



# Storage Automated Diagnostic Environment 2.2 User's Guide

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Device Edition

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# Preface

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The *Storage Automated Diagnostic Environment User's Guide* explains how to use the Storage Automated Diagnostic Environment graphical user interface (GUI) to collect data about the condition of various storage devices. In addition, this guide describes the tests that provide diagnostics for the following Sun™ products:

- Sun StorEdge™ T3, T3+, and 6120 array
- Sun StorEdge A5000 and A5200 array
- Sun StorEdge A3500FC array
- Sun StorEdge D2 array
- Sun StorEdge 3310 and 3510 array
- 1-Gbit and 2-Gbit Sun StorEdge network FC switch-8 and switch-16 switches
- 1-Gbit and 2-Gbit Brocade Silkworm switch
- 2-Gbit McData Switches
- 1 Gbit and 2-Gbit Sun StorEdge Fibre Channel network adapter (HBA)
- Internal Fibre Channel disk
- Fibre Channel Tape
- Sun Fire™ V880 server

This guide is written for system administrators and support personnel who are already familiar with Sun disk array and storage area network (SAN) products.

---

# How This Book Is Organized

This book contains the following topics:

**Chapter 1** provides an overview and general operating instructions for the Storage Automated Diagnostic Environment.

**Chapter 2** contains detailed installation and configuration information for the Storage Automated Diagnostic Environment.

**Chapter 3** explains the maintenance functions that are necessary for setting up the Storage Automated Diagnostic Environment for the first time, or for making necessary changes, to ensure proper monitoring and notification.

**Chapter 4** explains the monitoring functions that you can perform using the Storage Automated Diagnostic Environment, including monitoring devices, monitoring topology, and monitoring logs.

**Chapter 5** discusses the functionality of Storage Automated Diagnostic Environment diagnostic tests from the GUI and the diagnostic tools that are available.

**Chapter 6** discusses the various reports and lists associated with the Storage Automated Diagnostic Environment.

**Chapter 7** briefly describes the online help associated with the Storage Automated Diagnostic Environment, including utilities, man pages, the event grid, and the GUI online help.

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# Using UNIX Commands

This document does not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices.

See one or more of the following for this information:

- *Solaris Handbook for Sun Peripherals*
- AnswerBook2™ online documentation for the Solaris™ operating environment
- Other software documentation that you received with your system

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# Typographic Conventions

Typeface	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
<b>AaBbCc123</b>	What you type, when contrasted with on-screen computer output	% <b>su</b> Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized	Read Chapter 2 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this.
	Command-line variable; replace with a real name or value	To delete a file, type <code>rm filename</code> .

---

# Shell Prompts

Shell	Prompt
C shell	<i>machine_name</i> %
C shell superuser	<i>machine_name</i> #
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

# Product Abbreviations

The following table contains a list of the trademarked Sun product names and the abbreviations used in the Storage Automated Diagnostic Environment.

Trademarked Sun Product Name	Abbreviation
Sun StorEdge A5000 array	Sun A5000
Sun StorEdge A3500FC array	Sun A3500FC
Sun StorEdge T3 and T3+ array	Sun T3
Sun StorEdge D2 array	D2-Array
Internal Fibre Channel Disk	FC-Disk
Sun StorEdge 3310 and 3510 array	3310/3510
Fibre Channel Tape	FC-Tape
Sun StorEdge network 2 Gbit FC Switch 16	Sun-2 Gbit Switch
Sun StorEdge network FC switch-8 and switch-16 1 Gbit switch	Sun Switch
Brocade Silkworm switch	Brocade Switch
Sun Fire 880 FC-AL Disk	V880-Disk

# Related Sun Documentation

TABLE P-1 Related Sun Documentation

Product	Title	Part Number
<b>Sun StorEdge T3+ array</b>	• <i>Sun StorEdge T3+ Array Installation and Configuration Manual</i>	816-4769
	• <i>Sun StorEdge T3 and T3+ Array Administrator's Guide</i>	816-0776
<b>Sun StorEdge 6120 Array</b>	• <i>Start Here (Documentation Guide)</i>	817-0198
	• <i>Important Safety Information for Sun Hardware Systems</i>	816-7190
	• <i>Sun StorEdge 6120 Array Installation Guide</i>	817-0199
	• <i>Sun StorEdge 6120 Array Administration and Reference</i>	817-0200
	• <i>Sun StorEdge 6120 Array Release Notes</i>	817-0201
	• <i>Sun StorEdge 6120 Array Troubleshooting Guide</i>	817-0828
<b>Sun StorEdge Host Adapter</b>	• <i>Sun StorEdge PCI FC-100 HBA Installation Manual</i>	805-3682
	• <i>Sun StorEdge SBus FC-100 Host Adapter Installation &amp;Service</i>	802-7572
	• <i>Sun StorEdge PCI Dual FC Host Adapter Product Notes</i>	806-5857
	• <i>Sun StorEdge PCI Dual FC Host Adapter Installation Guide</i>	806-4199
	• <i>Sun StorEdge 2 Gb PCI Single FC Host Adapter Product Notes</i>	816-5000
	• <i>Sun StorEdge 2 Gb PCI Single FC Host Adapter Installation Guide</i>	816-4999
	• <i>Sun StorEdge 2 Gb cPCI Dual FC Host Adapter Product Notes</i>	816-5002
	• <i>Sun StorEdge 2 Gb PCI Dual FC Host Adapter Installation Guide</i>	816-5001
	• <i>Sun StorEdge 2 Gb cPCI Dual FC Host Adapter Product Notes</i>	X6769A
<b>Sun StorEdge A5000 array</b>	• <i>Sun StorEdge A5000 User's Guide</i>	806-1946
	• <i>Sun StorEdge A5000 Release Notes</i>	806-1947
	• <i>Sun StorEdge A5000 Product Notes</i>	805-1018
	• <i>Sun StorEdge A5000 Configuration Guide</i>	805-0264
	• <i>Sun StorEdge A5000 Installation and Documentation Guide</i>	805-1903
<b>Sun StorEdge A3500/A3500FC array</b>	• <i>Sun StorEdge A3500/A3500FC Configuration Guide</i>	805-4981
	• <i>Sun StorEdge A3500/A3500FC Controller Module Guide</i>	805-4980
	• <i>Sun StorEdge A3500/A3500FC Task Map</i>	805-4982
<b>Sun StorEdge D2 array</b>	• <i>Sun StorEdge D2 Array Installation, Operations, Service Manual</i>	816-2578
	• <i>Sun StorEdge D2 Array Release Notes</i>	816-1718
	• <i>Sun StorEdge D2 Array Cabinet Installation Guide</i>	816-1696
<b>Sun StorEdge 3310 SCSI Array</b>	• <i>Sun StorEdge 3310 SCSI Array Installation, Operation, and Service Manual</i>	816-7290
	• <i>Sun StorEdge 3310 SCSI Array Contents</i>	816-7294
	• <i>Sun StorEdge 3310 Quick Install Guide</i>	816-7849

**TABLE P-1** Related Sun Documentation

<b>Product</b>	<b>Title</b>	<b>Part Number</b>
<b>Sun Fire V880 Disk Server</b>	• <i>Sun Fire 880 Server Service Manual</i>	806-6597
	• <i>Sun Fire 880 Server Rackmounting Guide</i>	806-6594
	• <i>Sun Fire 880 Server Owner's Guide</i>	806-6592
	• <i>Sun Fire 880 Server Product Notes</i>	806-6593
<b>Sun StorEdge network FC switch-8 and switch-16</b>	• <i>Sun StorEdge Network FC Switch-8 and Switch-16 Field Troubleshooting Guide, SAN 3.1 Release</i>	816-1701
<b>Sun StorEdge SAN 4.0 (1 Gb switches)</b>	• <i>Sun StorEdge SAN 4.0 Release Guide to Documentation</i>	816-4470
	• <i>Sun StorEdge SAN 4.0 Release Installation Guide</i>	816-4469
	• <i>Sun StorEdge SAN 4.0 Release Configuration Guide</i>	806-5513
	• <i>Sun StorEdge Network 2 Gb FC Switch-16 FRU Installation</i>	816-5285
	• <i>Sun StorEdge SAN 4.0 Release Notes</i>	816-4472
<b>Sun StorEdge SAN 4.1 (2 Gb switches)</b>	• <i>Sun StorEdge SAN 4.1 Release Guide to Documentation</i>	817-0061
	• <i>Sun StorEdge SAN 4.1 Release Installation Guide</i>	817-0056
	• <i>Sun StorEdge SAN 4.1 Release Configuration Guide</i>	817-0057
	• <i>Sun StorEdge SAN 4.1 2 Gb Brocade Silkorm Fabric Switch Guide to Documentation</i>	817-0062
	• <i>Sun StorEdge SAN 3.1 2 Gb McData Intrepid Director Switch Guide to Documentation</i>	817-0063
	• <i>Sun StorEdge SAN 4.1 Release Notes</i>	817-0071
<b>Solaris</b>	• <i>Solaris Handbook for Sun Peripherals</i>	806-2210
<b>RAID Manager 6.22</b>	• <i>RAID Manager 6.22 User's Guide</i>	806-0478
	• <i>RAID Manager 6.22 Release Notes</i>	806-3721

# Accessing Online Sun Documentation

You can view, print, or purchase a broad selection of Sun documentation, including localized versions, at:

<http://www.sun.com/documentation>

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## Related Brocade Documentation

You can locate the following Brocade documentation on a special website provided by Brocade.

- *Brocade Silkworm® 2400 Hardware Reference Manual*
- *Brocade Silkworm® 2800 Hardware Reference Manual*
- *Brocade Silkworm® 3800 Hardware Reference Manual*
- *Brocade Silkworm® 3800 Quick Start Guide*
- *Brocade Fabric OS™ Reference Manual*
- *Brocade Fabric OS™ Procedures Guide*
- *Brocade QuickLoop User's Guide*
- *Brocade SES User's Guide*
- *Brocade WebTools User's Guide*
- *Brocade Zoning User's Guide*

## Accessing Brocade documentation

The URL for the Brocade site is <http://www.brocade.com>.

To access the Silkworm series hardware and software documentation, from the Brocade website:

1. **Click the Partners link.**
2. **Under Brocade Partner Network, click the Partner Login link.**
3. **Enter your User ID.**
4. **Enter your password (not included for security purposes).**

**You can obtain the User ID and password information from your Sun Partner representative.**

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**Note** – You must have a Brocade Partner login and password to access the documentation.

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# Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can email your comments to Sun at:

`docfeedback@sun.com`

Please include the part number (*817-0822*) of the document in the subject line of your email.

# Overview of the Storage Automated Diagnostic Environment

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## Introduction to the Storage Automated Diagnostic Environment

The Storage Automated Diagnostic Environment is a distributed online health and diagnostic monitoring tool for storage area network (SAN) and direct-attached storage (DAS) devices. It can be configured to monitor on a 24-hour basis, collecting information that enhances the reliability, availability, and serviceability (RAS) of the storage devices.

The Storage Automated Diagnostic Environment offers the following features:

- A common web-based user interface for device monitoring and diagnostics
- Distributed test invocation by means of lists or topology by means. You can run the tests through the Storage Automated Diagnostic Environment GUI or through the command line interface (CLI).
- Topology grouping for multi-level hosts and components
- Alternate master support for redundancy
- Revision checking
- Remote notification through SRS, SRS/NetConnect, Sun StorEdge Remote Response (SSRR), HTTP, and SNMP Providers, or email
- Support for direct attached storage (DAS) and storage area networks (SANs)
- Encryption by way of a Secure Socket Layer (SSL) protocol to protect transmitted information

---

# How the Software Works

The Storage Automated Diagnostic Environment uses a variety of system tools to monitor various devices. These system tools are executed by device-specific modules within the Storage Automated Diagnostic Environment. All information generated by the Storage Automated Diagnostic Environment is standardized to the common information model (CIM).

The Storage Automated Diagnostic Environment program executes at fixed intervals from the `cron(1M)` facility and relies on a configuration file describing each device that needs to be monitored. Whenever the devices can be discovered automatically, manual configuration entries are not required. The tasks required to configure the Storage Automated Diagnostic Environment are simplified by the use of a web browser-based GUI.

The Storage Automated Diagnostic Environment captures instrumentation data from, or associated with, the storage devices and applies rules to convert this into a set of events. These events contain information that characterizes the operational behavior of the device. Some of these events can represent conditions that require service action, in which case the event is tagged as an alert.

The Storage Automated Diagnostic Environment sends alerts and events to various recipients through a set of notification facilities, such as email or email targeted at a pager. In addition, the Storage Automated Diagnostic Environment can send events as a telemetry stream through the providers to a secure central repository at Sun. This enables the information to be used for product improvement and enables Sun trained personnel to be more effective in providing service, both proactive and reactive.

Because the Storage Automated Diagnostic Environment is executed from a `cron` and relies on the Internet services daemon (`inetd(1M)`) for communication and for the management console, storage space and resource requirements are kept at a minimum.

To minimize email transmission, the Storage Automated Diagnostic Environment keeps a state database on the local host running the agent. This database keeps state information from one execution to the next. When applicable, information is compared and only the differences are sent.

# Storage Automated Diagnostic Environment

## Master and Slave Agents

By allowing for both master and slave agents, the Storage Automated Diagnostic Environment aggregates all of the agents. This aggregation is also called a *domain*.

The following rules exist for a domain:

- All communicating master and slave agents must execute the same version and patch level of the Storage Automated Diagnostic Environment.

---

**Note** – Storage Automated Diagnostic Environment Revision Checking checks the hardware, software, and firmware revisions of all user-selected components. See “To Run Revision Checking Report” on page 191.

---

- To facilitate monitoring of this environment, configure the Storage Automated Diagnostic Environment as a set of distributed agents, in a master/slave relationship, spread across a series of servers. A single agent is given the role of master and acts as the collection point for events originating in the other slave agents.
- The master must always be configured before the slaves. For more information on master and slave configuration, see “To Start the Software on the Master” on page 17 and “To Set Up a Slave” on page 19.
- The master’s IP address controls the web server interface. You can use the Storage Automated Diagnostic Environment GUI to configure, monitor, and diagnose all supported devices, including the slaves.
- The master and slave code base is identical, except that the slave has one extra file, which identifies its master. This file is located in  
`/opt/SUNWstade/DATA/MASTER.`

# How the Software Monitors Devices

Monitoring varies from device to device but usually consists of the following methods. The Storage Automated Diagnostic Environment typically:

1. Finds and monitors message log files for the device and reports new, relevant entries
2. Executes commands to probe the device for status, state, and statistics information
3. Probes the device remotely for information, for devices that support remote access through a management path

## Other Functions the Software Performs

For each device, the Storage Automated Diagnostic Environment performs the following functions:

1. Sends the information, by way of a discovery event, to the system administrator, the Network Storage Command Center (NSCC), or to other storage management platforms through an interface with the transport mechanisms.

---

**Note** – The first access to a device yields a discovery event that collects all the information about that device, plus other events for other preconfigured devices, that may be generated by health monitors.

---

2. Reads the proper `/var/adm/messages` files, finds relevant entries, and reports them as events through the local email notification mechanism, if configured.
3. Monitors host message files for errors
4. Connects directly through in-band data paths and/or out-of-band management paths (Ethernet) of Sun StorEdge devices, and collects status information.
5. Reads the device's configuration and state information, stores it locally in the cache, compares the results of the last run, and transmits the differences.
6. Reads threshold information and reports errors when the frequency threshold reaches predefined levels.

## Diagnostic Functionality

Diagnostic tests have been integrated into the Storage Automated Diagnostic Environment for device diagnostics and field replaceable unit (FRU) isolation. Each test can be run individually from the command line or from the Storage Automated Diagnostic Environment user interface.

The Storage Automated Diagnostic Environment Diagnostic tests are described in Chapter 5, “Diagnostics.”

From the Storage Automated Diagnostic Environment user interface, you can select tests from a topology or from a list view. When the tests execute, the Storage Automated Diagnostic Environment initiates the test on the proper host. You can retrieve test results by using the Test Manager selection from the GUI.



# Installing and Starting the Software

---

This chapter presents instructions for installing, configuring, and starting `SUNWstade` on your system. It includes the following main topics:

- “Installation Checklist” on page 8
- “Host Requirements” on page 10
- “Installation Tips” on page 11
- “Installing the Software” on page 12
- “Configuring the Software” on page 16
- “Upgrading or Removing the Software” on page 21
- “Starting the Software” on page 23

# Installation Checklist

Use the information found in TABLE 2-1 to make sure you perform all of the steps necessary for a successful installation.

TABLE 2-1 Installation Checklist

	Step	Action
<input type="checkbox"/>	1	Download the latest compressed SUNWstade package from SunSolve.  <b>Note:</b> You must have root access to install SUNWstade.
<input type="checkbox"/>	2	Move the SUNWstade package to a temporary working directory; for example:  <code># cp SUNWstade.xxx.tar.Z /tmp</code>
<input type="checkbox"/>	3	Uncompress the SUNWstade package. <code># cd /tmp</code> <code># uncompress SUNWstadex.xxx.tar.Z</code>  <code>x.xxx</code> is the version number
<input type="checkbox"/>	4	Untar the SUNWstade package.  <code># tar -xvf SUNWstadex.xxx.tar</code>
<input type="checkbox"/>	5	Install the SUNWstade package using the <code>pkgadd -d .</code> command:  <code># pkgadd -d .</code>
<input type="checkbox"/>	6	Locate potential patches on the SunSolve web site and download them and install using the <code>patchadd</code> command.  As superuser, use the <code>patchadd (1M)</code> command. See “To Install a Patch” on page 20.
<input type="checkbox"/>	7	Once you have completely and successfully installed the SUNWstade package, execute the <code>ras_install</code> installation script. <code># cd /opt/SUNWstade/bin</code> <code># ./ras_install</code> See “Running the <code>ras_install</code> Script” on page 17.
<input type="checkbox"/>	8	Access the GUI on the host where the master was installed. Use the server name and port 7654 from a browser to set up the rest of the configuration: <code>http://&lt;master-server.domain&gt;:7654</code>

**TABLE 2-1** Installation Checklist

<input type="checkbox"/>	9	Log in to the Storage Automated Diagnostic Environment: <ul style="list-style-type: none"> <li>• Login: <code>ras</code></li> <li>• Default password: <code>agent</code></li> </ul>
<input type="checkbox"/>	10	Set the site information parameters. Note that fields with an asterisk (*) are mandatory. See Chapter 3, “Maintenance.”
<input type="checkbox"/>	11	Configure the Sun StorEdge T3 and T3+ array and the host to mirror the <code>syslog</code> . See “Setting Up Sun StorEdge Array Message Monitoring” on page 45.
<input type="checkbox"/>	12	Using the Update Host functionality, set the categories to monitor. See “Maintaining Hosts” on page 33.
<input type="checkbox"/>	13	Using Device Discovery, request the Storage Automated Diagnostic Environment to probe the environments for the desired device types. See “Discovering Devices” on page 42.
<input type="checkbox"/>	14	Customize the generation of email using the General Maintenance: Email Notification: Add Notification functionality. See “Customizing Email Deliveries” on page 54.
<input type="checkbox"/>	15	Send a test email and a short message to verify the master instance of the Storage Automated Diagnostic Environment’s mailing capability.
<input type="checkbox"/>	16	Create a topology snapshot using the Maintenance: Topology Maintenance functionality. See “To Create a Topology Snapshot” on page 79.
<input type="checkbox"/>	17	Push the configuration. Do this to ensure that all instances of the master agent are synchronized with every device the Storage Automated Diagnostic Environment is monitoring, or to update the slaves, if applicable. You should push the configuration everytime you change a configuration.
<input type="checkbox"/>	18	Review the configuration to ensure that the Storage Automated Diagnostic Environment is not missing required configuration information necessary for proper monitoring. See “Review the Configuration” on page 73.
<input type="checkbox"/>	19	Manually run the Storage Automated Diagnostic Environment. See “To Run the Agent Manually” on page 90.

---

# Host Requirements

The SUNWstade package is installed on a Storage Service Processor on a management workstation in the `/opt/SUNWstade` directory. Servers running in the Solaris operating environment (Solaris 8 4/01 or newer) and Sun StorEdge devices are supported. Install SUNWstade on a host that satisfies these conditions:

- The host has access to `/var/adm/messages` files, where device logs are sent.
- The host has access to the Sun StorEdge T3 and T3+ array message log, to which Sun StorEdge T3, T3+, and 6120 array device logs are sent. The name of the file appears in the Sun StorEdge T3 and T3+ array message log configuration window for each host.
- The host has access to the Sun StorEdge T3, T3+, and 6120 arrays and/or the Sun StorEdge network FC switch-8 and switch-16 switches over TCP/IP.
- For SAN datapath monitoring, the host has access to the data path of the devices being monitored.
- The master host can run a browser to complete and maintain the monitored configuration.
- The Storage Service Processor (which is defined as a *Solaris server host*) connects to Sun storage devices “out-of-band” through Ethernet.
- If Solaris 8 4/01 is installed, the host must have the SUNWsan package installed, along with the latest 111413-xx `luxadm` patch.



---

**Caution** – All communicating master and slave agents *must* be executing the same version and patch level of the Storage Automated Diagnostic Environment. The agent will produce a warning if the version and patch do not match.

---

## Example Configurations

- The Sun StorEdge T3, T3+, and 6120 array has an “in-band” datapath attachment to one host but logs its messages to another management host.
- In a multipath environment, more than one host has access to the same device(s).

---

# Installation Tips

- You should be familiar with UNIX commands and Sun's disk array products before attempting to use this product.
- System administrators should be knowledgeable about security risks associated with installing a web server. Take the appropriate action to protect access to the SUNWstade port 7654.
- You must use `/opt/SUNWstade` as the package base directory.
- When installing a new patch to SUNWstade, stop the agents before the installing the update and run `ras_install` after installing the update
- For Sun StorEdge™ arrays and Sun StorEdge™ Network FC switches connected in a non-Solaris environment, the package must be installed on a Solaris server and configured to monitor the devices through the management path.
- Brocade Silksworm switch configurations using segmented loop (SL) zones can be monitored and diagnosed, but the topology views will not show connections between devices.
- `switchtest(1M)` and `linktest(1M)` may not provide diagnostics for Fibre Channel links between downlevel HBAs and/or downlevel switches, as well as Fibre Channel links between switches and virtualization engines. This is a result of the current lack of support for the fabric ECHO test command in these products.
- Sun StorEdge 3900 and 6900 series solutions must have the file `/var/opt/SUNWstade/DATA/Solution.golden` created on the Storage Service Processor before launching the GUI. This is the default. However, if you perform an upgrade, execute `/opt/SUNWstade/bin/config_solution` on the Storage Service Processor to update the file.
- If you use Netscape 6.2.X with SSL enabled, you must point the browser to `https://hostname` *without* the port number.
- Creation of `/etc/fcswitch.conf` file may be utilized for discovery of all Storage Automated Diagnostic Environment support Sun StorEdge Network FC switches but is not required. Subnet Discovery is the preferred method of discovery.

---

# Installing the Software

This section contains the following procedures:

- “To Install the Software” on page 13
- “To Verify the Installation” on page 15

## Installation Notes

- After the package has been completely installed, execute the program `/opt/SUNWstade/bin/ras_install` to install the SUNWstade service and cron. See “Running the ras\_install Script” on page 17.
- After installing SUNWstade, set the environment variables `PATH` and `MANPATH` to include SUNWstade directories `/opt/SUNWstade/bin` and `/opt/SUNWstade/man`.

## ▼ To Install the Software

- Use the `pkgadd(1M)` command and answer the prompts as shown in FIGURE 2-1.

```
# pkgadd -d .

The following packages are available:
  1  SUNWstade Storage Automated Diagnostic Environment (sparc) 2.0

Select package(s) you wish to process (or 'all' to process
all packages). (default: all) [?,??,q]: 1

(various copyright notices)

Do you accept the terms? [yes,no,view,?] yes
Installation end.

Using </opt/SUNWstade> as the package base directory.

## Processing package information.
## Processing system information.
## Verifying disk space requirements.
## Checking for conflicts with packages already installed.
## Checking for setuid/setgid programs.

This package contains scripts which will be executed with super-user
permission during the process of installing this package.

Do you want to continue with the installation of <SUNWstade> [y,n,?] y

Installing Storage Automated Diagnostic Environment as <SUNWstade>
## Installing part 1 of 1.

/opt/SUNWstade/Diags/bin/linktest
/opt/SUNWstade/System/cron_started
/opt/SUNWstade/bin/rasagent
/opt/SUNWstade/bin/writeNetConnect <attribute change only>
/opt/SUNWstade/htdocs/index.html
/usr/lib/libqsw.so
/usr/lib/libsanbox.so
/usr/lib/sparcv9/libsanbox.so
[ verifying class <none> ]
## Executing postinstall script.

-----
After the package is completely installed,
execute the program '/opt/SUNWstade/bin/ras_install'
to install the rasagent inet service and cron.
-----

(Continued on following page)
```

*(Continued from previous page)*

If you choose not to use cron this time, re-run  
ras\_install later to establish a cron entry.

```
-----

# /opt/SUNWstade/bin/ras_install

**** Installing Storage Automated Diagnostic Environment and crons ****

? Are you installing a Master or a Slave Agent? (Enter M=master or S=slave, E=Empty Master)
[M/S/E]: (Default=M)

? Do you want to turn on https security? Y/N: (Default=N)
? Select language for GUI [en] (default=en)

*** Master Install ***

This script will now add the inet service to the inetd config file. When this script ends,
go to the IP Name/Address of the HOST configured as MASTER, port 7654, with a browser to
complete the configuration.

/etc/services is now updated.
/etc/inetd.conf is now updated.

? Do you want to C=start or P=stop the Agent cron [C/P] (default=C) : C

** cron installed.

- Resetting the inetd services to see the new rashttp service.
- Testing access to the webserver, (this will timeout after 30 secs) ...
*** ping 'xxx.central.sun.com' succeeded!
... attempting to contact agent service ...

*** Contacted agent service.

SUNWstade installed properly!

To complete the configuration, point your browser to http://<hostname>:7654. Use the
browser only after the package has been installed on all Master and Slave hosts.
```

**FIGURE 2-1** Sample SUNWstade Installation

---

**Note** – ras\_install scans every installation to determine if localizations have been installed. If localizations have been installed, they are selectable. English is always the default language.

---

## ▼ To Verify the Installation

- Use the `pkginfo(1M)` command:

```
# pkginfo -l SUNWstade
```

## Using the Sun Management Center (SunMC) Provider

The Storage Automated Diagnostic Environment software is capable of sending alarms for the devices it supports to the Sun Management Center, also known as *SunMC*. The *SUNesras* software is optionally installed on the Sun MC server host.

---

**Note** – If you do not plan to use the SunMC services, ignore the following information.

---

## ▼ To Install and Activate the *SUNesras* Packages

1. **Download and install the SunMC agent on the selected host.**
2. **Using the standard Solaris `pkgadd(1)` utility, install the *SUNesras* software on the same host as the SunMC agent.**
3. **Using the Storage Automated Diagnostic Environment software GUI, set the SunMC fields. In the *IP Address* field, enter the IP address or name of the host where the SunMC module is installed. See “SunMC Provider” on page 47 for more information.**

Once activated, the SunMC module receives information about monitored devices and displays alarms in the SunMC console.

For more information about SunMC, refer to <http://network.east/commu-team/symon/>, or refer to the *SunMC User's Guide*.

---

# Configuring the Software

After you have successfully installed the Storage Automated Diagnostic Environment, but before you launch it, there are several steps you must follow.

These steps include setting the environment variables, editing the configuration files and manually running `ras_install`.

## Configuration Files

`/opt/SUNWstade/DATA/rasagent.conf`

Information such as site location, hosts, devices, and local notifications that you enter into the Storage Automated Diagnostic Environment graphical user interface (GUI) is stored in the `/opt/SUNWstade/DATA/rasagent.conf` file. The file remains on the system between upgrades so that previously-entered configuration information is not lost.

`/etc/hosts`

- **Update the `/etc/hosts` file to include valid entries for *each system* with which the Storage Automated Diagnostic Environment will communicate. This includes proper aliases as well.**

## ▼ Running the `ras_install` Script

---

**Caution** – If a slave is configured behind a firewall with a non-routable IP address, `ras_install` will always fail, because the master cannot establish communications back to the client.

---

- Using the instructions below, you should run the `ras_install` script in the following circumstances:
  - After the initial execution and setup of `pkgadd -d`.
  - When you need to modify the `cron`.
  - When you install a patch.
  - When you need to change the master or slave title of a host agent.

## ▼ To Start the Software on the Master

1. Run `ras_install`.

```
# cd /opt/SUNWstade/bin
# ./ras_install
```

2. Type **M (master)** to the following question:

```
**** Installing the Storage Automated Diagnostic Environment Server and
Crons ****

? Are you installing a Master or a Slave Agent? (Enter M=master or S=slave,
E=Empty Master) [M/S/E]: (Default=M)
```

3. Specify if you want to turn on the security feature.

```
Do you want to turn on https security? Y/N
(Default=N)
```

---

**Note** – `https security` is the Secure Sockets Layer (SSL). The SSL encrypts and authenticates messages sent between a browser and the webserver. Encryption using public key cryptography ensures the privacy of the messages sent between the client and the browser. Plain HTTP messages are sent across the network in plain ASCII. Authentication using a trusted certification authority ensures that the client can trust that the server is what it claims to be.

---

The `ras_install` script, with the master option selected, sets up the host as a master, establishes a Storage Automated Diagnostic Environment entry in `cron` tab, and restarts the `cron` daemon. The `ras_install` script also alters the `/etc/inetd.conf` and the `/etc/services` files to enable the host to serve the GUI for configuring and setting up the Storage Automated Diagnostic Environment.

The `/etc/services` file is updated with the Storage Automated Diagnostic Environment HTTP port number (7654) to service requests from the slave agent and to open the GUI on that port.

**4. When you run the `ras_install` script, a `cron(1M)` entry is added to the `cron` facility, based on your answer to the following question:**

```
? Do you want to C=start or P=stop Storage Automated Diagnostic Environment
cron [C/P, default=C] : C
```

---

**Note** – For testing purposes or upon initial configuration, you can skip the `cron` activation during the installation and start the `cron` later by rerunning the `ras_install` script.

---

The text of the `cron` entry that executes is as follows:

```
0,5,10,15,20,25,30,35,40,45,50,55 * * * * \
/opt/SUNWstade/bin/rasagent -c >> /opt/SUNWstade/log/cron.log 2>&1
```

In this example, the `cron` attempts to start the `rasagent` program every five minutes. However, if the agent takes longer than five minutes to run, due to the size of the configuration, the program will abort.

You can adjust the monitoring frequency if necessary, and periodically enable or disable the `cron` in order to execute the `rasagent` program. To adjust the monitoring frequency, see “Maintaining Hosts” on page 33.

# Installing Distributed Agents (Slaves)

When a server satisfies all or only some of the host requirements to monitor specific storage devices, you can optionally install the Storage Automated Diagnostic Environment on multiple servers.

When you distribute the Storage Automated Diagnostic Environment over several systems, configure only one system (the master) to communicate with the providers. This way, the secondary agents send their findings to the primary host in the form of messages through the HTTP service activated on port 7654.

---

**Caution** – All communicating master and slave agents *must* be executing the same version and patch level of the Storage Automated Diagnostic Environment. The agent produces a warning if the version and patch do not match.

---

---

**Note** – To install a slave agent, you must know the IP address or host name of the host that is to be configured as the master agent. If you have not yet installed the master agent, abort installation of the slave agent and install the Storage Automated Diagnostic Environment on the host to be configured as the master.

---

## ▼ To Set Up a Slave

1. Run `ras_install` and type `S` in response to the following question:

```
**** Installing the Storage Automated Diagnostic Environment Server and
Crons ****

? Are you installing a Master or a Slave Agent?
(Enter M=master or S=slave): S
```

2. Enter the IP address or the host name of the master agent.

---

**Note** – If this instance of the slave was previously configured with a master, the IP address or name of that master host is the default selection.

---

### 3. Indicate whether you want to turn on the security feature.

```
Do you want to turn on https security? Y/N
(Default=N)
```

The Storage Automated Diagnostic Environment then verifies that the master host is reachable.



**Caution** – All communicating master and slave agents *must* be executing the same version and patch level of the Storage Automated Diagnostic Environment. If all of the Storage Service Processors are utilizing a down-level revision, and the data host is utilizing a newer revision, one of the Storage Service Processors must be configured as a master of all the Storage Service Processor slaves, with the data host as a master. This prevents the data host from communicating with the down-level revision, but provides monitoring and diagnostics for the data host connection.

## ▼ To Install a Patch

Patches are **not mandatory** if you have the most recent SUNWstade package installed. See Sunsolve or PatchPro for the most recent patches.

**Note** – When installing a patch to the Storage Automated Diagnostic Environment, stop the agents before installing the patch (see “Start and Stop Agents” on page 68). Then, run `ras_install` after installing the update.

1. Download the latest Storage Automated Diagnostic Environment patch from Sunsolve to a temporary workspace.
2. As superuser, use the `patchadd (1M)` command and answer the prompts as shown in CODE EXAMPLE 2-1.

CODE EXAMPLE 2-1 Patch Installation

```
# cd /tmp
# uncompress xxxxxx-xx.tar.Z
# tar xvf xxxxxx-xx.tar

# patchadd XXXXXX-XX .
# /opt/SUNWstade/bin/ras_install -options
```

3. Re-run `ras_install` using the instructions in “To Start the Software on the Master” on page 17.

---

# Upgrading or Removing the Software

This section contains the following subsections:

- “To Upgrade the Software” on page 21
- “To Remove the Software” on page 22

## ▼ To Upgrade the Software

---

**Note** – When installing a new version of, or a patch to, the Storage Automated Diagnostic Environment, stop the agents before installing the update (see “Start and Stop Agents” on page 68). Then, run `ras_install` after you have installed the update.

---

1. Remove any Storage Automated Diagnostic Environment patches.
2. Remove the existing SUNWstade installation using the following command from the `/opt/SUNWstade/` directory:

```
# pkgrm SUNWstade
```



---

**Caution** – Do not remove `/var/opt/SUNWstade/` or `/opt/SUNWstade/` files.

Removing the initial installation does not erase the previous configuration information. Configuration and data files, as well as the cache and topology information of each device is retained to maintain a consistent, historical view of the Sun StorEdge devices.

---

3. Reinstall the upgraded package using the following command:

```
# pkgadd -d .
```

4. Run `ras_install` to enable the cron and to configure the agent as master or slave.
  - a. Upgrade the master first.
  - b. Download all patches from SunSolve to the host prior to beginning an upgrade.

## ▼ To Remove the Software

1. Remove the initial installation using the following command:

```
# pkgrm SUNWstade
```

2. To completely remove the package for a clean install, remove the following directories once the `pkgrm` command has completed its run:

```
# rm -f /var/opt/SUNWstade  
# rm -f /opt/SUNWstade
```

---

# Starting the Software

Once you have executed `ras_install`, you can launch the Storage Automated Diagnostic Environment graphical user interface (GUI) from a web browser.

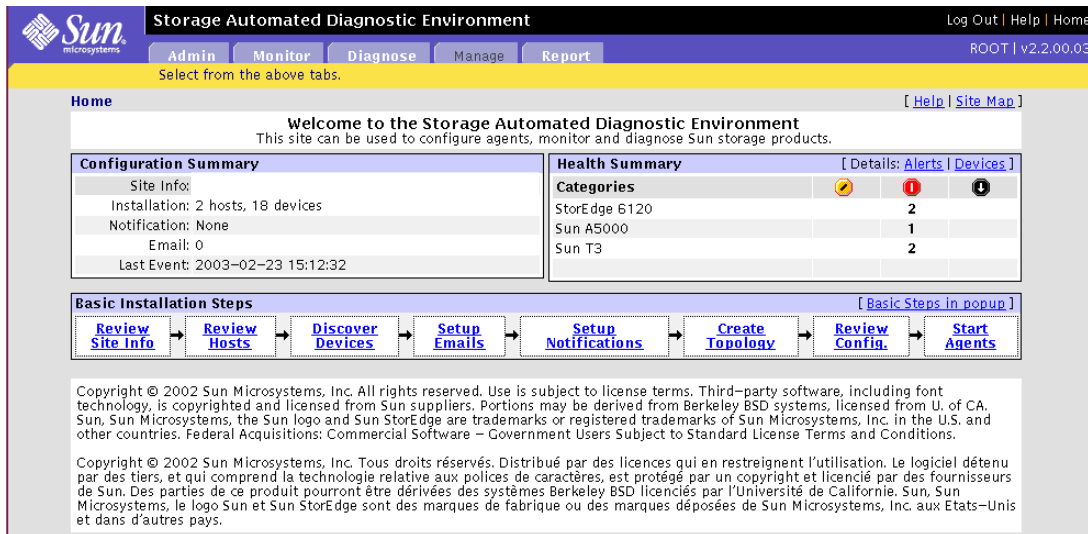
The Storage Automated Diagnostic Environment GUI is a browser-based tool that enables you to maintain and tune the Storage Automated Diagnostic Environment functions. To maintain and tune the Storage Automated Diagnostic Environment, point the browser to the host with the master instance of Storage Automated Diagnostic Environment.

The remainder of this guide explains how to use the GUI functionality.

## ▼ To Launch the Storage Automated Diagnostic Environment GUI

1. **Open a web browser and go to `http://hostname:7654`**  
where *hostname* is the IP address or the host name of the master.
2. **Log in to the Storage Automated Diagnostic Environment by typing:**
  - Default Login: `ras`
  - Default password: `agent`

The Storage Automated Diagnostic Environment main window is displayed.



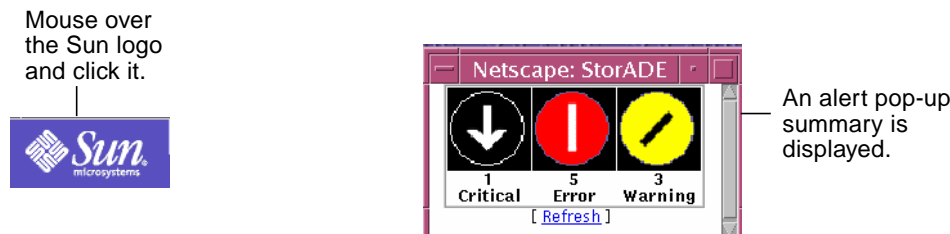
**FIGURE 2-2** Storage Automated Diagnostic Environment Main Window

The Master Configuration window opens automatically the first time you initiate the GUI.

**Note** – The Storage Automated Diagnostic Environment is always accessed on port 7654 of the *host* configured as the *master agent*. All of the agents communicate with one another through this port to synchronize their configurations.

### 3. You can mouse over the Sun logo and click it to display a pop-up window that summarizes the alerts.

Use this information as the first step in fault isolation and troubleshooting.



## Administrative Functions

The Maintenance section includes all the functions that are necessary for setting up the Storage Automated Diagnostic Environment for the first time or to make changes. The primary maintenance functions are shown in TABLE 3-1.

**TABLE 3-1** Storage Automated Diagnostic Environment General Maintenance Functions

Task	Function
Maintain host information.  See “Maintaining Hosts” on page 33.	<ul style="list-style-type: none"><li>• Supports the maintenance of host-specific information such as host name, location, and IP address.</li><li>• Enables you to manually add a new slave or an alternate master</li><li>• Tests the availability of the Storage Automated Diagnostic Environment on each host using the Ping Slaves function.</li><li>• Enables you to push slave configuration to the corresponding slaves.</li></ul>
Add or update the site information.  See “To Maintain Site Information” on page 31.	Supports the maintenance of customer information and master configuration information, including: <ul style="list-style-type: none"><li>• Customer name, contract number, and location information</li><li>• Default local message files</li><li>• Device category selection</li><li>• Monitoring frequency</li></ul>
Discover devices.  See “Discovering Devices” on page 42.	Requests that the Storage Automated Diagnostic Environment probe the environments for the desired device types.
Add devices manually.  See “To Add Information About a Device” on page 46.	Enables you to manually add any currently supported device and enter the information required for that device.

**TABLE 3-1** Storage Automated Diagnostic Environment General Maintenance Functions

Maintain devices.  See “Maintaining Devices” on page 46.	Supports the maintenance of device-specific information. With the Maintain devices functionality, you can update or delete existing devices.
Set up local email and pager notification.  See “To Set Up Local Email and Pager Notifications” on page 54.	Enables local notification information: : <ul style="list-style-type: none"><li>• Enable specific events to be emailed to local administrators. Events can be categorized by device type, severity level, and event type. Events can also be summarized and sent to a pager’s email address.</li><li>• Enables events to be automatically translated from their internal encoded format to a human-readable format</li></ul>
Set up a Provider.  See “To Set Up Notification Providers” on page 60.	Relays events generated by health monitors.
Control agent activity.  See “Start and Stop Agents” on page 68.	Temporarily stops the Storage Automated Diagnostic Environment from running on a selected host.
Start or stop devices.  See “To Activate Monitoring on a Device-by-Device Basis” on page 71.	If the device is being tested, or if faults are being injected into the device intentionally, temporarily stops the notifications for a specific device.
Test email.  See “Send Test Email” on page 72.	Sends test emails and messages to verify the mailing capability of the Storage Automated Diagnostic Environment.
Review configurations  See “Review the Configuration” on page 73.	Verifies all configuration settings.
Change configuration options  See “Configuration Options” on page 74.	Enables you to change defaults on selected configuration options.
Optimization/FSA	Aggregates alerts that share common FRUs and attempts to summarize them into more specific groups for root cause analysis.

