

# SGI® InfiniteStorage SMI Administration Guide

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## About This Guide

This guide provides information on preparing, installing, configuring, and starting the Storage Manager Interface (SMI) in a Linux or Windows environment.

To get the most out of this book, consult the README file first. It contains late-breaking installation and user information about the SMI software.

When you have finished the entire installation process, refer to the online Help system, which contains information common to all operating environments. Use the Main Application window Help system to learn more about working with the management domain.

### Audience

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

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

## Structure of this Guide

This guide contains the following chapters:

- Chapter 1, “Introduction” — Introduces the Storage Manager Interface (SMI) 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 the SGI InfiniteStorage 220 a for installing the SMI software.
- Chapter 3, “Installing the SMI Software” — Describes the procedures for installing the SMI Runtime, Agent, Client and Utilities software.
- Chapter 4, “Operating System Support” — Describes how to: identify volumes by device names, stop and start the SMI, disable and enable the Event Monitor, and how to uninstall the SMI software. This section also explains some restrictions to be aware of when using the SMI software.

## 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 220 RAID User's Guide*  
A complete user guide for the SGI InfiniteStorage 220 that gives an overview of all components of the rack. It contains procedures for replacing failed components and complete specifications.
- *SGI Storage Area Network Installation Instructions*  
This guide is available through Supportfolio Online and provides information on Storage Area Network installation and topologies.

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## Introduction

This chapter introduces the Storage Manager Interface (SMI) software, and provides information about hardware, software, and operating system requirements for the installation.

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

---

SMI is a Java-based graphical interface for configuring and monitoring SGI InfiniteStorage 220 RAID systems.

### About the Storage Management Interface

The storage management software is composed of the following components:

- “The Client Software”
- “The Host-Agent Software”
- “The Host-Util Software”
- “The Runtime Software”

## The Client Software

The SMI GUI client provides the graphical user interface for managing storage arrays. It features the following components:

- The SMI CLI client provides the command line interface for managing storage arrays.
- The SMI Event monitor is packaged with SMI 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 workstation or host.

## The Host-Agent Software

The SMI agent lets you manage storage arrays through the host's Fibre Channel or serial attached storage (SAS) connection. This is described in "Storage Array Management Methods" on page 7.

## The Host-Util Software

The `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 34.

## The Runtime Software

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

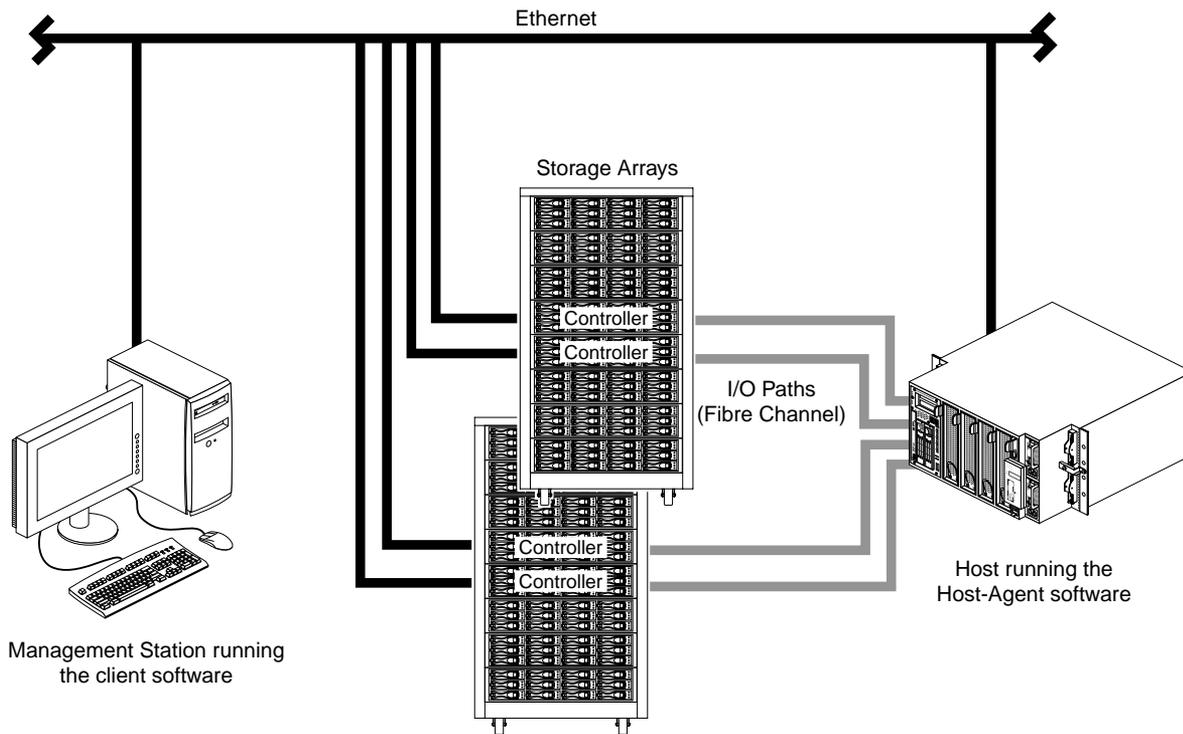
## Software Component Installation Requirements

