



# Storage Automated Diagnostic Environment User's Guide

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# Contents

---

How This Book Is Organized	xxii
Using UNIX Commands	xxiii
Typographic Conventions	xxiii
Shell Prompts	xxiv
Product Abbreviations	xxiv
Related McData Documentation	xxv
▼ To Access McData documentation	xxv
Related Brocade Documentation	xxvi
▼ To Access Brocade documentation	xxvi
Related Sun Documentation	xxvii
▼ To Access Online Sun Documentation	xxviii
Sun Welcomes Your Comments	xxix
<b>1. Overview</b>	<b>1</b>
What is the Storage Automated Diagnostic Environment?	1
Changes from Previous Release	2
How the Storage Automated Diagnostic Environment Works	3
Storage Automated Diagnostic Environment Master and Slave Agents	4
Monitoring Devices Using the Storage Automated Diagnostic Environment	5

Storage Automated Diagnostic Environment Functions	5
Diagnostic Functionality	6

## 2. **Installing and Starting** SUNWstade 7

Installation Checklist 8

Host Requirements 10

Example Configurations 10

Product Hints 11

Installing SUNWstade 12

Installation Notes 12

▼ To Install SUNWstade 13

▼ To Verify the Installation 15

Getting the Storage Automated Diagnostic Environment Ready 15

▼ To Set the Environment Variables 15

Configuration Files 16

`/opt/SUNWstade/DATA/rasagent.conf` 16

`/etc/hosts` 16

Sun StorEdge 3900 and 6900 Series Configuration 16

Sun StorEdge 3900 and 6900 Series Upgrades 18

▼ When To Run the `ras_install` Script 20

▼ To Start the Storage Automated Diagnostic Environment Services on the Master 20

Installing Distributed Agents (Slaves) 21

Prerequisites 22

▼ To Set Up a Slave 22

▼ To Install a Patch 23

Upgrading or Removing SUNWstade 24

▼ To Upgrade the Storage Automated Diagnostic Environment Package 24

▼ To Remove the SUNWstade Package 25

Launching Storage Automated Diagnostic Environment	26
▼ To Launch the Storage Automated Diagnostic Environment GUI	27
<b>3. Maintaining the Storage Automated Diagnostic Environment</b>	<b>29</b>
▼ To Access the Admin Window	32
General Maintenance	35
▼ To Maintain Site Information	36
Setting your Browser Window	37
▼ To Maintain Hosts	38
Push Slave Configs	40
▼ To Update the Master Configuration	41
▼ To Add a New Slave	44
Device Discovery	47
▼ To Access the Device Discovery Window	47
▼ To Discover a Sun StorEdge 3900 or 6900 Series Cabinet	49
▼ To Search the LAN for Sun StorEdge Devices Using Subnet Discovery	51
▼ To Set Up Sun StorEdge T3 and T3+ Array Message Monitoring	53
▼ To Maintain Devices	53
▼ To Access the Maintain Device Window	54
▼ To Add Information About a Device	55
▼ To Add a Device Manually	56
▼ To Update a Device Manually	60
▼ To Delete a Device	62
Renaming a Device	62
Customizing Email Deliveries	63
▼ To Set Up Local Email and Pager Notifications	63
▼ To Update or Delete an Existing Email Address	64
▼ To Add a New Email Address	64

- ▼ To Send a Customizable Subset of the Event-Driven Messages From the Host 65
- ▼ To Clear a Specified Number of Maximum Emails 66

#### Using Providers 67

- ▼ To Access the Notification Provider Maintenance Window 67
- ▼ To Set Up Providers 68

#### HTTP Provider 69

69

#### Email Provider 70

#### SSTR Provider 71

#### SRS Provider 72

#### SRS Net Connect Provider 73

#### SSRR Provider 74

#### SunMC Provider 75

#### SNMP Traps 77

- ▼ To Start or Stop Agent(s) 78
  - ▼ To Access the Start Agents Window 78
  - ▼ To Activate or Deactivate Monitoring on a Device-by-Device Basis 79
- ▼ To Send Test Email 80
  - ▼ To Access the Test Email Window 80
- ▼ To Review the Configuration 81
- ▼ To Change Configuration Options 81

#### Topology Maintenance 83

- ▼ To Access the Topology Window 84
- ▼ To Create a Topology Snapshot 84
- ▼ To Merge Topologies 86
- ▼ To Display Topology History 87

#### Grouping 88

- ▼ To Create and Maintain Groups 88
- ▼ To Add Devices to a Particular Group 90
- System Utilities 91
  - ▼ To Access the System Utilities Page 91
- System Time-Outs 92
  - ▼ To Change System Time-Out Settings 92
- Erase Cache 94
  - ▼ To Erase a Device's Cache 94
- Run Agent 95
  - ▼ To Run the Agent Manually 95
- Email Configuration 96
  - ▼ To Email Configuration Information 96
- Recover Configuration 97
- Run Scripts 98
- Password Maintenance 100
  - ▼ To Change the Security Password 100
- Update User Roles 101
- Clear Login 102
  - ▼ To Clear the Login Screen 102
- Application Launcher 103
- 4. Monitoring 105**
  - ▼ To Access the Monitor Page 105
- Monitoring Devices 106
  - ▼ To View Device Reports 106
- Monitoring Topology 110
  - ▼ To Access the Monitor Topology Page 110
    - ▼ To Display Host-Based Topology 111
    - ▼ To Clear Alerts 114

## Monitoring Logs 118

- ▼ To Access the Log Page 118
- ▼ To Review the Most Recent Entries on a Host 119
- ▼ To View an Event Log for a Host 120
- ▼ To View Alert Logs 122
- ▼ To Display Agent Errors 123

## 5. Diagnostics 125

Selecting a User Interface 126

Diagnostics Test Rules 127

Running Diagnostic Tests From the Command Line 127

Standard Command-Line Arguments 128

Running Diagnostic Tests From the GUI Window 129

- ▼ To Access the Diagnostic Tests 129

Test from Topology 130

- ▼ To Test from Topology 130

Notes 132

Test from List 132

- ▼ To Invoke the Test Option Pane for a Particular Device 133

Test Manager 134

- ▼ To Archive or Delete Tests 135

Diagnostics Tests Available in the Storage Automated Diagnostic Environment 136

Test Defaults 137

Default Option 137

Storage Automated Diagnostic Environment Tests 138

Sun StorEdge A3500FC LUN Test (a3500fctest) 138

a3500fctest Test Options 140

Sun StorEdge A5000 Array Enclosure Test (a5ksestest) 141

a5ksestest Test Options	142
Sun StorEdge A5000 Array Test (a5ktest)	143
a5ktest Subtests	143
Brocade Silkworm Test (brocadetest)	145
brocadetest (1M) Test Options	146
Sun StorEdge D2 Array Disk Test (d2disktest)	147
d2disktest(1M) Test Options	148
Sun Fire V880 FC-AL Disk SES Test (daksestest)	149
daksestest (1M) Test Options	149
Sun Fire V880 FC-AL Disk Test (daktest)	150
daktest(1M) Test Options	151
Sun StorEdge Internal Fibre Channel Disk Test (fcdisktest)	152
fcdisktest(1M) Test Options	153
Sun StorEdge FC Tape Test (fctapetest)	154
fctapetest Test Requirements	154
fctapetest Test Options	155
Sun StorEdge PCI Fibre Channel-100 Host Adapter Test (ifptest)	156
ifptest Test Options	157
Fibre Channel Link Diagnostic (linktest)	158
▼ To Invoke linktest	159
linktest Options	161
Sun StorEdge PCI Dual Fibre Channel Host Adapter Board Test (qlctest)	163
Sun StorEdge SBus Fibre Channel-100 Host Adapter Board Test (socialtest)	166
Sun StorEdge Network FC Switch-8 and Switch-16 Switch Test (switchtest)	169
switchtest Test Options	170
Sun StorEdge Network 2 Gb Fibre Channel Switch Test (switch2test)	171
switch2test Test Options	172

Sun StorEdge T3 and T3+ Array Test (t3ofdg)	173
t3ofdg Test Options	174
Sun StorEdge T3 and T3+ Array Test (t3test)	175
t3test Subtests	175
t3test Test Options	177
Sun StorEdge T3 and T3+ Array Test (t3volverify)	178
Sun StorEdge T3+ Array Passwords	179
t3volverify Test Options	180
Virtualization Engine LUN Test (veluntest)	181
veluntest Test Options	182
Installation Verification using ras_revcheck(1M) and stresstest(1M)	183
▼ To Verify a SAN Component	183
▼ To Verify the Entire SAN	183
Test Archive	184
Revision Checking	185
▼ To Run Revision Checking Report	185
▼ To Display Revision Checking Reports	187
Diagnostics Tools	188
▼ To Access the Storage Automated Diagnostic Environment Diagnostics Tools	188
Fibre Channel Counters Check	188
▼ To Access the Fibre Channel Counters Check Window	189
▼ To Run FC Check	190
<b>6. Sun StorEdge™ 3900 and 6900 Series Configuration Utility</b>	<b>191</b>
▼ To Access the Sun StorEdge 3900 and 6900 Series Configuration Window	192
Log Functions and Sun StorEdge 3900 and 6900 Series Maintenance	194
<b>7. Reports</b>	<b>195</b>

- ▼ To Access the Reports Page 195
- Agent Statistics 196
  - ▼ To Check Storage Automated Diagnostic Environment Statistics 196
- Thresholds List 197
- Fibre Channel (FC) Traffic 198
  - ▼ To Display the Switch Graph 199
  - ▼ To Display Switch Data 200
- 8. Storage Automated Diagnostic Environment Help 201**
  - ▼ To Access the Online Help 201
  - Storage Automated Diagnostic Environment Event Grid 203
    - ▼ To Customize an Event Report 203
  - Storage Automated Diagnostic Environment Architecture 205
  - Diagnostics Strategy 207
  - Utilities 207
    - Storage Automated Diagnostic Environment Diagnostics Tests 208
    - Diagnostics Utilities 209
    - Storage Automated Diagnostic Environment Agent Utilities 211



# Tables

---

TABLE 1-1	Storage Automated Diagnostic Environment 2.1 Additions	2
TABLE 2-1	Installation Checklist	8
TABLE 2-2	config_solutions(1M) options	17
TABLE 3-1	Storage Automated Diagnostic Environment General Maintenance Functions	29
TABLE 3-2	Maintenance Functions	33
TABLE 3-3	Site Information Fields	37
TABLE 3-4	Maintain Hosts Descriptions	39
TABLE 3-5	Master Configuration Update Fields	42
TABLE 3-6	Maintain Hosts: Add New Slave Fields	46
TABLE 3-7	Discovery: Subnet Fields	52
TABLE 3-8	Maintain Devices: Add a New Device	56
TABLE 3-9	Device Configuration	59
TABLE 3-10	Storage Automated Diagnostic Environment Providers	68
TABLE 3-11	Storage Automated Diagnostic Environment Configuration Options	82
TABLE 3-12	Time Out Settings	93
TABLE 3-13	Run Scripts Options for the Sun StorEdge T3+ Array	98
TABLE 3-14	Update User Roles	102
TABLE 5-1	Storage Automated Diagnostic Environment Diagnostics Functions	125
TABLE 5-2	Storage Automated Diagnostic Environment Diagnostics User Interface Differences	126
TABLE 5-3	Standard Command-Line Arguments	128

TABLE 5-4	Storage Automated Diagnostic Environment Diagnostic Tests Default Option	137
TABLE 5-5	a3500fctest Subtests	138
TABLE 5-6	a3500fctest Options	140
TABLE 5-7	a5ksestest Options	142
TABLE 5-8	a5ktest Subtests	143
TABLE 5-9	brocadetest Test Options	146
TABLE 5-10	d2disktest Test Options	148
TABLE 5-11	daksestest Test Options	149
TABLE 5-12	daktest Test Options	151
TABLE 5-13	fcdisktest Test Options	153
TABLE 5-14	fctapetest Options	155
TABLE 5-15	ifptest Options	157
TABLE 5-16	linktest Options	161
TABLE 5-17	qlctest Options	164
TABLE 5-18	socaltest Options	167
TABLE 5-19	switchtest Test Options	170
TABLE 5-20	switch2test Test Options	172
TABLE 5-21	t3ofdg Test Options	174
TABLE 5-22	t3test Subtests	175
TABLE 5-23	t3test Options	177
TABLE 5-24	t3verify Test Options	180
TABLE 5-25	veluntest Options	182
TABLE 6-1	Storage Automated Diagnostic Environment Management Functions	191
TABLE 8-1	Storage Automated Diagnostic Environment Component Definitions	206
TABLE 8-2	Storage Automated Diagnostic Environment Diagnostic Commands	209
TABLE 8-3	Storage Automated Diagnostic Environment Agent Commands	212

# Figures

---

- FIGURE 2-1 Sample SUNWstade Installation 14
- FIGURE 2-2 `config_solution -m 6910` Example 18
- FIGURE 2-3 Solution.golden Snapshot Example 19
- FIGURE 2-4 Storage Automated Diagnostic Environment Main Window 27
- FIGURE 3-1 Admin Sections window 32
- FIGURE 3-2 General Maintenance window 32
- FIGURE 3-3 Maintain Site Information window 36
- FIGURE 3-4 Update Window using Config Options 37
- FIGURE 3-5 Maintain Hosts window 39
- FIGURE 3-6 Maintain Hosts: Update All Hosts window 40
- FIGURE 3-7 Push Slave Configs window 40
- FIGURE 3-8 Master Configuration window 41
- FIGURE 3-9 Add New Slave window 44
- FIGURE 3-10 Device Discovery window 48
- FIGURE 3-11 Sun StorEdge 3900 and 6900 Series Discovery window 50
- FIGURE 3-12 Subnet Discovery 51
- FIGURE 3-13 Maintain Devices window 54
- FIGURE 3-14 Maintain Devices: Comments window 55
- FIGURE 3-15 Add Devices window 56
- FIGURE 3-16 Maintain Devices window 60

FIGURE 3-17	Maintain Devices:Update Device window	61
FIGURE 3-18	Local Email/Pager Notifications window	63
FIGURE 3-19	Email Notification: Add Email window	64
FIGURE 3-20	Clear Email Maximums	66
FIGURE 3-21	HTTP Provider window	69
FIGURE 3-22	Email Provider window	70
FIGURE 3-23	SSTR Provider window	71
FIGURE 3-24	SRS Provider window	72
FIGURE 3-25	NetConnect Provider window	73
FIGURE 3-26	SSRR Provider window	74
FIGURE 3-27	SunMC Provider window	75
FIGURE 3-28	SunMC Console window	76
FIGURE 3-29	SNMP Traps Provider window	77
FIGURE 3-30	Start/Stop Agents window	78
FIGURE 3-31	Start/Stop Devices window	79
FIGURE 3-32	Test Email window	80
FIGURE 3-33	Review Configuration window	81
FIGURE 3-34	Change Configuration Options window	81
FIGURE 3-35	Topology Maintenance window	84
FIGURE 3-36	Create Topology Snapshot window	85
FIGURE 3-37	Merge Topology Snapshot window	86
FIGURE 3-38	Display Topology History	87
FIGURE 3-39	Topology Grouping window	88
FIGURE 3-40	Topology Group Detail window	89
FIGURE 3-41	Group Summary window	90
FIGURE 3-42	System Utilities window	91
FIGURE 3-43	System TimeOuts window	92
FIGURE 3-44	Erase Cache window	94
FIGURE 3-45	Run Agent Manually window	95
FIGURE 3-46	Email Configuration window	96

- FIGURE 3-47 Recover Configuration window 97
- FIGURE 3-48 Script List 98
- FIGURE 3-49 Script List Example—Retrieve Tokens from a Sun StorEdge T3 Array 99
- FIGURE 3-50 Change Password window 100
- FIGURE 3-51 Update User Login/Roles window 101
- FIGURE 3-52 Application Launcher 103
- FIGURE 4-1 Monitor Sections 105
- FIGURE 4-2 Monitor Devices window 107
- FIGURE 4-3 Monitor Devices Report Options window 108
- FIGURE 4-4 Sun StorEdge T3 Array Graph Summary and Component Alert List 109
- FIGURE 4-5 Sample Topology View 111
- FIGURE 4-6 Topology in System View 113
- FIGURE 4-7 Topology Help 116
- FIGURE 4-8 Sun StorEdge D2 array Topology View 117
- FIGURE 4-9 Monitor Logs window 118
- FIGURE 4-10 /var/adm/messages window 119
- FIGURE 4-11 Event Logs window 120
- FIGURE 4-12 Example of Event Log Messages on Local Host 121
- FIGURE 4-13 Alert Logs window 122
- FIGURE 4-14 Display Agent Errors window 123
- FIGURE 4-15 Agent Error Logfile 123
- FIGURE 5-1 Diagnose window 129
- FIGURE 5-2 Diagnostic Tests window 129
- FIGURE 5-3 Test from Topology window 130
- FIGURE 5-4 Status of Test Running in Test Manager 131
- FIGURE 5-5 Test from List window 133
- FIGURE 5-6 Test Manager window 134
- FIGURE 5-7 Storage Automated Diagnostic Environment Diagnostics Set Test Defaults 137
- FIGURE 5-8 a3500fctest Test Options Dialog Box 139
- FIGURE 5-9 a5000sestest Test Options Dialog Box 141

FIGURE 5-10	a5ktest Test Options Dialog Box	144
FIGURE 5-11	brocadetest Test Options Dialog Box	145
FIGURE 5-12	d2disktest Test Options Dialog Box	147
FIGURE 5-13	daksestest Test Options Dialog Box	149
FIGURE 5-14	daktest Test Options Dialog Box	150
FIGURE 5-15	fcdisktest Test Options Dialog Box	152
FIGURE 5-16	fctapetest Test Options Dialog Box	154
FIGURE 5-17	IFP Test Options Dialog Box	156
FIGURE 5-18	linktest from Test from Topology	159
FIGURE 5-19	Test from Topology linktest	160
FIGURE 5-20	linktest Test Options Dialog Box	160
FIGURE 5-21	linktest Test Detail	162
FIGURE 5-22	qlctest Test Options Dialog Box	163
FIGURE 5-23	socaltest Test Options Dialog Box	166
FIGURE 5-24	switchtest Test Options Dialog Box	169
FIGURE 5-25	switch2test Test Options Dialog Box	171
FIGURE 5-26	t3ofdg Test Options Dialog Box	173
FIGURE 5-27	t3test Test Options Dialog Box	176
FIGURE 5-28	t3volverify Test Options Dialog Box	179
FIGURE 5-29	veluntest Test Options	181
FIGURE 5-30	Display Revision History	187
FIGURE 6-1	Sun StorEdge 3900 and 6900 Series Configuration	193
FIGURE 7-1	Reports window	195
FIGURE 7-2	Thresholds List	197
FIGURE 7-3	FC Traffic Percentage window	198
FIGURE 7-4	Switch Data Report	200
FIGURE 8-1	Help Content	201
FIGURE 8-2	Storage Automated Diagnostic Environment GUI Online Help	202
FIGURE 8-3	Storage Automated Diagnostic Environment Event Grid	203
FIGURE 8-4	Storage Automated Diagnostic Environment Architecture Diagram	205

FIGURE 8-5 Storage Automated Diagnostic Environment Commands 208

FIGURE 8-6 Storage Automated Diagnostic Environment Agent Commands 211



# Preface

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The *Storage Automated Diagnostic Environment User's Guide* describes 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 and T3+ array
- Sun StorEdge A5000 and A5200 array
- Sun StorEdge A3500FC array
- Sun StorEdge D2 array
- 1 Gb and 2 Gb Sun StorEdge network FC switch-8 and switch-16 switch
- 1 Gb and 2 Gb Brocade Silkworm switch
- McData switch
- 1 Gb and 2 Gb Sun StorEdge Fibre Channel Network Adapter (HBA)
- Internal Fibre Channel disk
- StorageTek 2 Gb T9840B Fibre Channel Tape Drive
- Virtualization engine for the Sun StorEdge 3900 and 6900 series
- Sun Fire V880 disk

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 available.

**Chapter 6** briefly explains the system tools and utilities specific to performing administrative tasks, which enable the user to manage the components for the Sun StorEdge 3900 and 6900 series solutions.

**Chapter 7** discusses the various reports and lists associated with the Storage Automated Diagnostic Environment.

**Chapter 8** 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

---

# Typographic Conventions

TABLE P-1 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

**TABLE P-2** 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

TABLE P-3 contains a list of the trademarked Sun product names and the abbreviations used in the Storage Automated Diagnostic Environment.

**TABLE P-3** Product Names and Abbreviations

Trademarked 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
StorageTek 2 Gb T9840B Fibre Channel Tape	FC-Tape
Sun StorEdge network 2 Gb FC Switch 16	Sun-2 Gb Switch
Sun StorEdge network FC switch-8 and switch-16 1 Gb switch	Sun Switch
Brocade Silksworm switch	Brocade Switch
McData switch	McDATA
Sun Fire 880 FC-AL Disk	V880-Disk
Virtualization Engine	VE
Sun StorEdge 3900 and 6900 series	Sun 3900/6900

For readability purposes, some Sun products are referred to within the Storage Automated Diagnostic Environment GUI with the abbreviated name.

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## Related McData Documentation

You can locate the following documentation on McData's website:

- *Intrepid™ 6064 Director Planning Manual*
- *Intrepid™ 6064 Director Product Manager User Manual*
- *SAN Planning Guide*
- *Manager Software User Manual*
- *Command Line Interface User Manual*

### ▼ To Access McData documentation

The URL for the McData website is <http://www.mcdata.com>.

To access the McData hardware and software documentation, from the McData website:

1. **Click the Knowledge Center link.**
2. **Click Technical Documents.**
3. **Select and download the documentation of your choice.**
4. **Additional publications are available by means of McData's secure web site. Please contact [webmaster@mcdata.com](mailto:webmaster@mcdata.com) for access.**

---

## 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*

### ▼ To Access Brocade documentation

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

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

1. **Click the Partners link.**
2. **Click the Brocade Partner Network 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. You must have a Brocade Partner login and password to access the documentation.**

# Related Sun Documentation

TABLE P-4 Related Sun Documentation

Product	Title	Part Number
Sun StorEdge T3 and T3+ array	• <i>Sun StorEdge T3+ Array Release Notes</i>	816-4771-10
	• <i>Sun StorEdge T3+ Array Start Here</i>	816-4768-10
	• <i>Sun StorEdge T3 and T3+ Array Regulatory and Safety Compliance Manual</i>	816-0774-10
	• <i>Sun StorEdge T3+ Array Installation and Configuration Manual</i>	816-4769-10
	• <i>Sun StorEdge T3+ Array Administrator's Guide</i>	816-4770-10
	• <i>Sun StorEdge T3 Array Cabinet Installation Guide</i>	806-7979-10
Sun StorEdge PCI FC-100 host adapter	• <i>Sun StorEdge PCI FC-100 Host Adapter Installation Manual</i>	805-3682
Sun StorEdge 2 Gb Network Adapters (HBAs)	• <i>Sun StorEdge 2 Gb PCI Single Fiber Channel Network Adapter</i>	x6767A
	• <i>Sun StorEdge 2 Gb PCI Dual Fibre Channel Network Adapter</i>	x6768A
	• <i>Sun StorEdge 2 Gb cPCI Dual Fibre Channel Network Adapter</i>	x6769A
Sun StorEdge PCI Dual Fibre Channel host adapter board	• <i>Sun StorEdge PCI Dual Fibre Channel Host Adapter Product Notes</i>	806-5857
	• <i>Sun StorEdge PCI Dual Fibre Channel Host Adapter Installation</i>	806-5600
Sun StorEdge SBus FC-100 host adapter board	• <i>Sun StorEdge SBus FC-100 Host Adapter Installation and Service Manual</i>	802-7572
Sun StorEdge A5000 array	• <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
Sun StorEdge A3500/A3500FC array	• <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
Sun StorEdge D2 array	• <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
Sun Fire V880 Disk Server	• <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

**TABLE P-4** Related Sun Documentation

<b>Product</b>	<b>Title</b>	<b>Part Number</b>
Sun StorEdge network FC switch-8 and switch-16	• <i>Sun StorEdge Network FC Switch-8 and Switch-16 Installation and Configuration Guide</i>	806-6922
	• <i>Sun StorEdge Network FC Switch-8 and Switch-16 Field Troubleshooting Guide, SAN 3.1 Release</i>	816-1701
	• <i>Sun StorEdge Network FC Switch-8 and Switch-16 Release Notes</i>	816-0842
Sun StorEdge network FC switch-8 and switch-16	• <i>Sun StorEdge SAN 4.0 Release Guide to Documentation</i>	816-4470-10
	• <i>Sun StorEdge SAN 4.0 Release Installation Guide</i>	816-4469-10
	• <i>Sun StorEdge SAN 4.0 Release Configuration Guide</i>	806-5513-10
	• <i>Sun StorEdge SAN 4.0 Release Regulatory and Compliance Manual</i>	816-5246-10
	• <i>Sun StorEdge Network 2 Gb FC Switch-16 FRU Installation</i>	816-5285-10
Sun StorEdge 3900 and 6900 series information	• <i>Sun StorEdge SAN 4.0 Release Notes</i>	816-4472-10
	• <i>Sun StorEdge 3900 and 6900 Series Version 1.1 Installation Guide</i>	816-5252-10
	• <i>Sun StorEdge 3900 and 6900 Series Version 1.1 Reference and Service Guide</i>	816-5253-10
	• <i>Sun StorEdge 3900 and 6900 Series Version 1.1 Regulatory and Safety Compliance Manual</i>	816-5257-10
Solaris	• <i>Sun StorEdge 3900 and 6900 Series Version 1.1 Site Prep Guide</i>	816-5256-10
	• <i>Solaris Handbook for Sun Peripherals</i>	806-2210
RAID Manager 6.22	• <i>RAID Manager 6.22 User's Guide</i>	806-0478
	• <i>RAID Manager 6.22 Release Notes</i>	806-3721

## ▼ To Access 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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# Sun Welcomes Your Comments

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`docfeedback@sun.com`

Please include the part number (*816-3142-11*) of the document in the subject line of your email.



# Overview

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## What is 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
- Support for the Storage Service Processor and virtualization engine components of Sun StorEdge 3900 and 6900 series offerings
- 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

# Changes from Previous Release

TABLE 1-1 lists the changes from the previous release of the Storage Automated Diagnostic Environment.

**TABLE 1-1** Storage Automated Diagnostic Environment 2.1 Additions

<b>Features</b>	<b>Function</b>
Improved discovery	Continue improvement to device discovery
Solaris 9	Support Solaris 9 as required
Improved GUI	Improvements to user interface
CLI interfaces	Support discovery and other functions from the command line interface
Security	Add Secure Socket Layer (SSL)
Sun Fire V880 disk	Add discovery, topology, monitoring, revision checking, diagnostic, and <code>linktest</code> support for the V880 Sun Fire Disk
FC Internal Disk	Add discovery, topology, monitoring, revision checking, diagnostic, and <code>linktest</code> support for the FC Internal Disk
Sun StorEdge D2 array	Add discovery, topology, monitoring, revision checking, and diagnostic support for the Sun StorEdge D2 array
Sun StorEdge T3 2.1 array firmware	Add discovery, topology, monitoring, revision checking, diagnostic, and <code>linktest</code> support for the Sun StorEdge T3 array firmware, version 2.1.
2 Gb HBA	Add discovery, topology, monitoring, revision checking, diagnostic, and <code>linktest</code> to support 2 Gb HBAs.
2 Gb Sun Switch	Add discovery, topology, monitoring, revision checking, diagnostic, and <code>linktest</code> to support 2 Gb Sun switch, in addition to 1 Gb Sun switches already supported.
Brocade Silkworm	Add discovery, topology, monitoring, revision checking, diagnostic, and <code>linktest</code> to support 1 Gb and 2 Gb Brocade switch
McData Switch	Add discovery, topology, monitoring, and revision checking, to support 1 Gb and 2 Gb McData switch.

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# How the Storage Automated Diagnostic Environment 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. Solaris versions and component firmware versions are verified against a PatchPro matrix, to make sure you are using the most recent packages and patches. Refer to “To Run Revision Checking Report” on page 185 for more information.

