SGI® InfiniteStorage System Manager (ISSM)

Enterprise Edition

Administration Guide

007-5478-001

Record of Revision

Version	Description
001	May 2008 Original printing.

What’s New in This Guide

New Features Documented

This document includes instructions for installing and running the SGI InfiniteStorage System Manager Enterprise Edition (ISSM-EE) software.

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About This Guide

This guide provides information on preparing, installing, configuring, and starting the SGI InfiniteStorage System Manager Enterprise Edition software (ISSM-EE) in a Linux or Windows environment.

This is part of a document set that supports ISSM-EE. To get the most out of this book, consult the following documentation first:

- `README` file — Read this text file first. It contains late-breaking installation and user information about the storage management software.

When you have finished the entire installation process, see the following online Help systems, which contain information common to all operating environments.

- Enterprise Management window Help — Use this online Help system to learn more about working with the management domain.
- Array Management window Help — Use this online Help system to learn more about managing storage arrays.

Audience

This guide is intended for system administrators. Use this guide to:

- Gain a basic understanding of the ISSM-EE software.
- Understand the two different storage array management methods.
- Learn about hardware and software requirements.
- Follow procedures to install the ISSM-EE software.

Structure of this Guide

This guide contains the following chapters:

- Chapter 1, “Introduction” — Introduces the ISSM-EE software and provides information about system requirements.
- Chapter 2, “Preparing for Installation” — Describes the two storage array management methods and the procedures necessary to prepare for installation.
- Chapter 3, “Installing the ISSM-EE Software” — Describes the procedures for installing the ISSM-EE Agent and Client software.
- Chapter 4, “Operating System Support” — Describes the restrictions of using ISSM-EE in the Linux environment, identifying volumes by device name, stopping and starting ISSM-EE, and uninstalling specific software components.

Related Publications

This Administration Guide is part of a product book set. To get the most out of this guide, consult the following documentation before using this guide.

- *SGI InfiniteStorage* hardware storage array documentation for:
  - SGI Total Performance TP9300, TP9500, and TP9700
  - InfiniteStorage 350
  - InfiniteStorage 4000
  - InfiniteStorage 4500
  - InfiniteStorage 4600
- *SGI InfiniteStorage System Manager Enterprise Edition (ISSM-EE) Software Concepts Guide*
  This guide explains the terminology and features of the ISSM-EE storage management software.
- *SGI Storage Area Network Installation Instructions*
  This guide is available through Supportfolio Online and provides information on Storage Area Network installation and topologies.

Conventions

The following conventions are used throughout this document:

Convention	Meaning
`Command`	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
variable	The italic typeface denotes variable entries and words or concepts being defined. Italic typeface is also used for book titles.
`user input`	This bold fixed-space font denotes literal items that the user enters in interactive sessions. Output is shown in nonbold, fixed-space font.
[ ]	Brackets enclose optional portions of a command or directive line.
...	Ellipses indicate that a preceding element can be repeated.
`man page`(*x*)	Man page section identifiers appear in parentheses after man page names.
GUI element	This font denotes the names of graphical user interface (GUI) elements such as windows, screens, dialog boxes, menus, toolbars, icons, buttons, boxes, fields, and lists.

Product Support

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- If you are in North America, contact the Technical Assistance Center at +1 800 800 4SGI or contact your authorized service provider.
- If you are outside North America, contact the SGI subsidiary or authorized distributor in your country.

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Introduction

This chapter introduces the (ISSM-EE) software, and provides information about hardware, software, and operating system requirements for the installation.

Note: Please review the `README` file on the DVD for the latest information, updates, supported configuration changes, and bug fixes.

ISSM-EE is a Java-based graphical user interface (GUI) for configuring and monitoring the SGI InfiniteStorage TP9300, TP9500, TP9700, IS350, IS4000, IS4500, and IS4600 storage systems.

About the Storage Management Software

The storage management software is composed of the following components:

- "The Client Software" on page 2
- "The Host-Agent Software" on page 2
- "The Host-Util Software" on page 2
- "The Runtime Software" on page 2

The Client Software

The ISSM-EE GUI client (`smeeclient`) provides the graphical user interface for managing storage arrays. It features the following components:

- **Enterprise Management** window **—** Used to add, remove, and monitor storage arrays within the management domain.
- **Array Management** window **—** Used to manage the various components of an individual storage array.

The ISSM-EE CLI client (`smeeclient`) provides the command line interface for managing storage arrays.

The ISSM-EE Event monitor (`smeemonitor`) is packaged with ISSM-EE client software. It monitors storage arrays and handles error notification through e-mail or SNMP traps when the storage array management software is not actively running on the storage management station or host.

The Host-Agent Software

The ISSM-EE agent (`smeeagent`) lets you manage storage arrays through the host's Fibre Channel connection. This is described in "Storage Array Management Methods" on page 7.

The Host-Util Software

The ISSM-EE `devices` utility lets you associate storage array volumes with operating system device names. This is described in "Identifying Volumes by Operating System Device Names" on page 37.

The Runtime Software

The ISSM-EE runtime provides the JAVA runtime environment, which is required in order to use the storage management software.

Software Component Installation Requirements

Table 1-1 lists the hardware required for installing the storage management software components.

Table 1-1 Hardware Requirements for Software Components

Software Component	Hardware Requirement	Notes
SMEEclient	- Management station - Host	Management stations: - If you install the client software on one or more management stations, you can use the direct managed method, the host-agent managed method, or a combination of both. Hosts: - If you install the client software on the host and only plan to manage the storage arrays connected to this host via the I/O (Fibre Channel) path, you do not need to connect to the network if the host-agent software is installed. - You must assign a static IP address to the host.
SMEEagent	- Host	Install the host-agent software if you will be managing the storage arrays with the agent software.
SMEEutil	- Host	The host-util software includes the `smeedevices` utility, which you use to associate volumes with operating system device names.
SMEEruntime	- Management station - Host	Installation of the runtime software is a prerequisite to install ISSM-EE Client, Agent, and Util.

Figure 1-1 shows an example of a typical storage array configuration.

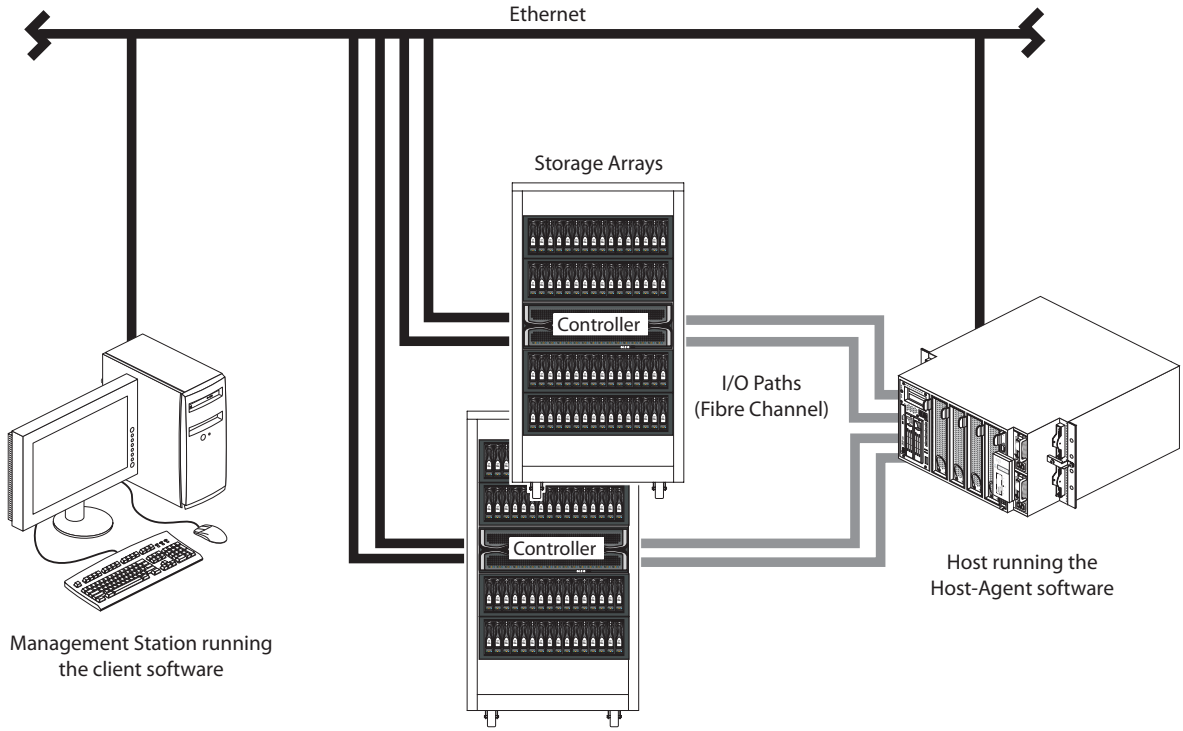

Figure 1-1 Typical Storage Management Configuration

System Requirements

This section provides information on the hardware, software, and operating system requirements for ISSM-EE.

