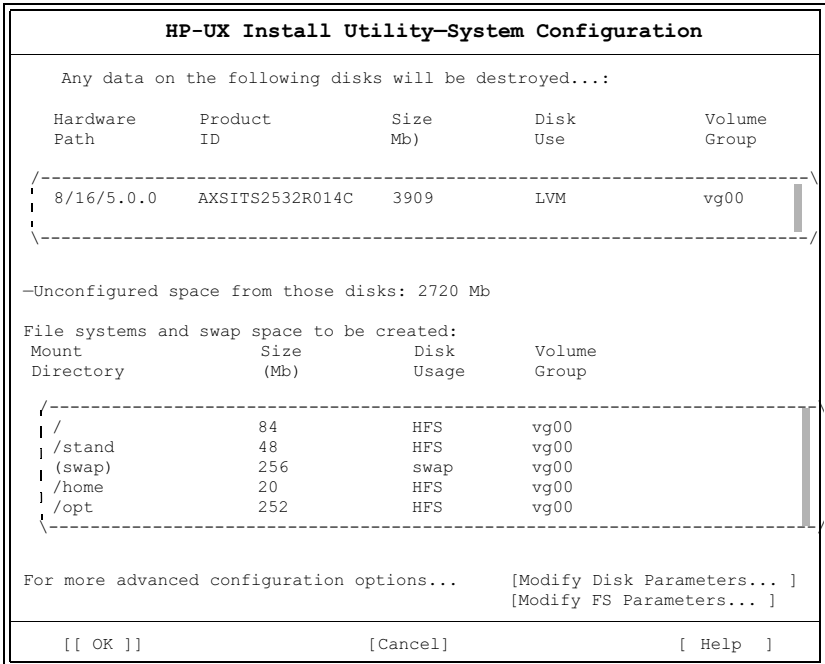key again to choose a selection.

Note: Help information is also available for a given
parameter by pressing the F1 key while the
parameter is highlighted.

2. Use your TAB key to select **OK** and press
   the ENTER key to accept the displayed
   configuration and continue the installation
   process.

   *This displays the System Configuration screen
   shown in* Figure 7.

Configuring the Disk and File System

Use this screen to review the configuration you established in "Selecting a Whole-System Configuration," on page 6. You can accept the system defaults (sufficient for most situations) or modify your disk and file system parameters as required.

```
            HP-UX Install Utility—System Configuration

    Any data on the following disks will be destroyed...:

   Hardware       Product          Size         Disk           Volume
   Path           ID               Mb)          Use            Group
 /----------------------------------------------------------------------\
 |  8/16/5.0.0   AXSITS2532R014C  3909         LVM            vg00        |
 |                                                                        |
 \----------------------------------------------------------------------/


—Unconfigured space from those disks: 2720 Mb

File systems and swap space to be created:
 Mount                Size         Disk         Volume
 Directory            (Mb)         Usage        Group

  /----------------------------------------------------------------------\
 | /                   84           HFS          vg00                      |
 | /stand              48           HFS          vg00                      |
 | (swap)              256          swap         vg00                      |
 | /home               20           HFS          vg00                      |
 | /opt                252          HFS          vg00                      |
  \----------------------------------------------------------------------/


For more advanced configuration options...    [Modify Disk Parameters... ]
                                               [Modify FS Parameters... ]

    [[ OK ]]                    [Cancel]                     [ Help  ]
```

Figure 7 View/Modify System Configuration

· **To accept the displayed configuration** options and proceed to loading the core operating system, use your TAB key to select **OK** and press the ENTER key. If you accept the system defaults, proceed to "Loading the Core Operating System," on page 18.

This displays the screen shown in Figure 12.

- *To modify disk or file system parameters*, use your TAB key to select a disk or file system parameters option and press the ENTER key to display another configuration screen.

This displays either the screen shown in Figure 8 *(***Modify Disk Parameters***) or* Figure 11 *(***Modify FS Parameters***).*

Note: You may see a warning screen stating that one or more of your target disks already contains a file system or that there are potential system configuration errors. From the warning screen, press **Continue...** if and only if you can safely overwrite such file systems and you can safely ignore any specified system configuration notes or warnings.

Note: If you want to change target disks at this point, select **Modify Configuration...** and then **Cancel** and successively back out to "Selecting the Root Disk," on page 5.

Setting Optional System Parameters

Setting optional system parameters enables an authorized user to custom configure parameters for the system's disks, file systems, and volume groups. Do not attempt to adjust these parameters without the proper authorization or required knowledge.

WARNING: Incorrect configuration of optional system parameters may affect your product warranty and service agreement. You should set optional system parameters only if you are authorized to do so.

Specifying Disk Usage (Optional)

If you selected **Modify Disk Parameters** in "Configuring the Disk and File System," on page 9, the system displays a screen similar to the one shown in Figure 8. At this screen you can modify disk usage and parameters. This screen is generally used for configuring a second disk. Bracketed fields such as **Disk Usage: [LVM –>]**, allow you to select items to modify mini-menus while blanked or underlined fields such as **Volume Group: <u>vg00</u>** allow direct entry of information.

```
              HP-UX Install Utility—Specify Disk Usage

   Select a disk from the list, specify the disk usage scheme and (if
   applicable) the volume group, then select Modify to apply the changes.

   Hardware      Product           Size        Disk           Volume
   Path          ID                Mb)         Use            Group

 /---------------------------------------------------------------------\
 |  8/16/5.0.0   AXSITS2532R014C   3909        LVM            vg00
 |
 \---------------------------------------------------------------------/



Disk Usage:     [LVM ->]
Volume Group:   vg00
                             [ Modify ]

[Modify Disk Parameters... ][Modify Volume Group Parameters... ]

    [[ OK ]]                    [Cancel]                   [ Help  ]
```

Figure 8 Specify Disk Usage

1. Select a disk and use the TAB key to select a field you want to change, then press the ENTER key to clear the field of existing information or to display a mini-menu from which you may make a selection.

