Managing Faults

proactively & reactively

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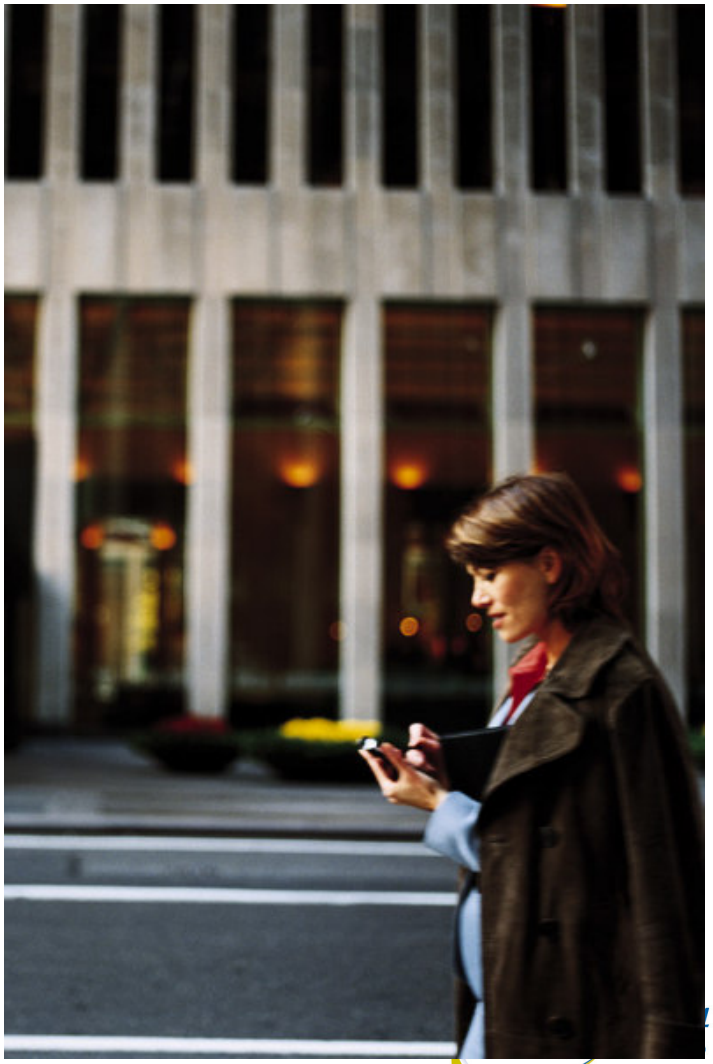
What's driving change? Three big shifts

- All processes and content will be transformed from physical and static to digital, mobile, personal and virtual
- The demand for simplicity, manageability and adaptability will change how customers work and organize, buy and use technology
- It’s a horizontal, heterogeneous, networked world. Standards are about connection and common language



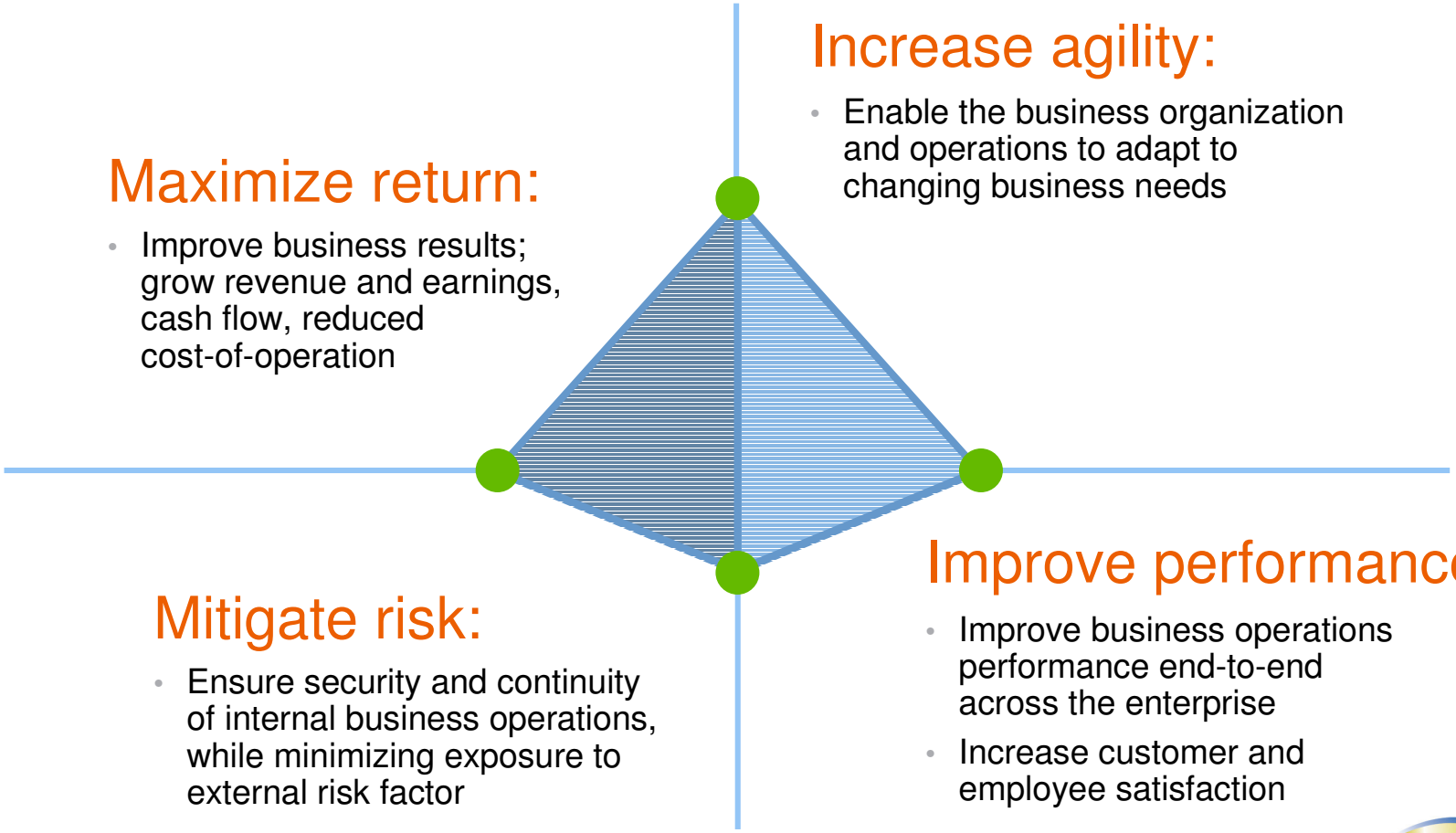
The IT's balancing act

Increase agility:

- Enable the business organization and operations to adapt to changing business needs

Maximize return:

- Improve business results; grow revenue and earnings, cash flow, reduced cost-of-operation



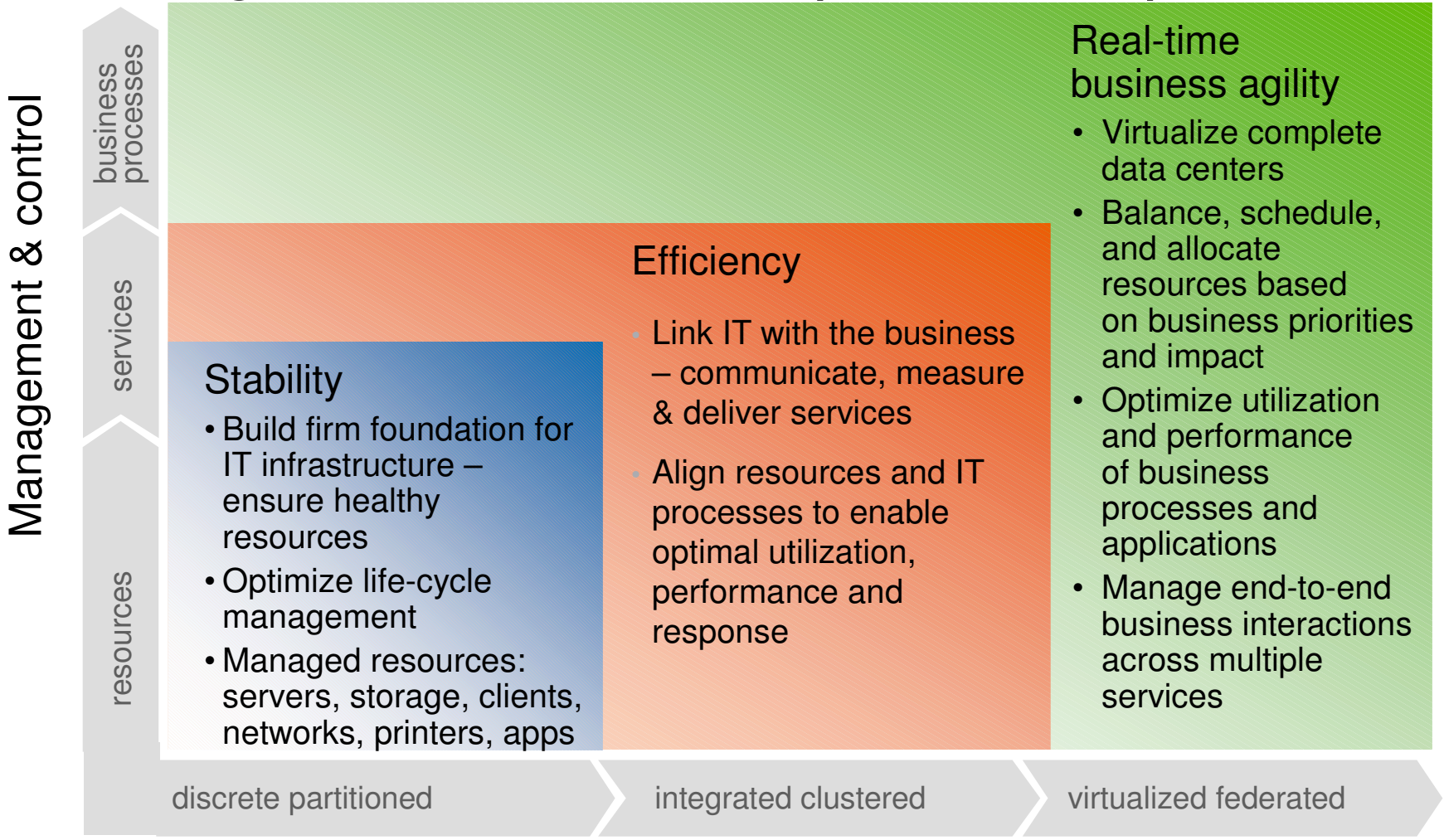
Improve performance:

- Improve business operations performance end-to-end across the enterprise
- Increase customer and employee satisfaction

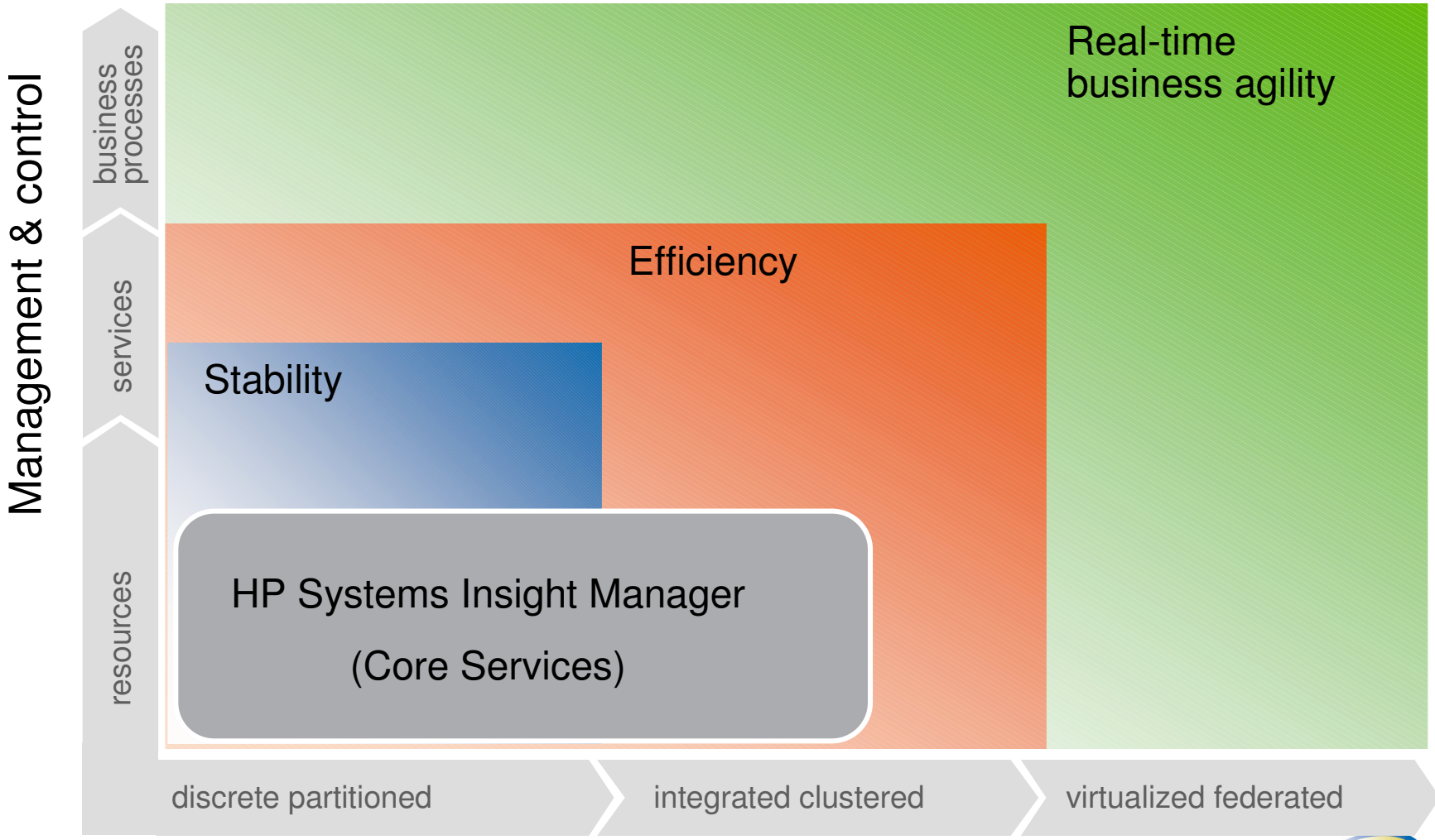
Mitigate risk:

- Ensure security and continuity of internal business operations, while minimizing exposure to external risk factor

Management for the adaptive enterprise



Management for the adaptive enterprise



HP System

Insight Manager

HP Systems Insight Manager

Comprehensive management through core services

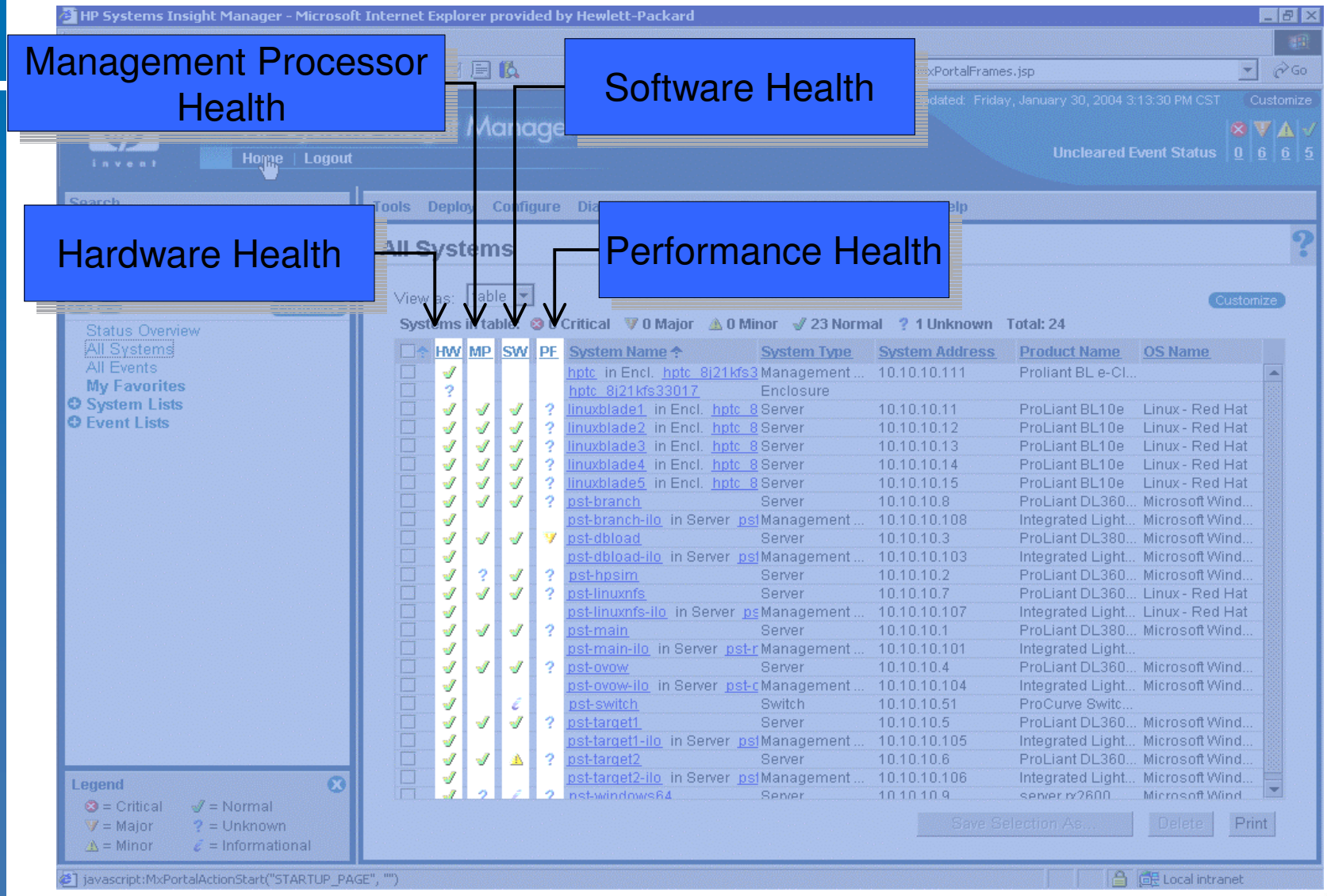
- Multi-OS - installs on HP-UX, Windows, and Linux
- Manages all HP server platforms
- Inventory, fault, and configuration management
- Secure - Role-based authorizations; OS based authentication; SSL, SSH support
- Distributed task facility to remotely run commands, scripts and batch files on managed systems
- Plug-in Extensibility – add additional tools & applications using the tool definitions

Proactive fault management

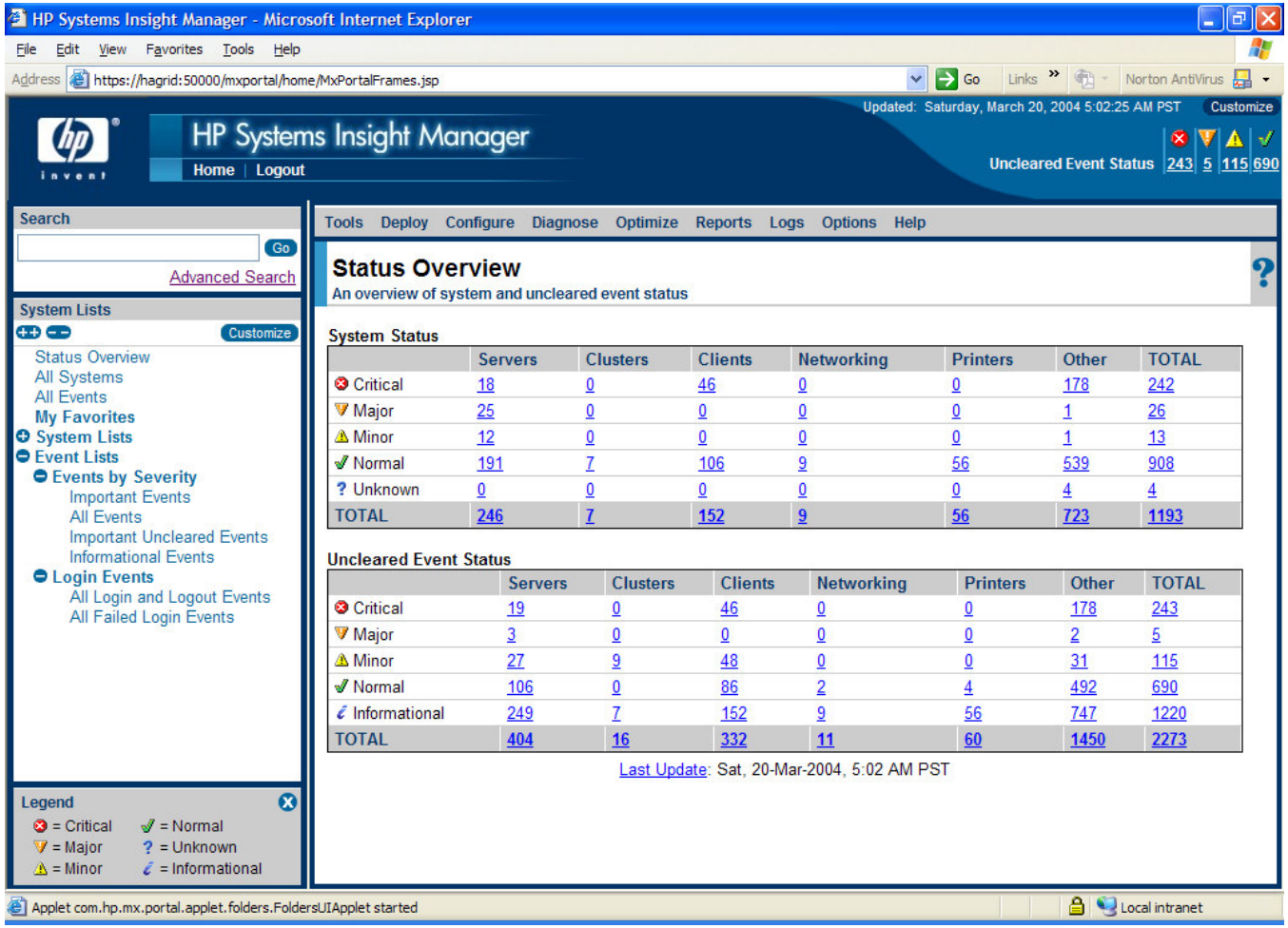
- HP Systems Insight Manager automatically or manually discovers and identifies managed systems
- HP Systems Insight Manager detects problems before they result in server downtime.
  - Disks, CPU, memory, fans, IO, server environmentals
  - ServiceGuard High Availability and MSCS Clusters
- HP Systems Insight Manager speeds failure diagnosis and resolution
  - Status drill down leads the way to failed components
  - Enables remote event notification and forwarding

Fault management

- Monitoring
  - Status polling & asynchronous
  - Incoming events
    - SNMP traps
    - DMTF/WBEM indications (events)
- HP Systems Insight Manager detects problems before they result in server downtime.
  - ProLiant servers (disks, CPU, memory, fans, IO, server environmentals) via SNMP insight agents
  - HP9000 & Integrity servers: EMS HW monitors & ServiceGuard/HA EMS monitors
- HP Systems Insight Manager speeds failure diagnosis and resolution
  - Status drill down leads the way to failed components
  - Enables remote event notification and forwarding

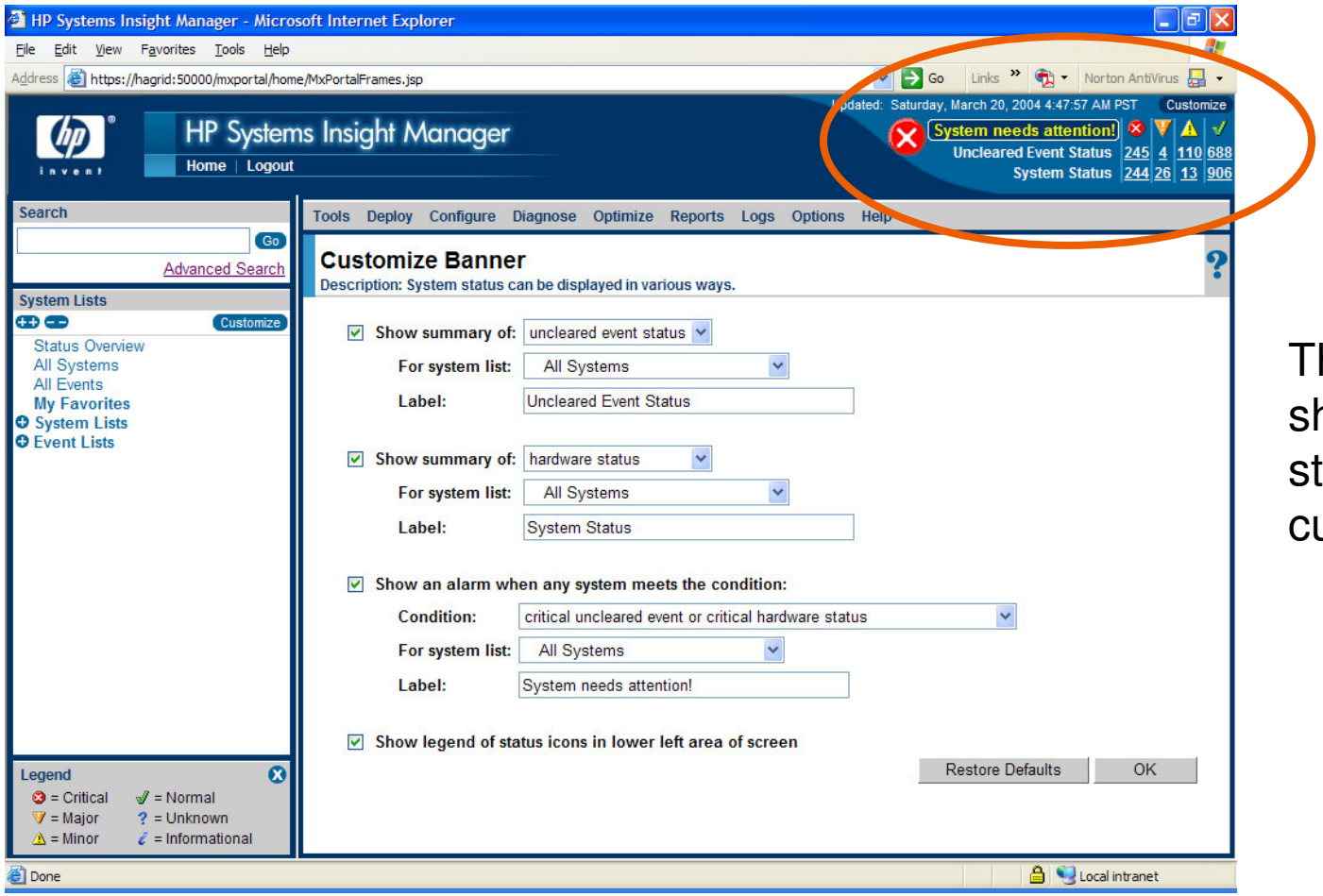

Management Processor Health
Software Health
Hardware Health
Performance Health
HP Systems Insight Manager - Microsoft Internet Explorer provided by Hewlett-Packard
Home | Logout
Uncleared Event Status
All Systems
Status Overview
All Systems
All Events
My Favorites
System Lists
Event Lists
Legend
= Critical
= Major
= Minor
= Normal
= Unknown
= Informational
Critical 0 Major 0 Minor 23 Normal 1 Unknown Total: 24
Save Selection As...
Delete
Print

Fault – status overview page



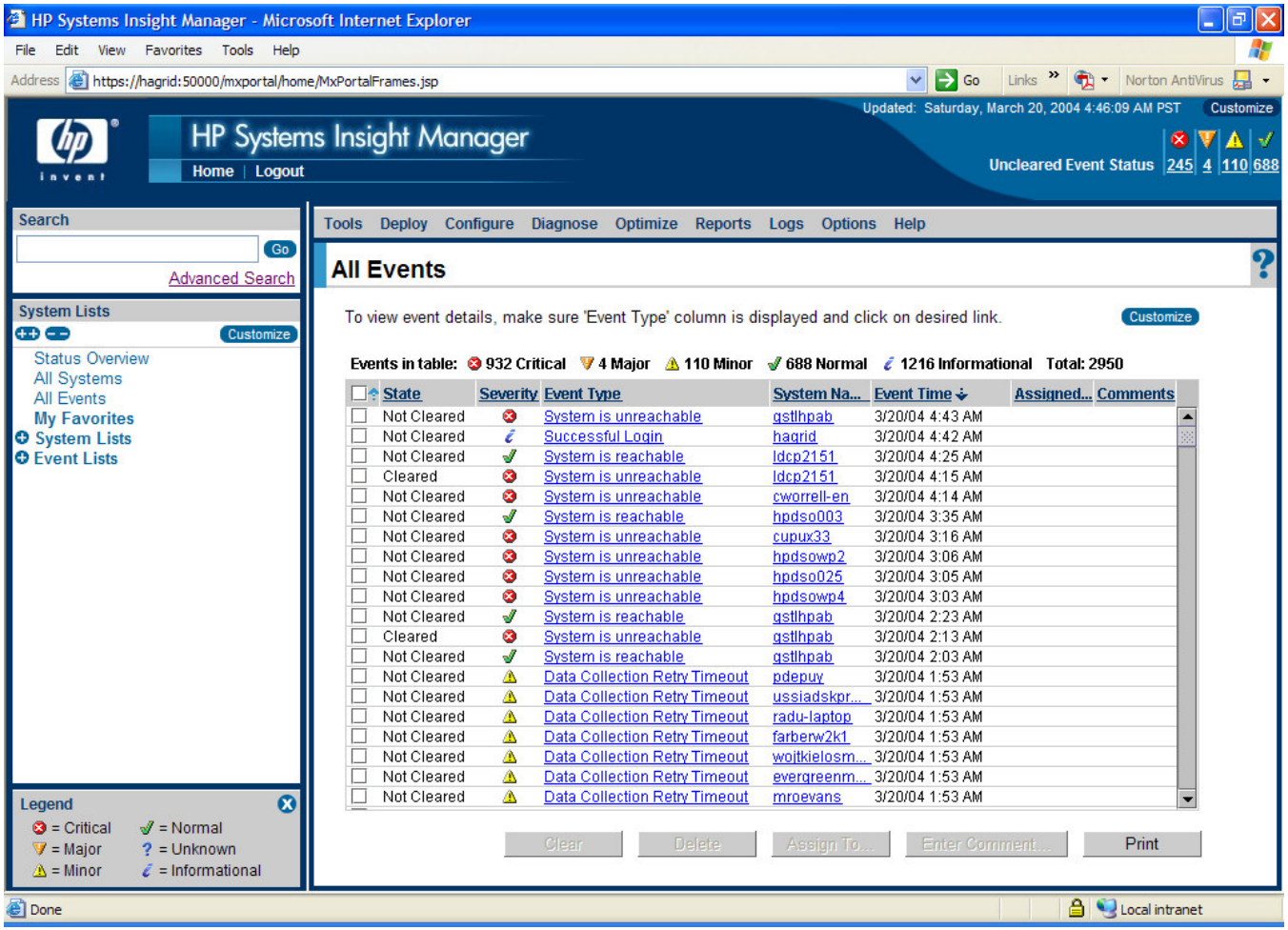
Overview of all systems with drill-down to details

Fault – banner customization



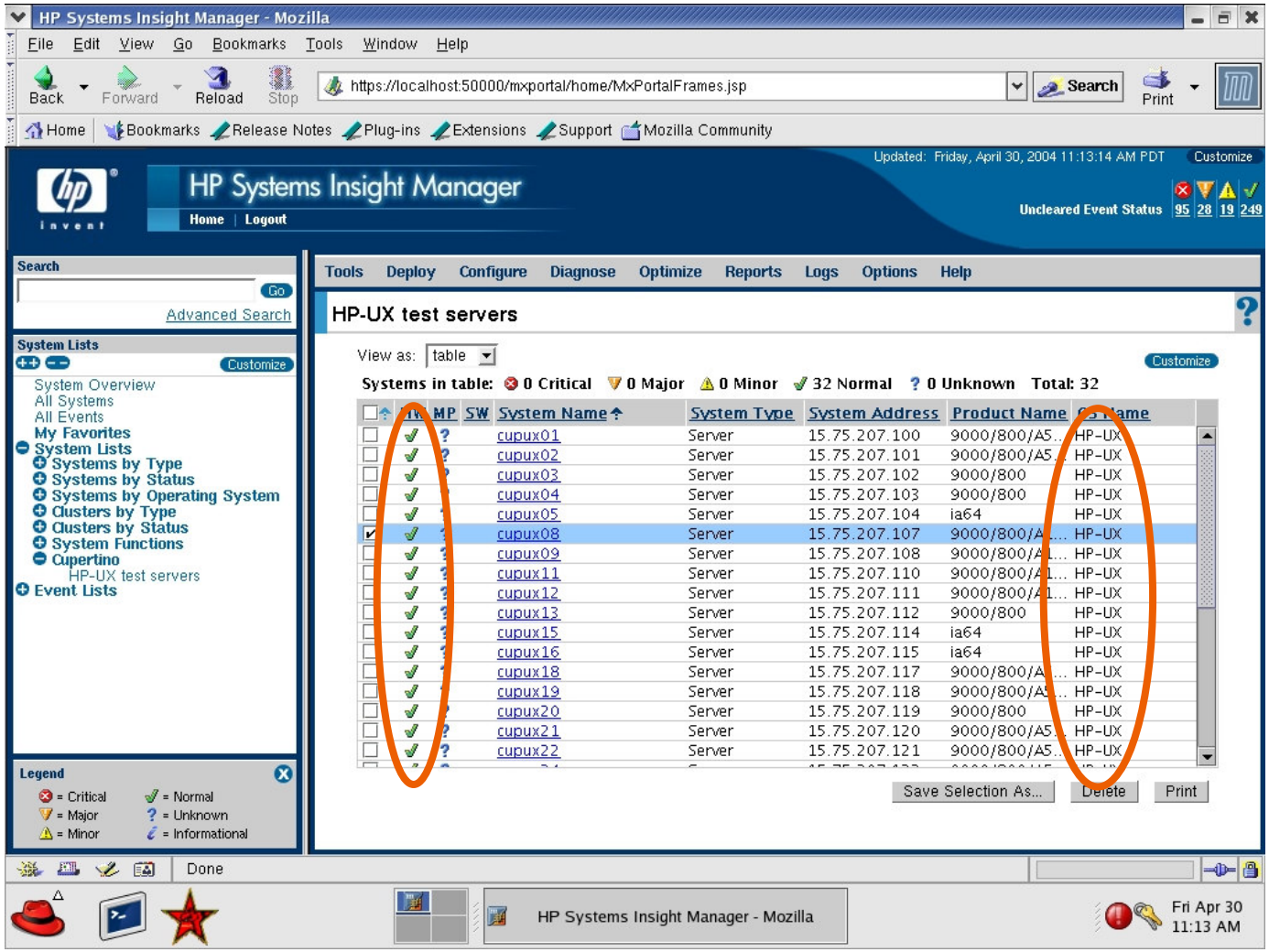
The banner shows overall status and can be customized

