Reactive Fault Management:
Support Tools Manager

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HP WORLD 2003
Solutions and Technology Conference & Expo

Support Tools Manager

Introduction

- Support Tools Manager Overview
- Benefits of the Support Tools Manager
- Support Tools Usage Flow
- Types of Support Tools Available
- Levels of Tool Licensing
- Support Tools Manager Architecture
- Support Tools Manager Daemon

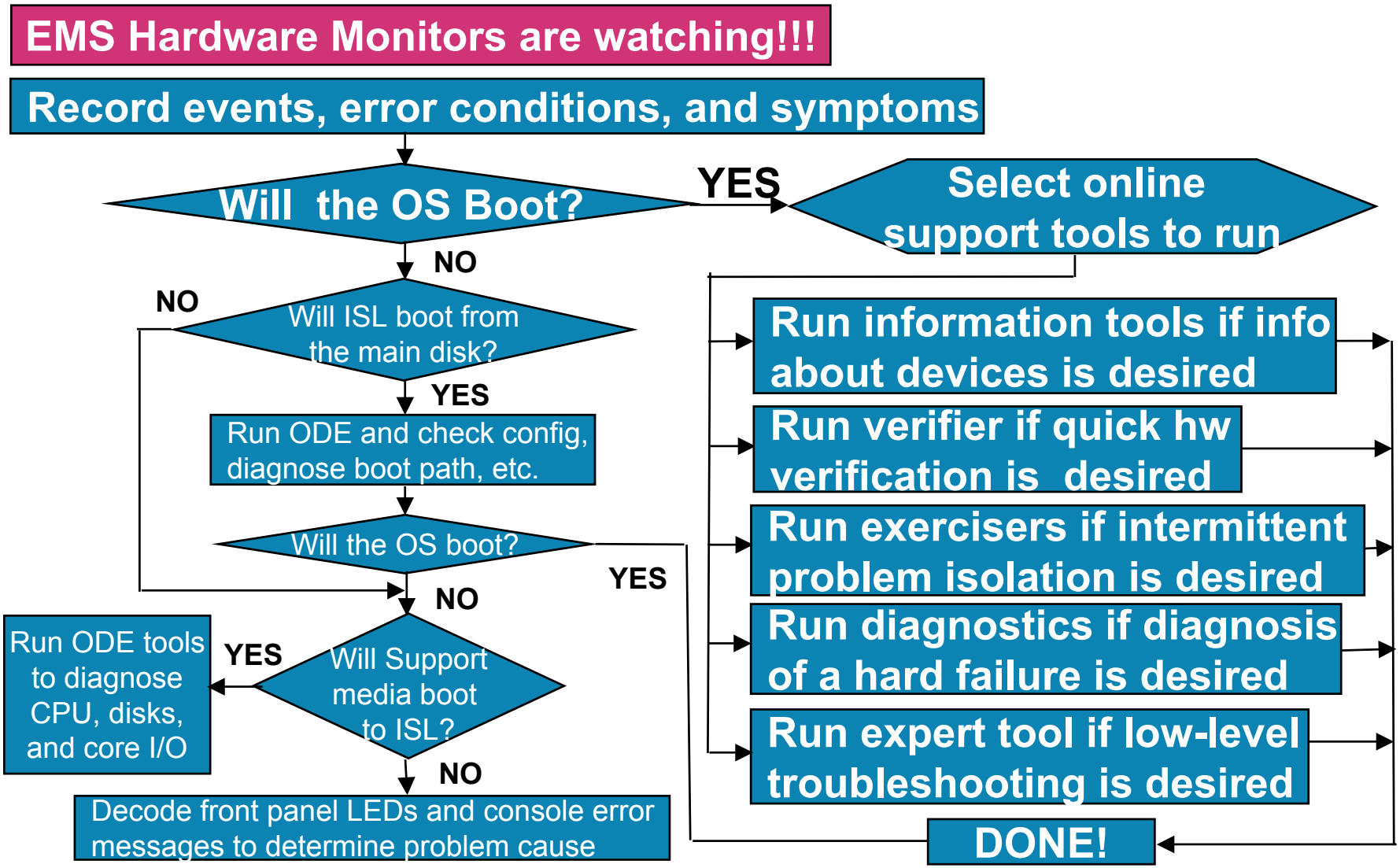
Support Tools Manager Overview

- Support Tools Manager (STM) consists of a complete set of online diagnostics support tools
- To assist you in verifying and trouble-shooting your systems against any system hardware failures
- Standard package as part of HP-UX to help keep your systems running at peak performance by providing you with predictive and preventative maintenance diagnostics for your hardware

Benefits of the Support Tools Manager

- Provide the ability to test the system while it is online
- Provide a representation of all of the hardware devices on the system, plus useful information about them
- Exercise the system to uncover intermittent problems
- Reduce time to repair
- Reduce system downtime
- Easy to use

Support Tools Usage Flow



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)

- 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 (3 of 4)

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

Types of Support Tools Available (4 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
  - Modmutil
    - Display modem information, reset the internal modem, run terminal commands, and test the internal modem
  - MOutil
    - Retrieve information about the MO devices and run various diagnostic tests to verify that all MO devices are functional

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

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

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

Example: Fibre Channel Interface Diagnostic Tool

- Perform as complete a 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

Example: CPU Expert Tool

- Provide sophisticated troubleshooting for problems associated with a specific processor
  - Current processor status information (active state, configuration state)
  - The ability to assign a process to a specific processor
  - The ability to enable or disable individual processor modules without requiring restart of the OS or reset of the system
  - The ability to mark individual processor modules for deconfiguration or reconfiguration on the next reboot
  - Extensive testing of individual processor modules

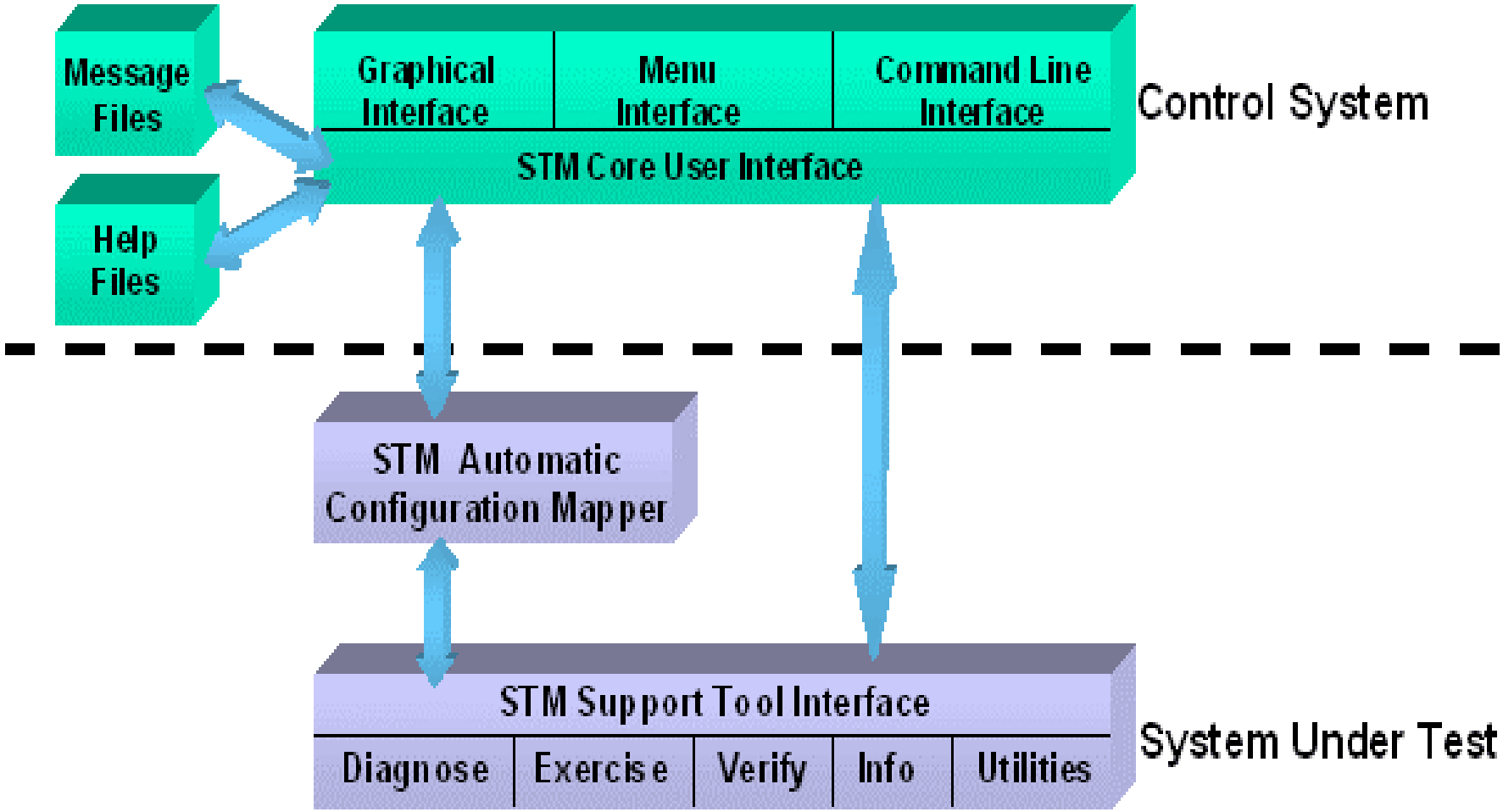
Levels of Licensing

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

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

Support Tools Manager Architecture



Support Tools Manager Daemon

- Support Tools Manager's monitor daemon (diagmond) is the heart of the online support tools
- Started automatically at boot time
  - Keep track of the system hardware configuration
  - Manage launching and controlling support tools
  - Maintain device/tool state information
  - Service user interface connection requests