Note: Use the TAB key to move between major sections of this screen and your arrow keys to move within sections, e.g. within lists, mini-menus, etc.

Note: To edit/clear data from configuration fields that allow direct data entry, highlight the field and press the Backspace key to clear it. Configuration fields ending in a "– – >"

contain mini-menus from which you may make a selection. To select an item from a mini-menu, highlight the item and press the ENTER key.

2. Change or enter **Disk Usage** and **Volume Group** data as required.

3. Use your TAB key to highlight **Modify** (if you have made changes) and press the EN-TER key to accept your changes.

4. Modify your disk or volume group parameters (LVM) by doing one of the following:

*   Use your TAB key to select **Modify Disk Parameters**, then press the ENTER key to display Figure 9.

*   Use your TAB key to select **Modify Volume Group Parameters**, then press the ENTER key to display Figure 10.

*   Use your TAB key to select **OK**, then press the ENTER key to leave the disk usage screen and begin loading the core operating system. See "Loading the Core Operating System," on page 18 for more information.

Modifying Disk Parameters (Optional)

If you selected **Modify Disk Parameters** in from the Specify Disk Usage screen, the system displays a screen similar to the one shown here. To modify volume group parameters, see "Modifying Volume Group Parameters (Optional)," on page 15.

```
            HP-UX Install Utility—Modify Disk Parameters

Select a disk for which to modify parameters, set the desired parameters, then
select "Apply" to apply the change. A "default" keyword signifies that the
default values as specified by the mkfs(1m), newfs(1m) or mediainit(1)
commands will be used. Otherwise, the specified value will be used.

Use care when making changes, the default values should be sufficient.

   Hardware       Product            Size
   Path           ID                 Mb)


 /------------------------------------------------------------------------\
 ¦                                                                        ¦
 ¦  8/16/5.0.0    AXSITS2532R014C    3909                                 ¦
 ¦                                                                        ¦
 \------------------------------------------------------------------------/


Tracks per cylinder: default
Disk RPM:            default
Initialize (mediainit) this disk? :[ No -> ]


    [ OK ]          [ Apply ]           [ Cancel ]          [ Help ]
```

Figure 9 Modify Disk Parameters

Caution: Before making changes to the disk parameters sub-screens, please consider the following:

Default disk parameters are usually suitable and should not be changed unless your disk setup specifically requires it.

Caution: *Initializing a disk (mediainit) is generally an unnecessary and time-consuming procedure. This procedure is usually needed only if a disk has sustained low-level formatting damage due to a control malfunction.*

---

1. If needed, make any applicable modifications and use your TAB key to select **OK**.

Note: Use the TAB key to move between major sections of this screen and your arrow keys to move within sections, e.g. within lists, mini-menus, etc.
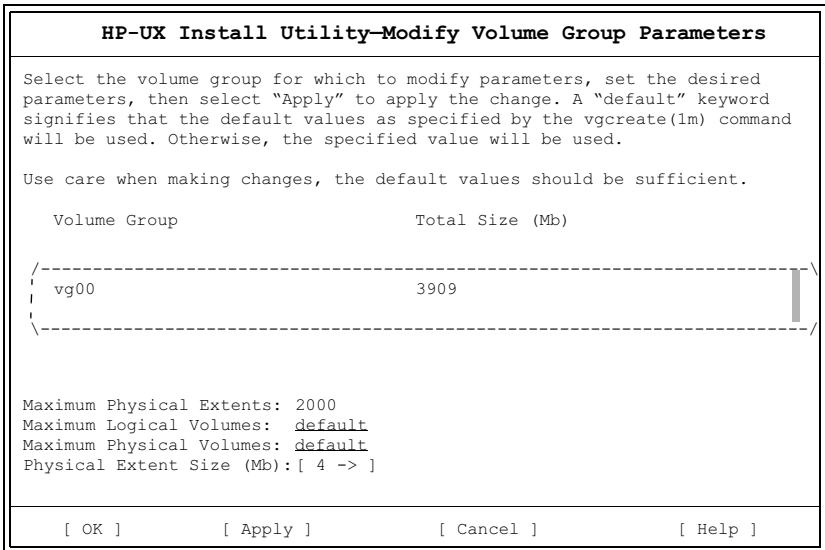
Note: To edit/clear data from configuration fields that allow direct data entry, highlight the field and press the Backspace key to clear it. Configuration fields ending in a "– – >" contain mini-menus from which you may make a selection. To select an item from a mini-menu, highlight the item and press the ENTER key.

2. Press the ENTER key to continue the installation.

Modifying Volume Group Parameters (Optional)

If volume group parameters are applicable to your configuration, and you selected **Modify Volume Group Parameters** in "Specifying Disk Usage (Optional)," on page 11, the system displays a screen similar to the one shown in Figure 10. To modify disk parameters, see "Modifying Disk Parameters (Optional)," on page 13. The Modify Volume Group Parameters dialog only appears if you have selected an LVM or disk array configuration.

```
         HP-UX Install Utility—Modify Volume Group Parameters

Select the volume group for which to modify parameters, set the desired
parameters, then select "Apply" to apply the change. A "default" keyword
signifies that the default values as specified by the vgcreate(1m) command
will be used. Otherwise, the specified value will be used.

Use care when making changes, the default values should be sufficient.

   Volume Group                        Total Size (Mb)

 /--------------------------------------------------------------------------\
 |  vg00                               3909                                 |
 |                                                                          |
 \--------------------------------------------------------------------------/


Maximum Physical Extents: 2000
Maximum Logical Volumes:  default
Maximum Physical Volumes: default
Physical Extent Size (Mb):[ 4 -> ]


    [ OK ]           [ Apply ]            [ Cancel ]           [ Help ]
```

Figure 10 Modify Volume Group Parameters

1. If needed, make any applicable modifications and use your TAB key to select **OK**.

Note: Use the TAB key to move between major sections of this screen and your arrow keys to move within sections, e.g. within lists, mini-menus, etc.