Fault – event list



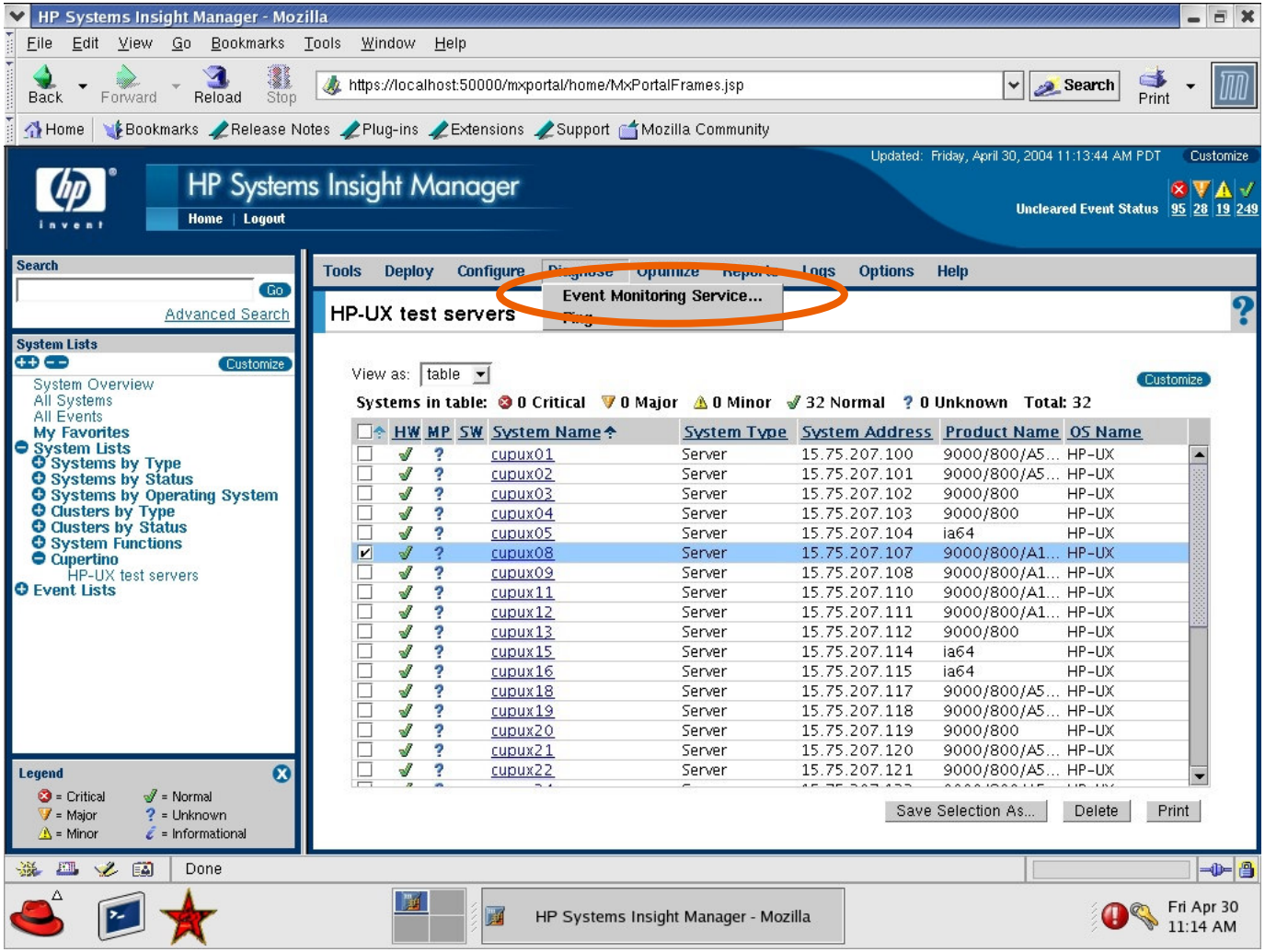
Events can be managed and further details can be displayed

Fault – HP-UX System Status



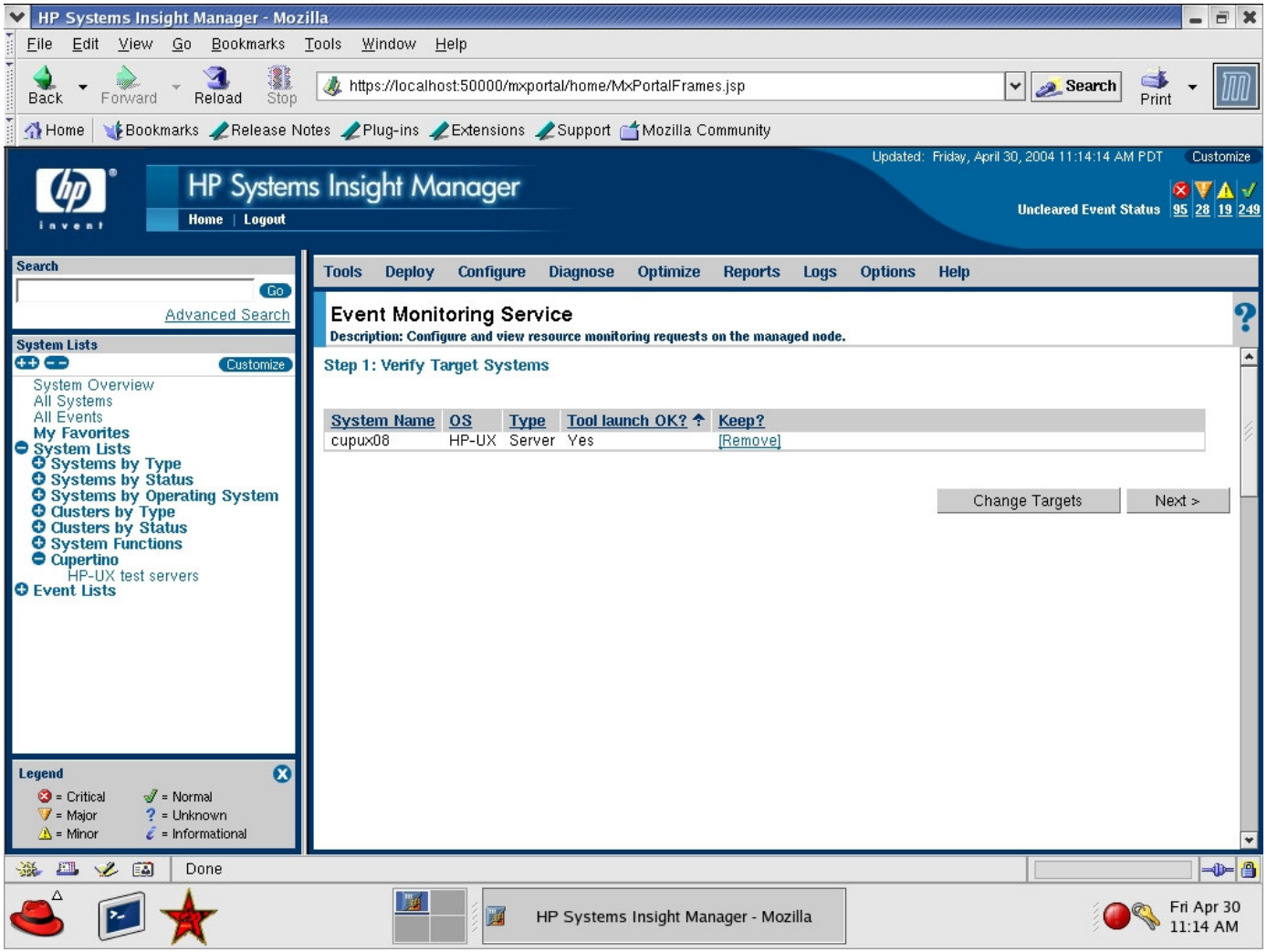
HW status is based on connectivity based status poll for HP-UX servers

Fault – HP-UX EMS



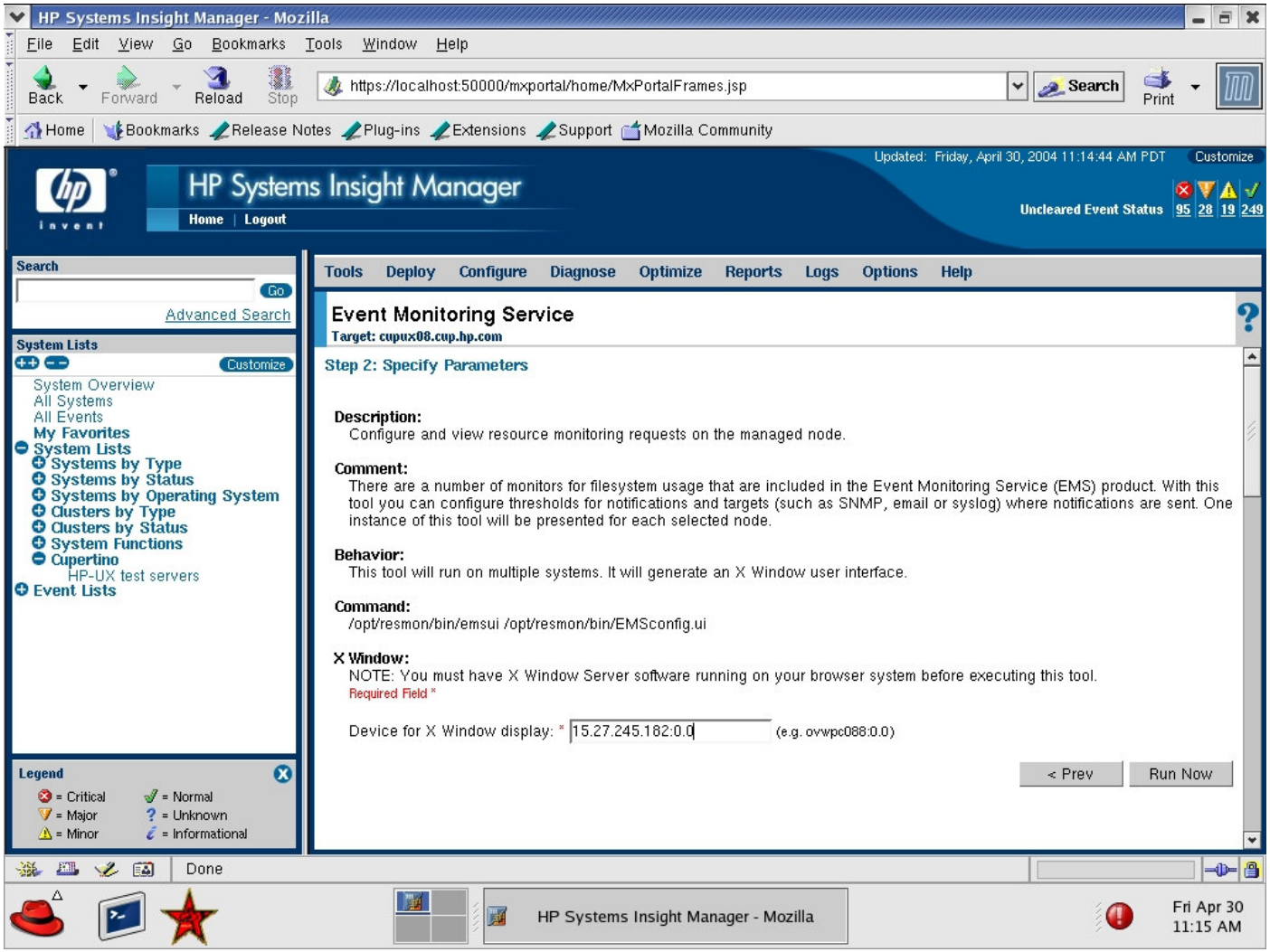
Select HP-UX system from list and then select EMS from tool menu

Fault – HP-UX EMS HA Monitors



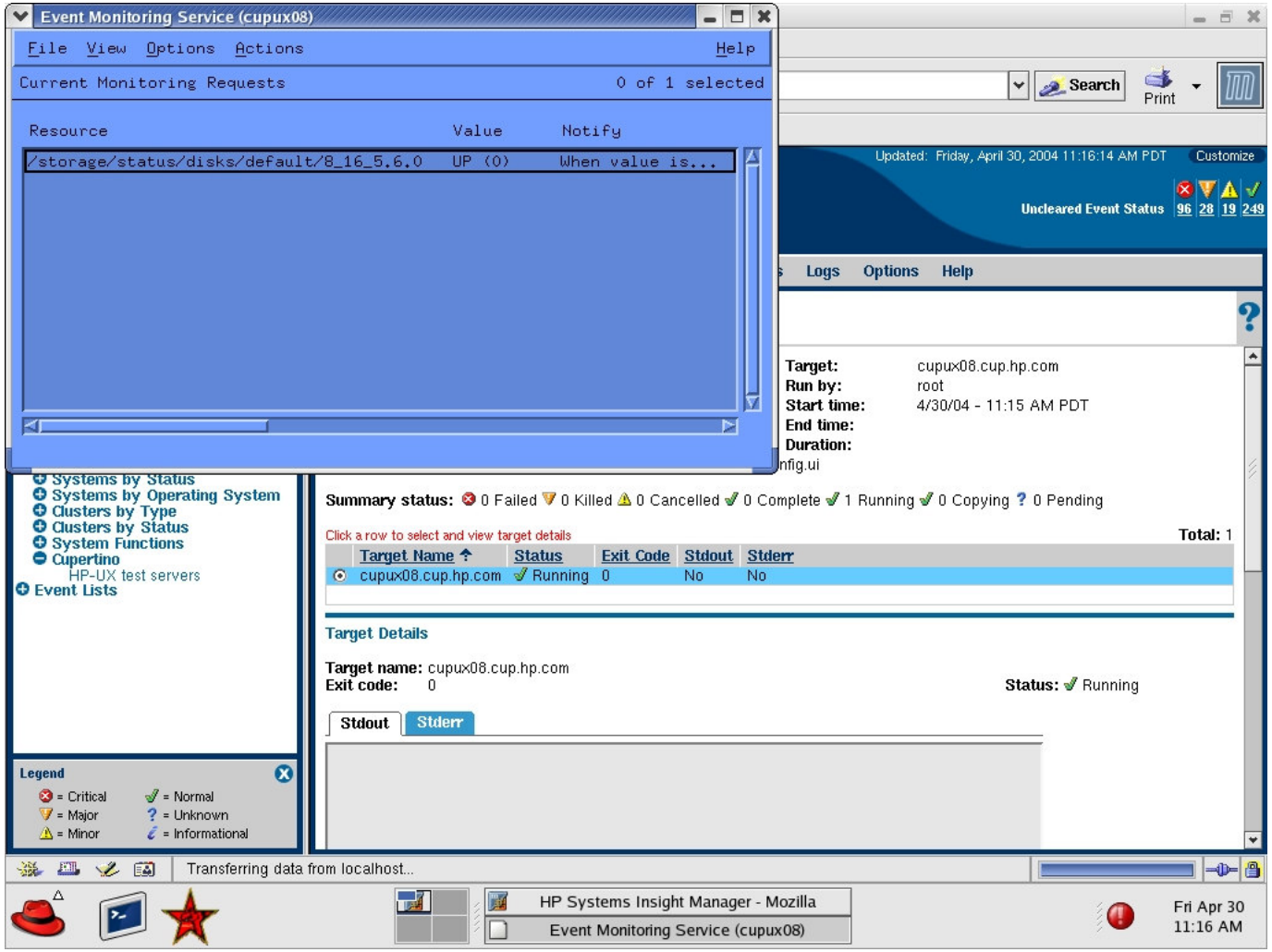
Verify HP-UX server to run EMS on

Fault – HP-UX EMS HA Monitors



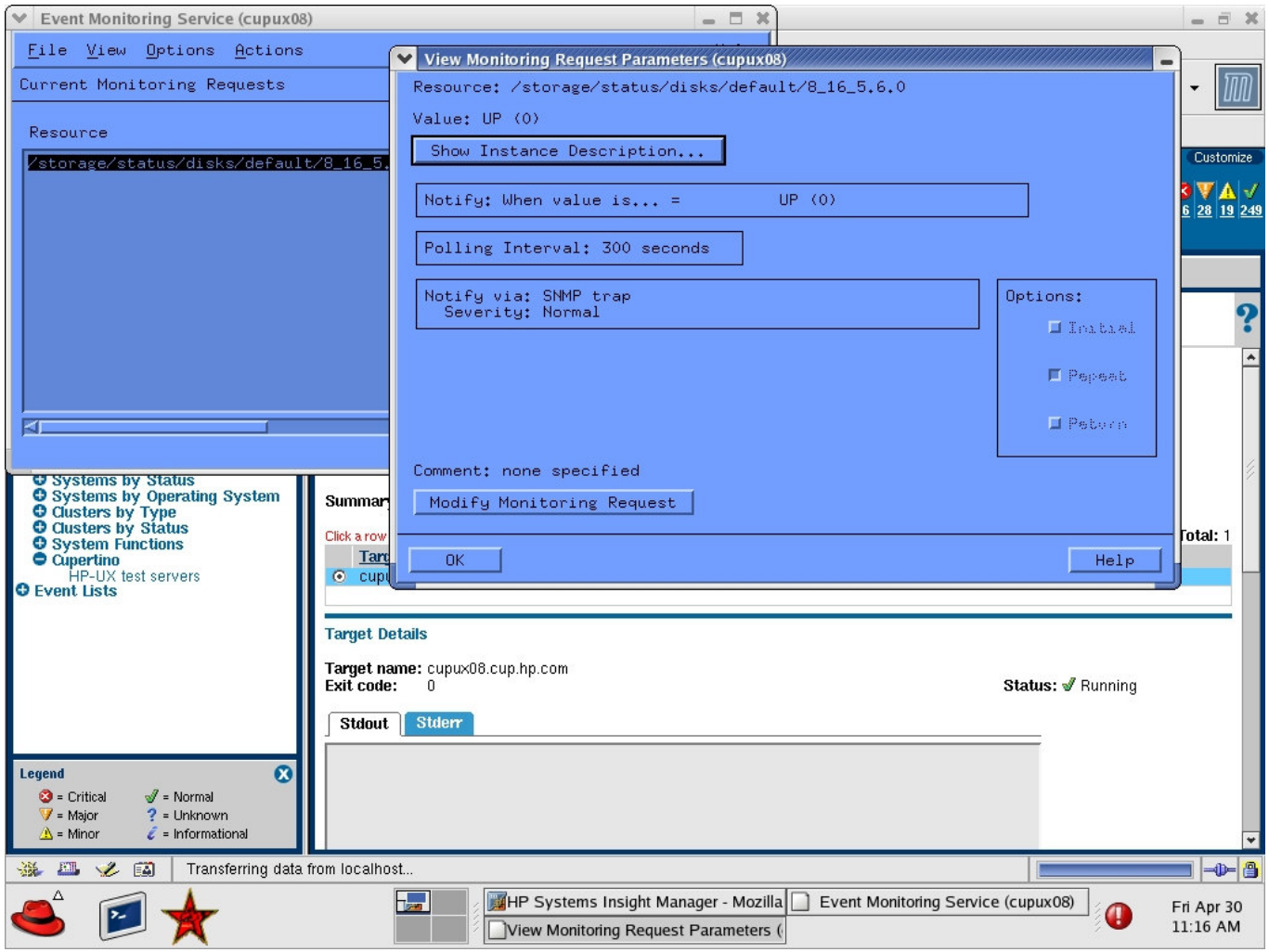
Since EMS has an X based GUI we need to specify where the GUI should be displayed (IP address where browser is being run)

Fault – HP-UX EMS HA Monitors



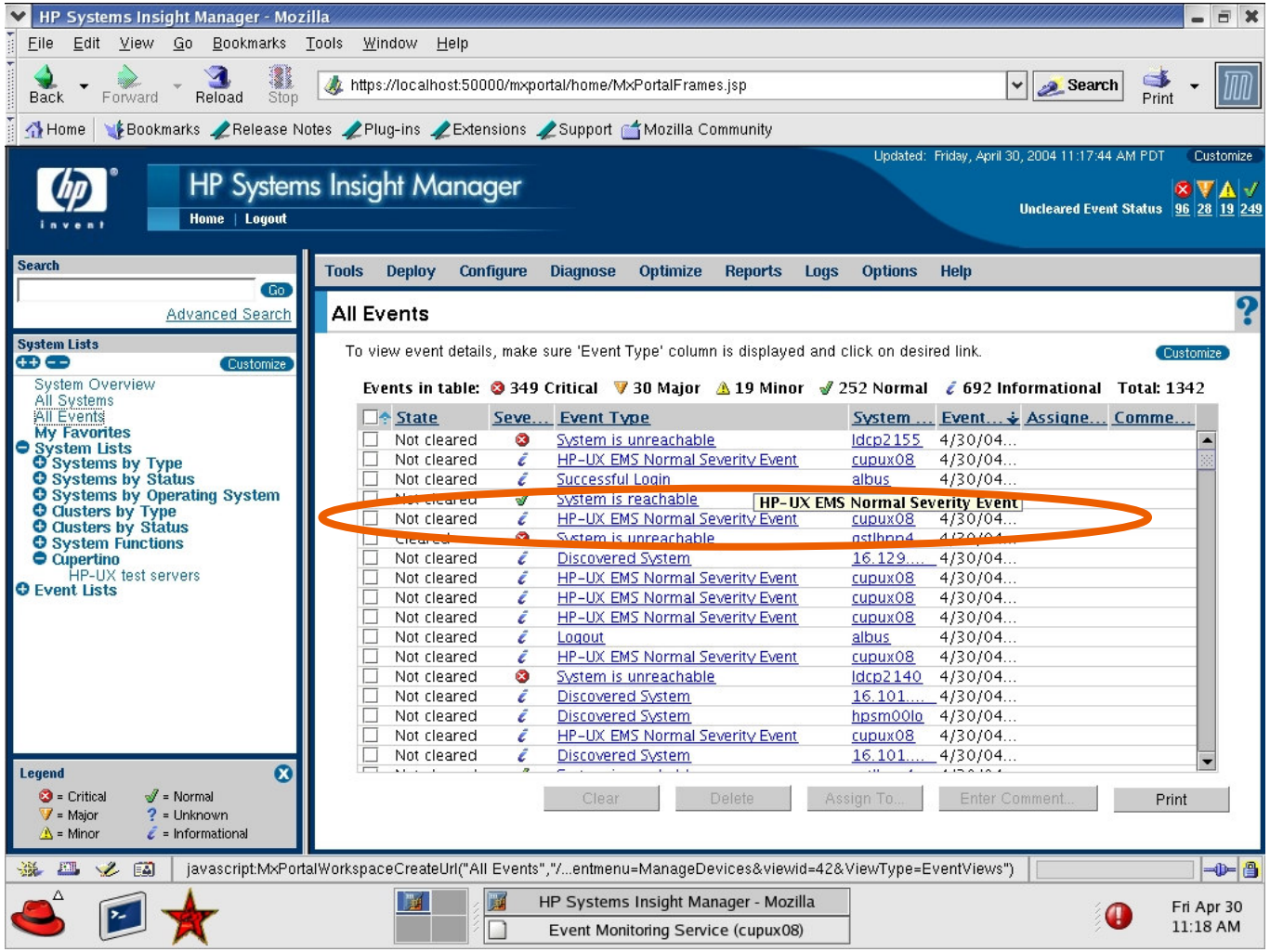
HP SIM will show new task is running on selected HP-UX server. The tool's X based GUI will pop-up in a separate window.

Fault – HP-UX EMS HA Monitors



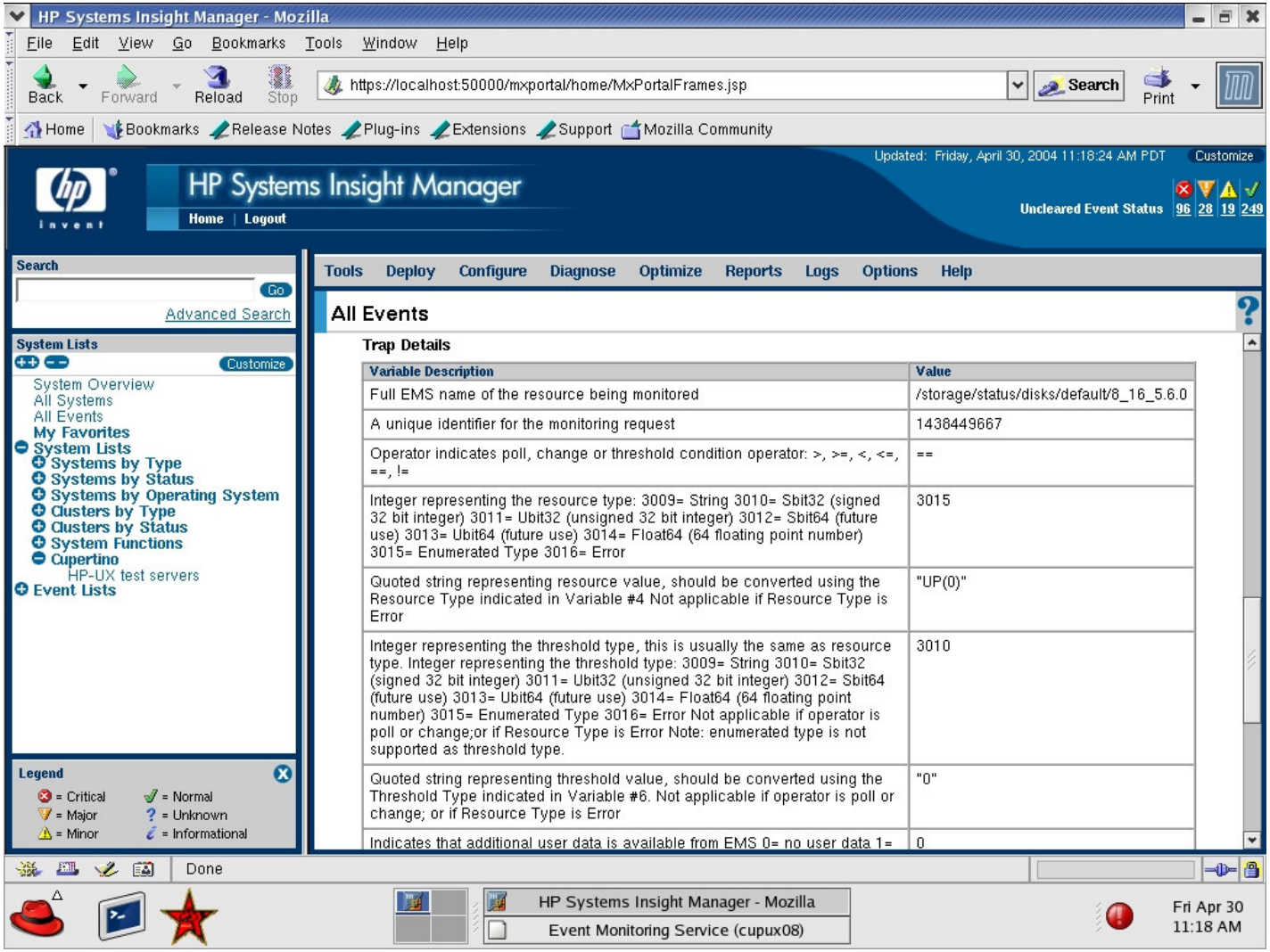
With EMS you can select from a large number of resources to monitor and send an SNMP trap when a threshold is reached.

Fault – HP-UX EMS HA Monitors



The SNMP traps from the HP-UX server show up in the Event List.

Fault – HP-UX EMS HA Monitors



Drilling down into the event shows the resource name being monitored.

Fault – HP-UX EMS Tips (HA & HW monitors)

1. To set up trust relationship between CMS and managed HP-UX server use **`mxagentconfig`** command on the CMS.
2. To run a X based tool like EMS you need to make sure you can display the X window from the computer you are browsing from. To add a X host to a Red Hat Linux computer use: **`xhost +hostname.`** On Windows computer you will need to run an Xserver tool like ReflectionX.
3. To add a trap destination to a managed HP-UX server, on that server:

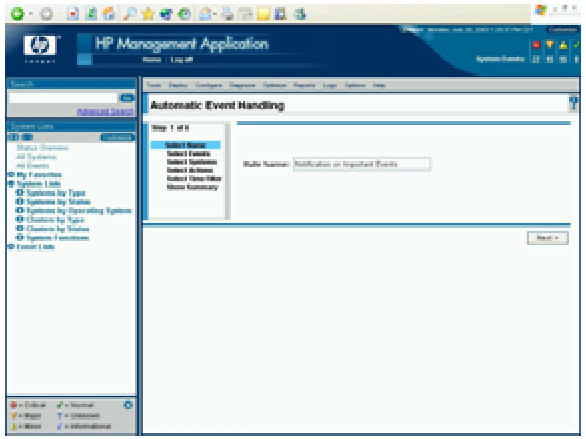
   Use: **`/sbin/init.d/SnmpMaster stop`** to stop SNMP process.

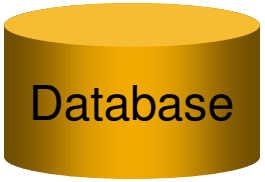
   Use: **`chmod +w snmpd.conf`** to allow file to be written to.

   Edit: **`/etc/SnmpAgent.d/snmpd.conf`** and uncomment "# trap-dest" and add the IP address of the HP SIM CMS

   Use: **`/sbin/init.d/SnmpMaster start`**

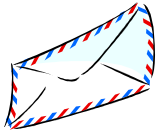
Fault - automated event handling



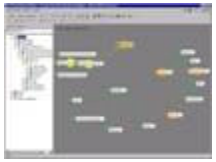


Send Page

Send E-mail



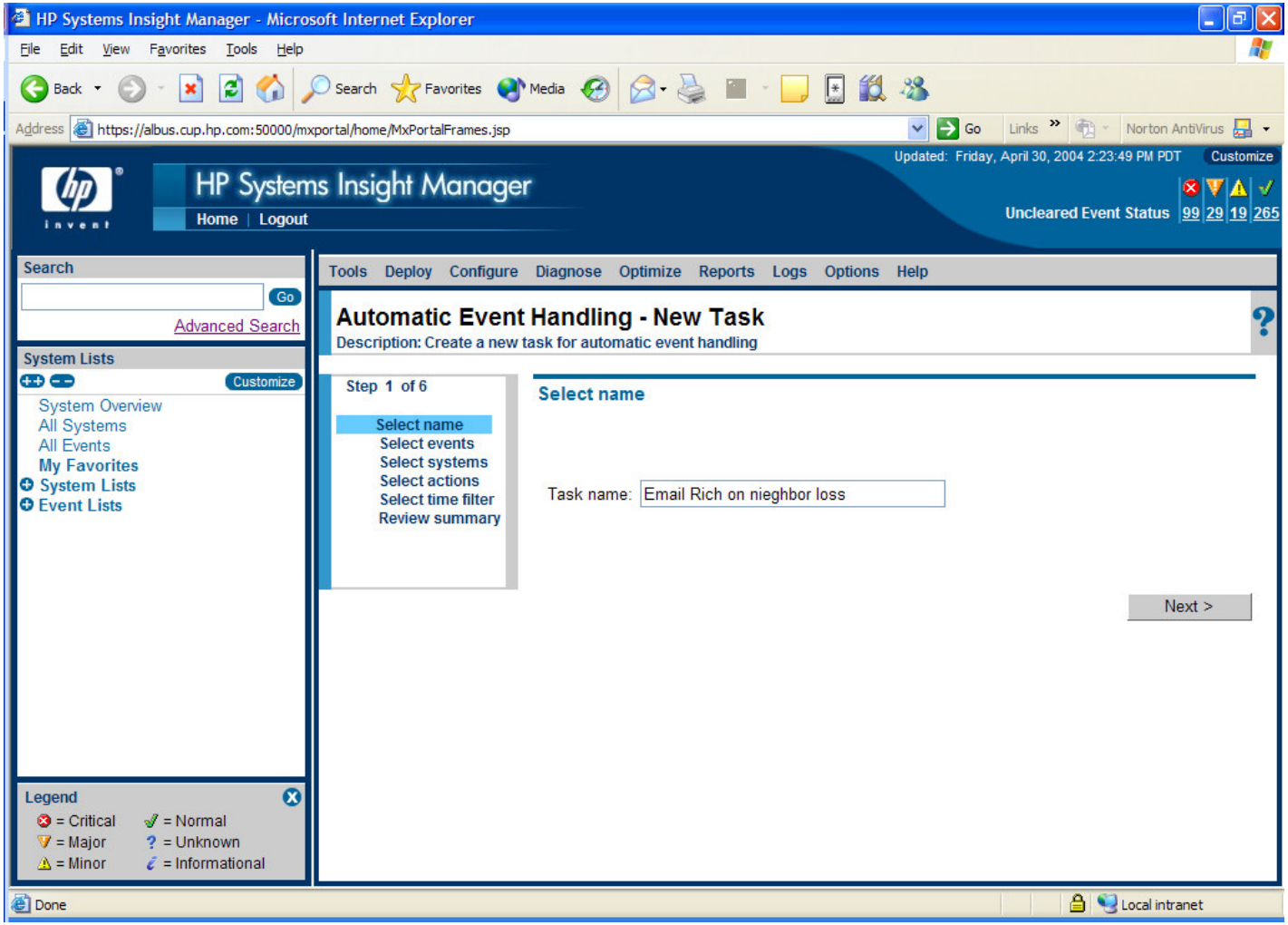
Forward Alert



Launch Script

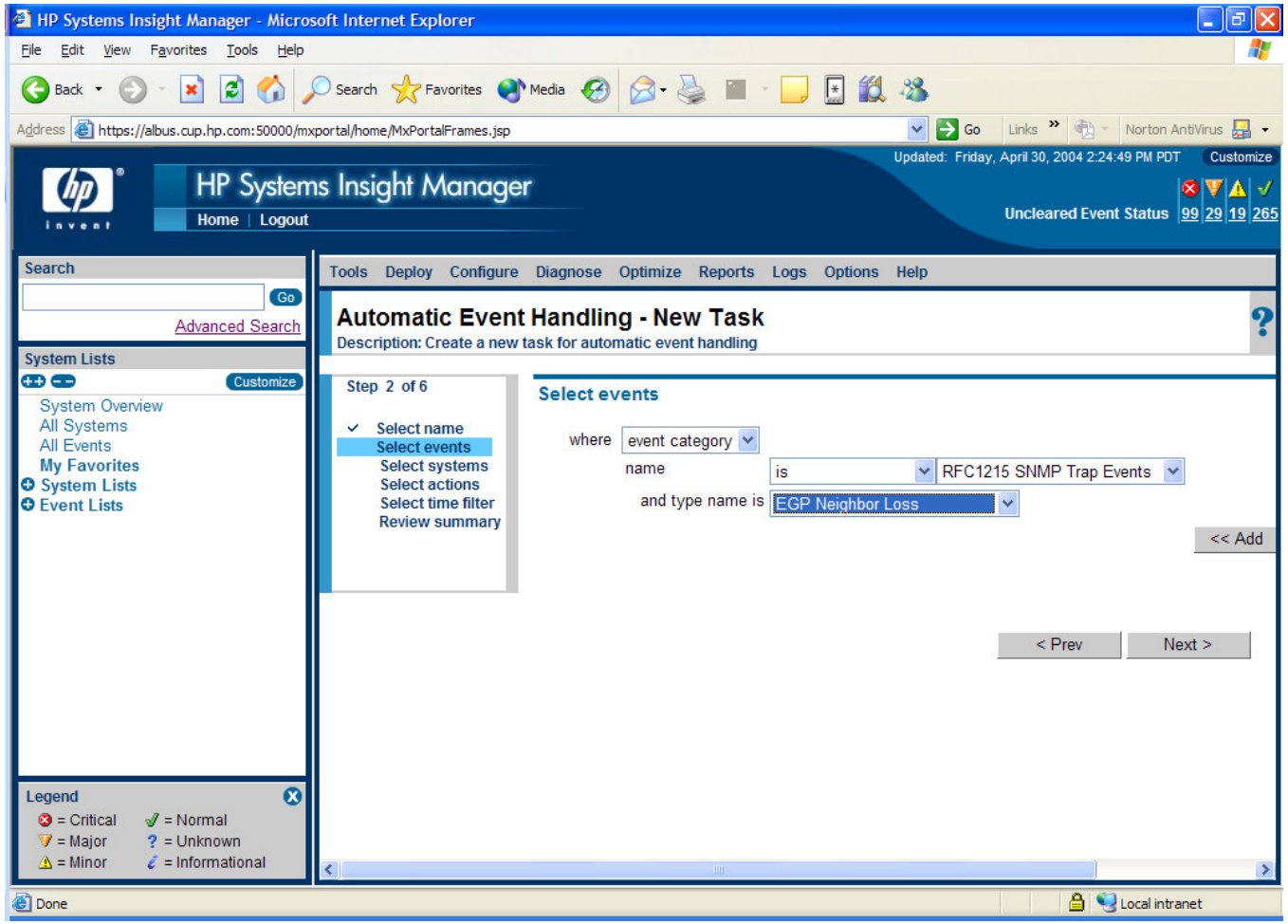
Send important event information
to the right place at the right time

