

Support Plus: Diagnostic User's Guide

PA-RISC and Itanium Computer Systems

First Edition



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The printing date and part number indicate the current edition. The printing date changes when a new edition is printed. (Minor corrections and updates which are incorporated at reprint do not cause the date to change.) The part number changes when extensive technical changes are incorporated.

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About This Manual

NOTE As of the September 1999 release, the name of the Diagnostic/IPR (Independent Product Releases) Media has been changed to Support Plus. In addition, the format has changed so that there is a separate CD-ROM for each version of the operating system (HP-UX 10.20, 11.00, etc.).

The following summarizes the contents of the chapters in this manual:

Chapter 1	Overview of Diagnostics on Support Plus
Chapter 2	Hardware Support Tools Overview
Chapter 3	Using Support Plus to Run Offline Diagnostics
Chapter 4	Support Tools Manager (STM)
Chapter 5	Using the Support Plus Media to Install Diagnostic
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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Current Information on the Web. This manual contains information that was current at the time of publication. For the most current information on Support Tools, see our Web site, "Diagnostics," at <http://docs.hp.com/hpux/diag/index.html>. This Web site also contains additional documents, such as tutorials, quick reference guides, and release information.

1 Overview of Diagnostics on Support Plus

NOTE As of the September 1999 release, the name of the Diagnostic/IPR Media has been changed to Support Plus. In addition, the format has changed so that there is a separate CD-ROM for each version of the operating system (HP-UX 10.20 and HP-UX 11.00).

The following hardware support tools are distributed on the Support Plus Media in the OnlineDiag `swinstall` bundle. For HP-UX 11i, the support tools are also distributed on the Operating Environment (OE) CD-ROM.

- Support Tools Manager (STM) (HP-UX 10.20 and 11.x only)
- EMS Hardware Monitors (HP-UX 10.20 and 11.x only)
- HP Predictive Support tools (Series 800 only; HP-UX 10.20 and 11.00 only. For 11i, use the HP SW Depot website)
- LIF-LOAD, a subset of the offline diagnostics, Offline Diagnostics Environment diagnostics (ODE), described below (HP-UX 10.x and 11.x)

In addition, the Support Plus Media is the platform for running the offline diagnostics, (ODE) for all PA-RISC systems. As such, the Support Plus Media allows you to diagnose and fix problems when the operating system cannot be booted from the system disk. The Support Plus Media runs on minimal hardware, with or without the system disk.

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

The Support Plus Media is organized as follows:

	LIF		SD Products (filesystem contains online	
			diagnostic bundles at	
			/mountpoint/DIAGNOSTICS)	

NOTE If your system is running HP-UX 10.01, 10.10, or 10.30, you can get support tools from an archive CD-ROM. For details, see our Web site: "Diagnostics" at <http://docs.hp.com/hpux/diag/index.html>. The specific URL for this page is http://docs.hp.com/hpux/onlinedocs/diag/st/st_oldos.htm.

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 *HP Predictive Support / UX User's Guide (part number: H2571-90009)*.

2 Hardware Support Tools Overview

This chapter describes the use of HP hardware support tools. This is not intended as a comprehensive troubleshooting guide, nor as a tutorial on the products themselves.

There are several support tools platforms provided by HP, each targeted at a different troubleshooting situation. A brief description of these products follows.

NOTE Distributed with the support tools (diagnostics) in the OnlineDiag depot are the EMS Hardware Monitors — an important 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.

Install Support Tools BEFORE Trouble Arises

To ensure the reliability of your computer system, install Support Tools before trouble arises:

- It's faster and easier to solve problems, if you have Support Tools already loaded on your system.
- Hardware monitors notify you proactively of suspicious hardware events, that might lead to failure.
- Some error logs are saved only if Support Tools Manager (STM) is installed. Without these logs, it may be impossible to identify the cause of some problems.
- Memory Page Deallocation (which reduces the possibility of system failures due to memory problems) is only available if STM is installed.
- The offline diagnostics (Offline Diagnostics Environment, or ODE) run from the system disk are only available if the Support Tools have been loaded.

Support Tools Manager (STM) System

The Support Tools Manager (STM) is an online support tools platform for HP9000 series 700 and 800 machines; it is also available for HP 3000 machines running MPE/iX 6.5 or later. 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.

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.

Verifiers quickly determine whether or not a specific device is operational by performing tasks similar in nature to the way applications use the device. A license is not required to run the verifiers.

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

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.

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 the user to provide information necessary to perform a particular task. These tools require the appropriate license to run.

Utilities are support tools which are not device-specific. Current tools include log viewing and disk backup tools (LOGTOOL and COPYUTIL).

The firmware update tools initiate the firmware update process for a selected device. Most require the appropriate license in order to run them.

Offline Diagnostics (ODE)

The Offline Diagnostics Environment (ODE) 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 computer 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 that cannot be tested using the online tools because a hardware problem prevents the system from booting. The offline environment is also useful for some types of testing where it is not desirable to boot the system first, as is often the case in manufacturing applications.

NOTE Some recent systems, such as V-Class and Itanium (e.g., RX 4610), do not use ODE. Instead, they have their own set of offline diagnostics, available on model-specific media.

Hardware Support Tools Usage

Figure 2-1 on page 16 shows a flow diagram outlining the use of the hardware support tools. This diagram does not cover every aspect of system troubleshooting, but rather provides an overall picture of the roles the various products play in troubleshooting systems.

If the system can boot to the operating system prompt, it is generally desirable to do so. In most cases, the system is probably already booted and it is not desirable to take it down to run offline diagnostics. If there are problems with the hardware, the online support tools (STM) should be used to attempt to troubleshoot them.

If the system will not boot, the offline tools from the Support Plus 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 for further testing.

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 condition determines whether to run the online versus the offline support tools. If the OS cannot boot, the offline tools are the only option. If the OS can boot, use the online tools. Of course, the user still has the option of taking down the system and using the offline tools, if desired. One of the advantages of using the offline tools is that they provide more extensive diagnostic coverage of the core chip set (CPU, memory, I/O controller chips, etc.).

