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Sun StorEdge™
Enterprise Storage Manager 2.1
Software Installation Guide

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Preface

This document describes the installation considerations, requirements, and procedures for the Sun StorEdge™ Enterprise Storage Manager 2.1 software.

The intended audience for this document includes Sun support engineers and storage system administrators. The installation and post-installation steps of the Sun StorEdge Enterprise Storage Manager software must be performed by a person who has a working knowledge of storage area networks (SANs) and direct-attached storage (DAS) configurations through Fibre Channel. If the installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software, a working knowledge of Oracle database administration is also needed.

How This Book Is Organized

Chapter 1 describes the Sun StorEdge Enterprise Storage Manager 2.1 software.

Chapter 2 provides the installation requirements and preparation procedures for the software.

Chapter 3 explains how to install the software.

Chapter 4 provides post-installation procedures that you perform after you install the software.

Chapter 5 describes general tips to troubleshoot problems that might occur when installing the software.

Appendix A explains how to configure the software and the HP OpenView Network Node Manager software to operate together.

Appendix B explains how to use the software to enable zoning in McDATA fabrics.

Appendix C explains how to write scriptable alerts, which you can use with the capacity reporting function of the software.

Appendix D provides a quick reference for the command-line interface of the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software.

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 the following for this information:

- Software documentation that you received with your system
- Solaris™ Operating System documentation, which is at

  `http://docs.sun.com`

Shell Prompts

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

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*.

* The settings on your browser might differ from these settings.

Related Documentation

Application	Title	Part Number
Man pages	esm(1M)	N/A
	esminstall(1M) esmuninstall(1M) esmcheck(1M) esmconfig(1M) esmcontrol(1M)	N/A
Release and product information	*Sun StorEdge Management Software 2.1 Getting Started Guide*	817-4797
	Sun StorEdge Enterprise Storage Manager 2.1 Release Notes	817-4799
	Sun StorEdge SAN Foundation Software 4.4 Guide to Documentation	817-3670
	Sun StorEdge SAN Foundation Software 4.4 Release Notes, Including Sun StorEdge Traffic Manager for the Solaris Operating System	817-3673

Application	Title	Part Number
Installation and configuration information	*Sun StorEdge SAN Foundation Software 4.4 Installation Guide*	817-3671
	Sun StorEdge SAN Foundation 4.4 Configuration Guide	817-3672
User and diagnostic information	*Sun Management Center 3.5 User's Guide*	816-2716
	Sun Management Center 3.5 Installation and Configuration Guide	816-2678

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Please include the title and part number of your document with your feedback:

Sun StorEdge Enterprise Storage Manager 2.1 Software Installation Guide, part number 817-4798-*10*

Sun StorEdge Enterprise Storage Manager Installation Overview

This chapter includes information about:

- "Software Features" on page 1
- "Management and Agent Stations" on page 3

Software Features

The Sun StorEdge Enterprise Storage Manager 2.1 software is a storage asset management tool that provides graphical views, device management, fault management, and capacity reporting of your storage area network (SAN) or direct attached storage (DAS) through a Fibre Channel environment. The software consists of:

- The SAN Manager component of the Sun StorEdge Enterprise Storage Manager software
- The Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software

The installation script allows you to install the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software only, or include the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software.

The Sun StorEdge Enterprise Storage Manager components allow you to link and launch each other. You can also launch other device management software from within Sun StorEdge Enterprise Storage Manager software to manage devices such as switches, arrays, and the like. Make sure you install the applications that you want to launch from the Sun StorEdge Enterprise Storage Manager software.

TABLE 1-1 briefly describes the features of the Sun StorEdge SAN Foundation version 4.3 software software.

TABLE 1-1 Sun StorEdge Enterprise Storage Manager Software Overview

Software Function	Description
Topology management and reporting	Lets you view devices in a storage area network (SAN) or direct-attached storage (DAS) environment.
Device configuration management services	Lets you manage Sun StorEdge T3, T3+, and 6000 Family storage arrays and devices in your SAN or DAS environment.
Health monitoring and diagnostic services	Provides fault management and health reporting for Sun storage devices. You can perform a variety of functions, such as monitor the health of SAN devices, complete diagnostic tests, view the SAN topology for all SAN devices, and use Email or pager notification of system events and alarms.
Capacity reporting	Scans storage devices and gathers information. The software uses the information to create reports and notify users when a device exceeds user-defined capacity thresholds.
	The Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software uses the Oracle Database Standard Edition software to store the information it collects. Before you install the Sun StorEdge Enterprise Storage Manager software, your network storage environment must include an Oracle database server. See "Setting Up the Database Environment" on page 29 for information about how to prepare the Oracle database server for use with Sun StorEdge Enterprise Storage Manager.

You can use the software to manage your storage devices using a web browser user interface (UI).

The SAN Manager component of the Sun StorEdge Enterprise Storage Manager software includes a command-line interface (CLI). You can install the CLI on a Sun StorEdge Enterprise Storage Manager agent station or a system that has no Sun StorEdge Enterprise Storage Manager components. Note that a CLI is not available for the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software.

The Sun StorEdge Enterprise Storage Manager 2.1 software package also includes:

- Sun StorEdge SAN Foundation Software 4.4, which incorporates kernel drivers and utilities that let a host connect to, monitor, and transfer data on a SAN
- Sun Web Console software, which authenticates and authorizes users, and provides a web browser UI

■ An optional plug-in for the HP OpenView Network Mode Manager software, which allows the Sun StorEdge Enterprise Storage Manager software to provide notifications about LUN availability to the HP OpenView console

Management and Agent Stations

The Sun StorEdge Enterprise Storage Manager software consists of management and agent software. You can install the software on any Solaris system in your SAN or DAS environment. Each system is considered a *station* and can have a different role:

■ Management station

The software components use a management station to run the server portion of their packages.

The management station is the system on which you install the software that enables you to use the web browser UI and CLI (for the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software only) to view information about, and to administer and report on, your SAN fabric or DAS devices.

Make sure that only one system in your SAN environment acts as the management station.

■ Agent station

The agent station is one or more systems in your SAN through which the software collects information about your SAN devices. SAN devices can be host systems, host bus adapters, switches, and storage devices. The agent station sends this information to the management station. You can view the information from the management station using the web browser UI or CLI.

Typically your network storage environment consists of one management station and multiple agent stations.

Note – The default installation installs both the management and agent software on a system so that this system is both the management station *and* an agent station.

Preparing for the Installation

This chapter includes information about tasks you must perform before you install the Sun StorEdge Enterprise Storage Manager software:

- "Installation Checklist and Worksheet" on page 6
- "System Requirements" on page 15
- "Configuring Role-Based Access Control to Enable Access to the Software" on page 21
- "Preparing the Management Station" on page 24
- "Preparing the Agent Station" on page 27
- "Setting Up the Database Environment" on page 29
- "Gathering the Required Information" on page 37

Note – Refer to the release notes listed in "Related Documentation" on page xv for possible additional installation and release information for each software component.

Installation Checklist and Worksheet

Before you start the installation:

1. Print the "Installation Checklist" on page 7 and use it to guide you through the installation procedure.

2. Print the "Installation Worksheet" on page 11 and use it to gather information that you must supply to the installation procedure's prompts.

3. Start the installation with "System Requirements" on page 15.

4. Follow the steps.

Note – The abbreviated steps in the installation checklist are fully explained in this guide. This checklist is intended to be an aide during the installation procedure and not as a replacement for this guide.

Installation Checklist

Done	Installation Steps Checklist
	Pre-Installation Steps
	1. Meet the hardware requirements: • CD-ROM drive on host system • Supported systems and hardware in TABLE 2-1.
	2. Verify that JNI host bus adapter cards meet requirements.
	3. Meet disk space and memory requirements.
	4. Meet operating system requirements.
	5. Meet Sun StorEdge SAN Foundation Software 4.4 software requirements on agent stations.
	6. Meet minimum web browser requirements.
	7. If installing the Capacity Reporter component, meet Oracle database software requirements.
	8. Create an ESMUser user role and password.
	9. Allow all logged-in users access to the software.
	Preparing the Management Station
	10. Make sure that the management station meets the requirements listed previously.
	11. Log in as root on the management station.
	12. Remove the Sun Web Console software if the version is earlier than version 2.0.
	13. Meet the requirements for settings in the `/etc/system` file, if necessary.
	14. Make sure that the `JAVA_HOME` environment variable is not set.
	15. Make sure that `/var` and `/var/opt` are files systems or directories.
	16. If installing the Capacity Reporter component, set Oracle environment variables.
	17. Reboot.
	18. Log in as root to install the software.
	Preparing the Agent Station
	19. If installing the Capacity Reporter component, note the different agent station software installation types.
	20. On each agent station, log in as root.
	21. On each agent station, make sure the correct software patches are installed.
	22. On each agent station, reboot if necessary.
	23. On each agent station, log in as root to install the software.
	Setting up the Oracle Database Environment (if installing the Capacity Reporter component)

Done	Installation Steps Checklist
	24.Make sure that you have a functioning Oracle database and support from an Oracle database administrator.
	25.Meet Oracle database server requirements.
	26.Set minimum recommended database values.
	27.Set the language and locale parameters on the Oracle database server system.
	28.Decide if you want to install the software in *trusted* or *untrusted* mode.
	29.If installing in *untrusted* mode, create Oracle tablespaces on the Oracle database server system.
	30.If installing in *untrusted* mode, assign database files to the tablespaces on the Oracle database server system.
	31.Create the `ESM_USER` user role.
	32.If installing in *untrusted* mode, create an Oracle database user account on the Oracle database server.
	33.Configure the Oracle database client.
	34.Gather required database and port information and complete the installation worksheet. Have the installation worksheet available when you perform the installation.

Installation Steps

	35.Verify that your system meets the requirements listed previously.
	36.Log in to the system as root.
	37.Note that the installation captures your answers to the installation procedure prompts for later use. Use the answer file if you want to install the same configuration on another system.
	38.Run the `esminstall` script to start the installation procedure.
	39.If you are upgrading the software, refer to the section "Upgrading the Software".
	40.Indicate if you want to include the Capacity Reporter component.
	41.Choose 1 to install the software on a single system that serves as both a management *and* an agent station (the default).
	42.Choose 2 to install the management station software on a system that serves as a management station only.
	43.Choose 3 to install the agent station software on a system that serves as an agent station only.
	44.Choose 4 to install the CLI client components.
	45.Choose 5 to install he HP OpenView plugin.
	46.(Optional) Configure the Sun Management Center SAN Manager component of the Sun StorEdge Enterprise Storage Manager agent software.

Post-Installation Steps

	47.Use the `esmcontrol` script to start or stop the software.

Done	Installation Steps Checklist
	48.Log in to the Sun Web Console to access the UI.
	49.If using the CLI, ensure that the `ESMUser` role is assigned to you.
	50.If accessing the CLI, configure the `.clif-esmconfig` properties file.
	51.To use the CLI, type: `/opt/SUNWstm/bin/esm` *option* and enter login information when prompted.
	52.If necessary, use the CLI to run diagnostic tests.
	53.If necessary, use the `esmconfig` script to reconfigure the software.
	54.If uninstalling the Capacity Reporter component, note the effects on the Oracle database.
	55.If necessary, use the `esmuninstall` script to remove the software.
	56.If necessary, remove the Sun Web Console.

Troubleshooting Steps

	57.Use the `esmcheck` script to check the system's state.
	58.Check `/var/sadm/install/logs/esm.log` for messages related to the installation.
	59.Refer to "Troubleshooting the Installation" on page 113 for a list of possible installation problems.

Optional Steps

	60.(Optional) Configure the HP OpenView plugin to work with the Sun StorEdge Enterprise Storage Manager software.
	61.(Optional) Configure the HP OpenView plugin to work with the Sun StorEdge Enterprise Storage Manager software.
	62.(Optional) Write script notifications for the Capacity Reporter component.

Installation Worksheet

Prompts	Notes
Unique string of at least 6 characters (which you make up) for encryption of sensitive product data	
PostgreSQL server port Default: `5437`	
SAN Manager RMI registry port Default: `1099`	
SAN Manager RMI registry host Default: *localhost*	
SAN Manager enterprise management SNMP agent port	
SAN size Default: `2`	
Cluster name	
Host name of virtual server for scanning the cluster	
ARPS HTTP port Default: `11140`	
ESM agent service port number Default: `11150`	
Directory path for the ESMOM repository (for the software that interprets and runs the scan schedules of selected storage elements) (`/var/opt/SUNWstm/esmom`)	

Prompts	Notes
ESMOM (the software that interprets and runs the scan schedules of selected storage elements) HTTP port Default: 11130	
Trusted (Yes) or untrusted (No) installation	
ESM Oracle net service name Default: ESMDB	
Host name or IP address of the Oracle database server	
Port number for the Oracle LISTENER Default: 1521	
Service name for the Oracle database	
Oracle DBA account name Deafault: SYSTEM Password	
Login ID for the Oracle database Default: ESM_STD_USER Password	
Name for the SMALL A tablespace Default: EMS_TBSP_SMALL_A	
Name for the SMALL B tablespace Default: EMS_TBSP_SMALL_B	
Name for the MEDIUM A tablespace Default: EMS_TBSP_MEDIUM _A	

Prompts	Notes
Name for the MEDIUM B tablespace Default: `EMS_TBSP_MEDIUM _B)`	
Name for the LARGE A tablespace Default: `EMS_TBSP_LARGE_A)`	
Name for the LARGE B tablespace Default: `EMS_TBSP_LARGE _B)`	
Path to the SMALL A tablespace data backing file	
Path to the SMALL B tablespace data backing file	
Path to the MEDIUM A tablespace data backing file	
Path to the MEDIUM B tablespace data backing file	
Path to the LARGE A tablespace data backing file	
Path to the LARGE B tablespace data backing file	
Directory path for storing scan reports Default: `/var/opt/SUNWstm/reports`	
Starting network address	
Ending network address	
SNMP port number Default: `161`	

Prompts	Notes
Community name Default: `public`	
Starting network address	
Ending network address	
SNMP port number Default: `161`	
Community name Default: `public`	
Maximum number of Oracle connections Default: `50`	
Minimum number of Oracle connections Default: `10`	
Account name for RMI communication with the ESMOM (the software that interprets and runs the scan schedules of selected storage elements) Password	

System Requirements

Your network storage environment must have the required software, hardware, disk space, and memory to install the Sun StorEdge Enterprise Storage Manager software successfully. The installation procedure terminates if it detects that your environment does not meet the minimum installation requirements. You must meet the missing requirements before you can attempt to install the software again.

Required Hardware

The Sun StorEdge Enterprise Storage Manager installation requires that you have a CD-ROM drive connected to the host system where you plan to install the software.

Supported Systems and Hardware

TABLE 2-1 lists the supported systems and hardware.

TABLE 2-1 Supported Systems and Hardware

Supported Solaris Host Systems	Host systems that use the Solaris Operating System support Sun StorEdge Enterprise Storage Manager software. Hosts include but are not limited to: • Sun Enterprise™ server models 220R, 250, 420R, 450 • Sun Enterprise server models 3500, 4500, 5000, 5500, 6500, 1000 • Sun Fire™ server models 280R, v1280, 3800, 4800, 4810, and 6800 • Sun Fire server models v480, v880, v880z • Sun Fire server models 12000, 15000 Management stations include the servers listed above. For the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software only, management stations include the Sun Ultra™ workstation model 80.
Other Discoverable Host Systems[*]	Host systems that use the following operating systems: • Windows 2000 Server • Windows 2000 Advanced Server • Windows 2003 Enterprise Edition • HP-UX 11.00 • HP-UX 11i
Supported and Discoverable Attached Storage	Sun StorEdge T3 arrays, minimum firmware release 1.18 Sun StorEdge T3+ arrays, minimum firmware release 2.0 Sun StorEdge 3510FC series arrays Sun StorEdge 6120, and 6320 system arrays[‡] Sun StorEdge 3900 and 6900 series storage subsystems[§] Sun StorEdge 9900 series systems (includes the Sun StorEdge 9910, 9960, 9970, and 9980 system arrays)

TABLE 2-1 Supported Systems and Hardware *(Continued)*

Supported Switches	Sun StorEdge Network FC Switch, 1 GBps, 8- and 16-port SAN switches
	Sun StorEdge Network FC Switch, 2 GBps, 8-, 16-, and 64-port SAN switches
	Brocade Communications Systems, 1 GBps, 8- and 16-port SAN switches
	Brocade Communications Systems, 2 GBps, 8-, 16-, and 64-port SAN switches
	McDATA Corporation, 2 GBps, 12-, 24-, 64-, and 140-port SAN switches
	INRANGE FC, 2 GBps, 64- or 128-port Edge Switches (for the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software only)
Supported HBAs	Sun StorEdge, 1 GBps, single and dual port host adapters
	Sun StorEdge, 2 GBps, single and dual port host adapters
	Emulex LP9002L and LP952L host adapters
	JNI, 2 GBps, single and dual port host adapters
	Qlogic 2310/2342 host adapters
Supported Tapes and Tape Libraries†	IBM LTO2 tape drives
	StorageTek 9840B and 9840C tape drives
	StorageTek L180and L700 FC tape libraries

* These systems must include the Sun StorEdge Traffic Manager 4.4 software so that the Sun StorEdge Enterprise Storage Manager management station can monitor them.

† Tapes and tape libraries are supported for Discovery only.

‡ Array management for Sun StoreEdge 6120 and 6320 system arrays depends on the availability of the agent.

§ SNMP discovery of Sun StorEdge 3900 series and 6900 series arrays require Service Processor 2.3.1 Upgrade on the arrays. Arrays with a service processor image prior to the 2.3.1 release will be discovered incorrectly as a Solaris host. Refer to the README and the 3900/6900 Array Administration Guide for instruction on how to upgrade the array.

Requirements for JNI Host Bus Adapters

If your storage network configuration includes a JNI host bus adapter card, make sure:

- You have the latest version of your card's JNIsnia and JNIC146x packages for the Solaris Operating System. These packages are available at the following URL:

  `http://www.jni.com`

- Your JNI HBA card drivers are current. The Sun StorEdge Enterprise Storage Manager software requires the latest packages and drivers.

Required Disk Space and Memory

TABLE 2-2 lists the disk space and memory requirements for the Sun StorEdge Enterprise Storage Manager installation.

TABLE 2-2   Required Space and Memory for Installation and Operation

	SAN Manager and Capacity Reporter		SAN Manager	
	Disk Space	**System Memory**	**Disk Space**	**System Memory**
Management Station	1 GByte	1 GByte	800 MByte	1 GByte
Agent Station	115 MByte	256 MByte	71 MByte	256 MByte
Management and Agent Station on Same System	1.25 GByte	1 GByte	1 GByte	1 GByte
Host System of Oracle Database Server[*]	1.5 GByte	512 MByte		
Host System of Management Station for Reports Directory	1 GByte			
Host System of Management Station for Scan Repository	1 GByte			

* The size allocated for tablespaces and data files supports one database schema and one installation of the management station. For more schemas and more installations in Untrusted mode, allocate more space for the additional tablespaces and data files.