Note: To edit/clear data from configuration fields that allow direct data entry, highlight the field and press the Backspace key to clear it. Configuration fields ending in a "– – >"

---

contain mini-menus from which you may make a selection. To select an item from a mini-menu, highlight the item and press the ENTER key.

2. Press the ENTER key to continue the installation.

   The system then displays the screen shown in Figure 8 to summarize the current status of disk usage.

Configuring File Systems (Optional)

If you selected **Modify FS Parameters** in "Configuring the Disk and File System," on page 9, the system displays a screen similar to the one shown in Figure 11. To modify disk parameters, see "Modifying Disk Parameters (Optional)," on page 13.

This screen allows you to configure file system space and usage. You can also change logical volume and other file system parameters as required.

```
            HP-UX Install Utility—Configure File Systems

To add, enter data and select 'Add'. To modify/remove, place cursor on list
item. To modify, enter data and select 'Modify'. To remove, select 'Remove'

   Mount              Size           Volume      Disk
   Directory          (Mb)           Usage       Group

 /-----------------------------------------------------------------------
 | /                  84             HFS         vg00
 | /stand             48             HFS         vg00
 | (swap)             256            swap        vg00
 | /home              20             HFS         vg00
 | /opt               252            HFS         vg00
 \-----------------------------------------------------------------------


Disk Group:     [ vg00 ->]        Information for: vg00
Volume Usage:   [ HFS ->]         - Space available: 2720 Mb
Mount Directory: /                - LVM physical extent size: 4 Mb
Size (Mb):      [ 84 ]

[ Add ]                    [ Modify ]                      [ Remove ]

[Modify Logical Volume Parameters... ][Modify File System Parameters... ]

   [ OK ]          [ Apply ]           [ Cancel ]           [ Help ]
```

Figure 11 Configure File Systems

⚡ **Caution**: As with adjusting disk parameters in "Modifying Disk Parameters (Optional)," on page 13, the default parameters are usually sufficient and should not be changed unless your file system setup requires it.

1. Use your TAB and arrow keys to move your cursor to the configuration item you want to change.

Note: Use the TAB key to move between major sections of this screen and your arrow keys to move within sections, e.g. within lists, mini-menus, etc.

Note: To edit/clear data from configuration fields that allow direct data entry, highlight the field and press the Backspace key to clear it. Configuration fields ending in a "– – >" contain mini-menus from which you may make a selection. To select an item from a mini-menu, highlight the item and press the ENTER key.

2. Accept the default system size or enter another appropriate value.

3. Use your TAB key to highlight **OK** when you are satisfied with the default system values or when you have finished making configuration changes.

4. Press the ENTER key to accept or modify the default system values and continue with the installation.

   The system accepts the configuration and re-displays the screen shown in Figure 7.

• To accept the configuration shown in "Configuring the Disk and File System," on page 9, press your TAB key to select **OK** and press the ENTER key to begin loading the core operating system.

   This displays the screen shown in Figure 12.

Loading the Core Operating System

After you have made your configuration choices, the system displays the swinstall information screen. Swinstall allows you to choose a default or custom installation path. You can choose to customize your installation of HP-UX by interacting with swinstall. For more information on customizing your installation of HP-UX, proceed to "Custom OS Installation (Interactive)," on page 20.

```
    HP-UX Install Utility—Enter SD-UX swinstall information

  The SD-UX software distribution utility, swinstall, will actually load
  the HP-UX software on your system. (This will take place after the disks
  and file systems are configured.)

  The software selections you have already specified should be sufficient,
  but you might want to interact with SD-UX swinstall to view or modify the
  software selections.

  Do you want to interact with SD-UX swinstall? [ No -> ]

  The following information is required for a non-interactive SD-UX
  swinstall; it is optional for an interactive network SD-UX swinstall.

  Enter the Internet Protocol (IP) address of the SD-UX server, as well as
  the SD-UX depot directory on the SD-UX server.

  SD-UX server IP address: _____
  SD-UX server depot directory: _____


  [[ OK ]]                    [Cancel]                    [ Help  ]
```

Figure 12 Enter HP-UX Swinstall Information

This screen offers you the following options:

· Default OS installation (non-interactive)

· Custom OS installation (interactive)

Note: If you need to customize your installation of HP-UX, select the interactive installation option and proceed to"Custom OS Installation (Interactive)," on page 20.

Caution: Operating System installation is *not* complete until you have installed the *RDI Software CD* system software that comes with your PrecisionBook. Install it immediately after installing HP-UX.

Default OS Installation (Non-interactive)

If you tell the HP-UX swinstaller that you do not want to interact with the installation process, the swinstaller configures your system using its default system values and the choices you made at the basic configuration screen shown in Figure 6.

This option loads the standard HP-UX bundles and products without user interaction. The swinstaller displays the system activity logs monitoring the installation process and a list of the default values it uses to install the selected software.

1. Select **NO** from the **Do you want to interact with SD-UX swinstall?** mini-menu and press the ENTER key. See "Loading the Core Operating System," on page 18.

Note: Use the TAB key to move between major sections of this screen and your arrow keys to move within sections, e.g. within lists, mini-menus, etc.

Note: To edit/clear data from configuration fields that allow direct data entry, highlight the field and press the Backspace key to clear it. Configuration fields ending in a "– – >" contain mini-menus from which you may make a selection. To select an item from a mini-menu, highlight the item and press the ENTER key.

2. Use the TAB key to select **OK** and press the ENTER key to begin loading the core OS.

A typical installation requires from 30 to 60 minutes to complete, depending on individual system performance and the number of products loaded.

Note: The system does not display the IP address or depot directory unless you have booted from a network source.

