Enterprise Storage Manager Overview

Version 1.2

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Contents

Preface

This document describes the Enterprise Storage Manager (ESM), version 1.2. The intended audience for this document includes Sun support engineers and storage system administrators.

How This Book Is Organized

Chapter 1 provides an overview of the Enterprise Storage Manager software.

Chapter 2 discusses the software packages that comprise the Enterprise Storage Manager: Sun StorEdge Topology Reporter, Sun StorEdge Diagnostic Environment, and Sun StorEdge Configuration Service.

Chapter 3 describes the configurations and helps users to make decisions about which combination of components most suits their storage management needs.

Chapter 4 describes the overall ESM features and those features related to each software component.

Appendix A includes frequently-asked questions and answers.

Using UNIX Commands

This document might 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

Typeface	Meaning	Examples
`AaBbCc123`	The names of commands, files, and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`% su` `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide.* These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename.*
[ ]	In syntax, brackets indicate that an argument is optional.	`scmadm` [`-d` *sec*] [`-r` *n*[:*n*][,*n*]...] [`-z`]
{ *arg* | *arg*}	In syntax, braces and pipes indicate that one of the arguments must be specified.	`sndradm -R b {p | s}`
\	At the end of a command line, the backslash (\) indicates that the command continues on the next line.	atm90 /dev/md/rdsk/d5 \ /dev/md/rdsk/d1 atm89 \ /dev/md/rdsk/d5 /bitmaps/map2 \ ip sync

Shell Prompts

Shell	Prompt
C shell	*machine-name*%
C shell superuser	*machine-name*#
Bourne shell and Korn shell	$
Bourne shell and Korn shell superuser	#

Related Sun Documentation

Product	Title	Part Number
Installation	*Enterprise Storage Manager 1.2 Installation Guide*	817-1037
System administration	*Sun StorEdge Enterprise Storage Manager 1.2 Topology Reporter Administration and Operations Guide*	817-1111
	Sun StorEdge Enterprise Storage Manager 1.2 Configuration Service Administrator's Guide	817-0997
	Storage Automated Diagnostic Environment User's Guide, Version 2.2	817-0192
Solaris	*Solaris Handbook for Sun Peripherals*	806-2210
Sun StorEdge T3+ array	• *Sun StorEdge T3+ Array Release Notes*	816-4771
	• *Sun StorEdge T3+ Array Start Here*	816-4768
	• *Sun StorEdge T3 and T3+ Array Regulatory and Safety Compliance Manual*	816-0774
	• *Sun StorEdge T3+ Array Installation and Configuration Manual*	816-4769
	• *Sun StorEdge T3+ Array Administrator's Guide*	816-4770
	• *Sun StorEdge T3 Array Cabinet Installation Guide*	806-7979

Product	Title	Part Number
Sun StorEdge 6120 Array	• *Start Here (Documentation Guide)*	817-0198
	• *Important Safety Information for Sun Hardware Systems*	816-7190
	• *Sun StorEdge 6120 Array Installation Guide*	817-0199
	• *Sun StorEdge 6120 Array Administration and Reference*	817-0200
	• *Sun StorEdge 6120 Array Release Notes*	817-0201
	• *Sun StorEdge 6120 Array Troubleshooting Guide*	817-0828
Sun StorEdge Host Adapter	• *Sun StorEdge PCI FC-100 HBA Installation Manual*	805-3682
	• *Sun StorEdge SBus FC-100 Host Adapter Installation &Service*	802-7572
	• *Sun StorEdge PCI Dual FC Host Adapter Product Notes*	806-5857
	• *Sun StorEdge PCI Dual FC Host Adapter Installation Guide*	806-4199
	• *Sun StorEdge 2 Gb PCI Single FC Host Adapter Product Notes*	
	• *Sun StorEdge 2 Gb PCI Single FC Host Adapter Installation Guide*	816-5000 816-4999
	• *Sun StorEdge 2 Gb cPCI Dual FC Host Adapter Product Notes*	
	• *Sun StorEdge 2 Gb PCI Dual FC Host Adapter Installation Guide*	816-5002 816-5001
	• *Sun StorEdge 2 Gb cPCI Dual FC Host Adapter Product Notes*	
	• *Sun StorEdge 2 Gb cPCI Dual FC Host Adapter Installation Guide*	X6769A
Sun StorEdge 6320 Series	• *Sun StorEdge 6320 Series Installation Guide*	816-7878
	• *Sun StorEdge 6320 Series Reference and Service Guide*	816-7879
	• *Sun StorEdge 6320 Series Regulatory and Safety Compliance Manual*	816-7876
	• *Sun StorEdge 6320 Series Site Prep Guide*	816-7877
	• *Sun StorEdge 6320 Series Troubleshooting Guide*	816-7881
	• *Man pages (CLI commands on Storage Service Processor)*	N / A
Sun StorEdge SAN 4.0 (1 Gb switches)	• *Sun StorEdge SAN 4.0 Release Guide to Documentation*	816-4470
	• *Sun StorEdge SAN 4.0 Release Installation Guide*	816-4469
	• *Sun StorEdge SAN 4.0 Release Configuration Guide*	806-5513
	• *Sun StorEdge Network 2 Gb FC Switch-16 FRU Installation*	816-5285
	• *Sun StorEdge SAN 4.0 Release Notes*	816-4472
Sun StorEdge SAN 4.1 (2 Gb switches)	• *Sun StorEdge SAN 4.1 Release Guide to Documentation*	817-0061
	• *Sun StorEdge SAN 4.1 Release Installation Guide*	817-0056
	• *Sun StorEdge SAN 4.1 Release Configuration Guide*	817-0057
	• *Sun StorEdge SAN 4.1 2 Gb Brocade Silkworm Fabric Switch Guide to Documentation*	817-0062
	• *Sun StorEdge SAN 3.1 2 Gb McData Intrepid Director Switch Guide to Documentation*	817-0063
	• *Sun StorEdge SAN 4.1 Release Notes*	817-0071

▼ 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`

Related McData Switch 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 site 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 for access.**

Related Brocade Silkworm Switch 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 site is `http://www.brocade.com`.