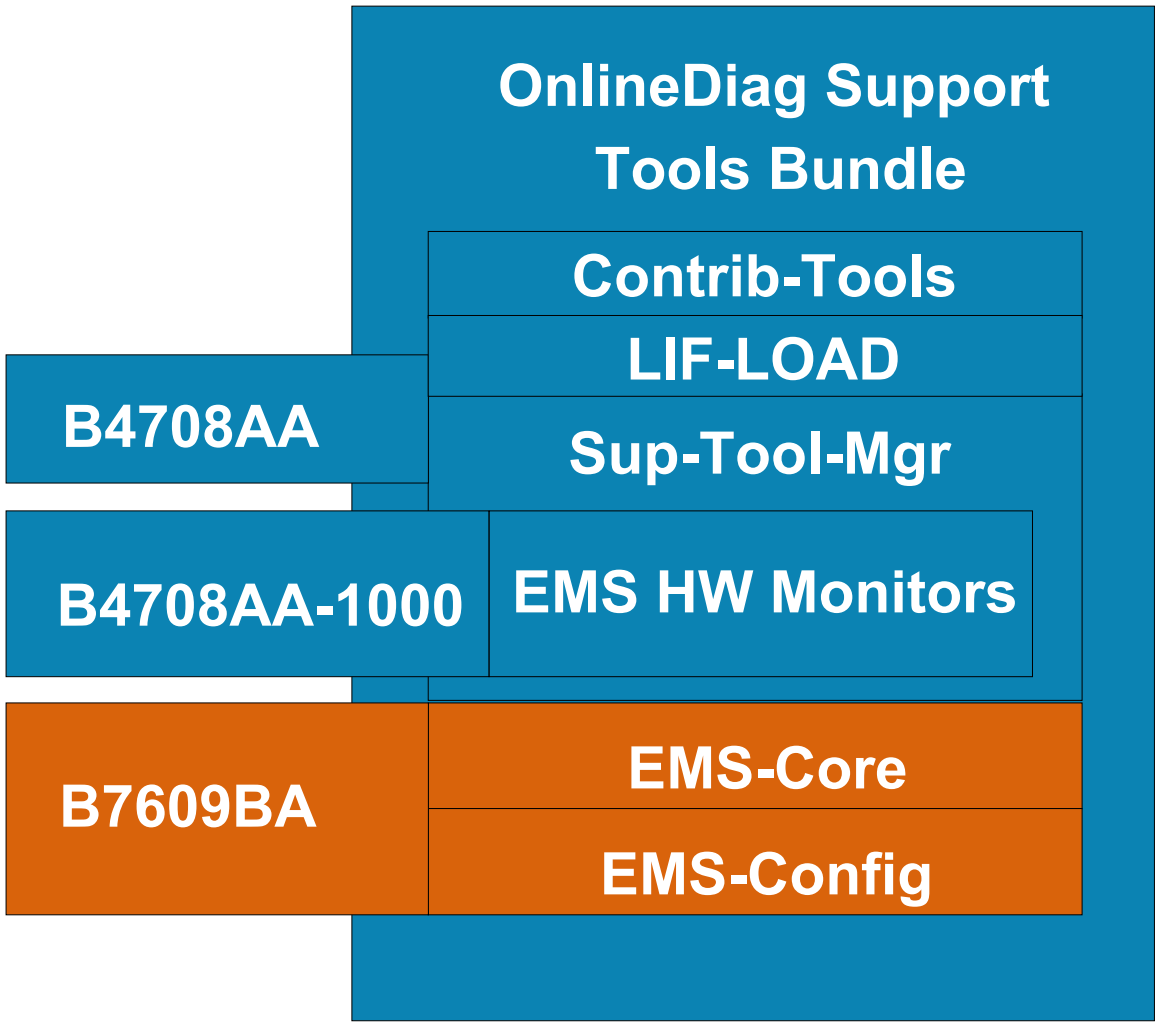
Support Tools Manager

Installation

- Product Structure
- Installing the Support Tools Manager

Product Structure

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



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)

Support Tools Manager

Usage and Operation

- User Interface
- Running the Support Tools Manager
- System Map
- Running Support Tools
- Getting Result Information
- UI Files
- System Files
- List of All Commands