## ▼ To Access the General Maintenance Window

1. Click the Admin link on the Storage Automated Diagnostic Environment main window.

Admin is divided into three sections: General Maintenance, Topology Maintenance, and System Utilities, as shown in FIGURE 3-1.

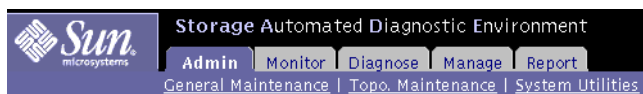


FIGURE 3-1 Admin Sections window

To configure the Storage Automated Diagnostic Environment, use the General Maintenance functions and the information found in TABLE 3-2.

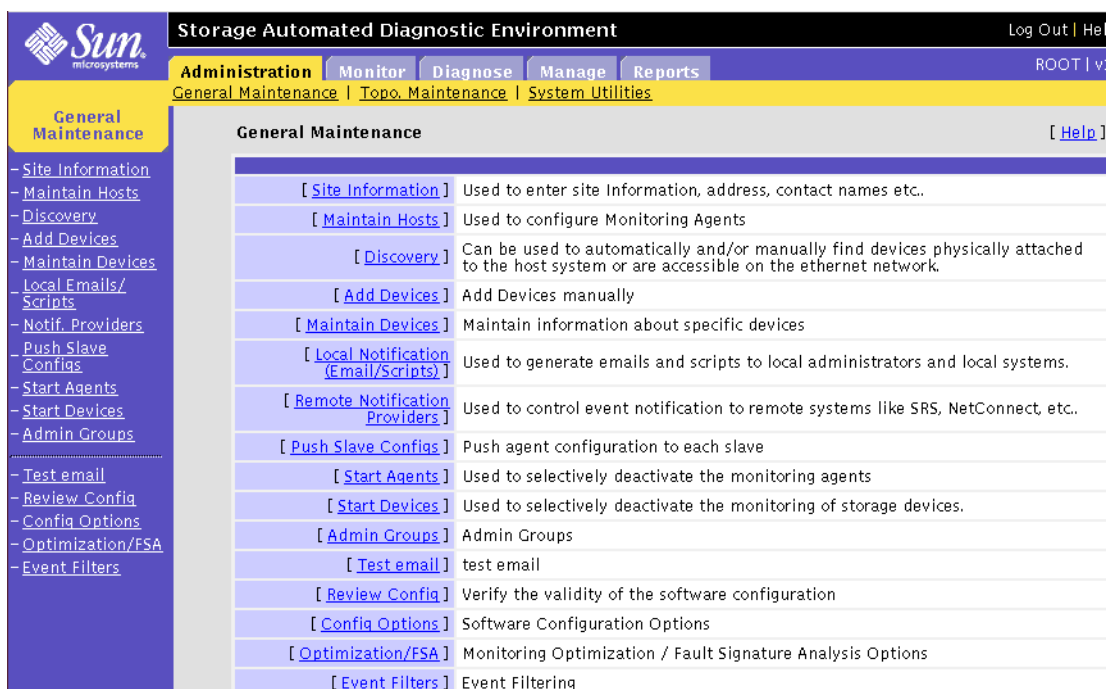


FIGURE 3-2 General Maintenance window

**TABLE 3-2** General Maintenance Functions

Function	Description
Site Information	Complete the mandatory fields, denoted with an asterisk (*) before you proceed.
Maintain Hosts	Enables agent configuration.
Discovery	<p>Enables the Storage Automated Diagnostic Environment to probe the in-band data paths of Sun StorEdge devices, as well as the out-of-band management paths for Sun StorEdge devices and Brocade Silkworm switches.</p> <p><b>Note:</b> Agents on hosts with a Sun StorEdge T3, T3+, and 6120 array message log file automatically finds only Sun StorEdge T3, T3+, and 6120 arrays that have made entries in that log file.</p>
Add Devices	Enables you to add devices manually.
Maintain Devices	Enables the Storage Automated Diagnostic Environment to manually add devices or delete unwanted devices or to change the agent's reference to the device(s) being monitored.
Email Notification	<p>Enables the configuration of certain types of events for specific device types, and sends an automatic email to a list of multiple users' email addresses.</p> <p>This option can be fully customized to streamline notifications; for example, in addition to specifying email addresses, you can specify pager numbers.</p>
Notification Providers	The selections you make here instruct the Storage Automated Diagnostic Environment to use the appropriate protocol to send the device data collected by the agent modules back to Sun.
Push Slave Configs	If you select this option, an update occurs, even when there is no information to be updated.

**TABLE 3-2** General Maintenance Functions (*Continued*)

Start/Stop Agent	<p>Enables the Storage Automated Diagnostic Environment to start or stop agents from executing.</p> <p>For a slave agent, this option disables monitoring of only those devices that the agent has been configured to monitor. If the master agent is turned off, the slaves continue to run. But if any events occur, the configurations are not pushed to the Storage Automated Diagnostic Environment until the master agent is restarted.</p>
Start/Stop Devices	<p>Enables the Storage Automated Diagnostic Environment to start or stop the alert notification of an event for one or more selected devices.</p> <p>This function does not stop the monitoring of the device and the interface to the provider.</p>
Test Email	<p>Enables the Storage Automated Diagnostic Environment to generate a generic email and send it to the list of recipients configured in the Email Notification step.</p>
Review Config	<p>Enables the Storage Automated Diagnostic Environment to verify all settings and display instructions for those that have been missed or for those that should be double-checked.</p>
Config Options	<p>Use this window to update existing configuration options.</p>
Optimization/FSA	<p>Fault Signature Analysis (FSA) aggregates alerts that share common suspect FRUs. After a set of events is generated but before these events are sent as email or to the NetConnect provider, the FSA module attempts to summarize into fewer and more specific and actionable events. The aggregation of events often points to a root cause of the problem, whereas events are merely <i>symptoms</i> of a problem.</p>

---

# General Maintenance

The following sections discuss the general maintenance functions that you can perform using the Storage Automated Diagnostic Environment:

- “To Maintain Site Information” on page 31
- “Maintaining Hosts” on page 33
- “Maintaining Devices” on page 46
- “Customizing Email Deliveries” on page 54
- “Using Providers” on page 59
- “Start and Stop Agents” on page 68
- “Send Test Email” on page 72
- “Review the Configuration” on page 73
- “Configuration Options” on page 74
- “Fault Signature Analysis” on page 77

# ▼ To Maintain Site Information

- From the General Maintenance window, select Site Information. The fields on this page must be completed before you proceed. The fields with an asterisk (\*) are mandatory.

Site Information

[\[ Help \]](#)

Used to enter site Information, address, contact names etc..

Customer Information

Customer Name: John Doe \* Mandatory

Customer No: 54321

Contract No: 895632

Stock Symbol: I

Site Information

Site Name: Brm 5 lab \*

Address: Building 5

City: Broomfield \*

State: CO

Zip Code: 800201 \*

Country: USA \*

Contact: \*

Phone No:

Contact Email: \*

Submit

FIGURE 3-3 Maintain Site Information window

TABLE 3-3 describes the fields on the the Storage Automated Diagnostic Environment Maintain Site Information window.

TABLE 3-3 Site Information Fields

Field	Action
Customer Name	Type your customer name.
Customer No.	Type your company's customer number.
Contract No.	Type your company's contract number.
Stock Ticket	Enter your company's stock market symbol as a unique company identifier.
Site Information	Type your site name and address. Include a contact person's name and either an email address or a phone number.

## To Customize the Window Settings

You can configure your browser window's size and specify whether to show or hide the left frame menu. Using the Config Options Update Window functionality from the General Maintenance menu, shown in FIGURE 3-4, you can select one of the following window options:

Window Options : [Config Options](#)

**Update Window**

Select Big screen if your monitor is 1280x1024 and you want to display up to 3 frames across on the browser. Select Small screen for 1024x864 monitors and want only 2 frames. Select 'No Frames' if you don't want the application to use frames.

Select Browser Window:	Big Screen
Color Scheme:	Old Sun Colors

**Update Window**

**FIGURE 3-4** Update Window using Config Options

- **Big Screen**—displays three windows: the left frame window, the top window (with tracking links), and the main topic window.
- **Small Screen**—displays three windows: the left frame window, the top window (with tracking links), and the main topic window
- **No Frames**—displays the top window (with tracking links) and the main topic window only.  
**Note:** Most of the GUI windows in this guide are shown using the No Frames option.
- **No Frames + Accessible**—displays the top window (with tracking links) and the main topic window, as with No Frames, but enables the user to use keystroke combinations to perform tasks instead of using the mouse.

# Maintaining Hosts

When the Storage Automated Diagnostic Environment package is installed on a host, it registers with the master agent and an entry is added to this page.

The Maintain Host section contains the following subsections:

- “To Update the Master Configuration” on page 35
- “To Add a New Host” on page 38
- “Discovering Devices” on page 42

---

**Note** – For this automatic registration to work, you must first install and run the master agent. (A Yes appears in the Active field of the Maintain Hosts window.) Once all hosts are installed, you can access this page to change the configuration of each host.

---

1. Click the Admin link on the Storage Automated Diagnostic Environment main window.
2. Click the Maintain Hosts link on the General Maintenance menu.

The Maintain Hosts window is displayed.

**Maintain Hosts** [\[ Help \]](#)

This page contains the list of all monitored hosts in this installation.

- [Add a new Slave] registers a new host with this installation. An agent must already be installed on this host prior to executing this function.
- [Ping Slaves] verifies that all slaves are available and retrieves their hostid and agent version.
- [Push Slave Configs] transmits the configuration (address, hosts, devices, emails) to all the Slave Hosts.

[\[ Update All Hosts \]](#)

Existing Hosts							Admin Group: <a href="#">[ All ]</a> <a href="#">GO</a>
Host Name	Type	#Devs	Host IP	Active	Ping /Hostid	Admin Group	
	Master	12		Yes		<input type="text"/>	

No slave present in this configuration.

[Add a new Slave](#) [Ping Slaves](#) [Update Groups](#) [Update Groups+](#)  
(Include Host's devices)

**FIGURE 3-5** Maintain Hosts window

TABLE 3-4 describes the fields on the Storage Automated Diagnostic Environment Maintain Hosts screen. The functionality is described in more detail in the following subsections.

**TABLE 3-4** Maintain Hosts Descriptions

Button	Function
Add a new Slave	Use when the agent does not automatically register. This can occur if a previously installed instance is temporarily deleted from the configuration. Note that the slave is not active if manually added.
Ping Slaves	Verify that the agent at each host is up and running. The Storage Automated Diagnostic Environment pings the slaves and requests each slave's hostID to verify that the host is up and that the Storage Automated Diagnostic Environment service is available.
<b>Note:</b> If 'No' appears in the Active field, you can activate the host using the procedures in "Start and Stop Agents" on page 68.	

## ▼ To Update the Master Configuration

- From the Maintain Hosts window, click an existing Host Name link and update the fields as required.

FIGURE 3-6 lists *all* devices currently supported by the Storage Automated Diagnostic Environment.

---

**Note** – The devices listed in *Categories to Monitor* depend on your system configuration.

---

**Update Host** [ Help ]

Update Host agent information

---

**Enter Local Agent Information**

Host Name: \_\_\_\_\_

Categories to Monitor: [Abbreviations](#)

<input type="checkbox"/> :Sun 3310	<input type="checkbox"/> :Sun A5000	<input type="checkbox"/> :Internal FC Disks	<input type="checkbox"/> :Sun 2GB Switch	<input type="checkbox"/> :Sun VE
<input type="checkbox"/> :Sun 3510	<input type="checkbox"/> :Brocade Silkworm	<input type="checkbox"/> :McDATA	<input type="checkbox"/> :Sun Switch	
<input checked="" type="checkbox"/> :Sun 6120	<input type="checkbox"/> :Sun D2	<input checked="" type="checkbox"/> :FC-Counters	<input checked="" type="checkbox"/> :Sun T3	
<input type="checkbox"/> :Sun 9900	<input checked="" type="checkbox"/> :Data Host	<input checked="" type="checkbox"/> :Sun 6320	<input type="checkbox"/> :FC-Tape	
<input type="checkbox"/> :Sun A3500FC	<input checked="" type="checkbox"/> :Host	<input type="checkbox"/> :Sun 3900/6900	<input type="checkbox"/> :Sun V880 Disk	

Monitoring Frequency: 5 Minutes

Monitor InBand DataPath?: ☐

Show only monitored devices in topology graph: ☐

**Enter Default Logfiles:**

Message Log:

Storage Array Message Log:

**FIGURE 3-6** Master Configuration Window for All Supported Devices

**TABLE 3-5** Master Configuration Update Fields

Field	Required Action
Categories to Monitor	<p>Select from the available categories supported <i>with this instance</i> of the Storage Automated Diagnostic Environment. You must make at least one selection.</p> <p>Categories from which to choose include:</p> <ul style="list-style-type: none"> <li>• Sun 3310</li> <li>• Sun 3510</li> <li>• Sun 6120</li> <li>• Sun 9900</li> <li>• Sun A3500FC</li> <li>• Sun A5000</li> <li>• Brocade Silkworm</li> <li>• Sun D2</li> <li>• Data Host</li> <li>• Host</li> <li>• Internal FC Disks</li> <li>• McDATA</li> <li>• FC-Counters</li> <li>• Sun 6320</li> <li>• Sun 3900/6900</li> <li>• Sun 2-Gbit Switch</li> <li>• Sun Switch</li> <li>• Sun T3</li> <li>• FC-Tape</li> <li>• Sun V880 Disk</li> <li>• Sun VE</li> </ul>
Monitoring Frequency	<p>Select a variable between 5 and 120 minutes. This frequency variable affects how often the Storage Automated Diagnostic Environment executes. The default is 5 minutes.</p> <p>Monitoring frequency does not affect the <code>cron</code>. The <code>cron</code> will initiate the Storage Automated Diagnostic Environment agent's execution, but it is the Storage Automated Diagnostic Environment agent's task to query this variable and test whether it is time for the Storage Automated Diagnostic Environment agent to run.</p>
Monitor InBand Data Path?	Select this checkbox to enable monitoring of the in-band data path.

**TABLE 3-5** Master Configuration Update Fields (*Continued*)

Show only monitored devices in topology graph	<p>When this option is selected, Topology shows only the devices in the Monitor Devices menu. In addition, only devices monitored by <i>that agent</i> are displayed in the agent's topology.</p> <p>See "Monitoring Topology" on page 109 for more information.</p>
Message Log	<p>The path for the message log (for example, <code>/var/adm/messages</code>), which displays the history of status messages.</p>
T3 Message Log	<p>Type the path for the host's T3, T3+, and 6120 array message log (for example, <code>/var/adm/messages.T3</code>). In this example, the path should be to where the T3, T3+, and 6120 logs are being sent. This field is used to tell the Storage Automated Discovery Environment where to look for the log files; it does not alter the location to where the array actually sends the log files.</p> <p><b>Note:</b> You can check and verify the path by looking at the <code>/etc/syslog.conf</code> on the host.</p>

## ▼ To Add a New Host

If an agent does not automatically register, you can add a new slave manually.

1. Click the **Maintain Hosts** link on the **General Maintenance** window.
2. Click the **Add a new Slave** button on the **Maintain Hosts** window.

The Maintain Hosts: Add Host window is displayed.

---

**Note** – The Categories to Monitor choices indicate Sun Microsystems network storage devices that are supported with the Storage Automated Diagnostic Environment.

---

**Add Host** [ Help ]

Add a Host/Agent manually.

**Enter Host Information**

HostID:

Host Name:

Special Contract:

Categories to Monitor [Abbreviations](#)

<input type="checkbox"/> :Sun 3310	<input type="checkbox"/> :Sun A5000	<input type="checkbox"/> :Internal FC Disks	<input type="checkbox"/> :Sun 2GB Switch	<input type="checkbox"/> :Sun VE
<input type="checkbox"/> :Sun 3510	<input type="checkbox"/> :Brocade Silkworm	<input type="checkbox"/> :McDATA	<input type="checkbox"/> :Sun Switch	
<input type="checkbox"/> :Sun 6120	<input type="checkbox"/> :Sun D2	<input type="checkbox"/> :FC-Counters	<input type="checkbox"/> :Sun T3	
<input type="checkbox"/> :Sun 9900	<input type="checkbox"/> :Data Host	<input type="checkbox"/> :Sun 6320	<input type="checkbox"/> :FC-Tape	
<input type="checkbox"/> :Sun A3500FC	<input type="checkbox"/> :Host	<input type="checkbox"/> :Sun 3900/6900	<input type="checkbox"/> :Sun V880 Disk	

Monitoring Frequency:

Alternate Master: ☐

Monitor InBand DataPath: ☐

Show only monitored devices in topology graph: ☐

**>Enter Logfiles Locations**

Message Log:

Storage Array Message Log:

**Add** **Back**

**FIGURE 3-7** Add Host window

3. Complete the fields using the descriptions shown in TABLE 3-6.
4. Click Add to add the new host.
5. To automatically update the slave's configurations and to verify that all slaves agree with the master configurations, click Push Slave Configs from the Maintenance menu.

*Notes:*

- Enter an 8-digit hostID in the `/usr/sbin/hostid` directory. The Storage Automated Diagnostic Environment will not add a new slave without it.

If you do not know the hostID, you can enter a dummy number and later correct it. Note, however, that the hostID cannot match any other previously accepted hostID.

The host you add as a slave must be accessible over the Ethernet from the master and must, at a minimum, be able to respond to a ping.

- If you manually enter a slave host and no instance of the Storage Automated Diagnostic Environment is installed on that host, you must also manually enter the hostID for that slave host.

Otherwise, the Categories to Monitor field will not have any devices selected and the Storage Automated Diagnostic Environment will not be active.

The Active state will depend on the slave configuration file (`rasagent.conf.push`) in the `/var/opt/SUNWstade/DATA` directory, and will also depend on whether the Active flag is set. If there is simply no slave configuration file (for example, if the host is a master), the Active state will be set to OFF.

TABLE 3-6 describes the fields on the Maintain Hosts: Add New Slave window.

**TABLE 3-6** Maintain Hosts: Add Host Options

Option	Required Input
HostID	<p>Type the 8-digit alphanumeric hostID, which is the same as the system ID (for example, 123x45y6) in the <code>/usr/sbin/hostid</code> directory. You can use the <code>hostid</code> command on the host to obtain a valid hostID.</p> <p>If the hostID is not available, you can enter a dummy number and later correct it. Note, however, that the hostID cannot match any other previously accepted hostID.</p>
Host Name	Type the name of the host ( <code>hostname.domain</code> ).
Categories to Monitor	<p>Choose the devices the Storage Automated Diagnostic Environment will monitor.</p> <p>The Categories to Monitor choices indicate Sun Microsystems Network Storage devices that are supported with the Storage Automated Diagnostic Environment.</p>
Monitoring Frequency	<p>Select a variable between 5 and 120 minutes. This frequency variable affects how frequently the Storage Automated Diagnostic Environment executes the health monitoring agents. The default setting is 5 minutes.</p> <p><b>Note:</b></p> <p>By default, the Storage Automated Diagnostic Environment is activated by a cron every 5 minutes. The program automatically checks the last run, notes the current time, and compares the difference to the last time the cron executed. If the time exceeds 60 minutes, it executes again.</p>
Alternate Master	<p>An alternate master is a slave that, on every run of the cron, verifies that the real master is still running. If the master does not respond to a ping, the alternate master takes over some of the master's tasks.</p> <p>The Alternate Master checkbox is enabled the first time you add a new slave. For the slave to be an Alternate Master, you must disable this checkbox.</p>
Monitor InBand Data Path	Enable this button if you want to view devices on the topology of a host that are accessible in-band by that host.

**TABLE 3-6** Maintain Hosts: Add Host Options

Option	Required Input
Show only monitored devices in topology graph	When this option is selected, Topology shows only the devices in the Monitor Devices menu. In addition, only devices monitored by <i>that agent</i> are displayed in the agent's topology.  See "Monitoring Topology" on page 109 for more information.
Message Log	The path for the message log (the default is <code>/var/adm/messages</code> ), which displays the history of the status messages.
Sun T3 Message Log	Type the path for the host's Sun StorEdge T3, T3+, or 6120 array Message Log. The path should be to where the array logs are being sent. This option is used to tell the Storage Automated Discovery Environment where to look for the log files; it does not alter the location to where the array actually sends the log files.  <b>Note:</b> You can check and verify the path by looking at the <code>/etc/syslog.conf</code> on the host.

# Discovering Devices

The Discovering Devices section contains the following subsections:

- “To Access the Device Discovery Window” on page 42
- “To Discover Devices from the IP List” on page 43
- “To Search the LAN for Sun StorEdge Devices Using Subnet Discovery” on page 44
- “Setting Up Sun StorEdge Array Message Monitoring” on page 45

You can request the Storage Automated Diagnostic Environment to probe the environments for the device types shown in the Discovery window.

The Storage Automated Diagnostic Environment discovers storage devices in two ways:

- Merged host-centric discovery views
- Storage-centric topology

---

**Note** – A subnet discovery mechanism discovers Sun StorEdge T3, T3+, and 6120 array storage, virtualization devices, and switch devices for a particular subnet.

---

## ▼ To Access the Device Discovery Window

1. Click the **Admin** link on the the Storage Automated Diagnostic Environment window.
2. Click the **Discovery** tab from the General Maintenance menu.

The Device Discovery window is displayed.

**Discovery** [ Help ]

This function will query all configured hosts for devices of the requested type. This process may take a few moments, depending on the size of the monitored configuration.

- **Devices from IP List** can be used to discover all devices entered in the /etc/deviceIP.conf file (format is similar to /etc/hosts). All supported devices including switches can be entered. The format of each line is: ipno1 name1 [ type1 (optional) ].
- **Switches from List** can be used to discover all switches entered in the /etc/fcswitch.conf file (format is similar to /etc/hosts). All supported switches can be entered in this file.
- The **Sun StorEdge 3900/6900** can be discovered using 'Devices from IP List' or 'Subnet Discovery'.
- **Subnet Discovery** uses snmp to query a subnet and can discover supported switches and arrays.

Discovery Method	Agents running	Agents done	Devices found
No pending discovery results!			

**Select product to discover**

Host: All Hosts

Product/Discovery Method: Devices from IP List (Async)

FIGURE 3-8 Discovery window

## ▼ To Discover Devices from the IP List

### 1. Enter the IP address and device name into the `/etc/deviceIP.conf` file.

The first continuous character string after the IP address is used as the device name. If there is no character string after the IP address, then a combination of the device type and IP address is used to name the device.

### 2. Select Devices from IP List from the Product/Discovery Method pull-down menu.

### 3. Click Discover.

The Storage Automated Diagnostic Environment is discovering the IP addresses that have been entered into the `/etc/deviceIP.conf` file.

The following explains which devices are automatically discovered and which are not.

- The Storage Automated Diagnostic Environment discovers the Sun StorEdge A5000 arrays, the Sun StorEdge A3500FC array, the Sun Fire V880 server, the Sun StorEdge D2 array, Internal Fibre Channel Disk, and Fibre Channel Tape devices on the physical data path attachments to the host. The devices are discovered on the physical data path attachments to the host because they do not have IP addresses.
- The Storage Automated Diagnostic Environment discovers the Sun StorEdge network FC switch-8 and switch-16 switches by reading the `/etc/fcswitch` file. Additionally, the Subnet functionality asks for an IP network prefix to scan for Sun StorEdge network 1 Gbit and 2 Gbit switch-16 switches answering to SNMP queries.
- The Storage Automated Diagnostic Environment *does not* automatically discover Brocade Silkorm switches. The current workaround is to manually add the Brocade Silkorm switch IP address to the `/etc/fcswitch` file. The Brocade switches can then be discovered using the IP address.
- The Storage Automated Diagnostic Environment automatically discovers the Sun StorEdge T3, T3+, and 6120 arrays by scanning the Sun StorEdge array log file on all hosts. Entries that contain a valid IP name or address are added to the configuration. In addition, the arrays are discovered by `luxadm`.
- The Storage Automated Diagnostic Environment discovers the Sun StorEdge 3900 and 6900 series using the `/etc/host` file of the Storage Service Processor.

---

**Note** – As long as there are valid Sun StorEdge T3, T3+ array entries in this log file, the *auto-discovery* finds them and adds them. You can avoid adding older, unwanted Sun StorEdge T3 and T3+ arrays by rolling over the log file, much the same way the system log rolls over. Refer to the scripts `/usr/lib/newsyslog` and `/etc/cron.d/logchecker`.

---

## ▼ To Search the LAN for Sun StorEdge Devices Using Subnet Discovery

Use Subnet Discovery to search the LAN for Sun StorEdge network FC switch devices, Brocade Silkworm devices, and Sun StorEdge T3 and T3+ arrays.

1. Click the **Admin** tab in the the **Storage Automated Diagnostic Environment** window.
2. Click **Discovery** from the **General Maintenance** menu.
3. In the **Discovery** window, choose **Subnet** from the **Product/Discovery Method** pull-down menu.
4. Click **Discover**.

The **Discovery: Submit** window is displayed.

Discovery : Subnet [ Help ]

Run on Host:	Local	
Subnet to Search:	Sub1: <IP-ADDRESS-1>	Sub2:
	Sub3: <IP-ADDRESS-2>	Sub4:
	Sub5:	Sub6:
Use Host Name as Prefix:	<input type="checkbox"/>	
Use Custom Prefix:	I	
SNMP timeout (optional):		
Turn Monitoring On:	<input checked="" type="checkbox"/>	

Confirm Subnet Discovery Back

FIGURE 3-9 Subnet Discovery

5. Choose a host from the **Run on Host** pull-down menu.
6. Enter the IP address of the subnet you want searched. You can enter up to six subnets.

7. Complete the remaining fields using the information found in the following table.

TABLE 3-7    Discovery: Subnet Fields

Field	Description
Use Host Name as Prefix	The Storage Automated Diagnostic Environment host assigns a name to the device when it discovers the device.  Select the <i>Use Host Name as Prefix</i> check box to start with the name of the host that discovered the device.
Use Custom Prefix	Enables the user to enter a custom prefix, rather than the name of the host that discovered the device.
SNMP timeout (optional)	Specifies how many seconds the subnet discovery function waits for an answer from a device.
Turn Monitoring On	If a device has been discovered and added to the Storage Automated Diagnostic Environment configuration file, enable the Turn Monitoring On function.  If the device has not been added to the configuration file, you must use the "Turn Monitoring On functionality described in "Start and Stop Agents" on page 68.

8. After you have completed the Discovery: Subnet fields, click Confirm Subnet Discovery.

The Storage Automated Diagnostic Environment searches the subnet for valid devices and sends the search results back to the master agent. The master agent moves the recently discovered, valid devices that were previously in the subnet into the main configuration file.

Setting Up Sun StorEdge Array Message Monitoring

In order for the Storage Automated Diagnostic Environment software package to monitor messages from a Sun StorEdge array, you must mirror the Sun StorEdge array's `/syslog` to a host with the Storage Automated Diagnostic Environment installed and configured to monitor Sun StorEdge T3, T3+, and 6120 arrays.

1. See the *Sun StorEdge T3 and T3+ Array Administrator's Guide, Monitoring the Array*, and the *Sun StorEdge 6120 array documentation* for procedures on how to set up the Sun StorEdge T3 and T3+ array and the host to forward `/syslog` messages.

2. See the section “Maintaining Hosts” on page 33 for information about how to configure each host with the name given to the Sun StorEdge T3 and T3+ array message log file.

## Maintaining Devices

Use the Maintain Devices window to configure the host to monitor each device. You can also use this window to change the name the storage device will use as a reference to that device through its email notifications.

The Maintain Devices section is divided into the following subsections:

- “To Add Information About a Device” on page 46
- “To Update a Device Manually” on page 51
- “To Delete a Device” on page 53
- “To Display a Renamed Device” on page 53

### ▼ To Add Information About a Device

1. Click the Add Devices link from the General Maintenance menu.

The Add Devices window is displayed.

2. From the Add devices window, select and click the device you want to add.



FIGURE 3-10 Add Devices window

The corresponding Add Devices screen is displayed, such as the example shown in FIGURE 3-11

Add Devices : Sun 3310/3510

[\[ Help \]](#)

Enter Device Information

Device Name:

Primary Host:

Local ☐

IP Name/Address:

Add

Back

FIGURE 3-11 Add Devices: Sun 3310/3510

3. Complete the required fields using the descriptions shown in the following table.

TABLE 3-8 Maintain Devices: Add Devices

Device	Required Input
Sun StorEdge 3310 and 3510 array	<ul style="list-style-type: none"><li>Type the <i>device name</i> that the Storage Automated Diagnostic Environment will use to identify the device.</li><li>Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li><li>Type the IP address that identifies the host to the network.</li></ul>
Sun StorEdge 9900	<ul style="list-style-type: none"><li>Type the <i>device name</i> that the Storage Automated Diagnostic Environment will use to identify the device.</li><li>Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li><li>Type the IP address that identifies the host to the network.</li></ul>
Sun StorEdge A3500FC array	<ul style="list-style-type: none"><li>Type the <i>device name</i> that the Storage Automated Diagnostic Environment will use to identify the device.</li><li>Enter the serial number for the device.</li><li>Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li></ul> <p><b>Note:</b> The default is the host that automatically discovered the device.</p>
Sun StorEdge A5000 array	<ul style="list-style-type: none"><li>Type the <i>device name</i> that the Storage Automated Diagnostic Environment will use to identify the device.</li><li>Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li></ul> <p><b>Note:</b> The default is the host that automatically discovered the device.</p>

**TABLE 3-8** Maintain Devices: Add Devices (*Continued*)

Device	Required Input
Brocade Silkworm switches	<ul style="list-style-type: none"> <li>Type the <i>device name</i> the Storage Automated Diagnostic Environment will use to identify the device.</li> <li>Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li> </ul> <p><b>Note:</b> The default is the host that automatically discovered the device.</p> <ul style="list-style-type: none"> <li>Type the required telnet password, which enables the Storage Automated Diagnostic Environment to log in to the Brocade switch.</li> <li>Type the IP address that identifies the host to the network.</li> </ul>
Sun StorEdge D2 array	<ul style="list-style-type: none"> <li>Type the <i>device path</i> with which the Storage Automated Diagnostic Environment will access the device.</li> <li>Select the Storage Automated Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li> <li>Type the <i>serial number</i> of the Sun StorEdge D2 array, which will be used to identify the device to the host.</li> </ul>
Internal FC Disk	<ul style="list-style-type: none"> <li>Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li> </ul>
McDATA switches	<ul style="list-style-type: none"> <li>Type the <i>device name</i> that the Storage Automated Diagnostic Environment will use to identify the device.</li> <li>Type the optional telnet password, which enables the Storage Automated Diagnostic Environment to log in to the McDATA switch.</li> <li>Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li> </ul> <p><b>Note:</b> The default is the host that automatically discovered the device.</p> <ul style="list-style-type: none"> <li>Type the IP address that identifies the host to the network.</li> </ul>
Sun Solutions	<p>This options adds a Sun StorEdge 3900, 6320 or 6320SL, or 6900 series system to your configuration as a single device.</p> <ul style="list-style-type: none"> <li>Type the <i>device name</i> that the Storage Automated Diagnostic Environment will use to identify the device.</li> <li>Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li> </ul> <p><b>Note:</b> The default is the host that automatically discovered the device.</p> <ul style="list-style-type: none"> <li>Type the IP address that identifies the host to the network.</li> <li>Type the Agent Login.</li> <li>Type the Agent Password.</li> </ul>

**TABLE 3-8** Maintain Devices: Add Devices (*Continued*)

Device	Required Input
Sun switches	<ul style="list-style-type: none"> <li>• Type the <i>device name</i> that the Storage Automated Diagnostic Environment will use to identify the device.</li> <li>• Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li> </ul> <p><b>Note:</b> The default is the host that automatically discovered the device.</p> <ul style="list-style-type: none"> <li>• Type the optional admin/telnet password, which enables the Storage Automated Diagnostic Environment to log in to the Sun switch.</li> <li>• Type the IP address that identifies the host to the network.</li> </ul>
Sun StorEdge T3, T3+, and 6120 array	<ul style="list-style-type: none"> <li>• Type the <i>device name</i> that the Storage Automated Diagnostic Environment will use to identify the device.</li> <li>• Type the optional telnet password, which enables the Storage Automated Diagnostic Environment to log in to the Sun StorEdge T3 and T3+ array device. Note that the user is not authorized to <i>change</i> an existing Sun StorEdge T3 and T3+ array password.</li> <li>• Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li> </ul> <p><b>Note:</b> The default is the host that automatically discovered the device.</p> <ul style="list-style-type: none"> <li>• Type the IP address that identifies the host to the network.</li> </ul>
FC Tape	<ul style="list-style-type: none"> <li>• Type the <i>device name</i> that the Storage Automated Diagnostic Environment will use to identify the device.</li> <li>• Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li> </ul> <p><b>Note:</b> The default is the host that automatically discovered the device.</p>
Sun Fire V880 FC-AL Server	<ul style="list-style-type: none"> <li>• Type the <i>device name</i> that the Storage Automated Diagnostic Environment will use to identify the device.</li> <li>• Select the Storage Automated Diagnostic Environment's <i>primary host</i> that will perform the actual monitoring of the device.</li> <li>• <b>Note:</b> The default is the host that automatically discovered the device.</li> </ul>

**4. From the Add Devices window, click Add.**

Be aware of the host's access method when making decisions about which devices the Storage Automated Diagnostic Environment will monitor, as shown in the following table.

Device Monitoring Method	In-band or Out-of-Band?
Monitor <i>Sun StorEdge A3500FC</i> arrays from a host that has an attachment through the Fibre Channel cables and can run the Sun StorEdge RAID Manager commands.	In-band
Monitor <i>Sun StorEdge A5000</i> arrays from the host that has an attachment through the Fibre Channel cables.	In-band
Monitor the <i>Sun switches</i> on any host on the subnet, because the probing is done over the network.	Out-of-Band
Monitor the <i>Brocade Silkworm switches</i> on any host on the subnet, because the probing is done over the network.	Out-of-Band
Monitor <i>Sun StorEdge T3, T3+, and 6120</i> arrays from the host that has access to the Sun StorEdge T3 and T3+ array message log file and has an Ethernet connection on the subnet.	In-band and Out-of-Band
Monitor <i>Fibre Channel tape devices</i> from the host that has an attachment through the Fibre Channel cables.	In-band
Monitor Fibre Channel internal disk devices.	In-band
Monitor Sun StorEdge D2 arrays.	In-band
Monitor Sun StorEdge 3510 FC arrays	In-band
Monitor Sun Fire V880 FC-AL disk devices.	In-band
Monitor <i>Sun StorEdge 3900, 6320, and 6900 series devices</i> from the Storage Service Processor, which has Ethernet connection to the Sun StorEdge arrays, the Sun switches, and the virtualization engine (Sun StorEdge 3900 and 6900 series only).	Out-of-Band

## ▼ To Update a Device Manually

### 1. Click the Maintain Devices link on the General Maintenance menu.

The Maintain Devices window is displayed.

**Storage Automated Diagnostic Environment** Log Out | Help | Hosts  
 Admin Monitor Diagnose Manage Report  
 General Maintenance Topo. Maintenance System Utilities  
**Maintain Devices** [ Help ]

This page displays all monitored devices. Update devices by clicking the appropriate link. Use the 'Info' link to add information and comments to this device. Select a specific host from the 'Host:' drop-down to display devices monitored by this host only.  
 A device can be marked **On/Off** if the device is active (first value) but the device category has never been checked in 'Maintain Hosts' (second value).

List Existing Devices Admin Group: [ All ] Host: All Hosts GO

Monitoring Host	DeviceName (select to update)	Dev. Type	Info	IP Address	WWN/Key	Monitor Device/Category	Admin Group	Delete
		t3b	<a href="#">Info</a>			On/On	<input type="text"/>	<input type="checkbox"/>
		6120	<a href="#">Info</a>			On/On	<input type="text"/>	<input type="checkbox"/>
		t3b	<a href="#">Info</a>			On/On	<input type="text"/>	<input type="checkbox"/>
		Switch2	<a href="#">Info</a>			On/On	<input type="text"/>	<input type="checkbox"/>
		t3	<a href="#">Info</a>			On/On	<input type="text"/>	<input type="checkbox"/>
		t3	<a href="#">Info</a>			On/On	<input type="text"/>	<input type="checkbox"/>
		t3	<a href="#">Info</a>			On/On	<input type="text"/>	<input type="checkbox"/>
		Switch1	<a href="#">Info</a>			On/On	<input type="text"/>	<input type="checkbox"/>
		Switch1	<a href="#">Info</a>			On/On	<input type="text"/>	<input type="checkbox"/>

FIGURE 3-12 Maintain Devices

**Note** – The IP Address is a unique number that identifies the device. The worldwide name and Key number are unique identifiers for a specific FRU. Although none of the identifiers are user-maintainable, they help Sun service representatives troubleshoot by enabling them to track the FRUs to specific Sun StorEdge T3, T3+, or 6120 arrays.

**2. In the Maintain Devices window, select and click the device you want to update from the Device Name column**

The corresponding Maintain Devices screen is displayed, as the example shown in FIGURE 3-13.

Maintain Devices : Sun Switch 2 [ Help ]

Device Type:	Switch2	Monitoring:	On
Device Name:	<input type="text"/>		
IP Name/Address:	<input type="text"/>		
IP Number:	<input type="text"/>		
Telnet Password (optional):	<input type="password"/>		
WWN:	<input type="text"/>		
Primary Host:	Local <input type="checkbox"/>		

Update Delete Back

**FIGURE 3-13** Maintain Devices window

**3. Update the necessary fields and click Update.**

---

**Note** – Changing the name of the device changes only the *reference* to that device within the Storage Automated Diagnostic Environment. It does not affect the access or reference to that device within the operating system.

---

---

**Note** – If you change the configuration of a device (for example, if you change the chassis ID of a switch), you must *delete* that unwanted device, using the functionality found in “To Delete a Device” on page 53.

---

The Storage Automated Diagnostic Environment displays a message stating that the previous device has been removed.

---

## ▼ To Delete a Device

You can delete an unwanted device once the device has been removed from the site or if device monitoring is no longer needed.

---

**Note** – You can delete a slave, but the only way to delete the master is to remove the package, which is described in Chapter 2.

---

1. **Click the Admin link on the Storage Automated Diagnostic Environment main window.**

2. **Click the Maintain Devices link on the Maintenance menu.**

The Maintain Devices window is displayed.

3. **From the Maintain Devices window, select the device you want to delete in the Device column.**

The device's maintenance screen is displayed.

4. **Click Delete on the bottom of the Maintain Devices window.**

Click one or all of the device's corresponding Delete check box.

- Deleting a device from the configuration does not remove access to the device instrumentation in the cache immediately. This will, however, be cleared the next time you manually run the agent, which is described in "To Run the Agent Manually" on page 90.
- State information for that device is also maintained until the agent's next run. Therefore, a device can be removed from a configuration and still be viewed in the Topology window and Instrumentation window as a "snapshot in time" until you take a new Topology snapshot.

## ▼ To Display a Renamed Device

If you rename a device and then execute the agent from the command line or from the GUI, the Storage Automated Diagnostic Environment displays a message that the previous device has been removed. The Storage Automated Diagnostic Environment topology will not, however, display the renamed device until you rediscover the device and take a new Topology snapshot.

---

**Note** – Unless you remove the SUNWstade directory or perform a clean `ras_install`, the configuration file remains on the system between upgrades.

---

# Customizing Email Deliveries

You can use the Local Email/Pager Notifications window to customize the generation of emails to yourself or to other administrators at their companies. For example, if you are interested in receiving only high-priority alerts coming from Sun StorEdge T3, T3+, and 6120 arrays, you can create a specialized notification for this instance only.

This section is divided into the following subsections:

- “To Set Up Local Email and Pager Notifications” on page 54
- “To Send a Customizable Subset of the Event-Driven Messages From the Host” on page 57

## ▼ To Set Up Local Email and Pager Notifications

Alerts are sent only to valid email addresses that you have entered through the Email Notification function. Local notification does *not* send mail to the provider.

**Local Notification (Email/Scripts)** [ Help ]

Use **[Add Notification]** to add new email addresses. **[Clear Email Maximums]** reset the counters that are used to avoid sending too many emails about the same problem.

**Notification Add/Update Form:**

- For Sun Solution, the Management-level can be selected. Select 'Components' to get device events (like t3.switch etc.). Select 'System' to get Solution-level events (like 3900/6900 etc.).
- Select Priority, Event Category and Event Type to filter events.
- 'Skip components of aggregated events' will decrease the number of events sent by only sending aggregated events. Aggregated events are generated by the 'Fault Signature Analysis' module.

Notification Type	Email/Script (Click to Update)	Event Categories	Event Type	Priority	Admin Groups
Email		All	All Events	All	All

**Add Notification** **Clear Email maximums**

**FIGURE 3-14** Local Email/Pager Notifications window

You can customize the following local notification information:

- Notification type
- Email address
- Category
- Event Type
- Priority

---

**Note** – The local email/pager notifications feature, shown in FIGURE 3-14, is optional and does not affect the main transmission functions of the Storage Automated Diagnostic Environment. The master instance of the Storage Automated Diagnostic Environment is the only instance generating emails based on local notifications. Slave instances of the Storage Automated Diagnostic Environment send their alerts to the master, which filters them and forwards them to the providers, if selected, and to local system administrators, if configured.

---

## ▼ To Update or Delete an Existing Email Address

- **Click an existing email link from the Email Notification window.**

The Local Notification Information window appears, similar to the window shown in FIGURE 3-15.