Fault – Action on Events



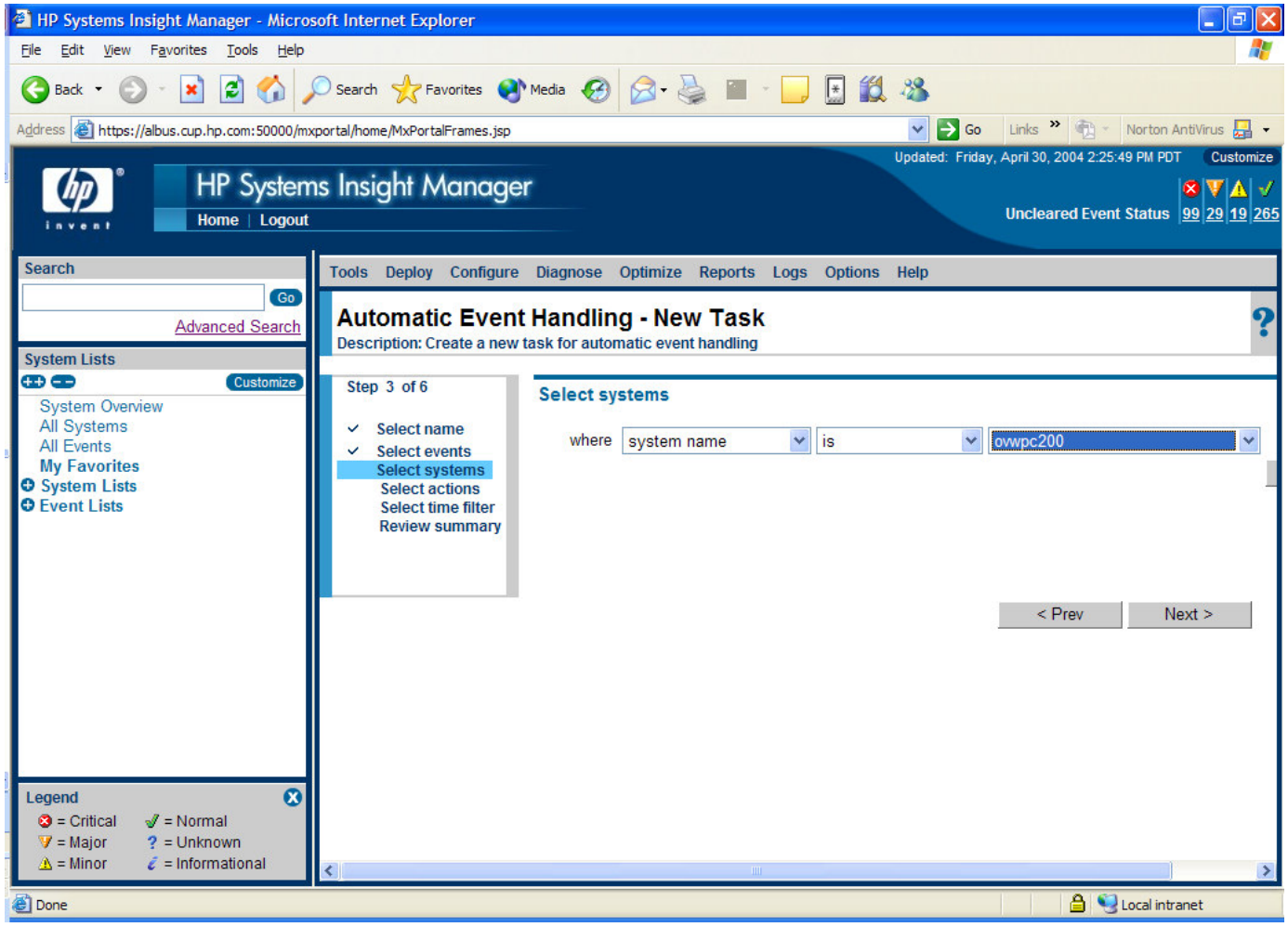
Create a new action on event task

Fault – Action on Events



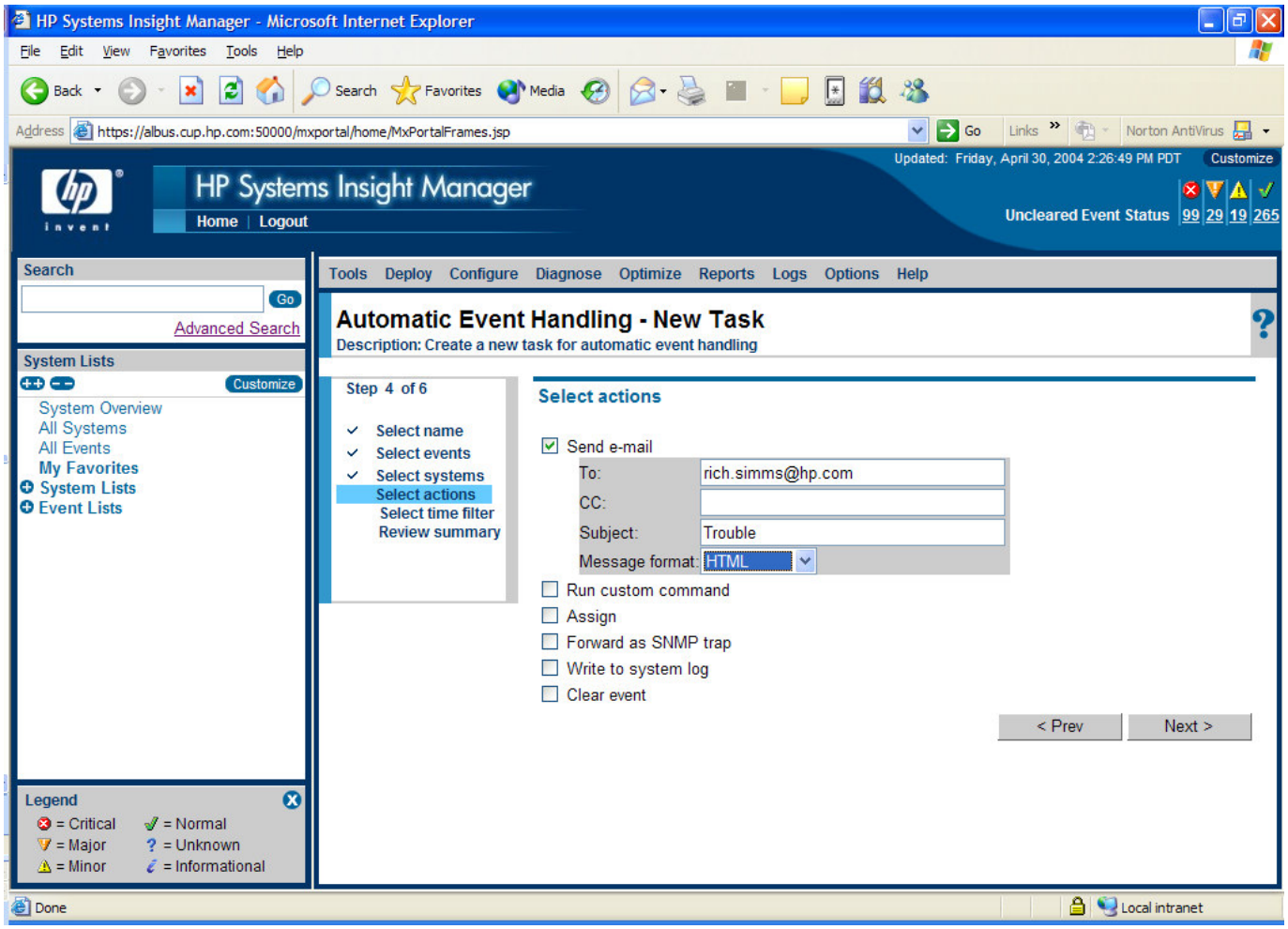
Select the event or events to take action on

Fault – Action on Events



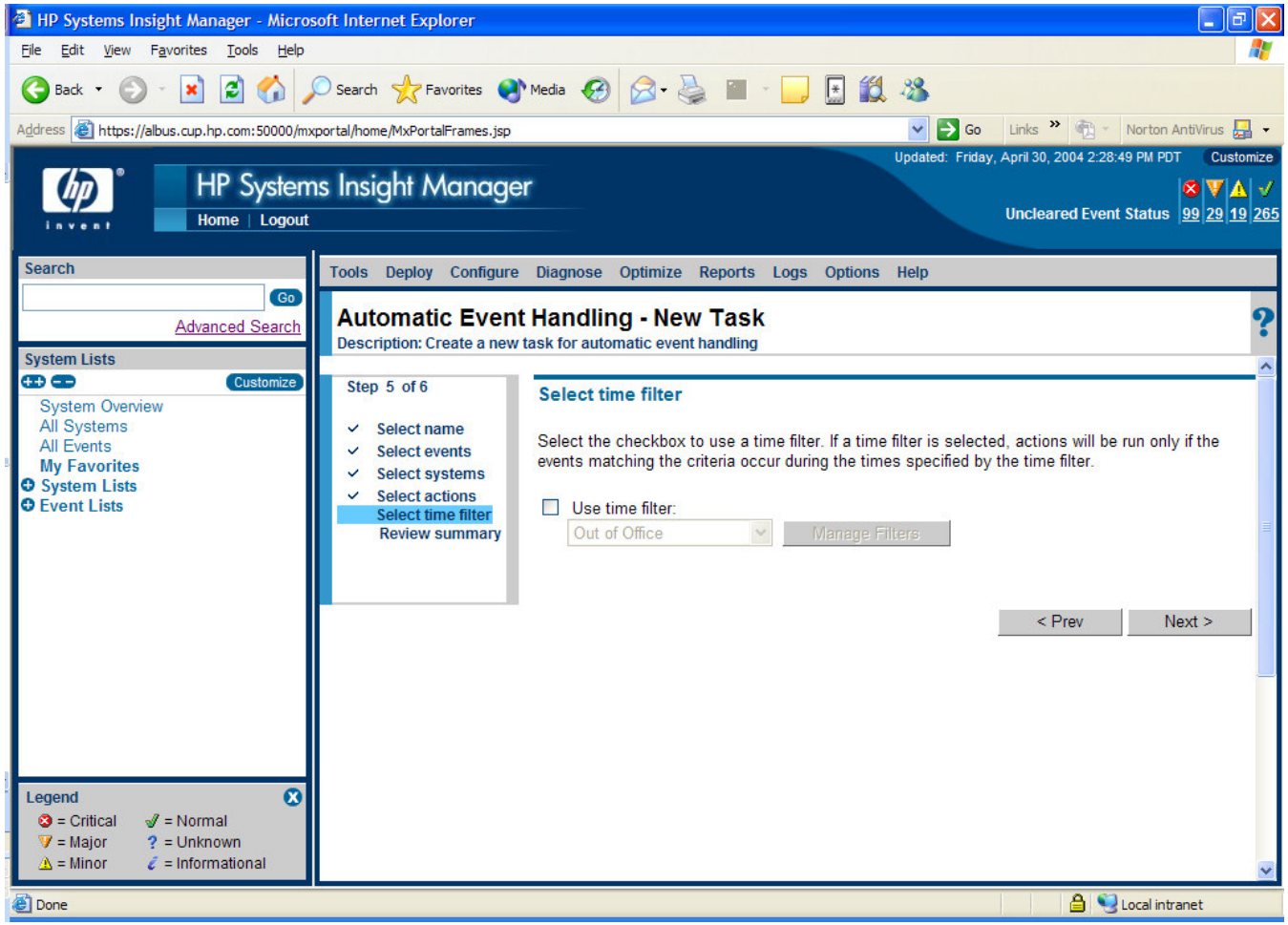
Select the systems that the new action task should apply to

Fault – Action on Events



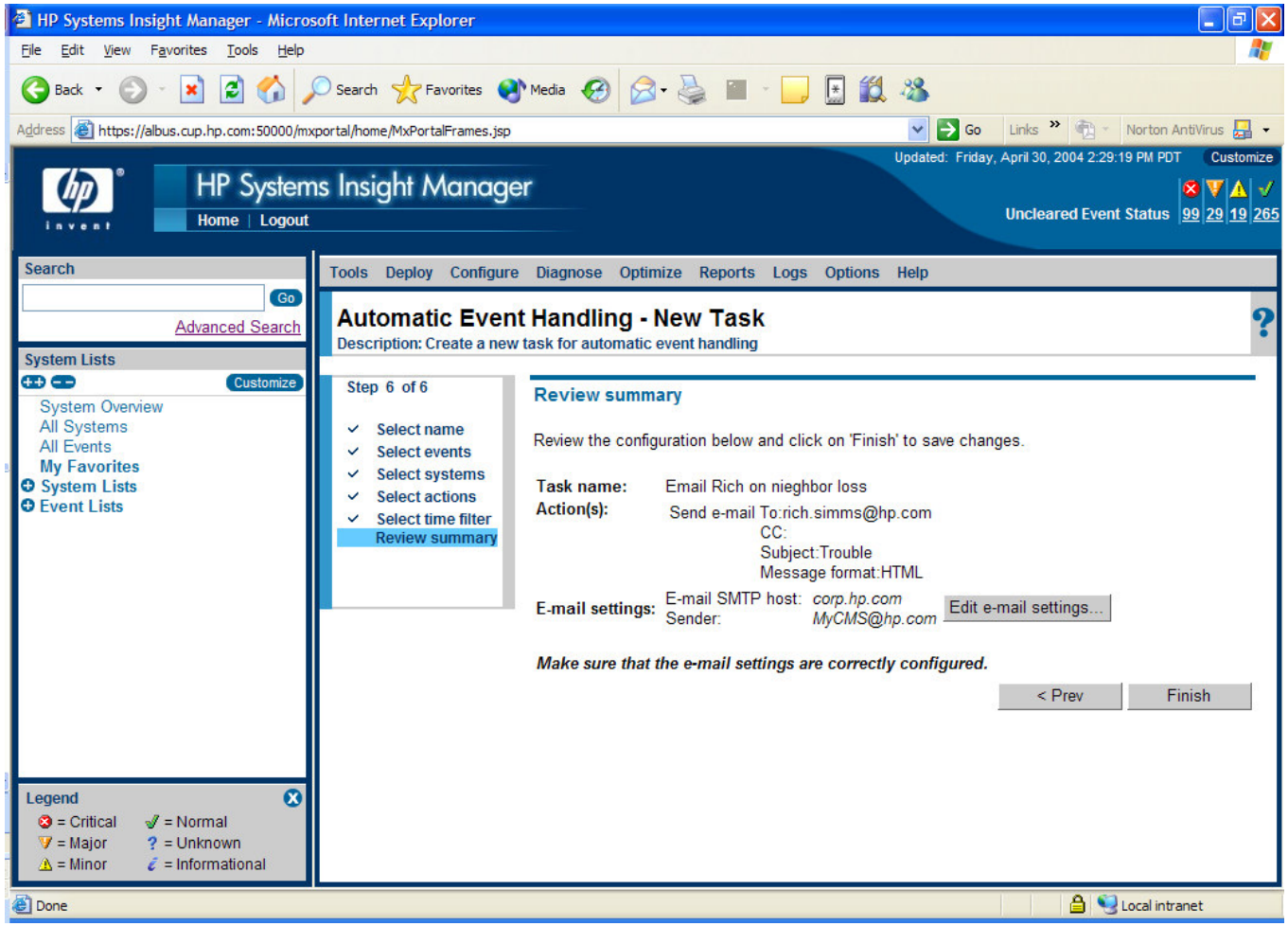
Select an action to take

Fault – Action on Events



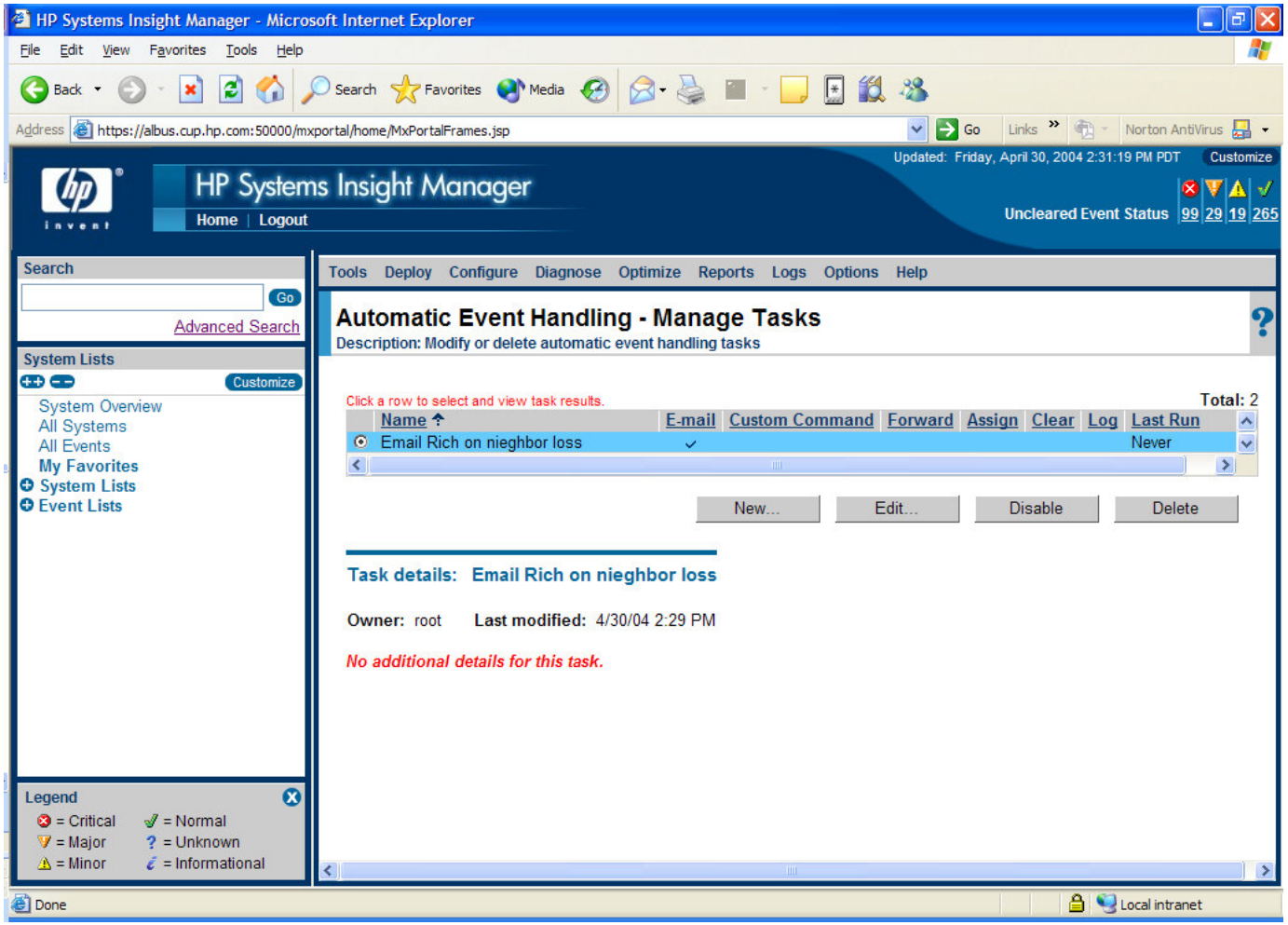
A time filter can be applied

Fault – Action on Events



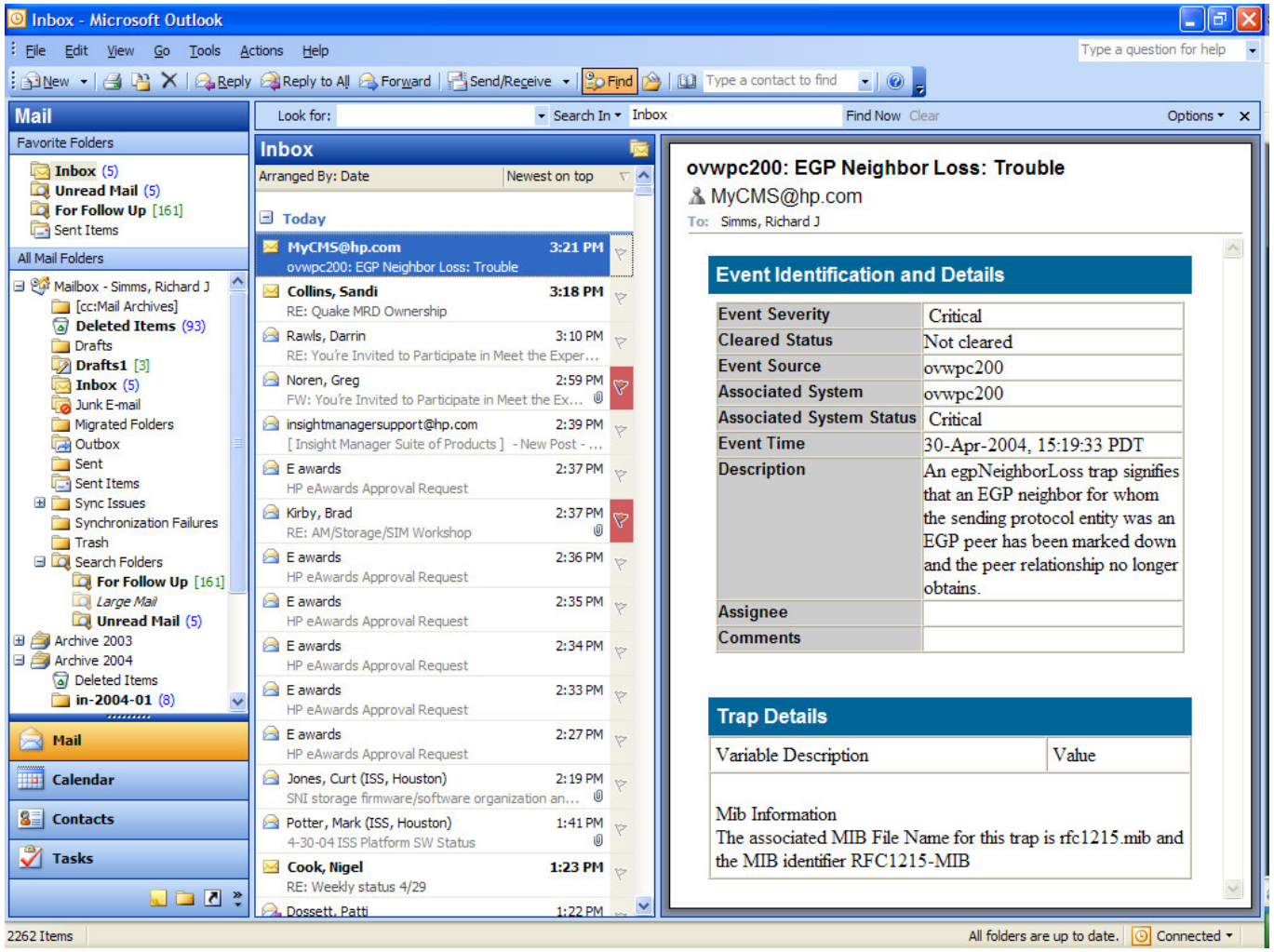
Review the new action of event task

Fault – Action on Events



The tasks can be monitored and edited as needed

Fault – Action on Events



Example of an email action

HP-UX EMS Hardware Monitors

EMS Hardware Monitors

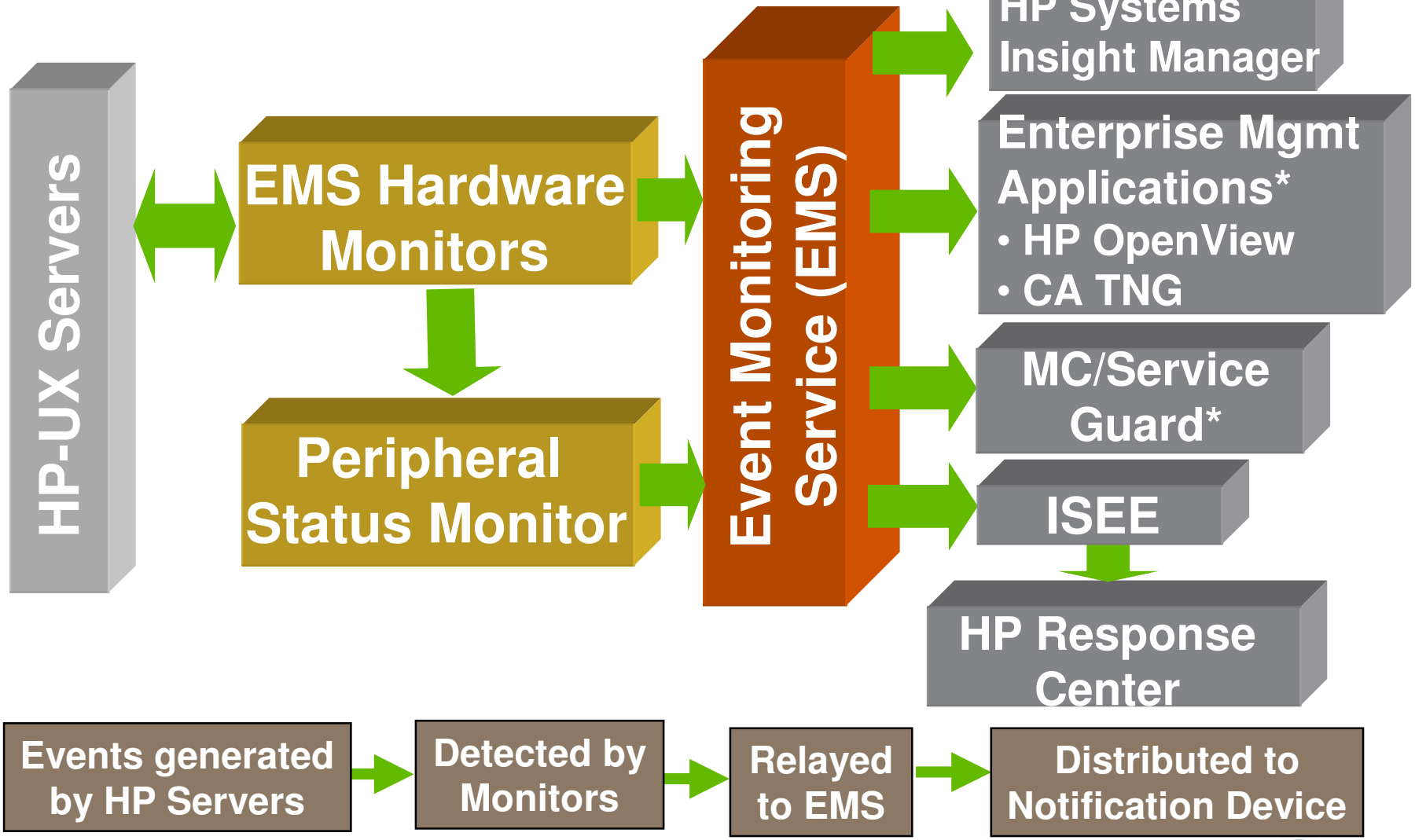
Introduction

- Hardware Monitoring Overview
- Hardware Monitoring Process
- Benefits of Hardware Monitoring
- Products Supported by Hardware Monitoring
- Available EMS Hardware Monitors

Hardware Monitoring Overview

- Hardware monitoring is part of the proactive fault management solution that gives you automatic fault detection, automatic fault isolation and automatic fault notification
- Included as base part of HP-UX (free) to provide a high level of protection against system hardware failures that could interrupt system operation or cause data loss
- Process of watching hardware resources for the occurrence of any unusual activity and reports the event to you using a variety of notification methods
  - Correctable error notifications are generated, even though the system may recover.
  - Excessive correctable errors generate different events with higher severity.
- Integrates easily with other management applications such as MC/ServiceGuard and HP OpenView, Instant Support Enterprise Ed.
  - Integrates with third party Enterprise System Management software such as CA Unicenter and IBM Tivoli (via SNMP traps or DMTF/WBEM indications)

Hardware Monitoring Process



Benefits of Hardware Monitoring

- Proactively monitors hardware resources
- Automated detection, isolation and notification of HW issues
- Easy to understand: problem description, probable cause, recommended action
- Reduce system downtime/time to repair
- Turnkey: Default monitoring configuration provided
- Allows various notification methods
- Integrate with Manageability applications & HP Support Services (Instant Support Enterprise Edition)
- Minimal maintenance

Products Supported by EMS Hardware Monitoring

- Server Platform
  - CPU, memory
  - chassis, interconnect, power, fans, etc.
- Disk Arrays
- Disk Products
- Tape Products
- High Availability Storage Systems
- Fibre Channel SCSI Multiplexers
- Fibre Channel Adapters
- Fibre Channel Arbitrated Loop Hubs
- Fibre Channel Switches
- Interface Cards

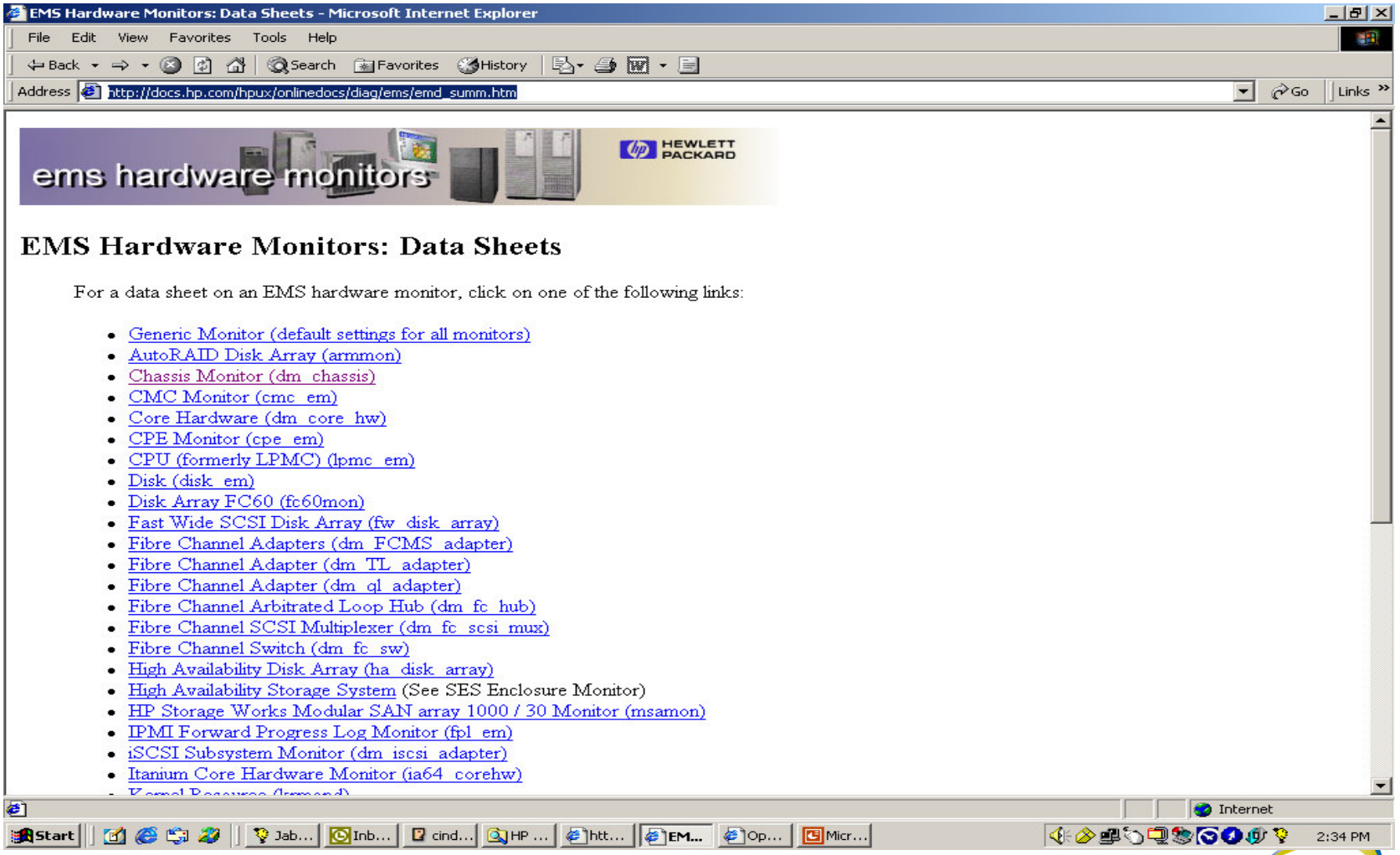
Available EMS HW Monitors

- For a list of available monitors:
  - See the EMS Hardware Monitors Reference Section.
  - Visit the EMS Hardware Monitors data sheets web page at: http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_summ.htm

