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SGI InfiniteStorage System Manager (ISSM)
Workgroup Edition
Administration Guide

Record of Revision

Version	Description
-001	February 2007
	Original printing.
-002	December 2007
	Changed the product naming convention from SMI to SGI ISSM Workgroup Edition. Also incorporated technical updates.
-003	October 2008
	Engineering technical updates and enhancements.

Contents

Figures

Tables

About This Guide

This guide provides information on preparing, installing, configuring, and starting SGI InfiniteStorage System Manager (ISSM) Workgroup Edition software 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 ISSM-WE software.

When you have finished the entire installation process, refer to the online Help system, which contain 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 ISSM-WE software
- Understand the two different storage array management methods
- Learn about hardware and software requirements
- Follow procedures to install the ISSM-WE software

Structure of this Guide

This guide contains the following chapters:

- Chapter 1, "Introduction" — Introduces the SGI InfiniteStorage System Manager (ISSM) 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 ISSM-WE software.

- Chapter 3, "Installing the ISSM-WE Software" — Describes the procedures for installing the ISSM-WE Runtime, Agent, Client and Utilities software.

- Chapter 4, "Operating System Support" — Describes how to: identify volumes by device names, stop/start and disable/enable the Agent, stop/start and disable/enable the Event Monitor, and how to uninstall the ISSM-WE software. This section also explains some restrictions to be aware of when using the ISSM-WE 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 Initial Setup Guide,* publication number 007-4938-00*x*
  A complete initial setup guide for the SGI InfiniteStorage 220 that gives an overview of all components of the storage array subsystem.

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Introduction

This chapter introduces the SGI InfiniteStorage System Manager (ISSM) Workgroup Edition application, and provides information about hardware, software, and operating system requirements for the installation. ISSM-WE is a Java-based graphical interface for configuring and monitoring SGI InfiniteStorage 220 RAID systems.

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

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 ISSM-WE GUI client provides the graphical user interface for managing storage arrays. It features the following components:

- The ISSM-WE CLI client provides the command line interface for managing storage arrays.

- The ISSM-WE Event monitor is packaged with ISSM-WE 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 ISSM-WE 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 36.

The Runtime Software

The ISSM-WE 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
SMWEclient	- Management work station - Host	Management workstations: - 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. 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.
SMWEagent	- Host	Install the host-agent software if you plan to manage the storage arrays with the agent software.
SMWEutil	- Host	The host-util software includes the `devices` utility. This utility enables you to associate volumes with operating system device names.
SMWEruntime	- Management workstation - Host	Installation of the runtime software is a prerequisite to install ISSM-WE Client, Agent, and Util.

Figure 1-1 shows an example of a typical storage array configuration.
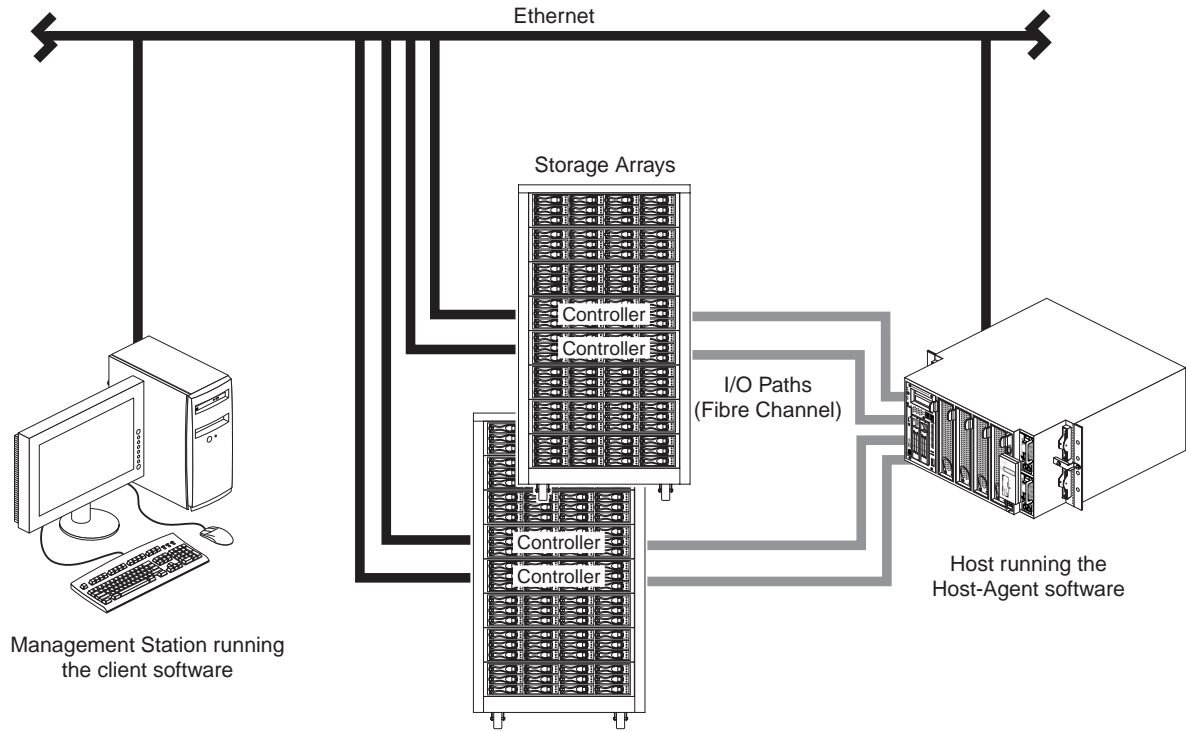
Figure 1-1   Typical Storage Management Configuration