Note – When you install the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software, the installation procedure creates the /var/opt/SUNWstm/reports directory to store reports from scanned systems. Though the Sun StorEdge Enterprise Storage Manager software deletes old reports from the reports directory, in rare instances the file system can run low on or out of disk space. Consequently, reports might display stale data. This situation can occur if other applications share the same file system as the reports directory or you scan a large number of storage elements. At a minimum, dedicate a partition or volume with 1 gigabyte of free space for the reports directory. When the installation procedure prompts for the directory path to store scan reports, enter the path to the dedicated directory.

Required Software

The Sun StorEdge Enterprise Storage Manager installation requires that you have the latest network, switch, and host bus adapter software packages and updates. These packages and updates are available at:

```
http://www.sun.com/storage/san
```

Patches are available at:

```
http://sunsolve.sun.com/
```

TABLE 2-3 lists the required SAN, operating environment, and database software for the Sun StorEdge Enterprise Storage Manager installation.

TABLE 2-3   Required SAN, Operating Environment, and Database Software

Required Operating Environment Version for the SAN Manager Component	For installations that include *only* the SAN Manager component of the Sun StorEdge Enterprise Storage Manager:
	Management Station: • Solaris 9, **or** • Solaris 8, update 4 Note that the Solaris 8, update 6 operating environment requires the latest patch cluster, including patches for the Java™ 2 SDK v1.4, which is available at the following URL: `http://sunsolve.sun.com` To download the patch cluster: 1. Click Patches under the SunSolve title on the left side of the page. 2. Click Patch Finder under the Patches title on the left side of the page. 3. Click J2SE Solaris 8 (65.1M) in the Recommended Solaris Patch Clusters and J2SE Clusters list box in the center of the page. 4. Click the radio button for the Readme file. 5. Choose Download HTTP or Download FTP as the method to download the patch cluster. 6. Click Go to download the patch cluster. 7. Refer to the Readme file for information about installing the patches. **Agent Stations:** Solaris 8, update 4

TABLE 2-3 Required SAN, Operating Environment, and Database Software *(Continued)*

Required Operating Environment Version for the Capacity Reporter Component	For installations that *also* include the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager: **Management Station:** Solaris 9, update 2 **Agent Stations:** Solaris 8, update 4
Required SAN Software on Each Agent Station	Sun StorEdge SAN Foundation Software 4.4 Though your system might already include the Sun StorEdge SAN Foundation Software 4.4, the Sun StorEdge Management Software CD includes SUNWsan and related software, which is also available from http://www.sun.com/storage/san/. **Note:** Before you install the Sun StorEdge SAN Foundation Software 4.4, check the web site to make sure you have the most recent version of the software. Patches are available at the following URL: http://sunsolve.sun.com/
Minimum Web Browser Version[*]	Netscape Navigator™ version 7.0 Microsoft Internet Explorer version 5.5 (if your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software) Microsoft Internet Explorer version 5.1 Mozilla™ 1.1
Required Database Software	*If you plan to use the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software:* • Oracle 9i Release 2 (9.2.0.2) Standard Edition Database Server software installed on any platform • Oracle 9i Release 2 (9.2.0.2) Standard Edition Client software installed on the Sun StorEdge Enterprise Storage Manager management station Start the Oracle database software before you install the Sun StorEdge Enterprise Storage Manager software. Refer to the Oracle product documentation for the latest information.

[*] Enable Javascript and cookies on your web browser.

Configuring Role-Based Access Control to Enable Access to the Software

The Sun Web Console uses Role-Based Access Control (RBAC) to allow users to access all features of the Sun StorEdge Enterprise Storage Manager software. By default, the installation procedure assigns the ESMUser user role to the superuser (root). The superuser can also assign these access rights (ESMAllRights) to other non-superuser users by using the /opt/SUNWstm/bin/esm_user script.

The software gives all Sun StorEdge Enterprise Storage Manager user rights to any user with the ESMUSer role. This user can then view any of the Sun StorEdge Enterprise Storage Manager software's UI pages and administer any feature.

Before you install the Sun StorEdge Enterprise Storage Manager management station software, you must create the ESMUser role and set a default password. You do not need to do this for agent station and CLI installations.

Note – After the installation completes, use the roles *username* command to verify that you have created and assigned the ESMUser role successfully. If you use the roles command before you install the software, you receive an error message.

▼ To Create the ESMUser Role and Set a Default Password

1. **Log in to your system as root.**

2. **Create a default** ESMUser **user role:**

```
# /usr/sbin/roleadd ESMUser
```

3. **Create the** ESMUser **user role password:**

```
# /usr/bin/passwd ESMUser
New password:
Re-enter new password:
```

You can also use the Solaris admintool utility to create the ESMUser role.

4. **Assign an additional user to the** ESMUser **user role:**

```
# /opt/SUNWstm/bin/esm_user -a guest
Assigning ESMUser role to local user: guest ...
Restarting name service cache daemon and lockhart server...
#
```

The esm_user script also removes a user from the ESMUser role. It does not change role passwords or remove users from the /etc/user_attr file. TABLE 2-4 lists the options for the esm_user script.

Syntax:

esm_user [-a, --add *username*] [-r, --remove *username*] [? |-h,--help]

TABLE 2-4   esm_user Script Options

Option	Description
None	Display a usage message.
-a, --add *username*	Assign the EMSUser role to a user.
-r, --remove *username*	Remove the ESMUser role from a user.
? -h, --help	Display a list of options and usage for the script.

Note – You can assign additional users before or after you install the Sun StorEdge Enterprise Storage Manager software.

▼ To Allow All Logged-In Users Access

1. **Log in to your system as root.**

2. **Edit the** /etc/security/policy.conf **file to append the** esm.user.all **privilege to the** AUTHS_GRANTED **line:**

```
AUTHS_GRANTED=solaris.device.cdrw,esm.user.all
```

Now all users who can log in to your system can access the software, regardless of their role (including no role).

▼ To Remove Users and `ESMUser` Role

1. **Log in to your system as root.**

2. **Delete the user:**

```
# userdel username
```

You can also use the Solaris `admintool` utility.

3. **Remove the `ESMUser` role manually:**

```
# roledel ESMUser
```

The Sun StorEdge Enterprise Storage Manager uninstallation procedure will remove the `ESMUser` role from the root user, and the `ESMAllRights` from the `ESMUser` role. It does not remove the `ESMUser` role.

You can also use the Solaris `admintool` utility.

Note that the installation procedure adds Sun StorEdge Enterprise Storage Manager entries to the following files and the uninstallation procedure does not remove them.

- `/etc/security/auth_attr`

```
esm.user.all:::Assign All Rights:help=ESMProfMgrAssign.html
esm.user.read:::Assign Read Rights:help=ESMProfMgrAssign.html
esm.user.write:::Assign Write Rights:help=ESMProfMgrAssign.html
```

- `/etc/security/prof_attr`

```
ESMAllRights:::a basic right that provides a user with the read,
write and update rights to ESM:help=ESMAllRights.html;auths=
esm.user.all
```

Preparing the Management Station

The management station must meet the following criteria:

- Disk and memory space requirements in TABLE 2-1
- Only one system in your SAN environments acts as the management station

▼ To Prepare the Management Station

1. **Log in as root.**

2. **Determine if the management station is running a version of the Sun Web Console software that is earlier than version 2.0:**

```
/usr/sbin/smcwebserver status
```

If the version of the Sun Web Console software is earlier than version 2.0, the installation procedure asks you to remove it.

3. **If necessary, remove the Sun Web Console software:**

```
/usr/lib/webconsole/setup -uf
```

Note – Make sure that other applications in your network storage environment do not need the Sun Web Console service before you remove it. Refer to "Removing the Sun Web Console Software" on page 107 for information.

4. **If necessary, back up and then use a text editor to modify the** /etc/system **file.**

Make sure the file has the following values, or add them to the end of the file:

```
set shmsys:shminfo_shmmax=0x2000000
set shmsys:shminfo_shmmin=1
set shmsys:shminfo_shmmni=256
set shmsys:shminfo_shmseg=256
set semsys:seminfo_semmap=256
set semsys:seminfo_semmni=512
set semsys:seminfo_semmsl=32
set semsys:seminfo_semmns=512
```

If an existing value in the `/etc/system` file is a decimal number, you can use the `bc(1)` command to convert hexadecimal and decimal values. For example, to display the decimal value of hexadecimal value 0x2000000 (which is decimal 33554432), type the following bold text at a terminal command prompt:

```
# bc
ibase=16
2000000
33554432
quit
#
```

To convert decimal to hexadecimal, use the `obase=16` option instead. See the `bc(1)` man page for more information.

Note – If you or an application previously edited this file and specified memory values, keep the higher of the memory values. For example, if the values shown in this section are higher, use these values. The internal database semaphores require these shared memory entries.

---

5. **Save and exit the file.**

6. **Make sure that the** `JAVA_HOME` **environment variable is not set.**

   The installation procedure sets the `JAVA_HOME` environment variable.

7. **Make sure that** `/var` **and** `/var/opt` **are file systems or directories. They must** *not* **be symbolic links.**

8. **If your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager, specify the following environment variables so the software can access the Oracle database client:**

   ```
   setenv ORACLE_HOME path/oracle/product/9.2 (csh,tcsh)

   ORACLE_HOME=path/oracle/product/9.2;export ORACLE_HOME (sh,ksh)
   ```

9. **Perform a reconfiguration reboot:**

> **Note –** If you are using this system as an agent station also, perform the procedures in "Preparing the Agent Station" on page 27 before performing this step. Except for this reconfiguration reboot, the software installation process does not require you to shut down and restart your system.

```
# reboot -- -r
```

10. When the system returns, log in as root to install the software.

Preparing the Agent Station

Make sure the agent station meets the disk and memory space requirements in TABLE 2-2.

You must install the agent station software on each host that is connected to the SAN or fabric. If you install the software on only some hosts, you will only partially discover information.

If your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager installation, the type of storage element that you want to scan determines how you install the agent station software (see TABLE 2-5).

TABLE 2-5   Agent Station Software Installation Types

Storage Element	What to Install
Standard host	The Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager agent software on any Sun Solaris system. The software scans the system on which it resides for information.
Sun StorEdge and Hitachi Data System 9900and 9900V series array	None
	The Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software supports Sun StorEdge and Hitachi Data Systems 9900 and 9900V series arrays that are managed by Hitachi Data Systems HiCommand™ Server (HiCommand Server) software.
	Agent station software (on the management station or on another host) communicates with the HiCommand Server's web user interface to collect information about Sun StorEdge and Hitachi Data Systems 9900 and 9900V series arrays. Therefore, a host with the agent station software must have a TCP/IP connection to the same network as the HiCommand Server that manages the 9900 990V series arrays.
Cluster	The Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager agent software on all member nodes of a cluster. Refer to "Installing the Software on Clusters" on page 28 for more information about how to prepare your host to scan clusters.
Storage array	The Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager agent software on a host for which the storage array supplies storage. To enable scanning, you must register the host as the storage array's access path.
Switch	The Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager agent software on a host that is a member of the switch's fabric.
Remote host, without installing agent software on it	None
	The management station can scan a remote host that does not include agent software. Refer to "Scanning Remote Hosts" on page 28 for more information.

Scanning Remote Hosts

If you cannot or do not want to install the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager agent software on a target Solaris system, you can use the remote host scanning function. The Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager remote host scanning function uses `telnet` to access a root-like privileged account and scan a host system without installation of the agent software. Note that the scan might not provide information as complete as that gathered when you install the agent software on the target host.

To scan a remote host system, you might have to provide two account names and passwords. When you register the remote host system:

1. You must include a login account name and corresponding password. The login account information allows you to use Telnet to log in to the remote host system. If the login account has root-like privileges, you can scan the remote host system successfully.

2. You might need to enter a privileged account name and corresponding password. If the login account does not have the necessary root-like privileges, you must provide a privileged account name that does have the appropriate privileges.

Installing the Software on Clusters

The Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software supports the Sun Cluster and VERITAS Cluster Server (VCS) software environment, which lets the agent station scan and report on shared cluster resources without counting them multiple times in reports.

There are two types of cluster installations:

- Cluster primary node
- Cluster secondary node or nodes

Before you install the agent station software on the cluster, collect the following information:

1. The cluster member node that has the lowest LLT number. This is the system from which you must register the cluster with the management station before any shared resources can be properly reported.

2. A suitable cluster alias for the cluster, which you use to register the cluster with the management station. The installation procedure suggests a cluster alias. Make sure that the cluster alias is not the same as the alias of another managed computer or cluster on the management station. The cluster alias must be a properly formatted computer system name that is unique on your network; however, it does not necessarily have to exist.

▼ To Prepare an Agent Station

1. **Log in as root.**

2. **Make sure that the correct software patches are installed on your system for your host bus adapter cards, switches, and environment.**

   The most current operating environment and Sun SAN Foundation software patches and patch clusters are available from `http://sunsolve.sun.com/`.

3. **After installing the patches, perform a reconfiguration reboot *only if the patch installation requires it* (see the patch README file):**

   Note – Except for this possible patch reconfiguration reboot, the software installation process does not require you to shut down and restart your system.

   ```
   # reboot -- -r
   ```

4. **When the system returns, log in as root to install the software.**

Setting Up the Database Environment

The following sections describe the configuration tasks that are specific to the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software. Refer to the Oracle product documentation for information about how to install and configure the Oracle database.

The Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software uses an Oracle database to store the data it collects from the network storage environment. For the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software to function properly with the Oracle database software, you must configure the Oracle server and client systems appropriately.

Configuring the Oracle Database Server

You must have a functioning Oracle 9i Release 2 (9.2.0.2) database server installation on any operating system environment in your network storage environment. Make sure that the system has sufficient disk space and memory.

Setting Minimum Recommended Oracle Database Values

TABLE 2-6 lists the minimum recommended Oracle database settings to ensure that the performance of the Sun StorEdge Enterprise Storage Manager software is acceptable.

TABLE 2-6　　Minimum Recommended Oracle Database Settings

Tablespace Settings	System tablespace size	512 MByte
	Temporary tablespace size	250 MByte
	Undo tablespace size	300 MByte
Redo Log Settings	Three (3) redo log groups, each with at least one redo log file:	
	Redo log file size	100 KByte
Oracle SGA Settings	Shared pool size	300 MByte
	Buffer cache size	150 MByte
	Large pool size	50 MByte
	PGA size	25 MByte
Initialization Settings	Database block size	16 KByte
	Number of processes	150
	Number of open cursors	300
	Sort area size	500 KByte

Configuring for Internationalization

For internationalization purposes:

- Select the Unicode character set
- Use the following recommended National Language Support (NLS) settings:

Parameter*	Setting
NLS_COMP	BINARY
NLS_NCHAR_CONV_EXP	FALSE
NLS_SORT	BINARY
NLS_LENGTH_SEMANTICS	CHAR

* Set the NLS_LANG and NLS_CALENDAR parameters according to your geography.

Note – If the Oracle database server uses different NLS settings, the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software might not display fields or sort data properly.

Choosing Trusted or Untrusted Mode

You must choose from one of two installation modes to install the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software:

- **Trusted mode** – Means that you let the installation procedure define all the required Oracle database objects automatically. To do this, you must provide a privileged DBA Oracle account name and the corresponding password to the installation script prompt. Because the installation procedure has access to the privileged DBA Oracle account, it will access the Oracle database to allocate space, create tablespaces, and create accounts.

  If you choose to install the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software in trusted mode, skip to "Configuring the Oracle Database Client" on page 36.

- **Untrusted mode** – Means that you do not let the installation procedure define all the required Oracle database objects automatically. You might not have or want to provide a privileged DBA Oracle account and the corresponding password for the installation script prompt. Therefore, an Oracle database administrator must create the following database objects before you install the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software:

  - Six (6) tablespaces and six (6) associated data files (see "Creating Oracle Tablespaces" on page 32)

- A user role that defines necessary privileges (see "Creating the User Role" on page 34)
- An Oracle database user account and password with the user role (see "Creating the Oracle Database User Account" on page 35)

Creating Oracle Tablespaces

In trusted mode, the installation procedure establishes six predefined tablespaces for small, medium, and large schema objects. To help separate data and indices, each tablespace is one of a pair with the same storage parameters.

To eliminate fragmentation and the need to coalesce the Oracle database, the Sun StorEdge Enterprise Storage Manager software uses locally managed tablespaces with UNIFORM extent sizes.

Locally managed tablespaces use bitmaps, which are in data file headers, to control space allocation and deallocation. The locally managed tablespaces do not contend for data dictionary resources, which eliminates recursive operations in the data dictionary, such as allocation of new extents.

The predefined tablespaces use uniform extents; therefore, all objects that the software creates in the tablespaces use the same extent sizes. Because any isolated free extents in a tablespace match the specified extent size, there is virtually no fragmentation. The use of uniform extent sizes also simplifies the table and index creation DDL. Because the software sets the sizing parameters at the tablespace level, it does not need to address sizing when it creates an object. The uniform extent size of a locally managed tablespace cannot be overridden when a table or an index is created.

In untrusted mode, your Oracle database administrator must create small, medium, and large tablespaces and their associated database files. Note that the maximum size of the tablespaces is unlimited. Refer to TABLE 2-7 and CODE EXAMPLE 2-1 for recommendations about how to create the required tablespaces.