Getting Details About a HW Monitor

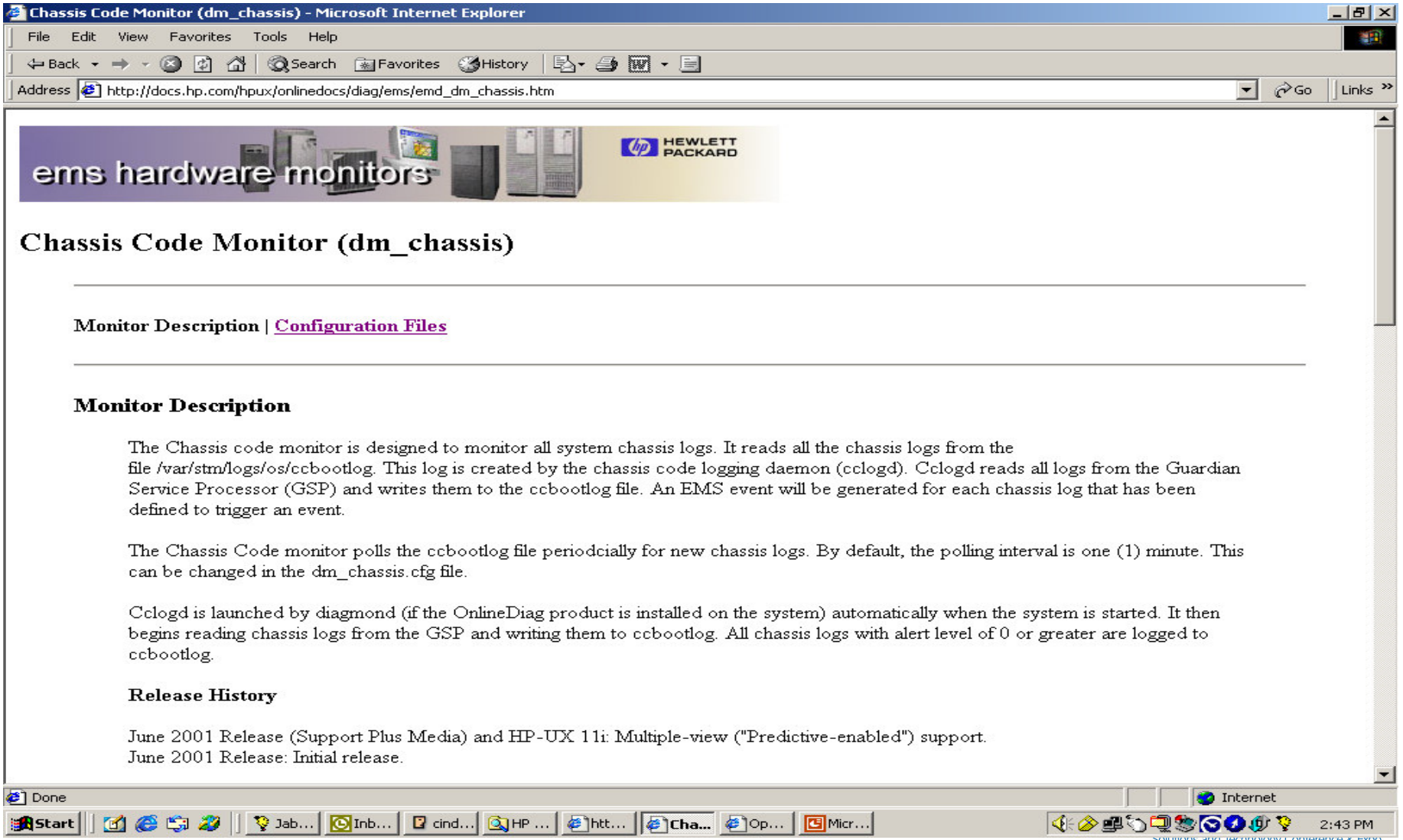
- Key information about each monitor is contained in the monitor data sheet, which provides:
  - What the monitor does and how it operates
  - When the monitor was released or underwent major changes
  - Firmware, OS versions, etc. required to properly operate
  - Resource path for the monitor
  - Whether it supports automatic PSM state control
  - Monitor name
  - Locations, names, and default values for all configuration files
- Basic information can be obtained from HP-UX man page
  - *man <MONITOR_NAME>*

EMS Hardware Monitors Data Sheets Web Page



http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_summ.htm

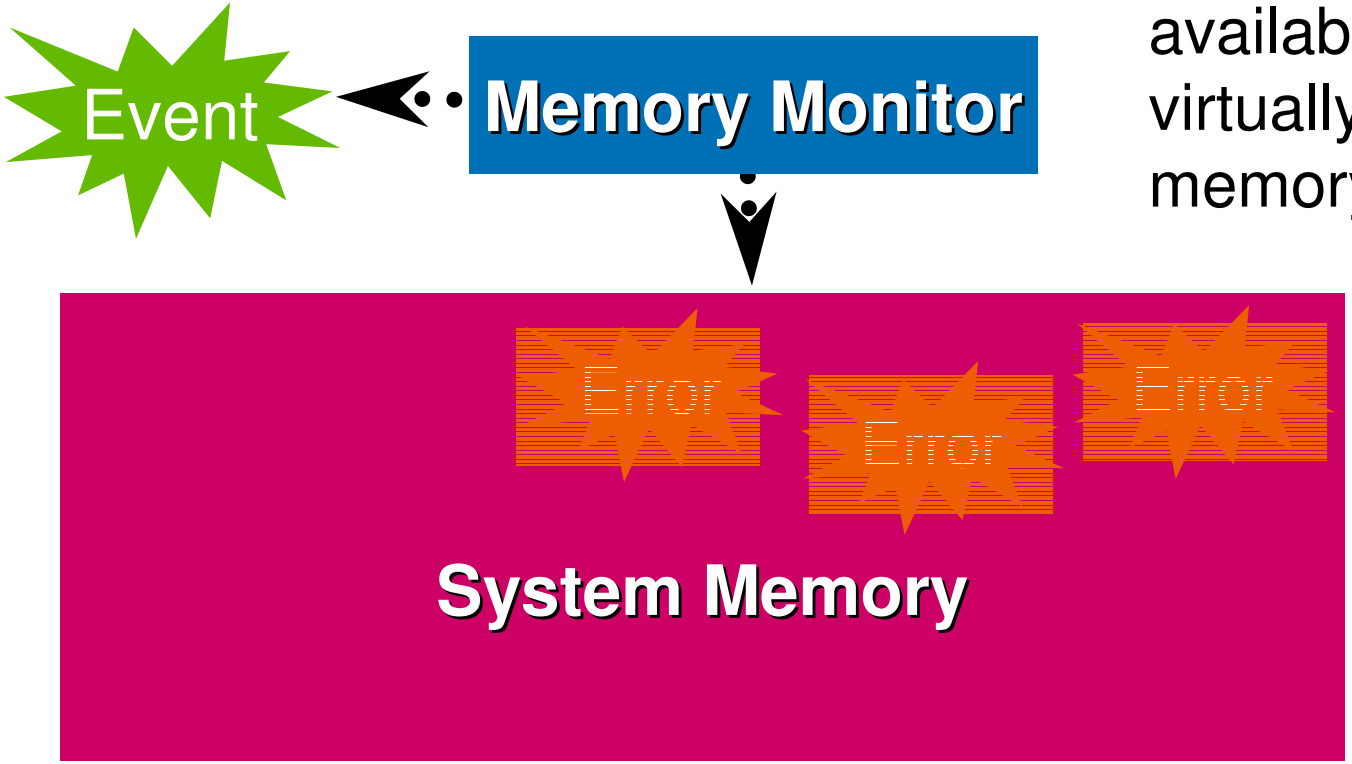
EMS Hardware Monitor Data Sheet Example



Example: Memory Monitor

Dynamic Memory Resilience

Monitors the rate of correctable errors in the system memory

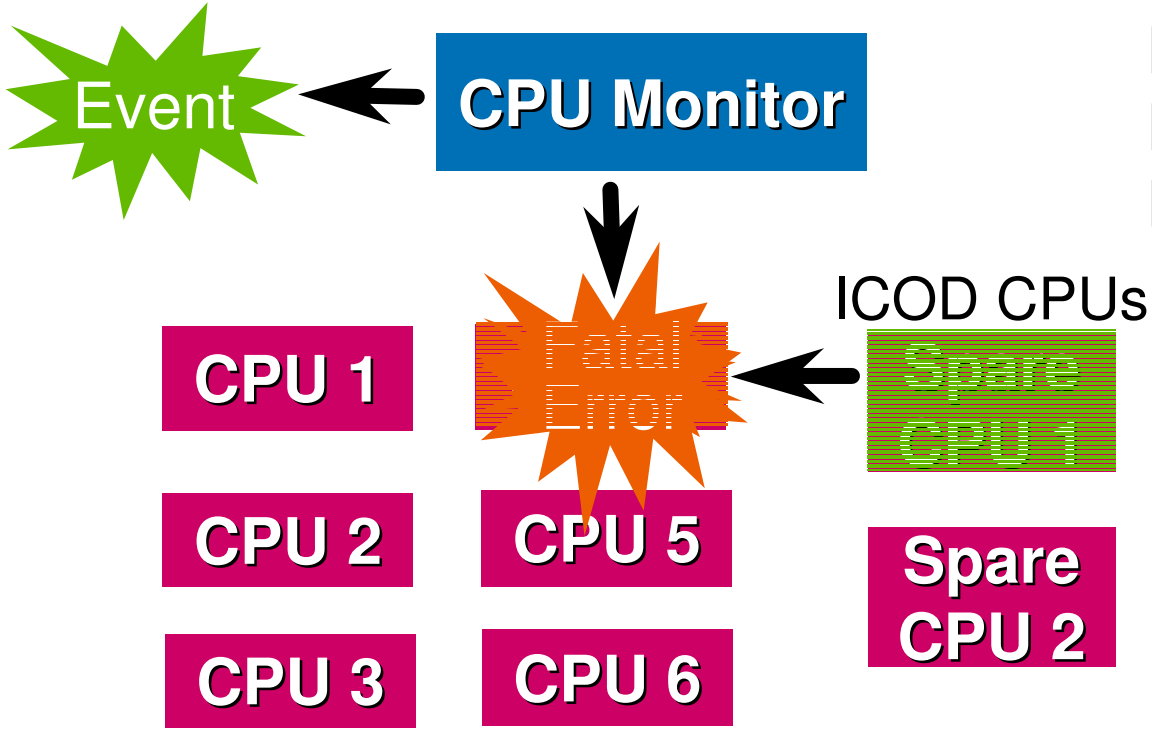


Improves system availability with virtually no visible memory loss to you!

Example: CPU Monitor

Dynamic Processor Resilience

Monitors the rate of correctable errors in each processor's on-board cache



HP proven technology

Provides:

No system crash

No performance loss

No resource loss

completely transparent to the end-users!

EMS Hardware Monitors

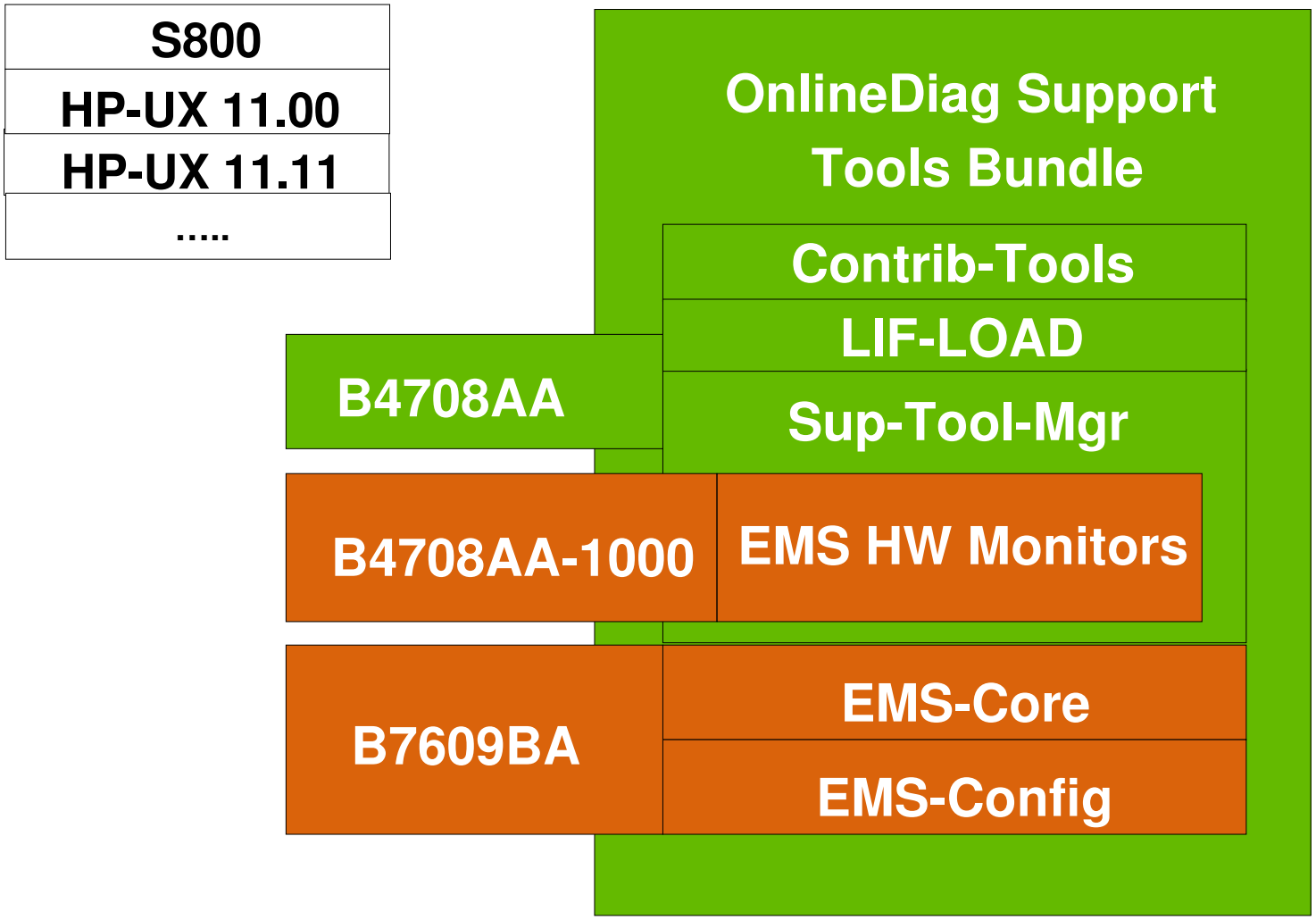
Installation

- Installing EMS Hardware Monitors
- Product Structure

Installing EMS Hardware Monitors

- By default, the Diagnostics and Support Tools are AUTOMATICALLY installed when you install the HP-UX operating system
- New versions of the Diagnostics and Support Tools are released
  - Incorporate improvements to the interface, tools, or functionality
  - Support new functionality or new hardware
- A copy of the OnlineDiag Software Depot can be obtained from:
  - HP-UX Operating System software
  - Support Plus CD-ROM
  - HP Software Depot (http://www.software.hp.com)

EMS HW Product Structure



EMS Hardware Monitors

Usage and Operation

- Monitoring Request Overview
- Default HW Event Notification & Logging
- Anatomy of Notification Subscription
- Notification Methods
- Event Severity Levels
- Monitoring Request Manager

HW Monitoring Request Overview

- Used to implement your strategy for monitoring hardware resources
- Mechanism by which you manage how hardware event notification takes place
- Used to determine the following:
  - What events should be reported
  - What notification method should be used to report the events
- Monitoring Request Example:
  - Send events generated by all monitors with severity >= SERIOUS to EMAIL sysad@hp.com

Default HW Event Notification & Logging

Severity Levels	Notification Methods
All (> = INFORMATION)	Text Log File: */var/opt/resmon/log/event.log*
Major Warning, Serious, Critical	SYSLOG: */var/adm/syslog/syslog.log*
Major Warning, Serious, Critical	EMAIL: *Root* email address

Anatomy of Notification Subscription

EMS Hardware Monitor

This setting identifies what Hardware you want to monitor. You can select multiple monitors for each request.

Severity Level:
Critical = 5
Serious = 4
Major Warning = 3
Minor Warning = 2
Information = 1

+

Operator
=
>
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!

Together, these settings identify what events you want reported. You can select one pair of settings for each request.

Notification Method

This setting identifies the Notification method to use when an event occurs. You can select only one notification method for each request.

Notification Methods

NOTIFICATION METHOD	NOTIFICATION TARGET
Write to syslog	*/var/adm/syslog/syslog.log*
Write to console	System console
Write to text log	User defined text log (default: */var/opt/resmon/log/event.log*)
Send via eMail	User defined eMail address (default: eMail root)
Send via TCP/UDP	User written socket program – host & port specified
Send via SNMP	Any application configured to receive SNMP msgs
Send OPC format	Templates provided for integration with HP OpenView IT/O

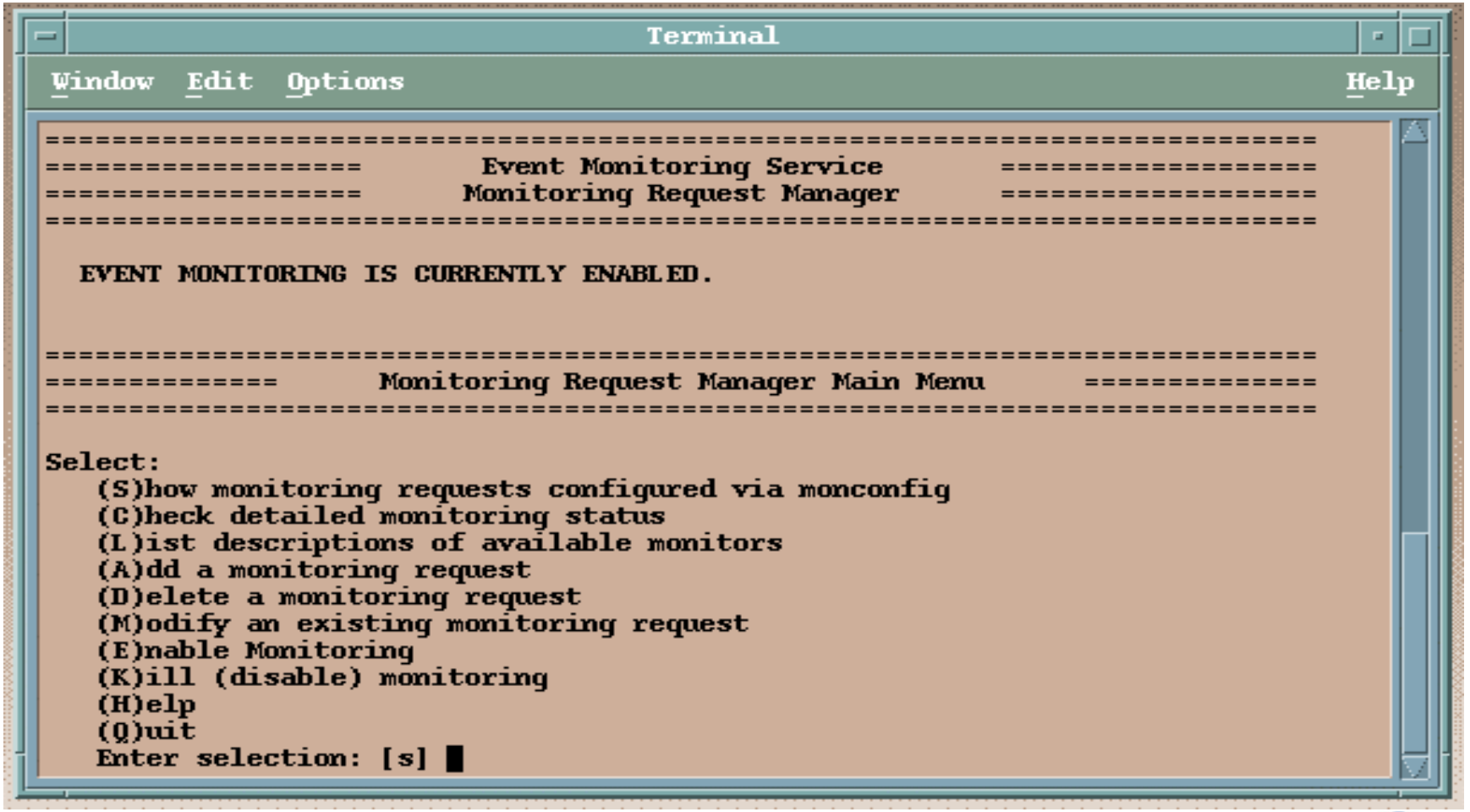
Event Severity Levels

Critical	**An event that will or has already caused data loss, system down time, or other loss of service. System operation will be impacted and normal use of the HW should not continue until the problem is corrected. Immediate action is required to correct the problem.**
Serious	**An event that may cause data loss, system down time, or other loss of service if left uncorrected. System operation and normal use of the HW may be impacted. The problem should be repaired as soon as possible.**
Major Warning	**An event that could escalate to a Serious condition if not corrected. System operation should not be impacted and normal use of the HW can continue. The problem should be repaired at a convenient time.**
Minor Warning	**An event that will not likely escalate to a more severe condition if left uncorrected. System operation will not be interrupted and normal use of the hardware can continue. The problem can be repaired at a convenient time.**
Information	**An event that occurs as part of the normal operation of the hardware. No action is required.**

EMS HW Monitoring Request Manager

- A tool provided to you for creating and managing hardware monitoring requests
- To run the Monitoring Request Manager, you must be logged on as *root*
- Type */etc/opt/resmon/lbin/monconfig*

HW Monitoring Request Manager: Opening Screen



HW Monitoring Request Manager: Functions (1 of 3)

- Enable hardware event monitoring
  - Use the “(E)nable Monitoring” selection to enable hardware event monitoring if it is not already enabled
- List monitor description
  - Use the “(L)ist descriptions of available monitors” selection to list the descriptions of the available monitors and the hardware type each monitor supports
- View current monitoring requests
  - Use the “(S)how monitoring requests configured via monconfig” selection to view a list of all the current monitoring requests (both active and inactive)

HW Monitoring Request Manager: Functions (2 of 3)

- Add monitoring requests
  - Use the “(A)dd a monitoring request” selection to add a new monitoring request
- Modify monitoring requests
  - Use the “(M)odify an existing monitoring request” selection to alter one of the settings used in the monitoring request
- Check detailed monitoring status
  - Use the “(C)heck detailed monitoring status” selection to view a list of all the active monitoring requests

HW Monitoring Request Manager: Functions (3 of 3)

- Delete monitoring requests
  - Use the “(D)elete a monitoring request” selection to delete a monitoring request
  - USE WITH CAUTION: Only monitoring requests created exclusively for the hardware resource that has been removed from your system should be deleted
- Disable hardware event monitoring
  - Use the “(K)ill (disable) monitoring” selection to disable hardware event monitoring
  - USE WITH EXTREME CAUTION: While hardware event monitoring is disabled, your hardware resources are vulnerable to undetected failures

EMS Hardware Monitors

Detailed Picture of Hardware Monitoring

- Hardware Monitoring Components
- Event Detection Methods
- Peripheral Status Monitor (PSM)
- Monitor Configuration Files
- Event Messages

Hardware Monitoring Components

- Event Monitoring System (EMS):
  - The framework for event notification
- Hardware event monitoring components:
  - The EMS Hardware Monitors
  - The associated configuration files
  - The Monitoring Request Manager (monconfig)
- Support Tools Manager (STM):
  - The low-level handling components that are also used for recording and viewing system errors
  - The map used by the EMS Hardware Monitors to determine which devices they should be watching

Event Detection Methods

- Two event detection methods and a monitor may use one or both of the methods to detect events
- Polling Method
  - Checks the status of its hardware resources at regular intervals for any unusual condition reported by the hardware
  - Polling interval is selected to provide reasonable detection without impacting system performance
- Asynchronous Method
  - Allows a monitor to detect an event when it occurs to allow immediate notification and response to a critical situation

Peripheral Status Monitor

EMS Hardware Monitor

The HW event monitor assigns a severity level to each event and passes it to the PSM.

Peripheral Status Monitor (PSM)

The PSM converts the severity level of the event to a device status (UP or DOWN) and passes the status to EMS.

Event Monitoring Service (EMS)

EMS Notification

If a PSM monitoring request has been created for the resource (via SAM), the specified notification method is used to alert you.

To MC/ ServiceGuard

If the resource is configured as an MC/ServiceGuard package dependency, EMS alerts MC/SG to the change in state. If the status of the resource has changed to DOWN, MC/SG will fail-over the package.

Monitor Configuration Files

- Several configuration files are used to control the operation of each EMS Hardware Monitor
  - Located in */var/stm/config/tools/monitor/* directory
- The default configuration settings for each monitor have been carefully selected to provide efficient monitoring for most systems, it is not recommended to alter these settings unless you fully understand the implications of doing so
- For more detailed information on Monitor Configuration Files, see the EMS Hardware Monitors Reference Section.

Retrieving Event Messages

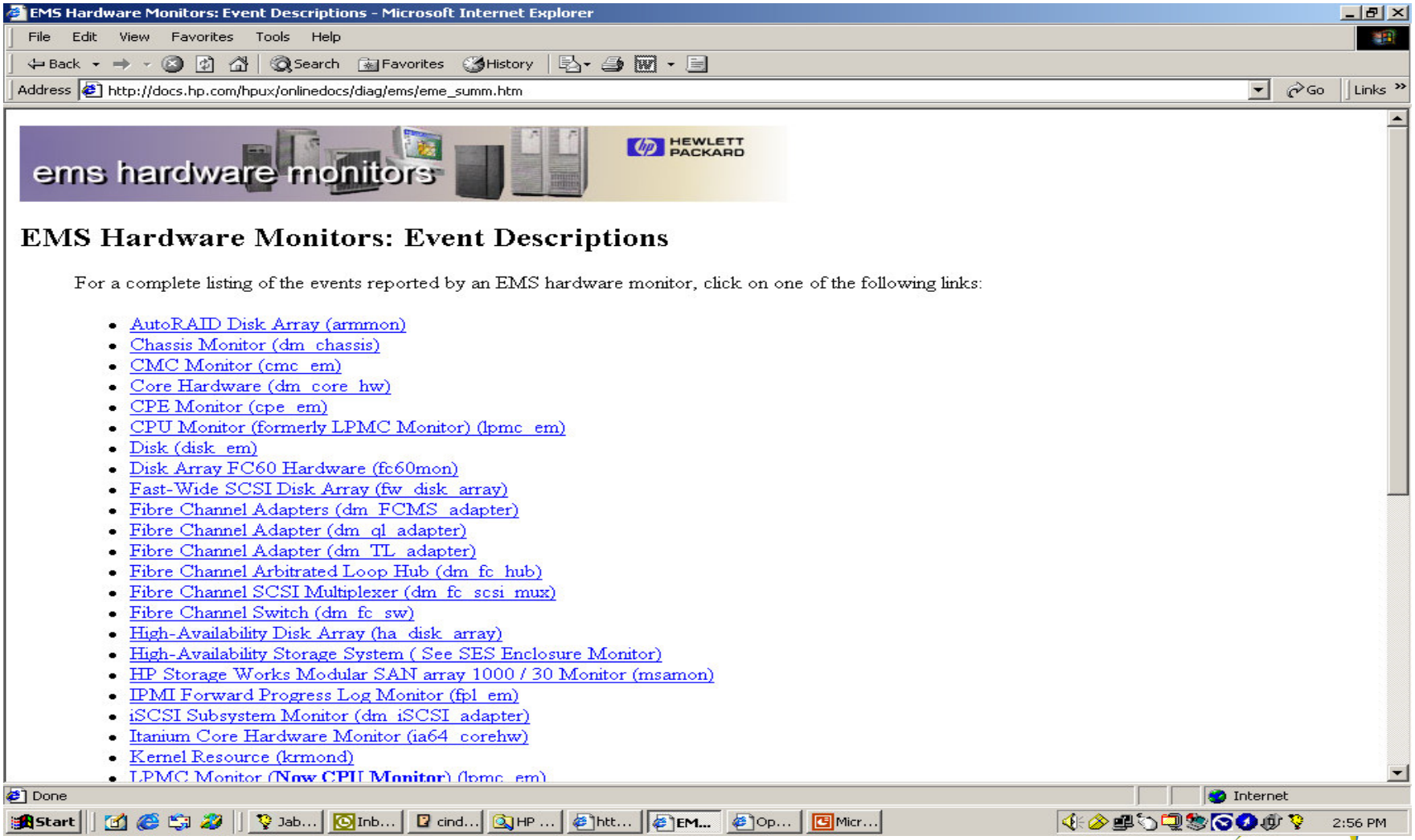
- Email and text file notification methods deliver the entire content of the event message
- Other notification methods (such as console, syslog) alert you to the occurrence of an event
  - You will need to use the *resdata* utility in order to retrieve the entire content of the event message

Interpreting Event Messages

- Information contained in an event message:
  - Notification time
  - Value that triggered event
  - Event data from monitor
  - Description of error
  - Probable cause
  - Recommended action
  - Additional event and system data
  - Hardware resource information

EMS Hardware Monitors Event Descriptions

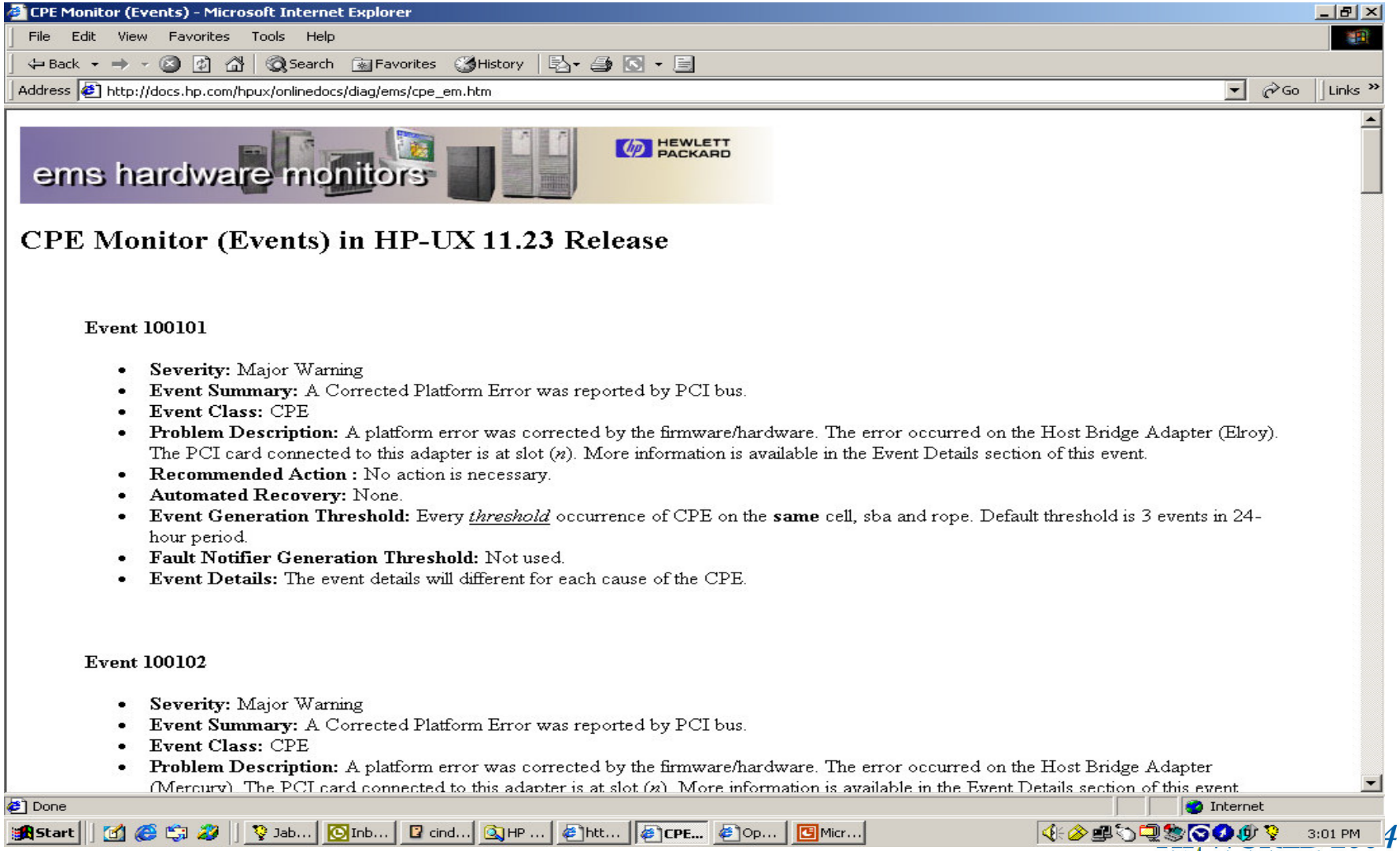
http://docs.hp.com/hpux/onlinedocs/diag/ems/eme_summ.htm



http://docs.hp.com/hpux/onlinedocs/diag/ems/eme_summ.htm

Ems Hardware Monitors Event Description

http://docs.hp.com/hpux/onlinedocs/diag/ems/cpe_em.htm



Sample Event Message
Event #4500, memory_ia64 (1 of 3)

```
>-------- Event Monitoring Service Event Notification -------<

Notification Time: Thu Apr 11 18:17:02 2003

hpdst351 sent Event Monitor notification information:

/system/events/memory_ia64/memory is >= 1.
Its current value is CRITICAL(5).

Event data from monitor:
Event Time..........: Thu Apr 11 18:17:01 2003
Severity............: CRITICAL
Monitor.............: memory_ia64
Event #.............: 4500
System..............: hpdst351.cup.hp.com

Summary:
     Memory Event Type : Single bit error (SBE) event.  A
     correctable single bit error has been detected and logged.

Description of Error:
    The memory component: Cab 1 Cell 0 DIMM 0A
    is experiencing an excessive rate of single bit errors on
    a single component.
```

Sample Event Message
Event #4500, memory_ia64 (2 of 3)

Probable Cause / Recommended Action:

Although the single bit errors are being corrected, it is strongly advisable to monitor the situation. This condition can indicate a potential problem. Contact your memory vendor support representative to check the memory boards.