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- Only one master is allowed per domain, unless the master is on a subnet.
- To facilitate monitoring of this environment, the Storage Automated Diagnostic Environment can be configured 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, refer to “To Start the Storage Automated Diagnostic Environment Services on the Master” on page 20 and “To Set Up a Slave” on page 22.
- 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 codebase is identical, except the slave has one extra file which identifies its master. This file is located in  
`/opt/SUNWstade/DATA/MASTER.`

# Monitoring Devices Using the Storage Automated Diagnostic Environment

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

## Storage Automated Diagnostic Environment Functions

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 SUNWstade

---

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
- “Installing SUNWstade” on page 12
- “Getting the Storage Automated Diagnostic Environment Ready” on page 15
- “Configuration Files” on page 16
- “Upgrading or Removing SUNWstade” on page 24
- “Launching Storage Automated Diagnostic Environment” on page 26

# 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 SUNWstadex.xxx.tar.Z</code>
<input type="checkbox"/>	3	Uncompress the SUNWstade package.  <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>  <b>Note:</b> You can combine steps 2, 3, and 4 into one step:  <code># uncompress &lt; /SUNWstade   tar -xvf -</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 SunSolve and download them and install using the <code>patchadd</code>  As superuser, use the <code>patchadd (1M)</code> command. Refer to “To Install a Patch” on page 23.
<input type="checkbox"/>	7	Once you have completely and successfully installed the SUNWstade package, execute the <code>ras_install</code> installation script. Refer to “When To Run the <code>ras_install</code> Script” on page 20.
<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. Refer to Chapter 3, “Maintenance.”
<input type="checkbox"/>	11	Configure the Sun StorEdge T3 and T3+ array and the host to mirror the <code>syslog</code> . Refer to “To Set Up Sun StorEdge T3 and T3+ Array Message Monitoring” on page 53.
<input type="checkbox"/>	12	Using the Update Host functionality, set the categories to monitor. Refer to “To Maintain Hosts” on page 38.
<input type="checkbox"/>	13	Using Device Discovery, request the Storage Automated Diagnostic Environment to probe the environments for the desired device types. Refer to “Device Discovery” on page 47.
<input type="checkbox"/>	14	Customize the generation of email using the General Maintenance: Email Notification: Add Notification functionality. Refer to “Customizing Email Deliveries” on page 63.
<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. Refer to “To Create a Topology Snapshot” on page 84.
<input type="checkbox"/>	17	Verify the component’s revision using the Diagnose: Tools: Revision Check functionality. Refer to “To Run Revision Checking Report” on page 185.
<input type="checkbox"/>	18	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. Refer to “Push Slave Configs” on page 40.
<input type="checkbox"/>	19	Manually run the Storage Automated Diagnostic Environment. Refer to “Run Agent” on page 95.
<input type="checkbox"/>	20	Review the configuration to ensure that the Storage Automated Diagnostic Environment is not missing required configuration information necessary for proper monitoring. Refer to “To Review the Configuration” on page 81.

---

# 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 T3 and T3+ array message log, to which Sun StorEdge T3 and T3+ array device logs are sent. The name of the file appears on the Sun StorEdge T3 and T3+ array message log configuration screen for each host.
- The host has access to the Sun StorEdge T3 and T3+ 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 and T3+ 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).

---

# Product Hints

- 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™ T3 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 3600 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 performed at the factory. 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 SUNWstade

This section contains the following procedures:

- “To Install SUNWstade” 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. Refer to “When To Run the ras\_install Script” on page 20.
- After installing SUNWstade, set the environment variables `PATH` and `MANPATH` to include SUNWstade directories `/opt/SUNWstade/bin` and `/opt/SUNWstade/man`.

Refer to “To Set the Environment Variables” on page 15.

## ▼ To Install SUNWstade

- 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? (Enter M=master or S=slave):**M**  
(Default = M) \*\*\* Master Install \*\*\*

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

This script will now add the Storage Automated Diagnostic Environment service to the inetd  
config file. When this script ends, go to the master agent IP-address, port 7654 with a  
browser to complete the Storage Automated Diagnostic Environment configuration.

/etc/services is now updated.

- The inetd.conf entry for rashttp is already in /etc/inetd.conf.

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

\*\* Storage Automated Diagnostic Environment cron is now installed.

- Resetting the inetd services to see the new rashttp service.

- Testing access to Storage Automated Diagnostic Environment webserver, (this will timeout  
in 20 secs) ...

Storage Automated Diagnostic Environment installed properly!

To complete the Storage Automated Diagnostic Environment configuration, point your  
browser to http://<hostname>:7654. Use the browser only after the Storage Automated  
Diagnostic Environment has been installed on all master and slave hosts.

**FIGURE 2-1** Sample SUNWstade Installation

---

**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.

---

## ▼ To Verify the Installation

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

```
# pkginfo -l SUNWstade
```

---

# Getting the Storage Automated Diagnostic Environment Ready

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`.

## ▼ To Set the Environment Variables

After installing the Storage Automated Diagnostic Environment, you must set the environment variables `PATH` and `MANPATH` to include the Storage Automated Diagnostic Environment directories `/opt/SUNWstade/bin` and `/opt/SUNWstade/man`.

1. For the Korn or Bourne shell, type the following:

```
$ PATH=/opt/SUNWstade/bin:$PATH
$ MANPATH=/opt/SUNWstade/man:$MANPATH
$ export PATH MANPATH
```

2. For the C shell, type the following:

```
% setenv PATH /opt/SUNWstade/bin:$PATH
% setenv MANPATH /opt/SUNWstade/man:$MANPATH
```

# 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.**

For example, although `10.0.0.10 msp0` is acceptable with standard Ethernet systems, you can change one entry or all of the host entries, by updating the `/etc/hosts` file, to `10.0.0.10 msp0.domain.name.com msp0`.

## Sun StorEdge 3900 and 6900 Series Configuration

Using the options described in TABLE 2-2, the factory (Manufacturing Operations) uses the `config_solution(IM)` command to create a `/var/opt/SUNWstade/DATA/Solution.golden` file on the Storage Service Processor, which is a component of a Sun StorEdge 3900 and 6900 series solution. See FIGURE 2-3 for an example of the output from a `/var/opt/SUNWstade/DATA/Solution.golden` file.

Creating a golden file on the Storage Service Processor is required *before* the Storage Automated Diagnostic Environment GUI is launched. If this step is not done, the Storage Automated Diagnostic Environment will post an error during discovery and prompt the user to run the command.

**TABLE 2-2** `config_solutions(1M)` options

Options	Description
<code>-h=help</code>	Display help information
<code>-i=ip_prefix</code>	Specifies the subnet prefix. The default is <code>ifconfig</code> for <code>dmfe1</code> .
<code>-m=expected_model</code>	Specifies the specific model of the configuration. For example: <code>config_solution -m 6910</code> . Valid options are 3910, 3960, 3900SL, 6910, 6960, 6910SL and 6960SL. SL = switchless
<code>-p=ve_password</code>	Specifies the password for the virtualization engine.

Manufacturing Operations also creates a `Solution.golden` snapshot during the manufacture and upgrade of a Sun StorEdge 3900 and 6900 Series solution. See FIGURE 2-3 for an example of a `Solution.golden` snapshot.



**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.

## Sun StorEdge 3900 and 6900 Series Upgrades

After any upgrade or component change (including model number upgrades), `/opt/SUNWstade/bin/config_solution` must again be executed on the Storage Service Processor, which enables proper discovery of the Sun StorEdge 3900 and 6900 Series Solutions. Anytime the `/opt/SUNWstade/bin/config_solution` file is executed, the Storage Automated Diagnostic Environment master must rediscover this cabinet using instructions given from the Discovery menu, Solution option. Refer to “Device Discovery” on page 47 for more information.

```
$ config_solution -m 6910

sp0:
v1a: -> found VE (v1a / xx.x.x.xx / 2900006022004188)
v1b: -> found VE (v1b / xx.x.x.xx / 2900006022004193)
sw1a: -> found Switch (xx.x.x.xx / 100000c0dd00b1f4)
sw1b: -> found Switch (xx.x.x.xx / 100000c0dd0057aa)
sw2a: -> found Switch (xx.x.x.xx / 100000c0dd008467)
sw2b: -> found Switch (xx.x.x.xx / 100000c0dd00b170)
t3b0: -> found T3 (xx.x.x.xx / 50020f230000a2a6/50020f230000a0d0/
slr-mi.370-3990-02-e-f2.041638)
t3b1: -> found T3 (xx.x.x.xx / 50020f23000068cc/50020f2300004331/
slr-mi.370-3990-01-e-f0.026828)
t3b2: -> Warning: cannot ping xx.x.x.xx
t3b3: -> Warning: cannot ping xx.x.x.xx
t3be0: -> Warning: cannot ping xx.x.x.xx
t3be1: -> Warning: cannot ping xx.x.x.xx
t3be2: -> Warning: cannot ping xx.x.x.xx
t3be3: -> Warning: cannot ping xx.x.x.xx
t3be4: -> Warning: cannot ping xx.x.x.xx

-----
                Configuration Summary
-----
| Model : 6910, Requested = 6910
| Switch: 4 * 8 ports
|       : sw1a, sw1b, sw2a, sw2b,
| T3s   : 2
|       : t3b0, t3b1,
| VEs   : 2
|       : v1a, v1b,
-----

NO ERRORS FOUND!
Snapshot /var/opt/SUNWstade/DATA/Solution.golden saved!
Done.
```

**FIGURE 2-2** `config_solution -m 6910` Example

```
# Solution Golden Snapshot

created=2002-02-08 00:32:40
created2=Fri Feb 8 00:32:40 MST 2002

model=6910

[device1]
type=ve
class=switch.ve
ip=xx.x.x.xx
ipno=xx.x.x.xx
name=hostname1
wwn=2900006022004188
login=v1
initiator=I00001

[device2]
type=ve
class=switch.ve
ip=xx.x.x.xx
ipno=xx.x.x.xx
name=hostname2
wwn=2900006022004193
login=v1
initiator=I00002

...

[device8]
type=t3
class=storage.t3
ip=xx.x.x.xx
ipno=xx.x.x.xx
name=hostname8
wwn=50020f23000068cc
wwn2=50020f2300004331
key=slr-mi.370-3990-01-e-f0.026828
ctrl_model=375-0084-02-JJ11
```

**FIGURE 2-3** Solution.golden Snapshot Example

## ▼ When To Run the `ras_install` Script

- Using the instructions below, you should run the `ras_install` script:
  - 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 Storage Automated Diagnostic Environment Services 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):M
```

---

**Note** – M = master is the default.

---

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

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

The `ras_install` script 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, refer to “To Maintain Hosts” on page 38.

## 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 will produce a warning if the version and patch do not match.

---

## Prerequisites

To install a slave agent, you must know the IP address of the host 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 (slave)** 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 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. Specify if 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.

## ▼ To Install a Patch

Patches are **not mandatory** if you have the most recent SUNWstade package installed. Refer to 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 (refer to “To Start or Stop Agent(s)” on page 78). Then, run `ras_install` after installing the update.

---

1. Download the latest Storage Automated Diagnostic Environment patch `xxxxxx-xx` 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

# unzip xxxxxx-xx.tar.Z
# tar xvf xxxxxx-xx.tar
# cd xxxxxx-xx

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

3. Re-run `ras_install` using the instructions in “To Start the Storage Automated Diagnostic Environment Services on the Master” on page 20.

---

# Upgrading or Removing SUNWstade

This section contains the following subsections:

- “To Upgrade the Storage Automated Diagnostic Environment Package” on page 24
- “To Remove the SUNWstade Package” on page 25

## ▼ To Upgrade the Storage Automated Diagnostic Environment Package

---

**Note** – When installing a new version of, or a patch to, the Storage Automated Diagnostic Environment, stop the agents before installing the update (refer to “To Start or Stop Agent(s)” on page 78). Then, run `ras_install` after installing 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 SUNWstade Package

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
```

---

# Launching Storage Automated Diagnostic Environment

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.

**Configuration Summary**

Site Info:	Todd Broomfield
Installation:	1 host, 15 devices
Notification:	None
Email:	1 (todd.mckenney@sun.com)
Last Event:	2002-08-19 11:55:27

**Alert Summary**

Categories			
Sun A5000		1	
McData switch		1	
Sun Switch		2	
Sun T3		2	

**Basic Installation Steps**

Review Site Info → Review Hosts → Discover Devices → Setup Emails → Setup Notifications → Create Topology → Review Config → Start Agents

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**FIGURE 2-4** 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.

---



# Maintaining the Storage Automated Diagnostic Environment

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  Refer to “To Maintain Hosts” on page 38.	<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.  Refer to “To Maintain Site Information” on page 36.	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  Refer to “Device Discovery” on page 47.	Requests that the Storage Automated Diagnostic Environment probe the environments for the desired device types

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

<p>Add devices manually.</p> <p>Refer to “To Add a Device Manually” on page 56</p>	<p>Enables you to manually any currently-supported device and enter the information that is required for that device.</p>
<p>Maintain devices</p> <p>Refer to “To Maintain Devices” on page 53.</p>	<p>Supports the maintenance of device-specific information. With the Maintain devices functionality, you can update or delete existing devices.</p>
<p>Set up local email and pager notification.</p> <p>Refer to “To Set Up Local Email and Pager Notifications” on page 63.</p>	<p>Enables local notification information: :</p> <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>
<p>Set up a Provider.</p> <p>Refer to “To Set Up Providers” on page 68.</p>	<p>Relays events generated by health monitors.</p>
<p>Control agent activity.</p> <p>Refer to “To Start or Stop Agent(s)” on page 78.</p>	<p>Temporarily stops the Storage Automated Diagnostic Environment from running on a selected host.</p>
<p>Start or stop devices</p> <p>Refer to “To Activate or Deactivate Monitoring on a Device-by-Device Basis” on page 79.</p>	<p>If the device is being tested, or if faults are being injected into the device intentionally, temporarily stops the notifications for a specific device.</p>

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

Test email  Refer to “To Send Test Email” on page 80.	Sends test emails and messages to verify the mailing capability of the Storage Automated Diagnostic Environment.
Review configurations  Refer to “To Review the Configuration” on page 81.	Verifies all configuration settings.
Change configuration options  Refer to “To Change Configuration Options” on page 81.	Enables you to change defaults on selected configuration options.

## ▼ To Access the Admin Window

1. Click the Admin tab 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.

General Maintenance		[ Help ]
[ Site Information ]	Used to enter site Information, address, contact names etc..	
[ Maintain Hosts ]	Used to configure Monitoring Agents	
[ Discovery ]	Can be used to automatically and/or manually find devices physically attached to the host system or are accessible on the ethernet network.	
[ Add Devices ]	Add Devices manually	
[ Maintain Devices ]	Maintain information about specific devices	
[ Email Notification ]	Used to customize the generation of local emails to system admins	
[ Notification Providers ]	Used to control event providers like SRS, NetConnect, etc..	
[ Push Configs ]	Push agent configuration to each slaves	
[ Start Agents ]	Used to selectively deactivate the monitoring agents	
[ Start Devices ]	Used to selectively deactivate the monitoring of storage devices.	
[ Test email ]	test email	
[ Review config. ]	Verify the validity of the software configuration	
[ Config Options ]	Software Configuration Options	

FIGURE 3-2 General Maintenance window

**TABLE 3-2** Maintenance Functions

---

<b>Function</b>	<b>Description</b>
Site Information	Complete the mandatory fields, denoted with an asterisk (*) before you proceed.
Maintain Hosts	Enables agent configuration..
Discovery	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.  <b>Note:</b> Agents on hosts with a T3 and T3+ message log file will automatically find only Sun StorEdge T3 and T3+ arrays that have made entries in that log file.
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	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.  This option can be fully customized to streamline notifications; for example, in addition to specifying email addresses, you can specify pager numbers.
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 Configs	If you select this option, an update will occur, even when there is no information to be updated.
Start/Stop Agent	Enables the Storage Automated Diagnostic Environment to start or stop agents from executing.  For a slave agent, this 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.

---

**TABLE 3-2** Maintenance Functions

---

Start/Stop Devices	Enables the Storage Automated Diagnostic Environment to start or stop the alert notification of an event for one or more selected devices.  This function does not stop the monitoring of the device and the interface to the provider.
Test Email	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.
Review Config	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.
Config Options	Use this window to update existing configuration options.

---

---

# 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 36
- “To Maintain Hosts” on page 38
- “To Maintain Devices” on page 53
- “Customizing Email Deliveries” on page 63
- “Using Providers” on page 67
- “To Start or Stop Agent(s)” on page 78
- “To Send Test Email” on page 80
- “To Review the Configuration” on page 81
- “To Change Configuration Options” on page 81

## ▼ 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.

Use Config Options from the General Maintenance menu to set the browser window.

Storage Automated Diagnostic Environment

Home | Help | Logout

Admin | Monitor | Diagnose | Manage | Report

General Maintenance | Topo. Maintenance | System Utilities

ROOT | v2.1.A3.002

Start > Admin > General Maintenance > Site Information [ Help ]

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

Customer Information	
Customer Name:	<input type="text"/> * is mandatory
Customer No:	<input type="text"/>
Contract No:	<input type="text"/> Stock Symbol: <input type="text" value="SUNW"/>

Site Information	
Site Name:	<input type="text"/> *
Address:	<input type="text"/>
City:	<input type="text"/> *
State:	<input type="text"/> Zip Code: <input type="text"/> *
Country:	<input type="text"/> *
Contact:	<input type="text"/> *
Phone No:	<input type="text"/> Email: <input type="text"/>
Is this a production Site?:	<input type="checkbox"/> No

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.

## Setting your Browser Window

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:



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. Big Screen is recommended if your monitor size is 1280 x 1024.
- **Small Screen**—displays three windows, as with the Big Screen selection, but is recommended if your monitor size is 1024 x 864.
- **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.

## ▼ To Maintain 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 41
- “To Add a New Slave” on page 44
- “Device Discovery” on page 47
- “To Set Up Sun StorEdge T3 and T3+ Array Message Monitoring” on page 53

---

**Note** – For this automatic registration to work, you must first install and run the master agent. (A ‘Y’ will appear 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 tab 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.

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.
PUSH Slave Configs	Once all slaves have been updated, you can push the new configurations by using this button. Each instance of the Storage Automated Diagnostic Environment has identical copies of the configuration file, but the administration of the slaves is done from the master.

**Note:**  
If 'N' appears in the Active field, you can activate the host using the procedures in "To Start or Stop Agent(s)" on page 78.

**Note** – You can click an existing Host Name link from the Maintain Hosts window to launch the Update Host window. The Update Host window enables you to update fields, as required, and is explained in more detail in “To Update the Master Configuration” on page 41.

In addition, you can click the Update All Hosts link from the Maintain Hosts window to change the monitoring frequency setting for all hosts at one time, as shown in FIGURE 3-6.

FIGURE 3-6 Maintain Hosts: Update All Hosts window

## Push Slave Configs

Use Push Slave Configs whenever you change a configuration. The Push Slaves Configs functionality is very important. It synchronizes all slave instances under a master instance to ensure proper monitoring and notification.

FIGURE 3-7 Push Slave Configs window

## ▼ To Update the Master Configuration

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

**Update Host** [ Help ]

Update Host agent information

**Enter Local Agent Information**

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

Categories to Monitor: [Abbreviations](#)

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

Monitoring Frequency: 5 minutes ▾

Monitor InBand DataPath?:

Show only monitored devices in topology graph:

**Enter Default Logfiles:**

Message Log: /var/adm/messages

Sun T3 Message Log: \_\_\_\_\_

**Submit** **Back**

**FIGURE 3-8** Master Configuration window

TABLE 3-5 describes the fields on the Storage Automated Diagnostic Environment Master Configuration window that you can update.

**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 StorEdge A3500FC array</li> <li>• Sun StorEdge A5000 array</li> <li>• Sun StorEdge D2 array</li> <li>• Host</li> <li>• Sun V880 Disk</li> <li>• McData switches</li> <li>• FC Counters</li> <li>• Sun StorEdge 1 Gb and 2 Gb switches</li> <li>• Brocade Silkworm 1 Gb and 2 Gb switches</li> <li>• Sun StorEdge T3 and T3+ array</li> <li>• StorageTek 2 Gb T9840B Fibre Channel Tape</li> <li>• Internal Fibre Channel Disk</li> <li>• Virtualization Engine</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	<p>Select this checkbox to enable monitoring of the in-band data path.</p>

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

---

Show Only Monitored Devices in Topology	When checked, Topology shows only the devices in the Monitor Devices menu. In addition, if a device is manually deleted, it does not show in the Topology.
Message Log	The path for the message log (for example, <code>/var/adm/messages</code> ), which displays the history of status messages.
T3 Message Log	Type the path for the host's Sun StorEdge T3 and T3+ array Message Log (for example, <code>/var/adm/messages.T3</code> ). The path should be to where the T3 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 Sun StorEdge T3 and T3+ array actually sends the log files.

**Note:** You can check and verify the path by looking at the `/etc/syslog.conf` on the host.

---

## ▼ To Add a New Slave

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 New Slave** 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 A3500FC	<input type="checkbox"/> :Internal FC Disks	<input type="checkbox"/> :Sun Switch
<input type="checkbox"/> :Sun A5000	<input type="checkbox"/> :McDATA	<input type="checkbox"/> :Sun T3
<input type="checkbox"/> :Brocade Silkworm	<input type="checkbox"/> :FC-Counters	<input type="checkbox"/> :FC-Tape
<input type="checkbox"/> :Sun D2	<input type="checkbox"/> :Sun 3900/6900	<input type="checkbox"/> :Sun V880 Disk
<input type="checkbox"/> :Host	<input type="checkbox"/> :Sun 2GB Switch	<input type="checkbox"/> :Sun VE

Monitoring Frequency:

Alternate Master:

Monitor InBand DataPath:

Show only monitored devices in topology graph:

:

**>Enter Logfiles Locations**

Message Log:

Sun T3 Message Log:

**Add** **Back**

**FIGURE 3-9** Add New Slave window

3. Complete the fields using the descriptions shown in TABLE 3-6.
4. Click Add to add the new slave host.

---

**Caution** – If the system you are adding as a Slave is currently a master, the following message is displayed:

```
WARNING: System is currently configured as a master. Please use
the Push Slave Configs section to change this system to a slave.
```

---

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 New Slave Fields

Field	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 default is 5 minutes.</p> <p><b>Note:</b></p> <p>The <code>cron</code> continues to run every 5 minutes, but it checks this frequency setting before loading any modules.</p>
Alternate Master	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.
Sun StorEdge 3900 and 6900 series	Enable the Sun StorEdge 3900 and 6900 series button if the device or devices the Storage Automated Diagnostic Environment will monitor are part of a Sun StorEdge 3900 or 6900 series solution.

**TABLE 3-6** Maintain Hosts: Add New Slave Fields

Field	Required Input
Message Log	The path for the message log (the default is <code>/var/adm/messages</code> ), which displays the history of the status messages.
T3 Message Log	Type the path for the host's Sun StorEdge T3 and T3+ array Message Log. The path should be to where the Sun StorEdge T3 and T3+ array 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 Sun StorEdge Sun StorEdge T3 and T3+ 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.
Monitor In-Band 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.

## Device Discovery

You can request the Storage Automated Diagnostic Environment to probe the environments for the device types shown on the Device 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 and T3+ array storage, virtualization devices, and switch devices for a particular subnet. For Sun StorEdge 3900 and 6900 series solutions, the host's file validates the discovery results.

---

### ▼ To Access the Device Discovery Window

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

- **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** button discovers devices using the `/etc/host` file of the Service Processor.
- **Subnet Discovery** uses `snmp` to query a subnet and can discover supported switches and Sun T3.

**Select product to discover**

<b>Host:</b>	All Hosts
<b>Product/ Discovery Method:</b>	Sun A3500FC

**Discover**

FIGURE 3-10 Device Discovery window

- The Storage Automated Diagnostic Environment discovers the Sun StorEdge A5000 arrays, the Sun StorEdge A3500-FC Raid Controllers, the Sun Fire V880 Disk, the Sun StorEdge D2 array, Internal Fibre Channel Disk, and StorageTek 2 Gb T9840 Fibre Channel Tape devices on the physical data path attachments to the host.
- The Storage Automated Diagnostic Environment automatically 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 Gb and 2 Gb Switch-16 switches answering to SNMP queries.
- The Storage Automated Diagnostic Environment *does not* automatically discover Brocade Silksworm switches. The current workaround is to manually add the Brocade Silksworm switch IP address to the `/etc/fcswitch` file.
- The Storage Automated Diagnostic Environment automatically discovers the Sun StorEdge T3 and T3+ arrays by scanning the Sun StorEdge T3 and T3+ array logfile on all hosts. Entries that contain a valid IP name or address are added to the configuration.
- 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 and T3+ array entries in this log file, the *auto-discovery* will find them and add 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. Reference the scripts `/usr/lib/newsyslog` and `/etc/cron.d/logchecker`.

---

## ▼ To Discover a Sun StorEdge 3900 or 6900 Series Cabinet

Sun StorEdge 3900 series storage systems for direct attach storage (DAS) environments and Sun StorEdge 6900 series storage systems for storage area network (SAN) environments are complete, preconfigured storage solutions. End users have only restricted accessibility to the internal components of the subsystems, but they do have full utilization of its storage functionality.

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

3. From the Discovery window, select Sun 3900/6900 from the Product/Discovery Method pull-down menu.
4. Click Discover.

The Discovery: Sun 3900/6900 Series window is displayed.



FIGURE 3-11 Sun StorEdge 3900 and 6900 Series Discovery window

5. From the Run on Host pull-down menu:
  - a. If the master is a Sun StorEdge 3900 and 6900 series configuration, select the master host from the Run on host pull-down menu.
  - b. If the slave is a Sun StorEdge 3900 and 6900 series configuration, select the slave's Storage Service Processor from the Run on host pull-down menu.

This procedure is written with the assumption that the `Solution.golden` file was created on all Sun StorEdge 3900 and 6900 series configurations using the `config_solution(1M)` command.

The `Solution.golden` file is created during the manufacturing and upgrades of the Sun StorEdge 3900 and 6900 series, or when components are replaced, as discussed in “Sun StorEdge 3900 and 6900 Series Configuration” on page 16.

6. Disable the Turn Monitoring Off checkbox.
7. Click Confirm 3900/6900 Discovery.

This function uses the local `/etc/hosts` file for discovery on the Storage Service Processor.

8. To return to the main Discovery window, click Discover other devices.

## ▼ 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 on the the **Storage Automated Diagnostic Environment** window.
2. Click the **Discovery** link on the **General Maintenance** menu.
3. From the **Discovery** window, select **Subnet** from the **Product/Discovery Method** pull-down menu.
4. Click **Discover**.

The **Discovery: Submit** window is displayed

The screenshot shows a web-based configuration window titled "Discovery : Subnet" with a "[ Help ]" link in the top right corner. The window contains several sections:

- Run on Host:** A pull-down menu currently set to "Local".
- Subnet to Search:** Six input fields labeled Sub1 through Sub6. Sub1 and Sub2 are pre-filled with "<IP-ADDRESS-1>" and "<IP-ADDRESS-2>" respectively. Sub3, Sub4, Sub5, and Sub6 are empty.
- Use Host Name as Prefix:** An unchecked checkbox.
- Use Custom Prefix:** A text input field containing the letter "I".
- SNMP timeout (optional):** A small text input field.
- Turn Monitoring On:** A checked checkbox.

At the bottom of the window are two buttons: "Confirm Subnet Discovery" and "Back".

FIGURE 3-12 Subnet Discovery

1. Select a host from the **Run on Host** pull-down menu.
2. Enter the IP address of the subnet you want searched. You can enter up to six devices (Sun StorEdge FC switches, Brocade Silkworm devices, and/or Sun StorEdge T3 and T3+ arrays).

### 3. Complete the remaining fields using the information found in TABLE 3-7

TABLE 3-7 Discovery: Subnet Fields

Setting	Definition
Use Host Name as Prefix	<p>The Storage Automated Diagnostic Environment host assigns a name to the device when it discovers the device.</p> <p>Check the <i>Use Host Name as Prefix</i> checkbox to start with the name of the host that discovered the device.</p>
Use Custom Prefix	<p>Enables the user to enter a custom prefix, rather than the name of the host that discovered the device.</p>
SNMP timeout (optional)	<p>Specifies how many seconds the subnet discovery function will wait for an answer from a device.</p>
Turn Monitoring On	<p>If a device has been discovered and added to the Storage Automated Diagnostic Environment configuration file, the Turn Monitoring On function can be enabled using the Discovery:Subnet window.</p> <p>If the device has not been added to the configuration file, you must use the Turn Monitoring on functionality found in “To Start or Stop Agent(s)” on page 78.</p>

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

The Storage Automated Diagnostic Environment will search the subnet for valid devices and send 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.

## ▼ To Set Up Sun StorEdge T3 and T3+ Array Message Monitoring

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

1. Refer to the *Sun StorEdge T3 and T3+ Disk Array Installation, Operation, and Service Manual* for procedures on how to set up the Sun StorEdge T3 and T3+ array and the host to forward `/syslog` messages.
2. Refer to the section “To Maintain Hosts” on page 38 to configure each host with the name given to the Sun StorEdge T3 and T3+ array message log file.

## ▼ To Maintain 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 a Device Manually” on page 56
- “To Update a Device Manually” on page 60
- “To Delete a Device” on page 62
- “Renaming a Device” on page 62

## ▼ To Access the Maintain Device Window

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

The Maintain Devices window is displayed.

Clicking the Info link enables you to access the Add Comments screen, where you can add additional information about a device.

The screenshot displays the 'Storage Automated Diagnostic Environment' interface. The top navigation bar includes 'Admin', 'Monitor', 'Diagnose', 'Manage', and 'Report' tabs. The left sidebar shows the 'General Maintenance' menu with 'Maintain Devices' selected. The main content area is titled 'Maintain Devices' and contains a table of existing devices. An arrow points to the 'Info' link in the first row of the table.