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

**Table 1-1** Hardware Requirements for the Software Components

Software Component	Hardware Requirement	Notes
SMI Client	- Management work station - Host	<p>Management workstations:</p> <ul style="list-style-type: none"> <li>- If you install the client software on one or more management stations, you can use the out-of-band management method, the in-band management method, or a combination of both.</li> </ul> <p>Hosts:</p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- You must assign a static IP address to the host.</li> </ul>
SMI Agent	- Host	Install the host-agent software if you plan to manage the storage arrays with the agent software.
SMI Util	- Host	The host-util software includes the <code>devices</code> utility. This utility enables you to associate volumes with operating system device names.
SMI Runtime	- Management workstation - Host	Installation of the runtime software is a prerequisite to install SMI Client, SMI Agent, and SMI 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 SMI.

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

**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 CD-ROM

Table 1-3 lists the hardware required for installing SMI.

**Table 1-3** Hardware Requirements

Hardware Component	Requirements
Storage arrays	Storage arrays with controllers running firmware version 06.17.xx.yy. Please refer to the product release notes for updates.
Management workstation station or host (for client software)	See the README file located on CD-ROM.
Host OS	See the README file located on CD-ROM.



## Preparing for Installation

This chapter describes the two storage array management methods and the procedures necessary to prepare the SMI software.

### The Installation Process

The installation process involves the following:

- Deciding on either in-band management or out-of-band management for your storage array (“Storage Array Management Methods” on page 7)
- Preparing for the installation (“Preparing for a Network Installation” on page 13)
- Installing the SMI software (“Software Installation Procedures” on page 25)
- Completing the installation (“Completing the Installation” on page 27).

### Storage Array Management Methods

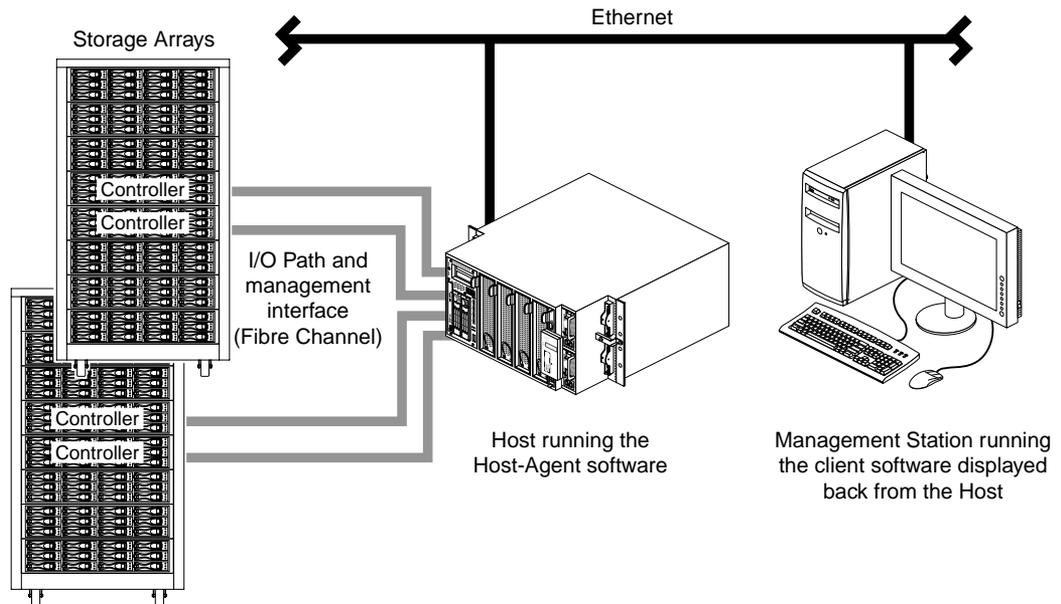
The storage management software provides two methods for managing storage arrays:

- In-band management using a host-agent and the Fibre Channel or Serial Attached SCSI path(s)
- Out-of-band management using Ethernet network connections

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

## In-band Managed (Fibre Channel)

When using the in-band management 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 administrated using in-band management.



**Figure 2-1** In-band Managed Storage Arrays

The advantages of using in-band management include:

- 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 automatically discovers any storage arrays attached to that host.