Additional Event Data:

```
System IP Address...: 15.16.130.249
Event Id.............: 0x3cb6358d00000002
Monitor Version.....: B.01.00
Event Class.........: Memory
Client Configuration File...........:
/var/stm/config/tools/monitor/default_memory_ia64.clcfg
Client Configuration File Version...: A.01.00
     Qualification criteria met.
          Number of events..: 320
          Received within...: 7 day(s)
Associated OS error log entry id(s):
     None
```

Sample Event Message
Event #4500, memory_ia64 (3 of 3)

```
Additional System Data:
     System Model Number.........: ia64 hp superdome server SD64A
     EMS Version.................: A.04.00
     STM Version.................: B.40.00
     OS Version..................: B.11.23
     Latest information on this event:

          http://docs.hp.com/hpux/content/hardware/ems/memory_ia64.htm#4500


v-v-v-v-v-v-v-v-v-v    D  E  T  A  I  L  S    v-v-v-v-v-v-v-v-v-v
Component Data:
     DIMM Location...........: Cab 1 Cell 0 DIMM 0A
     Serial Number...........: A56E03466111
     Part Number.............: A5198-60001

>------ End Event Monitoring Service Event Notification -------<
```

EMS Hardware Monitors

Tips, Tricks

- Push EMS Hardware Monitors Configuration to Multiple Systems
- Disable an EMS Hardware Monitor for a Single Instance
- Controlling Individual EMS Hardware Monitor Events
- Troubleshooting EMS Hardware Monitors

Push EMS Hardware Monitors Configuration to Multiple Systems

- Create all the necessary monitoring requests on one system via the Monitoring Request Manager
- Perform further edits, if any, in the other configuration files
- For each system where the new configuration is desired, copy all files in */var/stm/config/tools/monitor/* to the new system
- Execute */etc/opt/resmon/lbin/startcfg_client* to enable the new configuration on the new system

Disable an EMS HW Monitor for a Single Instance (1 of 2)

- To temporarily stop the reporting of the error message on a hardware instance only after you have acknowledged the event and until you get the hardware instance working again
- You can now use the */var/stm/data/tools/monitor/disabled_instances* text file to list all the instances that you wanted to disable
  - Fully qualified instances listed, one per line
  - Wildcards can be used in the instance names
- Instances listed in the disabled instance file will show no monitoring requests in monconfig
  - The monitor will not stop polling the device but any events will not be forwarded to the log files

Disable an EMS HW Monitor for a Single Instance (2 of 2)

- Perform the following:
  - Add/delete/modify instances in the disabled_instances file
  - Run the Monitoring Request Manager and execute (E)nable Monitoring
- USE WITH CAUTION!

Controlling Individual EMS Hardware Monitor Events

- For multiple-view monitors, you can control the way a monitor reports individual events by modifying the client configuration files (.clcfg) for the monitor
- To control the qualification criteria on when a monitor should generate an event to meet your monitoring and notification strategy
- For each event:
  - Severity
  - Enable flag
  - Suppression time
  - Threshold
- USE WITH CAUTION!

Troubleshooting EMS Hardware Monitors (1 of 2)

- To check if EMS Hardware Monitors are functioning:
  - Run the Monitoring Request Manager
  - The initial screen tells you whether hardware monitoring is enabled
  - List all monitoring requests that have been created by executing (S)how monitoring request configured via monconfig
  - List all currently active monitoring requests by executing (C)heck detailed monitoring status
- To verify if EMS Hardware Monitors are working:
  - For multiple-view monitors, use the *send_test_event* program to have the monitor generate a test event
  - */etc/opt/resmon/lbin/send_test_event –v –a <monitor_name>*

Troubleshooting EMS Hardware Monitors (2 of 2)

- To check if EMS Hardware Monitors are properly functioning:
  - Check the *api.log* file for any error messages logged by the monitor
  - Used to indicate if there were any errors encountered when trying to perform its operation of monitoring the hardware resource
  - Located in the */etc/opt/resmon/log/* directory
  - Any error messages logged will identify the error, indicate the probable cause(s), and recommend action to the error encountered

EMS Troubleshooting Tips

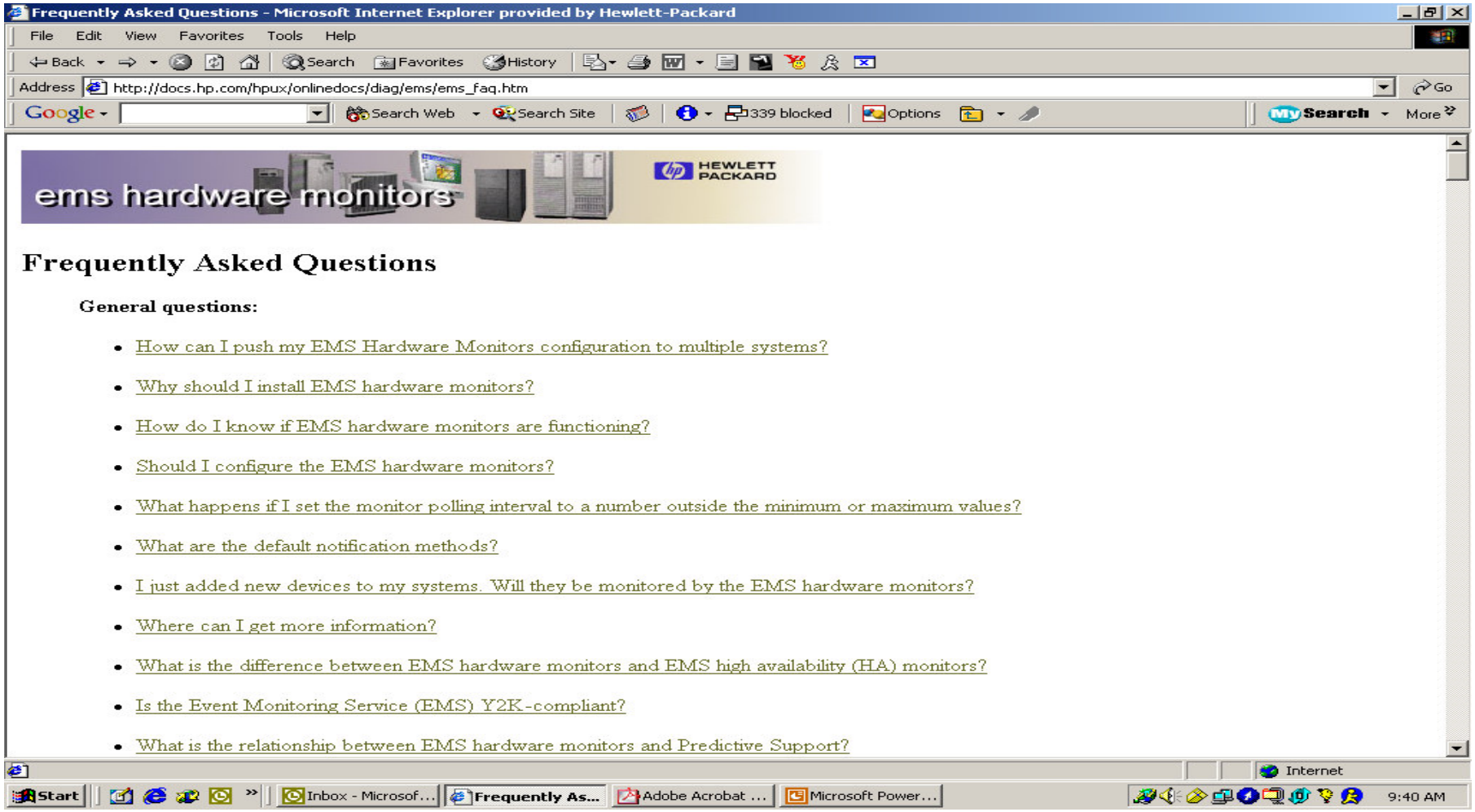
Frequently asked questions can be found at the following website:

http://docs.hp.com/hpux/onlinedocs/diag/ems/ems_faq.htm

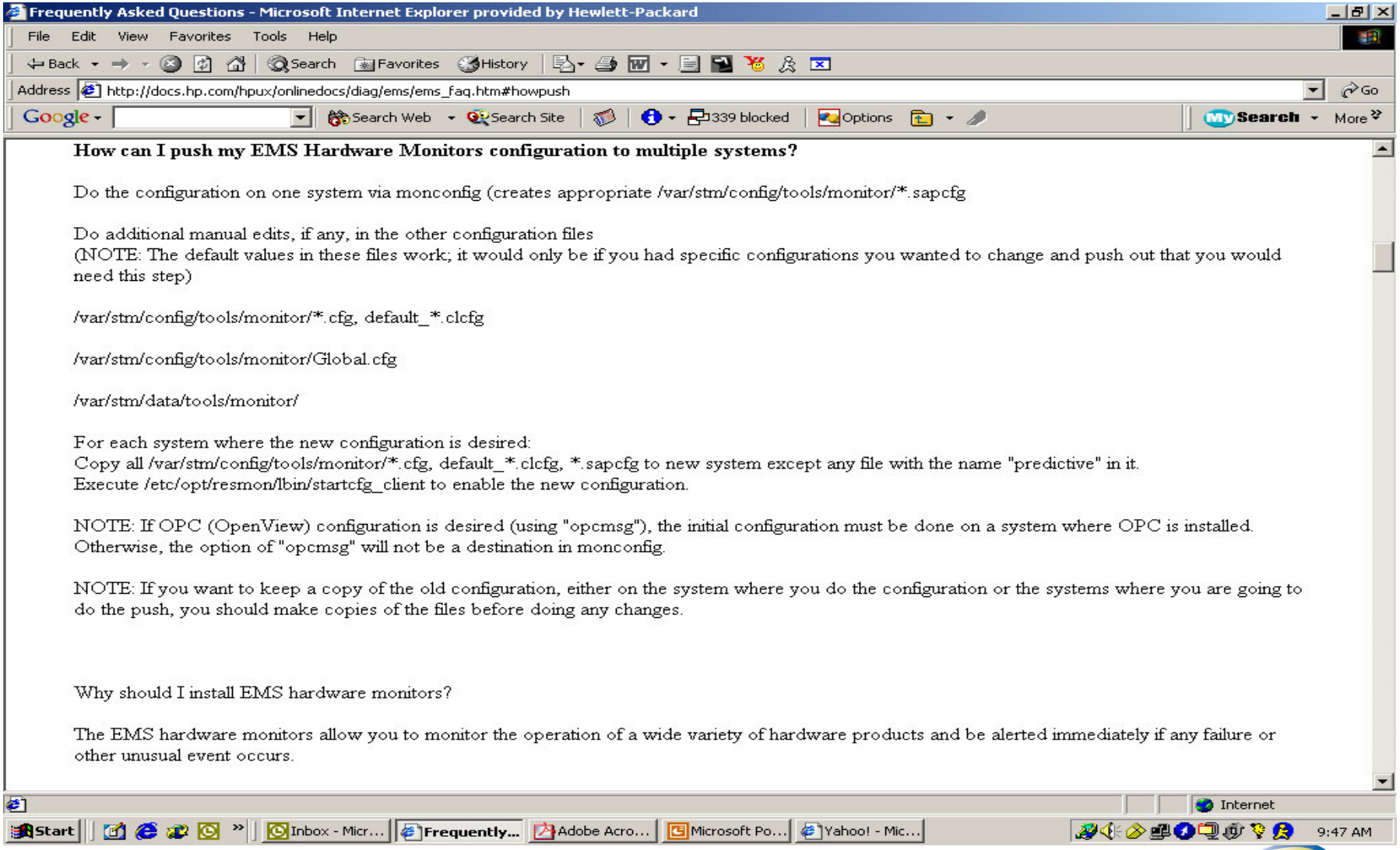
This site offers answers to general questions, and solutions to some of the most common problems.

Example:

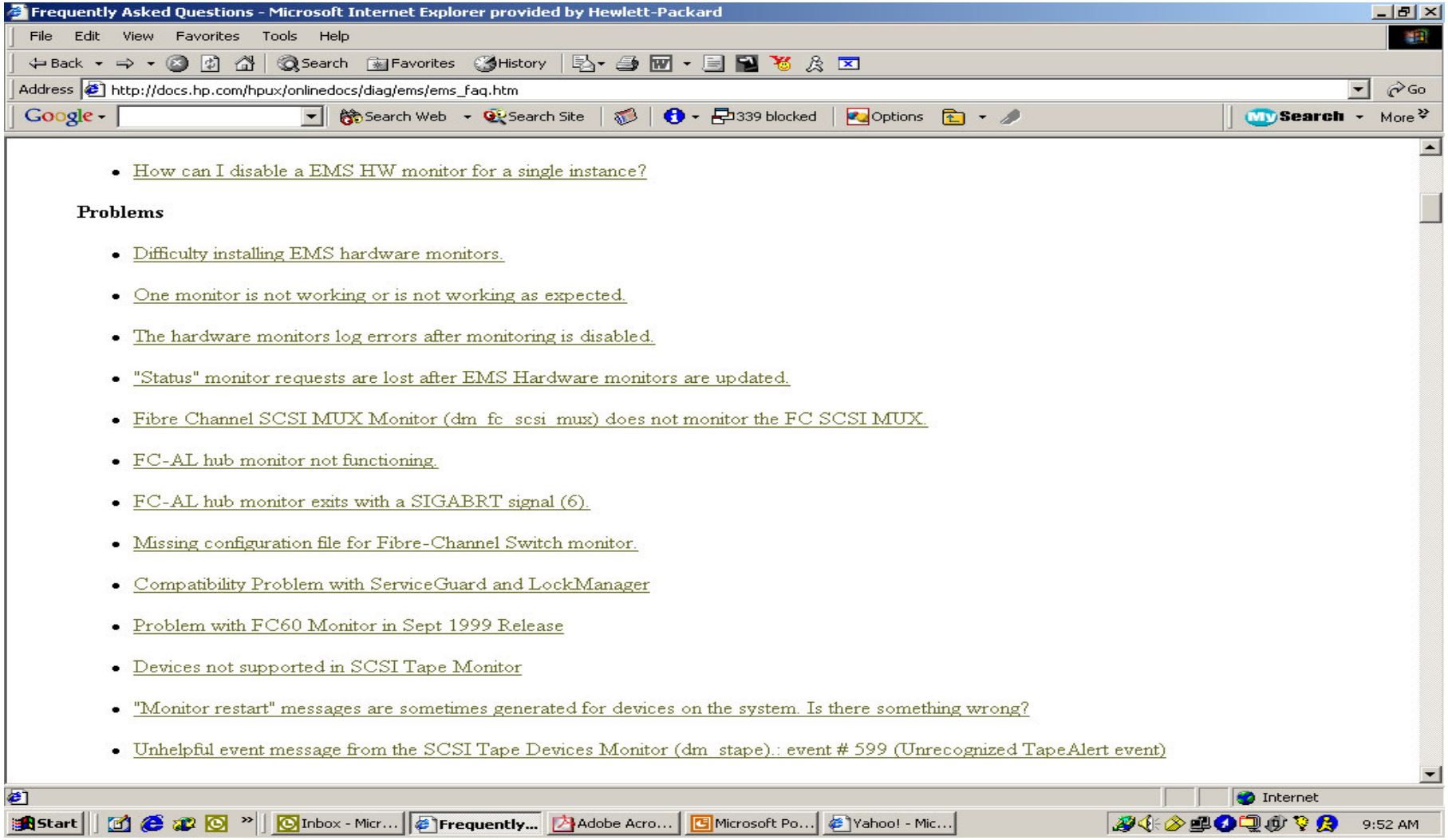
EMS Hardware Monitors
Frequently Asked Questions – General (1 of 2)



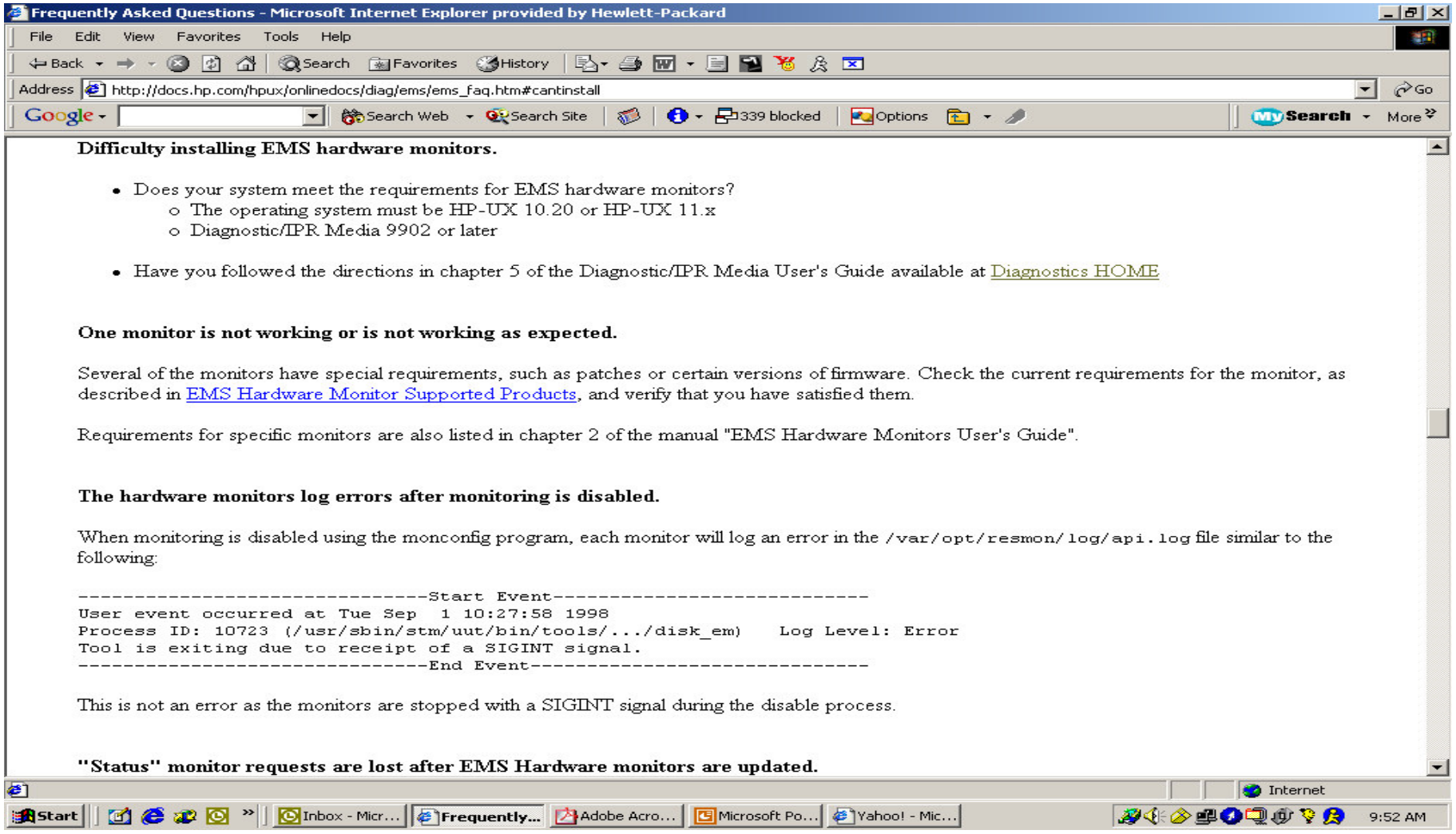
EMS Hardware Monitors FAQs – General (2 of 2)



EMS Hardware Monitors
Frequently Asked Questions – Problems (1 of 2)



EMS Hardware Monitors FAQs – Problems (2 of 2)



EMS Hardware Monitors Reference Section Index

- Available Hardware Monitors
- Monitor Configuration Files
- Useful URLs

Support Tools Manager

Available EMS Hardware Monitors

(1 of 4)

EMS HW Monitor	Monitor Name	Responsible for monitoring
Chassis Code Monitor	dm_chassis	System chassis logs
Core Hardware Monitor	dm_core_hw* ia64_corehw^	Hardware in the System Processing Unit (SPU)
CPU Monitor	lpmc_em* cmc_em^	Processors
Memory Monitor	dm_memory* memory_ia64^	System memory
Kernel Resource Monitor	krmond	Variety of HP-UX resources
System Status Monitor	sysstat_em	System and Online Diagnostics up status

* = HP 9000 Servers ^ = HP Integrity Servers

Available EMS Hardware Monitors
(2 of 4)

EMS HW Monitor	Monitor Name	Responsible for monitoring
AutoRAID Disk Array Monitor	armmon	AutoRAID Disk Arrays
High-Availability Disk Array Monitor	ha_disk_array	High-Availability Disk Arrays
Fast/Wide SCSI Disk Array Monitor	fw_disk_array	Fast/Wide SCSI Disk Arrays
Disk Array FC60 Monitor	fc60mon	HP StorageWork E Disk Array FC60
Disk Monitor	disk_em	Fixed disk drives
SCSI Tape Devices Monitor	dm_stape	SCSI tape devices

Available EMS Hardware Monitors
(3 of 4)

EMS HW Monitor	Monitor Name	Responsible for monitoring
High-Availability Storage System Monitor	dm_ses_enclosure	SES Enclosure
Fibre Channel SCSI Multiplexer Monitor	dm_fc_scsi_mux	Fibre Channel SCSI Multiplexers
Fibre Channel Adapters Monitor	dm_FCMS_adapter	Fibre Channel Adapter Cards
A5158A Fibre Channel Adapter Monitor	dm_TL_adapter	A5158A, A6684A, A6685A, A6795A Fibre Channel Adapter Cards
Fibre Channel Arbitrated Loop Hub Monitor	dm_fc_hub	Fibre Channel Arbitrated Loop Hubs

Available EMS Hardware Monitors
(4 of 4)

EMS HW Monitor	Monitor Name	Responsible for monitoring
Fibre Channel Switch Monitor	dm_fc_sw	Fibre Channel Switches
SCSI Card Monitor	scsi123_em	SCSI1, SCSI2, and SCSI3 interface cards
Remote Monitor	RemoteMonitor	Devices via a remote connection to the device's management software
UPS Monitor	ups_mond	Uninterruptible Power System (UPS) devices connected to a system through RS-232 cables

For more information, please visit:

www.docs.hp.com/hpux/diag/index.html

Return

Monitor Configuration Files
(1 of 2)

- Several configuration files are used to control the operation of each EMS Hardware Monitor
  - Located in */var/stm/config/tools/monitor/* directory
- Global monitor configuration file (*Global.cfg*)
  - Contains settings defined to be used for all monitors, unless overridden by a monitor-specific file
- Monitor-specific configuration file (*<monitor_name>.cfg*)
  - Contains monitor-specific settings that will override comparable settings defined in the global configuration file
- Client configuration files (*<monitor_name>.clcfg*)
  - Only for multiple-view monitors
  - Contains the qualification criteria on when to generate event to allow each client to control when to receive events

Monitor Configuration Files
(2 of 2)

- Startup configuration file (*<monitor_name>.sapcfg*)
  - Contains the monitoring requests currently defined for the monitor
- Peripheral Status Monitor configuration file (*<monitor_name>*.psmcfg)
  - Controls the interaction between the Peripheral Status Monitor and the monitor
- Before editing any configuration file, create a backup copy of it
- The default configuration settings for each monitor have been carefully selected to provide efficient monitoring for most systems, it is not recommended to alter these settings unless you fully understand the implications of doing so

Useful URL Links (1 of 2)

- For an overview on the EMS Hardware Monitors, see the "EMS Hardware Monitors: Overview":
  - http://docs.hp.com/hpux/onlinedocs/diag/ems/emo_summ.htm
- For complete background information on the EMS Hardware Monitors, see the "EMS Hardware Monitors User's Guide":
  - http://docs.hp.com/hpux/onlinedocs/2512/ems.pdf
- For key information about each EMS Hardware Monitor, see "EMS Hardware Monitors: Data Sheets":
  - http://docs.hp.com/hpux/onlinedocs/diag/ems/emd_summ.htm
- For a list of events reported by each EMS Hardware Monitor, see "EMS Hardware Monitors: Event Descriptions":
  - http://docs.hp.com/hpux/onlinedocs/diag/ems/eme_summ.htm

Useful URL Links (2 of 2)

- For a history of changes to the EMS Hardware Monitors, see the “EMS Hardware Monitors: Release Notes”:
  - http://docs.hp.com/hpux/onlinedocs/diag/ems/ems_rel.htm
- For information on both general and specific Frequently Asked Questions (FAQs) about the EMS Hardware Monitors, see the “EMS Hardware Monitors: FAQs”:
  - http://docs.hp.com/hpux/onlinedocs/diag/ems/ems_faq.htm
- For information on the requirements and the products supported by the EMS Hardware Monitors, see the “Requirements and Supported Products”:
  - http://docs.hp.com/hpux/onlinedocs/diag/ems/ems_prod.htm
- For information on supporting the Multiple-View feature in the EMS Hardware Monitors, see “Multiple-View Monitors”:
  - http://docs.hp.com/hpux/onlinedocs/diag/ems/ems_pred.htm

Questions?

HP-UX Online Diagnostics

Support Tools Manager

Overview

- Support Tools Manager Overview
- Installation & Product Structure
- Tool Licensing
- Types of Support Tools Available
- Support Tools Usage Model
- Support Tools Manager Architecture
- Support Tools User Interface
- Support Tools Examples

Support Tools Manager Overview

- Provides a map of all hardware devices in the system, plus useful information about them
- Support Tools Manager (STM) consists of a extensive set of online diagnostics support tools
- To assist you in verifying and trouble-shooting your system's hardware problems

Support Tools Manager

Installation

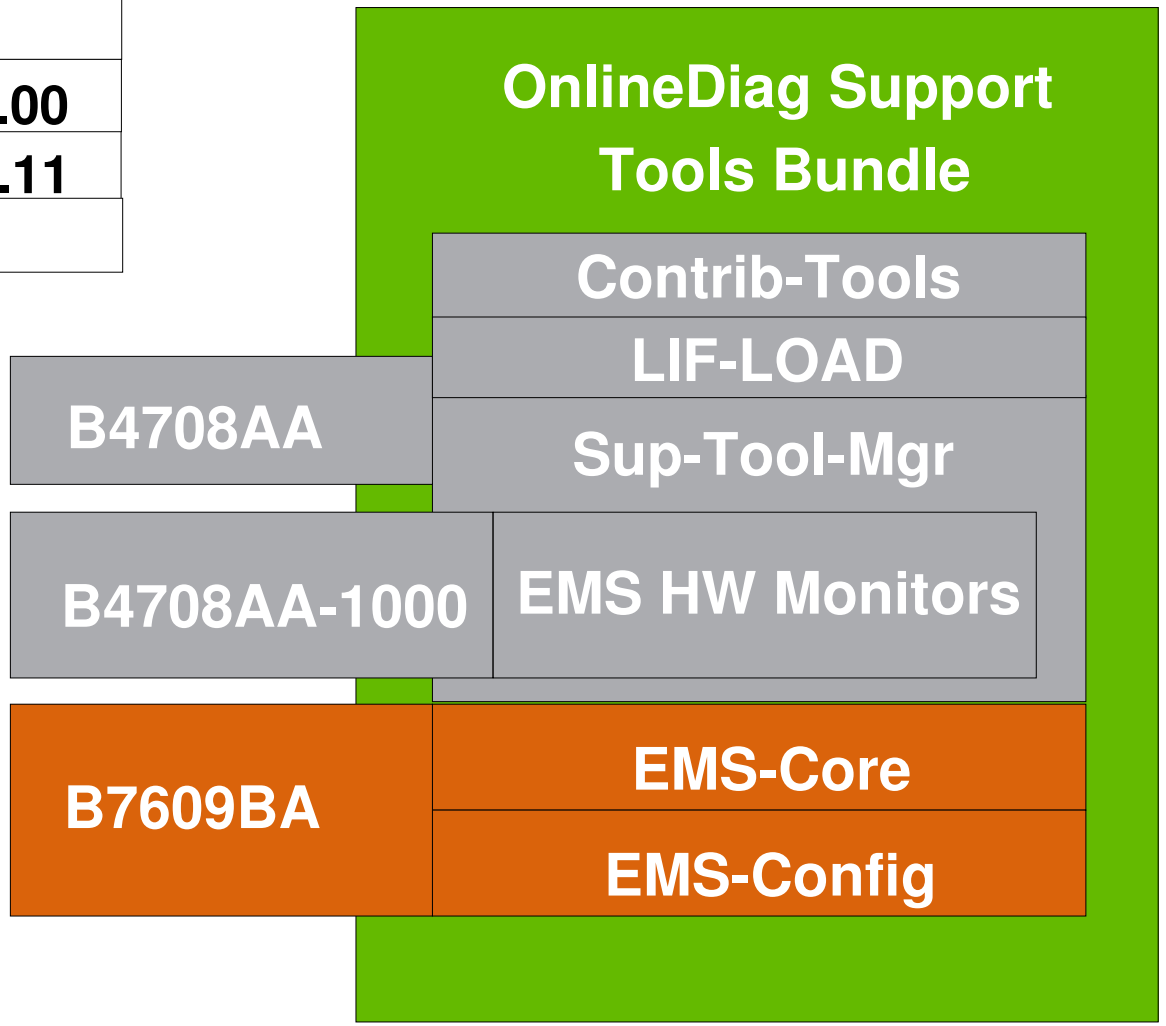
- Installing the Support Tools Manager
- Product Structure

Installing the Support Tools Manager

- By default, the Diagnostics and Support Tools are AUTOMATICALLY installed when you install the HP-UX operating system
- New versions of the Diagnostics and Support Tools are released
  - Incorporate improvements to the interface, tools, or functionality
  - Support new functionality or new hardware
- A copy of the OnlineDiag Software Depot can be obtained from:
  - Update Media (CD-ROM)
  - HP Software Depot (http://www.software.hp.com)

Product Structure

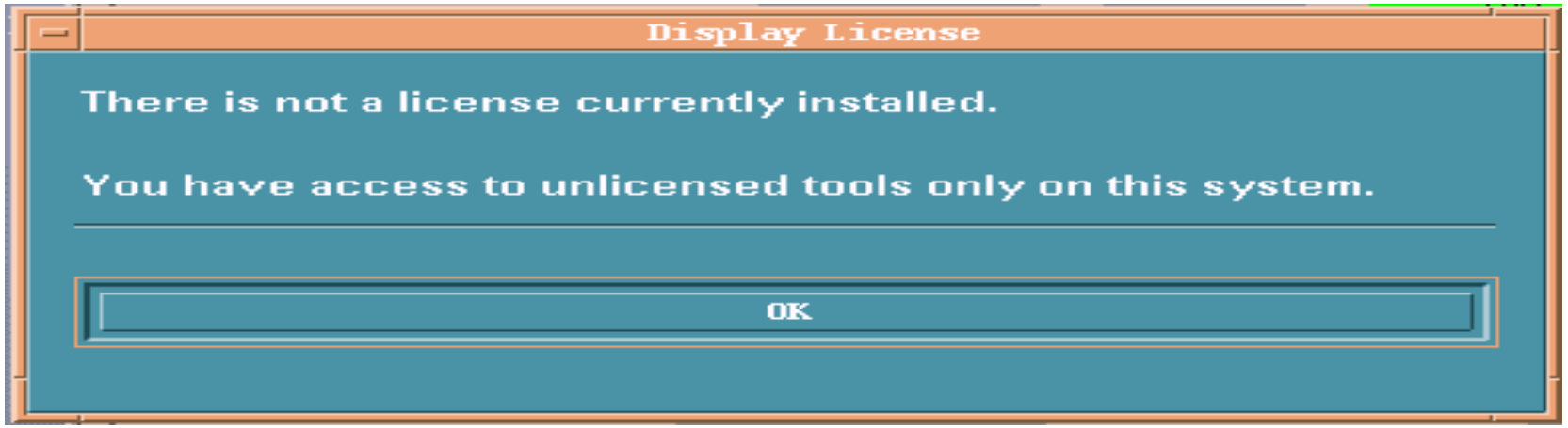
S800
HP-UX 11.00
HP-UX 11.11
.....