Table 1-2 lists the permissions and operating system requirements for installing ISSM-EE.

Table 1-2 Operating System Requirements

Requirement	Description
Permissions	Root (superuser) level permissions are required to install the client software and the host-agent software
Operating system	See the `README` file located on DVD

Table 1-3 lists the hardware required for installing ISSM-EE.

Table 1-3 Hardware Requirements

Hardware Component	Requirements
Storage arrays	See the readme file and release notes located on DVD
Management station or host (for client software)	See the `README` file located on DVD
Host OS	See the `README` file located on DVD

Preparing for Installation

This chapter describes the two storage array management methods and the procedures necessary to prepare the SGI InfiniteStorage array for installing the ISSM-EE software.

The Installation Process

The installation process involves the following:

- Deciding on either a host-managed or direct managed storage array (“Storage Array Management Methods” on page 7).
- Preparing for the installation (“Preparing for a Network Installation” on page 12).
- Installing the ISSM-EE software (“ISSM-EE Software Installation Procedure” on page 24 and “Completing the Installation” on page 27).

Storage Array Management Methods

The storage management software provides two methods for managing storage arrays:

- Host-managed via agent and client over Fibre Channel path(s)
- Direct-managed via network (Ethernet) connections

Depending upon your specific storage array configurations, you can use either or both methods.

Host-Agent (Fibre Channel) Managed

With this method, you manage storage arrays through a Fibre Channel connection to a host. The host-agent receives communication from the storage management software and passes it to the storage array controllers via a Fibre Channel I/O path. Figure 2-1 shows a system in which storage arrays are managed through the host-agent.

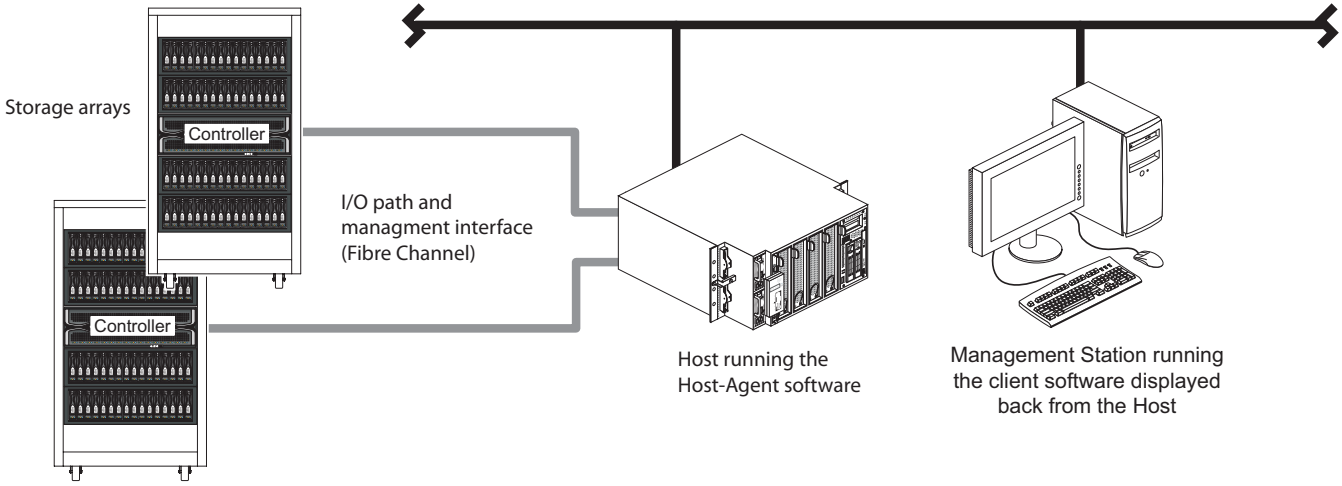

Figure 2-1 Host-Agent Managed Storage Arrays

The advantages of using the host-agent managed method include the following:

- Ethernet cables are not required to connect each controller to the network.
- Network configuration tasks for each controller are not required.
- Only a host name or IP address for the host must be specified when you add storage arrays (rather than the information for each controller in a storage array). After you have added a specific name or IP address of a host, the host-agent software will automatically discover any storage arrays attached to that host.

The disadvantages of using the host-agent managed method include the following:

- You are limited to one less logical unit number (LUN) than the maximum allowed by your operating system and host adapter.
- The host-agent requires a special Access Volume to communicate with the storage array controllers. The Access Volume uses LUN 31 as the default.

Direct (Ethernet) Managed

With this method, the storage array is managed directly over the network through each controller's Ethernet connection. To do this, you define each controller's IP address and host name, and attach a cable to each Ethernet connection on the controller enclosure. Figure 2-2 shows a system in which storage arrays are managed directly.

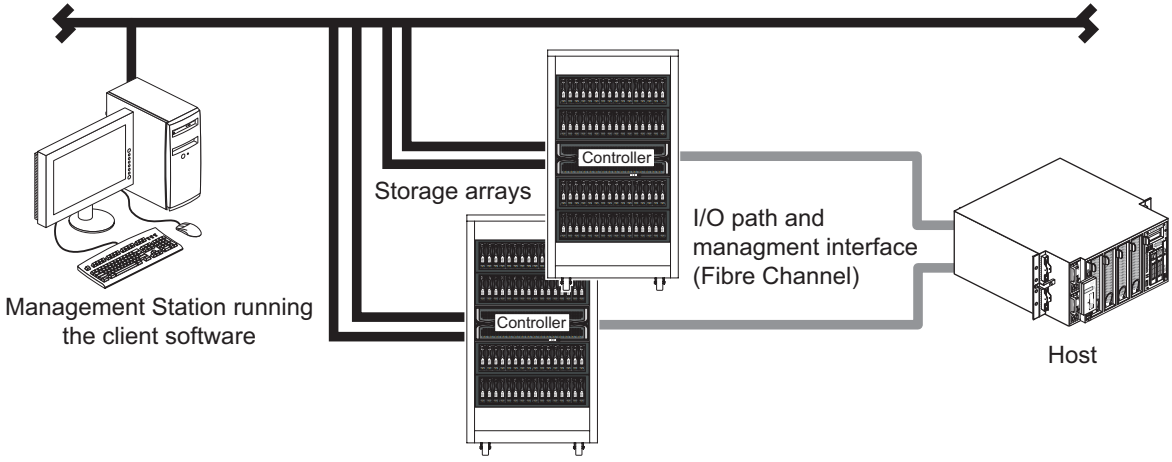

Figure 2-2 Direct Managed Storage Arrays

The advantages of managing storage arrays directly include:

- You can use a management station to manage storage arrays connected to a host with an operating system other than that supported by the storage management software. Contact your customer support representative for more information.
- To manage the array, you can use a PC workstation to connect to an SGI host. Check the README file on the DVD or the Release Notes for your system to verify supported management platforms.

The disadvantages of using the direct managed method include:

- Each controller requires an Ethernet cable for connection (two per controller enclosure).
- You will need to specify an IP address or host name for each controller whenever you add storage arrays.
- You will need to complete several network preparation tasks (see "Preparing for a Network Installation" on page 12 for a summary of the preparation tasks).