The disadvantages of using in-band management include:

- 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 LUN number.

## **Out-of-band Managed (Ethernet)**

With this method, the storage array is managed directly over the network through an Ethernet connection to each controller. To use this method, you must define each controller's IP address and host name, and attach a cable to the Ethernet connection on each RAID controller (2 per controller enclosure).

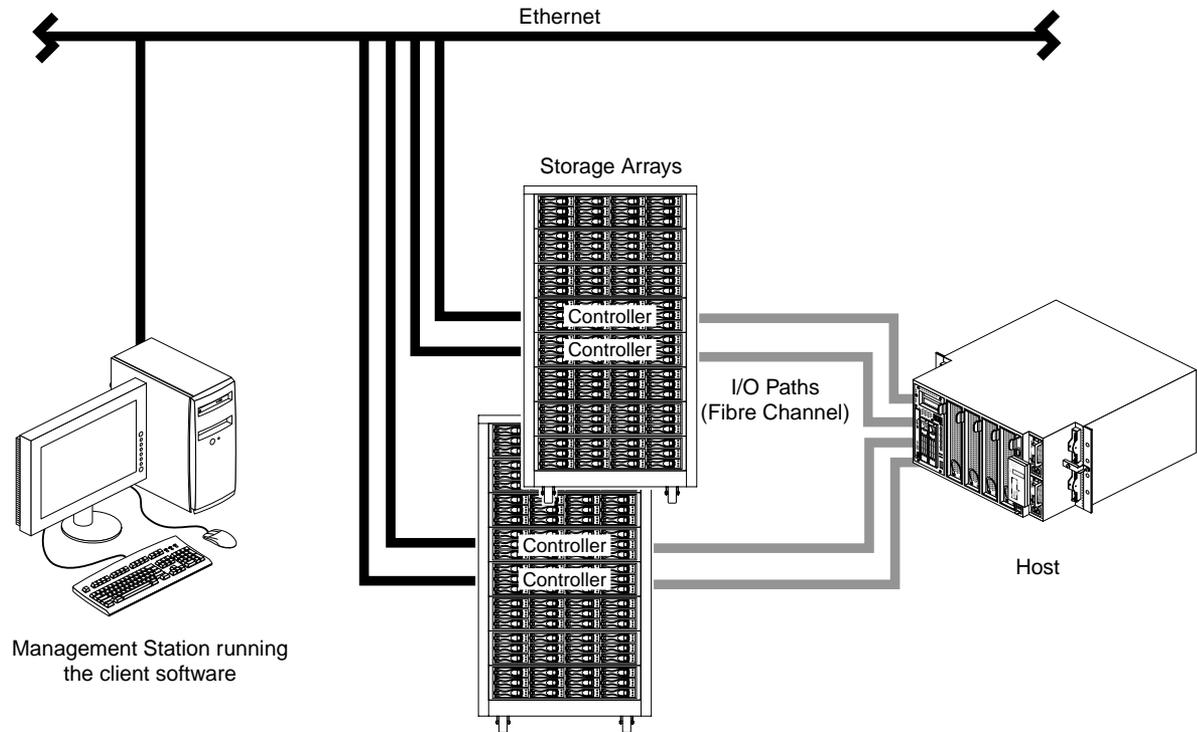
The advantages of using out-of-band management include:

- You can use a Linux or Windows XP workstation to manage storage arrays connected to a host that is running an operating system other than one supported by the storage management software. Contact your customer support representative for more information.
- To manage the array, you can use a Linux or Windows workstation to connect to the host. Check the README file on the CD-ROM or the Release Notes for your system to verify supported management platforms.

The disadvantages of using the out-of-band management method include:

- Each controller requires an Ethernet cable for connection (two per controller enclosure).
- You must specify an IP address or host name for each controller whenever you add storage arrays.
- You must complete several network preparation tasks (see "Preparing for a Network Installation" on page 13 for a summary of the preparation tasks).

Figure 2-2 shows a system in which storage arrays are administrated using out-of-band management.



**Figure 2-2** Out-of-band Managed Storage Arrays

## 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 12 for an example of a network that uses both types of management methods.)

**Network A** —Out-of-band managed storage array installation with the following components:

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

**Network B** — In-band 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 RAID controllers
2. Continue to “Preparing for a Network Installation” on page 13.