Primary Host	Device Name (select to update)	Dev. Type	Info	IP Address	WWN/Key	Monitor	Delete
diag176	t3-165	t3b	<a href="#">Info</a>	172.20.67.165	50020f2300000262	On	<input type="checkbox"/>
diag176	McData	McDATA	<a href="#">Info</a>	172.20.35.161	1000080088a028ea	On	<input type="checkbox"/>
diag176	McData	McDATA	<a href="#">Info</a>	172.20.35.162	1000080088a0cc4c	On	<input type="checkbox"/>
diag176	McDATA	McDATA	<a href="#">Info</a>	172.20.35.163	1000080088a0ac78	On	<input type="checkbox"/>
diag176	sw197	Switch1	<a href="#">Info</a>	172.20.67.197	100000c0dd008863	On	<input type="checkbox"/>
diag176	sw-67-101	Switch2	<a href="#">Info</a>	172.20.67.101	100000c0dd00b7da	On	<input type="checkbox"/>
diag176	172.20.67.183	Switch2	<a href="#">Info</a>	172.20.67.183	100000c0dd00bfcc	On	<input type="checkbox"/>
diag176	172.20.67.155	Switch2	<a href="#">Info</a>	172.20.67.155	100000c0dd00bf92	On	<input type="checkbox"/>
diag176	172.20.67.195	Switch1	<a href="#">Info</a>	172.20.67.195	100000c0dd008849	On	<input type="checkbox"/>
diag176	1	Switch1	<a href="#">Info</a>	172.20.67.198	100000c0dd006fd7	On	<input type="checkbox"/>
diag176	172.20.67.166	t3b	<a href="#">Info</a>	172.20.67.166	50020f230000068cc	On	<input type="checkbox"/>
diag176	T3B	t3b	<a href="#">Info</a>	172.20.67.139	50020f230001a510	On	<input type="checkbox"/>
diag176	2	Switch2	<a href="#">Info</a>	172.20.67.131	100000c0dd00bfa6	On	<input type="checkbox"/>

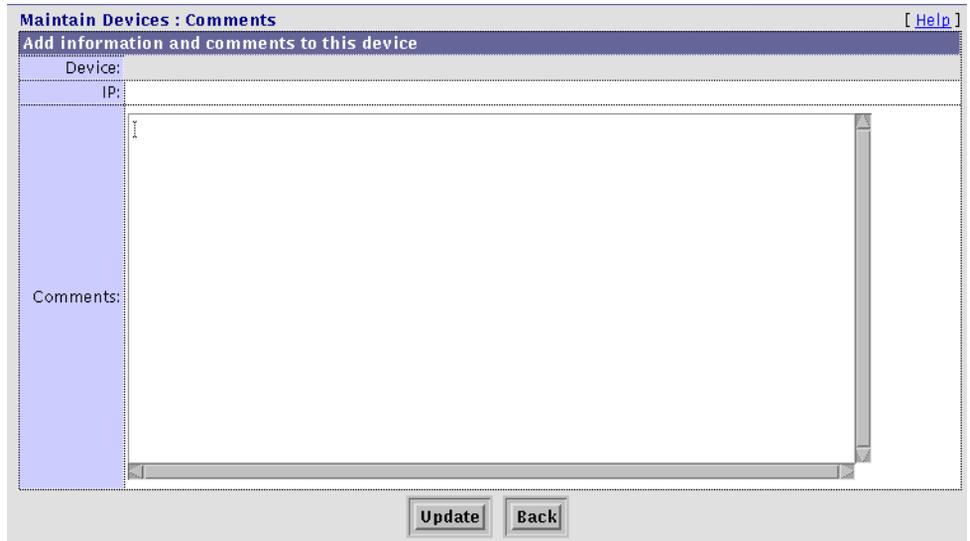
Buttons at the bottom: **Delete All Devices** and **Delete Selected**.

FIGURE 3-13 Maintain Devices window

## ▼ To Add Information About a Device

- Click the **Info** link from the **Maintain Devices** window to access the **Comments** screen shown in FIGURE 3-14.

The **Maintain Devices: Comments** screen enables you to add additional information about a device. For example, you can enter the device's serial number, its location, or whether the device is associated with a Sun StorEdge 3900 or 6900 series solution.



The screenshot shows a web browser window titled "Maintain Devices : Comments" with a "[ Help ]" link in the top right corner. Below the title bar is a dark blue header with the text "Add information and comments to this device". The main content area is divided into sections: "Device:" followed by "IP:" and a large text area labeled "Comments:". At the bottom of the window are two buttons: "Update" and "Back".

**FIGURE 3-14** Maintain Devices: Comments window

## ▼ To Add a Device Manually

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



FIGURE 3-15 Add Devices window

Complete the required fields using the descriptions shown in TABLE 3-8.

TABLE 3-8 Maintain Devices: Add a New Device

Device	Required Input
Sun StorEdge A3500FC array	<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>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> 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>
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 optional telnet password, which enables the Storage Automated Diagnostic Environment to log into 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>

**TABLE 3-8** Maintain Devices: Add a New Device

Device	Required Input
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>
Sun StorEdge network FC switch-8 and switch-16 switch	<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 optional admin/telnet password, which enables the Storage Automated Diagnostic Environment to log into the Sun switch.</li> <li>• Type the IP address that identifies the host to the network.</li> </ul>
Sun StorEdge T3 and T3+ Array	<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>• Type the optional telnet password, which enables the Storage Automated Diagnostic Environment to log into 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>
StorageTek T9840B FC Tape Drive	<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>
Sun Fire V880 FC-AL Disk	<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> <li>• <b>Note:</b> The default is the host that automatically discovered the device.</li> </ul>

**TABLE 3-8** Maintain Devices: Add a New Device

Device	Required Input
Virtualization Engine	<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> <p><b>Note:</b> The default is the host that automatically discovered the device.</p> <ul style="list-style-type: none"> <li>• Enable the Turn Monitoring On button.</li> </ul>
McData 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>• Type the telnet password, which enables the Storage Automated Diagnostic Environment to log into 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>

**2. Once your list is complete, click Update Selected Slaves from the Push Configs link.**

The Update Selected Slaves functionality is required to update a slave's configurations after you have added or updated one or more devices.

Be aware of the host's access method when making decisions about which devices the Storage Automated Diagnostic Environment will monitor:

**TABLE 3-9** Device Configuration

Device Monitoring Method	Inband or Out-of-Band?
Monitor <i>Sun StorEdge A3500-FC arrays</i> from a host that has an attachment through the Fibre Channel cables and can run the Sun StorEdge RAID Manager commands.	Inband
Monitor <i>Sun StorEdge A5000 arrays</i> from the host that has an attachment through the Fibre Channel cables.	Inband
Monitor the <i>Sun StorEdge network FC switch-8 and switch-16 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 the <i>McData switches</i> on any host on the subnet, because the probing is done over the network.	Out-of-Band
Monitor <i>Sun StorEdge T3 and T3+ arrays</i> 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.	Inband and Out-of-Band
Monitor StorageTek 2 Gb T9840B <i>Fibre Channel tape devices</i> from the host that has an attachment through the Fibre Channel cables.	Inband
Monitor Fibre Channel internal disk devices	Inband
Monitor Sun StorEdge D2 arrays	Inband
Monitor Sun Fire V880 FC-AL disk devices	Inband
Monitor <i>Sun StorEdge 3900 and 6900 series cabinets</i> from the Storage Service Processor, which has Ethernet connection to the Sun StorEdge T3 and T3+ array, the Sun StorEdge network FC switch-8 and switch-16 switches, and the virtualization engine.	Out-of-Band

## ▼ To Update a Device Manually

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

The **Maintain Devices** window is displayed.

**Maintain Devices** [ [Help](#) ]

This page displays all monitored devices. Add or 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. Use **[Push Slave Configs]** to update the configuration of your slave agents.

List Existing Devices Host:

Primary Host	DeviceName (select to update)	Dev.Type	Info.	IP Address	WWN/Key	Monitor	Delete
		McDATA	<a href="#">Info</a>			On	<input type="checkbox"/>
		McDATA	<a href="#">Info</a>			On	<input type="checkbox"/>
		a5k	<a href="#">Info</a>			On	<input type="checkbox"/>
		Switch1	<a href="#">Info</a>			On	<input type="checkbox"/>
		t3b	<a href="#">Info</a>			On	<input type="checkbox"/>
		3x00 Brocade	<a href="#">Info</a>			On	<input type="checkbox"/>
		Switch1	<a href="#">Info</a>			On	<input type="checkbox"/>
		Switch2	<a href="#">Info</a>			On	<input type="checkbox"/>
		Switch2	<a href="#">Info</a>			On	<input type="checkbox"/>
		Switch2	<a href="#">Info</a>			On	<input type="checkbox"/>
		Switch1	<a href="#">Info</a>			On	<input type="checkbox"/>
		t3b	<a href="#">Info</a>			On	<input type="checkbox"/>
		t3b	<a href="#">Info</a>			On	<input type="checkbox"/>
		Switch2	<a href="#">Info</a>			On	<input type="checkbox"/>
		McDATA	<a href="#">Info</a>			On	<input type="checkbox"/>

FIGURE 3-16 Maintain Devices window

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

---

**Note** – After you have added, deleted, or updated a device, refresh the system by clicking Re-Discover.

---

The screenshot shows a web-based interface for managing devices. The breadcrumb navigation is 'Start > Admin > General Maintenance > Maintain Devices :: Sun T3'. A '[ Help ]' link is in the top right. The main content area is titled 'Device Information' and contains the following fields:

Device Type :	t3	Monitoring :	On
Device Name :	<input type="text"/>		
Telnet Password (optional) :	<input type="password" value="*****"/>		
IP Name/Address :	<input type="text"/>		
IP Number :	<input type="text"/>		
Key :	<input type="text"/>		
WWN :	<input type="text"/>		
Primary Host :	<input type="text"/>		

At the bottom of the form are four buttons: 'Update', 'Delete', 'Re-Discover', and 'Back'.

FIGURE 3-17 Maintain Devices:Update Device window

**4. Once you have corrected the necessary fields, 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 62.

---

The Storage Automated Diagnostic Environment displays a message stating that the previous device has been removed. The Storage Automated Diagnostic Environment topology will not, however, display the deleted device until you manually add and discover the device using the functionality found in “To Maintain Devices” on page 53.

---

## ▼ 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 “To Remove the SUNWstade Package” on page 25.

---

**1. Click the Admin tab 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 from the Device Name column.**

The device’s maintenance screen is displayed.

**4. Click Delete.**

- 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 95.
- 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.

## Renaming a 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.

You can avoid this problem by manually adding the world wide name (WWN) into the Storage Automated Diagnostic Environment configuration file, which is located in the file `/var/opt/SUNWstade/DATA/rasagent.conf`.

---

**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 and T3+ 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 63
- “To Send a Customizable Subset of the Event-Driven Messages From the Host” on page 65

## ▼ 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.

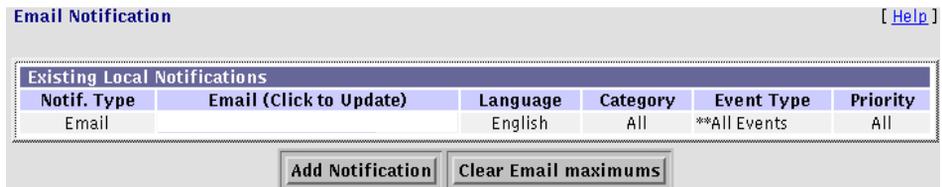


FIGURE 3-18 Local Email/Pager Notifications window

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 3-18, 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 3-19.

## ▼ 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.

The screenshot shows a dialog box titled "Email Notification: Add Email" with a "[ Help ]" link in the top right corner. The main content area is titled "Enter Local Notification Information" and contains the following fields:

- Notification Type:** Radio buttons for "Email" (selected) and "Pager".
- Email Address:** A text input field.
- Email Type:** A dropdown menu with "Service Person" selected.
- Language:** A dropdown menu with "English" selected.
- Priority:** A dropdown menu with "All Priorities" selected.
- Category:** A dropdown menu with "All categories" selected.
- Event Type:** A list box containing the following items: "All Events", "AgentDeinstallEvent", "AlarmEvent", "AuditEvent", "CommunicationEstablishedEvent", and "CommunicationLostEvent".

At the bottom of the dialog box are two buttons: "Add" and "Back".

FIGURE 3-19 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. Please refer to the *Sun StorEdge 3900 and 6900 series Installation and Service Manual*, pn 816-3244-10 for more information.

---

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

1. Enter one or more email addresses into the Email Address/File name textbox.

2. For each address, choose from:

- 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 Category list—Select from the current suite 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.

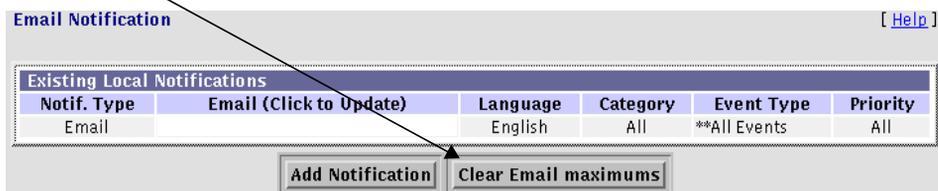
The Storage Automated Diagnostic Environment sends the specific event-type messages, by device type, to one or more email addresses you specified.

## ▼ To Clear a Specified Number of Maximum Emails

For events that produce frequent error messages, you can specify the number of times you are notified. If the maximum number is set to a value other than “no maximum” (the default), you can receive an email 5, 10, 20, or 50 times within an eight-hour period. The last email indicates that this is the final notification you will receive within the eight-hour time period.

To set the maximum email number, refer to “To Change Configuration Options” on page 81.

- To clear a previously-set value, click **Clear Email maximums** from the **Email Notification** window.



**FIGURE 3-20** Clear Email Maximums

The specified email maximum numbers are cleared and all events will now be emailed every time the agent runs.

---

**Note** – If you have set the maximum number of emails to 10, have received 10 emails on the same component within an eight-hour time period, and want to receive more email notifications, you must click the **Clear Email maximums** button.

---

# 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 eight providers: HTTP, Email, Sun StorEdge Topology Reporter (SSTR), Sun Remote Services (SRS), SRS/NetConnect, Simple Network Management Protocol (SNMP), Sun StorEdge Remote Response (SSRR), and SunMC.

This section discusses the following topics:

- “To Set Up Providers” on page 68
- “HTTP Provider” on page 69
- “Email Provider” on page 70
- “SSTR Provider” on page 71
- “SRS Net Connect Provider” on page 73
- “SRS Provider” on page 72
- “SSRR Provider” on page 74
- “SNMP Traps” on page 77
- “SunMC Provider” on page 75

## ▼ To Access the Notification Provider Maintenance Window

1. **Click the Admin tab in the Storage Automated Diagnostic Environment main window.**
2. **Click the Providers link on the Maintenance menu.**

The Notification Provider Maintenance window is displayed.

## ▼ To Set Up Providers

To set up one of the Providers, complete the required fields shown in TABLE 3-10.

**TABLE 3-10** Storage Automated Diagnostic Environment Providers

Provider	Required Action
HTTP	<ul style="list-style-type: none"> <li>• Enable the Active checkbox.</li> <li>• Type the IP address that identifies the host to the network.</li> <li>• Type the Proxy address.</li> <li>• Specify, in seconds, the duration of time before timeout is to occur.</li> </ul>
Email	<ul style="list-style-type: none"> <li>• Enable the Active checkbox.</li> <li>• Type the email address to where the messages will be sent.</li> </ul>
SSTR	<ul style="list-style-type: none"> <li>• Enable the Active checkbox.</li> <li>• Type the IP address that identifies the host to the network.</li> <li>• Type an optional timeout duration (in seconds). The default is 90 seconds.</li> <li>• Specify in which format you would like the information transmitted: Internal or XML.</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 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 an optional second IP address. A second IP address is allowed if events need to be sent to a second notification provider, which must also accept the SRS XML format.</li> </ul>
SSRR Sun StorEdge Remote Response	<ul style="list-style-type: none"> <li>• Enable the Active checkbox.</li> <li>• Select or deselect <i>Use Proxy</i>. The Proxy can be used when the modem is not set up.</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>

# HTTP Provider

The HTTP Provider, internal to Sun, sends HTTP calls to an HTTP server and transfers CIM data in the appropriate format. This is an Intranet mechanism for transporting reliability, availability, and serviceability (RAS) information collected by the Storage Automated Diagnostic Environment agent.

All available instrumentation, events, and topology information is sent to the Network Storage Command Center (NSCC). Although the information extracted is used to improve products and service, the information is not monitored by Sun Service personnel.

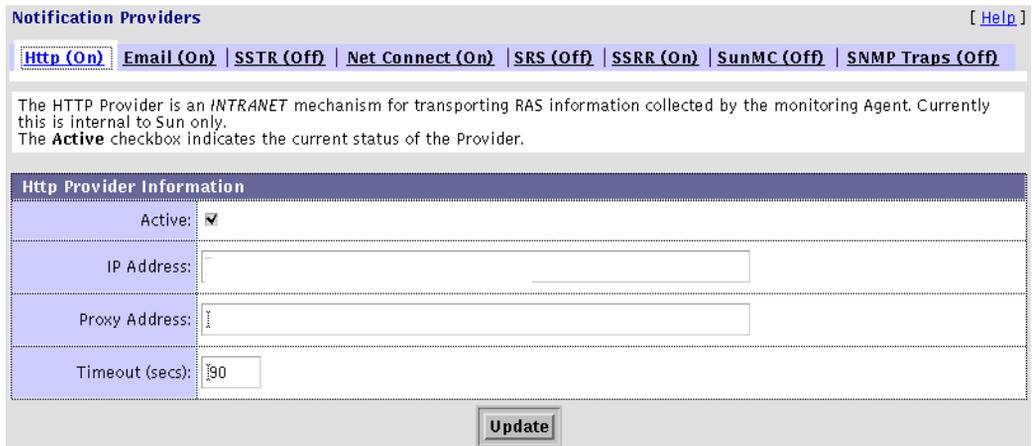


FIGURE 3-21 HTTP Provider window

Requirements for HTTP Provider	Necessary for this Provider?
Sun Service contract	No
Additional software	No
Additional hardware	No

## Email Provider

The Email Provider enables specific events to be emailed to local administrators. Events can also be summarized and sent to a pager's email address. This is an Intranet mechanism for transporting reliability, availability, and serviceability (RAS) information collected by the Storage Automated Diagnostic Environment agent. Although the information extracted is used to improve products and service, the information is not monitored by Sun Service personnel.

For information on how to categorize events by device type, severity level, and event type, refer to "To Set Up Local Email and Pager Notifications" on page 63.

The screenshot shows a web-based configuration interface titled "Notification Providers" with a "[ Help ]" link in the top right. A navigation bar contains several tabs: "Http (On)", "Email (On)", "SSTR (Off)", "Net Connect (On)", "SRS (Off)", "SSRR (On)", "SunMC (Off)", and "SNMP Traps (Off)". The "Email (On)" tab is selected. Below the tabs, a text box states: "The email provider is used to send events to the SUN Network Storage Command Center using email." A section titled "Email Information" contains two fields: "Active:" with a checked checkbox and "Address:" with an empty text input field. An "Update" button is located at the bottom center of the form.

FIGURE 3-22 Email Provider window

Requirements for Email Provider	Necessary for this Provider?
Sun Service contract	No
Additional software	No
Additional hardware	No

## SSTR Provider

The SSTR Notification Provider is a mechanism for transporting alerts collected by the monitoring agent to the Sun StorEdge Topology Reporter (SSTR). All available instrumentation, events, and topology information is sent to SSTR in XML format. The SSTR uses the information to generate alerts.

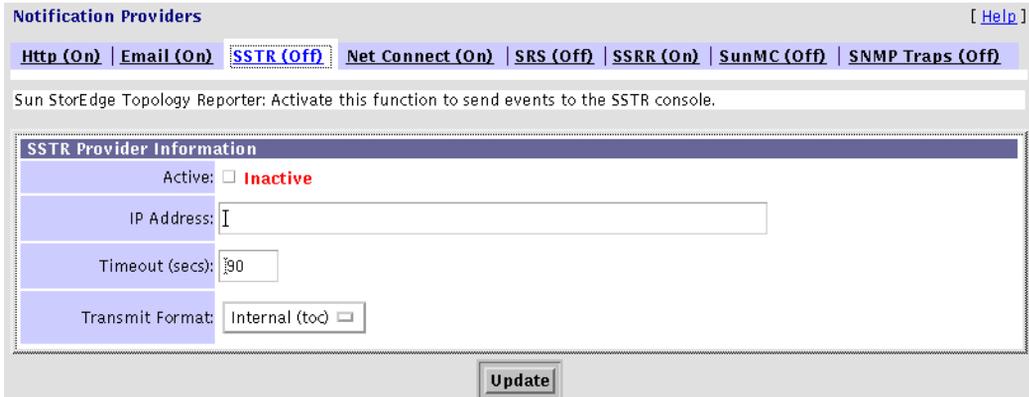


FIGURE 3-23 SSTR Provider window

Requirements for SSTR Provider	Necessary for this Provider?
Sun Service contract	No
Additional software	Sun StorEdge Enterprise Storage Manager (ESM) 1.0
Additional hardware	No

The SSTR console enables the user to:

- View hardware assets such as hosts, host bus adapters, switches, and storage devices, including a graphical view of your environment
- Manage users, alarms, and assets
- Configure user email notification and network host notification
- Manage asset reporting (also known as discovery)
- Launch other web browser-based applications related to devices in the customer's environment.

Refer to the *Sun StorEdge Enterprise Storage Manager 1.0 Topology Reporter Administrator and Operations Guide* for more information.

## 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.

---

**Note** – The Sun Remote Services (SRS) Provider enables a second IP address, in case the events need to be sent to a second notification provider that also accepts the SRS XML format.

---

 Inactive', 'IP Address: ', and 'Heartbeat Frequency (hours): '. At the bottom of the section is an 'Update' button."/>

Notification Providers [ Help ]

Http (On) | Email (On) | SSTR (Off) | Net Connect (On) | **SRS (Off)** | SSRR (On) | SunMC (Off) | SNMP Traps (Off)

Enter the IP address of the SRS console and check 'Active' to turn on the SRS Notification Provider.  
A second IP is allowed if events need to be sent to a second Notification Provider that also accepts the SRS xml format.

**SRS Provider Information**

Active:  Inactive

IP Address:

Heartbeat Frequency (hours):

Update

FIGURE 3-24 SRS Provider window

---

Requirements for SRS Provider	Necessary for this Provider?
Sun Service contract	Yes
Additional software	Yes
Additional hardware	Yes

---

## SRS Net Connect Provider

The SRS Net Connect Provider is a part of the SRS family of products. Net Connect 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).

Although the information extracted is used to improve products and service, the information is not monitored by Sun Service personnel. Currently, the storage information is not available by way of the SRS Net Connect portal.

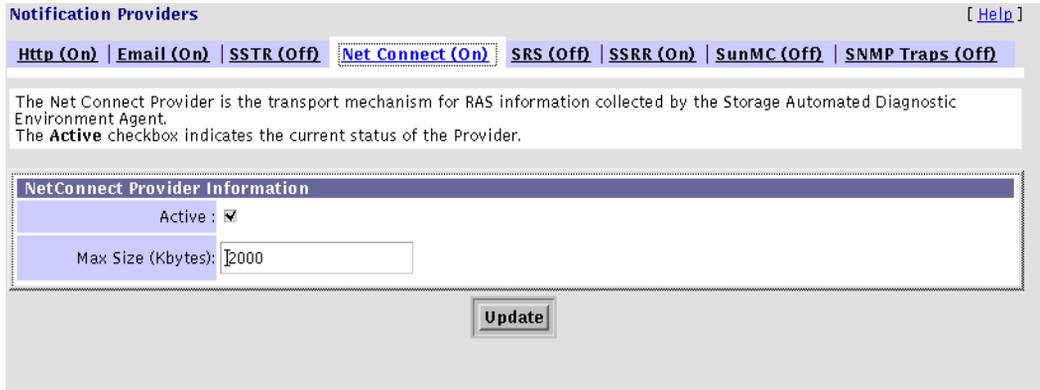


FIGURE 3-25 NetConnect Provider window

---

**Note** – The host with the master agent must be the same host that is configured as the relay in an SRS Net Connect Provider configuration.

---

---

Requirements for Net Connect Provider	Necessary for this Provider?
Sun Service contract	No
Additional software	SRS Net Connect, available on the Sun Download Center
Additional hardware	No

---

## 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 3-26 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.`

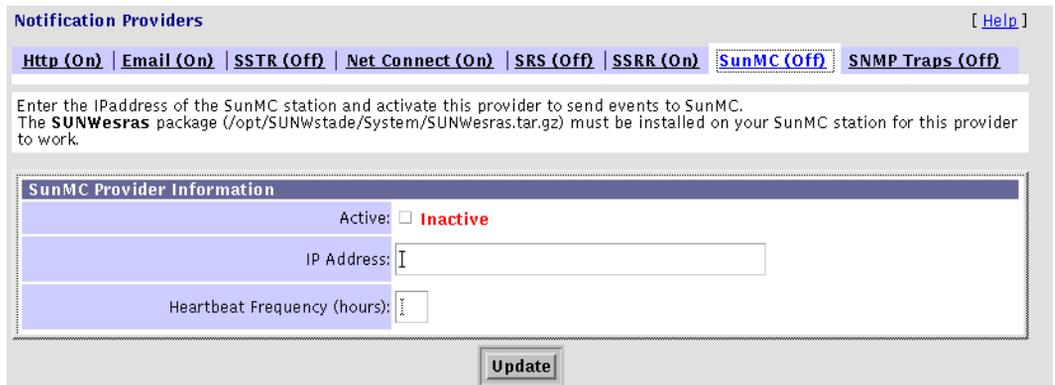
---

Requirements for SSRR Provider	Necessary for this Provider?
Sun Service contract	Yes
Additional software	Yes
Additional hardware	Yes

## 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.

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.



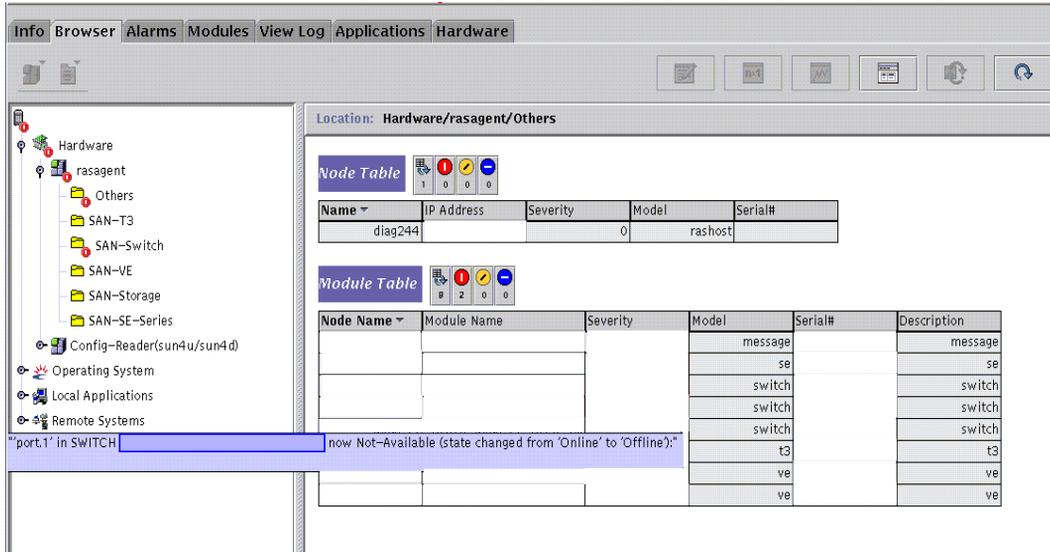
**FIGURE 3-27** SunMC Provider window



**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 3-28.



**FIGURE 3-28** SunMC Console window

# 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.

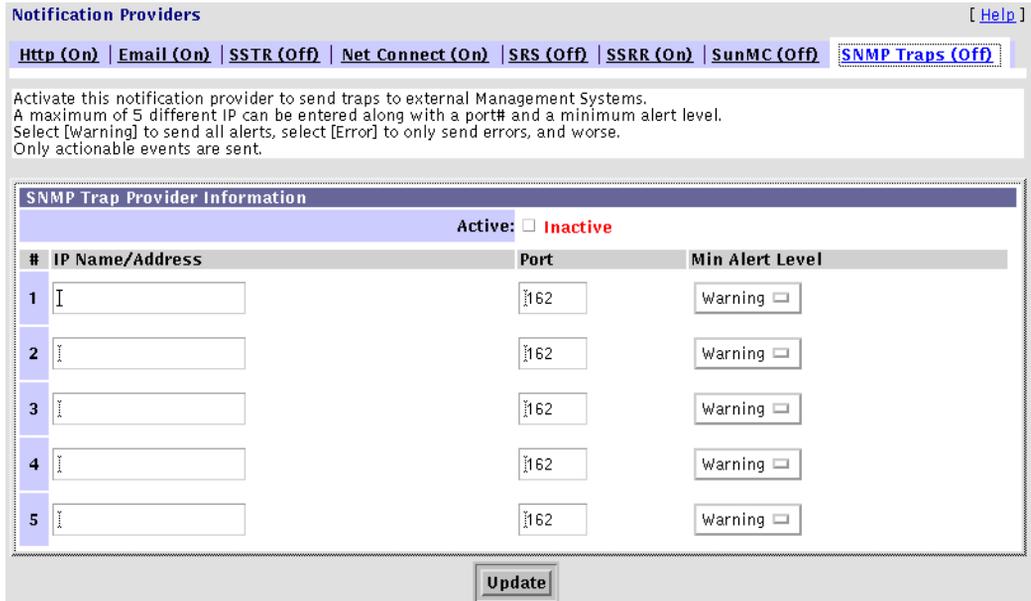


FIGURE 3-29 SNMP Traps Provider window

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

---

## ▼ To Start or Stop Agent(s)

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 Access the Start Agents Window” on page 78
- “To Activate or Deactivate Monitoring on a Device-by-Device Basis” on page 79

## ▼ To Access the Start Agents Window

1. Click the **Admin** tab 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 3-30 Start/Stop Agents window

Using the Start Agent(s) function to avoid creating email notifications on false errors works only if you are monitoring a *single* device type and all of the devices are monitored simultaneously, as in an upgrade.