System Requirements

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

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

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-ROM

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

Table 1-3   Hardware Requirements

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

Preparing for Installation

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

The Installation Process

The installation process involves the following:

- Deciding on either in-band management or our-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 ISSM-WE software ("Software Installation Procedures" on page 23)

- Completing the installation ("Completing the Installation" on page 28).

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.
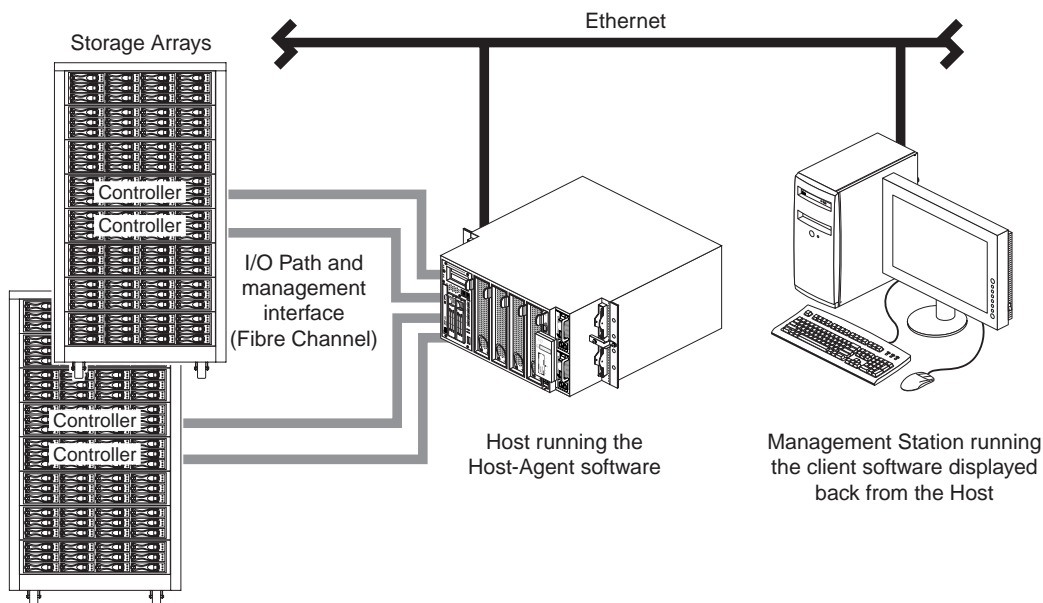
Figure 2-1   In-band Managed Storage Arrays