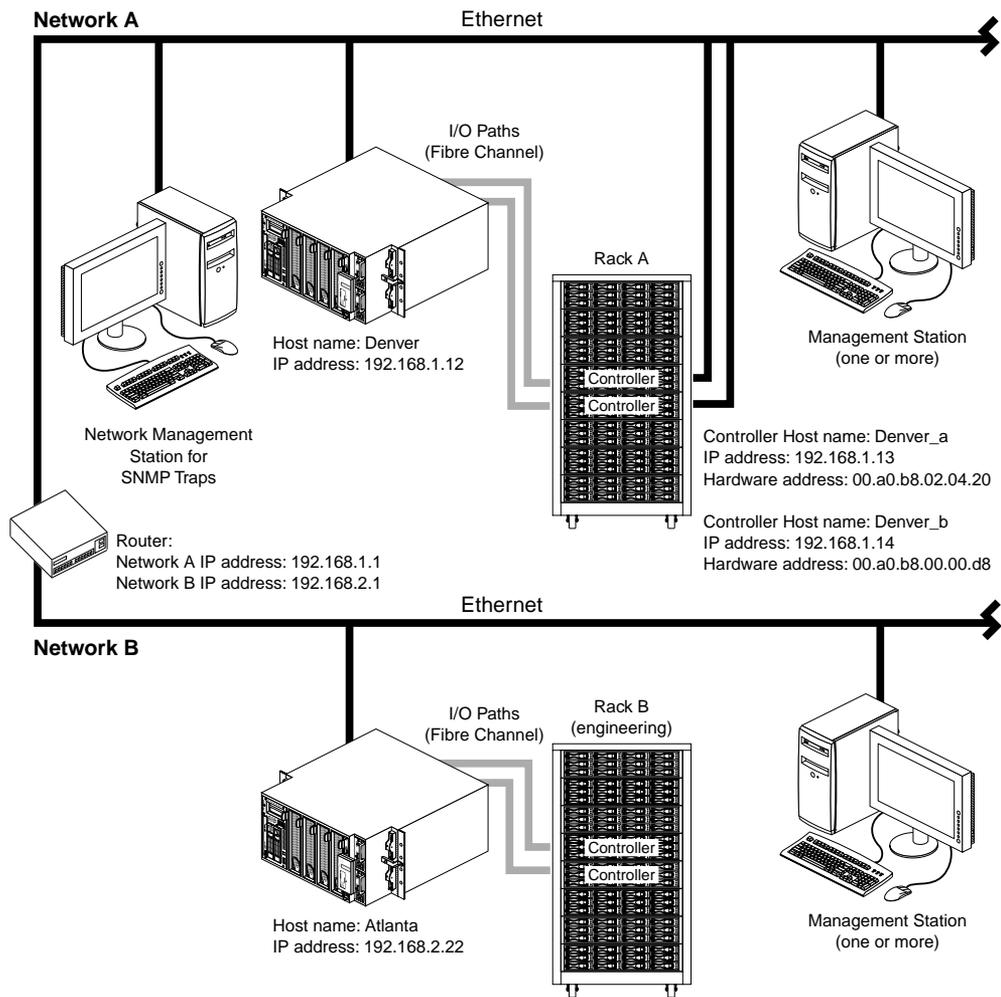


Figure 2-3 Network Using Directly and Host-Agent Managed Storage Arrays

## 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 15), 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 14.

**Note:** Actual installation of network components can be performed using the procedure described in “Network Setup Using the RS-232 Interface” on page 19 (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:
Out-of-band and in-band	1. Install Ethernet connection.	To establish the Ethernet connection.	N/A
Out-of-band and in-band	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 16.
Out-of-band and in-band	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.
Out-of-band	4. Connect a VT100 terminal to the controller <sup>a</sup> .	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 19.
Out-of-band and in-band	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 23.
Out-of-band and in-band	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 in-band managed storage array and a out-of-band managed storage array.

**Table 2-2** Sample Information Record

<b>Storage Array Name</b>	<b>Management Type</b>	<b>Controller A— Ethernet, IP Address, and Host Name</b>	<b>Controller B— Ethernet, IP Address, and Host Name</b>	<b>Host— IP Address and Host Name</b>
Storage array name: <b>perf36</b>	<b>Out-of-band</b>	Ethernet Address: <b>00a0b8020420</b> IP Address: <b>192.168.1.13</b> Host Name: <b>Denver_a</b>	Ethernet Address: <b>00a0b80000d8</b> IP Address: <b>192.168.1.14</b> Host Name: <b>Denver_b</b>	
Storage array name: <b>perf33</b>	<b>In-band</b>			IP Address: <b>192.168.2.22</b> Host Name: <b>Atlanta</b>

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:	<input type="checkbox"/> Out-of-band <input type="checkbox"/> In-band	Ethernet Address:  IP Address:  Host Name:	Ethernet Address:  IP Address:  Host Name:	IP Address:  Host Name:
Name:	<input type="checkbox"/> Out-of-band <input type="checkbox"/> In-band	Ethernet Address:  IP Address:  Host Name:	Ethernet Address:  IP Address:  Host Name:	IP Address:  Host Name:
Name:	<input type="checkbox"/> Out-of-band <input type="checkbox"/> In-band	Ethernet Address:  IP Address:  Host Name:	Ethernet Address:  IP Address:  Host Name:	IP Address:  Host Name:
Name:	<input type="checkbox"/> Out-of-band <input type="checkbox"/> In-band	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 are displayed as <unnamed>. You then can use the SMI 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 15).