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

1. **Click the Partners link.**
2. **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.

Sun Welcomes Your Comments

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

`docfeedback@sun.com`

Please include the part number (*817-1039-10*) of the document in the subject line of your email.

CHAPTER 1

Introduction

The Sun StorEdge™ Enterprise Storage Manager (ESM) is an open, standards-based, and scalable end-to-end storage area network (SAN) management platform.

ESM supports the Common Information Model (CIM) standard for storage management. Through open standards, ESM software offers:

- Lower management costs through simplified end-to-end storage management of hetereogenous storage environments through a common, consolidated console.
- Increased choice leading to best-of-breed storage networking solutions.
- Investment protection, because you can add new devices easily into your storage infrastructure without changing your storage management solution.

ESM software provides end-to-end scalability by supporting the full range of customer storage infrastructure needs from the workgroup to the data center, including storage arrays, fabric switches, and Fibre Channel host bus adapters (HBAs).

ESM's in-context "link and launch" capability facilitates the management of other Sun applications, as well as third party network devices, from a single web-based console, as shown in FIGURE 1-1. From a single interface, users can access reporting and analysis tools for their storage environment, including health and diagnostic information.

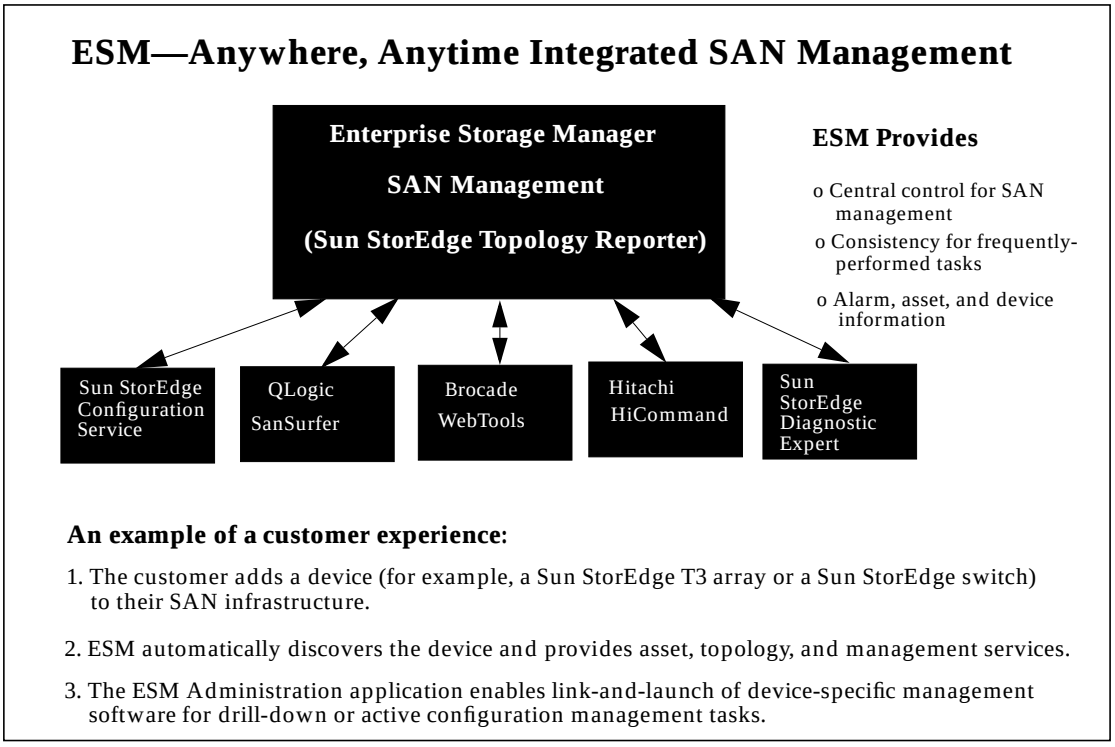

FIGURE 1-1 ESM—Anywhere, Anytime Integrated SAN Management

For a description of ESM features, functions, and benefits, refer to “ESM 1.2 Features” on page 19.

Key Applications

- **SAN Topology Management and Reporting**

  ESM's Sun StorEdge Topology Reporter (SSTR) provides SAN topology management and reporting services that enable an end-to-end view of your SAN infrastructure. With SSTR, you can employ a central point of access and control for servers and network storage devices.

- **Device Configuration Management Services**

  ESM's Sun StorEdge Configuration Service (SSCS) enables you to access the software's autodiscovery and scalable wizard-based storage from a single console.

