

User Guide

# hp OpenView storage management appliance software

**Product Version:** 2.1

Fourth Edition (October 2003)

**Part Number:** AA-RS0AD-TE

This guide describes how to configure and use the HP OpenView Storage Management Appliance software v2.1.



i n v e n t

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Storage Management Appliance Software User Guide  
Fourth Edition (October 2003)  
Part Number: AA-RSOAD-TE



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## about this guide

This guide provides information to help you:

- Understand the user interface
- Configure the Storage Management Appliance (SMA) software
- Use the Storage Management Appliance software core features

“About this Guide” topics include:

- [Overview](#), page x
- [Conventions](#), page xii
- [Rack Stability](#), page xiv
- [Getting Help](#), page xv

## Overview

This section covers the following topics:

- [Intended Audience](#)
- [Prerequisites](#)
- [Related Documentation](#)

## Intended Audience

This book is intended for use by storage and system administrators who are experienced with managing storage area networks (SANs).

## Prerequisites

Before you install this update, you must have Storage Management Appliance software v1.0C (January 2002 update) or v2.0 installed.

## Related Documentation

Refer to the following documentation for information about the Storage Management Appliance software v2.1:

- *HP OpenView Storage Management Appliance Software Update Installation Card*
- *HP OpenView Storage Management Appliance Software Release Notes*
- *HP OpenView Storage Management Appliance Software Using Backup Software Application Notes*
- *HP OpenView Storage Management Appliance Software Using Antivirus Software Application Notes*
- *HP OpenView Storage Management Appliance Software Event Code Definitions Application Notes*
- *HP OpenView Storage Management Appliance Software High Availability Application Notes*
- *HP OpenView Storage Management Appliance Software Using Multiple Storage Management Appliances in a SAN Application Notes*
- *HP OpenView Storage Management Appliance Software Using System Management Software Application Notes*

- *HP OpenView Storage Management Appliance Software Using Uninterruptible Power Supply Software Application Notes*
- *HP OpenView Using Storage Area Manager on the Storage Management Appliance Application Notes*
- *HP StorageWorks SAN Design Reference Guide*
- *HP OpenView Automation Manager Script Development Guide*
- *HP StorageWorks HSG Element Manager User Guide*
- *HP StorageWorks HSG Element Manager Release Notes*
- *HP StorageWorks Command View EVA Getting Started Guide*
- *HP StorageWorks Command View EVA Release Notes*
- HP OpenView Storage Management Appliance software online help

Additional information, including white papers and best-practices documents, is available from the HP website at

<http://h18006.www1.hp.com/products/sanworks/managementappliance/documentation.html>.

The online help system provided with the Storage Management Appliance software provides detailed information and procedures for using every system feature. Refer to the online help for troubleshooting advice, as well. The purpose of this User Guide is to summarize and supplement information found in the online help system. Unlike the online help, this guide presents information in chapters that address general user needs.

## Conventions

Conventions consist of the following:

- [Document Conventions](#)
- [Text Symbols](#)
- [Equipment Symbols](#)

## Document Conventions

The document conventions included in [Table 1](#) apply in most cases.

**Table 1: Document Conventions**

Element	Convention
Cross-reference links	Blue text: <a href="#">Figure 1</a>
Key and field names, menu items, buttons, and dialog box titles	<b>Bold</b>
File names, application names, and text emphasis	<i>Italics</i>
User input, command and directory names, and system responses (output and messages)	Monospace font COMMAND NAMES are uppercase monospace font unless they are case sensitive
Variables	<monospace, italic font>
Website addresses	Blue, underlined sans serif font text: <a href="http://www.hp.com">http://www.hp.com</a>

## Text Symbols

The following symbols may be found in the text of this guide. They have the following meanings:



**WARNING:** Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

---



**Caution:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

---

---

**Note:** Text set off in this manner presents commentary, sidelights, or interesting points of information.

---

## Equipment Symbols

The following equipment symbols may be found on hardware for which this guide pertains. They have the following meanings:



Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

**WARNING:** To reduce the risk of injury from electrical shock hazards, do not open this enclosure.

---



Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

**WARNING:** To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

---



Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

**WARNING:** To reduce the risk of injury from a hot component, allow the surface to cool before touching.

---



Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

**WARNING:** To reduce the risk of injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.

---



Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

**WARNING:** To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.

---

## Rack Stability

Rack stability protects personnel and equipment.

---



**WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
  - The full weight of the rack rests on the leveling jacks.
  - In single rack installations, the stabilizing feet are attached to the rack.
  - In multiple rack installations, the racks are coupled.
  - Only one rack component is extended at any time. A rack may become unstable if more than one rack component is extended for any reason.
-

## Getting Help

If you still have a question after reading this guide and consulting the online help system, contact an HP authorized service provider or access our website:

<http://www.hp.com>.

## HP Technical Support

Telephone numbers for worldwide technical support are listed on the following HP website: <http://www.hp.com/support/>. From this website, select the country of origin.

---

**Note:** For continuous quality improvement, calls may be recorded or monitored.

---

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

## HP Storage Website

The HP Storage website has the latest information on this product, as well as the latest updates and drivers. Select the appropriate product or solution at:

<http://www.hp.com/country/us/eng/prodserv/storage.html>.

## HP Authorized Reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP website for locations and telephone numbers:  
<http://www.hp.com>.





# Understanding the Storage Management Appliance Software



This chapter describes basic features of the Storage Management Appliance software v2.1, including the following:

- [Software Features](#), page 2
- [Logging On](#), page 4
- [Home Page](#), page 9
- [Getting Started Page](#), page 10
- [Tools Page](#), page 11
- [Devices Page](#), page 12
- [My Links Page](#), page 13
- [hp.com Link](#), page 13
- [User Interface Features](#), page 14
- [Security Features](#), page 21

## Software Features

The Storage Management Appliance software provides a central, host-independent, unobtrusive way to manage and monitor your storage elements. These elements include devices such as switches, hubs, and RAID arrays and the management applications that control them. You can use the SMA as a single point of management for all SAN applications and devices.

Since the Storage Management Appliance is located outside the data path, it performs management functions without involving host computers. Data transfers proceed independently between computers and storage devices. The SMA provides the following SAN-wide functions:

- Monitors storage elements for failure, warning, and informational events.
- Manages elements and accounting services for storage devices.

The core services of the updated Storage Management Appliance software include the following:

- **Security**—Provides network security features for domain and workgroup memberships as well as SMA users.
- **Application Installer**—Installs and removes optional HP storage management applications with an installation wizard.
- **Element Managers**—Launches the appropriate element manager for controlling your HSG or HSV-based storage systems.
- **Management Agents**—Provides tools for managing the hardware devices of your SMA.
- **Automation**—Automates the management of your SAN through the use of policies.
- **Remote Access**—Provides logon information required for communication between management applications.
- **Event/Notification**—Sets up notification settings for specific events so your users are kept aware of important activity in the SAN.
- **Discovery**—Uses IP address ranges to discover and identify storage elements in the SAN.

- **Auditing**—Logs activities on the Storage Management Appliance, so you can see which users performed which activities.
- **Backup/Restore**—Backs up your Management Appliance specific data (database and application files).

In addition to these core services, you may purchase optional HP storage management applications. If you have any of the following HP storage management applications installed, you can access them through the **Tools** page of the Storage Management Appliance software.

- HP StorageWorks Business Copy EVA
- HP StorageWorks Continuous Access EVA
- HP StorageWorks Secure Path Manager
- HP OpenView Storage Area Manager
- HP OpenView Storage Provisioner
- HP SANworks Network View

---

**Note:** Storage Area Manager cannot be installed on the same system that has Network View installed.

---

## Logging On

You can log on to the Storage Management Appliance from any computer on your network using IP addressing.

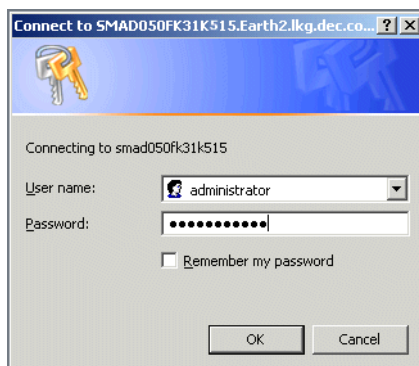
1. Open a supported Web browser.

See the HP OpenView Storage Management Appliance software v2.1 QuickSpecs for supported browsers and operating systems. The QuickSpecs are available at the following website:

<http://h18006.www1.hp.com/products/sanworks/managementappliance/specifications.html>

2. Enter the Storage Management Appliance IP address or name in the browser's location bar and press **Enter**.

The SMA logon dialog box prompts you for your logon information (Figure 1).



**Figure 1: Storage Management Appliance software logon**

3. Enter your user name and password and click **OK** to display the Storage Management Appliance **Home** page. You should receive your user name and password from the system administrator or user assigned the Administrator privilege level.

After installing the v2.1 update, you can log on with the same administrator user name and password that you used with the prior version of the Storage Management Appliance. Unless it was changed during operation of the prior version, the administrator logon information consists of the following defaults:

**User name:** administrator

**Password:** adminxxxxxx

where <xxxxxx> is the last six characters of the Storage Management Appliance serial number in reverse order. For example, with a serial number of D136FK31K069, the default password would be admin960K13. Note that the password is case sensitive and any letters in the serial number must be entered as uppercase. The serial number is located on the front panel of the Storage Management Appliance.

---

**Note:** To maintain system security you should change the administrator password as soon as possible. Be sure the latest password can be retrieved by authorized personnel.

