Diagnostic/IPR Media User's Guide

PA-RISC Computer Systems

**HEWLETT®
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Printing History

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June 1999	.....	Edition 1

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About This Manual

The Diagnostic/IPR Media performs two functions:

- The Diagnostic/IPR Media is the `swinstall` format distribution media for the following hardware support products for 10.01, 10.10, 10.20, 10.30, and 11.x HP-UX systems; it is also the `update` format distribution media for the 9.04 and 9.07 HP-UX systems)

  - Online diagnostics subsystem)

  - Support Tools Manager (HP-UX 10.x and 11.x))

  - EMS Hardware Monitors (HP-UX 10.20 and 11.x only)

  - HP Predictive Support tools (Series 800 only)

  - LIF-resident offline diagnostics

  - IPR patches

- It is the platform for running offline diagnostics for all PA-RISC systems.

This manual is intended to provide an overview of how to use the Diagnostic Media for these two functions.

The following is a summary of the contents of the chapters in this manual:

Chapter 1   Diagnostic/IPR Media product overview

Chapter 2   Hardware support tools overview

NOTE   Chapter 2, "Hardware Support Tools Overview," provides a simplified approach to starting the hardware problem solving process, using the tools provided on the Diagnostic/IPR Media. This is not intended as a comprehensive troubleshooting guide, nor as a tutorial on the products themselves. It is merely intended as an aid in beginning the process, and in explaining briefly how the various tools can be used.

Chapter 3   Using the Diagnostic/IPR Media to run offline diagnostics

Chapter 4   Support Tools Manager (STM)

Chapter 5   Using the Diagnostic/IPR Media to install the diagnostic products on your system

Appendix A   Disk Copy Utility - To make an image of a disk after install or upgrade (HP-UX to 11.x)

Appendix B   EMS Hardware Monitors

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For the most current information on Support Tools, see our Web site, "Systems Hardware, Diagnostics, and Monitoring," at `http://www.docs.hp.com/hpux/systems/`. This Web site also contains additional documents, such as tutorials, quick reference guides, and release information.

1 Diagnostic/IPR Media Product Overview

The Diagnostic/IPR Media allows you to diagnose and fix problems when the operating system cannot be booted from the system disk. The Diagnostic/IPR Media runs on minimal hardware, with or without the system disk.

The Diagnostic/IPR Media performs two functions:

- The Diagnostic/IPR Media is the `swinstall` format distribution media for the following hardware support products for 10.01, 10.10, 10.20, 10.30, and 11.x HP-UX systems; it is also the `update` format distribution media for the 9.04 and 9.07 HP-UX systems)

  - Online diagnostics subsystem

  - Support Tools Manager (HP-UX 10.x and 11.x))

  - EMS Hardware Monitors (HP-UX 10.20 and 11.x only)

  - HP Predictive Support tools (Series 800 only)

  - LIF-resident offline diagnostics

  - IPR patches

- It is the platform for running offline diagnostics for all PA-RISC systems.

The Diagnostic/IPR Media is primarily intended for HP-UX systems; however, it is used for running offline diagnostics on MPE/iX systems.

NOTE **If you have an HP Hardware and Software Support Agreement, then be sure to install HP Predictive Support along with the HP-UX Support Tools. For details, see the** *HP Predictive Support/UX User's Guide (part number: H2571-90008).*

Design of the Diagnostic/IPR Media

The following subsections discuss the physical layout of the Diagnostic/IPR Media.

Media Layout

The Diagnostic/IPR Media contains Software Distributor (SD) bundles, which contain all of the online tools to be loaded onto your system, including the following:

- Online diagnostics subsystem)

- Support Tools Manager (HP-UX 10.x and 11.x))

- EMS Hardware Monitors (HP-UX 10.20 and 11.x only)

- HP Predictive Support tools (Series 800 only)

- LIF-resident offline diagnostics

- IPR patches

In general terms, the Diagnostic/IPR Media is organized as follows (details of organization for your particular media type may vary):

```
    |          |              SD Products (filesystem contains online
    |   LIF    |                           diagnostic bundles at
    |          |                           /mountpoint/diagnostics)
```
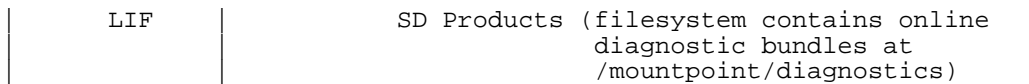
2 Hardware Support Tools Overview

The purpose of this chapter is to give a brief high-level overview of the recommended use of HP hardware support tools. This is not intended as a comprehensive troubleshooting guide, nor as a tutorial on the products themselves. It is merely intended as an aid in beginning the process, and in explaining briefly how the various tools can be used.

There are several support tools platforms provided by HP, each targeted at a different troubleshooting situation or type of user. A brief description of these products follows. In addition, each system provides a help facility to assist users in getting started, determining what tools are available and how to run them, etc.

For the HP-UX 10.01, 10.10, 10.20, 10.30, and 11.x releases, the Support Tools Manager (STM) diagnostic systems is available. The STM diagnostic system is the diagnostic system used for information, verification, and diagnosis. The STM system provides a map of the system, and lets you know what tools are available for each component, at the time it is accessed.

NOTE	Included on the Diagnostic/IPR Media are the EMS Hardware Monitors -- an important new tool for maintaining system availability. The EMS hardware monitors allow you to monitor the operation of a wide variety of hardware products and be alerted immediately if any failure or other unusual event occurs.
	For more information, see Appendix B, "EMS Hardware Monitors." in this manual.

Support Tools Manager (STM) System

The Support Tools Manager (STM) is an online support tools platform that is currently available on HP9000 series 700 and 800 machines. STM provides automatic configuration mapping, and a set of verifiers, exercisers, information modules, expert tools, utilities, and firmware update tools for various devices on HP-UX systems. STM provides three user interfaces: a graphical interface for X-based terminals (XSTM), a menu interface for HP ASCII terminals (MSTM), and a command line interface for all ASCII terminals (CSTM). The graphical and menu interfaces are designed to be intuitive and usable by novices. The command line interface is provided mainly as a convenient method of driving STM via scripts. STM is invoked via the "xstm", "mstm", or "cstm" commands, depending on which interface is desired.

The STM verifiers are designed to quickly determine whether or not a specific device is operational by performing tasks similar in nature to the way applications use the device. No license is required to run the verifiers.

The STM exercisers are designed to stress devices in order to facilitate the reproduction of intermittent problems. The exercisers on HP-UX 9.X systems require a license to run.

The STM information modules create a log of information specific to one device, including:

- The product identifier
- A description of the device
- The hardware path to the device
- The vendor
- On-board log information (if applicable)
- Miscellaneous information associated with the device

Typically, the firmware revision code, if firmware is present in the device, will also be displayed.

The STM expert tools are device specific troubleshooting utilities for use by sophisticated users. Their functionality varies from tool to tool, but they are intended to be interactive, and rely on you to provide information necessary to perform a particular task. These tools require you to have the appropriate license if you wish to run them.

The STM utilities are support tools which are not device specific. Current tools include log viewing and disk backup tools.

The STM firmware update tool initiates the firmware update process for a selected device. Most require that you have the appropriate license in order to run them.

Initial System Loader (ISL) Standalone Environment

The ISL standalone environment consists of the Initial System Loader, ISL-based tools which run directly from ISL, and the Offline Diagnostic Environment (ODE). On most PA-RISC machines, ISL is the first program run after execution of the firmware. ISL implements a command line interface which allows the user to obtain information on the bootup characteristics of the system; to modify these characteristics; and to load and execute programs such as the operating system, ISL-based tools, and the Offline Diagnostics Environment.

ISL-based tools consist of a set of diagnostics that diagnose the Central Processing Unit (CPU), memory, and portions of the I/O system on older series 700, 800, and 900 machines; and the Offline Diagnostics Environment (ODE).

The Offline Diagnostics Environment is an offline support tools platform that is run from ISL and is available on series 700, 800, and 900 machines. ODE provides a common user-friendly interface for diagnostics and utilities developed to run in this environment. Diagnostics and utilities provided under ODE include:

- MAPPER - a utility for mapping out the physical layout of the SPU and its peripherals

- IOTEST - a utility for testing I/O cards using IODC

- PERFVER - a utility for testing peripherals attached to the boot path

- A set of diagnostics/utilities for testing disks.

- A set of diagnostics for testing CPU, memory, and selected I/O modules.

A license is required to run most of the ODE diagnostics and utilities.

The main purpose of the offline tools is to enable the user to troubleshoot a system which cannot be tested via the online tools, generally because a hardware problem exists which prevents the system from booting. The offline environment is also useful for some types of testing in which it is not desirable to have to boot the system first, as is often the case in manufacturing applications.

Hardware Support Tools Usage

Each one of the products described above plays a role in the overall system troubleshooting strategy. Figure 2-1 contains a simple flow diagram that outlines the intended use of the hardware support tools. Please note that this diagram is not intended to cover every aspect and corner case of system troubleshooting, but rather to provide an overall picture of what roles the various products play in troubleshooting systems.

As can be seen from the flow diagram, the basic assumption is that if the system can boot to the operating system prompt, it is generally desirable to do so. In a majority of cases, the system is probably already booted and it is not desirable to take it down to run diagnostics. If there are problems with the hardware, the online support tools should be used to attempt to troubleshoot them. If the system will not boot, the offline tools from the Diagnostic/IPR Media should be used to troubleshoot the problem with the intent of getting the system to boot again. Once booted, the online tools can be used if any further testing is desired.

Of course, before altering the state of a system that is exhibiting problems, it is crucial to record any error messages, symptoms, etc., before proceeding. This information may be very valuable later on in determining what action to take to isolate the problem cause.

The following key decisions drive the troubleshooting strategy as outlined in the flow diagram:

Will the OS boot?

This step determines whether or not the online versus offline support tools can be used. If the OS cannot boot, the offline tools are the only option. If the OS can boot, the recommendation is to use the online tools. Of course, the user still has the option of taking down the system and using the offline tools if it is so desired.

Will ISL boot from the main disk?

If the machine will boot to ISL from the main disk, the user would typically run the offline tools to troubleshoot the problem that is preventing the system from booting to the OS. The hardware problems that would be common here would be problems with the boot disk or other disks on the system that are used during boot; problems with the boot path that only manifest themselves under a load; configuration problems, etc. Great care must be taken when running the ODE disk tools, since they can alter data on the disk. Backups of all OS and user files should be available, in case they need to be restored after the disk is repaired.

After ODE has been run and any problems that were encountered are fixed, the user should again try to boot to the OS. If boot is successful, the online tools can be used for any further testing that is desired. If the OS will still not boot, the user should continue the troubleshooting process by turning to the Diagnostic/IPR Media.

Figure 2-1 Hardware Support Tools Usage Flow Diagram

systrbl3
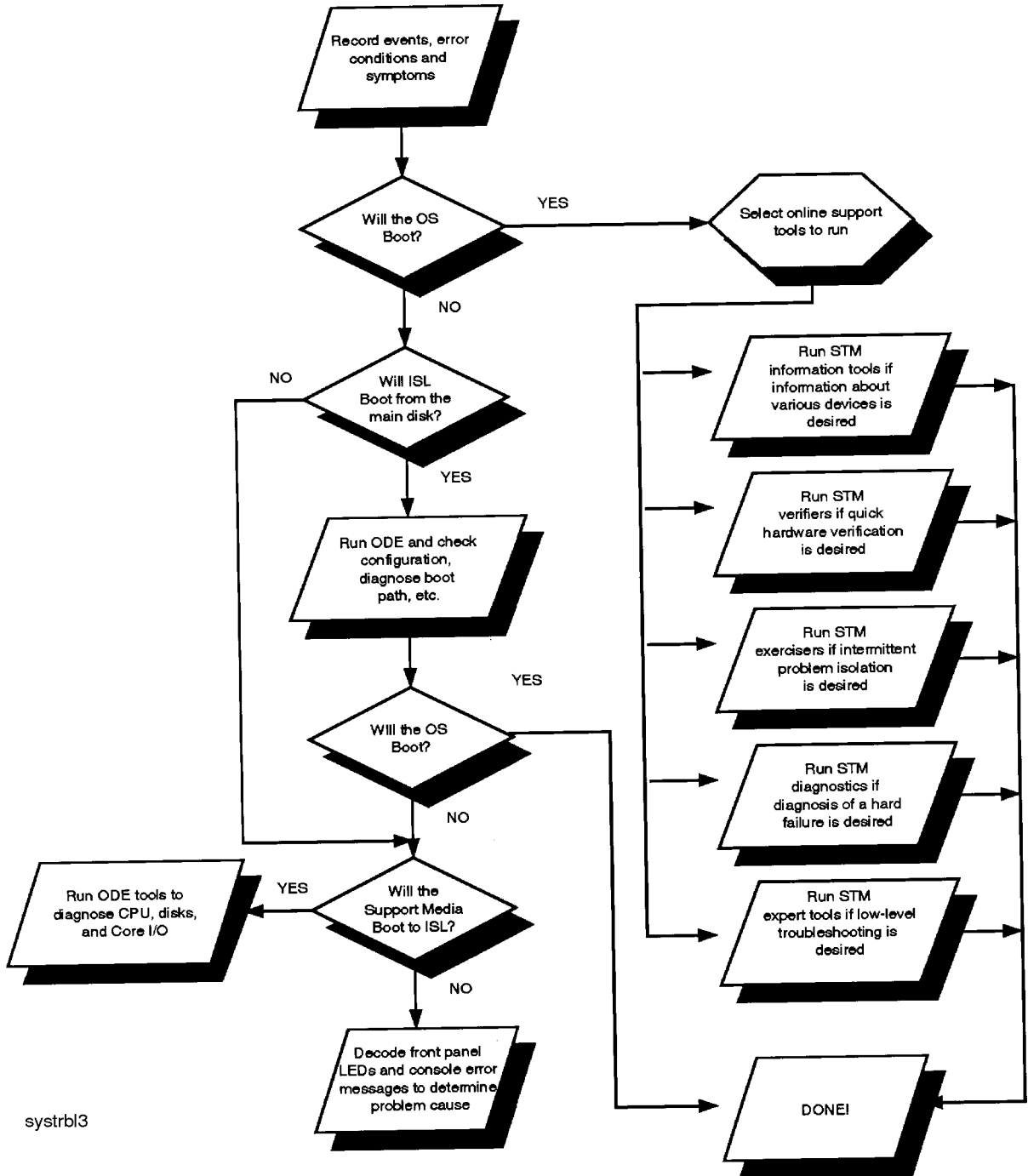
Will the Diagnostic/IPR Media boot?

If the machine will not boot to ISL from the main disk, or even if it will boot ISL, but still won't boot the OS, the user has little choice but to either start swapping suspect hardware, using the error codes displayed on the front panel LEDs and console error messages for guidance, or attempt to boot from the Diagnostic/IPR Media. This decision is likely to be

influenced by the type of machine that is having the problem and the error symptoms. If the user is troubleshooting a high-end server with many Field Replaceable Units (FRUs), it is usually beneficial to use the Diagnostic/IPR Media approach to try and isolate the most likely failing FRU. If, on the other hand, the machine is a workstation with CPU, memory, and I/O all in one FRU, it may be desirable at this point to just replace the board and see if that takes care of the problem.

If the user elects to boot from the Diagnostic/IPR Media, and does so successfully, the problem is likely to be with the main disk or the I/O path to it, although it could still be a memory or SPU problem that is not manifested in the Diagnostic/IPR Media environment. In this case, the tools on the Diagnostic/IPR Media should be used to test the SPU, boot path components, the main disk and, if necessary, perform data recovery operations on the main disk.

If the machine will not even boot to ISL from the Diagnostic/IPR Media, the front panel LEDs and console error messages should contain error information that may help to isolate the most probable cause. The typical approach at this point is to go to a minimum configuration (e.g., just the boot device and the console) and start swapping hardware to try to get to the point where the system can at least boot ISL.

Which online tools should be used?