- **Health Monitoring and Diagnostic Services**

  ESM's Sun StorEdge Diagnostic Expert (SSDE) provides health monitoring and intelligent diagnostic services for proactive health checking, fault isolation, and expert-based advice to quickly remedy potential problems, increase uptime, and improve application service levels.

- **Sun Professional Services**

  Sun Professional Services consultants understand the storage environment and the interdependencies between storage and the rest of your infrastructure. They can can design and implement storage management solutions that leverage the industry-leading features of the ESM software.

ESM Specifications

The following section lists supported SAN infrastructure elements. Refer to the *Sun StorEdge Enterprise Storage Manager 1.2 Installation Guide*, pn 817-1037 for details about the following:

- Disk and memory space requirements
  - for the Management Station
  - for the Agent Station
- Required software, packages and patches
- Required hardware

Supported SAN Infrastructure Elements

- **Host Machines**

  ESM 1.2 software is supported on host machines using the Solaris operating environment. Hosts include, but are not limited to:

  - Sun Enterprise™ server models 220R, 250, 420R, 450
  - Sun Enterprise server models 3500, 4500, 5500, 6500
  - Sun Fire™ server models 280R, 3800, 4800, 4810, and 6800

  Management stations include the above list and the following workstations:

  - Sun Ultra workstation models 5, 10, 60, and 80
- **Arrays**
  - Sun StorEdge T3 arrays, minimum firmware release 1.17
  - Sun StorEdge T3+ arrays, minimum firmware release 2.0 (to support 3900 and 6900 Series systems)
  - Sun StorEdge 6120 arrays (to support 6320 Series systems)
  - Sun StorEdge 9910 and 9960 system arrays (to support 9900 Series systems)
- **Integrated Systems**
  - Hitachi Data Systems Freedom 9900 series storage systems
  - Sun StorEdge 6320 Series systems
  - Sun StorEdge 3900 and 6900 Series storage systems
- **Switches**
  - Sun StorEdge Network 1-Gbit and 2-Gbit switches
  - Brocade Silkworm 1-Gbit and 2-Gbit switches
  - McData 2 Gb 16-, 32-, and 64-port SAN switches
- **Host Bus Adapters**
  - QLogic Fibre Channel HBAs
  - JNI Fibre Channel HBAs

SNMP Management Framework Support

ESM offers Simple Network Management Protocol (SNMP) for Enterprise Storage Resource Management (ESRM) framework products. The following management frameworks are supported:

- CA Unicenter TNG
- HP OpenView

Supported Web Browsers (minimum version)

- Netscape™ Navigator, versions 4.79
- Microsoft Internet Explorer, version 5.0

For More Information

- For a description of the Sun StorEdge Topology Reporter (SSTR), Sun StorEdge Configuration Service (SSCS), and Sun StorEdge Diagnostic Expert (SSDE) applications, refer to Chapter 2 of this Overview.
- For a list of documents that provide detailed information about each of the applications, refer to “Related Sun Documentation” on page vii.
- For additional information about the Enterprise Storage Manager, visit `www.sun.com/storage/software/esm/`

CHAPTER 2

ESM 1.2 Components

ESM 1.2 provides customers with a consolidated presentation of three major areas of storage management:

ESM Sun StorEdge Topology Reporter

The Sun StorEdge Topology Reporter (SSTR) provides a centralized view of a storage area network (SAN), then displays the physical and logical relationship between the storage devices and hosts. SSTR provides a web-based user interface to launch the device management applications for supported SAN devices, shown in FIGURE 2-1. Additionally, SSTR provides support for alarms and the ability to deliver the alarms remotely, through notification providers.

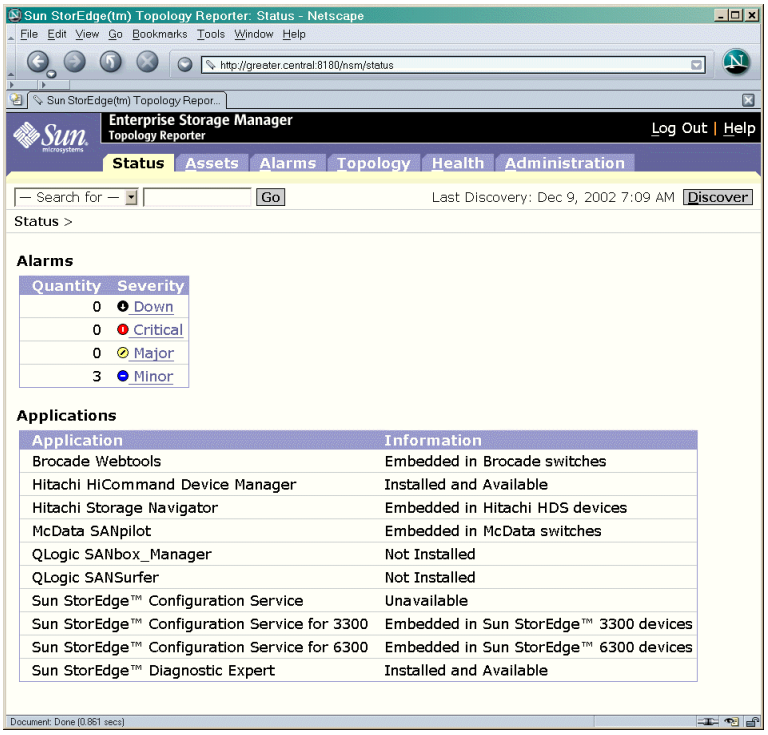

FIGURE 2-1 ESM Topology Reporter Main Window

SSTR-Launched Applications (In-Context)

From the ESM Topology Reporter main window, you can launch the applications listed below using one of several methods, as shown in FIGURE 2-2.