TABLE 2-7   Recommended Tablespace Configuration

Tablespace Name	Initial Size	Extent Size
ESM_TBSP_SMALL_A	150 MByte	80 KByte
ESM_TBSP_SMALL_B	150 MByte	80 KByte
ESM_TBSP_MEDIUM_A	250 MByte	512 KByte
ESM_TBSP_MEDIUM_B	250 MByte	512 KByte
ESM_TBSP_LARGE_A	300 MByte	1 MByte
ESM_TBSP_LARGE_B	300 MByte	1 MByte

CODE EXAMPLE 2-1   create_tablespace.sql

```
CREATE TABLESPACE ESM_TBSP_SMALL_A
       LOGGING PERMANENT
       DATAFILE '&&1' SIZE 153664K
       AUTOEXTEND ON NEXT 10M MAXSIZE UNLIMITED
       EXTENT MANAGEMENT LOCAL UNIFORM SIZE 80K
       SEGMENT SPACE MANAGEMENT AUTO
       ONLINE
/
CREATE TABLESPACE ESM_TBSP_SMALL_B
       LOGGING PERMANENT
       DATAFILE '&&2' SIZE 153664K
       AUTOEXTEND ON NEXT 10M MAXSIZE UNLIMITED
       EXTENT MANAGEMENT LOCAL UNIFORM SIZE 80K
       SEGMENT SPACE MANAGEMENT AUTO
       ONLINE
/
CREATE TABLESPACE ESM_TBSP_MEDIUM_A
       LOGGINGPERMANENT
       DATAFILE '&&3' SIZE 256064K
       AUTOEXTEND ON NEXT 25M MAXSIZE UNLIMITED
       EXTENT MANAGEMENT LOCAL UNIFORM SIZE 512K
       SEGMENT SPACE MANAGEMENT AUTO
       ONLINE
/
CREATE TABLESPACE ESM_TBSP_MEDIUM_B
       LOGGING PERMANENT
       DATAFILE '&&4' SIZE 256064K
       AUTOEXTEND ON NEXT 25M MAXSIZE UNLIMITED
       EXTENT MANAGEMENT LOCAL UNIFORM SIZE 512K
       SEGMENT SPACE MANAGEMENT AUTO
       ONLINE
/
CREATE TABLESPACE ESM_TBSP_LARGE_A
       LOGGING PERMANENT
       DATAFILE '&&5' SIZE 307264K
       AUTOEXTEND ON NEXT 30M MAXSIZE UNLIMITED
       EXTENT MANAGEMENT LOCAL UNIFORM SIZE 1M
       SEGMENT SPACE MANAGEMENT AUTO
       ONLINE
```

```
/
CREATE TABLESPACE ESM_TBSP_LARGE_B
        LOGGING PERMANENT
        DATAFILE '&&6' SIZE 307264K
        AUTOEXTEND ON NEXT 30M MAXSIZE UNLIMITED
        EXTENT MANAGEMENT LOCAL UNIFORM SIZE 1M
        SEGMENT SPACE MANAGEMENT AUTO
        ONLINE
/
EXIT
/
```

Assigning Database Files

In trusted mode, you must supply the names of the database files associated with each tablespace.

In untrusted mode, the installation script does not prompt you for the database files; however, it does verify that the tablespaces and their associated database files exist.

Sun recommends that you use only one database file for each tablespace.

Creating the User Role

In trusted mode, the installation procedure creates the ESM_ROLE user role, which defines the necessary privileges for the Oracle database user account.

In untrusted mode, the Oracle database administrator must create the ESM_ROLE user role. Refer to CODE EXAMPLE 2-2 for recommendations about how to create the ESM_ROLE user role.

CODE EXAMPLE 2-2   `create_role_noexist.sql`

```
DECLARE
  counter NUMBER;

BEGIN
  SELECT COUNT(1) INTO counter FROM dba_roles WHERE UPPER(role) =
UPPER('ESM_ROLE');
  IF counter = 0 THEN
    EXECUTE IMMEDIATE 'CREATE ROLE &&1';
    EXECUTE IMMEDIATE 'GRANT CONNECT, RESOURCE, OEM_MONITOR TO
ESM_ROLE';
  END IF;
END;
/
exit
/
```

Creating the Oracle Database User Account

In trusted mode, the installation procedure creates a Sun StorEdge Enterprise
Storage Manager Oracle database user account and grants it the necessary privileges
(ESM_ROLE) to access the Oracle database.

In untrusted mode, the Oracle database administrator must create the Sun StorEdge
Enterprise Storage Manager Oracle database user account and grant it the necessary
privileges (ESM_ROLE) to access the Oracle database. Refer to CODE EXAMPLE 2-3 for
recommendations about how to create the ESM Oracle database user account.

CODE EXAMPLE 2-3   `create_user_noexist.sql`

```
-Creates user ONLY if it does not already exist
SET VERIFY OFF
DECLARE
  counter NUMBER;

BEGIN
 SELECT COUNT(1) INTO counter FROM dba_users WHERE UPPER(username)
= UPPER('&&1');

  IF counter = 0 THEN
    EXECUTE IMMEDIATE 'CREATE USER &&1 IDENTIFIED BY &&2 ' ||
                      'DEFAULT TABLESPACE &&4 ' ||
                      'TEMPORARY TABLESPACE &&5 ' ||
                      'QUOTA UNLIMITED ON &&6 ' ||
                      'QUOTA UNLIMITED ON &&7 ' ||
                      'QUOTA UNLIMITED ON &&8 ' ||
                      'QUOTA UNLIMITED ON &&9 ' ||
                      'QUOTA UNLIMITED ON &&10 ' ||
                      'QUOTA UNLIMITED ON &&11';

    EXECUTE IMMEDIATE 'GRANT &&3 to &&1';
  END IF;
END;
/
exit
/
```

Configuring the Oracle Database Client

Setting up the Oracle database client involves two steps:

1. Installing the Oracle 9i client software on the same system on which you plan to install the ESM management station software.

2. Editing the `tnsnames.ora` file to define the net service name for the Oracle instance that the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software uses. The recommended default for the net service name is `ESMDB`.

Gathering the Required Information

The installation procedure starts by prompting you for all required information. Once you have answered the prompts or accepted the default values, you need not supply any other information. The following help you gather the required information for the installation procedure's prompts:

- TABLE 2-8 lists the prompts to which you must supply Oracle database information.
- TABLE 2-9 lists the default service port numbers.

Note that the installation procedure retains this information in an answer file, which you can use during subsequent installations to duplicate your settings. Refer to "Using the Answer File" on page 42 for more information about the answer file.

TABLE 2-8 Required Database Information for Installation

Script prompts for	Description	Default
Permission to create Oracle tables and users	**No** indicates *untrusted mode*, which does not let the installation procedure create the required database objects. You do not supply a privileged DBA Oracle account user name and password; therefore, the Oracle database administrator must create the database objects before you start the installation. **Yes** indicates *trusted mode*, in which you must supply a privileged DBA Oracle account user name and password so that the installation procedure can create the required database objects.	No
Host name or IP address of the Oracle database server	The system in your environment that hosts the Oracle database server and to which the Oracle database client software on the Sun StorEdge Enterprise Storage Manager management station connects. Note that the host name or IP address must be the same as that in the ESM Oracle net service name.	None
Port number for the Oracle database	The Oracle port number, which must be the same as that in the ESM Oracle net service name.	1521
Oracle DBA account name	The privileged DBA Oracle account name, which you must supply for a trusted mode installation.	SYSTEM

TABLE 2-8   Required Database Information for Installation   *(Continued)*

Script prompts for	Description	Default
Oracle DBA account password	The privileged DBA Oracle account password, which you must supply for a trusted mode installation.	None
Login ID for the Oracle database	The ESM Oracle database user account name that lets the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software access the Oracle database. In **trusted** mode, the installation procedure creates this account, creates the user role (ESM_ROLE), and assigns the role to the account. In **untrusted** mode, the Oracle database administrator must create the account and assign the necessary role (ESM_ROLE) before you start the installation. The installation script verifies that the account exists.	ESM_STD_USER
Login password for the Oracle database	The password for the ESM Oracle database user account.	None
ESM Oracle net service name	The net service name for the Oracle instance that the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software uses. This name is typically in the `tnsnames.ora` file used in your environment.	ESMDB
Service name for the Oracle database	The Oracle database service name, which must be the same as that in the ESM Oracle net service name.	None
Name for the SMALL configuration A tablespace	In **untrusted mode**, the name the Oracle database administrator gives to the existing SMALL configuration tablespace.	ESM_TBSP_SMALL_A
Name for the SMALL configuration B tablespace	In **untrusted mode**, the name the Oracle database administrator gives to the existing SMALL configuration tablespace.	ESM_TBSP_SMALL_B
Name for the MEDIUM configuration A tablespace	In **untrusted mode**, the name the Oracle database administrator gives to the existing MEDIUM configuration tablespace.	ESM_TBSP_MEDIUM_A
Name for the MEDIUM configuration B tablespace	In **untrusted mode**, the name the Oracle database administrator gives to the existing MEDIUM configuration tablespace.	ESM_TBSP_MEDIUM_B
Name for the LARGE configuration A tablespace	In **untrusted mode**, the name the Oracle database administrator gives to the existing LARGE configuration tablespace.	ESM_TBSP_LARGE_A

TABLE 2-8   Required Database Information for Installation *(Continued)*

Script prompts for	Description	Default
Name for the LARGE configuration B tablespace	In **untrusted mode**, the name the Oracle database administrator gives to the existing LARGE configuration tablespace.	ESM_TBSP_LARGE_B
Path to the TablespaceName1 data backing file	Full path name of the data file for the SMALL_A tablespace. The installation script prompts for the path name during **trusted mode** installations only.	None
Path to the TablespaceName2 data backing file	Full path name of the data file for the SMALL_B tablespace. The installation script prompts for the path name during **trusted mode** installations only.	None
Path to the TablespaceName3 data backing file	Full path name of the data file for the MEDIUM_A tablespace. The installation script prompts for the path name during **trusted mode** installations only.	None
Path to the TablespaceName4 data backing file	Full path name of the data file for the MEDIUM_B tablespace. The installation script prompts for the path name during **trusted mode** installations only.	None
Path to the TablespaceName5 data backing file	Full path name of the data file for the LARGE_A tablespace. The installation script prompts for the path name during **trusted mode** installations only.	None
Path to the TablespaceName6data backing file	Full path name of the data file for the LARGE_B tablespace. The installation script prompts for the path name during **trusted mode** installations only.	None

Default Port Numbers

TABLE 2-9 lists the default port numbers for the Sun StorEdge Enterprise Storage Manager software. You need to know the port numbers in case other applications on your system conflict with the Sun StorEdge Enterprise Storage Manager software. The installation and configuration scripts allow you to reset the default ports.

TABLE 2-9   Sun StorEdge Enterprise Storage Manager Default Port Numbers

Port	Description	Port Number
SNMP Port	Destination port for SNMP traps	161
Apache HTTP Server port	HTTP/HTTPS port for the Apache web server	1024
SAN Manager RMI Registry port	Port for the Remote Method Invocation (RMI) registry	1099
ESMOM HTTP port	HTTP listener port for the software that interprets and runs the scan schedules of selected storage elements	11130
ESMOM RMI port	RMI listener port for the software that interprets and runs the scan schedules of selected storage elements	11131
ARPS HTTPS port	Agent station port for communication between management and agent stations	11141
ESM Agent Service port	Solaris host provider port	11150
Oracle Database port	Port for the Oracle database, which is required by the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software	1521
Service RMI port	RMI port for communication between the UI and the Job Manager	4099
Indication Handler port	Destination port for indications or event messages	4567
PostgreSQL Server port	Port for the embedded PostgreSQL database, which comes with the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software	5437
SSL HTTP Server port	Secure Socket Layer (SSL) HTTP server port for the Sun Web Console, which provides the Sun StorEdge Enterprise Storage Manager web browser user interface	6789
SAN Manager enterprise management SNMP agent port	SNMP port that an enterprise management application can use to retrieve information from the SAN Manager software	8085

CHAPTER **3**

Installing and Upgrading the Software

This chapter includes information about the Sun StorEdge Enterprise Storage Manager software installation procedure:

- "Using the Answer File" on page 42
- "Using the esminstall Script" on page 44
- "Upgrading the Software" on page 77
- "Sun Management Center Integration" on page 81

Note – If your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software, the Oracle database *must* be started before you proceed with the installation procedure.

Using the Answer File

When you install the Sun StorEdge Enterprise Storage Manager software, the installation procedure records your answers to the prompts and other configuration information in an answer file. The default location for the answer file is `/tmp/esm.answer`.

You can use the answer file as follows:

- To review your installation's configuration information.
- As an option to begin a non-interactive installation session.
- To install identical configurations. Typically, you use an answer file when you want to install the same configuration on multiple agent stations in your network storage environment.
- To reinstall the software if the installation fails (it is assumed that the configuration attribute values are correct).

CODE EXAMPLE 3-1 shows a sample of an answer file.

Note – To make configuration changes, use the `esmconfig` script. Do not edit the answer file in a text editor.

CODE EXAMPLE 3-1   Sample Answer File

```
ARP_HTTPS_PORT=11141
ARP_HTTP_PORT=11140
AT_PASSWORD=atpwd
CLUSTER_IDENTIFIER=
CLUSTER_VIRTUAL_SERVER=
DBAPrivAcct=SYSTEM
DBAPrivPass=
DT_PASSWORD=dtpwd
DataFileName1=
DataFileName2=
DataFileName3=
DataFileName4=
DataFileName5=
DataFileName6=
ENABLE_CLUSTER=false
ENABLE_SCANNABLE_ASSET=true
DB_LOGIN_ID=smith
ORACLE_DB_PASSWORD=smith
ORACLE_DB_PORT=1521
ORACLE_DB_SERVER=jones
ORACLE_DB_SID=ESM20
SERVICE_ENABLE_SSL=false
SERVICE_LOCATION=localhost
SERVICE_RMI_PORT=4099
SMICC_HOSTNAME=localhost
SMICC_PORT=6789
ServiceName=jones
.
.
.
TablespaceName1=ESM_TBSP_SMALL_A
TablespaceName2=ESM_TBSP_SMALL_B
TablespaceName3=ESM_TBSP_MEDIUM_A
TablespaceName4=ESM_TBSP_MEDIUM_B
TablespaceName5=ESM_TBSP_LARGE_A
TablespaceName6=ESM_TBSP_LARGE_B
TempTablespaceName=TEMP
TrustingMode=false
UAGENT_PORT=11150
esm.rdp.report.report_dir=/var/opt/SUWNstm/reports
```

Using the `esminstall` Script

The `esminstall` script on the product CD also installs the Sun StorEdge Enterprise Storage Manager software. You can choose to install either the SAN Manager component of the Sun StorEdge Enterprise Storage Manager or the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software, or both.

Note – The installation script checks for prerequisite software on the management and agent stations. If the installation procedure determines that prerequisites are missing, it will not continue.

The `esminstall` Script Options

The `esminstall` script, which is on the product CD, includes options that let you choose a non-interactive session or use an answer file to duplicate an installation's configuration attributes.

TABLE 3-1 lists the options for the `esminstall` script. The script can accept short or long names for each option. A short name option requires a single hyphen (-). A long name option requires a double hyphen (--).

For example, to install the agent software on a single system (agent station) in silent mode, type:

```
# ./esminstall -a -s /tmp/esm.answer
```

Note – When you use a long name option, do not type a space between hyphens.

Syntax:

esminstall [–A, --all *answerfile*] [–m, --management *answerfile*] [–a, --agent *answerfile*]
[-c, --cli *answerfile*] [–p, --product *product*] [–o, --openview] [-s, --silent]
[? | –h, --help]

TABLE 3-1 esminstall Script Options

Option	Description
None	Display the main installation menu. Refer to "Using the esminstall Script" on page 44 for more information.
-A, --all *answerfile*	Install both the management and agent station components. An answer file provides configuration attribute settings. Refer to "Using the Answer File" on page 42 for more information about answer files.
-m, --management *answerfile*	Install the management station components. You must specify an answer file that contains the values of the management station component's configuration variables.
-a, --agent *answerfile*	Install the agent station components. You must specify an answer file that contains the values of the agent station component's configuration variables.
-c, --cli *answerfile*	Install the CLI station components. You must specify an answer file that contains the values of the CLI component's configuration variables.
-p, --product *product*	Install the selected product only. Use cr (for the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager) or sm (for the SAN Manager component of the Sun StorEdge Enterprise Storage Manager).
-o, --openview	Install the HP OpenView plugin.
-s, --silent	Install the software in silent mode. You must specify which components to install when you use this option. The installation script does not display messages or prompts; it records error messages in a log file.
? -h, --help	Display a list of options and usage for the script.

> **Note –** If you are upgrading an existing installation of the Sun StorEdge Enterprise Storage Manager software, go to "Upgrading the Software" on page 77.

▼ To Install the Software on a Single System That Acts as a Management Station and Agent Station

> **Note –** The Sun StorEdge Management Software CD includes a setup script from which you can start the installation. If you used the setup script and chose the SAN management, capacity reporting, health monitoring, and fault management option, start with Step 7.

1. **Make sure that your system includes the Sun StorEdge SAN Foundation Software 4.4 or the JNI HBA software.**

   Because your system acts as an agent station, it requires the agent station prerequisite software. See TABLE 2-3 for information about required SAN software or "Requirements for JNI Host Bus Adapters" on page 17 for information about JNI HBA software. If your system does not include the required software, the installation procedure does not complete.

2. **Log in to your system as root.**

3. **Insert the CD into the CD-ROM drive:**

   a. **Determine if the Volume Manager daemon is running**

   ```
   # ps -ef | grep vold
   ```

   b. **If necessary, start the Volume Manager daemon** vold**(1):**

   ```
   # /etc/init.d/volmgt start
   ```

> **Note –** You need to start the Volume Manager daemon only once. Do not start the daemon again.

> **Note –** You need to start the Volume Manager daemon only once. Do not start the daemon again.

4. **Run the** `esminstall` **script to start the installation procedure:**

```
# cd /cdrom/cdrom0
# ./esminstall
```

5. **Type** `yes` **to accept the license terms.**

6. **Type** `1` **to choose to install both components of the Sun StorEdge Enterprise Storage Manager software:**

```
=======================================================

      Sun StorEdge(TM)
      Enterprise Storage Manager 2.1
      MAIN INSTALL MENU


=======================================================

1) All Applications (default)
2) Capacity Reporter
3) SAN Manager
q) Quit.
=======================================================
Type a number to install the selected applications
[press Enter for default (All), Type q to Quit]:
=======================================================
Your Choice: 1
```

7. Press Enter to accept the default installation option, which installs all software components:

```
=====================================================

      Sun StorEdge(TM)
      Enterprise Storage Manager 2.1
      INSTALL MENU


=====================================================
1) All Management and Agent Station Components (default)
2) Management Station Components (including the CLI Client)
3) Agent Station Components
4) Command Line Interface Client Components
5) HP OpenView(TM) Plugin
q) Quit.
=====================================================
Type a number to install the selected components
[press Enter for default (management and agent stations),
Type q to Quit]:
=====================================================
Your Choice:
```

Note – The menu displays the Command Line Interface Client Components option only if your installation includes the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software.

TABLE 3-2 describes the main installation options.