If the system can be booted to the OS, the user has several online tools available to troubleshoot problems. The following are the strategic uses for each set of tools:

1. STM verifiers are useful primarily for finding reproducible problems that are causing a particular device to fail. They will run a quick verification on selected devices and indicate whether they are basically functioning properly or not. This type of testing is probably most useful when new hardware is added or configuration changes have been made and need to be verified.

2. STM exercisers are designed to help the user reproduce intermittent problems by stressing various system components and devices. In general, if the user has no good evidence that seems to indicate where the problem is, the exercisers should be used to try and isolate the problem to a specific device or area of the system.

3. STM diagnostics provide fault isolation capabilities for some devices. Typically, diagnostics are only available for hardware which comprises numerous FRUs.

4. STM information tools provide comprehensive information about specific devices. They typically also provide basic verification that the device is responding.

5. STM expert tools are used for interactive testing of a particular device, in order to isolate a particular problem.

NOTE	Included on the Diagnostic/IPR Media are the EMS Hardware Monitors -- an important new tool for maintaining system availability. The EMS hardware monitors allow you to monitor the operation of a wide variety of hardware products and be alerted immediately if any failure or other unusual event occurs.

3 Using the Diagnostic/IPR Media to Run Offline Diagnostics

The Offline Diagnostics Environment (ODE) consists of a Test Controller (TC), a System Library (SysLib), and any number of Test Modules (TMs), all resident on the Diagnostic/IPR Media in the LIF. It provides you with a consistent interface for executing the ISL-based support tools from the Diagnostic/IPR Media, in the event that your system is offline.

The TC provides the user with two basic interfaces: a pure command-line interface for expert users, and a menu-oriented interface for less experienced users. In the command-line interface, users can select and run specific tests and/or utilities. In the menu-oriented interface, users select specific hardware modules to test, and do not have to know which diagnostic is associated with a particular module.

NOTE   ODE utilities like `MAPPER` and `FUPDATE` (formerly `UPDATE`) can only be run from the command-line interface.

Figure 3-1 provides a graphic representation of the relationship that exists between the ODE Test Controller (TC) and the underlying Test Modules (TMs):

Figure 3-1 Relationship Between ODE Test Controller and Test Modules
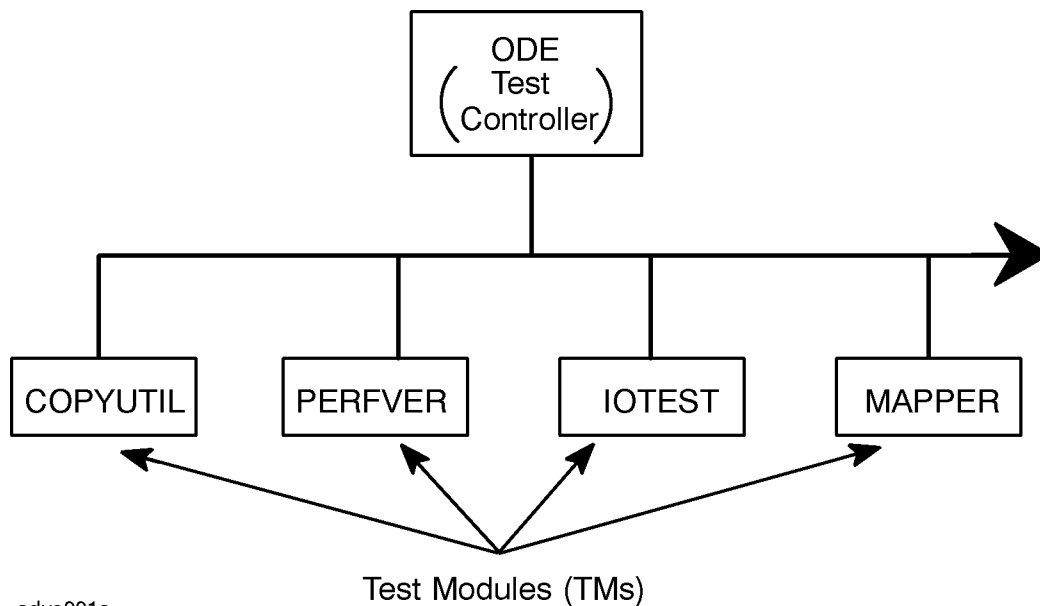
odus001a

NOTE   To see ISL-based programs, type `ls` at the ISL prompt. To see ODE-based programs, start ODE from the ISL prompt, and then type `ls` at the ODE prompt.

NOTE	Changes to Offline Diagnostics as of June 1999 (IPR 9906):

- The UPDATE utility for ODE has been replaced by FUPDATE. FUPDATE is backward compatible with existing computer systems

- For 64-bit systems like N-Class, there will be a different version of the offline diagnostic programs. The 64-bit version will have a "2" appended to its name. For example, the 64-bit version of MAPPER is MAPPER2.

- The ODE module TMMGR (TM Manager) will only be updated to support new 32-bit systems (such as the J5000, J7000, C3000, and B1000). TMMGR will NOT be updated to support new 64-bit systems (such as the L-Class and N-Class).

How to Run ODE's Command Line Interface

To start ODE's command line interface, do the following:

1. If you are at the PDC prompt (e.g., `BOOTADMIN>`), type `search` for a list of bootable devices:

   `BOOTADMIN>search`

2. Select the tape or CD device, depending upon your Diagnostic/IPR Media, and boot from that device:

   `BOOTADMIN>boot SCSI.3.3`

3. At the `ISL>` prompt, type the following:

   `ISL>ODE`

   The following prompt will then be displayed:

   `ODE>`

4. Type the following, for a list of available commands with a capsule description of each:

   `ODE>help`

   The following information will be displayed:

```
                      MAIN HELP SCREEN

   Basic Commands

   HELP  Prints detailed information to the screen, when "help <command>"
    or "help <var>" is typed
   LS  List modules available on boot medium
   <Module_Name>  Load and initialize a module by typing its name
                  (For more help, type "help module_name")
   RUN  Run a module (after setting desired environment variables)
   Control-Y|Control-C  Abort an ODE command; pause a module run
   RESUME  Restart a paused module
   DISPLOG  After running a module, display contents of a log
   EXIT  Return to next higher level prompt

   Environmental Variables
   -
   SHOWSTATE  Display the value of the following environment variables:
       LOOP  Run a test this many times
       ERRPRINT [ON|OFF]  Print low-level error messages to console
       (primarily for manufacturing use)
       ERRNUM [ON|OFF]  Print one-line, numbered errors to the console
       ERRPAUSE [ON|OFF]  Pause module upon error detection
       ERRONLY [ON|OFF]  Print ONLY error messages; disable non-error
      and isolation message printing
       INFOPRINT [ON|OFF]  Print informational messages to the console
       ISOPRINT [ON|OFF]  Print fault isolation messages to the console
       ISOPAUSE [ON|OFF]  Pause module when isolation message is generated
   LOGSIZE  Set the size of a message log
   DEFAULT  Reset environment variables to default state
```

5. For more information on any of these commands or options, type `help <command>` or `help <var>`, as appropriate.

6. To list the ODE modules that will run on the current SPU, type `ls` at the ODE prompt.

---

7. Select the test module on the LIF that you wish to run, and decide whether you wish to run it interactively, or non-interactively.

8. If you wish to run interactively, type the following at the ODE prompt:

   ```
   ODE><module_name>
   ```

   This command loads the module from LIF into memory, and initializes it, displaying the module_name prompt:

   ```
   MODULE_NAME>
   ```

   To run interactively, type `help` for a list of commands which are valid for use with selected module:

   ```
   MODULE_NAME>help
   ```

9. To run non-interactively, type the following at the ODE prompt:

   ```
   ODE>run module_name
   ```

Test Module Manager (`TMMGR`) .

`TMMGR` (pronounced TM Manager) is a special ODE module that implements an ease-of-use user interface for ODE. `TMMGR` is a hybrid menu/command interface that enables the user to test specific hardware modules without having to know which diagnostic to load and launch — instead, the user simply selects from a menu the specific hardware module to test, and the appropriate diagnostic is executed. `TMMGR` provides the user with a consistent set of commands, as well as context-sensitive help. Note, `TMMGR` can only be run from the Support CD-ROM.

NOTE	As of the June 1999 release (IPR 9906), the ODE module TMMGR (TM Manager) will only be updated to support new 32-bit systems (such as the J5000, J7000, C3000, and B1000). TMMGR will NOT be updated to support new 64-bit systems (such as the L-Class and N-Class).

Running `TMMGR`

To launch `TMMGR`, enter the following:

```
ODE>MENU
```

After `TMMGR` loads and configures the system (this may take several minutes), it allows the user to interact with ODE through several different screens. Following is a brief summary of each screen:

System Screen The system screen is the first screen displayed to the user. It provides a map of all hardware modules in the system and allows the user to select and test sets of modules.

Test Screen A test screen displays a list of tests for a particular module. It allows the user to select and run a set of tests for a specific module.

Logging Screen The logging screen displays of log of all test activity. The user can use this screen to get detailed error or isolation information from a particular TM.

Environment Screen The environment screen displays a list of environment variables accessible to the user. From this screen the user can adjust certain aspects of `TMMGR`.

For all screens, the set of available user commands is displayed across the top of the display. These are the only commands that can be entered at the command prompt. To get a summary of each available command, use the `HELP` command with no parameter. To display detailed information about a specific command, use the `HELP` command with the command's name as the parameter. Note, some screens may contain more than one page of information. To display the previous or subsequent page, use the `PREV` or `NEXT` commands or their respective shortcuts, Ctrl-P or Ctrl-N. To quickly go to the first or last page of a

screen, use the `FIRST` or `LAST` commands. User commands at the command prompt may be chained together using a semicolon as a separator. For example, to select items 1 and 5 and then run them, the following could be entered at the command prompt:

```
Command-> select 1 5;run <cr>
```

System Screen

Below is an example of the system screen:

```
Commands: EXIT, NEXT, LAST, LOG, ENV, RUN, SELECT, INFO, REFRESH, HELP


                          ** HP 9000/712 **

Selection     Module/Device                        Path            Status

    1         Processor [1 Found]                                  N/A
    2  *      Memory [1 Controller Found]                          READY
    3         Builtin Graphics                     1               N/A
    4  *      Core Bus Adapter                     2               READY
    5  *      Core SCSI                            2/0/1           READY
    6  *      Core LAN                             2/0/2           READY
    7  *      Core RS-232                          2/0/4           READY
    8  *      Core Centronics                      2/0/6           READY
    9  *      Audio                                2/0/8           READY
   10  *      Core Floppy                          2/0/10          READY
   11  *      Core PS/2                            2/0/11          READY
   12  *      Core PS/2                            2/0/12          READY
   13  *      Core Bus Adapter                     6               READY

%< Page 1 of 2 >                        %< Test Loops Completed: 0 >

Command->
```

The system screen shows a map of the computer system displaying a short description of each HP- architected module, its architected path, and its status. The status field gives information about the test state of the hardware module. The status field may have the following values:

N/A	The TM for this module is not available. Either the TM does not exist on the LIF volume, or the TM is unable to be executed.
READY	No tests for this module have been launched. The TM for this module is ready for execution.
PASSED	All tests run on this module passed.
FAILED	One or more tests run on this module failed.
ABORTED	The user aborted test execution, or all tests run were aborted by the system
SKIPPED	Tests for this module were launched, but all were skipped.

An asterisk next to a selection number indicates that this module is selected for testing. The set of all selected modules will be tested when the user executes the RUN command. Use the SELECT command to alter the set of selected modules. To launch the tests for all selected modules, enter RUN at the command prompt. This will run all default or

user-selected tests for all selected hardware modules. Note, not all available tests for a module may be considered default. At any time the user may hit Ctrl-C to abort test execution. To do detailed testing on just one particular module, one can enter the module's selection number at the command prompt. This will cause the module's test screen to be displayed.

Test Screen

Below is an example test screen:

```
Commands: EXIT, LOG, ENV, RUN, SELECT, INFO, REFRESH, HELP


                         ** Memory Controller @ 9 **

Test           Description                                          Status

    1 *     Single Bit Error Test                                  READY
    2 *     Walking Ones Test                                      READY
    3 *     Refresh Test                                           READY
    4 *     Read Hammer Write Test                                 READY
    5 *     Write Hammer Read Test                                 READY
    6 *     Full Address Test                                      READY
    7 *     Marching Ones Test                                     READY
    8 *     Pseudorandom Architected Test                          READY
    9 *     Binary Tree Test                                       READY




%< Page 1 of 1 >                            %< Test Loops Completed: 0 >

Command->
```

The test screen displays all the tests for a selected module and indicates which ones are selected for testing. By default, not all tests may be tagged. For example, tests that require special loopback connectors may not be selected by default. Therefore, if one wants to ensure that a specific set of tests is run for a particular module, one should enter the test screen for that module and select the appropriate tests. The test screen also displays the status of each test. The status field may have the following values:

READY   This test has not been run. It is ready for execution.

PASSED   The test passed.

FAILED   The test failed.

ABORTED   The user aborted test execution, or the test was aborted by the system

SKIPPED   The test was skipped.

The user can execute the `RUN` command to run the set of selected tests. At any time the user may hit Ctrl-C to abort test execution. Use the `EXIT` command to return to the system screen. The current set of selected tests will be preserved. Thus, on a subsequent `RUN` from the system screen, only the user-selected tests will be executed.

Logging Screen

To enter the logging screen, type `LOG` at the command prompt. The logging screen displays detailed information that each TM may have output during its execution. One can display the various pages of the log to correlate a failing test with any associated error information that the TM may have output.

Environment Screen

To enter the environment screen, type `ENV` at the command prompt. The following is an example environment screen:

```
Commands: EXIT, ERRCOUNT, ROWS, SCROLL, TERM, LOOP, REFRESH, HELP


                       ** Environment Variables **

Variable        Description                                     State

ERRCOUNT        Number of errors that stop test execution       0

ROWS            Number of console text rows                     24

SCROLL          Activates scrolling during screen redraws       ON

TERM            Terminal type                                   UNKNOWN

LOOP            Number of times to loop test execution          1


%< Page 1 of 1 >
```

`Command->`

The environment screen displays each environment variable, an associated description, and its current state. Use the `HELP` command to get more online information about each environment variable.

Environment Variables

This section gives a brief discussion of each environment variable. Note, the command syntax for each variable indicates its legal states. A | in the command syntax means or.

ROWS

`ROWS <integer>`

NOTE	<integer> must be 12 or greater.

The `ROWS` environment variable indicates the number of text rows supported by the current console display.

SCROLL

`SCROLL ON|OFF`

The `SCROLL` environment variable controls how screen redraws are performed. When the state of `SCROLL` is ON, the screen is redrawn by scrolling the current text off the top of the console display.

When the state of SCROLL is OFF, the console display is updated using special terminal-specific control mechanisms (allowing the redraw to occur much faster). If one wants to save previous screen displays in terminal display memory, or if one is using a terminal not supported by TMMGR, SCROLL should be set to ON. Note, if the current terminal type is unknown, one will not be able to change the state of SCROLL to OFF.

LOOP

```
LOOP <integer>|FOREVER
```

The LOOP environment variable indicates how many times to loop on test execution before control is returned to the user. To loop forever, the state of LOOP should to set to FOREVER. When in this state, the user must hit <Ctrl>-Y or <Ctrl>-C to stop test execution. Note, the effect of the LOOP environment variable is context-dependent. If test execution is launched from the system screen, the LOOP state indicates how many times the tests for the tagged modules will be executed. If test execution is launched from a test screen, the LOOP state indicates how many times the tagged tests will be executed.

TERM

```
TERM HP|UNKNOWN
```

The TERM environment variable indicates the current type of the console. Currently, only HP serial terminals are fully supported by TMMGR. If one is using a non HP terminal or a graphics display, TERM should be set to UNKNOWN.

ERRCOUNT

```
ERRCOUNT <integer>
```

The ERRCOUNT environment variable indicates how many test errors can be generated before test execution is stopped and control returned to the user. If one does not want error generation to stop test execution, the state of ERRCOUNT should be set to 0.