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

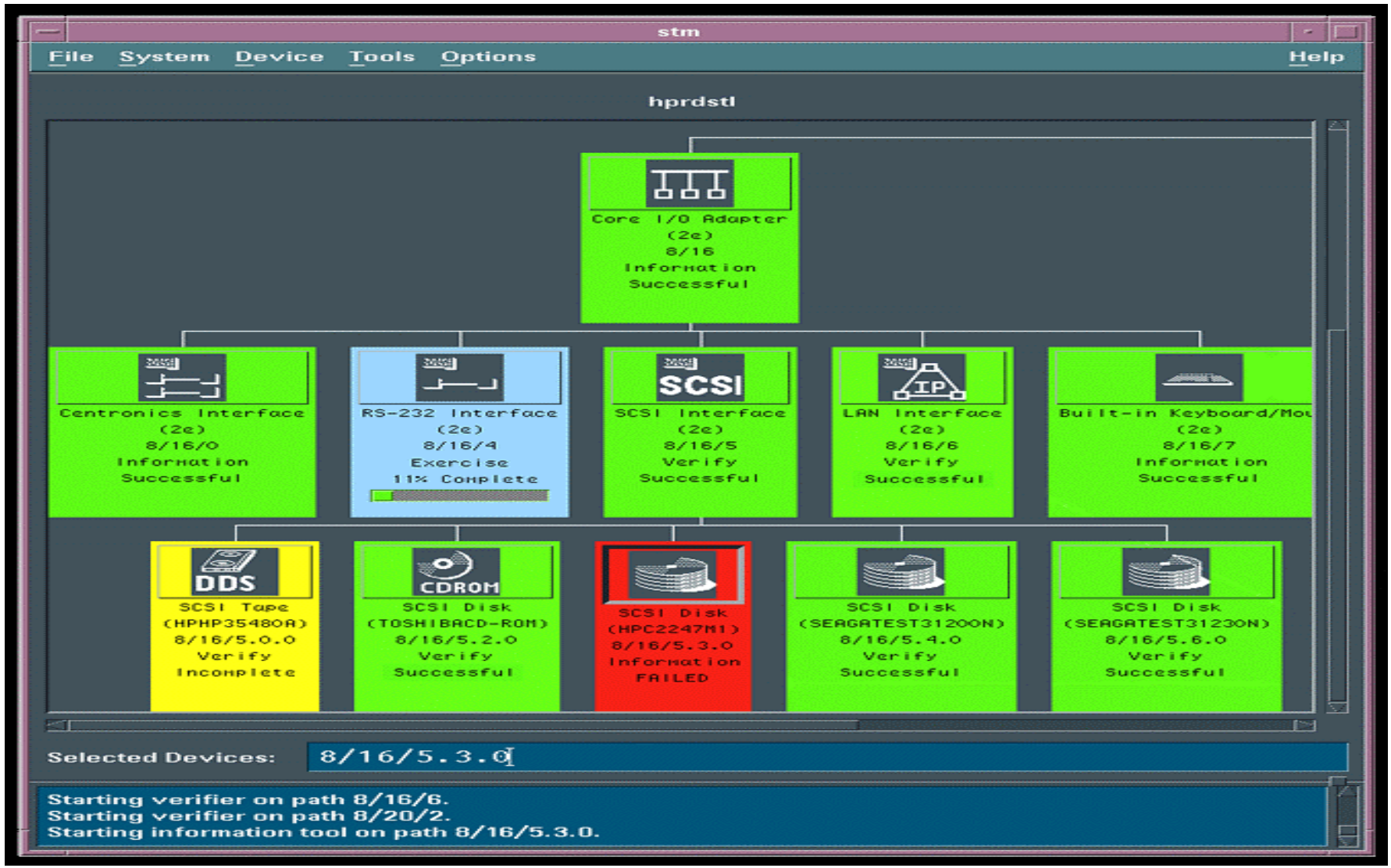
Running the Support Tools Manager

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

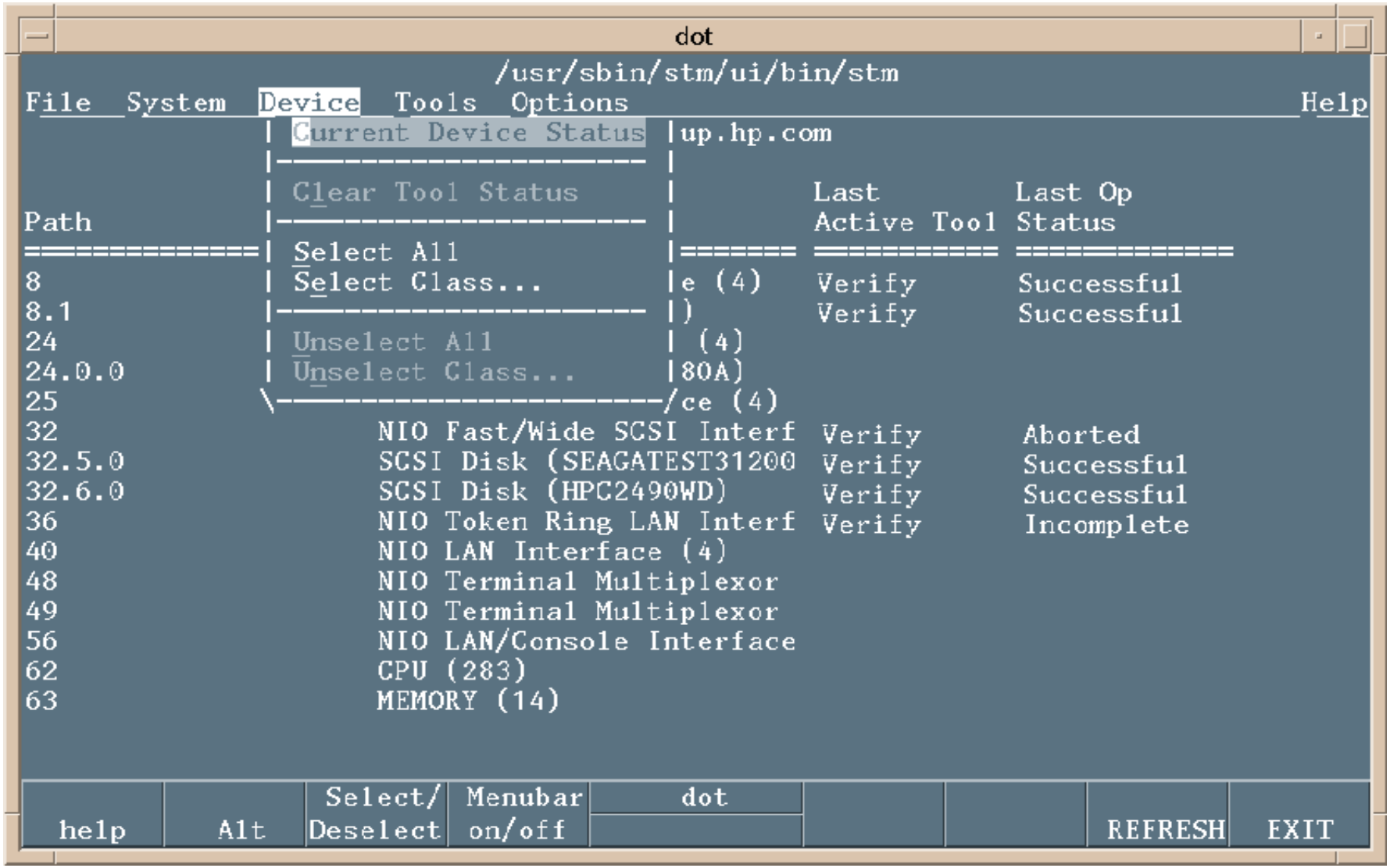
System Map

- 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

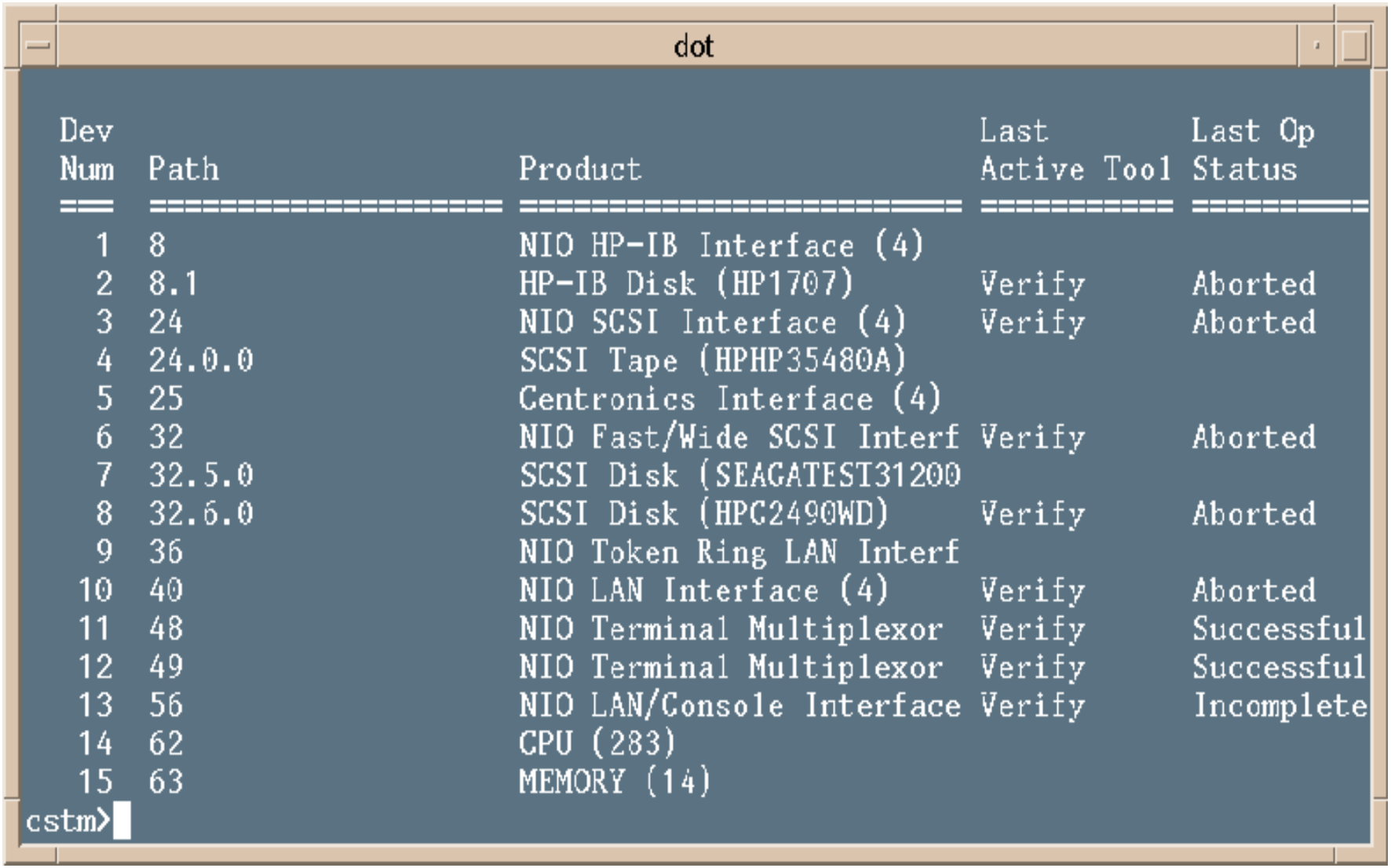
Graphical User Interface (XSTM): System Map



Menu User Interface (MSTM): System Map



Command Line User Interface (CSTM): System Map



Running Support Tools

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

Getting Result Information (1 of 2)

- Result information from support tools can be obtained easily from the system map device status
  - Successful
  - Failed
  - Incomplete
  - Abort Pending
  - Aborted
  - Query Pending
  - Warning
  - Hung
  - Killed
  - Suspended

Getting Result Information (2 of 2)

- Tool Logs
  - Failure Log
    - Tool failure information identifying the likely causes for the device failure and probable cause(s)/recommended action(s)
  - Test Activity Log
    - Tool activity information showing detailed tool status, test options, etc.
  - Information Tool Log
    - Information tool data (created by the information tools only) providing useful information on the selected device

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

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

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

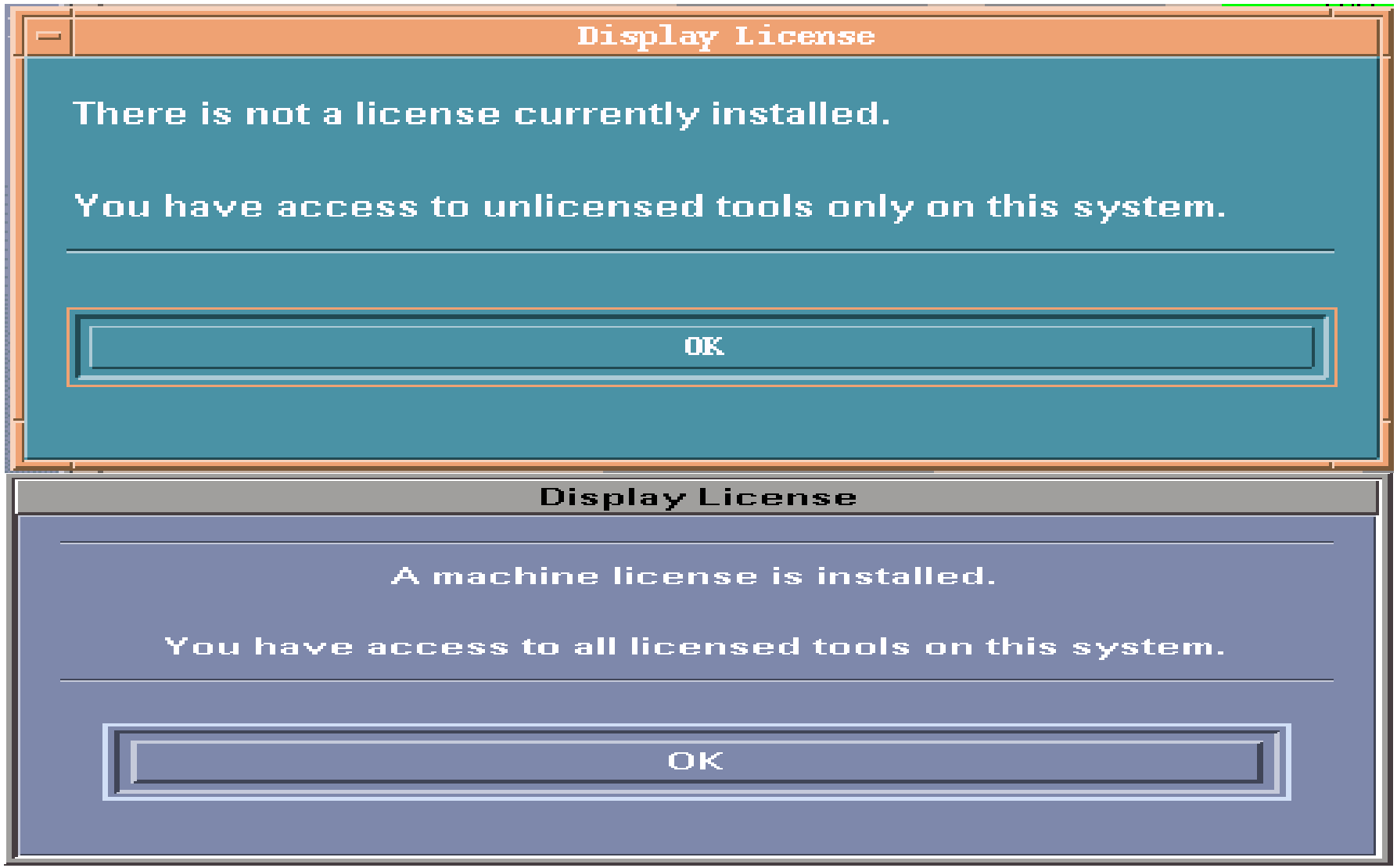
System Commands (2 of 3)