Integrating Your Storage Arrays Into a Network

You can manage storage arrays over the network using either or both of the storage array management methods described in “Storage Array Management Methods” on page 7.

1. Decide how you will manage your storage arrays. (See Figure 2-3 on page 11 for an example of a network that uses both types of management methods.)

   Network A — Directly Managed storage array installation with the following components:

   - Host connected to a storage array via a Fibre Channel I/O path
   - Management station connected through the Ethernet network to the storage array controllers

   Network B — Host-Agent Managed storage array installation with the following components:

   - Host connected to a storage array via a Fibre Channel I/O path
   - Management station connected through the Ethernet network to the host to manage the storage array controllers

2. Continue to “Preparing for a Network Installation” on page 12.

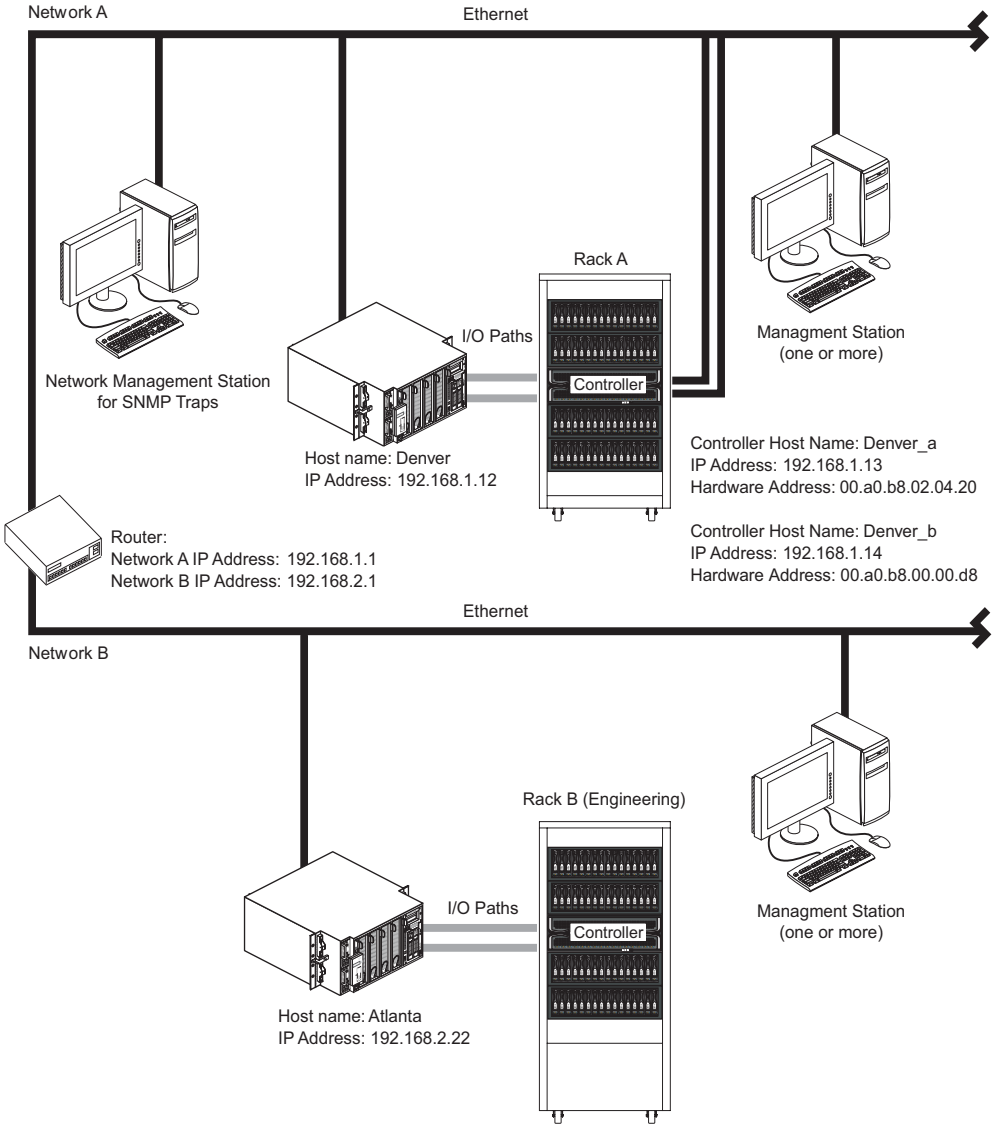

Figure 2-3 Network Using Directly and Host-Agent Managed Storage Arrays

Preparing for a Network Installation

To ensure that you have installed and checked all network components and that you have obtained and recorded all required host and controller information (see the blank information record provided in Table 2-3 on page 14), you must complete all of the applicable installation preparation tasks listed in Table 2-1. An example of a completed information record is provided in Table 2-2 on page 13.

Note: Actual installation of network components can be performed using the procedure described in "Network Setup Using the RS-232 Interface" on page 18 (also see task 4 or task 5 in Table 2-1).

Table 2-1 Summary of Network Preparation Tasks

Management Method	Task	Purpose	Go To:
Direct and host-agent	**1.** Install Ethernet connection.	To establish the Ethernet connection.	N / A
Direct and host-agent	**2.** Establish and record a naming scheme for your storage arrays.	To add the storage arrays to the management domain after installing the software.	"Naming the Storage Arrays" on page 15.
Direct and host-agent	**3**. Obtain IP addresses and host names from the network administrator.	Host-agent management requires host IP addresses and host names. Direct management requires controller IP addresses and host names to set up the host (or DNS) table.	"Obtaining IP Addresses and Host Names" on page 18.
Direct	**4.** Connect a VT100 terminal to the controller[a].	To allow the a user to use the VT100 terminal to provide network configuration information to the controllers.	"Network Setup Using the RS-232 Interface" on page 18.
Direct and host-agent	**5.** Set up the host (or DNS) table.	To ensure that the management station can communicate with the host running host-agent software or with the controllers.	"Setting Up the DNS or Host Table" on page 21.
Direct and host-agent	**6**. Power up network devices	To ensure that all devices and links are operational.	The Installation Guide specific to each hardware component.

a. Use either task 5 or task 6 to provide network configuration information to the controllers.

Table 2-2 shows a sample information record with entries for a directly managed storage array and a Host-Agent Managed storage array.

Table 2-2 Sample Information Record

storage array Name	Management Type	Controller A— Ethernet, IP Address, and Host Name	Controller B— Ethernet, IP Address, and Host Name	Host— IP Address and Host Name
storage array Name: **perf36**	**Direct**	Ethernet Address: **00a0b8020420** IP Address: **192.168.1.13** Host Name: **Denver_a**	Ethernet Address: **00a0b80000d8** IP Address: **192.168.1.14** Host Name: **Denver_b**	
storage array Name: **perf33**	**Host-Agent**			IP Address: **192.168.2.22** Host Name: **Atlanta**

Table 2-3 provides a blank information record. Photocopy the blank information record and complete the information for each network storage array and controller. This will help you correctly add storage arrays after initial installation.

Table 2-3 Storage Array and Controller Information Record

Storage Array Name	Management Type (choose one)	Controller A—Ethernet, IP Address, and Host Name	Controller B—Ethernet, IP Address, and Host Name	Host—IP Address and Host Name
Name:	___ Direct ___ Host-Agent	Ethernet Address: IP Address: Host Name:	Ethernet Address: IP Address: Host Name:	IP Address: Host Name:
Name:	___ Direct ___ Host-Agent	Ethernet Address: IP Address: Host Name:	Ethernet Address: IP Address: Host Name:	IP Address: Host Name:
Name:	___ Direct ___ Host-Agent	Ethernet Address: IP Address: Host Name:	Ethernet Address: IP Address: Host Name:	IP Address: Host Name:
Name:	___ Direct ___ Host-Agent	Ethernet Address: IP Address: Host Name:	Ethernet Address: IP Address: Host Name:	IP Address: Host Name:

Naming the Storage Arrays

When planning your network configuration, consider how you will name the storage arrays. When you start the storage management software for the first time, all storage arrays in the management domain will be displayed as `<unnamed>`. You then can use the **Array Management** window to rename individual storage arrays.