Commands

This section gives a brief description of each user command supported by TMMGR. The following conventions are used in the command syntax:

```
| or
[] items within brackets are optional
... item to the left can be repeated 0 or more times
{} groups items together
```

FIRST

```
FIRST
```

Use this command to display the first page of the system screen, the environment screen, the logging screen, or a test screen.

LAST

```
LAST
```

Use this command to display the last page of the system screen, the environment screen, the logging screen, or a test screen.

NEXT

`NEXT (N)`

Use this command to display the next page of the system screen, the environment screen, the logging screen, or a test screen. Note, <Ctrl>-N (N) can be used as a shortcut for this command.

PREV

`PREV (P)`

Use this command to display the previous page of the system screen, the environment screen, the logging screen, or a test screen. Note, <Ctrl>-P (P) can be used as a shortcut for this command.

REFRESH

`REFRESH`

Use this command to redraw the current console display. Using this command may become necessary if the console display becomes unsynchronized with internal program data structures.

ENV

`ENV`

Use this command to go to the environment screen. The environment screen allows one to view and modify all environment variables.

SELECT

`SELECT`

<num> is an integer indicating any valid selection number. <range> is a range of selection numbers of the form A/B (A %< B). Use this command to select a group of modules to test or a group of tests to execute. A group of modules or tests is specified by explicitly specifying a list of selection numbers and/or a range of selection numbers. All tests or testable modules can be selected at once by using the command parameter, ALL. To deselect a group of modules or tests, one can prepend –   to each element in the group specification. Note, elements of a group specification are processed from left to right. This fact can be used to specify groups with minimal effort.

Examples:

To select modules or tests 1, 4, 6, 7, 8, and 9, enter:

`-> select 1 4 6 7 8 9 <cr>     or     -> select 1 4 6/9 <cr>`

To select all modules or tests except 3 and 4, enter:

`-> select all -3 -4 <cr>`

EXIT

`EXIT [ALL]`

Use this command to return back to the previous screen. To exit all the way back to ISL, type `EXIT ALL`.

LOG

`LOG`

Use this command to go to the logging screen. The pages within the logging screen show detailed output from each test previously run.

RUN

`RUN`

Use this command to execute the currently tagged tests or to execute the tests for the currently tagged modules.

HELP

`HELP [<name>]`

<name> is the name of a valid command for the current page in the current screen. Use this command to display help information for the various commands valid for the current page in the current screen. Executing this command with no parameter will display a short summary of each valid command.

INFO

`INFO <num>`

NOTE	<num> is a valid module or test selection number.

Use this command to display general information about a module or test. The desired module or test should be specified by its associated selection number as indicated on screen.

Updating Processor Firmware Using the Diagnostic/IPR Media

CAUTION	**If you should run ODE support tools with the wrong revision of processor firmware (PDC) on your system, you could cause an HPMC**. The following procedure will ensure that your ODE support tools and your PDC are running compatible versions.

NOTE	As of the June 1999 release (IPR 9906), the `UPDATE` utility for ODE has been replaced by `FUPDATE`. `FUPDATE` is backward compatible with existing computer systems

Following is the procedure for updating the PDC on your system, prior to running any ODE support tools:

1. At the prompt, type `swinstall`. Three windows will be displayed.

2. Move the cursor to the window displaying the `Machine` and `Depot` dialog boxes.

3. Enter the appropriate information in the `Machine` field (this is the machine you are loading PDC update script onto; the default is the machine on which you are running the Diagnostic/IPR Media).

4. Enter the appropriate information in the `Depot` field (this is the media — that is, the tape or CD-ROM — from which you are loading the PDC update script).

5. Move the cursor to `Change Software View` and select it.

6. Select `Products`.

7. Move the highlight bar to `PROC_FIRMWARE`.

8. Move the cursor to the `Actions` pulldown menu, and select `Install`.

   You should see the messages `Loading` and then `Done`.

9. Once you see the message `Done` displayed, you should exit.

10. Type `cd usr/sbin/diag/firmware` at the prompt.

    You should see the following three files listed:

    ```
    FRMW_LIF        README        cp_lif_tape
    ```

11. Be sure you have a blank tape inserted into the drive; then type `cp_lif_tape`.

12. You will be prompted to enter the tape drive address (a typical address would be `0m`).

    The `cp_lif_tape` script will copy the LIF file `FRMW_LIF` to a DAT tape.

13. Once you have made the DAT tape with `FRMW_LIF` on it, you should insert that tape into a bootable DAT tape drive connected to the system whose firmware you wish to change.

14. It is necessary that you shutdown the operating system on the system whose firmware you wish to change. This can be done with the `reboot -h` command.

15. Once the system's operating system is shutdown, you can then cycle the power of the system by pushing the power button OFF and then ON. The system should then begin to boot. If you look at the console, you will observe the system eventually display a boot prompt or indicate that in 10 seconds it will autoboot unless you hit a key.

16. If you see the 10 second message, you should hit a key to get to the boot prompt.

17. At the boot prompt, you have to tell the system which path to boot from. You will want to boot from the path that points to the DAT tape drive in which you placed the DAT tape that you made earlier.

18. If you do not know the path to the DAT tape drive, type `search` at the boot prompt and then hit **Return**. The system will display all the bootable devices it can find. The DAT tape will be a sequential boot device.

19. Once you have selected the boot path for the DAT tape drive, you should issue a boot command using that path.

20. As the system boots, it may prompt you to know if it should interact with ISL or not. If the system prompts you for such information, you should type `y`. Next, you should see the `ISL` prompt.

21. At the `ISL` prompt, you should type `ODE` and hit **Return**.

22. At the `ODE` prompt, you should type `README`. The `README` utility will display an index indicating which image files on the LIF are for which systems, along with the versions associated with those image files.

23. If you would like to see more detailed information about a particular firmware revision, you can use the `README` utility commands to scroll through appropriate text files.

24. Once you have determined which image file(s) are appropriate for your system, you should exit the `README` utility and type `FUPDATE` (or `UPDATE`) at the `ODE` prompt.

25. At the `FUPDATE (or UPDATE)` prompt, you should type the `IMAGE` command, followed by the image filename(s) you determined was correct for your system. If your system requires more than one image file, you should list the filenames in the order they appeared in the `README` index.

CAUTION **IF YOU SELECT THE WRONG IMAGE FILE(S), YOU CAN RENDER YOUR SYSTEM UNUSABLE!**

---

26. Once you have entered the `IMAGE` command, you can type the `RUN` command to start the processor firmware update process on the system.

27. You will be prompted by the `FUPDATE` (or `UPDATE`) utility and you should respond as appropriate. Once the update process is complete, the `UPDATE` utility will reboot your system so that the new firmware can begin to operate.

THIS ENDS THE PROCEDURE FOR UPDATING THE PDC ON YOUR SYSTEM FROM THE SUPPORT MEDIA.

---

4 Support Tools Manager (STM)

The Support Tools Manager (STM) is a platform for online support tools currently available for HP9000 Series 700 and 800 machines.

Upon startup, you connect to a local or remote system. STM displays a map of the hardware configuration. You use this system map to select one or more devices, then run the desired tool (such as a verifier, exerciser, or expert tool) on the selected device(s). Results are displayed on the system map.

NOTE	For the most current information on Support Tools, see our Web site, "Systems Hardware, Diagnostics, and Monitoring," at `http://www.docs.hp.com/hpux/systems/`. This Web site also contains additional documents, such as tutorials, quick reference guides, and release information.

This chapter introduces STM and covers the following topics:

- Running STM
- Three Interfaces
- System Map and Device Icons
- Menus and Commands
- Getting Result Information (Logs)
- Remote Execution
- Getting Help
- Common Problems

Running STM

To start STM and run support tools:

1. Enter the command appropriate for your terminal.

   - For X Windows terminals and workstations, enter `/usr/sbin/xstm`.

   - For non-graphics terminals, enter `/usr/sbin/mstm` (menu-based version) or `/usr/sbin/cstm` (command-line version).

     You can also enter `/usr/bin/stm`. This command will start the X-windows interface, if the `DISPLAY` environment variable is set; otherwise, the menu interface will be started.

2. If you want to test a remote machine, select the computer system to test. The remote machine must be running a compatible version of STM (i.e., the version running on the system you wish to connect to must be identical to, or a later version than, the version running on the system you are connecting from).

3. Select one or more devices from the system map that is displayed.

4. Choose a support tool (for example a verifier) to run on the selected device(s).

5. Results appear on the system map (for example on xstm, a green icon indicates that a device successfully passed the test).

6. If the device fails, see the device Failure Log for the cause of the failure and suggested actions.

7. If a test result is anything other than Successful or Failure, look at the Test Activity Log for the device.

The specific steps depend on whether you are running xstm, mstm, or cstm. For example, in xstm, commands are accessed by means of pull-down menus. In mstm, you traverse menus and select commands by pressing function keys. In cstm, you enter the command name (or its abbreviated form) at the prompt.

For detailed instructions, use the STM online help system. (See "Getting Help"later in this chapter.)

Three Interfaces

You can access the Support Tools Manager (STM) through any of three interfaces. Choose the interface appropriate for your needs, preferences, and resources. If possible, use xstm.

xstm (X Window graphical)

- X Window graphics terminals or workstations

- Command: `/usr/sbin/xstm` or `/usr/sbin/stm/ui/bin/stm -x`

mstm (menu-based)

- Non-graphics terminals

- Command: `/usr/sbin/mstm` or `/usr/sbin/stm/ui/bin/stm -m`

cstm (command line)

- For running scripts

- Command: `/usr/sbin/cstm` or `/usr/sbin/stm/ui/bin/stm -c`

Displays from the three interfaces are shown in the rest of this chapter.

System Map and Device Icons

When you first connect to a computer system, you see a system map showing all the hardware entities in the system (CPU, memory, device adapters, and I/O devices).

You use the system map to select the devices to test. After a test runs, the system map displays the results. For example, a device icon in xstm is green for Successful and red for Failure.

System Map in xstm

In xstm, the system map is composed of device icons (see Figure 4-1). You left-click on a device icon to select that device and unselect all others.

Do a Control-left-click on a device icon to toggle the select of that device and leave all other selected devices in their current state.

Figure 4-1 xstm System Map
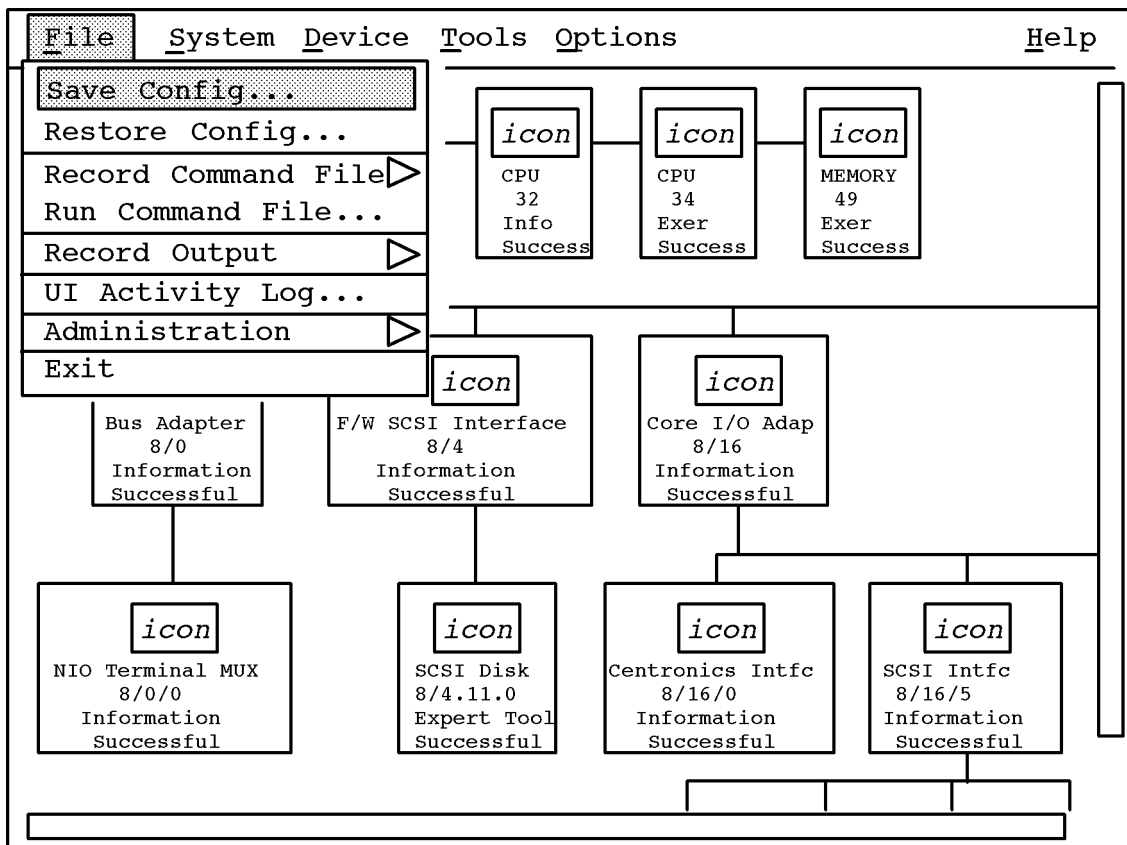
mspg043

System Map in mstm

The following figure shows a system map in mstm:

Figure 4-2

```
                         /usr/sbin/stm/ui/bin/stm
                               hpdst199

File     System    Device   Tools   Options                      Help
====     ======    ======   =====   =======                      ====


                                     Last        Last Op
Path           Product               Active Tool Status
===========    ========================= =========== ==================
8              Bus Adapter           Information Successful
8/0            Bus Adapter           Information Successful
8/0/0          NIO Terminal Multiplexor  Information Successful
8/4            Fast/Wide SCSI Interface  Information Successful
8/4.3.0        SCSI Disk             Exercise    Aborted
8/4.4.0        SCSI Disk             Verify      Successful
8/4.10.0       SCSI Disk             FW Update   Successful
8/4.11.0       SCSI Disk             FW Update   Successful
8/16           Core I/O Adapter      Information Successful
8/16/0         Centronics Interface  Information Successful
8/16/5         SCSI Interface        Information Successful
8/16/5.1.0     SCSI Tape             Verify      Query Pending
8/16/5.2.0     SCSI Disk             Information Successful
8/16/6         LAN Interface         Exercise    Abort Pending
8/16/7         Built-in Keyboard/Mouse   Information Successful
8/20           Core I/O Adapter      Information Successful
8/20/2         RS-232 Interface      Information Successful
8/20/5         EISA Adapter          Information Successful
10             Bus Adapter           Information Successful
32             CPU                   Exercise    Successful
34             CPU                   Exercise    Successful
49             MEMORY                Exercise    Successful
```

Navigation of the system map is done by using the Up/Down/Left/Right arrow keys and the Prev/Next or Page Up/Page Down keys.

To select a specific device for testing, place the cursor on the specific device and press Return; all other devices are unselected. (To select a device and leave all other selected devices in their current state, place the cursor on the specific device and press the space bar.):

You can use the TAB key to activate a pull down menu which allows you to select the specific tool that you want to run on the selected device(s). :

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System Map in cstm

The cstm system map is almost identical to the mstm system map. The main difference is that cstm provides each device with a device number:

Figure 4-3

```
                        /usr/sbin/stm/ui/bin/stm
                               hpdst199

Dev                                       Last        Last Op
Num  Path         Product                 Active Tool Status
===  ==========   =======================  ==========  ==================
1    8            Bus Adapter             Information Successful
2    8/0          Bus Adapter             Information Successful
3    8/0/0        NIO Terminal Multiplexor Information Successful
4    8/4          Fast/Wide SCSI Interface Information Successful
5    8/4.3.0      SCSI Disk               Exercise    Aborted
6    8/4.4.0      SCSI Disk               Verify      Successful
                     .
                     .
                     .
```

You select devices by using the `select` command with a device number or path modifier. A minus sign (-) in front of a parameter unselects it. Examples:

```
select device 1
select path 5/4.3.2
select device -1
select path -5/4.3.2
```

Kinds of Support Tools

To use the diagnostics and support tools, the user first invokes one of the user interface modules (`xstm, mstm,` or `cstm`), selects one or more devices, and invokes one of the following tools to specify what type of operation is to be performed on the device(s):

Information Creates a log of information specific to one device, including the product identifier, a description of the device, the hardware path to the device, the vendor, and the firmware revision code, if firmware is present in the device.