---

## Logging On to the System Management Home Page

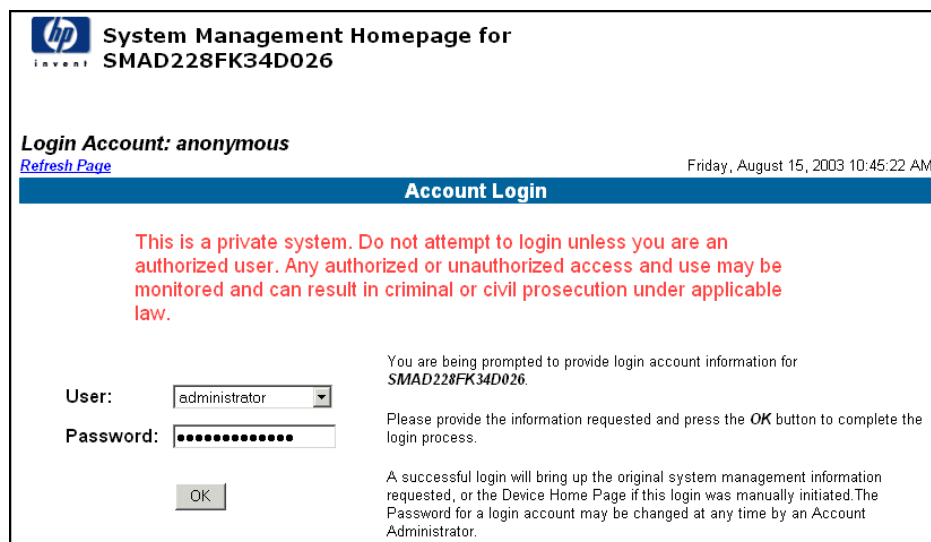
The following value-added HP storage management applications, device managers, and core services use the System Management Web server. This is an HP proprietary Web server that, in some cases, requires you to log on separately:

- HP StorageWorks Business Copy EVA
- HP StorageWorks Continuous Access EVA
- HP StorageWorks Secure Path Manager
- HP OpenView Storage Provisioner
- HP SANworks Network View
- HP StorageWorks HSG Element Manager
- HP StorageWorks Command View EVA
- Automation core service

When initially launching these applications and the Automation core service, the SMA software eliminates the separate logon. However, after a service is launched, there are two situations where you might be required to log back on to the Web server:

- If the HTTP session times out.
- If the Web server gets restarted for any reason (which may occur if an application installation is in progress).

If either of these situations occur, then the System Management logon page opens (Figure 2).



**Figure 2: HP System Management logon screen**

You will need to use the System Management logon information to access the application again. The default settings are as follows:

User—**administrator**

Password—**administrator**

The user name and password are case sensitive.

Alternatively, you can close all the application browser windows and launch them again using the **Tools** or **Devices** page.

## Browser Configuration

To optimize performance, HP recommends you configure your Web browser to disable caching. This ensures that the browser displays the most current data.

### Configuring Internet Explorer

To use Internet Explorer (IE), configure the browser to reload pages automatically to prevent the browser from caching information.

To configure Internet Explorer:

1. Choose **Start > Settings > Control Panel > Internet Options**.  
The **Internet Properties** dialog box is displayed.
2. Click **Settings** under Temporary Internet files on the General tab.
3. Click **Automatically**.
4. Click **OK**.

### Clearing the IE Browser Cache Manually

To clear the IE browser cache manually, press the **Shift** key and click **Refresh** on the IE browser toolbar. HP recommends clearing the cache each time you log on to the SMA.

### Configuring Netscape Navigator

To use Netscape Navigator, configure the browser to clear the cache every time the browser is launched.

To configure Netscape Navigator from Windows 2000:

1. Choose **Edit > Preferences** from the Netscape browser toolbar.  
The **Preferences** window opens.
2. Expand the **Advanced** option.
3. Click **Cache**.
4. Click **Every time**.
5. Click **OK**.

## Clearing the Netscape Navigator Browser Cache Manually

To clear the Netscape Navigator browser cache manually:

1. Choose **Edit > Preferences** from the Netscape browser toolbar.  
The **Preferences** window opens.
2. Expand the **Advanced** option.
3. Click **Cache**.
4. Click **Clear Memory Cache** and **Clear Disk Cache**.
5. Click **OK**.

## Configuring Netscape Navigator for Linux Operations

To ensure that the Storage Management Appliance software is displayed properly in a Netscape Navigator browser for a Linux operating system:

1. Choose **Edit > Preferences** from the Netscape browser toolbar.  
The **Fonts** dialog box is displayed.
2. Click **Fonts** under the Appearance option.
3. Click **Use document-specified fonts, but disable Dynamic Fonts**.
4. In the Variable Width Font and Size boxes:
  - a. Select **Helvetica** or a **Sans-serif** font.
  - b. Set the size to **10**.
5. Expand the **Advanced** option.
6. Click **Proxies**.  
The **Proxies** dialog box opens.
7. Click **Automatic proxy configuration**.
8. Enter the proxy configuration URL.
9. Click **OK**.



## Home Page

After successful login, the Storage Management Appliance software **Home** page opens (Figure 3). This page contains links to several of the SMA's most useful features:

- Getting Started
- Tools
- Devices
- My Links
- hp.com

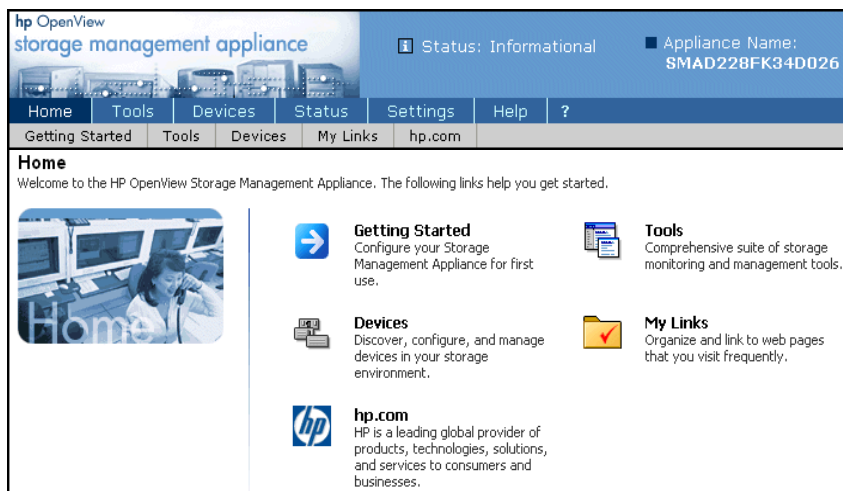
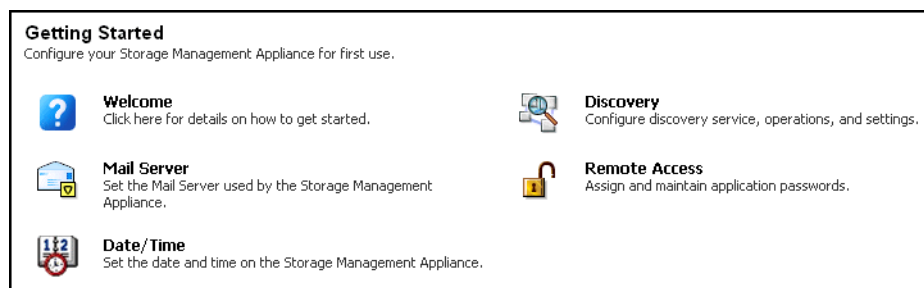


Figure 3: Storage Management Appliance software home page

## Getting Started Page

The **Getting Started** page (Figure 4) provides a convenient set of links to help you prepare your Storage Management Appliance software for use. Most links on the **Getting Started** page are also available from the **Settings** page.



**Figure 4: Getting Started page**

To set up the Storage Management Appliance software v2.1 for first use, you might need to adjust the following initial settings:

**Discovery**—Set up and schedule a discovery so that your Storage Management Appliance software is aware of all your storage elements. See Chapter 4, “[Discovering Devices and Applications](#)” on page 45 for more information.

The Storage Management Appliance automatically performs an initial discovery during installation of the update.

**Mail Server**—Specify the mail server used for sending e-mail notifications to users when certain events occur. This setting is only necessary when you use the Storage Management Appliance notification features. See “[Mail Server Settings](#)” on page 38 for more information.

**Remote Access**—Create and manage access profiles used by one management application to initiate communication with another management application. See “[Remote Access](#)” on page 36 for more information.

**Date/Time**—Set the date and time for the Storage Management Appliance software. See “[Date and Time Settings](#)” on page 37 for more information. The default time zone is Mountain Time.

**Migrate Notification Settings**—Import previous notification settings into the Storage Management Appliance software v2.1. This option is only available when the system detects previous event notification settings. See [Appendix A](#) “[Migrating Event Notification Settings](#)” on page 83 for more information.

## Tools Page

The **Tools** page lets you launch any value-added HP storage management applications that you have installed on your system, which can include:

- HP StorageWorks Business Copy EVA
- HP StorageWorks Continuous Access EVA
- HP StorageWorks Secure Path Manager
- HP OpenView Storage Area Manager
- HP OpenView Storage Provisioner
- HP SANworks Network View

---

**Note:** Storage Area Manager cannot be installed on the same system that has Network View installed.

---

**Figure 5** shows a sample **Tools** page. Each of the installed applications opens in its own separate browser window.



**Figure 5: Tools page**

---

**Note:** When any of these applications is launched, a Security Alert dialog box opens. Click **Yes** to proceed with using the application.