To control email notifications for specific devices, refer to “To Activate or Deactivate Monitoring on a Device-by-Device Basis” on page 79.

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

To access the Start Devices Monitoring window:

1. Click the **Admin** tab 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 > Admin > General Maintenance > Start Devices [ Help ]  
Used to selectively deactivate the monitoring of storage devices

Primary Host	Name	Type	Address/WWN	Monitoring	Start	Stop
		a5k		On		<input type="checkbox"/>
		a5k		On		<input type="checkbox"/>
		internal		On		<input type="checkbox"/>
		a5k		On		<input type="checkbox"/>
	l	switch		On		<input type="checkbox"/>
		switch		On		<input type="checkbox"/>
		switch		On		<input type="checkbox"/>
		switch		On		<input type="checkbox"/>
		brocade		On		<input type="checkbox"/>
		t3		On		<input type="checkbox"/>
		t3		On		<input type="checkbox"/>

Submit Changes

FIGURE 3-31 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.

---

## ▼ To 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.

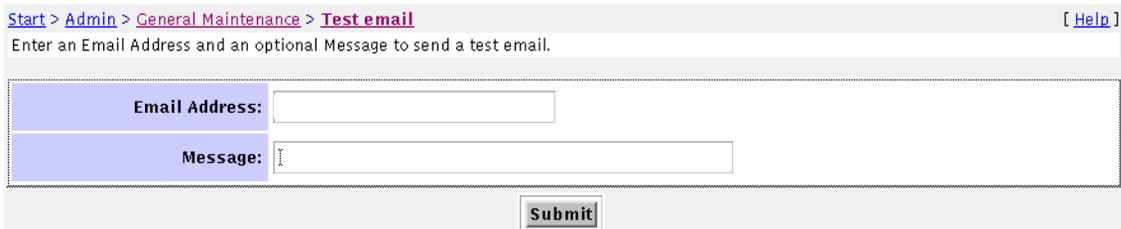
## ▼ To Access the Test Email Window

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

The Test Email window is displayed.

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.



The screenshot shows a web interface for sending a test email. At the top, there is a breadcrumb trail: [Start](#) > [Admin](#) > [General Maintenance](#) > [Test email](#). To the right of the breadcrumb is a [\[ Help \]](#) link. Below the breadcrumb, there is a text prompt: "Enter an Email Address and an optional Message to send a test email." The main form area contains two textboxes. The first is labeled "Email Address:" and is empty. The second is labeled "Message:" and is also empty. Below the textboxes is a "Submit" button.

**FIGURE 3-32** Test Email window

## ▼ To 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.

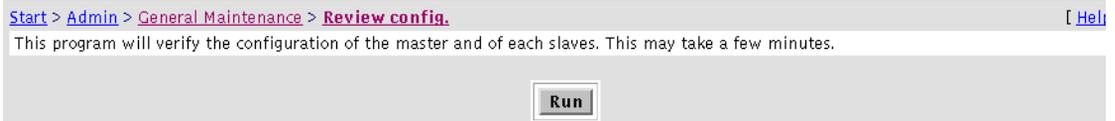


FIGURE 3-33 Review Configuration window

## ▼ To Change 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 options.

Config Options [ Help ]

Enter Configuration Options

Number of old (historical) topologies to save for comparison: 15

Test Manager Refresh rate: 30 (minimum is 5 secs.)

Max Event File Size: 2 (Meg)

Path to Email Program: /usr/bin/mail

System Admin Email: yourself@yoursite

Send one email per event (Provide a specific email subject):

Maximum number of emails about the same component in the same 8 hours period: No maximum

GUI Bandwidth: High Bandwidth

Create Hubs when appropriate:

Update 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

Update Window

FIGURE 3-34 Change Configuration Options window

**TABLE 3-11 Storage Automated Diagnostic Environment Configuration Options**

Configuration Option	Description
Number of old (historical) topologies to save for comparison	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, in seconds, 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.
Path to Email Program	Use to change the local email program path.
System Admin Email	Specify the email address of the system administrator responsible for receiving event output.
Send One Email Per Event	Enable this checkbox to limit the number of emails sent about a specific event to one.
Maximum Number of Emails	Specify the maximum number of emails that will be sent within an eight-hour period about a specific event. The default is <i>no maximum</i> ; options include 5, 10, 20, or 50. You can also clear the specified maximum number of emails using “Customizing Email Deliveries” on page 63.
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.
Browser Window Screen Size	Use to configure the default GUI screen size. <ul style="list-style-type: none"> <li>• Big Screen—displays three windows: the left frame window, the top window (with tracking links), and the main topic window. Big Screen is recommended if your monitor size is 1280 x 1024.</li> <li>• Small Screen—displays three windows, as with the Big Screen selection, but is recommended if your monitor size is 1024 x 864.</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>

---

# 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 Admin Window” on page 32
- “To Create a Topology Snapshot” on page 84
- “To Merge Topologies” on page 86
- “To Display Topology History” on page 87
- “Grouping” on page 88

## ▼ To Access the Topology Window

1. Click the **Admin** tab 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**.

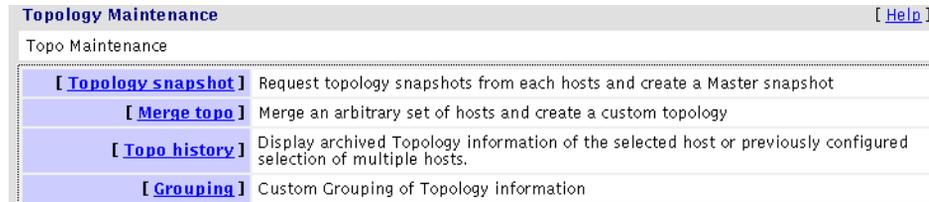


FIGURE 3-35 Topology Maintenance window

---

**Note** – In order to view a topology, you must first execute the `ras_install` command 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 have been 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.

[Start](#) > [Admin](#) > [Topology Maintenance](#) > [Topology snapshot](#) [\[ Help \]](#)

This function is used to retrieve topologies from different hosts (master and slaves) and merge them into a Master Topology.

- Click [Create and Retrieve Selected Topologies] to start discovery on the selected hosts.
- Once all topologies are retrieved, the Status should say 'Done'. Then click [Merge and Push Master Topology] to merge all available topology into the 'MASTER' topology.
- The 'Last Snapshot' column contains the date of the last time a topology was extracted from this host.
- The 'Last Master' column contains the date the last Master Topology was sent back to that host.
- If a timeout-error occurs, you may need to increase the timeouts in [System Timeouts](#).

**Note:** This function requires Solaris 8 or above to work.

Select	Topology	Last Snapshot	Last Master	Status	Error Details	Delete
<input type="checkbox"/>	Master	2002-05-21 15:54:15	2002-05-21 15:55:01	Done	<a href="#">Review</a>	
<input type="checkbox"/>	Slave	2002-05-21 15:54:38	2002-05-21 15:55:02	Done	<a href="#">Review</a>	

FIGURE 3-36 Create Topology Snapshot window

## 2. To display topology errors, click the Review link from the Error Details column.

## 3. 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.

## 4. 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 Time-Out Settings” on page 92.**

---

**Note** – 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. To create a combined (merged) topology, select two or more topologies from the Available Topologies section and enable the corresponding Select checkbox.**

**3. Type a unique name for the merged topology. Click Create.**

Start > Admin > Topology Maintenance > Merge topo [ Help ]

Merge the topologies

Combined topologies			
Delete	SanName	Created	Components
	MASTER	2002-05-21 15:55:02	

Delete Selected

Available Topologies		
Select	HostName	Created
<input type="checkbox"/>		2002-05-21 15:54:15
<input type="checkbox"/>		2002-05-21 15:54:38

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

FIGURE 3-37 Merge Topology Snapshot window

**4. To delete a merged topology, select the topology from the Combined topologies section and click Delete Selected.**

---

**Note** – Topologies can be updated only by creating a new Topology snapshot, which overwrites the old snapshot.

Merged topologies automatically incorporate new snapshots.

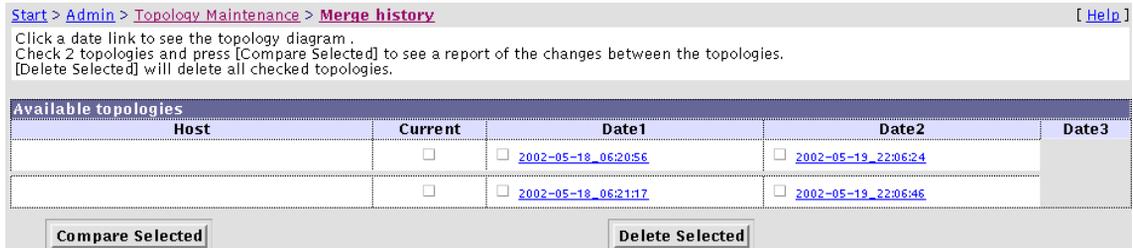
If you wish to delete a merged topology, use the SAN Merge Topologies functionality, not the Snapshot History functionality.

---

## ▼ 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 web interface for 'Merge history'. At the top, there is a breadcrumb trail: 'Start > Admin > Topology Maintenance > Merge history' with a '[ Help ]' link on the right. Below the breadcrumb, there are three instructions: '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 the instructions is a table titled 'Available topologies'. The table has five columns: 'Host', 'Current', 'Date1', 'Date2', and 'Date3'. There are two rows of data. Each row has a checkbox in the 'Current' column and checkboxes in the 'Date1' and 'Date2' columns. The 'Date1' and 'Date2' cells contain date and time links. Below the table are two buttons: 'Compare Selected' and 'Delete Selected'.

Host	Current	Date1	Date2	Date3
	<input type="checkbox"/>	<input type="checkbox"/> <a href="#">2002-05-18_06:20:56</a>	<input type="checkbox"/> <a href="#">2002-05-19_22:06:24</a>	
	<input type="checkbox"/>	<input type="checkbox"/> <a href="#">2002-05-18_06:21:17</a>	<input type="checkbox"/> <a href="#">2002-05-19_22:06:46</a>	

FIGURE 3-38 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 88
- “To Add Devices to a Particular Group” on page 90

## ▼ 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 hostname 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.

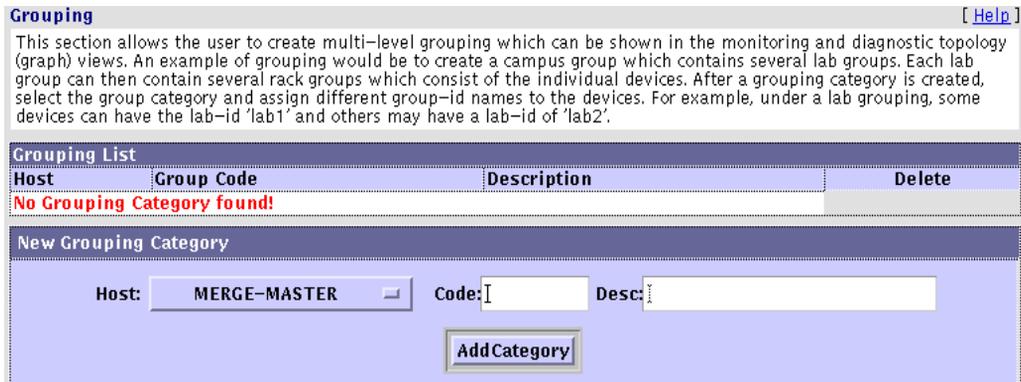


FIGURE 3-39 Topology Grouping window

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, shown in FIGURE 3-40.

The screenshot shows the SAD web interface. The top navigation bar includes 'Admin.', 'Monitor', 'Diagnose', 'Manage', and 'Report'. The main menu is 'Topology Maint.' with sub-items: 'Topo. Snapshot', 'Merge Topologies', 'Topology History', and 'Grouping'. The 'Grouping' section is active, displaying a 'Maintain' button and a 'MERGE-MASTER:building5' link. Below this is a table with columns: '+ Type', 'ID', 'Name', 'building5-Id', and 'Select'. The table contains three rows: 'a5k' with three '5xxxxxxxxxxxxx' IDs, 'host' with '<host-1>' and '<host-2>' names, and 'internal' with '<internal host-1>' name. At the bottom right, there is a 'building5-Id:' input field and an 'Update' button.

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	5xxxxxxxxxxxxx			<input type="checkbox"/>
	5xxxxxxxxxxxxx			<input type="checkbox"/>
	5xxxxxxxxxxxxx			<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 3-40 Topology Group Detail window

## ▼ To Add Devices to a Particular Group

1. From the Group Detail window, select the device's corresponding checkbox.
2. In the group's corresponding text box, type in 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 '.' notation in the Group-ID field. By using names such as lab1.rack1 and lab1.rack2, you create a lab1 group that contains two separate rack groups. The '.' notation enables multilevel grouping.

3. To access the Group Summary window, select the Summary link, located in the upper right corner of the Group Detail window.

This menu enables you to select the color and type of group icon that you want displayed. From this window, you can also add a description, which will appear next to the icon in the topology view.

4. To delete a component from a group, clear the Description field of the component you want to delete, and click UpdateIDs.

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"/>	<input type="text" value="standard=default"/>	<input type="text" value="Ipurple"/>

FIGURE 3-41 Group Summary window

---

# System Utilities

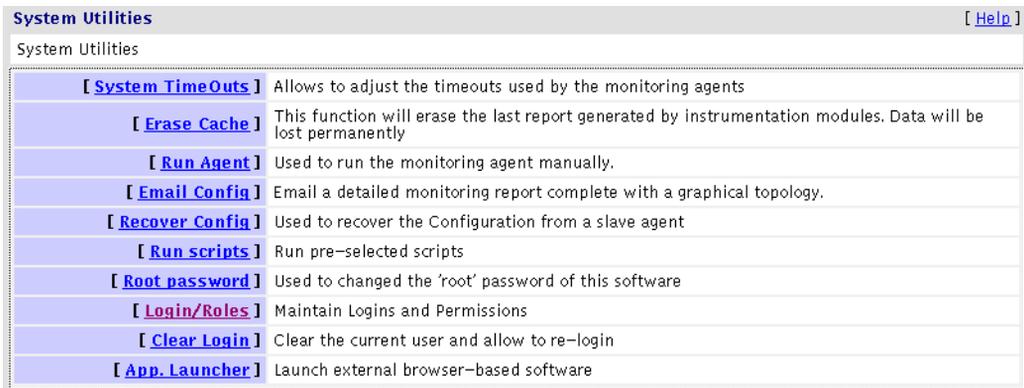
The Utilities section contains optional tools you can use for Storage Automated Diagnostic Environment administration.

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

- “To Change System Time-Out Settings” on page 92
- “To Erase a Device’s Cache” on page 94
- “To Run the Agent Manually” on page 95
- “To Email Configuration Information” on page 96
- “To Change the Security Password” on page 100

## ▼ To Access the System Utilities Page

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



System Utilities <span style="float: right;">[ Help ]</span>	
System Utilities	
[ <a href="#">System TimeOuts</a> ]	Allows to adjust the timeouts used by the monitoring agents
[ <a href="#">Erase Cache</a> ]	This function will erase the last report generated by instrumentation modules. Data will be lost permanently
[ <a href="#">Run Agent</a> ]	Used to run the monitoring agent manually.
[ <a href="#">Email Config</a> ]	Email a detailed monitoring report complete with a graphical topology.
[ <a href="#">Recover Config</a> ]	Used to recover the Configuration from a slave agent
[ <a href="#">Run scripts</a> ]	Run pre-selected scripts
[ <a href="#">Root password</a> ]	Used to changed the 'root' password of this software
[ <a href="#">Login/Roles</a> ]	Maintain Logins and Permissions
[ <a href="#">Clear Login</a> ]	Clear the current user and allow to re-login
[ <a href="#">App. Launcher</a> ]	Launch external browser-based software

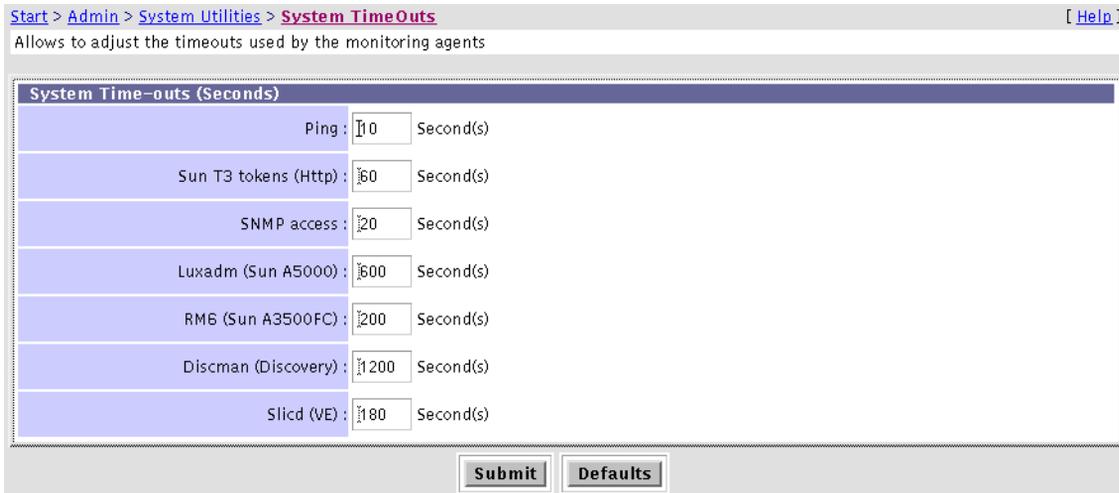
FIGURE 3-42 System Utilities window

# System Time-Outs

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

## ▼ To Change System Time-Out Settings

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



The screenshot shows a web-based configuration window titled "System Time-Outs (Seconds)". The window has a breadcrumb trail: "Start > Admin > System Utilities > System TimeOuts" and a "[ Help ]" link. Below the breadcrumb is the text "Allows to adjust the timeouts used by the monitoring agents". The main content area is a table with the following settings:

System Time-outs (Seconds)		
Ping :	<input type="text" value="10"/>	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)

At the bottom of the window are two buttons: "Submit" and "Defaults".

FIGURE 3-43 System TimeOuts window

2. Change the default settings for scheduled time-outs and click **Submit**. Refer to TABLE 3-12 for definitions of timeout settings.
3. To return to the default settings, click **Defaults**.

**TABLE 3-12** Time Out Settings

Setting	Definition
Ping	The timeout used to perform a ping. The default is 10 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 77.
Luxadm (Sun A5000)	The timeout used to query the Sun StorEdge A5000 array using luxadm(1M). The default is 600 seconds (10 minutes).
	For more information, reference the luxadm(1M) man page.
RM6 (Sun A3500FC)	The timeout used to query the Sun StorEdge A3500FC array 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 using discman(1M). The default is 1200 seconds (20 minutes).
	For more information, reference the discman(1M) man page.
Slicd (VE)	The timeout used to query the virtualization engines using the slicd daemon and libraries. The default is 180 seconds (3 minutes).
	For more information, refer to 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.



FIGURE 3-44 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

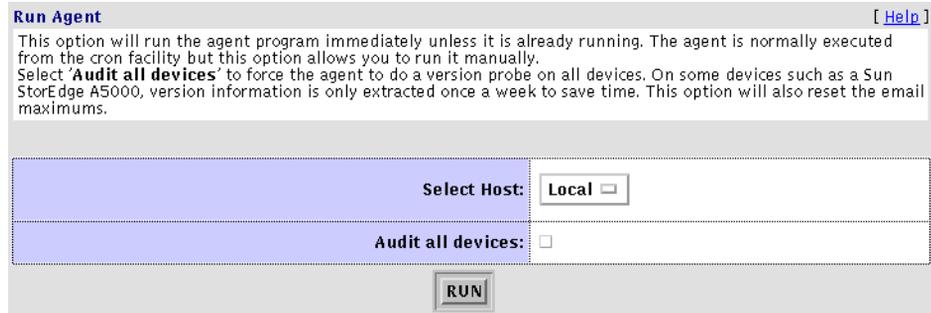


FIGURE 3-45 Run Agent Manually window

- Select a host from the Select Host pull-down menu and click RUN.

---

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

---

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

### *Audit All Devices*

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.

# 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. Refer to 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.

Start > Admin > System Utilities > 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:	<input type="text"/>
Comments:	<input type="text"/>
Select Host Topology	
<HOSTNAME1>	<input type="radio"/>
<HOSTNAME2>	<input type="radio"/>

Email

FIGURE 3-46 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 (slave) by copying the configuration from the alternate master to the master. The recovered configuration includes information that identifies the device setup, the host setup, and the email notification configuration of the alternate master.

You must know the IP address or name of the alternate master.

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 3-47** 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.

1. Click Run Scripts in the System Utilities window.
2. Select and click on a script from the Script List, shown in FIGURE 3-48. An example of a script is shown in FIGURE 3-49.

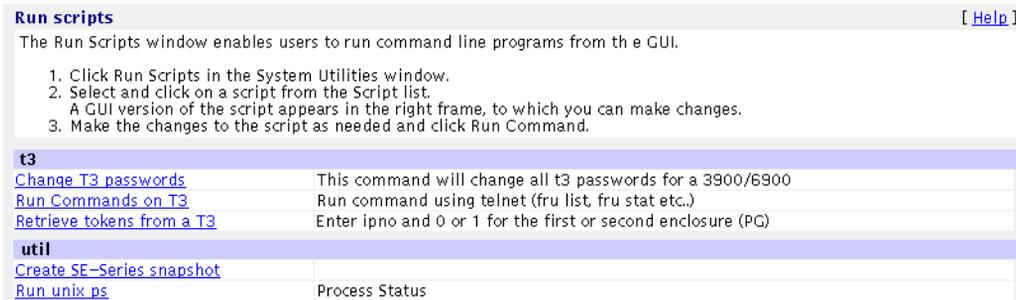


FIGURE 3-48 Script List

TABLE 3-13 provides a brief description of the scripts that are currently available for the Sun StorEdge T3+ Array.

TABLE 3-13 Run Scripts Options for the Sun StorEdge T3+ Array

Script Option	Description
<i>Sun StorEdge T3+ Array Scripts</i>	
Change T3 passwords	This command 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 command 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.

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

**Run scripts** [\[ Help \]](#)

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

1. Click Run Scripts in the System Utilities window.
2. Select and click on a script from the Script list.  
A GUI version of the script appears in the right frame, to which you can make changes.
3. Make the changes to the script as needed and click Run Command.

**Retrieve tokens from a T3**

Enter ipno and 0 or 1 for the first or second enclosure (PG)

**t3.testt3: bin/testt3**

Select host:	<input type="text" value="diag176.central.sun.com"/>
Arguments:	IP: <input type="text"/>
	Enclosure#: <input type="text" value="0"/>

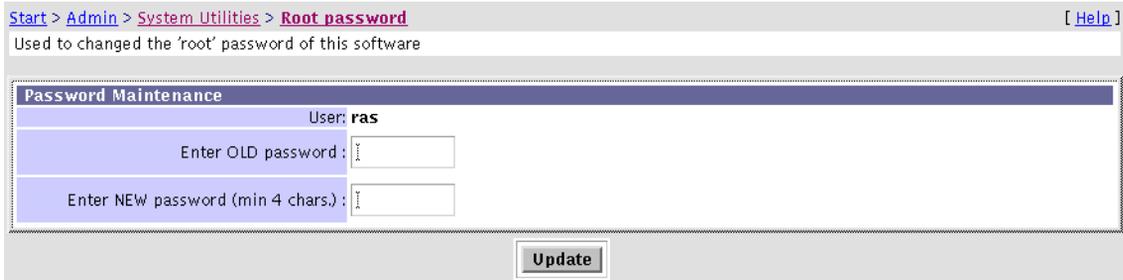
FIGURE 3-49 Script List Example—Retrieve Tokens from a Sun StorEdge T3 Array

### 4. To return to the Run Scripts main menu, click List.

# Password Maintenance

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

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



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 3-50 Change Password window

## ▼ To Change the Security Password

1. **You must know the current password. 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).

---

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

The security password is changed.

# Update User Roles

The Storage Automated Diagnostic Environment administrator can assign permission privileges for the categories listed in TABLE 3-14. In addition to assigning privileges, the administrator can add a new user, maintain passwords, and update or remove existing users.

**Note** – To remove a user, the administrator must delete the encrypted password and click Add/Update.

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

Use this screen to add 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	reserved for use by Sun Service managing Sun StorEdge 3900/6900 Series machines configured with SSRR.

**Login / Roles maintenance**

#	Del.	User	Password	Lang.	Window	Customer		Service				
						user	admin	user	admin	script	test	expert
1	<input type="checkbox"/>	storade	<input type="password"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
add:		<input type="text"/>	<input type="password"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
add:		<input type="text"/>	<input type="password"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
add:		<input type="text"/>	<input type="password"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
add:		<input type="text"/>	<input type="password"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
add:		<input type="text"/>	<input type="password"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
add:		<input type="text"/>	<input type="password"/>	English <input type="text"/>	Big <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**FIGURE 3-51** Update User Login/Roles window

---

**Note** – New to this release of the Storage Automated Diagnostic Environment is the ability to customize the size of the GUI window. Options include Big Screen (recommended if your monitor size is 1280 x 1024), Small Screen (recommended if your monitor size is 1024 x 864), and No Frames (displays tracking links only).

Refer to “To Change Configuration Options” on page 81 for more information.

In addition, a Language menu has been added with pulldown options of English, French, or Japan. At this time, English is the only available language.

---

**TABLE 3-14** 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.
storade	Reserved for use by Sun Service engineers who are trained to manage Sun StorEdge 3900 and 6900 series systems that have been configured with Sun StorEdge Remote Response (SSRR).

---

## Clear Login

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

### ▼ To Clear the Login Screen

1. **Click Cancel to the question “Authorization Failed. Retry?”**
2. **To return to the Login screen, reload the browser window.**

# Application Launcher

The Application Launcher, shown in FIGURE 3-52, enables users to store URL bookmarks in the Storage Automated Diagnostic Environment on a device-by-device basis.

**Note** – The Application Launcher provides an easy way to launch the Brocade Silkworm Switch Management Interface directly from the Storage Automated Diagnostic Environment without having to open a new browser window and type the URL of the Brocade Silkworm switch manually.

Currently the devices for which URL bookmarks can be stored include the following:

- Sun StorEdge T3 and T3+ arrays
- Brocade Silkworm switches
- Sun StorEdge Network FC Switches
- Sun StorEdge 3900 and 6900 series
- StorageTek 2 Gb T9840B Fibre Channel Tape devices
- Virtualization engines

**App. Launcher** [ Help ]

Use this form to associate each device-types to an external web-based application. These applications can be used to manage each type of device. The special symbol \$ip and \$swrn 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.

Enter name and URL		
Device Type	Application Name	Application URL
Sun T3 1:	IT3 Web UI	http://\$ip
2:		
Brocade switch 1:	brocade Web UI	http://\$ip
2:		
Sun Switch 1:	\$UNWswmgr	http://\$ip
2:		
Sun Switch2 1:	\$UNWswmgr	http://\$ip
2:		
Sun 3900/6900 1:		
2:		
FC-Tape 1:		
2:		
Vicom VE 1:		
2:		

**Update**

FIGURE 3-52 Application Launcher



# Monitoring

---

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

- “Monitoring Devices” on page 106
- “Monitoring Topology” on page 110
- “Monitoring Logs” on page 118

## ▼ To Access the Monitor Page

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

Monitoring is divided into three sections: Monitor Devices, Monitor Topology, and Monitor Log, as shown in FIGURE 4-1.



FIGURE 4-1 Monitor Sections

---

# 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.

## ▼ To View Device Reports

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.