Verify If available, performs a simple test of component function, providing a "pass/fail" indication of device condition; typically, this is the first level test of a device's condition.

Diagnose If available, runs a diagnostic program on the device, which is designed to detect and isolate faulty hardware on that device. Diagnose tools equire a Support Class or Node license.

Exercise If available, stresses the device or subsystem. This function is useful in providing very high confidence verification, and in detecting intermittent errors.

Firmware Update Initiates the firmware update process for a selected device. While the user interface to the firmware update tools is generic, the tools themselves are device-specific.

Expert Tools Are device specific troubleshooting utilities for use by sophisticated users. Their functionality varies from tool to tool, but they are intended to be interactive, and rely on you to provide information necessary to perform a particular task. Expert tools require a Support Class or Node license, or in some cases an HP-only license.

Utilities Are support tools which are not device specific. Current tools include logtool (for reading system logs) and a disk copy utility. Most utilities do not require a license.

Verifiers, exercisers and information tools require no license to run. Some of the other tools may require a license. To see the license level required for the tools available on a device, perform a "current device status" request on the device. For example in xstm, select the device, then select "Current Device Status" from the Device pull-down menu.

Menus and Commands

The xstm, mstm, and cstm interfaces all have different ways to display menus and accept commands from the user.

The following subsections detail the xstm, mstm, and cstm menus and commands.

xstm Menus and Commands

In xstm, commands are accessed by means of pull-down menus.

Figure 4-4 xstm Menus and Commands

Menu Bar

File	System	Device	Tools	Options	Help
Save Config...	Sel System to Test –>	Current Device Status	Information–>*	Tool Options–>	On Item...
Restore Config...	Save Map...	Clear Tool Status	Verify –>*	Map...	On Tasks...
Record Command File –>	Print Map...	Select All	Diagnose–>*	General...	On Application...
Run Command File...	Remap System	Select Class...	Exercise–>*		On Menus/
Record Output –>	Map Log	Unselect All	Firmware Update –>*		Commands...
UI Activity Log	License–>	Unselect Class...	Expert Tool –>*		On Home Topic...
Administration–>	System Activity Log...		Utility –>*		On Help...
Exit	Daemons –>		Latest Logs –>		On Version...
			Tool Management–>		

The entries above marked with '–>' display one of the cascade menus shown below. Each tool (marked with '') generates the cascade menu below labeled '*(Tools)–>'.*

Cascade Menus

Record Command File –>

Start Recording...
Stop Recording

Record Output –>

Start Recording...
Stop Recording
Record Map

Administration –>

Read UUT Config File
Update Tool Info
STM Startup
STM Shutdown
Local UUT Logs –>

Local UUT Logs –>

Map Log
System Activity Log
syslog

mspg075

Sel System to Test –>

Connect to Systems...
Select Current System...
Disconnect Systems...

License –>

Display
Install...
Install HP–Only...
Deinstall

Daemons –>

Daemon Starup...
Daemon Shutdown...
Daemon Kill...
Daemon Activity Log...

*(Tools) –>

Run
[Information Log]
Activity Log
Failure Log
Info

Latest Logs –>

Activity Log
Failure Log

Tool Management –>

Abort Tool
Suspend Tool
Resume Tool
Kill Tool
Abort Utility...
Kill Utility...
Display '"Query Pending"

Tool Options –>

Information...
Verify...
Diagnose...
Exercise...
Firmware Update...
Expert Tool...
Utility...
Tool Launch...

mstm Menus and Commands

In mstm, you traverse screens and menus, and select commands from pulldown menus, which are similar to those found in xstm:
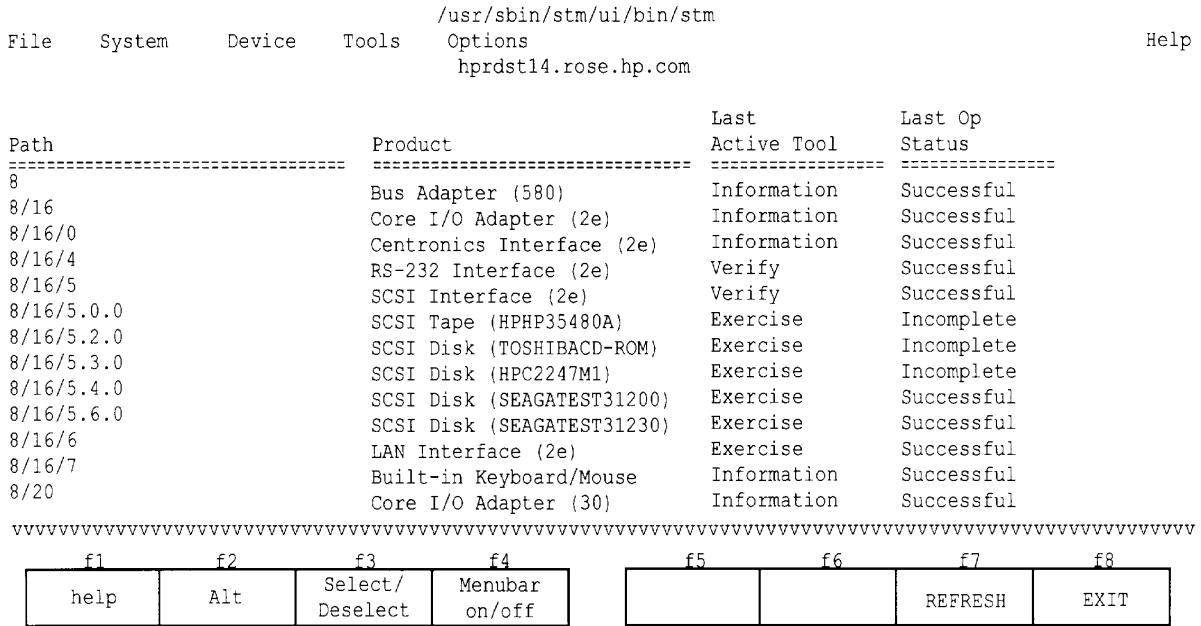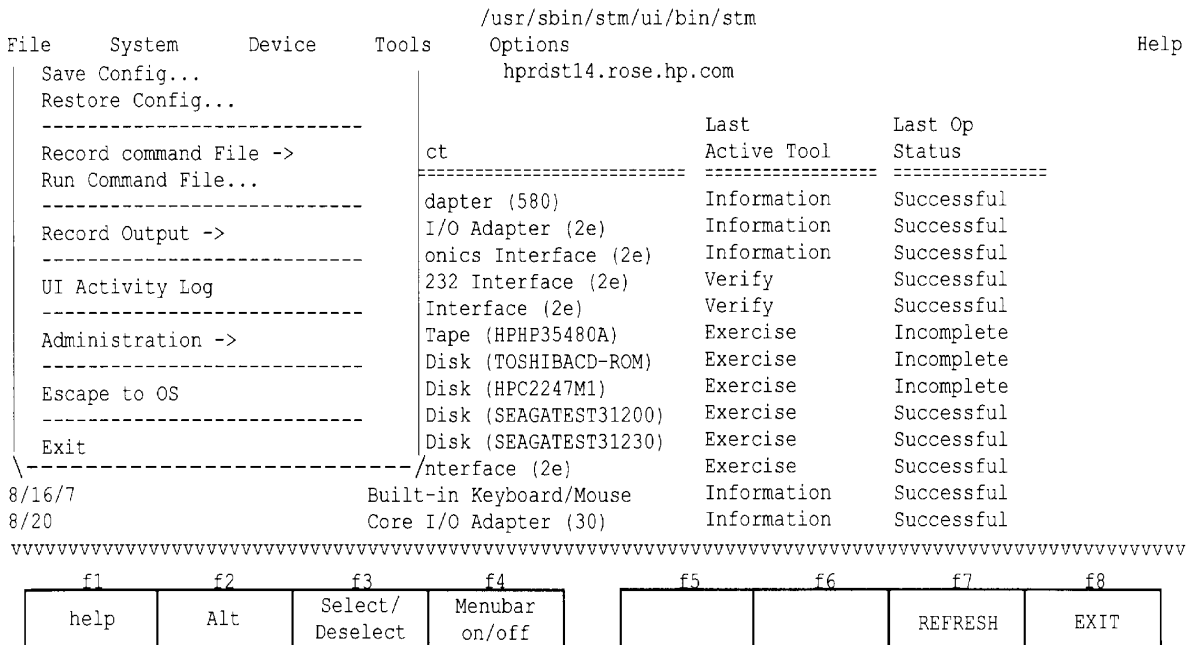
Figure 4-5   mstm Menu Bar and Softkeys

```
                                        /usr/sbin/stm/ui/bin/stm
   File     System     Device    Tools    Options                                              Help
                                          hprdst14.rose.hp.com


                                                        Last             Last Op
   Path                              Product            Active Tool      Status
   =================================  ================================  =================  ================
   8
   8/16                              Bus Adapter (580)         Information       Successful
   8/16/0                            Core I/O Adapter (2e)     Information       Successful
   8/16/4                            Centronics Interface (2e) Information       Successful
   8/16/5                            RS-232 Interface (2e)     Verify            Successful
   8/16/5.0.0                        SCSI Interface (2e)       Verify            Successful
   8/16/5.2.0                        SCSI Tape (HPHP35480A)    Exercise          Incomplete
   8/16/5.3.0                        SCSI Disk (TOSHIBACD-ROM) Exercise          Incomplete
   8/16/5.4.0                        SCSI Disk (HPC2247M1)     Exercise          Incomplete
   8/16/5.6.0                        SCSI Disk (SEAGATEST31200) Exercise         Successful
   8/16/6                            SCSI Disk (SEAGATEST31230) Exercise         Successful
   8/16/7                            LAN Interface (2e)        Exercise          Successful
   8/20                              Built-in Keyboard/Mouse   Information       Successful
                                     Core I/O Adapter (30)     Information       Successful
   vvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvv
       f1          f2          f3          f4              f5          f6          f7          f8
    +--------+----------+------------+----------+    +--------+--------+----------+----------+
    |        |          |  Select/   | Menubar  |    |        |        |          |          |
    |  help  |   Alt    |  Deselect  | on/off   |    |        |        | REFRESH  |  EXIT    |
    +--------+----------+------------+----------+    +--------+--------+----------+----------+
```

Figure 4-6   mstm Pulldown Menu Example

```
                                        /usr/sbin/stm/ui/bin/stm
   File      System      Device     Tools     Options                                          Help
    +--------------------------+             hprdst14.rose.hp.com
    | Save Config...           |
    | Restore Config...        |                      Last             Last Op
    |--------------------------|    ct                Active Tool      Status
    | Record command File ->   |    ============================  =================  ================
    | Run Command File...      |    dapter (580)           Information       Successful
    |--------------------------|    I/O Adapter (2e)        Information       Successful
    | Record Output ->         |    onics Interface (2e)    Information       Successful
    |--------------------------|    232 Interface (2e)      Verify            Successful
    | UI Activity Log          |    Interface (2e)          Verify            Successful
    |--------------------------|    Tape (HPHP35480A)       Exercise          Incomplete
    | Administration ->        |    Disk (TOSHIBACD-ROM)    Exercise          Incomplete
    |--------------------------|    Disk (HPC2247M1)        Exercise          Incomplete
    | Escape to OS             |    Disk (SEAGATEST31200)   Exercise          Successful
    |--------------------------|    Disk (SEAGATEST31230)   Exercise          Successful
    | Exit                     |    nterface (2e)           Exercise          Successful
    \-------------------------/
   8/16/7                            Built-in Keyboard/Mouse   Information       Successful
   8/20                              Core I/O Adapter (30)     Information       Successful
   vvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvv
       f1          f2          f3          f4              f5          f6          f7          f8
    +--------+----------+------------+----------+    +--------+--------+----------+----------+
    |        |          |  Select/   | Menubar  |    |        |        |          |          |
    |  help  |   Alt    |  Deselect  | on/off   |    |        |        | REFRESH  |  EXIT    |
    +--------+----------+------------+----------+    +--------+--------+----------+----------+
```

Screen Navigation

There are two types of screen navigation:

* Navigating between screens

* Navigating within screens

To navigate between one screen and another, use the Tab key.

To navigate from one portion to another portion of the same screen, use the Prev and Next keys (or, alternatively, the Cursor Up and Cursor Down keys).

Menu Bar

The following table summarizes the use of the menu bar.

Table 4-1   Menu Bar Navigation

To do this:	Do this:
Position the cursor on the menu bar	Use the Tab key (or the Menu Bar on/off function key).
Move to a pulldown menu	Use the cursor arrow keys.
Expand a menu/sub-menu	Use the Return key.
Highlight a command or sub-menu	Use the cursor keys.
Perform a command	Use the Return key.
Invoke a menu directly:	Use Alt function key; then hit non-underlined character in menu title.
Activate a menu command/expand pulldown sub-menu:	Hit the letter which is underlined in the command or sub-menu.

Figure 4-7 mstm Menus and Commands

Menu Bar

File	System	Device	Tools	Options	Help
Save Config...	Sel System to Test –>	Current Device Status	Information–>*	Tool Options–>	On Tasks...
Restore Config...	Save Map...	Clear Tool Status	Verify –>*	Map...	On Application...
Record Command File –>	Print Map...	Select All	Diagnose–>*	General...	On Menus/
Run Command File...	Remap System	Select Class...	Exercise–>*		Commands...
Record Output –>	Map Log	Unselect All	Firmware Update –>*		On Home Topic...
UI Activity Log	License–>	Unselect Class...	Expert Tool –>*		On Shortcuts...
Administration–>	System Activity Log...		Utility –>*		On Keyboard...
Escape to OS	Daemons –>		Latest Logs –>		On Help...
Exit			ToolManagement–>		On Version...

The entries above marked with '–>' display one of the cascade menus shown below. Each tool (marked with '*') generates the cascade menu below labeled '*(Tools)–>'.

Cascade Menus

Record Command File –>
Start Recording...
Stop Recording

Record Output –>
Start Recording...
Stop Recording
Record Map

Administration –>
Read UUT Config File
Update Tool Info
STM Startup
STM Shutdown
Local UUT Logs –>

Local UUT Logs –>
Map Log
System Activity Log
syslog

mspg075a

Sel System to Test –>
Connect to Systems...
Select Current System...
Disconnect Systems...

License –>
Display
Install...
Install HP–Only...
Deinstall

Daemons –>
Daemon Starup...
Daemon Shutdown...
Daemon Kill...
Daemon Activity Log...

*(Tools) –>
Run
[Information Log]
Activity Log
Failure Log
Info

Latest Logs –>
Activity Log
Failure Log

Tool Management –>
Abort Tool
Suspend Tool
Resume Tool
Kill Tool
Abort Utility...
Kill Utility...
Display "'Query Pending"
Attach to Tool

Tool Options –>
Information...
Verify...
Diagnose...
Exercise...
Firmware Update...
Expert Tool...
Utility...
Tool Launch...

---

mstm Shortcut Keys

A new 'shortcuts' feature has been added to mstm which lets you do frequently performed operations quickly. For example, to select all disks and then run the verify tool on them, the user would hit the keys 'dv<RETURN>' while the mstm map is displayed. For a list of the shortcut keys, hit the '?' key while the mstm map is displayed:

```
                          Shortcut Keys

Device Selections              Device Tools              Utilities
 (a) all devices                (v) verify               (l) logtool
 (d) disks                      (e) exercise
 (m) memory                     (i) information
 (p) processors                 (s) current device status
 (t) tapes


Other Shortcut Keys
 (?) this help page
 <cr> execute shorcut key commands and exit from this help page.
 <back-space> delete the last shortcut key entered and undo its selection.

Notes
 - The first device selection will unselect all currently selected
   devices.
   Subsequent selections will be additive.
 - Only one tool or utility operation is allowed per shortcut operation.

Shortcut Key Examples:
 "av<cr>"  Select all devices and run verifier.
 "l<cr>"   Run logtool.
 "dte<cr>" Select only disk and tapes and run exerciser.
```

cstm Menus and Commands

In cstm, you simply enter the command name (or its abbreviated form) at the prompt. There are no menus and you can enter any command at any time.