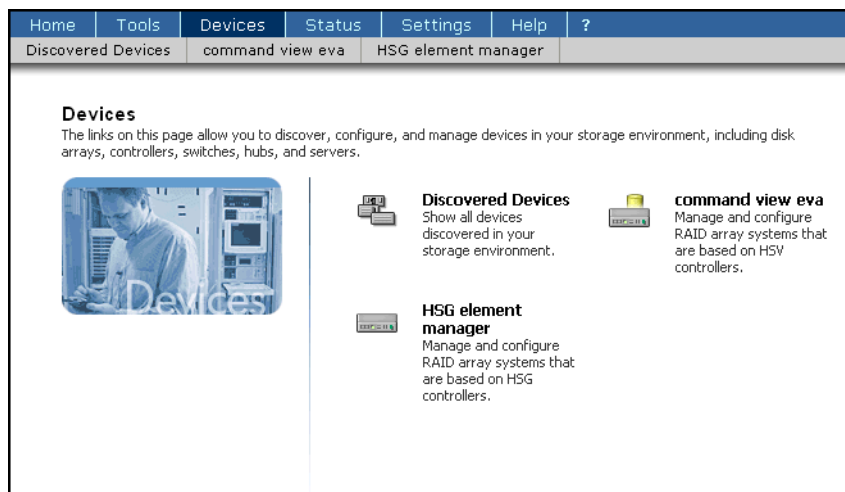
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For more information about installing value-added applications, see “[Installing Software](#)” on page 75.

## Devices Page

The **Devices** page (Figure 6) lets you organize, visualize, configure, and monitor your SAN storage devices. It contains links to the following:

- **Discovered Devices**—Lists devices found by all IP discoveries.
- **Command View EVA**—Launches the element manager for managing HSV controller-based RAID arrays.
- **HSG Element Manager**—Launches the element manager for managing HSG controller-based RAID arrays.



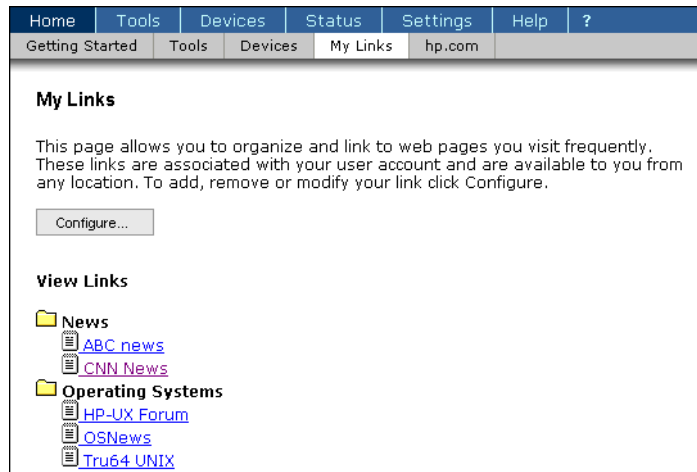
**Figure 6:** Devices page

**Note:** When Command View EVA or the HSG Element Manager is launched, a Security Alert dialog box opens. Click **Yes** to proceed with using the element manager. You can opt to view and install the certificates to establish a permanent trust relationship between the SMA and the element manager.

For more information, see [Chapter 3, “Discovering Devices and Applications”](#) on page 45.

## My Links Page

The My Links feature lets you set up links to Internet or intranet sites you visit frequently. These links are specific to your user logon and display whenever you log on regardless of your physical location. [Figure 7](#) shows a configured **My Links** page.



**Figure 7: My Links page example**

For more information on using My Links, see the Storage Management Appliance online help.

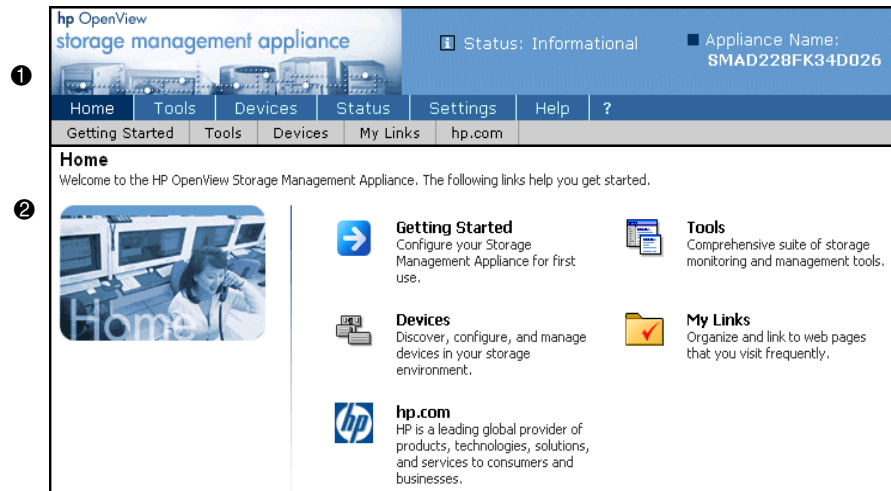
## hp.com Link

The hp.com link connects to the Storage Management Appliance website where you can obtain more information and technical assistance for the SMA and related products. The website page opens in a separate browser window.

## User Interface Features

This section describes elements and navigational features of the Storage Management Appliance user interface.

The Storage Management Appliance window is divided into two panes—**Session** and **Content** panes (Figure 8).



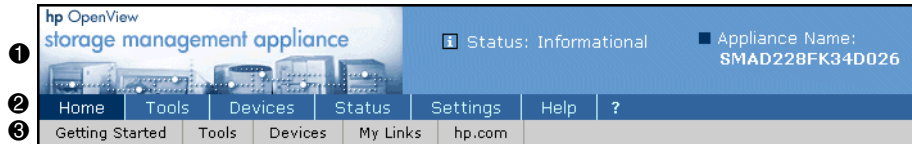
**Figure 8: Storage Management Appliance user interface**

① Session Pane

② Content Pane

## Session Pane

The Session pane (Figure 9) is located in the upper portion of each page and consists of an informational section and the navigation bars. The Session pane displays the appliance name, system status, and the navigation bars.



**Figure 9: Session pane**

- ❶ Product name, system status indication, and appliance name
- ❷ Primary navigation bar (available from every page)
- ❸ Secondary navigation bar (submenus for the selected primary option)

The informational section of the Session pane displays the appliance name and its current status (Figure 10).



**Figure 10: Session pane: informational section**

The navigation section (Figure 11) contains two navigation bars—primary and secondary.



**Figure 11: Session pane: navigation section**

Use the primary navigation bar items to open the primary pages (**Home**, **Tools**, **Devices**, **Status**, **Settings**, and **Help**). These primary navigation choices are available from every page of the interface. Use the secondary navigation bar to choose an option available for the current primary item. Options on the secondary navigation bar change depending on which primary item you select.

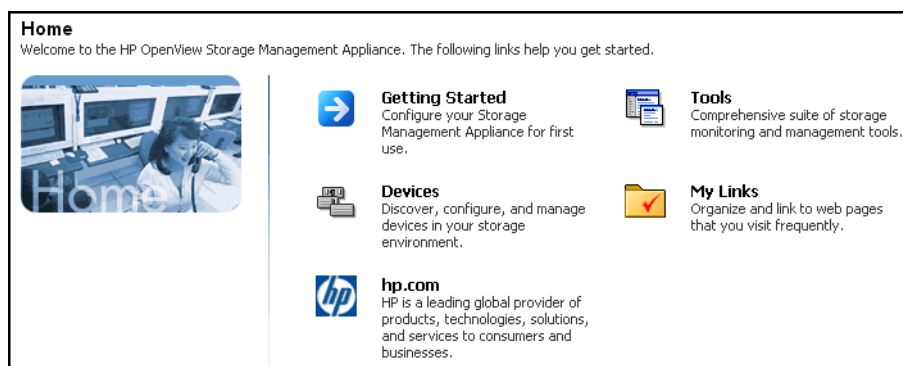
Options on the secondary navigation bar give you access to the Storage Management Appliance features. Your ability to access features depends on your assigned privilege level. See “[User Privilege Levels](#)” on page 27 for information about privilege levels. See [Appendix C](#) for a reference table of the privilege levels required to use various features.

## Online Help

The Storage Management Appliance online help describes and provides instructions for every task you can perform with the SMA software. The help is accessible from the primary navigation bar in two ways to let you find information quickly. The **Help** button opens the Storage Management Appliance help system, which has three types of navigation—Contents, Index, and Search. Clicking the question mark “?” displays a context-sensitive help topic describing the current software page.

## Content Pane

The Content pane ([Figure 12](#)) contains information formatted as a links page or as a task page. A links page contains several links that provide access to major feature sets.



**Figure 12: Content Pane: links page example**

Task pages allow you to complete a specific function and can be formatted as a wizard set, a properties page, or a list table with task buttons.



## Wizard Pages

The Content pane for a wizard page (Figure 13) requests various types of information and is one of a set of two or more pages displayed in sequence to complete a given task.

Home Tools Devices Status Settings Help ?

Maintenance Users Discovery Manage Tools Network Notification Licensing

### New Discovery Wizard

**General**  
Specify name, description, and schedule information.

Name:

Description:

This discovery will be run according to the schedule below.

Enable Schedule

Hourly at  minutes past the hour

Daily at  :  (hh:mm)

Weekly on  at  :  (hh:mm)

Discover on demand only

**Figure 13: Content pane: wizard page example**

## Properties Pages

The Content pane for a properties page (Figure 14) displays information about a given object such as a user or device.

Many of the properties pages use a tab interface to display various types of information for a given object and you can edit the values on these pages. For example, Figure 14 displays three tabs labeled **General**, **Include Range**, and **Exclude Range**. Click one of these tabs to edit fields on that tab. Figure 14 illustrates the **General** tab that displays the properties for a **Small SAN Discovery**. You can edit these properties and make changes to the schedule.

The screenshot shows a dialog box titled "Change discovery settings for Small SAN discovery". On the left, there is a tabbed interface with three tabs: "General" (selected), "Include Range", and "Exclude Range". The "General" tab contains the following fields and options:

- Name:
- Description:  (with up and down arrow buttons)
- This discovery will be run according to the schedule below.
- Enable Schedule
- Hourly at  minutes past the hour
- Daily at  :  (hh:mm)
- Weekly on  at  :  (hh:mm)
- Discover on demand only
- Last Run: 9/26/2002 4:30:09 PM    Next Run: Disabled

**Figure 14: Content pane: properties page example**

## List Tables

Many task pages contain tables that list a number of similar items. You can select an item and perform various tasks by clicking a button on the right side of the display. For example, [Figure 15](#) shows the list table found on the **Audit Log** page. Every table you use in the Storage Management Appliance software provides the same navigation features. You can use sort, search, and browse features to find the item you need.