Tool Licensing

- 3 levels of licensing:
  - Free (no special license required)
  - Class License
  - HP Only
- Licenses are obtained by:
  - Purchasing a support contract
  - Temporary licenses provided by HP support

Display License (XSTM)



Tool Licensing

Tool Type	Licensing Required
Information Tools	No
Verifiers	No
Exercisers	No
Diagnostics	Yes
Expert Tools	Yes
Firmware Update Tools	Yes
Logtool Utility	No
Copyutil Utility	Yes
Modmutil Utility	No
MOutil Utility	No

Types of Support Tools Available
(1 of 4)

- Identification Modules
  - Identify devices on the system in order to provide a representation of all of the hardware
  - Only executed when the configuration map is built
- Information Tools
  - Provide quick access to the most useful information about hardware components
  - Typical information includes
    - Product identifier
    - Physical path
    - Firmware revisions
    - On-board log information

Types of Support Tools Available
(2 of 4)

- Utilities
  - Logtool
    - Access to system log files that contain recoverable errors detected by the system
  - Copyutil
    - Backup data from a SCSI disk device, and at a later time, to restore the data from the backup medium to the desired disk
  - MOutil
    - Retrieve information about the MO devices and run various diagnostic tests to verify that all MO devices are functional
  - Modmutil
    - Display modem information, reset the internal modem, run terminal commands, and test the internal modem

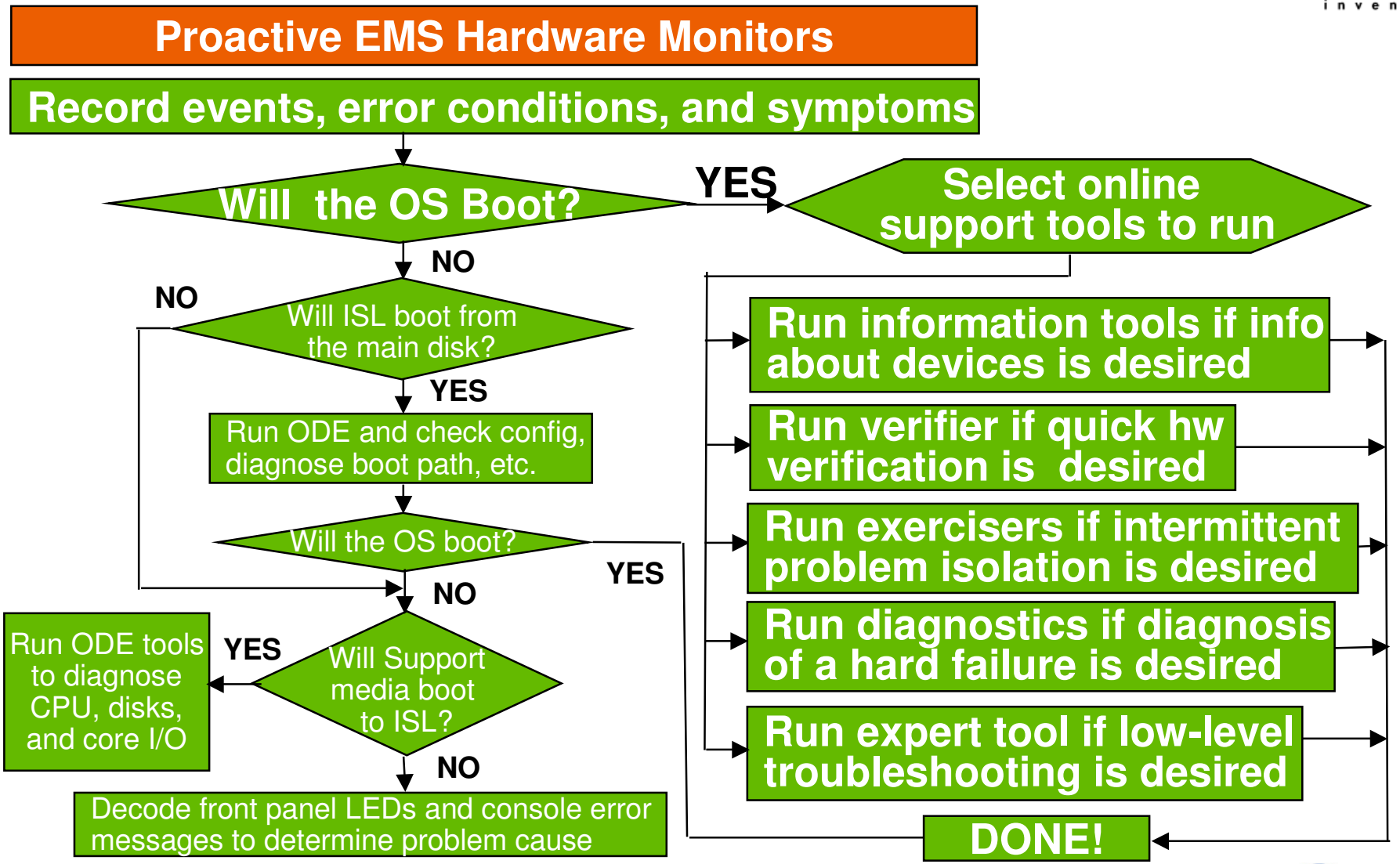
Types of Support Tools Available
(3 of 4)

- Verifiers
  - Provide a quick verification of the hardware to ensure it is properly connected and functional from an end-user perspective
  - Isolate the cause of failures
- Exercisers
  - Stress the hardware in order to facilitate the reproduction of intermittent problems
  - Isolate errors, if possible
- Diagnostics
  - Perform as complete a test as possible on the hardware to detect and isolate faulty hardware on the device
  - Isolate failures to FRU & component level

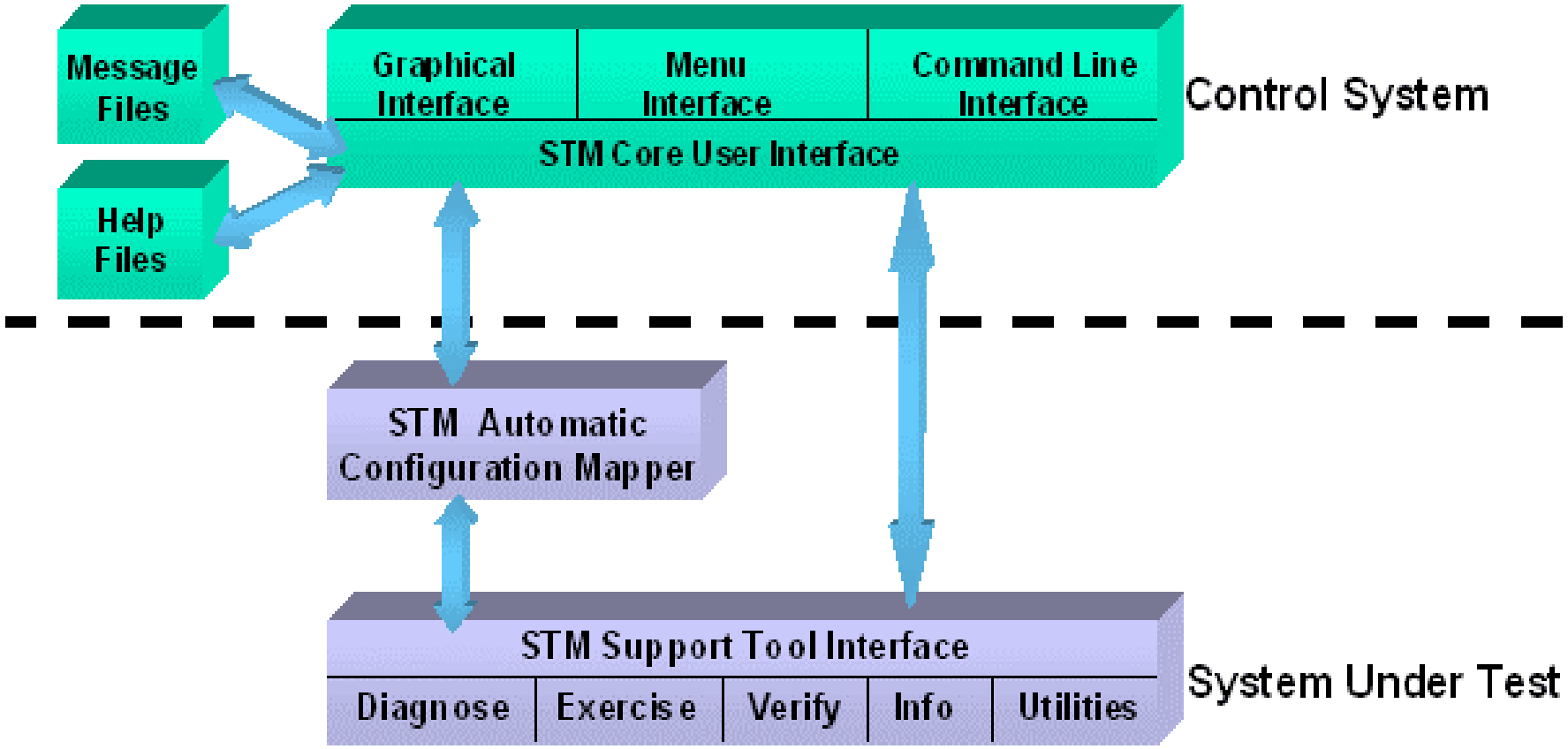
Types of Support Tools Available
(4 of 4)

- Firmware Update Tools
  - Initiate the firmware update process for a selected device
  - Provide a common front-end for various device-specific firmware update processes
- Expert Tools
  - Device-specific sophisticated troubleshooting utilities for expert users
  - Functionality depends on the type of device and needs of users
  - Interactive tool

Support Tools Usage Model



Support Tools Manager Architecture



Running the Support Tools Manager

- Start the Support Tools Manager with the desired user interface
  - Graphical: */usr/sbin/xstm*
  - Menu: */usr/sbin/mstm*
  - Command Line: */usr/sbin/cstm*

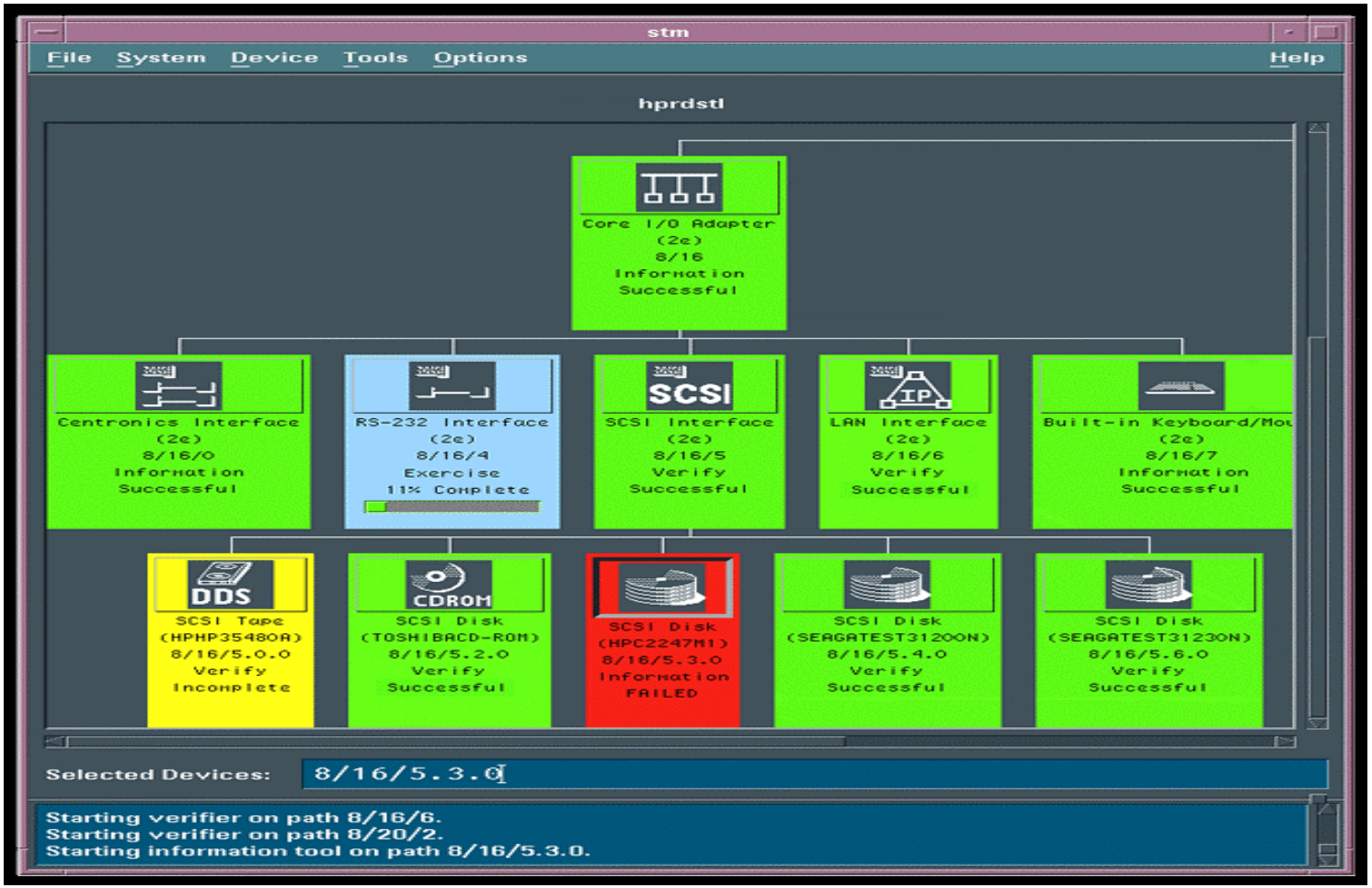
User Interface

- Support Tools Manager can be accessed through any of three interfaces
- Graphical User Interface (XSTM)
  - X Window graphics terminals or workstations
- Menu User Interface (MSTM)
  - Non-graphics terminals
- Command Line User Interface (CSTM)
  - Non-graphics terminals
  - Useful for running scripts

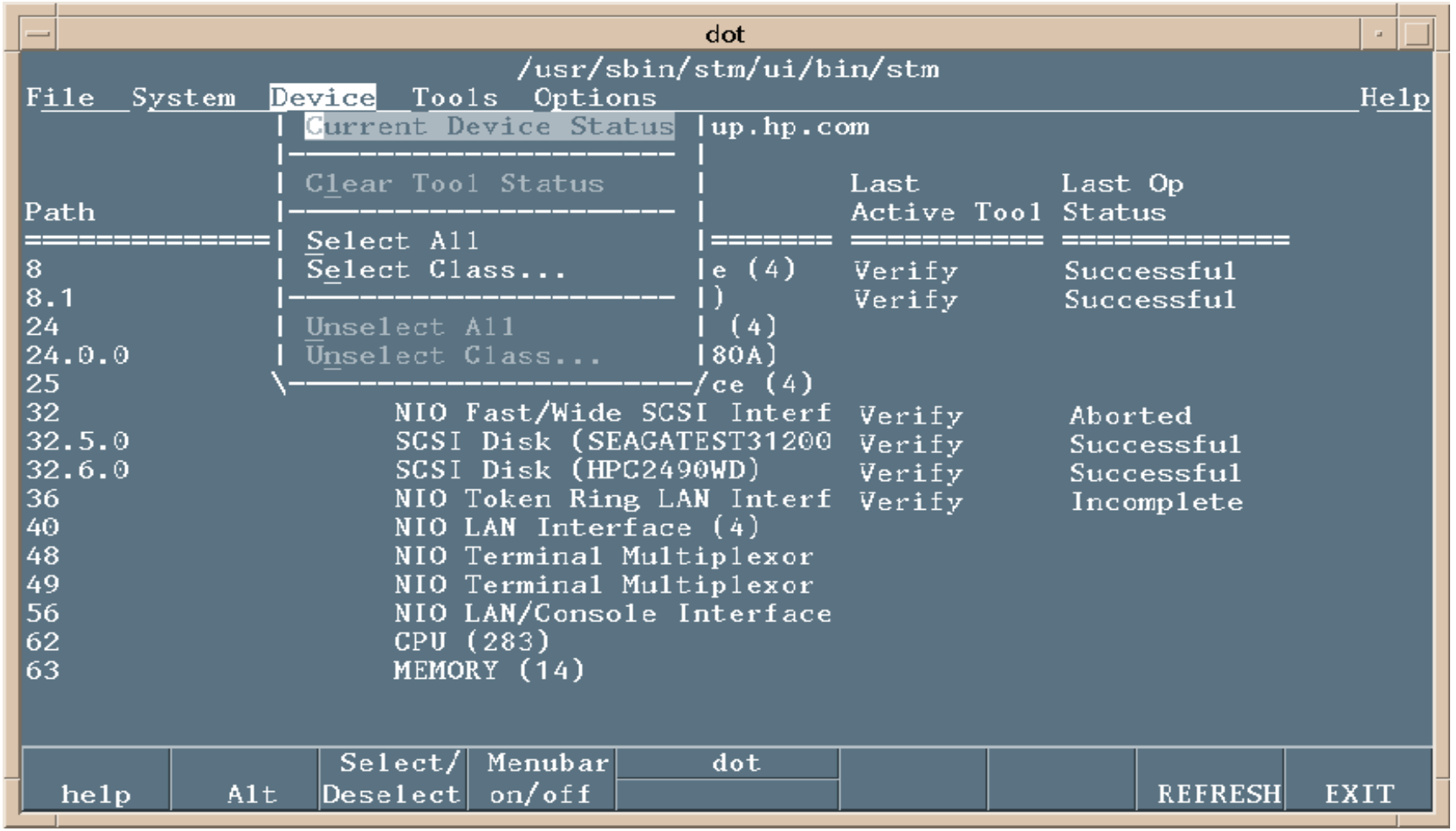
System Map

- Upon startup, the Support Tools Manager provides you with a system map displaying all of the hardware within the system
- The system map is used to select the specific devices to test and to display a summary of the test results
- The system map also provides information on device type, device path, last active tool, and test status

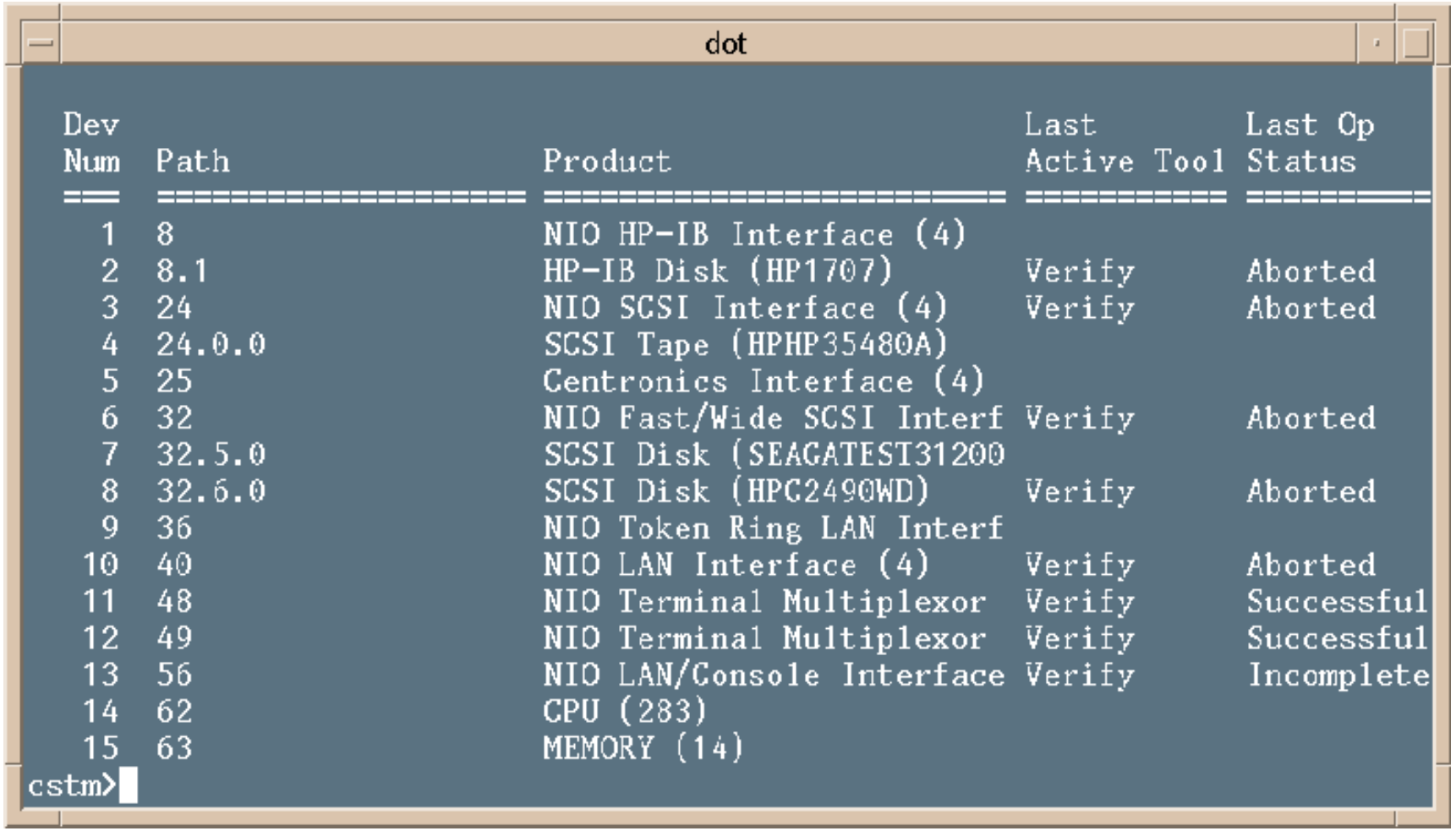
Graphical User Interface (XSTM):
System Map



Menu User Interface (MSTM):
System Map



Command Line User Interface (CSTM): System Map



Support Tools Manager

Using Support Tools

- 3 Step Paradigm
- Getting Results Information

Using Support Tools

- Support tools can be run using a simple three-step paradigm:
  - Select the device(s) to test
  - Select a tool (test) to execute on the device(s)
  - Examine the results

Getting Results Information
(1 of 2)

- Result information from support tools can be obtained easily from the system map device status
  - **Successful** - The most recent operation succeeded
  - **Failed** – The most recent operation failed
  - **Warning** – Operation completed, warnings in log
  - **Incomplete** – The operation could not be completed
  - **Aborted** – The user has stopped the operation
  - **Abort Pending** – Abort waiting
  - **Query Pending** – Query waiting
  - **Hung** – The operation was hung
  - **Killed** – User has killed the operation
  - **Suspended** – Suspended by the user

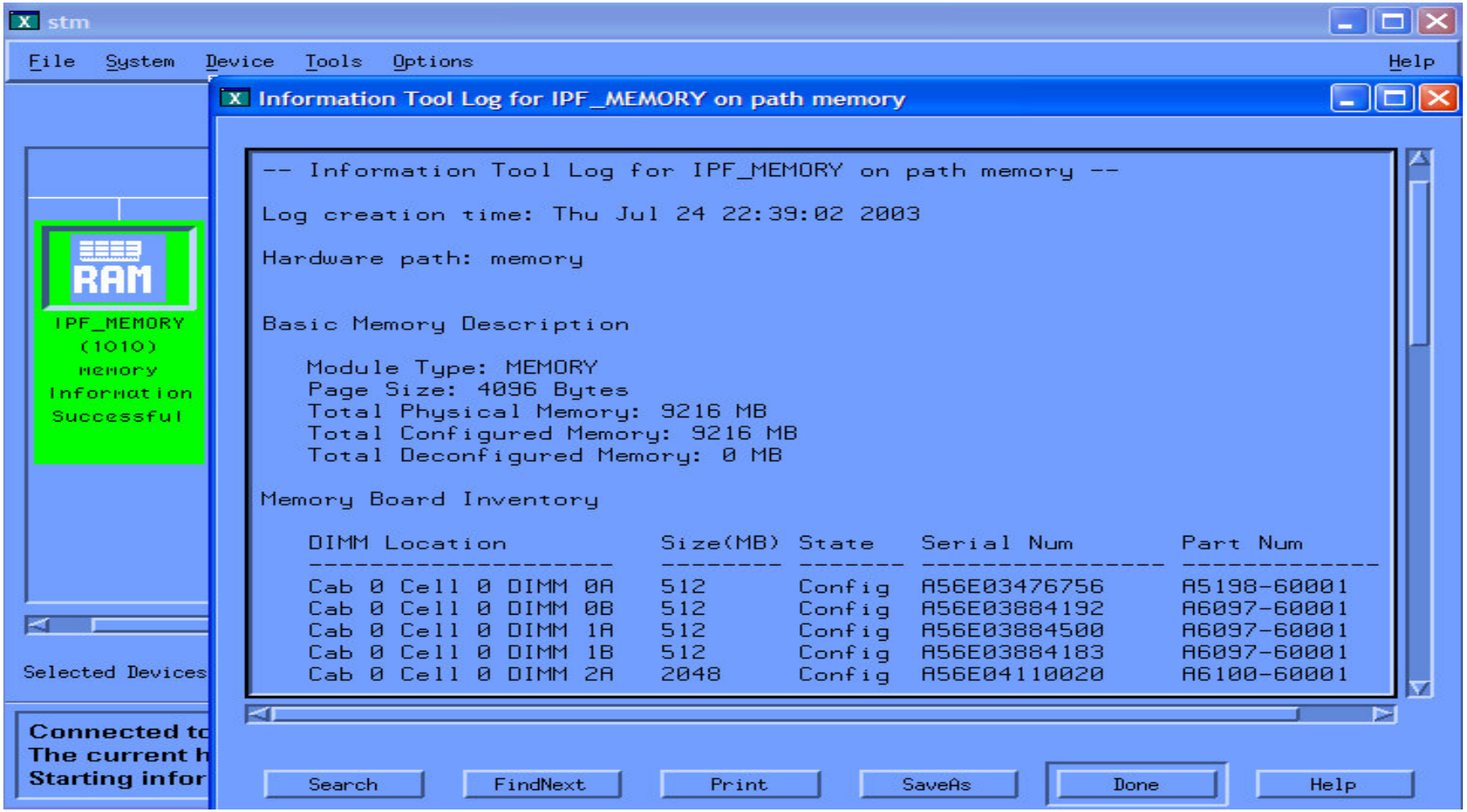
Getting Results Information
(2 of 2)

- Tool Logs
  - Failure Log
    - Failure information identifying the likely causes for the device hardware failure, probable cause(s) and recommended action(s)
    - Use this log when a tool completes with a failure status
  - Test Activity Log
    - Tool activity information showing detailed tool status, test options, etc.
    - Use this log when a tool completes with anything other than a successful status
  - Information Tool Log
    - Information tool data (created by the information tools only) providing useful information on the selected device
    - Use this log after running an information tool

Example: Memory Information Tool

- Provide general information about the memory hardware subsystem
  - Information on amount of memory installed, configured, or deconfigured on the system
  - Inventory of all DIMM slots on the system
  - Summary of memory errors on the system
  - Summary of memory entries in the Page Deallocation Table
- Can be used for support, manageability, and memory upgrade activity

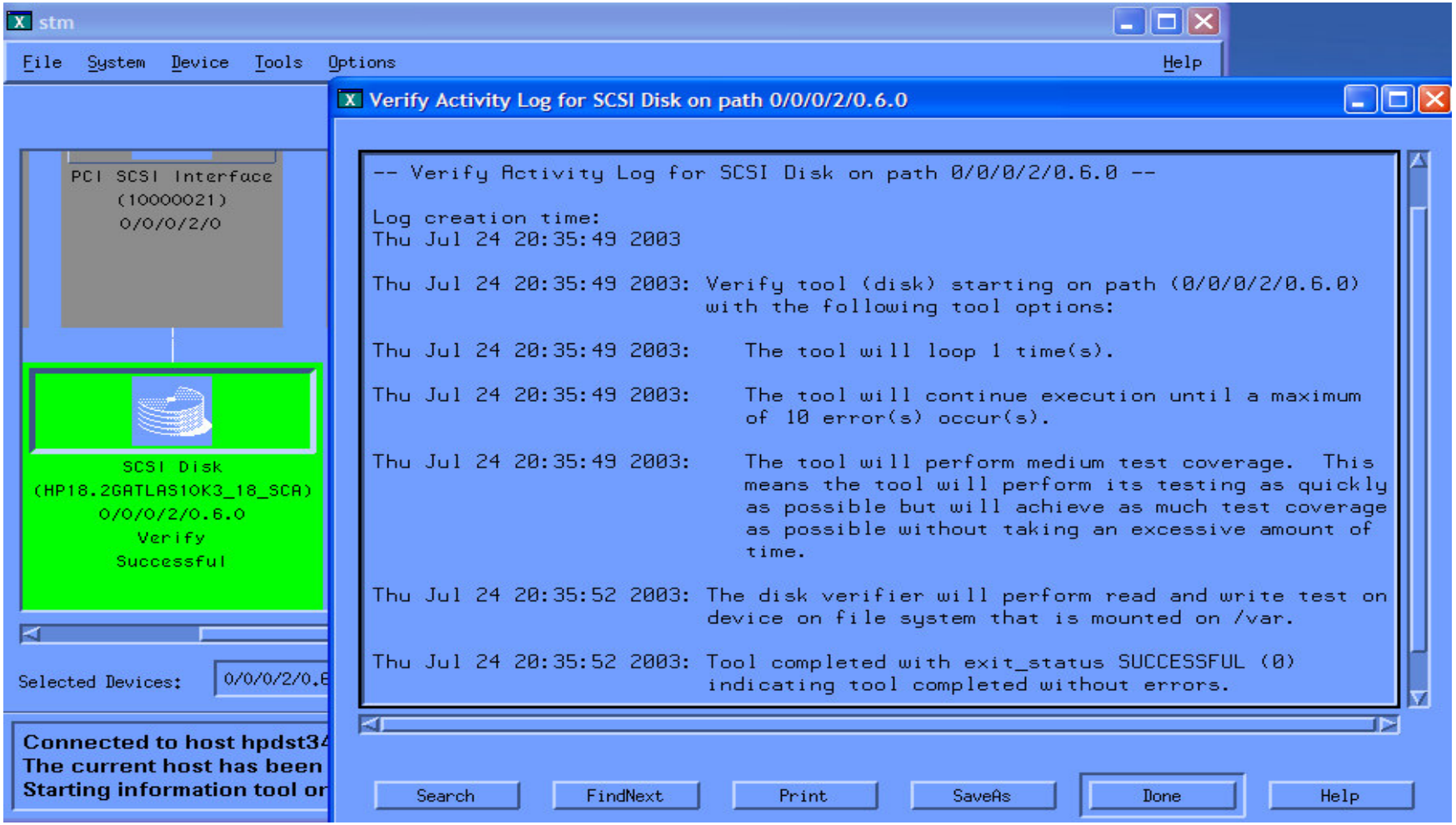
Memory Information Tool (XSTM)



Example: Disk Verifier

- Provide quick verification on the selected disk device to determine if it is functional
- Write/Read tests will be performed when:
  - Disk is mounted and media is fixed
  - Media is removable and write enabled
- Read-Only tests will be performed when:
  - Media is removable and write protected
  - Full media verification required

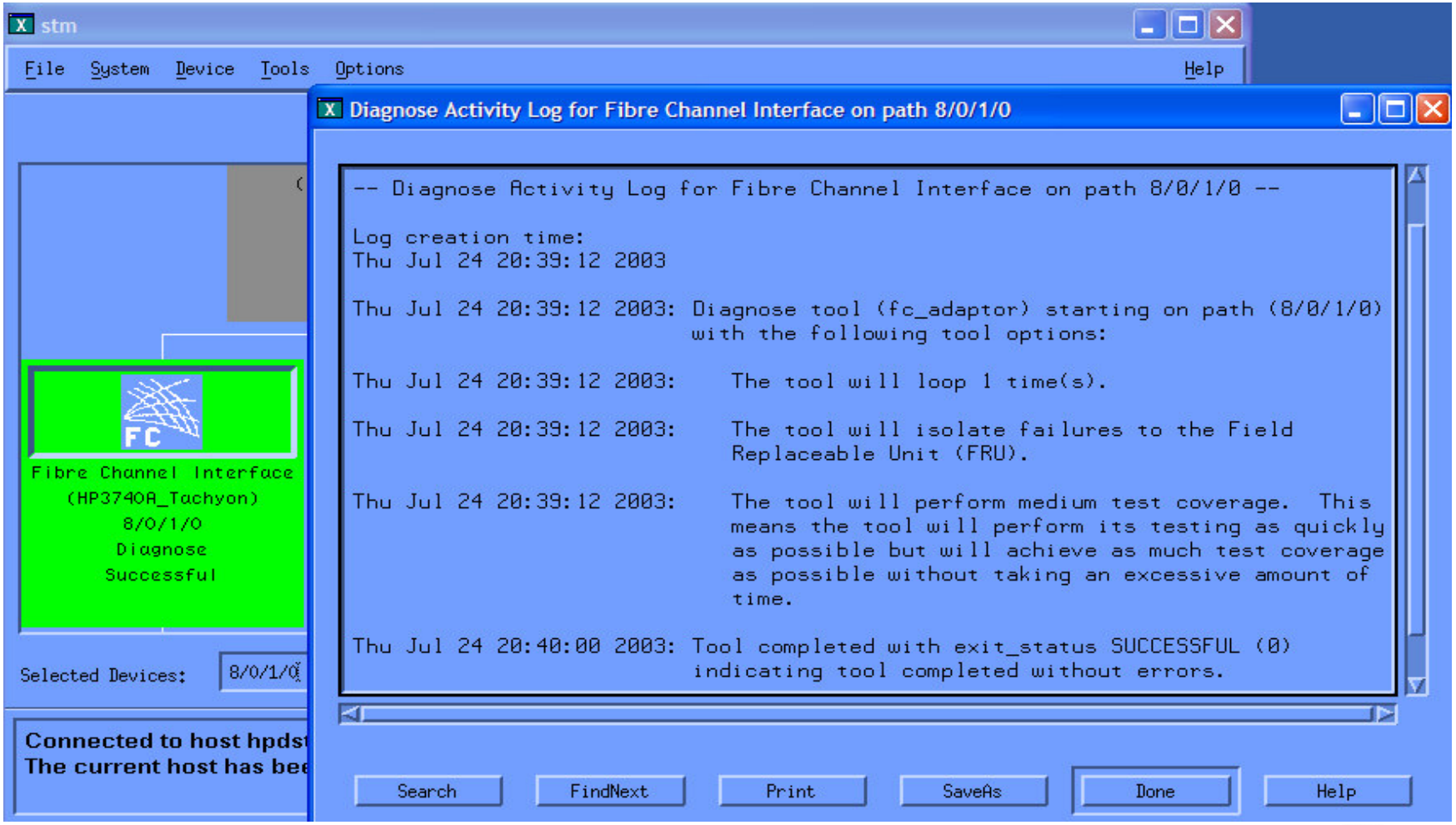
Disk Verifier (XSTM)



Example: Fibre Channel Interface Diagnostic Tool

- Perform a complete set of test to check the functionality of the selected Fibre Channel Interface card
- An external loop back test is performed to identify any FRU level problems
- Both internal and external loop back tests are performed to identify any component level problems

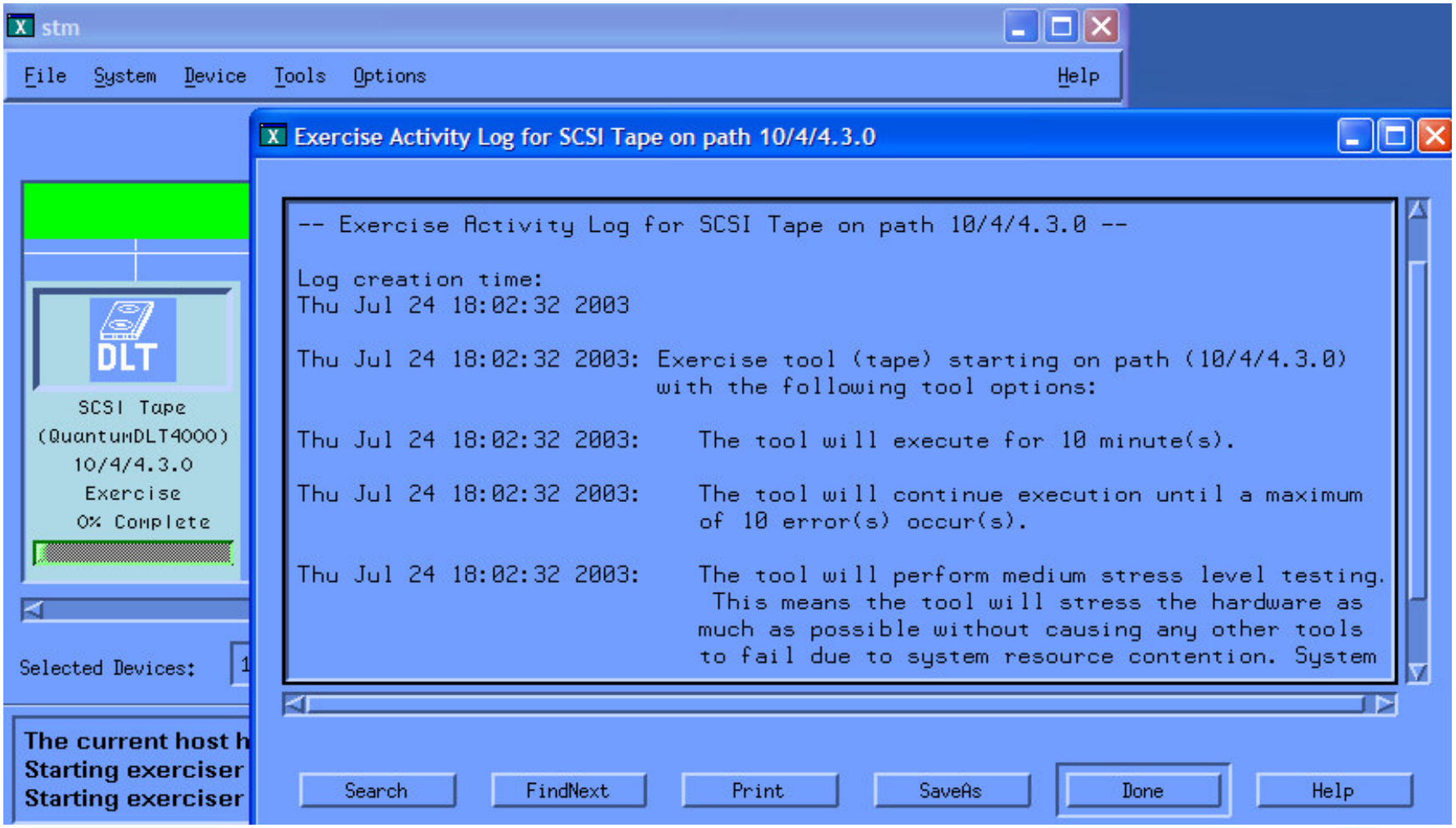
Fibre Channel Interface Diagnostic Tool (XSTM)