The following lists the cstm commands for the HP-UX 10.10 to 11.0 releases by category. The format is *command* (*abbreviation*):
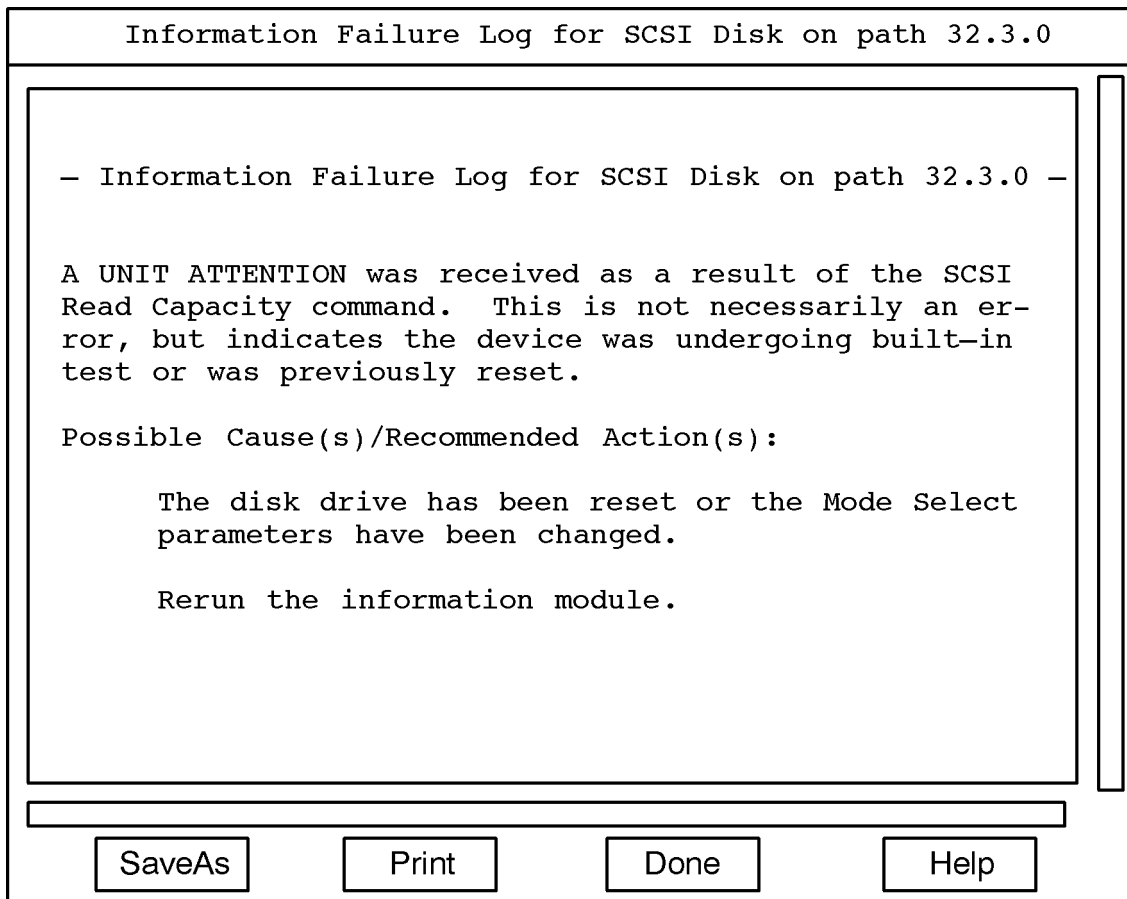
```
File:                     System:                   Device:
saveconfig (scfg)         connectsys (cs)           currdevstatus (cds)
restoreconfig (rcfg)      selcurrentsys (scs)       cleartoolstatus (cts)
recordcmdfile (rcf)       disconnectsys (ds)        select (sel)
stoprecordcmd (srcf)      savemap (smap)            selall (sall)
runcmdfile (rncf)         printmap (pmap)           selclass (scl)
recordoutput (ro)         remapsystem (rs)          unselall (usal)
stoprecordout (sro)       maplog (ml)               unselclass (uscl)
uiactlog (uial)           displaylic (dl)
readuutconfig (ruc)       license (lic)
updatetoolinfo (uti)      hplicense (hlic)
stmstartup (ssu)          deinstalllic (dlic)
stmshutdown (ssd)         sysactlog (sal)
resetsysactlog (rsa)      daemonstartup (dsu)
localmaplog (lml)         daemonshutdown (dsd)
localsysactlog (lsal)     daemonkill (dk)
syslog (sl)               daemonactlog (dacl)
os (os)                   map (map)
exit (ex)


Tools:                    Tools (Continued)         Options:
information (info)        fwupdatefaillog (ffl)     infooptions (iop)
infolog (il)              fwupdateinfo (finf)       veroptions (vop)
infoactlog (ial)          experttool (xt)           diagoptions (dop)
infofaillog (ifl)         expactlog (xal)           exeroptions (eop)
infoinfo (iinf)           expfaillog (xfl)          fwupdateoptions (fop)
verify (ver)              expinfo (xinf)            expoptions (xop)
veractlog (val)           runutil (ru)              utiloptions (uop)
verfaillog (vfl)          utilactlog (ual)          launchoptions (lop)
verinfo (vinf)            utilfaillog (ufl)         mapoptions (mop)
diagnose (dgn)            utilinfo (uinf)           generaloptions (gop)
diagactlog (dal)          lateactlog (lal)
diagfaillog (dfl)         latefaillog (lfl)
diaginfo (dinf)           aborttool (abt)
exercise (exc)            suspendtool (st)          Help:
exeractlog (eal)          resumetool (ret)          help
exerfaillog (efl)         killtool (klt)            help more
exerinfo (einf)           abortutil (abu)           help syntax
firmwareupdate (fwu)      killutil (klu)            help all
fwupdatelog (fal)         displayquery (dq)         help COMMAND (ACCEL)
                          attach (at)               help help
                          wait (wait)               version (vers)
```

Getting Result Information (Logs)

Most of the time you will get the information you need by looking at the status of device icons on the system map. For example, a device icon in xstm is green for Successful and red for Failure.

If a device has a Failure, consult the device Failure Log for a message identifying likely causes for the failure and suggesting possible actions. Figure 4-8 shows a sample Failure Log in xstm.

Figure 4-8   Sample Failure Log in xstm


```
              Information Failure Log for SCSI Disk on path 32.3.0


      — Information Failure Log for SCSI Disk on path 32.3.0 —


      A UNIT ATTENTION was received as a result of the SCSI
      Read Capacity command.   This is not necessarily an er-
      ror, but indicates the device was undergoing built—in
      test or was previously reset.

      Possible Cause(s)/Recommended Action(s):

           The disk drive has been reset or the Mode Select
           parameters have been changed.

           Rerun the information module.
```

SaveAs   Print   Done   Help

mspg085

If a test result is anything other than Successful or Failure, look at the Test Activity Log for the device. For example, if a test results in a Incomplete status, the Test Activity Log will explain whether the problems is due to "malloc" failures or to missing device files, or other possible errors.

Other logs are available with a record of STM system events (for example, a User Interface Log).

Remote Execution

You can run the STM user interface on one machine, and use it to run support tools on one or more remote machines. See Figure 4-9 for a display of possible connections.

The computer running the user interface is the *UI system* and the computer running the support tools is the *Unit Under Test* or *UUT*).

As always you can run the user interface and support tools on the same machine. In this case the UI machine and the UUT are one and the same.
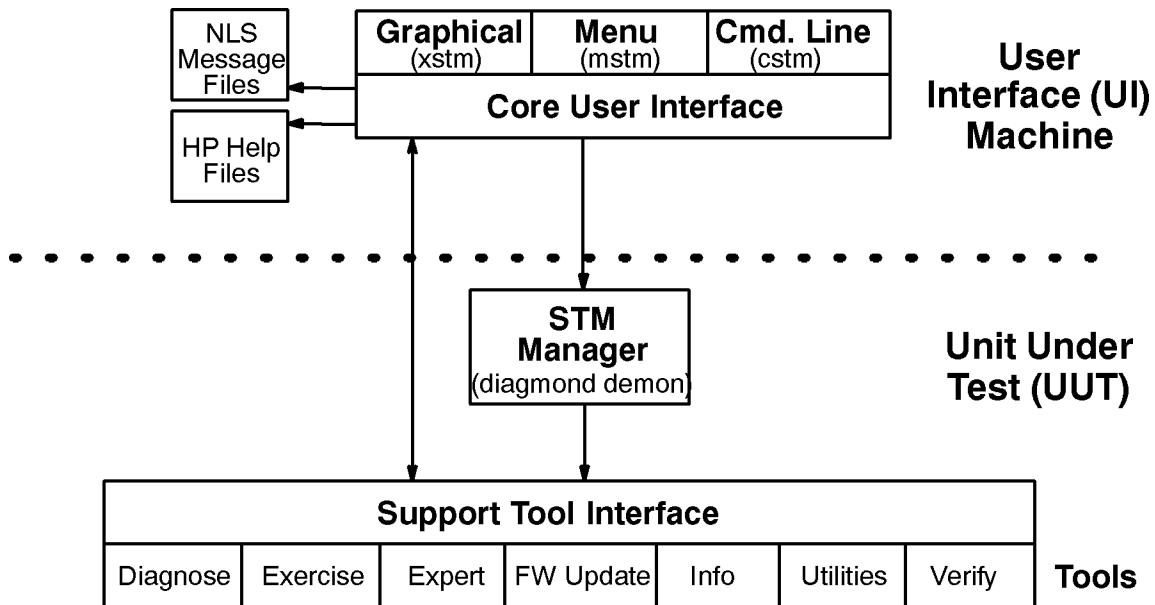
Figure 4-9 Possible UI and UUT Connections
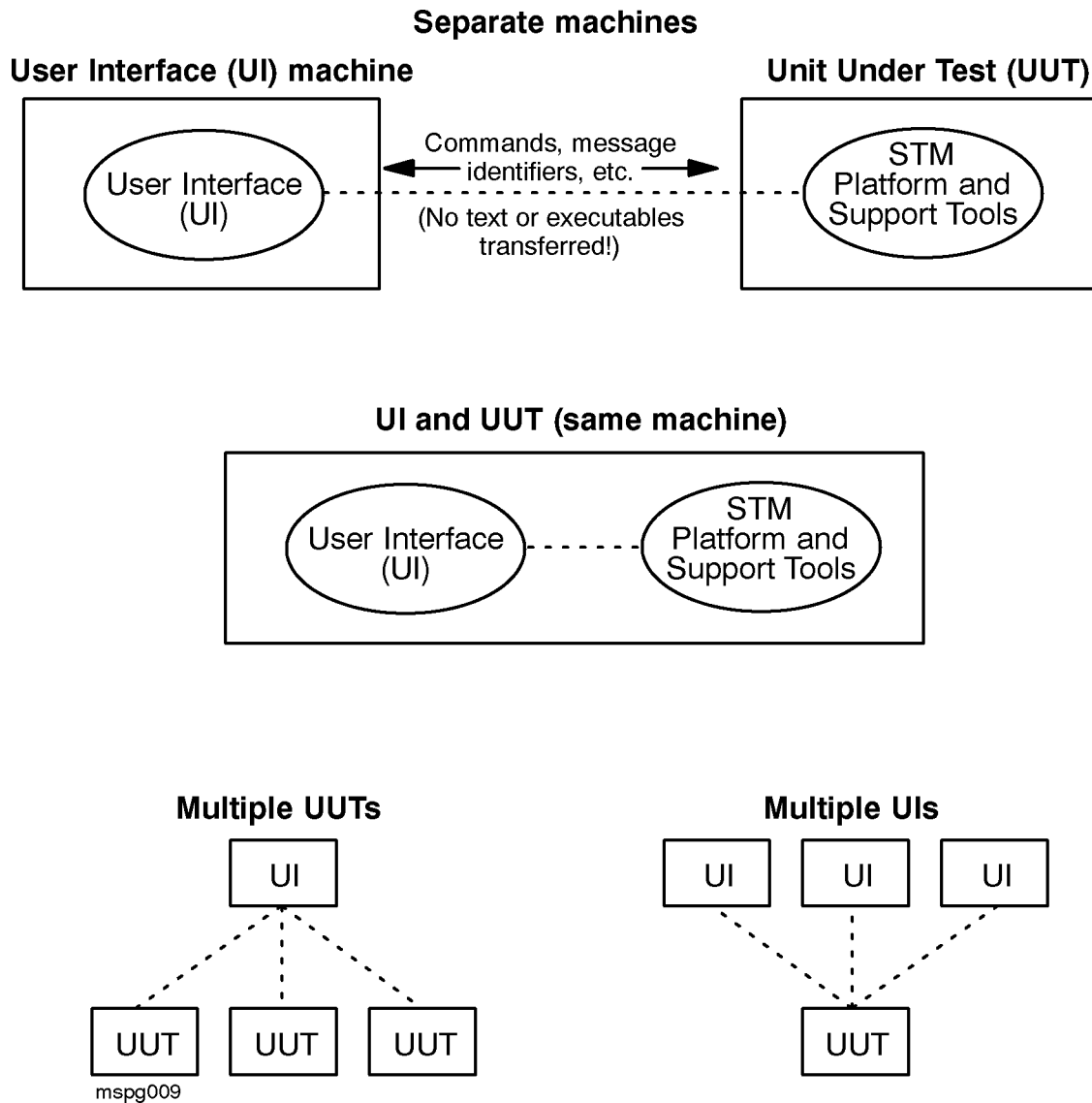
Distributed Structure

Efficient remote execution is possible because STM has a distributed structure. Figure 4-10 shows how the parts of STM are distributed between the UI machine and the UUT.

Figure 4-10 Diagram of STM's Distributed Structure

mspg084

The UI system contains the binaries for the graphical, menu, and command line interfaces, as well as for the Core UI which underlies them. The UI also contains the text to be displayed (message catalogs and help volumes).

The Unit Under Test (UUT) contains the binaries for the support tools (Diagnose, FW Update, Exercise, Expert, etc) and the libraries which support them.

Improving Performance

This distributed design makes for good performance. This is because data and code reside on the machine that makes use of them. The UI system has code for the UI, and message text for both the UI and support tools. The UUT system has the support tool executables. Little text is passed between the two machines, usually only the information required to locate a message.

Getting Help

STM provides sophisticated and full-featured help systems for the main STM interface and for interactive tools such as Expert tools and Firmware Update tools. See Figure 4-11 for a sample help display in xstm.

To access an online help system:

- *xstm:* Use the "Help" menu at the far right of the menu bar.

- *mstm:* Press the "Help" function key.

- *xstm:* Enter the command `help`.

Kinds of Help

Help for the main STM user interface covers the following:

- *On Item*: Context-sensitive information on parts of the interface (xstm only).

- *On Tasks*: Cookbook procedures for performing common system tasks using STM.

- *On Application*: General information about the Support Tool Manager

- *On Help*: Information about using the HP Help system.

- *On Version*: Copyright, version, and legal information about STM.

Figure 4-11 Sample Online Help in xstm (for FW Update Tool)

Support Tool Manager – Help

File Search Navigate   Help

Topic Hierarchy

Help for the Firmware Update Tool

**Topic
Hierarchy**
(Click on topics
listed here to jump
to parent topics.)

Help for the Firmware Update Tool

The Firmware Update Tool allows you to update
firmware on a SCSI disk device.