- 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

XSTM: Display License



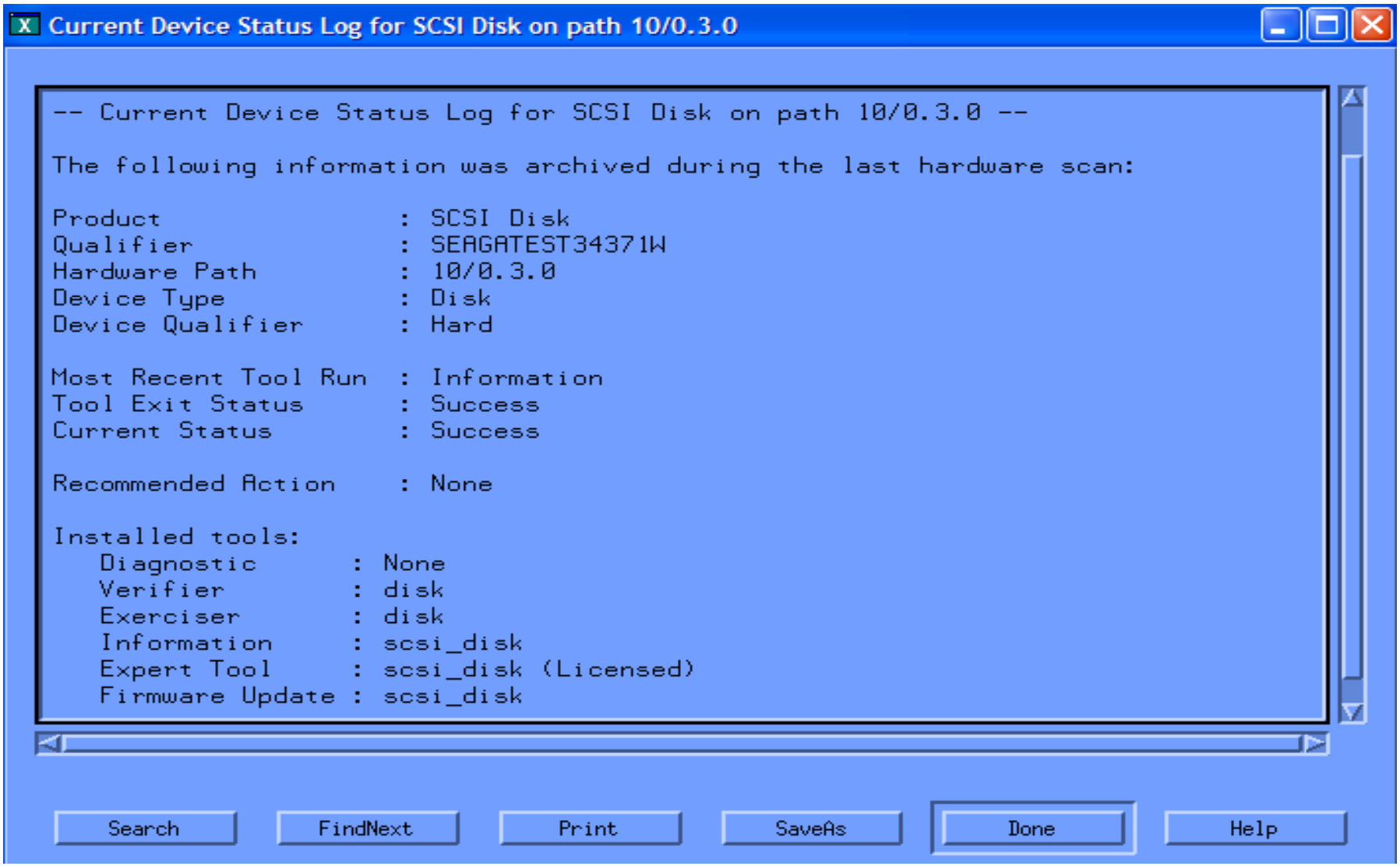
Device Commands (1 of 2)

- 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

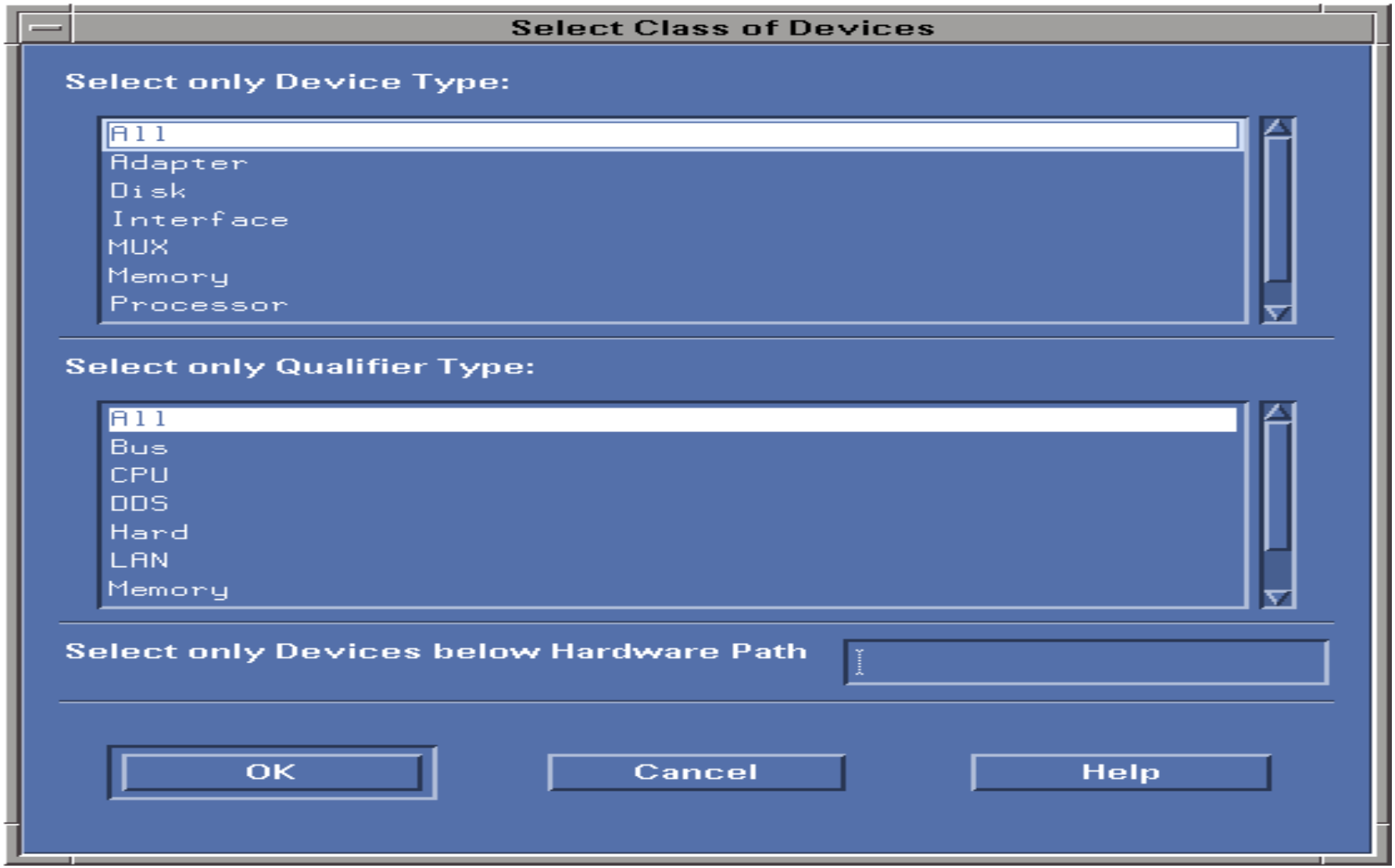
Device Commands (2 of 2)