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**Note:** Depending on which management method or methods you use, you may need to record the hardware Ethernet address for each RAID controller.

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Do you plan to manage your storage arrays using out-of-band management or in-band-management?

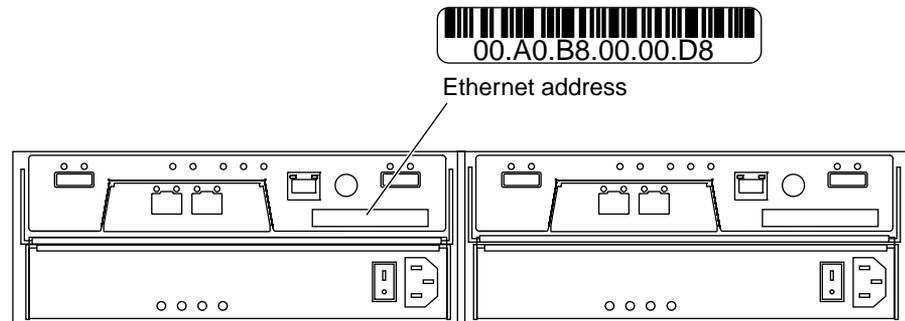
**Out-of-band management** Go to “Identifying the Controller Hardware Ethernet Address” on page 17.

**In-band management** 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 use out-of-band management to manage the storage arrays through Ethernet connections to each controller.

1. 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 2-4 shows the location of the controller's hardware Ethernet address on the SGI InfiniteStorage IS220 RAID controller.
2. Record each Ethernet address in the information record (Table 2-3 on page 15).



**Figure 2-4** Controller Ethernet Address Label

## 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 using out-of-band management and others with in-band management.

**Table 2-4** Management Method

<b>Out-of-band Management Method</b>	<b>In-band Management Method</b>
<ol style="list-style-type: none"><li>1. Assign (or obtain from the network administrator) a unique IP address and associated host name for each storage array controller that you are managing. Record each controller IP address and host name in the information record (Table 2-3 on page 15).</li></ol>	<ol style="list-style-type: none"><li>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 using the in-band method. Record the IP address and host name in the information record (Table 2-3 on page 15).</li></ol>
<ol style="list-style-type: none"><li>2. Go to “Network Setup Using the RS-232 Interface” on page 19.</li></ol>	<ol style="list-style-type: none"><li>2. Go to “Setting Up the DNS or Host Table” on page 23.</li></ol>

## Network Setup Using the RS-232 Interface

The SGI InfiniteStorage 220 storage array enables you to 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
- 9-pin null modem cable with female connectors to attach to the RS-232 port on the controller
- 9-pin DB9 to 6-pin mini-din dongle cable

### 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
```

3. Save the configuration as **console**.
4. Enter **minicom** to connect to the RS-232 port on the controller.
5. Send CTRL-A followed by F to send a BREAK command.

## Windows Systems

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

1. Install the version of HyperTerminal that supports the transmission of a CTRL-BREAK.
2. Select **Start >> Programs >> Accessories >> 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.
3. Enter the desired name in the **Name:** text box and select **OK**. The **Connect to** dialog is displayed.
4. 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.
5. From the **Bits per second:** spinner box, choose the baud rate you will use to send/receive data (for example, 9600). Select **OK**.
6. 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 you will not have to repeat this procedure.

On Windows 2000 systems, perform the following procedure:

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 you will 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 you will 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 the login prompt.
5. Enter the password of **infiniti**.
6. Enter the following:

```
> netCfgSet
```

A list of network configuration options is displayed.

7. Set the configuration values as follows for the SGI InfiniteStorage 220 storage array as follows:

```
My Host Name      : raid129      (sets the name of the controller)
IP Address if0    : 163.154.24.143 (sets the IP address of the controller)
Subnet Mask if0   : 255.255.255.0 (sets the Subnet Mask)
Server Host Name  :
Server IP Address :
Gateway IP Address : 163.154.24.1 (sets the gateway IP address)
Network Init Flags : 0x80      (when set to 0x00 the IP Address is
                                obtained from a DHCP/BOOTP server,
                                when set to 0x80 static IP Address
                                is used)

User Name         :
User Password     :
```

After these values are set, they are written to the controller's non-volatile memory (NVS RAM). No reboot is required. The changes take effect immediately.

8. Verify the changes by entering the following command:

```
netCfgShow
```

- Verify that the following is displayed for the SGI InfiniteStorage 220 storage array:

```
==== CURRENT NETWORK CONFIGURATION ====
My Host Name      : raid129
Interface Name    if0 : esmc0
MAC Address       if0 : 00:a0:b8:24:59:7e
IP Address        if0 : 163.154.24.143
Subnet Mask       if0 : 255.255.255.0
Server Host Name  :
Server IP Address : 0.0.0.0
Gateway IP Address : 163.154.24.1
Network Init Flags : 0x80
User Name         :
User Password     :
```

- Repeat steps 1 through 10 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.

- 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 12), 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

- If you plan to manage storage arrays through a firewall, configure your firewall to open port 2463 to TCP data.
- Refer to Chapter 3, “Installing the SMI Software” for more information.



## Installing the SMI Software

This chapter describes the process installing the SMI Agent and Client software.

### Software Installation Procedures

If you are installing the software on the host, install the Agent, Util, and Runtime software. If you are installing the software on the management workstation, install the Client and Runtime software.

---

**Note:** The installation software includes Java JRE, so it does not matter if your system has an older version of the Java Runtime Environment (JRE) installed, or not installed at all.

---

## Linux Installation

Perform the following procedure to install the SMI software on a Linux system:

1. Ensure that you have root privileges, which are required to install the software.
2. Insert the CD that contains the management software and, if necessary, mount the CD-ROM drive.
3. Install the software packages in the order listed.
  - a. At the system prompt, type the appropriate installation command and press enter. In the following commands, *CDROM* is the mount point of the CD-ROM drive and *build* is the management software version level (for example, 09.10.A8.00-1).

```
> cd /CDROM/rpms/ia64
> rpm -ivh SMIRuntime-build.ia64.rpm
> rpm -ivh SMIclient-build.noarch.rpm
> rpm -ivh SMIagent-build.ia64.rpm
> rpm -ivh SMIutil-build.ia64.rpm
```

---

**Note:** SMIagent and SMIutil should be installed only on the server that will be used for in-band management.

---

- b. At the system prompt, type the appropriate verify command for each installed package and press enter:

```
> rpm -qi SMIRuntime
> rpm -qi SMIclient
> rpm -qi SMIagent
> rpm -qi SMIutil
```

---

**Note:** When removing the SMI software, remove SMIRuntime last, because it has dependencies on the other SMI software products.

---

## Completing the Installation

Use the following procedures to finish installing the SMI software.

### Starting the Main Application Window

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

1. Enter the following:  