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 DVD-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.
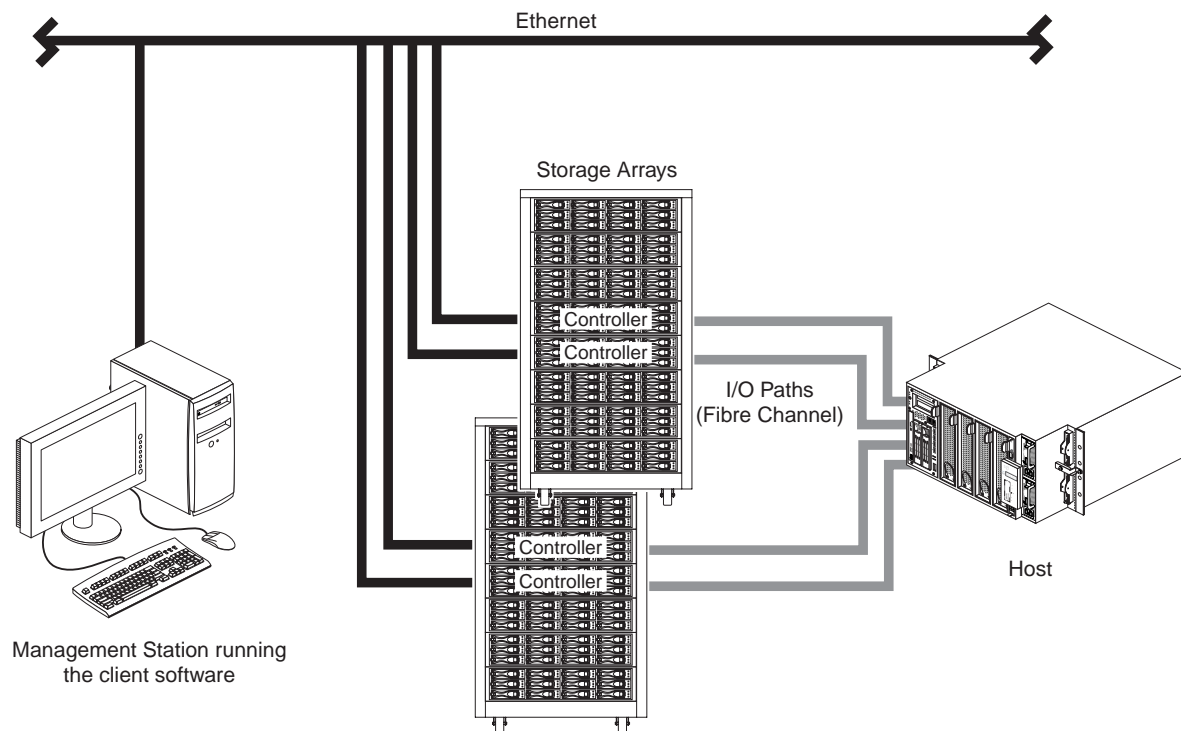
Figure 2-2   Out-of-band Managed Storage Arrays

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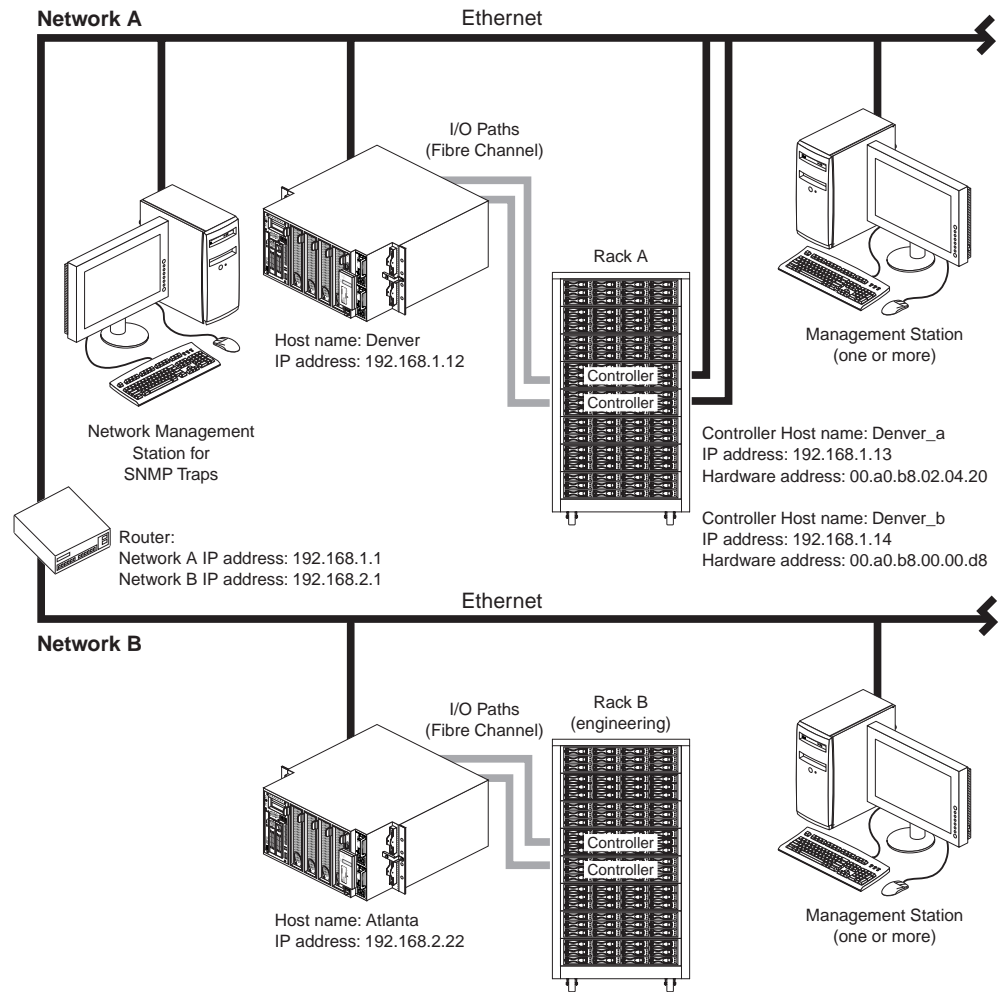
Figure 2-3   Network Using Directly and Host-Agent Managed Storage Arrays