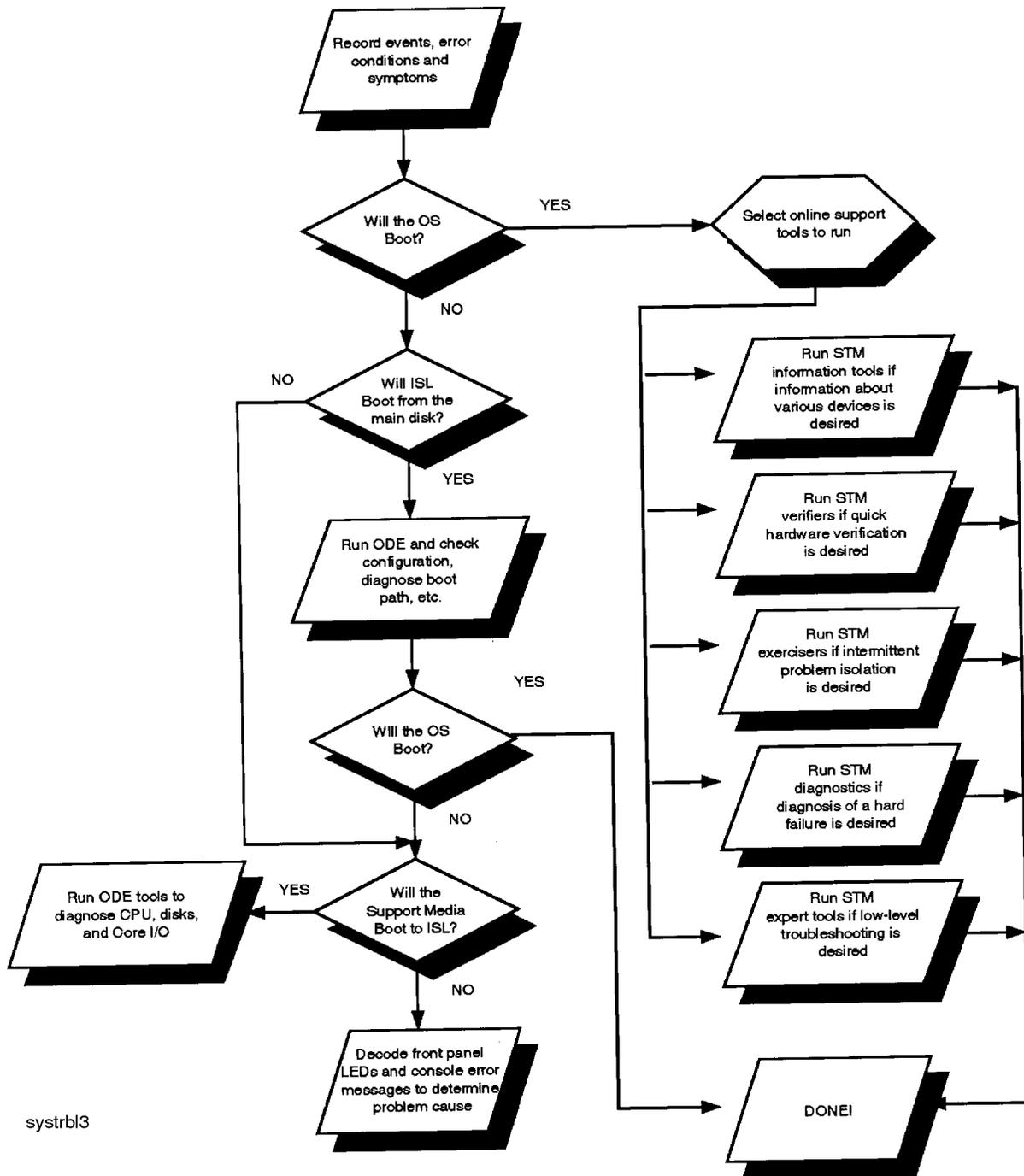
Will ISL boot from the main disk?

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 most common here are problems with the boot disk, or with 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.

CAUTION Use great care 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 the boot is successful, the online tools can be used for further testing. If the OS will still not boot, the user should continue the troubleshooting process by turning to the Support Plus Media.

Figure 2-1 Hardware Support Tools Usage Flow Diagram



sysrbl3

Will the Support Plus Media boot?

If the machine will not boot to ISL or the OS from the main disk, 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 Support Plus Media. This decision is likely to be influenced by the type of machine 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 Support Plus

Media approach to 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 Support Plus 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 computer problem that is not manifested in the Support Plus Media environment. In this case, the tools on the Support Plus Media should be used to test the computer, boot path components, the main disk and, if necessary, perform data recovery operations on the main disk.

If the machine will not boot to ISL from the Support Plus 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 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, you can use several online tools 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 run a quick verification on selected devices and indicate whether they are basically functioning properly or not (go/no go). This type of testing is most useful when new hardware is added or configuration changes have been made and need to be verified.
2. *STM Exercisers* help the user reproduce intermittent problems by stressing system components and devices. In general, if the user has no good evidence that seems to indicate the location of the problem, the exercisers should be used to 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 Support Plus Media are the EMS Hardware Monitors—an important 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 Support Plus Media to Run Offline Diagnostics

The Offline Diagnostics Environment (ODE) is an offline support tools platform that enables users to troubleshoot a system that is running without an operating system, or which cannot be tested using the online tools. The offline environment is also useful for some types of testing, that it is not desirable to have to boot the system first.

Diagnostics and utilities provided under ODE include:

- MAPPER — a utility for mapping out the physical layout of the computer and its peripherals.
- IOTEST — a utility for testing I/O cards, using I/O Dependent Code (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.

The 64-bit computer systems, like N-Class, have a different version of the offline diagnostics programs. The 64-bit version has a “2” appended to the program name. For example, the 64-bit version of MAPPER is MAPPER2.

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

ODE provides a common, user-friendly interface for diagnostics and utilities developed to run in this environment. You have the choice between a pure command line interface and a menu-driven interface. The command line interface allows you to select specific tests and/or utilities to execute on a specific hardware module. The menu-driven interface allows you to specify the hardware module to be tested, and ODE selects the appropriate tests to execute on the module.

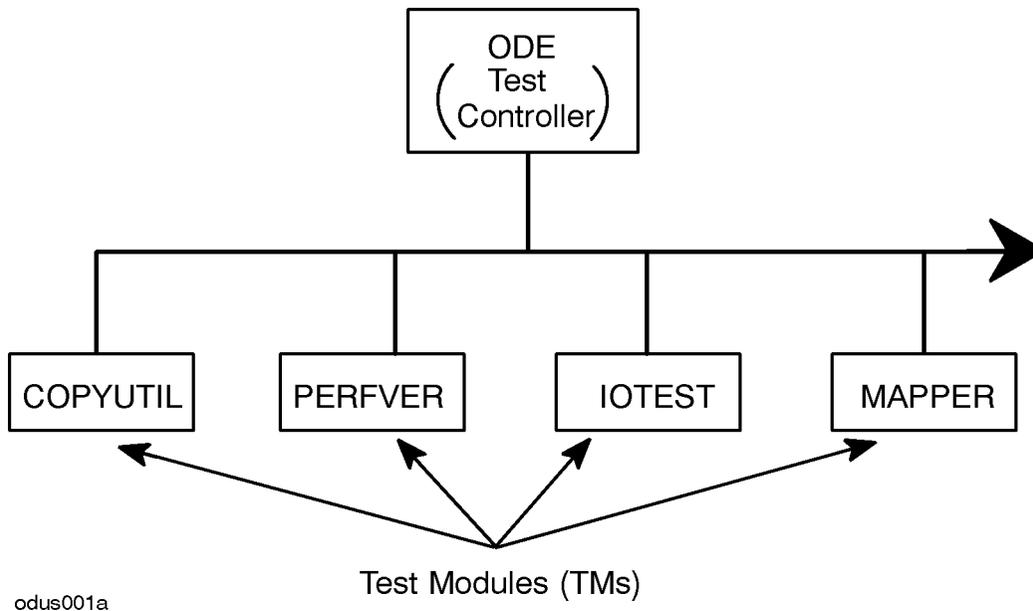
ODE has a distributed architecture, consisting of several modules. Each module has a specific function, uses well-defined protocols to communicate with the other modules.

ODE consists of:

- Test Controller — which acts as the interface to the user, and launches execution of the Test Modules.
- Test Modules — which consist of diagnostic or utility programs designed to execute within ODE. These modules exercise or diagnose the user-specified hardware unit, or may perform some specific utility-type operation, such as firmware download.
- System Library (SysLib) — which consists of a set of common routines for use by both the Test Controller and Test Modules. These routines perform such functions as I/O, string parsing, and system control.

Figure 3-1 on page 20 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



You can run ODE from either of two different packages:

- The complete set of offline diagnostics, run from the Support Plus media.
- A subset of the offline diagnostics, run from the LIF volume on the computer’s system disk.

In general, we suggest that you run the offline diagnostics from the Support Plus Media:

- Complete set of offline diagnostics.
- Run directly from the Support Plus Media, when the system is offline. You boot the system from the Support Plus Media, choose to interact with IPL (ISL), then enter “ODE.”
- Requires Support Plus Media. A system disk is not necessary.
- Can run on HP 3000 (MPE/iX) systems, as well as on HP 9000 (HP-UX) systems.
- Two user interfaces: command line and menu-oriented (TMMGR).
- It is almost as fast to load and use offline diagnostics from the Support Plus Media, as it is to use the offline diagnostics on the system disk. (This was not true in the past, when offline diagnostics were distributed on tape.)