The system reboots and returns you to the system Main menu, as shown in Figure 1.

---

3. Type **boot pri** at the system Main Menu and press the ENTER key to boot the system and continue the installation process.

Note: The boot-up process may require several minutes to complete.

Note: If the following message prompt appears during the boot process, type "n" and press the ENTER key to continue the boot process:

```
Interact with IPL (Y or N)?> n
```

Note: After rebooting, the system prompts you to begin setting system parameters. See "Entering System Information," on page 26 for more information on configuring parameters.

Custom OS Installation (Interactive)

If you tell the HP-UX swinstaller that you want to interact with the installation process, the swinstaller configures your system using its default system values, your basic configuration choices ("Selecting a Basic Configuration," on page 7), and any custom selections you make during the swinstall installation and confirmation process.

Note: Choose this installation option if you are an authorized user and you have been directed to customize your installation of HP-UX. This installation option allows you to install software products or bundles not included in the core OS.

Note: The SD-UX Swinstall Information dialog does not display the IP address or depot directory fields unless you have booted from a network source. See "Loading the Core Operating System," on page 18 for an example of swinstall information fields.

Caution: RDI does not recommend this installation option. This installation option should only be used by local network administrators as needed to install software products or bundles not included in the core OS.

Caution: Operating System installation is *not* complete until you have installed the *RDI Software CD* system software that comes with your PrecisionBook. Install it immediately after installing HP-UX.

A typical interactive installation may require from 30 to 90 minutes (or longer) to complete, depending on individual system performance and the number of products loaded.

1. Select **YES** from the **Do you want to interact with HP-UX swinstall?** mini-menu and press the ENTER key. See "Loading the Core Operating System," on page 18.

Note: Use the TAB key to move between major sections of this screen and your arrow keys to move within sections, e.g. within lists, mini-menus, etc.

Note: To edit/clear data from configuration fields that allow direct data entry, highlight the field and press the Backspace key to clear it. Configuration fields ending in a "– – >" contain mini-menus from which you may make a selection. To select an item from a mini-menu, highlight the item and press the ENTER key.

2. Use the TAB key to select **OK** and press the ENTER key to begin loading the core OS.

The system displays the following messages to assist you in navigating and using the SD Install program:

```
  * Will use the cold-install media for swinstall as well

  * Starting Swinwinstall:

  * The next step in the installation process will be to interact with
    the swinstall (1m) application in order to load the software
    desired. Once you have "Marked" the desired software for loading
    (using the "Actions" menubar item), then use the "Actions" menubar
    item and select the "Install Analysis" item to begin the software
    loading process.

Press Return to continue:
```

```
To move around in swinstall:

— use the "Tab" key to move between screen elements
— use the arrow keys to move within screen elements
— use "Ctrl-F" for context-sensitive help anywhere in swinstall

On screens with a menubar at the top like this:

   File     View     Options   Actions                   Help

  — use "Tab" to move from the list to the menubar
  — use arrow keys to move around
  — use "Return" to pull down a menu or select a menu item
  — use "Tab" to move from the menubar to the list without selecting a
    menu item
  — use the spacebar to select an item in the list

  On any screen, press "Ctrl-K" for more information on how to use the
  keyboard.

Press Return to continue...
```

After pressing the ENTER key at this system message, the system displays the SD Install - Software Selection (1) dialog as shown in Figure 13.

Selecting Software

The swinstaller interface allows you to review all of the products and bundles available to you for installation. You can open, mark and ignore bundles, products, and filesets. You can also review each item's description file to receive more information.

The following dialog displays typical software selections and fields.

```
                 SD Install - Software Selection (1)

   File     View     Options    Actions                 Help


                  Press CTRL-K for keyboard help.

Source: [ mynewname ]:/SD_CDROM
Target: [ mynewname ]:/

Only software compatible with the target is available for selection.

Top (Bundles and Products)                          0 of 27 selected


  Marked?    Name                Revision      Information
 /------------------------------------------------------------------\
            2 User Degrade ->  B.10.20       HP-UX 2-user license (fo
            Analysis-Tools     B.10.20       HP-UX 9.0-10.0 Upgrade
            B3782EA            B.10.20       HP-UX Media kit (Referen
            DCE Prog           B.10.20       DCE Programming and Arch
            DCESystemAdmin     B.10.20       DCE System Administratio
            HPUXDanRT700       B.10.20       Danish HP-UX VUE Runtime
            HPUXDutRT700       B.10.20       Dutch HP-UX VUE Runtime
  Yes       HPUXEngCR700       B.10.20       English HP-UX CDE Runtin
            HPUXEngRT700       B.10.20       English HP-UX VUE Runtin
 \------------------------------------------------------------------/
```

Figure 13 Software Selection (1)

1. After marking the applicable software bundles, press the TAB key to go to the menubar.

2. Press the right-arrow key to highlight the **Actions** menu.

3. Press the ENTER key to open the **Actions** menu.

4. Press the down-arrow key to highlight
    Install (analysis)....

5. Press the ENTER key to begin the system
    installation analysis.

A typical installation analysis may require
15 minutes or more to complete. The analysis
phase is complete when all dialog option
buttons (e.g., OK, Cancel) are again
available to the user.

6. Press **OK** to proceed with installing HP-UX
    or **Cancel** to return to previous selection
    screens, after the installation analysis has
    completed.

    The installation program prompts you to confirm
    that you are ready to begin installation.

7. Select **Yes** when prompted to confirm that
    you are ready to begin installing the
    HP-UX operating system and all selected
    products marked for installation.

    The installation program displays the following
    system message:

```
Kernel file sets will be installed on the local system. The
installation process will include building a new kernel.

Do you still wish to start installation? YES
```

8. Enter **Yes** when asked if you want to start
    installation.

    The system displays an installation status window.
    This window displays target, status, percentile com-
    plete, Kbytes installed, and time remaining infor-
    mation.