## ▼ To Add a New Email Address

- **Click the Add Notification button to add new email addresses to the notification list.**

In addition to sending the RAS information collected by the Storage Automated Diagnostic Environment, you can send a customizable subset of the event-driven messages from the host (configured as master) directly to local system administrators at the customer's site by email. You can specify that the message information sent is at a system level or a component level.

**Local Notification (Email/Scripts) : Add Email** [Help]

Use [Add Notification] to add new email addresses. [Clear Email Maximums] reset the counters that are used to avoid sending too many emails about the same problem.

**Notification Add/Update Form:**

- For Sun Solution, the Management-level can be selected. Select 'Components' to get device events (like t3,switch etc.). Select 'System' to get Solution-level events (like 3900/6900 etc.).
- Select Priority, Event Category and Event Type to filter events.
- 'Skip components of aggregated events' will decrease the number of events sent by only sending aggregated events. Aggregated events are generated by the 'Fault Signature Analysis' module.

**Enter Local Notification Information**

Notification Type: ☒ Email ☐ Pager ☐ Script

Email Address:

Run script:  [Help]

Management Level: **System**  
**Component**

Priority:

Event Categories:   
Sun 3310  
Sun 3510  
StorEdge 6120

Event Type:   
AgentDeinstallEvent  
AlarmEvent  
AuditEvent  
CommunicationEstablishedEvent

Admin Groups:   
SYSTEM - System/Agent Events

Apply Event Filters: ☐

Skip components of aggregated events: ☐

Add Back

**FIGURE 3-15** Email Notification: Add Email window

**Note** – Email might not be sent if the system is not properly configured to send mail to the recipient. This is primarily evident in Storage Service Processor environments where the Storage Service Processors are on a subnet and there is no gateway to the intended recipient.

## Run Script Arguments

The Run Script text box enables you to run a script along with each event sent in an email. This script is executed for each new event and receives the following arguments:

**TABLE 3-9** Run Script Arguments

Argument	Description
-C [category]	The category of the event (for example, t3)
-S [severity]	The severity of the event (for example, 1=warning, 2=error, 3=down)
-E [event_type]	Event type
-T [target]	The target number of the event (for example: switch:10000023EA345A)
-N [TargetName]	The name of the target (for example, switch-1a)
-D [description]	The description of the event

### ▼ To Send a Customizable Subset of the Event-Driven Messages From the Host

**1. Enter a valid email address into the Email Address textbox.**

**2. For each address, choose from:**

- Management Level
  - System—solution level (Sun StorEdge 3900 and 6900 series)
  - Component—device level
- The Priority list:
  - 0 = information (green). This is the lowest priority.
  - 1 = warning (yellow)
  - 2 = error (red)
  - 3 = down (red)—the system is down.
  - Warning+Error+Down
  - Actionable only

- The Event Category list—Select from the current list of storage products that are monitored by the Storage Automated Diagnostic Environment.
- The Event Type list—Select from a list of event types, categorized by device type.

All Events is the default. Other Event options include:

- Agent Deinstall Event
- Alarm Event
- Audit Event
- Communication Established Event
- Communication Lost Event
- Discovery Event
- Heartbeat Event
- Location Change
- Removal Event
- State Change Event
- Statistics
- Topology Event
- Link Event
- Diagnostic Test

### **3. Click Add.**

The Storage Automated Diagnostic Environment sends the specific event-type messages, by device type, to one or more email addresses you specified.

# Using Providers

Storage Automated Diagnostic Environment Providers encode data and interface with transport mechanisms, which transmit information to the storage management platforms about configured storage devices. A provider's main function is to relay events generated by health monitors.

The Storage Automated Diagnostic Environment supports seven providers: Email, SAE, Sun Remote Services (SRS), NetConnect, Simple Network Management Protocol (SNMP), Sun StorEdge Remote Response (SSRR), and SunMC.

This section discusses the following topics:

- “To Set Up Notification Providers” on page 60
- “Email Provider” on page 61
- “SAE Provider” on page 62
- “NetConnect Provider” on page 62
- “SRS Provider” on page 63
- “SSRR Provider” on page 64
- “SNMP Traps” on page 67
- “SunMC Provider” on page 65

## ▼ To Display the Notification Provider Maintenance Window

1. **Click the *Notific. Providers* link on the *General Maintenance* menu.**

The Notification Provider Maintenance window is displayed.

## ▼ To Set Up Notification Providers

- **Complete the required fields shown in** TABLE 3-10.

**TABLE 3-10** Notification Providers

Provider	Required Action
Datahost Provider	<ul style="list-style-type: none"><li>• Enable the Active checkbox.</li><li>• Type the IP address of the Data Host agent.</li></ul>
Email	<ul style="list-style-type: none"><li>• Enable the Active checkbox.</li></ul>
SAE	<ul style="list-style-type: none"><li>• Enable the Active checkbox.</li><li>• Type the IP address of the SSDE management console</li><li>• Type the number of hours for heartbeat frequency.</li></ul>
NetConnect	<ul style="list-style-type: none"><li>• Enable the Active checkbox.</li><li>• Type the maximum size, in Kbytes, of RAS information that the Storage Automated Diagnostic Environment agent will collect and transport.</li></ul>
SRS	<ul style="list-style-type: none"><li>• Enable the Active checkbox.</li><li>• Type the IP address of the SRS console</li><li>• Type the number of hours for heartbeat heartbeat.</li></ul>
SSRR Sun StorEdge Remote Response	<ul style="list-style-type: none"><li>• Enable the Active checkbox.</li><li>• Type the number of hours for heartbeat frequency</li></ul>
SunMC	<ul style="list-style-type: none"><li>• Enable the Active checkbox.</li><li>• Type the SunMC console IP address.</li><li>• Type the number of hours for heartbeat frequency.</li></ul>
SNMP Traps	<ul style="list-style-type: none"><li>• Enable the Active checkbox.</li><li>• Type the IP name and address that identifies the host to the network. You can provide information for up to five IP addresses.</li><li>• Specify the port number. Default is 162.</li><li>• Specify the minimum alert level: Warnings, Error, or Down.</li></ul>

## Data Host Provider

With the DataHost Transfer option activated, each run of the Storage Automated Diagnostic Environment agent sends information to the Sun StorEdge Diagnostic Expert about the HBAs of the host where the Storage Automated Diagnostic Environment is installed. HBA information includes port status, Fibre Channel counters for each port, and the World Wide Name (WWN) of each port. The Sun StorEdge Diagnostic Expert uses the HBA information to complete its topology.

The screenshot shows the 'Remote Notification Providers' window. At the top, there is a navigation bar with links: DataHost (Off), Email (Off), NetConnect (Off), SAE (Off), SRS (Off), SSR (Off), SunMC (Off), and Trap (Off). Below this, a text box states: 'This provider will send hba information to another agent. Use port 7654 when sending to an instance of Storage A.D.E.'. The main section is titled 'DataHost transfer' and contains an 'Active' checkbox which is unchecked, with the word 'Inactive' in red text next to it. Below this is a text input field labeled 'Send Datahost info to this IP:port:' with a placeholder 'x'. To the right of the input field is a note: 'Use a colon between IP and Port'. At the bottom right of the section is an 'Update' button.

FIGURE 3-16 Data Host Provider window

## Email Provider

The Email Provider is an Intranet mechanism for transporting reliability, availability, and serviceability (RAS) information collected by the Storage Automated Diagnostic Environment agent to specified recipients.

For information on how to categorize events by device type, severity level, and event type, See “To Set Up Local Email and Pager Notifications” on page 54.

The screenshot shows the 'Remote Notification Providers' window. At the top, there is a navigation bar with links: DataHost (Off), Email (Off), NetConnect (Off), SAE (Off), SRS (Off), SSR (Off), SunMC (Off), and Trap (Off). Below this, a text box states: 'The email provider is used to send events to the Sun Network Storage Command Center using email.'. The main section is titled 'Email Information' and contains an 'Active' checkbox which is unchecked, with the word 'Inactive' in red text next to it. Below this is a text input field labeled 'Address:' with the value 'nscc\_transport@sun.com'. At the bottom right of the section is an 'Update' button.

FIGURE 3-17 Email Provider window

## NetConnect Provider

The NetConnect Provider is a part of the SRS family of products. NetConnect uses internet-based technology which avoids the need for additional dedicated network connections at the customer site. All available instrumentation, events, and topology information is sent to the Network Storage Command Center (NSCC).

The screenshot shows the 'Remote Notification Providers' window. At the top, there is a navigation bar with links: DataHost (Off), Email (Off), **NetConnect (Off)**, SAE (Off), SRS (Off), SSRR (Off), SunMC (Off), and Trap (Off). Below this, a text box explains: 'The Net Connect Provider is the transport mechanism for RAS information collected by the Storage Automated Diagnostic Environment Agent. The **Active** checkbox indicates the current status of the Provider.' The main section, titled 'NetConnect Provider Information', contains an 'Active' checkbox which is unchecked and labeled 'Inactive' in red, and a 'Max Size (Kbytes):' field with the value '2000'. An 'Update' button is located at the bottom right.

FIGURE 3-18 NetConnect Provider window

## SAE Provider

When the SAE Provider is activated, the Storage Automated Diagnostic Environment sends events to the Sun StorEdge Diagnostic Expert 1.2.

---

**Note** – The IP:port should include the IP address of the Sun StorEdge Diagnostic Expert management station, followed by the station's port number. Currently the port number is 8088. For example: `http://123.45.67.89:8088`

---

The screenshot shows the 'Remote Notification Providers' window. The navigation bar has links: DataHost (Off), Email (Off), NetConnect (Off), **SAE (Off)**, SRS (Off), SSRR (Off), SunMC (Off), and Trap (Off). Below this, a text box states: 'This provider can be used to send events to Storage A.D.E. Enterprise (aka Diagnostic Expert)'. The main section, titled 'Enterprise Agent', contains an 'Active' checkbox which is unchecked and labeled 'Inactive' in red, an 'SAE IP Address:' text field, and a 'Heartbeat:' field with a spinner set to '1' and the unit 'Minutes'. An 'Update' button is located at the bottom right.

FIGURE 3-19 SAE Provider window

## SRS Provider

The Storage Automated Diagnostic Environment pulls the storage device events and channels them through a sender, which sends the event data, written in XML, to the SRS station.

The SRS Notification Provider is a frame relay mechanism for transporting reliability, availability, and serviceability (RAS) information collected by the monitoring agent. All available instrumentation, events, and topology information is sent to the Network Storage Command Center (NSCC). This information is used to improve products and service and is monitored by Sun Service personnel.

The screenshot shows a web-based configuration window titled "Remote Notification Providers" with a "[ Help ]" link in the top right corner. Below the title is a horizontal menu bar with several tabs: "DataHost (Off)", "Email (Off)", "NetConnect (Off)", "SAE (Off)", "SRS (Off)", "SSRR (Off)", "SunMC (Off)", and "Trap (Off)". The "SRS (Off)" tab is currently selected. Below the menu bar is a text area containing the following instructions: "Enter the IP address of the SRS Station and check 'Active' to turn on the SRS Notification Provider. Only actionable events related to storage devices are sent to SRS: this includes hba, switch and storage events." Below this text area is a section titled "SRS Provider Information" with a blue header. This section contains three rows of configuration options: "Active:" with a checkbox and the text "Inactive" in red, "IP Address:" with a text input field, and "Heartbeat Frequency (hours):" with a spin button. At the bottom right of the "SRS Provider Information" section is an "Update" button.

FIGURE 3-20 SRS Provider window

## SSRR Provider

The Sun StorEdge Remote Response Provider uses modem technology with UNIX-to-UNIX Communication Protocol (UUCP). SSRR software is required on the customer data host. The SSRR Provider is intended for customers who have purchased a remote support service offering and have supplied phone lines to enable the modem phone home capability. The Storage Automated Diagnostic Environment, which records events, resides on the Storage Service Processor.

All available instrumentation, events, and topology information is sent to the Network Storage Command Center (NSCC). This information is used to improve products and service and is monitored by Sun Service personnel.

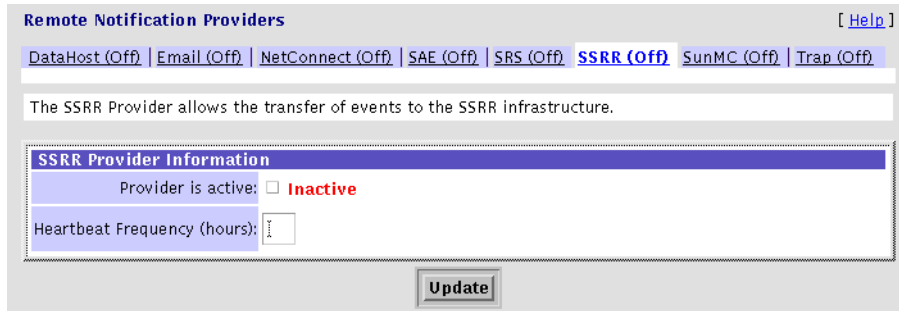


FIGURE 3-21 SSRR Provider window

After the Storage Automated Diagnostic Environment identifies the event:

1. **The Storage Automated Diagnostic Environment logs the event and alerts Sun engineers by email or pager, if the data falls outside of pre-defined tolerances.**
2. **The Sun engineer, located behind a firewall, accesses the SSRR server and runs a script.**

The script initiates a call to the customer's modem and supplies logins and passwords to the client Network Terminal Concentrator (NTC) and the Storage Service Processor.

3. **The script negotiates a secure point-to-point protocol (PPP) connection between the customer's Storage Service Processor and the SSRR Server and automatically logs the Sun engineer on to the customer's Storage Service Processor.**
4. **The Sun engineer can then access SAN components to remotely diagnose and perform a number of maintenance routines.**

---

**Note** – If the Storage Automated Diagnostic Environment is run either manually or from the `cron`, and the SSRR Provider is selected, but the SSRR software is not installed or is not configured properly, the following error message appears:  
\*\*\*ERR: Cannot find Machine name in Permissions file.

---

## SunMC Provider

The SunMC Provider enables the Storage Automated Diagnostic Environment to send actionable events and monitoring topologies to the SunMC Console, which displays the alarms and alert text. SunMC information is similar and compatible with Sun Remote Services (SRS). SunMC can send information to SRS, in which case the SRS Provider need not be activated in the Storage Automated Diagnostic Environment.

**Remote Notification Providers** [ Help ]

DataHost (Off) | Email (Off) | NetConnect (Off) | SAE (Off) | SRS (Off) | SSRR (Off) | **SunMC (Off)** | Trap (Off)

Enter the IP Address (default is local) of the SunMC agent and activate this provider to send events to SunMC.

A local SunMC agent should be installed on the same server as the StorADE master for best results. The **SUNWesraa** package (/opt/SUNWstade/System/SunMC/SUNWesraa.tar.gz) must be installed on your SunMC agent station with the 'rasagent' module loaded for this provider to work. Each SunMC agent can handle one StorADE master. The SunMC console will do the aggregations if your site has multiple StorADE masters. The **SUNWesras** package (/opt/SUNWstade/System/SunMC/SUNWesras.tar.gz) can also be used to perform "Group Operations" in SunMC.

**SunMC Provider Information**

Active: ☐ **Inactive**

IP Address:

Heartbeat Frequency (hours):

**Update**

FIGURE 3-22 SunMC Provider window

## To Activate and Use the SunMC Provider

1. Download and install the SunMC agent on the selected host. See “To Install and Activate the SUNesras Packages” on page 8 for more information.
2. In the *IP Address* field (shown in the “SunMC Provider” on page 65), enter the IP address or name of the host where the SunMC agent is installed and click Update.
3. Discover the monitored devices. See “Discovering Devices” on page 42 for instructions.

Once activated, the SunMC module receives information about monitored devices and displays alarms in the SunMC console.

**Caution** – If two masters point to the same SunMC Provider console, the Storage Automated Diagnostic Environment cannot access events in the SunMC console.

Therefore each Storage Automated Diagnostic Environment master must point to its own SunMC console, preferably the SunMC console on the host where the master is installed.

The SunMC Console window is shown in FIGURE 3-23.

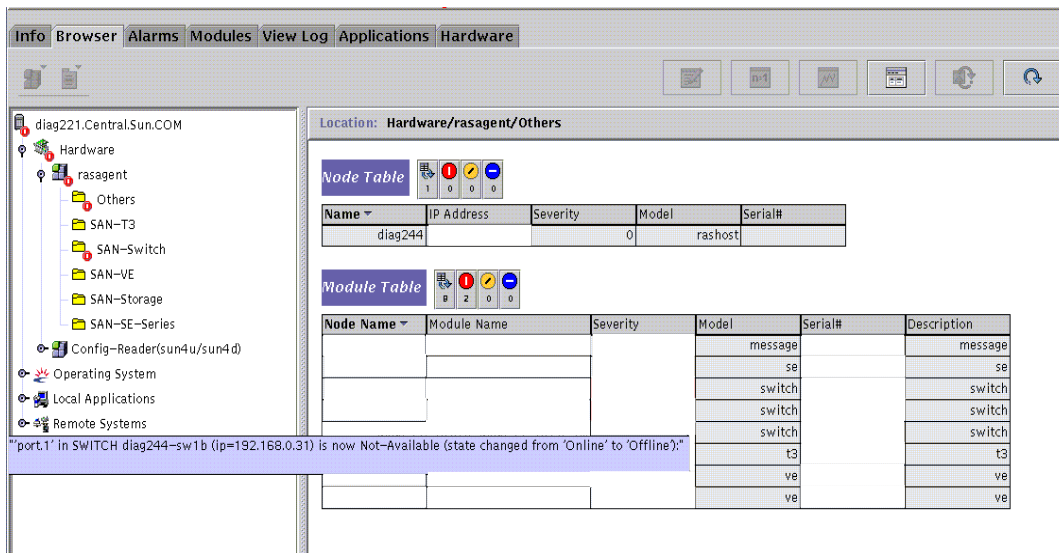


FIGURE 3-23 SunMC Console window

All available instrumentation, events, and topology information is sent to the Network Storage Command Center (NSCC). This information is used to improve products and service and is monitored by Sun Service personnel.

## SNMP Traps

The SNMP Traps Provider enables the Storage Automated Diagnostic Environment to send traps, for all actionable events that occur during monitoring, to external management systems.

The screenshot shows a window titled "Remote Notification Providers" with a tabbed interface. The "Trap (Off)" tab is selected. Below the tabs, there is a text area with instructions: "Activate this notification provider to send traps to external Management Systems. A maximum of 5 different IP can be entered along with a port# and a minimum alert level. Select [Warning] to send all alerts, select [Error] to only send errors, and worse. Only actionable events are sent." Below this is a section titled "SNMP Trap Provider Information" containing a table with 5 rows. Each row has columns for "#", "IP Name/Address", "Port", and "Min Alert Level". The "Active:" checkbox is unchecked, and the "Update" button is at the bottom.

#	IP Name/Address	Port	Min Alert Level
1	<input type="text"/>	<input type="text" value="162"/>	Warning <input type="checkbox"/>
2	<input type="text"/>	<input type="text" value="162"/>	Warning <input type="checkbox"/>
3	<input type="text"/>	<input type="text" value="162"/>	Warning <input type="checkbox"/>
4	<input type="text"/>	<input type="text" value="162"/>	Warning <input type="checkbox"/>
5	<input type="text"/>	<input type="text" value="162"/>	Warning <input type="checkbox"/>

FIGURE 3-24 SNMP Traps Provider window

When an alert occurs, it is sent to the SNMP transport as an SNMP trap. An SNMP trap listener can use the `StorAgent.mib` SNMP MIB file, which is included in the `SUNWstade` package to decode these alerts.

The alerts contain the following information:

- Storage Automated Diagnostic Environment agent location
- Storage Automated Diagnostic Environment device to which alert pertains
- Alert level
- Message content

---

**Note** – SNMP-capable management application software is required for the SNMP Provider

---

# Start and Stop Agents

You can control agent activity to temporarily stop the Storage Automated Diagnostic Environment from running on a selected host. You can also avoid creating email notifications on false errors when a device is being tested and faults are injected intentionally.

---

**Note** – By default, the master Monitoring function does not automatically default to *On*. You must manually enable Monitoring to *On*.

---

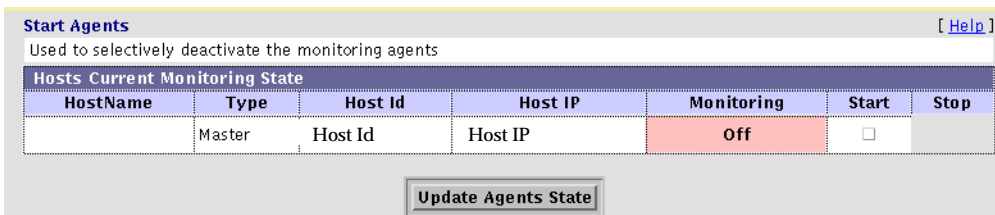
The subsections associated with controlling agent activity are as follows:

- “To Display the Start Agents Window” on page 68
- “To Disable a Specific Agent” on page 69
- “To Disable the `cron` Using the GUI” on page 70
- “To Disable the `cron` Using the CLI” on page 70
- “To Activate Monitoring on a Device-by-Device Basis” on page 71

## ▼ To Display the Start Agents Window

1. Click the **Admin** link in the Storage Automated Diagnostic Environment main window.
2. Click the **Start Agents** link on the General Maintenance menu.

The Start Agents window is displayed.



**FIGURE 3-25** Start Agents window

---

**Note** – To control email notifications for specific devices, See “To Activate Monitoring on a Device-by-Device Basis” on page 71.

---

There are several ways to stop the Storage Automated Diagnostic Environment monitoring agents from probing a storage array.

## ▼ To Disable a Specific Agent

When you disable a specific agent, you stop that agent but other devices continue to be monitored.

1. **From the Maintain Hosts window, click an existing Host Name link and update the fields as required. See “Maintaining Hosts” on page 33 for more information.**

FIGURE 3-26 lists *all* devices currently supported by the Storage Automated Diagnostic Environment.

---

**Note** – The devices listed in *Categories to Monitor* depend on your system configuration.

---

**Update Host** [ Help ]

Update Host agent information

**Enter Local Agent Information**

Host Name:

Categories to Monitor: [Abbreviations](#)

Monitoring Frequency: 5 Minutes

Monitor InBand DataPath?: ☐

Show only monitored devices in topology graph: ☐

**Enter Default Logfiles:**

Message Log: /var/adm/messages

Storage Array Message Log:

**Categories to Monitor:**

<input type="checkbox"/> :Sun 3310	<input type="checkbox"/> :Sun A5000	<input type="checkbox"/> :Internal FC Disks	<input type="checkbox"/> :Sun 2GB Switch	<input type="checkbox"/> :Sun VE
<input type="checkbox"/> :Sun 3510	<input type="checkbox"/> :Brocade Silkworm	<input type="checkbox"/> :McDATA	<input type="checkbox"/> :Sun Switch	
<input checked="" type="checkbox"/> :Sun 6120	<input type="checkbox"/> :Sun D2	<input checked="" type="checkbox"/> :FC-Counters	<input checked="" type="checkbox"/> :Sun T3	
<input type="checkbox"/> :Sun 9900	<input checked="" type="checkbox"/> :Data Host	<input checked="" type="checkbox"/> :Sun 6320	<input type="checkbox"/> :FC-Tape	
<input type="checkbox"/> :Sun A3500FC	<input checked="" type="checkbox"/> :Host	<input type="checkbox"/> :Sun 3900/6900	<input type="checkbox"/> :Sun V880 Disk	

**Submit** **Back**

**FIGURE 3-26** Stop a Specific Agent

2. **Deselect the device in Categories to Monitor.**  
By default, all devices are selected.
3. **Click Update.**

The most efficient way to stop the software from monitoring entirely is to stop the `cron` from executing. You can stop the `cron` from executing using the GUI or the CLI.

▼ To Disable the `cron` Using the GUI

- 1. Click the **Admin** link in the **Storage Automated Diagnostic Environment** main window.
- 2. Click the **Start Agents** link on the **General Maintenance** menu.

The Start Agents window is displayed.

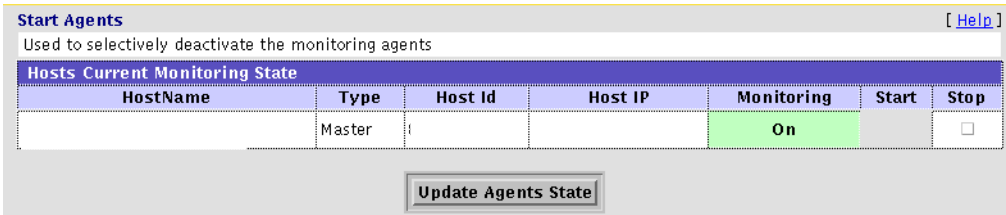


FIGURE 3-27 Start Agents window

- 3. Enable the host’s corresponding **Stop** check box.
- 4. Click **Update Agents State**.

▼ To Disable the `cron` Using the CLI

- 1. Execute `ras_install`.  
See “Running the `ras_install` Script” on page 17 for more information.
- 2. Select **P** to postpone the execution of `rasagent` from the `cron`.

This removes the `cron` entry that starts the agent every five minutes.

**Note** – This step does not immediately stop any existing agent execution of the. To ensure all activity has ended, use the `ps` command . For example:

```
# ps -ef | grep ras
```

## ▼ To Activate Monitoring on a Device-by-Device Basis

To access the Start Devices Monitoring window:

1. Click the **Admin** link on the **Storage Automated Diagnostic Environment** main window.
2. Click the **Start Devices** link from the **General Maintenance** menu.

The Start Devices window is displayed.

Start/Stop Device Monitoring						
Primary Host	Name	Type	Address/WWN	Monitoring device /device category	Start	Stop

FIGURE 3-28 Start/Stop Devices window

3. To start or stop devices, check the appropriate checkbox.
  - When Monitoring is *on*, the “Stop” checkbox is available.
  - When Monitoring is *off*, the “Start” checkbox is available.
4. Click **Submit Changes**.

The Storage Automated Diagnostic Environment must update the configuration files on all the slave hosts configured with this master. To accomplish this, use the Push Configs function on the Admin menu.

5. If the device is being tested or if faults are being injected into the device intentionally, you can temporarily stop the local notifications for a specific device by using the Start/Stop Device Monitoring window.

---

**Note** – Monitoring continues when the device is deactivated (turned off). However, email notifications will not occur for any faults that are detected while the device monitoring is in this state. Consequently, any errors that may have been detected will be logged and sent by means of the NetConnect or HTTP Providers, but not by means of email notification.

---

# Admin Groups

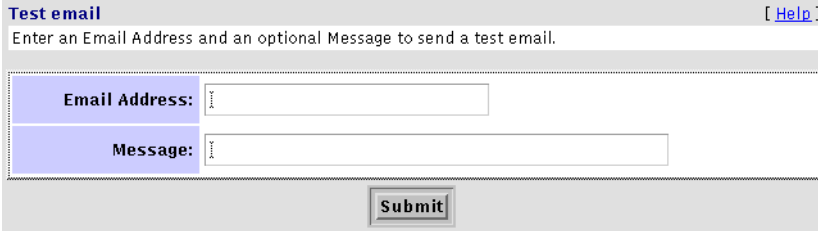
## Send Test Email

Use the Test Email window to send test emails and a message, and to verify that the mailing capability of the Storage Automated Diagnostic Environment is installed and working properly.

### ▼ To Access the Test Email Window

1. Click the **Admin** link in the Storage Automated Diagnostic Environment main window.
2. Click **General Maintenance**.
3. Click the **Test Email** link from the General Maintenance menu.

The Test Email window is displayed.



**Test email** [ [Help](#) ]

Enter an Email Address and an optional Message to send a test email.

**Email Address:**

**Message:**

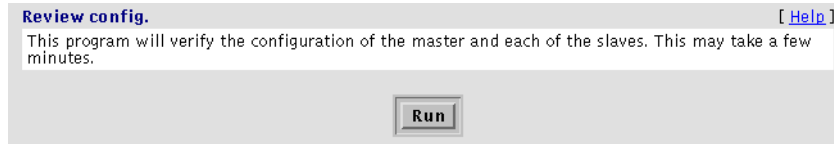
**Submit**

4. Type your email address into the **Email Address** textbox.
5. Type a brief comment into the **Message** textbox.

If you leave the Message text box blank, the test email contains a default message with the words *Test Message* in the subject line. If you place a carriage return in the Message field, you cannot enter text. To restart, click in the Message textbox and enter text.

# Review the Configuration

1. Once you have completed your configuration and you want to verify all settings, select the **Review Configuration** link on the **General Maintenance** menu.
2. If necessary, follow the displayed instructions for settings that you might have missed or for those that you need to double-check.



**FIGURE 3-29** Review Configuration window

# Configuration Options

The Configuration Options window enables you to change the defaults on selected configuration options. Use the information in TABLE 3-11 to update existing configuration option

**Config Options : [Window Options](#)** [\[ Help \]](#)

**Enter Configuration Options**

Number of old (historical) topologies to save for comparison :	<input type="text" value="5"/>
Test Manager Refresh rate:	<input type="text" value="30"/> ( minimum is 5 secs. )
Max LogFile Size:	<input type="text" value="2"/> (Meg)
GUI Bandwidth:	<input type="text" value="High Bandwidth"/>
Create Hubs when appropriate:	<input type="checkbox"/>
Is this a production Site?:	<input checked="" type="checkbox"/> Is this site used for production or just for testing and development?

**Enter email options**

Sendmail from this Host/IP:	<input type="text"/>	(optional)
Email from:	<input type="text"/>	(Optional)
Maximum number of emails about the same component in the same 8 hours period:	<input type="text" value="6"/>	Emails per time period
Path to Email Program:	<input type="text" value="/usr/bin/mail"/>	

**Update Options**

**Window Options : [Config Options](#)**

**Update Window**

Select Big screen if your monitor is 1280x1024 and you want to display up to 3 frames across on the browser. Select Small screen for 1024x864 monitors and want only 2 frames. Select 'No Frames' if you don't want the application to use frames.

Select Browser Window:	<input type="text" value="Big Screen"/>
Color Scheme:	<input type="text" value="Old Sun Colors"/>

**Update Window**

FIGURE 3-30 Configuration Options

**TABLE 3-11** Config Options

Option	Description
<b><i>Configuration Options</i></b>	
Number of old (historical) topologies to save	Type the number of topologies to save in Topology History for comparison. The default is 5.
Test Manager Refresh Rate	Specify the window refresh (re-load) rate for test output. The default is 30 seconds, and the minimum refresh rate is 5 seconds.
Max Event File Size	Specify, in megabytes, the maximum event file size. Used to limit data packet size to notification providers. The default is 2.
GUI Bandwidth	Specify the bandwidth for low and high speed local area network (LAN). The default is High Bandwidth.
Create Hubs when appropriate	Enable this checkbox if you want Hubs to be drawn in the Topology.
Is this a production site?	Specify Yes (the default if checked) or No (unchecked).
<b><i>Email Options</i></b>	
Send mail from this Host/IP (optional)	
Email From (optional)	Type the From email address.
Maximum number of emails about the same component in the same 8-hour period	Specify the maximum number of messages that will be sent within an 8-hour period about a specific event. The default is no maximum. Options include 2, 4, 6, or 8. You can also clear the specified maximum number of messages using “Customizing Email Deliveries” on page 54.
Path to Email Program	Use to change the local email program path.

TABLE 3-11 Config Options

Option	Description
<b>Window Options</b>	
Select Browser Window	<p>Use to configure the default GUI screen size.</p> <ul style="list-style-type: none"><li>• Big Screen—displays three frames: the left frame window, the top window (with tracking links), and the main topic window.</li><li>• Small Screen—displays three frames, as with the Big Screen selection, but the frames are smaller.</li><li>• No Frames—displays the top window (with tracking links) and the main topic window only.</li><li>• No Frames + Accessible—displays the top window (with tracking links) and the main topic window, as with No Frames, but enables the user to use keystroke combinations to perform tasks instead of using the mouse.</li></ul> <p><b>NOTE:</b></p> <p>The browser does not support Topology if the No Frames + Accessible option is selected.</p> <p>If you want to use the Topology functionality, select Big Screen, Small Screen, or No Frames.</p>
Color Scheme	Use to configure the default GUI screen color.

# Fault Signature Analysis

The Fault Signature Analysis (FSA) option enables the aggregation of alerts that share common suspect FRUs. With FSA enabled, a one-probing cycle delay makes sure that all slaves have reported their events to the master agent.

## ▼ To Aggregate Events

Select the appropriate check box based on the information shown in the following table.

The screenshot shows a window titled "Optimization & FSA" with a "[ Help ]" link in the top right corner. The window is divided into two main sections. The first section, "Fault Signature Analysis", has a description: "This module creates new aggregated events by grouping together events that share common 'suspect frus'. With FSA on, a one-probing-cycle delay is introduced to make sure that all slaves have reported their events to the master agent. When turned on, this module will delay the generating of events by one 'run' of the agent. This is done to ensure that all events have been generated before starting the correlation." Below this is a checkbox labeled "Turn on Fault Signature Analysis?" which is currently unchecked. The second section, "Sun T3/6120 Monitoring Optimization", has a description: "This options allows to minimize the probing of t3/6120 that appear to be healthy by relying on the message.t3 logfile and on 'ping'. Arrays will still be probed at least every 6 hours even when they appear healthy. If 'ping' fails or if there are new entries in the messages.t3 logfile, normal probing will immediately resume. This function should only be used when monitoring a large amount of arrays from the same agent (> 50). \*\*\*WARNING\*\*\* This function relies heavily of the messages.t3 logfile. Verify that all array's remote-logging is configured properly before turning this option on." Below this is a checkbox labeled "Turn on T3/6120 Optimization:" which is also unchecked. At the bottom center of the window is a button labeled "Update Options".

**FIGURE 3-31** Optimization/Fault Signature Analysis window

**Note** – Fault Signature Analysis requires two agent intervals to run. For example, if the agent is set to run every five minutes, 10 minutes are needed for the first analysis.

**TABLE 3-12** Fault Signature Analysis Options

FSA Feature	Description
Optimization/FSA	The FSA module collects the events and summarizes them into fewer and more specific, actionable events. The collection of events often points to a root cause of a problem, whereas single events are merely symptoms of the problem.
Sun StorEdge T3, T3+, and 6120 array Monitoring Optimization	Enable this option to minimize probing of Sun StorEdge T3, T3+, and 6120 arrays that appear to be healthy. The Storage Automated Diagnostic Environment determines the health of the arrays by pinging them and by referring to the output in the mirrored syslog file.

---

# Topology Maintenance

The Storage Automated Diagnostic Environment's graphical storage area network (SAN) interface displays all fabric components and the state of those components. Fabric components include HBAs, switch ports, storage controllers, and disks, along with more specialized components such as fans, batteries, power, and volumes.

---

**Note** – Only HBAs connected to storage devices are displayed in Topology.

---

SAN agents collect counter information based on error messages and telemetry information. This information is then used in the topology drawing to indicate link failures.

This section includes the following SAN maintenance functions that you can perform using the Storage Automated Diagnostic Environment:

- “To Access the General Maintenance Window” on page 27
- “To Create a Topology Snapshot” on page 79
- “To Merge Topologies” on page 81
- “To Display Topology History” on page 82
- “Grouping” on page 83

## ▼ To Display the Topology Window

1. Click the Admin link in the Storage Automated Diagnostic Environment main window.

Administration is divided into three sections: General Maintenance, Topology Maintenance, and System Utilities.

2. Click Topology Maintenance.

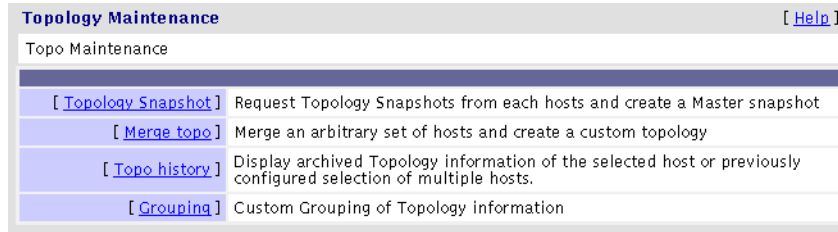


FIGURE 3-32 Topology Maintenance window

---

**Note** – In order to view a topology and create a snapshot, you must first execute the `ras_install` command and create a snapshot to start the Storage Automated Diagnostic Environment services.

---

## ▼ To Create a Topology Snapshot

Use this function to create and update the topology view from the host or to review error details. Once the individual host topologies are updated, the merged topology views are also updated.

---

**Note** – This function requires Solaris 8 4/01 or newer. If using Solaris 8 4/01, the host must have the `SUNWsan` package installed, along with the latest 111413-xx `luxadm` patch.

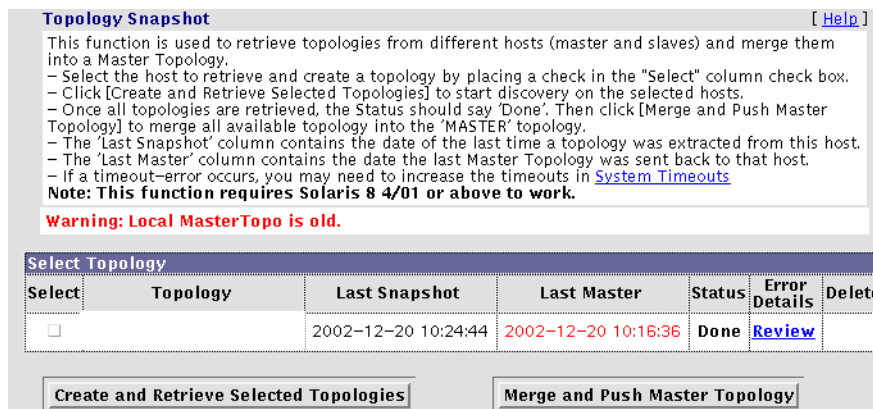
To view topologies in the Monitoring and Diagnostic windows, you must first create a snapshot.

---

Before you create a Topology snapshot, make sure there are no failed over paths. If there are failed over paths, the Topology view will not properly display them.

**1. From the Topology Maintenance window, select Topology Snapshot.**

The Topology Snapshot window is displayed.



**FIGURE 3-33** Create Topology Snapshot window

**2. To retrieve the selected master or slave topology, select the checkbox that corresponds to the topology and click Create and Retrieve Selected Topologies.**

While the system creates the selected topology, the status will be in one of two states:

- **Running**—discovery is running on the selected host and the system creates and retrieves the selected topology.
- **Done**—the topology has been created and is ready for you to retrieve.
  - Click the Review link to review the error details, if applicable.
  - Click the Clear link in the Delete column to clear a selected topology.

**3. Once the individual host snapshots have been retrieved, click Merge and Push Master Topology to synchronize the master and slaves.**

**If a timeout occurs during this process, you may need to increase the timeout specifications using the System Timeout functionality, found in "To Change System Timeout Settings" on page 87.**

**4. Once the topology has been created, verify the Topology view.**

## ▼ To Merge Topologies

A master configuration topology includes the master and all slaves and is automatically generated. You can, however, merge or delete selected topologies if you would like to create a topology that is something *less* than the master and all slaves. By merging topologies, multiple-host topology drawings are combined into a single topology drawing.

1. **From the Topology Maintenance window, select Merge Topologies.**

The SAN Merge Topologies window is displayed.

2. **Select two or more topologies from the Available Topologies section, and select the corresponding Select check box.**
3. **Type a unique name for the merged topology, and click Create.**

Combined topologies			
Delete	SanName	Created	Components
<input type="checkbox"/>	MASTER	2002-12-20 10:16:37	

Delete Selected

Available Topologies		
Select	HostName	Created
<input type="checkbox"/>		2002-12-20 10:24:44

Select Agents and enter a name for this new topology:  Create

FIGURE 3-34 Merge Topology Snapshot window

## ▼ To Delete a Merged Topology

- **Select the topology from the Combined topologies section, and click Delete Selected.**

---

**Note** – If you want to delete a merged topology, use the SAN Merge Topologies functionality, not the Snapshot History functionality.

---

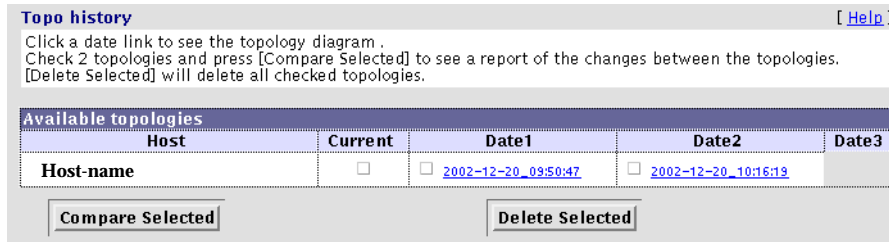
## ▼ To Update a Topology

The only way to update a topology is to create a new topology snapshot, which overwrites the old snapshot. Merged topologies automatically incorporate new snapshots.

## ▼ To Display Topology History

With this function, you can compare and delete current Topology snapshots, or you can view, compare or delete previously stored Topology snapshots.

1. From the Topology Maintenance window, select Topology History.



The screenshot shows a window titled "Topo history" with a [ Help ] link. Below the title bar, there is instructional text: "Click a date link to see the topology diagram .", "Check 2 topologies and press [Compare Selected] to see a report of the changes between the topologies.", and "[Delete Selected] will delete all checked topologies." Below this text is a table titled "Available topologies". The table has five columns: "Host", "Current", "Date1", "Date2", and "Date3". The "Host" column contains the text "Host-name". The "Current" column contains an unchecked checkbox. The "Date1" column contains a date link "2002-12-20\_09:50:47". The "Date2" column contains a date link "2002-12-20\_10:16:19". The "Date3" column is empty. Below the table are two buttons: "Compare Selected" and "Delete Selected".