If you don’t have a copy of the Support Plus Media on hand, you can run offline diagnostics from the system disk:

- Subset of the most commonly used offline diagnostics:
 For 32-bit systems (e.g., K-Class): MAPPER, IOTEST, PERFVER.
 For 64-bit systems (e.g., N-Class): MAPPER2, IOTEST2, PERFVER2.
- Run from the boot LIF volume of the system disk, when the system is offline. You boot the system from the computer’s system disk, choose to interact with IPL (ISL), then enter **ODE**.
- Requires a system disk. The Support Plus Media is not necessary.
- Only available after the OnlineDiag bundle is installed. This bundle contains the online diagnostics (STM), the hardware monitors, and the LIF-LOAD subset of the offline diagnostics. It is installed from the

Support Plus Media using `swinstall`.

- Can only run on HP 9000 (HP-UX) systems. Cannot run on HP 3000 (MPE/iX) systems.
- Command line interface only. No menu-oriented interface (TMMGR).
- Labelled as LIF-LOAD in the OnlineDiag bundle.

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).

NOTE Offline Diagnostics cannot be run from OE CD-ROM:

With HP-UX 11i, the hardware tools (diagnostics) are distributed on the OE CD-ROM, as well as on the Support Plus Media. The Offline Diagnostics can only be run from the Support Plus Media. They cannot be run from the Operating Environment (OE) CD-ROM.

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 Support Plus 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 (referred to as 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.

TMMGR Screens

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 a 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	Built-in 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

Test Module Manager (TMMGR)

```

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 be 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.

Test Module Manager (TMMGR)

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.

4 Support Tools Manager (STM)

The Support Tools Manager (STM) is a platform for online support tools on HP9000 Series 700 and 800 (HP-UX) machines. It is also available for HP 3000 (MPE/iX) machines running MPE/iX 6.5 or later.

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, “Diagnostics” at <http://docs.hp.com/hpux/diag/>. 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” on page 47.)

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.

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`

Depending on your system configuration, you may be able to access STM by entering just the command name (`xstm`, `mstm`, or `cstm`).

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).

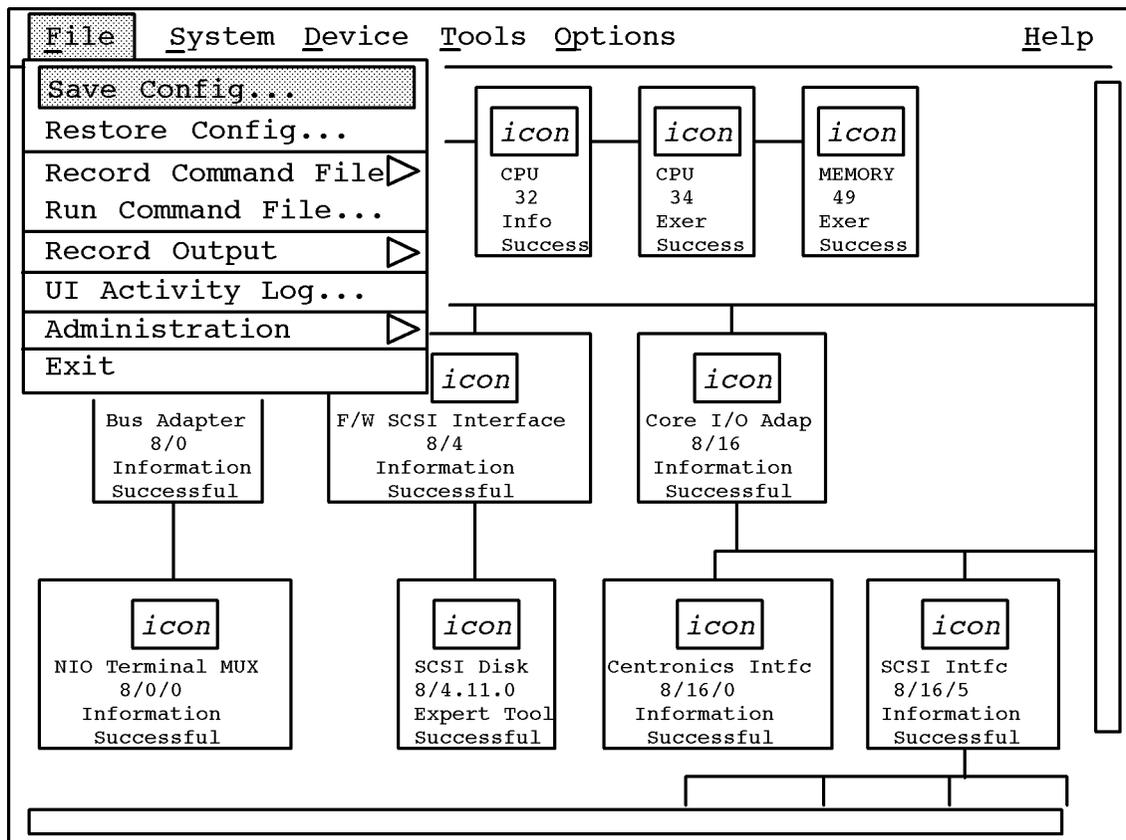
You use the system map to select the devices to test. After a test runs, the system map displays the results. For example, a device icon in *green* for Successful and *red* for Failure.

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



mosp043

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
====      =====      =====      =====      =====      =====

Path      Product
-----      -----
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).

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 Num	Path	Product	Last Active Tool	Last Op 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 deselects 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 require 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...
			ToolManagement->		

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 ->	Sel System to Test ->	*(Tools) ->	Tool Options ->
Start Recording...	Connect to Systems...	Run	Information...
Stop Recording	Select Current System...	[Information Log]	Verify...
	Disconnect Systems...	Activity Log	Diagnose...
Record Output ->	License ->	Failure Log	Exercise...
Start Recording...	Display	Info	Firmware Update...
Stop Recording	Install...	Latest Logs ->	Expert Tool...
Record Map	Install HP-Only...	Activity Log	Utility...
	Deinstall	Failure Log	Tool Launch...
Administration ->	Daemons ->	Tool Management ->	
Read UUT Config File	Daemon Starup...	Abort Tool	
Update Tool Info	Daemon Shutdown...	Suspend Tool	
STM Startup	Daemon Kill...	Resume Tool	
STM Shutdown	Daemon Activity Log...	Kill Tool	
Local UUT Logs ->		Abort Utility...	
Map Log		Kill Utility...	
System Activity Log		Display "Query Pending"	
syslog			
mosp075			

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

Path  Product  Last  Last Op
-----
8     Bus Adapter (580)  Information  Successful
8/16  Core I/O Adapter (2e)  Information  Successful
8/16/0 Centronics Interface (2e)  Information  Successful
8/16/4 RS-232 Interface (2e)  Verify  Successful
8/16/5 SCSI Interface (2e)  Verify  Successful
8/16/5.0.0 SCSI Tape (HPHP35480A)  Exercise  Incomplete
8/16/5.2.0 SCSI Disk (TOSHIBACD-ROM)  Exercise  Incomplete
8/16/5.3.0 SCSI Disk (HPC2247M1)  Exercise  Incomplete
8/16/5.4.0 SCSI Disk (SEAGATEST31200)  Exercise  Successful
8/16/5.6.0 SCSI Disk (SEAGATEST31230)  Exercise  Successful
8/16/6 LAN Interface (2e)  Exercise  Successful
8/16/7 Built-in Keyboard/Mouse  Information  Successful
8/20  Core I/O Adapter (30)  Information  Successful