**Audit Log**

Select 'Download Log', 'Log Properties', 'Clear Log', 'Acknowledge' or 'Acknowledge All' to perform tasks on the entire log. To view the details of a specific log entry, select an entry and then choose 'Audit Details'.

Search: Type  **1**  **2**

<input type="checkbox"/>	Type	Date	Time	User <b>3</b>	Device	Category	Tasks
<input type="checkbox"/>	Success	07/09/2003	11:24:38 AM	smad228fk34d026 \admi...	SMAD228FK34D026	Appliance	Audit Details... Download Log... Log Properties... Clear Log Acknowledge Acknowledge All
<input type="checkbox"/>	Success	07/08/2003	5:51:09 PM	SMAD228FK34D026 \Admi...	SMAD228FK34D026	Appliance	
<input type="checkbox"/>	Success	07/08/2003	5:32:16 PM	SMAD228FK34D026 \Admi...	SMAD228FK34D026	Appliance	
<input type="checkbox"/>	Success	07/08/2003	5:11:27 PM	SMAD228FK34D026 \Admi...	SMAD228FK34D026	Appliance	
<input type="checkbox"/>	Success	07/08/2003	5:03:35 PM	SMAD228FK34D026 \Admi...	SMAD228FK34D026	Appliance	
<input type="checkbox"/>	Success	07/08/2003	5:01:50 PM	SMAD228FK34D026 \Admi...	SMAD228FK34D026	Appliance	
<input type="checkbox"/>	Success	07/08/2003	4:35:39	SMAD228FK34D026	SMAD228FK34D026	Appliance	

**4**

**Figure 15: Content pane example: Audit Log list table**

The following list provides hints for using each part of a list table.

- The Search feature **1** lets you search for a particular entry in a list. This is useful when the table contains a large number of entries. To search for an entry, select a category from the **Search** drop-down list, type text in the box, and click **Go**. The available categories correspond to the column headings. When entering search text in the box, do not use any wildcard characters.
- The maximum number of entries per table page is 100. When there are more than 100 records, page icons are available above the table **2**. These buttons let you jump to the next or previous page in the table.

- You can sort the rows of information by the values in any column ③. To change the order of rows in the display, click a column heading and the page refreshes with a re-sorted table. An arrow head beside a column heading indicates the table is sorted based on the content of that column. The direction of the arrow head (up or down) indicates if the sort is ascending or descending.
- The checkbox next to the Type field ④ in the column heading selects all items on the current table page. If the list table has more than 100 items and multiple pages, this action selects items only on the page currently displayed.
- Multi-page list tables typically have one or more “All” buttons that allow you to simultaneously perform an action on all items on all table pages (Figure 16). Using an All button performs the specified action on all list items and ignores any individual selections.

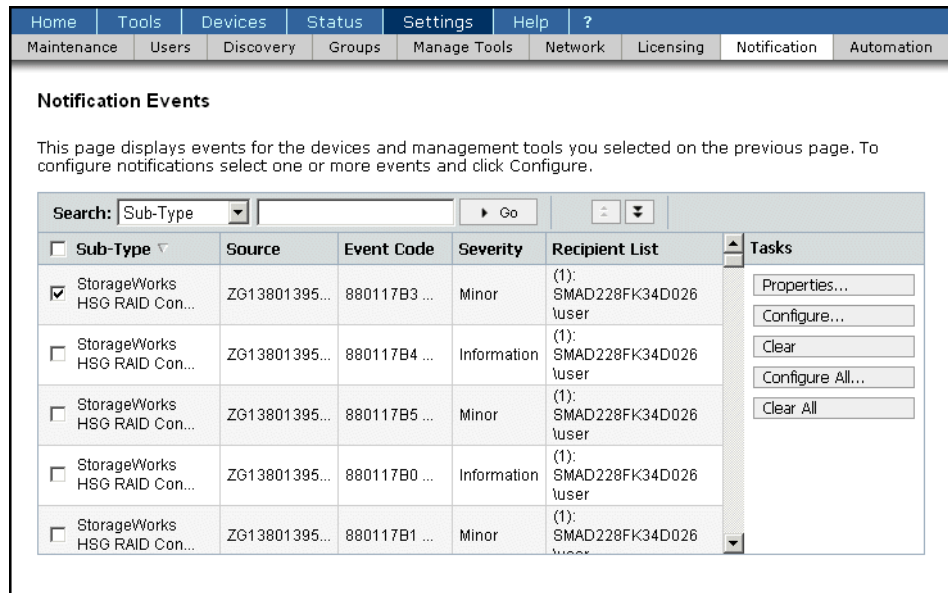


Figure 16: List table example with “All” buttons

## Security Features

The Storage Management Appliance software is capable of securely allowing users with various privilege levels to work with your storage devices and applications. The security feature allows you to set up users with different privilege levels and optionally use Secure Sockets Layer (SSL) when sending sensitive information. The system maintains audit information that allows an administrator to review user activities.

### Using the Secure Sockets Layer

Secure Sockets Layer (SSL) is a protocol for safely transmitting data via a Web browser. You can use SSL with the Storage Management Appliance software to ensure that sensitive data, such as password information, cannot be viewed by others on the network.

To set the Storage Management Appliance to use SSL, change the **http** in the browser's location bar to **https**, and then press **Enter**. Alternatively, you can click the **Secure Site** link that appears on some pages such as the **Create User** page (Figure 19 on page 28). This action refreshes the interface into a secure site with **https** in the browser's location bar.

If you are a Storage Management Appliance administrator, you can change the default ports used for both the encrypted (SSL) and non-encrypted data exchange. Specify these settings on the **Administration Web Site** page.

If you have a proxy server set up, make sure that it is configured to allow SSL traffic on port 2381. This port configuration is required for browsing to the SMA.



# Configuring the Software

## 2

This chapter provides an overview for configuring the Storage Management Appliance software. It highlights the activities you must complete before using the system to run discoveries as described in [Chapter 3](#) and create notification settings as described in [Chapter 4](#). Detailed instructions for all activities are available in the Storage Management Appliance online help.

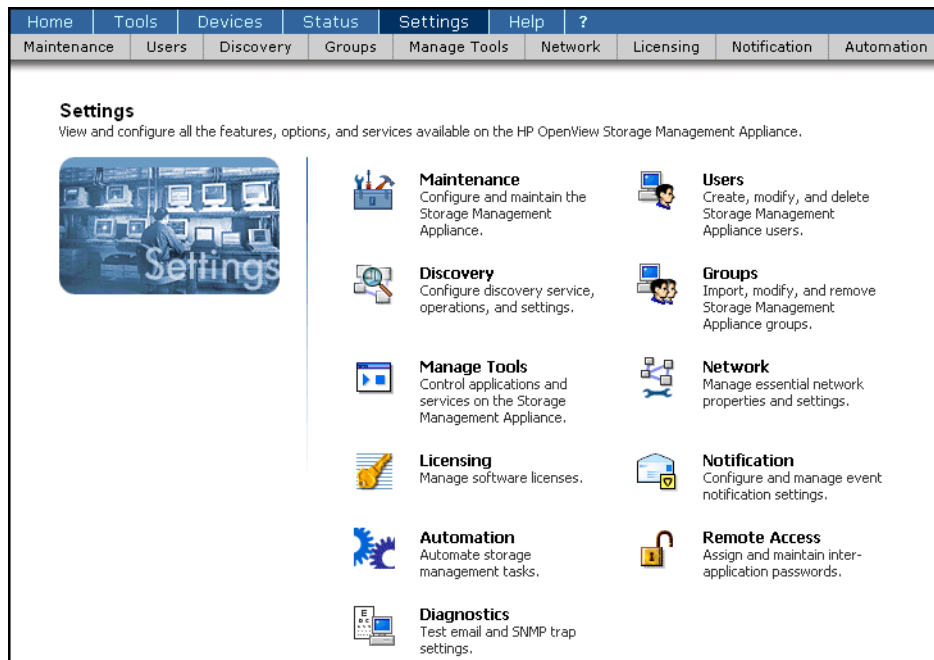
Some of the tasks described in this chapter are optional, while others may be required to meet the needs of your network configuration or local operations. You should review all sections of this chapter to determine those activities necessary for your installation.

This chapter contains the following major topics:

- [Storage Management Appliance Settings](#), page 24
- [Working with Users](#), page 26
- [Working with User Groups](#), page 33
- [Managing Passwords](#), page 35
- [Date and Time Settings](#), page 37
- [Mail Server Settings](#), page 38
- [Network Settings](#), page 39

## Storage Management Appliance Settings

Most configuration tasks start with the Storage Management Appliance **Settings** page (Figure 17).



**Figure 17: Settings page**

The **Settings** page offers the following options:

- **Maintenance**—Opens the **Maintenance** page, which provides additional maintenance options. See [Chapter 5, “SAN Maintenance”](#) on page 73 for further information.
- **Users**—Opens the **Users** page, which lets you manage Storage Management Appliance users and their settings. See [“Working with Users”](#) on page 26 for more information.
- **Discovery**—Opens the **Discovery** page, where you can configure, modify, or start discoveries.