9. Select **Done** and press the ENTER key
    when the installation program has finished
    loading the software products you have se-
    lected.

This phase of the installation process may require 30 - 60 minutes to complete, depending on your selected configuration options and the products marked for installation along with the core operating system.

The installation program will redisplay the Software Selection dialog when it has finished loading the core operating system and any optional products you have selected.

10. Press the TAB key to highlight the File menu and press the ENTER key.

11. Press the down arrow key to highlight **Exit** from the File menu and press the ENTER key.

The installation program exits the Software Selection dialog and continues the installation process. When the installation program has finished, the system builds a new system kernel and reboots the system.

Note: After rebooting, the system prompts you to begin setting system parameters. See "Entering System Information," on page 26 for more information on configuring parameters.

Caution: Operating System installation is *not* complete until you have installed the *RDI Software CD* system software that comes with your PrecisionBook. Install it immediately after installing HP-UX.

Entering System Information

After completing the installation process, the system reboots and prompts you to provide information for system configuration. The required information varies according to your installation of the HP-UX OS.

In general you will need to provide the system with the following information:

- Hostname
- Time zone
- Local time zone and date

- System date and time
- Root password
- Network information

After the system has completed the installation process it prompts you to begin entering system parameters.

```
                      Set System Parameters

                        Welcome to HP-UX!

  Before using your system you will need to answer a few questions. The
  first question is whether you plan to use this system on a network.

  Answer "Yes" if you have connected the system to a network and are ready
  to link with a network.

  Answer "No" if you:

  o Plan to set up this system as a standalone system (no networking)

  o Want to use the system now as a standalone system and connect to a
  network later

  Are you ready to link this system to a network?

    Yes                                                    No
```

Figure 14 Set System Parameters

1. Select **No** from the Set System Parameters dialog if you do not want to configure the system for networking at this time.

*If you select **No**, the system continues the configuration process and prompts you to provide the required system information beginning with a system name (hostname).*

Note: Select **Yes** from the Set System Parameters dialog to enable networking as a part of the system configuration process.

*If you select **Yes**, the system continues the configuration process and prompts you to provide the required network and system information.*

Note: For more information on enabling system networking, see "Enabling System Networking," on page 34.

```
                        Required Information

    Before you begin using this system, you need to obtain the following
    information from your local network administrator:

    o A name for your system (hostname)

    o Your time zone

    NOTE: If you plan to eventually connect your system to a network, you may
    want to check with your network administrator to obtain a valid system
    user name now, so you won't have to change it later.

    Do you wish to continue?

    Yes, Continue                                       No, Halt System
```

Figure 15 Required Information

Setting the Hostname

This installation assumes the workstation is installed as a standalone system, relying on local system files for password and host information. In this procedure, the name "mynewname" will be used; replace this name with the one appropriate for your system.

Note: This installation requires you to provide your system hostname. Obtain this information before proceeding.

The system prompts you to enter your hostname by displaying a message similar to the following:

```
                            System Hostname

   For the system to operate correctly, you must assign it a unique
   system name or "hostname". The hostname can be a simple name or an
   Internet fully-qualified domain name. A simple name, or each dot (
   . ) separated component of a domain name, must:

   * Contain no more than 64 characters.

   * Contain only letters, numbers, underscore ( _ ), or dash ( - ).

   * Start with a letter.

   NOTE:
   * Uppercase letters are not recommended.

   * The first component should contain 8 characters or less for
     compatibility with the 'uname' command.

    NOTE: The current hostname is unknown. You cannot configure
    networking or run HP-VUE if the hostname is unknown. Please choose
    another name.

    NOTE: Enter the hostname by typing it in the field below, then click
    on OK. If you leave the field blank, the default hostname "unknown"
    will be used. This option is not recommended.

    Enter the hostname by typing it in the field below, then click on OK.

   Hostname:  mynewname

              OK                              Reset
```

Figure 16 System Hostname

1. Enter your system **Hostname** and press **OK**.

   This opens the Confirm Hostname dialog.
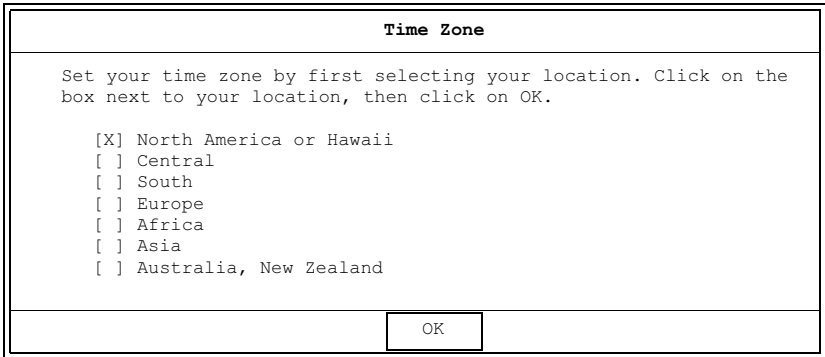
2. Press **Yes** when prompted to confirm the system hostname and continue the installation process.

   This opens the system Time Zone dialog and allows you begin selecting geographic and regional time zone settings.

Choosing a Time Zone

The system displays the following screen and prompts you to set a regional location and time zone.

```
                                Time Zone
 _____

 Set your time zone by first selecting your location. Click on the
 box next to your location, then click on OK.

    [X] North America or Hawaii
    [ ] Central
    [ ] South
    [ ] Europe
    [ ] Africa
    [ ] Asia
    [ ] Australia, New Zealand


 _____
                             |      OK      |
```

Figure 17 Time Zone

1. Select an applicable time zone location.

Note: The example above shows **North America or Hawaii** as the workstation location.

2. Select OK and press the ENTER key to continue.

   This opens a time zone dialog specific to the location you select.