```

f1	f2	f3	f4	f5	f6	f7	f8
help	Alt	Select/ Deselect	Menubar 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...
-----
Record command File ->  ct  Last  Last Op
Run Command File...  Active Tool  Status
-----
Record Output ->  dapter (580)  Information  Successful
-----
UI Activity Log  I/O Adapter (2e)  Information  Successful
-----
Administration ->  onics Interface (2e)  Information  Successful
-----
Escape to OS  232 Interface (2e)  Verify  Successful
-----
Exit  Interface (2e)  Verify  Successful
-----
8/16/7  Tape (HPHP35480A)  Exercise  Incomplete
8/20  Disk (TOSHIBACD-ROM)  Exercise  Incomplete
-----
Built-in Keyboard/Mouse  Exercise  Incomplete
-----
Core I/O Adapter (30)  Exercise  Successful
-----
Disk (HPC2247M1)  Exercise  Successful
-----
Disk (SEAGATEST31200)  Exercise  Successful
-----
Disk (SEAGATEST31230)  Exercise  Successful
-----
Interface (2e)  Exercise  Successful
-----

```

f1	f2	f3	f4	f5	f6	f7	f8
help	Alt	Select/ Deselect	Menubar on/off			REFRESH	EXIT

Menus and Commands**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 of a screen to another, 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/ Commands...
Run Command File...	Remap System	Select Class...	Exercise->*		On Home Topic...
Record Output ->	Map Log	Unselect All	Firmware Update ->*		On Shortcuts...
UI Activity Log	License->	Unselect Class...	Expert Tool ->*		On Keyboard...
Administration->	System Activity Log...		Utility ->*		On Help...
Escape to OS	Daemons->		Latest Logs ->		On Version...
Exit			ToolManagement->		

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	Sel System to Test -> Connect to Systems... Select Current System... Disconnect Systems...	*(Tools) -> Run [Information Log] Activity Log Failure Log Info	Tool Options -> Information... Verify... Diagnose... Exercise... Firmware Update... Expert Tool... Utility... Tool Launch...
Record Output -> Start Recording... Stop Recording Record Map	License -> Display Install... Install HP-Only... Deinstall	Latest Logs -> Activity Log Failure Log	
Administration -> Read UUT Config File Update Tool Info STM Startup STM Shutdown Local UUT Logs ->	Daemons -> Daemon Starup... Daemon Shutdown... Daemon Kill... Daemon Activity Log...	Tool Management -> Abort Tool Suspend Tool Resume Tool Kill Tool Abort Utility... Kill Utility... Display "Query Pending" Attach to Tool	
Local UUT Logs -> Map Log System Activity Log syslog mspg075a			

Menus and Commands

mstm Shortcut Keys

A new shortcut 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 **d**, **v** and the **Enter** keys 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 shortcut 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 by category. The format is *command (abbreviation)*:

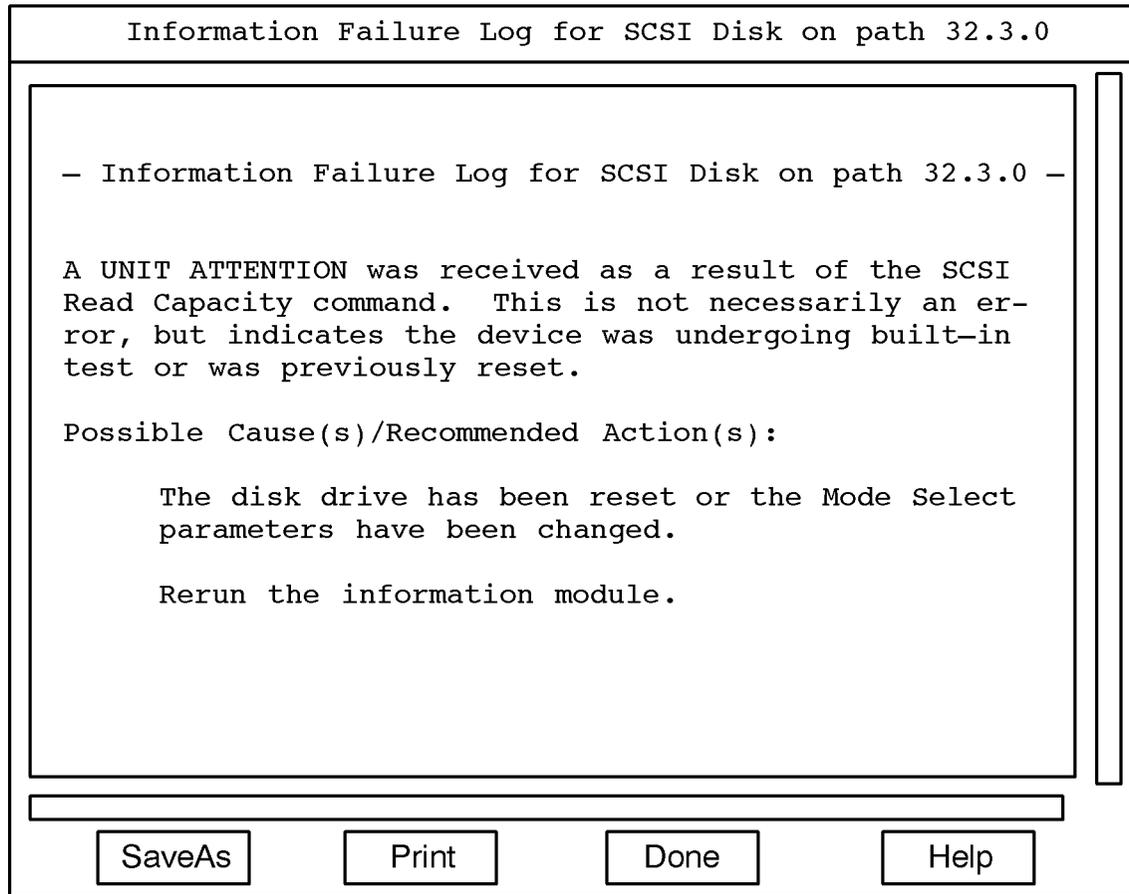
File:	System:	Device:
saveconfig (scfg)	connectsys (cs)	currdevstatus (cde)
restoreconfig (rcfg)	selcurrentsys (scs)	cleartoolstatus (cts)
recordcmdfile (rcf)	disconnectsys (ds)	select (sel)
stoprecordcmd (srcf)	savemap (smap)	selall (sall)
runcmdfile (rncf)	printmap (pmap)	selclass (scl)
recordoutput (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)	infoptions (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
fwupdateelg (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`



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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).

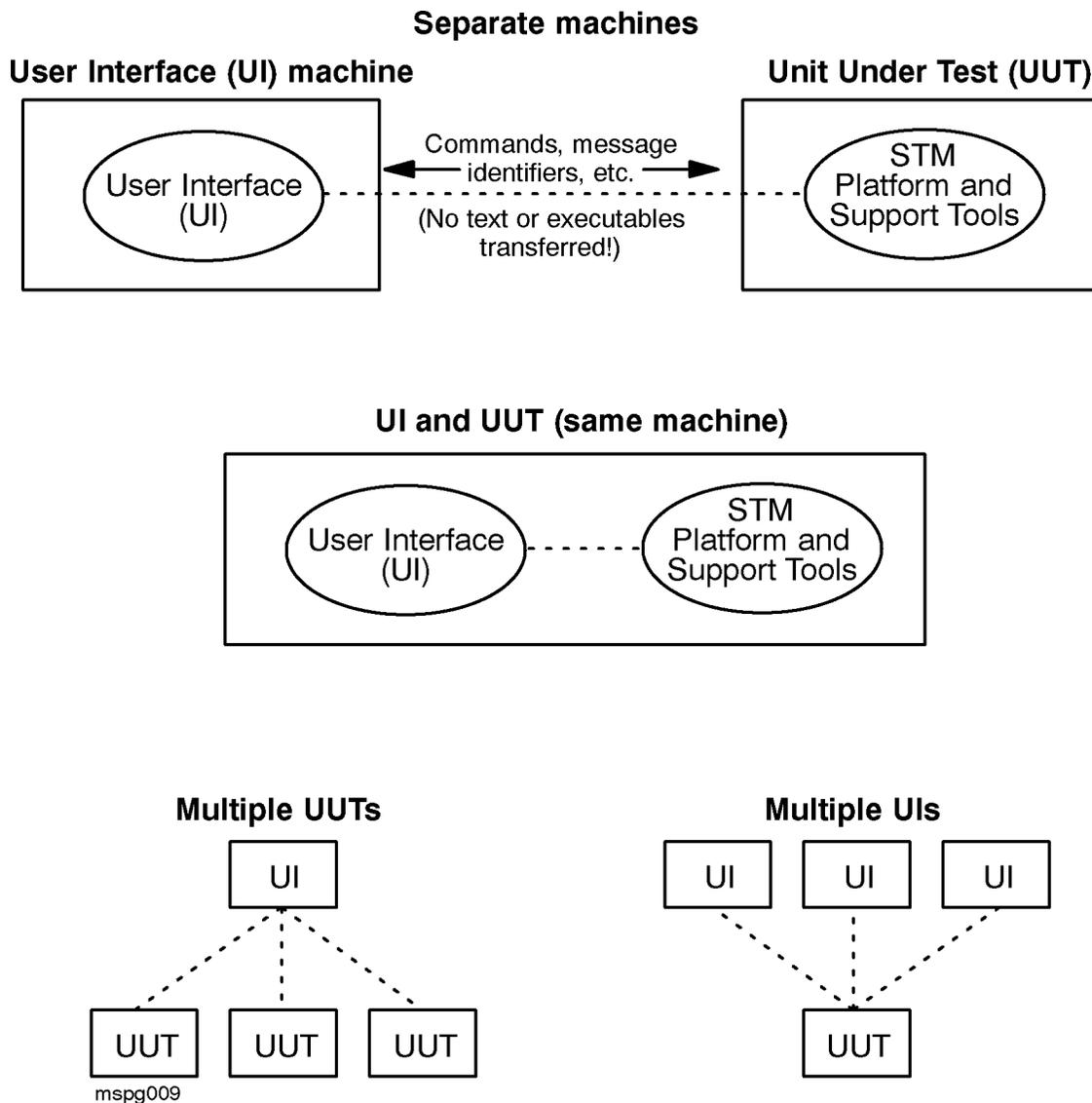
Remote Execution

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.

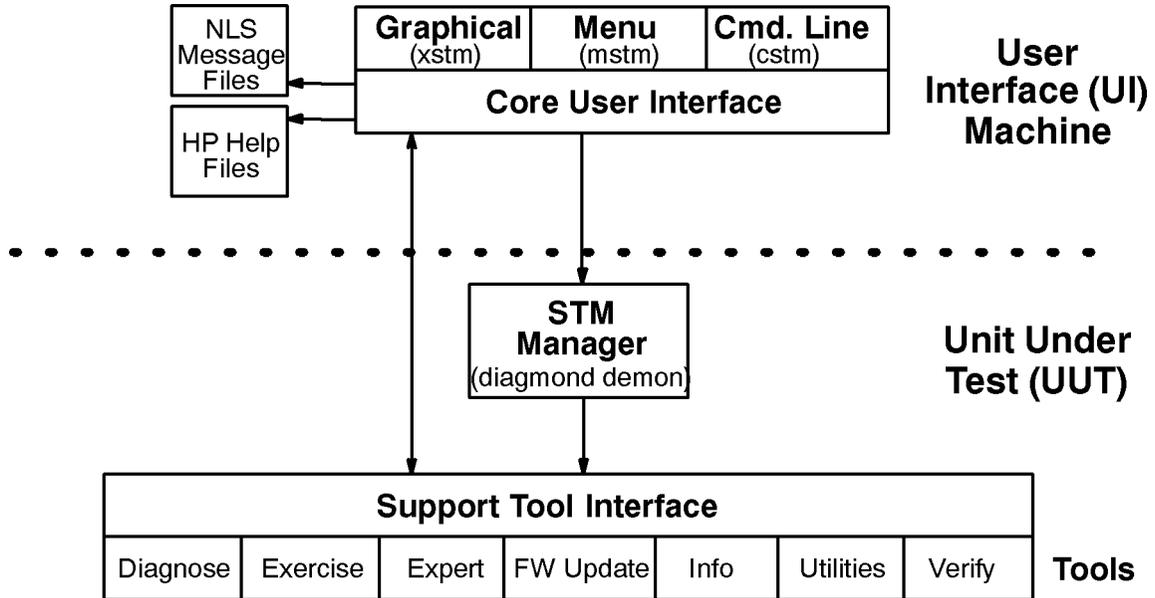
Figure 4-9 Possible UI and UUT Connections



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



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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 on page 48 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`.

NOTE

A web-based version of STM help is available at
http://docs.hp.com/hpux/onlinedocs/diag/stm/sth_summ.htm.

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

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 unusable and data could be lost.

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

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

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

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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.

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)

Common Problems

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 Support Plus Media to Install Diagnostics

The following hardware support tools are distributed on the Support Plus Media in the OnlineDiag swinstall bundle:

- Support Tools Manager (STM) (HP-UX 10.20 and 11.x only)
- EMS Hardware Monitors (HP-UX 10.20 and 11.x only)