Example: Tape Exerciser

- Stress the selected tape device in order to assist in finding intermittent problems
- Stress the tape channel by performing continuous read and write operations to the selected device

Tape Exerciser (XSTM)



Support Tools Manager

Troubleshooting

- STM Online Help
- STM FAQ
- System Map Building
- Unknown Device in System Map
- Hung State
- Cannot Start Tool
- Disabled Commands/Menus
- Useful URL Links

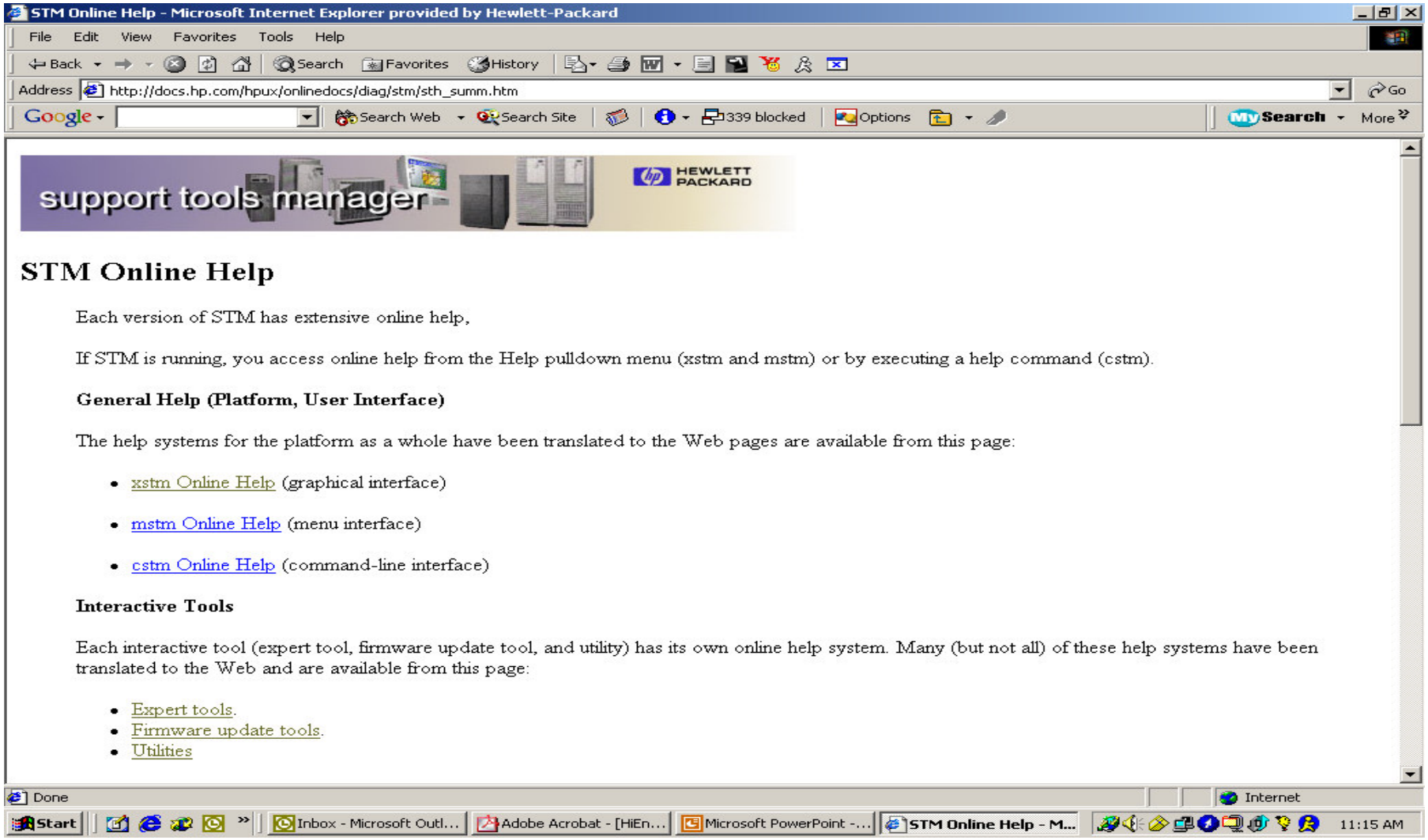
STM Online Help

STM offers extensive online help for each user interface. Online help can be found at the following website:

http://docs.hp.com/hpux/onlinedocs/diag/stm/sth_summ.htm

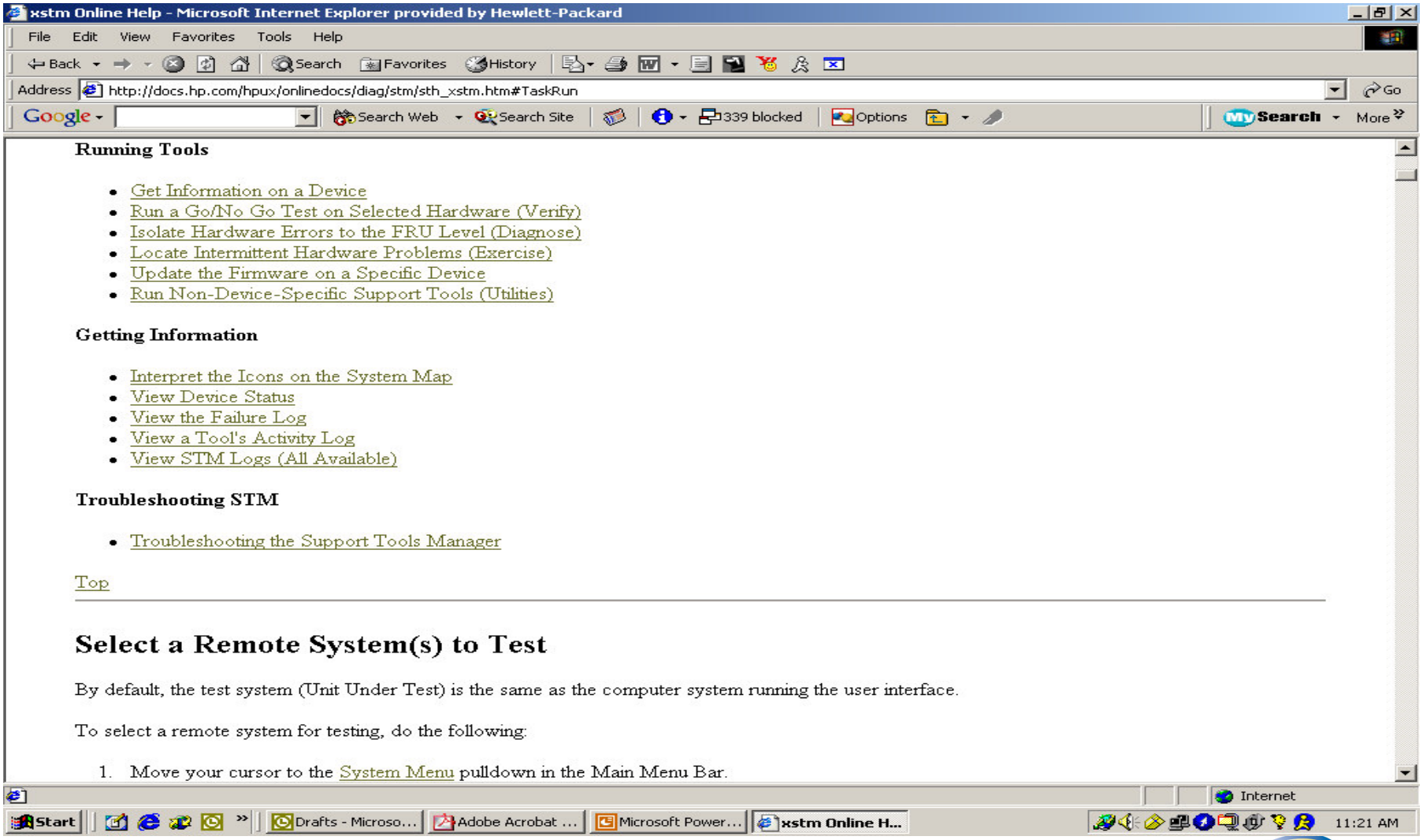
Example:

STM Online Help



STM Online Help - xstm

STM Online Help – xstm (cont.)



STM Online Help – xstm (cont.)

STM Troubleshooting Tips

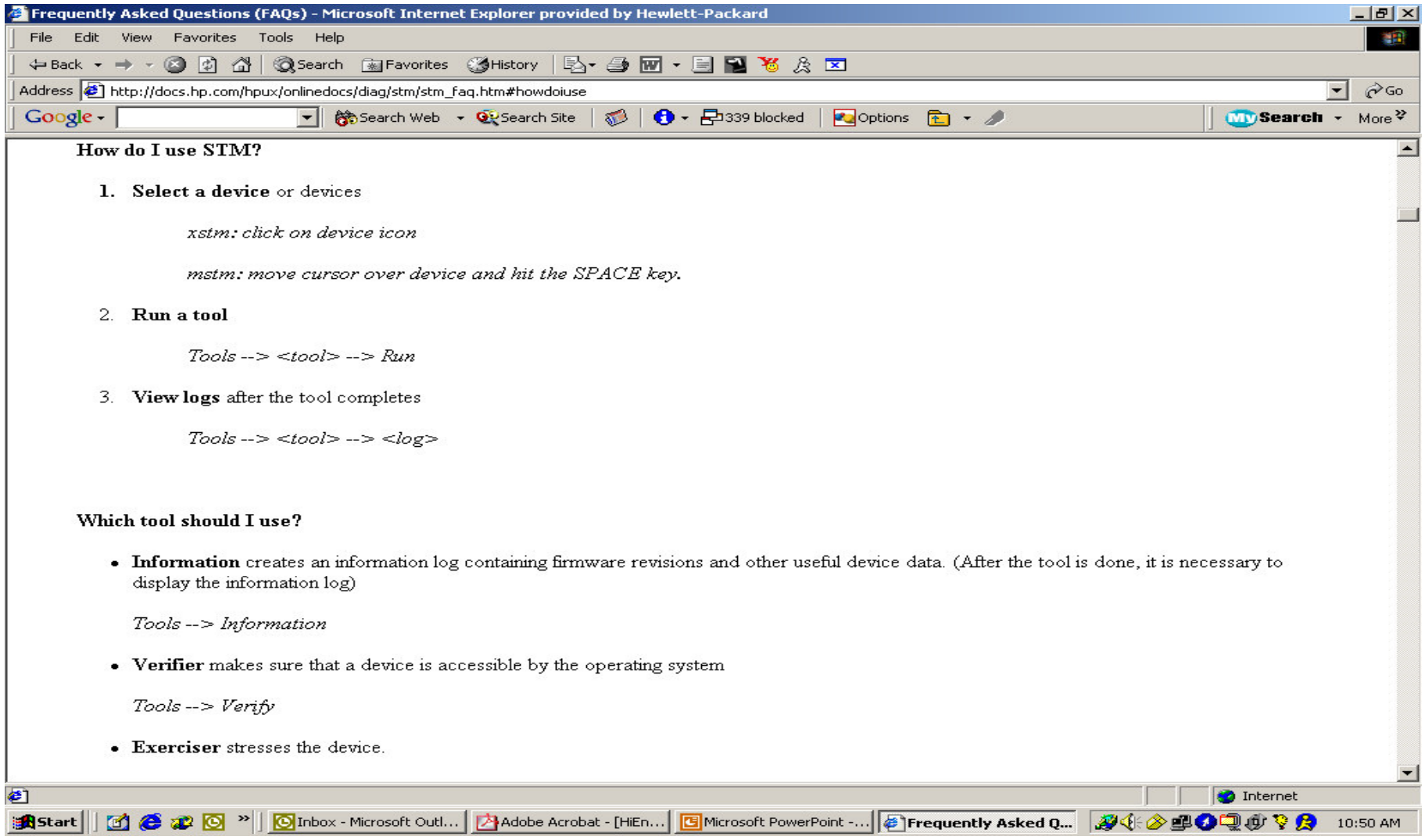
Frequently asked questions can be found at the following website:

http://docs.hp.com/hpux/onlinedocs/diag/stm/stm_faq.htm

This site groups questions into different categories:

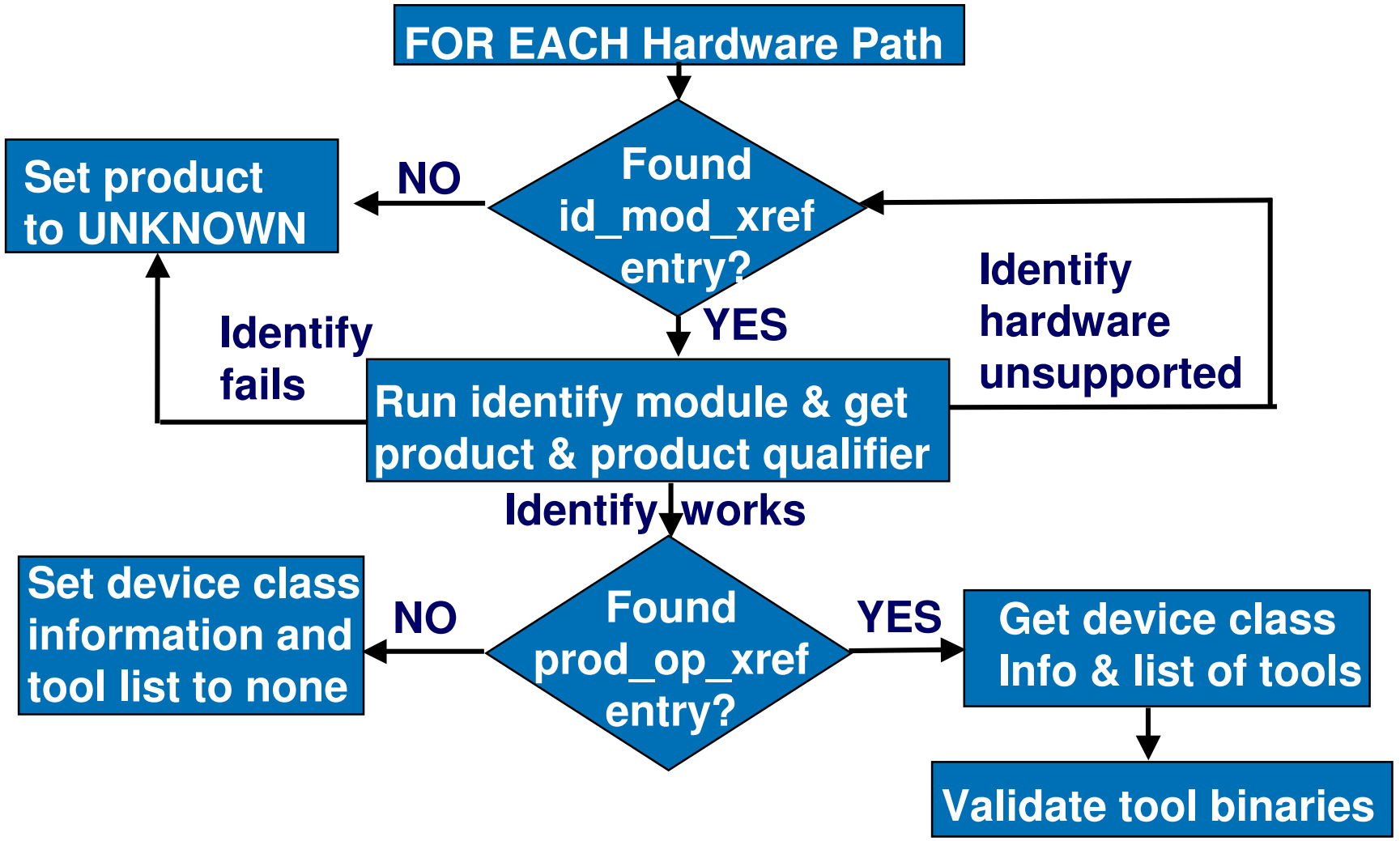
- General STM
- Installing STM
- Starting STM
- Tools and Scripts.

STM FAQs - General



STM Frequently Asked Questions

System Map Building



Unknown Device in System Map

- A device in the Support Tools Manager system map is “Unknown” (or its icon is blank)
- Reasons for an “Unknown” device:
  - The device was turned off or removed from the system but a reboot has not yet been performed
  - The driver associated with the device is not recognized by the Support Tools Manager
  - The device file for the device was not created by the system at boot time
- In any case, display the *scan_hw_log* file for the cause of the “Unknown” device and what to do about it
- Check if your version of the Support Tools Manager needs to be updated

Tool in “HUNG” State

- Tool going into and out of “HUNG” state
  - Indicate the tool cannot get enough time to execute properly
    - System is very busy
    - User is attempting to start many tools simultaneously
    - User has multiple tools already running
    - System has limited resources
  - Update the diagmond configuration to wait longer
- Tool stays in “HUNG” state
  - Determine if there is an error by examining the tool activity log file for errors
  - Examine the last time the tool logged compared to the current time

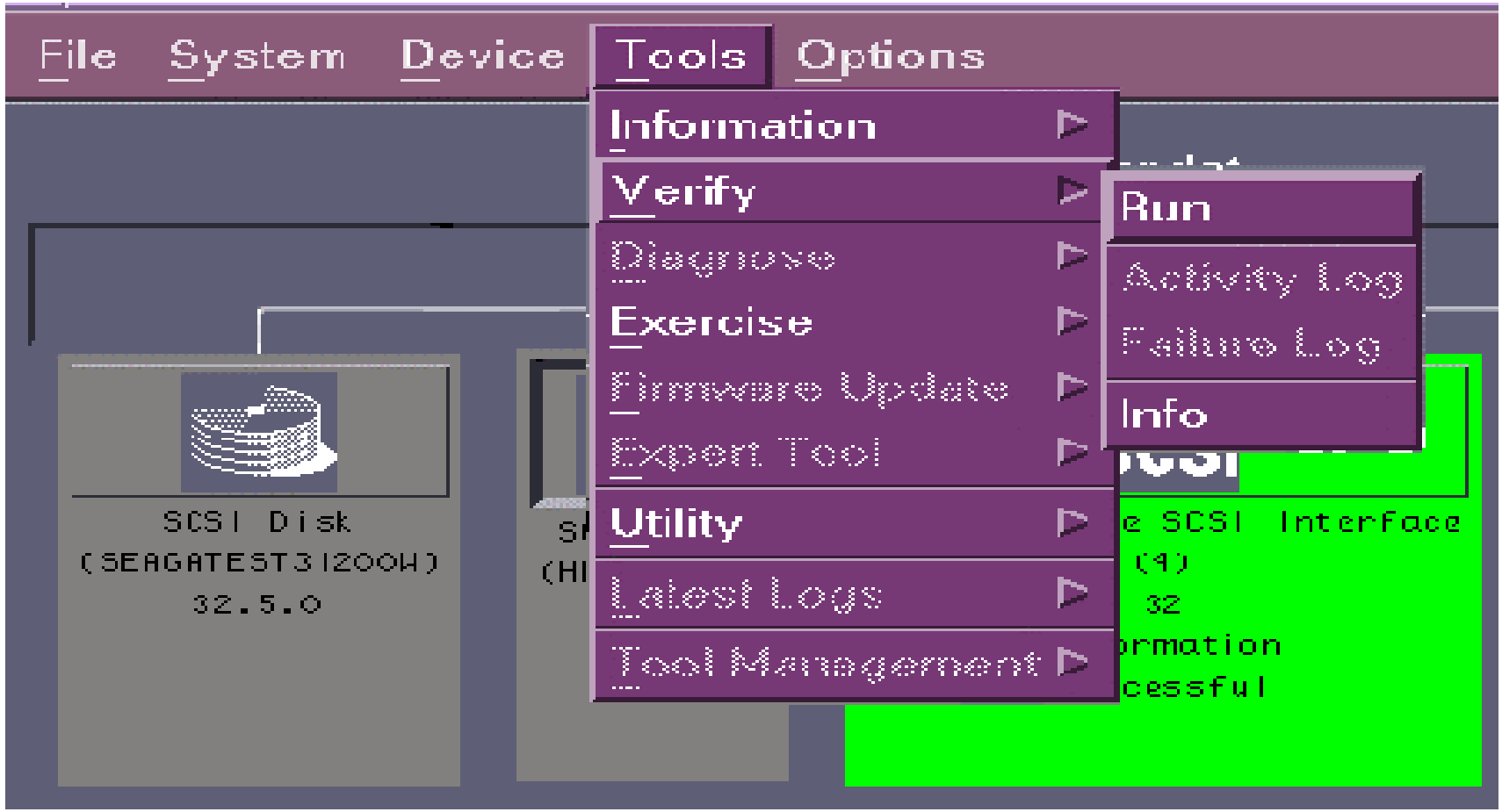
Cannot Start Tools

- Tools fail to start from user interface
  - UI occasionally fails to start tools if STM cannot get enough time to initiate the tool properly
  - View the UI activity log file for a message indicating a timeout when trying to start the tool
- Tools start but exit with an incomplete status
  - Tools occasionally cannot perform initiation tasks if they cannot get enough time to initiate properly
  - View the UI activity log file for a message indicating a timeout when trying to perform initialization
- In both cases, retry at a later time when system is not so busy

Disabled Commands/Menus

- There may be commands/menus in the Support Tools Manager that are disabled
- Disabled commands/menus:
  - In XSTM, will appear dimmed compared to other elements in the pull-down menu
  - In MSTM, will appear “grayed-out” on the menu keys
  - In CSTM, will display an error message when the command is typed at the prompt
- Reasons for disabled commands/menus:
  - Command requires a device to be selected
  - Command requires a license to be installed
  - Command runs on a tool that is not available

XSTM: Disabled Commands/Menus



Useful URL Links
(1 of 2)

- For an overview on the Support Tools Manager, see the “STM Overview”:
  - http://docs.hp.com/hpux/onlinedocs/diag/stm/sto_summ.htm
- For a tutorial on the Support Tools Manager, see the “STM Tutorial”:
  - http://docs.hp.com/hpux/onlinedocs/diag/stm/stt_summ.htm
- For online help on the Support Tools Manager, see the “STM Online Help”:
  - http://docs.hp.com/hpux/onlinedocs/diag/stm/sth_summ.htm
- For a quick reference guide on the Support Tools Manager, see the “STM Quick Reference Guide”:
  - http://docs.hp.com/hpux/onlinedocs/diag/stm/stm_qik.htm

Useful URL Links
(2 of 2)

- For a history of changes to the Support Tools Manager, see the “STM Release Notes”:
  - http://docs.hp.com/hpux/onlinedocs/diag/stm/stm_rel.htm
- For information on both general and specific Frequently Asked Questions (FAQs) about the Support Tools Manager, see the “STM FAQs”:
  - http://docs.hp.com/hpux/onlinedocs/diag/stm/stm_faq.htm
- For information on the installation of the Support Tools Manager, see the “Diagnostics: Installation”:
  - http://docs.hp.com/hpux/diag/index.html#Diagnostics:%20Installation
- For information on individual tools (Logtool), see the “Online Diagnostics: Individual Tools”:
  - http://docs.hp.com/hpux/diag/index.html#Online%20Diagnostics:%20Individual%20Tools

Support Tools Manager

Commands

- System Commands
- Device Commands
- Tools Commands
- File Commands
- Options Commands
- Help Commands
- UI Files
- System Files

System Commands
(1 of 3)

- Connect to systems
  - Connect UI to the selected system
- Select current system
  - Makes selected system current with its system map displayed
- Disconnect system
  - Disconnect UI from selected system
- Save map
  - Save a text version of the map for the current system to a file
- Print map
  - Print a text version of the map for the current system

System Commands
(2 of 3)

- Remap system
  - Rescan the hardware on the current system and rebuild the system map
- Map log
  - Format and display *scan_hw_log* for current system
- Display license
  - Display the license level active for the current system
- Install license
  - Install a normal license on the current system
- Install HP-Only license
  - Install an HP-Only license for the session in which the UI is active

System Commands
(3 of 3)

- Deinstall license
- De-install all licenses on the current system
- System activity log
  - Format and display the system *activity_log* for the current system
- Map (CSTM only)
  - Display the map for the current system

Device Commands
(1 of 2)

- Current device status
  - Format and display information about the current state of the selected device
- Clear tool status
  - Reset tool history for the currently selected devices to indicate no tools have been executed
- Select all/unselect all
  - Select or unselect all devices on the current system
- Select class/unselect class
  - Select/unselect device on current system based on device type and device qualifier selected

Device Commands
(2 of 2)

- Filter set/clear
  - Limit the number of items which are displayed in the system map at a given time

Tools Commands
(1 of 2)

- Run
  - Run the tool on the selected devices
    - * Information
    - * Verify
    - * Exercise
    - * Utility
    - * Diagnose
    - * Expert Tool
    - * Firmware Update
- Information log (Information Tools only)
  - Format and display the information retrieved by the information tool
- Activity log
  - Format and display the *activity_log* created by the tool

Tools Commands
(2 of 2)

- Failure log
  - Format and display the *failure_log* created by the tool
- Info
  - Format and display basic information about the tool
- Abort/suspend/resume/kill tool
  - Abort/suspend/resume/kill the tool executing on the currently selected device
- Abort/kill utility
  - User interface will ask the user which active utility to abort
- Display “Query Pending”
  - Display the query from the currently selected tool

File Commands
(1 of 3)

- Save/restore UI configuration on
  - Map options
  - General options
  - Tool options
- Start/stop recording command file
  - Create command files by recording actions
- Run command file
  - Read in and execute a sequence of commands from file
- Start/stop recording output
  - Save UI output to a file

File Commands
(2 of 3)

- UI activity log
  - Format and display *ui_activity_log*
- Reread UUT configuration
  - Have *diagmond* reread *diagmond.cfg* file
- Update tool information
  - Reread *prod_op_xref* entry for selected devices
- Local startup/shutdown
  - Startup and shutdown local *diagmond*
- Local map log
  - Format and display *scan_hw_log* on local system
  - Does not require UI to be connected or *diagmond* to be up

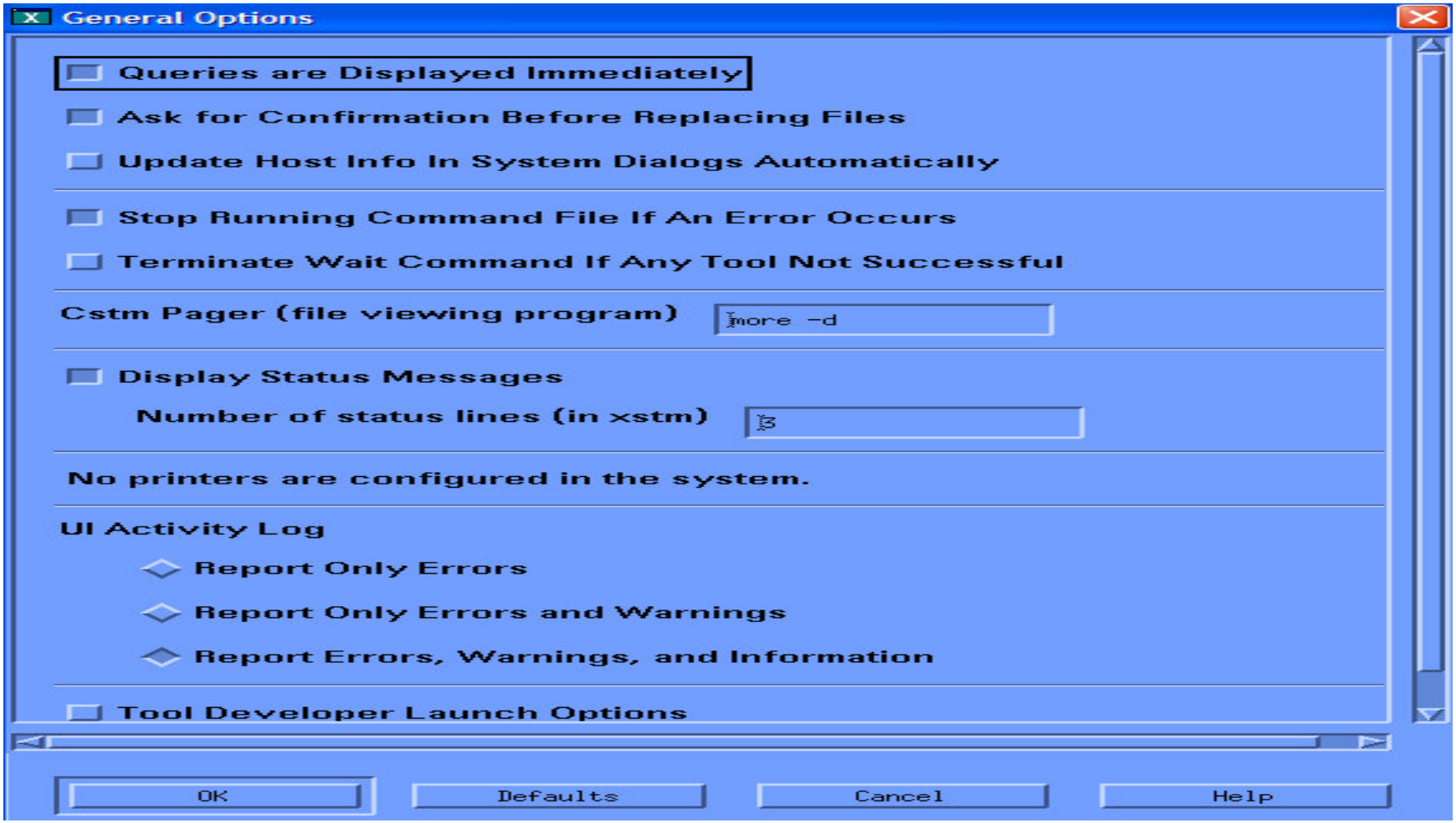
File Commands
(3 of 3)

- Local system activity log
  - Format and display system *activity_log* on local system
  - Does not require UI to be connected or *diagmond* to be up
- Local syslog
  - Display log created by *syslogd*
- Escape to OS (MSTM and CSTM only)
  - Suspend user interface and bring up Shell prompt
- Exit

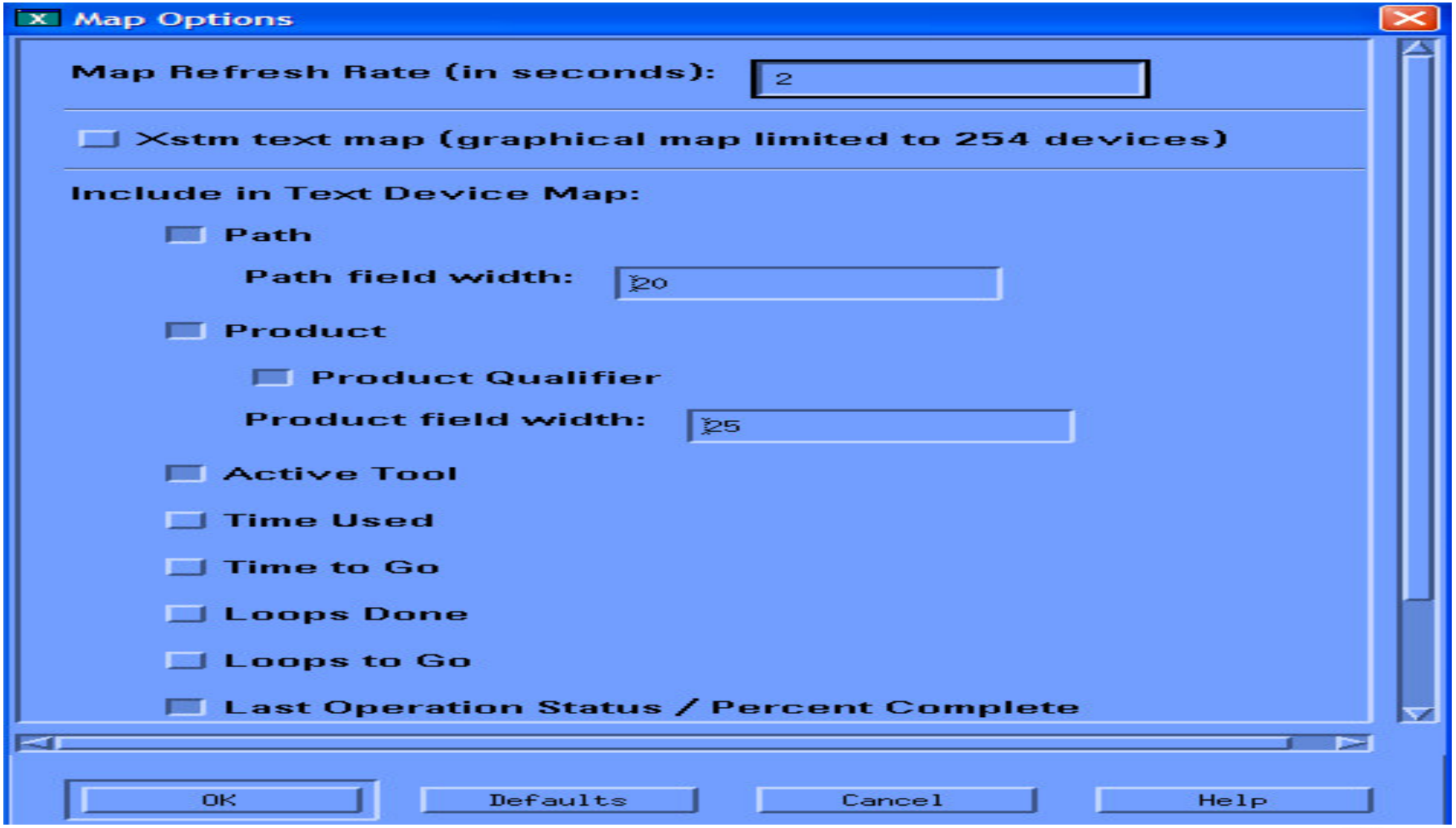
Options Commands

- General options
  - Options for controlling UI operation
- Map options
  - Options for controlling fields displayed in system map
- Tool options
  - Set of options for each tool type

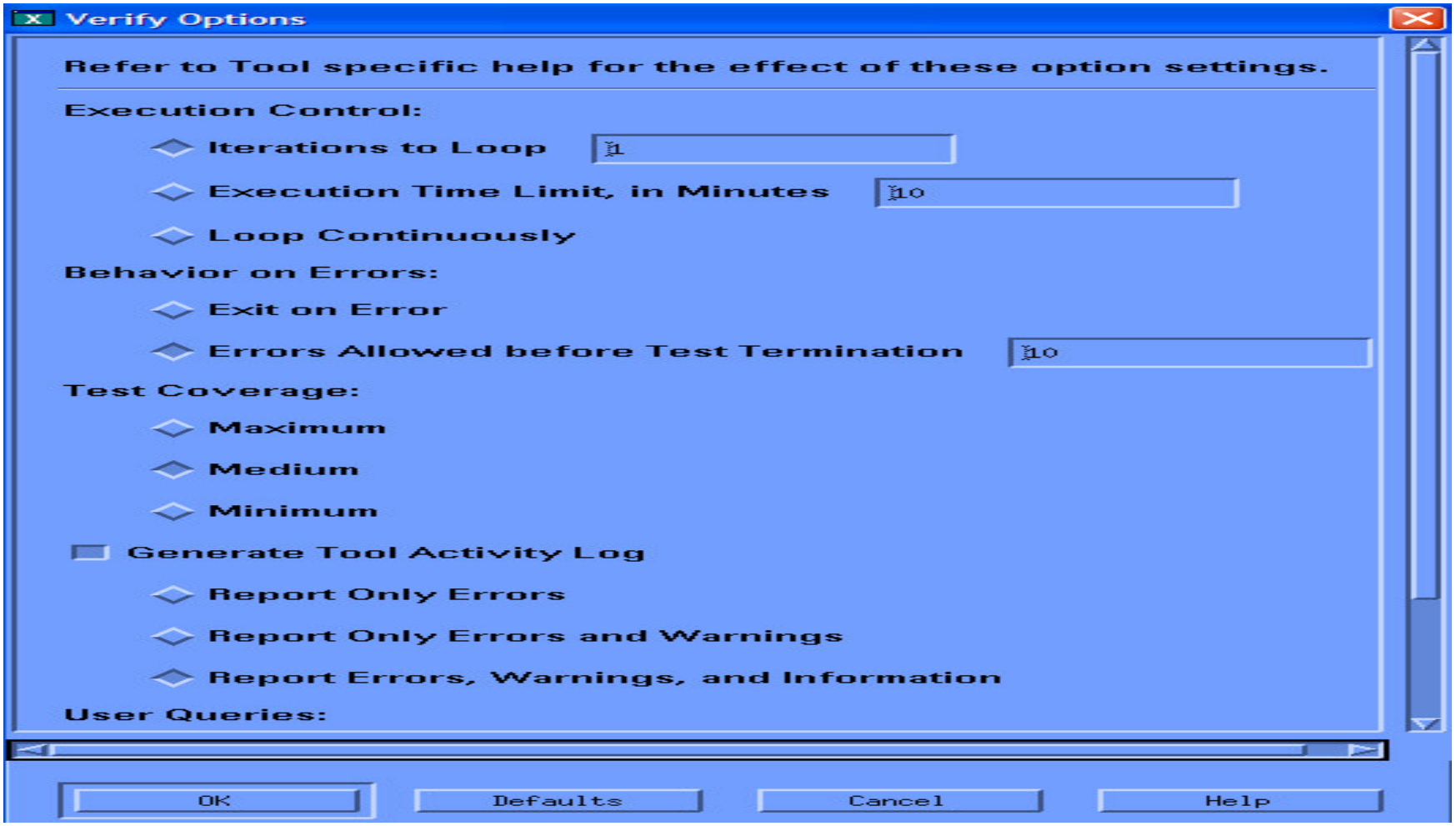
General Options



Map Options (XSTM)



Verify Options (XSTM)



Help Commands

- On item
  - Select the particular item on which to display help
- On tasks
  - Display help on common tasks
- On application
  - Display general help on STM
- On help
  - Display help on how to use the help system
- On version
  - Display STM version information
- On menus/commands
  - Display help on specific menus/commands

UI Files

- XSTM X resource file (*/usr/lib/X11/app-defaults/XStm)*
  - Contain X resource definitions
    - Size of windows
    - Foreground colors
    - Background colors
    - Highlights
    - Colors for different tool states
- .stmrc startup script (*/usr/sbin/stm/ui/config/.stmrc*)
  - Contain UI startup commands
  - User can copy the default script into their $HOME directory to create customize startup script
- config.stm configuration file (*$HOME/config.stm*)
  - Contain UI configuration when user selects to save it

System Files

- id_mod_xref (*/var/stm/data/id_mod_xref)*
  - Determine identify modules to execute to identify hardware on the system
  - Identify modules to determine product information
- prod_op_xref *(/*var/stm/data/prod_op_xref)
  - Determine device-class information
  - Determine list of available tools for product information (determined by identify modules)
- diagmond.cfg (*/var/stm/config/sys/diagmond.cfg)*
  - Contain configuration information for the *diagmond* daemon

Questions?