Choosing a Local Time Zone

After selecting a regional time zone, the system prompts you to set a time zone according to your location. This example uses the **Pacific Standard/ Daylight**.

```
                     [North American] Time Zones

     Click on the box next to your local time zone, then click on OK.

        [ ] Newfoundland Standard/Daylight
        [ ] Atlantic Standard/Daylight
        [ ] Eastern Standard/Daylight
        [ ] Eastern Standard Only (U.S. Most of Indiana)
        [ ] Central Standard/Daylight
        [ ] Mountain Standard/Daylight
        [ ] Mountain Only (Arizona)
        [x] Pacific Standard/Daylight
        [ ] Yukon Standard/Daylight
        [ ] Aleutian Standard/Daylight
        [ ] Hawaii Standard/Daylight
        [ ] Unlisted time zone


           OK                          Previous Window
```

Figure 18 Time Zone

1. Select the appropriate time zone and press the EN-TER key to continue.

2. Select **OK** and press the ENTER key to continue.

   *The system prompts you to confirm your time zone selections. If correct, press **Yes** to confirm your time zone selections. The system then asks you to confirm the current system date and time.*

Setting a System Date and Time

At this point, the system prompts you to confirm the local system date and time settings. If the displayed settings are incorrect, press **No** to open the Date and Time dialog and change the current date and time settings.

```
+--------------------------------------------------------------------+
|                          Date and Time                             |
+--------------------------------------------------------------------+
|     Edit the fields below to reflect the current time.             |
+--------------------------------------------------------------------+
|                                                                    |
|              Year         (0-99):    | 98 |                        |
|              Month        (1-12):    | 01 |                        |
|              Day          (1-31):    | 22 |                        |
|              Hour         (0-23):    | 15 |                        |
|              Minute       (0-59):    | 07 |                        |
|                                                                    |
+--------------------------------------------------------------------+
|    | OK |              | Cancel |              | Reset |           |
+--------------------------------------------------------------------+
```
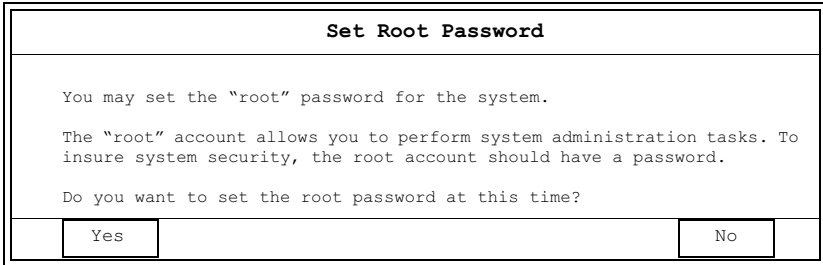
Figure 19 Time Zone

1. Verify the displayed information is correct.

2. If any information is incorrect, correct it.

3. When the displayed information is correct, select **OK** and press the ENTER key to continue.

   *The system prompts you to confirm your date and time settings. If correct, press **Yes**. The system then opens the Set Root Password dialog and prompts you to set a root password.*

Setting a Root Password

After entering basic host and time zone information, the system opens the Set Root Password dialog and prompts you to enter a root password.

```
                       Set Root Password

  You may set the "root" password for the system.

  The "root" account allows you to perform system administration tasks. To
  insure system security, the root account should have a password.

  Do you want to set the root password at this time?

    Yes                                                      No
```
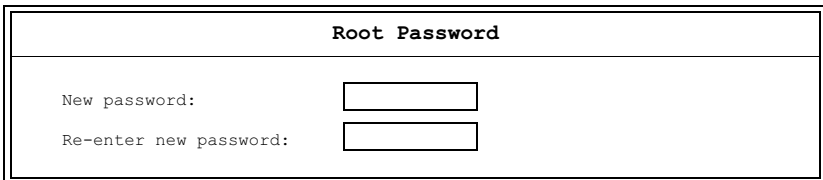
Figure 20 Set Root Password

1. Select **Yes** when prompted to set a root password.

   The system displays the Root Password dialog and prompts you to enter a root password.

```
                       Root Password

  New password:              [          ]

  Re-enter new password:     [          ]
```

Figure 21 Set Root Password

2. Enter the new password in the **New password** field.

Note:	This password will be required to log into the workstation as root.

3. Re-enter the password in the **Re-enter new password** field and press the ENTER key.

   The system confirms that the root password has been accepted.

4. Press **Close** to close the confirmation dialog and continue.

The system opens the Configure Font Server dialog and asks if you want to configure the system as a network font server.

5. Select **No** when prompted to configure the system as a network font server.

6. Press the ENTER key to continue.

   The system displays the System Parameters confirmation dialog, indicating the end of the initial installation and configuration process.

7. Press **Close** when the System Parameters confirmation dialog appears.

   The system completes the boot-up process and prompts you to login.

8. Login as "root" and enter the root password you defined in "Setting a Root Password," on page 32.

   The initial boot-up and login process may take several minutes to complete. The system will then prompt you to login and ask you for the root password before displaying the Common Desktop Environment.

Logging in as Root

After completing the initial system bootup, the system displays the system login prompt. Log in as "root" to complete the installation of the HP-UX operating system.

1. Login as **root** and press **OK** to display the password dialog.

2. Enter the password you established for the root account.

   The system sets up the Common Desktop Environment and displays the CDE desktop.

Note: This completes the initial configuration phase for the HP-UX operating system.

Caution: Operating System installation is *not* complete until you have installed the *RDI Software CD* system software that comes with your PrecisionBook. Install it immediately after installing HP-UX.

Enabling System Networking

To enable system networking, you will need to provide the following information, as applicable:

· Internet Protocol (IP) address

· Subnetwork Mask and Default Gateway

· Domain Name System (DNS)

· Network Information Service (NIS)

· Font Server Information

Caution: If you enable networking, you will need to know your networking parameters. If you enter this information incorrectly, networking will not be properly enabled and your system may require significantly longer to boot, or may not boot at all.