- HP Predictive Support tools (Series 800 only, HP-UX 10.20 and 11.00 only. For 11i, use HP SW Depot website.)
- LIF-resident offline diagnostics (ODE) (HP-UX 10.x and 11.x)

This chapter summarizes the hardware support tools listed above, then describes how to install the support tools from the Support Plus Media.

NOTE For HP-UX 11i, the hardware support tools are also distributed on the Operating Environment CD-ROM. When you install the HP-UX 11i operating system, the support tools (diagnostics) are automatically installed.

For HP-UX 11.20, the support tools are distributed on the Core-OS DVD for 11.20. when the HP-UX 11.20 operating system is installed, the support tools are automatically installed.

NOTE As of the September 1999 release, the name of the Diagnostic/IPR Media has been changed to Support Plus. In addition, the format has changed so that there is a separate CD-ROM for each version of the operating system (HP-UX 10.20 and HP-UX 11.00).

NOTE If your system is running HP-UX 10.01, 10.10, or 10.30, you can get support tools from an archive CD-ROM. For details, see our Web site “Diagnostics” at <http://docs.hp.com/hpux/diag/index.html>. The specific URL for this page is: http://docs.hp.com/hpus/onlinedocs/diag/st/st_oldos.htm.

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

The Support Tools Manager (STM) on HP-UX 10.20 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 Diagnostics at <http://docs.hp.com/hpux/diag/>.
- The manpages `xstm(1M)`, `mstm(1M)`, and `cstm(1M)`.

EMS Hardware Monitors

Included on the Support Plus Media are the EMS Hardware Monitors — an important 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 Support Plus Media (formerly called the Diagnostic/IPR Media) of February 1999 or later. Hardware event monitoring is not currently available on the special high security systems, HP-UX 10.26 (TOS) and HP-UX 11.04 (VVOS).

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.

Predictive Support is not available on 10.26 HP-UX systems (TOS). Instead, it can be downloaded from the HP Software Depot at <http://www.software.hp.com> under “network and sys admin.”

On HP-UX 11i, Predictive Support is no longer distributed with the hardware support tools in the OnlineDiag SD bundle, as it was in previous operating systems.

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. For 64-bit systems like N-Class, the offline diagnostic programs have a "2" appended to their names. For example, the 64-bit version of MAPPER is MAPPER2.

MAPPER 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 ODE-based test module that runs supported IODC tests on modules.

PERFVER 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 Support Plus Media to Run Offline Diagnostics."

Manually installing the offline diagnostics

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, perform the following steps to manually install the offline diagnostics:

Prerequisites:

- The root(/) disk has a 'Whole Disk' layout.
- The bootlif has at least 4 megabytes of SWAP.

Instructions:

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

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

Step 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.

NOTE Some recent systems, such as the V-Class and Itanium (e.g., RX 4610), do not use ODE. but have their own set of offline diagnostics, available on model-specific media.

Installation Procedure

This section describes how to install support tools (diagnostics) from the Support Plus Media (CD-ROM or Web).

NOTE If you have HP-UX 11i, the support tools (diagnostics) are AUTOMATICALLY installed when you install the operating system. You do not need to load it as described in this procedure.

NOTE 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 Support Plus Media, consider installing the Support Tools from it, instead of downloading them from the Web. The Support Plus Media contains the required patches and may be easier to use.

NOTE If your system is running HP-UX 10.01, 10.10, or 10.30, you can get support tools from an archive CD-ROM. For details, see our Web site: “Diagnostics” at <http://docs.hp.com/hpux/diag/index.html>. The specific URL for this page is http://docs.hp.com/hpux/onlinedocs/diag/st/st_oldos.htm.

NOTE For information on installing Predictive Support tools using the terminal version of `swinstall`, see the *HP Predictive Support/UX User's Guide*, part number: H2571-90009.

1. Boot HP-UX.

(If you have HP-UX 11i or 11.20, the support tools were automatically installed when you installed the operating system. You do not need to continue with this procedure, unless you want to update the support tools to a more current version.)

2. Insert the Support Plus 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/rdisk/c0t3d0
```