TABLE 3-2 Installation Options

Installation	Description
1) All Management and Agent Station Components (default)	Install the management station, agent station, and command-line interface (CLI)[*] client software on a single system, which acts as both the management station and the agent station. This is the default installation choice.
2) Management Station Components (including the CLI Client)	Install only the management station software on a management station. Note that the installation procedure also installs the CLI client software.
3) Agent Station Components	Install only the agent station software on an agent station in your SAN.
4) Command Line Interface Client Components	Install the CLI client component on a system other than the management station.
	The installation procedure installs the Sun StorEdge Enterprise Storage Manager CLI software on the management station by default. To use the CLI on another system in your network storage environment, you must install the CLI software on it.
5) HP OpenView Plugin	Install the plugin on a system that is running the HP OpenView Network Node Manager software. If the system will also be an agent station, you must run the installation procedure twice, once to install the Sun StorEdge Enterprise Storage Manager agent station software and once to install the HP OpenView plugin. You may install the software in any order you choose.
	Note: You cannot install the HP OpenView Network Node Manager software on the same system as the Sun StorEdge Enterprise Storage Manager management station software.

[*] Note that a CLI client is available only for the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software.

If you plan to install the management and agent station software separately, install the management station software first.

8. **Press Enter to start the Sun StorEdge Enterprise Storage Manager processes when the installation is complete:**

```
Begin: Invoking Preconfiguration Actions
End:   Invoking Preconfiguration Actions

Begin: Get Configuration Attributes

Once install is complete, would you like to start the ESM processes
(yes):
```

If you type `no`, you can use the `esmcontrol` script to start the Sun StorEdge Enterprise Storage Manager processes at a later time. Refer to the "Starting and Stopping the Software" on page 88 for information about starting the software.

9. **If you want to set advanced attributes, type** `yes`**.**

```
----- Service Tier -----

Do you want to set the advanced attributes, in addition to the
required attributes (no):

----- PostgreSQL -----

What is the PostgreSQL server port (5437):

----- RMI Registry -----

What is the SAN Manager RMI registry port (1099):
What is the SAN Manager RMI registry host (localhost):

----- SAN Manager Keystore Password -----

Please enter the password for the SAN Manager Keystore
(************):

----- SAN Manager Truststore Password -----

Please enter the password for the SAN Manager Truststore
(************):

Enter the SAN Manager enterprise management SNMP agent port
(8085):
```

Advanced attributes typically pertain to the settings of the many service port numbers that the Sun StorEdge Enterprise Storage Manager software requires at installation. You can set:

- PostgreSQL database server port information
- RMI registry port information
- Default passwords used for communication between the SAN Manager and Web Console software
- SAN Manager enterprise management SNMP agent port information, for either the HP OpenView or SunMC enterprise management applications, to retrieve information from the SAN Manager software

If your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software, you can set advanced attributes later in the installation procedure.

10. **Indicate the size of your SAN:**

```
----- --- Installation --- -----

Approximately how big is the SAN that you plan to manage
(1: small; 2: medium; 3: large) (2):
```

The approximate number of devices in each size SAN are as follows:

- Small – 20 devices
- Medium – 50 to 70 devices
- Large – 70 or more devices

11. If you want to enable initial discovery of S-MIS compliant devices, type `yes`**:**

```
Enable initial discovery of SAN management CIMOMs (yes):

Enter a hostname or IP address for a host running a CIMOM for a
device (default: your-system) [?] ?

Enter CIMOM user name(root) [?]

Enter CIMOM user's password [?]
Please re-enter the password for confirmation:  [?]

Enter additional CIMOM credentials [y,n,?] n

Here are the CIMOM hosts and credentials you have entered:

Host IP Address  Hostname         CIMOM User  Password
---------------  ---------------  ----------  --------
172.20.194.11    v4u-30a          root        ********



Do you wish to use these values [y,n,?] y
```

The Sun StorEdge Enterprise Storage Manager software provides aggregated
management of S-MIS compliant storage arrays. The storage arrays must include a
SAN management CIMOM. The CIMOM provides the Sun StorEdge Enterprise
Storage Manager software with access to the storage arrays. The software must have
the host name, the CIMOM user name, and the CIMOM user's password to connect
to the storage array.

**12. If your installation includes only the SAN Manager component of the Sun
StorEdge Enterprise Storage Manager software, go to Step 26.**

13. **Make up a string of characters to respond to the prompt, which the software uses to encrypt data:**

```
Enter the string used to encrypt sensitive product data:
```

Choose a string that includes at least six (6) characters.

Note – Make sure you do not lose or forget the string. You may have to supply it if you contact Sun technical support.

14. **If your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software, type** yes **so that the management station displays in the UI as a managed storage element:**

```
----- Agent Tier -----

Enable this host as an ESM scannable asset (yes):
```

15. **If your installation is on the primary node of a cluster, enter cluster information:**

```
Enable cluster support (yes):
```

When installing the agent station software on a cluster, the installation script detects the cluster software and prompts for registration as a cluster member:

```
Enter cluster name:
Enter the virtual server hostname for scanning this cluster:
```

Refer to "Installing the Software on Clusters" on page 28 for information about choosing a suitable cluster name or alias and the virtual host server.

16. If you typed `yes` **at the advanced attributes prompt in Step 9, do the following:**

   a. Set the ARPS HTTP and ESM agent service port numbers:

```
Enter the number for the ARPS HTTP port (11140):
What is the ESM agent service port number (11150):
```

   b. Set the port number for the software that interprets and runs the scan schedules of selected storage elements:

```
Enter the number for the ESMOM HTTP port (11130):
```

17. Type a directory path for a repository, to be used by the software that interprets and runs the scan schedules of selected storage elements:

```
Enter the directory path for the ESMOM repository
(/var/opt/SUNWstm/esmom):
Checking available disk space (mount point: '/var')...
```

The installation procedure checks that 1 gigabyte of disk space is available on the partition on which the path resides. If there is insufficient space, the installation procedure displays a listing for currently mounted file systems so you can determine which partitions have sufficient space:

```
The partition on which '/var/opt/SUNWstm/esmom' resides does not
have sufficient space.
(The partition '/var' currently has only 433102 kilobytes of free
space.)
It is recommended that at least 1 GB (1048576 kilobytes) should be
available on the target partition to store the ESMOM repository.

Here are the current filesystem capacities on this system:
Filesystem             size    used   avail  capacity   Mounted on
/dev/dsk/c0t0d0s0      1.8G     96M    1.7G       6%    /
/dev/dsk/c0t0d0s6      6.0G     1.3G   4.6G      23%    /usr
/proc                   0K      0K     0K        0%    /proc
mnttab                  0K      0K     0K        0%    /etc/mnttab
fd                      0K      0K     0K        0%    /dev/fd
/dev/dsk/c0t0d0s1      3.9G     3.4G   423M      90%    /var
swap                   8.2G     168K   8.2G       1%    /var/run
/dev/dsk/c0t1d0s7      8.7G     10K    8.6G       1%    /files
swap                   8.3G     71M    8.2G       1%    /tmp
/dev/dsk/c0t0d0s5      4.8G     1.2G   3.6G      25%    /opt
udist-43,udist-42:/usr/dist
                        50G     17G    32G       35%    /usr/dist

Are you sure you want to use /var/opt for the ESMOM repository?
[y,n,?] n

The path where the ESMOM creates and maintains its internal
database. The partition containing this path must have at least
1GB of free space. The directory you specify must either be empty,
or else not exist; that is, the directory must be dedicated to the
ESMOM repository.

Enter the directory path for the ESMOM repository
(/var/opt/SUNWstm/esmom): /files/esmom
Checking available disk space (mount point: '/files')... done.
```

18. **Type** `yes` **if you will allow the installation procedure to create Oracle database objects (trusted mode installation) or** `no` **if you will not allow the installation procedure to create Oracle database objects (untrusted mode installation). Enter the appropriate Oracle database information:**

```
----- Oracle Database -----

Allow the ESM software to create the ESM Oracle tables and users
(no):
Enter the Oracle net service name (ESMDB):
Checking Oracle tnsnames for 'name' service name... found.
Enter the hostname or IP address of the Oracle database server:
your_database_server_ID
Checking accessibility of the database server... ID is alive
Enter the port number of the Oracle LISTENER (1521):
Enter the Oracle service name: your_service_name
```

If you choose an untrusted mode installation, your database administrator must have created the Sun StorEdge Enterprise Storage Manager user account, tablespaces, and database files prior to the installation.

19. **If this is a trusted mode installation, enter the Oracle DBA account name and password:**

```
Enter Oracle DBA account name (SYSTEM):
Enter the password for the Oracle DBS account(******):
Please re-enter the password for confirmation:
```

20. **Enter the Oracle login information:**

```
Enter the Oracle user login ID(ESM_STD_USER): your_oracle_username
Enter the password for the Oracle user login ID ([no default
value]): your_oracle_password
Please re-enter the password for confirmation: your_oracle_password
```

21. **Do one of the following, depending on whether this is an untrusted or trusted mode installation:**

   ■ If this is an untrusted mode installation, enter the tablespace names:

```
Enter the name for the Oracle temporary tablespace (TEMP):
Enter the name for the SMALL A tablespace (ESM_TBSP_SMALL_A):
Enter the name for the SMALL B tablespace (ESM_TBSP_SMALL_B):
Enter the name for the MEDIUM A tablespace (ESM_TBSP_MEDIUM_A):
Enter the name for the MEDIUM B tablespace (ESM_TBSP_MEDIUM_B):
Enter the name for the LARGE A tablespace (ESM_TBSP_LARGE_A):
Enter the name for the LARGE B tablespace (ESM_TBSP_LARGE_B):
```

   ■ If this is a trusted mode installation, enter the paths to the tablespace data files on the Oracle server:

```
Enter the path to the SMALL A tablespace data backing file ([no
default value]): /oracle/data/your_SID/ESM_TBSP_SMALL_A.dbf
Enter the path to the SMALL B tablespace data backing file ([no
default value]): /oracle/data/your_SID/ESM_TBSP_SMALL_B.dbf
Enter the path to the MEDIUM A tablespace data backing file ([no
default value]): /oracle/data/your_SID/ESM_TBSP_MEDIUM_A.dbf
Enter the path to the MEDIUM B tablespace data backing file ([no
default value]): /oracle/data/your_SID/ESM_TBSP_MEDIUM_B.dbf
Enter the path to the LARGE A tablespace data backing file ([no
default value]): /oracle/data/your_SID/ESM_TBSP_LARGE_A.dbf
Enter the path to the LARGE B tablespace data backing file ([no
default value]): /oracle/data/your_SID/ESM_TBSP_LARGE_B.dbf
```

22. **Type the path of the directory in which you want to store scan reports:**

```
Enter the directory path for storing scan reports
(/var/opt/SUNWstm/reports):
Checking available disk space (mount point: '/var')... done.
```

Refer to "Required Disk Space and Memory" on page 18 for information about sufficient disk space for the reports directory.

23. **If you typed** `yes` **at the advanced attributes prompt in** **Step 9**, **enter the maximum and minimum number of simultaneous connections to the Oracle database that the software uses:**

```
Enter the maximum number of Oracle connections (50):
Enter the minimum number of Oracle connections (10):
```

24. **Enter an account name and password for RMI communications with the software that interprets and runs the scan schedules of selected storage elements:**

```
----- Service Tier -----

Enter the account name used for RMI communications with the ESMOM
(root):
Enter the password for the account used for RMI communications with
the ESMOM (*):
Please re-enter the password for confirmation:
```

25. **Type** `yes` **if you want the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager to perform an initial scan or discovery of storage elements:**

```
Enable initial discovery of managable assets (yes):

Please enter network addresses using the dotted octet form of:
a.b.c.d
For example: 192.1.135.0

Starting network address (default: 129.148.43.0) [?]
Ending network address (default: 129.148.43.255) [?]
SNMP port number (default: 161) [1-65535,?]
Community name (default: public) [?]

Enter additional network addresses [y,n,?]

Here are the network specifications you have entered:

Starting Address   Ending Address    SNMP Port  Community Name
----------------   --------------    ---------  --------------
129.148.43.0       129.148.43.255       161       public

Do you wish to use these values [y,n,?]
```

The installation procedure can provide an initial SNMP-based discovery. At the prompts, you must enter:

- Starting and ending IP addresses. You can specify an unlimited number of addresses.
- An SNMP port number. The default value is 161.
- An SNMP community name. The default community name is public.

26. Type `y` **if you have a Sun StorEdge 3510 FC array attached to the agent station:**

```
----- Sun StorEdge(tm) 3500 FC Array Support -----

Do you have a Sun StorEdge(tm) 3510 FC Array attached to this host
(n):
```

The installation procedure installs the necessary software to support the link and launch capability from the SAN Manager UI to the 3510 FC array configuration service. After you start the software, refer to the online help for information about how to configure and launch the Sun StorEdge 3510 FC array Configuration Service software.

27. Type `yes` **to enable fault monitoring for Sun StorEdge 3310, A3500FC, or A52XX storage arrays:**

```
Do you want to enable fault monitoring for Sun StorEdge(tm) 3310,
A3500FC, and A52XX storage arrays (no):

End:    Get Configuration Attributes
```

28. If the installation fails because your environment is missing prerequisites, make the necessary correction and run the installation procedure again:

```
Begin: Checking for prerequisites

Checking for prerequisite account:

Checking for prerequisite memory:
ERROR: shmsys:shminfo_shmseg value is set to: 100; minimum
required is: 256
```

If your environment meets the requirements, the installation procedure installs the software components, applies configuration parameters, applies security, and starts the Sun Web Console.

```
Begin: Invoking Post-Install Actions
Assigning root user the ESMUser role...
Creating Keystore and Truststore...
Registering Keystore and Truststore...
Restarting smcwebserver...
```

The installation procedure displays a number of informational messages until it completes the post-installation actions:

```
End:    Invoking Post-Install Actions
```

29. **If you typed** n **in Step 8, start the Sun StorEdge Enterprise Storage Manager processes:**

```
# /opt/SUNWstm/bin/esmcontrol start
```

If you typed y in Step 8, the installation procedure automatically starts the Sun StorEdge Enterprise Storage Manager processes:

```
Begin: Start ESM processes

Starting Sun StorEdge(TM) SAN Manager Components
Starting PostgreSQL ...
JAVA_HOME is set to /usr/java
Starting CRE
Starting the ESM Management Station platform...
Starting the ESMOM...

Starting Sun StorEdge(TM) SAN Manager Agent Components
Starting the ESM Capacity Reporter Agent Components...
Starting the SSCRA ARP...
Starting GIDU...
End:   Start ESM processes

Enterprise Storage Manager Version 2.1 Install Successfully
Completed.

To log in to the application from a web browser, please type the
following URL in the URL text field to display the SMI Common
Console Login Page:
      https://mgmt-station-hostname.domain:6789/

INFO: Sun StorEdge(tm) ESM  Installer Log:
      /var/sadm/install/logs/esm.log
```

When the installation procedure is complete, if necessary, view details about the installation in these files:

■ /tmp/esm.answer (Refer to "Using the Answer File" on page 42 for more information about the answer file.)

■ /var/sadm/install/logs/esm.log (Refer to "Checking the Log File" on page 112 for more information about the log file.)

Go to Chapter 4 for information about getting started with the software and for instructions about reconfiguring the software for your environment.

▼ To Install the Software on a System That Acts as a Management Station

1. **Log in to your system as root.**

2. **Insert the CD into the CD-ROM drive:**

   a. **Determine if the Volume Manager daemon is running**

   ```
   # ps -ef | grep vold
   ```

   b. **If necessary, start the Volume Manager daemon** vold**(1):**

   ```
   # /etc/init.d/volmgt start
   ```

   Note – You need to start the Volume Manager daemon only once. Do not start the daemon again.

   ---

3. **Run the** esminstall **script to start the installation procedure:**

   ```
   # cd /cdrom/cdrom0
   # ./esminstall
   ```

4. **Type** yes **to accept the license terms.**

5. Type `1` **to choose to install both components of the Sun StorEdge Enterprise Storage Manager software:**

```
========================================================

      Sun StorEdge(TM)
      Enterprise Storage Manager 2.1
      MAIN INSTALL MENU


========================================================

1) All Applications (default)
2) Capacity Reporter
3) SAN Manager
q) Quit.
========================================================
Type a number to install the selected applications
[press Enter for default (All), Type q to Quit]:
========================================================
Your Choice: 1
```

6. Type `2` **to install the management station components only:**

```
========================================================

      Sun StorEdge(tm)
      Enterprise Storage Manager 2.1
      INSTALL MENU


========================================================

1) All Management and Agent Station Components (default)
2) Management Station Components (including the CLI Client)
3) Agent Station Components
4) Command Line Interface Client Components
5) HP OpenView(TM) Plugin
q) Quit.
========================================================
Type a number to install the selected components
[press Enter for default (All), Type q to Quit]:
========================================================
Your Choice: 2
```

> **Note –** The menu displays the Command Line Interface Client Components option only if your installation includes the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software.

7. **Starting with Step 8 on page 50, follow the steps, less the prompts for agent station information.**

   When the installation procedure is complete, go to Chapter 4 for information about getting started with the software and for instructions about reconfiguring the software for your environment.

▼ To Install the SAN Manager Component Software on a System That Acts as an Agent Station

Plan to install the agent station software on each agent host in a fabric or cluster. If you install the software on only some agent hosts, you will only partially discover information in your environment.

1. **Make sure that each agent host includes the Sun StorEdge SAN Foundation Software 4.4 or the JNI HBA software.**

   See TABLE 2-3 for information about required SAN software or "Requirements for JNI Host Bus Adapters" on page 17 for information about JNI HBA software. If your agent hosts do not include the required software, the installation procedure does not complete.

2. **Log in to your system as root.**

3. **Insert the CD into the CD-ROM drive:**

   a. **Determine if the Volume Manager daemon is running**

   ```
   # ps -ef | grep vold
   ```

   b. **If necessary, start the Volume Manager daemon** vold**(1):**

   ```
   # /etc/init.d/volmgt start
   ```

   Note – You need to start the Volume Manager daemon only once. Do not start the daemon again.

4. **Run the** esminstall **script to start the installation procedure:**

   ```
   # cd /cdrom/cdrom0
   # ./esminstall
   ```

5. **Type** yes **to accept the license terms.**

6. Type 3 **to choose to install only the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software:**

```
=======================================================

      Sun StorEdge(TM)
      Enterprise Storage Manager 2.1
      MAIN INSTALL MENU


=======================================================

1) All Applications (default)
2) Capacity Reporter
3) SAN Manager
q) Quit.
=======================================================
Type a number to install the selected applications
[press Enter for default (All), Type q to Quit]:
=======================================================
Your Choice: 3
```

7. Type 3 **to install the agent station components only:**

```
=======================================================

      Sun StorEdge(tm)
      Enterprise Storage Manager 2.1
      INSTALL MENU


=======================================================

1) All Management and Agent Station Components (default)
2) Management Station Components (including the CLI Client)
3) Agent Station Components
4) Command Line Interface Client Components
5) HP OpenView(TM) Plugin
q) Quit.
=======================================================
Type a number to install the selected components
[press Enter for default (All), Type q to Quit]:
=======================================================
Your Choice: 3
```

> **Note –** The menu displays the Command Line Interface Client Components option only if your installation includes the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software.