Use the following procedure to name storage arrays.

1. Decide on a storage array naming scheme that makes sense for your enterprise. Here are some tips on naming storage arrays:
   - The software allows a 30-character limit. All leading and trailing spaces will be deleted.
   - Use a unique, meaningful naming scheme that is easy to understand and remember.
   - Avoid arbitrary names or names that would quickly lose their meaning in the future.
   - The software displays storage array names with the prefix `storage array`. Therefore, if you rename a storage array *Engineering*, it will display as `storage array` *Engineering*.
2. Record the storage array names in the information record (Table 2-3 on page 14).

Depending on which management method or methods you will use, you might need to record your controller's hardware Ethernet addresses.

Do you plan to manage your storage arrays directly or with the host-agent software?

Direct Managed Go to "Identifying the Controller Hardware Ethernet Address" on page 16.

Host-Agent Managed Go to "Obtaining IP Addresses and Host Names" on page 18.

Identifying the Controller Hardware Ethernet Address

Use the following procedure if you plan to directly manage storage arrays through Ethernet connections to each controller.

1. You must remove the front panel from TP9500, TP9700, IS4500 controller enclosures. This step is not necessary for TP9300, IS350, and IS4000 controller enclosures.

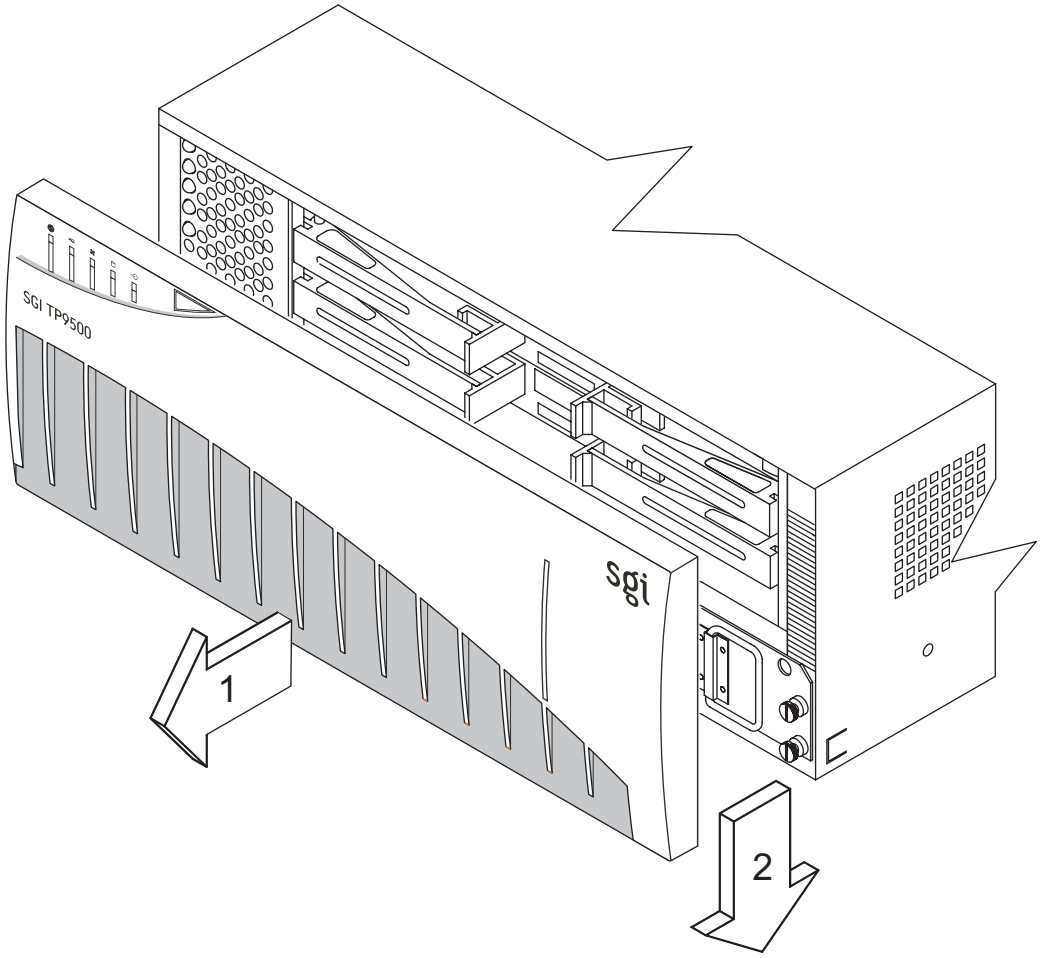

Figure 2-4 Removing the Front Panel of the SGI InfiniteStorage TP9500 Controller Enclosure

2. Look on the controller canister for a label with the controller's hardware Ethernet address. The number will be in hexadecimal form (for example, 00.a0.b8.00.00.d8).

   Figure 2-5 shows the location of the controller's hardware Ethernet address on the SGI InfiniteStorage RAID controllers.

3. Record each Ethernet address in the information record (Table 2-3 on page 14).

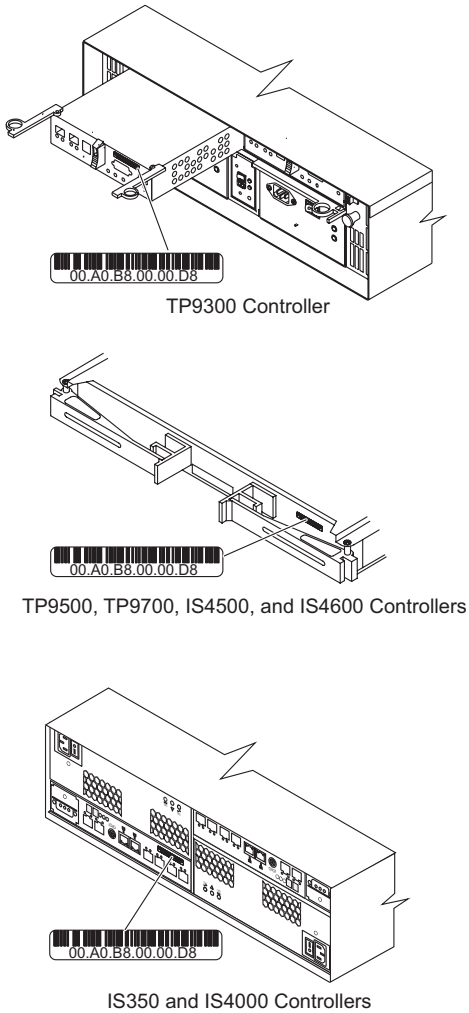

Figure 2-5 Identifying the Controller Ethernet Address on SGI InfiniteStorage Controllers

Obtaining IP Addresses and Host Names

Depending on which management method or methods you use, perform the following procedures to obtain IP addresses and host names. Within your enterprise, you might choose to manage some storage arrays directly and others with the host-agent software.

Table 2-4 Management Method

Direct Management Method	Host-Agent Management Method
1. Assign (or obtain from the network administrator) a unique IP address and associated host name for each storage array's controllers that you will manage directly. Record each controller IP address and host name in the information record (Table 2-3 on page 14).	**1.** Assign (or obtain from the network administrator) a unique IP address and associated host name of each host that you will use to manage the storage array via the host-agent method. Record the IP address and host name in the information record (Table 2-3 on page 14).
2. Go to "Network Setup Using the RS-232 Interface" on page 18.	**2.** Go to "Setting Up the DNS or Host Table" on page 21.

Network Setup Using the RS-232 Interface

You can set up the network interface through the RS-232 port on each controller. To interface to the RS-232 port, you need:

- A PC or device that can emulate a VT100 console.
- A 9-pin null modem cable with female connectors to attach to the RS-232 port on the controller.