SSTR provides *in-context launch* for the following applications:

- Sun StorEdge 33xx series array manager (SANscape, SANpath)
- McData switch management
- Sun StorEdge 3900 and 6900 series management software
- Sun StorEdge 99xx series (9980/60) management software

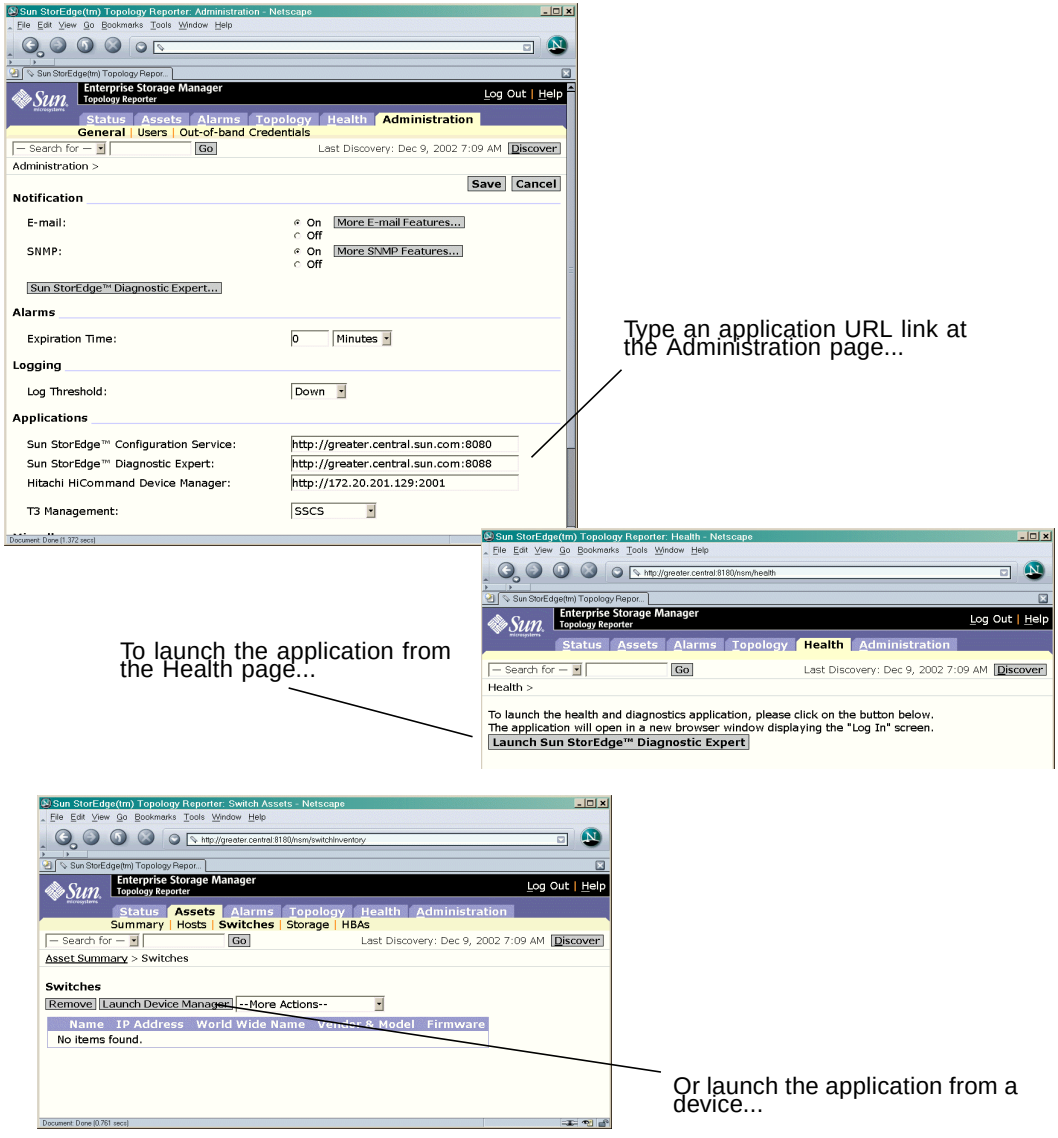

FIGURE 2-2 SSTR-launched applications

ESM Sun StorEdge Configuration Service

The ESM Sun StorEdge Configuration Service (SSCS) provides the user with both web-based and command line interfaces to manage Sun StorEdge T3, T3+, and 6120 storage arrays. From the SSCS, the user can configure storage, set storage array attributes, and enable or disable storage array components. Additionally, the SCCS provides support for logging, and the ability to deliver alarms locally and remotely through notification providers.