The installation procedure begins to gather configuration information.

8. **If you want to start the Sun StorEdge Enterprise Storage Manager processes when the installation is complete, type** `yes`**:**

```
Please wait - checking for Sun StorEdge(tm) ESM version 1.x
stations...
Please wait - checking initial state of previously-installed Sun
StorEdge(tm) ESM stations...

Begin: Invoking Preconfiguration Actions
End:   Invoking Preconfiguration Actions

Begin: Get Configuration Attributes

----- --- Installation --- -----
Once install is complete, would you like to start the ESM processes
(yes):
```

If you type `no`, you can use the `esmcontrol` script to start the Sun StorEdge Enterprise Storage Manager processes at a later time. Refer to "Starting and Stopping the Software" on page 88 for information about starting the software.

9. **Type** `yes` **if you want to set advanced attributes:**

```
Do you want to set the advanced attributes, in addition to the
required attributes (no): yes
```

10. **Type** `y` **if you have a Sun StorEdge 3510 FC array attached to the agent station:**

```
----- Sun StorEdge(tm) 3500 FC Array Support -----

Do you have a Sun StorEdge(tm) 3510 FC Array attached to this host
(n):
```

The installation procedure installs the necessary software to support the link and launch capability from the SAN Manager UI to the 3510 FC Array configuration service. After you start the software, refer to the online help for information about how to configure and launch the Sun StorEdge 3510 FC array Configuration Service software.

11. **Type** `yes` **to enable fault monitoring for Sun StorEdge 3310, A3500FC, or A52XX storage arrays:**

```
Do you want to enable fault monitoring for Sun StorEdge(tm) 3310,
A3500FC, and A52XX storage arrays (no):

End:   Get Configuration Attributes

Begin: Checking for prerequisites

Checking for prerequisite package:
End:   Checking for prerequisites
.
.
.
```

When the installation procedure is complete, go to Chapter 4 for information about getting started with the software and for instructions about reconfiguring the software for your environment.

▼ To Install the Capacity Reporter Component Software on a System That Acts as an Agent Station

Plan to install the agent station software on each agent host in a fabric or cluster. If you install the software on only some agent hosts, you will only partially discover information in your environment.

1. **Make sure that each agent host includes the Sun StorEdge SAN Foundation Software 4.4 or the JNI HBA software.**

See TABLE 2-3 for information about required SAN software or "Requirements for JNI Host Bus Adapters" on page 17 for information about JNI HBA software. If your agent hosts do not include the required software, the installation procedure does not complete.

2. **Log in to your system as root.**

3. **Insert the CD into the CD-ROM drive:**

   a. **Determine if the Volume Manager daemon is running**

```
# ps -ef | grep vold
```

b. If necessary, start the Volume Manager daemon `vold`**(1):**

```
# /etc/init.d/volmgt start
```

Note – You need to start the Volume Manager daemon only once. Do not start the daemon again.

4. **Run the** `esminstall` **script to start the installation procedure:**

```
# cd /cdrom/cdrom0
# ./esminstall
```

5. **Type** `yes` **to accept the license terms.**

6. **Type** `2` **to choose to install only the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software:**

```
======================================================

      Sun StorEdge(TM)
      Enterprise Storage Manager 2.1
      MAIN INSTALL MENU


======================================================

1) All Applications (default)
2) Capacity Reporter
3) SAN Manager
q) Quit.
======================================================
Type a number to install the selected applications
[press Enter for default (All), Type q to Quit]:
======================================================
Your Choice: 2
```

7. Type 3 **to install the agent station components only:**

```
=====================================================

      Sun StorEdge(tm)
      Enterprise Storage Manager 2.1
      INSTALL MENU


=====================================================

1) All Management and Agent Station Components (default)
2) Management Station Components (including the CLI Client)
3) Agent Station Components
4) Command Line Interface Client Components
5) HP OpenView(TM) Plugin
q) Quit.
=====================================================
Type a number to install the selected components
[press Enter for default (All), Type q to Quit]:
=====================================================
Your Choice: 3
```

Note – The menu displays the Command Line Interface Client Components option only if your installation includes the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software.

The installation procedure begins to gather configuration information.

8. **If you want to start the Sun StorEdge Enterprise Storage Manager processes when the installation is complete, type** `yes`**:**

```
Please wait - checking for Sun StorEdge(tm) ESM version 1.x
stations...
Please wait - checking initial state of previously-installed Sun
StorEdge(tm) ESM stations...

Begin: Invoking Preconfiguration Actions
End:   Invoking Preconfiguration Actions

Begin: Get Configuration Attributes

----- --- Installation --- -----
Once install is complete, would you like to start the ESM processes
(yes):
```

If you type `no`, you can use the `esmcontrol` script to start the Sun StorEdge Enterprise Storage Manager processes at a later time. Refer to "Starting and Stopping the Software" on page 88 for information about starting the software.

9. **Type** `yes` **if you want to set advanced attributes:**

```
Do you want to set the advanced attributes, in addition to the
required attributes (no):
```

10. **Type** `yes` **to ensure that the agent station is displayed in the UI as a managed storage element:**

```
----- Agent Tier -----

Enable this host as an ESM scannable asset (yes):
```

11. **Type the host name or IP address of the system on which you have installed the management station software:**

```
----- Service Tier -----

Enter the hostname or IP address of the Management Station ([no
default value]):
```

The software confirms that the system on which you installed the management station software is accessible.

When the installation procedure is complete, go to Chapter 4 for information about getting started with the software and for instructions about reconfiguring the software for your environment.

▼ To Install the CLI Client

1. Log in to your system as root.

2. Insert the CD into the CD-ROM drive:

a. Determine if the Volume Manager daemon is running

```
# ps -ef | grep vold
```

b. If necessary, start the Volume Manager daemon vold**(1):**

```
# /etc/init.d/volmgt start
```

Note – You need to start the Volume Manager daemon only once. Do not start the daemon again.

---

3. Run the esminstall **script to start the installation procedure:**

```
# cd /cdrom/cdrom0
# ./esminstall
```

4. Type yes **to accept the license terms.**

5. Type 3 **to choose to install the SAN Manager component of the Sun StorEdge
Enterprise Storage Manager software:**

```
========================================================

      Sun StorEdge(TM)
      Enterprise Storage Manager 2.1
      MAIN INSTALL MENU


========================================================

1) All Applications (default)
2) Capacity Reporter
3) SAN Manager
q) Quit.
========================================================
Type a number to install the selected applications
[press Enter for default (All), Type q to Quit]:
========================================================
Your Choice: 3
```

The CLI client is available only for the SAN Manager component of the Sun
StorEdge Enterprise Storage Manager software.

6. Type 4 **to install the CLI client components only:**

```
========================================================

      Sun StorEdge(tm)
      Enterprise Storage Manager 2.1
      INSTALL MENU


========================================================

1) All Components (default)
2) Management Station Components
3) Agent Station Components
4) Command Line Interface Client Components
5) HP OpenView(TM) Plugin
q) Quit.
========================================================
Type a number to install the selected components
[press Enter for default (All), Type q to Quit]:
========================================================
Your Choice: 4
```

The installation procedure checks for a previous installation, starts preconfiguration actions, and gets configuration attributes:

```
Please wait - checking for Sun StorEdge(tm) ESM version 1.x
stations...

Please wait - checking initial state of previously-installed Sun
StorEdge(tm) ESM stations...


Begin: Invoking Preconfiguration Actions
End:    Invoking Preconfiguration Actions

Begin: Get Configuration Attributes
```

7. **Type the host name or IP address of the Sun StorEdge Enterprise Storage Manager management station with which the system will communicate:**

```
----- SAN Manager CLI Client -----

What is the SAN Manager management hostname or IP address
(localhost):

End:    Get Configuration Attributes
```

When the installation procedure is complete, go to Chapter 4 for information about getting started with the software and for instructions about reconfiguring the software for your environment, and to "To Access the CLI" on page 92 for information about accessing the CLI.

▼ To Install the HP OpenView Plugin

You must run the installation procedure twice: once to install the Sun StorEdge Enterprise Storage Manager agent station software, and once to install the HP OpenView plugin. You can install the software in any order you choose.

Before you start, make sure that the system on which you plan to install the HP OpenView plugin meets these criteria:

- It is not the Sun StorEdge Enterprise Storage Manager management station.
- It is running the HP OpenView Network Node Manager software.

1. **Log in to the system as root.**

2. **Insert the CD into the CD-ROM drive:**

   a. **Determine if the Volume Manager daemon is running**

   ```
   # ps -ef | grep vold
   ```

   b. **If necessary, start the Volume Manager daemon** vold**(1):**

   ```
   # /etc/init.d/volmgt start
   ```

   Note – You need to start the Volume Manager daemon only once. Do not start the daemon again.

3. **Run the** esminstall **script to start the installation procedure:**

   ```
   # cd /cdrom/cdrom0
   # ./esminstall
   ```

4. **Type** yes **to accept the license terms.**

5. **Type** 5 **to install the HP OpenView plugin:**

```
======================================================

      Sun StorEdge(tm)
      Enterprise Storage Manager 2.1
      INSTALL MENU


======================================================

1) All Components (default)
2) Management Station Components
3) Agent Station Components
4) Command Line Interface Client Components
5) HP OpenView(TM) Plugin
q) Quit.
======================================================
Type a number to install the selected components
[press Enter for default (All), Type q to Quit]:
======================================================
Your Choice: 5
```

6. **If the installation procedure determines that your environment does not include the required software, make the necessary correction and run the installation procedure again:**

```
ERROR: HP Openview is not installed on this system.

       Enterprise Storage Manager requires HP Openview
       Network Node Manager version 6.4

ERROR: One or more ESM prerequisites are missing, exiting the
install.

Enterprise Storage Manager Version 2.1 Install Failed.
```

Refer to for more information.

When the installation procedure is complete, install the agent station software if you have not done so already. Refer to for more information.

Refer to Appendix A for information about how to use the HP OpenView Network Node Manager software with Sun StorEdge Enterprise Storage Manager software.

Upgrading the Software

Note – When you upgrade from the version 2.0 software to the version 2.1 software, make sure that you upgrade *all* your agent stations as well as the management station. Agent stations that run the version 2.0 software are not compatible with the version 2.1 software. You must perform a complete upgrade to your SAN environment to take advantage of the new features available with the Sun StorEdge Enterprise Storage Manager 2.1 software.

Use the `esminstall` script to upgrade an existing installation of the Sun StorEdge Enterprise Storage Manager software to version 2.1.

▼ To Upgrade the Software

1. **Log in to your system as root.**

2. **Insert the CD into the CD-ROM drive:**

   a. **Determine if the Volume Manager daemon is running**

   ```
   # ps -ef | grep vold
   ```

   b. **If necessary, start the Volume Manager daemon** `vold`**(1):**

   ```
   # /etc/init.d/volmgt start
   ```

Note – You need to start the Volume Manager daemon only once. Do not start the daemon again.

3. **Run the** `esminstall` **script:**

   ```
   # ./esminstall

   Enterprise Storage Manager version 2.0.0 is already installed.
   ```

4. Indicate whether you want to change or retain the current configuration attributes:

```
Do you want to upgrade this to version 2.1(default: y) [y,n,?]
```

- Type n to change the current attributes.

  The installation procedure proceeds as shown in "To Install the Software on a Single System That Acts as a Management Station and Agent Station" on page 46, starting at Step 5.

- Type y to retain the current attributes.

  Note that the installation procedure does not prompt you for the information that you entered for the current installation.

a. If the installation procedure detects an existing installation of the Sun StorEdge Enterprise Storage Manager software, press Enter to remove it:

```
Please wait - checking for Sun StorEdge(tm) ESM version 1.x
stations...
Please wait - checking initial state of previously-installed Sun
StorEdge(tm) ESM stations...

Previously installed station found:

Management station: fully installed
Agent station:      fully installed

Would you like to remove all stations prior to installing
Management Agent station(s) (Default: y) [y,n,?,q]
```

If you type:

- **y** — the installation procedure removes the existing software and continues with the installation.

- **n** — the installation procedure halts and your environment remains unchanged.

b. If you want to enable initial discovery of S-MIS compliant devices, type yes. Otherwise, type no and go to the next step.

```
Begin: Get upgrade configuration attributes

----- Service Tier -----
Enable initial discovery of SAN management CIMOMs (yes):

Enter a hostname or IP address for a host running a CIMOM for a
device (default: your-system) [?] ?

Enter CIMOM user name(root) [?]

Enter CIMOM user's password [?]
Please re-enter the password for confirmation:  [?]

Enter additional CIMOM credentials [y,n,?] n

Here are the CIMOM hosts and credentials you have entered:

Host IP Address   Hostname          CIMOM User   Password
---------------   ---------------   ----------   --------
172.20.194.11     v4u-30a           root         ********


Do you wish to use these values [y,n,?] y
```

The Sun StorEdge Enterprise Storage Manager software provides aggregated management of S-MIS compliant storage arrays. The storage arrays must include a SAN management CIMOM. The CIMOM provides the Sun StorEdge Enterprise Storage Manager software with access to the storage arrays. The software must have the host name, the CIMOM user name, and the CIMOM user's password to connect to the storage array.

5. **Type** y **if you want to enable fault monitoring for Sun StorEdge 3310, A3500FC, or A52XX storage arrays:**

```
----- Sun StorEdge(tm) Array Support -----

Do you want to enable fault monitoring for Sun StorEdge(tm) 3310,
A3500FC, and A52XX storage arrays (no):

End:   Get upgrade configuration attributes
```

As the installation procedure continues, it removes components that are affected by the upgrade and replaces them. However, the installation procedure does not remove any data that the Sun StorEdge Enterprise Storage Manager 2.0 software generated.

Sun Management Center Integration

The SAN Manager component of the Sun StorEdge Enterprise Storage Manager software includes components that enable it to work with the Sun Management Center software. When you complete the procedures in this section, you can use the Sun Management Center software to view management and agent station status, and to launch the Sun StorEdge Enterprise Storage Manager web browser user interface.

When you install the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software on a management station, the installation procedure also installs the following:

- The Sun Management Center agent module for the Sun StorEdge Enterprise Storage Manager software
- The Sun Management Center `sunmc.configure` configuration script, which enables the Sun Management Center software to launch the Sun StorEdge Enterprise Storage Manager software in a separate browser window

To enable the Sun Management Center agent module:

1. Run the `sunmc.configure` configuration script on the management station and each agent station to enable status reporting to the Sun Management Center software.

2. Install and start the Sun Management Center agent software (including the `SUNWesagt` package) on each agent station. See the *Sun Management Center 3.5 Installation and Configuration Guide* for more information.

3. Run the `sunmc.configure` configuration script on the Sun Management Center host system.

Refer to the *Sun Management Center 3.5 User's Guide* for more information about how to manage modules.

Preparing to Start the SAN Manager Component of the Sun StorEdge Enterprise Storage Manager Software

Before you can launch the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software in a web browser from the Sun Management Center, you must do the following:

1. Configure the SAN Manager component of the Sun StorEdge Enterprise Storage Manager and other software as described in Chapter 4.

2. Make sure you have installed and started the Sun Management Center agent software (including the SUNWesagt package) on each agent station.

3. Load the Sun StorEdge Enterprise Storage Manager agent module, which the Sun StorEdge Enterprise Storage Manager installation procedures installs. See the *Sun Management Center 3.5 Installation and Configuration Guide*, part number 816-2678-10, for information about how to manage modules.

▼ To Configure the Management and Agent Stations

1. **Log in to the management station as root.**

2. **Type:**

```
# /opt/SUNWstm/sbin/sunmc.configure -H hostname 6789
```

hostname is the management station host name.

3. **Enable the status reporting agent software on each agent station:**

```
# /opt/SUNWstm/sbin/sunmc.configure -A
```

4. **Make sure the SunMC** SUNWesagt **package is installed and started on each agent station.**

Use the pkginfo(1M) command to view the installed packages. See the *Sun Management Center 3.5 Installation and Configuration Guide* for information about how to manage modules.

▼ To Configure the SunMC Host

1. **Log in to the SunMC host system as root.**

2. **Type the following to enable the Sun StorEdge Enterprise Storage Manager software to start from the SunMC software:**

```
# /opt/SUNWstm/sbin/sunmc.configure -S
```

The script prompts for the management station host name and port, and displays the following output:

```
/var/opt/SUNWsymon/cfg/tools-extension-j.x updated.
```

▼ To Start the Sun StorEdge Enterprise Storage Manager Software From the SunMC Main Console

1. **From the SunMC main console window, select the system configured as the Sun StorEdge Enterprise Storage Manager management station.**

2. **Make sure that the management and agent station software is running on the selected system:**

   a. Click Tools and select Details to display the Details window. (See FIGURE 3-1.)
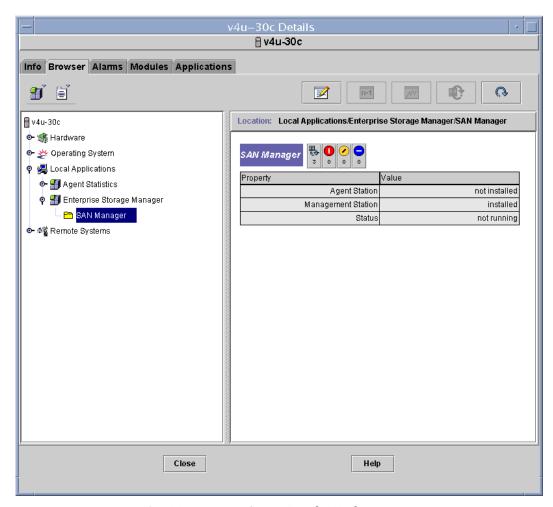
FIGURE 3-1   Sun Management Center Details Window

    b. Click the Browser tab and expand Local Applications to show the SAN Manager folder.

    c. Select the SAN Manager folder.

    d. Make sure that the management and agent station Value is `installed` and the Status is `running`.

    e. Close the Details window and return to the SunMC main console window.