Note: See your local network administrator *before* enabling system networking and for the specific networking information applicable to your system.

Setting the Internet (IP) Address

If you choose to enable system networking, the system displays the following dialog:

```
If you wish networking to operate correctly, you must assign the
system a unique Internet address. The Internet address must:

* Contain 4 numeric components.

* Have a period ( . ) separating each numeric component.

* Contain numbers between 0 and 255.

For example: 134.32.3.10

Hostname:  15.32.199.48

   OK                      Reset                      Cancel
```

1. Enter the IP Address for your system. This example uses the address "15.32.199.48".

2. Select **OK** and press the ENTER key to assign a system internet address.

3. Press **Yes** to confirm that the displayed internet address is correct and continue, or press **No** to return to the System Internet Address dialog.

Note: If you do not need to configure any additional network parameters, this concludes network configuration for your system.

*If you chose **No** from the Additional Network Parameters dialog, the system displays a confirmation dialog advising you of the parameters you have set.*

4. Press **Close** from the System Parameters dialog to allow the system to reboot and complete the network configuration process.

The system boots and allows you to login as root.

Additional Network Parameters

> After confirming the system internet address, the system opens the Additional Network Parameters dialog and asks if you would like to set additional network parameters. Additional network parameters allow you to set subnet mask and default gateway, DNS, and NIS information as applicable. Do not set additional network parameters without consulting your local network administrator.

Note: (Optional) Press **Yes** at the Additional Network Parameters dialog if you want to specify additional networking parameters such as a subnet, default gateway, DNS, or NIS at this time.

Note: (Optional) Press **No** at the Additional Network Parameters dialog if you do not want to specify additional networking parameters at this time.

Configuring a Subnetwork Mask and Default Gateway

If your system requires a subnetwork mask and default gateway, the system will display a dialog requesting this information. A system dialog similar to the following will be displayed on the screen.

```
                    Subnetwork Mask and Gateway

   These network parameters enable your system to operate correctly on
   a segmented network.

   Note: If you clear the Subnetwork Mask field or leave it empty, the
   subnet mask will be set by the operating system to the value shown
   in the confirmation dialog which follows.

   Examples:

        Subnetwork Mask: 255.255.255.0
      Gateway Host Name: local -gw
     Gateway IP Address: 134.2.45.1

                      Subnetwork Mask:  255.255.248.0

                    Gateway Host Name:  mynewname

                    Gateway IP Address:  15.2.56.1


     OK                    Cancel                    Reset
```

Figure 22 Subnetwork Mask and Default Gateway

1. Enter the applicable subnetwork mask and gateway information.

2. Select **OK** and press the ENTER key to continue.

   The system prompts you to confirm the network parameters you have entered.

3. Press **Yes** at the Confirm Network Parameters dialog to confirm your settings and continue setting networking parameters.

   The system opens the Domain Name System dialog and prompts you to enter further networking parameters.

Configuring a Domain Name System (DNS)

If your system configuration requires a domain name
system information, the system will display a dialog
requesting this information. A system dialog similar to
the following will be displayed on the screen:

```
                        Domain Name System

  These network parameters enable your system to operate correctly on
  a segmented network.

  Note: If you clear the Subnetwork Mask field or leave it empty, the
  subnet mask will be set by the operating system to the value shown
  in the confirmation dialog which follows.

  Examples:

                       Local Domain Name: 255.255.255.0
                    DNS Server Host Name: local -gw
                    DNS Server IP Address: 134.2.45.1
  _____

              Local Domain Name:  | 255.255.248.0 |

           DNS Server Host Name:  | mynewname     |

           DNS Server IP Address: | 15.2.56.1     |

  _____

    | OK |              | Cancel |              | Reset |
```

Figure 23 Domain Name System

Note:	If your DNS or NIS server is not configured correctly with your local host name, CDE will attempt to load and then abruptly abort without providing an obvious error message. Be certain that this information is correct *before* proceeding.

1. Enter the applicable domain name system parameters

2. Select **OK** and press the ENTER key to continue.

   The system prompts you to confirm the network parameters you have entered.

3. Press **Yes** at the Confirm DNS Parameters
    dialog to confirm your settings and con-
    tinue setting networking parameters.

    *The system displays the Register Node with Name
    Server dialog to confirm that DNS has been success-
    fully configured on your system.*

4. Press **Close** at the Register Node with
    Name Server dialog.

    *The system opens the Network Information Service
    dialog and prompts you to enter further networking
    parameters.*

Configuring a Network Information Service (NIS)

If your system configuration requires network information service information, the system will display a dialog requesting this information. A message similar to the following will be displayed on the screen:

```
                     Network Information Service
┌─────────────────────────────────────────────────────────────────┐
│ This section enables you to configure the system as a Network     │
│ Information Service (NIS) client in order to access the various    │
│ information provided by an NIS server. Click on [Cancel] if you do │
│ not want to set up an NIS client.                                 │
│                                                                   │
│ NOTE:                                                             │
│                                                                   │
│ * The NIS domain name is not related to the DNS domain name.      │
│                                                                   │
│ * If wait-for-server-on-bootup is "yes", your system will not boot │
│   until it finds an NIS server for the specified NIS Domain.       │
│                                                                   │
│ Example:                                                          │
│                                                                   │
│                                        NIS Domain Name: widget-lab │
│                       Wait for NIS Server on Bootup: < x > yes     │
├───────────────────────────────────────────────────────────────────┤
│                                                                   │
│                       NIS Domain Name:  │ widget-lab │             │
│                                                                   │
│             Wait for NIS Server on Bootup: < > Yes < x > No        │
│                                                                   │
├───────────────────────────────────────────────────────────────────┤
│  ┌──────────┐          ┌──────────┐              ┌──────────┐      │
│  │   OK     │          │  Cancel  │              │  Reset   │      │
│  └──────────┘          └──────────┘              └──────────┘      │
└───────────────────────────────────────────────────────────────────┘
```

Figure 24 Network Information Service

1. Enter a domain name as applicable.

2. Select **No** at the **Wait for NIS Server on Bootup** option.

3. Select **OK** and press the ENTER key to continue.

   The system prompts you to confirm the NIS parameters you have entered.