Linux Systems

On Linux systems, perform the following procedure to set up the network interface through the RS-232 port on each controller:

1. Enter the following command to start `minicom` in setup mode:

   ```
   # minicom -s
   ```

   Note: Enter CTRL-A followed by Z to display the `minicom` command summary.

The following menu is displayed. Use the tab or arrow keys to navigate the menu.

```
Filenames and paths
File transfer protocols
Serial port setup
Modem and dialing
Screen and keyboard
Save setup as dfl
Save setup as..
Exit
Exit from Minicom
```

2. Select `Serial port setup` and set the following parameters:

```
A - Serial Device: /dev/ttyS0
B - Lockfile Location: /var/lock
C - Callin Program:
D - Callout Program:
E - Bps/Par/Bits: 9600 8N1
F - Hardware Flow Control: No
G - Software Flow Control: No
```

Windows Systems

On Windows systems, perform the following procedure to set up the network interface through the RS-232 port on each controller:

1. Select **Start >> Programs >> Accessories >>Communications>> Hyperterminal**.
   a. If this is the first time that HyperTerminal has been started, the **Location Information** dialog is displayed:
   – Select **Cancel**.
   – A **Confirmation** dialog is displayed. Select **Yes**.
   – An **Informational** dialog is displayed. Select **OK**.
   – The **New Connection Dialog** is displayed.
   b. If this is not the first time that HyperTerminal has been started, the **New Connection** dialog is displayed.
2. Enter the desired name in the **Name** text box and select **OK**. The **Connect to** dialog is displayed.
3. From the **Connect using** spinner box, choose the COM port you will use to connect to the RAID controller serial port. Select **OK**. The **Properties** dialog is displayed.

4. From the **Bits per second** spinner box, choose the baud rate that you want to use to send / receive data (for example, 9600). Select **OK**.
5. At this point, the configuration setup has been completed and you are ready to send and receive data. Before shutting down this application, save your settings so that you do not have to repeat this procedure.

After you have connected the cable and started the VT100 emulator, you must establish communication to the controller following these steps:

1. Enter a Ctrl+break key sequence.
2. When prompted, press the space bar to set the transfer baud rate.
3. Enter another Ctrl+break sequence.
4. Press Esc to get to the login prompt, then enter:
   a. For controller firmware versions less than 7.10
      Enter the password of **`infiniti`**
   b. For controller firmware versions equal to or greater than 7.10
      Enter the login of **`shellUsr`**
      Enter the password of **`wy3oo&w4`**
5. Enter the following command:

   > **`netCfgSet`**

   A list of network configuration options is displayed. The settings you need to change / set are **IP Address**, **Subnet Mask**, and **Gateway IP Address**.

   Note: If the controller has multiple Ethernet ports, then only set the IP Address and Subnet Mask for the first one listed (for example, `if0`).

6. Use the following command to verify the changes:

   > **`netCfgShow`**

7. After you set the values, you may need to reboot the controller for changes to take effect (depending upon the version of the controller firmware running on the storage array). If so, then enter the following command:

   > **`sysReboot`**

8. Repeat steps 1 through 7 for each controller.

Setting Up the DNS or Host Table

Use the following procedure to set up the Domain Name Server (DNS) or host table. Make sure the controller host names correspond to the appropriate controller IP addresses.

1. Edit either the DNS or the host table (`/etc/hosts`) to add the IP address and host name for each network controller.

   For example, to set up the host table for the Network A controllers, (Figure 2-3 on page 11), use a text editor to create the following controller IP address and name entries

Table 2-5 IP Address and Controller Host Name

IP Address	Controller Host Name
127.0.0.01	localhost
192.168.1.13	Denver_a
192.168.1.14	Denver_b

2. If you plan to manage storage arrays through a firewall, configure your firewall to open port 2463 to TCP data.
3. Go to Chapter 3, “Installing the ISSM-EE Software”.

Installing the ISSM-EE Software

This chapter describes how to install the ISSM-EE Client and Host software.

Note: The ISSM-EE software is not supported on IRIX systems. In order to use in-band management method on an IRIX system, you must install the TPSSM Host software on the IRIX system. Next, install and run the ISSM-EE Client software on another platform that is running either the Linux or Windows operating system. This management configuration will enable you to manage storage arrays connected to IRIX systems using in-band management.

Note: You must remove the TPSSM storage management software before you install the ISSM-EE management software, if TPSSM was previously installed on the management station.

Note: You must remove the ISSM-WE storage management software before you install the ISSM-EE management software, if ISSM-WE was previously installed on the management station.

Note: You must remove the SMI storage management software before you install the ISSM-EE management software, if SMI was previously installed on the management station.

ISSM-EE Software Installation Procedure

In these procedures, you must enter commands to install the applicable software packages. After each initial command, the software installation starts. When the installation has completed, a message indicates that the installation was successful. You are then returned to the command prompt.

Linux Installation

To install the ISSM-EE software on a Linux system, perform the following procedure:

1. Ensure that you have root privileges, which is required to install the software.
2. Insert the DVD that contains the management software and, if necessary, mount the DVD-ROM drive.
3. Type the following command making sure to include the **<***machine-arch***>** where **<***machine-arch***>** refers to; i386 (x86), x86_64 (x64), or ia64, and press Enter.

   > **cd /<***mount-point***>/rpms/<***machine-arch***>**

   Note: There are no native x86_64 RPM packages. If your system platform has an x86_64 (x64) *machine-arch*, then specify the *machine-arch* as i386.

4. Install the RPM binary packages in the order listed below:
   a. If installing Client management software.

      > **rpm -ivh SMEEruntime-LINUX-<***build***>-<***machine-arch***>.rpm**
      > **rpm -ivh SMEEesm-LINUX-<***build***>-<***machine-ach***>.rpm**
      > **rpm -ivh SMEEclient-LINUX-<***build***>-<***machine-arch***>.rpm**

   b. If installing Host management software.

      > **rpm -ivh SMEEruntime-LINUX-<***build***>-<***machine-arch***>.rpm**
      > **rpm -ivh SMEEagent-LINUX-<***build***>-<***machine-arch***>.rpm**
      > **rpm -ivh SMEEutil-LINUX-<***build***>-<***machine-arch***>.rpm**

5. To verify installation, type the following command-line for each of the installed RPM software packages and press enter:

```
> rpm -qi SMEEruntime
> rpm -qi SMEEesm
> rpm -qi SMEEclient
> rpm -qi SMEEagent
> rpm -qi SMEEutil
```

Windows Installation

1. Be sure that you have administrative privileges which are required to install this software.
2. Insert the DVD that contains the storage management software.
3. Using explorer navigate to the <*drive*>:\installers folder.
4. From the installers folder, double-click <SMWS-IA-*xx-version*>.exe.

Note: The installers\Readme.txt file contains information on the correct <SMWS-IA-*xx-version*>.exe file to use for your version of Windows and your CPU architecture.

The installation options:

- Typical (Full Installation)
- Management Station
- Host
- Custom

Note: The Host (which contains Utilities, Agent, and Fail-over Driver) installation is only applicable for server based platforms, running Windows Server operating system.

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5. Select the applicable installation option, and click Next. If you select Custom, these options appear:

    - System Manager Client
    - System Manager Utilities)
    - System Manager Agent
    - Fail-Over Driver
    - Java Access Bridge

    Note: The Utilities, Agent, and Fail-over Driver installation is only applicable for server based platforms, running Windows Server operating system.

6. Deselect any options that are not needed for the installation, and click Next.
7. Select the Automatically Start or Do not Automatically start Monitor radio button, and click Next.

Note: If using out-of-band (network) management method, only one machine should be running the SMEE Monitor software.

8. Enter the installation folder location, and click Next.
9. Review the **Pre-Installation Summary** dialog content. If changes are needed then click Previous. If not changes are needed then click Install.
10. The installation process starts.

Completing the Installation

Use the following procedures to finish installing the ISSM-EE software.

Starting the Enterprise Management Window

To complete the installation procedure, you must initiate storage array discovery using the **Enterprise Management** window. Start the **Enterprise Management** window using this procedure:

1. For Linux based systems, enter the following:

   `> smeegui`

   The client software will start, displaying the **Enterprise Management** window and the **Enterprise Management Window Task Assistant** window will be displayed after selecting a storage array to manage from the **Enterprise Management** window (Figure 3-1).