3. Choose Enterprise Storage Manager from the Tools menu to display a web browser window. (See FIGURE 3-2.**)**
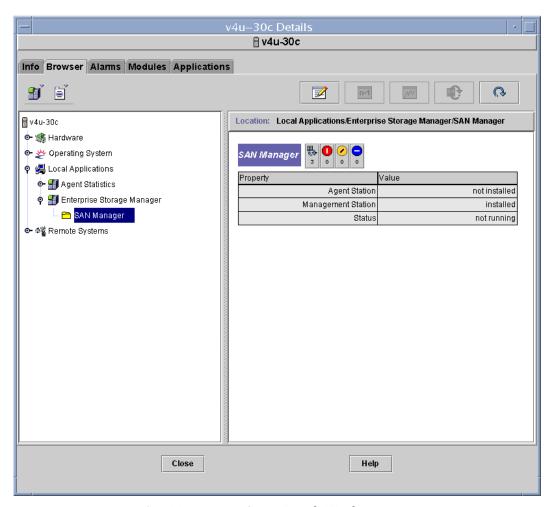
FIGURE 3-2   Sun Management Center Details Window

4. **Log in to the software as described in "Accessing the Sun StorEdge Enterprise Storage Manager Software" on page 90.**

Accessing and Configuring the Software

This chapter provides information about accessing and configuring the Sun StorEdge Enterprise Storage Manager software:

- "Sun StorEdge SAN Foundation Software" on page 87
- "Starting and Stopping the Software" on page 88
- "Accessing the Sun StorEdge Enterprise Storage Manager Software" on page 90
- "Reconfiguring the Software" on page 95
- "Uninstalling the Software" on page 102
- "Removing the Sun Web Console Software" on page 107

Sun StorEdge SAN Foundation Software

If you installed the Sun StorEdge SAN Foundation software from the Sun StorEdge Enterprise Storage Manager 2.1 software package onto your agent hosts, see the *Sun StorEdge SAN Foundation Software 4.4 Installation Guide* (on the CD or at `http://www.sun.com/storage/san`) for the post-installation procedures that ensure the product operates correctly.

Starting and Stopping the Software

This section describes how to start, stop, or restart the Sun StorEdge Enterprise Storage Manager software on the management station and each agent station. You can use the standard Solaris /etc/init.d/esm scripts to start and stop the software.

You can also use the esmcontrol script to do the following:

- Start the software if you did not tell the installation procedure to start the software upon completion.
- Stop the software before you use the esmconfig script to change default attributes. After you reconfigure, you must start the software again.
- Stop the software before you use the esmuninstall script to uninstall the software.

The esmcontrol script is in the /opt/SUNWstm/bin directory and on the product CD.

Note – You must start and stop the Sun StorEdge Enterprise Storage Manager software as root.

The `esmcontrol` Script Options

TABLE 4-1 lists the options for the `esmcontrol` script. The script can accept short or long names for each option. A short name option requires a single hyphen (-). A long name option requires a double hyphen (--).

Note – When you use a long name option, do not type a space between hyphens.

Syntax:

`esmcontrol start | stop | restart` [-m, --management] [-a, --agent] [? | -h, --help]

TABLE 4-1 `esmcontrol` Script Options

Option	Description
None	Display a usage message.
start	Start Sun StorEdge Enterprise Storage Manager processes.
stop	Stop Sun StorEdge Enterprise Storage Manager processes.
restart	Stop and start Sun StorEdge Enterprise Storage Manager processes again.
-m, --management	Start, stop, or restart the management station only.
-a, --agent	Start, stop, or restart the agent station only.
? -h, --help	Display a list of options and usage for the script.

If you do not indicate the management or agent station as an option, the `esmcontrol` script attempts to start, stop, or restart all installed stations.

If you have installed both the SAN Manager and Capacity Reporter components of the Sun StorEdge Enterprise Storage Manager software, the `esmcontrol` script starts, stops, or restarts both components.

CODE EXAMPLE 4-1 provides an example of the output you see when you use the `esmcontrol` script to stop the Sun StorEdge Enterprise Storage Manager software processes.

CODE EXAMPLE 4-1   `esmcontrol` Script

```
# /opt/SUNWstm/bin/esmcontrol stop

Begin: Stopping processes
Stopping the ESMOM...
Stopping the ESM Management Station platform...
End:   Stopping processes

Enterprise Storage Manager Version 2.1 control Successfully
Completed.

INFO: Sun StorEdge(tm) ESM  Installer Log:
      /var/sadm/install/logs/esm.log

#
```

Accessing the Sun StorEdge Enterprise Storage Manager Software

You can access the Sun StorEdge Enterprise Storage Manager software using either of the following:

■ Web browser user interface (UI)

When you have successfully installed and started the Sun StorEdge Enterprise Storage Manager software, log in to the application from a web browser.

The Sun StorEdge Enterprise Storage Manager installation procedure installs the Sun Web Console. The Sun Web Console, which provides authentication and authorization services, is the starting point for the Sun StorEdge Enterprise Storage Manager software. You can choose to access either the SAN Manager or Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software from the Sun Web Console; the link-and-launch feature in both lets you move between the two.

■ `esm` CLI

If you plan to use the Sun StorEdge Enterprise Storage Manager command-line interface (CLI) on a system that is not the management station, make sure that you install the CLI software on the system. Note that the system does not require the Sun StorEdge Enterprise Storage Manager software to be installed on it.

> **Note –** Sun StorEdge Enterprise Storage Manager 2.1 software does not support the versions 1.0, 1.1, or 1.2 `/opt/SUNWnsm/bin/sstr`(1M) CLI. You must rewrite any scripts that use the `sstr`(1M) CLI; use the `esm`(1M) CLI and its options.

▼ To Log In Through a Web Browser

1. **Open your web browser.**

   Make sure that:

   - Your web browser has cookies and Javascript™ enabled.
   - You do not set your preferences to suppress pop-up windows. Your browser's Suppress Popup setting or commercial anti-pop-up software interferes with the Sun StorEdge Enterprise Storage Manager software's pop-up windows.

2. **Type the following URL in the URL text field to display the Sun Web Console login page (note that the URL begins with** `https`**):**

   ```
   https://mgmt-station-hostname.domain:6789/
   ```

   mgmt-station-hostname.domain is the management station host name, and `6789` is the default port number for the Sun Web Console software. If you configured the port to be different, use that port number.

3. **Enter your user name and** `ESMUser` **role (along with the corresponding passwords) to log in to the Sun Web Console and display the applications to which you have access.**

   See "Configuring Role-Based Access Control to Enable Access to the Software" on page 21 for more information.

4. **Click the Sun StorEdge Enterprise Storage Manager — SAN Manager link to display the Topology page, which is the initial page of the application.**

   See the online help for information about using the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software.

5. **Click the Sun StorEdge Enterprise Storage Manager — Capacity Reporter link to display the Alarms page, which is the initial page of the application.**

   Refer to the online help for information about using the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software.

▼ To Access the CLI

1. **Ensure that the superuser has assigned the** `ESMUser` **role to you.**

2. **Configure the** `.clif-esmconfig` **properties file before issuing the** `esm`**(1M) command and its subcommands:**

   Place the `.clif-esmconfig` file in any directory from which you will issue the `esm`(1M) command and subcommands. As a best practice and for convenience, include this file in your home directory and make sure that your path includes your home directory.

   This file must contain the following entries (you can substitute the management station host name for `localhost` in the following example):

   ```
   ~server=localhost
   ~port=6789
   ~servlet_path=/esm/clif/CLIFrontController
   ~secure=true
   ~strict-certificate=false
   ```

3. **Type** `/opt/SUNWstm/bin/esm` **and an option. For example:**

   ```
   /opt/SUNWstm/bin/esm listassets --type host
   ```

   You can use the `--help` option to list the options.

4. **Enter your login information:**

   ```
   ~USERNAME:
   ~PASSWORD:
   ~ROLENAME:
   ~ROLE_PASSWORD:
   ```

   The CLI will prompt you for this information each time you enter a CLI command.

5. **If you do not want the CLI to prompt you after every command, run the** `cli_user_setup` **script to configure your login information and store it in encrypted files:**

```
# /opt/SUNWstm/bin/cli_user_setup

Please enter ESM user name: ESM_user_name

Please enter ESM user password: ESM_user_password
Please re-enter the password for confirmation: ESM_user_password

Please enter ESM role name: ESM_role

Please enter ESM role password: ESM_role_password
Please re-enter the password for confirmation: ESM_role_password
```

To remove the encrypted files with the login information, run the script with the remove option:

```
# /opt/SUNWstm/bin/cli_user_setup --remove
```

Or:

```
# /opt/SUNWstm/bin/cli_user_setup -r
```

Note – You can no longer use the `.clif-user` file available for the Sun StorEdge Enterprise Storage Manager Version 2.0 software.

See Appendix D for a quick reference of the CLI commands.

Using the CLI to Run Diagnostic Tests That Require a Password

The CLI includes the `test` subcommand, which enables you to run diagnostic tests on elements in your SAN environment from the command line. Some diagnostic tests require that you enter a password to execute them.

The Sun StorEdge Enterprise Storage Manager installation procedure installs the following files:

- `.esm-test` – This file is installed in the superuser root directory for superuser use.
- `/opt/SUNWstm/etc/esm-test.tmpl` – This files is a copy of `.esm-test` for non-superuser users. Copy this file to your home directory and rename it to `.esm-test`

The `.esm-test` file enables you to run the diagnostic tests without having to specify the password on the command line, adding a layer of security to the CLI use. Use this file as follows.

▼ To Use the esm CLI With Tests That Require a Password

1. **Open the** `.esm-test` **file in a text editor.**

   If you are a non-superuser user, you must first copy the `/opt/SUNWstm/etc/esm-test.tmpl` file to your home directory and rename it to `.esm-test`.

2. **Type a password definition entry for each test or element that requires a password, as follows:**

   password-key=*password*

   Where:
   - *password-key* is text representing the password you need to run a diagnostic test. The esm test command refers to the key in this file as specified on the esm command line.
   - *password* is the password required to execute the command.

   For example, the file might contain the following entry:

   xyz=admin1234

3. **Save and exit the file.**

   You can specify the `esm test` command as follows (this example runs a test on a storage device named t3-1):

   ```
   esm test -t test-id -x "password-key=xyz, FRU=fru1" -n t3-1
   ```

Reconfiguring the Software

To set configuration attributes that you need to change frequently, use the Sun StorEdge Enterprise Storage Manager web browser UI or CLI (for installations that include only the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software). Theses configuration attributes include scan policies, methods of notification, and the like. Refer to the online help or the man pages for information about setting these configuration attributes.

To change configuration attributes that you set during the installation procedure, use the `emsconfig` script in the `/opt/SUNWstm/bin/` directory. These configuration attributes, which you change infrequently, include port numbers, Oracle database information, and the like. For example, use the `emsconfig` script to increase the number of Oracle database connection pools or change a port number if another application already uses the default port number.

If you need to reconfigure the software after installation, you must first stop the software before you run the `esmconfig` script. If you do not stop the software and it is running while you attempt to configure it, the software detects that ports are in use.

The `esmconfig` script reports only on the attributes of the system on which it runs. For example, if you run the `esmconfig` script from a system that has only the agent station software installed, you cannot configure a management station.

The `esmconfig` Script Options

The `esmconfig` script includes options that are useful when you want to apply configuration attributes from another installation or when you do not want an interactive configuration session. The script is in the `/opt/SUNWstm/bin` directory.

TABLE 4-2 lists the options for the script. The script can accept short or long names for each option. A short name option requires a single hyphen (-). A long name option requires a double hyphen (--).

For example, to configure all packages, type:

```
# /opt/SUNWstm/bin/esmconfig
```

Note – When you use a long name option, do not type a space between hyphens.

Syntax:

esmconfig [-c, --create *answerfile*] [? | –h, --help]

TABLE 4-2   `esmconfig` Script Options

Option	Description
None	Display the main configuration menu.
-c, --create *answerfile*	Create an answer file that contains the values of all of the current configuration attributes. The software uses `/tmp/esm.answer` as the default answer file. Refer to "Using the Answer File" on page 42 for information about answer files.
? -h, --help	Display a list of options and usage for the script.

▼ To Reconfigure the Software

1. **Log in to your system as root.**

   The system types are management station or agent station. Note that a single system can act as a management station and agent station.

2. **Run the** `esmcontrol` **script to stop the software:**

   ```
   # /opt/SUNWstm/bin/esmcontrol stop
   ```

3. **Run the** `esmconfig` **script to display the main configuration menu:**

   ```
   # /opt/SUNWstm/bin/esmconfig
   ```

4. Type `1` **to a configure all software components and to access the Configuration Category Menu:**

```
Please wait - checking previously-installed Sun StorEdge(tm) ESM
stations...

======================================================

       Sun StorEdge(tm)
       Enterprise Storage Manager 2.1
       MAIN CONFIGURATION MENU

NOTE: Configuration attribute changes will be applied
      upon exiting esmconfig

======================================================

1) Set All Management and Agent Station Attributes
2) Set Management Station Attributes (including CLI Client)
3) Set Agent Station Attributes
4) Set Command Line Interface Client Attributes
q. quit
======================================================
Enter the number for what you want to configure,
or q to Quit.
======================================================
Your Choice: 1

Please wait...
======================================================
```

The configuration menu is dynamic; the menu presents configuration choices only for currently installed software packages. For example, if you invoke the configuration script on a system with the management station packages installed, the menu displays choices for the management station packages and does not display choices for agent station packages.

5. Type 2 **to change the configuration attributes for the RMI Registry:**

```
=======================================================

      Sun StorEdge(tm)
      Enterprise Storage Manager 2.1
      CONFIGURATION CATEGORY MENU

NOTE: Configuration attribute changes will be applied
      upon exiting esmconfig


=======================================================

1) PostgreSQL
2) RMI Registry
3) SAN Manager Keystore Password
4) SAN Manager Trustore Password
5) Service Tier
q) Return to the Main Menu
=======================================================
Enter the number for what you want to configure,
or q to Quit.
=======================================================
Your Choice: 2
```

6. Type 2 **to change the server port number:**

```
========================================================

        Sun StorEdge(tm)
        Enterprise Storage Manager 2.1
        CONFIGURATION TITLE MENU

NOTE: Configuration attribute changes will be applied
      upon exiting esmconfig


========================================================

1) SSSM RMI Registry Host ( localhost )
2) SSSM RMI Registry Server Port ( 1099 )
q) Return to the Category Menu
========================================================
Enter the number for what you want to configure,
or q to Quit.
========================================================
Your Choice: 2
What is the RMI Registry server port (1099): 2477


========================================================

        Sun StorEdge(TM)
        Enterprise Storage Manager 2.1.0
        CONFIGURATION TITLE MENU

NOTE: Configuration attribute changes will be applied
      upon exiting esmconfig


========================================================

1) SSSM RMI Registry Host ( localhost )
2) SSSM RMI Registry Server Port ( 2477 )
q) Return to the Category Menu
========================================================
Enter the number for what you want to configure,
or q to Quit.
========================================================
Your Choice:
```

When you run the `esmconfig` script, the software allows you to choose the next available port number. For example, it might allow you to choose port 8280 but not port 8180.

7. **Type** q **to Quit and return to the Configuration Category Menu, and then type** q **again to return to the Main Menu.**

8. **Type** q **to Quit from the Main Menu, and press Enter to apply the new configuration parameters:**

```
======================================================

       Sun StorEdge(tm)
       Enterprise Storage Manager 2.1
       MAIN CONFIGURATION MENU

NOTE: Configuration attribute changes will be applied
       upon exiting esmconfig


======================================================

1) Set All Management and Agent Station Attributes
2) Set Management Station Attributes (including CLI Client)
3) Set Agent Station Attributes
4) Set Command Line Interface Client Attributes
q. quit
======================================================
Enter the number for what you want to configure,
or p to print attribute values,
or q to Quit.
======================================================
Your Choice: q

Would you like to apply configuration
parameters (default: y) [y,n,?,q] y

Enterprise Storage Manager Version 2.1 configuration Successfully
Completed.

INFO: Sun StorEdge(tm) ESM  Installer Log:
       /var/sadm/install/logs/esm.log
```

9. **Start the software:**

```
# /opt/SUNWstm/bin/esmcontrol start
```

Uninstalling the Software

If your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager, refer to "Uninstalling the Capacity Reporter Component of the Sun StorEdge Enterprise Storage Manager" on page 102 for information before running the esmuninstall script. Otherwise, refer to "The esmuninstall Script" on page 103.

Uninstalling the Capacity Reporter Component of the Sun StorEdge Enterprise Storage Manager

If your installation includes a trusted mode installation of the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager, the esmuninstall script will delete the Oracle database objects that the installation procedure created. Before you run the esmuninstall script, use the following:

1. The esmcontrol stop script to stop all Sun StorEdge Enterprise Storage Manager processes (refer to "Starting and Stopping the Software" on page 88 for more information about stopping processes).

2. Oracle database tools to back up the database.

If your installation includes an untrusted mode installation for the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager, the esmuninstall script does not delete Oracle database objects. The uninstallation procedure indicates that you must remove the Oracle database manually:

```
WARNING: The DBA has mandated manual DB configuration, therefore
all DB uninstallation must be manually performed (tablespaces,
user and role)
```

The uninstallation procedure continues and removes the Sun StorEdge Enterprise Storage Manager components.

The `esmuninstall` Script

The `esmuninstall` script file removes the Sun StorEdge Enterprise Storage Manager software interactively or automatically. Run this script on the management station and each agent station with the Sun StorEdge Enterprise Storage Manager software. The `esmuninstall` script is in the `/opt/SUNWstm/bin` directory and on the product CD.

By default, the `esmuninstall` script deletes all installed Sun StorEdge Enterprise Storage Manager packages, except for any files that other applications are using and Oracle database persistence files. You can choose to perform a full uninstallation, which deletes all software packages and files associated with Sun StorEdge Enterprise Storage Manager, or a partial uninstallation, which removes a specified component.

Note – The `esmuninstall` script does not remove the Sun Web Console software. See "Removing the Sun Web Console Software" on page 107 for information about how to remove the software.

The script displays removal messages (except when you choose silent mode (-s)) and also writes the messages to `/var/sadm/install/logs/`*filename*`.log.`

TABLE 4-3 lists the options you can use with the `esmuninstall` script. The script can accept a short or long name for each option. A short name requires a single hyphen (-). A long name requires a double hyphen (--). This section shows the short name option followed by the long name option in parentheses.

Note – When you use a long name option, do not type a space between hyphens.

Syntax:

esmuninstall [-m,--management] [-a,--agent] [-c,--cli] [-p,--product
product] [-o,--openview] [-f,--full][-s,--silent] [? | -h,--help]

TABLE 4-3   esmuninstall Script Options

Option	Description
none	Uninstall all the Sun StorEdge Enterprise Storage Manager products and components in verbose mode. The uninstallation procedure retains some Sun StorEdge Enterprise Storage Manager software configuration files. **Note:** If you have a trusted mode installation of the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager, the uninstall procedure removes Oracle database objects. You must back up your database.
-m, --management	Uninstall the management station component only.
-a, --agent	Uninstall the agent station components only.
-c, --cli	Uninstall the CLI client components only.
-p, --product *product*	Uninstall the selected product only. Use cr (for the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager) or sm (for the SAN Manager component of the Sun StorEdge Enterprise Storage Manager).
-o, --openview	Uninstall the HP OpenView plugin.
-f, --full	Fully uninstall the Sun StorEdge Enterprise Storage Manager software and any associated files, including Oracle database persistence files. Note that only the installation, uninstallation, and configuration logs remain.
-s, --silent	Uninstall the software in silent mode. The installation script does not display messages or prompts (that is, it automatically removes all packages without prompting you). A log file records any error messages.
? -h, --help	Display a list of options and usage for the script.