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[a].	To allow 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 22.
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

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**	**Out-of-band**	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**	**In-band**			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:	___ Out-of-band ___ In-band	Ethernet Address: IP Address: Host Name:	Ethernet Address: IP Address: Host Name:	IP Address: Host Name:
Name:	___ Out-of-band ___ In-band	Ethernet Address: IP Address: Host Name:	Ethernet Address: IP Address: Host Name:	IP Address: Host Name:
Name:	___ Out-of-band ___ In-band	Ethernet Address: IP Address: Host Name:	Ethernet Address: IP Address: Host Name:	IP Address: Host Name:
Name:	___ Out-of-band ___ 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 ISSM-WE 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).

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

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).
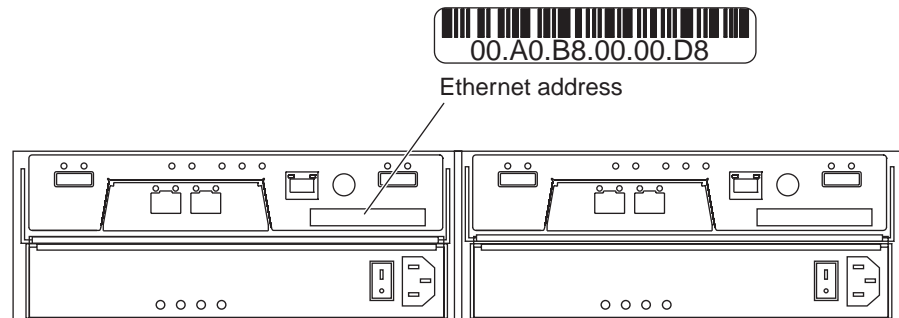
Figure 2-4   Controller Ethernet Address Label

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

Out-of-band Management Method	In-band Management Method
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).	**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).
2. Go to "Network Setup Using the RS-232 Interface" on page 19.	**2.** Go to "Setting Up the DNS or Host Table" on page 22.

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 converter 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.

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.

    a. For controller firmware versions less than 7.35

       Enter the password of **`infiniti`**

    b. For controller firmware equal to or greater than 7.35

       Enter the login of **`shellUsr`**

       Enter the password of **`wy3oo&w4`**

5. Enter the following:

   > **`netCfgSet`**

   A list of network configuration options is displayed.

   The main ones to change/set are **IP Address**, **Subnet Mask**, and **`Gateway IP Address`**.

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

6. Use the following command to verify the changes:

   > **`netCfgShow`**

7. 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 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

2. If you plan to manage storage arrays through a firewall, configure your firewall to open port 2463 to TCP data. This is only applicable when using the in-band management method

3. Refer to Chapter 3, "Installing the ISSM-WE Software" for more information.

Installing the ISSM-WE Software

This chapter describes the process installing the ISSM-WE Host and Client software.

Note: If the management software product named TPSSM is installed, you must remove the TPSSM software management software in order to be able to install the ISSM-WE management software.