- **Groups**—Opens the **Groups** page, where you can import, modify, and remove predefined user groups for the Storage Management Appliance. See [“Working with User Groups”](#) on page 33 for more information.
- **Manage Tools**—Opens the **Manage Tools** page, which lets you manage core components and added-value applications you have installed on the Storage Management Appliance. See [“Managing Tools and Components”](#) on page 78 for more information.
- **Network**—Opens the **Network** page, which provides additional options for managing network properties and settings. See [“Network Settings”](#) on page 39 for more information.
- **Licensing**—Opens the **Licensing** page, which lets you manage software licenses. See [“Managing Licenses”](#) on page 79 for more information.
- **Notification**—Opens the **Notification** page, where you can view or change the applications and devices that generate events. See [“SAN Events and Event Notification”](#) page 62 for more information.
- **Automation**—Opens the Automation Manager component in a separate browser window. See [“Automating Maintenance”](#) on page 81 for more information.
- **Remote Access**—Opens the **Manage Application Passwords** page, where you can view and manage access information so that applications on the Storage Management Appliance can communicate with applications on remote systems. See [“Managing Passwords”](#) on page 35 for more information.
- **Diagnostics**—Opens the **Diagnostics** page, where you can test e-mail and SNMP trap settings. See [“Diagnostic Tasks”](#) on page 80 for more information.

The rest of this chapter describes the first activities that you might need to perform before using the Storage Management Appliance, such as setting up users and passwords, specifying date, time, and mail server settings, and changing the SMA name and domain.

## Working with Users

The Storage Management Appliance software requires each user to complete a logon process. An Administrator can create users, assigning each user a user name and password plus a privilege level. The assigned privilege level determines what pages the person can view and what actions the person can perform. Any user assigned the Administrator privilege level can add or delete users as well as edit the properties of any existing user including the assigned privilege level.

The Storage Management Appliance **Users** page (Figure 18) lists current users and lets you add, import, and delete users, as well as specify passwords, properties, and notification settings.

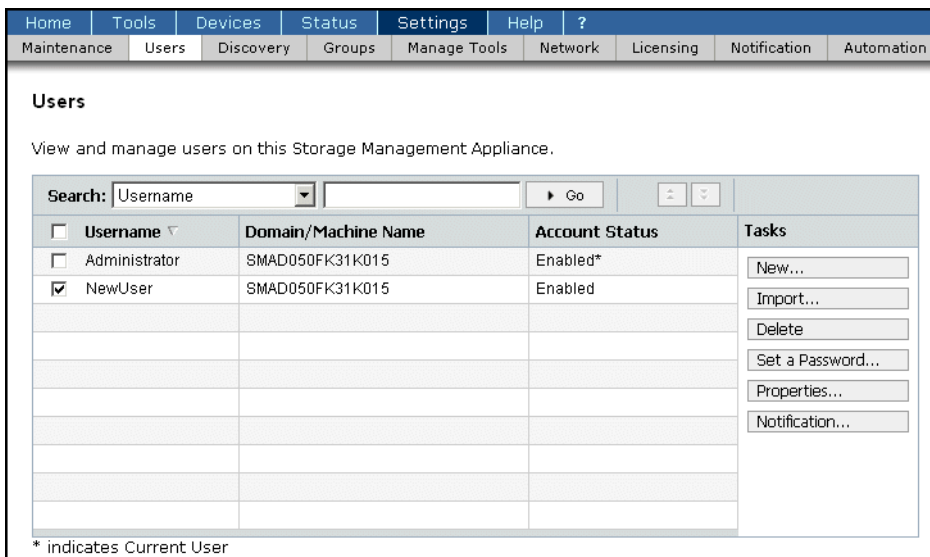


Figure 18: Users page

## User Privilege Levels

The privilege level assigned to a user determines the features that person can access on the Storage Management Appliance. Administrators can assign each user one of the following privilege levels:

- **Administrator**—Can create, view, and modify the properties that define each Storage Management Appliance user. Individuals with this privilege level can control their own access and notification settings as well as the settings for any other user. They can view and change the assigned privilege level of any user. See “[Setting Additional User Properties](#),” page 31 for detailed information.
- **Operator**—Can view and modify their own information with the exception of assigned privilege level. Operator privileges allow a person to launch applications and manage their own notification settings. Operator privileges also allow a person to use the Remote Access function to manage inter-application passwords.
- **User**—Can view and modify some of their own user attributes but cannot change their own privilege level and or notification settings. User privileges allow a person to receive notifications. However, only a user with Administrator privileges can create or change notification settings.

See [Appendix C](#) for more information about the privilege levels required to access various features.

## Adding New Users

An Administrator must set up each user on the Storage Management Appliance before the user can log on, perform tasks, or receive notifications. You must assign each user one of three privilege levels. See “[User Privilege Levels](#)” for information about this topic.

Access the **Create User** page (Figure 19) by clicking the **New** button on the **Users** page (Figure 18 on page 26).

**Figure 19: Create User page**

For further instructions on adding new users, see the Storage Management Appliance online help.

## Importing Users

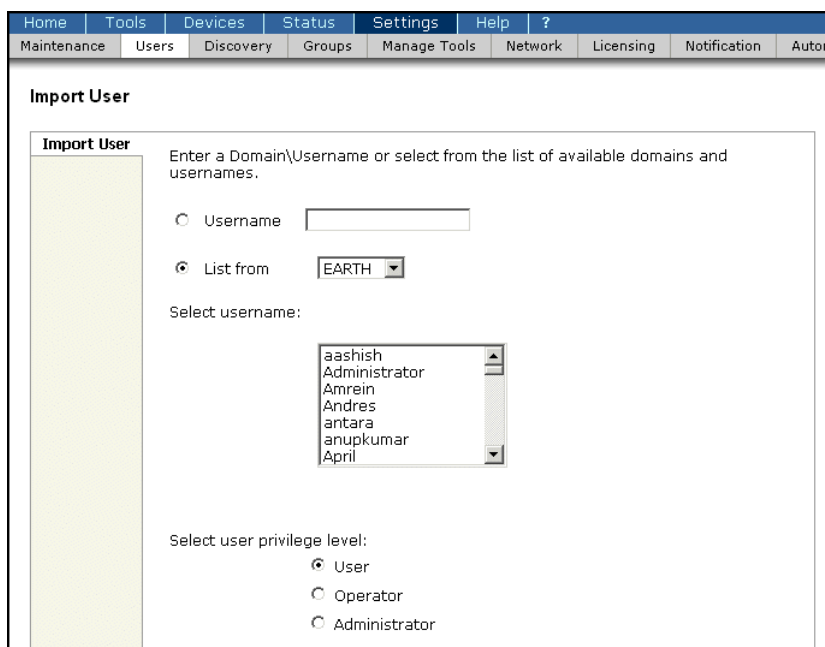
Administrators can make a Windows domain user a Storage Management Appliance user by using the **Import** feature. The import feature is a convenient way to add a Storage Management Appliance user with the same user name and password the person uses to access their local network.

Access the **Import User** page (Figure 20) by clicking the **Import** button on the **Users** page (Figure 18 on page 26).

---

**Note:** The **Import** button is only available when the Storage Management Appliance is part of a domain. See “[Domain Membership](#)” on page 43 for more information.

---



The screenshot shows the 'Import User' page within a web-based management interface. The top navigation bar includes 'Home', 'Tools', 'Devices', 'Status', 'Settings', 'Help', and '?'. Below this, a secondary menu contains 'Maintenance', 'Users', 'Discovery', 'Groups', 'Manage Tools', 'Network', 'Licensing', 'Notification', and 'Autom'. The main content area is titled 'Import User' and contains the following elements:

- A header 'Import User' and a text prompt: 'Enter a Domain\Username or select from the list of available domains and usernames.'
- Two radio buttons: 'Username' (unselected) and 'List from' (selected).
- A dropdown menu for 'List from' currently showing 'EARTH'.
- The text 'Select username:' followed by a list box containing the following entries: 'aashish', 'Administrator', 'Amrein', 'Andres', 'anitra', 'anupkumar', and 'April'.
- The text 'Select user privilege level:' followed by three radio buttons: 'User' (selected), 'Operator', and 'Administrator'.

Figure 20: Import User page

You can only import users from a domain that the Storage Management Appliance has joined. Authentication for these imported users is dependent on the SMA's continuing domain membership. If the SMA is removed from the domain, imported users will not be able to log on. However, the users will regain access privileges when the SMA rejoins the domain.

For further instructions on importing users, see the Storage Management Appliance online help.

## Modifying and Deleting Users

The **Users** page ([Figure 18](#)) allows you to change the properties for a Storage Management Appliance user account. If you are assigned a User or Operator privilege level, the **Users** page displays only your own user account, which you can then modify. Administrators can view and modify all existing Storage Management Appliance users. Refer to “[User Privilege Levels](#)” on page 27 for more information about this topic.

Depending on your privilege level, you can perform the following tasks:

- **Delete**—The **Delete User** page lets Administrators remove selected users from the list of Storage Management Appliance users. Users and Operators cannot delete themselves.
- **Properties**—The **User Properties** page lets you view or modify your own or a selected user's settings. See “[Setting Additional User Properties](#)” on page 31 for more information.
- **Set a Password**—Users and Operators can use the **Set Password** page to specify their own passwords. Administrators can set any user's password. This feature is not available for imported users. See “[Managing Passwords](#)” on page 35 for more information.
- **Notification**—The **User Event Notification** page lets Administrators set up or modify event notification settings for any user; it lets Operators do the same for themselves. See “[Setting Up Notifications](#)” on page 69 for more information.

## Setting Additional User Properties

The **User Properties** page (Figure 21) allows you to edit the attributes of a user account such as full name and description.

The screenshot shows a web interface with a navigation menu at the top containing: Home, Tools, Devices, Status, Settings, Help, and ?. Below this is a sub-menu with: Maintenance, Users, Discovery, Groups, Manage Tools, Network, Licensing, and Notification. The main content area is titled "User Properties For SMAD228FK34D026\Administrator". On the left, there are five tabs: General (selected), Contact Info, Access, Default Page, and Notification Info. The General tab displays the following information:

- Username: SMAD228FK34D026\Administrator
- Full name: [Text input field]
- Description: Built-in account for administering the cor
- Disabled

**Figure 21: User Properties page: General tab**

The **User Properties** page has a maximum of five tabs and the number of tabs displayed depends on your assigned privilege level as shown in Table 2.