▼ To Remove the Software

1. **Log in to your system as root.**

2. **Run the** `esmcontrol` **file script to stop all processes and daemons related to the software:**

```
# /opt/SUNWstm/bin/esmcontrol stop
```

3. **Run the** `esmuninstall` **file script to remove the software packages:**

```
# /opt/SUNWstm/bin/esmuninstall
```

CODE EXAMPLE 4-2 esmuninstall Script Sample Output

```
Begin: Removing ESM Station(s)
      Stopping cr_agent...
Stopping the ESM Capacity Reporter Agent Components...
Stopping the SSCRA ARP...
Stopping GIDU...
      Removing cr_agent package(s)...
Unregistering the ARP with the Management Station...
unreg_arp Success
Removing ARP configuration...
Removing Unix agent configuration...
      Stopping tr_agent...
Stopping Sun StorEdge(TM) SAN Manager Components
SAN Manager Agent ..............running.
      Removing tr_agent package(s)...
      Stopping esmom...
Stopping the ESMOM...
      Removing esmom package(s)...
      Stopping platform...
Stopping the ESM Management Station platform...
      Removing platform package(s)...
Beginning Data Tier Uninstall
Stopping the SMICC to release database connections...
Shutting down Sun(TM) Web Console Version 2.1...
Dropping Database User and Role...
Dropping Tablespaces...
Starting the SMICC...
Starting Sun(TM) Web Console Version 2.0...
See /usr/share/webconsole/logs/catalina.out for server logging
information
Data Tier Uninstall Complete
Unregistering the UI with the SMICC...


    Unregistering com.sun.netstorage.mgmt.ui.framework_1.0.
Restarting the SMICC...
Shutting down Sun(TM) Web Console Version 2.0 ...
Starting Sun(TM) Web Console Version 2.0 ...
See /usr/share/webconsole/logs/catalina.out for server logging
information
Removing ESM reports directories...
Removing security keys...
      Removing tr_cli package(s)...
      Stopping tr_mgmt...
Stopping Sun StorEdge(TM) SAN Manager Components
JAVA_HOME is set to /usr/java
Stopping CRE
```

CODE EXAMPLE 4-2   `esmuninstall` Script Sample Output

```
Stopping PostgreSQL ...
        Removing tr_mgmt package(s)...
Removing the keystore and truststore registration from SMICC...
Removing ESM 2.1 registration from SMICC...
        Removing cr_common package(s)...
        Removing esm_common package(s)...
End:    Removing ESM Station(s)


Enterprise Storage Manager Version 2.1 Uninstall Successfully
Completed.


INFO: Sun StorEdge(tm) ESM  Installer Log:
        /var/sadm/install/logs/esm.log
```

Removing the Sun Web Console Software

The Sun StorEdge Enterprise Storage Manager installation procedure installs the Sun Web Console software. Because other applications may need to use this software, the `esmuninstall` script does not remove it from your network storage environment. However, you can remove the software manually.

Note – Make sure that other applications in your network storage environment do not need the Sun Web Console service before you remove it.

▼ To Remove the Sun Web Console Software

1. **Log in as root.**

2. **Type:**

```
/usr/lib/webconsole/setup -uf
```

Evaluating the Installation

This chapter includes information about checking the completed installation and how to solve possible installation problems:

- "Checking the Environment and Processes" on page 109
- "Checking the Log File" on page 112
- "Troubleshooting the Installation" on page 113

Checking the Environment and Processes

If the installation fails, run the `esmcheck` script file for information about the system's state. The `esmcheck` script provides information about the Sun StorEdge Enterprise Storage Manager environment and its processes, such as:

- Operating system version
- Prerequisite packages and software patches for the Sun StorEdge Enterprise Storage Manager software installation
- Sun StorEdge Enterprise Storage Manager packages that are already fully or partially installed on your system
- Any Sun StorEdge Enterprise Storage Manager processes that are running

The `esmcheck` script is in the `/opt/SUNWstm/bin` directory and on the product CD. You must run the script as root.

The `esmcheck` Script Options

TABLE 5-1 lists the options for the `esmcheck` script. The script can accept a short or long name for each option. A short name requires a single hyphen (-). A long name requires a double hyphen(--). This section shows the short name option followed by the long name option in parentheses.

Note – When you use a long name option, do not type a space between hyphens.

Syntax:

`esmcheck [-a, --attributes] [-A, --all] [-c, --components] [-p, --processes] [-l, --logs] [-S, --status] [? |-h, --help]`

TABLE 5-1   `esmcheck` Script Options

Option	Description
None	Invoke the main configuration menu.
-a,--attributes	Display information about all the configuration attributes for the installed components. You can specify this option with any of the other options.
-A,--all	Display all information about all the installed components. This is equivalent to `esmcheck -c -p -l -a`.
-c, --component	Display information about the installed Sun StorEdge Enterprise Storage Manager components.
-p, --processes	Display the status of the Sun StorEdge Enterprise Storage Manager processes running on the host system.
-l, --logs	Display the names and sizes of the Sun StorEdge Enterprise Storage Manager log files on the host system.
-S, --status	Return process status; used by other Sun StorEdge Enterprise Storage Manager utility scripts.
? -h, --help	Display a list of options and usage for the script.

CODE EXAMPLE 5-1   esmcheck Script Sample Output

```
# ./esmcheck

'ESM_Common' Component Package State Version
     SUNWstm                    fully installed      2.1.0
'Storage Automated Diagnostic Environment' Component Package State
Version
     SUNWstade                  fully installed      2.3
'SAN Manager Management' Component Package State Version
     SUNWstoba                  fully installed      2.1.0
     SUNWstmsu                  fully installed      2.1.0
     SUNWstmsr                  fully installed      2.1.0
     SUNWstmdb                  fully installed      2.1.0
     SUNWstmm                   fully installed      2.1.0
     SUNWstui                   fully installed      2.1.0
     SUNWestra                  fully installed      2.1.0
'SAN Manager Command Line Interface Client' Component Package
State Version
     SUNWstcli                  fully installed      2.1.0
     SUNWstmm                   fully installed      2.1.0
'SAN Manager Agent' Component Package State Version
     SUNWstas                   fully installed      2.1.0
     SUNWnsmat                  fully installed      1.2.0
End:   Checking for components
.
.
Begin: Checking for processes
1472
The CRE for SSSM.......................running
26926
The Out-of-Band Brocade Server..........running
27035
The Out-of-Band McData Server...........running
26946
The Out-of-Band Sun/Qlogic Server.......running
26948
SAN Manager Agent.......................running
.
.
End:   Checking for log sizes

Enterprise Storage Manager Version 2.1 esmcheck Successfully
Completed

INFO: Sun StorEdge(tm) ESM  Installer Log:
     /var/sadm/install/logs/esm.log
```

Checking the Log File

The `esminstall`, `esmuninstall`, `esmconfig`, and `esmcheck` scripts record messages to a single log file. The log file includes:

- Installation messages
- Removal messages
- Configuration messages
- Error messages
- Informational messages

The default location for this log file is `/var/sadm/install/logs/esm.log`.

The log file delimits the output from each script with separator lines, the name of the script and a time stamp. CODE EXAMPLE 5-2 shows a sample Sun StorEdge Enterprise Storage Manager installation log file.

CODE EXAMPLE 5-2   Sample Log File

```
==================================================
Sun StorEdge(TM)
Enterprise Storage Manager 2.1
Start <action>
2003/02/28 17:23:24:
==================================================

    <log output>


INFO: Sun StorEdge(tm) ESM  Installer Log:
    /var/sadm/install/logs/esm.log
==================================================
Sun StorEdge(TM)
Enterprise Storage Manager 2.1
End of Install
2003/02/28 17:23:29:
==================================================
```

Troubleshooting the Installation

The following lists possible problems that you might encounter when you install the Sun StorEdge Enterprise Storage Manager software:

Cannot determine if ESMUser role is set

You must create the ESMUser role prior to installation and complete the installation to set the role. Then you can use the roles *username* command to verify that the role is set. Refer to "To Create the ESMUser Role and Set a Default Password" on page 21 for more information about creating the ESMUser role.

Login page does not display expected components

If you are not authenticated and authorized by the Sun Web Console software, the login page does not display links to the components of the Sun StorEdge Enterprise Storage Manager. You must be assigned the ESMUser role. Refer to "To Create the ESMUser Role and Set a Default Password" on page 21 for more information about the esm_user script.

Unexpected Installation Type

If you use the esminstall script and type more than one option to choose an installation type, the last option on the command line is used.

Installation Fails

If your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software, make sure you have specified the ORACLE_HOME environment variable. Refer to "To Prepare the Management Station" on page 24 for more information about preparing the management station.

Performance problems

If your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software and the Oracle database settings are less than the recommended minimum value, the performance of the Sun StorEdge Enterprise Storage Manager software might be unacceptable. Refer to "Setting Minimum Recommended Oracle Database Values" on page 30 for more information about minimum Oracle database values.

Reports display unexpectedly

If your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software, and the NLS settings are not the default values, the Sun StorEdge Capacity Reporter software might not display fields or sort data as expected. Refer to "Configuring for Internationalization" on page 31 for more information about the default NLS values.

Failure to create database objects

If your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software, verify that you can use the Oracle database client. Refer to "Configuring the Oracle Database Client" on page 36 for more information about how to set up the Oracle database client.

Agent and database synchronization failure

If your installation includes the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software, verify that you supplied a valid account name and password for RMI communications with the software that interprets and runs the scan schedules of selected storage elements. Refer to "To Install the Software on a Single System That Acts as a Management Station and Agent Station" on page 46 for more information.

System becomes extremely slow

If more than one management station discovers a single agent station, the performance of the management station becomes unacceptably slow. Make sure that only one system in your SAN acts as the management station.

HP OpenView installation fails

The installation fails if the system on which you try to install the HP OpenView plugin has the following characteristics:

- Does not include the HP OpenView Server

- Includes the HP OpenView Server, but does not include the HP OpenView Network Node Manager

- Includes the incorrect version of the HP OpenView Network Node Manager; the installation procedure requires version 6.4

Using the Software With the HP OpenView Network Node Manager Software

The Sun StorEdge Enterprise Storage Manager software installation procedure can install a plugin on a system that runs HP OpenView Network Node Manager software. The plugin allows the Sun StorEdge Enterprise Storage Manager software to report information about data path availability to an HP OpenView Network Node Manager console.

This appendix provides information about using the HP OpenView plugin:

- "Getting Started" on page 117
- "Using the HP OpenView Network Node Manager Software" on page 119
- "Uninstalling the Sun StorEdge Enterprise Storage Manager Software" on page 120

Getting Started

Before the HP OpenView Network Node Manager software can receive information from a Sun StorEdge Enterprise Storage Manager management station, you must do the following:

- Install the Sun StorEdge Enterprise Storage Manager software's HP OpenView plugin on an HP OpenView Network Node Manager station.
- Load the Sun StorEdge Enterprise Storage Manager ESM MIB.
- Configure the HP OpenView Network Node Manager software to receive SNMP traps from the Sun StorEdge Enterprise Storage Manager management station.

■ Set up SNMP notification on the Sun StorEdge Enterprise Storage Manager
management station.

▼ To Prepare the Environment

1. **Make sure that the HP OpenView Network Node Manager software is installed
   and running.**

Note – The Sun StorEdge Enterprise Storage Manager management station and the
HP OpenView Network Node Manager software must be installed on different
systems.

---

2. **Use the Sun StorEdge Enterprise Storage Manager installation procedure, as
   described in Chapter 3, to install the HP OpenView plugin.**

   The installation procedure installs the HP OpenView plugin and ESM MIB on the
   system that is running the HP OpenView Network Node Manager software.

3. **From the HP OpenView Network Node Manager console menu, load the ESM
   MIB:**

   a. **Click Options > Load/UnLoad MIBs SNMP.**

   b. **Type the ESM MIB path:**

   ```
   /opt/SUNWstm/sssm/share/snmp/mibs/esm1.mib
   ```

   c. **Click Tools > SNMP MIB Browser to view the ESM MIB.**

4. **From the HP OpenView Network Node Manager console menu, configure the
   software to receive SNMP traps from the Sun StorEdge Enterprise Storage
   Manager management station:**

   a. **Select Options > Event Configurator.**

   b. **Select esmTraps from the Enterprise Identification list box.**

   Refer to the HP OpenView Network Node Manager software product
   documentation for more information about how to configure events.

5. **From the Sun StorEdge Enterprise Storage Manager management station,
   configure SNMP notification so that the management station sends SNMP
   notifications to the HP OpenView Network Node Manager software:**

   a. **Click Administration > Notification**

6. **Enable SNMP Notification.**

   a. **Click SNMP Notification to display the SNMP Notifications page.**

b. Click New to display the SNMP Subscription Details page.

Type information for the following fields:

- Recipient – any informational text.
- Hostname – the name of the system that is running HP OpenView Network Node Manager software.
- Port Number – the SNMP port number. The default port number is 161.
- Alarm Severities – Down, to specify events in which the data path is down.

Refer to the online help of the SAN Manager component of the Sun StorEdge Enterprise Storage Manager software for information about enabling and setting up SNMP notifications.

7. Exit from and restart the HP OpenView UI.

Note that the HP OpenView console menu now includes an ESM menu.

8. Configure the software from the HP OpenView Network Node Manager console menu:

a. Select ESM > Configure.

b. Type information for the following prompts:

- ESM host – The fully qualified name of the Sun StorEdge Enterprise Storage Manager management station.
- ESM SNMP Port – The SNMP port number. The default SNMP port number is 8085. If you used the advanced attributes option to change default port numbers during the Sun StorEdge Enterprise Storage Manager software installation procedure, make sure that the SNMP port numbers on the Sun StorEdge Enterprise Storage Manager management station and the plugin system are the same.
- Polling interval – Optionally, a polling interval. By default, the plugin software polls the Sun StorEdge Enterprise Storage Manager management station every 10 seconds.

Using the HP OpenView Network Node Manager Software

When you have configured the software, click the ESM menu on the HP OpenView Network Node Manager console menu for the following options:

- **Start** – The plugin software begins to poll for information that the Sun StorEdge Enterprise Storage Manager management station has collected about a monitored host and the corresponding storage.

- **Launch** – The Sun Web Console login page is displayed, enabling you to access the Sun StorEdge Enterprise Storage Manager UI. Refer to "Accessing the Sun StorEdge Enterprise Storage Manager Software" on page 90 for more information about using the Sun Web Console to log in to the software.
- **Stop** – The plugin software stops polling the Sun StorEdge Enterprise Storage Manager management station for information.

Refer to the HP OpenView Network Node Manager software product documentation for information about how to use the HP OpenView Network Node Manager software.

Uninstalling the Sun StorEdge Enterprise Storage Manager Software

Use the `esmuninstall` script to remove the HP OpenView plugin from the system that is running the HP OpenView Network Node Manager software. Refer to "Uninstalling the Software" on page 102 for more information about how to remove the software.

Enabling Zoning in McDATA Fabrics

To use the Sun StorEdge Enterprise Storage Manager software to enable zoning in McDATA fabrics, you must install the Enterprise Fabric Connectivity Management (EFCM) Lite software from McDATA Corporation.

If you are installing the EFCM Lite software for the first time, follow all the steps below.

After you reboot the host system that is running the EFCM Lite software, the software will not be running and zoning might not be enabled. Therefore, you must stop the Sun StorEdge Enterprise Storage Manager software on the management station (as shown in Step 1) and restart the EFCM Lite software again (Go to Step 5 and continue with the following steps).

▼ To Enable Zoning in McDATA Fabrics

The system on which you plan to install and run the EFCM Lite software must be in the same network as the McDATA switches that you want to manage. The system can be any host in the network, including a host that is acting as an agent station or the host that is the management station. The McDATA switches do not have to be attached to the host.

1. **Stop the Sun StorEdge Enterprise Storage Manager software on the management station:**

```
# /opt/SUNWstm/bin/esmcontrol stop
```

2. **Copy the following McDATA files to the host system on which you want to install the McDATA management software:**

   - `mcdataClientInstall.bin`

- `mcdataLiteServerInstall.bin`
- `BridgeAgentInstall.bin`

3. **Make the files executable:**

```
#  chmod +x  filename.bin
```

4. **If the host on which you want to install the McDATA management software is remote to your display, set up your display to view the installer GUI:**
   - On your local system:

```
xhost +  remote_host_name
```

   - On the remote host:

```
DISPLAY=local_host_name:0.0
export DISPLAY
```

5. **Run the following** bin **files one at a time.**

   For the `mcdataLiteServerInstall.bin` file, deselect the start server/client boxes. For the `mcdataClientInstall.bin` file, deselect the start client box.

```
./mcdataLiteServerInstall.bin
./BridgeAgentInstall.bin
./mcdataClientInstall.bin
```

6. **Check for and kill any EFCMLite processes that you might have started out of sequence:**

```
ps -ef | grep -i efc
kill process-id
```

7. **Start the BridgeAgent and EFC services:**

```
cd /McDATA/EfcmLite/BridgeAgent

./BAStart
Done.

./McDATA/EfcmLite/start

Starting EFC Services...
Done.
```

Note — If you use the `bash` and `tcsh` shell and the services do not start, make sure you precede the command with `./`.

8. **Verify that the four following processes are running:**

```
ps -ef | grep -i efc

root 25890 25857  0 17:01:53 pts/2    0:03 /bin/../java/bin/java
com.zerog.lax.LAX
/McDATA/EfcmLite/BridgeAgent/BridgeAgen
    root 25925    1  0 17:02:04 pts/2    0:00 /bin/sh
//McDATA/EfcmLite/EFC_Services
    root 25970 25925  0 17:02:04 pts/2    0:06
/McDATA/EfcmLite/jre1.3/bin/../bin/sparc/native_threads/java -
Xmx102400000 com.
    root 25857    1  0 17:01:52 pts/2    0:00 /bin/sh
/McDATA/EfcmLite/BridgeAgent/BridgeAgent
```

9. **Access the client to manage the McDATA fabric to display the EFCM Lite client login box:**

```
/EFCM/EFC_Manager
```

10. **Log in to the client software and type the following information at the prompts:**
    - User: `Administrator`
    - Password: *password*
    - Server: IP address of the host where you installed and started the EFCM Lite software

    If you already use the Sun StorEdge Enterprise Storage Manager and EFCM Lite software to enable zoning, and you rebooted the host system that is running the EFCM Lite software, go to Step 12. Otherwise, go to the next step.