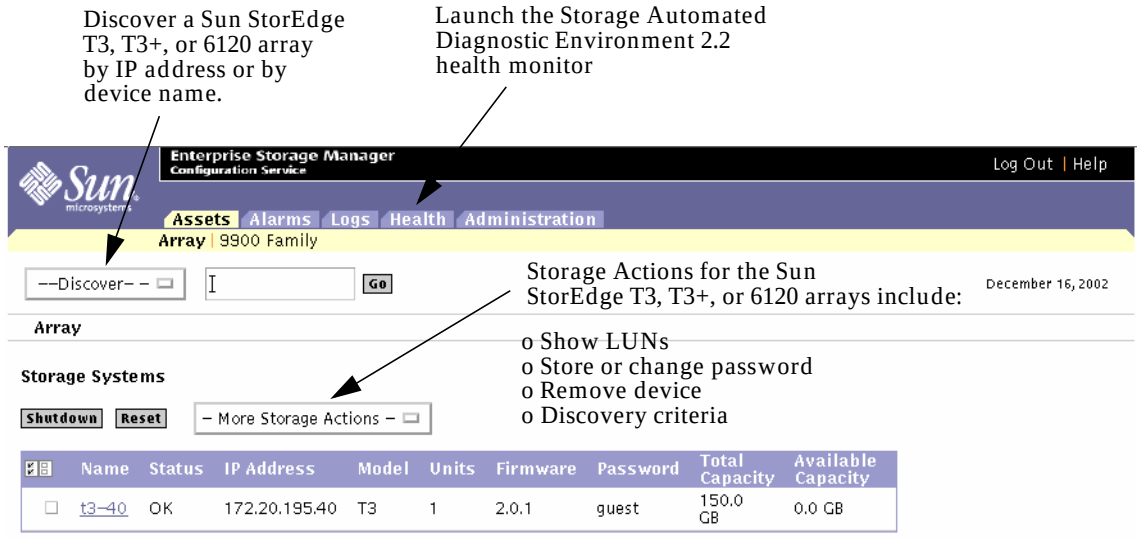

FIGURE 2-3 ESM Sun StorEdge Configuration Service Main Window

SSCS-Enabled Tasks

SSCS enables the user to perform the following tasks:

Management Operations

- System Level Management
- Port Management
- Volume Management
- Volume Slice Management
- LUN Mapping / Masking Support

Control Operations

- Power down device
- Reset device

View Properties

- Unit number with which the port is associated
- LUNs that are visible by means of a port
- Status
- World Wide Name (WWN) for the ports, volumes, and units visible on the SAN.

View and Set Properties

- Sun Host (yes / no)
- Fibre ALPA Mode (hard / soft)
- Port number, if ALPA Mode is hard

Enterprise Storage Manager Diagnostic Expert

The Sun StorEdge Diagnostic Expert (SSDE) enables you to view and manage your storage area network (SAN) environment through a web browser. The Enterprise Storage Manager Diagnostic Expert Main Window is displayed in FIGURE 2-4.

SSDE can be used to collect data and analyze the condition of supported Sun storage devices. Fault isolation and diagnostic tests can be used on a 24 x 7 basis to verify the condition of the system, identify failing FRUs, and verify FRU replacement. In addition, SSDE offers expert-based advice to quickly remedy potential problems.

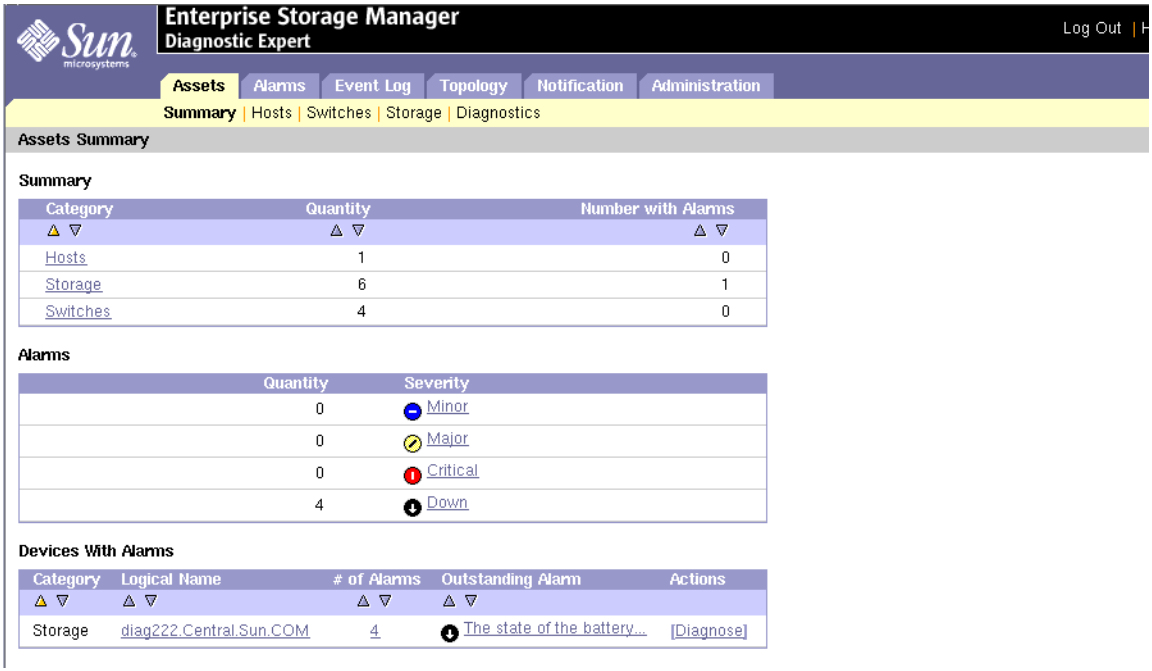

FIGURE 2-4 Enterprise Storage Manager Diagnostic Expert Main Window

Sun StorEdge Diagnostic Expert-Enabled Tasks

- Capture and log trend information
- Access diagnostic tests for managed devices
- Review the results of the diagnostic tests
- Aggregate alarms and events
- Report on the health of the enterprise infrastructure
- Manage notification delivery using providers
- Filter events based on device and topic
- Filter alarms based on device, topic, state, and acknowledge status