To update the firmware on a device, make sure
the firmware update file is on the Unit Under
Test (UUT), select the device at the main STM
window, select the firmware update file (at the
main STM window or in the firmware update
tool), then start the update process.

CAUTION

Make sure you select the correct firmware file for
the device! Updating a device with incorrect
firmware can make the device permanently un-
usable and data could be lost.

- Introduction
- Step–by–Step Instructions
- Troubleshooting
- Commands and Buttons

Hyperlink
(Click on underlined
phrases to jump to
new topics.)

mspg081

Common Problems

Exercisers sometimes enter a "Hung" state.

STM monitors the progress of all running tools and expects each tool to send a "heartbeat" every minute or so. If these heartbeat indications are not received within a two-minute window, the tool state is changed to "Hung". Two possible causes:

- *Cause 1: Not enough CPU time* The most probable cause is that the tool is not getting enough CPU time. This situation may occur if the computer is extremely busy or if several exercisers are executing simultaneously, especially with the "Maximum Stress" option.

  If the cause of the problem is not enough CPU time, the tool will eventually make enough progress to send another heartbeat at which time its state will be changed back to "Running". You may choose to suspend or abort the tool and wait for the system to become less busy. If you want to run several exercisers simultaneously, use the "Medium Stress" option.

- *Cause 2: Tool has stopped executing* Only rarely would the tool stop executing. Typically, this behavior would be caused by a kernel driver that has stopped responding or something of that nature.

  The tool may eventually start executing again if it becomes unblocked, at which time its state will be changed back to "Running". You may choose to abort the tool at this point. If the tool is blocked due to a kernel resource such as in a driver, you not be able to abort the tool. In this case, the tool will stay in an "abort pending" state indefinitely.

The user interface will not connect to a machine.

This problem usually occurs when the machine address cannot be resolved or because the `diagmond` daemon is not running on the machine that is being connected to. Use `/etc/ping` to verify that the host address can be resolved.

If `ping` works, check to see if `diagmond` is running on the host machine. If it is not, log into the host machine, run STM on it, and use the "File — >Administration — >Local UUT Logs" command to view the log files on the host machine and determine what the problem is.

The remote machine must have:

- HP-UX 10.01 or higher.

- The bundle containing STM (OnlineDiag) loaded.

- The `diagmond` demon running.

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The `diagmond` demon is automatically started for customers when they boot. It also happens automatically when you update the diagnostic system, as that also forces a reboot, which launches `diagmond`. If diagnostics are installed on the system but `diagmond` is not running, you can start it in one of two ways (you need to be root for both cases):

1. Type `/usr/sbin/stm/uut/bin/sys/diagmond`

2. Run xstm, mstm, or cstm and perform a local-startup:

   - xstm: File->Administration->Local Startup

   - mstm: file, admin, LOCAL STARTUP

   - cstm: localstartup (lsu)

If `diagmond` won't stay up, follow the standard procedure to figure out why. Run xstm, mstm, or cstm locally and look at the Local UUT Logs:

- cstm: localsyslog

- mstm: file, admin, local uut logs, sys act log

- xstm: File->Administration->Local UUT Logs->System Activity Logs

A device in the STM map is "Unknown" or its icon is blank.

This problem typically occurs if the driver that is associated with the device is not recognized by STM. Please report all unknown devices through STARS. Include the following information:

- The contents of the Scan HW Log.

- The output of the "Device — >Current Device Status" STM command.

- The output of the `ioscan -kF` HP-UX command.

- The type of device and its product number (if known).

Slow response to user commands.

When many tools are started simultaneously, STM may be slow to respond to user commands. This is due primarily to the messaging traffic between the tools and STM which is particularly heavy when tools are first run. During this time, one or more tools may enter a "Hung" state.

These problems should disappear once all of the tools have gotten through the start-up phase.

SCSI Tape and Disk Tools report SCSI commands as failed in the Test Activity Logs.

Some of the SCSI disk and tape tools log errors in their Test Activity logs indicating that commands such as LOG SENSE and INQUIRY failed. This is usually because the drive being tested is an older drive which did not implement these commands in the form they are being used. If this is the case, the Cause/Action text in the log message will suggest this as a possible cause of the problem.

No tools are available for a particular device.

Due to resource constraints, support tools for all device were not developed for this release. Tools for these devices will probably be available in subsequent releases.

Some tools may not be available because they require a license. Currently the only tools that require a license are expert tools. To see a list of the tools installed for a device and the license level, if any, required to run the tool, use the "Device — >Current Device Status…" command. The following is a display for a SCSI disk device:

```
Installed tools:
   Diagnostic      : None
   Verifier        : disk
   Exerciser       : disk
   Informaton      : scsi_disk
   Expert Tool     : scsi_disk (Licensed)
   Firmware Update : scsi_disk
```

The "Device — >Select Class" command did not work.

This is usually because the "Device Type" and "Qualifier Type" you selected don't both match a device in the system. For example, selecting a type of "Disk" and a qualifier of "SCSI" will not select any devices because SCSI disks use qualifiers of "Hard," "Floppy," etc. Use the "Device — >Current Device Status" command to determine the valid type and qualifier that apply to a specific device.

5 Using the Diagnostic/IPR Media to Install Diagnostics on Your System

The Diagnostic/IPR Media is the `swinstall` format distribution media for the following hardware support products for 10.01, 10.10, 10.20, 10.30, and 11.x HP-UX systems; it is also the `update` format distribution media for the 9.04 and 9.07 HP-UX systems.

- Online diagnostics subsystem (STM)

- Support Tools Manager (HP-UX 10.x and 11.x)

- EMS Hardware Monitors (HP-UX 10.20 and 11.x only)

- HP Predictive Support tools (Series 800 only)

- LIF-resident offline diagnostics

- IPR patches

This chapter summarizes the hardware support products listed above, then describes how to install the online support tools from the Diagnostic/IPR Media.

Support Tools Manager (HP-UX 9000 Series 800/700)

The Support Tools Manager (STM) on HP-UX 10.x and 11.x systems provides a simple interface to online diagnostics and support tools. For information on STM, see:

- Chapter 4, "Support Tools Manager (STM)," in this manual.

- The Web page for HP 9000/3000 Systems Hardware, Diagnostics and Monitoring at `http://www.docs.hp.com/hpux/systems/` - see the topics under "Diagnostics"

- The manpages `xstm(1M)`, `mstm(1M)`, and `cstm(1M)`.

EMS Hardware Monitors

Included on the Diagnostic/IPR Media are the EMS Hardware Monitors -- an important new tool for maintaining system availability. The EMS hardware monitors allow you to monitor the operation of a wide variety of hardware products and be alerted immediately if any failure or other unusual event occurs. Hardware event monitoring is available to users running HP-UX 10.20 or 11.x (IPR 9902 or later; 9902 refers to the February 1999 release).

Hardware event monitoring provides a high level of protection against system hardware failure. By using hardware event monitoring, you can virtually eliminate undetected hardware failures that could interrupt system operation or cause data loss.

The EMS Hardware Monitors are installed with the Support Tools Manager. Once the monitoring software is installed, monitoring is automatically enabled and all supported hardware devices on your system are automatically monitored. (In releases earlier than June 1999, you must first enable hardware monitoring.)

For more information, see Appendix B (EMS Hardware Monitors) in this manual.

HP Predictive Support

HP Predictive Support helps improve the reliability of your HP 9000 Series 800s by monitoring disk/tape drives and system memory for potential problems. If a potential problem is detected, HP Predictive Support transfers this information to the Hewlett-Packard Response Center.

HP Predictive Support monitors hardware by automatically collecting system information and comparing it against historical data and predetermined thresholds. Then it reports configuration changes, exceeded thresholds, and significant errors.

How the Process Works

HP Predictive Support involves your entire HP support team to help you monitor, prevent, and resolve problems with your systems and peripherals:

1. Potential problem? After analyzing your system and peripherals, HP Predictive Support sends any information on potential problems to the HP Response Center.

2. HP Response Center analyzes the problem. An HP Response Center Engineer (RCE) analyzes the data and adds it to the system's history. If further action is needed, the RCE may ask the system administrator to perform remote diagnostics, or may forward the information to the HP Account CE.

3. HP Account CE may provide backup support. The Account CE may suggest corrective actions to the system administrator, or schedule a visit within the support agreement coverage hours.

Usually, all of this activity occurs before there is any noticeable impact to system performance.

What HP Predictive Support Covers

HP Predictive Support covers:

- **Disk drives**, by scanning the onboard logs of CS80 and SCSI/Fast-Wide SCSI disk drives, and system logs. The **DISCSCAN**, **SCSISCAN**, and **LOGSCAN** utilities provide coverage on disk drives.

- **Memory**, by scanning the memory logs with the **MEMSCAN** utility.

- **Tape drives**, by scanning system log files with the **LOGSCAN** utility.

- **Low Priority Machine Checks (LPMC)**, by scanning system log files with the **LOGSCAN** utility.

- **The inventory of software and patches** installed on your systems is tracked by the PROACTIVE patching utility.

The HP Response Center Engineers use this information to recommend patches for customers with high-end support agreements, such as *Personalized System Support* or *Business Continuity*.

LIF-LOAD (HP-UX 9000 Series 800 and 700 Systems)

The LIF-LOAD product provides offline diagnostic tools by installing a subset of the Offline Diagnostics Environment (ODE) in the computer system's boot LIF volume. These tools are then available at ISL level at the next reboot of the computer system. These tools enable the user to verify the installation and operability of devices attached to HP Precision Architecture RISC (PA-RISC) computer systems, prior to booting the computer to the operating system level.

The following ODE tools are installed in the computer system's boot LIF volume:

MAPPER   MAPPER is an ODE-based offline system configuration mapping utility. It identifies and displays components of PA-RISC systems. System components include hardware modules and peripheral devices.

IOTEST   IOTEST is an ODE-based test module that runs supported IODC tests on modules.

PERFVER   PERFVER is an ODE-based test module that runs supported IODC tests on devices.

The LIF-LOAD product is structured as follows:

```
SD-product: LIF-LOAD (for Series 800 and 700 systems)
```

After the LIF-LOAD product is installed, the ODE tools will be available at the ISL level at the next reboot of the computer system. For further information about ODE, refer to Chapter 3, "Using the Diagnostic/IPR Media to Run Offline Diagnostics."

NOTE   If the offline diagnostics failed to load onto your system, and the `swagent` log contains the error message: `There is not enough room in the bootlif to install the offline diagnostics.`, please read the following in order to manually install the offline diagnostics:

Requirements:

1. the root(/) disk has a 'Whole Disk' layout.

2. the bootlif has at least 4 megabytes of SWAP.

Instructions:

1. Carefully read and comprehend the `mkboot (1m)` manual page.

    Please pay close attention to the `-f` option of `mkboot`.

2. From the console as root, issue the following commands:

    ```
    shutdown 0
    cd /usr/sbin/diag/lif
    mkboot -vfb updatediaglif -p ISL -p HPUX -p AUTO /dev/rroot
    reboot
    ```

You MUST immediately reboot the system following the `mkboot` command line.

Installing Online Support Tools from the Diagnostic/IPR Media (CD-ROM)

The following procedure is an example using a graphical user interface on an X11 terminal.

NOTE	Prior to executing the following procedure on a 9.04 system, run the following procedure to install the CD-ROM drivers and CDFS subsystem, assuming they are not already installed:

- Run SAM.

- Choose `Kernel Configuration Menu`.

- Choose the `Subsystems` submenu.

- Select the `CD-ROM/9000` subsystem to install in the kernel (the `Current State` and `Pending State` fields should have values of `Out` and `In`, respectively.

- Choose `Actions` from the `Kernel Configurations` menu bar.

- Choose `Add Subsystem to Kernel` from the `Actions` pulldown menu.

- Choose `Create a New Kernel` from the `Actions` pulldown menu; after a new kernel is created, you are prompted to move the new kernel into place and reboot.

- Move the new kernel, as indicated, and reboot your system.

The dart32 CD-ROM should now be accessible. You may now execute the procedure immediately following the next note.

NOTE	For further information on installing Predictive Support tools using the terminal version of `swinstall`, see the *HP Predictive Support/UX User's Guide*, part number: H2571-90008.

NOTE	As of May 1999, the Support Tools can be downloaded from the HP Software Depot at `http://www.software.hp.com/`. At the site, select the product category named "Enhancement Releases". Then scroll down to the entry for "Support Tools for the HP 9000". Click on the entry for a description of the package. Installation instructions are also available at the site. When the Support Tools have been downloaded to the target system, move it to an appropriate directory (such as `/tmp`), then proceed with the procedure described in this manual.

If you can obtain the current Diagnostic/IPR Media, consider installing the Support Tools from it, instead of downloading them from the Web. The Diagnostic/IPR Media contains the required patches and may be easier to use.

1. Boot HP-UX

2. Insert the Diagnostic/IPR Media CD-ROM into the drive.

3. Find the device file for the CD-ROM drive by using the `ioscan -fn` or `ioscan -fnC disk` command.

   The following is an example of information displayed by `ioscan` for a CD-ROM drive at address 2/0/1.3.0 on a series 700 system:

   ```
   disk  3  2/0/1.3.0  sdisk     CLAIMED   DEVICE     TOSHIBA CD-ROM XM-3301TA
                       /dev/dsk/c0t3d0        /dev/rdsk/c0t3d0
   ```

   In this example, the device file needed to install support tools from the Diagnostic/IPR Media is `/dev/dsk/c0t3d0`. (In the example commands that follow, substitute the CD-ROM device file for your system.)

4. Create a temporary read-only mount point in order to access the data on the CD-ROM, using commands similar to the following.

   ```
   cd /
   mkdir /diagtemp
   mount -r /dev/dsk/c0t3d0 /diagtemp
   ```

   In this example, we have used `diagtemp` as the name of the mount point.

NOTE   If the `-r` option is not used, the following I/O error message appears and the CD-ROM will not mount:

   ```
   mount: /dev/dsk/c0t3d0 on /diagtemp : I/O error
   ```

---

5. Confirm that the CD-ROM has been mounted, by entering the `mount` command and look for `/diagtemp`. The following is a sample output:

   ```
   /diagtemp on /dev/dsk/c0t3d0 ro on Thu Mar 25 15:46:16 1999
   ```

6. Determine which patches must be installed first before you install the diagnostics. (Without these patches, some versions of the Support Tools cannot be installed or will not operate correctly.) See the section "Required Patches" in the DIAGNOSTICS.readme file for the current release (IPR) of Support Tools. For IPR 9904, this file is located in the DOCUMENTATION directory on the CD-ROM. For IPR 9902 and IPR 9904, the files are available online at:
   `http://www.docs.hp.com/hpux/content/hardware/st/st_read.htm`

7. If patches are required before loading the support tools, install them now. The recommended method is to install the patches from the Diagnostic/IPR Media.The patches are typically contained in the Hardware Critical (HWCR) or Hardware (HW) patch bundle for your system, for example XSW800HWCR1020. Most people will only want to install the individual patches required for STM rather than the entire HWCR bundle which can be many megabytes in size.

   The following is a summary of the process for installing patches using the `swintall` program. For details on using `swintall`, see the steps on the next few pages.

   a. Set the DISPLAY variable (for a graphics interface) and enter the command
      `swinstall -i .`

---

b. Set Source Depot Type to "Local CDROM". For the Source Depot Path, specify the path to the appropriate HWCR or HW patch bundle for your system. For example, `/diagtemp/XSW800HWCR1020`, `/diagtemp/XSW700HW1020`, or `/diagtemp/XSWHWCR1100`.

c. Select the bundle from the `swinstall` display, then choose "Open Item" from the "Actions" menu. All the patches in the patches bundle are displayed.

d. Select the patches required for STM by using the "Mark for Install" command in the "Actions" menu.

e. Install the patches using the "Install (analysis)" command in the "Action menu. Respond to the prompts that are displayed.

An advantage of installing patches from the Diagnostic/IPR Media is that only one reboot is required for multiple kernel (OS) patches.