Host	Current	Date1	Date2	Date3
Host-name	<input type="checkbox"/>	<a href="#">2002-12-20_09:50:47</a>	<a href="#">2002-12-20_10:16:19</a>	

FIGURE 3-35 Display Topology History

2. To see a summary of the changes between two topologies, select two hosts and enable the corresponding Current checkbox, then click Compare Selected. The host must have at least two topologies to use the Compare Selected feature.
3. To delete a topology, select one or more topologies and enable the corresponding checkbox, then click Delete Selected.
4. To view a previously stored Topology snapshot, double click the date link from the Date1, Date2, or Date3 columns. The oldest snapshot is displayed first.
5. To compare or delete previously stored Topology snapshots, click the corresponding checkbox on the Date1, Date2, or Date3 columns.
  - a. To compare two or more previously stored snapshots, click Compare Selected.
  - b. To delete one or more previously stored snapshots, click Delete Selected.

# Grouping

The Storage Automated Diagnostic Environment Topology Grouping function enables you to display multilevel topologies and to aggregate a large number of devices in a single view.

This section discusses the following functions that are associated with Topology grouping:

- “To Create and Maintain Groups” on page 83
- “To Add Devices to a Topology Group” on page 85

## ▼ To Create and Maintain Groups

1. From the Topology Maintenance window, select Grouping.
2. In the Grouping window, create a group name.

To create a new group name, you must specify a host name or merged topology name, a group code, and a description.

The code and group name (description) can be arbitrary, but you should choose a name that adequately defines the group. An example of this might be Code name of Building 1 and a Group Description of Campus1.

**Grouping** [ [Help](#) ]

This section allows the user to create multi-level grouping which can be shown in the monitoring and diagnostic topology (graph) views. An example of grouping would be to create a campus group which contains several lab groups. Each lab group can then contain several rack groups which consist of the individual devices. After a grouping category is created, select the group category and assign different group-id names to the devices. For example, under a lab grouping, some devices can have the lab-id 'lab1' and others may have a lab-id of 'lab2'.

Host	Group Code	Description	Delete
No Grouping Category found!			

**New Grouping Category**

Host:  Code:  Description:

FIGURE 3-36 Topology Grouping window

3. Click Add Category to add the group name.

#### 4. Click the Merge Master link to create the new group.

The Group Detail window is displayed, showing a list of all the devices contained in the host or merged topology you chose.

**Storage Automated Diagnostic Environment** [Home](#) [Help](#) [Logout](#)

**Admin.** **Monitor** **Diagnose** **Manage** **Report**

**General Maintenance** | **Topology Maint.** | **System Utilities**

**Topology Maint.**

- Topo. Snapshot
- Merge Topologies
- Topology History
- **Grouping**

**Grouping** [\[ Help \]](#) [ROOT](#)

This section allows the user to create multi-level grouping which can be shown in the monitoring and diagnostic topology (graph) views. An example of grouping would be to create a campus group which contains several lab groups. Each lab group can then contain several rack groups which consist of the individual devices. After a grouping category is created, select the group category and assign different group-id names to the devices. For example, under a lab grouping, some devices can have the lab-id 'lab1' and others may have a lab-id of 'lab2'.

**Maintain** [MERGE-MASTER:building5](#)

Category 'MERGE-MASTER:building5' Type: **\*All** [Go](#) [\[ Details | Summary \]](#)

+ Type	ID	Name	building5-id	Select
a5k	5xxxxxxxxxxxxxx			<input type="checkbox"/>
	5xxxxxxxxxxxxxx			<input type="checkbox"/>
	5xxxxxxxxxxxxxx			<input type="checkbox"/>
host	<host-1>	<hostname-1>		<input type="checkbox"/>
	<host-2>	<hostname-2>		<input type="checkbox"/>
internal	<internal host-1>	<internal hostname>		<input type="checkbox"/>

Page: 1 of 1

building5-id:  [Update](#)

FIGURE 3-37 Topology Group Detail window

## ▼ To Add Devices to a Topology Group

1. From the Group Detail window, select the device's corresponding check box.
2. In the group's corresponding text box, type an identifier.

The Group ID enables multiple instances of similar objects. An example of this is rack1, rack2, rack3, and so on.

You can also create subgroups by using the dot ('.') notation in the ID field. By using names such as lab1.rack1 and lab1.rack2, you create a lab1 group that contains two separate rack groups. The dot notation enables multilevel grouping.

3. Click the Summary link, located in the upper-right corner of the Group Detail window to access the Group Summary window.
  - a. This menu enables you to select the color and type of group icon that you want displayed.
  - b. From this window, you can also add a description, which will appear next to the icon in the topology view.

Storage Automated Diagnostic Environment [Home](#) [Help](#) [Logout](#)

[Admin.](#) [Monitor](#) [Diagnose](#) [Manage](#) [Report](#)

[General Maintenance](#) | [Topology Maint.](#) | [System Utilities](#)

**Topology Maint.**

- [Topo. Snapshot](#)
- [Merge Topologies](#)
- [Topology History](#)
- [Grouping](#)

**Grouping** [\[ Help \]](#) [ROOT](#)

This section allows the user to create multi-level grouping which can be shown in the monitoring and diagnostic topology (graph) views. An example of grouping would be to create a campus group which contains several lab groups. Each lab group can then contain several rack groups which consist of the individual devices. After a grouping category is created, select the group category and assign different group-id names to the devices. For example, under a lab grouping, some devices can have the lab-id 'lab1' and others may have a lab-id of 'lab2'.

**Maintain** [MERGE-MASTER:building5](#)

**Maintain CategoryID for 'MERGE-MASTER:building5'** [\[ Details \]](#) [Summary \]](#)

CategoryID	#Members	Description	Style	Color
	1	<input type="text" value="I"/>	standard=default <input type="checkbox"/>	Ipurple <input type="checkbox"/>

[UpdateIDs](#)

FIGURE 3-38 Group Summary window

## ▼ To Delete a Component From a Group

- Clear the Description field of the component you want to delete, and click UpdateIDs.

---

# System Utilities

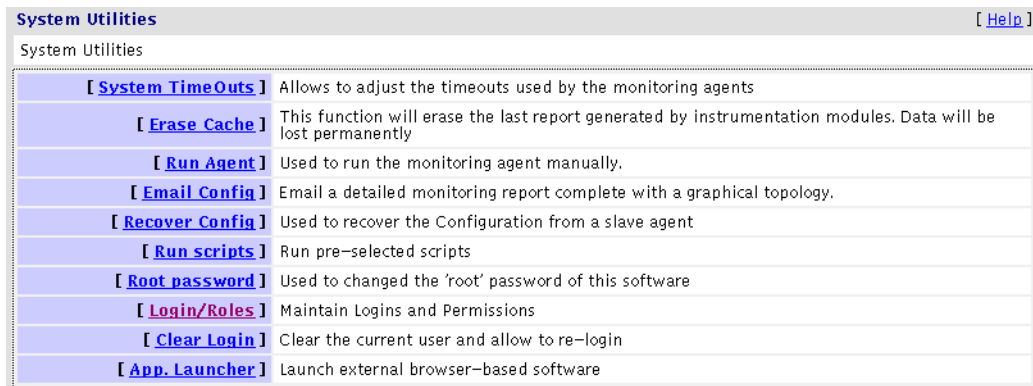
The Utilities section contains optional tools you can use for Storage Automated Diagnostic Environment administration.

The sections that follow explain how to perform the administrative tasks.

- “System Timeouts” on page 87
- “Erase Cache” on page 89
- “Run Agent” on page 90
- “Email Configuration” on page 91
- “Recover Configuration” on page 92
- “Run Scripts” on page 93
- “Password Maintenance” on page 95
- “User Roles” on page 96
- “To Clear the Login Window” on page 98
- “To Use the Application Launcher” on page 98

## ▼ To Display the System Utilities Window

1. Click the **Admin** link in the **Storage Automated Diagnostic Environment** main window.
2. Click the **System Utilities** link.



**FIGURE 3-39** System Utilities window

# System Timeouts

System timeouts are the values the Storage Automated Diagnostic Environment agent uses to ensure that it does not spend too much time waiting on a response for commands to return.

## ▼ To Change System Timeout Settings

- 1. Click **System TimeOuts** in the **System Utilities** window.

System TimeOuts

Allows to adjust the timeouts used by the monitoring agents

System Time-outs (Seconds)		
Ping :	<input type="text" value="10"/>	Second(s)
Email :	<input type="text" value="30"/>	Second(s)
Sun T3 tokens (Http) :	<input type="text" value="60"/>	Second(s)
SNMP access :	<input type="text" value="20"/>	Second(s)
Luxadm (Sun A5000) :	<input type="text" value="600"/>	Second(s)
RM6 (Sun A3500FC) :	<input type="text" value="200"/>	Second(s)
Discman (Discovery) :	<input type="text" value="1200"/>	Second(s)
Slicd (VE) :	<input type="text" value="180"/>	Second(s)

Submit

Defaults

FIGURE 3-40 System TimeOuts window

- 2. Change the default settings for scheduled time-outs and click **Submit**.  
See TABLE 3-13 for definitions of timeout settings.
- 3. To return to the default settings, click **Defaults**.

**TABLE 3-13** Timeout Settings

Setting	Definition
Ping	The timeout used to perform a ping. The default is 10 seconds.
Email	The timeout used when email messages. The default is 30 seconds.
Sun T3 tokens (Http)	The timeout used when extracting token information from a Sun StorEdge T3 or T3+ array. The default is 60 seconds.
SNMP access	The timeout used to query switches that support simple network management protocol (SNMP). The default is 20 seconds.
	For more information on SNMP, see “SNMP Traps” on page 67.
luxadm (Sun A5000)	The timeout used to query the Sun StorEdge A5000 array device that are using luxadm(1M). The default is 600 seconds (10 minutes).
	For more information, refer to the luxadm(1M) man page.
RM6 (Sun A3500FC)	The timeout used to query the Sun StorEdge A3500FC array device that are using the rm6 library. The default is 200 seconds (3.33 minutes).
	<b>Note:</b> To find the device name for the Sun StorEdge A3500FC array, use the RM6 command <code>drvutil -l devName</code> , where <i>devName</i> is from the <code>/usr/lib/osa/bin/lad</code> command.
Discman (Discovery)	The timeout used to discover HBAs and storage devices in topology that are using discman(1M). The default is 1200 seconds (20 minutes).
	For more information, refer to the discman(1M) man page.
slicd (VE)	The timeout used to query the virtualization engines that are using the slicd daemon and libraries. The default is 180 seconds (3 minutes).
	For more information, See the <i>Sun StorEdge™ 3900 and 6900 Series Version 1.1 Reference and Service Guide</i> .

# Erase Cache

When you select an existing device, the last report in the cache for that device is erased. This forces the Storage Automated Diagnostic Environment agent to regenerate discovery events.

Erase Cache

[\[ Help \]](#)

Use this section to erase the last report generated by instrumentation for a particular device and/or function. Doing this forces rediscovery of the device's instrumentation upon the next execution, since it will have no old report to compare to. The device will still be monitored.  
[Delete All Reports] deletes the last report generated by instrumentation for **ALL** listed Devices.  
[Delete Complete Database] remove most files in the DATA directory. Running rasagent after this will be like the first run after pkgadd. This function will not erase the config file.

**NOTE:** There is **NO WARNING** and **NO VERIFICATION** for these actions.

Select Host:

Local ☐

Display Files

Devices:

Type	Device ID (Click to erase)	Name	Delete
3310			<input type="checkbox"/>
3310message			<input type="checkbox"/>
backup			<input type="checkbox"/>
topo			<input type="checkbox"/>

Delete Selected

Delete All Reports

Delete Complete Database

FIGURE 3-41 Erase Cache window

## ▼ To Erase a Device's Cache



**Caution** – There are no safeguard messages for this function. Once you have selected a device, the instrumentation report for that device is immediately erased.

The Erase Device Cache function erases the cache of all the selected devices and the list is removed. Although the device's cache is erased, however, the device will continue to be monitored.

1. **Select a host from the Select host pull-down menu and click Display Files.**  
A list of devices for the selected host is displayed.
2. **Click the device's corresponding Delete checkbox to erase the device's cache.**  
The device is removed from the list.

# Run Agent

Although the Storage Automated Diagnostic Environment is normally run from the cron facility, the Run Agent function enables you to run the Storage Automated Diagnostic Environment manually.

## ▼ To Run the Agent Manually

**Run Agent** [ Help ]

This option will run the agent program immediately unless it is already running. The agent is normally executed from the cron facility but this option allows you to run it manually. Select 'Audit all devices' to force the agent to do a version probe on all devices. On some devices such as a Sun StorEdge A5000, version information is only extracted once a week to save time. This option will also reset the email maximums.

Select Host:	Local <input type="checkbox"/>
Audit all devices:	<input type="checkbox"/>
Ignore Email Maximums (send all events):	<input checked="" type="checkbox"/>

**RUN**

FIGURE 3-42 Run Agent Manually window

1. Select a host from the Select Host pull-down menu.

---

**Note** – Select and run the slaves first. The master should be manually run last.

---

2. In the section “Configuration Options” on page 74, you can specify the maximum number of emails that will be sent within an 8-hour period about a specific event. The default is no maximum.

If you check *Ignore Email Maximums*, the system overrides current specifications and sends all events. You can also clear the specified maximum number of emails using “Customizing Email Deliveries” on page 54.

3. On some devices, such as the Sun StorEdge A5000 device, the Storage Automated Diagnostic Environment automatically extracts revision information once a week.

If you check *Audit All Devices*, you manually force the Storage Automated Diagnostic Environment to run an extensive probe of all devices, rather than having to wait until the next scheduled run.

4. After you have selected or deselected the options, click RUN.

A summary report displays the status of all the components that are running.

# Email Configuration

Using the Email Configuration functionality, you can forward a detailed configuration report to specified email recipients. The configuration report includes a list of all monitored devices and the most recent instrumentation report available for each device. Topology information can also be forwarded via email.

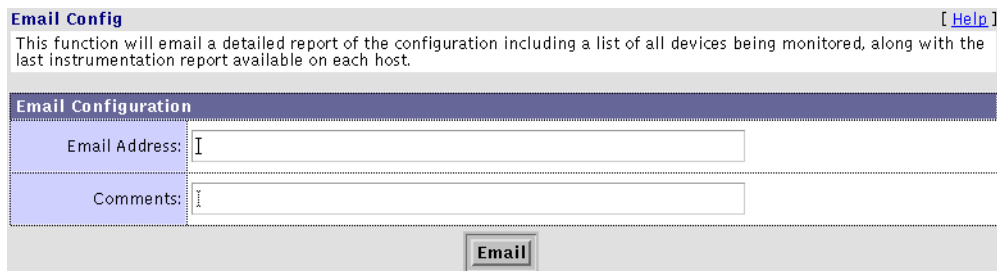
---

**Note** – Email might not be sent if the system is not properly configured. This is primarily evident in Storage Service Processor environments where the Storage Service Processors are on a subnet and there is no gateway to the intended recipient. See the *Sun StorEdge 3900 and 6900 Series Hardware Installation and Service Manual* for more information.

---

## ▼ To Email Configuration Information

1. Click the **Email Config** link in the **System Utilities** window.



**Email Config** [ Help ]

This function will email a detailed report of the configuration including a list of all devices being monitored, along with the last instrumentation report available on each host.

**Email Configuration**

Email Address:

Comments:

Email

**FIGURE 3-43** Email Configuration window

2. Type an email address into the **Email Address** text box and click **EMAIL**.

---

**Note** – The Email Configuration function enables Sun personnel to view customer information. Note, however, that in order to view the topology in an emailed configuration report, the browser must have access to Sun's Internal Wide Area Network (SWAN).

---

# Recover Configuration

The Recover Configuration function enables you to recover the configuration from the alternate master. The configuration includes identification information, along with device, host, and email notification information.

Start > Admin > System Utilities > Recover Config [ Help ]

This function enables configuration recovery by copying the configuration from one agent to an existing agent.  
The existing agent configuration includes information that identifies the device, the host, and the email notification setup.

Enter Information	
Enter IP Name/Addr of slave:	<input type="text"/>
Recover Configuration:	<input checked="" type="checkbox"/>
Reset slave to this master:	<input checked="" type="checkbox"/>

Recover

**FIGURE 3-44** Recover Configuration window

Once the system has completed running, a message displays confirming recovery of the Configuration file. A message is also sent to the email address specified in the Configuration file.

# Run Scripts

The Run Scripts window enables the user to run several command line programs from the GUI.

## ▼ To Run Scripts

1. Click Run Scripts in the System Utilities window.
2. Select and click on a script from the Script List, shown in FIGURE 3-45. An example of a script is shown in FIGURE 3-46.

Run scripts [ Help ]

**t3**

[Change T3 passwords](#)

This command will change all t3 passwords for a 3900/6900

[Run Commands on T3](#)

Run command using telnet (fru list, fru stat etc.)

[Retrieve tokens from a T3](#)

Enter IP Address and a 0 or 1 for the first or second enclosure (Partner Group)

**util**

[Create SE-Series snapshot](#)

Create SE-Series snapshot

[Run unix ps](#)

Process Status

FIGURE 3-45 Script List

TABLE 3-14 provides a brief description of the scripts that are currently available for the Sun StorEdge T3+ Array.

TABLE 3-14 Run Scripts Options for the Sun StorEdge T3+ Array

Script Option	Description
<i>Sun StorEdge T3+ Array Scripts</i>	
Change T3 passwords	This script changes the password of all Sun StorEdge T3+ Array that are components of a Sun StorEdge 3900 and 6900 Series system.
Run Commands on T3	This script enables the user to run Sun StorEdge T3+ Array commands, such as fru list and fru stat, using Telnet.
Retrieve tokens from a T3	This script enables the user to enter IP number 0 or 1 for the first or second enclosure.
Run unix ps	This script enables the user to run all Unix processes from the util.ps:bin/ps directory on a selected host.

### 3. Make changes, if necessary, to the script and click Run Command.

<b>Retrieve tokens from a T3</b>	
Enter IP Address and a 0 or 1 for the first or second enclosure (Partner Group)	
<b>t3.testt3: bin/testt3</b>	
Select Host:	<input type="text"/>
Arguments:	IP: <input type="text"/>
	Enclosure#: <input type="text" value="0"/>
<input type="button" value="Run Command"/> <input type="button" value="Back"/>	

**FIGURE 3-46** Script List Example—Retrieve Tokens from a Sun StorEdge T3 Array

# Password Maintenance

Use the Password Maintenance window to change the security password for the Storage Automated Diagnostic Environment GUI.

## ▼ .To Change the Root Password

1. Click **Root password** in the **System Utilities** window.

The Password Maintenance window is displayed.

Start > Admin > System Utilities > Root password [ Help ]

Used to changed the 'root' password of this software

**Password Maintenance**

User: **ras**

Enter OLD password:

Enter NEW password (min 4 chars.):

**Update**

FIGURE 3-47 Change Password window

2. If you do not know the current password, use the `save_password(1M)` utility to create a new password.

---

**Note** – The default login and password after initial installation are `ras/agent` (all lowercase).

---

3. Enter the **OLD** password.
4. Enter a new password, with a minimum of four characters.
5. Click **Update**.

The security password is changed.

# User Roles

The Storage Automated Diagnostic Environment administrator can assign permission privileges for the categories listed in TABLE 3-15. In addition to assigning privileges, the administrator can add a new user, maintain passwords, update or remove existing users, and set the browser window.

## ▼ To Update User Roles

### 1. Click Login/Roles in the System Utilities window.

The Login/Roles window is displayed.

**Login/Roles**
[\[ Help \]](#)

Use this screen to add a new user to your system, check at least one privilege for each user. User names must start with one letter. Use 'Del.' and the [Add/Update] button to delete users.

Privilege	Description
user	Cannot make changes in the maintenance functions.
admin	This privilege is required to add/delete/update in the Maintenance section.
test	Required to run tests.
script	This privilege is required to run scripts. Sun StorEdge 3900/6900 Series configuration scripts are available.
expert	Required to use the FC Analysis section.

'storade' login reserved for use by Sun Service managing Sun StorEdge 3900/6900 Series machines configured with SSRR.

**Login / Roles maintenance**

#	Del.	Login	Use NIS password	Password	Language	Window	Service				
							User	Admin	Script	Test	Expert
1	<input type="checkbox"/>	storade	<input type="checkbox"/>	<input type="text"/>	English <input type="text"/>	Big <input type="text"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Add:		<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Add:		<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Add:		<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Add:		<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Add:		<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Add:		<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Add/Update

FIGURE 3-48 Update User Login/Roles window

2. **Add a user name and assign one or more service roles to the user. Roles are defined in TABLE 3-15.**

**TABLE 3-15** Update User Roles

Privilege	Description
user	The user does not have privileges to make changes in the maintenance functions
admin	This privilege is required to add, delete, or update information in the Maintenance section
test	This privilege is required to run tests
script	This privilege is required to run scripts. Currently, Sun StorEdge 3900 and 6900 Series configuration scripts are available.
expert	This privilege is required to use the Fibre Channel Counter Analysis section.

3. **Type a password, which is encrypted, or select the Use NIS password check box.**

4. **Select an option from the Window pull-down menu.**

Big—displays three frames: the left frame window, the top window (with tracking links), and the main topic window.

Small—displays three frames, as with the Big Screen selection, but the frames are smaller.

No Frame—displays the top window (with tracking links) and the main topic window only.

Accessible—displays the top window (with tracking links) and the main topic window, as with No Frames, but enables the user to use keystroke combinations to perform tasks instead of using the mouse.

---

**Note** – The browser does not support Topology if the Accessible option is selected.

If you want to use the Topology functionality, select Big Screen, Small Screen, or No Frames.

---

5. **Click Add/Update.**

## ▼ To Remove a User

- **Delete the encrypted password and click Add/Update.**

## ▼ To Clear the Login Window

The Clear Login screen enables you to clear a current user and log in again as another user without having to exit the browser.

### 1. Click Clear Login in the System Utilities window.

A Netscape:Password pop-up window is displayed.

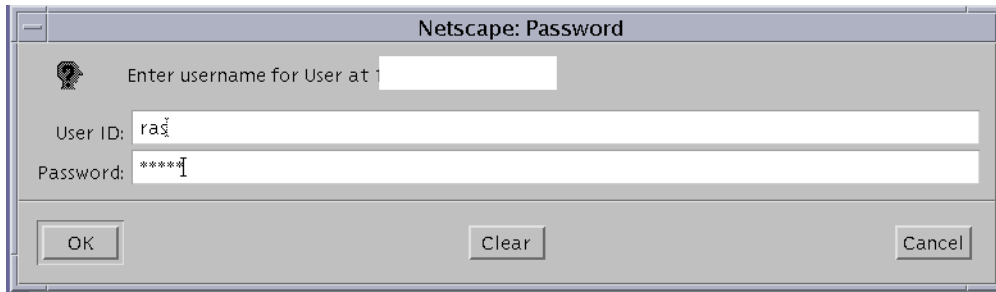


FIGURE 3-49 Clear Login

### 2. Type in a new User ID and password.

a. Click Clear to clear the fields and start over.

b. Click OK to log in again as another user.

The Storage Automated Diagnostic Environment main window is displayed.

## To Use the Application Launcher

The Application Launcher, shown in FIGURE 3-50, enables users to store URL bookmarks in the Storage Automated Diagnostic Environment on a device-by-device basis. Use the Application Launcher to launch management interfaces directly from the software, without having to open a new browser window and type the URL of the program directly.


▼ To Launch an External Web-Based Application

1. Click App. Launcher in the System Utilities window.

The Application Launcher window is displayed

App. Launcher

[\[ Help \]](#)

Use this form to associate each device-type to an external web-based application. These applications can be used to manage each type of device. The special symbol \$ip and \$wvsn can be used in the url.  
Example: http://\$ip to manage a switch by calling the switch's web-server directly.  
The symbol  is used to launch these external systems.

Urls updated!

Enter Application name and URL		
Device Type	Application Name	Application URL
Sun T3 1:	<input type="text"/>	<input type="text"/>
	2:	<input type="text"/>
Brocade switch 1:	<input type="text" value="Brocade"/>	<input type="text" value="http://\$ip"/>
	2:	<input type="text"/>
Sun Switch 1:	<input type="text"/>	<input type="text"/>
	2:	<input type="text"/>
Sun Switch2 1:	<input type="text"/>	<input type="text"/>
	2:	<input type="text"/>
Sun 3900/6900 1:	<input type="text" value="Sun 3900/6900"/>	<input type="text" value="http://\$ip/?LIID=\$lid"/>
	2:	<input type="text"/>
Sun 6320 1:	<input type="text" value="Sun 6320"/>	<input type="text" value="http://\$ip/?LIID=\$lid"/>
	2:	<input type="text"/>
FC-Tape 1:	<input type="text"/>	<input type="text"/>
	2:	<input type="text"/>
Vicom VE 1:	<input type="text"/>	<input type="text"/>
	2:	<input type="text"/>

Update

FIGURE 3-50 Application Launcher

2. Type a meaningful name of the application package in the Application Name text box.
3. Type the application URL that will launch the application in the Application URL text box.
4. Click Update.
- The software updates and stores the application's URLs.



# Monitoring

This section discusses the following monitoring functions you can perform using the Storage Automated Diagnostic Environment:

- “Monitoring Devices” on page 102
- “Monitoring Topology” on page 109
- “Monitoring Logs” on page 117
- “Monitoring Utilities” on page 124

## ▼ To Access the Monitor Window

- **Click the Monitor link on the Storage Automated Diagnostic Environment main window.**

Monitoring is divided into four sections: Monitor Devices, Monitor Topology, Monitor Log, and Utilities.



FIGURE 4-1 Monitor Window

---

# Monitoring Devices

You can use the Monitor Devices window to review all FRU-level information and to access components of a selected device.

Instrumentation agents are very different from one another because they are specialized modules designed to probe a specific type of device. Each instrumentation agent produces reports and, when available, reads new entries into the logs accessed by the `/var/adm/messages` function.

## Events, Alerts, and Alarms

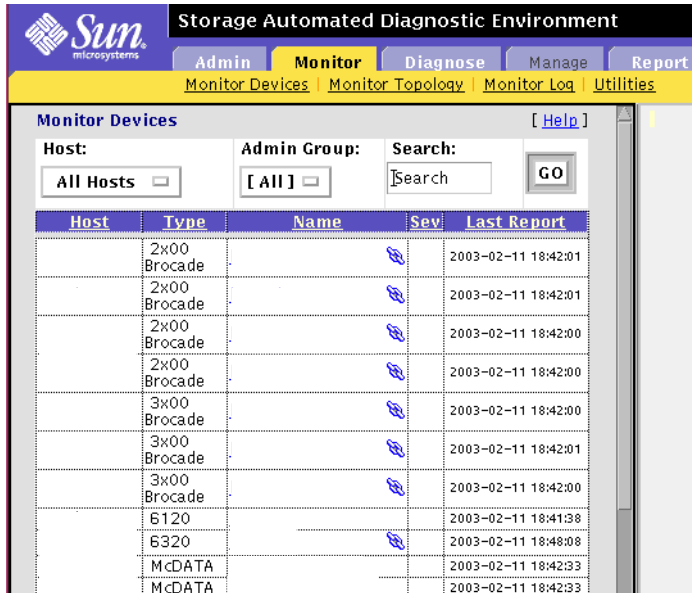
The terms event, alert, and alarm are often mistakenly used interchangeably. The terms are defined as follows:

- An *event* is a notification that contains information about something that happened on a device. There are many types of events and each type describes a separate occurrence.
- An *alert* is a subtype of an event that requires user intervention. Often, the term actionable event describes an alert.
- An *alarm* is the user interface mechanism by which a user manages an alert. It is a warning of an existing or approaching alert.

## ▼ To View Device Reports

1. Click the **Monitor Devices** link on the **Monitor** main window.

The Monitor Devices window is displayed.



**FIGURE 4-2** Monitor Devices window

The Monitor Devices window, displayed in FIGURE 4-2, contains:

- A list of all monitored devices
  - The severity column, which shows current errors and warnings on a selected device. To access the Alerts page, drag your mouse over a severity button and left click the mouse button. The Alerts summary is displayed.
  - The report date on which alerts, logs, and report summaries were generated.
2. To narrow the list of devices, enter at least a portion of the device name or IP address to display specific devices into the Search text box.  
For example, if you enter '192,' the search returns both 'diag-192' and device '192.xx.xx.x.'
  3. Click a device from the Name column to view a list of all of the device's components.

A summary of the device is displayed, as shown in FIGURE 4-3.

**Note** – You can also access the content of the Monitor Devices Report window, using the Topology view, by right-clicking an icon and clicking Report.

4. Click on a component's corresponding Summary, Health, Log, Report, or Graph link.

Click here for Report options

The screenshot shows the 'Monitor Devices' window with the following structure:

**Monitor Devices** [ [Summ](#) | [Health](#) | [Log](#) | [Report](#) | [Graph](#) ] [ [Help](#) ]

IP: ..

Model: SUNW,Ultra-Enterprise

#	Reg	Slot	Port-WWN
10	qlc0	Board:4 Slot:0 Port:1	
11	qlc1	Board:4 Slot:0 Port:2	
12	qlc2	Board:4 Slot:1 Port:1	
13	qlc3	Board:4 Slot:1 Port:2	
14	qlc4	Board:5 Slot:0 Port:1	
15	<b>qlc7</b>	Board:5 Slot:1 Port:0	
16	qlc5	Board:7 Slot:0 Port:1	
17	qlc6	Board:7 Slot:0 Port:2	
18	<b>qlc8</b>	Board:7 Slot:1 Port:1	

LunType	Device	WWN	Status
StorEdge_3510			O.K.

Filesystem Space	Mounted	Capacity
/dev/dsk/c0t10d0s0	/	22%
/proc	/proc	0%
code	/usr6	84%
fd	/dev/fd	0%
	/export/hs57/	71%
mnttab	/etc/mnttab	0%
speserv	/diag_src	57%
	/export/home26/	95%
swap	/tmp	1%
swap	/var/run	1%
var_opt_SUNWstade		22%

Hba Status	Status
/devices/pci@a,2000/SUNW,qlc@2/fp@0,0	not connected
/devices/pci@a,2000/pci@2/SUNW,qlc@4/fp@0,0	not connected
/devices/pci@a,2000/pci@2/SUNW,qlc@5/fp@0,0	not connected

**FIGURE 4-3** Monitor Devices Report Options window

## Monitoring Options

Options from the Monitor Devices Report window include:

- A Summary Report page about the selected device
- A Health page showing any problem with the selected device
- A Log page showing all events generated against the selected device
- A Report page showing, in detail, all monitored attributes for the selected device
- A Graph summary, displaying a summary of the component in graphical format

### *Summary Report*

- **Access the Summary Report by clicking the Summary link from the Monitor Devices window.**

The Summary Report page provides detailed information about the selected device. Sun StorEdge 6120 array detail includes the following:

- Product information—array name, monitoring host name, WWN number, and communication status.
- Array type (for example, disk, controller, midplane, loop, port, volume)
- Array identifier
- Array status (for example, ready-enabled, fault-enabled, online, normal, mounted)
- Revision number and additional information.

### *Health Report*

1. **Access the Health Report by clicking the Health link from the Monitor Devices window.**

A list of all events and alarms on the device and a summary of the health of every FRU for the device is displayed, along with its severity level.

2. **If you want to delete the Health Summary, click Delete Health.**

## *Event Log*

1. **To access the Event Log Report, click the Log link from the Monitor Devices menu.**

The Event Log contains the following information.

- Date and time the event occurred.
- Severity icon

---

**Note** – Mouse over the severity icon to find the numerical value associated with each severity level:

---

- 0 = green
- 1 = yellow (warning)
- 2 = red (error)
- 3 = down (component is down)
- Event
- Description of the event

2. **Click the Event's link to access the Event Grid.**

The device's EventGrid Info screen is displayed.

The Event Grid, also known as the *Service Advisor* shows all of the actionable and non-actionable events the Storage Automated Diagnostic Environment generates. See "Service Advisor" on page 166.

## *Device Report Detail*

The Device Report Detail page provides detailed information about a selected device. From the Summary Report page, you can gather very detailed information about each component of the device. The information is nested for easy navigation.

To access the Device Report Detail page:

- 1. Click the Report link from the Summary Report page.**
- 2. Click the plus (+) icon that corresponds to the component for which you need detailed information.**

The subtopics for that component are displayed.

- 3. Click the link on the subtopic.**

The details for the subtopic are displayed in a second window, below the main menu.

Topics for the Sun StorEdge 6120 are listed below.

- Controller (+)
- Disk (+)
- ID
- Info
- Location
- Loopcard (+)
- LUN
- Midplane (+)
- Port (+)
- Power (+)
- Slice
- Sys
- System
- Unit
- Volume (+)

## Graph Summary

When you select Graph from the Monitor Devices Report window, the status of the component is displayed in graphical format.

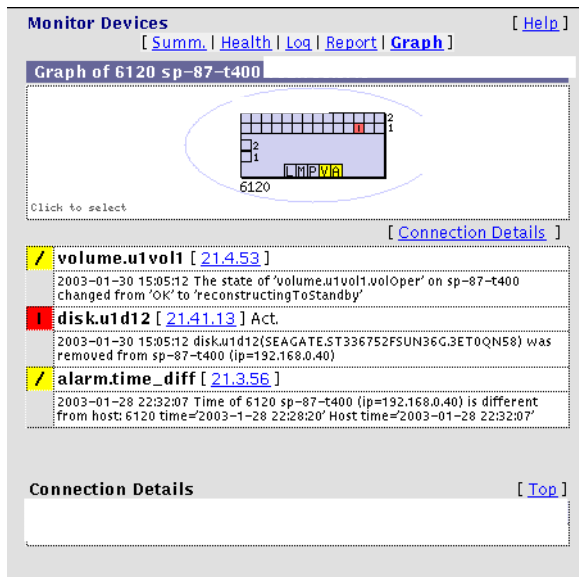


FIGURE 4-4 Monitor Devices in Graphical Format

---

# Monitoring Topology

This section discusses Topology monitoring functions you can perform using the Storage Automated Diagnostic Environment. Use the Topology section to display a host-based topology and SAN-based topologies.

The browser does not support Topology if the No Frames + Accessible option, available in “To Change Configuration Options” on page 72, is selected.

## ▼ To Access the Monitor Topology Page

1. **Click the Monitor link on the Storage Automated Diagnostic Environment main window.**
2. **Click the Monitor Topology link.**

The Topologies window is displayed.

To view a topology, you must do the following:

1. Execute the `ras_install` command to start the Storage Automated Diagnostic Environment services. This is part of the normal installation process, as documented in “To Install the Software” on page 13.
2. After device discovery, create a Topology snapshot. See “To Create a Topology Snapshot” on page 79 for more information.

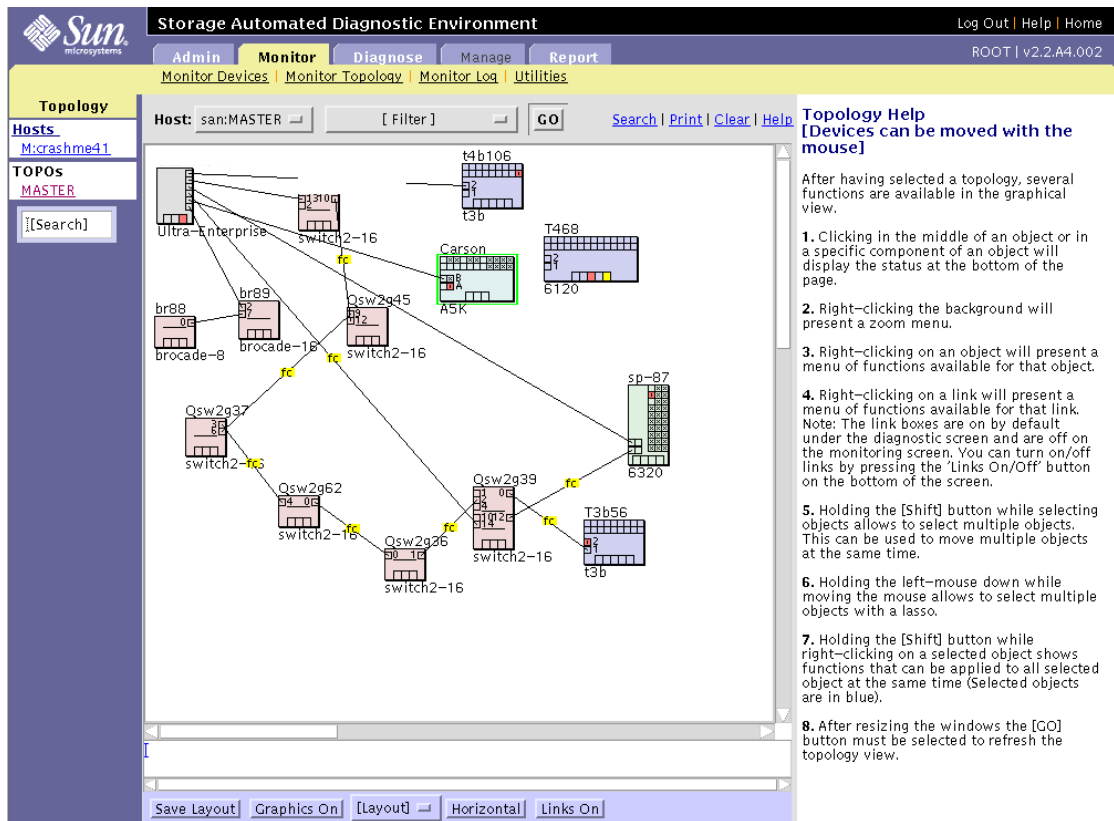
## ▼ To Display Host-Based Topology

### 1. Select Monitor Topology from the Monitor Menu.

The Topology menu appears.

### 2. Using your left mouse button, select an individual host or a merged (master) topology.

The index displays all host topologies that include that device, as shown in the following example.






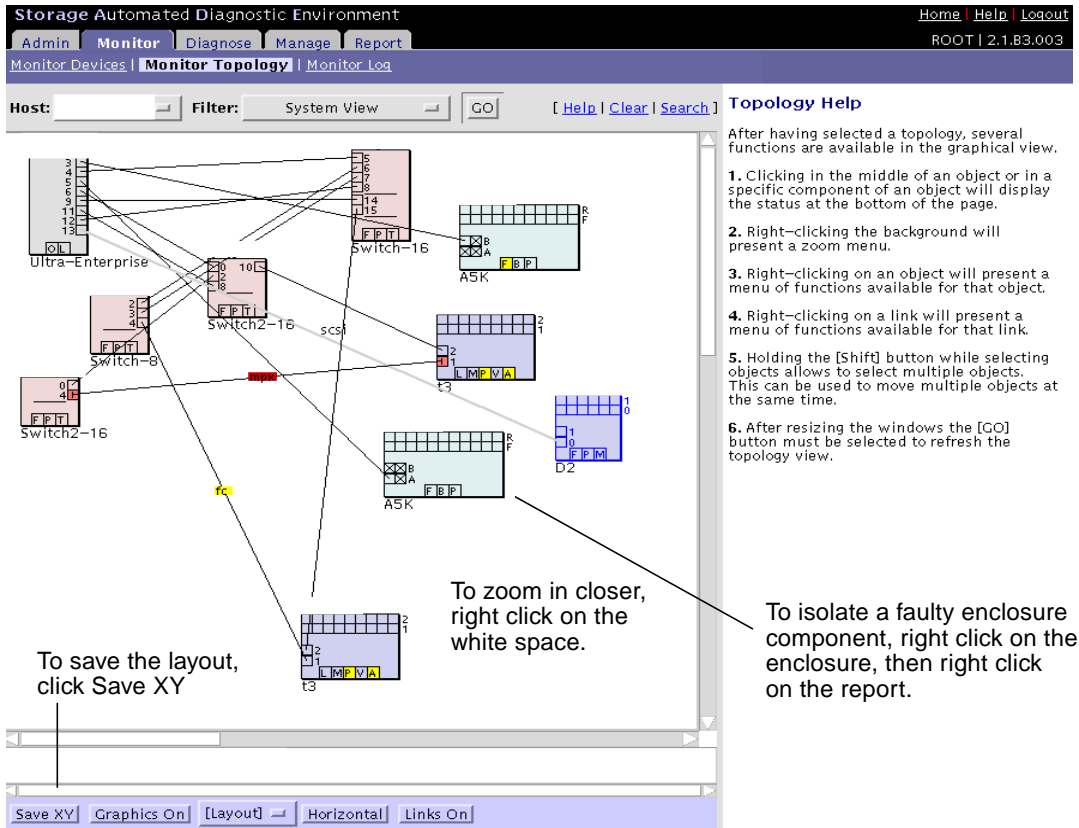
**FIGURE 4-5** Sample Topology View

**Note** – If two hosts (one master host and one slave host) are connected to the same set of switches, always select Master Topology from the Monitor Topology menu.

Whereas the master topology displays an accurate representation of a two-host topology, the slave topology inaccurately displays the devices as direct-attached.

You might see red, yellow, or down-arrow symbols in the topology: The symbols indicate the following:

Symbol	Severity
	Red—critical (error)
	Yellow—alert (warning)
	Down—the system is down



**FIGURE 4-6** Topology in System View

## ▼ To Clear Alerts

### *Green Links*

- **Select the Clear link in the Topology view.**  
All green links are removed from the Topology.