**Table 2: Tabs on User Properties Page for Different User Privilege Levels**

Privilege Level	General tab	Contact Info tab	Access tab	Default Page tab	Notification Info tab
User	X	X		X	
Operator	X	X		X	X
Administrator	X	X	X	X	X

Refer to “[User Privilege Levels](#)” on page 27 for more information about this topic.

Use the **General** tab to modify a user’s **Full name** and **Description**. You cannot change this information for an imported user. Selecting the **Disable this user account** checkbox on the **General** tab lets you retain the user in the database, but prevent the user from logging on to the Storage Management Appliance. This checkbox is unavailable for an imported user.

Use the **Access** tab to change the privilege level assigned to a user.

The **Default Page** tab allows you to set the page displayed when the user logs on. Select one of the following pages:

- Home (default)
- Tools
- Devices
- Status

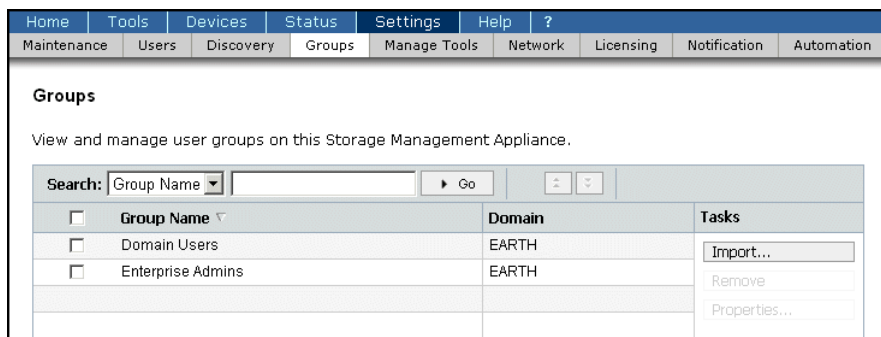
If you want a user to receive notifications, you must first enter a standard e-mail address or e-mail pager address on the **Contact Info** tab and then specify settings on the **Notification Info** tab. See “[Enabling User Properties for Notification](#)” on page 67 for more information.

For further instructions on using the **Properties** pages, see the Storage Management Appliance online help.



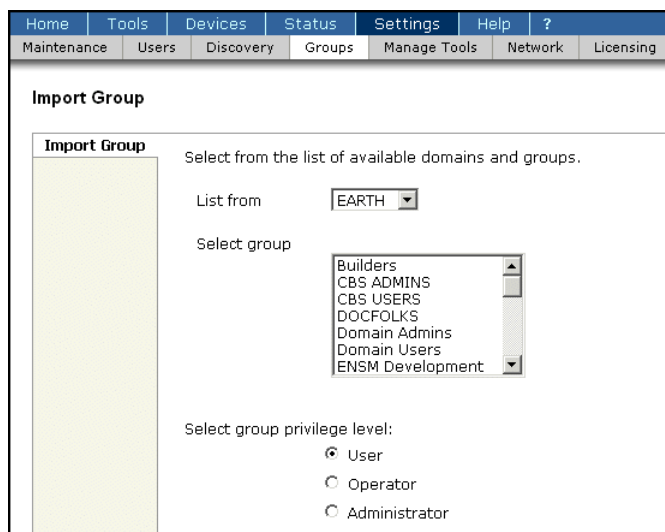
## Working with User Groups

Using the **Groups** page (Figure 22), you can import, modify, and remove user groups for the Storage Management Appliance. The SMA must be a member of a Windows domain before you can import user groups from that domain.



**Figure 22: Groups page**

When you import a user group (Figure 23), you assign access privileges that apply to all members of the group. The group members can then log on to the SMA with their domain user name and password.



**Figure 23: Import Group page**

The groups you import must be predefined. In addition, the SMA must be in the same domain as the group you want to import, or the group must be in a domain trusted by the SMA's domain. See “[Domain Membership](#)” on page 43 for more information.

After importing a group, you can change the group's privilege level or remove the group entirely.



**Caution:** If you remove a group that provides your authentication for the Storage Management Appliance, you will lose access to the SMA.

---

After you import user groups, authentication for those imported users is dependent on the SMA's domain membership. If the SMA is removed from the domain, users from the imported group will no longer be able to log on to the SMA. When the SMA rejoins the domain, the users from groups in that domain regain their previous access privileges.

For detailed instructions on using the Groups pages, see the Storage Management Appliance online help.

## Managing Passwords

The Storage Management Appliance allows you to manage the passwords needed by users to access the system. You can also maintain access profiles for selected applications that require passwords and other logon information. These access profiles allow two applications operating in your SAN environment to exchange data.

Consider using SSL to encrypt the transmission of passwords when creating or modifying passwords. See [“Using the Secure Sockets Layer”](#) on page 21 for details.

## User Passwords

The Storage Management Appliance logon process prompts each user for a user name and password. For imported users, the user name and password are those assigned in their Windows domain user account.

---

**Note:** The password for an imported user cannot be changed with any Storage Management Appliance feature. See [“Importing Users”](#) on page 29 for more information.

---

Individuals with a User or Operator privilege level can change their own password. A user with Administrator privileges can set the password for any user.

Access the **Set Password** page ([Figure 24](#)) from the **Users** page ([Figure 18](#)).

Home	Tools	Devices	Status	Settings	Help	?
Maintenance	Users	Discovery	Groups	Manage Tools	Network	Licensing

**Set Password For SMAD228FK34D026\Administrator**

New password

Confirm password

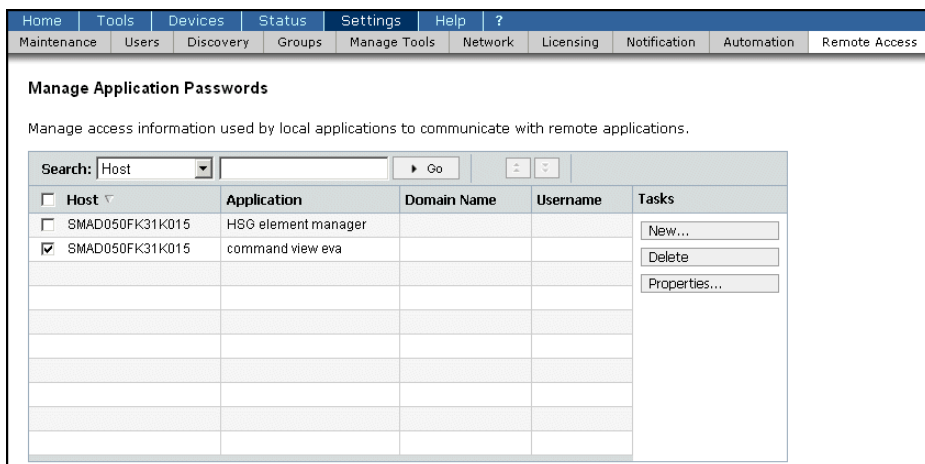
Warning: The information on this page can be viewed by other users on the network. To prevent other users from viewing your information, type https instead of http in the Address box and use secure port number 443. **Secure site**

**Figure 24: Set Password page**

## Remote Access

The Remote Access feature allows you to create and maintain an access profile for each of several network management applications. You must be assigned the Administrator or Operator privilege level to use this feature.

Access the **Manage Application Passwords** page (Figure 25) from the **Settings** page (Figure 17).



**Figure 25: Manage Application Passwords page**

Each access profile contains logon information required by one management application to initiate communication with a target application. The access profile includes the host name or TCP/IP address of a remote system, the name of an application on that system, a password, and, for some applications, a domain name and user name. You create one access profile for each target application.

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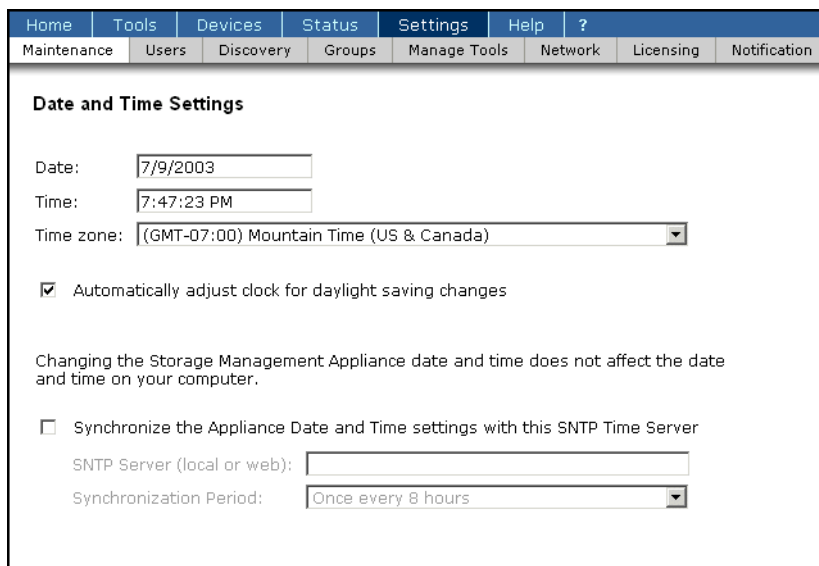
**Note:** You must enter the System Management user name and password for Command View EVA (HSV Element Manager) on the **Manage Application Passwords** page before HSV storage elements can be discovered by the Storage Management Appliance. See [“Logging On to the System Management Home Page”](#) on page 5 for more information about the System Management Web server.

---

For further instructions on configuring passwords and remote access, see the Storage Management Appliance online help.

## Date and Time Settings

The Storage Management Appliance maintains various logs and supplies the date and time for each log entry. To ensure that the time shown for each log entry is accurate, use the **Date/Time** feature to set the proper date and time. This feature also provides the option of synchronizing the Storage Management Appliance and an SNTP Time Server. You must be assigned the Administrator privilege level to use the **Date and Time Settings** page (Figure 26). This page is accessible from the **Getting Started** page (Figure 4 on page 10) or the **Maintenance** page (Figure 43 on page 74).