Alternately, you can obtain the patches through the HP Electronic Support Centers:

- For Americas and Asia-Pacific: `http://us-support.external.hp.com/`

- For Europe: `http://europe-support.external.hp.com/`

Log onto the appropriate URL and follow the directions given. One problem with loading individual patches from these patch machines is that a system reboot is required for every patch that requires a reboot (for example, patches to the kernel, indicated by "PHKL" in the patch name).

8. Install support tool files using `swinstall`.

For a graphical user interface, set the DISPLAY variable with a command like `export DISPLAY=your_workstation:0.0` .

Then, enter the command `swinstall -i`.

9. The "Specify Source" window appears. Change the "Source Depot Path" to the depot you wish to load; for example, `/diagtemp/DIAGNOSTICS/B.xx.xx`, where `xx.xx` represents `10.10, 10.20,` or `11.00,` depending upon which OS release your system is running.


NOTE   The following examples (Figures 5-1 to 5-4) use a source depot path for a B.10.20 bundle. Set your path appropriately for the OS version on your system (for example B.11.00, B.10.20, or B.10.10).


Figure 5-1 Specify Source Window


```
┌─────────────────────────────────────────────────────────────────┐
│ ─                    Specify Source (hpdst29)                   ▫ │
├─────────────────────────────────────────────────────────────────┤
│                                                                   │
│  Specify the source type, then host name, then path on that host.│
│                                                                   │
│  Source Depot Type:   ┌─Local CDROM           ▭─┐                 │
│                                                                   │
│                                                                   │
│     ┌─Source Host Name...─┐  ┌─hpdst29─────────────────────┐      │
│     └─────────────────────┘  └─────────────────────────────┘      │
│                                                                   │
│     ┌─Source Depot Path...─┐  ┌─/diagtemp/DIAGNOSTICS/B.10.20─┐    │
│     └──────────────────────┘  └──────────────────────────────┘    │
│                                                                   │
│     ┌─Software Filter...─┐   None                                 │
│     └────────────────────┘                                        │
│                                                                   │
├─────────────────────────────────────────────────────────────────┤
│  ┌──────┐            ┌────────┐              ┌──────┐             │
│  │  OK  │            │ Cancel │              │ Help │             │
│  └──────┘            └────────┘              └──────┘             │
└─────────────────────────────────────────────────────────────────┘
```
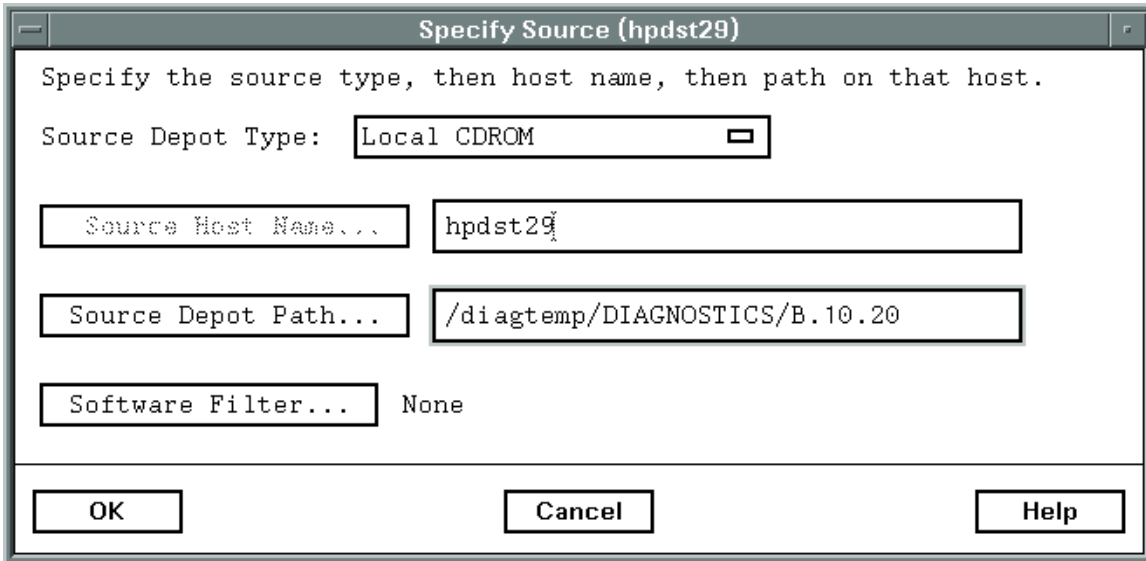
10. Click on the ok button. The "Software Selection Window" appears:

Figure 5-2 Software Selection Window
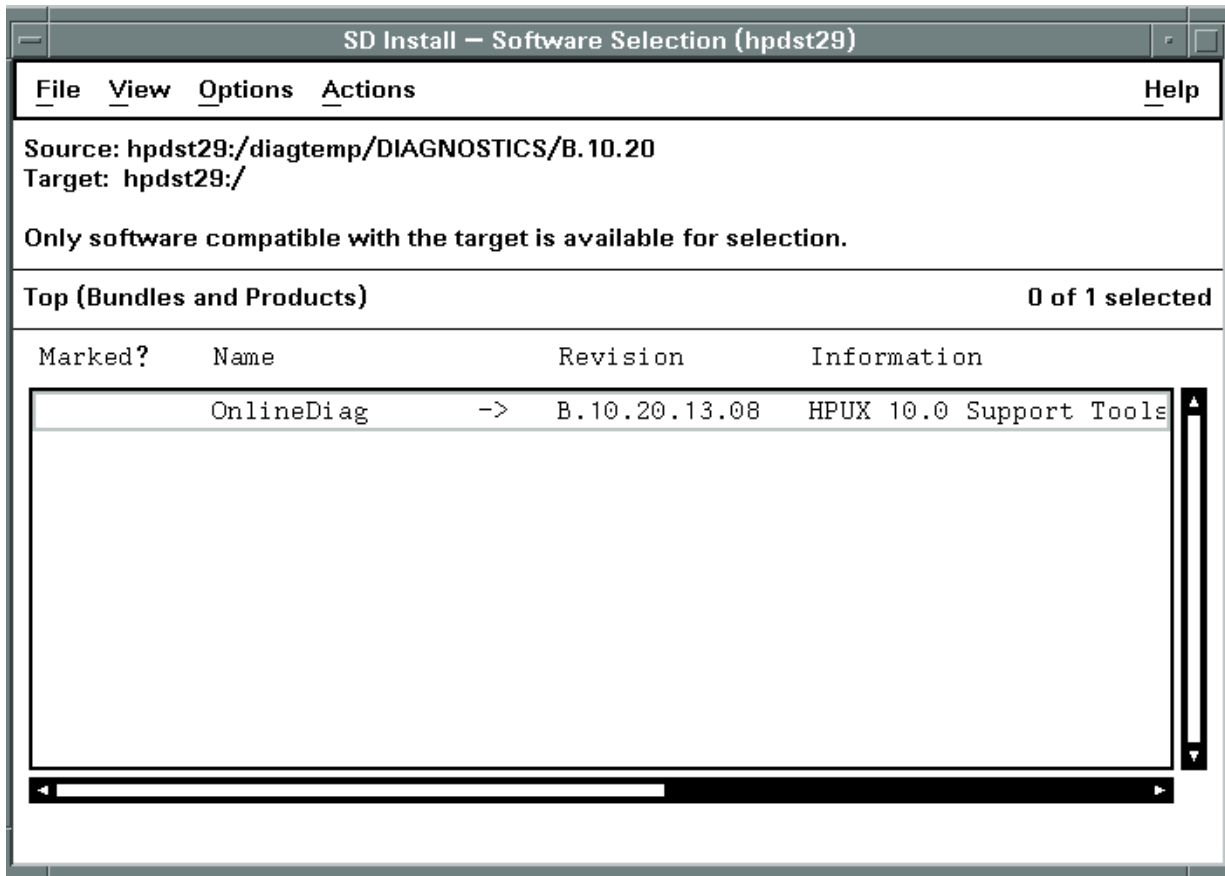
11. Select "OnlineDiag" and use the "Actions" menu option "Open Item" for a list of products available from the CD-ROM:

Figure 5-3 Listing Available Online Diagnostic CD-ROM Products
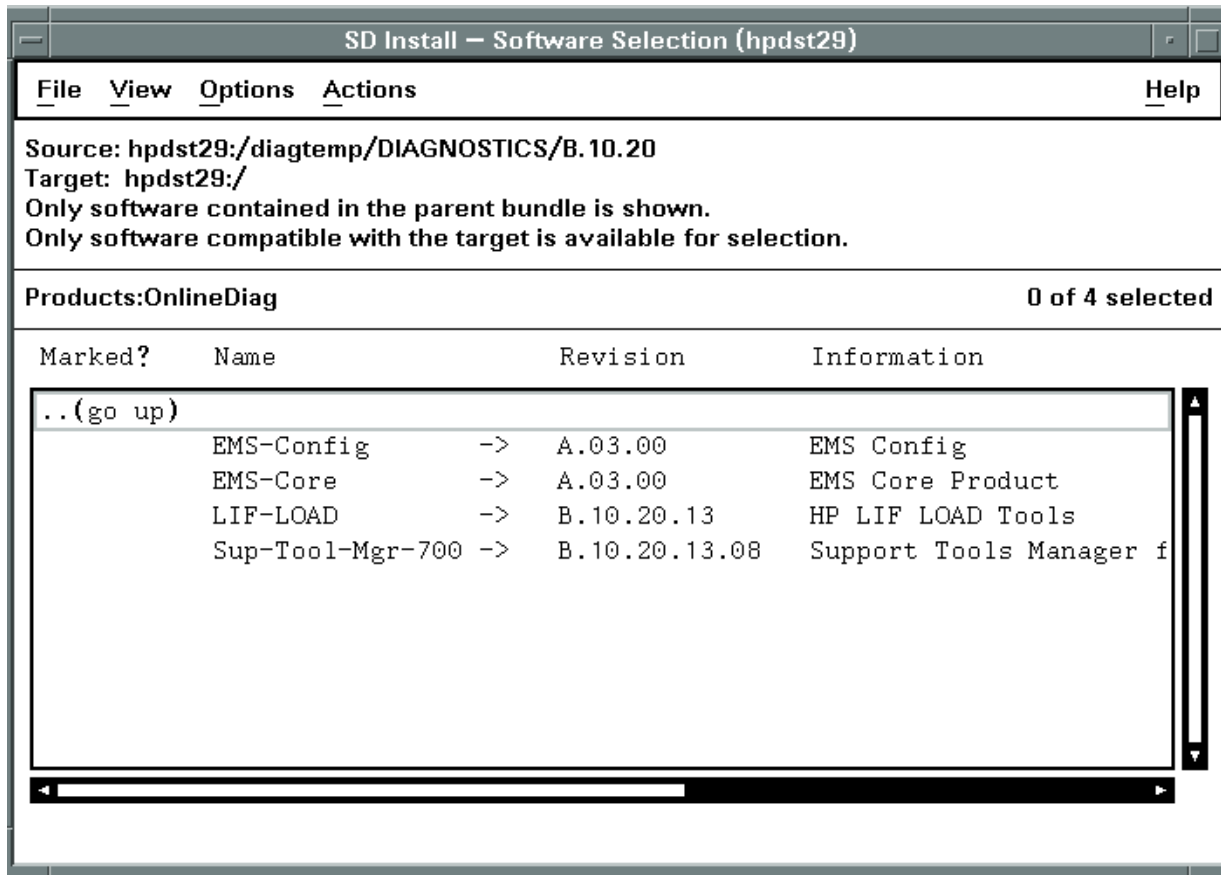
Highlight the product to be installed. Use the "Actions" menu option "Mark for Install" to indicate that the highlighted product is to be installed. Repeat the selection process until all the desired products have been marked for installation.

It is not necessary to select EMS-Config and EMS-Core products, since these are automatically installed when you install Support Tools Manager for HP-UX 10.20 or 11.x (IPR 9902 or later).

Most users select the offline diagnostics (LIF-LOAD) and the Support Tool Manager (Sup-Tool-Mgr-x00) to be installed as shown in the following example. If you have an S800 system, you may also choose HP Predictive Support (not shown in this example, since it is not available on S700 systems).

Figure 5-4 Marking Products to Be Installed
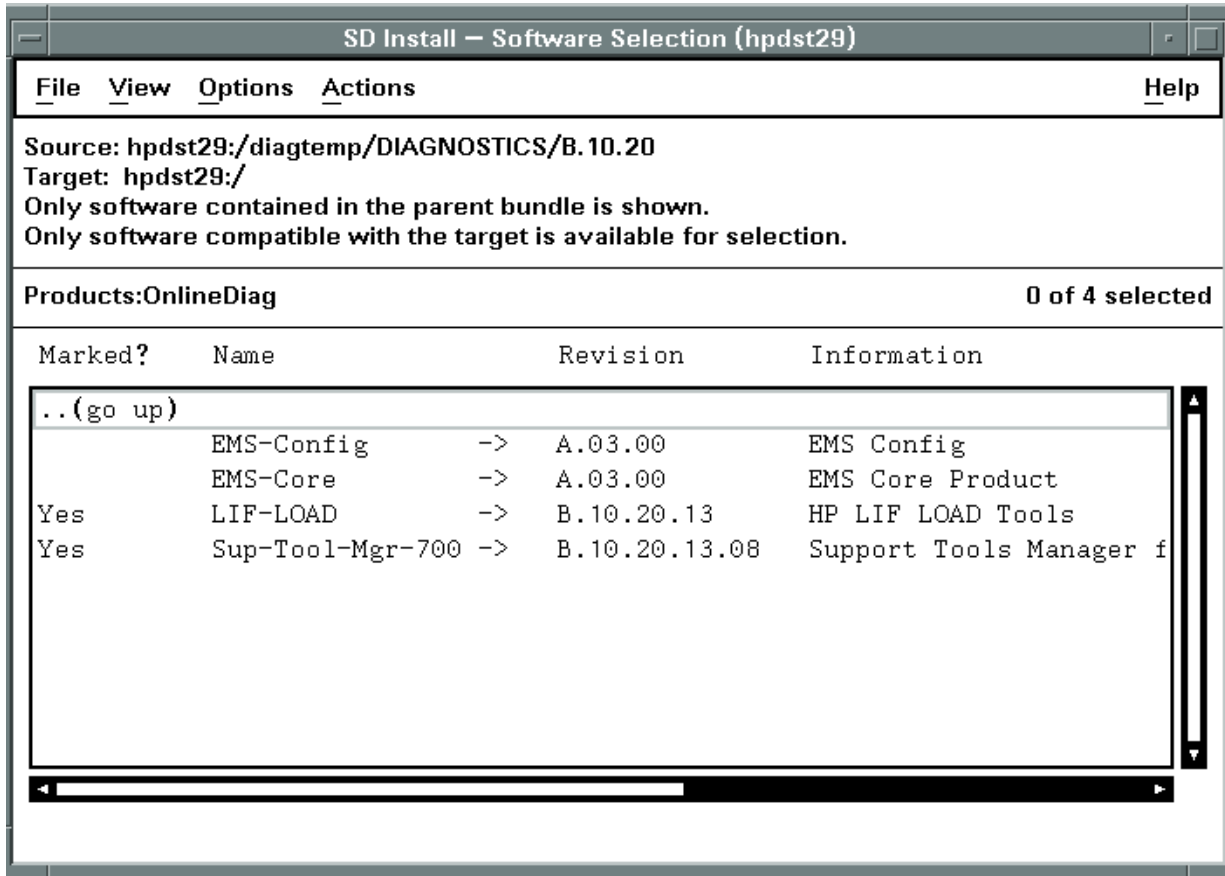
12. To install the selected products, use the "Actions" menu option "Install (analysis)" to begin the analysis phase of the installation:

Figure 5-5 Install Analysis Window
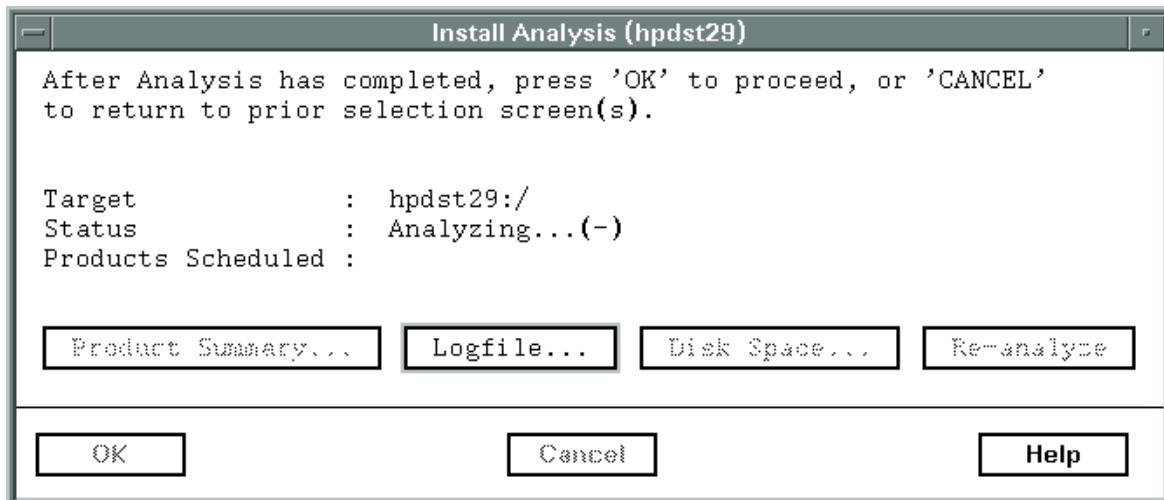
13. After the analysis has completed, click the **OK** button to start the installation. The first "Confirmation" window appears.