Note: If `smeegui: command not found` is reported, then try one of the following workarounds:

Enter **`rehash`**, then enter **`smeegui`**

OR

Enter **`/opt/smee/client/smeegui`**

The above workarounds are only applicable during the initial installation. The next time you log in or create a new shell window, they should not be required.

Note: If `/usr/bin` is not contained in the PATH environment variable, the fully-qualified-path name is required on the command line (`/opt/smee/client/`**`smeegui`**) to open the **Enterprise Management** window.

The **Enterprise Management** window might take several minutes to open. No wait cursor is displayed.

---

2. For Windows based systems, enter following:

   Click **Start**, point to **Programs**, and then navigate through the menus to **SGI InfiniteStorage**, and then select **Enterprise Edition System Manager Client** program and click it.

The client software will start, displaying the **Enterprise Management** window and the **Enterprise Management Window Task Assistant** window will be displayed after selecting a storage array to manage from the **Enterprise Management** window (Figure 3-1).

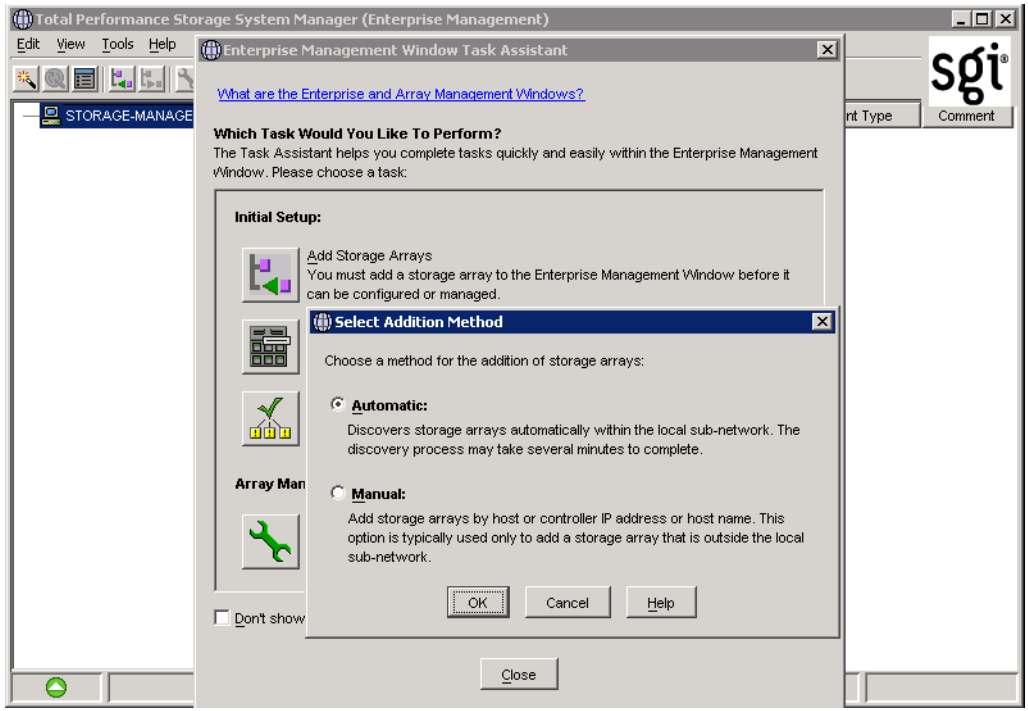

Figure 3-1 The Add storage arrays Dialog Box of the Enterprise Management Window Task Assistant

3. The **Enterprise Management Window Task Assistant** will launch by default (when a storage array has been selected. Common setup task shortcuts are available in the **Task Assistant** to simplify initial setup. The first available option, **Add storage arrays**, allows you to either perform automatic discovery of hosts and storage arrays on your subnet, or to add hosts or storage arrays manually via hostname or IP address. If you do not want to perform the initial automatic discovery, select **Manual**. This will give you the option of adding storage arrays with up to two controllers, or a host that is running the In-Band management agent.

   Select **Automatic** to begin an initial automatic discovery of hosts and storage arrays attached to the local subnetwork on which the management station is installed. This might take several minutes. The software sends a broadcast message across the local subnetwork where the management station is installed. It discovers host-agent managed storage arrays if the hosts that provide network management connections to the storage arrays respond to the broadcast. The software discovers directly managed storage arrays if the controllers in those storage arrays respond to the broadcast message.

   Note: It might take several minutes for the **Enterprise Management** window to refresh after an initial automatic discovery. If you need to stop the automatic discovery operation for any reason, close the **Enterprise Management** window.

   When the initial automatic discovery is completed, you should see all of the hosts and storage arrays attached to the local subnetwork (Figure 3-2 on page 30).

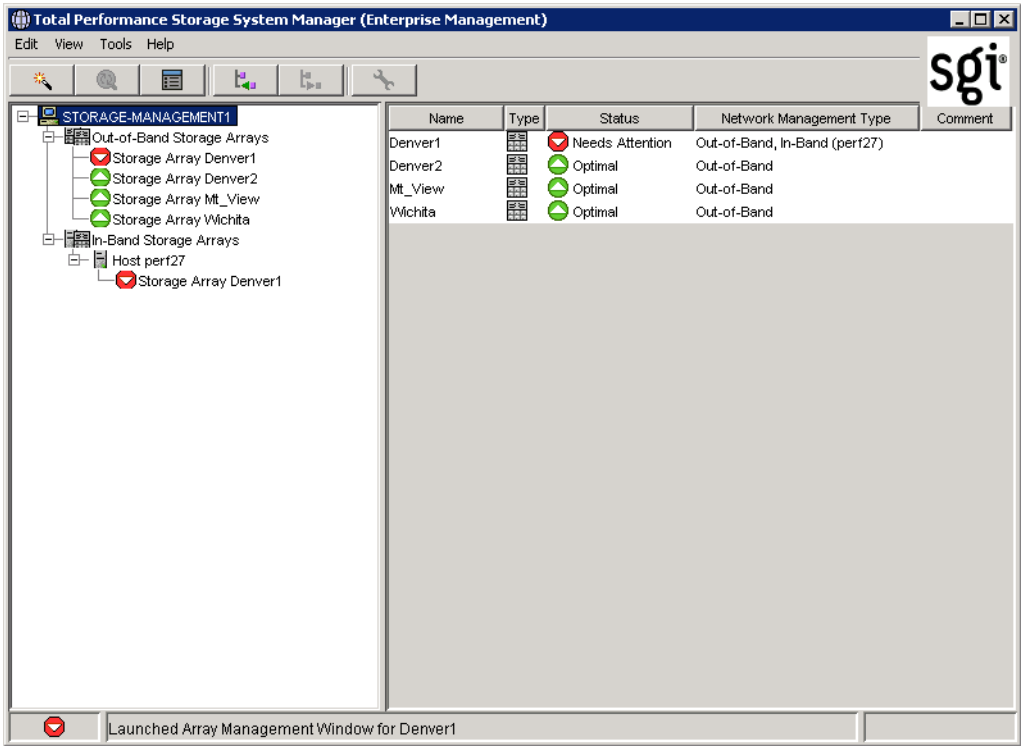

Figure 3-2 Enterprise Management Window

If you do not see all of the hosts and storage arrays you expected to see:

- Check the hardware and connections for possible problems (see the hardware documentation listed in “Related Publications” on page x for specific procedures).
- In the case of in-band management method, verify that the Agent software is installed and running on the server system.

Note: If the server system is on a different subnet, then automatic discovery will not detect the server system(s). In this case you’ll need to use the manual method to add the server system(s).

- In the case of out-of-band management method, verify that the correct IP Address or DNSname has been entered for each storage array.

  Note: If the storage array is on a a different subnet, then automatic discovery will not detect the storage array(s). In this case you'll need to use the manual method to add the storage array(s).