Note: If the management software product named SMI is installed, you must remove the SMI storage management software in order to be able to install the ISSM-WE management software.

Software Installation Procedures

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

Note: The installation software includes Java Runtime Environment (JRE), so it does not matter if your system has an older or newer version of the JRE installed, or no JRE installed at all.

Linux Installation

Perform the following procedure to install the ISSM-WE software on a Linux system.

1. Ensure that you have root privileges, which are 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 commands making sure to specify the **<machine-arch>** (where **<machine-arch>** refers to i386 (x86) 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 SMWEruntime-LINUX-<build>.<arch>.rpm
      > rpm -ivh SMWEesm-LINUX-<build>.noarch.rpm
      > rpm -ivh SMWEclient-LINUX-<build>.noarch.rpm

   b. If installing Host management software.

      > rpm -ivh SMWEruntime-LINUX-<build>.<arch>.rpm
      > rpm -ivh SMWEagent-LINUX-<build>.<arch>.rpm
      > rpm -ivh SMWEutil-LINUX-<build>.<arch>.rpm

5. To verify the installation, type the following command-line for each of the installed RPM software packages and press enter:
      > **rpm -qi** *SMWE***runtime**
      > **rpm -qi** *SMWE***esm**
      > **rpm -qi** *SMWE***client**
      > **rpm -qi** *SMWE***agent**
      > **rpm -qi** *SMWE***util**

Note: When removing the ISSM-WE software, remove SMWEruntime last, because it has dependencies on the other ISSM-WE software products.

Note: Prior to removing the SMWEclient software, you must also remove the SMWEesm software.

Windows Installation

Perform the following procedure to install the ISSM-WE software on a Windows system.

1. Ensure that you have administrative privileges, which are required to install the software.

2. Insert the DVD that contains the management software.

3. Using explorer navigate to the <dive>:\installers folder.

4. From the **installers** folder, double-click SMIA-WS<arch>-<build>.exe

Note: Please refer to the **installers\Readme.txt** file which contains information on which SMIA-WS<arch>-<build>.exe should be used for specific Windows operating system versions as well as system CPU architecture.

The installation options are:

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

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

5. Select the applicable installation option, and click Next. If you selected Custom, a list of selectable software products will be displayed. For example,

   - System Manager Client

   - System Manager Utilities

   - System Manager Agent

   - Failover Driver

   - Java Access Bridge

   Deselect or select the applicable software products, and click Next.

   Note: The Utilities, Agent, and Failover Driver installation is only applicable for server based platforms, running Window Server operating system.

6. Select the "Automatically Start" or "Do not Automatically" start Monitor radio button, and click Next.

   Note: If using out-of-band (network) management method, the Monitor service should only be started on a specific management station.

7. Enter the installation folder location, or use defaults, and client Next.

8. Review the **Pre-Installation Summary** dialog content. If changes are needed then click Previous. If no change are needed, then click Install.

9. The installation process starts.

Completing the Installation

Use the following procedures to finish installing the ISSM-WE 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:

   > **smwegui**

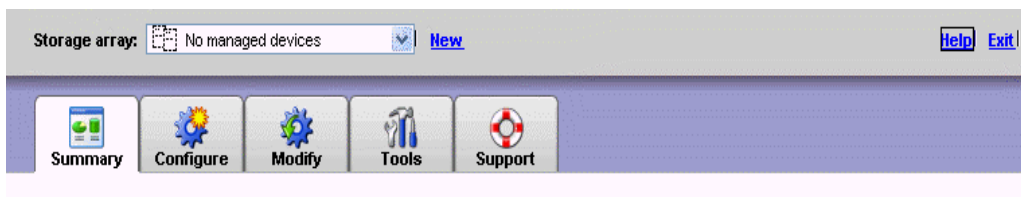2. The GUI client software starts and displays the **Main Application** window and the **Add New Storage Array Window** (Figure 3-1 and Figure 3-2).