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

Storage Automated Diagnostic Environment

Admin Monitor Diagnose Manage Report

Monitor Devices | Monitor Topology | Monitor Log

Monitor Devices [ Help ]

Search:  Host: All Hosts

Host	Type	Name	Sev	Last Report
	3x00 Brocade			2002-08-19 13:25:17
	McDATA			2002-08-19 13:25:22
	McDATA			2002-08-19 13:25:31
	McDATA			2002-08-19 13:25:27
	Switch1			2002-08-19 13:26:03
	Switch1			2002-08-19 13:25:33
	Switch1			2002-08-19 13:25:32
	Switch2			2002-08-19 13:25:42
	Switch2			2002-08-19 13:25:57
	Switch2			2002-08-19 13:26:28
	Switch2			2002-08-19 13:25:51
	a5k			2002-08-16 14:08:36
	host			2002-08-16 14:11:17
	t3b			2002-08-19 13:26:53
	t3b			2002-08-19 13:26:55
	t3b			2002-08-19 13:26:45

Use the 'Name:' field to search large list of devices.  
Name Search Syntax: Enter a few or all letters of the device name.  
Wildcards are not supported

FIGURE 4-2 Monitor Devices window

2. In the Search field, type at least a portion of the device name to display specific devices, or click on the device name link from the Name column.
3. Select a host from the Host pulldown menu and click GO.  
A list of devices for that host appears.
4. Click on a device from the Name column to view a list of all of the device's components.

---

**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.

---

5. Click on a component's corresponding Summary, Alerts, Log, Report, or Graph link.

Click here for Report options

**Monitor Devices** [ [Help](#) ]

[ [Summ.](#) | [Alerts](#) | [Log](#) | [Report](#) | [Graph](#) ]

**McDATA mc-35-161**

port#	Slot - Port	Admin/Port State	Attached WWN
0	0 - 0	online-online	2016080088a0cc4c
1	0 - 1	online-online	2017080088a0cc4c
2	0 - 2	online-offline	Not Connected
3	0 - 3	online-online	2b00006022004170
4	1 - 0	online-online	202a080088a0cc4c
5	1 - 1	online-online	202b080088a0cc4c
6	1 - 2	online-offline	Not Connected
7	1 - 3	online-online	2b00006022004171
8	2 - 0	online-offline	Not Connected
9	2 - 1	online-offline	Not Connected
10	2 - 2	online-offline	Not Connected

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

Options from the Monitor Devices Report window include:

- A summary report about the selected device
- An alert state 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

## Graph Summary

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

---

**Note** – The Storage Automated Diagnostic Environment currently displays only the Sun StorEdge T3 and T3+ array in the graphical view, as in FIGURE 4-4.

---

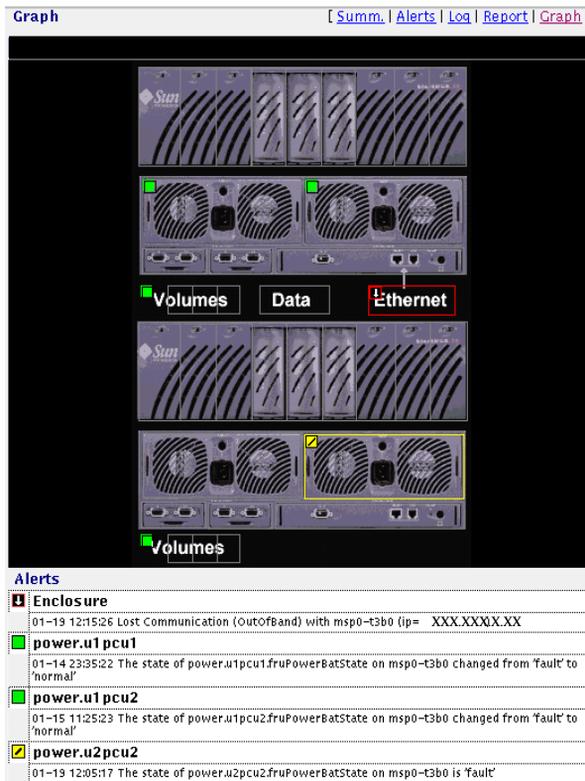


FIGURE 4-4 Sun StorEdge T3 Array Graph Summary and Component Alert List

Devices other than the Sun StorEdge T3 array do not display in graphical format, in which case the following message appears: `No Graph Available!`

The Alerts list, however, does appear with every device (providing that an outstanding Alert exists).

---

## 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.

### ▼ 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 “Installing SUNWstade” on page 12.
2. After device discovery, create a Topology snapshot. Refer to “To Create a Topology Snapshot” on page 84 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.

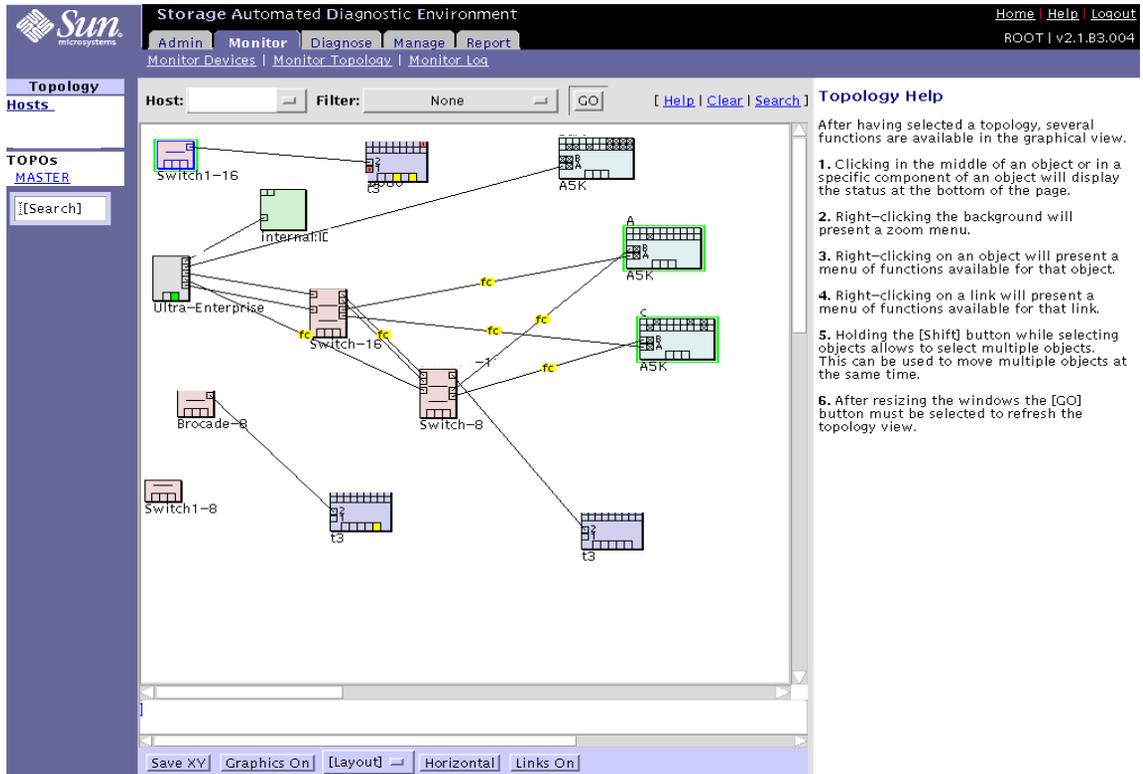


FIGURE 4-5 Sample Topology View

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

---

### *Topology in System View*

When System View is selected from the Monitor Topology menu, storage subsystems appear as a single device in the topology. The subsystem icon contains component indicators that can be individually selected to view the device's reports and alerts, along with other topology features.

To display the topology in System View:

- 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.**
- 3. From the Filter pull-down menu, select System View and click GO.**

The System View Topology is displayed, as shown in FIGURE 4-6.

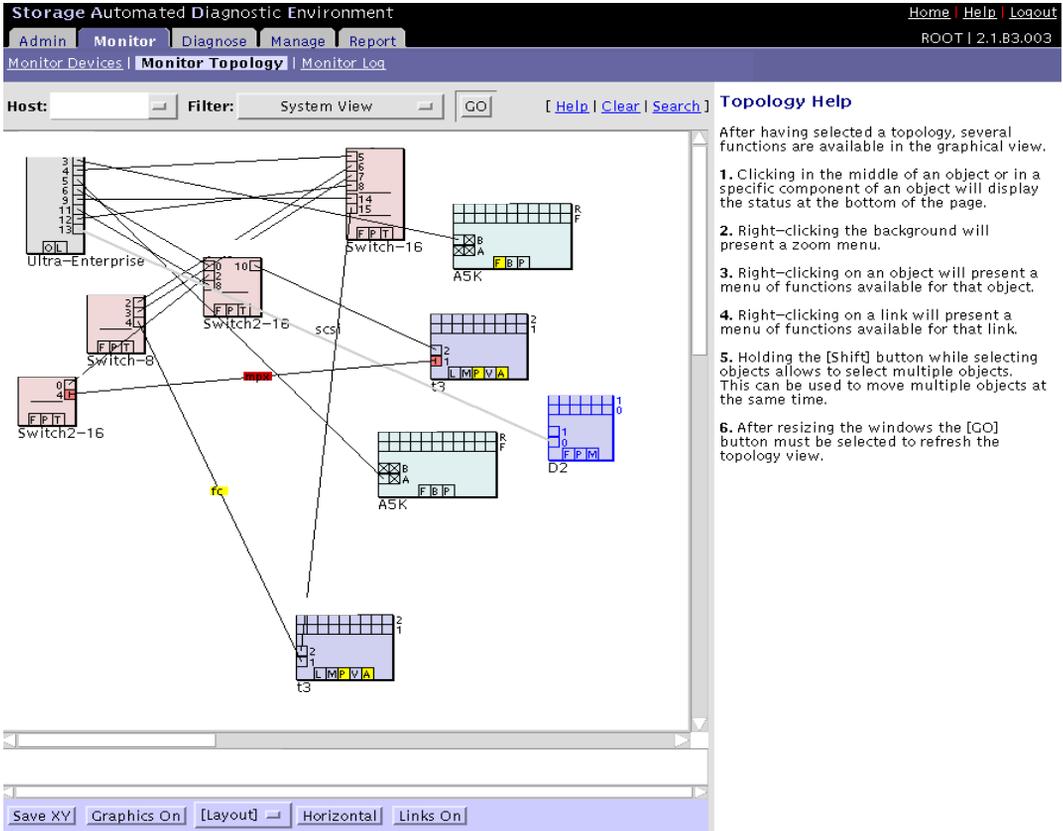


FIGURE 4-6 Topology in System View

## ▼ 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.**

---

**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 to 100%, 83%, 66%, or 50% 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 XY 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 layout of the topology from default to Sun StorEdge 3900 or 6900 series Solutions cabinet, click the Layout 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 XY.

## 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.

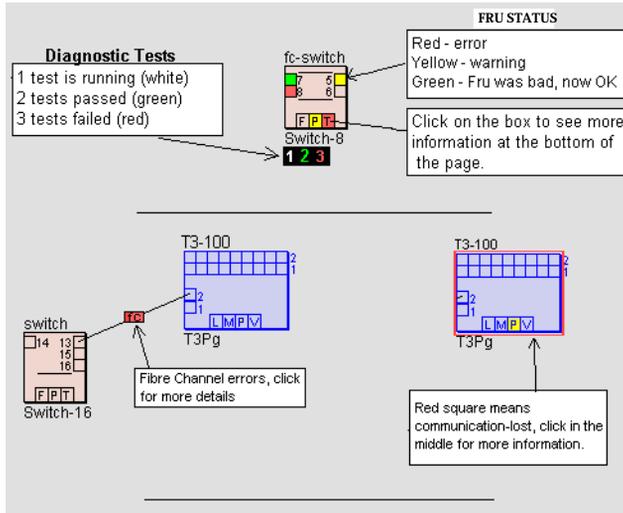


FIGURE 4-7 Topology Help

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
- l = 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.

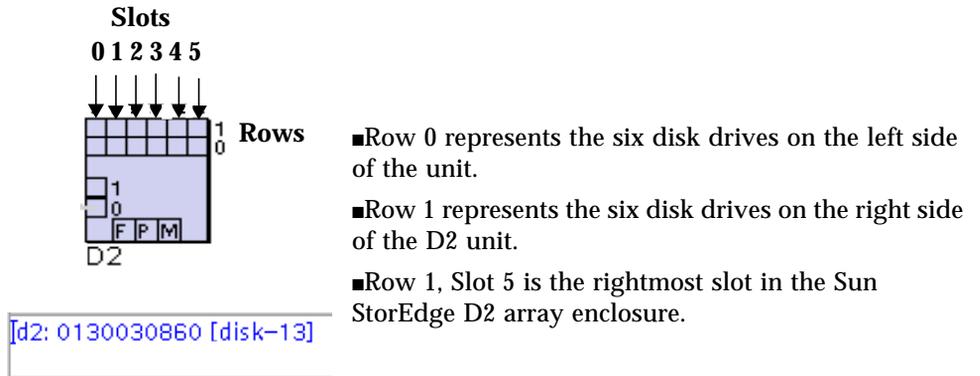
If a GREEN “mpxio” label is displayed in the Topology, a Sun StorEdge Traffic Manager failover has occurred on this path, but was later corrected.

---

---

**Note** – 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.

---



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 119
- “To View an Event Log for a Host” on page 120
- “To View Alert Logs” on page 122
- “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.

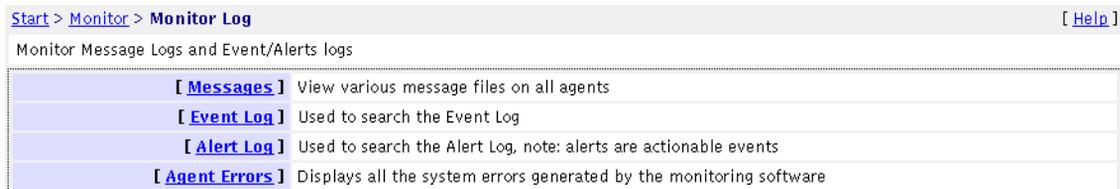


FIGURE 4-9 Monitor Logs window

## ▼ 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.



The screenshot shows a web interface for monitoring messages. At the top, there is a breadcrumb trail: [Start](#) > [Monitor](#) > [Monitor Log](#) > [Messages](#). A [\[ Help \]](#) link is in the top right corner. Below the breadcrumb, the text "View various message files on all agents" is displayed. The main content is a table titled "Host's log files". The table has six columns: HostName, Type, Host ID, Host IP, Log, and Sun T3 log. There are two rows of data. The first row has a blank HostName, Type "Master", blank Host ID and Host IP, and Log links for [/messages](#) and [/messages.0](#). The second row has a blank HostName, Type "Slave", blank Host ID and Host IP, Log links for [/messages](#) and [/messages.0](#), and "not exist" in the Sun T3 log column.

HostName	Type	Host ID	Host IP	Log	Sun T3 log
	Master			<a href="#">/messages</a> <a href="#">/messages.0</a>	
	Slave			<a href="#">/messages</a> <a href="#">/messages.0</a>	not exist

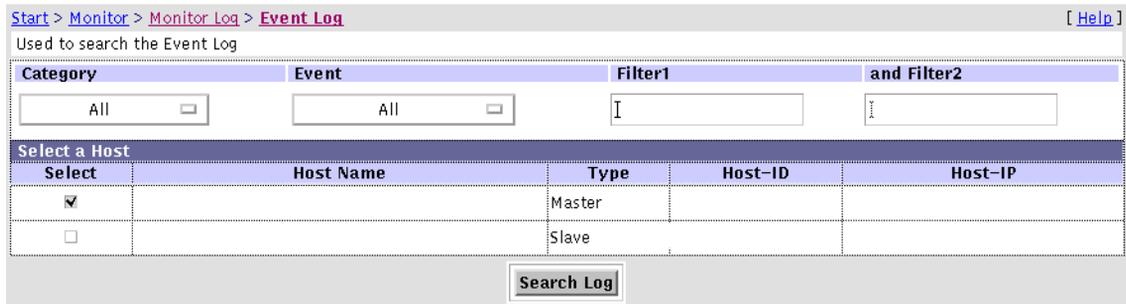
FIGURE 4-10 `/var/adm/messages` window

- **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 a web interface for viewing event logs. At the top, there is a breadcrumb trail: Start > Monitor > Monitor Log > Event Log, with a [ Help ] link on the right. Below this is a search prompt: "Used to search the Event Log". The main area is divided into two sections. The first section contains four search filters: "Category" (a pull-down menu set to "All"), "Event" (a pull-down menu set to "All"), "Filter1" (a text input field), and "and Filter2" (a text input field). The second section is titled "Select a Host" and contains a table with the following columns: "Select", "Host Name", "Type", "Host-ID", and "Host-IP". The table has two rows: one for "Master" and one for "Slave". The "Master" row has a checked checkbox in the "Select" column, while the "Slave" row has an unchecked checkbox. Below the table is a "Search Log" button.

Category	Event	Filter1	and Filter2	
All	All			

Select a Host				
Select	Host Name	Type	Host-ID	Host-IP
<input checked="" type="checkbox"/>		Master		
<input type="checkbox"/>		Slave		

FIGURE 4-11 Event Logs window

2. To search for events on a given device type, choose the device from the Category pull-down menu.

All is the default.

Pull-down menu options include devices currently supported by the Storage Automated Diagnostic Environment.

3. Choose an Event from the Event pull-down menu.

All is the default.

Pull-down menu options include Communication Events, Discovery, Alarm Event, Removal Event, Diagnostic Test, Topology Event, Audit Event, State Change Event, Agent Event, Backup Event, Patch Event, Link Event, Location Change Event, and Statistical Event.

4. To narrow the size of the Event Log, type the IP address for which you want to view the Event Log into the Filter1 and/or Filter2 text box.

5. Select one or more hosts and click Search Log.

The corresponding event log window is displayed.

Time	Sev	Event	Description
2002-05-21 17:10:05	■	<a href="#">agent.AgentInstallEvent host</a>	Agent on host 808acd2e was Added to the Config File
2002-05-21 01:10:05	■	<a href="#">agent.HeartbeatEvent</a>	
2002-05-20 01:00:07	■	<a href="#">agent.AgentInstallEvent host</a>	Agent on host <HOSTNAME> 808acd2e was Added to the Config File
2002-05-20 01:00:07	■	<a href="#">agent.AgentInstallEvent host</a>	Agent on host <HOSTNAME> 08acd2e was Added to the Config File
2002-05-19 22:55:09	■	<a href="#">agent.AgentInstallEvent host</a>	Agent on host <HOSTNAME> 808acd2e was Added to the Config File
2002-05-19 14:50:14	■	<a href="#">host.PatchInfo</a>	Patch and/or Package Information has changed:
2002-05-19 14:50:12	■	<a href="#">host.backup</a>	NS Agent backup
2002-05-18 12:40:06	■	<a href="#">agent.AgentInstallEvent host</a>	Agent on host <HOSTNAME> 808acd2e was Added to the Config File
2002-05-18 10:35:08	■	<a href="#">agent.AgentInstallEvent host</a>	Agent on host <HOSTNAME> 808acd2e was Added to the Config File
2002-05-18 10:35:07	■	<a href="#">agent.AgentInstallEvent host</a>	Agent on host <HOSTNAME> 808acd2e was Added to the Config File
2002-05-18 10:35:07	■	<a href="#">agent.AgentInstallEvent host</a>	Agent on host <HOSTNAME> 808acd2e was Added to the Config File
2002-05-18 08:30:57	■	<a href="#">host.PatchInfo</a>	New Patch and Package Information generated
2002-05-18 08:30:57	■	<a href="#">host.backup</a>	NS Agent backup
2002-05-18 08:30:08	■	<a href="#">agent.AgentInstallEvent host</a>	Agent on host <HOSTNAME> 808acd2e was Added to the Config File
2002-05-18 08:30:08	■	<a href="#">agent.AgentInstallEvent host</a>	Agent on host <HOSTNAME> 80c9a11a was Added to the Config File
2002-05-18 08:30:06	■	<a href="#">agent.AgentInstallEvent host</a>	Agent on host <HOSTNAME> 808acd2e was Added to the Config File

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

## ▼ To View Alert Logs

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

Start > Monitor > Monitor Log > Alert Log [ Help ]

Used to search the Alert Log, note: alerts are actionable events

Category	Event	Severity
All	All	All

Select a Host

Select	Host Name	Type	Host-ID	Host-IP
<input checked="" type="checkbox"/>		Master		
<input type="checkbox"/>		Slave		

Search Log

FIGURE 4-13 Alert Logs window

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

- Category—All is the default.

The device types supported by the current Storage Automated Diagnostic Environment agent version are displayed in the pull-down menu.

- Event—All is the default.

The Event types supported by the current Storage Automated Diagnostic Environment agent version are displayed in the pull-down menu.

- Severity—All is the default.

Options that are displayed in the pull-down menu include System Down, Critical (Error), Alert (Warning), and Caution (Information).

---

**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.

## ▼ 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.

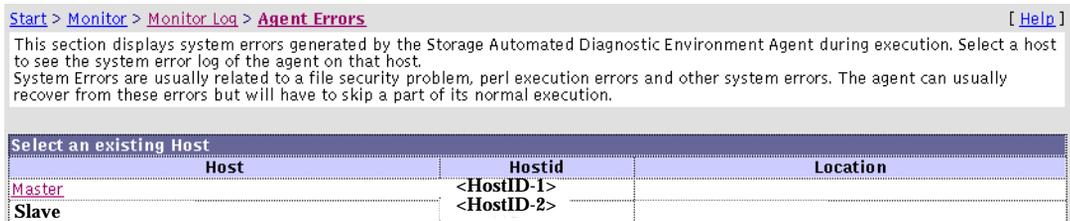


FIGURE 4-14 Display Agent Errors window

2. Select an existing host.

The corresponding Storage Automated Diagnostic Environment Agent Error Logfiles window is displayed, as shown in FIGURE 4-15.

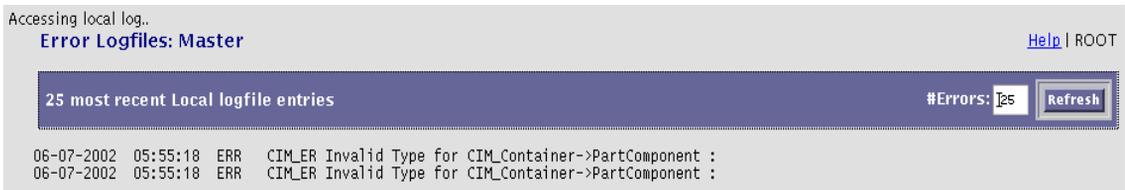


FIGURE 4-15 Agent Error Logfile



# Diagnostics

Through the Storage Automated Diagnostic Environment GUI, you can perform the tasks that appear in TABLE 5-1.

**TABLE 5-1** Storage Automated Diagnostic Environment Diagnostics Functions

Task	Function
Run Diagnostic tests from the GUI window.  Refer to “Running Diagnostic Tests From the GUI Window” on page 129.	<ul style="list-style-type: none"><li>• Enables you to access diagnostic test from a topology view</li><li>• Enables you to access diagnostic test from a list</li><li>• Enables you to adjust the default settings for selected diagnostic tests</li><li>• Enables you to review, delete, or archive diagnostic tests.</li><li>• Enables you to review the results of old tests.</li></ul>
Check revision level of components.  Refer to “To Display Revision Checking Reports” on page 187	Enables you to check the software, hardware, and firmware revisions of all user-selected components
Check the health of FC links.  Refer to “To Run FC Check” on page 190	Enables you to verify the health of physical Fibre Channel links.

# 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 5-2 describes the basic differences between the user interfaces.

**TABLE 5-2** Storage Automated Diagnostic Environment Diagnostics User Interface Differences

Interfaces	Description
GUI Window	You can select tests and test options inside the Storage Automated Diagnostic Environment GUI's Topology section in one of two ways: <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	You run each test individually from a shell tool command line. All diagnostics are located in <code>/opt/SUNWstade/Diags/bin</code> . Refer to the man pages for more details.  <b>Note:</b> You must log into the appropriate host or slave for testing.

# 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` (which tests the 2200 and 2300 Qlogic HBA) 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.

---

## 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. Refer to TABLE 5-3 for details.

The standard syntax for most tests is as follows :

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

For a list of diagnostic tests and for information about the man pages, refer to “Storage Automated Diagnostic Environment Diagnostics Tests” on page 208.

## Standard Command-Line Arguments

TABLE 5-3 describes the standard command-line arguments.

**TABLE 5-3** 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 from the Storage Automated Diagnostic Environment main window, you can easily access test configuration, control, and results using the buttons in the dialog boxes. The test parameter options, however, are unique for each test and are illustrated in the individual sections with each test in this chapter.

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

## ▼ To Access the Diagnostic Tests

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



FIGURE 5-1 Diagnose window

2. Click the **Diagnostic Tests** link in the **Diagnose** page.

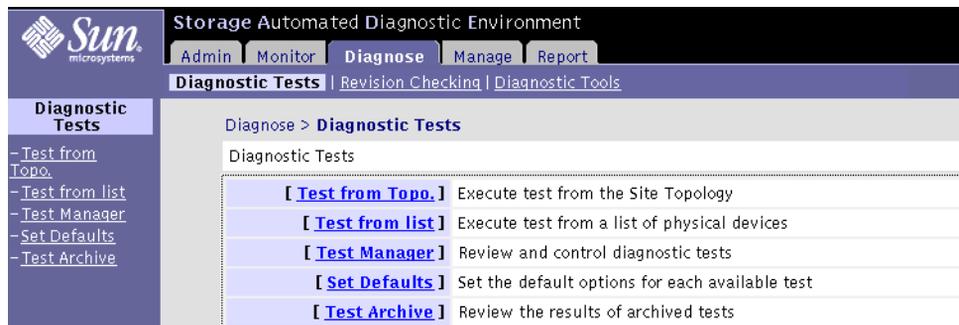


FIGURE 5-2 Diagnostic Tests window

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

1. You can invoke the Link Test by right-clicking on the box in the link displayed in the topology. You cannot invoke the Link Test functionality using Test from List.
2. 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.

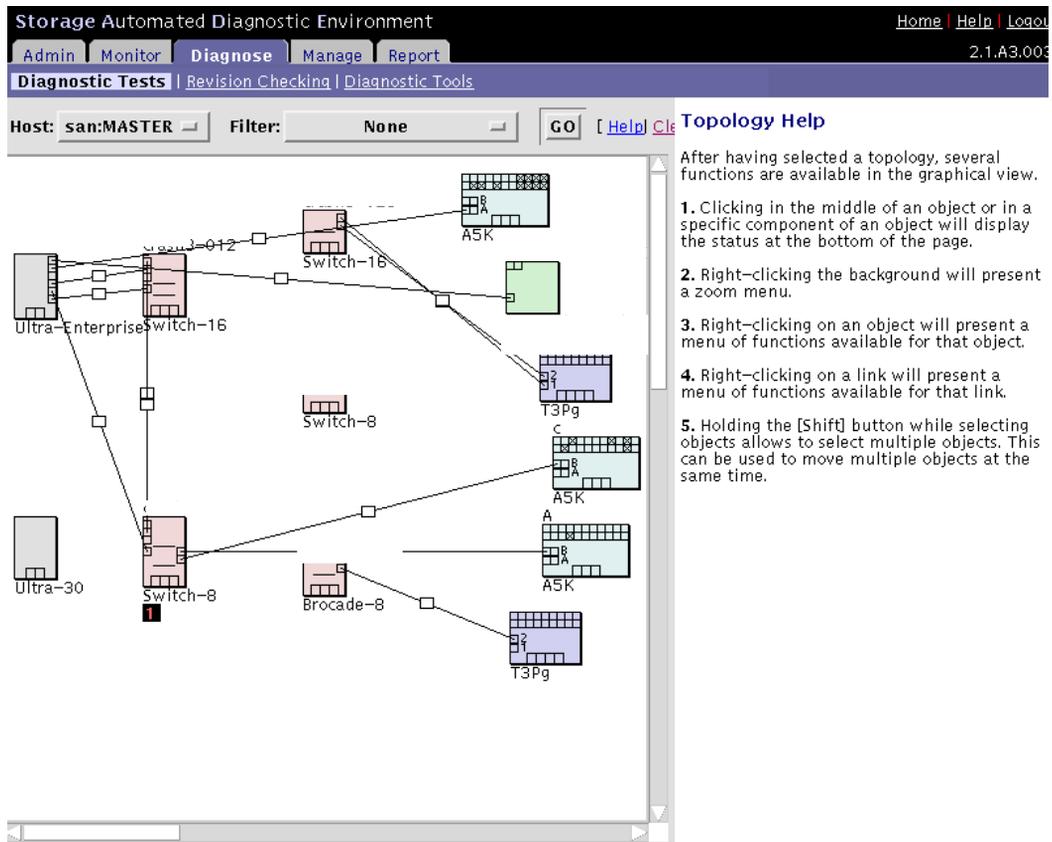


FIGURE 5-3 Test from Topology window

2. Select a host from the host pull-down menu.
3. To narrow the size of the topology, select an address from the Filter pull-down menu and click GO.
4. To zoom in closer, right click on the screen's white space. You can zoom to 100%, 83%, 66%, or 50% by selecting the value with your left mouse button.
5. Using your right mouse button, select the device.  
A list of test options is displayed.
6. With your left mouse button, select the test you want to run on the device.  
The applicable test is displayed in the right pane.
7. 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

1. 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.
2. In-band tests can be run from the Test from Topology view with no restrictions.
3. An out-of-band test (that is, `t3ofdg`, `t3volverify`, `switchtest`, or `veddiag`) can be run from the Test from Topology view under the following conditions:
  - It is run from the monitoring host view
  - It is run from the merged topology view
4. To specify email addresses to where test results are sent, use the Set Defaults screen. Refer to “Test Defaults” on page 137.