11. **Click the new product button to manage the McDATA fabric:**

    a. **Type the IP address of the McDATA switch.**

    b. **Select the correct switch model number from the drop-down list.**

12. **Click the Fabric tab to verify that the McDATA software displays the fabric.**

13. **From the Sun StorEdge Enterprise Storage Manager management station, restart the software:**

    ```
    /opt/SUNWstm/bin/esmcontrol start
    ```

14. **Wait for or perform a discovery to view the McDATA fabric.**

    If the management station software has already discovered the host with the attached McDATA switch, the discovery finishes in about 5 to 10 minutes. Refresh the Topology page until you see the McDATA fabric.

    If you have added a new host with an attached McDATA switch to your SAN, you must perform a manual discovery so that both the host and the McDATA switch are displayed in the SAN topology.

15. **Set the credentials for the McDATA switch:**

    a. **Go to the Switch details page, and click Contact Information.**

    b. **Click Edit.**

    c. **In the Edit Switch Contact Info field, set the password and management address to the values you used for the McDATA client login in Step 10.**

    d. **Click Save.**

16. **Navigate to the McDATA fabric to view the fabric details.**

17. **Click New in the ZoneSets and Zones tables to create zone sets and zones within the fabric.**

Note – Use the Sun StorEdge Enterprise Storage Manager software or the EFCM Lite software to create zones and zone sets; if you use the McDATA web tool or any other software, the management station will not discover zones and zone sets within the fabric.

Writing Script Notifications

The Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software can respond to conditions that it detects in several ways. One response is for the software to execute a user-supplied script. You use the web browser UI to enable the script option.

When the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager software detects a particular condition, it passes the appropriate context information to the user-supplied script. The software then executes the script, and the script execution writes output to a file.

The Sun StorEdge Enterprise Storage Manager installation procedure creates the directories in which the user-supplied scripts and the script output reside. You must be running as root to access either of these directories.

Note – User-supplied scripts run on the management station; they do not run on an agent station.

▼ To Write Script Notifications

1. **Make sure you are logged in as root.**

2. **Write the script and save it in the** `/var/opt/SUNWstm/scripts` **directory.**

   The software passes context information to the script through command-line parameters. You must follow the required format of the command-line parameters to make use of the context information. Note that different conditions provide different types of context information.

   TABLE C-1 describes the different command-line arguments and their usage.

TABLE C-1   Command-Line Arguments and Usage

Applicable Policy Type	Argument Variable	Argument Name	Value Description
All*	$1	Policy type	One of the following strings: • `capacityThreshold` • `discoveryThreshold` • `missingResourceThreshold`†
All	$2	Asset ID	The unique ID of a storage element.
All	$3	Asset name	The name property of a storage element.
All	$4	Asset type	A string describing the type of storage element.
All	$5	Asset subtype	If applicable, a further qualification of the storage element type.
Capacity	$6	Available threshold setting	The threshold setting specified by the user indicating the amount of available space that causes an alarm of a particular severity.
Capacity	$7	Percent used threshold setting	The threshold setting specified by the user indicating the percent of capacity that causes an alarm of a particular severity.
Capacity	$8	Current value	The capacity measurement that triggers the alarm.
Discovery	$6	Addresses	A list of IP addresses or worldwide names (WWNs) of the discovered storage element.
Discovery	$7	Address format	Whether the addresses argument contains IP addresses or WWW names.
Discovery	$8	When discovered	The UTC time when the storage element was discovered.
Discovery	$9	Other	A text string that describes the discovered storage element, which changes depending on the storage element type. For clusters, the text string describes a member server in the cluster.

*   *All* is applicable to all policy types
†   This string refers to an unavailable storage element.

Note – The notification of an unavailable storage element uses the arguments that apply to all policy types only.

3. Check /var/opt/SUNWstm/scripts/output **directory for the output from the script execution.**

Refer to the online help for more information about using a notification script and about other ways in which the Capacity Reporter component of the Sun StorEdge Enterprise Storage Manager can respond to conditions.

See /opt/SUNWstm/doc/esm-sample-alarm-script.sh for an example of a script notification.

`esm`(1M) Command-Line Interface Quick Reference

Note – The Sun StorEdge Enterprise Storage Manager version 2.1 software does not support the versions 1.0, 1.1, or 1.2 `/opt/SUNWnsm/bin/sstr`(1M) CLI. Any scripts that you have written using the `sstr`(1M) CLI and that you want to keep using must be rewritten with the `esm`(1M) CLI and its options. The options for this CLI are completely different than the options for `sstr`(1M).

Using the `esm` CLI

By default, the root user (superuser) is allowed to use the Sun StorEdge Enterprise Storage Manager `esm`(1M) CLI. Non-superuser users can also use the CLI if they are configured to do so.

The `esm` command accepts short or long names for each subcommand option. A short name option requires a single hyphen (-). A long name option requires a double hyphen (--). For example, to display all the ports for a specified device, including the ID for each subcommand, type one of the following:

```
esm listports --name t3_1
esm listports -n t3_1
```

Type `esm --help` at a terminal command line to see a brief list of all subcommands. You can also use the `--help` option to display information about a specific subcommand. For example, to show information about the discovery subcommand, type:

```
esm discovery --help
```

Note – See the `esm`(1M) man page for a more detailed description of the subcommands and options.

`esm`(1m) CLI Quick Reference

`esm` [`-?` | `--help`]
Display a brief list of all subcommands.

`esm` *subcommand* [`-?` | `--help`]
Display information about a specific subcommand.

`esm` *subcommand* [`-b, --noheading`]
Disables the display of columnar and other headings.

`esm` [`-V, --version`]
Display the current version of the software.

`esm alarm` { `-k,--ack` | `-r,--remove` } *alarm-id*

Acknowledge or remove the specified alarm.

`esm asset` {`-c,--contact` *contact-info* | `-g,--location` *location-info* } { `-n,--name` *asset-name* | `-i,--ip` *ip-addr* | `-w,--wwn` *asset-wwn* }

Associate an element with a specified contact (for example, a host).

`esm asset -M,--monitor` { `on`|`off` } { `-n,--name` *asset-name* | `-i,--ip` *ip-addr* | `-w,--wwn` *asset-wwn* }

Enable or disable health monitoring for a specified storage element.

Note – Note: You must specify the `-M,--monitor` option and *one* of the `-n`, `-i`, or `-w` options.

`esm asset -r,--remove` { `-n,--name` *asset-name* | `-i,--ip` *ip-addr* | `-w,--wwn` *asset-wwn* }

Remove a specified storage element from list of Sun StorEdge Enterprise Storage Manager storage elements. The element can be added later as the result of subsequent discovery.

Note – You must specify the `-r,--remove` option and *one* of the `-n`, `-i`, or `-w` options.

---

esm configapps

Display a list of all elements and their supporting applications.

esm configapps -a,--add -p,--application *application-name*
-l,--location *location* **-t,--type** { **switch** | **storage** }

Create supporting application entries for storage element types.

esm configapps -m,--map -p,--application *application-name*
{ **-n,--name** *asset-name* | **-i,--ip** *ip-addr* | **-w,--wwn** *asset-wwn* }

Map a storage element to a supporting application.

Note – You must specify the `-m,--map` and `-p,--application` options and *one* of the `-i`, `-n`, or `-w` options.

---

esm configapps -r,--remove -p,--application *application-name*

Remove a supporting application entry.

esm configcontact [**-u,--company** *company-name* | **-s,--site-name** *site-name* | **-a,--address** *address* | **-c,--city** *city* | **-S,--state** *state* | **-z,--zip** *zip-code* | **-C,--country** *country* | **-n,--contact-name** *contact-name* | **-e,--email** *email* | **-p,--phone** *phone-number* | **-P,--support-number** *Sun-contact-number*]

Configure or display information about the site contact.

esm configemail

Display a list of current email subscriptions.

esm configemail -a,--add -e,--email { *email-address* | *pager-number* } **-R,--recipient** *recipient* [**-p,--pager**] [**-d,--device** *device-type*] [**-l,--level** { **all** | **down** | **critical** | **major** }] [**-t,--Topics** *topic-list*]

Create email subscriptions for email notification of alarms and events.

Note – You must specify the `-a,--add`, `-e,--email,` and `-R,--recipient` options.

`esm configemail -r`,`--remove -i,--id` `contact-id`

Remove an email subscriber profile.

`esm configntf`

Display the notification settings.

`esm configntf` [**`-C,--netconnect`** { **`on`** |**`off`** }] [**`-s,--netconnect-size`** `maximum-size`][**`-v,--netconnect-ver`** { **`auto`** | **`2`** | **`3`** | **`31`** }]

Enable or disable Sun Remote Service (SRS) Net Connect notification. For more information about Net Connect notification, go to `http://www.sun.com/service/support/srs/netconnect/`.

Note – You must specify at least one option.

`esm configntf` [**`-e,--email`** { **`on`** | **`off`** }] [**`-E,--email-server`** `smtp-server-name`]

Enable or disable email notification.

Note – You must specify at least one option.

`esm configntf -S,--snmp` { **`on`** | **`off`** }

Enable or disable SNMP notification.

`esm configntf` [**`-U,--sunmc`** { **`on`** |**`off`** }] [**`-u,--sunmc-server`** `server-name`] [**`-P,--sunmc-port`** `port-number`] [**`-y,--sunmc-resource`** `resource-path`] [**`-z,--sunmc-retryinterval`** `number-of-minutes`] [**`-Y,--sunmc-heartbeat`** `number-of-minutes`] }

Enable or disable Sun(TM) Management Center notification.

Note – You must specify at least one option.

`esm configsnmp`

Display a list of current SNMP subscriptions.

```
esm configsnmp -a,--add  -h,--host hostname
-R,--recipient recipient  -p,--port port [ -l,--level
{ all | down | critical | major | minor } ]
```

Create SNMP profiles for email notification of alarms. The host machine where an alarm occurs routes the alarm information to a Sun StorEdge Enterprise Storage Manager management station.

```
esm configsnmp -r,--remove -i,--id contract-id
```

Remove an SNMP profile.

```
esm createvolume -s,-- size volume-size -S,--setting
storage-setting [ -q,--quota number-of-volumes ]
```

Create a volume on a selected set of arrays that match storage settings within a fabric or zone.

```
esm createzone -F,--fabric fabric-wwn -z,--zone zone-name
zone-members
```

Create a zone within a fabric.

```
esm createzoneset -F,--fabric fabric-wwn -Z,--zoneset
zoneset-name zone-names
```

Create a zone set within a fabric.

```
esm deletezone -F,--fabric fabric-wwn -z,--zone zone-name
```

Delete a zone from a fabric.

```
esm deletzoneset -F,--fabric fabric-wwn -Z,--zoneset
zoneset-name
```

Delete a zone set from a fabric.

```
esm discovery { -i,--ip ip-addr [ -I,--toip ip-addr2 ] }
```

Start a discovery based on a single IP address or a range of IP addresses.

```
esm job { -c,--cancel | -d,--delete | -D,--details } job-id
```

Cancel, delete, or view details about a job.

```
esm listalarms [ -o,--scope { san |fabric-id |zone-id } ]
{ -n,--name asset-name|-i,--ip ip-addr | -w,--wwn asset-
wwn } [ -g,--page page-number ] [ -R,--row row-number ] [
-f,--filter "key1=value1, key2=value2" ] [ -S,--sort
"key1=value1, key2=value2" ]
```

Display a list of alarms.

Note – You must specify *one* of the -n, -i, or -w options.

---

esm listassets [**-o,--scope** {**san** | *fabric-id* | *zone-id* }]

Display a list of assets for the specified scope. san is the default if the -o,--scope option is not specified.

esm listassets -t,--type { **switch** | **storage** | **host** | **hba** }
{ **-n,--name** *asset-name* | **-i,--ip** *ip-addr* | **-w,--wwn** *asset-wwn* } [**-o,--scope** { **san** | *fabric-id* | *zone-id* }]

Display a list of assets of the specified type, including health information, and the unique asset identification.

Note – You must specify the -t,--type option and *one* of the -n, -i, or -w options.

---

esm listcapablearrays -s,--settings *setting-name* **-S,--size** *volume-size*

Display a list of arrays that are capable of creating a volume using specified criteria.

esm listcomps [{**-v,--volume** | **-C,--comp** *component-id* }]
{ **-n,--name** *asset-name* | **-i,--ip** *ip-addr* **-w,--wwn** *asset-wwn* }

Display a list of subcomponents, components, or host bus adapters (HBAs)for the specified device.

Note – You must specify *one*of the -n, -i, or -w options.

---

esm listconns { **-n,--name** *asset-name* | **-i,--ip** *ip-addr* | **-w,--wwn** *asset-wwn* }[**-o,--scope** {**san** | *fabric-id* | *zone-id* }]

Display a list of direct or indirect connections for the specified device to other devices.

Note – You must specify *one* of the -n, -i, or -w options.

---

esm listevents { **-n,--name** *asset-name* | **-i,--ip** *ip-addr* | **-w,--wwn** *asset-wwn* } [**-o,--scope** { **san** | *fabric-id* |

zone-id}] [**-g,--page** *page-number*] [**-R,--row** *row-number*]
[**-f,--filter** "*key1=value1, key2=value2*"] [**-S,--sort** "*key1=value1, key2=value2*"]

Displays a list of events for a specified scope or device.

Note – **Note:** You must specify *one* of the -n, -i, or -w options.

---

esm listjobs -t,--type { **discovery** | **test** | **configuration** | **configuration-archives** }

Display a list of jobs specified by type..

esm listjobs -t,--type test-archives [**-g,--page** *page-number*] [**-R,--row** *row-number*]

Display an archived test list.

esm listports { **-n,--name** *asset-name* | **-i,--ip** *ip-addr* | **-w,--wwn** *asset-wwn* }

Display a list of ports for the specified device, including the ID for each subcomponent.

Note – You must specify *one* of the -n, -i, or -w options.

---

esm listports -F,--fabric *fabric-wwn*

Display a list of port connections within a fabric.

esm listrevisions { **-e,--element** | **-u,--upgrade** } [**-f,--fabric** *fabric-wwn* **-z,--zone** *zone-name*]

Display a revision summary report.

esm listscopes

Display all the fabrics and zones in the SAN and their unique IDs. This information can be used as input to the listalarms, listassets, listconns, listevents, and viewtopology subcommands.

esm liststoragesettings [**-F,--fabric** *fabric-wwn* **-z,--zone** *zone-name* | **-n** *array-name*]

Display a storage settings report storage or profile fora list of storage arrays in a fabric or zone.

```
esm listtests [ -C,--comp component-id ] { -n,--name
asset-name | -i,--ip ip-addr | -w,--wwn asset-wwn }
```

Display a list of all diagnostic tests for the specified device.

Note – You must specify *one* of the −n, −i, or −w options.

```
esm listzones -F,--fabric fabric-wwn
```

Display a list of zones within a fabric and their activation status.

```
esm listzonesets -F,--fabric fabric-wwn
```

Display a list of zone sets within a fabric.

```
esm modifyzone { -a,--add | -r,--remove } -F,--fabric
fabric-wwn -z,--zone zone-name zone-members
```

Add members to or remove members from a zone.

```
esm modifyzoneset { -a,--add | -r,--remove } zone-members
-F,--fabric fabric-wwn -Z,--zoneset zoneset-name
```

Add zones to or remove zones from a zone set.

```
esm modifyzoneset { -A,--activate | -D,--deactivate } -F,-
-fabric fabric-wwn -Z,--zoneset zoneset-name
```

Activate or deactivate a zone set.

```
esm revision [ -t,--time hh:mm ]
```

Run revision analysis data gathering for all hosts and devices currently known in the SAN.

```
esm test -t,--test-id test-id [ -x,--params "key1=value1,
key2=value2..." ] [ -C,--comp component-id ] { -n,--name
asset-name | -i,--ip ip-addr | -w,--wwn asset-wwn }
```

Run the specified test and display the test results.

Note – You must specify the −t,−−test-id option and *one* of the −n, −i, or −w options.

---

of the −i, −n, or −w options.

```
esm viewalarm alarm-id
```

Display details of an alarm.

esm viewasset [**-C,--comp** *hba-wwn*] { **-n,--name** *asset-name*
|
-i,--ip *ip-addr* | **-w,--wwn** *asset-wwn* }

Display details for the specified asset.

Note – You must specify *one* of the -n, -i, or -w options.

---

esm viewcomp { **-n,--name** *asset-name* | **-i,--ip** *ip-addr* |
-w,--wwn *asset-wwn* } { *component-id* | *subcomponent-id* }

Display details of one specified subcomponent or component of one specified
device.

Note – You must specify *one* of the -n, -i, or -w options and a *component-id*
or *subcomponent-id.*

---

esm viewDAS [{**-n,--name** *host-name* **| -i,--ip** *host-ip-*
address }]

Display Direct Attached Storage (DAS) information on the specified host or all hosts.
All hosts are displayed if an option is not specified.

esm viewevent *event-id*

Display details of an event.

esm viewpath { **-n,--name** *from-asset-name* | **-i,--ip** *from-*
ip-address }{ **-N,--toname** *to-asset-name* | **-I,--toip** *to-*
ip-address | **-W,--towwn** *to-asset-wwn* }

Display the connection path between a host and related storage.

Note – Specify a *from* and a *to* option. For example, -n (from) and -N (to).

---

esm viewrevision -n,--name *element-name*

Display revision analysis details for specified storage elements.

esm viewstoragesetting -s,--setting *setting-name*

Display storage setting details for a storage array.

esm viewtest -R,--result *test-key*

Display diagnostic test details.

`esm viewtest -t,--test-id` *test-id* { **`-n`** *asset-name* | **`-i`** *ip-addr* | **`-w`** *asset-wwn*} [**`-C,--comp`** *component-id*]

Display diagnostic test details.

`esm viewtopology` [**`-o,--scope`** { **`san`** | *fabric-id* | *zone-id* }]

Display topology information in tabular form. **san** is the default if the `-o,--scope` option is not specified.

`esm viewzone -F,--fabric` *fabric-wwn* **`-z,--zone`** *zone -name*

Display details about a specified zone within a fabric.

`esm viewzoneset -F,--fabric` *fabric-wwn* **`-Z,--zoneset`** *zoneset-name*

Display details about a specified zone set, such as tge zone set name, zone set statu, and a list of zone set members.

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