### *Yellow or Red Links*

---

**Note** – Yellow or red links must be removed manually and should not be removed until you are certain the faults have been corrected.

---

1. **Right click on a device that has one or more yellow or red alerts.**
2. **From the menu, select Alerts.**  
A list of all Alerts is displayed.
3. **Click Delete Alerts to clear all alerts for the device.**

---

**Note** – You can also delete alerts using the information found in “Monitoring Utilities” on page 124.

---

---

**Caution** – Red and yellow alerts are removed from the topology, even if the condition that caused the alert(s) still exists.

---

4. **To clear the red and yellow alerts for a link, right-click the link and select Display Error in the menu. Click Clear Link Errors in the description of the alerts.**

## *Topology Feature Hints*

- To narrow the size of the topology, select a device from the Filter pull down menu and click GO.
- To zoom in closer, right click on the screen's white space. You can zoom by selecting the value with your left mouse button.

---

**Note** – After you adjust the screen, click GO. This forces the topology applet to resize the window.

---

- To isolate a faulty enclosure component, right click on the enclosure, then right click on the report. An Alert log will display all alerts for the enclosure's components separately.

---

**Note** – Some enclosures might have two power supplies but only one P box. In this case, the P box will turn red or yellow if *either* power supply is faulty.

---

- To save the layout, click Save Layout on the footer bar.
- To view actual illustrations of the devices vs. conceptual drawings of them, click the Graphics On button on the footer bar.
- To change the view from horizontal to vertical, click the Horizontal button on the footer bar.
- Show connections between devices by clicking the Links On/Off toggle button. After the links are displayed, right click the link to display link errors, or run the Link Test.
- To rearrange the topology, right click on a device, hold it, and move the device or multiple devices to the position of your choice. Once the topology is rearranged, click Save Layout.

## Topology Help

Access the Topology Help window, and all other Help information, by clicking the Help link located in the upper right corner of every window.

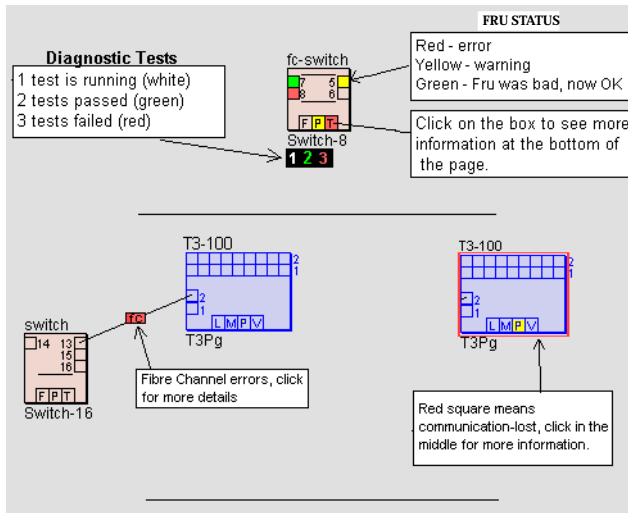


FIGURE 4-7 Topology Help

The icons shown in FIGURE 4-5 and FIGURE 4-7 symbolize the various storage devices that Storage Automated Diagnostic Environment monitors. Inside each storage device icon are boxes that represent:

- Disks inside the arrays
- Ports
- Other components

The “Other” category includes a variable set of boxes that represent components of the enclosures that are monitored. “Other” variables include the following:

- A=Alerts
- B = Backplane
- F = Fan
- I = loop card (on Sun StorEdge T3+ array)
- L = Lun
- M = Midplane
- O = Other
- P = Power
- T = Temp
- V = Volume

---

**Note** – Links that are labeled ‘mpxio’ in the Topology could indicate one of the following:

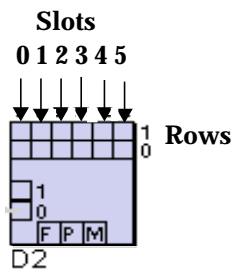
If a RED “mpxio” label is displayed in the Topology, a Sun StorEdge Traffic Manager failover has occurred on this path.

If a GREEN “mpxio” label is displayed in the Topology, a Sun StorEdge Traffic Manager failover has occurred on this path, but was later corrected.

---

### *Sun StorEdge D2 Arrays in the Topology*

The Sun StorEdge D2 array unit has 12 slots for disk drives. These slots are accessed through the front door of the Sun StorEdge D2 array. In the topology view, these 12 slots are represented by two rows of squares, as shown in FIGURE 4-8.



**Row 0** represents the six disk drives on the left side of the unit.

**Row 1** represents the six disk drives on the right side of the D2 unit.

**Row 1, Slot 5** is the rightmost slot in the Sun StorEdge D2 array enclosure.

```
[d2: 0130030860 [disk-13]
```

In this example, **disk-13** represents the fourth slot in Row 1.

**FIGURE 4-8** Sun StorEdge D2 array Topology View

---

# Monitoring Logs

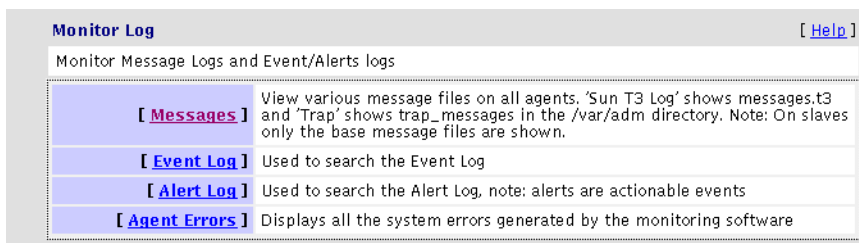
This section discusses the following log monitoring functions you can perform using Storage Automated Diagnostic Environment:

- “To Review the Most Recent Entries on a Host” on page 118
- “To View an Event Log for a Host” on page 119
- “To View Alert Logs” on page 121
- “To Display Agent Errors” on page 123

## ▼ To Access the Log Page

1. Click the **Monitor** link on Storage Automated Diagnostic Environment main window.
2. Click the **Monitor Log** link.

The Log window is displayed.



**FIGURE 4-9** Monitor Logs window

# ▼ To Review the Most Recent Entries on a Host

You can review the content of the `/var/adm/messages` and T3 and T3+ message log files from a host. Log entries are displayed from the end of the file going back; the most recent entries are shown first. The Storage Automated Diagnostic Environment must be functioning properly on each host for the `/var/adm/messages` log file to display the entries correctly.

Messages

[\[ Help \]](#)

View various message files on all agents. 'Sun T3 Log' shows messages.t3 and 'Trap' shows trap\_messages in the /var/adm directory. Note: On slaves only the base message files are shown.

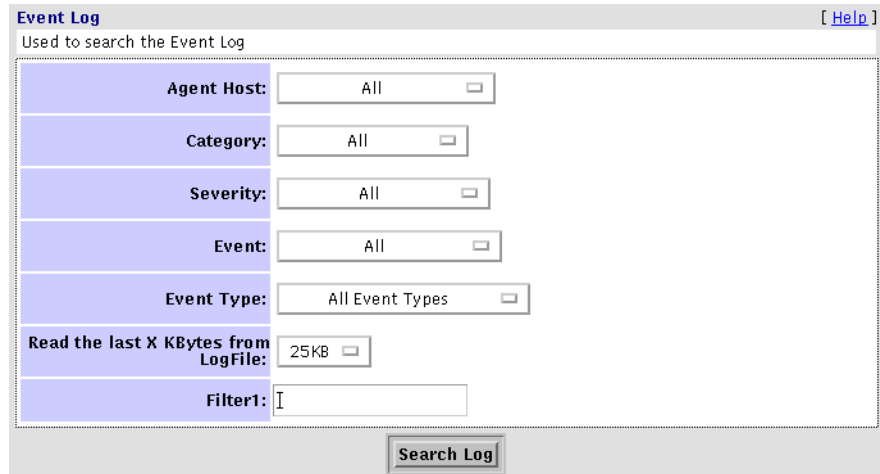
Host's log files					
HostName	Type	Host IP	Log	Sun Array log	Trap
HostName	Master	172.20.67.245	<a href="#">/messages</a> <a href="#">/messages.0</a> <a href="#">/messages.1</a> <a href="#">/messages.2</a> <a href="#">/messages.3</a>	<a href="#">/messages.3310</a>	No files

FIGURE 4-10 `/var/adm/messages` window

- **Select a host from the HostName column and click the corresponding `/messages` or `/messages/t3` link.**  
A descending list of `/var/adm/messages` on the local host is displayed.

## ▼ To View an Event Log for a Host

### 1. From the Monitor Log menu, select Event Log.



The screenshot shows the 'Event Log' window with a title bar containing '[ Help ]'. Below the title bar is a text field labeled 'Used to search the Event Log'. The main area contains several filter options, each with a label and a pull-down menu:

Agent Host:	All
Category:	All
Severity:	All
Event:	All
Event Type:	All Event Types
Read the last X KBytes from LogFile:	25KB
Filter1:	

At the bottom right of the window is a button labeled 'Search Log'.

**FIGURE 4-11** Event Logs window

Customize the report by using the following pull-down menus

- Agent Host
- Category-All is the default.  
The device types supported by the current Storage Automated Diagnostic Environment version will be displayed in the pull-down menu.
- Severity-options include All (the default), System Down, Critical (error), Alert (warning), and Caution (information).
- Event-All is the default.
- Event Type-options include All (the default), System Component Events, and System Events.
- Read the last X Kbytes from LogFile-options include 25KB (the default), 50 KB, 75KB, 100KB.
- Filter1-Type the IP address for which you want to view the Event Log into the Filter1 text box.

After you have altered each field (or accepted All as the defaults), click Search Log to produce a customized Event Log.

The corresponding event log window is displayed.








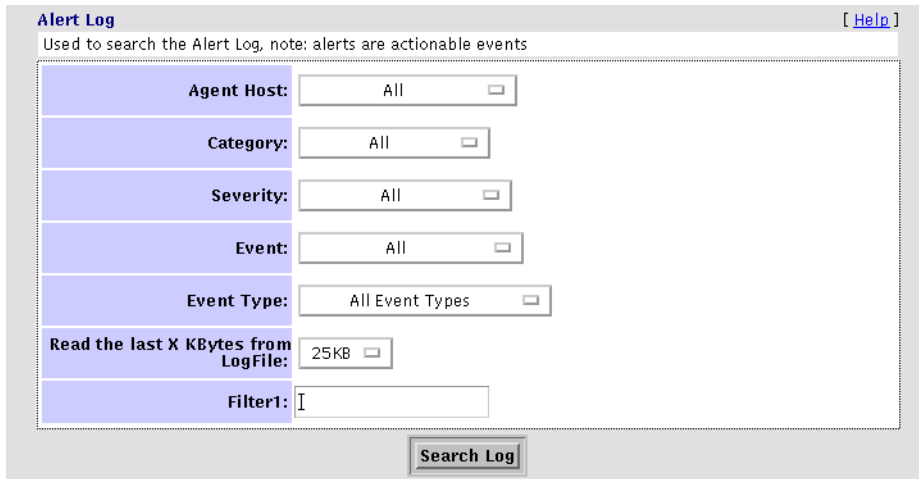
Event Log		[ Help ]
Time	Sev	Event
2003-01-09 15:09:55		<a href="#">topo_Discovery_SAN_Topology</a> Topology event with 1 host(s), 0 switch(es), 0 VE(s) and 1 Storage Array(s)
2003-01-09 15:09:52	 Act	<a href="#">3310.Alarm X.info.status</a> The state of 'info.status' on is '[Undefined]'
2003-01-09 15:09:51		<a href="#">3310.Discovery</a> Discovered a new 3310 called (wwn=204000c0ff000003)
2003-01-09 09:25:42		<a href="#">topo_Discovery_SAN_Topology</a> Topology event with 1 host(s), 0 switch(es), 0 VE(s) and 1 Storage Array(s)
2003-01-09 09:25:40		<a href="#">host_PatchInfo</a> New Patch and Package Information generated
2003-01-09 09:25:40		<a href="#">host_backup</a> NS Agent backup: GSV_ACRONYM=Storage A.D.E. GSV_DESC=Storage Automated Diagnostic Environment GSV_NAME=Storage Automated Diagnostic Environment GSV_PKG=SUNWstade GSV_PKGDIR=SUNWstade GSV_PORT=7654 GSV_SVE_PKGDIR=/opt/svengine active=N admin_email=yourself@yoursite categories=3310 6120 a3500fcl a5kl brocade d2 datahost host internal mc data san se2 se switch2 switch t3 tape v880 disk ve contract=895632 cust_no=54321 customer= frequency=5 gui_bandwidth=H hostname
2003-01-09 09:25:30		<a href="#">agent.AgentInstall host</a> Agent on host

FIGURE 4-12 Example of Event Log Messages on Local Host

## ▼ To View Alert Logs

### 1. From the Monitor Log window, select Alert Log.

Alerts are actionable events. The Alert log is considerably shorter than the Event Log.



The screenshot shows the 'Alert Log' window. At the top, there is a title bar with 'Alert Log' and a '[ Help ]' link. Below the title bar is a subtitle: 'Used to search the Alert Log, note: alerts are actionable events'. The main area contains several search filters, each with a label and a pull-down menu or text box. The filters are: 'Agent Host:' with a pull-down menu showing 'All'; 'Category:' with a pull-down menu showing 'All'; 'Severity:' with a pull-down menu showing 'All'; 'Event:' with a pull-down menu showing 'All'; 'Event Type:' with a pull-down menu showing 'All Event Types'; 'Read the last X KBytes from LogFile:' with a pull-down menu showing '25KB'; and 'Filter1:' with a text box containing the letter 'I'. At the bottom right of the window is a 'Search Log' button.

FIGURE 4-13 Alert Logs window

### 2. Customize the report by using the following pull-down menus:

Customize the report by using the following pull-down menus

- Agent Host
- Category-All is the default.  
The device types supported by the current Storage Automated Diagnostic Environment version will be displayed in the pull-down menu.
- Severity-options include All (the default), System Down, Critical (error), Alert (warning), and Caution (information).
- Event-All is the default.
- Event Type-options include All (the default), System Component Events, and System Events.
- Read the last X Kbytes from LogFile-options include 25KB (the default), 50 KB, 75KB, 100KB.
- Filter1-Type the IP address for which you want to view the Event Log into the Filter1 text box.

After you have altered each field (or accepted All as the defaults), click Search Log to produce a customized Alert Log.

**Note** – The intent of this log is not to view the content of the Alert, but rather to view the list of Alert types that have been generated. You can obtain the actual content by scanning through the appropriate message logs or through the email that was sent for each notification.

The corresponding alert log window is displayed.

Alert Log <span style="float: right;">[ <a href="#">Help</a> ]</span>		
<span>⬇️ Down (0)</span>   <span>🔴 Critical (6)</span>   <span>⚡ Alert (0)</span>   <span>🟢 Caution (0)</span>		
Time	Sev	Event
2002-11-12 11:47:06	🔴	<a href="#">6120_Alarm 6120.disk.u1 d1</a> 'disk.u1d1' in 6120 is now Not-Available (state changed from 'unknown' to 'fault-disabled');
2002-11-11 10:13:51	🔴	<a href="#">se2.StateChange M.slot.1</a> Slot 1 of SE2-6320 The state of 'power.u2pcu2.fruPowerBatState' on
2002-11-11 10:13:49	🔴	<a href="#">6120_Alarm X.power.u2pcu2.fruPowerBatState</a> The state of 'power.u2pcu2.fruPowerBatState' on sp- is '[Undefined]'
2002-11-11 10:13:48	🔴	<a href="#">6120_Alarm X.power.u2pcu1.fruPowerBatState</a> The state of 'power.u2pcu1.fruPowerBatState' on sp is '[Undefined]'
2002-11-11 10:13:46	🔴	<a href="#">6120_Alarm X.power.u1pcu2.fruPowerBatState</a> The state of 'power.u1pcu2.fruPowerBatState' on is '[Undefined]'
2002-11-11 10:13:48	🔴	<a href="#">6120_Alarm X.power.u1pcu1.fruPowerBatState</a> The state of 'power.u1pcu1.fruPowerBatState' on s '[Undefined]'

## ▼ To Display Agent Errors

The Storage Automated Diagnostic Environment System Errors window displays system errors that have occurred on a given host.

1. **To access the Storage Automated Diagnostic Environment System Errors window, click Agent Errors on the Monitor Log window.**

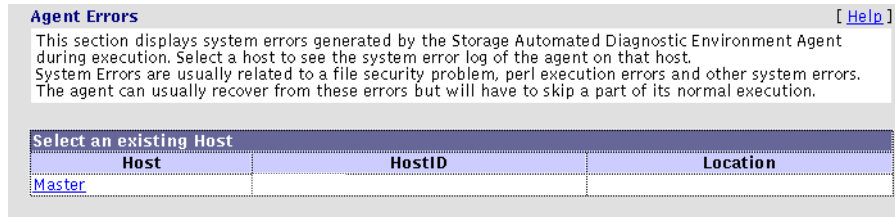


FIGURE 4-14 Display Agent Errors window

2. **Select an existing host.**

The corresponding Storage Automated Diagnostic Environment Agent Error Logfiles window is displayed.

# Monitoring Utilities

This section discusses the Clear Device Health function you can perform from the Monitoring Utilities window.

## ▼ To Access the Monitoring Utilities Window

1. From the Monitor window, click Utilities.

The Monitor Utilities window is displayed.

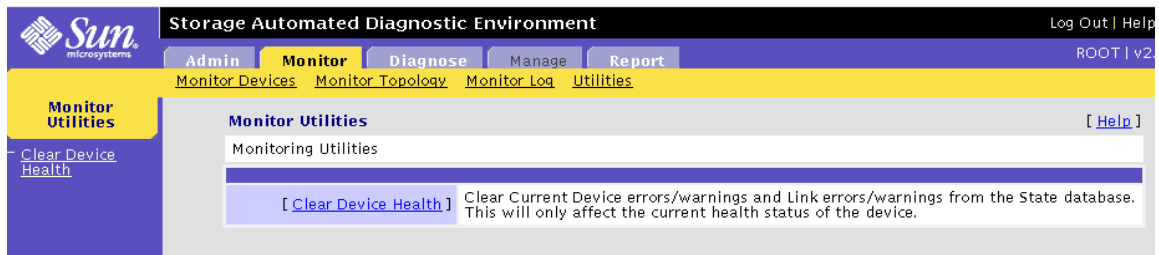


FIGURE 4-15 Monitor Utilities Window

The Clear Device Health function enables you to clear current device errors and warnings and link errors and warnings from the State database.

## ▼ To Clear the Health Status of a Device

2. Click Clear Device Health from the Monitor Utilities menu.

A window that shows the component's current state is displayed (see FIGURE 4-16).








Clear Device Health				<a href="#">[ Help ]</a>
Clear Current Device errors/warnings and Link errors/warnings from the State database. This will only affect the current health status of the device.				
Current Component State				
Delete	Device	Component	Severity	Description
<input type="checkbox"/>		slot.1		11-07 18:15:05 Slot 1 of SE2-6320 sp-87.central.sun.com: Lost Communication (OutOfBand) with
<input type="checkbox"/>	6120:sp-	e		11-07 18:15:04 Lost Communication (OutOfBand) with sp-87-t400
	6120:sp-87	power.u2pcu1.fruPowerPowTemp		11-04 06:17:20 The state of 'power.u2pcu1.fruPowerPowTemp' on sp-87-t400 is 'overTemp'
	6120:sp-87	power.u2pcu2.fruPowerPowTemp		11-04 06:17:20 The state of 'power.u2pcu2.fruPowerPowTemp' on
	6120:sp-	power.u1pcu1.fruPowerBatState		11-04 06:17:20 The state of 'power.u1pcu1.fruPowerBatState' on
	6120:sp	power.u1pcu1		11-04 06:17:20 'power.u1pcu1'(0x301.3001562.654322) in 6120 now Not-Available (state changed from 'unknown' to 'fault-enabled');
	6120:sp-	power.u1pcu2		11-04 06:17:20 'power.u1pcu2'(0x301.3001562.654321) in 6120 now Not-Available (state changed from 'unknown' to 'fault-enabled');

FIGURE 4-16 Clear Device Health Window

3. Select the device component and click its corresponding Delete button. Scroll down to the bottom of the window and select your deletion option:

- Delete Selected
- Delete All Green
- Delete All Warnings
- Delete All Link Alerts
- Delete All Alerts



## Diagnostics

---

This chapter provides an overview of the diagnostic tests available from the Storage Automated Diagnostic Environment GUI and the command line interface. In addition, this chapter covers test options, requirements, and rules.

This chapter includes the following sections:

- “Diagnostics Test Rules” on page 127
- “Selecting a User Interface” on page 128
- “Diagnostic Tests” on page 140
- “Revision Checking” on page 191

---

## Diagnostics Test Rules

Certain tests have limitations and cannot be run with other tests. The following rules exist with Storage Automated Diagnostic Environment diagnostic tests:

- All tests are offline tests that can be used to verify and replace FRUs.
- All devices and paths must be quiesced prior to invocation of diagnostic tests.
- `a5ksestest` cannot be run concurrently with the `qlctest` or the `socaltest`.
- `qlctest` cannot be run concurrently with any child test (while any attached device is running).
- `switchtest` can run only on one port on a single switch instance at a time.
- `linktest` cannot be run with other tests, and can only be run using Test from Topology. You cannot run `linktest` using Test from List.

---

**Note** – Any attempts to ignore or circumvent diagnostic test rules will cause pop-up warnings to display.

---

---

# Selecting a User Interface

You can run the Storage Automated Diagnostic Environment tests either from the Storage Automated Diagnostic Environment graphical user interface (GUI) or from the command line.

TABLE 5-1 describes the basic differences between the user interfaces.

**TABLE 5-1** Storage Automated Diagnostic Environment Diagnostics User Interfaces

Interfaces	Description
GUI Window	<p>You can select tests and test options inside the Storage Automated Diagnostic Environment GUI's Topology section in one of two ways:</p> <ul style="list-style-type: none"><li>• While in the Topology view, point to a device or host and click the right mouse button.</li><li>• Select a test from the Test from List window.</li></ul>
Command line	<p>You run each test individually from a shell tool command line. All diagnostics are located in <code>/opt/SUNWstade/Diags/bin</code>. See the man pages for more details.</p> <p><b>Note:</b> You must log in to the appropriate host or slave for testing.</p>

# Running Diagnostic Tests From the Command Line

In some cases it is more convenient to run a single Sun StorEdge diagnostic test from the command line rather than through a Storage Automated Diagnostic Environment interface.

When running a test from the command line, you must specify all test options in the form of command-line arguments. Standard arguments are common to most tests. See TABLE 5-2 for details.

The standard syntax for most tests is as follows :

```
% testname [-uvf][-o test-specific-arguments]
```

## Standard Command-Line Arguments

TABLE 5-2 describes the standard command-line arguments.

TABLE 5-2 Standard Command-Line Arguments

Argument	Description
-u	Displays command-line Usage information.
-v	Runs the test in Verbose mode and displays messages with more detailed information about the testing process. The default is False.
-f	Runs the test in full Functional test mode. This mode assumes that the test has complete control of the device being tested. The default is False.
-o	Indicates that the Options and arguments that follow are test-specific.

**Note –** All options must be listed in a quoted list following the standard -o argument. The options must be separated by a pipe ( | ); for example:

```
command_name -o "dev_path | ..."
```

# Running Diagnostic Tests From the GUI Window

If you run the diagnostic test using the Storage Automated Diagnostic Environment, you can easily access test configuration, control, and results, using the buttons in the dialog boxes. In addition, you can use the GUI to perform the following tasks.

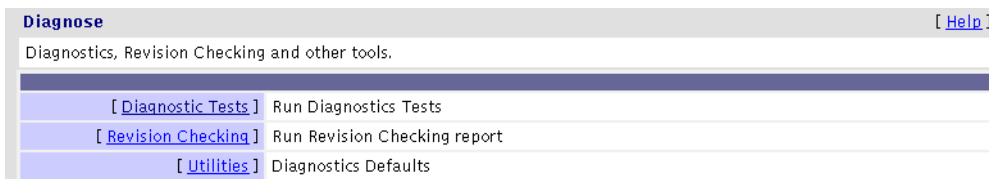
- Enables you to access diagnostic tests from a topology view.
- Enables you to access diagnostic tests from a list.
- Enables you to adjust the default settings for selected diagnostic tests.
- Enables you to review, delete, or archive diagnostic tests.
- Enables you to review the results of old tests.

The diagnostic tests are designed to test the target FRU and to operate on an in-band or out-of-band data path. The Storage Automated Diagnostic Environment scheduler dispatches the test to be run on the appropriate server (host).

## ▼ To Access the Diagnostic Tests

1. Click the **Diagnose** tab in the Storage Automated Diagnostic Environment main window.

The Diagnose menu is displayed.



**FIGURE 5-1** Diagnose window

2. Click the Diagnostic Tests link in the Diagnose window.

The Diagnostic Tests window is displayed.

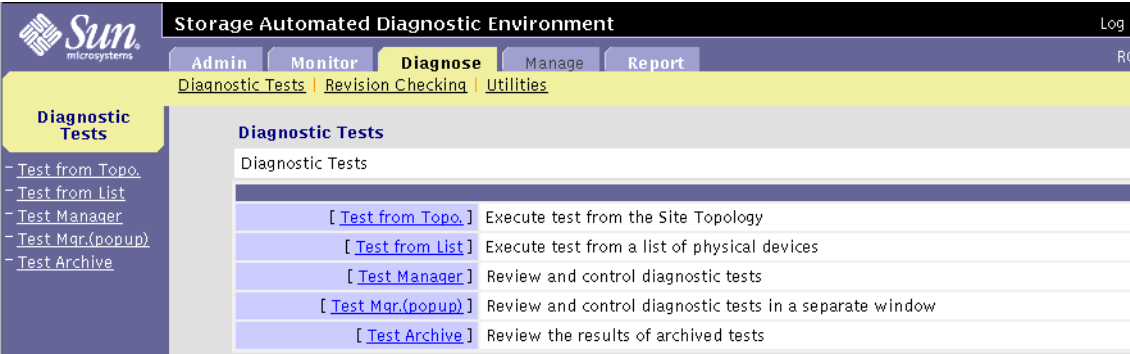


FIGURE 5-2 Diagnostic Tests window

With *two exceptions*, you can run Storage Automated Diagnostic Environment diagnostic tests from either Test from List or Test from Topology.

- You can invoke the Link Test by right-clicking the box in the link displayed in the topology. You cannot invoke the Link Test functionality using Test from List.
- Unconnected HBAs (HBAs that are not connected to any device) can only be tested using the Test from List option.

# Test from Topology

Storage Automated Diagnostic Environment's implementation of diagnostic tests verify the operation of all the user-selected components. Tests are selected from a graphical view of the system's topology.

The Storage Automated Diagnostic Environment Graph view shows the physical topology of a system or merged system. Using the Topology view, you can select specific subtests and test options. The monitoring status of devices and links appears both in the Test from Topology view and in the Test from List menu.

## ▼ To Test from Topology

### 1. Click the Test from Topology link.

The Test from Topology window is displayed.

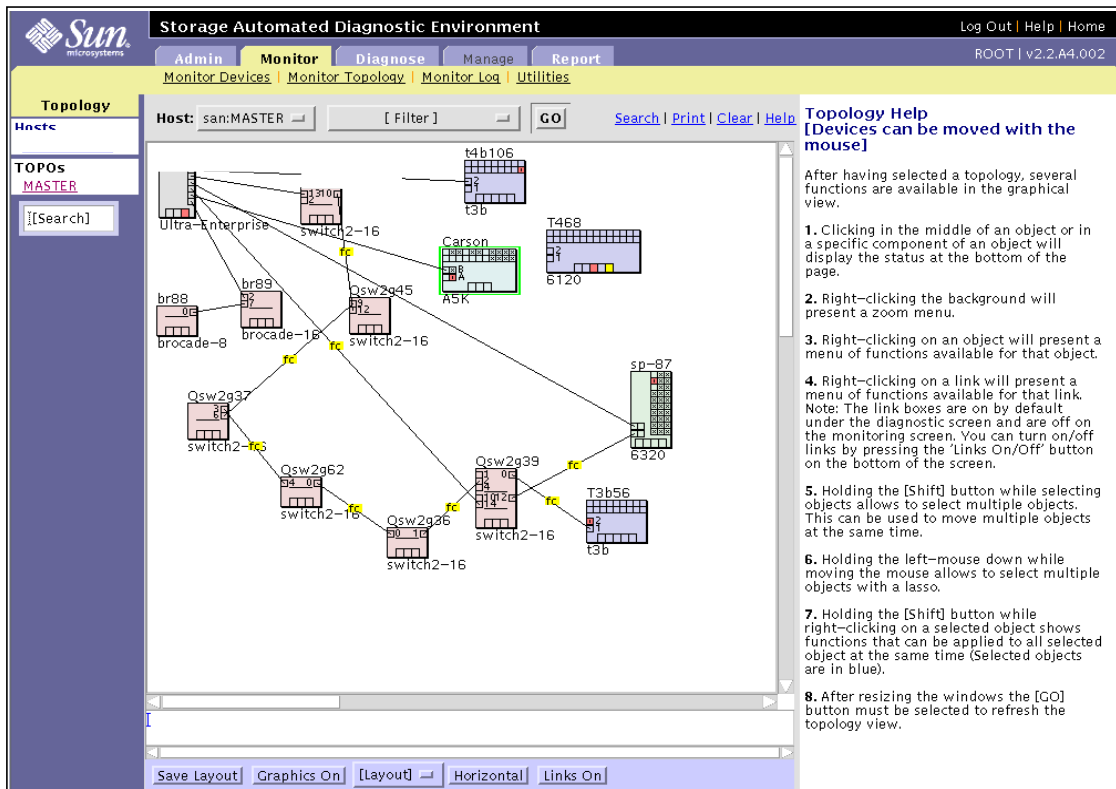


FIGURE 5-3 Test from Topology window

2. Select a host from the host pull-down menu.
3. To narrow the size of the topology, select a device from the Filter pull-down menu and click GO.
4. Using your right mouse button, select the device.  
A list of test options appears.
5. With your left mouse button, select the test you want to run on the device.  
The applicable test is displayed in the right pane.
6. Select the Clear link in the Topology view to remove all the green links from the topology. The red and yellow links remain in the topology until all faults have been corrected.

---

**Note** – If a red “mpxio” label is displayed in the Topology, a Sun StorEdge Traffic Manager failover has been discovered on this path.

If a green “mpxio” label is displayed in the Topology, a Sun StorEdge Traffic Manager failover has occurred on this path, but was later corrected.

---

While a test is running, you can access Test Manager to view the status of the test.



**FIGURE 5-4** Status of Test Running in Test Manager

After the test has completed its run, an email message is sent to the specified email recipient.

## Notes

- The Storage Automated Diagnostic Environment Link Test enables FRU isolation for Fibre Channel devices. You can invoke the Link Test from the Topology view by selecting the link.
- In-band tests can be run from the Test from Topology view with no restrictions.
- An out-of-band test (that is, `t3ofdg`, `t3volverify`, or `switchtest`) can be run from the Test from Topology view under the following conditions:
  - It is run from the monitoring host view, or
  - It is run from the merged topology view.
- To view a test's man page, click the man page link on the device's GUI test.

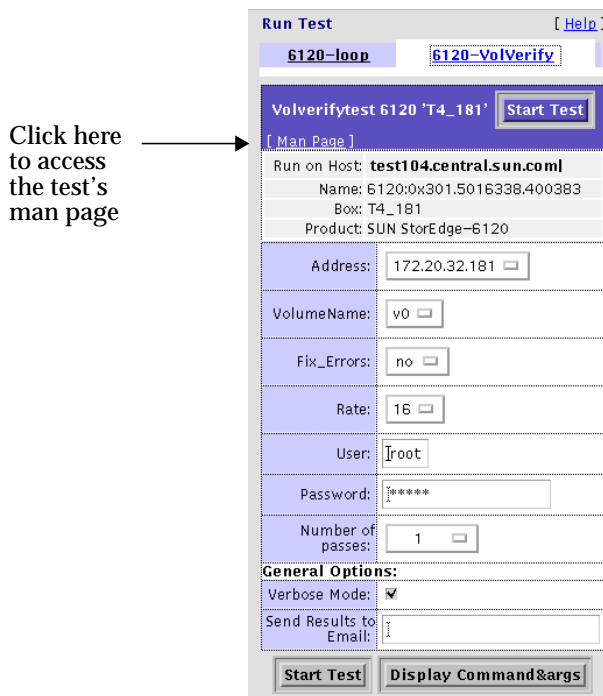


FIGURE 5-5 View Man Page from the GUI

## Test from List

Storage Automated Diagnostic Environment's implementation of diagnostic tests verifies the operation of all the user-selected components. Tests are selected from a list of physical devices.

The Test from List view shows the devices and their associated tests. This list also includes warnings and errors reported by the monitoring agents. In addition, Test from List displays all available host/HBA tests and not just the connected ports, as the Test from Topology view displays.

Using Test from List:

- You can sort by host, device type, test type, and device status.
- You can select options for a specific device, select multiple devices, or select all devices.
- You can specify the number of passes each test will run.

## ▼ To Invoke the Test Option Pane for a Particular Device

1. In the Test from List window, select the diagnostic test that you want.

**Storage Automated Diagnostic Environment**

Admin Monitor **Diagnose** Manage Report

Diagnostic Tests Revision Checking Utilities

**Diagnostic Tests**

- Test from Topo.
- Test from List
- Test Manager
- Test Mgr.(popup)
- Test Archive

**Test from List** [ Help ]

Host:  Filter:

+ Device	Component	Status	Run Test
<a href="#">6120:T468</a>	OutOfBand		<a href="#">b120-loop</a> <a href="#">6120-VolVerify</a>
<a href="#">a5k:Carson</a>	port0		<a href="#">A5000-SES</a>
	port1		<a href="#">A5000-SES</a>
	All Disks		<a href="#">A5000-Disk</a>
<a href="#">brocade:br88</a>	All Ports		<a href="#">Brocade-Test(s)</a>
<a href="#">brocade:br89</a>	All Ports		<a href="#">Brocade-Test(s)</a>
<a href="#">hostcrashme41</a>	hba0 / soc0_0		<a href="#">SOCAL</a>
	hba1 / soc0_1		<a href="#">SOCAL</a>
	hba2 / soc1_0		<a href="#">SOCAL</a>
	hba3 / soc1_1		<a href="#">SOCAL</a>
	hba4 / soc2_0		<a href="#">SOCAL</a>
	hba5 / soc2_1		<a href="#">SOCAL</a>
	hba6 / soc3_0		<a href="#">SOCAL</a>
	hba7 / soc3_1		<a href="#">SOCAL</a>
	hba8 / ifp0		<a href="#">IFP</a>
	hba9 / qlc14		<a href="#">QLC</a>
	hba10 / qlc15		<a href="#">QLC</a>
	hba11 / qlc0		<a href="#">QLC</a>
	hba12 / qlc1	<a href="#">link</a>	<a href="#">QLC</a>
	hba13 / qlc10		<a href="#">QLC</a>
	hba14 / qlc11		<a href="#">QLC</a>
	hba15 / qlc6		<a href="#">QLC</a>
	hba16 / qlc7		<a href="#">QLC</a>
	hba17 / qlc13		<a href="#">QLC</a>
	hba18 / qlc2		<a href="#">QLC</a>
	hba19 / qlc3		<a href="#">QLC</a>
<a href="#">se2:sp-87</a>	lpath c15t2d0s2		<a href="#">SE2-Test</a>
	lpath c15t2d1s2		<a href="#">SE2-Test</a>
	lpath c7t20030003		<a href="#">SE2-Test</a>
	A202DF3d0s2		<a href="#">SE2-Test</a>
	lpath c7t20030003		<a href="#">SE2-Test</a>
	A202DF3d1s2		<a href="#">SE2-Test</a>
	OutOfBand		<a href="#">Config</a>

FIGURE 5-6 Test from List window

2. Select a host from the host pull-down menu.
3. From the Filter pull-down menu, select a specific device, multiple devices, or click All to display all devices.
4. Click GO.

A list that is customized to your criteria is displayed.

5. Select the test name link in the Run Test column to run diagnostics.

The appropriate test window is displayed in the right frame

# Test Manager

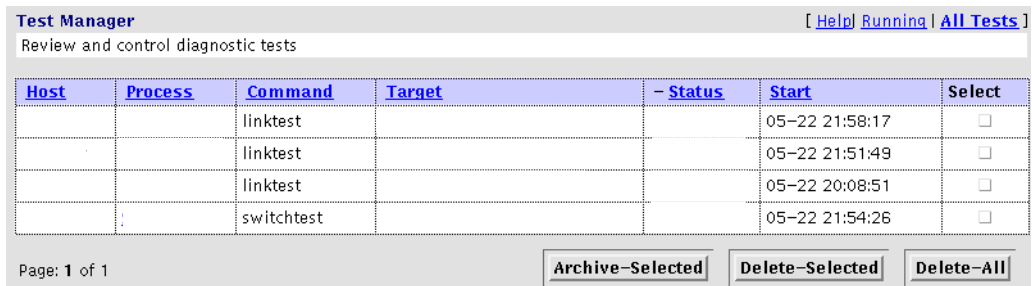
The Storage Automated Diagnostic Environment’s integration with diagnostic tests implements the Test Manager to track and control the progress of the user-selected tests.

The Test Output view enables you to view test output for active and completed tests in the Test Monitor view.

---

**Note** – All tests are keyed by the unique process identifier (PID) that Test Manager assigns during test invocation.

---



The screenshot shows the 'Test Manager' window with the subtitle 'Review and control diagnostic tests'. It features a table with columns: Host, Process, Command, Target, - Status, Start, and Select. There are four rows of test data. Below the table, there are three buttons: 'Archive-Selected', 'Delete-Selected', and 'Delete-All'. The page number 'Page: 1 of 1' is displayed at the bottom left.

Host	Process	Command	Target	- Status	Start	Select
		linktest			05-22 21:58:17	<input type="checkbox"/>
		linktest			05-22 21:51:49	<input type="checkbox"/>
		linktest			05-22 20:08:51	<input type="checkbox"/>
		switchtest			05-22 21:54:26	<input type="checkbox"/>

Page: 1 of 1

Archive-Selected Delete-Selected Delete-All

**FIGURE 5-7** Test Manager window

The Storage Automated Diagnostic Environment runs the device tests in a distributed manner. The master calls the proper host to begin tests.

---

**Note** – To sort in Test Manager, click on the header for any column and the list sorts the entries in that column. A plus (“+”) indicator signifies that this is the current sort.

---

For test processes, the status can be:

- Running—User intervention is required for the test to continue. *User intervention* may involve answering a question or replacing the cables or the gigabit interface converters (GBICs).
- Done OK—The test ran successfully with no errors.
- Done Error—The test failed and no longer continues to run.
- Done Aborted—The user manually stopped the test before it had finished running.

**Note** – There is a system timeout associated with the Waiting state. If you want to change the default settings for scheduled time-outs, See “System Timeouts” on page 87.

▼ **To Archive or Delete Tests**

Storage Automated Diagnostic Environment’s implementation of diagnostic tests enables you to view archived diagnostic logs saved by the Test Manager.

- 1. **Click the Select check box for the test from the Test Manager window.**
- 2. **Click the Archive-Selected (to archive) or Delete-Selected (to delete) check box.**

The Archived Tests view lists all archived tests and their associated output based on the criteria you specify.

▼ **To View a List of Archived Tests**

- **Click the Test Archive link from the Diagnostic Tests menu.**

.The Test Archive window is displayed.

Test Archive

[\[ Help \]](#)

Review the results of archived tests

Look back: 10 days

Host	Test	System	Comp	- Started	Result	Archived	Pid	Select
	<a href="#">t3ofdq</a>	t3:slr-mi.370-3990-01-e-e1.002399		2002-06-13 20:05:23	FAIL	2002-06-13 20:08:42	7457	<input type="checkbox"/>

Page: 1 of 1

Delete-Archived

Click a test to review the result of an archived test.

Use the Test Archive functionality to view tests that have previously run on a host, or to delete an archived test.

A summary of the test is displayed, along with recommended actions you can take to run a more successful test.

ST 7457 2002-06-13 20:08:42			
Status:	Done:ERROR	Host:	
Start:	06-13 20:05:23 (0:0:36)	Target:	b7-spet32
Killed:	15, 2002-06-13 20:05:59		
Passes:	1	End:	06-13 20:05:59
Key/Ports:	slr-mi.370-3990-01-e-e1.002399		
Options:	t3ofdg -y -v -o dev=172.20.104.21  syslog=Disable  fast_test=Disable  health_check=Enable  fast_find=Disable  find=Disable  loop=all  usr=root  passwd=diags		
PASS 1 of 1			
Ended: 2002-06-13 20:05:59, RC: 65280			
Running health_check			
health_check is 1 percent complete			
health_check is 25 percent complete			
health_check is 75 percent complete			
health_check is 100 percent complete			
health_check detected errors!			
healthCheck failed			
loop_id: fastTest			
Extra Error Info: 1 fail u2I1 fastTest 1 fail u2I2 ;			
Summary:			
health_check detected errors.			
Unable to determine faulty FRU.			
Recommended_Actions:			
Run this test with fast_find enabled.			
Run T3 LUN test.			
Examine syslog output.			

**Note** – Test Manager offers the same functionality as Test Archive.

---

# Diagnostic Tests

This section describes the following Storage Automated Diagnostic Environment Diagnostic tests that are available from the Storage Automated Diagnostic Environment GUI or the command line.