## 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. Using the Test from List window shown in FIGURE 5-5, select the diagnostic test.
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. To run diagnostics, select the test name link in the Run Test column.  
The appropriate test window is displayed in the right frame.

Storage Automated Diagnostic Environment

Admin Monitor **Diagnose** Manage Report

Diagnostic Tests | Revision Checking | Diagnostic Tools

Test from list [ Help ]

Execute test from a list of physical devices

Host: san:MASTER Filter: All GO

+ System	Component	Status	Run Test
a5k:	port0		<a href="#">A5000-SES</a>
	All Disks		<a href="#">A5000-Disk</a>
a5kc:	port1		<a href="#">A5000-SES</a>
	All Disks		<a href="#">A5000-Disk</a>
a5kA:	port1		<a href="#">A5000-SES</a>
	All Disks		<a href="#">A5000-Disk</a>
brocade	All Ports		<a href="#">Brocade-Test(s)</a>
host:	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 / qlc0		<a href="#">QLC</a>
	hba9 / qlc1		<a href="#">QLC</a>
	hba10 / qlc2		<a href="#">QLC</a>
	hba11 / qlc3		<a href="#">QLC</a>
internal:	All Disks		<a href="#">FC-Disk</a>

Page: 1 of 2 [ First | Previous | Next | Last ]

FIGURE 5-5 Test from List window

# Test Manager

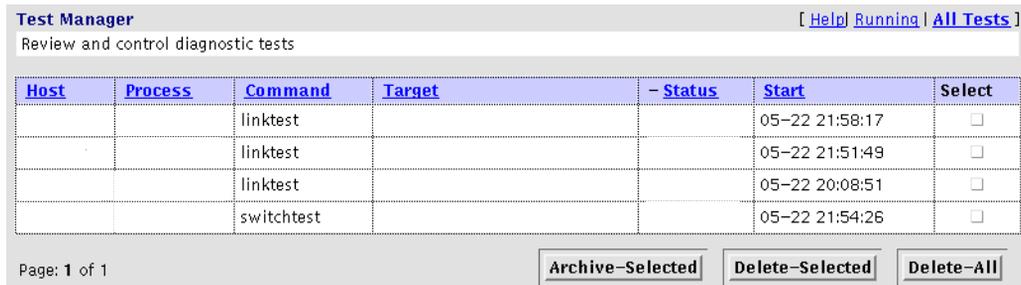
Storage Automated Diagnostic Environment's integration with diagnostic tests implements Test Manager to track and control the progress of the user-selected tests.

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 following data:

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

Buttons: Archive-Selected, Delete-Selected, Delete-All

**FIGURE 5-6** Test Manager window

Storage Automated Diagnostic Environment runs the device tests in a distributed fashion. The Storage Automated Diagnostic Environment 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 “+” indicator signifies that this is the current sort.

---

For test processes, the states can be:

- **Waiting**—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 time-out associated with the waiting state. If you want to change the default settings for scheduled time-outs, refer to “System Time-Outs” on page 92.

---

## ▼ 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 checkbox that corresponds to the test from the Test Manager window.**
2. **Click the Archive-Selected (to archive) or Delete-Selected (to delete) checkbox.**

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

3. **To view a list of archived tests, click the Test Archive link from the Diagnostics menu.**

# Diagnostic Tests Available in the Storage Automated Diagnostic Environment

Test options exist for each individual test. The Set Test Defaults options screen enables you to change the default options for the following diagnostic tests:

- “Sun StorEdge A3500FC LUN Test (a3500fctest)” on page 138
- “Sun StorEdge A5000 Array Enclosure Test (a5ksestest)” on page 141
- “Sun StorEdge A5000 Array Test (a5ktest)” on page 143
- “Brocade Silkworm Test (brocadetest)” on page 145
- “Sun StorEdge D2 Array Disk Test (d2disktest)” on page 147
- “Sun Fire V880 FC-AL Disk SES Test (daksestest)” on page 149
- “Sun Fire V880 FC-AL Disk Test (daktest)” on page 150
- “Sun StorEdge Internal Fibre Channel Disk Test (fcdisktest)” on page 152
- “Sun StorEdge FC Tape Test (fctapetest)” on page 154
- “Sun StorEdge PCI Fibre Channel-100 Host Adapter Test (ifptest)” on page 156
- “Fibre Channel Link Diagnostic (linktest)” on page 158
- “Sun StorEdge PCI Dual Fibre Channel Host Adapter Board Test (qlctest)” on page 163
- “Sun StorEdge SBus Fibre Channel-100 Host Adapter Board Test (socialtest)” on page 166
- “Sun StorEdge Network 2 Gb Fibre Channel Switch Test (switch2test)” on page 171
- “Sun StorEdge Network FC Switch-8 and Switch-16 Switch Test (switchtest)” on page 169
- “Sun StorEdge T3 and T3+ Array Test (t3ofdg)” on page 173
- “Sun StorEdge T3 and T3+ Array Test (t3test)” on page 175
- “Sun StorEdge T3 and T3+ Array Test (t3volverify)” on page 178
- “Virtualization Engine LUN Test (veluntest)” on page 181

# Test Defaults

Storage Automated Diagnostic Environment's implementation of diagnostic tests enables you to set default options to be applied to user-selected tests.

**Set Defaults** [ Help ]

Set the default options for each available test

**Set Defaults to selected Diagnostic Test**

Select Test: Defaults [v] GO

**Default Options:**

Verbose Mode:  -v

Send Results to Email: I #EMAIL

Update Reset

FIGURE 5-7 Storage Automated Diagnostic Environment Diagnostics Set Test Defaults

- Select the test for which you want to change defaults from the Select Test pull-down menu and click GO.

## Default Option

TABLE 5-4 Storage Automated Diagnostic Environment Diagnostic Tests Default Option

Item	Description
Verbose Mode -v	Runs the test in verbose mode and displays messages with more detailed information about the testing process. The default is ON.
Send Results to Email	Enter email addresses to where the test results will be sent. An entry in Send Results to Email from the Default Options screen sends the results of all tests. To send results to email recipients on an individual test, access that test's Default Option screen.

**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. Please refer to the *Sun StorEdge 3900 and 6900 Series Service and Reference Guide* for more information.

---

# Storage Automated Diagnostic Environment Tests

This section describes the Storage Automated Diagnostic Environment Diagnostic tests that are available from the Storage Automated Diagnostic Environment GUI.

## Sun StorEdge A3500FC LUN Test (`a3500fctest`)

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

TABLE 5-5 `a3500fctest` Subtests

Subtest	Description
Media	Verifies LUN media by reading data from the LUN. The Media subtest treats a LUN as one large chunk 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 Box

## a3500fctest Test Options

TABLE 5-6 describes the test options for the a3500fctest test.

**TABLE 5-6** 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 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 1(/usr), where 1 is the partition number and /usr 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 will run. The default is 1.

# Sun StorEdge A5000 Array Enclosure Test (a5ksestest)

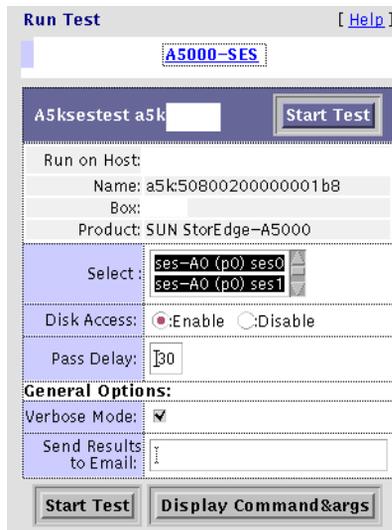
The a5ksestest(1M) test provides configuration verification, fault isolation, and repair validation of the disks in the Sun StorEdge A5000 array. It tests both Sun StorEdge A5000 14- and 22-slot disk enclosures.

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™. The a5ksestest test 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 socaltest tests at the same time.

---

## a5ksestest Test Options

TABLE 5-7 describes the test options for the a5ksestest test.

**TABLE 5-7** 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 a5ksestest 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 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.

## a5ktest Subtests

The `a5ktest` subtests are listed in TABLE 5-8.

**TABLE 5-8** a5ktest Subtests

Subtest	Description
Media	Verifies disk media by reading data from the disk. The Media subtest treats a disk as one large chunk 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 pre-mounted, then 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 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 5-7). An instance of a5ktest is present for each disk in a Sun StorEdge A5000 array.

a5ktest a5k 'Carson'		Start Test
Run on Host:		
Name:	a5k508002000001e618	
Product:	SUN StorEdge-A5000	
Select:	f0 c9t64d0s2 f1 c9t65d0s2 f2 c9t66d0s2	
Select Pattern Type:	critical	
User Defined Pattern:	0x7e7e7e7e	
Disk Self Test:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable	
Check RDLS Counts:	<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:	2	
Media Test 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 5-10** 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.

The screenshot shows a 'Run Test' dialog box for a 'Brocade-Switch'. At the top right is a '[ Help ]' link. Below the title bar is a 'Warning' box with the text 'No password defined for this device.' and a 'Start Test' button. The main area contains several fields: 'Host' (empty), 'Product: Brocade-8', 'WWN: 1000006069221 d4d', 'Select:' (a list box with 'port0 / g-port', 'port1 / g-port', and 'port2 / g-port'), 'Loop iterations:' (a text box with '500'), 'Password:' (a text box with 'I'), 'User Defined Pattern:' (a text box with '0x7e7e7e7e'), 'Select Pattern Type:' (a dropdown menu with 'critical'), 'Number of passes:' (a text box with '1'), 'General Options:' (a section header), 'Verbose Mode:' (a checked checkbox), and 'Send Results to Email:' (a text box with 'I'). At the bottom are two buttons: 'Start Test' and '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. In order 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` will fail, indicating that another user may be logged into the switch.

---

## brocadetest (1M) Test Options

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

**TABLE 5-9** `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 will run. 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 disk using five subtests: Media, File System, Synchronous I/O and Asynchronous I/O, Write/Read Buffer, and Self Test.

<b>Select Test:</b>	D2-Disk <input type="button" value="GO"/>
<b>d2disktest Options</b>	
Select Pattern Type:	critical <input type="button" value="selectpattern"/>
User Defined Pattern:	0x7e7e7e7e <input type="button" value="userpattern"/>
Disk Self Test:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable <input type="button" value="selftest"/>
W/R Device Buffer Test:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable <input type="button" value="wrdevbuf"/>
W/R Device Buffer Iterations:	1000 <input type="button" value="wrdevbufiterations"/>
Test Media:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable <input type="button" value="rawsub"/>
Partition:	0 <input type="button" value="partition"/>
Method:	SyncIO+AsyncIO <input type="button" value="method"/>
Media Coverage(%):	1 <input type="button" value="rawcover"/>
Media Transfer Size:	32KB <input type="button" value="rawiosize"/>
Test File System:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable <input type="button" value="fstest"/>
File System File Size:	512KB <input type="button" value="fssize"/>
File System Transfer Size:	512B <input type="button" value="fsiosize"/>
Number of passes:	1 <input type="button" value="#PASSES"/>
<b>General Options:</b>	
Verbose Mode:	<input checked="" type="checkbox"/> <input type="button" value="-v"/>
Send Results to Email:	I <input type="button" value="#EMAIL"/>
<input type="button" value="Update"/> <input type="button" value="Reset"/>	

FIGURE 5-12 d2disktest Test Options Dialog Box

## d2disktest(1M) Test Options

TABLE 5-10 describes the test mode options for the `d2disktest` test.

**TABLE 5-10** `d2disktest` 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.
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 will run.
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 ( <code>SyncIO</code> or <code>AsyncIO</code> )
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 will run. 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. `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

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

## `daksestest` (1M) Test Options

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

**TABLE 5-11** `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 via the I2C interface.
Loopback Test	When enabled, the subtest will cause 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 system-friendly 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 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 only 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"/>	wrdevbufferiterations
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

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

## daktest(1M) Test Options

TABLE 5-12 describes the test mode options for the `daktest` test.

**TABLE 5-12** `daktest` 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 will run.
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 will run. 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 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"/>	wrdevbufferiterations
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

## fcdisktest(1M) Test Options

TABLE 5-13 describes the test mode options for the `fcdisktest` test.

**TABLE 5-13** `fcdisktest` 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 will run.
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 will run. The default is 1.

# 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, such as the StorageTek 2 Gb T9840B tape drive. 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.

---

fctapetest Options		
Mode:	<input type="radio"/> :Readonly <input checked="" type="radio"/> :Write/Read	m
Number of Blocks:	Short <input type="checkbox"/>	l
Specified Number of Blocks:	25300	s
Tape Data Density:	Compression <input type="checkbox"/>	d
Tape File Mark Test:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable	ft
<b>General Options:</b>		
Verbose Mode:	<input checked="" type="checkbox"/>	-v
Send Results to Email:	<input type="text"/>	#EMAIL

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

## fctapetest Test Options

TABLE 5-14 describes the test options for the `fctapetest` test.

**TABLE 5-14** `fctapetest` 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>• <code>EOT</code>: The default; Tests the entire tape</li><li>• <code>Long</code>: Tests 70,000 blocks of the tape</li><li>• <code>Short</code>: Tests only the first 1000 blocks</li><li>• <code>Specified</code>: 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 <code>Specified</code> under the Number of Blocks option, you must type the number of blocks you want to test.
Tape Data Density	If you do not want the <code>fctapetest</code> test to run in the compression mode (the default), specify <code>low</code> , 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.

# 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)`, `a5kctest(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.

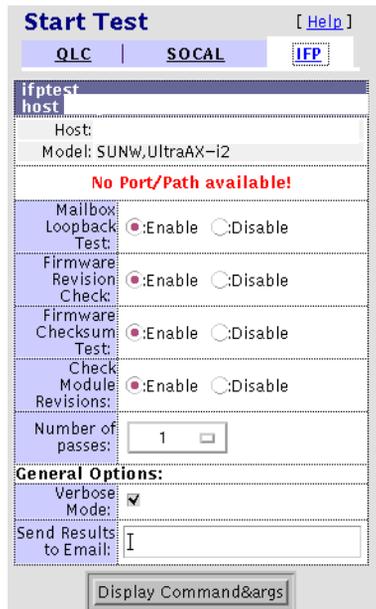


FIGURE 5-17 IFP Test Options Dialog Box

## ifptest Test Options

TABLE 5-15 describes the ifptest Test Options dialog box.

TABLE 5-15 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 in 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 will run. The default is 1.

## Fibre Channel Link Diagnostic (`linktest`)

`linktest`, delivered 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
- QLC22XX HBAs.

For link segments that do not provide external loopback test (for example, SOC+ to the Sun StorEdge A5200 array), the Sun StorEdge A5000 passive components are diagnosed using the SOC+ external loopback test. The passive components include GBICs, Sun StorEdge FC switches, MIA, 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 way of 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.

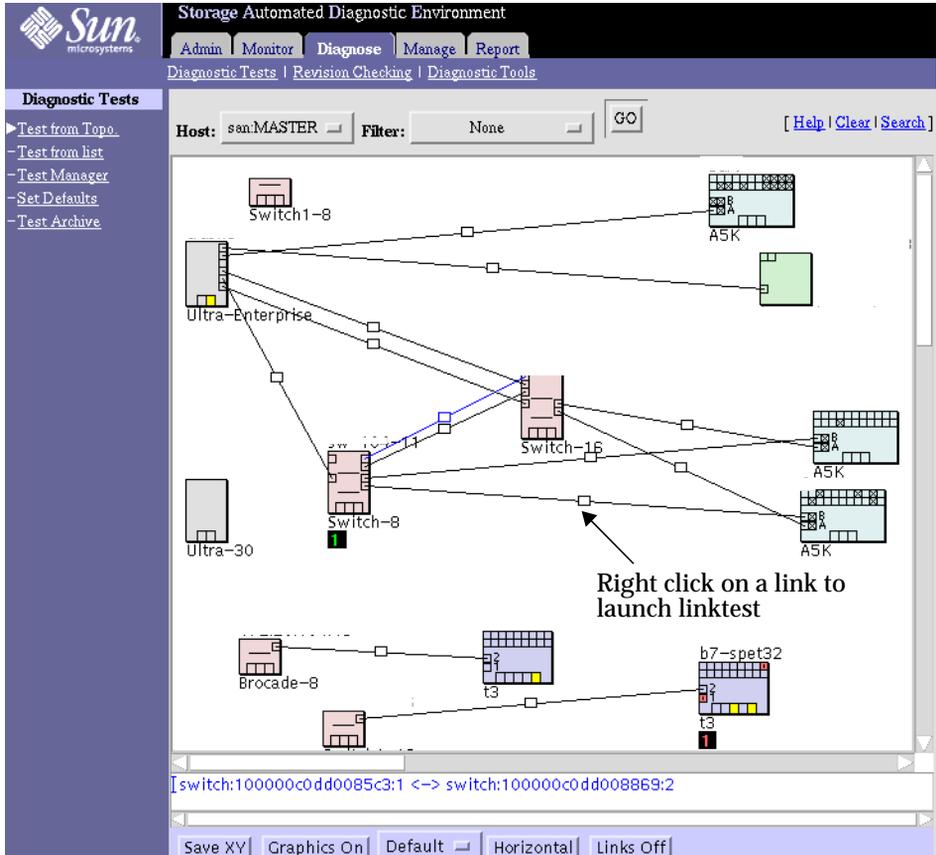


FIGURE 5-18 linktest from Test from Topology

2. Right-click on the defective or intermittent link displayed in the topology.

FIGURE 5-19 Test from Topology linktest

Link Test		[ Help ]
<b>Link Components</b>		
Start:	switch:	
End:	switch	
Pattern Type:	critical ▾	
User Pattern:	[0x7e7e7e7e7e]	
<b>General Options:</b>		
Verbose:	<input checked="" type="checkbox"/>	
Email:	<input type="text"/>	
<b>Start LinkTest</b>		
<b>Test other Links from switch</b>		
	<input type="text" value="sw-104-11.1"/>	<b>GO</b>

FIGURE 5-20 linktest Test Options Dialog Box

# linktest Options

TABLE 5-16 describes the linktest Test Options dialog box.

TABLE 5-16 linktest Options

Item	Description
Pattern Type	Choices of pattern to run include user   critical   all  <b>critical</b> is the I/O pattern causing device failure <b>all</b> is a complete list of patterns <b>critical</b> is the default pattern
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 screen sends the results of all tests. To send results to email recipients on an individual test, access that test's Default Option screen.

After starting linktest, Test Manager guides you through FRU isolation.

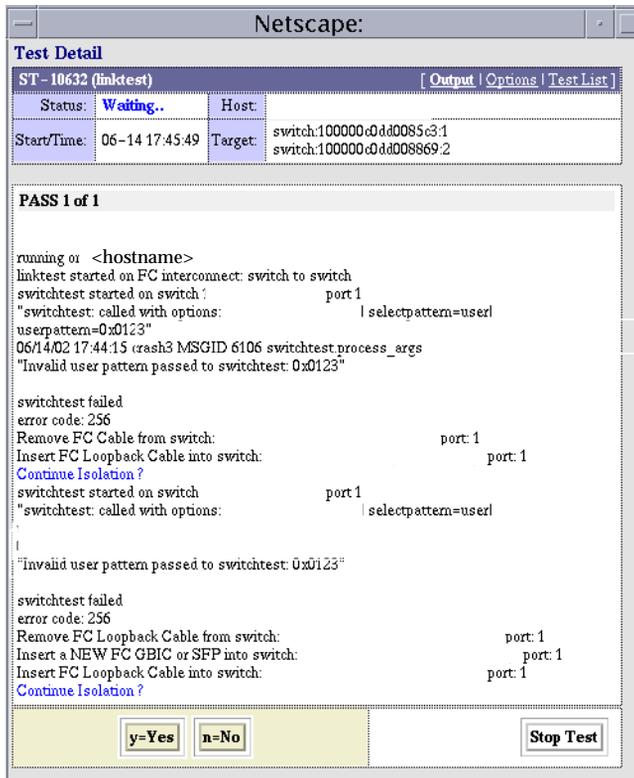


FIGURE 5-21 linktest Test Detail

# Sun StorEdge PCI Dual Fibre Channel Host Adapter Board Test (qlctest)

The qlctest(1M) test tests the functions of the Sun StorEdge 1 Gb and 2 Gb PCI and cPCI Fibre Channel Network Adapter boards. This diagnostic test is not scalable.

---

**Note** – To run the qlctest when connected to storage, enable the Yes option in the “Test if Connected to Storage” field in the qlctest dialog box, as shown in TABLE 5-17. This step is needed only if you select an internal test.

---

Start Test [ Help ]	
QLC	
qlctest host 'd' Start Test	
Host:	Model: SUNW,Ultra-Enterprise
Select:	Board7, Slot0, Port2 qlc3 (17) Board4, Slot0, Port1 qlc6 (10) Board4, Slot0, Port2 qlc7 (11)
Test If Connected to Storage:	<input type="radio"/> Yes <input checked="" type="radio"/> No
Online Selftest:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Mailbox Loopback Test:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Firmware Checksum Test:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Internal Loopback Test 10 bit:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Internal Loopback Test 1 bit:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
External Loopback Test:	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Loopback Transfer Count:	0x10000
Loopback Iteration Count:	100
User Defined Pattern:	0x7e7e7e7e
Select Pattern Type:	critical
Number of passes:	1
<b>General Options:</b>	
Verbose Mode:	<input checked="" type="checkbox"/>
Send Results to Email:	
Start Test Display Command&args	

FIGURE 5-22 qlctest Test Options Dialog Box

**Note the following:**

- Do not run customer applications while running `qlctest`, as the test will take 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 5-17 describes the `qlctest` Test Options dialog box.

**TABLE 5-17** `qlctest` Options

Option	Description
Test 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 needed only if you select an internal test.
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.
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.
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.
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.

**TABLE 5-17** qlctest Options (Continued)

Option (Continued)	Description
External Loopback Test	Performs an external loopback test. This test is done with data sourcing from the system memory and going to 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 <code>critical</code> .
Number of Passes	Specifies the number of times the test will run. 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.

**Start Test** [ Help ]

SOCAL

socaltest host **Start Test**

Host:  
Model: SUNW,Ultra-Enterprise

Select:  
Board1, Slotd, Port0 soc0\_0 (0)  
Board1, Slotd, Port1 soc0\_1 (1)  
Board1, Slot1, Port0 soc1\_0 (2)

Internal Loopback Test: :Enable :Disable

External Loopback Test: :Enable :Disable

Loopback Frame Test: :Enable :Disable

User Defined Pattern: 0x7e7e7e7e

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 5-23** 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 above, 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 5-18 describes the `socaltest` Test Options.

**TABLE 5-18** `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 5-18** socaltest Options

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 will run. 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 Gb 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.

The `switchtest` options are shown in TABLE 5-19.

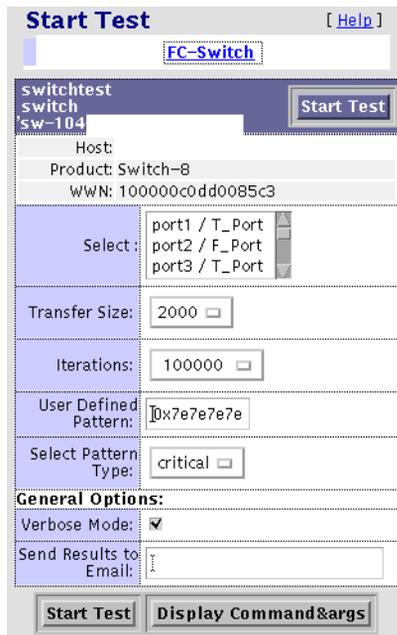


FIGURE 5-24 `switchtest` Test Options Dialog Box

## switchtest Test Options

TABLE 5-19 describes the test mode options for the `switchtest` test.

**TABLE 5-19** `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 will run, 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)

# Sun StorEdge Network 2 Gb Fibre Channel Switch Test (switch2test)

The `switch2test(1M)` test is used to diagnose the Sun StorEdge Network 1 Gb and 2 Gb Fibre Channel switches. The `switch2test` process also provides command-line access to switch diagnostics. `switch2test` supports testing on local and remote switches.

`switch2test` runs the port diagnostic on connected switch ports. While `switch2test` is running, the port statistics are monitored for errors.

The `switch2test` options are shown in TABLE 5-20.

Start Test [ Help ]	
Sun-2 gig Switch	
switch2test switch [ Start Test ]	
Host:	
Product:	Switch2-16
WWN:	100000c0dd00b7da
Select:	port0 / f-port port1 / unknown port2 / f-port
Transfer Size:	2000
Iterations:	5000
User Defined Pattern:	0x7e7e7e7e
Select Pattern Type:	critical
Password:	
Number of passes:	1
<b>General Options:</b>	
Verbose Mode:	<input checked="" type="checkbox"/>
Send Results to Email:	
[ Start Test ] [ Display Command&args ]	

FIGURE 5-25 `switch2test` Test Options Dialog Box

## switch2test Test Options

TABLE 5-20 describes the test mode options for the `switch2test` test.

**TABLE 5-20** `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 will run, 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 Gb Fibre Channel switches.
Number of Passes	Specifies the number of times the test will run. 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 first do the following:

- Run the Storage Automated Diagnostic Environment manually by following the procedures explained in “When To Run the ras\_install Script” on page 20.
- Generate a report for the device against which you are running the test (for example, Sun StorEdge T3 and T3+ arrays).

If the number of existing volumes do not match, an error message is displayed.

**Start Test** [ Help ]

T3-ofdg T3-VolVerify

**Warning**  
No password defined for this device.  
(slr-mi.370-3990-01-e-e1.002974)

t3ofdg  
t3 't3-104-10'

Start Test

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:

**General Options:**

Verbose Mode:

Send Results to Email:

Start Test Display Command&args

FIGURE 5-26 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. Use the Update Device section of “To Maintain Devices” on page 53 to add an optional T3 password.

---

## t3ofdg Test Options

**TABLE 5-21** t3ofdg Test Options

---

Syslog Dump	<p><i>Enable</i> will dump all syslog entries that have been added, while the test is running, to the screen.</p> <p><i>ofdg</i> will dump only OFDG lines, added to the syslog, to the screen. The default is <i>Disable</i>.</p>
Fast_Test	<p><i>Fast_Test</i> performs a fast Go/No Go test of the selected enclosure and loop. It does not attempt to detect bad FRUs. The default is <i>Enable</i>.</p>
Health_Check	<p><i>Health_Check</i> runs <i>Fast_Test</i> multiple times, one time for each loop per unit. The default is <i>Disable</i>.</p>
Fast_Find	<p><i>Fast_Find</i> can be used to detect bad loop cards, interconnect cables, and controllers. <i>Fast_Find</i> does not try to isolate down to a single disk port. Run <i>Fast_Find</i> before <i>Find</i> to eliminate loop cards, interconnect cables, and controllers as bad FRUs before the midplane or disks are suspended (which are checked using <i>Find</i>). The default is <i>Disable</i>.</p>
Find	<p><i>Find</i> performs an extensive Go/No Go test. If loop failures are detected, it 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 <i>Disable</i>.</p>
Loop	<p><i>Loop</i> specifies which loop to test. <i>All</i> tests both loops. The default is <i>All</i>.</p>
Password	<p>The Sun StorEdge T3+ array telnet password enables the Storage Automated Diagnostic Environment to log into the Sun StorEdge T3+ array device. The password is required.</p>

---

**Note:** The user cannot change an existing Sun StorEdge T3+ array password.

---

# Sun StorEdge T3 and T3+ Array Test (`t3test`)

The `t3test(1M)` test verifies the functionality of Sun StorEdge T3 and T3+ 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 `t3test` test is present for each Volume.

## `t3test` Subtests

TABLE 5-22 describes the `t3test` subtests.

**TABLE 5-22** `t3test` Subtests

Subtest	Description
Media	Verifies LUN media by reading data from the LUN. The Media subtest treats a LUN as one large chunk 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.

t3test 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
Check T3 Log File:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	logcheck
W/R Device Buffer Test:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	wrdevbuf
W/R Device Buffer Iterations:	<input type="text" value="10000"/>	wrdevbufiterations
Test Media:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	rawsub
Partition:	<input type="text" value="2"/>	partition
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 5-27** t3test 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 may be mirrored to the `/var/adm/messages.t3` file on the host.