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

XSTM: Current Device Status



XSTM: Select/Unselect Class



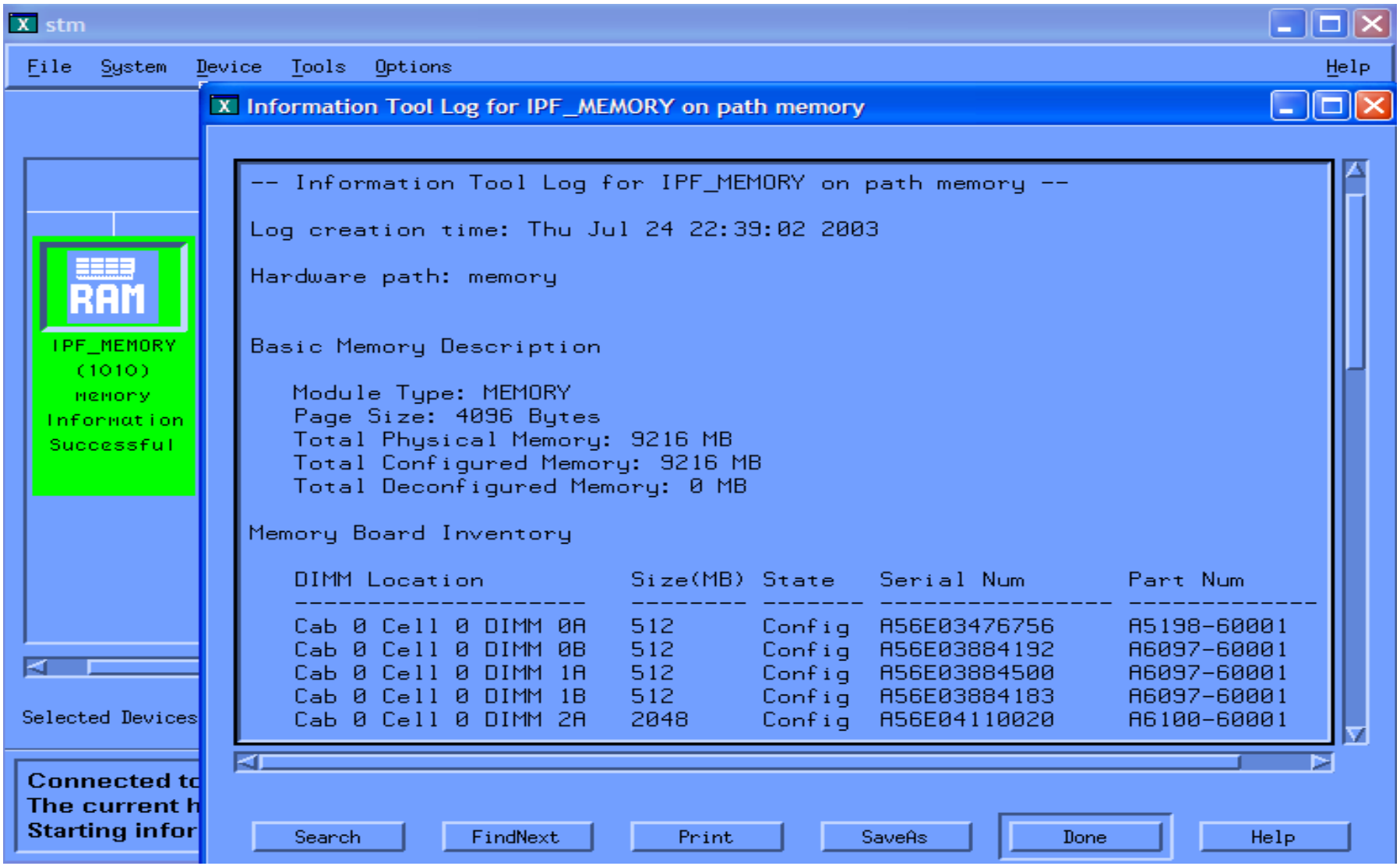
Tools Commands (1 of 2)

- 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

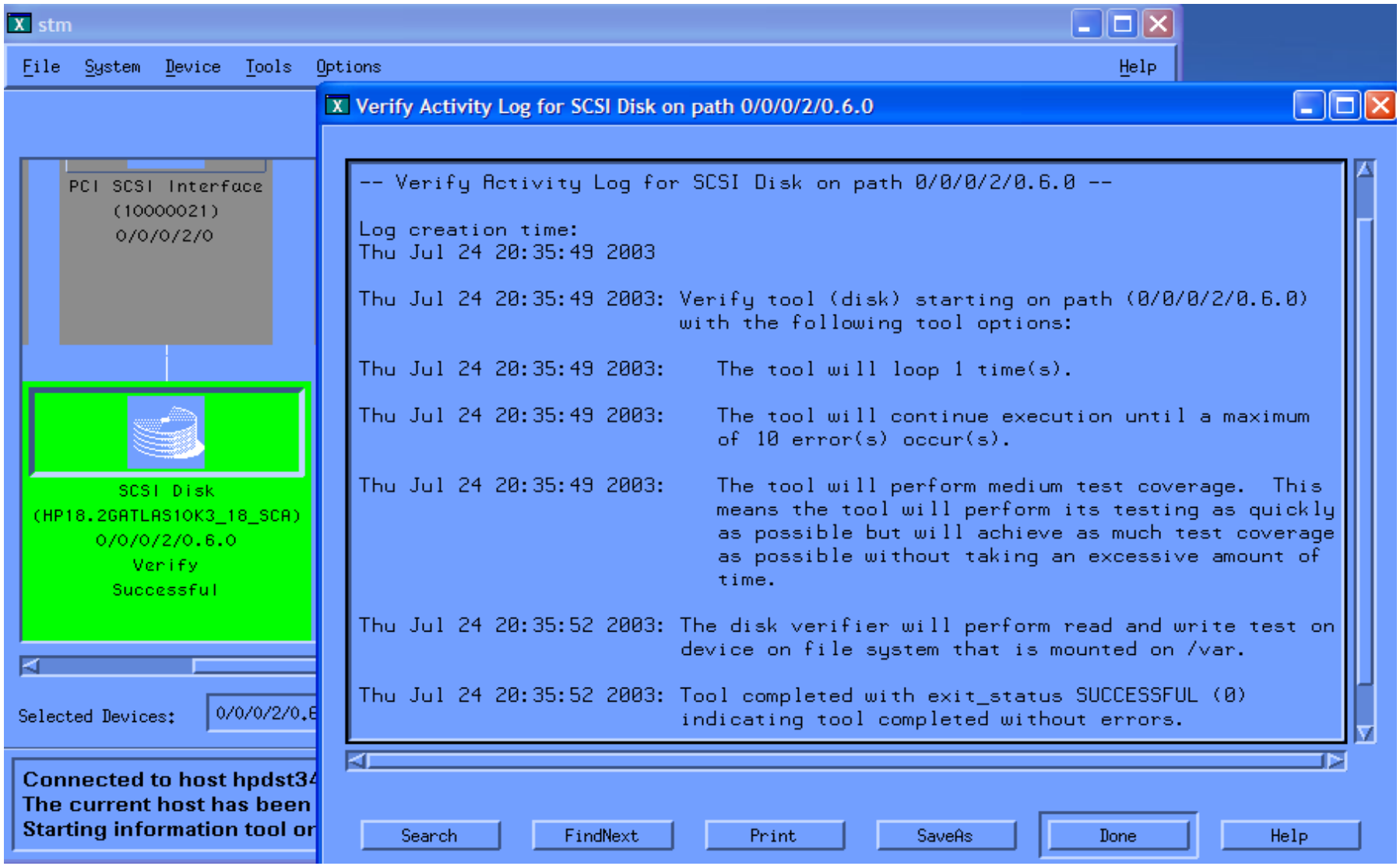
Tools Commands (2 of 2)