The screenshot shows the 'Date and Time Settings' page within a web application. The top navigation bar includes 'Home', 'Tools', 'Devices', 'Status', 'Settings', 'Help', and '?'. Below this, a secondary menu contains 'Maintenance', 'Users', 'Discovery', 'Groups', 'Manage Tools', 'Network', 'Licensing', and 'Notification'. The main content area is titled 'Date and Time Settings' and contains the following elements:

- Date:** A text input field containing '7/9/2003'.
- Time:** A text input field containing '7:47:23 PM'.
- Time zone:** A dropdown menu currently showing '(GMT-07:00) Mountain Time (US & Canada)'.
- Automatically adjust clock for daylight saving changes
- Text: Changing the Storage Management Appliance date and time does not affect the date and time on your computer.
- Synchronize the Appliance Date and Time settings with this SNTP Time Server
- SNTP Server (local or web):** An empty text input field.
- Synchronization Period:** A dropdown menu currently showing 'Once every 8 hours'.

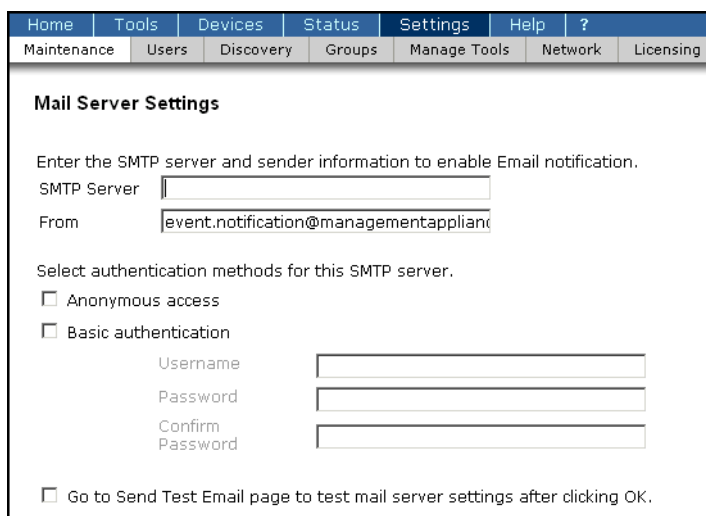
**Figure 26: Date and Time Settings page**

For further instructions on setting the date and time, see the Storage Management Appliance online help.

## Mail Server Settings

The mail server must be defined in the Storage Management Appliance before the system can send e-mail notifications to users. You can access the **Mail Server Settings** page (Figure 27) from the **Getting Started** page (Figure 4 on page 10) or the **Maintenance** page (Figure 43 on page 74).

You can use the **Mail Server Settings** page to change the mail server's host name or IP address. This page also provides a link to a page where you can send an e-mail to test your server settings. See “**Diagnostic Tasks**” on page 80 for more information.



The screenshot shows the 'Mail Server Settings' page within a web-based management interface. At the top, there is a navigation menu with tabs for Home, Tools, Devices, Status, Settings (which is active), Help, and ?. Below this is a secondary menu with tabs for Maintenance, Users, Discovery, Groups, Manage Tools, Network, and Licensing. The main content area is titled 'Mail Server Settings' and contains the following elements:

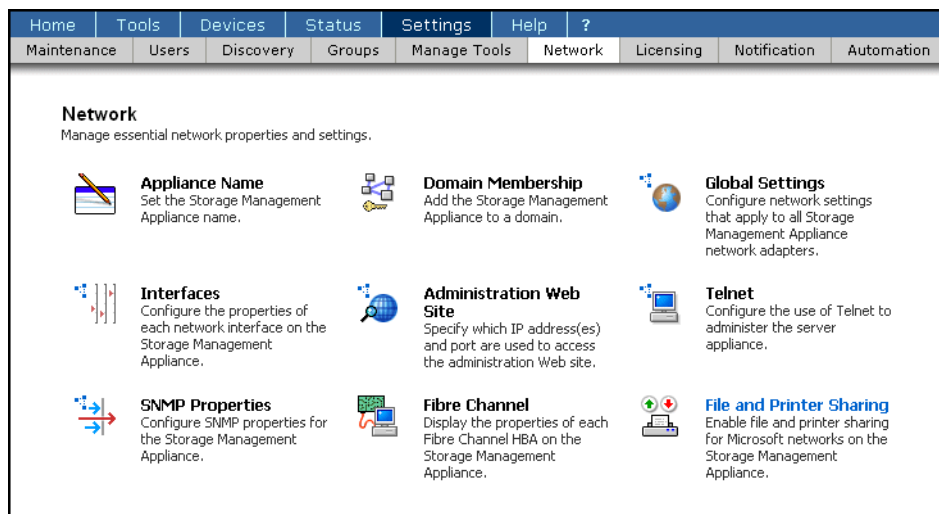
- Instruction: "Enter the SMTP server and sender information to enable Email notification."
- Field: "SMTP Server" with an empty text input box.
- Field: "From" with a text input box containing the value "event.notification@managementappliance.com".
- Section: "Select authentication methods for this SMTP server." with two radio button options:
  - Anonymous access
  - Basic authentication
- Fields for Basic authentication:
  - "Username" with an empty text input box.
  - "Password" with an empty text input box.
  - "Confirm Password" with an empty text input box.
- Check box:  Go to Send Test Email page to test mail server settings after clicking OK.

**Figure 27: Mail Server Settings page**

For further instructions on configuring the mail server for notifications, see the Storage Management Appliance online help.

## Network Settings

The links on the **Network** page (Figure 28) let you manage the Storage Management Appliance's network settings.



**Figure 28: Network page**

The **Network** page includes the following features:

- **Appliance Name**—Defines the name of the SMA
- **Domain Membership**—Defines the domain membership of the SMA
- **Global Settings**—Configures overall network settings for the SMA, such as mapping NetBIOS names to IP addresses
- **Interfaces**—Configures the properties of each network adapter on the SMA
- **Administration Web Site**—Defines the IP addresses that can be used to access the administration website
- **Telnet**—Enables Telnet access to this SMA
- **SNMP Properties**—Configures SNMP settings and trap recipients
- **Fibre Channel**—Displays the properties of each Fibre Channel HBA on the SMA
- **File and Printer Sharing**—Enables file and printer sharing for Microsoft networks on the SMA

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**Note:** If you use the Network Interfaces page to change the IP, DNS, or WINS settings, you must restart the SMA for the changes to take effect.

---

The following sections discuss changing the SMA name and adding the SMA to a domain. See the Storage Management Appliance online help system for further instructions on using all of the features available on the **Network** page.



**Caution:** HP recommends that you always use the Storage Management Appliance software to carry out operations on your SMA. Do not use operating system features, such as the Windows Control Panel or System tool, to perform operations, as doing so can lead to unpredictable results.

---



## Changing the Storage Management Appliance Name

As an Administrator, you can optionally rename the Storage Management Appliance to a name that suits your needs. If the Storage Management Appliance is a domain member, the device can only be renamed within the existing domain. See “[Domain Membership](#)” on page 43 for information about changing domain membership.

**Note:** Be sure to complete migration of notification settings before renaming the Storage Management Appliance. See Appendix A, “[Migrating Event Notification Settings](#)” on page 83 for more information.

Access the **Appliance Name** page ([Figure 29](#)) from the **Network** page ([Figure 28](#)).

The screenshot shows a web interface with a navigation bar at the top containing: Home, Tools, Devices, Status, Settings, Help, and ?. Below this is a secondary navigation bar with: Maintenance, Users, Discovery, Manage Tools, Network, Notification, and Lic. The main content area is titled "Appliance Name".

Fields and content on the page include:

- Server appliance name:
- DNS suffix:
- Member of: Domain: EARTH2
- Instructions: "Type the information for the user who has permission to join the domain. Include the domain name when you enter the User name (for example: DOMAIN\USER):"
- User:
- Password:
- Warning: "The information on this page can be viewed by other users on the network. To prevent other users from viewing your information, type https instead of http in the Address box and use secure port number 443." A pink circle highlights the text "Secure site" with a pink arrow pointing to the word "Link".
- Note: "If you are using DHCP, the new name will not be effective until the DNS has been updated. You must then run 'Local SAN Discovery' to complete the process."
- Message with a yellow warning icon: "The appliance cannot be renamed because the following installed application(s) are configured to use the current name: Network View"

**Figure 29: Appliance Name page**

The system displays the warning text shown in [Figure 29](#) if you are not using a secure connection—see “[Security Features](#)” on page 21 for detailed information. You can make the manual entries described in the warning or use the **Secure Site** link to establish a secure connection.

The **Appliance Name** page contains other material shown below the **DNS suffix** box only when the Storage Management Appliance is a domain member. When the Storage Management Appliance is a domain member, you must enter the name and password for a person who is in the Domain Administrator group for that domain. See “[Domain Membership](#)” on page 43 for more information about this subject.

You should consider the following dependencies when renaming your Storage Management Appliance.

- If you have an application installed that is dependent on the Storage Management Appliance name, you cannot change the system name. A message at the bottom of the page tells you if an application is installed that prevents you from changing the Storage Management Appliance name.
- The changed Storage Management Appliance name will not display in the list on the **Manage Application Password** page until you run a discovery. See “[Remote Access](#)” on page 36 for detailed information. You must run the built-in Local SAN discovery to have the new name recognized. If you are using DHCP, you must run the Local SAN discovery after the DNS server has updated.



**Caution:** Do not use the Windows Control Panel to rename the Storage Management Appliance. The Storage Management Appliance database can become corrupted and prevent proper assignment of service privileges.

---

For further instructions on naming, see the Storage Management Appliance online help.

## Domain Membership

You can enhance the built-in security features of the Storage Management Appliance software by adding the SMA to a domain. Joining a domain improves security because the user and group accounts are subject to the security policies set by the domain administrator and enforced by the Windows network.