In this example, the device file needed to install support tools from the Support Plus 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 looking 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 and Recommended Patches” in the `DIAGNOSTICS.readme` file for the current release (IPR) of Support Tools. This file is located in the `DIAGNOSTICS` directory, directly below the mountpoint on the CD-ROM, for example `/diagtemp/DIAGNOSTICS/DIAGNOSTICS.readme`. Online versions of this file for current and previous releases are available online at:

http://docs.hp.com/hpux/onlinedocs/diag/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 Support Plus 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 `swinstall` program. For details on using `swinstall`, 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 “Actions” menu. Respond to the prompts that are displayed.

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

Alternately, you can obtain the patches through the HP IT Resource Center:

- <http://us.itrc.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. After installing patches, install support tool files using `swinstall`.

Installation Procedure

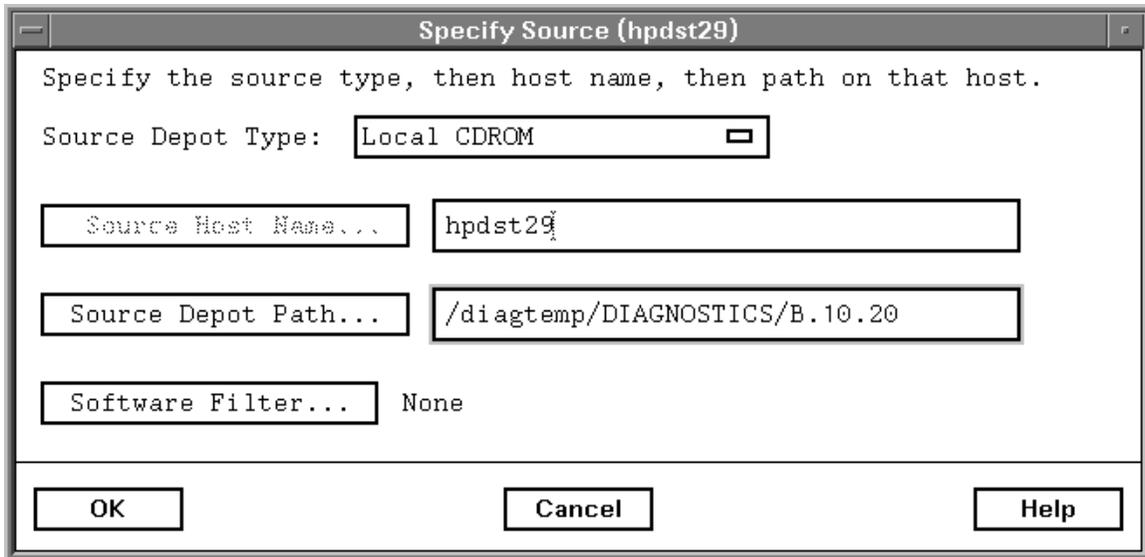
For a graphical user interface, set the DISPLAY variable with a command like `export DISPLAY=your_workstation:0.0`.

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 10.20, 11.00, etc., depending upon which OS release your system is running.

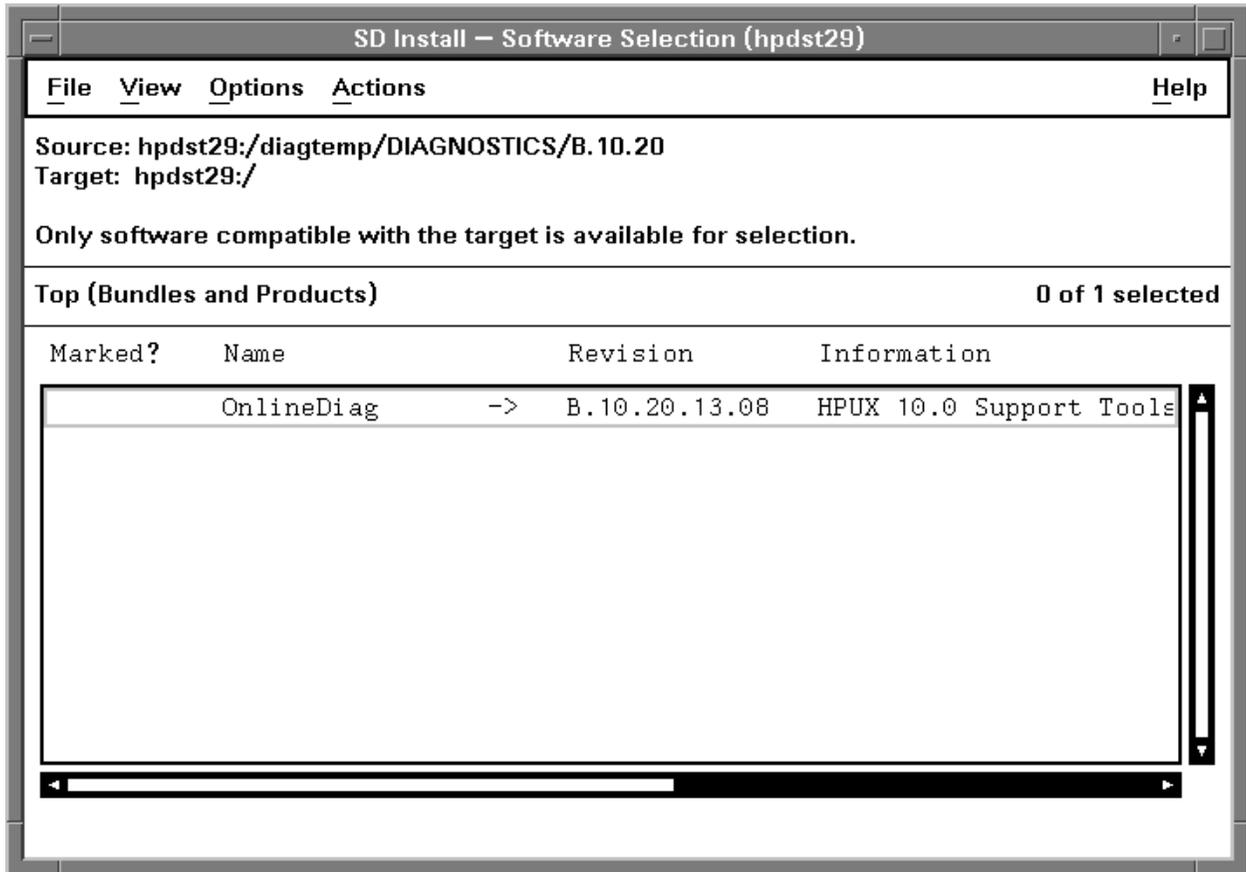
NOTE The following examples (Figures 5-1 to 5-4) use a source depot path for a B.10.20 bundle. Set your path appropriately for the OS version on your system (for example B.11.00 or B.10.20).