Health Services

Health services are available for the following devices:

- McData switches
- Sun StorEdge host bus adapters (HBAs)

Health Monitoring and Alert Notification Services

Health monitoring and alert notification services are available for the following devices:

- Sun StorEdge network FC 1 Gb and 2 Gb switches
- Brocade Silkworm 1 Gb and 2 Gb switches
- Sun StorEdge T3, T3+, and 6120 arrays
- Sun StorEdge 6320 and 6320 SL series devices
- Sun StorEdge 33xx series devices

Discovery Services

Discovery services are available for the following devices:

- Sun StorEdge network FC 1 Gb and 2 Gb switches
- Brocade Silkworm 1 Gb and 2 Gb switches
- Sun StorEdge 6120 arrays
- Sun StorEdge HBAs
- Sun StorEdge 6320 and 6320 SL series devices
- Sun StorEdge 3900 and 6900 series devices (if installed on the Storage Service Processor)

CHAPTER 3

ESM 1.2 Documentation Strategy

When you order ESM 1.2, you receive a single CD, a single installation manual, the ESM 1.2 Overview (this document), and three User Guides to support the following applications:

- Sun StorEdge Topology Reporter 1.2 (SSTR)
- Sun StorEdge Configuration Service 1.2 (SSCS)
- Sun StorEdge Diagnostic Expert 1.2 (SSDE)

Document Architecture

The intended audience for the Sun ESM 1.2 software consists of Sun service and support engineers, SAN and DAS administrators, and system administrators. The documentation assumes that the reader has experience installing Solaris software, using CLI commands, and using web browsers.

The ESM 1.2 documentation that is discussed in this section consists of the following:

ESM Integrated Installation Guide

The *Sun StorEdge™ Enterprise Storage Manager 1.2 Installation Guide* consists of the following information:

- Installation requirements and preparation
- Installing the ESM 1.2 software (which comprises SSTR, SSCS, and SSDE)
- Post-installation configuration procedures
- Uninstall procedure
- Upgrade procedure
- Troubleshooting tips

The *Sun StorEdge™ Enterprise Storage Manager 1.2 Installation Guide* describes the installation, configuration, and uninstallation of the three ESM 1.2 applications.

- **Installation**—Upon invoking the installation script, you are presented a text menu of component combinations from which to choose. The default combination is *Install All Components*. After you have selected a component combination, the script installs the appropriate components.

  You can also invoke the installation script from the command line, but the command line interface disables the text menu.
- **Configuration**—Again, you are presented a text menu of component combinations from which to choose. After you have selected a component combination, the script configures the appropriate components.

  You can also invoke the configuration script from the command line, but the command line interface disables the text menu.
- **Uninstall**—The uninstall script removes all ESM 1.2 components on a given host.

Note – 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 and historical view of all monitored storage devices. The CLI provides a “force” argument, however, that enables you to remove *all* files and directories that remain with a standard *uninstall*.

All this information is fully documented in the *Sun StorEdge Enterprise Storage Manager 1.2 Installation Guide*, pn 817-1037.

ESM 1.2 Component User's Guides

Each ESM 1.2 application has a user guide:

- *Sun StorEdge Topology Reporter Administration and Operation Guide*, pn 817-1112-10
- *Sun StorEdge Diagnostic Expert User's Guide, version 1.2*, pn 817-0195-10
- *Sun StorEdge SSCS Administrator's Guide*, pn 816-4295-10

These guides contain the following types of information for administrators:

- Overview of the software
- Task summary
- Description of basic and common tasks
- Task-oriented chapters for maintaining and modifying the software.
- Example how-to information

In addition, each application has its own online help, which provides usage information for the Web-browser user interface.

Related SAN Documentation

A broad list of related SAN documentation, and instructions about how to access the documentation, can be found in "Related Sun Documentation" on page vii.

Related documentation covers the following ESM 1.2-supported SAN devices:

- Sun StorEdge T3, T3+, and 6120 arrays
- Sun StorEdge host bus adapters (HBAs)
- Sun StorEdge 6320 and 6320 SL series
- Sun StorEdge network FC switches, Brocade Silkworm switches, and McData switches

CHAPTER 4

ESM 1.2 Features

ESM 1.2 enables you to view and manage devices in a storage area network (SAN) or direct-attached storage (DAS) environment. The supported devices are listed in TABLE 4-1.