- “Sun StorEdge A3500FC LUN Test (a3500fctest)” on page 141
- “Sun StorEdge A5000 and A5200 Array Enclosure Test (a5ksestest)” on page 144
- “Sun StorEdge A5000 and A5200 Array Test (a5ktest)” on page 146
- “Brocade Silksworm Test (brocadetest)” on page 148
- “Sun StorEdge D2 Array Disk Test (d2disktest)” on page 150
- “Sun Fire V880 FC-AL Disk SES Test (daksestest)” on page 152
- “Sun Fire V880 FC-AL Disk Test (daktest)” on page 153
- “Sun StorEdge Internal Fibre Channel Disk Test (fcdisktest)” on page 155
- “Sun StorEdge FC Tape Test (fctapetest)” on page 157
- “Sun StorEdge PCI Fibre Channel-100 Host Adapter Test (ifptest)” on page 159
- “Fibre Channel Link Diagnostic (linktest)” on page 161
- “Sun StorEdge PCI Dual Fibre Channel Host Adapter Board Test (qlctest)” on page 165
- “Sun StorEdge SBus Fibre Channel-100 Host Adapter Board Test (socaltest)” on page 168
- “Sun StorEdge Network 2-Gbit Fibre Channel Switch Test (switch2test)” on page 171
- “Sun StorEdge Network FC Switch-8 and Switch-16 Switch Test (switchtest)” on page 173
- “Sun StorEdge T3 and T3+ Array Test (t3ofdg)” on page 175
- “Sun StorEdge T3 and T3+ Array Test (t3LUN)” on page 177
- “Sun StorEdge T3 and T3+ Array Test (t3volverify)” on page 180
- “Sun StorEdge 6120 Loop Test (6120loop)” on page 182
- “Sun StorEdge 6120 Array LUN Test (6120LUN)” on page 185
- “Sun StorEdge 6120 Array Test (6120volverify)” on page 188

Using the procedures in “Test from Topology” on page 132 or “Test from List” on page 135, you can run the tests listed in the following pages.

## Sun StorEdge A3500FC LUN Test (a3500fctest)

The `a3500fctest(1M)` test verifies the functionality of the Sun StorEdge A3500FC array by using four subtests: Media, File System, Synchronous I/O and Asynchronous I/O, and Write/Read Device Buffer. These subtests are described in TABLE 5-3.

**TABLE 5-3**    `a3500fctest` Subtests

Subtest	Description
Media	Verifies LUN media by reading data from the LUN. The Media subtest treats a LUN as one large portion of contiguous data.
File System	Verifies the LUN system's integrity. The File System subtest exercises the partition being tested to determine if it is mounted. If the partition is not already mounted or premounted, the test is blocked. The test opens two temporary files (of the size specified on <code>File System File Size</code> ) and performs a read/write test.
Synchronous I/O and Asynchronous I/O	Uses the asynchronous read/write feature of the Solaris LUN driver to exercise the LUN. In read-only mode the test sends a maximum of four asynchronous read packets, each with a random size and a random offset, into the selected partition. The test then waits for all outstanding I/O activity to complete before issuing another round of packets. This process continues until the whole area is tested. In read/write mode, one write packet is issued in every four read packets as a spot check of the write operation.
Write/Read Device Buffer	This test verifies the Fibre Channel loop by performing a pattern test. If the Write/Read Device Buffer subtest fails on a particular device, there is a problem with an upstream Fibre Channel component that might not be on the actual device where the test failed.

---

**Note** – An instance of `a3500fctest` is present for each LUN. The File System subtest can be run only if the selected partition is mounted.

---

a3500fctest Options		
Select Pattern Type:	<input type="text" value="critical"/>	selectpattern
User Defined Pattern:	<input type="text" value="0x7e7e7e7e"/>	userpattern
Check RDLS Counts:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable	checkrdls
W/R Device Buffer Test:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	wrdevbuf
W/R Device Buffer Iterations:	<input type="text" value="1000"/>	wrdevbufiterations
Test Media:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	rawsub
Partition:	<input type="text" value="0"/>	partition
Media Test Method:	<input type="text" value="SyncIO+AsyncIO"/>	method
Media Coverage(%):	<input type="text" value="1"/>	rawcover
Media Transfer Size:	<input type="text" value="32KB"/>	rawiosize
Test File System:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable	fstest
File System File Size:	<input type="text" value="512KB"/>	fssize
File System Transfer Size:	<input type="text" value="512B"/>	fsiosize
Number of passes:	<input type="text" value="1"/>	#PASSES
<b>General Options:</b>		
Verbose Mode:	<input checked="" type="checkbox"/>	-v
Send Results to Email:	<input type="text" value="I"/>	#EMAIL
<input type="button" value="Update"/> <input type="button" value="Reset"/>		

**FIGURE 5-8** a3500fctest Test Options Dialog Window

TABLE 5-4 describes the test options for the `a3500fctest` test.

**TABLE 5-4** `a3500fctest` Options

Option	Description
Select Pattern Type	Enables you to choose user, critical, or all pattern options.
User Defined Pattern	Defines the pattern specified by the user.
Check RDLS Counts	Monitors the read link status (RDLS) counts.
W/R Device Buffer Test	Enables or disables the write/read actions of the Device Buffer Test <b>Note:</b> The Sun StorEdge A3500FC array firmware level must be at 3010360 or greater to support the W/R Device Buffer Test.
W/R Device Buffer Iterations	Specifies the number of times W/R iterations are done to the internal buffer of the Sun StorEdge A3500FC array.
Test Media	Enables or disables the Media subtest.
Partition	Specifies the partition for the Media subtest. If a partition is mounted, its mount point is appended after the partition number, such as <code>1(/usr)</code> , where 1 is the partition number and <code>/usr</code> is the mount point.
Media Test Method	Enables or disables the Media Test Method (SyncIO or AsyncIO).
Media Coverage (%)	Tests all or part of a partition (in percentages).
Media Transfer Size	Specifies the transfer size of the Media subtest.
Test File System	Enables or disables the File System subtest.
File System File Size	Creates a file twice the size of what is specified.
File System Transfer Size	Specifies the transfer size of the File System subtest.
Number of passes	Specifies the number of times the test runs. The default is 1.

# Sun StorEdge A5000 and A5200 Array Enclosure Test (a5ksestest)

The a5ksestest(1M) test provides configuration verification, fault isolation, and repair validation of the disks in the Sun StorEdge A5000 array. It tests both Sun StorEdge A5000 14-slot and 22-slot disk enclosures.

The a5ksestest test detects all Sun StorEdge A5000 arrays that are connected to the HBA and collects relevant configuration information.

---

**Note** – The Sun StorEdge A5000 array was formerly known as the Sun Enterprise Network Array™ systems. The a5ksestest tests both versions of this disk array subsystem.

---



**FIGURE 5-9** a5000sestest Test Options Dialog Box

The diagnostic software attaches at least one instance of a5ksestest whenever a Sun StorEdge A5000 SCSI enclosure services (SES) device is found. Normally, two instances occur for each path to a Sun StorEdge A5000 array.

---

**Note** – To prevent test failures, do not run the a5ksestest and socalttest tests at the same time.

---

TABLE 5-5 describes the test options for the `a5ksestest` test.

**TABLE 5-5** `a5ksestest` Options

Option	Description
Select	Select one of the Sun StorEdge A5000 SCSI enclosure service (SES) devices: device 0 or device 1.
Disk Access	During testing, each disk is accessed through each active connection leading to that disk. The <code>a5ksestest</code> test opens partition 2 on the disk and reads 512 bytes of raw data.
Pass Delay	Specifies the number of seconds between passes. The default is 30 seconds.

# Sun StorEdge A5000 and A5200 Array Test (a5ktest)

The a5ktest(1M) test verifies the functionality of the Sun StorEdge A5000 array using five subtests: Media, File System, Synchronous I/O and Asynchronous I/O, Write/Read Device Buffer, and Self Test.

The a5ktest subtests are listed in TABLE 5-6.

**TABLE 5-6** a5ktest Subtests

Subtest	Description
Media	Verifies disk media by reading data from the disk. The Media subtest treats a disk as one large portion of contiguous data.
File System	Verifies the file system's integrity. The File System subtest exercises the partition being tested to determine if it is mounted. If the partition is not already mounted or premounted, then the test is blocked. The test opens two temporary files (of the size specified on File System File Size) and performs a read/write test.
Synchronous I/O and Asynchronous I/O	Uses the asynchronous read feature of the Solaris disk driver to exercise the disk. In read-only mode, the test sends a maximum of four asynchronous read packets, each with a random size and a random offset into the selected partition. The test then waits for all outstanding I/O activity to complete before issuing another round of packets. This process continues until the whole area is tested.
Write/Read Device Buffer	Verifies the Fibre Channel loop by performing a pattern test. If the Write/Read Device Buffer subtest fails on a particular device, there is a problem with an upstream Fibre Channel component that might not be on the actual device where the test failed.
Disk Self Test	Instructs a device to run its internal diagnostics. If the device fails this test, check the error message for a more detailed description of the error.

The a5ktest Test Options dialog box shows all the partitions that are available for testing. The File System subtest can be run only if the selected partition is mounted (described in TABLE 5-6). An instance of a5ktest is present for each disk in a Sun StorEdge A5000 array.

A5ktest a5k 'Carson'		Start Test
[ Main Page ]		
Run on Host:		
Name:		
Box:		
Product:	SUN StorEdge-A5000	
Select:		
Select Pattern Type:	critical	
User Defined Pattern:	0x7e7e7e7e	
Disk Self Test:	:Enable <input checked="" type="radio"/> :Disable	
Check RDLS Counts:	:Enable <input checked="" type="radio"/> :Disable	
Run W/R Buffer Test to Last Disk:	:Enable <input checked="" type="radio"/> :Disable	
W/R Device Buffer Test:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	
W/R Device Buffer Iterations:	1000	
Test Media:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	
Partition:	2	
Media Test Method:	SyncIO+AsyncIO	
Media Coverage(%)	1	
Media Transfer Size:	32KB	
Test File System:	:Enable <input checked="" type="radio"/> :Disable	
File System File Size:	512KB	
File System Transfer Size:	512B	
Number of passes:	1	
<b>General Options:</b>		
Verbose Mode:	<input checked="" type="checkbox"/>	

FIGURE 5-10 a5ktest Test Options Dialog Box

# Brocade Silkworm Test (brocadetest)

The `brocadetest(1M)` test is used to diagnose Brocade switch devices. The `brocadetest` process also provides command line access to Brocade Silkworm switch diagnostics. Brocadetest supports testing on all Brocade Silkworm switches that have network access from the testing host.

Brocadetest runs the port diagnostic on connected switch ports. While `brocadetest` is running, the port statistics are monitored for errors.

The `brocadetest(1M)` options are shown in FIGURE 5-11.

Run Test [ Help ]

Brocade-Switch

Brocadetest brocade [ Start Test ]

[ Man Page ]

Host:

Product:

WWN:

Select:

loop iterations:

Password:

User Defined Pattern:

Select Pattern Type:

Number of passes:

General Options:

Verbose Mode: ☒

Send Results to Email:

[ Start Test ] [ Display Command&args ]

FIGURE 5-11 `brocadetest` Test Options Dialog Box

---

**Note** – The `brocadetest(1M)` uses a telnet session from which to run the diagnostics. For the diagnostics to run correctly, no users can have a telnet session open to the switch while the diagnostics are running. If there is a telnet session open, the `brocadetest` fails, indicating that another user might be logged in to the switch.

---

TABLE 5-7 describes the test mode options for the `brocadetest` test.

**TABLE 5-7** `brocadetest` Test Options

Option	Description
Loop iterations	Specifies the number of iterations the port test should run, between 0 and 1,000,000.
Password	Specifies the password used by the admin user of the switch. There is no default value, and this a required field.
User Defined Pattern	Specifies the default pattern, in hexadecimal format, to be used for the port test. You can also enter the hexadecimal pattern to run for the test.
Select Pattern Type	Gives the user the choice of running the one user pattern, critical patterns (10 of the most critical patterns), or all patterns (a complete list of test patterns).
Number of passes	Specifies the number of times the test runs. The default is 1.

# Sun StorEdge D2 Array Disk Test (d2disktest)

The d2disktest(1M) test verifies the functionality of the internal Sun StorEdge D2 array by using five subtests: Media, File System, Synchronous I/O and Asynchronous I/O, Write/Read Buffer, and Self Test.

D2disktest d2		Start Test
[ Man Page ]		
Run on Host:		
Name:		
Box:		
Product: SUN StorEdge		
Select:	esm0-0 c19t0d0s2 esm0-10 c19t12d0s2 esm0-11 c19t13d0s2	
Select Pattern Type:	critical	
User Defined Pattern:	0x7e7e7e7e	
Disk Self Test:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable	
W/R Device Buffer Test:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable	
W/R Device Buffer Iterations:	1000	
Test Media:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable	
Partition:	0	
Method:	SyncIO+AsyncIO	
Media Coverage(%):	1	
Media Transfer Size:	32KB	
Test File System:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable	
File System File Size:	512KB	
File System Transfer Size:	512B	
Number of passes:	1	
<b>General Options:</b>		
Verbose Mode:	<input checked="" type="checkbox"/>	
Send Results to Email:		

**FIGURE 5-12** d2disktest Test Options Dialog Box

TABLE 5-8 describes the test mode options for the `d2disktest` test.

**TABLE 5-8** `d2disktest` Test Options

Option	Description
Select Pattern Type	Enables you to choose critical, user, and all options. Critical is the default.
User Defined Pattern	Defines the pattern specified by the user.
Disk Self Test	Instructs a device to run its internal diagnostics. If the device fails this test, check the error message for a more detailed description of the error.
W/R Device Buffer Test	Enables or disables the write/read actions of the Device Buffer Test.
W/R Device Buffer Iterations	Specifies the number of times the W/R Device Buffer Test runs.
Test Media	Enables or disables the Media subtest.
Partition	Specifies the partition for the Media subtest. If a partition is mounted, its mount point is appended after the partition number, such as <code>1 (/usr)</code> , where <code>1</code> is the partition number and <code>/usr</code> is the mount point.
Media Test Method	Enables or disables the Media Test Method (SyncIO or AsyncIO).
Media Coverage (%)	Tests all or part of a partition (in percentages).
Media Transfer Size	The transfer size of the Media subtest.
Test File System	Enables or disables the File System subtest.
File System Test Size	Creates a file twice the size of what is specified.
File System Transfer Size	Specifies the transfer size of the File System subtest.
Number of Passes	Specifies the number of times the test runs. The default is 1.

# Sun Fire V880 FC-AL Disk SES Test (daksestest)

The `daksestest(1M)` tests the Sun Fire V880 FC-AL disk backplane. The `daksestest` verifies the operation of the embedded SES controllers and the disk enclosure system of the Sun Fire V880 workgroup server.

No special hardware is required to run the daksestest test.

daksestest Options		
Test SES Path:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	test_ses_path
Test I2C Path:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	test_i2c_path
Loopback Test:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	lb
Firmware Tests:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	fwtest
<b>General Options:</b>		
Verbose Mode:	<input checked="" type="checkbox"/>	-v
Send Results to Email:	<input type="text"/>	#EMAIL

Update
Reset

**FIGURE 5-13** daksestest Test Options Dialog Box

TABLE 5-9 describes the test mode options for the `daksestest` test.

**TABLE 5-9** daksestest Test Options

Option	Description
Test SES Path	The <code>daksestest</code> tests the device over the Fibre Channel interface.
Test I2C Path	The <code>daksestest</code> tests using the I2C interface.
Loopback Test	When enabled, the subtest causes the SES device to loop a packet around the fiber bus with varying data patterns. The device reads the packet after the packet is received, and verifies that the data payload is correct.
Firmware Test	When enabled, this subtest runs the embedded firmware tests on the SES/SSC100 device.

# Sun Fire V880 FC-AL Disk Test (daktest)

The `daktest(1M)` test verifies the functionality of the Internal Fibre Channel disk by using five subtests: Media, File System, Synchronous I/O and Asynchronous I/O, Write/Read Buffer, and Self Test.

---

**Note** – The File System subtest can also be run if the selected partition is mounted.

---

The `daktest(1M)` options are shown in FIGURE 5-14.

daktest Options		
Select Pattern Type:	<input type="text" value="critical"/>	selectpattern
User Defined Pattern:	<input type="text" value="0x7e7e7e7e"/>	userpattern
Check RDLS Counts:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable	checkrdfs
Disk Self Test:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable	selftest
W/R Device Buffer Test:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable	wrdevbuf
W/R Device Buffer Iterations:	<input type="text" value="1000"/>	wrdevbufiterations
Test Media:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable	rawsub
Partition:	<input type="text" value="0"/>	partition
Media Test Method:	<input type="text" value="SyncIO+AsyncIO"/>	method
Media Coverage(%):	<input type="text" value="1"/>	rawcover
Media Transfer Size:	<input type="text" value="32KB"/>	rawiosize
Test File System:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable	fstest
File System File Size:	<input type="text" value="512KB"/>	fssize
File System Transfer Size:	<input type="text" value="512B"/>	fsiosize
Number of passes:	<input type="text" value="1"/>	#PASSES
<b>General Options:</b>		
Verbose Mode:	<input checked="" type="checkbox"/>	-v
Send Results to Email:	<input type="text"/>	#EMAIL
<input type="button" value="Update"/> <input type="button" value="Reset"/>		

**FIGURE 5-14** `daktest` Test Options Dialog Box

TABLE 5-10 describes the test mode options for the `daktest` test.

**TABLE 5-10** `daktest` Test Options

Option	Description
Select Pattern Type	Enables you to choose critical, user, and all options. Critical is the default.
User Defined Pattern	Defines the pattern specified by the user.
Check RDLS Counts	Monitors the read link status (RDLS) counts.
Disk Self Test	Instructs a device to run its internal diagnostics. If the device fails this test, check the error message for a more detailed description of the error.
W/R Device Buffer Test	Enables or disables the write/read actions of the Device Buffer Test.
W/R Device Buffer Iterations	Specifies the number of times the W/R Device Buffer Test runs.
Test Media Partition	Enables or disables the Media subtest.  Specifies the partition for the Media subtest. If a partition is mounted, its mount point is appended after the partition number, such as <code>1 (/usr)</code> , where <code>1</code> is the partition number and <code>/usr</code> is the mount point.
Media Test Method	Enables or disables the Media Test Method (SyncIO or AsyncIO)
Media Coverage (%)	Tests all or part of a partition (in percentages)
Media Transfer Size	The transfer size of the Media subtest.
Test File System	Enables or disables the File System subtest.
File System Test Size	Creates a file twice the size of what is specified.
File System Transfer Size	Specifies the transfer size of the File System subtest.
Number of Passes	Specifies the number of times the test runs. The default is 1.

# Sun StorEdge Internal Fibre Channel Disk Test (fcdisktest)

The `fcdisktest(1M)` test verifies the functionality of the Internal Fibre Channel disk by using five subtests: Media, File, System, Synchronous I/O and Asynchronous I/O, Write/Read Buffer, and Self Test.

fcdisktest Options		
Select Pattern Type:	<input type="text" value="critical"/>	selectpattern
User Defined Pattern:	<input type="text" value="0x7e7e7e7e"/>	userpattern
Check RDLS Counts:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable	checkrdls
Disk Self Test:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable	selftest
W/R Device Buffer Test:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	wrdevbuf
W/R Device Buffer Iterations:	<input type="text" value="1000"/>	wrdevbufterations
Test Media:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	rawsub
Partition:	<input type="text" value="0"/>	partition
Method:	<input type="text" value="SyncIO+AsyncIO"/>	method
Media Coverage(%):	<input type="text" value="1"/>	rawcover
Media Transfer Size:	<input type="text" value="32KB"/>	rawiosize
Test File System:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable	fstest
File System File Size:	<input type="text" value="512KB"/>	fssize
File System Transfer Size:	<input type="text" value="512B"/>	fsiosize
Number of passes:	<input type="text" value="1"/>	#PASSES
<b>General Options:</b>		
Verbose Mode:	<input checked="" type="checkbox"/>	-v
Send Results to Email:	<input type="text"/>	#EMAIL
<input type="button" value="Update"/> <input type="button" value="Reset"/>		

**FIGURE 5-15** fcdisktest Test Options Dialog Box

TABLE 5-11 describes the test mode options for the `fdisktest` test.

**TABLE 5-11** `fdisktest` Test Options

Option	Description
Select Pattern Type	Enables you to choose <code>critical</code> , <code>user</code> , and <code>all</code> options. <code>Critical</code> is the default.
User Defined Pattern	Defines the pattern specified by the user.
Check RDLS Counts	Monitors the read link status (RDLS) counts.
Disk Self Test	Instructs a device to run its internal diagnostics. If the device fails this test, check the error message for a more detailed description of the error.
W/R Device Buffer Test	Enables or disables the write/read actions of the Device Buffer Test.
W/R Device Buffer Iterations	Specifies the number of times the W/R Device Buffer Test runs.
Test Media Partition	Enables or disables the Media subtest. Specifies the partition for the Media subtest. If a partition is mounted, its mount point is appended after the partition number, such as <code>1 (/usr)</code> , where <code>1</code> is the partition number and <code>/usr</code> is the mount point.
Media Test Method	Enables or disables the Media Test Method (SyncIO or AsyncIO).
Media Coverage (%)	Tests all or part of a partition (in percentages).
Media Transfer Size	The transfer size of the Media subtest.
Test File System	Enables or disables the File System subtest.
File System Test Size	Creates a file twice the size of what is specified.
File System Transfer Size	Specifies the transfer size of the File System subtest.
Number of passes	Specifies the number of times the test runs. The default is <code>1</code> .

# Sun StorEdge FC Tape Test (fctapetest)

The `fctapetest(1M)` writes a pattern on the tape. `fctapetest` then rewinds the tape and reads and compares the data just written. The `fctapetest` file test writes four files to the tape and then reads them back, comparing the data.

The `fctapetest` diagnostic provides a variety of tests for Sun-supported Fibre Channel tape drives. The `fctapetest` does not test the tape library. It presumes that the user of the diagnostic either uses tape-library management software or manually inserts tapes into the drives.

## fctapetest Test Requirements

If you have a Sun Fibre Channel tape drive in your system, load a blank writable tape (scratch tape) before you start the diagnostic application.



---

**Caution** – If you mount a tape containing valid data, that data will be overwritten by the `fctapetest` diagnostic.

---

**FIGURE 5-16** `fctapetest` Test Options Dialog Box

TABLE 5-12 describes the test options for the `fcctapetest` test.

**TABLE 5-12** `fcctapetest` Options

Option	Description
Mode	If you enable write/read mode, the test first writes to the tape and then reads it back to compare. If you enable read-only mode, the test assumes the tape has already been written and merely reads it. Read-only mode is useful for checking proper head alignment.
Number of Blocks	The amount of the tape to be tested. The choices are: <ul style="list-style-type: none"><li>• EOT: The default; tests the entire tape.</li><li>• Long: Tests 70,000 blocks of the tape.</li><li>• Short: Tests only the first 1000 blocks.</li><li>• Specified: Type the number of blocks to be tested in the <code>number of blocks</code> field.</li></ul>
Specified Number of Blocks	If you select Specified in the Number of Blocks field, you must type the number of blocks you want to test.
Tape Data Density	If you do not want the <code>fcctapetest</code> test to run in the compression mode (the default), specify low, for <i>low</i> compression.
Tape File Mark Test	Verifies that the tape drive is able to correctly write and navigate file marks on the tape.
Number of Passes	Specifies the number of times the test runs. The default is 1.

# Sun StorEdge PCI Fibre Channel-100 Host Adapter Test (ifptest)

The `ifptest(1M)` test verifies the functionality of the Sun StorEdge PCI Fibre Channel-100 host adapter, which is a single-loop Fibre Channel card with an on-board gigabit interface converter (GBIC).

The `ifptest` tests the functionality when there are no devices attached to the loop. The driver checks for devices on the Fibre Channel loop. If any devices are detected, the driver blocks any diagnostic commands.

An error message is displayed if the device is attached to storage. If devices are attached to the loop, do not run `ifptest`. Instead, run the `t3test(1M)`, `a3500fctest(1M)`, `a5ktest(1M)`, or `fctapetest(1M)` test on the individual devices.

The `ifptest` test uses the “mailbox” interface to the card, which enables certain firmware operations to be performed that normally would not be available to the application layer.

**Start Test** [ Help ]

QLC | **SOCAL** | IFP

**ifptest host**

Host:  
Model: SUNW,UltraAX-i2

**No Port/Path available!**

Mailbox Loopback Test: ☒ Enable ☐ Disable

Firmware Revision Check: ☒ Enable ☐ Disable

Firmware Checksum Test: ☒ Enable ☐ Disable

Check Module Revisions: ☒ Enable ☐ Disable

Number of passes:

**General Options:**

Verbose Mode: ☒

Send Results to Email:

Display Command&args

FIGURE 5-17 `ifptest` Options Dialog Box

TABLE 5-13 describes the `ifptest` Test Options dialog box.

**TABLE 5-13** `ifptest` Options

Option	Description
Mailbox Loopback Test	Enables or disables the mailbox loopback command. This test writes data patterns into the mailboxes and then reads them back from the output mailboxes and verifies that the data is correct. It is run by default, but it can be disabled.
Firmware Revision Check	Enables or disables the firmware revision check command. This test extracts the firmware revision from the RISC firmware code and verifies it against expected values. It is run by default, but it can be disabled.
Firmware Checksum Test	Enables or disables the firmware checksum command. This command instructs the interface's RISC processor to calculate the current checksum on the microcode and then compare it to the checksum that was loaded with the microcode. It is run by default, but it can be disabled.
Check Module Revisions	Enables or disables the firmware check module command. This command returns the revision level of several modules on the interface card. Although this test is executed when enabled, the module revision levels are displayed only in verbose mode. It is run by default, but it can be disabled.
Number of Passes	Specifies the number of times the test runs. The default is 1.

# Fibre Channel Link Diagnostic (`linktest`)

The `linktest`, which is packaged with the Storage Automated Diagnostic Environment software, verifies the functionality of passive Fibre Channel components in a SAN or DAS environment.

`linktest` provides failing FRU isolation for devices that have external loopback tests. Currently this is limited to:

- Sun StorEdge Network Fibre Channel switches
- SOC+ HBA
- QLogic HBAs

For link segments that do not provide an external loopback test (for example, SOC+ to the Sun StorEdge A5200 array), the Sun StorEdge A5000 array passive components are diagnosed by using the SOC+ external loopback test. The passive components include GBICs, media interface adapters (MIA), Sun StorEdge FC switches, and Fibre Channel network adapters. `linktest` tests both ends of the link segment (if possible) and enters a guided isolation when it detects a failure.

---

**Note** – `linktest` is available only from the Storage Automated Diagnostic Environment GUI, Test from Topology view.

`linktest` is *not* available by way of the command-line interface (CLI) or from the Storage Automated Diagnostic Environment GUI, Test from List view.

---

## ▼ To Invoke linktest

Run `linktest` if you detect a bad or intermittent link, either by receiving an alert or by visually detecting a red link on the topology graph.

### 1. Click the Test from Topology link.

The Test from Topology window is displayed.

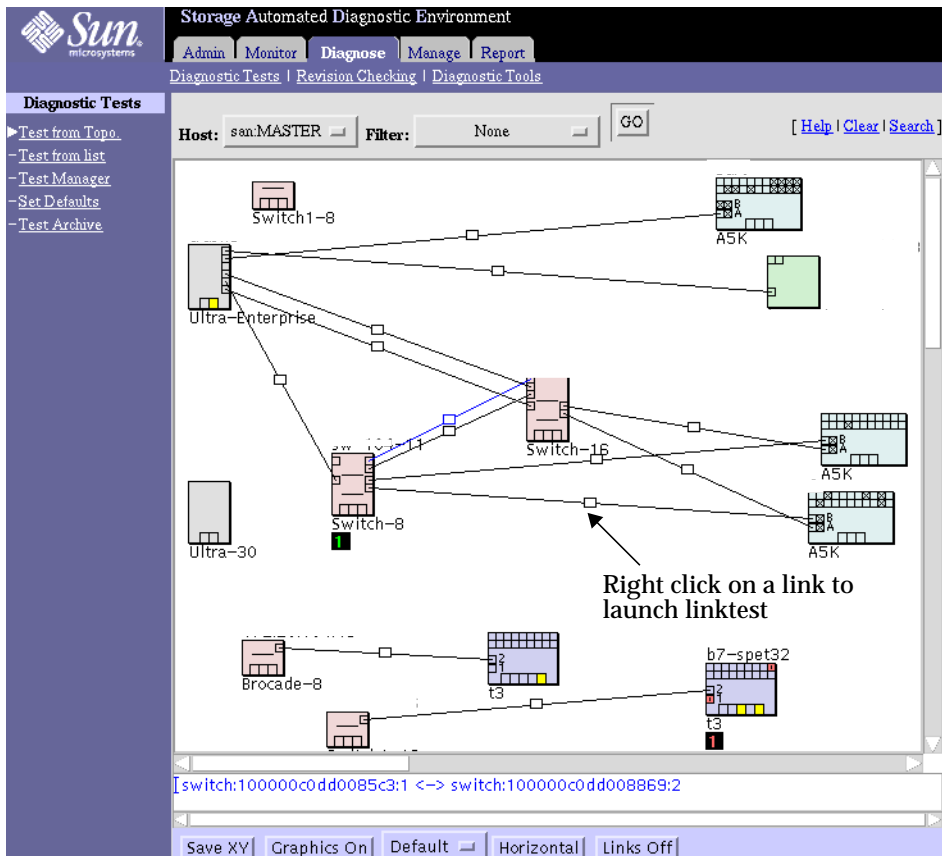
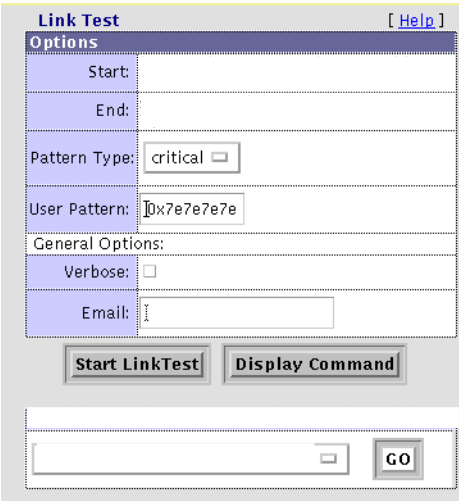


FIGURE 5-18 linktest from Test from Topology

2. Right-click the defective or intermittent link displayed in the topology.  
The linktest dialog window is displayed.



**FIGURE 5-19** linktest Test Options Dialog Box

TABLE 5-14 describes the linktest Test Options dialog box.

**TABLE 5-14** linktest Options

Item	Description
Pattern Type	Choices of pattern to run include user   critical   all. <ul style="list-style-type: none"> <li>critical is the I/O pattern causing device failure.</li> <li>all is a complete list of patterns.</li> <li>critical is the default pattern.</li> </ul>
User Pattern	User-specified pattern in hexadecimal format. For example, pattern=0x4a4a4a4a.
Verbose	Runs the test in Verbose mode and displays messages with more detailed information about the testing process. The default is Off.
Email	Enter email addresses to where the test results need to be sent, for example, email=email@address.com. An entry in Send Results to Email from the Default Options window sends the results of all tests. To send results to email recipients on an individual test, access that test's Default Option window.

After starting linktest, Test Manager guides you through FRU isolation.

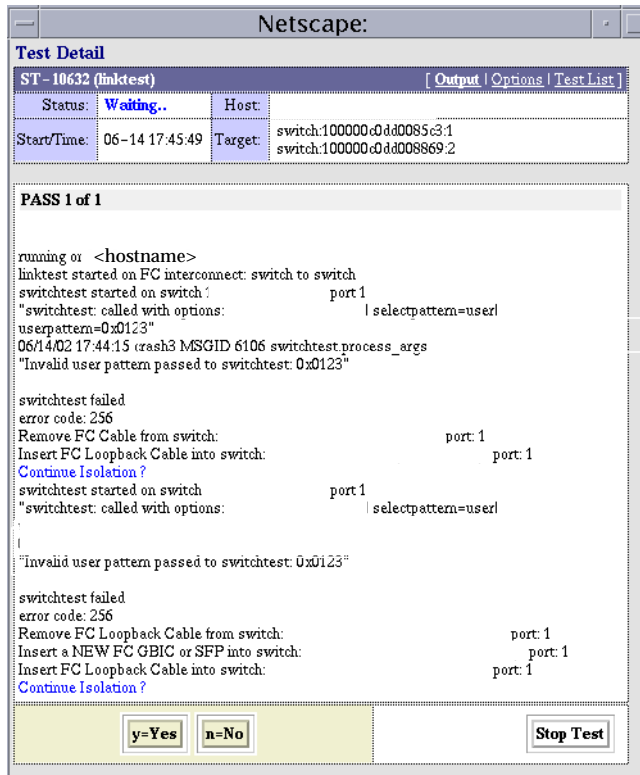


FIGURE 5-20 linktest Test Detail

# Sun StorEdge PCI Dual Fibre Channel Host Adapter Board Test (qlctest)

The qlctest(1M) tests the functions of the Sun StorEdge 1-Gbit and 2-Gbit PCI and cPCI Fibre Channel network adapter boards. This diagnostic test is not scalable.

**Note** – To run the qlctest when connected to storage, select Yes in the “Test if Connected to Storage” field in the qlctest dialog box. This step is necessary only if you select an internal test.

Run Test [ Help ]

QLC

Qlctest host Start Test

[ Man Page ]

Host:

Model: SUNW,Ultra-Enterprise

Select: Board4, Slot0, Port1 qlc14 (9)  
Board4, Slot0, Port2 qlc15 (10)  
Board4, Slot1, Port1 qlc0 (11)

Allow Internal Tests to Run if Connected to Storage: ☐ Yes ☒ No

Internal Online Selftest: ☐ Enable ☒ Disable

Internal Mailbox Loopback Test: ☐ Enable ☒ Disable

Internal Firmware Checksum Test: ☐ Enable ☒ Disable

Internal Loopback Test 10 bit: ☐ Enable ☒ Disable

Internal Loopback Test 1 bit: ☐ Enable ☒ Disable

External Loopback Test: ☒ Enable ☐ Disable

Loopback Transfer Count: 0x10000

Loopback Iteration Count: 100

User Defined Pattern: 0x7e7e7e7e

Select Pattern Type: critical

Number of passes: 1

General Options:

Verbose Mode: ☒

Send Results to Email:

Start Test Display Command&args

FIGURE 5-21 qlctest Test Options Dialog Box

Note the following:

- Do not run customer applications while running `qlctest`, because the test takes priority over customer data requests. Data cannot be accessed while the `qlctest` test is running.
- Do not run other tests while the `qlctest` test is running. The `qlctest` test might cause other tests to fail.
- Running the `qlctest` test can affect the switch counters along with the operation of the Storage Automated Diagnostic Environment agent.

TABLE 5-15 describes the `qlctest` Test Options dialog box.

**TABLE 5-15** `qlctest` Options

Option	Description
Allow Internal Tests to Run if Connected to Storage	Runs <code>qlctest</code> while connected to storage. Set this option to Yes if another option other than the external loopback is selected and the port is connected to storage. The default is No. This step is necessary only if you select an internal test.
Internal Online Selftest	Evaluates the functionality of ISP hardware by performing the following tests: <ul style="list-style-type: none"><li>• Transmit FIFO test</li><li>• Receive FIFO test</li><li>• SRAM test</li><li>• Miscellaneous Register tests</li></ul> It runs by default, but it can be disabled.
Internal Mailbox Loopback Test	Loads a series of registers into the input mailboxes on the card and then reads the output mailboxes and compares the results. Verifies that the system side of the card is operating correctly and that the internal data paths are correct. It runs by default, but it can be disabled.
Internal Firmware Checksum Test	Runs an internal checksum test on the installed firmware. This test verifies that the RISC RAM on the card is fully functional and that the installed firmware is still intact. This test also serves as a quick RAM check of the RISC RAM. It runs by default, but it can be disabled.
Internal Loopback Test 10-bit	Performs an internal loopback test within the host adapter ISP hardware at the 10-bit interface. This test is done with data sourcing from the system memory. You select the desired data pattern, transfer count, and iteration count from the Test Options dialog box. It runs by default, but it can be disabled.

**TABLE 5-15** qlctest Options (*Continued*)

Option	Description
Internal Loopback Test 1-bit	Performs an internal loopback test within the host adapter ISP hardware at the 1-bit interface. This test is done with data sourcing from the system memory. You select the data pattern, transfer count, and iteration count from the Test Options dialog box. It runs by default, but it can be disabled.
External Loopback Test	Performs an external loopback test. This test is done with data sourcing from the system memory. You select the data pattern, transfer count, and iteration count from the Test Options dialog box. This is an intervention test, because a loopback cable from the transceiver to the QLC receiver of the QLC port must be inserted when testing this port by itself. This subtest can also test the entire Fibre Channel loop when the loop is connected to the storage to be tested. It does not run by default, but it can be enabled.
Loopback Transfer Count	Controls the packet size used in the internal 10-bit, internal 1-bit, and external loopback tests. The default value is 0x10000.
Loopback Iteration Count	Sets the number of times to loop the internal 10-bit, internal 1-bit, and external loopback tests. The default value is 10.
User Defined Pattern	Uses the user-entered data pattern to loop for the internal 10-bit, internal 1-bit, and external loopback tests. The default value is 0x7e7e7e7e.
Select Pattern Type	Selects which data pattern to loop for the internal 10-bit, internal 1-bit, and external loopback tests. The default value is critical .
Number of Passes	Specifies the number of times the test runs. The default is 1.

# Sun StorEdge SBus Fibre Channel-100 Host Adapter Board Test (socaltest)

The `socaltest(1M)` test aids the validation and fault isolation of the Sun StorEdge SBus Fibre Channel-100 host adapter board.

**Run Test** [ Help ]

**SOCAL**

**Socaltest host** **Start Test**

[ Man Page ]

Host:  
Model: SUNW,Ultra-Enterprise

Select:  
Board1, Slotd, Port0 soc0\_0 (0)  
Board1, Slotd, Port1 soc0\_1 (1)  
Board5, Slotd, Port0 soc1\_0 (2)

Internal Loopback Test: ☐:Enable ☒:Disable

External Loopback Test: ☐:Enable ☒:Disable

Loopback Frame Test: ☒:Enable ☐:Disable

User Defined Pattern: 10x7e7e7e7e

Select Pattern Type: critical

Loopback Iteration Count: 1000

Loopback Transfer Count: 0x10000

Number of passes: 1

**General Options:**

Verbose Mode: ☒

Send Results to Email:

**Start Test** **Display Command&args**

**FIGURE 5-22** socaltest Test Options Dialog Box

---

**Note** – Do not run `socaltest` and `a5ksestest` at the same time. Otherwise, test failures might occur. Do not run `socaltest` with a high system load.

---

In addition to the tests described earlier, the `socaltest` test also tests the basic functions of the SOC+ chip, the on-board XRAM, and the host control buffer by invoking the appropriate tests implemented in firmware.

---

**Note** – You cannot run the Internal or External Loopback tests if the port is connected to a disk array.

---

TABLE 5-16 describes the `socaltest` Test Options.

**TABLE 5-16** `socaltest` Options

Option	Description
Internal Loopback Test (with no storage attached)	<p>Checks the host adapter card and the DMA with the host system, as follows:</p> <ol style="list-style-type: none"><li>1. A frame is created in the host adapter local memory, sent out through the SOC+ transmitter, and internally looped back to the SOC+ receiver. The received data is compared to the original data.</li><li>2. A frame is created in the host adapter local memory, sent out through the SOC+ transmitter, and looped back through the SERDES (serializer-deserializer) chip on the host adapter card. The received data is compared to the original data.</li><li>3. A frame is created in the host main memory, transferred through the DMA to the host adapter transmitter, looped back within the SOC+ chip, and transferred from the receiver to the host main memory through the DMA. The received frame is compared to the original transmitted frame, which tests the host memory to the host adapter DMA path. If the board is not connected to storage, the Internal Loopback test is selected by default. External Loopback and Loopback Frame tests are disabled.</li></ol>
External Loopback Test (with no storage attached)	<p>Verifies the proper functioning of the GBIC module. A frame is created in the host adapter local memory and is sent out and looped back through the external loopback connector attached to the port. If the External Loopback test is run together with the Internal Loopback test, the DMA path is also tested by creating a frame in host main memory, transferring it to the host adapter through the DMA, looping it back through the external loopback connector, and transferring the received frame back to the host main memory by DMA. By default, this is always disabled.</p>
Loopback Frame Test (with storage attached)	<p>Sends out a buffer initialized with the selected pattern and compares it to the looped-back frame. It passes if the two match and fails if they do not. If the board is connected to storage, the Loopback Frame test is selected by default. Internal and External loopback tests are disabled.</p>

**TABLE 5-16** socaltest Options (*Continued*)

Option	Description
User Defined Pattern	User-specified pattern in hexadecimal. The default is 0x7e7e7e7e.
Select Pattern Type	Applies only to Loopback Frame test. user uses the pattern entered by user. critical runs the 10 most critical patterns for fault detection. all runs the complete list of hexadecimal patterns for fault detection. The all pattern includes the critical pattern. The default is critical, which applies only to Loopback Frame Pattern.
Loopback Iteration Count	Sets the number of times to loop the internal 10-bit, internal 1-bit, and external loopback tests. The default value is 10.
Loopback Transfer Count	Controls the packet size used in the internal 10-bit, internal 1-bit, and external loopback tests. The default value is 0x10000.
Number of Passes	Specifies the number of times the test runs. The default is 1.