Figure 5-1 Specify Source Window



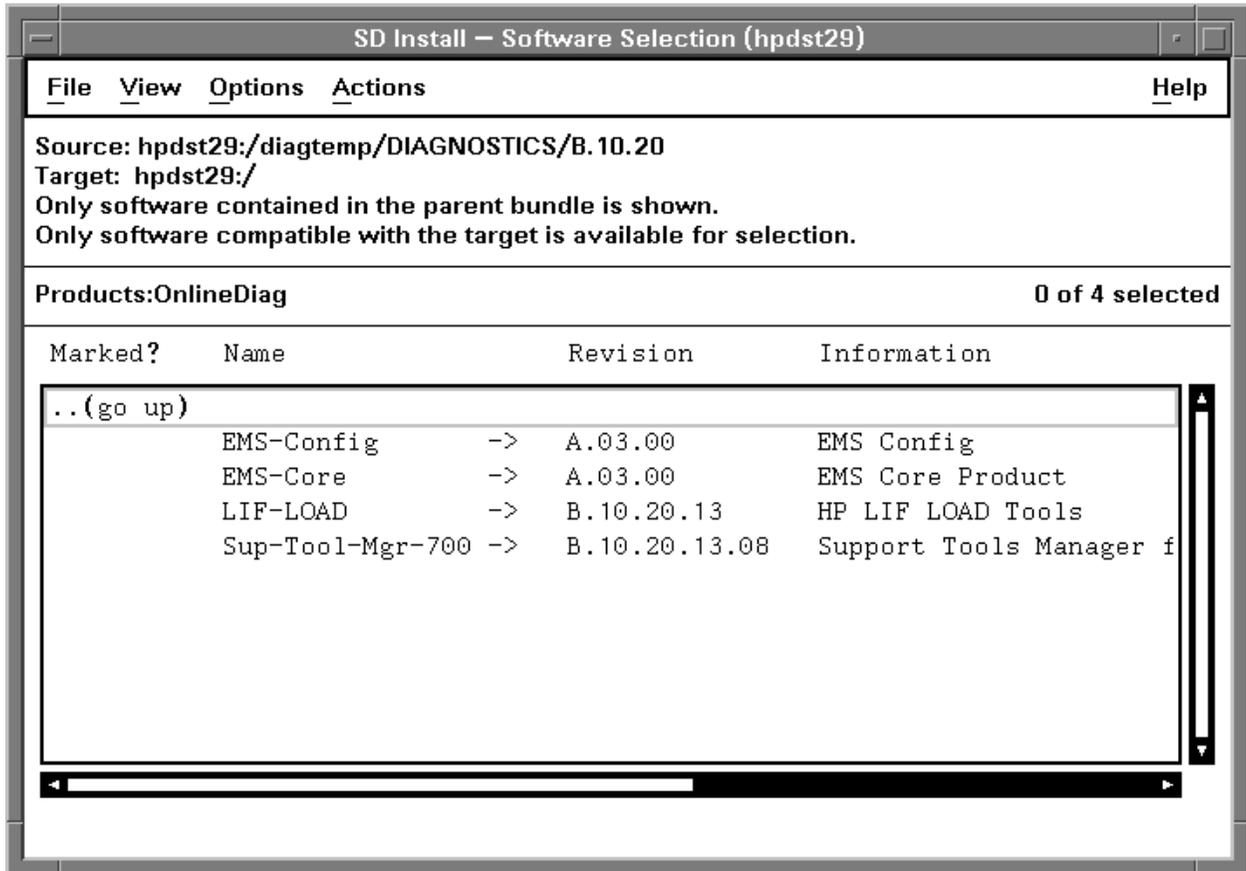
10. Click on the **OK** button. The “Software Selection Window” appears:

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

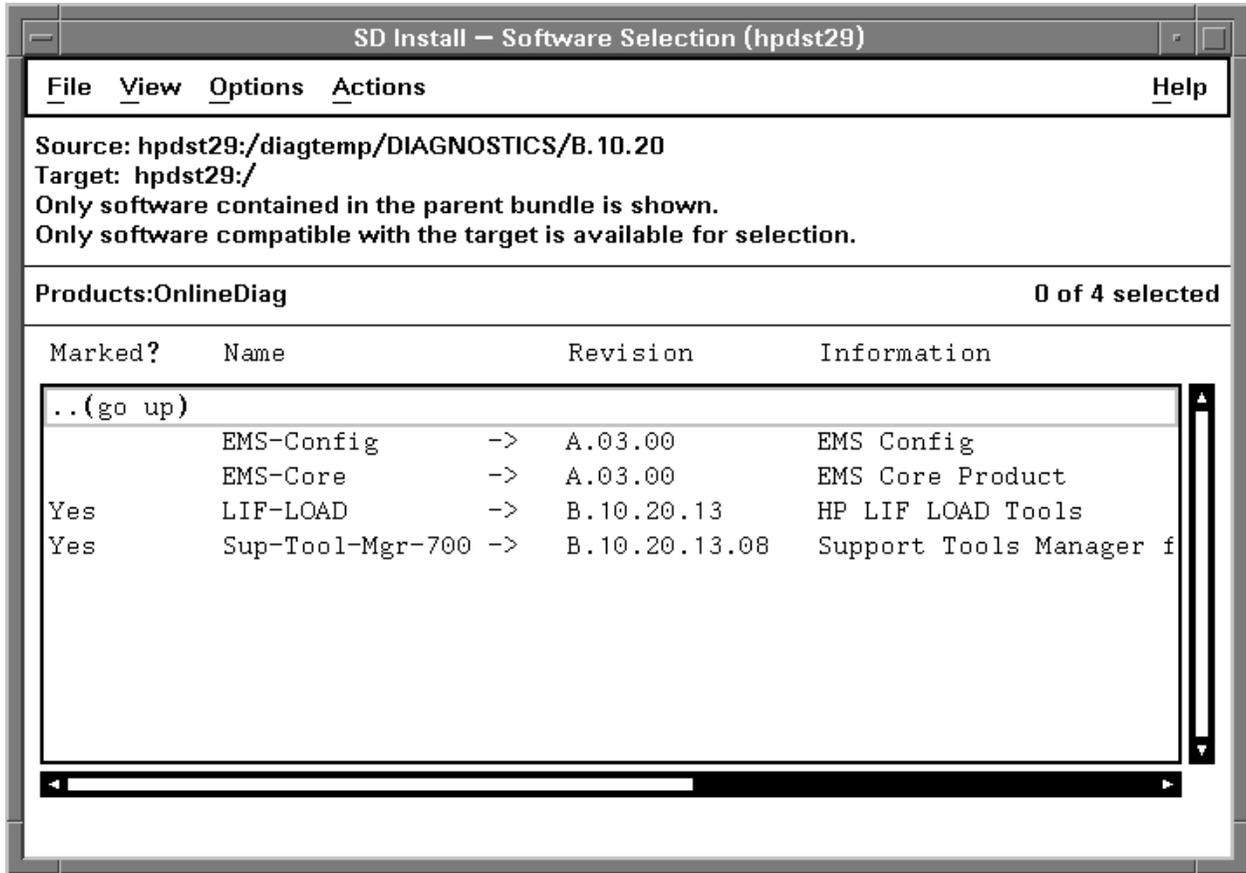


Highlight the product to be installed. Use the “Actions” menu option “Mark for Install” to indicate that the highlighted product is to be installed. Repeat the selection process until all the desired products have been marked for installation.