- See the **Enterprise Management** window Help topic about discovering storage arrays.
- Make sure that the device is on the local subnetwork. If not, use the **Add Device** option.

If any device shows a status of `Unresponsive`, use the software to remove the device from the management domain and add it again. See the **Enterprise Management** window Help for instructions on removing and adding devices.

Note: A storage array might be duplicated in the Device Tree after an automatic discovery if the storage array is directly managed but is attached to a host with the host-agent software installed and running. In this case, remove the duplicate storage array icon from the Device Tree using the **Remove Device** option in the **Enterprise Management** window.

Adding Devices

You might want to add hosts or storage arrays outside the local subnetwork. To learn more about this option, see the **Enterprise Management** window Help.

Note: If you are managing storage arrays through the host-agent software and you physically add new storage arrays, you must stop and restart the host-agent software so it can recognize the new storage arrays. Then go to the **Enterprise Management** window and select **Tools** > **Rescan** to add the new storage arrays to the management domain.

Setting Up Alert Notifications

After you have added devices to the management domain, you should set up alert notification options to report critical events on the storage arrays. The following options are available for alert notification:

- Notification to designated e-mail addresses.
- Notification to designated alphanumeric pagers (when a third-party software package is used to convert e-mail messages).

The **Enterprise Management** window must remain open if you want to monitor the condition of storage arrays included in your management domain. If you close this window, you will not receive alert notifications. You can minimize the window.

Note: See the **Enterprise Management** window Help for more information on alert notification options.

Starting the Array Management Window

Use this procedure to start an **Array Management** window for a selected storage array.

1. In the **Enterprise Management** window, select a storage array.
2. Select **Tools** > **Manage Device**.

Note: Optionally, right-click the storage array and select **Manage Devices** to start an **Array Management** window.

The software displays the **Array Management** window for the selected storage array (Figure 3-3).

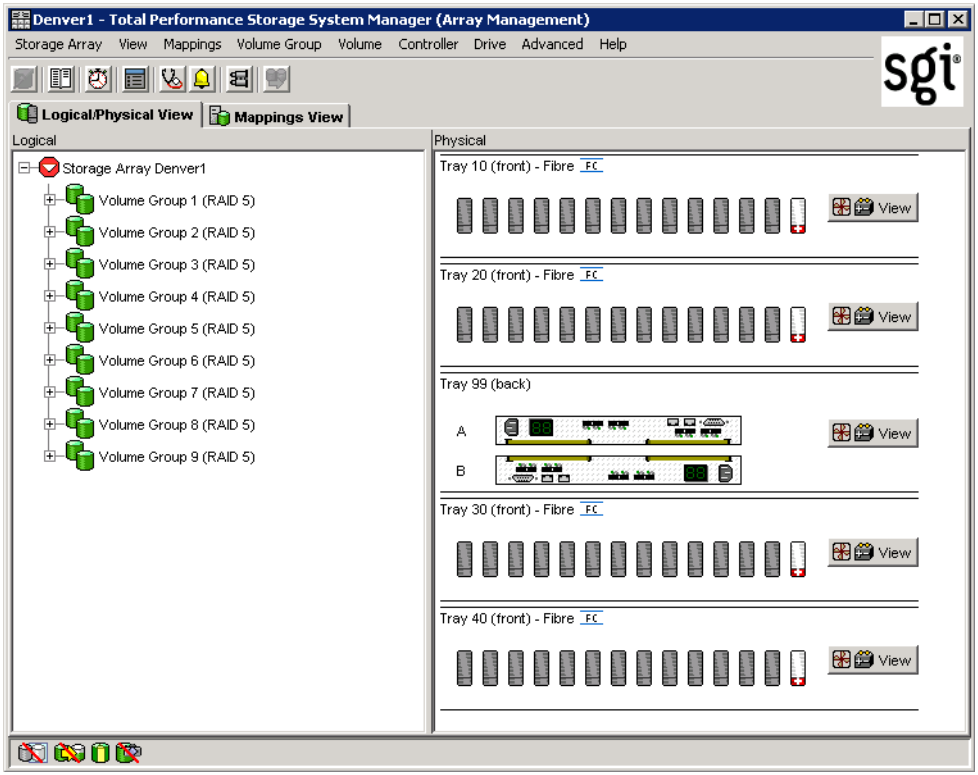

Figure 3-3 Array Management Window

Note: The **Array Management** window you opened lets you manage only the selected storage array. However, you can open multiple **Array Management** windows to manage other storage arrays.

Renaming Storage Arrays

When you start the storage management software for the first time, the storage arrays are unnamed. You must use the **Array Management** window to rename each storage array from `<unnamed>` to the name you want. Refer to the names you entered in the information record you created using Table 2-3 on page 14. Then, see the renaming storage arrays topic in the **Array Management** window Help. The Help topic provides detailed instructions for renaming storage arrays.

Other Storage Array Management Tasks

There are several other tasks you might want to perform at this time. These tasks include:

- Locating a storage array
- Viewing a storage array profile
- Configuring a storage array password
- Creating and managing volumes and volume groups
- Creating storage partitions (if applicable)
- Synchronize the controller clocks

To create storage partitions, you must obtain the worldwide name or port name of each host adapter in each host connected to the storage array.

Note: To learn more about these and other storage array management tasks, see the appropriate topics in the **Array Management** window Help.

Operating System Support

This chapter describes the restrictions of using ISSM-EE software, identifying volumes by device names, stopping and starting Host-Agent, disabling and enabling the Event Monitor, and uninstalling ISSM-EE software.

Understanding the Restrictions

Table 4-1 provides information about the restrictions that apply to ISSM-EE.

Note: Always check for a `README` file on the DVD. This `README` file might contain important, late-breaking information that was not available when this manual was written. Also, see release notes, which contain a list of known issues, bug fixes, as well as enhancements. See the `README` file on the DVD for instructions on how to view the release notes.

Table 4-1 Restrictions

Restriction	Workaround
Clicking on the vertical scroll arrows (either up or down) causes the scroll box to move all the way to the opposite end of the scroll bar.	This is a known defect in the Java Runtime Environment. Click the scroll box and slide it until you reach the desired position in the window.
If you are managing storage arrays with the host-agent software, do not download an NVSRAM configuration settings file with the `Access Volume Disabled` attribute. Doing so deletes the Access Volume on host-agent managed storage arrays, causing those storage arrays to become inaccessible.	If you download NVSRAM files to a host-agent managed storage array using the **storage array** > **Download** > **NVSRAM** option, select an NVSRAM file in the NVSRAM Download File Selection area, and then check the File Information to make sure that the file does not contain the `Access Volume Disabled` attribute. **Note:** If you accidentally delete the Access Volume, contact your customer support representative for assistance.

Table 4-1 Restrictions **(continued)**

Restriction	Workaround
After trying to add a host device to the management domain of more than five clients, the host-agent managed storage arrays attached to that host become unresponsive.	A single instance of the host-agent software can only communicate with five or fewer clients.
When both ports of a dual-port Fibre Channel drive fail while the drive is part of a storage array, both A and B loops are brought down. You will lose access to the data on the storage devices. The probability of both ports failing on a single drive is remote. For example, based on 1.2 million hours MTBF, the likelihood for both ports to fail is 0.08%.	Shut down all drive tray(s) and the controller tray. Power up all of the drive tray(s) and then power up the controller tray. The drive with the port failures will not display in the **Array Management** window. Revive any failed drives caused by the drive failure (data integrity is preserved.) Replace the drive that does not display in the **Array Management** window with a good drive. Reconstruction begins and the volume is restored.
After pulling all drives from a storage array, the storage management software prompts you for a password when you start the software or when you perform protected operations. Any password you enter fails.	Password information is stored on a reserved area of each drive on the storage array. Each drive stores a mirrored copy of the password data. With no drives in the storage array, the storage management software does not find the password data when you attempt password protected operations. Add one of the drives to the storage array and reattempt the operation.
If you configure a new storage array with a single controller, you must place the controller in the left slot of the controller enclosure (slot A). The controller firmware cannot recognize or talk to a single controller until slot A is populated. This restriction does not apply to storage arrays that are configured with two controllers.	None.
The Automatic Discovery option of the Enterprise Management window does not discover all of the appropriately configured storage arrays on a subnetwork.	Add the devices manually using the `Add Device` option. See the **Enterprise Management** window Help for more information.