# Sun StorEdge Network 2-Gbit Fibre Channel Switch Test (switch2test)

The switch2test(1M) test is used to diagnose the Sun StorEdge network 1-Gbit and 2-Gbit Fibre Channel switches. The switch2test process also provides command-line access to switch diagnostics. switch2test supports testing on local and remote switches.

The switch2test runs the port diagnostic on connected switch ports. While the switch2test is running, the port statistics are monitored for errors.

Run Test

[ Help ]

Sun-2\_gig\_Switch

Switch2test switch2

Start Test

[ Man Page ]

Host:

Product:

WWN:

Select :

port0 / E\_Port  
port1 / UNKNOWN  
port2 / UNKNOWN

Transfer Size:

2000

Iterations:

5000

User Defined Pattern:

0x7e7e7e7e

Select Pattern Type:

critical

Password (If security Enabled):

\*\*\*\*\*

Number of passes:

1

General Options:

Verbose Mode:

☒

Send Results to Email:

Start Test

Display Command&args

FIGURE 5-23 switch2test Test Options Dialog Box

TABLE 5-17 describes the test mode options for the `switch2test` test.

**TABLE 5-17** `switch2test` Test Options

Option	Description
Transfer Size	Specifies the transfer count for the port test, between 200 and 2000.
Iterations	Specifies the number of iterations the port test runs, between 0 and 1,000,000.
User Defined Pattern	Specifies the default pattern, in hexadecimal format, to be used for the port test. You can also enter the hexadecimal pattern to run for the test.
Select Pattern Type	Gives the user the choice of running the one-user pattern, critical patterns (10 of the most critical patterns), or all patterns (a complete list of test patterns).
Password	A password is required for the Sun StorEdge Network 2 Gbit Fibre Channel switches.
Number of Passes	Specifies the number of times the test runs. The default is 1.

# Sun StorEdge Network FC Switch-8 and Switch-16 Switch Test (switchtest)

The `switchtest(1M)` test is used to diagnose the Sun StorEdge network 1-Gbit FC switch-8 and switch-16 switches. The `switchtest` process also provides command-line access to switch diagnostics. `switchtest` supports testing on local and remote switches.

`switchtest` runs the port diagnostic on connected switch ports. While `switchtest` is running, the port statistics are monitored for errors.

**Run Test** [ Help ]

Sun-Switch

Switchtest switch [ ] **Start Test**

[ Man Page ]

Host: [ ]

Product: Qlogic Switch-8

WWN: [ ]

Select: port4 / TL\_Port  
port2 / E\_Port  
port3 / E\_Port

Transfer Size: 2000 [ ]

Iterations: 100000 [ ]

User Defined Pattern: 0x7e7e7e7e

Select Pattern Type: critical [ ]

Number of passes: 1 [ ]

**General Options:**

Verbose Mode: ☒

Send Results to Email: [ ]

**Start Test** **Display Command&args**

**FIGURE 5-24** switchtest Test Options Dialog Box

TABLE 5-18 describes the test mode options for the `switchtest` test.

**TABLE 5-18** `switchtest` Test Options

Option	Description
Transfer Size	Specifies the transfer count for the port test, between 200 and 2000.
Iterations	Specifies the number of iterations the port test runs, between 0 and 1,000,000.
User Defined Pattern	Specifies the default pattern, in hexadecimal format, to be used for the port test. You can also enter the hexadecimal pattern to run for the test.
Select Pattern Type	Gives the user the choice of running the one-user pattern, critical patterns (10 of the most critical patterns), or all patterns (a complete list of test patterns).
Number of Passes	Specifies the number of times the test runs. The default is 1.

# Sun StorEdge T3 and T3+ Array Test (t3ofdg)

The t3ofdg(1M) test runs the internal diagnostics of the Sun StorEdge T3 and T3+ array.

Before you run the t3ofdg(1M) test, you must do the following:

- Run the Storage Automated Diagnostic Environment manually by following the procedure “Running the ras\_install Script” on page 17.
- Generate a report for the device against which you are running the test (for example, Sun StorEdge T3 and T3+ arrays).

If the numbers of existing volumes do not match, an error message is displayed.

**Run Test** [ Help ]

**T3-ofdg** **T3-VolVerify**

**Start Test**

[ Man Page ]

Run on Host:

Name:

Box:

Product: SUN StorEdge-T3

T3\_Address:

Syslog Dump: Disable ☐

Fast\_Test: Disable ☐

Health\_Check: Enable ☐

Fast\_Find: Disable ☐

Find: Disable ☐

Loop: all ☐

User: root

Password: \*\*\*\*\*

Number of passes: 1 ☐

**General Options:**

Verbose Mode: ☒

Send Results to Email:

**Start Test** **Display Command&args**

FIGURE 5-25 t3ofdg Test Options Dialog Box

---

**Note** – This test requires the user to enter the user ID and password options for the Sun StorEdge T3 or T3+ array that is being tested. See “Maintaining Devices” on page 46 for information about how to add an optional T3 password.

---

**TABLE 5-19** t3ofdg Test Options

Syslog Dump	Enable dumps all syslog entries that have been added, while the test is running, to the screen. ofdg dumps only off-line diagnostic lines, that have been added to the syslog, to the screen. The default is Disable.
Fast_Test	Fast_Test performs a fast Go/No Go test of the selected enclosure and loop. It does not attempt to detect bad FRUs. The default is Enable.
Health_Check	Health_Check runs Fast_Test multiple times, one time for each loop per unit. The default is Disable.
Fast_Find	Fast_Find can be used to detect bad loop cards, interconnect cables, and controllers. Fast_Find does not attempt to isolate to a single disk port. Run Fast_Find before Find to eliminate loop cards, interconnect cables, and controllers as bad FRUs before the midplane or disks are suspended (which are checked using Find). The default is Disable.
Find	Find performs an extensive Go/No Go test. If loop failures are detected, Find automatically initiates the full-loop-fault-isolation diagnostic. The loop fault diagnostic has the capability to detect and isolate a single disk port but is very time-consuming. The default is Disable.
Loop	Loop specifies which loop to test. All tests both loops. The default is All.
Password	The Sun StorEdge T3+ array telnet password enables the Storage Automated Diagnostic Environment to log in to the Sun StorEdge T3+ array device. The password is required.
<b>Note:</b> The user cannot change an existing Sun StorEdge T3+ array password.	

---

# Sun StorEdge T3 and T3+ Array Test (t3LUN)

The t3LUN(1M) test verifies the functionality of Sun StorEdge T3 and T3+ array logical unit numbers (LUNs) by using three subtests: Media, File System, and Synchronous I/O and Asynchronous I/O.

The File System subtest can be run only if the selected partition is mounted. An instance of the t3LUN test is present for each volume.

TABLE 5-20 describes the t3LUN subtests.

TABLE 5-20 t3LUN Subtests

Subtest	Description
Media	Verifies LUN media by reading data from the LUN. The Media subtest treats a LUN as one large portion of contiguous data.
File System	Verifies the LUN system's integrity. The File System subtest exercises the partition being tested to determine if it is mounted. If the partition is not already mounted or premounted, the test is blocked. The test opens two temporary files (of the size specified on File System File Size) and performs a read/write test.
Synchronous I/O and Asynchronous I/O	Uses the asynchronous read/write feature of the Solaris LUN driver to exercise the LUN. In read-only mode, the test sends a maximum of four asynchronous read packets, each with a random size and a random offset into the selected partition. The test then waits for all outstanding I/O activity to complete before issuing another round of packets. This process continues until the whole area is tested. In read/write mode, one write packet is issued in every four read packets as a spot check of the write operation.

T3test t3 'T3b56'	
[ Main Page ]	
Run on Host:	
Name:	
Box: T3000	
Product: SUN StorEdge-T3	
Select:	c10t60020F200000DF323D63BF1B00086F4Fc c10t60020F200000DF323D9417A0000495F7
Select Pattern Type:	critical <input type="checkbox"/>
User Defined Pattern:	0x7e7e7e7e
Check RDLS Counts:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable
Check T3 Log File:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable
W/R Device Buffer Test:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable
W/R Device Buffer Iterations:	10000
Test Media:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable
Partition:	2 <input type="checkbox"/>
Test Method:	SyncIO+AsyncIO <input type="checkbox"/>
Media Coverage(%):	1
Media Transfer Size:	32KB <input type="checkbox"/>
Test File System:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable
File System File Size:	512KB <input type="checkbox"/>
File System Transfer Size:	512B <input type="checkbox"/>
Number of passes:	1 <input type="checkbox"/>
<b>General Options:</b>	
Verbose: <input type="checkbox"/>	

**FIGURE 5-26** t3LUN Test Options Dialog Box

---

**Caution** – Before using the diagnostics package to monitor messages from a Sun StorEdge T3 or T3+ array, you must set up the array to mirror its `/syslog` messages to the host that is running the diagnostics package. The array messages can be mirrored to the `/var/adm/messages.t3` file on the host.

---

TABLE 5-21 describes the test mode options for the `t3LUN` test.

**TABLE 5-21** `t3LUN` Options

Option	Description
Select Pattern Type	Selects which pattern to run. You will choose the user, critical pattern, or all patterns.
User Defined Pattern	User-defined test pattern.
Check RDLS Counts	Monitors the read link status (RDLS) counts.
Check T3 Log File	Scans Sun StorEdge T3 and T3+ array log file for errors during test.
W/R Device Buffer Test	Enables or disables the write/read actions of the Device Buffer Test.
	<b>Note:</b> Sun StorEdge T3+ 2.1 firmware must be installed to run this test.
W/R Device Buffer Iterations	Specifies the number of times the W/R Device Buffer Test runs.
Test Media Partition	Enables or disables the Media subtest.  The partition for the Media subtest. If a partition is mounted, its mount point is appended after the partition number, such as <code>1(/usr)</code> , where <code>1</code> is the partition number and <code>/usr</code> is the mount point.
Test Method	Enables or disables the Test Method (SyncIO and AsyncIO).
Media Coverage (%)	Tests all or part of a partition (in percentages).
Media Transfer Size	The transfer size of the Media subtest.
Test File System	Enables or disables the File System subtest.
File System File Size	Creates two files, half the size of what is specified.
File System Transfer Size	The transfer size of the File System subtest.
Number of Passes	Specifies the number of times the test runs. The default is 1.

## Sun StorEdge T3 and T3+ Array Test (t3volverify)

The `t3volverify(1M)` test enables array administrators to execute manual parity checks on existing volumes. Parity checking applies only to RAID 1 and RAID 5 volumes. Check data parity by using the `t3volverify` test before performing tape backup overwrite cycles, approximately once every 30 days.

Before you run the `t3volverify` test, you must do the following:

- Run the Storage Automated Diagnostic Environment manually by following the procedure “Running the `ras_install` Script” on page 17.
- Generate a report for the device against which you are running the test (for example, Sun StorEdge T3 and T3+ arrays).

If the numbers of existing volumes do not match, an error message is displayed.

---

**Caution** – Ensure that system health is in optimal condition before running `t3volverify`. For example, make sure that no LUNs are under reconstruction, the status of all disks is zero, and other similar conditions are resolved before performing this procedure.

For more information, see the Sun StorEdge T3 and T3+ array documentation, which is listed in the section “Related Sun Documentation” on page 10.

---

**Run Test** [ Help ]

T3-ofdg T3-VolVerify

**Volverify t3 'diag208'** [ Start Test ]

[ Main Page ]

Run on Host:

Name:

Box: diag208

Product: SUN StorEdge-T3

T3_Address:	
VolumeName:	v0
Fix_Errors:	no
Rate:	16
User:	root
Password:	*****
Number of passes:	1

**General Options:**

Verbose Mode: ☒

Send Results to Email:

[ Start Test ] [ Display Command&args ]

**FIGURE 5-27** t3volverify Test Options Dialog Box

## Sun StorEdge T3+ Array Passwords

The t3volverify test requires a user ID and password for the Sun StorEdge T3+ array that is being tested.

The Storage Automated Diagnostic Environment test uses the user ID and password that you set up according to the procedure “To Add Information About a Device” on page 46.

If no password exists for the Sun StorEdge T3+ array, you can add a password by using the information found in “To Update a Device Manually” on page 51.

# Sun StorEdge 6120 Loop Test (6120loop)

The 6120loop(1M) test tests the functions of the Sun StorEdge 6120 array controller. Each controller has three sims (chips) that run the Fibre Channel loops inside and outside the array.

The 6120loop(1M) options are shown in TABLE 5-22

Ondg 6120 'T468'	
<a href="#">[ Main Page ]</a>	
Run on Host:	
Name:	
Box:	T468
Product:	SUN StorEdge-6120
IP Address:	
Controller:	Primary
Controller Sim:	Front
User Defined Pattern:	0x7e7e7e7e
Select Pattern Type:	critical
Loop Payload Size:	0xffff
Echo Payload Size:	0xdc
Loop Back Test Iterations:	1000
Number of passes:	1
User:	root
Password:	*****
<b>General Options:</b>	
Verbose Mode:	<input checked="" type="checkbox"/>
Send Results to Email:	
<b>Start Test</b> <b>Display Command&amp;args</b>	

FIGURE 5-28 6120loop Test Options Dialog Box

TABLE 5-22 describes the 6120loop Test Options dialog box.

**TABLE 5-22** 6120loop Test Options

Option	Description
IP Address	Specifies the Sun StorEdge 6120 array against which to run the test.
Controller	Specifies which controller sim (chip) will run the test. Options include: <ul style="list-style-type: none"> <li>• Primary—the default.</li> <li>• Alternate—this is not an option if the Sun StorEdge 6120 array is a standalone unit.</li> <li>• All—the test will run on both controllers, if the configuration is a partner group.</li> </ul>
Controller sim	Specifies which controller sim against which to run the test. Options include: <ul style="list-style-type: none"> <li>• Front—the default.</li> <li>• Back-A—Run the test on the primary controller</li> <li>• Back-B—Run the test on the alternate controller</li> <li>• All—The test will run on both controllers, if the configuration is a partner group.</li> </ul>
Pattern Type	Selects which data pattern to loop for the internal 10-bit, internal 1-bit, and external loopback tests. Options include user (user-defined), critical (the default), and all (all pattern types).
Loop Payload Size	Specifies the payload size for the 6120_echo test. <b>Note:</b> If this test is run on a front end external loop, the attached device must support loopback and the specified payload size. Options range from 16 bytes to 220 bytes. The default is 0xffff8.
Echo Payload Size	Specifies the payload size for the 6120_loop test. <b>Note:</b> The attached device must support Echo and the specified payload size. Options range from 16 bytes to 65528 bytes. The default is 0xdc.
Loop Back Test Iterations	Sets the number of times to loop the internal 10-bit, internal 1-bit, and external loopback tests. The default value is 1000.
Number of passes	Specifies the number of times the test will run. The default is 1. Options range from 1 to forever.
User	The user login for the Sun StorEdge 6120 array.
Password	The Sun StorEdge 6120 array telnet password enables the Storage Automated Diagnostic Environment to log into the Sun StorEdge 6120 array device. The password is required. <b>Note:</b> The user cannot change an existing Sun StorEdge 6120 array password.

---

**Note** – There is one front-end sim and two back-end sims per controller. The two back-end sims control the two back-end loops. For each sim, you can run the same tests, so most of the options listed in TABLE 5-22 are to specify on which sim the diagnostic tests will run.

---

### *Example of a 6120loop Test*

If the following conditions exist, the test will run the loopback tests on all 12 back-end loops and 4 front-end internal loops, and Echo out the external front-end loop.

- The Sun StorEdge 6120 array is a partner group.
- The partner group is attached to a Fibre Channel switch.
- You specify *All* (both) controllers and *All* Sims.
- You enable the Internal Loopback 10-bit Test, the Internal Loopback 1-bit Test, and the External Loopback Test.

# Sun StorEdge 6120 Array LUN Test (6120LUN)

The 6120LUN(1M) test verifies the functionality of Sun StorEdge 6120 array logical unit numbers (LUNs) using three subtests: Media, File System, and Synchronous I/O and Asynchronous I/O.

The File System subtest can be run only if the selected partition is mounted. An instance of the 6120LUN test is present for each volume.

TABLE 5-23 describes the 6120LUN subtests.

TABLE 5-23 6120LUN Subtests

Subtest	Description
Media	Verifies LUN media by reading data from the LUN. The Media subtest treats a LUN as one large portion of contiguous data.
File System	Verifies the LUN system's integrity. The File System subtest exercises the partition being tested to determine if it is mounted. If the partition is not already mounted or premounted, the test is blocked. The test opens two temporary files (of the size specified on File System File Size) and performs a read/write test.
Synchronous I/O and Asynchronous I/O	Uses the asynchronous read/write feature of the Solaris LUN driver to exercise the LUN. In read-only mode, the test sends a maximum of four asynchronous read packets, each with a random size and a random offset into the selected partition. The test then waits for all outstanding I/O activity to complete before issuing another round of packets. This process continues until the whole area is tested. In read/write mode, one write packet is issued in every four read packets as a spot check of the write operation.

6120test 6120		Start Test
[ Main Page ]		
Run on Host:		
Name:		
Box:		
Product: SUN StorEdge-6120		
Select:	c15t1d0s2 c15t1d1s2	
Select Pattern Type:	critical <input type="checkbox"/>	
User Defined Pattern:	0x7e7e7e7e	
Check RDLS Counts:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable	
Check Log File:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	
W/R Device Buffer Test:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	
W/R Device Buffer Iterations:	10000	
Test Media:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	
Partition:	2 <input type="checkbox"/>	
Test Method:	SyncIO+AsyncIO <input type="checkbox"/>	
Media Coverage(%):	1	
Media Transfer Size:	32KB <input type="checkbox"/>	
Test File System:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable	
File System File Size:	512KB <input type="checkbox"/>	
File System Transfer Size:	512B <input type="checkbox"/>	
Number of passes:	1 <input type="checkbox"/>	
<b>General Options:</b>		
Verbose Mode:	<input checked="" type="checkbox"/>	
Send Results to Email:		

**FIGURE 5-29** 6120LUN Test Options Dialog Box

---

**Caution** – Before using the diagnostics package to monitor messages from a Sun StorEdge 6120 array, you must set up the array to mirror its `/syslog` messages to the host that is running the diagnostics package. The array messages can be mirrored to the `/var/adm/messages.t3` file on the host.

---

TABLE 5-24 describes the test mode options for the 6120LUN test.

**TABLE 5-24** 6120LUN Test Options

Option	Description
Select Pattern Type	Selects which pattern to run. You will choose the user, critical pattern, or all patterns.
User Defined Pattern	User-defined test pattern.
Check RDLS Counts	Monitors the read link status (RDLS) counts.
Check T3 Log File	Scans Sun StorEdge T3 and T3+ array log file for errors during test.
W/R Device Buffer Test	Enables or disables the write/read actions of the Device Buffer Test.
	<b>Note:</b> Sun StorEdge T3+ 2.1 firmware must be installed to run this test.
W/R Device Buffer Iterations	Specifies the number of times the W/R Device Buffer Test runs.
Test Media	Enables or disables the Media subtest.
Partition	The partition for the Media subtest. If a partition is mounted, its mount point is appended after the partition number, such as 1(/usr), where 1 is the partition number and /usr is the mount point.
Test Method	Enables or disables the Test Method (SyncIO and AsyncIO).
Media Coverage (%)	Tests all or part of a partition (in percentages).
Media Transfer Size	The transfer size of the Media subtest.
Test File System	Enables or disables the File System subtest.
File System File Size	Creates two files, half the size of what is specified.
File System Transfer Size	The transfer size of the File System subtest.
Number of Passes	Specifies the number of times the test will run. The default is 1.

## Sun StorEdge 6120 Array Test (6120volverify)

The 6120volverify(1M) test enables array administrators to execute manual parity checks on existing volumes. Parity checking applies only to RAID 1 and RAID 5 volumes. Check data parity by using the 6120volverify test before performing tape backup overwrite cycles, approximately once every 30 days.

Before you run the 6120volverify test, you must first do the following:

- Run the Storage Automated Diagnostic Environment manually by following the procedure “Running the ras\_install Script” on page 17.
- Generate a report for the device against which you are running the test (for example, Sun StorEdge 6120 arrays).

If the number of existing volumes do not match, an error message is displayed.

---

**Caution** – Ensure that system health is in optimal condition before running 6120volverify. For example, make sure that no LUNs are under reconstruction, the status of all disks is zero, and other similar conditions are resolved before performing this procedure.

See the Sun StorEdge 6120 array documentation, which are listed in Related Documentation of the Preface of this document, for more information.

---

**Run Test** [ Help ]

**6120-loop** **6120-VolVerify**

Volverifytest 6120 [ ] **Start Test**

[ Man Page ]

Run on Host

Name: [ ]

Box: [ ]

Product: SUN StorEdge-6120

Address: [ ]

VolumeName: v0 [ ]

Fix\_Errors: no [ ]

Rate: 16 [ ]

User: root [ ]

Password: [ ]

Number of passes: 1 [ ]

**General Options:**

Verbose Mode: ☒ [ ]

Send Results to Email: [ ]

**Start Test** **Display Command&args**

**FIGURE 5-30** 6120volverify Test Options Dialog Box

## Sun StorEdge 6120 Array Passwords

The 6120volverify test requires a user ID and password for the Sun StorEdge 6120 array that is being tested.

The Storage Automated Diagnostic Environment test uses the user ID and password that you set up according to the procedure “To Add Information About a Device” on page 46.

If no password exists for the Sun StorEdge 6120 array, you can add a password by using the information found in “To Update a Device Manually” on page 51.

**TABLE 5-25** 6120volderify Test Options

Option	Description
VolumeName	The name of the volume to verify. Note that the volume name is a name internal to the array and is not seen by the host.
Fix_Errors	Corrects parity errors on RAID 5 volumes and corrects mirrored data errors on RAID 1 volumes. If Fix_Errors is <i>not</i> specified, then 6120volderify reports errors but does not correct them.  If the Fix_Errors option is specified and an error is detected, the 6120volderify command regenerates parity from the existing data on the volume.
Rate	The speed at which the 6120volderify is run. The verification rate is <i>n</i> , where <i>n</i> equals any number from 1 to 16. The default rate is 1, which has the minimum performance impact on the data host.  16 has the highest performance impact on the data host.
Password	The Sun StorEdge 6120 array telnet password enables the Storage Automated Diagnostic Environment to log into the Sun StorEdge 6120 array device. The password is required.  <b>Note:</b> You cannot change an existing Sun StorEdge 6120 array password. If no password exists, however, you can add a password using the information found in “Sun StorEdge T3+ Array Passwords” on page 181.

# Revision Checking

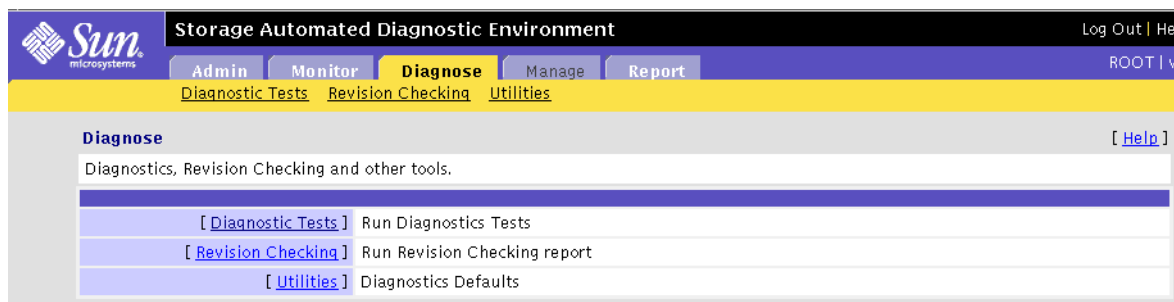
The Storage Automated Diagnostic Environment's revision checking feature checks the software, hardware, and firmware revisions of all user-selected components.

Revision checking is based on an updatable matrix, which you generate by using the PatchPro database. The matrix provides distributed revision checking across the system. Solaris operating system versions and component firmware versions are verified against the matrix.

## ▼ To Run Revision Checking Report

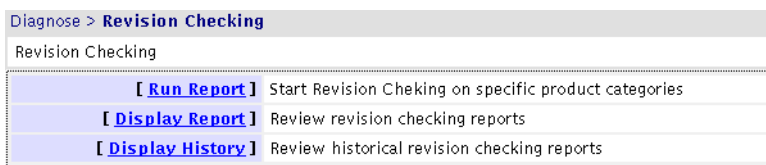
1. Click the **Diagnose** tab from the main menu.

The Diagnose window is displayed.



2. Click **Revision Checking** from the Diagnose page.

The Revision Checking window is displayed.



### 3. Click Run Report.

The Run Report window is displayed.

The screenshot shows a window titled "Run Report" with a "[ Help ]" link in the top right corner. Below the title bar is a section titled "Select options to run Revision Checking". This section contains three main input areas: "Select Host:" with a pull-down menu showing "Local" and a "GO" button; "Select Matrix:" with a pull-down menu showing "config-matrix\_3.15.001 -- Revision: 3.15.001 , created: 01/06/2003"; and "Select Module:" with a list of modules, each preceded by a checked checkbox. The modules are: Sun StorEdge 6120 array firmware/disk/loop/pcu, Sun StorEdge A5000 array Patches and Disk Firmware, Sun StorEdge D2, Host Patches, HBA Patches, McData Switch Firmware, Brocade SilkWorm Firmware ( 1Gb and 2Gb ), Sun StorEdge network FC switch-8 and switch-16, Sun StorEdge network 2Gb FC switch-8 and switch-16, Sun StorEdge T3 and T3+ array firmware/disk/loop/pcu, and Sun FC-Tape Firmware. At the bottom of the form is an "Email:" text box. Below the form are two buttons: "Run Revision Checking" and "Display Command&args".

Select options to run Revision Checking	
Select Host:	Local <input type="button" value="GO"/>
Select Matrix:	config-matrix_3.15.001 -- Revision: 3.15.001 , created: 01/06/2003 <input type="button" value="GO"/>
Select Module:	<input checked="" type="checkbox"/> Sun StorEdge 6120 array firmware/disk/loop/pcu
	<input checked="" type="checkbox"/> Sun StorEdge A5000 array Patches and Disk Firmware
	<input checked="" type="checkbox"/> Sun StorEdge D2
	<input checked="" type="checkbox"/> Host Patches
	<input checked="" type="checkbox"/> HBA Patches
	<input checked="" type="checkbox"/> McData Switch Firmware
	<input checked="" type="checkbox"/> Brocade SilkWorm Firmware ( 1Gb and 2Gb )
	<input checked="" type="checkbox"/> Sun StorEdge network FC switch-8 and switch-16
	<input checked="" type="checkbox"/> Sun StorEdge network 2Gb FC switch-8 and switch-16
	<input checked="" type="checkbox"/> Sun StorEdge T3 and T3+ array firmware/disk/loop/pcu
<input checked="" type="checkbox"/> Sun FC-Tape Firmware	
Email:	<input type="text"/>

### 4. Select a host from the pull-down menu and click GO.

The window reloads, and returns updated information for the specified host.

### 5. Select a configuration matrix from the pull-down menu.

The matrices are sorted by revision level and date, with the most recent matrix listed first.

### 6. Deselect a device or devices from the Select Module list. All the devices are selected by default.

### 7. In the email text box, type an email address or addresses to where Revision Checking results should be sent.

### 8. Click Run Revision Checking.

A confirmation message is displayed, prompting you to click Display Report to read the revision checking report.

In this example, the user requested revision checking for Brocade SilkWorm Firmware (1 Gb and 2 Gb), Sun StorEdge network FC switch-8 and switch-16 switches, and Sun StorEdge 2 Gb FC switch-8 and switch-16 switches. The email recipient received the following revision checking report.

Revision Checking report, Use Matrix: config-matrix\_3.15.001  
Run on diag230.central.sun.com

Type	Name	Status	Curr_Ver	Expect_Ver
Curr_Patch	Expect_Patch	Comments		
=====	=====	=====	=====	=====
SilkWorm	172.20.67.100	DOWNREV	v3.0.2a	v3.0.2c
	Please contact your SUN representative to install the expected level firmware			
Switch	diag187	PASS	30462	30462
Switch	110696-04 1G switch			
Switch	diag192	PASS	30462	30462
Switch	110696-04 1G switch			
Switch	diag99	UPREV	40233	e40230
	FC-SW2 compliant 1G switch			
Switch	diag140	UPREV	V1.3-52-0	V1.3-43-0
	2G switch			
Switch	diag141	UPREV	V1.3-52-0	V1.3-43-0
	2G switch			
Switch	112429-07			

## ▼ To Display Revision Checking Reports

### 1. From the Revision Checking menu, click Display Report.

**Display Report**
[\[ Help \]](#)

Review revision checking reports

Monitor Revision Report			
Host	Last Report	Status	Report List
Local	<a href="#">Display Report</a>	Done / Tue Feb 25 14:13:18 MST 2003	<input type="checkbox"/>

Save to History

### 2. Click the corresponding host's Report List check box and click Display Report.

Consistent with the email message displayed above, the Display History reports that the Brocade switch is downlevel and displays the expected version level.

**Display History**
[\[ Help \]](#)

Revision Checking report

Date: 2003-02-25 14:13:17

Host: diag230.central.sun.com Matrix-File: config-matrix\_3.15.001 Report Section: [ [UPREV=3](#) | [DOWNREV=1](#) | [PASS=2](#) | [ALL](#) ]

Report Section: SilkWorm Switch Switch\_2G

Name	Status	Current Version	Expected Version	Current Patch	Expected Patch	Comments
SilkWorm	DOWNREV	v3.0.2a	v3.0.2c			Please contact your SUN representative to install the expected level firmware

3. From the Display Report window, click the corresponding host's Report List check box and click Save To History.

The report is saved to history.

4. From the Revision Checking menu, click Display History.

A report similar to the one shown in FIGURE 5-31 is displayed.

Display History : Revision			[ <a href="#">Help</a> ]
Report List			
Host	Report	Report List	
-	<a href="#">2003-02-25_14:13:17</a>	<input type="checkbox"/>	
			<input type="button" value="Delete-Selected"/>

**FIGURE 5-31** Display Revision History

# Reports

---

The Reports section summarizes system information, including agent statistics and system thresholds, on every device that is currently supported by the Storage Automated Diagnostic Environment.

This section also displays device-specific report information on the Sun StorEdge network FC switches. In addition, troubleshooting information is presented in the form of a tool called *Service Advisor*, which displays a customizable event grid or event report based on specified criteria.

---

## General Reports

Using the SAN Traffic Report, you can display the status of each port on every switch. Using the FRU reports and Event reports, you can quickly display a summary of the status of your device and further customize the report using the filters provided.

This section contains the following topics:

- “Traffic Report” on page 197
- “FRU Report” on page 198
- “Event Reports” on page 200
- “Device Health Report” on page 202
- “Device Health Summary Report” on page 203
- “Array Performance Report” on page 204

1. Click the Report tab in the Storage Automated Diagnostic Environment main window.

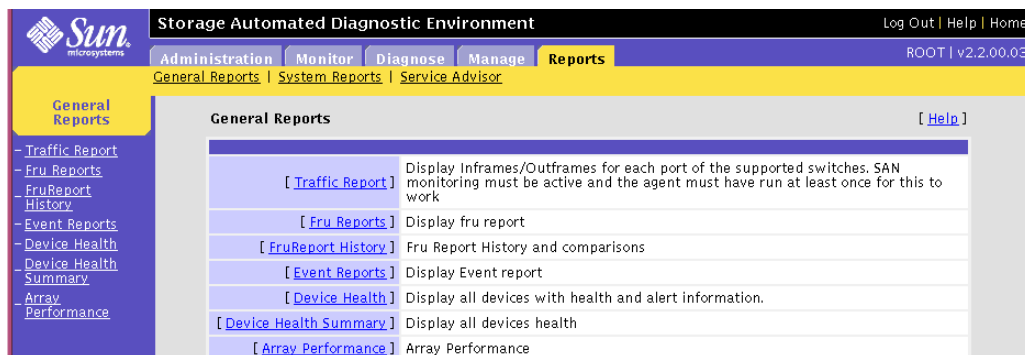


FIGURE 6-1 General Reports window

# Traffic Report

Using the SAN Traffic Report, you can display the status of each port on every switch. SAN monitoring must be active and the Storage Automated Diagnostic Environment must have run at least once for port and switch traffic information to display.

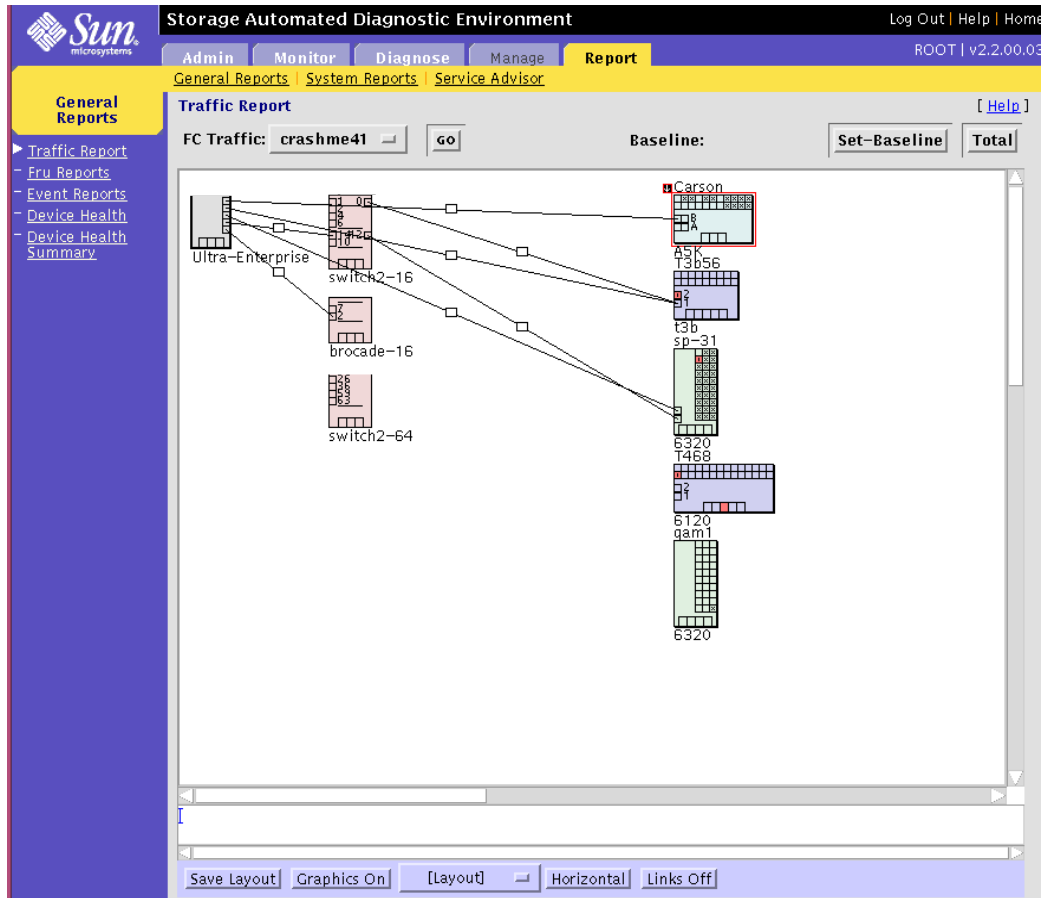


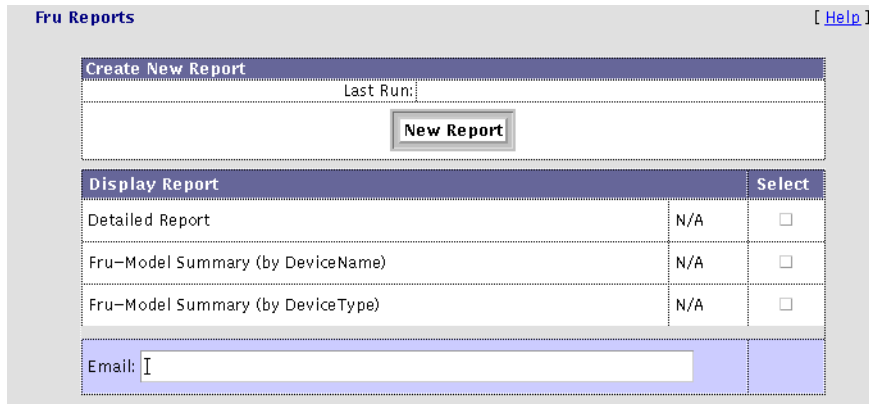
FIGURE 6-2 Traffic Report

# FRU Report

## ▼ To Generate a Customized FRU Report

1. From the General Reports menu, click FRU Reports.
2. Click New Report.

A screen like the one shown in FIGURE 6-3 is displayed.



The screenshot shows a web interface titled "Fru Reports" with a "[ Help ]" link in the top right corner. The interface is divided into two main sections: "Create New Report" and "Display Report".

The "Create New Report" section includes a "Last Run:" label and a "New Report" button.

The "Display Report" section is a table with three columns: "Display Report", "N/A", and "Select". It lists three report types, each with a checkbox in the "Select" column.

Display Report	N/A	Select
Detailed Report	N/A	<input type="checkbox"/>
Fru-Model Summary (by DeviceName)	N/A	<input type="checkbox"/>
Fru-Model Summary (by DeviceType)	N/A	<input type="checkbox"/>

Below the table is an "Email:" label followed by a text input field.

**FIGURE 6-3** FRU Reports

3. Enter an email address in the Email text field to where the FRU report will be sent.

4. **Select one report and click Display.**

- **Detailed Report**—displays a detailed list of FRU identifiers, as shown in TABLE 6-1. From the detailed FRU report, you can filter the FRU report using [device type] and [FRU type] filters.

**TABLE 6-1** Detailed FRU Report Information

FRU Identifier	Description
Name	Host name
Device	Device type
FruType	Component FRU ( for example, controller, disk, loopcard)
Fru	FRU identifier number
Vendor	FRU vendor (for example, Seagate for disks)
Model	Model number
Serial	Serial number
Revision	SUNWstads package
Status	Current device status

- **Fru-Model Summary (by DeviceName)**  
Displays the FRU type, vendor name, model number, revision number, and number of FRUs per FRU type for a selected device name (for example, sp-87-t400).
- **Fru-Model Summary (by DeviceType)**  
Displays the FRU type, vendor name, model number, revision number, and number of FRUs per FRU type for a selected device (for example, 6120).

# Event Reports

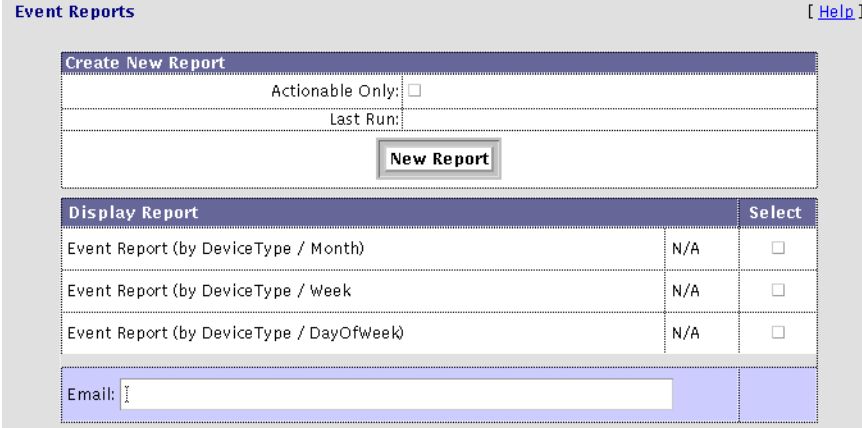
## ▼ To Generate a Customized Event Report

1. From the General Reports menu, click Event Reports.

2. Click New Report.

Click the Actionable Only checkbox if you want to display only events that are actionable.

A screen like the one shown in FIGURE 6-3 is displayed



The screenshot shows a web interface titled "Event Reports" with a "[ Help ]" link in the top right corner. The interface is divided into two main sections: "Create New Report" and "Display Report".

**Create New Report**

Actionable Only:	<input type="checkbox"/>
Last Run:	
<input type="button" value="New Report"/>	

**Display Report**

		Select
Event Report (by DeviceType / Month)	N/A	<input type="checkbox"/>
Event Report (by DeviceType / Week)	N/A	<input type="checkbox"/>
Event Report (by DeviceType / DayOfWeek)	N/A	<input type="checkbox"/>

Below the table is an "Email:" label followed by a text input field.

**FIGURE 6-4** Event Reports

3. In the Email text field, enter the email address where the Event Report should be sent.

**4. Select one report from the following options.**

- **Event Report (by DeviceType / Month)**—Displays a summary of events sorted by:
  - Device-Type
  - Year-Month (for example, 2002-11)
  - Info—Click the number link in the Info column to launch a pop-up window with a summary of information available for that device. The summary includes the date, event type, topic, and description.
  - Severity level—Warning, Error, Down—Click the number link in a severity column to launch a pop-up window with a summary of that particular severity level. The summary includes the date, event type, topic, description, and severity.
- **Event Report (by DeviceType / Week)**—Displays a summary of events sorted by:
  - Device-Type
  - Year-Week (for example, 2002-11-03)
  - Info—Click the number link in the Info column to launch a pop-up window with a summary of information available for that device. The summary includes the date, event type, topic, and description.
  - Severity level (Warning, Error, Down)—Click the number link in a severity column to launch a pop-up window with a summary of that particular severity level. The summary includes the date, event type, topic, description, and severity.
- **Event Report (by DayOfWeek)**—Displays a summary of events sorted by:
  - Device-Type
  - DayOfWeek (for example, 1 Mon)
  - Info—Click the number link in the Info column to launch a pop-up window with a summary of information available for that device. The summary includes the date, event type, topic, and description.
  - Severity level (Warning, Error, Down)—Click the number link in a severity column to launch a pop-up window with a summary of that particular severity level. The summary includes the date, event type, topic, description, and severity.