- 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

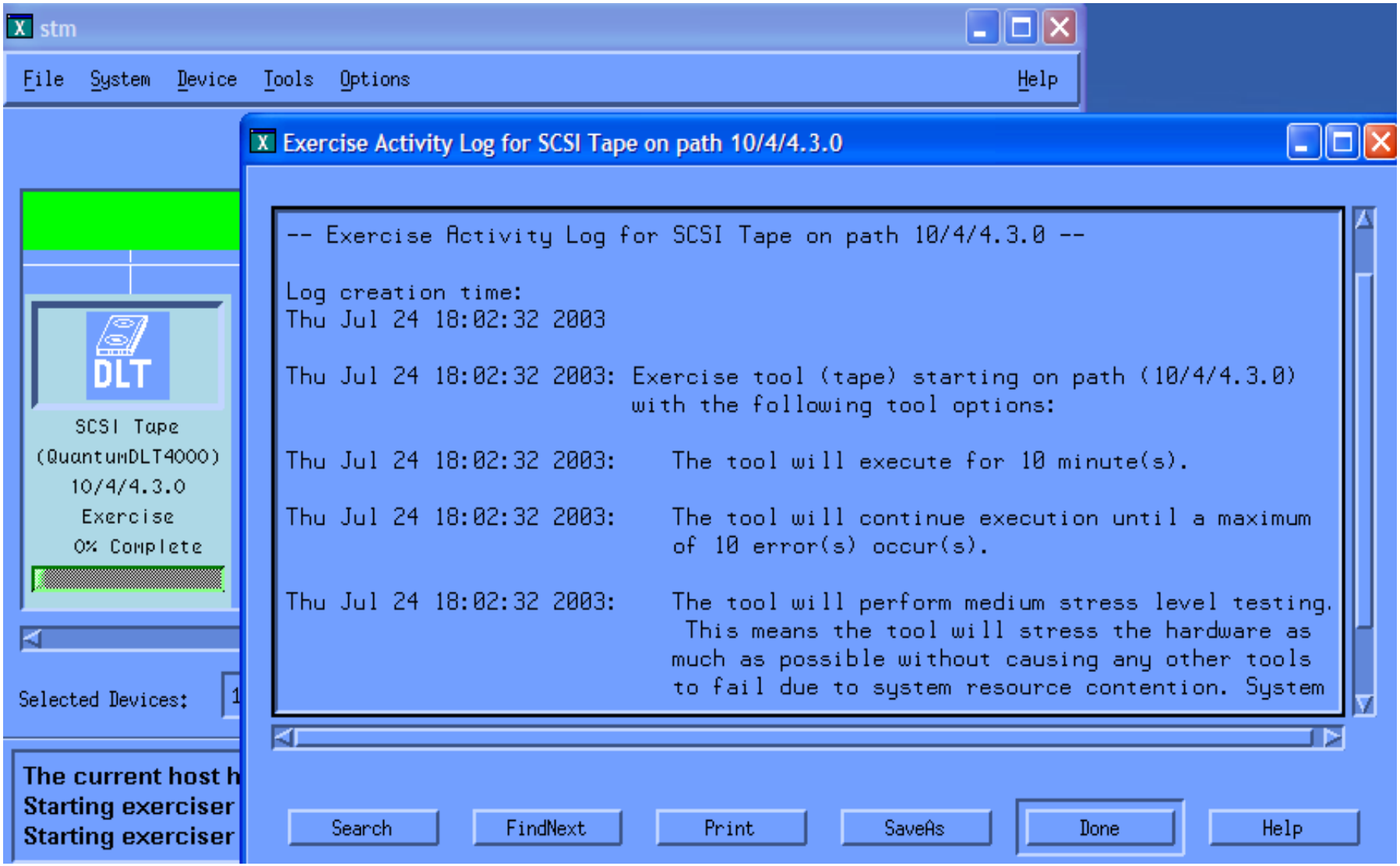
XSTM: Memory Information Tool



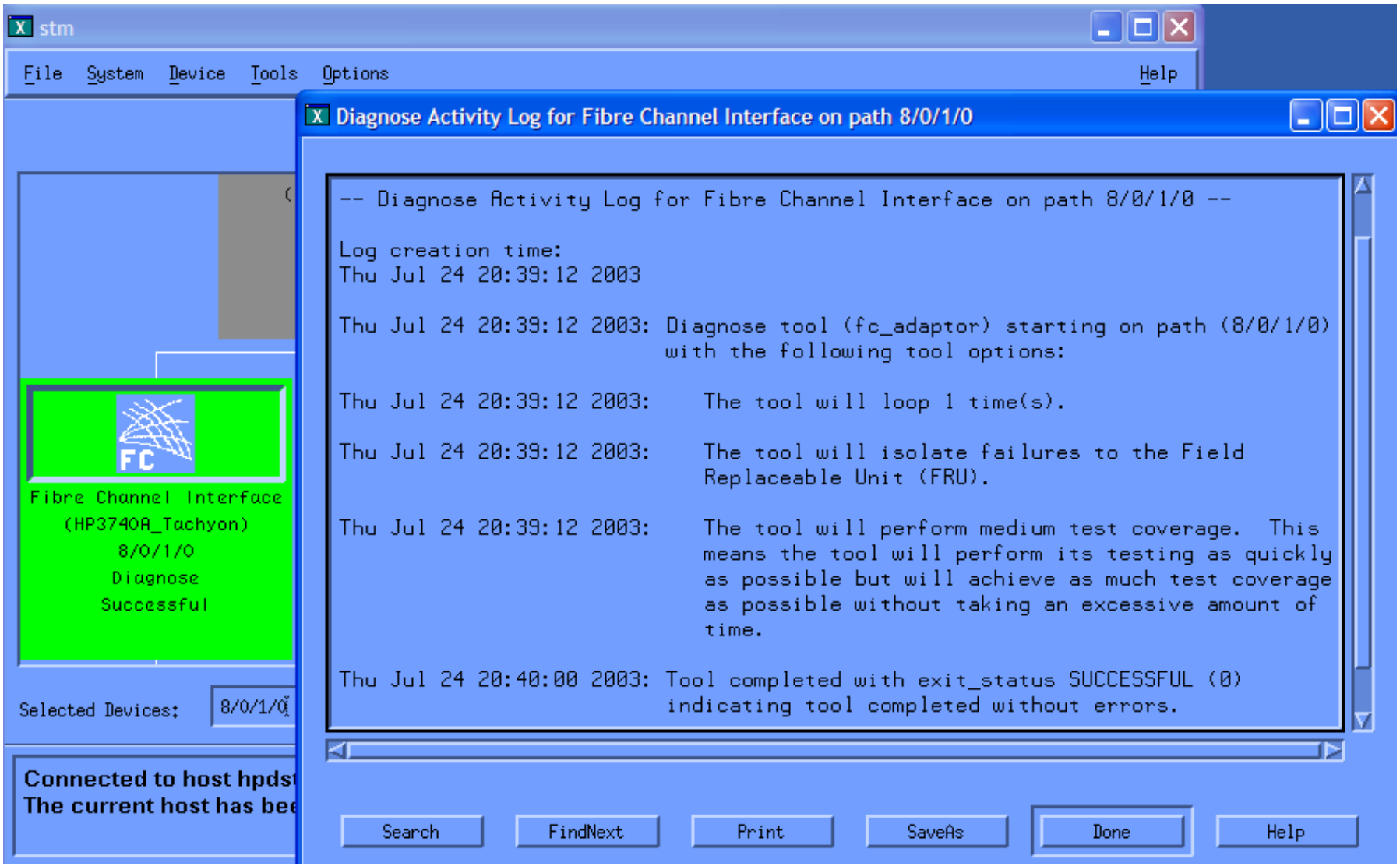
XSTM: Disk Verifier



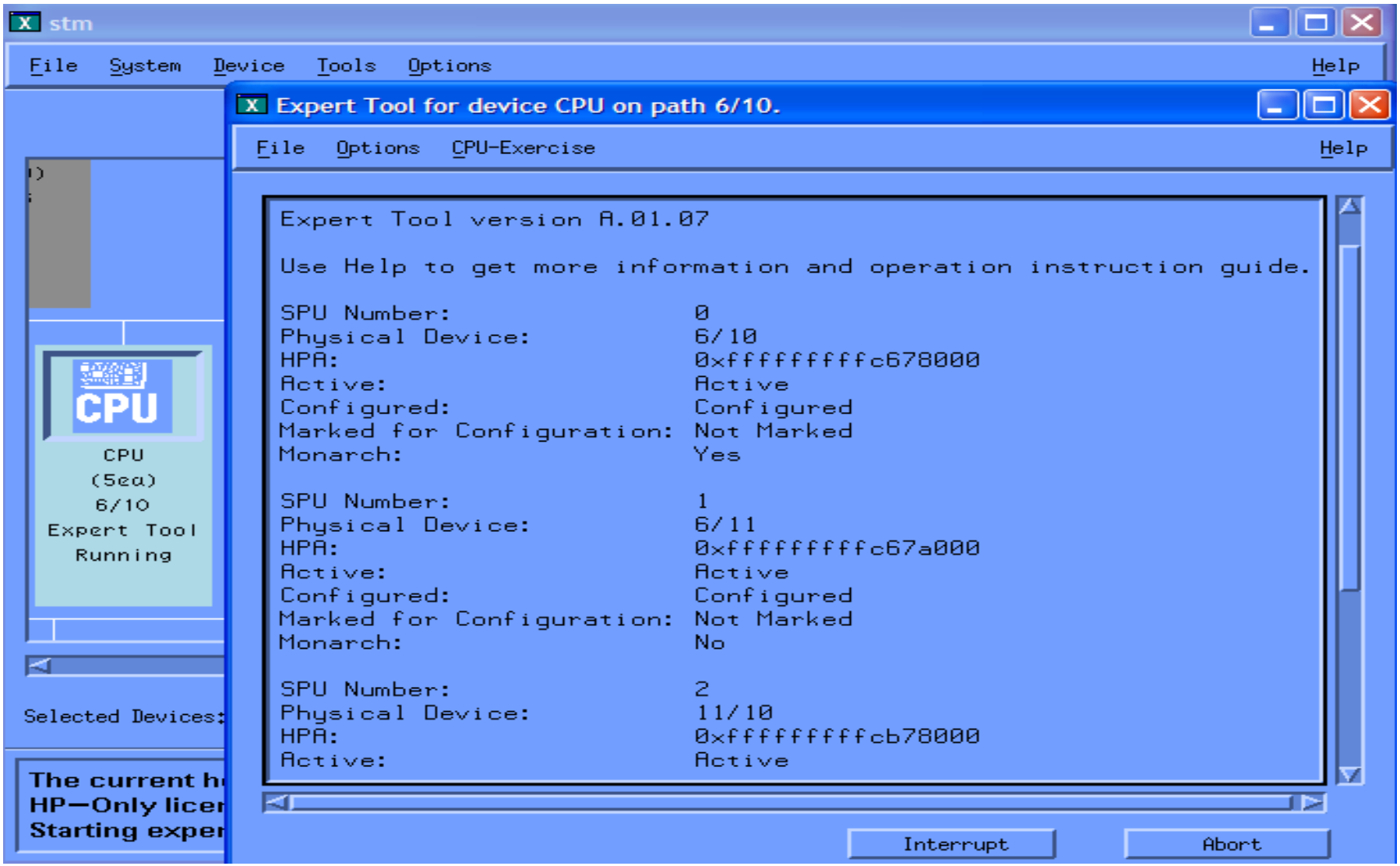
XSTM: Tape Exerciser



XSTM: Fibre Channel Interface Diagnostic Tool



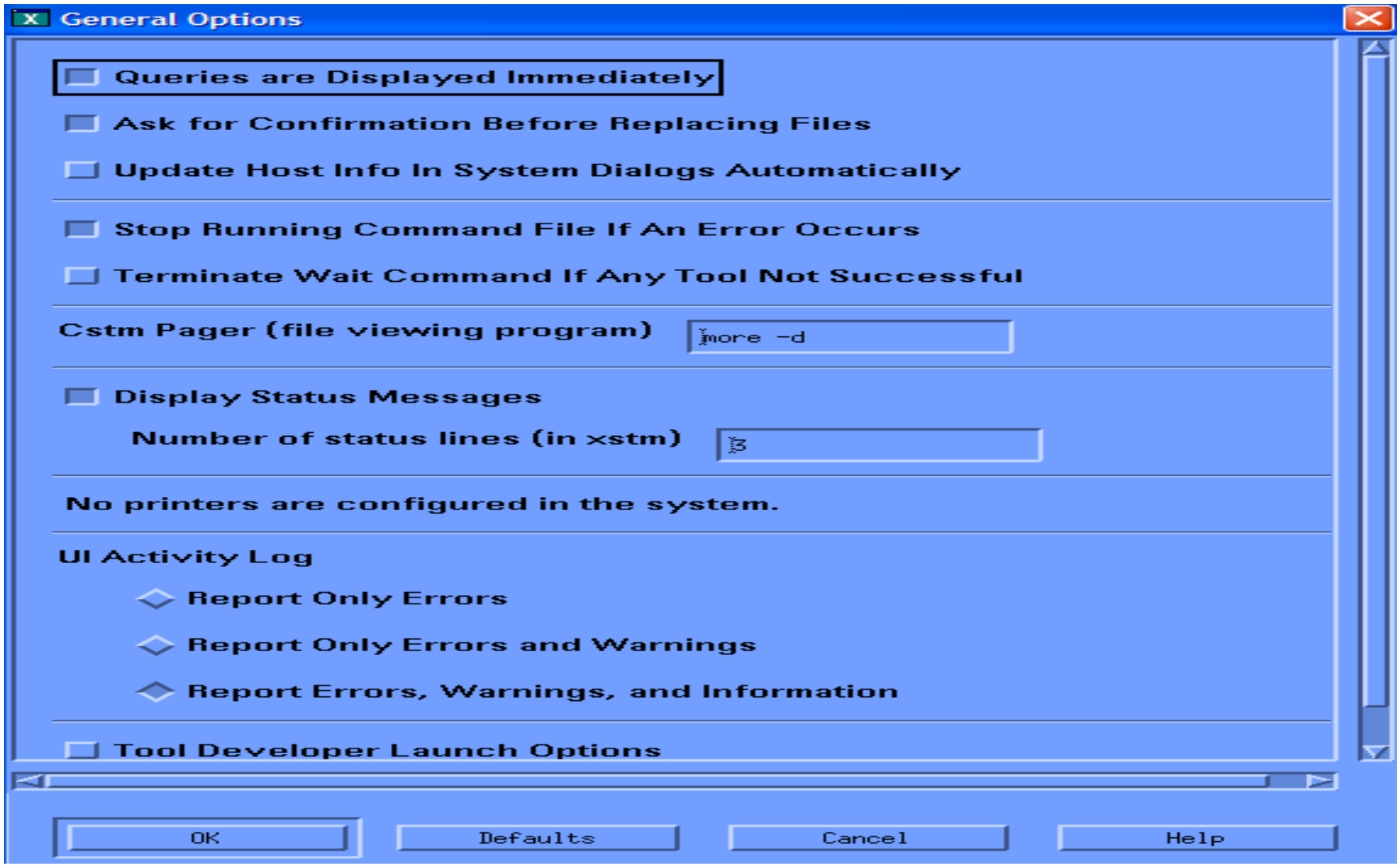
XSTM: CPU Expert Tool



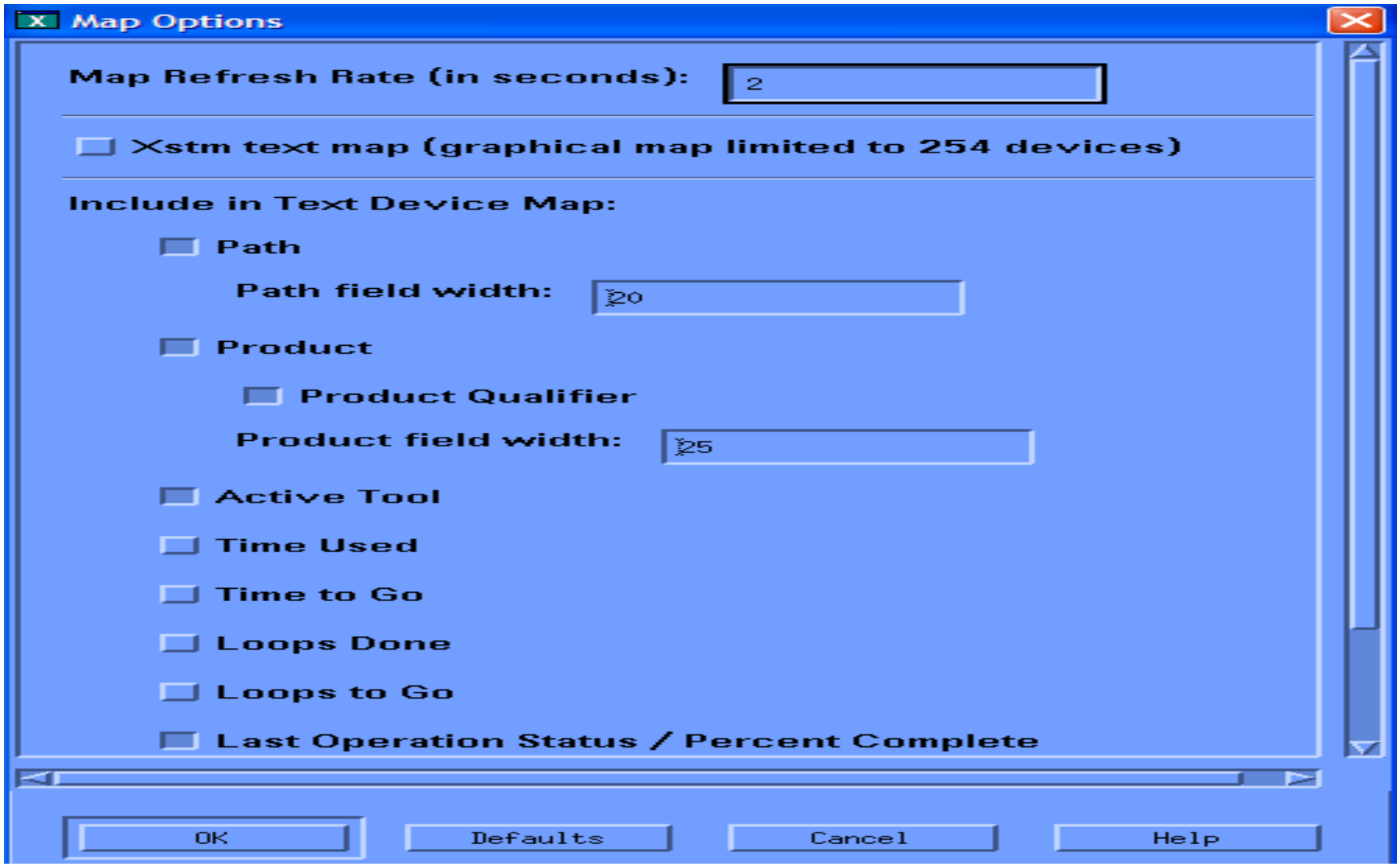
Options Commands

- 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