The Sun StorEdge Topology Reporter (SSTR) software enables you to launch other device management applications in a separate browser or application window (known as “link-and-launch”), including the following:

- Sun StorEdge SSCS 1.2
- Sun StorEdge Diagnostic Expert 1.2
- Sun StorEdge 6320 and 6320 SL series management software
- SANSurfer
- Other switch-based management applications:
  - WebTools (Brocade)
  - EFCM Lite (McData)
- Sun StorEdge 99xx series (Hitachi) management software (HiCommand)
- Sun StorEdge 33xx series management software (SanScape)

ESM 1.2 Support Matrix

TABLE 4-1 ESM 1.2 Support Matrix (X = Supported)

Product	Information	SSTR	Config Service[1]	SSDE
SAN	• SAN Foundation Kit 4.1 or 4.2 with required patches	X		X
Sun StorEdge HBAs	• 1 Gb cPCI/SBus dual port • 2 Gb single and dual port	X	N/A	X
JNI HBAs	2 Gb PCI/Sbus, single and dual port	X	N/A	X
Sun StorEdge Network FC switches	• 1 Gb—8, 16 port • 2 Gb—8, 16 port	X	SanSurfer	X
Brocade Silkworm switches	• 1 Gb—8, 16 port • 2 Gb—8, 16 port	X	WebTools	X
McData switches	2 Gb—16, 32, 64 port	X	EFCM Lite	X
Sun StorEdge T3 and T3+ arrays	Firmware versions: • 1.16, 1.7, 1.8 • 2.0, 2.0.1, 2.1	X	X	X
Sun StorEdge 33xx series systems	FC-Fabric	X	SunScape	X
Sun StorEdge 3900 and 6900 series system	Sun StorEdge 3900 and 6900 series FC devices	X	X	X

TABLE 4-1 ESM 1.2 Support Matrix (X = Supported) *(Continued)*

Sun StorEdge 6x00 system and arrays	6120—midrange 1 6120—midrange 2 6320 and 6320SL[2]—midrange 3	X	Management software on: • MR1, MR2-installed on Solaris Host • MR3-installed on Service Processor	
Sun StorEdge 99xx series system (Hitachi)	9910, 9960, 9970, 9980	X	HiCommand Software	HiCommand Software
Solaris Operating Environment	Solaris version 8 10/01	X	X	X
Netscape, 4.79 and 7.0 Internet Explorer, 5.0 and higher	Web-browser user interface	X	X	X

Notes:

[1] SSCS, or other device management software

[2] SL = switchless

ESM Features, Functions, and Benefits

Using a command line interface (CLI) or a web-based browser interface, you can perform a variety of functions in ESM 1.2. Some of the highlighted features, functions, and benefits are listed in TABLE 4-2.

TABLE 4-2 ESM Features, Functions, and Benefits

Simplified Storage Management	
Feature	Common Web-based console
Function	Consolidates multiple storage management tools
Benefit	Reduced total cost of managed storage.
End-to-End SAN Management	
Feature	SAN Topology Reporter
Function	Provides an end-to-end view of the SAN infrastructure
Benefit	Effective service level agreement (SLA) management
Real-Time Health Monitoring	
Feature	Health monitoring of managed devices
Function	IP-based agents non-intrusively monitor the storage enterprise
Benefit	Higher storage infrastructure availability
Improved Serviceability	
Feature	Fault mitigation
Function	Host-based and device-based diagnostics guide the user through fault isolation, component replacement, and verification
Benefit	Increased data availability and improved application uptime.

TABLE 4-2 ESM Features, Functions, and Benefits *(Continued)*

Customized Notification	
Feature	Customized notification services
Function	Event notification messages can be selectively routed to the appropriate administrators
Benefit	Better administrative resource allocation
Proactive Health Management	
Feature	Automated health monitoring, intelligent diagnostics and expert advice.
Function	IP-based agents provide 24x7 health monitoring and integrated knowledge base provides recommendations for remedial action.
Benefit	Improved infrastructure availability and reduced downtime costs
Automated Configuration	
Feature	Automated configuration services
Function	Wizard-based configuration services assist system administrators to configure Sun StorEdge T3, T3+, and 6120 arrays.
Benefit	Improved administrator productivity and effectiveness
Heterogeneous Device Management	
Feature	Adaptable heterogeneous device management
Function	Common console provides support for open, standards-based device-management technologies such as the Common Information Model (CIM) and the Web-Based Enterprise Management (WBEM) standards.
Benefit	Customer choice and investment protection
Scalable Architecture	
Feature	Modular, scalable architecture
Function	Modular architecture allows users to add and manage new devices over time.
Benefit	Investment protection through scalable heterogeneous device management

TABLE 4-2 ESM Features, Functions, and Benefits *(Continued)*

Storage Infrastructure Visualization	
Feature	Visualization technology
Function	Graphical representation of storage interconnects and hosts present relationships through visualization technology.
Benefit	Faster, more informed administrator decisions.

APPENDIX **A**

Frequently-Asked Questions

TABLE A-1 Frequently-Asked Questions

Q	**What is ESM 1.2?**
A	Enterprise Storage Manager (ESM) is an integrated storage management solution that provides device and SAN management capabilities and performs health monitoring, fault detection and isolation, and diagnostics. It simplifies administration of heterogeneous SAN environments and improves application service levels. ESM 1.2 consists of: • ***Sun StorEdge Topology Reporter (SSTR)*** — Displays a topology view of your storage environment and enables automated device discovery. — Identifies and launches interfaces of other SMI and third-party applications. — Provides comprehensive, end-to-end visualization and control of all elements in the data path of a SAN solution, including HBAs, Sun StorEdge storage arrays, and fabric switches. — Open and standards-based by design, SSTR supports heterogeneous SAN infrastructures. • ***Sun StorEdge Configuration Service (SSCS)*** — Simplifies Sun StorEdge array configuration and administration. — Provides autodiscovery and wizard-based configuration services for Sun StorEdge storage arrays. • ***Sun StorEdge Diagnostic Expert (SSDE)*** — Integrated, proactive health management increases availability of the SAN infrastructure. — Provides health checking, intelligent diagnosis, and fault isolation, as well as expert advice from an integrated, best-practice knowledge base, which improves recoverability and increased storage infrastructure uptime.