Figure 5-6 First Confirmation Window
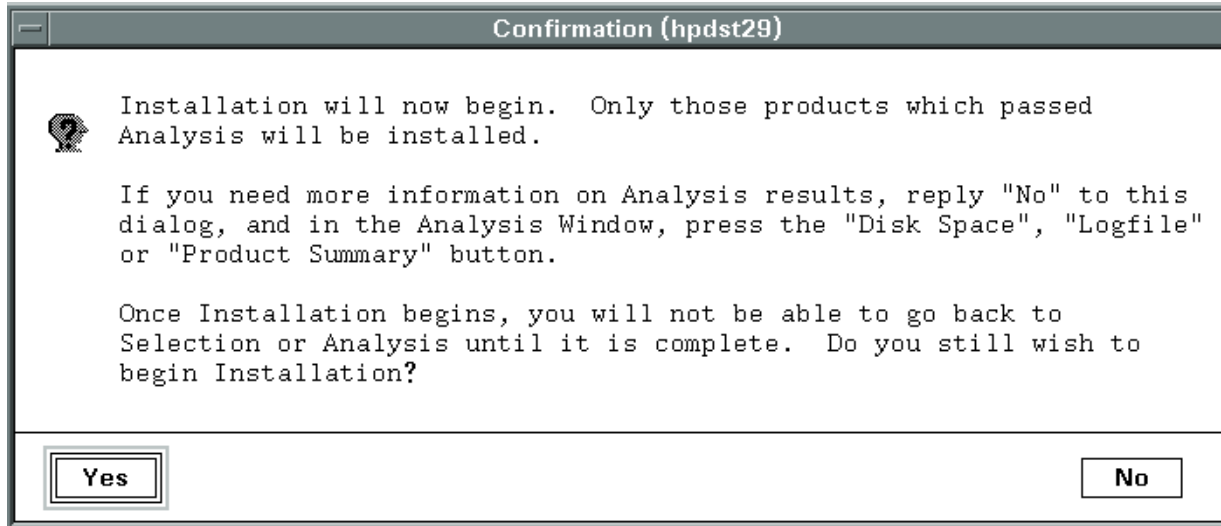
14. Click the **Yes** button to continue with the installation. A second "Confirmation Window" appears for 10.20 systems. (This window does not appear for 11.x systems, since a reboot is not required.)

Figure 5-7 Second Confirmation Window
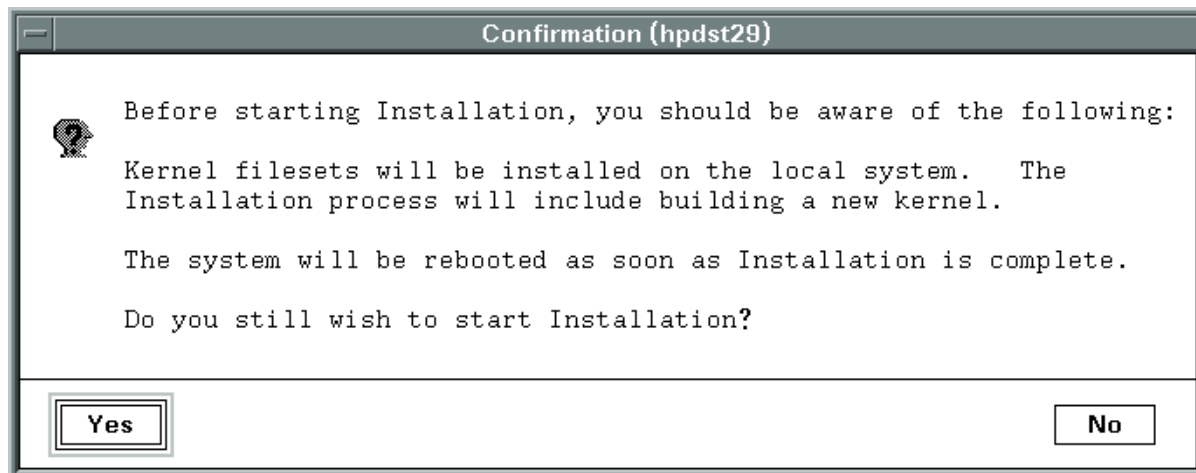
15. Click the **Yes** button to continue with the installation.

16. Once installation is complete, unmount the CD-ROM with the `umount` command, for example: `umount /dev/dsk/c0t3d0` .

17. Eject the CD-ROM from the drive.

18. Check the Release Notes for other information on the products you installed. The Release Notes contain any special post-installation actions that may be required following this procedure.

   - STM: `/usr/sbin/stm/Rel_NOTES.STM`

   - EMS Hardware Monitors: `/usr/sbin/stm/Rel_NOTES.HWE`

   - Predictive Support: `/opt/pred/bin/Rel_NOTES.PRED`

19. For the February 1999 or April 1999 releases of the Diagnostic/IPR media, you should enable the EMS hardware monitors (the monitors are automatically enabled on June 1999 and later releases.) Follow this procedure to enable the monitors:

   a. Run the monitoring request manager by typing:
      `/etc/opt/resmon/lbin/monconfig`

   b. From the main menu selection prompt, enter E(nable Monitoring)

   c. See the "EMS Hardware Monitors User's Guide" and other monitor documentation for information about configuring and using the monitors.

THIS COMPLETES THE PROCEDURE FOR INSTALLING SUPPORT TOOLS..

For the most current information on Support Tools, see our Web site, "Systems Hardware, Diagnostics, and Monitoring," at `http://www.docs.hp.com/hpux/systems/`. This Web site also contains additional documents, such as tutorials, quick reference guides, and release information.

A Disk Copy Utility — To make an image of a disk after install or upgrade (HP-UX 10.x to 11.x)

COPYUTIL is designed to copy data from a given disk to a tape and then at a later time, copy the data from the tape back to a disk. The utility can be used to save off a bootable copy of the operating system and if the system crashes, that version of the boot disk can be restored. Lastly, COPYUTIL can be used to transfer data from a bad disk to a new good disk.

NOTE	For systems going from HP-UX 10.x to HP-UX 11.x, CopyUtil can be used to make a system disk image so that the system can be dropped back to 10.x if for some reason 11.x is not desired.

The utility uses two commands, BACKUP and RESTORE, to perform the copying of information between devices. Both commands in effect perform the same function, copying. However the BACKUP command copies data from disk to tape and can tolerate read errors but will halt on a write error. The RESTORE command, on the other hand, copies data from tape back to disk and will not tolerate read errors, or write errors.

COPYUTIL supports all bootable disks on all HPPA supported systems. Thus, all SCSI2 hard drives and Disk Arrays are supported. CD-ROM drives and MO drives are not supported.

CAUTION	CopyUtil is designed to recover data off of defective disks. It is NOT intended to be a system-level backup tool.

Operating Environment

COPYUTIL operates under ODE and thus it only operates in an offline environment. When COPYUTIL is executed, ODE handles all the I/O with the user and it handles several higher level commands like LOG, HELP, and so forth.

COPYUTIL is a TM running under ODE. This means COPYUTIL must first satisfy all of ODE's requirements. Since COPYUTIL is not a diagnostic all the hardware except the disk drive must be working properly, and the disk drive can only have software read errors that will not cause the system to halt.

NOTE	An online version of COPYUTIL, running under STM, is also available.

Though COPYUTIL is not a diagnostic, all Read errors are isolated down to the block address.

Quick Start Instructions

Executing `COPYUTIL` .

To execute `COPYUTIL`, boot to `ISL`, then type:

```
ISL> ode copyutil



******************************************************************************
******                                                                 ******
******              Offline Diagnostic Environment                     ******
******                                                                 ******
******        (C) Copyright Hewlett-Packard Co 1993                    ******
******                  All Rights Reserved                            ******
******                                                                 ******
******   HP shall not be liable for any damages resulting from the     ******
******   use of this program.                                          ******
******                                                                 ******
******                  TC  Version A.00.14                            ******
******                  SysLib Version A.00.37                         ******
******                                                                 ******
******************************************************************************


Type HELP for command information.
ISL_CMD> copyutil

Type HELP for command information.

******************************************************************************
******                                                                 ******
******                         COPYUTIL                                ******
******                                                                 ******
******        Copyright (C) 1994 by Hewlett-Packard Company            ******
******                  All Rights Reserved                            ******
******                                                                 ******
******   HP shall not be liable for any damages resulting from the     ******
******   use of this program.                                          ******
******                                                                 ******
******                  Version A.00.22                                ******
******                                                                 ******
******************************************************************************
Please wait while I scan the device busses...
Ty Indx Path            Product ID                   Bus    Size   Rev

D  0    2/0/1.0.0       QUANTUMLPS270S disc drive    SCSI   258 MB 5909
D  1    2/0/1.1.0       SEAGATEST3600N disc drive    SCSI   499 MB 9686
D  2    2/0/1.3.0       HPC2244 disc drive           SCSI   1.0 GB 0B04
D  3    2/0/1.4.0       QUANTUMLPS525S/A2565A disc drive SCSI 499 MB 3100
T  4    2/0/1.5.0       HPC1504[X]/HPC1521B DDS tape SCSI     N/A 1009
D  5    2/0/1.6.0       QUANTUMLPS270S disc drive    SCSI   258 MB 5909


Legend:
Ty   = Device type. 'D' for Disk; 'T' for Tape.
Indx = Index number used for referencing the device
Rev  = Firmware Revision of the device
Size = Size of the Disk drive or "N/A" for a Tape drive.

Note:  Due to different calculation methods used, the size
       of the device shown is only a rough approximation.

COPYUTIL>
```

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At this point, typing UTILINFO would give you a good idea of what to do, but let us assume we just want to copy data off the last Quantum disk drive (disk index 5) onto the DDS tape drive (tape index 4). To do that, use the BACKUP command.

```
COPYUTIL> backup

Enter the Disk Index ([q]/?): 5

Enter the Tape Index ([q]/?): 4

*************************************************************************
*   Please Load into Tape Drive, Tape Volume 0 for Backup.
*************************************************************************
If you have to, you may safely remove the SUPPORT MEDIA now.

Ready to continue ([y]/n/q/?): y
Checking for the beginning of tape:  DONE.
..........10% completed
..........20% completed
..........30% completed
..........40% completed
..........50% completed
..........60% completed
..........70% completed
..........80% completed
..........90% completed
..........100% completed

COPYUTIL>
```

You can now exit the program, switch off the power, replace the bad disk and start the program again.

```
COPYUTIL> exit
Replace the SUPPORT MEDIA now, if you removed it earlier.

ODE>
```

Assume you have restarted the program and it looks just like the last time. You now want to restore the data back onto the new disk drive. To do this, you use the RESTORE command.

```
COPYUTIL> restore

Enter the Tape Index ([q]/?): 4

Enter the Disk Index ([q]/?): 5

*************************************************************************
*   Please Load into Tape Drive, Tape Volume 0 (or the Desire Tape).
*************************************************************************
If you have to, you may safely remove the SUPPORT MEDIA now.

Ready to continue ([y]/n/q/?): y
Checking for the beginning of tape:  DONE.
..........10% completed
..........20% completed
..........30% completed
..........40% completed
..........50% completed
..........60% completed
..........70% completed
..........80% completed
..........90% completed
..........100% completed
```

```
Restored Successful.
```

```
COPYUTIL>
```

You have now restored the data onto your new disk drive. You may wish to verify that the data on the tape and the disk are the same. You now have restored data and can exit the program and power cycle the machine.

Remember that if the `BACKUP` command could not read a block, the RESTORED block is all nulls.

B EMS Hardware Monitors

Included on the Diagnostic/IPR Media are the EMS Hardware Monitors -- an important new tool for maintaining system availability. The EMS Hardware Monitors allow you to monitor the operation of a wide variety of hardware products and be alerted immediately if any failure or other unusual event occurs. Hardware event monitoring is available to users running HP-UX 10.20 or 11.x, with a Diagnostic/IPR Media of February 1999 or later..

Hardware event monitoring provides a high level of protection against system hardware failure. By using hardware event monitoring, you can virtually eliminate undetected hardware failures that could interrupt system operation or cause data loss.

NOTE	**Complete Information**
	For complete information on installing and using EMS hardware event monitors, as well as a list of supported hardware, refer to the EMS Hardware Monitors Users Guide. An electronic copy of this book is included on the Diagnostic/IPR Media CD-ROM in the /Documentation directory.
	You can also download the latest version of the book from the Systems Hardware, Diagnostics, and Monitoring section of Hewlett-Packard's online documentation web site at `http://www.docs.hp.com/hpux/systems/`.
	This site also contains much additional information on the EMS product.

Enabling Hardware Monitoring

The EMS Hardware Monitors are installed with the Support Tools Manager. Once the monitoring software is installed, you simply need to enable hardware monitoring and all supported hardware devices on your system will automatically be monitored.

On the June 1999 and later releases of the Diagnostic/IPR media, the monitors are automatically enabled when they are installed. On February 1999 and April 1999 releases, you must enable hardware event monitoring with the following procedure:

1. Run the monitoring request manager by typing:

   /etc/opt/resmon/lbin/monconfig

2. From the main menu selection prompt, enter E(nable Monitoring).

The default monitoring requests will automatically provide the following notification methods for all monitors:

> All events sent to text file /var/opt/resmon/log/event.log
> Serious and Critical events sent to SYSLOG
> Serious and Critical events sent to EMAIL address root

The Hardware Monitoring Request Manager, /etc/opt/resmon/lbin/monconfig, can be used to customize the monitoring requests and add new ones.

At the time of publication, monitors are provided to support the following:

> HP Disk Arrays
> Fibre Channel Interconnect
> Fibre Channel Interface Cards
> High Availability Storage System Enclosures
> SCSI Tape Products
> HP SCSI Disk Products
> HP Fibre Channel Disk Products
> Memory
> LPMCs
> Core hardware
> Kernel resources

In addition, a hardware status monitor is provided to monitor the current status of the products supported by the above list.

For detailed information concerning which products are supported by which monitors and additional dependencies, check the Systems Hardware, Diagnostics, and Monitoring section of Hewlett-Packard's online documentation website at
`http://www.docs.hp.com/hpux/systems/`.

NOTE	EMS Hardware Monitors are installed as part of the STM-UUT-RUN Fileset. However, the EMS Hardware Monitors are dependent on the EMS-Core and EMS-Config products and additional filesets in the Sup-Tool-Mgr Product.

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