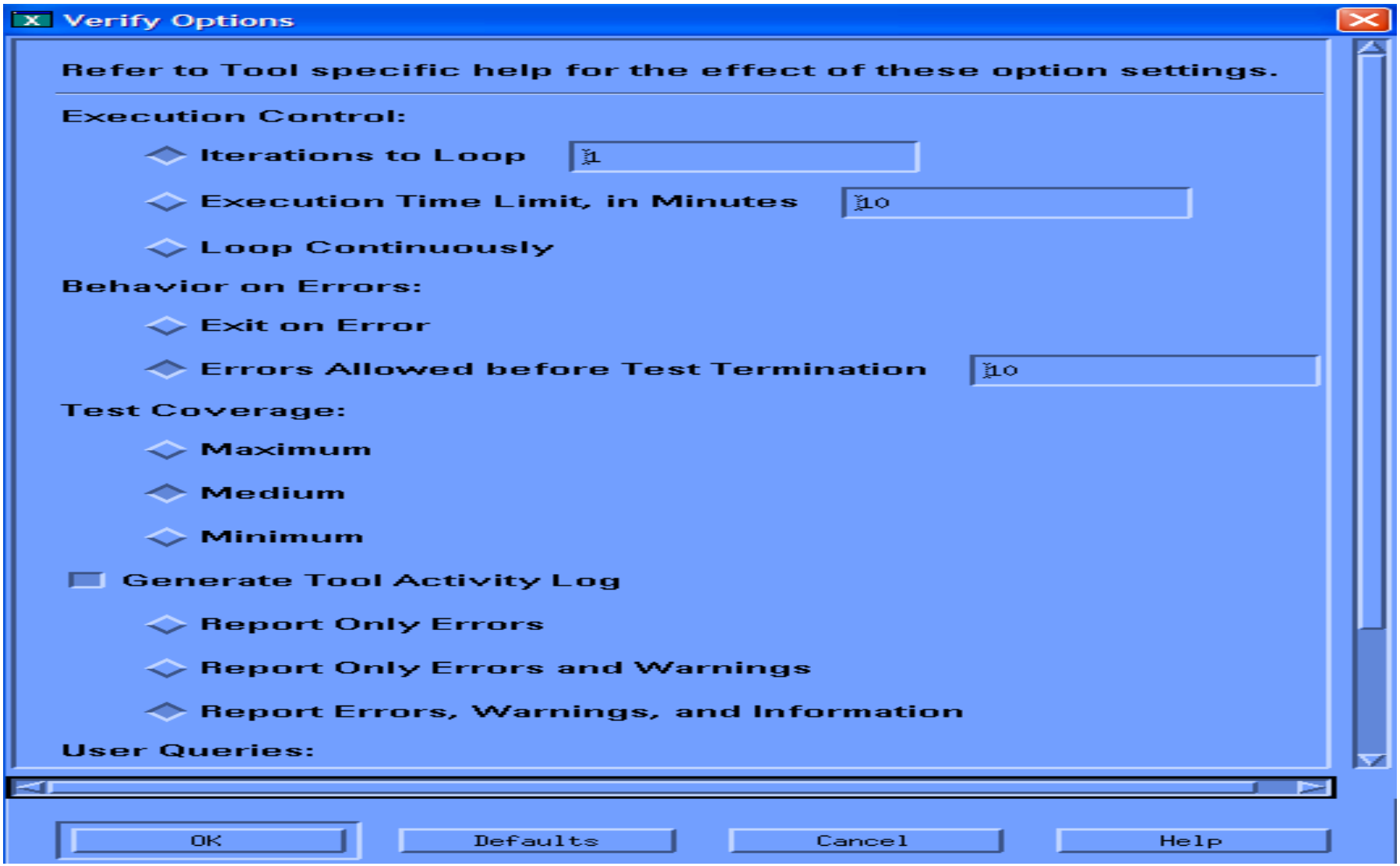
XSTM: General Options



XSTM: Map Options



XSTM: Verify Options



Help Commands

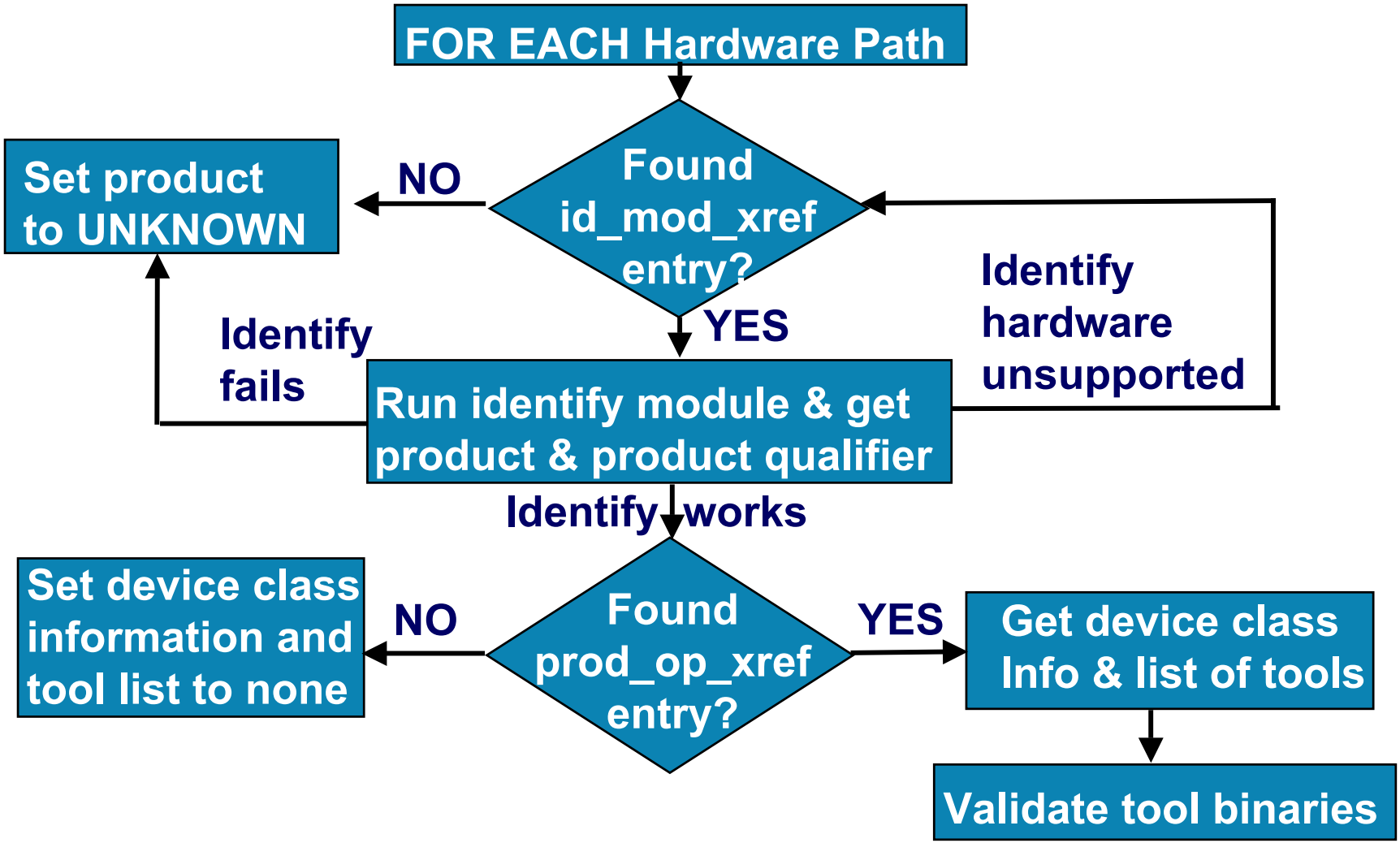
- On item
  - Select the particular item on which to display help
- On tasks
  - Display help on common tasks
- On application
  - Display general help on STM
- On help
  - Display help on how to use the help system
- On version
  - Display STM version information
- On menus/commands
  - Display help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