# Device Health Report

The Device Health Summary displays all devices with health and alert information.

## ▼ To Generate a Device Health Report

- From the General Reports menu, click Device Health.

A screen like the one shown in FIGURE 6-6 is displayed.

**Storage Automated Diagnostic Environment** Log Out | Help | Home  
ROOT | v2.2.00.03

Admin Monitor Diagnose Manage **Report**

General Reports | System Reports | Service Advisor

**General Reports**

- Traffic Report
- Fru Reports
- Event Reports
- ▶ **Device Health**
- Device Health Summary

**Device Health Summary** [ Help ]

**Detailed Report** [ Detail | Summary ]

+ Type	Name	Health	IP	Key	Monitoring
3x00	Brocade				On
6120					On
2003-02-24 18:04:02 'power.u2pcu2'(0x3AD from 'unknown' to 'fault-disabled') in 6120 T468 (ip= ) is now Not-Available (state changed from 'unknown' to 'fault-disabled')					
6320					On
2003-02-24 18:05:41 Slot 1 of SE2-sp-31 (ip= ) change from writeThrough to writeBehind :0:10 CacheMode on volume.u2vol1 of 6120					
6320					On
Switch2					On
2003-02-24 18:05:23 MPXIO: OFFLINE on /devices/pci@9 2000/pci@2/SUNW qlc@5/fp@0 0					
Switch2					On
a5k					On/NoReport
2003-02-24 18:04:05 Lost Communication (InBand( )) with Carson (wwn= )					
host					On
t3b					On
2003-02-24 18:05:10 'controller.u2ctr'( 'unknown' to 'ready-disabled') in T3 T3b56 (ip= ) is now Not-Available (state changed from 'unknown' to 'ready-disabled')					

Switches: 3, Storage: 5, Hosts: 1

Reload every minute Acknowledge & Clear all Alerts

FIGURE 6-5 Device Health Report






# Device Health Summary Report

## ▼ To Generate a Device Health Summary Report

The Device Report displays the health summary of all monitored devices.

- From the General Reports menu, click Device Health Summary.

A screen like the one shown in FIGURE 6-6 is displayed.

Device Health Summary					
[ Help ]					
Summary Report					
[ Detail   Summary ]					
+ Type	Name	Health	IP	Key	Monitoring
3x00	Brocade				On
6120					On
6320					On
6320					On
Switch2					On
Switch2					On
a5k					On/NoReport
host					On
t3b					On

Switches: 3, Storage: 5, Hosts: 1

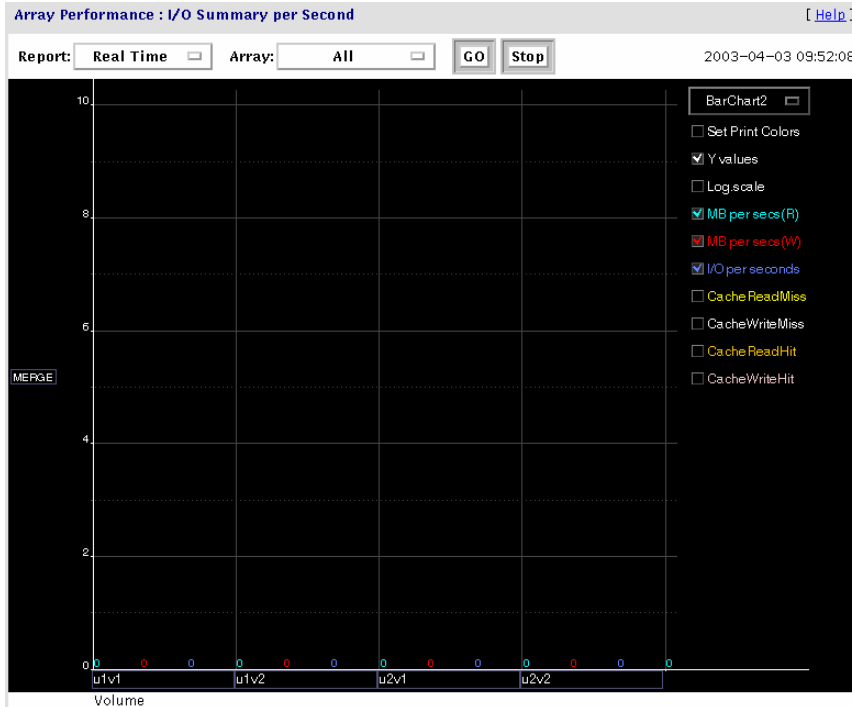
FIGURE 6-6 Device Health Summary Report

# Array Performance Report

The Array Performance Report tracks and reports the I/O of specified arrays.

## ▼ To Generate an Array Performance Report

1. From the General Reports menu, click Array Performance.



The Array Performance Report displays an I/O Summary sorted by:

- I/O Summary Report:
  - I/O Hourly Summary
  - I/O Daily Summary
  - Real Time (I/O that is occurring now)
- Array
  - An individual array
  - Combined arrays

2. Click GO to generate the customized Array Performance report.

# System Reports

The System Reports section provides information about agent statistics, thresholds, Fibre Channel counters. In addition, the device policy feature shows all the attributes used for monitoring devices and event severity.

This section contains the following topics:

- “Agent Statistics” on page 205
- “Email/Events Maximums” on page 206
- “Thresholds List” on page 207
- “Switch Data” on page 208
- “Event and Severity Mapping” on page 209

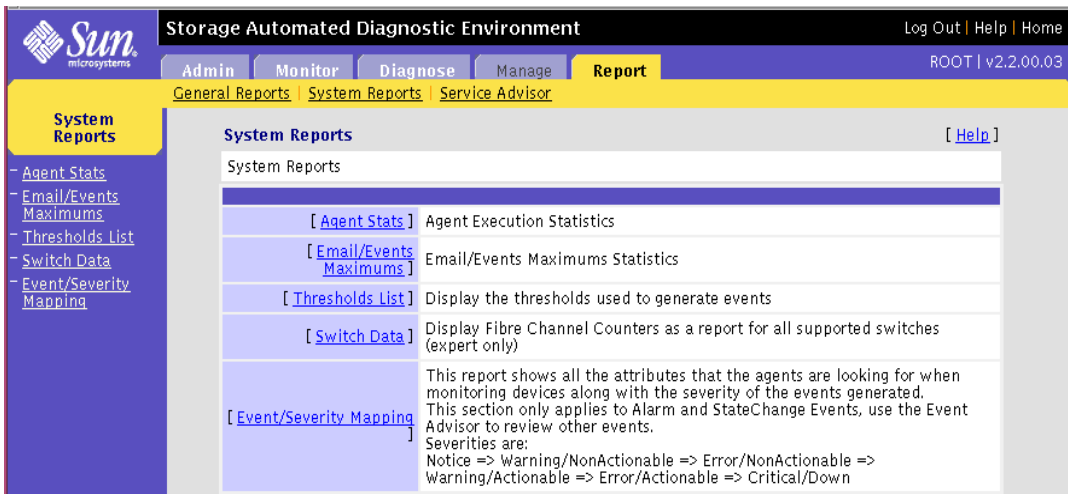


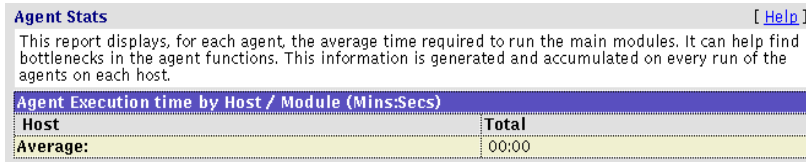
FIGURE 6-7 System Reports

## Agent Statistics

Using the Agent Stats functionality, you can determine the average time required to run the modules. The information is generated on every run of Storage Automated Diagnostic Environment’s host.

## ▼ To Check Storage Automated Diagnostic Environment Statistics

- Click **Agent Stats** in the **System Reports** window.



The screenshot shows a window titled "Agent Stats" with a "[ Help ]" link in the top right. Below the title bar is a paragraph of text explaining the report. Underneath is a table titled "Agent Execution time by Host / Module (Mins:Secs)". The table has two columns: "Host" and "Total". The "Host" column contains the text "Average:" and the "Total" column contains "00:00".

Agent Execution time by Host / Module (Mins:Secs)	
Host	Total
Average:	00:00

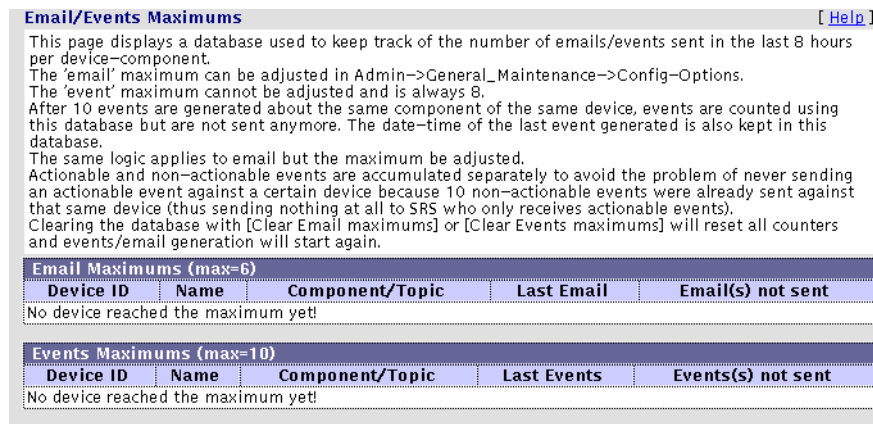
**FIGURE 6-8** Agent Statistics

The execution time for each agent, measured in minutes and seconds, is displayed.

## Email/Events Maximums

The Email/Events Maximums page, shown in FIGURE 6-9, displays the database that keeps track of the number of emails and events sent per device or component.

The maximum number of emails sent can be adjusted using the functionality in “Configuration Options” on page 74. The maximum number of events cannot be adjusted and is always 8.



The screenshot shows a window titled "Email/Events Maximums" with a "[ Help ]" link in the top right. Below the title bar is a paragraph of text explaining the database. Underneath are two tables. The first table is titled "Email Maximums (max=6)" and has columns: "Device ID", "Name", "Component/Topic", "Last Email", and "Email(s) not sent". The second table is titled "Events Maximums (max=10)" and has columns: "Device ID", "Name", "Component/Topic", "Last Events", and "Events(s) not sent". Both tables show "No device reached the maximum yet!" in the "Device ID" column.

Email Maximums (max=6)				
Device ID	Name	Component/Topic	Last Email	Email(s) not sent
No device reached the maximum yet!				

Events Maximums (max=10)				
Device ID	Name	Component/Topic	Last Events	Events(s) not sent
No device reached the maximum yet!				

**FIGURE 6-9** Email/Events Maximums

# Thresholds List

The Thresholds window displays the thresholds that are used to monitor entries related to I/O interfaces in the `/var/adm/messages` file.

## ▼ To List Threshold Rules

- **Click Thresholds List in the System Reports window**
  - Frequency is the number of alerts and hours required to generate a new message.
  - Quiet is the quiet time in between messages, which is used to avoid sending too many messages at once.

Thresholds					
	Name	Frequency	Quiet	Type	Description
<b>driver</b>					
	driver.SF_OFFLINE	10 / 24hours	1hours	Warning	socal/ifp Offline
	driver.SF_OFFLALERT	15 / 24hours	1hours	Error	socal/ifp Offline
	driver.SCSI_TRAN_FAILED	10 / 4hours	1hours	Warning	SCSI transport failed
	driver.SCSI_ASC	10 / 4hours	1hours	Warning	scsi
	driver.SCSI_TR_READ	10 / 4hours	1hours	Warning	scsi READ
	driver.SCSI_TR_WRITE	10 / 4hours	1hours	Warning	scsi WRITE
	driver.SSD_WARN	5 / 24hours	1hours	Warning	SSD Warning
	driver.SSD_ALERT	20 / 24hours	1hours	Error	SSD Alert
	driver.PFA	1 / 24hours	1hours	Error	Predictive Failure
	driver.SF_CRC_WARN	10 / 24hours	1hours	Warning	CRC Warning
	driver.SF_CRC_ALERT	15 / 24hours	1hours	Error	CRC Alert
	driver.SFOFFTOWARN	5 / 24hours	1hours	Warning	Offline Timeouts
	driver.SF_DMA_WARN	1 / 24hours	1hours	Warning	SF DMA Warning
	driver.SF_RESET	10 / 24hours	1hours	Warning	SF Reset
	driver.ELS_RETRY	10 / 24hours	1hours	Warning	ESL retries
	driver.SF_RETRY	10 / 24hours	1hours	Warning	SF Retries

FIGURE 6-10 Thresholds List

# Switch Data

Use the Switch Data functionality to view the values of Fibre Channel counters in a report format.

1. Click **Switch Data** in the **General Reports** window.
2. Select a switch from the **Select Switch** pull-down menu and click **Display**.

After you have set the Set-Baseline field, the Switch FC Data report will display counter increments and the start time and the duration of the baseline, as shown in FIGURE 6-11.

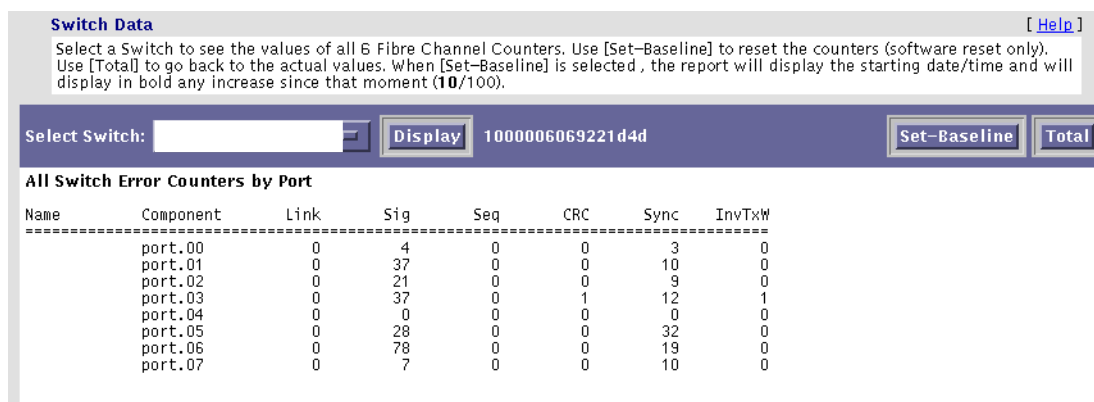


FIGURE 6-11 Switch Data Report

3. Click **Total** to erase the values saved by **Set-Baseline** and to display the total Fibre Channel counters.

# Event and Severity Mapping

The Event and Severity Mapping page displays every device attribute the agent looks for when monitoring the devices.

The Event and Severity Mapping Report displays the monitored devices on which you can click to gather event details.

Event/Severity Mapping [\[ Help \]](#)

This report shows all the attributes that the agents are looking for when monitoring devices along with the severity of the events generated.

This section only applies to Alarm and StateChange Events, use the Event Advisor to review other events.

Severities are:  
Notice => Warning/NonActionable => Error/NonActionable => Warning/Actionable => Error/Actionable => Critical/Down

[\[ Summary | Detail \]](#)

Device	Attribute Name	Value	Severity	Actionable
<a href="#">3310</a>	Sun 3310/3510			
<a href="#">6120</a>	StorEdge 6120			
<a href="#">A1000</a>	Sun A1000			
<a href="#">A3500fc</a>	Sun A3500FC			
<a href="#">A5k</a>	Sun A5000			
<a href="#">Brocade</a>	Brocade switch			
<a href="#">D2</a>	Sun D2			
<a href="#">Host</a>	Host			
<a href="#">Lun</a>				
<a href="#">Mcdata</a>	McData switch			
<a href="#">Sve2</a>	Sun SVE			
<a href="#">Switch</a>	Sun Switch			
<a href="#">Switch2</a>	Sun Switch2			
<a href="#">T3</a>	Sun T3			
<a href="#">Tape</a>	FC-Tape			
<a href="#">V880disk</a>	Sun V880 Disk			
<a href="#">Ve</a>	Vicom VE			

FIGURE 6-12 Event and Severity Mapping Report

The Event and Severity Mapping Detail Report, shown in FIGURE 6-13, displays the severity of each event and whether or not the event is actionable.

For more detailed information about events and recommended action, refer to “Service Advisor” on page 211.

Event/Severity Mapping

[ Help ]

This report shows all the attributes that the agents are looking for when monitoring devices along with the severity of the events generated. Severities are:  
Notice => Warning/NonActionable => Error/NonActionable => Warning/Actionable => Error/Actionable => Critical/Down

[ Summary   Detail ]				
Device	Attribute Name	Value	Severity	Actionable
6120	StorEdge 6120			
6120	alarmEvent	cacheMode	Error	No
		initiators	Warning	No
		lunPermission	Warning	No
		system_reboot	Warning	No
		sysvolslice	Warning	No
		time_diff	Warning	No
		volCount	Warning	No
		volOwner	Warning	Yes
	fruDiskPort1State	notReady	Error	Yes
		ready	Notice	No
	fruDiskPort2State	notReady	Error	Yes
		ready	Notice	No
	fruLoopCable1State	installed	Notice	No
		notInstalled	Warning	No
	fruLoopCable2State	installed	Notice	No
		notInstalled	Warning	No
	fruPowerBatState	fault	Error	Yes
		normal	Notice	No
		off	Error	Yes
		refreshing	Notice	No
	fruPowerFan1State	unknown	Error	Yes
		fault	Error	Yes
		normal	Notice	No
		off	Error	Yes
		refreshing	Notice	No

FIGURE 6-13 Event and Severity Mapping Detail Report

---

# Service Advisor

The Service Advisor shows all the actionable and non-actionable events the Storage Automated Diagnostic Environment generates. It lets you customize an event grid by selecting device type, FRU-level components, event type, and the type of output (report, grid, or .pdf format). In all cases, the following information is displayed:

- Category (device type)
- Component (FRU-level)
- Event Type
- Severity Level
  - green—an error has occurred
  - yellow—A serious error has occurred.
  - red—A serious error has occurred that requires your immediate attention.
  - down—A fatal, nonrecoverable error has occurred and the device is offline or unreachable.
- Diagnostic information and recommended action, if applicable.

## ▼ To Access the Service Advisor

1. Click **Service Advisor** from the **Report** menu.

The Service Advisor window is displayed.



FIGURE 6-14 Service Advisor Window

## 2. To customize an event report, click Event Advisor.

You can view the events at a device type level by selecting from the Category menu.

Select a component to isolate events to component level (for example, 'backplane'). 'All' is the default.

Select an event type to narrow your event list. 'All' is the default.

Select the ReportFormat checkbox to view your events in a detailed report format.

Click GO.

**StorADE 2 Event Advisor** [\[ Help \]](#)

Select a Category/Component/EventType and type [GO] to limit the report. Click on the Columns headers to change the sort. Check [ReportFormat] to display a Report format. Click Info/Action to Review.

Category: 3310 (Sun 3310/3510) Component: All EventType: All ReportFormat ☐ **GO**

+ Cat	Code	Comp.	EventType	Sev.	Action	Description
3310	18.20.116	cpu	LogEvent		Y	Error(s) found in logfile: /var/adm/messages.3310 on msp (id=830bfa3ff)
3310	18.20.90	array_error	LogEvent		Y	[ Info/Action ] Fan status has been changed
3310	18.3.19	fan	AlarmEvent		Y	The state of 'info.status' on [enclosure] changed from 'Online' to 'Offline'
3310	18.3.16	enclosure	AlarmEvent		Y	[enclosure] (wwn=204000c0ff000003): Channel 0 is missing
3310	18.3.120	channel	AlarmEvent		Y	Firmware_version changed from [Old_Version] to [New_Version]
3310	18.3.117	Revision	AlarmEvent		Y	Revision changed from [Old_Version] to [New_Version]
3310	18.3.72	part	AlarmEvent		Y	[ Info ] Total Partitions in logical drive has been changed
3310	18.3.37	power	AlarmEvent		Y	[ Info/Action ] Power status has been changed
3310	18.3.69	raid_level	AlarmEvent			[ Info ] Raid level has been changed on logical.0 from 5 to 0
3310	18.3.70	size	AlarmEvent			[ Info ] Effective size has been changed on part.1 from 38952MB to 68952MB
3310	18.3.51	temperature	AlarmEvent		Y	[ Info/Action ] Temperature status has been changed
3310	18.3.53	volume	AlarmEvent			[ Info ] Total Partitions in logical drive has been changed
3310	18.11.21	ib	Comm_EstablishedEvent			[ Info ] Communication regained (InBand([Host_Name])) with [Array_Name] ([IP_Address]) ( last reboot was 2001-09-27 15:22:00)

FIGURE 6-15 Event Advisor

## 3. To obtain more information, click the [Info/Action] link from the Description field on the Event Advisor.

A pop-up menu displays the information for that event and the action recommended for problem resolution.

**Note** – The Storage Automated Diagnostic Environment Event Advisor is intended to be used interactively, but it is also printable. To see all details about each event, run the Event Advisor with the ReportFormat checkbox enabled (see FIGURE 6-15).

If you do not run the Event Advisor with the ReportFormat checkbox enabled, you must click the [Info/Action] details link, one event at a time.

4. To view the events in a detailed report format, check the ReportFormat box after you have specified your parameters and click GO.

Event Advisor <span style="float: right;">[ Help ]</span>						
Category:		Component:		EventType:		ReportFormat
6120		All		All		GO

+ Cat	Code	Comp.	EventType	Sev.	Action	Description
6120	21.4.41	power.temp	AlarmEvent+	-		The state of power.u1pcu1.PowTemp on diag213 (lp=xxx.20.67.213) is Normal
6120	21.3.48	sysvolslice	AlarmEvent	WRN	Y	Volume Slicing is now off!
<p>The vol slice feature is possible in 6120+ firmware 2.1 and above. This option enables volume slicing, up to 16 lun per single 6120 or partner pair. This also enables lun masking (HBA Zoning) features.</p> <p><b>Action:</b> The option enable_volslice is disabled by default. To activate the feature type 'sys enable_volslice on' from the 6120 command line. Notification regarding slice and LUN changes will occur when changes are made to volume slices and lun masks. Volume slice or LUN mask changes which were not initiated by a user could indicate a potential problem. Please connect to the storage device or the appropriate management software to validate the system status.</p>						
6120	21.5.76	volOwner	AlarmEvent-	WRN	Y	Volume owner for u1vol1 changed from 'u1' to 'u2'
Volume or controller failover has occurred.						
6120	21.3.79	lunPermission	AlarmEvent	WRN		The access permission has changed for LUN 01 from old_access to new_access.
6120	21.3.78	initiators	AlarmEvent	WRN		initiator changed from old_value to new_value
6120	21.5.14	disk.port	AlarmEvent-	ERR	Y	The state of disk.u1d1.Port1State on 6120 612000 changed from 'OK' to 'failed'
<p>The 6120 has reported that one port of a dual-ported disk has failed</p> <p><b>Action:</b> 1. Telnet to affected 6120 2. Verify disk state in 'fru stat', 'fru list' and 'vol stat'</p> <p>Drive Status Messages:            Value Description            0 Drive mounted            2 Drive present            3 Drive is spun up            4 Drive is disable            5 Drive has been replaced            7 Invalid system area on drive            9 Drive Not Present            D Drive disabled; drive is being reconstructed            S Drive Drive Substituted</p> <p>3. Replace disk if necessary</p>						
6120	21.5.25	interface.loopcard.cable	AlarmEvent-	ERR	Y	The state of loopcable.u1l1.CableState changed from 'OK' to 'failed'

## Event Advisor—Customized Report



# Storage Automated Diagnostic Environment Help

---

This chapter explains the GUI online help and the command-line utilities help associated with the Storage Automated Diagnostic Environment. The Help option links are displayed in FIGURE 7-1.

This chapter explains the online help available from the GUI, and the command-line man pages associated with the Storage Automated Diagnostic Environment.

This chapter contains the following topics:

- “Online Help Topics” on page 215
- “Admin Overview” on page 217
- “Architecture” on page 218
- “Command Line Utilities” on page 221

---

## Online Help Topics

The Storage Automated Diagnostic Environment software includes a series of HTML pages viewable through a web browser. Each page provides you with information about a specific topic.

### ▼ To Access the Online Help

1. **Click the Help link in the upper right hand corner of the Storage Automated Diagnostic Environment main window.**

The Help Content window is displayed.

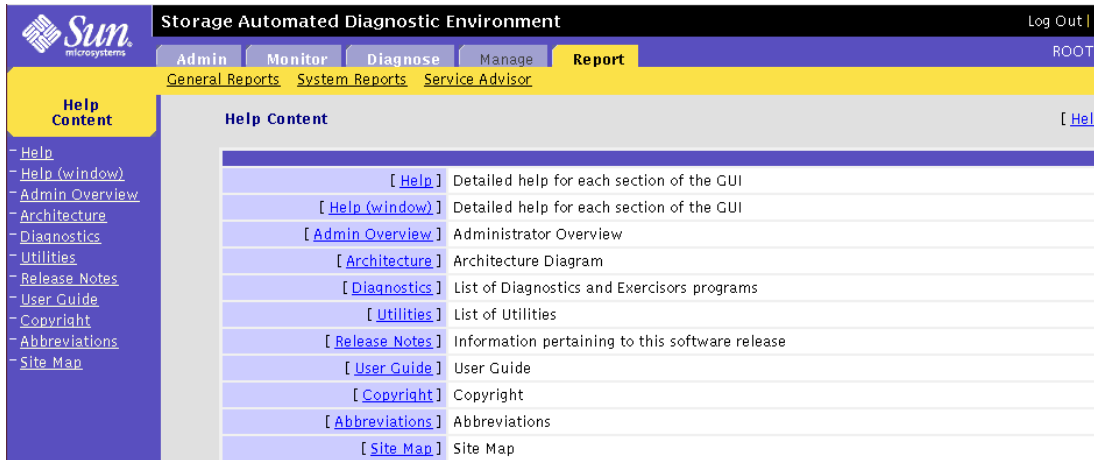


FIGURE 7-1 Help Content

## 2. Click the Help link on the Help Content menu.

The Help Summary window is displayed.



FIGURE 7-2 Storage Automated Diagnostic Environment GUI Online Help

## 3. Click the topic for which you need information from the Help list.

---

# Admin Overview

This detailed administration overview provides valuable and comprehensive information about the following:

- The Storage Automated Diagnostic Environment
- The StorADE Installation Life Cycle
- Monitoring Strategy
- Monitoring Cycle
- Event Life Cycle
- Information about the Alternate Master
- Product Footprint
- Security Options
- Information about Sun StorEdge 3900 and 6900 series and 6320 and 6320SL system solutions.
- Notification Providers
- Site Map
- Product Abbreviation List
- Commands used for monitoring
- Certificate Details
- Event List

To Access the Admin Overview

**1. Click Admin Overview on the Help menu.**

The Storage Automated Diagnostic Environment 2.x (StorADE) Administration Overview is displayed.

**2. Scroll until you find the information you are interested in learning more about.**

The Admin Overview is a printable file.

# Architecture

The following block diagram represents the product architecture and shows conceptually how information flows through the Storage Automated Diagnostic Environment software.

## ▼ To Access the Architecture Diagram

1. Click **Architecture** on the **Help** menu.

The Storage Automated Diagnostic Environment Architecture Diagram is displayed.

2. For details of the component, move your mouse over the section within the diagram (or see TABLE 7-1).

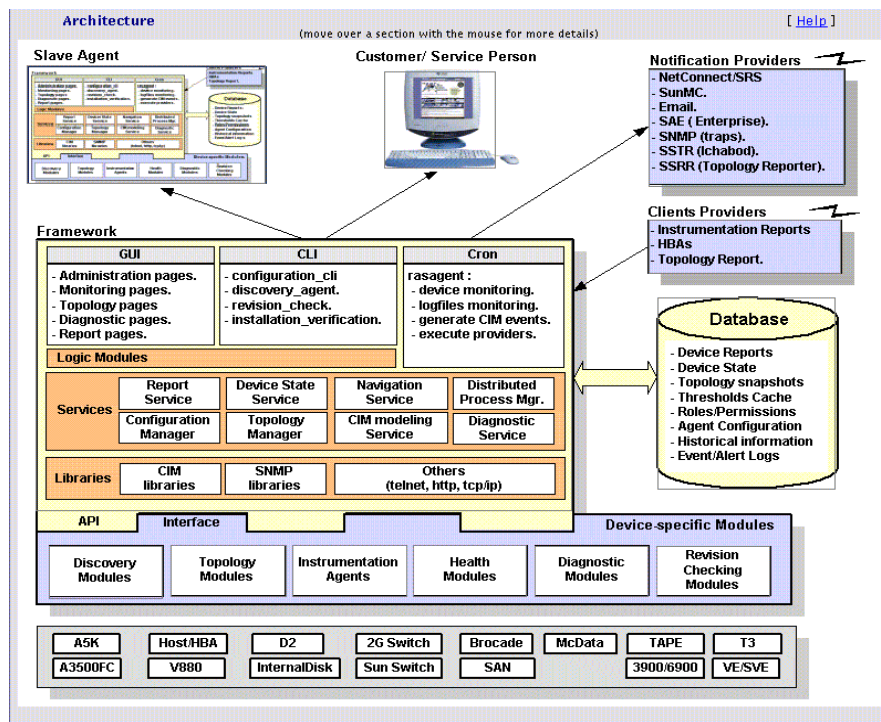


FIGURE 7-3 Storage Automated Diagnostic Environment Architecture Diagram

**TABLE 7-1** Storage Automated Diagnostic Environment Component Definitions

Component Name	Component Definition
Slave Agent	<p>Each slave agent includes the same functionality as the master agent:</p> <ul style="list-style-type: none"> <li>• Tests</li> <li>• Instrumentation</li> <li>• Event Generation</li> </ul> <p>Slave agents are scheduled from the cron. They generate CIM events that are transmitted to the Master.</p>
Notification Providers	<ul style="list-style-type: none"> <li>• HTTP—Sends HTTP calls to an HTTP server and transfers CIM data in the appropriate format. Internal to Sun only.</li> <li>• SSTR —The SSTR Provider sends events to the Sun StorEdge Enterprise Storage Manager 1.0 Topology Reporter console.</li> <li>• NetConnect—A common information model (CIM) provider that requests information, converts the information to the appropriate format, and relays it to NetConnect.</li> <li>• SRS—The Sun Remote Services (SRS) provider accepts and sends information in xml format.</li> <li>• SNMP Traps—Enables the Storage Automated Diagnostic Environment to send traps for all actionable events that occur during monitoring to external management systems.</li> <li>• SSRR—Uses modem technology with Unix-to-Unix Communication Protocol (UUCP). Sun StorEdge Remote Response (SSRR) software is required on the host and must be configured accordingly.</li> <li>• <i>Local Provider (Email)</i>—The local provider can email events to administrators. Events can be filtered per administrator using event-type, severity level, or device-type filters.</li> </ul>
Browser UI	<p>The user interface (UI) uses HTML browsers. Using the UI, administrators can configure the agents, monitor storage devices, review the topology, execute diagnostic tests, and verify the configuration.</p>
Storage Automated Diagnostic Environment Services	<p>The services are the core of the framework. They provide logic and persistence to all agents, monitors, and user interface functions. The services include:</p> <ul style="list-style-type: none"> <li>• A database of current instrumentation reports</li> <li>• All CIM schemas (.MOF files) required to generate events</li> <li>• The current configuration of all agents</li> <li>• Topology functions</li> <li>• The current state of each storage device</li> <li>• A database of diagnostic processes</li> <li>• Logic and persistence for timers, threshold, transitions, and revision matrix</li> </ul>

**TABLE 7-1** Storage Automated Diagnostic Environment Component Definitions

Health Monitors	Health monitors read instrumentation reports and generate CIM events that are stored and sent to Notification providers. Events are generated using a cache database that stores previous reports, timers, and thresholds.
Diagnostic Modules	Diagnostic tests can be executed locally or remotely to test different components.
Instrumentation Agents	Instrumentation agents probe storage devices and monitor log files to generate detailed reports on the state of each component of the device. Agents are scheduled to execute by crons. Instrumentation reports are stored and compared by the health monitors to generate CIM events.

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# Command Line Utilities

The explanations of the various diagnostic tests and functionality associated with the Storage Automated Diagnostic Environment are available from the command line.

## Diagnostic Test Man Pages

The Storage Automated Diagnostic Environment diagnostics tests are defined in TABLE 7-2 and are located in `/opt/SUNWstade/Diags/bin`. See the man pages for more detail.

**TABLE 7-2** Storage Automated Diagnostic Environment Diagnostic Commands

Diagnostic Command	Command Description
<code>a3500fctest(1M)</code>	Verifies the functionality of the Sun StorEdge A3500FC array using the two subtests provided
<code>a5ksestest(1M)</code>	Provides configuration verification, fault isolation, and repair validation of Sun StorEdge A5200 array
<code>a5ktest(1M)</code>	Verifies the functionality of the Sun StorEdge A5200 array
<code>brocadetest(1M)</code>	Verifies the functionality of the Brocade Silkorm switch ports
<code>d2disktest(1M)</code>	Verifies the functionality of the internal Sun StorEdge D2 array disk
<code>daksestest(1M)</code>	Tests the Sun Fire 880 FC-AL disk backplane.
<code>daktest(1M)</code>	Verifies the functionality of the internal Fibre Channel disk
<code>fcdisktest(1M)</code>	Verifies the functionality of the Sun Fire 880 FC-AL disk
<code>fctapetest(1M)</code>	Tests the Fibre Channel tape drive
<code>ifptest(1M)</code>	Tests the functionality of the Sun StorEdge PCI FC-100 host adapter board.
<code>linktest(1M)</code>	Tests two end points of a Fibre Channel link segment and assists in FRU isolation of the link segment. This test is typically run when the FCAL topology indicates a problem.
<code>qlctest(1M)</code>	Tests the functions of the Sun StorEdge PCI 1 Gbit and 2 Gbit Single and Dual and cPCI Dual Fibre Channel host adapter board.
<code>socaltest(1M)</code>	Validates and performs fault isolation on the Sun StorEdge SBus FC-100 host adapter board.

**TABLE 7-2** Storage Automated Diagnostic Environment Diagnostic Commands

<code>switchtest(1M)</code>	Diagnoses the Sun StorEdge network FC switch-8 and switch-16 switches
<code>switch2test(1M)</code>	Diagnoses the Sun StorEdge network 2 Gbit FC switch-16
<code>t3LUN(1M)</code>	Verifies the functionality of the Sun StorEdge T3 and T3+ array
<code>t3ofdg(1M)</code>	Tests all of the FRUs within the Sun StorEdge T3 and T3+ array enclosure. The <code>t3ofdg</code> is an out-of-band diagnostic test for Sun StorEdge T3 and T3+ array LUNs attached through an Ethernet connection.
<code>t3volverify(1M)</code>	Out-of-band diagnostic for T3 and T3+ LUNs attached through an Ethernet connection. <code>t3volverify</code> executes the volume verify function on the selected Sun StorEdge T3 and T3+ array.
<b>Diagnostic Command</b>	<b>Command Description</b>
<code>6120loop(1M)</code>	Tests the functions of the Sun StorEdge 6120 array controller and the sims that run the Fibre Channel loops inside and outside the array.
<code>6120volverify(1M)</code>	Out-of-band diagnostic for 6120 LUNs attached through an Ethernet connection. <code>6120volverify</code> executes the volume verify function on the selected Sun StorEdge 6120 array.

# Storage Automated Diagnostic Environment Agent Utilities

The Storage Automated Diagnostic Environment agent utilities that are defined in TABLE 7-3 are located in the `/opt/SUNWstade/bin` directory. See the man pages for more detail.

**TABLE 7-3** Storage Automated Diagnostic Environment Agent Commands

Utilities Command	Command Description
<code>checkcron(1M)</code>	Verifies whether the Storage Automated Diagnostic Environment main program is entered in the <code>crontab(1M)</code> file
<code>clearcache(1M)</code>	Clears the Storage Automated Diagnostic Environment cache files that contain the current report for each device being monitored
<code>disk_inquiry(1M)</code>	Identifies devices on the data path that are using SCSI commands
<code>rasagent(1M)</code>	Calls the modules for network storage devices supported by Storage Automated Diagnostic Environment. It is automatically executed by <code>cron</code> , or it can be run manually from the command line.
<code>ras_admin(1M)</code>	Performs common Storage Automated Diagnostic Environment administrative tasks from the command line interface (CLI).
<code>ras_fccheck(1M)</code>	Checks available Fibre Channel counters to verify link integrity.
<code>ras_install(1M)</code>	Sets up the HTTP service, adds a <code>cron</code> , and registers with the master agent during a slave install. It must be run manually upon executing the <code>pkgadd</code> command.
<code>ras_revcheck(1M)</code>	Checks the hardware, software, and firmware revision levels.
<code>sanbox(1M)</code>	Displays Fibre Channel switch information
<code>testt3(1M)</code>	Retrieves tokens from a Sun StorEdge T3, T3+, and 6120 array. It verifies whether the IP address used is correct and whether the IP address points to a Sun StorEdge T3 and T3+ array that can provide tokens.



# Glossary

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<b>alarm</b>	A message with an attached level of severity
<b>array</b>	A disk subsystem, comprised of multiple disk drives, that functions as a single large, fast, super-reliable device. Arrays are designed to provide high performance, high availability, and increased storage capacity.
<b>DAS</b>	Direct Access Storage
<b>diagnosis</b>	A process to determine the fault cause and corrective action
<b>diagnostic</b>	A test to uncover faults
<b>DMA</b>	Direct Memory Access. The transfer of data directly into memory without supervision of the processor. The data is passed on the bus directly between the memory and another device.
<b>domain</b>	<p>On the Internet, a domain is part of a naming hierarchy. An Internet domain consists of a sequence of names (labels) separated by periods (dots). For example, <code>eng.sun.com</code>.</p> <p>In RAS, a domain is a logical partition of system components, including CPUs, memory, and I/O devices. Each domain supports a separate Solaris image.</p>
<b>Ethernet hub</b>	Hardware used to network computers together. Ethernet hubs serve as a common wiring point, enabling information to flow through one central location to any other computer in the network.
<b>EOT</b>	End of Tape
<b>fault coverage</b>	The percentage of faults detected against all possible faults or against all faults of a given type.
<b>fault detection</b>	The ability of a diagnostic to uncover a fault, given that a fault exists.
<b>FC-AL</b>	Fibre Channel-Arbitrated Loop. FC-AL is implemented as either a loop or a fabric. A loop can contain up to 126 nodes, accessible through only one or two servers.

<b>Fibre Channel</b>	A cost-effective gigabit communications link deployed across a wide range of hardware. Commonly used for SAN configurations.
<b>fibre channel switch</b>	A networking device that can send packets directly to a port associated with a given network address.
<b>FRU</b>	Field Replaceable Unit. An assembly that a manufacturer replaces on failure of an assembly component.
<b>GBIC</b>	Gigabit Interface Converter. A hot-swappable input/output (I/O) device that plugs into a Gigabit Ethernet port or Fibre Channel.
<b>HBA</b>	Host Bus Adapter. A controller board connecting the I/O expansion bus to the fibre channel subsystem.
<b>HTTP</b>	HyperText Transfer Protocol
<b>IP</b>	Internet Protocol
<b>LUN</b>	Logical Unit Number. The major and minor device numbers make up the logical unit numbering sequence for a particular device connected to a computer.
<b>NSCC</b>	Sun's Network Storage Command Center
<b>PCI</b>	Peripheral Component Interconnect. This is a high-performance 32-bit or 64-bit local bus that provides a host-processor-independent interface and an interconnect mechanism between highly integrated peripheral components.
<b>RAS</b>	Reliability, Availability, and Serviceability
<b>RDLS</b>	Read Link Status
<b>remote monitoring</b>	The ability to monitor the functionality and performance of a hardware system from a location other than where the hardware resides.
<b>remote support</b>	The ability to directly or indirectly troubleshoot, diagnose, and service computer hardware from a location other than where the hardware resides.
<b>RSS</b>	Remote Support Service. Software delivered with the service processor bundle.
<b>SAN</b>	Storage Area Network
<b>SCSI</b>	Small Computer Systems Interface. An industry standard for connecting disk and tape devices to a workstation.
<b>SES</b>	SCSI Enclosure Services device. An interface to SCSI enclosure services devices. These devices sense and monitor the physical conditions within an enclosure, as well as enable access to the status reporting and configuration features of the enclosure (such as indicator LEDs on the enclosure).
<b>SRS</b>	Sun Remote Services (SRS) is Sun's portfolio of services, comprised of SRS Event Monitoring and SRS NetConnect, customizable Sun storage self-management, and 24/7, proactive, mission-critical system monitoring by Sun.

<b>storage service processor</b>	Sun's rack-mountable Netra X1 server, preconfigured with advanced remote management and monitoring capabilities. The service processor monitors the SAN and provides service and support access for Sun engineers.
<b>T3 and T3+ Array</b>	Sun's hardware-based array, featuring Fibre Channel architecture that provides the basis for modular network storage.
<b>UUCP</b>	UNIX-to-UNIX Communication Protocol. UUCP is a protocol that transfers files, news, and mail, and executes remote commands between UNIX machines.



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