---

## t3test Test Options

TABLE 5-23 describes the test mode options for the t3test test.

**TABLE 5-23** t3test 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 will run.
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 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 using the `t3volverify` test before performing tape backup overwrite cycles, approximately once every 30 days.

Before you run the `t3volverify` test, you must first do the following:

- Run the Storage Automated Diagnostic Environment manually by following the procedures explained in “When To Run the `ras_install` Script” on page 20.
- Generate a report for the device against which you are running the test (for example, Sun StorEdge T3 and T3+ arrays).

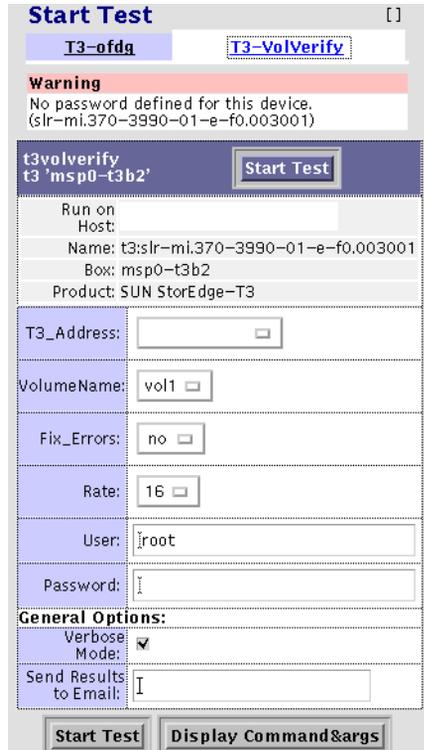
If the number of existing volumes do not match, an error message will be displayed.

---

**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.

Refer to the Sun StorEdge T3 and T3+ array documentation, which are listed in Related Documentation of the Preface of this document, for more information.

---



**FIGURE 5-28** 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 will use the user id and password that were set up using the steps in “To Add a Device Manually” on page 56.

If no password exists for the Sun StorEdge T3+ array, you can add a password using one of the following methods:

- “To Update a Device Manually” on page 60.
- Access the t3volverify defaults screen. Refer to “Test Defaults” on page 137 for more information.

## t3volverify Test Options

**TABLE 5-24** t3volverify Test Options

---

Option	Description
VolumeName	<i>VolumeName</i> is 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	<p>The <i>Fix_Errors</i> option corrects parity errors on RAID 5 volumes and corrects mirrored data errors on RAID 1 volumes. If <i>Fix_Errors</i> is <i>not</i> specified, then t3volverify will report errors but not correct them.</p> <p>If the <i>Fix_Errors</i> option is specified and an error is detected, the t3volverify command will regenerate parity from the existing data on the volume.</p>
Rate	<p><i>Rate</i> refers to the speed at which the t3volverify 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.</p> <p><i>16</i> has the highest performance impact on the data host.</p>
Password	<p>The Sun StorEdge T3+ array telnet password enables the Storage Automated Diagnostic Environment to log into the Sun StorEdge T3+ array device. The password is required.</p> <p><b>Note:</b> You cannot change an existing Sun StorEdge T3+ array password. If no password exists, however, you can add a password using the information found in “Sun StorEdge T3+ Array Passwords” on page 179.</p>

---

# Virtualization Engine LUN Test (veluntest)

For Sun StorEdge 6900 series systems, the only in-band test available is the `veluntest(1M)`. You can run the `veluntest(1M)` by selecting the virtualization engine in the Topology, and then selecting the VE-LUN tab. Since the Sun StorEdge T3+ arrays are not visible to the host for Sun StorEdge 6900 series systems, only the virtualization LUNs can be tested.

In a Sun StorEdge 6900 series configuration, the `veluntest(1M)` replaces the `t3test(1M)`. Valid LUNs must exist for the `veluntest(1M)` test to run.

veluntest Options		
Test Media:	<input checked="" type="radio"/> :Enable <input type="radio"/> :Disable	rawsub
Partition:	2	partition
Test Method:	SyncIO+AsyncIO	method
Media Coverage(%):	1	rawcover
Media Transfer Size:	32KB	rawiosize
Test File System:	<input type="radio"/> :Enable <input checked="" type="radio"/> :Disable	fstest
File System File Size:	512KB	fssize
File System Transfer Size:	512B	fsiosize
Select Pattern Type:	critical	selectpattern
User Defined Pattern:	0x7e7e7e7e	userpattern
Number of passes:	1	#PASSES
<b>General Options:</b>		
Verbose Mode:	<input checked="" type="checkbox"/>	-v
Send Results to Email:	I	#EMAIL
<input type="button" value="Update"/> <input type="button" value="Reset"/>		

FIGURE 5-29 veluntest Test Options

## veluntest Test Options

TABLE 5-25 describes the test options for the `veluntest` test.

**TABLE 5-25** `veluntest` Options

Option	Description
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 <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 Media Test Methods (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
Select Pattern Type	Selects which pattern to run. You will choose the <code>user</code> , <code>critical</code> pattern, or <code>all</code> patterns.
User Defined Pattern	User defined test pattern.
Number of passes	Specifies the number of times the test will run. The default is 1.

---

# Installation Verification using `ras_revcheck(1M)` and `stresstest(1M)`

To verify a recently-added component of a SAN, or to verify the entire SAN, use the `ras_revcheck(1M)` test and the `stresstest(1M)` test with `FC_CHECK` enabled.

By running `ras_revcheck(1M)`, you can determine that your firmware and software are up to date.

By running `stresstest(1M)`, you can:

- Apply a load to your system for a specified period of time
- Monitor the data path for retry and other errors

---

**Note** – Both `ras_revcheck(1M)` and `stresstest(1M)` are available only through the command line interface (CLI) at this time. They cannot be accessed through the Storage Automated Diagnostic Environment GUI.

---

## ▼ To Verify a SAN Component

- **Type:**

CODE EXAMPLE 5-1 Add a new Sun StorEdge T3+ array

```
# /opt/SUNWstade/bin/ras_revcheck -M "T3"  
# /opt/SUNWstade/Diags/bin/stresstest -M "T3 | FC_CHECK" -T "180"
```

## ▼ To Verify the Entire SAN

- **Type:**

CODE EXAMPLE 5-2 Verify an entire SAN

```
# /opt/SUNWstade/bin/ras_revcheck -M "ALL"  
# /opt/SUNWstade/Diags/bin/stresstest -M "ALL" -T "600"
```

# Test Archive

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

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

Review the results of archived tests

Look back:  days

Host	Test	System	Comp	- Started	Result	Archived	Pid	Select
	<a href="#">t3ofdg</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

Click a test to review the result of 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**

<b>Status:</b> Done:ERROR	<b>Host:</b>
<b>Start:</b> 06-13 20:05:23 (0:0:36)	<b>Target:</b> b7-spet32
<b>Killed:</b> 15, 2002-06-13 20:05:59	
<b>Passes:</b> 1	<b>End:</b> 06-13 20:05:59
<b>Key/Ports:</b> slr-mi.370-3990-01-e-e1.002399	
<b>Options:</b> 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 u2l1 fastTest 1 fail u2l2 ;

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.

---

---

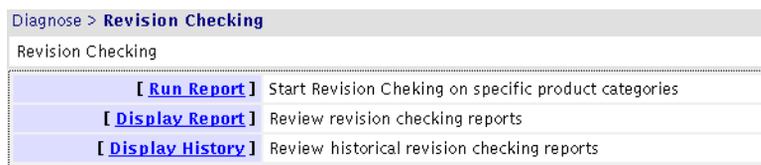
# Revision Checking

Storage Automated Diagnostic Environment's implementation of Revision Checking checks the software, hardware, and firmware revisions of all user-selected components.

Revision checking is based on an updatable matrix, which is generated using the PatchPro database. The matrix provides distributed revision checking across the system. Solaris versions and component firmware versions are verified against the matrix.

## ▼ To Run Revision Checking Report

1. Click Revision Checking from the Diagnose page.



2. 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. The main area is titled "Select options to run Revision Checking" and contains several sections:

- Select Host:** A dropdown menu showing "Local" and a "GO" button.
- Select Matrix:** A dropdown menu showing "config-matrix\_3.13 -- Revision: 3.13 , created: 07/08/2002".
- Select Module:** A list of modules with checkboxes, all of which are checked by default:
  - Sun StorEdge A5000 array Patches and Disk Firmware
  - 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
- Email:** A text input field.

At the bottom of the window, there are two buttons: "Run Revision Checking" and "Display Command&args".

**3. Select a host from the pulldown menu and click GO.**

The window reloads, and returns updated information for the specified host.

**4. Select a configuration matrix from the pulldown menu.**

The matrices are sorted by revision level and date, the most recent matrix first.

**5. Deselect a device or devices from the Select Module list. All of the devices are checked by default.**

**6. In the email text box, type an email address or addresses to where Revision Checking results will be sent.**

**7. Click Run Revision Checking.**

## ▼ To Display Revision Checking Reports

1. From the Display Report window, check the Select checkbox that corresponds to the host for which you are displaying a report.

**Display Report** [ Help ]  
 Review revision checking reports

Monitor Revision History			
Host	Last Report	Status	Select
Local	<a href="#">Display Report</a>	Done / Thu May 23 09:40:53 MDT 2002	<input type="checkbox"/>
	<a href="#">Display Report</a>	Done / Wed May 22 19:57:16 MDT 2002	<input type="checkbox"/>

2. Click Display Report.

3. To keep track of the module's counters, click Save to history.

A report similar to the one shown in FIGURE 5-30 is displayed.

**Display History** [ Help ]  
**Revision Checking report** Date: 2002-05-23 09:40:53

Host: Matrix-File: config-matrix\_3.13    Report Section: [ [DOWNREV=3](#) | [PASS=5](#) | [Not installed=4](#) | [ALL](#) ]

Report Section: Driver HBA

Name	Status	Current Version	Expected Version	Current Patch	Expected Patch	Comments
<b>Driver</b>						
	DOWNREV			108203-01	108203-05	leadville adb
	DOWNREV			106541-17	106541-20	kernel with leadville
	NI				109787-04	leadville qlc
	NI				109118-02	leadville usoc
	NI				109116-04	leadville fctl & fp
	NI				109117-05	leadville fcp
	DOWNRFV			106980-17	106980-18	required by 109962-04

FIGURE 5-30 Display Revision History

# Diagnostics Tools

- ▼ To Access the Storage Automated Diagnostic Environment Diagnostics Tools
  1. Click the **Diagnose** link on the Storage Automated Diagnostic Environment main window.
  2. Click the **Diagnostic Tools** link on the Diagnose page.



## Fibre Channel Counters Check

Use the Fibre Channel Counters Check functionality to perform a quick check of the system's transient noise. Run the Fibre Channel Counters Check only on an idle system.

The Fibre Channel Counters Check functionality verifies the health of physical Fibre Channel links. FC Counters Check extracts and compares link status information from devices and switches that the host is configured to monitor, and then displays error counters.

---

**Note** – Fibre Channel Counters Check *does not* check loops with a Sun StorEdge A3500FC array attached to them, because the Sun StorEdge A3500FC array is not supported by luxadm.

---

Fibre Channel Counters Check retrieves the Fibre Channel Read Link Status (RDLS) counter information from the available devices. This counter information is stored while the Fibre Channel Check program begins the second pass. The second pass begins two minutes after the first pass completes its run. The results of both passes are then compared and changes are displayed in the resulting table.

---

**Note** – Fibre Channel Counters Check does not validate connections. Use this functionality only to test for transient noise on the physical Fibre Channel connectors and components. If a system exhibits excessive transient noise, it should be checked for proper cable connections. Diagnostics should then be run on the suspect components.

---

## ▼ To Access the Fibre Channel Counters Check Window

1. Click the **Diagnose** link on the Storage Automated Diagnostic Environment main window.
2. Click the **Diagnostic Tools** link on the **Diagnose** page.
3. Click the **FC Check** link from the **Diagnostic Tools** menu.

The FC Check window is displayed.

The screenshot shows the 'FC Check' window with the following content:

**FC Check** [ Help ]

The **FC Check** section is used to verify the quality of the Fibre Channel links of your system by measuring the activity of the FC link status counters. The test will extract counter information twice. The first pass sets a benchmark and the second pass will do a comparison to that benchmark and report excessive increments. FC counters are used to isolate transient recoverable errors.

- This function will take a few minutes to complete.
- Your system should be connected and perceived to be working normally prior to executing this test.
- Link-status counters cannot be used to isolate permanent faults.
- Do not change the configuration of your host while this is running.
- This function does not apply to SCSI devices.
- Select FC Check Report from the left hand menu to view status and output.

Select host to check: Local

Select Category:

- Sun A5000
- Brocade Silkworm
- McDATA
- Sun Switch
- Sun 2GB Switch
- Sun T3

## ▼ To Run FC Check

1. Select a host from the **Select host to check** pull-down menu.
2. Click **GO**.
3. Select one, some, or all devices from the **Select Category** list. Narrowing the categories will shorten the run time.
4. Click **START FC Check**.

---

**Caution** – Do not change the configuration of the host while the FC Counters Check is running.

---

The FC Check Report window is displayed.

FC Check Report <span style="float: right;">[ Help ]</span>			
Monitor FC Check			
Host	Last Report	Status	Select
Local	No Report	Not running	
	<a href="#">Display Report</a>	Done / Wed May 22 20:00:24 MDT 2002	<input type="checkbox"/>

5. Check the **Select** checkbox that corresponds to the host for which you are displaying the FC Check Report.
6. Click the **Display Report** link.
7. To keep track of the module's revisions, click **Save to history**.

FC Check Report <span style="float: right;">[ Help ]</span>		
Select Report		
Host	Report	Select
	<a href="#">2002-05-22_20:07:16</a>	<input type="checkbox"/>

8. To delete an archived FC Check Report, click **Delete-Selected**.

## Sun StorEdge™ 3900 and 6900 Series Configuration Utility

Through the Storage Automated Diagnostic Environment GUI, you can perform the tasks that appear in TABLE 6-1.

**TABLE 6-1** Storage Automated Diagnostic Environment Management Functions

Task	Function
Manage Sun StorEdge 3900 and 6900 series components	Enables you to review, configure, display, and manage the Sun StorEdge 3900 and 6900 series components (Sun StorEdge T3 and T3+ array, Sun StorEdge network FC switch-8 and switch-16 switches, and virtualization engine for the Sun StorEdge 6900 series solutions).

The hardware components for the Sun StorEdge 3900 and 6900 series include the Storage Service Processor, customer management connection, Sun StorEdge T3+ arrays, Fibre Channel switches, and a Sun StorEdge expansion cabinet. In addition, the Sun StorEdge 6900 series has a virtualization engine. These components can be displayed, configured, verified, and managed using the Sun StorEdge Configuration functionality.

For more information on the Configuration Utility and how to use the options, please refer to the *Sun StorEdge 3900 and 6900 Series Service and Reference Manual*.

---

**Note** – To utilize the Sun StorEdge 3900 and 6900 series configuration functionality, the machine must be registered in the Storage Automated Diagnostic Environment as a Sun StorEdge 3900 and 6900 series solution.

---

## ▼ To Access the Sun StorEdge 3900 and 6900 Series Configuration Window

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

The Sun StorEdge 3900 and 6900 series configuration window is displayed.



2. Click the **Configuration** link.

The Configure 3900/6900 window is displayed.



3. Click the **Configure 3900/6900** link.

The Sun StorEdge 3900 and 6900 Series Configuration window is displayed.

<b>Sun StorEdge (Unknown Mode) System</b>	
<b>Sun StorEdge T3+ Array View/Configure</b>	
<a href="#">Display Config</a>	Display Sun StorEdge T3+ Array Configuration
<a href="#">Save Config</a>	Save Sun StorEdge T3+ Array Configuration
<a href="#">Configure</a>	Configure Sun StorEdge T3+ Array(s)
<a href="#">Modify Parameters</a>	Modify Sun StorEdge T3+ Array System Parameters
<a href="#">Restore</a>	Restore Sun StorEdge T3+ Array Configuration
<a href="#">Verify</a>	Verify Sun StorEdge T3+ Array Configuration
<a href="#">Configuration Status</a>	Display Sun StorEdge T3+ Array Configuration Status
<a href="#">Manage LUN Slicing</a>	Create/Remove/List/Enable Sun StorEdge T3+ Slice (only on 3900 series)
<a href="#">Manage LUN Masking</a>	Sun StorEdge T3+ Lun Masking (only on 3900 series)
<a href="#">Manage Password</a>	Store/Clear Persisted Sun StorEdge T3+ Array Password
<b>Switch View/Configure</b>	
<a href="#">Display Config</a>	Display Switch Configuration
<a href="#">Verify</a>	Verify Switch Configuration
<a href="#">Set Config</a>	Set Switch Configuration
<a href="#">Save Config</a>	Save Sun StorEdge network FC switch Configuration
<a href="#">Restore Config</a>	Restore Sun StorEdge network FC switch Configuration
<a href="#">Set Switch Port SL Mode</a>	Set Switch Port SL Mode Per Sun StorEdge T3+ Array (StorEdge 3900 Series Only)
<a href="#">Set Switch Port TL Mode</a>	Set Switch Port TL Mode (StorEdge 3900 Series Only)
<a href="#">Set Switch Port F Mode</a>	Set Switch Port F Mode (StorEdge 3900 Series Only)
<a href="#">Modify Switch Zones</a>	Modify Switch Zones (StorEdge 3900 Series Only)
<a href="#">Download Firmware</a>	Download Switch Firmware
<b>Virtualization Engines</b>	
<a href="#">Manage Disk Pools</a>	Manage Disk Pools
<a href="#">Manage VLUNs</a>	Manage Virtual LUNs
<a href="#">Manage Zones</a>	Manage Virtualization Engine Zones
<a href="#">Manage ConfigFiles</a>	Manage Configuration Files
<a href="#">Manage Hosts</a>	Manage Virtualization Engine Hosts
<a href="#">Manage MP Drive Fallback</a>	MP Drive Fallback Support
<a href="#">View Map</a>	View Virtualization Engine Map
<a href="#">Manage slicd Daemon</a>	Manage Virtualization Engine Daemon
<a href="#">Manage Password</a>	Store/Clear Persisted Virtualization Engine Password
<b>Log Functions and Sun StorEdge Series Maintenance</b>	
<a href="#">View Log</a>	View Sun StorEdge Series Log File
<a href="#">View Errors</a>	View Sun StorEdge Series Errors
<a href="#">Remove Locks</a>	Remove Lock Files

**FIGURE 6-1** Sun StorEdge 3900 and 6900 Series Configuration

## Log Functions and Sun StorEdge 3900 and 6900 Series Maintenance

You can review the content of the Sun StorEdge 3900 and 6900 Series Configuration log files. Log entries are displayed from the end of the file going back; the most recent entries are displayed last.

### *View Log*

The View Log option enables you to look at all the logs containing messages about the configuration actions taken.

### *View Errors*

The View Errors option enables you to look at all the errors that have occurred on a given host. The errors are sorted by date, the most recent are displayed last.

### *Remove Locks*

Using the Remove Locks functionality, you can remove lock files on the Sun StorEdge network FC switch-8 and switch-16 switch, the virtualization engines, and/or the Sun StorEdge T3+ array.

---

**Note** – Use the Remove Locks function only if you know the device *is not* in use, but the Sun StorEdge 3900 and 6900 Series Configuration shows that the device *is* in use.

---

# 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.

## ▼ To Access the Reports Page

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

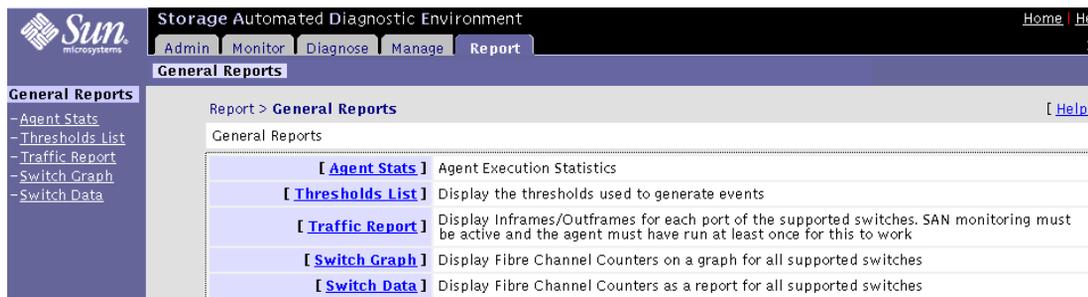


FIGURE 7-1 Reports window

# 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

### 1. Click Agent Stats in the General Reports window.

**Agent Stats** [\[ Help \]](#)

This report displays, for each agent, the average time required to run the main modules. It can help find bottlenecks in the agent functions. This information is generated and accumulated on every run of the agents on each host.

Agent Execution time by Host / Module (Mins:Secs)									
Host	BROCADE	MCDATA	MESSAGE	SE	SWITCH	SWITCH2	T3	T3MESSAGE	Total
<b>Average:</b>	00:13	00:15	00:00	00:00	00:01	00:54	00:33	00:00	01:59

### 2. Click an existing host.

The execution time for each agent, measured in minutes and seconds, is displayed.

# 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.

- 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 List

[\[ Help \]](#)

This page lists all threshold rules. The 'Frequency' is the number of alerts/hours required to generate a new message/email. The 'Quiet' value refers to the quiet time in between messages, used to avoid sending too many emails. Text in blue gives information about last message date or about the current number of alerts found against a specific threshold key. This text will appear only after Storage Automated Diagnostic Environment ran for a while.

Thresholds					
Name	Frequency	Quiet	Type	Desc	
<b>driver</b>					
driver.SF_OFFLINE	10 / 24hours	0hours	Warning	social/ifp Offline	
driver.SF_OFFLALERT	15 / 24hours	0hours	Error	social/ifp Offline	
driver.SCSI_TRAN_FAILED	10 / 4hours	0hours	Warning	SCSI transport failed	
driver.SCSI_ASC	10 / 4hours	0hours	Warning	scsi	
driver.SCSI_TR_READ	10 / 4hours	0hours	Warning	scsi READ	
driver.SCSI_TR_WRITE	10 / 4hours	0hours	Warning	scsi WRITE	
driver.SSD_WARN	5 / 24hours	0hours	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	
driver.TOELS	10 / 24hours	1hours	Warning	ELS Timeouts	
driver.SFTOELS	10 / 24hours	1hours	Warning	SFTOELS Timeouts	
driver.DDOFFL	10 / 24hours	1hours	Warning	Offlines	
driver.LOOP_OFFLINE	1 / 5mins	0mins	Error	Loop Offline	
driver.LOOP_ONLINE	1 / 5mins	0mins	Error	Loop Online	
driver.QLC_LOOP_OFFLINE	1 / 5mins	0mins	Error	Loop Offline	
driver.QLC_LOOP_ONLINE	1 / 5mins	0mins	Error	Loop Online	
driver.VM_SF_OFFLINE	10 / 24hours	0hours	Warning	social/ifp Offline	
driver.VM_SF_OFFLALERT	15 / 24hours	0hours	Error	social/ifp Offline	
driver.VM_SCSI_TRAN_FAILED	10 / 4hours	0hours	Warning	SCSI transport failed	
driver.VM_SCSI_ASC	10 / 4hours	0hours	Warning	scsi	
driver.VM_SCSI_TR_READ	10 / 4hours	0hours	Warning	scsi READ	
driver.VM_SCSI_TR_WRITE	10 / 4hours	0hours	Warning	scsi WRITE	

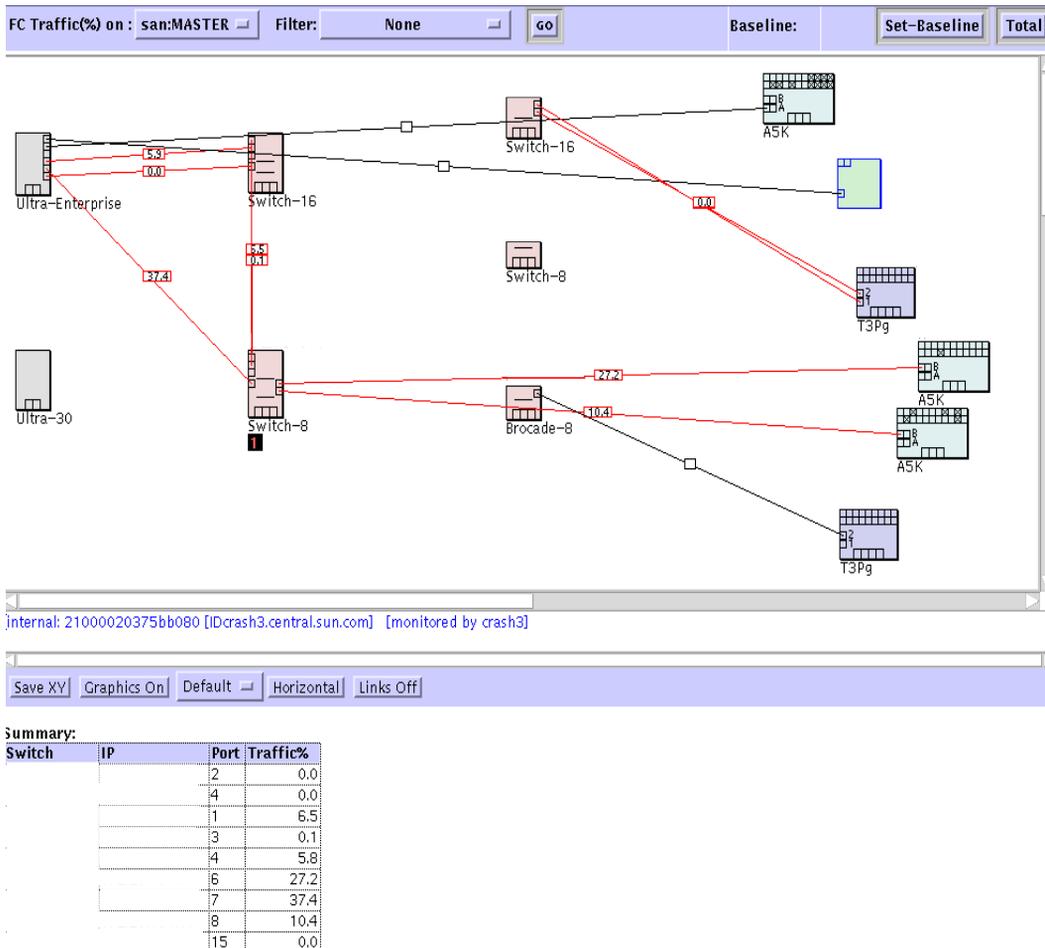
FIGURE 7-2 Thresholds List

# Fibre Channel (FC) Traffic

Use the FC Traffic functionality to display inframes and outframes for each port of each switch. SAN monitoring must be active and the Storage Automated Diagnostic Environment must have run at least once for this functionality to work properly.

- **Click Traffic Report in the General Reports window.**

A SAN topology and a Summary are displayed, showing the percentage of traffic for each switch.



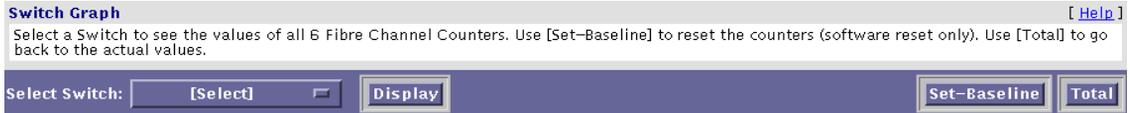
**FIGURE 7-3** FC Traffic Percentage window

## ▼ To Display the Switch Graph

Use the Switch Graph functionality to view the values of Fibre Channel counters in graph format.

### 1. Click Switch Graph in the General Reports window.

The Switch Graph selection menu is displayed.



### 2. Select a switch from the Select Switch pull-down menu and click Display.

The switch graph displays errors for the switch you selected.



3. Click **Set-Baseline** to reset all counters by saving them and displaying only the delta between the new values and the saved values.

After you have set the Set-Baseline field, the graph report only displays counter increments. The report also displays the start time and the duration of the baseline.

4. Click **Total** to erase the values saved by Set-Baseline and to display the total Fibre Channel counters.

## ▼ To Display 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 7-4.

**Switch Data** [\[ Help \]](#)

Select a Switch to see the values of all 6 Fibre Channel Counters. Use [Set-Baseline] to reset the counters (software reset only). Use [Total] to go back to the actual values. When [Set-Baseline] is selected, the report will display the starting date/time and will display in bold any increase since that moment (10/100).