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 11.00 (IPR 9902 or later).

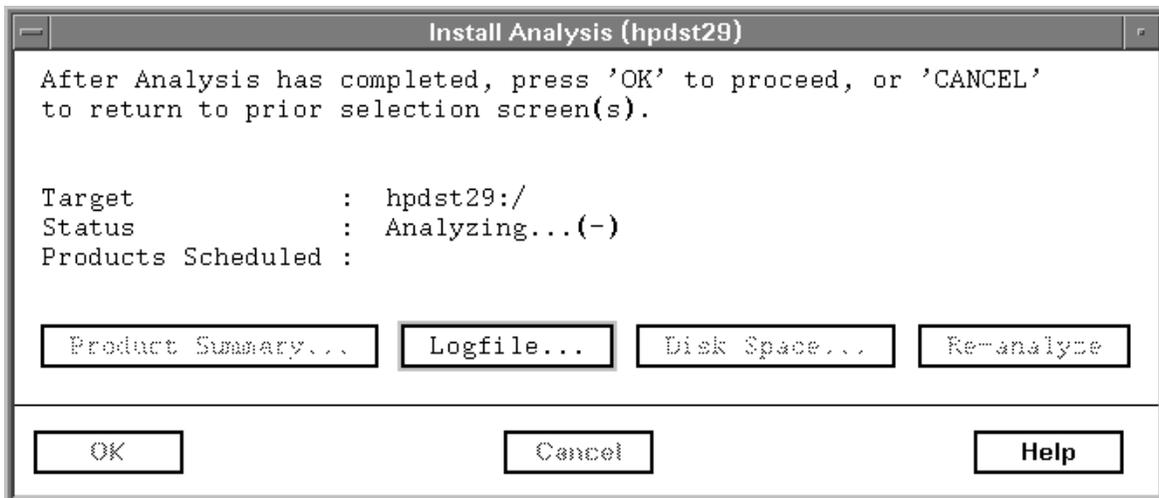
Most users select the offline diagnostics (LIF-LOAD) and the Support Tool Manager (Sup-Tool-Mgr-x00) to be installed as shown in the following example. If you have an S800 system, you may also choose HP Predictive Support (not shown in this example, since it is not available on S700 systems).

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:

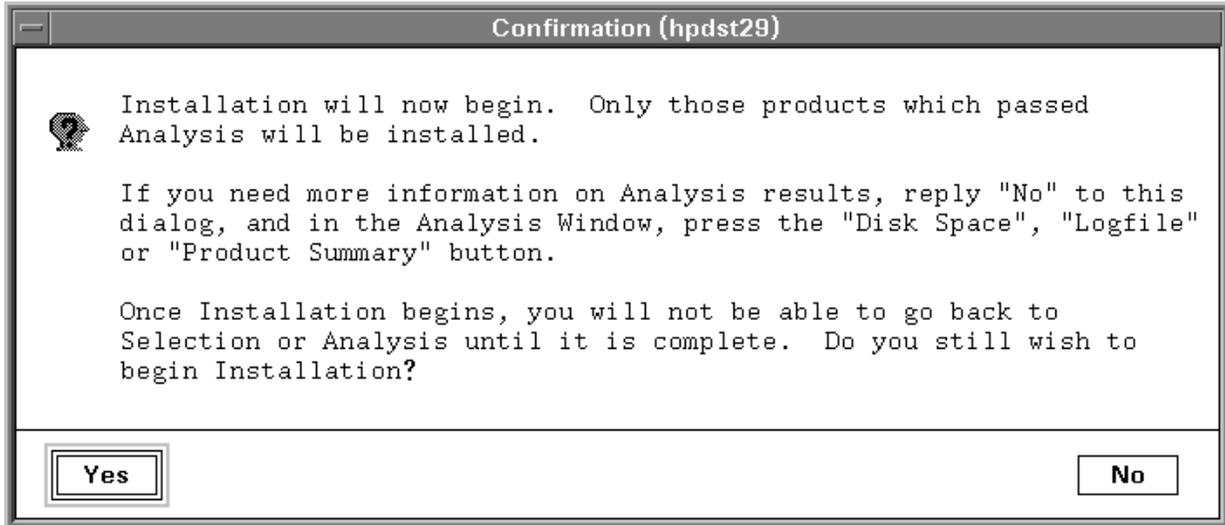
Figure 5-5 Install Analysis Window



13. After the analysis has completed, click the **OK** button to start the installation. The first “Confirmation”

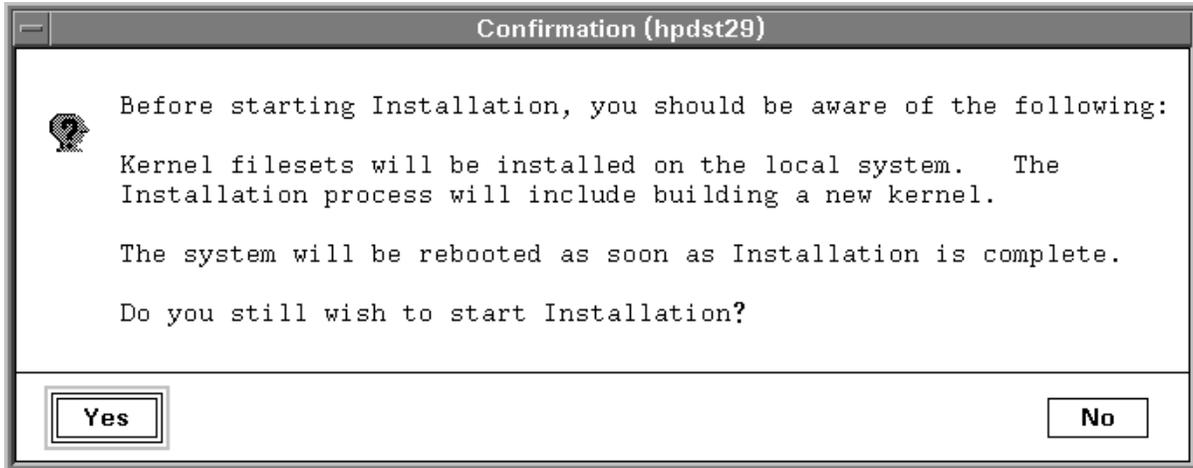
window appears.

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 /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`

Online versions of the Release Notes for STM and the EMS Hardware Monitors can be found at our Web site, "Diagnostics," at <http://docs.hp.com/hpux/diag/>

THIS COMPLETES THE PROCEDURE FOR INSTALLING SUPPORT TOOLS.

For the most current information on Support Tools, see our Web site, "Diagnostics" at <http://docs.hp.com/hpux/diag/>. 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

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.

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 from the Support Plus Media, 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.

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

Quick Start Instructions

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

COPYUTIL>

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.

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

Quick Start Instructions

B EMS Hardware Monitors

Distributed with the support tools (diagnostics) on the OnlineDiag depot 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, 11.00, or 11i, with a version of the support tools that is February 1999 or later. Hardware event monitoring is not currently available on the special high security systems, HP-UX 10.26 (TOS) and HP-UX 11.04 (VVOS).

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 Support Plus Media CD-ROM in the <mount_point>/DIAGNOSTICS directory.

You can also download the latest version of the book from the Diagnostics section of Hewlett-Packard's online documentation web site at <http://docs.hp.com/hpux/diag/>.

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 Support Plus Media (formerly called the Diagnostic/IPR Media), the monitors are automatically enabled when they are installed.

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/sbin/monconfig`, can be used to customize the monitoring requests and add new ones.

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

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. These are automatically installed when the EMS Hardware Monitors are installed.

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