TABLE A-1 Frequently-Asked Questions *(Continued)*

Q	**What *technology* problems does ESM solve?**
A	• Simplifies management of complex, heterogeneous storage environments. • Provides a single enterprise-wide storage management solution that scales from the workgroup up to the data center. • Identifies and displays relationships between storage devices, interconnects, and hosts. • Integrates with other storage management framework solutions (such as CA Unicenter) through SNMP. • Provides centralized administration of the network infrastructure. • Provides consolidated and detailed reporting of assets, health, and alert information. • Provides online guidance to isolate faults and expert-based advice for quick remedy and recovery. • Automates manual operations, which can reduce configuration errors and improve availability.
Q	**What *business* problems does ESM solve?**
A	ESM helps IT management solve a variety of business problems: • Manages the quality of storage service to optimize the end-to-end data and storage infrastructure • Reduces the total cost of managed storage • Decreases management complexity with a consistent look and feel across applications • Identifies areas of storage infrastructure risks and provides recommendations for remedial actions.
Q	**Which industries are best suited for ESM?**
A	ESM is a horizontal solution, meaning it spans all verticals. It addresses problems associated with: • The complexities of deploying and administering a heterogeneous storage network • A single integrated storage management solution • End-to-end data and storage resource management • The cost of managed storage • Business continuance • The availability of storage infrastructure and enterprise applications.

TABLE A-1 Frequently-Asked Questions *(Continued)*

Q	**What is *in-context* management and what third-party storage or device management applications can be launched from within ESM?**
A	ESM incorporates *in-context* management of third party storage devices to provide a common console for management of heterogeneous storage infrastructures. The term *in-context* means that a hyperlink is provided from within ESM to the specific point within the partner application that is appropriate for what the storage manager needs to accomplish. The following partners' device management applications are accessible through an in-context hyperlink: • Hitachi Data Systems HiCommand device manager (to support 99xx series) • Brocade WebTools • Qlogic SanSurfer • SANscape and SANpath (to support Sun StorEdge 33xx series array manager)

Glossary

alarm	A message with an attached level of severity
array	A disk subsystem, comprised of multiple disk drives, that functions as a single large, fast, super-reliable device. Arrays are designed to provide high performance, high availability, and increased storage capacity.
DAS	Direct Access Storage
diagnosis	A process to determine the fault cause and corrective action
diagnostic	A test to uncover faults
fault coverage	The percentage of faults detected against all possible faults or against all faults of a given type.
fault detection	The ability of a diagnostic to uncover a fault, given that a fault exists.
Fibre Channel	A cost-effective gigabit communications link deployed across a wide range of hardware. Commonly used for SAN configurations.
Fibre Channel switch	A networking device that can send packets directly to a port associated with a given network address.
FRU	Field Replaceable Unit. An assembly that a manufacturer replaces on failure of an assembly component.
HBA	Host Bus Adapter. A controller board connecting the I/O expansion bus to the fibre channel subsystem.
HTTP	HyperText Transfer Protocol
in-context launch	A hyperlink, provided from within ESM, to the specific point within the partner application that is appropriate for what the storage manager needs to accomplish.
IP	Internet Protocol
LUN	Logical Unit Number. The SCSI identifier of a logical unit of storage within a SCSI target.

LUN mapping The ability to change the virtual LUN as presented to the server from storage. This enables such benefits as the ability of a server to boot from the SAN without requiring a local disk drive. Each server requires LUN 0 to boot.

LUN masking The characteristic that enables an administrator to dynamically map an HBA to a specified LUN. This provides an individual server or multiple servers access to an individual drive or to multiple drives, and prohibits unwanted server access to the same drives.

Out-of-Band Refers to the connections and devices that are not in the data path. For example, the Storage Service Processor does not have access to the data that is stored on the Sun StorEdge 3900 and 6900 series storage subsystems, so information is considered to be *out-of-band*.

PCI Peripheral Component Interconnect. This is a high-performance 32-bit or 64-bit local bus that provides a host-processor-independent interface and an interconnect mechanism between highly integrated peripheral components.

RAS Reliability, Availability, and Serviceability

remote monitoring The ability to monitor the functionality and performance of a hardware system from a location other than where the hardware resides.

remote support The ability to directly or indirectly troubleshoot, diagnose, and service computer hardware from a location other than where the hardware resides.

SAN Storage Area Network

SCSI Small Computer Systems Interface. An industry standard for connecting disk and tape devices to a workstation.

storage service processor Sun's rack-mountable server, preconfigured with advanced remote management and monitoring capabilities. The service processor monitors the SAN and provides service and support access for Sun engineers.

T3, T3+, 6120 Array Sun's hardware-based array, featuring Fibre Channel architecture that provides the basis for modular network storage.

World Wide Name (WWN) A global, unique, and durable name used to identify SCSI and Fibre Channel entities.

zone A group of ports or nodes on a fabric for which access is restricted to only members of the group. Members of a zone can only access other members of the ssame zone.

zoning The act of grouping ports and/or nodes for the purpose of restricting access to only members of a group.

Index