Select Switch:  **Display** 1000006069221 d4d **Set-Baseline** **Total**

**All Switch Error Counters by Port**

Name	Component	Link	Sig	Seq	CRC	Sync	InvTxW
port.00		0	4	0	0	3	0
port.01		0	37	0	0	10	0
port.02		0	21	0	0	9	0
port.03		0	37	0	1	12	1
port.04		0	0	0	0	0	0
port.05		0	28	0	0	32	0
port.06		0	78	0	0	19	0
port.07		0	7	0	0	10	0

FIGURE 7-4 Switch Data Report

3. Click **Total** to erase the values saved by Set-Baseline and to display the total Fibre Channel counters.

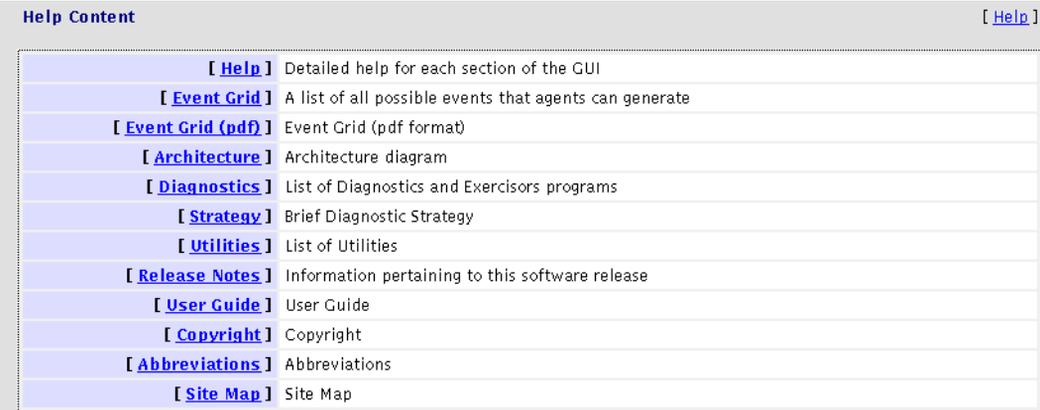
# Storage Automated Diagnostic Environment Help

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 8-1.

## ▼ 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.



Help Content		[ <a href="#">Help</a> ]
[ <a href="#">Help</a> ]	Detailed help for each section of the GUI	
[ <a href="#">Event Grid</a> ]	A list of all possible events that agents can generate	
[ <a href="#">Event Grid (pdf)</a> ]	Event Grid (pdf format)	
[ <a href="#">Architecture</a> ]	Architecture diagram	
[ <a href="#">Diagnostics</a> ]	List of Diagnostics and Exercisors programs	
[ <a href="#">Strategy</a> ]	Brief Diagnostic Strategy	
[ <a href="#">Utilities</a> ]	List of Utilities	
[ <a href="#">Release Notes</a> ]	Information pertaining to this software release	
[ <a href="#">User Guide</a> ]	User Guide	
[ <a href="#">Copyright</a> ]	Copyright	
[ <a href="#">Abbreviations</a> ]	Abbreviations	
[ <a href="#">Site Map</a> ]	Site Map	

FIGURE 8-1 Help Content

2. For online help on Storage Automated Diagnostic Environment's main topics, click the Help link on the Help Content menu.

The Help Summary window is displayed.

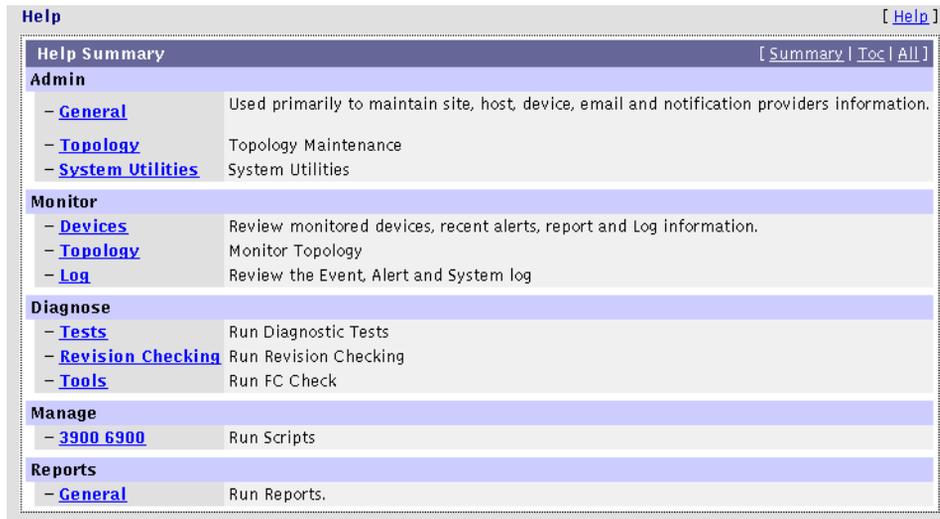


FIGURE 8-2 Storage Automated Diagnostic Environment GUI Online Help

3. Click the topic for which you need information from the Help Summary list.

# Storage Automated Diagnostic Environment Event Grid

The Event Grid shows all the actionable and non-actionable events Storage Automated Diagnostic Environment can generate.

## ▼ To Customize an Event Report

1. Click the Event Grid link on the Help menu.
2. Select the criteria from the Storage Automated Diagnostic Environment event grid, like the one shown in FIGURE 8-3.

Event Grid <span style="float: right;">[ Help ]</span>						
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:	Component:	EventType:	ReportFormat	<input type="checkbox"/> <input type="button" value="GO"/>		
mcdata <input type="button" value="▾"/>	All <input type="button" value="▾"/>	All <input type="button" value="▾"/>	<input type="checkbox"/>			
+ Cat	Code	Comp.	EventType	Sev.	Action	Description
mcdata	17.20.36	port.statistics	LogEvent	<input checked="" type="checkbox"/>	Y	[ Info/Action ] Change in Port Statistics on switch diag156-sw1b (ip=192.168.0.31):
mcdata	17.20.2	PhysState	LogEvent	<input checked="" type="checkbox"/>	Y	[ Info ] PhysicalState of port 4 changed from 'on' to 'off'
mcdata	17.3.47	system_reboot	AlarmEvent	<input checked="" type="checkbox"/>		[ Info/Action ] Switch uptime decreased on sw2 (ip=172.20.67.195) from 774396s to 524848s
mcdata	17.3.62	sensor.powerSupply	AlarmEvent	<input checked="" type="checkbox"/>	Y	[ Info/Action ] The state of 'sensor.power-supply.5.status' on 172.20.67.164 (ip=172.20.67.164) is 'absent'
mcdata	17.3.43	sensor.fan	AlarmEvent	<input checked="" type="checkbox"/>	Y	[ Info/Action ] The state of 'sensor.fan.5.status' on 172.20.67.164 (ip=172.20.67.164) is 'absent'
mcdata	17.10.16	enclosure	AuditEvent			Auditing a new switch called ras d2-sw1 (ip=xxx.0.0.41) 10002000007a609
mcdata	17.11.31	oob	Comm_EstablishedEvent			Communication regained with sw1a (ip=xxx.20.67.213)
mcdata	17.12.31	oob	Comm_LostEvent	<input checked="" type="checkbox"/>	Y	[ Info/Action ] Lost communication with sw1a (ip=xxx.20.67.213)
mcdata	17.13.339	switchtest	DiagnosticTest-	<input checked="" type="checkbox"/>		switchtest (diag240) on d2-sw1 (ip=xxx.0.0.41) 10002000007a609

FIGURE 8-3 Storage Automated Diagnostic Environment Event Grid

**3. For more diagnostic information, click the Info/Action link from the Description field.**

A pop-up menu displays the information for that event and the action recommended for problem resolution.

---

**Note** – The Storage Automated Diagnostic Environment Event Grid is intended to be used interactively, but it is also printable. Before printing the Event Grid, run the page with the ReportFormat checkbox enabled; to see all the details about each event. Otherwise, you must click the **[details]** link to see details, one event at a time.

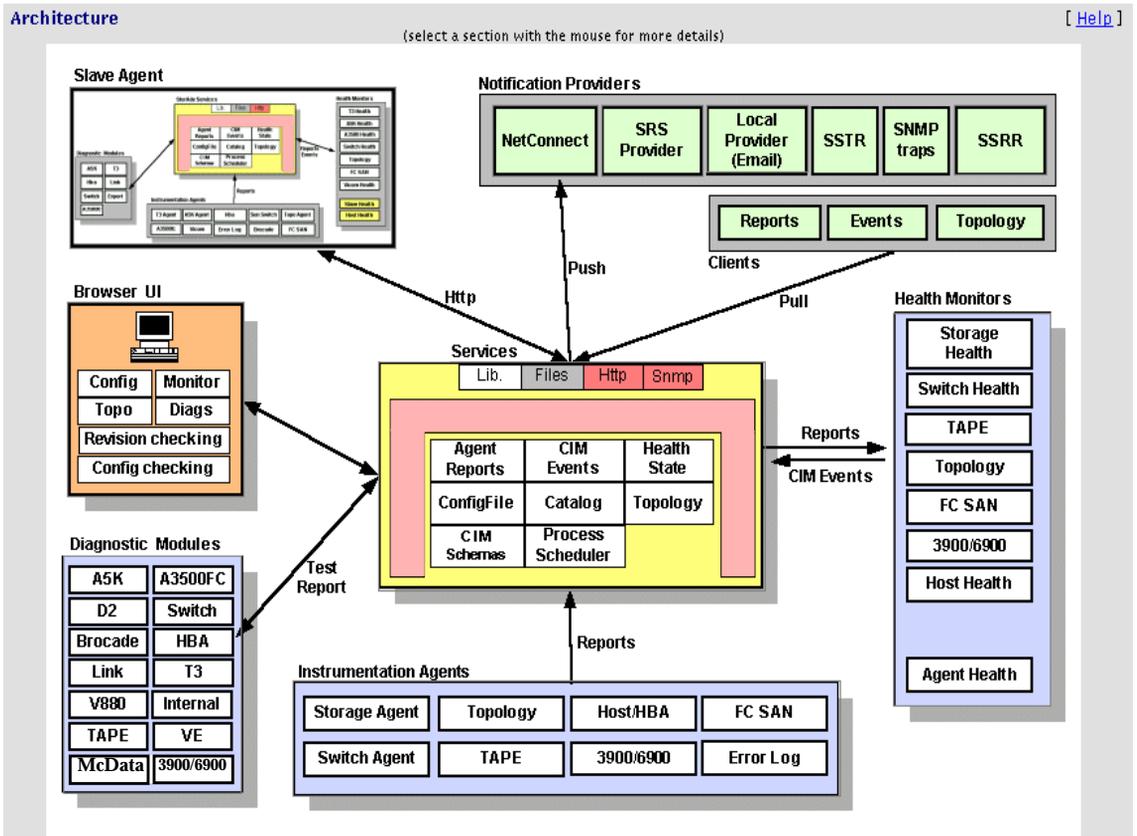
---

# Storage Automated Diagnostic Environment Architecture

**1. Click Architecture on the Help menu.**

The Storage Automated Diagnostic Environment Architecture Diagram, as shown in FIGURE 8-4, is displayed.

**2. For details of the component, move your mouse over the section within the diagram, or refer to TABLE 8-1.**



**FIGURE 8-4** Storage Automated Diagnostic Environment Architecture Diagram

**TABLE 8-1** 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 8-1** 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.

---

## Diagnostics Strategy

Storage Automated Diagnostic Environment Diagnostic tests:

- May be run from the test list or from a topology.
- The functional tests are designed to test the target FRU.
- The tests operate on inband and/or out-of-band data paths.
- The scheduler dispatches the test to the appropriate server (host). These are offline tests that might be utilized to verify FRUs or FRU replacements.
- The tool `FC_Check`, or the SAN monitoring agent, detects intermittent or solid Fibre Channel link failures. If an FC link alert is generated, or an FC link turns red in the topology, use the `linktest` to isolate the failing FRU in the link segment.

All of this information is further explained in Chapter 5, “Diagnostics.”

---

## Utilities

The explanations of the various diagnostics tests associated with the Storage Automated Diagnostic Environment, shown in FIGURE 8-5, are available from the command line. These utilities also have `man(1M)` pages.

# Storage Automated Diagnostic Environment Diagnostics Tests

The Storage Automated Diagnostic Environment diagnostics tests are defined in TABLE 8-2 and are located in /opt/SUNWstade/Diags/bin. Refer to the man pages for more detail.

Diagnostics <span style="float: right;">[ <a href="#">Help</a> ]</span>	
List of Diagnostics and Exercisors programs	
Storage Automated Diagnostic Environment Diagnostics / Exercisors	
All diagnostics are located in /opt/SUNWstade/Diags/bin, refer to the man pages for more details.	
Diagnostic	Description
<b>a3500fctest(1 M)</b>	In-band diagnostic for Sun StorEdge A3500FC LUNs attached via the host data-path.
<b>a5ksestest(1 M)</b>	In-band diagnostic for Sun StorEdge A5000 Enclosures attached via the host data-path.
<b>a5ktest(1 M)</b>	In-band diagnostic for Sun StorEdge A5000 disk drives attached via the host data-path.
<b>brocadetest(1 M)</b>	Out-of-band diagnostic for testing ports on Brocade Silkworm Fibre Channel switch.
<b>d2disktest(1 M)</b>	SCSI disk diagnostic for Sun StorEdge D2 SCSI disks.
<b>daksestest(1 M)</b>	In-band diagnostic for Sun Fire V880 Enclosures attached via the host data-path.
<b>daktest(1 M)</b>	In-band diagnostic for Sun Fire V880 disk drives attached via the host data-path.
<b>fdisktest(1 M)</b>	In-band diagnostic for Internal FC disk drives attached via the host data-path.
<b>fcctapetest(1 M)</b>	In-band diagnostic for FC Tape drives attached via the host data-path.
<b>ifptest(1 M)</b>	Sun StorEdge PCI FC-100 Host Bus Adapter diagnostic for HBAs using the ifp driver
<b>qlctest(1 M)</b>	Sun StorEdge PCI Dual Fibre Channel Host Bus Adapter diagnostic for HBAs using the qlc driver.
<b>socaltest(1 M)</b>	Sun StorEdge SBus FC-100 Host Bus Adapter diagnostic for HBAs using the socal driver.
<b>linktest(1 M)</b>	The linktest is designed to test two end points of a FC link segment and assist the user in FRU isolation of the link segement. This test is typically run when the FCAL topology indicates a link problem. i.e. A red link.
<b>switchtest(1 M)</b>	Out-of-band diagnostic for testing ports on Sun StorEdge Network FC switch-8 and switch-16.
<b>switch2test(1 M)</b>	Out-of-band diagnostic for testing ports on Sun StorEdge Network FC 2 Gigabit switch-8 and switch-16.
<b>t3test(1 M)</b>	In-band diagnostic for Sun StorEdge T3 and T3+ LUNs attached via the host data-path.
<b>t3ofdg(1 M)</b>	Out-of-band diagnostic for Sun StorEdge T3 and T3+ LUNs attached via the an enet connection. t3ofdg will test all of the FRUs within the T3 enclosure
<b>t3volverify(1 M)</b>	Out-of-band diagnostic for Sun StorEdge T3 and T3+ LUNs attached via the an enet connection. t3volverify will execute the volume verify function on the selected T3.
<b>vediag(1 M)</b>	Out-of-band diagnostic for Virtualization Engine (VE) attached via the an enet connection. Instantiates and monitors diagnostics on the virtualization engine.
<b>veluntest(1 M)</b>	In-band diagnostic for Virtualization Engine VE attached storage. Verifies the functionality of the in-band virtualization engine Sun StorEdge 3900/6900 Series LUN(s).
Exercisors	
<b>stresstest(1 M)</b>	In-band exercisor for all I/O devices attached via a host data-path.
<b>dex(1 M)</b>	In-band exercisor for all disk and tape drives attached via the host data-path.
<b>lbf(1 M)</b>	In-band exercisor for FC loops(media) utilized by the host Sun StorEdge HBAs soc+ and QLC 2200.

FIGURE 8-5 Storage Automated Diagnostic Environment Commands

# Diagnostics Utilities

**TABLE 8-2** Storage Automated Diagnostic Environment Diagnostic Commands

<b>Diagnostic Command</b>	<b>Command Description</b>
a3500fctest(1M)	Verifies the functionality of the Sun StorEdge A3500FC array using the two subtests provided
a5ksestest(1M)	Provides configuration verification, fault isolation, and repair validation of Sun StorEdge A5200 array
a5ktest(1M)	Verifies the functionality of the Sun StorEdge A5200 array
brocadetest(1M)	Verifies the functionality of the Brocade Silkworm switch ports
d2disktest(1M)	Verifies the functionality of the internal Sun StorEdge D2 array disk
daksestest(1M)	Tests the Sun Fire 880 FC-AL disk backplane.
daktest(1M)	Verifies the functionality of the internal Fibre Channel disk
fcdisktest(1M)	Verifies the functionality of the Sun Fire 880 FC-AL disk
fctapetest(1M)	Tests the StorageTek 2 Gb T9840B Fibre Channel tape drive
ifptest(1M)	Tests the functionality of the Sun StorEdge PCI FC-100 host adapter board.
linktest(1M)	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.
qlctest(1M)	Tests the functions of the Sun StorEdge PCI 1 Gb and 2 Gb Single and Dual and cPCI Dual Fibre Channel host adapter board.
ras_fccheck(1M)	Checks available Fibre Channel counters to verify link integrity
ras_revcheck(1M)	Checks the software, hardware, and firmware revision levels of all user-selected modules. The report displays the current revision, the expected revision, and upgrade information.
stresstest(1M)	Induces a load on a storage area network (SAN) and checks for errors that might occur. This program is most effectively used to verify components that have been recently added to a SAN.
socaltest(1M)	Validates and performs fault isolation on the Sun StorEdge SBus FC-100 host adapter board.
switchtest(1M)	Diagnoses the Sun StorEdge network FC switch-8 and switch-16 switches
switch2test(1M)	Diagnoses the Sun StorEdge network 2 Gb FC switch-16
t3test(1M)	Verifies the functionality of the Sun StorEdge T3 and T3+ array

**TABLE 8-2** Storage Automated Diagnostic Environment Diagnostic Commands

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<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.
<code>veluntest(1M)</code>	In-band diagnostic for virtualization engine attached storage. Verifies the functionality of the in-band virtualization engine LUN(s).

---

# Storage Automated Diagnostic Environment Agent Utilities

The Storage Automated Diagnostic Environment agent utilities that are defined in TABLE 8-3 are located in the `/opt/SUNWstade/bin` directory. Refer to the man pages for more detail.

Utilities	
All utilities are located in <code>/opt/SUNWstade</code> , see the man pages for more details	
Program	Description
<code>bin/checkcron</code>	If executed from the command line, this executable program verifies that the executable program "rasagent" is entered in the crontab(1M) file. <b>Note:</b> You must be root to run this program.
<code>bin/clearcache</code>	If executed from the command line, this executable program will remove the instrumentation information for all the configured devices from the CACHE. This is typically used during testing purposes so that a DiscoveryEvent can be forced to occur upon the next execution of the Storage Automated Diagnostic Environment Agent.
<code>disk_inquiry</code>	Used by Storage Automated Diagnostic Environment to discover devices on the data-path that are using SCSI commands.
<code>bin/ras_admin</code>	performs common Storage Automated Diagnostic Environment administrative tasks from the command line interface (CLI).
<code>bin/ras_install</code>	This program will set-up the HTTP service, add a cron and register with the master Storage Automated Diagnostic Environment Agent in the case of a slave install. It must be run manually upon completing the 'pkgadd'. This program can be executed anytime after the initial execution and setup when a modification to the cron is desired or to change the Master/Slave title of a Host agent. Refer to the User's Guide before making changes.
<code>bin/ras_revcheck</code>	Checks the software, hardware, and firmware revision levels of all user-selected modules. The report displays the current revision, the expected revision, and upgrade information.
<code>bin/ras_fccheck</code>	Utility is used to provide a check of available Fibre Channel counters to verify link integrity. <code>ras_fccheck</code> utility probes the device counters and creates an initial baseline for comparison. After a short period of time, the <code>ras_fccheck</code> utility again compares the device counters and compares them to the baseline to determine if problems exist.
<code>bin/rasagent</code>	This is the executable program that calls the modules for the different Network Storage Devices supported by this monitoring agent. It is executed automatically by cron or can be run manually from the command line. Keep in mind however, if run from the command line, <code>rasagent</code> will first check that another process for <code>rasagent</code> is not already running.
<code>bin/save_password</code>	Utility used by the system administrator to change the password to Storage Automated Diagnostic Environment's graphical user interface. Changing the password can also be performed in the GUI itself. However this utility would be used from the command line when the administrator forgot the password. Usage: <code>save_password &lt;password&gt;</code>
<code>bin/sandbox</code>	Utility used by Storage Automated Diagnostic Environment to gather Fibre Channel Switch information.
<code>bin/testt3</code>	Verify that the tokens of a specific T3 are working. T3 token files <code>elemprop.html</code> and <code>sysprop.html</code> must be available for the Storage Automated Diagnostic Environment probing capabilities to work properly. Running this utility from the command will require that the IP Address of the T3 being probed is known. Usage: <code>testt3 &lt;ip_address&gt;</code>

FIGURE 8-6 Storage Automated Diagnostic Environment Agent Commands

TABLE 8-3 provides descriptions for commands available for the Storage Automated Diagnostic Environment agent functions.

**TABLE 8-3** Storage Automated Diagnostic Environment Agent Commands

Utilities Command	Command Description
checkcron(1M)	Verifies whether the Storage Automated Diagnostic Environment main program is entered in the <code>crontab(1M)</code> file
clearcache(1M)	Clears the Storage Automated Diagnostic Environment cache files that contain the current report for each device being monitored
disk_inquiry(1M)	Identifies devices on the data path that are using SCSI commands
rasagent(1M)	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.
ras_admin(1M)	Performs common Storage Automated Diagnostic Environment administrative tasks from the command line interface (CLI).
ras_fccheck(1M)	Checks available Fibre Channel counters to verify link integrity.
ras_install(1M)	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.
ras_revcheck(1M)	Checks the hardware, software, and firmware revision levels.
sanbox(1M)	Displays Fibre Channel switch information
save_password(1M)	Changes the password to the Storage Automated Diagnostic Environment GUI. This function can also be performed in the GUI itself. <code>save_password</code> is usually used if the system administrator forgets the password.
testt3(1M)	Retrieves tokens from a Sun StorEdge T3 and T3+ 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.

# Index

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## SYMBOLS

.conf files  
    how to edit, 15  
/opt/SUNWstade directory, 10  
/opt/SUNWstade/DATA/rasagent.conf, 16  
/var/adm/messages, 10  
    on local host, 119  
/var/opt/SUNWstade/DATA/Solution.golden, 16

## A

add new hosts  
    required fields, 36

## B

Brocade documentation, xxvi  
Brocade switch  
    test options, 146  
Brocade switch support, xxi, xxiv, 2, 33, 42, 49, 51, 56, 59, 103, 145, 205  
brocadetest(1M), 209

## C

cache  
    erasing, 94  
checkcron(1M), 212

checklist  
    installation, 8  
clearcache(1M), 212  
command line arguments  
    standard for diagnostic tests, 128  
configuration  
    of Sun StorEdge 3900 and 6900 series, 16  
    update of master, 29  
    updating master, 41  
configuration file, 16  
configuration recovery, 97  
customer information  
    maintenance of, 29

## D

device  
    discovery, 29  
    maintenance, 30  
    maintenance of, 30  
    monitoring, 5  
diagnostic tests  
    rules for running, 127  
disk\_inquiry(1M), 212  
documentation  
    related, xxvii  
documentation conventions  
    typographic, xxiii

- E**
  - email
    - customization of, 9
  - email configuration, 96
  - email notifications
    - how to customize, 63
  - encryption
    - using SSL, 1
  - erase cache, 94
  - event report
    - how to customize, 203
  - events, categorization of, 30
  
- H**
  - host
    - how to maintain, 38
    - maintenance, 29
    - requirements, 10
    - updating, 41
  
- I**
  - ifptest
    - options, 157
  - installation
    - checklist, 8
    - requirements, 10
    - verification of, 15
  
- L**
  - local notification, 30
  
- M**
  - maintain hosts
    - functions of
      - push slave configurations, 39
    - slaves, add new
      - required fields, 46
  - MANPATH
    - environment variable
      - how to set, 15
  
- McData
  - related documentation, xxv
- McData switch support, xxi, 2, 42, 58, 59, 205
  
- N**
  - notification
    - setting up, 30
    - through providers, 1
  - notifications
    - how to add, 64
    - local, 30
    - local email/pager, 63
  
- O**
  - online help
    - how to access, 201
    - use of, 195, 201
  - organization of book, xxii
  
- P**
  - password security, 100
  - passwords
    - how to change, 100
  - patch
    - installation of, 23
  - PATH
    - environment variable
      - how to set, 15
  - permission privileges
    - assignment of, 101
  - pkgadd -d command, 13
  - product abbreviations, xxiv
  - protection of information, 1
  - providers
    - setting up, 30
  
- R**
  - ras\_install script
    - how to run, 20

ras\_install(1M), 212  
rasagent(1M), 212  
requirements, installation, 10

## S

sanbox(1M), 212  
save\_password(1M), 100, 212  
Secure Socket Layer (SSL), 1  
shell prompts, xxiv  
slave  
    how to add, 44  
slave setup, 22  
slave(s)  
    distributing on multiple servers, 21  
SSL  
    see Secure Socket Layer, 1  
statistics  
    how to check, 196  
Storage Automated Diagnostic Environment  
    agent commands, 211  
    architecture diagram, 205  
    configuring using the maintenance functions, 32  
    description of, xxi  
    diagnostic commands, 209  
    event grid, 203  
    features, 1  
    functions, 5  
    how to log in, 9, 27  
    how to run manually, 95  
    installation, 7  
    main window, 27  
    maintaining, 29  
    new functionality, 2  
    overview, 1  
    reports, 195  
    starting, 15  
    tests, 208  
Sun product abbreviations, xxiv  
Sun StorEdge 3900 and 6900 series  
    hardware components, 191  
    log files, 194  
Sun StorEdge T3 array messages  
    monitoring, 53  
SUNWstade  
    how to untar, 8

    moving the package, 8  
    removing, 24  
    removing the package, 25  
    uncompressing, 8  
    upgrading, 24

SUNWstade package  
    downloading, 8  
switch  
    graph, 199  
system time-outs, 92

## T

Tape  
    2 Gb StorageTek T9840B, xxiv  
tape  
    StorageTek 2 Gb T9840  
        monitoring of, 42  
    StorageTek 2 Gb T9840B, xxi, 154  
test  
    veluntest  
        test options, 182  
    a3500fctest, 138  
    a3500fctest(1M), 209  
    a5ksestest  
        test options, 142  
    a5ksestest, 141  
    a5ksestest(1M), 209  
    a5ktest, 143  
    a5ktest(1M), 209  
    archiving, 135  
    brocadetest command  
        options, 145  
    brocadetest(1M), 209  
    d2disktest, 147  
    d2disktest command  
        options, 147  
    d2disktest(1M), 209  
    daksestest, 149  
    daksestest command  
        options, 149  
    daksestest(1M), 209  
    daktest  
        subtests, 150  
    daktest, 150  
    daktest command  
        options, 150

- daktest(1M), 209
- defaults, 137
- deleting, 135
- fcdisktest, 152
- fcdisktest command
  - options, 152
- fcdisktest(1M), 209
- fctapetest
  - test requirements, 154
- fctapetest, 154
- fctapetest command
  - options, 155
- fctapetest(1M), 209
- from list, 132
  - warnings, 132
- from topology, 130
- ifptest, 156
- ifptest command
  - options, 157
- ifptest(1M), 209
- Link
  - running in Test Manager, 131
- linktest(1M), 209
- qlctest, 163
- qlctest command
  - options, 164
- qlctest(1M), 209
- ras\_fccheck(1M), 209
- ras\_revcheck(1M), 209
- socaltest, 166
- socaltest(1M), 209
- socaltest,
  - options, 166
- stresstest(1M), 209
- switch2test(1M), 209
- switchtest, 169, 171
- switchtest command
  - options, 169, 171
- switchtest(1M), 209
- t3ofdg, 173
- t3ofdg Command
  - options, 173
- t3ofdg command
  - options, 173, 174
- t3ofdg(1M), 210
- t3test
  - subtests, 175
- t3test, 175
- t3test Command

- options, 176
- t3test(1M), 209
- t3volverify, 178
- t3volverify(1M), 210
- t3volverifytest options, 180
- veluntest, 181
- veluntest command
  - options, 182
- veluntest(1M), 210
- Test Manager
  - process states, 134
  - use of, 134
- tests
  - list of, 6
  - selecting a user interface, 126
- Storage Automated Diagnostic Environment, 208
- testt3(1M), 212
- thresholds
  - viewing, 197
- time-out settings
  - how to change, 92
- topology
  - navigation of window, 130

## U

- upgrades
  - of Sun StorEdge 3900 and 6900 series, 18
- user privileges, 101
- utility
  - checkcron(1M), 212
  - clearcache(1M), 212
  - disk\_inquiry(1M), 212
  - ras\_admin(1M), 212
  - ras\_fccheck(1M), 212
  - ras\_install(1M), 212
  - ras\_revcheck(1M), 212
  - rasagent(1M), 212
  - sanbox(1M), 212
  - save\_password(1M), 212
  - testt3(1M), 212