Support Tools Manager

Troubleshooting

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

System Map Building



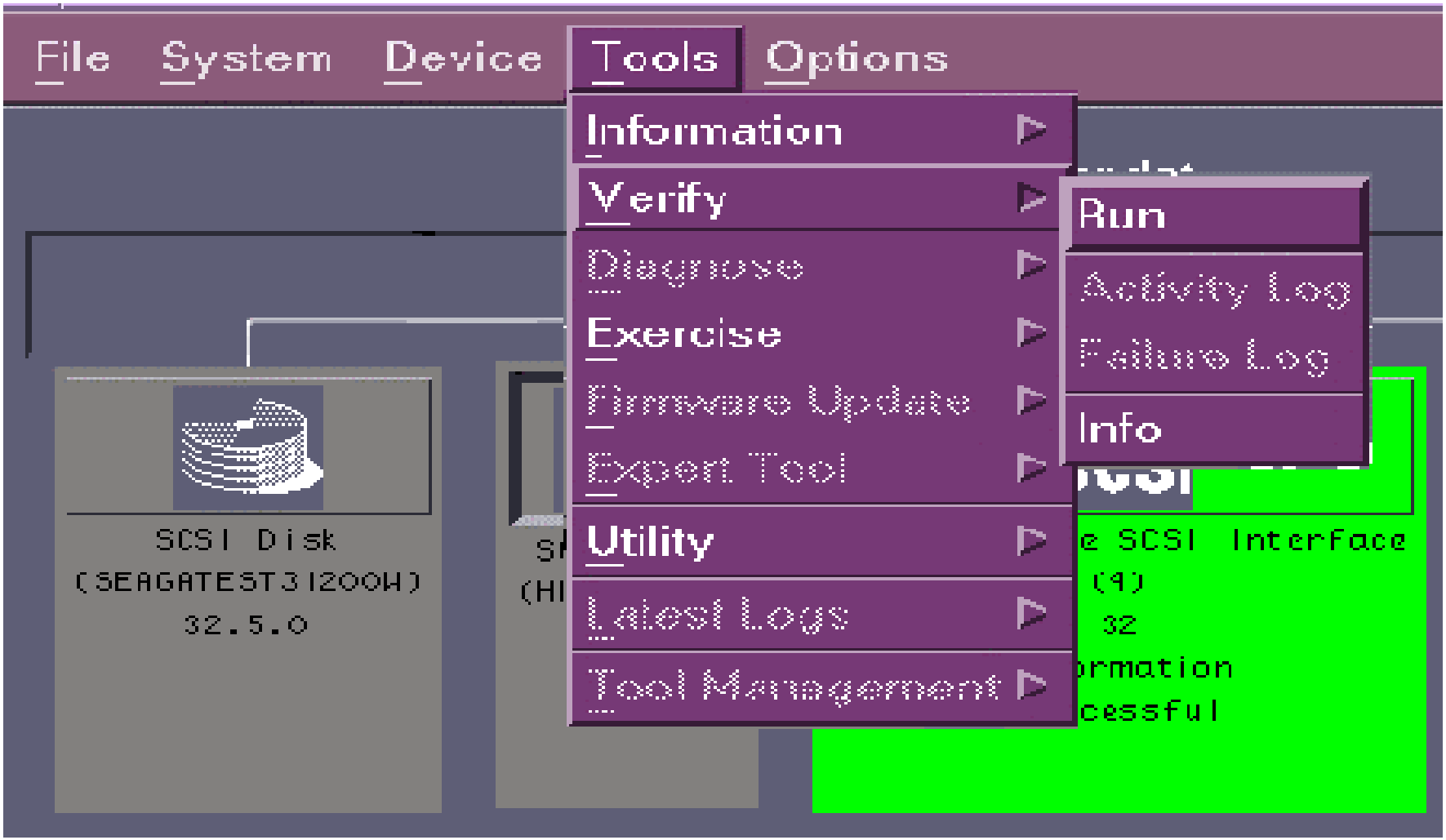
Unknown Device in System Map

- 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

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



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

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

Questions?

Interex, Encompass and HP bring you a powerful new HP World.