Identifying Volumes by Operating System Device Names

The host-util software includes a utility that lets you see which storage array volume is associated with a particular operating system device name. The `utilities command` provides a detailed listing of device names to the storage array Volume names and their World Wide Name IDs. This capability is useful for operations such as data placement and volume deletion.

On IRIX systems, to use the utility enter the following:

```
> tpssmdevices
```

Note: If `/usr/bin` is not contained in the PATH environment variable, the fully-qualified-path name is required on the command line (`/opt/tpssm/util/tpssmdevices`).

On Linux systems, to use the utility enter the following:

```
> smeedevices
```

Note: If `/usr/bin` is not contained in the PATH environment variable, the fully-qualified-path name is required on the command line (`/opt/smee/util/smeedevices`).

On Windows systems, to use the utility, open a command prompt window. From the command prompt window enter the following:

```
> cd [drive:]<install_folder>\SMEE\util

> SMdevices
```

The software displays device identification information. The table below shows an example output (from a Linux system) with a description of each column.

Table 4-2 Device Identification Information

Disk Device Name	Controller Name	Volume Group	Vol. Name	Vol. World Wide Id
/dev/sg3	[storage array RAID7/8,	Volume LUN 0,	LUN 0,	WWN <600a0b80000664d400000073396cd12f>]
/dev/sg4	[storage array RAID7/8,	Volume LUN 1,	LUN 1,	WWN <600a0b80000664d400000075396cd134>]
/dev/sg5	[storage array RAID7/8,	Volume LUN 2,	LUN 2,	WWN <600a0b80000664d400000077396cd138>]
/dev/sg6	[storage array RAID7/8,	Volume LUN 3,	LUN 3,	WWN <600a0b80000664d400000079396cd13c>]
/dev/sg7	[storage array RAID7/8,	Volume LUN 4,	LUN 4,	WWN <600a0b800000139600000833977470f>]
/dev/sg8	[storage array RAID7/8,	Volume LUN 5,	LUN 5,	WWN <600a0b800007b8370000000b39775aa1>]
/dev/sg9	[storage array RAID7/8,	Vol. Acc. volume,	LUN 31,	WWN <600a0b800007b8370000000000000000>]
/dev/sg10	[storage array RAID7/8,	Volume LUN 0,	LUN 0,	WWN <600a0b80000664d400000073396cd12f>]
/dev/sg11	[storage array RAID7/8,	Volume LUN 1,	LUN 1,	WWN <600a0b80000664d400000075396cd134>]
/dev/sg12	[storage array RAID7/8,	Volume LUN 2,	LUN 2,	WWN <600a0b80000664d400000077396cd138>]
/dev/sg13	[storage array RAID7/8,	Volume LUN 3,	LUN 3,	WWN <600a0b80000664d400000079396cd13c>]
/dev/sg14	[storage array RAID7/8,	Volume LUN 4,	LUN 4,	WWN <600a0b800000139600000833977470f>]
/dev/sg15	[storage array RAID7/8,	Volume LUN 5,	LUN 5,	WWN <600a0b800007b8370000000b39775aa1>]
/dev/sg16	[storage array RAID7/8,	Vol. Acc. volume,	LUN 31,	WWN <600a0b800000139600000000000000000>]

Stopping and Starting the Host-Agent Software

Note: You must stop the host-agent software if you want to add storage arrays. When you restart the software, the host-agent discovers the new storage arrays and adds them to the management domain.

On IRIX systems, follow these procedures to stop and start the host-agent software installed on the host.

- To stop the host-agent software, enter the following:

  ```
  > /etc/init.d/tpssmagent stop
  ```

- To start the host-agent software, enter the following:

  ```
  > /etc/init.d/tpssmagent start
  ```

  Note: The agent will not be started if the `tpssmagent` configuration flag is set to `off`. Refer to the `man` page for `chkconfig(1M)` for details.

On Linux systems, follow these procedures to stop and start the host-agent software installed on the host.

- To stop the host-agent software, enter the following:

  > **/etc/rc.d/init.d/smeeagent stop**

- To start the host-agent software, enter the following:

  > **/etc/rc.d/init.d/smeeagent start**

On Windows systems, follow these procedures to stop and start the host-agent software installed on the host.

- To stop the host-agent software, open the **Services** applet. To stop a service select the **ServiceName** (SMEE Agent), then from the **Service Status** pane select **Stop** button, then select the **Apply** button.
- To start the host-agent software, open the **Services** applet. To start a service select the **ServiceName** (SMEE Agent), then from the **Service Status** pane select **Start** button, then select the **Apply** button.

Note: To open Services applet, click **Start**, click **Control Pane**l, double-click **Administrative Tools**, and then double-click **Services**.

Note: The host-agent software, if configured to, automatically starts after you reboot the host. However, you must restart the software manually if you stopped it to add storage arrays.

Note: It might take several minutes for the agent daemon startup process to complete.

Disabling and Enabling the Event Monitor

The Event Monitor, which is packaged with ISSM-EE client software, monitors storage arrays and handles error notification through e-mail or SNMP traps when the storage management software is not actively running on the storage management station or host.

Note: If you installed ISSM-EE client software and configured alert notifications on multiple machines, you may receive duplicate error messages from the same storage array. To avoid receipt of duplicate error messages, disable the Event Monitor on all but one machine. It is recommended that you run the Event Monitor on one machine that will run continually.

Note: If using direct (network) management, only one machine should be running the Event Monitor software.

You can disable and enable the event monitor without having to reboot a management station (workstation) or host (server), or you can permanently disable or enable the boot-time loading of the event monitor.

Disabling the Event Monitor

On Linux systems, enter the following to disable the Event Monitor:

```
> /etc/init.d/smeemonitor stop
```

On Windows systems, open the **Services** applet. To start a service select the **ServiceName** (SMEE Event Monitor), then from the **Service Status** pane select **Stop** button, then select the **Apply** button.

Note: To open Services applet, click **Start**, click **Control Pane**l, double-click **Administrative Tools**, and then double-click **Services**.

Enabling the Event Monitor

On Linux systems, enter the following to enable the Event Monitor:

```
> /etc/init.d/smeemonitor start
```

On Windows systems, open the **Services** applet. To start a service select the **ServiceName** (SMEE Event Monitor), then from the **Service Status** pane select **Start** button, then select the **Apply** button.

Note: To open Services applet, click **Start**, click **Control Pane**l, double-click **Administrative Tools**, and then double-click **Services**.

Disabling Boot-time Loading of the Event Monitor

On Linux systems, enter the following to disable boot-time loading of the Event Monitor:

```
> chkconfig smeemonitor off
```

On Windows systems, open the **Services** applet. To disable auto-start of a service select the **ServiceName** (SMEE Event Monitor), then from the **StartType** pull-down list select **Disable**, then select the **Apply** button.

Note: To open Services applet, click **Start**, click **Control Pane**l, double-click **Administrative Tools**, and then double-click **Services**.

Enabling Boot-time Loading of the Event Monitor

On Linux systems, enter the following to enable boot-time loading of the Event Monitor:

```
> chkconfig smeemonitor on
```

Note: The Event Monitor service is not started if the `chkconfig` service state is not set to on. See the manual page (`man chkconfig`) for further details.

On Windows systems, open the **Services** applet. To auto-start a service select the **ServiceName** (SMEE Event Monitor), then from the **StartType** pull-down list select **Automatic**, then select the **Apply** button.

Note: To open Services applet, click **Start**, click **Control Pane**l, double-click **Administrative Tools**, and then double-click **Services**.

Note: The Event Monitor service will not be started if the **ServiceName** (SMEE Event Monitor) **StartType** is not set to **Automatic**.

Uninstalling the ISSM-EE Software

See the `README` file located on the DVD for instructions on removing the storage management software.

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