⚡ **Caution**: If the wait-for-server-on-bootup option is set to "yes", your system *will not* boot until it finds an NIS server for the specified NIS domain.

Configuring a Font Server

If desired, you can enable your system to supply fonts across the network. This option is useful if you need to conserve disk space by storing font information in a centralized location.

```
                    Configure Font Server

  Configuring your system as a font server allows the system to supply fonts
  to hosts on the network which are configured as font clients.

  You should always configure font servers before configuring any font
  clients they will serve.

  If you want to configure this system as a font server in the future, you
  may re-run this section at any time by typing the command:

      /sbin/set_parms font_c-s

  Do you want to configure this system as a font server?

   [ Yes ]                                              [ No ]
```

Figure 25 Configure Font Server

1. Select **Yes** to set up your system to supply fonts across the network or select **No** to bypass configuring your system to supply fonts across the network.

2. Press the ENTER key to continue.

Note: If the PrecisionBook is not connected to a network, the audio server will *fail* to initialize during system startup. This is normal behavior for HP-UX. For more information about the HP-UX audio server, contact your authorized Hewlett-Packard representative.

Caution: Operating System installation is *not* complete until you have installed the *RDI Software CD* system software that comes with your PrecisionBook. Install it immediately after installing HP-UX.

A   HP-UX 10.20 Hard Disk Drive Parameters

Appendix A lists the types of hard disk drives that RDI has made available. Each section lists the drive's corresponding parameters when used with HP-UX 10.2.

```
Manufacturer: IBM 24090
Model:          DLGA-24090
Cylinders.      7944
Alternate:      -
Heads:          16
Sectors:        63
RPM:            4000
```

Notes

B RDI Software Installation Procedures

The RDI Software CD-ROM contains the RDI-specific software and drivers you will need to get the highest possible performance from your PrecisionBook.

It includes the following components:

- Power Management software—this package contains software needed for the system to operate properly with AC/DC power.

- PCMCIA & PC card serial driver—this package contains the PCMCIA Device Manager, Card Service, Socket Service, the PCMCIA Adapter driver, and the PC Card Serial driver for Fax/Modem cards.

- RDI enhanced asio driver—this driver fixes a bug in the original asio driver in dealing with the transmission rate of the built-in RS-232 port on the PCI bridge chip.

Note: It is recommended that the RDI software components be installed in the following order:

1. RDI enhanced asio driver

2. Power Management software

3. PCMCIA & PC card serial driver

Before installing the RDI system software:

1. Boot the system up to the CDE login banner, login as root, and bring up a Terminal/Xterm window.

2. Insert the RDI software CD-ROM into the CD-ROM drive and mount the file system on the CD-ROM media onto a local directory.

Note: For this document, the mount directory is assumed to be /tmp/mnt.

Example

mount /dev/dsk/c0t6d0 /tmp/mnt

To install the RDI enhanced asio driver:

1. Type the following command strings and press ENTER:

cd /tmp/mnt/hpux-1020/asio

./asioinstall

The new asio driver is installed in the system library /usr/conf/lib/libhp-ux.a and a new vmunix is generated. The original asio driver is saved as /usr/conf/lib/asio0.o.orig and the current vmunix is saved as /stand/vmunix.prev.

Note: The system must be rebooted after the installation script completes for this change to take effect. However, you can continue to install all the RDI software packages and reboot only at the end of the installation for the changes to take effect.

To restore the original asio driver (non-enhanced):

1. Type the following command strings and press ENTER:

   # /usr/conf/lib/restore_asio

   # /etc/reboot

To install the Power Management software:

1. Type the following command strings and press ENTER:

   # cd /tmp/mnt/hpux-1020/pm

   # ./pminstall

   The Power Management software is installed in the /etc/pm directory. The PM driver is installed in the /usr/conf/lib/libusrdrv.a library and a new vmunix is generated, the original vmunix is saved as /stand/vmunix.prepm.

The system must be rebooted after the installation script completes for this change to take effect. However, you can continue to install all the RDI software packages and reboot only at the end of the installation for the changes to take effect.

To remove the Power Management software:

1. Type the following command strings and press ENTER:

   # /etc/pm/pmremove

   # /etc/reboot

To install the PCMCIA & PC card serial driver:

1. Type the following command strings and press ENTER:

   # cd /tmp/mnt/hpux-1020/pcmcia

   # ./pcminstall

   The PCMCIA drivers are installed in the /usr/ conf/libusrdrv.a library and a new vmunix is generated. The original vmunix is saved as /stand/ vmunix.prev.

> *Note:* The system must be rebooted after the installation script completes for this change to take effect. However, you can continue to install all the RDI software packages and reboot only at the end of the installation for the changes to take effect.

After you complete the installation and reboot the system, the PC Card serial devices are created as /dev/pcmcia/pcsio0 and /dev/pcmcia/pcsio1 for socket0 and socket1.

To remove the PCMCIA & PC Card software:

1. Type the following command strings and press ENTER:

   # /stand/build/pcmremove

   # /etc/reboot

RDI Software Installation CD-ROM File System Layout

The following directories list the mountable file system layout for the RDI Software CD-ROM. Please use this mapping when mounting the Software CD's file system to your workstation.

Top Dir: /hpux-1020

Subdirs: /hpux-1020/pm

/hpux-1020/asio

/hpux-1020/pcmcia

**RDI Software
Installation**

Notes

I   Index

Index

Index

Notes