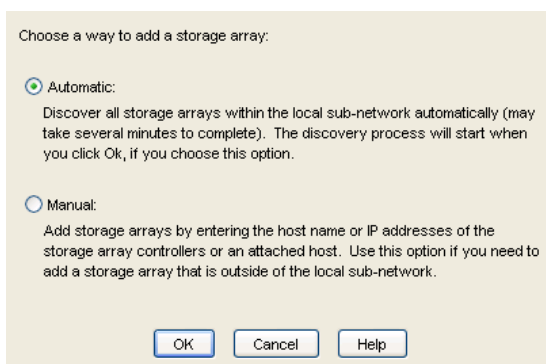**Figure 3-1**   Main Application Window

Figure 3-2   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).
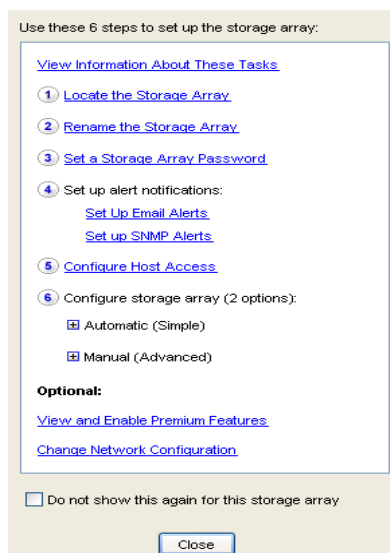

Use these 6 steps to set up the storage array:

View Information About These Tasks

① Locate the Storage Array

② Rename the Storage Array

③ Set a Storage Array Password

④ Set up alert notifications:
   Set Up Email Alerts
   Set up SNMP Alerts

⑤ Configure Host Access

⑥ Configure storage array (2 options):
   ⊞ Automatic (Simple)
   ⊞ Manual (Advanced)

Optional:

View and Enable Premium Features

Change Network Configuration

☐ Do not show this again for this storage array

Close

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.
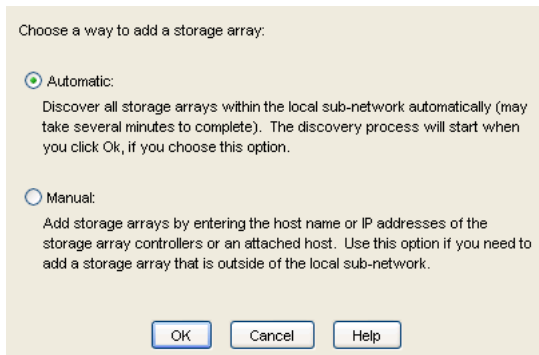

Figure 3-4   Manual Add Storage Array Dialog

5.   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).
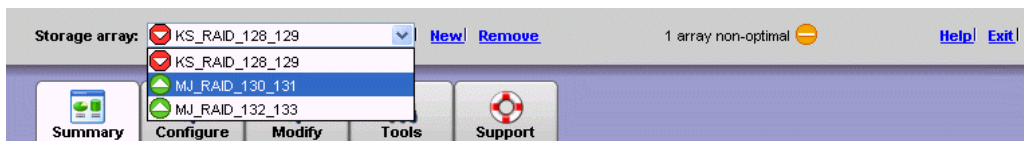

Figure 3-5   Storage Array Drop Down List on the Array Selector Bar

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 Summary tab.
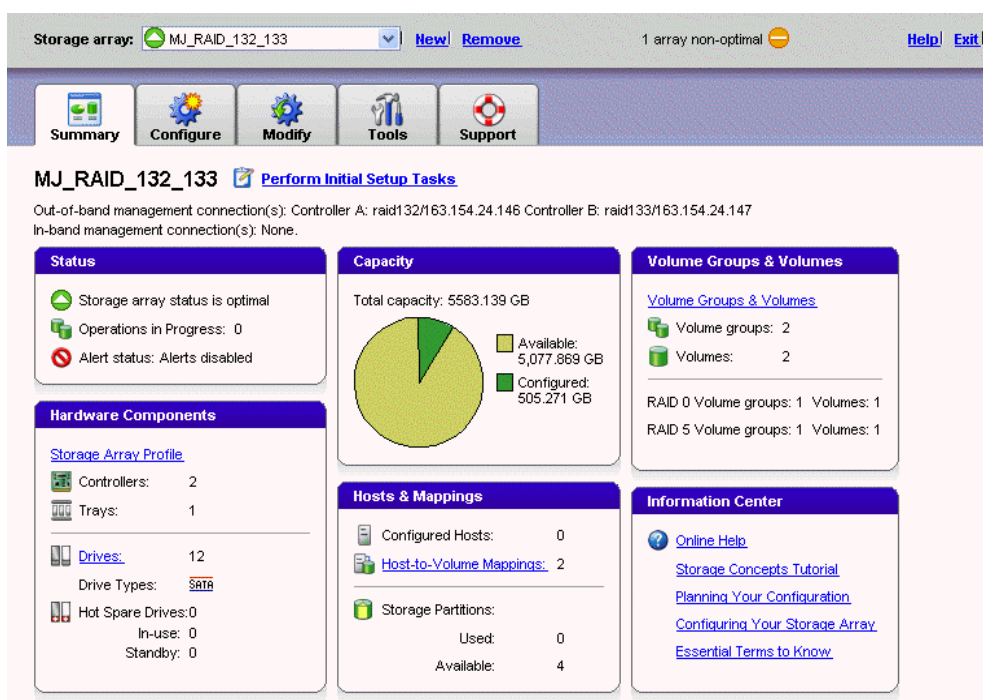
Figure 3-6   ISSM-WE Summary Window