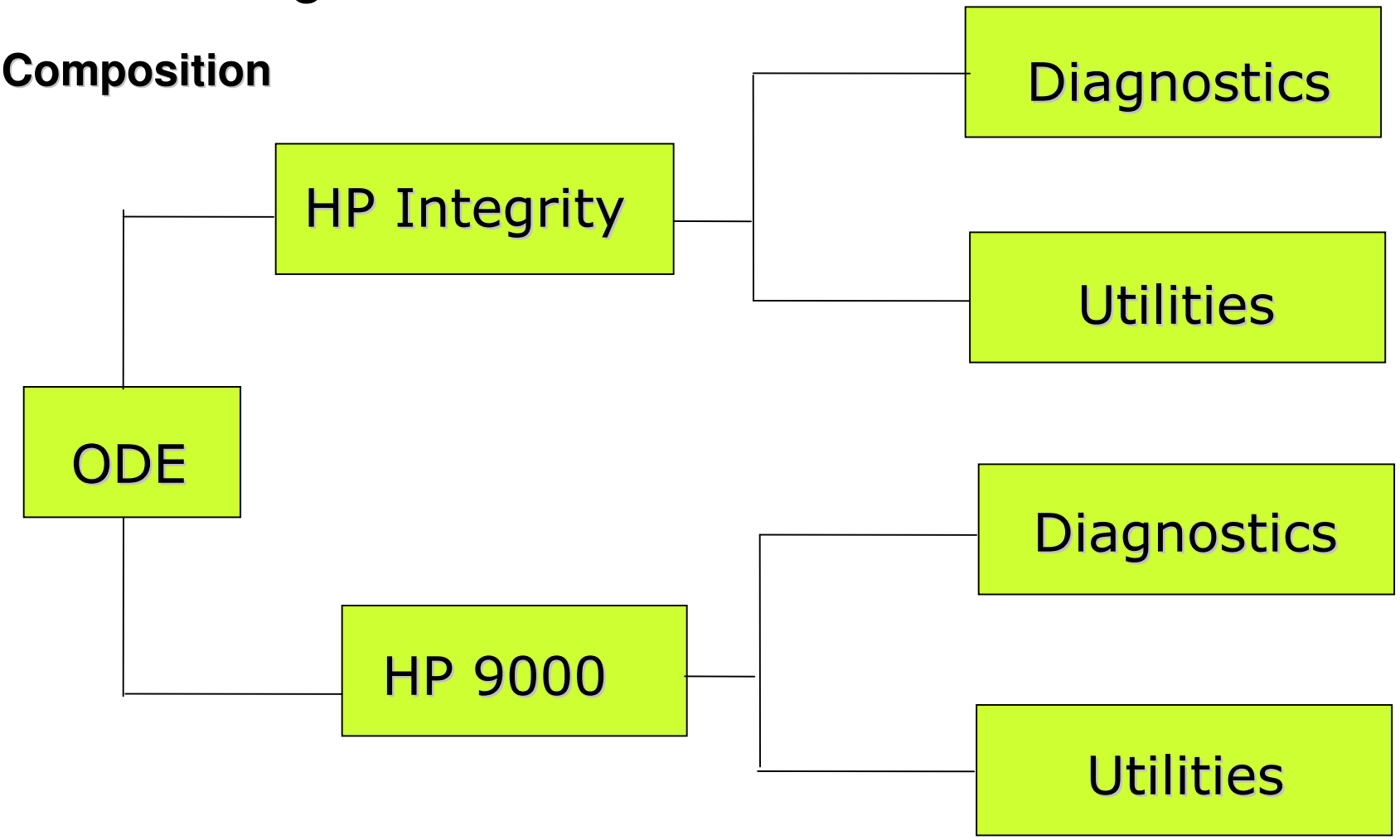
HP-UX Offline Diagnostics

Offline Diagnostics Environment

- What is ODE
- Why & when to use ODE
- How to use ODE
- What tools are available
- Use MAPPER first
- Common ODE commands
- Sample tool output
  - MAPPER
  - CPUDIAG
  - DFDUTIL
- Troubleshooting
  - FAQ

What is ODE?
Offline Diagnostics Environment

Composition



What is ODE?

ODE

- ODE stands for Offline Diagnostics Environment
- ODE is Operating System neutral (pre-OS boot)
- It is dependent on the CPU/HW architecture:
  - PA (HP9000)
  - IPF (HP Integrity)
- Unlike online exercisers
- Point to point (directed functional) test for system components
- Includes utilities for HW manageability

What is ODE?

Diagnostics

- The ODE Diagnostics Suite consist a set of diagnostics that test major components of a system & isolates the fault down to a Field Replaceable Unit (FRU).
- The following is a list of the major components in the ODE Diagnostics Suite:
  - Processor
  - Memory
  - Core Electronic chipset
  - Core IO
  - IO cards

What is ODE?

Utilities

- ODE Suite also contains a set of utilities that allows the user to view the system components and update firmware when system is offline.
- The major utilities consist of the following:
  - MAPPER: Display inventory/configuration of a system
  - DFDUTIL: updates SCSI disk drive firmware
  - FCFUPDATE: updates IO card firmware on supported cards
  - COPYUTIL: offline backup/restore tool for boot devices; use image copy instead of file system copy

Why use ODE suite?

Why

- ODE is the only diagnostics choice when system is down
- ODE contains comprehensive test coverage for faulty FRU (Field Replacement Unit) identification
  - Some Hardware test can't/shouldn't be done in a production OS environment
- All HP9000 (PA) & Integrity (IPF) server shipped must pass ODE tests
- Boots quickly

When to use ODE suite?

When

- System crash
- OS is not bootable
- HW problems that are hard to isolate
  - Requires testing/verifying very specific HW functions

Which ODE tools to use?

Which

- When time is limited, run the selected diagnostics tailored to the component suspected of failure
  - ex. If you notice that your LAN card is not working, run IOTEST to confirm that the card is indeed bad.
- Running all diagnostics on all components on a large configuration, could take a long time

Getting ODE?

How

- Pre-installed on HP-UX servers
  - PA-RISC LIF or IPF Service Partition
- Offline CD (included with system purchase)
- The same diagnostics can be used from the smallest workstation to the largest server.
- Getting update for offline tools
  - IPF: **http://www.hp.com/support/itaniumservers**
  - PA: **http://www.software.hp.com/ER_products_list.html**

Launch for HP 9000 Systems (PA-RISC)

Overview

- System disk
  - Boot ODE from the system disk (LIF directory)
- Support Plus Media CD
  - Boot the system from the Support Plus Media
- Boot from LAN
  - Ability to designate on system as the boot server, and have all systems that desire to run diagnostics boot from the boot server

Launch for HP Integrity Systems (IPF)

Overview

- System disk
  - Boot ODE from the system disk (HP Service Partition)
- Boot from IPF Offline Diagnostics and Utilities CD
- Boot from LAN
  - Ability to designate on system as the boot server, and have all systems that desire to run diagnostics boot from the boot server

ODE Command Line Interface

```
e-Diagtools for IPF    rev. A.01.XX      (c) Hewlett-Packard Company, 2002

**************************************************************************
******                                                              ******
******              Offline Diagnostic Environment                  ******
******                                                              ******
******  (C) Copyright Hewlett-Packard Co 1993-2003                  ******
******                    All Rights Reserved                       ******
******                                                              ******
******  HP shall not be liable for any damages resulting from the   ******
******  use of this program.                                        ******
******                                                              ******
******                TC  Version B.00.11                           ******
******                SysLib Version B.00.06                        ******
******                Mapfile Version B.01.05                       ******
******                                                              ******
**************************************************************************

Type HELP for command information.
ODE>
```

Available tools on ODE (Availability)

```
ODE> ls

          Modules on this boot media are:

filename       type    size      created    description
-------------------------------------------------------------------------
CIODIAG2.EFI   TM      643072    07/09/2003   Core IO diagnostic
CPUDIAG.EFI    TM      741376    07/09/2003   Processor diagnostic
IODIAG.EFI     TM      144384    07/09/2003   Runs selftests on I/O modules
MAPPER.EFI     TM      1654272   07/09/2003   System mapping utility
MEMDIAG.EFI    TM      263168    07/09/2003   Memory diagnostic
PERFVER.EFI    TM      817664    07/09/2003   Runs ROM-based selftests on
peripherals
PLUTODIAG.EFI  TM      514560    07/09/2003   SBA/LBA diagnostic
COPYUTIL.EFI   TM      1041920   07/09/2003   Disk-to-tape copy utility
DFDUTIL.EFI    TM      850432    07/09/2003   Disk firmware download utility
FCFUPDATE.EFI  TM      608256    07/09/2003   FW Update Utility for Fibre Channel

ODE> mapper
```

Use MAPPER first

MAPPER

- It's a good practice to always run MAPPER before you run any diagnostics. Running MAPPER first identifies which components exist on the system.
- Check the MAPPER output to determine obvious inconsistencies.

Common ODE Commands

ODE

COMMAND	FUNCTION
CLEARLOG	Clears the contents of a message log
Control-Y/C	Abort a Test command or stop execution of a Test Module
DEBUG	Enable debug print off
DISPLOG	Display a message log
DUMP	Read and display memory locations
ERRNUM	Set/Display the state of the ERRNUM flag
ERRONLY	Enable printing of errors only
ERRPAUSE	Set/Display the state of the ERRPAUSE flag
ERRPRINT	Set/Display the state of the ERRPRINT flag

Common ODE Commands (Cont.)

ODE

EXIT	Return to higher level prompt
HELP	Display information on Test Commands and Test Modules
LOGSIZE	Set the size of a message log
LOOP	Set the loop counter
LS	List ODE modules and data files
RESET	Reinitialize a TM and reset ODE environment variables
RESUME	Continue execution of a TM that was paused
RUN	Start execution of a TM
SAVE	Save error log to a file. OUTPUT.TXT
UNLOAD	Remove a TM from memory

MAPPER Output

MAPPER

```
MAPPER> run
STARTING EXECUTION OF MAPPER
Date : 03/06/2002  Time : 15:25:44

System Identification:
OEMId          =HP
Mfr Model ID =  Everest
ACPI version =2

Processor Identification:
                                                Processor          L3
 Socket   Status      Vendor      Family          Type      Speed      cache
 ------   ------      ----------  ------------    -------   -----      -----
 cpu 0    Active      INTEL   Itanium Processor  Central   1.500GHz   6144KB
 cpu 1    Active      INTEL   Itanium Processor  Central   1.500GHz   6144KB
 cpu 2    Active      INTEL   Itanium Processor  Central   1.500GHz   6144KB
 cpu 3    Active      INTEL   Itanium Processor  Central   1.500GHz   6144KB
```

MAPPER Output (Cont.)

MAPPER

```
Memory Device Identification:
     Type       Location                  Size(MByte)
     HP RAM     Ext 0-DIMM 0A              256
     HP RAM     Ext 0-DIMM 0B              256
     HP RAM     Ext 0-DIMM 1A              256
     HP RAM     Ext 0-DIMM 1B              256
Total Memory found: 1024 MB

Cache Identification:
Cache Level     Instruction(KBytes)    Data(KBytes)
  0                 16                    16
  1                 N/A                   256
  2                 N/A                   6144

Configuring I/O...
Please wait.

Looking for SCSI devices via LSI SPT device driver.....
Looking for IDE devices via IDE device driver.....
Looking for USB devices via USB device drivers.....
```

MAPPER Output (Cont.)

MAPPER

```
 SubSys
                                                  VENDOR DEVICE Vendor SUBSYS REV
PATH         COMPONENT NAME                       ID     ID     ID     ID     ID
---------- ------------------------------------ ------ ------ ------ ------ -----
0            System Bus Adapter                   103CH  1229H                 0022H
0/0          Local Bus Adapter                    103CH  122EH                 0032H
0/0/1/0
    USB Controller                                1033H  0035H  1033H  0035H  0041H
0/0/1/0.1.0              USB SILITEK USB Keyboard and Mouse (Keyboard)  01.20
0/0/1/0.1.1              USB SILITEK USB Keyboard and Mouse (Generic HID device)
01.20
0/0/1/1
    USB Controller                                1033H  0035H  1033H  0035H  0041H
0/0/1/1.1.0              USB Logitech N43 (Mouse)                       04.01
0/0/1/2
    USB Controller                                1033H  00e0H  1033H  00e0H  0002H
0/0/2/0
    IDE Controller                                1095H  0649H  1095H  0649H  0002H
0/0/2/0.0.0              IDE ATAPI CDROM DW-224E                        C.0B
0/0/3/0
    Ethernet Controller                           8086H  1229H  103cH  1274H  000DH
```

MAPPER Output (Cont.) MAPPER

```
0/1         Local Bus Adapter                    103CH  122EH                 0032H
0/1/1/0
            SCSI Bus Controller                  1000H  0030H  1000H  1000H  0007H
0/1/1/0.0.0              SCSI HP 36.4G ST336607LC                             HPC3
0/1/1/0.1.0              SCSI HP 36.4G ST336607LC                             HPC3
0/1/1/1
Ethernet Controller                         14e4H  1645H  103cH  12a4H  0015H
0/2         Local Bus Adapter                    103CH  122EH                 0032H
0/6/1/0
    SCSI Bus Controller                          1000H  0021H  103cH  1330H  0001H
0/7         Local Bus Adapter                    103CH  122EH                 0032H
0/7/1/0
    Communications Controller                    103cH  1290H  103cH  1291H  0001H
0/7/1/1
 Serial Controller                           103cH  1048H  103cH  1282H  0003H
0/7/2/0
    VGA or 8514 Controller                       1002H  5159H  103cH  12abH  0000H
IO map Done...

MAPPER execution complete
Date : 07/24/2003  Time : 01:13:20
Exiting...

RUN COMPLETED.
ODE>
```

Launching CPUDIAG

CPUDIAG

```
ODE> cpudiag

**********************************************************************
******                                                          ******
******                          CPUDIAG                         ******
******                                                          ******
******          Copyright (C) 2002 by Hewlett-Packard Company   ******
******                     All Rights Reserved                  ******
******                                                          ******
******   HP shall not be liable for any damages resulting from the  ******
******   use of this program.                                   ******
******                                                          ******
******                       Version B.00.51                    ******
******                                                          ******
**********************************************************************
Type HELP for command information.

Please wait, detecting if a MP system....
Initializing MP Protocol Interface....
Done
Number of Processors = 4
CPUDIAG>
```

Section/Loop Command

CPUDIAG

```
CPUDIAG> sec 1/2
CPUDIAG> loop 2
CPUDIAG> run
STARTING EXECUTION OF CPUDIAG

SECTION 001
general register Test Section

Started Date : 7/24/2003  Time : 16:31:24
Sent AP(3) Start Message
Sent AP(2) Start Message
Sent AP(1) Start Message
Finished Date : 7 /24/2003  Time : 16:31:24

SECTION 002
Bank register Test Section

Started Date : 7/24/2003  Time : 16:31:24
Sent AP(3) Start Message
Sent AP(2) Start Message
Sent AP(1) Start Message
Finished Date : 7 /24/2003  Time : 16:31:24
END OF LOOP 1
```

Section/Loop Command (Cont.)


```
STARTING EXECUTION OF CPUDIAG
SECTION 001
general register Test Section

Started Date : 7/24/2003  Time : 16:32:34
Sent AP(3) Start Message
Sent AP(2) Start Message
Sent AP(1) Start Message

Finished Date : 7 /24/2003  Time : 16:32:34

SECTION 002
Bank register Test Section

Started Date : 7/24/2003  Time : 16:32:34
Sent AP(3) Start Message
Sent AP(2) Start Message
Sent AP(1) Start Message

Finished Date : 7 /24/2003  Time : 16:32:34

END OF LOOP 2
RUN COMPLETED.
CPUDIAG>
```

Proc Command

CPUDIAG

```
CPUDIAG> proc 0/1
CPUDIAG> loop 1
CPUDIAG> run

STARTING EXECUTION OF CPUDIAG

SECTION 001
general register Test Section

Started Date : 7/24/2003  Time : 16:35:35
Sent AP(1) Start Message

Finished Date : 7 /24/2003  Time : 16:35:35
 SECTION 002
Bank register Test Section

Started Date : 7/24/2003  Time : 16:35:35
Sent AP(1) Start Message

Finished Date : 7 /24/2003  Time : 16:35:35

RUN COMPLETED.
CPUDIAG>
```

Master Command CPUDIAG

```
CPUDIAG> master 1
CPU:ID 1 is now Master.
CPUDIAG> sec 20

CPUDIAG> run
STARTING EXECUTION OF CPUDIAG

SECTION 020
MP Purge Test Section

Started Date : 7/24/2003  Time : 17:48:20
Sent AP(1) Start Message

Master CPU: 1
Slave CPU: 0
Finished Date : 7 /24/2003  Time : 17:48:20

RUN COMPLETED.
CPUDIAG>
```

Error Messages

Error

```
CPUDIAG> proc 0/3
CPUDIAG> run
STARTING EXECUTION OF CPUDIAG

SECTION 001
general register Test Section

Started Date : 7/24/2003  Time : 18:4 :11

Sent AP(3) Start Message
Sent AP(2) Start Message
Sent AP(1) Start Message
2 0 0x000281 0x1880000000000340 Processor Bus Check
2 0 0x00028E 0x000000003FFFCDB0 Processor Mod Err Info Target ID

ERROR 1000 IN SECTION 001

CMC was detected!
CPUDIAG PAUSED>
```

DFDUTIL (thru system disk)

DFDUTIL

- Need to copy ODE suite to the LIF (HP9000) or HP Service Partition (Integrity)
- Download the latest disk firmware from HP support
- Store the firmware in the LIF (HP 9000) or HP Service partition (Integrity) directory
- Launch ODE from system disk by issuing ODE at the shell prompt.
    - Ex. fs0:\EFI\HP\DIAG\ODE>ode (Integrity)

DFDUTIL Banner


```
**************************************************************************
******                                                              ******
******              Offline Diagnostic Environment                  ******
******                                                              ******
******  (C) Copyright Hewlett-Packard Co 1993-2003                  ******
******                    All Rights Reserved                       ******
******                                                              ******
******  HP shall not be liable for any damages resulting from the   ******
******  use of this program.                                        ******
******                                                              ******
******                TC  Version B.00.11                           ******
******                SysLib Version B.00.06                        ******
******                Mapfile Version B.01.05                       ******
******                                                              ******
**************************************************************************

Type HELP for command information.
ODE> dfdutil
```

DFDUTIL Warning Message DFDUTIL

```
**********************************************************************
******                                                          ******
******                          DFDUTIL                         ******
******                                                          ******
******      Copyright (C) 2001-2003 by Hewlett-Packard Company  ******
******                    All Rights Reserved                   ******
******                                                          ******
******   HP shall not be liable for any damages resulting from the  ******
******   use of this program.                                   ******
******                                                          ******
******                       Version B.00.11                    ******
******                                                          ******
**********************************************************************
Type HELP for command information.
Entering DFD_entry()

**********************************************************************
*                           WARNING!                                 *
*                          ---------                                 *
* DFDUTIL must have exclusive access to all the disks you wish to update. *
* If you are in a multihost environment such as Switchover & ServiceGuard,*
* make sure all other hosts are powered down before continuing.      *
**********************************************************************
```

Detected Disks

DFDUTIL

```
Press <Return> to continue; Type h for help
Looking for SCSI devices via LSI SPT device driver.....
The Shared Library <SLMOD.EFI> is loaded.
... <23> modules found

Warning: CONFIGDATA is not loaded.
*************************************************************************
*                        HP Supported Disks Found                       *
*************************************************************************
Indx  Path               Product ID                       Bus    Size   Rev
--- ------------------ -------------------------------- ------ ------ ------
0   0/1/1/0.0.0
                         SCSI HP 18.2G ATLAS10K3_18_SCA   SCSI   18. GB   HP05
1   0/1/1/0.1.0
                         SCSI FUJITSU  MAJ3364MC          SCSI   36. GB   HP07
2   0/1/1/1.2.0
                         SCSI HP 18.2G ATLAS10K3_18_SCA   SCSI   18. GB   HP05
Legend:
Indx = Index number used for referencing the device
Rev  = Firmware Revision of the device

Note:  Due to different calculation methods used, the size
       of the device shown is only a rough approximation.
Create a firmware file list? (q for quit) [default for y]
```

Detected Firmware

DFDUTIL

```
Create a firmware file list? (q for quit) [default for y]

Please wait while I search for all the firmware files.
Note: This may take a while if you are booting from tape.
numFile = 4
..

*****************************************************************************
*                      Firmware Files Found (not disks)                     *
*****************************************************************************
File name         Intended Product ID                        Rev.    Size
---------------- ---------------------------------------- ------ --------
MAJ3364MC.HP08.frm rm                                        HP08   233472

Legend:
File name           = name of the firmware file
Intended Product ID = firmware file's intended product name
Rev.                = firmware Revision of the firmware file
Size                = exact byte size of the firmware image
eXiting DFD_entry()

DFDUTIL>
```

Update Firmware

```
DFDUTIL> download MAJ3364MC.HP08.frm 1
About to work on (1) range of disks w/MAJ3364MC.HP08.FRM firmware file.

************************************************************
* Downloading firmware to a disk MAY destroy the data on the *
* disk.  Make sure you have made the necessary backups.      *
************************************************************

************************************************************
* About to download firmware MAJ3364MC.HP08.FRM onto disk(s): 1.
************************************************************

Do you wish to continue with the download (y/[n]/q)? y

************************************************************
*                          WARNING!                        *
* DO NOT INTERRUPT THIS PROCESS OR THE DISK MAY BE DAMAGED!  *
************************************************************
```

Update Finished

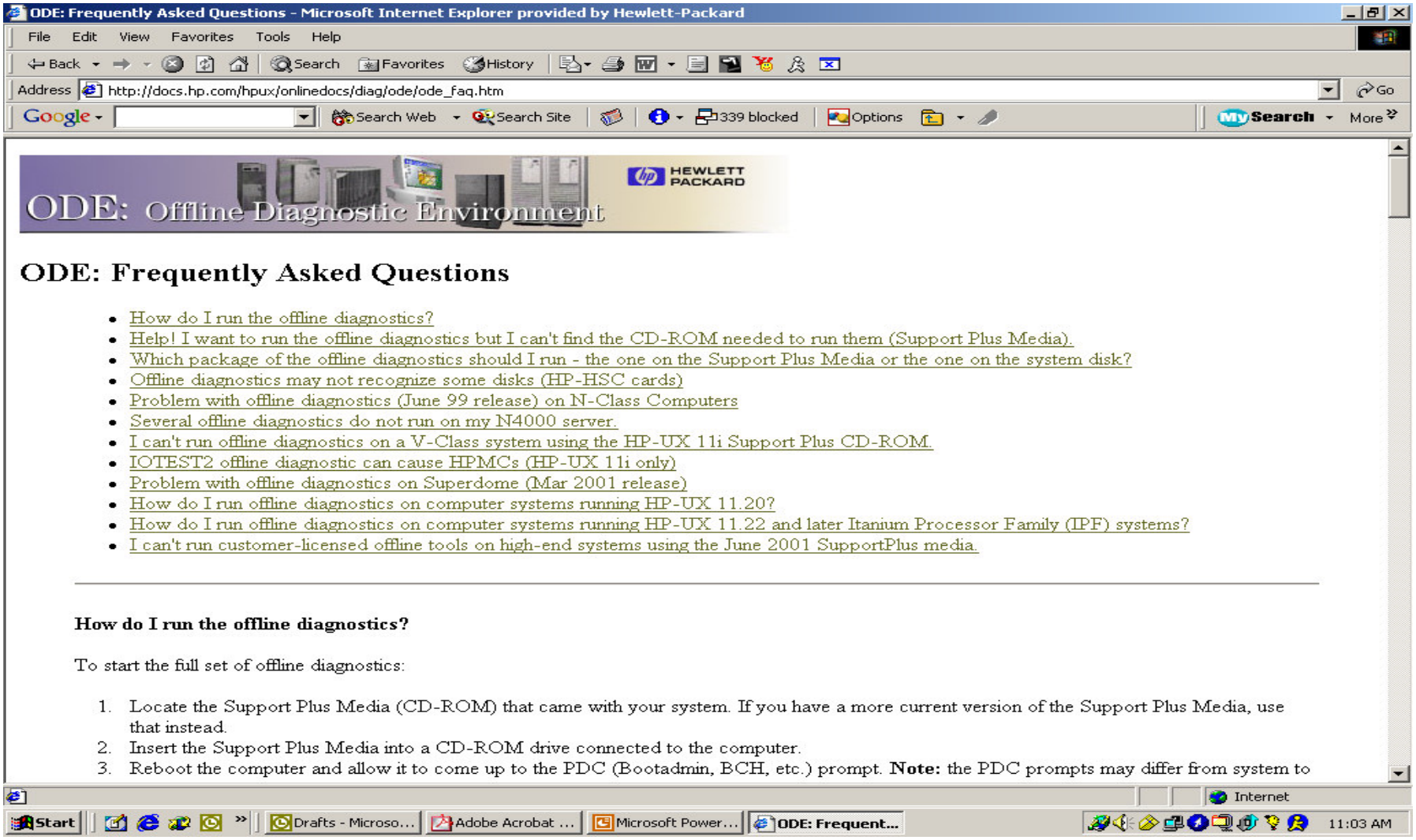

```
************************************************************
* Please wait while disk 1 at 0/1/1/0.1.0              is updated
* from revision HP07 to HP08.
************************************************************
Please wait a few minutes for file verification of the downloaded firmware ....
Please wait while the disk ROMs are updating.

30 seconds left    ..........
20 seconds left    ..........
10 seconds left    ..........
Done!

************************************************************
*              Firmware downloaded SUCCESSFULLY!           *
*              -------------------------------             *
* Power off & on disk drive(s) to activate the new firmware. *
************************************************************

DFDUTIL>
```

ODE Troubleshooting Tips

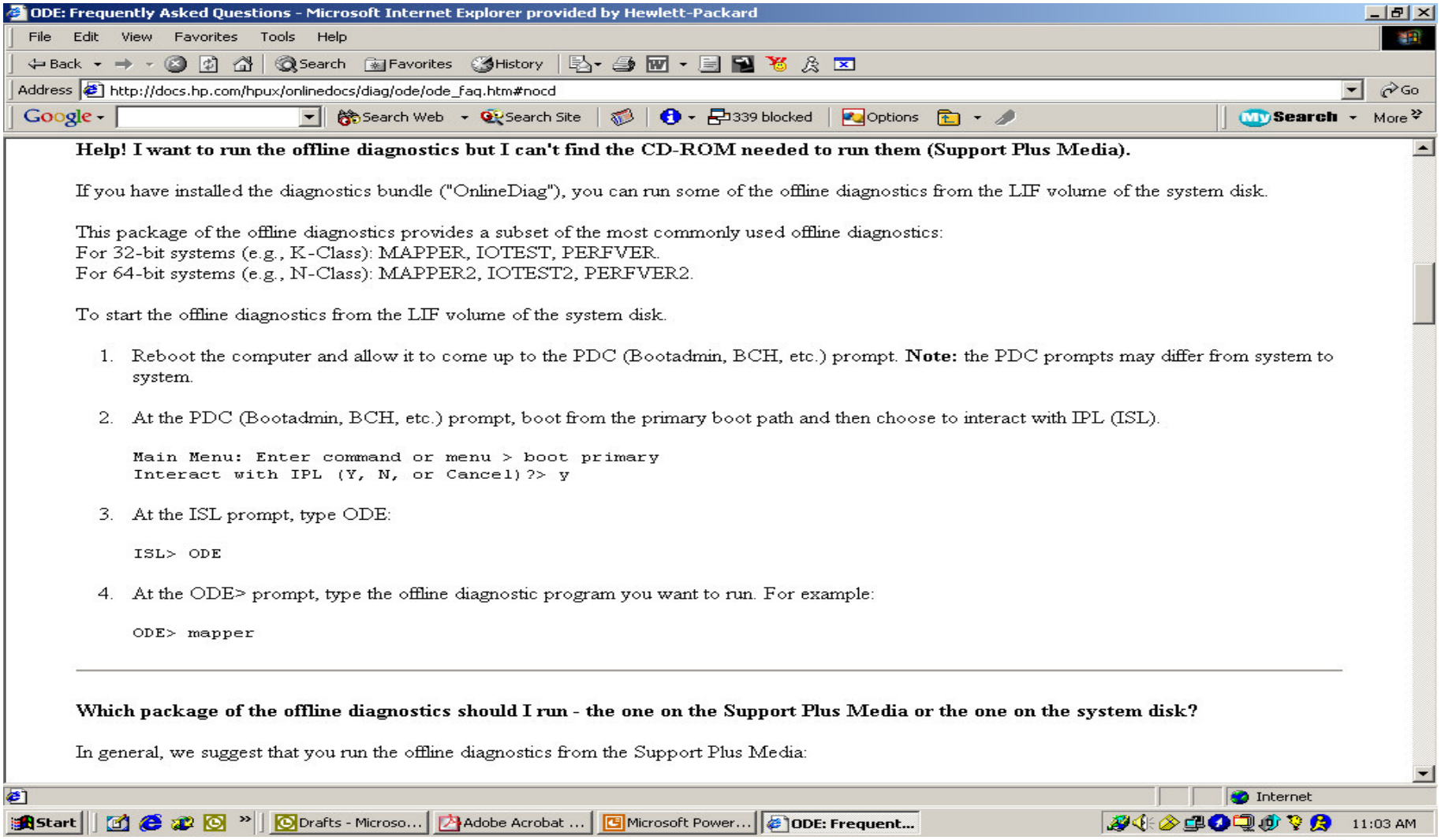
Frequently asked questions can be found at the following website:
http://docs.hp.com/hpux/onlinedocs/diag/ode/ode_faq.htm

- This site lists the most frequently asked questions pertaining to the Offline Diagnostics Environment.
- Example:

ODE Frequently Asked Questions



ODE Frequently Asked Questions



Questions?

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