```
> smigui
```
2. The GUI client software starts and displays the **Main Application** window and the **Add New Storage Array Window** (Figure 3-1 and Figure 3-2).



Figure 3-1 Main Application Window

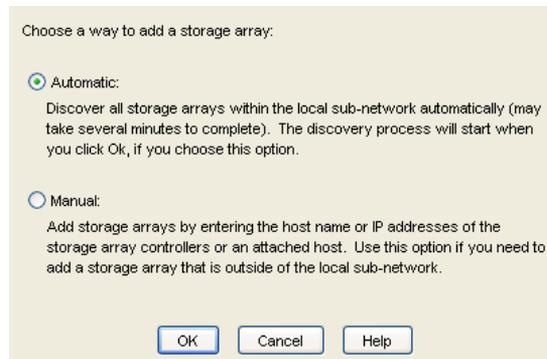
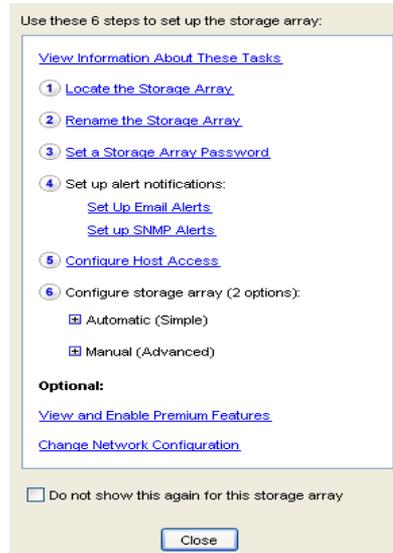


Figure 3-2 SMI Add New Storage Array Window

3. The initial setup dialog is displayed every time you add a storage array or select a storage array from the Storage Array drop down list from the array selector bar.

Select the “Do not show this again for this storage Array” check box to prevent the menu from displaying. You can select tasks from the initial setup dialog to configure your storage array (refer to Figure 3-3).



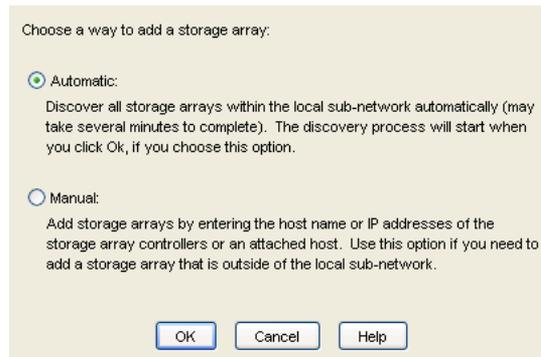
**Figure 3-3** Initial Setup Tasks Dialog

4. The **Add New Storage Array** window launch by default. The first available option, **Add New Storage Array** window, enables 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 enables you to add storage arrays with up to two controllers, or a host that is running the in-band management agent (refer to Figure 3-4).

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

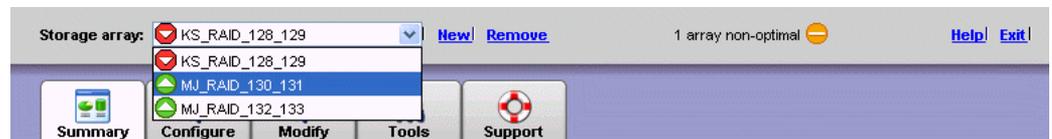
connections to the storage arrays respond to the broadcast. The software discovers out-of-band managed storage arrays if the controllers in those storage arrays respond to the broadcast message.

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



**Figure 3-4** Manual Add Storage Array Dialog

- When the initial automatic discovery is completed, you should see all of the hosts and storage arrays attached to the local subnetwork (refer to Figure 3-5).



**Figure 3-5** Storage Array Drop Down List on the Array Selector Bar

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

- Check the hardware and connections for possible problems (refer to the hardware documentation listed in “Related Publications” on page xii for specific procedures).
- Refer to the **Main Application** window **Help** feature topic “Discovering Storage Arrays.”
- Make sure that the device is on the local subnetwork. If not, click new from the **Array Selector Bar**.

If any device shows a status of **Unresponsive**, click **Refresh** from the **Array Selector Bar**. Refer to the **Main Application** window **Help** feature for instructions on “Recovering from an Unresponsive Storage Array.”

Figure 3-6 shows the information that is displayed under the SMI Summary tab.

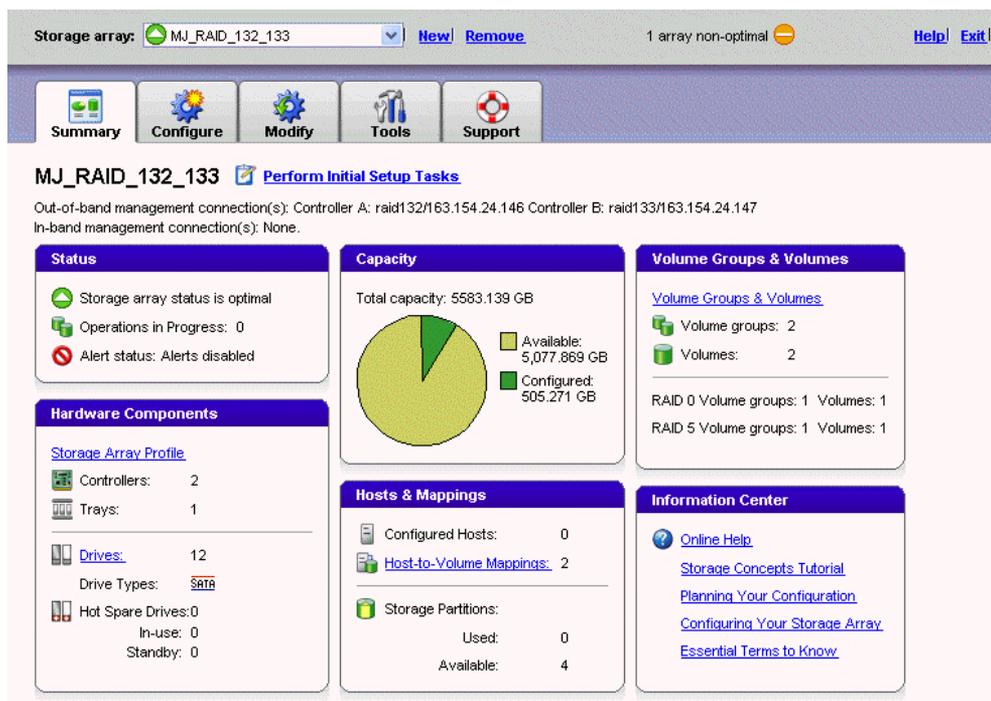


Figure 3-6 SMI Summary Window

## Adding Devices

You might want to add hosts or Storage Arrays outside the local subnetwork. To learn more about this option, refer to the **Main Application** window **Help** feature for instructions on “How to Add a Storage Array.”

---

**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 (see “Starting and Stopping the Host-Agent Software on Linux Systems” on page 35). Then go to the **Main Application** window and click **New** from the **Array Selector Bar**, 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).

---

**Note:** Refer to the **Main Application** window **Help** feature for more information on alert notification options.

---

## Renaming Storage Arrays

When you start the storage management software for the first time, the storage arrays are unnamed. You must use the **Main Application** 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 15. Then, refer the “Renaming Storage Arrays” topic in the **Main Application** window **Help** feature.

## Other Storage Array Setup Tasks

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

- Locating a Storage Array
- Configuring alert notifications
- Configuring a Storage Array password
- Creating and managing volumes and volume groups
- Creating storage partitions (if applicable)

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 setup tasks, refer to the “Configure a Storage Array” topic in the **Main Application** window **Help** feature.

---

---

## Operating System Support

This chapter describes how to: identify volumes by device names, stop and start the SMI, disable and enable the Event Monitor, and how to uninstall the SMI software. This section also explains some restrictions to be aware of when using the SMI software.

### Understanding the Restrictions

Table 4-1 provides information on the restrictions that apply to using the SMI software.

---

**Note:** Always check for a `README` file on the CD-ROM. This `README` file might contain important, late-breaking information that was not available when this Administration Guide 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 CD-ROM for instructions on how to view the release notes.

---

**Table 4-1** SMI Restrictions

Restriction	Workaround
Only a single instance of the GUI client software can run from a host platform	None
The GUI client can not be used to manage mid-range to high-end of storage array products from SGI. For example, SGI InfiniteStorage TP9300, SGI InfiniteStorage TP9500, SGI InfiniteStorage 4500, and SGI InfiniteStorage 4000.	None

---

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

Restriction	Workaround
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 <b>Main Application</b> window does not discover all of the appropriately configured storage arrays on a subnetwork.	Add the devices manually. Refer to the <b>Main Application</b> window <b>Help</b> feature for more information.

## Identifying Volumes by Operating System Device Names

The host-util software includes a utility that lets you see which storage arrays volume is associated with a particular operating system device name. The `smidevices` 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.

To use the utility, enter the following:

```
> smidevices
```

The software displays device identification information. Table 4-2 Table 4-2 shows an example output with a description of each column.

**Table 4-2** Device Identification Information

Entry in Linux	Controller Name	Volume Group	Volume Name	Volume ID (WWN)	Alternate Path
/dev/sdd (/dev/sg3)	[Storage Array KS_RAID_128_129,	Volume 2,	LUN 1,	Volume ID <600a0b800024597e000002d345311e3b>,>	Alternate Path (Controller-B): Not In Use]
/dev/sde (/dev/sg4)	[Storage Array KS_RAID_128_129,	Volume 3,	LUN 2,	Volume ID <600a0b80002459d4000002ee45311e70>,>	Alternate Path (Controller-B): Not In Use]
/dev/sdf (/dev/sg5)	[Storage Array KS_RAID_128_129,	Volume 4,	LUN 3,	Volume ID <600a0b800024597e000002d445311e89>,>	Alternate Path (Controller-B): Not In Use]
/dev/sdg (/dev/sg6)	[Storage Array KS_RAID_128_129,	Volume 5,	LUN 4,	Volume ID <600a0b80002459d4000002f045311ecc>,>	Preferred Path (Controller-B): In Use]
/dev/sdh (/dev/sg7)	[Storage Array KS_RAID_128_129,	Volume 6,	LUN 5,	Volume ID <600a0b800024597e000002d545311edf>,>	Preferred Path (Controller-B): In Use]

## Starting and Stopping the Host-Agent Software on Linux Systems

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

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.

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

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

The host-agent software automatically starts after you reboot the host (if the `smiagent` configuration flag is set to `on`). However, you must start the software manually if you stop it to add storage arrays.

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

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

---

**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 SMI 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 SMI 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 a machine that operates continuously.

---

---

**Note:** If using out-of-band management, only one machine should run the Event Monitor software.

---

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

### Disabling the Event Monitor

Enter the following command to disable the Event Monitor:

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

### Enabling the Event Monitor

Enter the following command to enable the Event Monitor:

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

## Disabling Boot-time Loading of the Event Monitor

Enter the following command to disable boot-time loading of the Event Monitor

```
> chkconfig smimonitor on
```

## Enabling Boot-time Loading of the Event Monitor

Enter the following to enable boot-time loading of the Event Monitor:

```
> chkconfig smimonitor off
```

## Uninstalling the SMI Software

See the `README` file located on the CD-ROM for instructions on removing the storage management software.



---

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