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 38). 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/start and disable/enable the Agent, stop/start and disable/enable the Event Monitor, and how to uninstall the ISSM-WE software. This section also explains some restrictions to be aware of when using the ISSM-WEsoftware.

Understanding the Restrictions

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

Note: Always check for a README file on the DVD-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 DVD-ROM for instructions on how to view the release notes.

Table 4-1   ISSM-WE Software Restrictions and Workarounds

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 storage array products from SGI. For example, SGI InfiniteStorage TP9300, SGI InfiniteStorage TP9500, SGI InfiniteStorage TP9700, SGI InfiniteStorage 4000, SGI InfiniteStorage 4500 and SGI InfiniteStorage 4600	None

Table 4-1   ISSM-WE Software Restrictions and Workarounds **(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 **Main Application** window does not discover all of the appropriately configured storage arrays on a subnetwork.	Add the devices manually. Refer to the **Main Application** window **Help** 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 utilities command (`smwedevices`) 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 Linux systems, to use the utility enter the following:

```
> smwedevices
```

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

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

> cd [drive:]<installer_folder>\SMWE\util

> SMdevices

Where <installer_folder> is the location were the management software was installed.

The software displays device identification information. Table 4-2 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	Volume Name	Volume ID (WWN)	Alternate Path
/dev/sg3	[Storage Array KS_RAID_128_129,	Volume 2,	LUN 1,	Volume ID <600a0b800024597e000002d345311e3b>,	Alternate Path (Controller-B): Not In Use]
/dev/sg4	[Storage Array KS_RAID_128_129,	Volume 3,	LUN 2,	Volume ID <600a0b80002459d4000002ee45311e70>,	Alternate Path (Controller-B): Not In Use]
/dev/sg5	[Storage Array KS_RAID_128_129,	Volume 4,	LUN 3,	Volume ID <600a0b800024597e000002d445311e89>,	Alternate Path (Controller-B): Not In Use]
/dev/sg6	[Storage Array KS_RAID_128_129,	Volume 5,	LUN 4,	Volume ID <600a0b80002459d4000002f045311ecc>,	Preferred Path (Controller-B): In Use]
/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

Note: When you add or remove storage arrays, you must stop, then restart the host-agent service.

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/smweagent stop
```

The host-agent software automatically starts after you reboot the host (if the smweagent 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/smweagent start
```

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

On Windows 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, open the **Services** applet. To stop a service select the **ServiceName** (SMWEAgent), 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 stop a service select the **ServiceName** (SMWEAgent), then from the **Service Status** pane select **Start** button, then select the **Apply** button.

Note: To open Service applet, click **Start**, click **Control Panel**, 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/remove storage array(s).

Note: It might take several minutes for the host-agent service process to complete.

Disabling and Enabling the Event Monitor

The Event Monitor, which is packaged with ISSM-WE 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-WE 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

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

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

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

Note: To open the Service applet, click **Start**, click **Control Panel**, double-click **Administrative Tools**, and then double-click **Services**.

Enabling the Event Monitor

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

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

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

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

Disabling Boot-time Loading of the Event Monitor

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

```
> chkconfig smwemonitor off
```

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

Note: To open the Service applet, click **Start**, click **Control Panel**, 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 smwemonitor on
```

Note: The Event Monitor service will not be started if the `chkconfig` service state is not set to **on**. Please refer to the **CHKCONFIG** man page for additional information.

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

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

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

Uninstalling the ISSM-WE Software

Please refer to the `EADME` file located on the DVD-ROM for instructions on removing the storage management software.

Index