The Storage Management Appliance can be a member of only one domain at any given time. Use the **Domain Membership** page (Figure 30) to add your Storage Management Appliance to a specified domain.

Home Tools Devices Status Settings Help ?

Maintenance Users Discovery Manage Tools Network Notification Licensing

### Domain Membership

Server appliance name: SMAD050FK31K015  
DNS suffix:

Member of:

Workgroup:

Domain:

Type the information for the user who has permission to join the domain. Include the domain name when you enter the User name (for example: DOMAIN\USER);

User:

Password:

Warning: The information on this page can be viewed by other users on the network. To prevent other users from viewing your information, type https instead of http in the Address box and use secure port number 443. [Secure site Link](#)

**Figure 30: Domain Membership page**

The system displays the warning text shown in Figure 30 if you are not using a secure connection—see “[Security Features](#)” on page 21 for detailed information. You can make the manual entries described in the warning or use the **Secure Site** link to establish a secure connection.

You must enter the name and password for a person in the Domain Administrator group for the domain that the Storage Management Appliance is joining. For example, if you are changing domain membership, enter the name and password for a person in the Domain Administrator group for the destination domain.

For further instructions on domain membership, see the Storage Management Appliance online help.



# Discovering Devices and Applications

## 3

Through device discovery, the Storage Management Appliance software helps you determine what components are connected to your storage network and then manage those components. This chapter describes the features available for discovering the devices and applications associated with your storage network. The following topics are covered:

- [About Discoveries](#), page 46
- [Performing Discoveries](#), page 48
- [About Devices](#), page 50
- [Managing Discovered Devices](#), page 50

## About Discoveries

The Storage Management Appliance uses a discovery process to identify devices and applications operating in your storage network environment. You can create any number of discovery processes, and each process can have a different set of parameters. Each process is referred to as a *discovery*.

You can schedule a discovery to run at regular intervals or to run only on demand, which means you must start the process manually.

To find all devices in your Storage Area Network (SAN) you must use two discovery types—IP discoveries and SAN discoveries.

## IP Discoveries

The Storage Management Appliance is connected to your organization's LAN via a Network Interface Card and an Ethernet cable. You can define any number of *IP discoveries* that query SNMP agents at specified IP addresses. An IP discovery can identify any device connected to the LAN with an enabled SNMP agent. Such devices include host computers and Fibre Channel switches.

IP discoveries also identify any Storage Management Appliances connected to your storage network.

---

**Note:** Not all devices identified by an IP discovery generate events supported by the Storage Management Appliance. See Chapter 5 "[Monitoring the SAN](#)" on page 55 for more information.

---

## SAN Discoveries

The Storage Management Appliance is also connected to the SAN fabric via a fabric switch. Some devices within the SAN fabric have no SNMP agent or LAN connection. The Storage Management Appliance uses a SAN discovery to identify storage elements connected to the local SAN. A SAN discovery identifies HSG and HSV controllers (or controller pairs) that are connected to the local Storage Management Appliance.

This special discovery is preset on the Storage Management Appliance and runs by default during the update. It is called the *Local SAN Discovery* and is listed on the **Discovery** page (Figure 31). This discovery is set to run on demand and must be run whenever you add controllers to your SAN or change the Storage Management Appliance name. Table 3 shows the settings for the Local SAN Discovery should you need to reset it.

**Table 3: Local SAN Discovery Settings**

IP Address	Community String
127.0.0.1	public

If you use Command View EVA to manage HSV storage elements in your network, you must use the Remote Access feature to create a user name and password before the element manager can be identified by a SAN discovery. See “[Remote Access](#)” on page 36 for more information about creating such a user name and password.

## Performing Discoveries

Access the **Discovery** page (Figure 31) from the **Settings** page (Figure 17 on page 24).

**Discovery**

You can configure new discoveries, start discoveries or modify properties of existing discoveries. Select a name entry, then choose a task. To create a new discovery, click New.

Search: Name

<input type="checkbox"/> Name ▾	Enabled	Running	Last Run	Next Run	Tasks
<input type="checkbox"/> Full segment	Yes	No	10/10/2002 5:50:11 PM	10/10/2002 6:50:00 PM	<input type="button" value="New..."/> <input type="button" value="Delete"/> <input type="button" value="Properties..."/> <input type="button" value="Start Discovery"/> <input type="button" value="Enable"/> <input type="button" value="Disable"/>
<input checked="" type="checkbox"/> Local SAN Discovery	Yes	No	9/24/2002 6:00:09 PM	On demand	
<input type="checkbox"/> Short Segment	Yes	No	10/9/2002 6:46:35 PM	On demand	

**Figure 31: Discovery page**

You can use features on the **Discovery** page to view, add, change, delete, and run existing discoveries. You must be assigned the Administrator privilege level to create or change discoveries.



## Discovery Settings Summary

You define a discovery by providing values for the following settings or properties:

- Enter a name and description.
- Select one of two schedule options. One option is to run the discovery at regular intervals and define the interval. The other option is to run the discovery only on demand.
- For an IP discovery, define one or more IP address ranges to be searched.
- For each range to be searched, specify one or more community strings to be used in the discovery process. A community string is necessary for SNMP authentication.
- For an IP discovery, you can define one or more IP address ranges to be excluded from the discovery “search” process. Each excluded range should fall within one of the ranges to be searched.

For complete instructions on performing discoveries, see the Storage Management Appliance online help.

## About Devices

The Storage Management Appliance is capable of identifying particular devices and applications in your storage area network using one or more discovery processes. Devices include host computers, Fibre Channel switches, Modular Data Routers (MDRs) and NAS devices. A *storage element* is defined as any storage system with a single controller (or pair of controllers) connected to a switch port. Storage elements can incorporate a wide range of technologies that include disk arrays and tape devices.

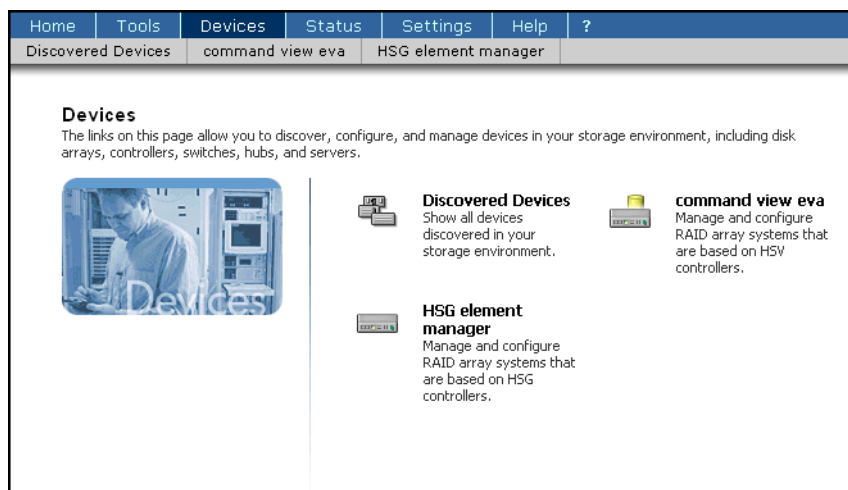
Many devices can be identified by querying an SNMP agent operating on the device. Some devices have no SNMP agent and must be identified by querying the associated management application.

## Managing Discovered Devices

Your Storage Management Appliance can have any number of discoveries running at various times or started manually. The devices identified by all the IP-based discoveries are called *discovered devices*.

Using the **Devices** page ([Figure 32](#) on page 51), you can manage the following:

- **Discovered Devices**—Lists devices found by all IP discoveries. See [“Discovered Devices”](#) on page 52 for more information.
- **Command View EVA**—Launches the element manager for managing HSV controller-based RAID arrays.
- **HSG Element Manager**—Launches the element manager for managing HSG controller-based RAID arrays.



**Figure 32: Devices page**

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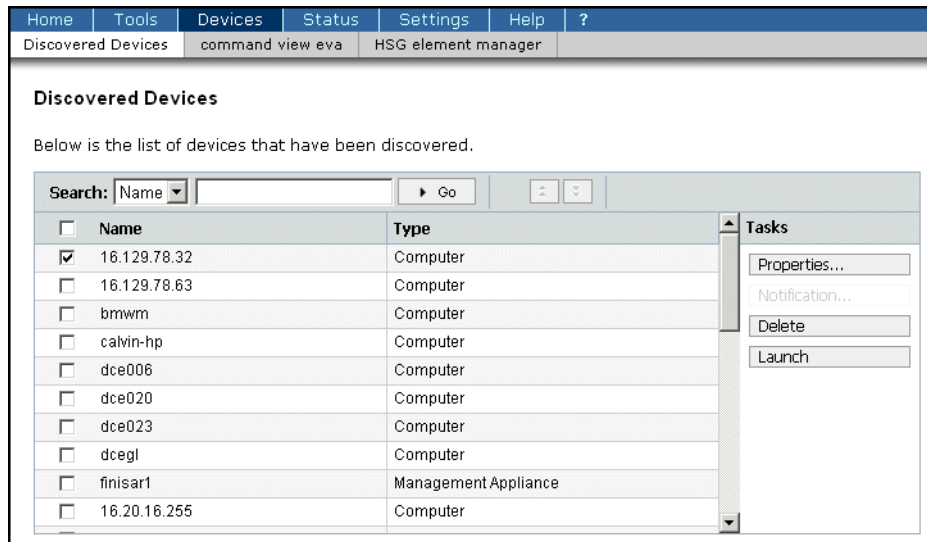
**Note:** HSV and HSG storage elements are identified only by the SAN discovery. You must enter a password for Command View EVA before the discovery can identify any HSV storage elements. See ["Remote Access"](#) on page 36 for detailed information.

---

## Discovered Devices

All devices identified by IP discoveries appear in a list on the **Discovered Devices** page (Figure 33). Devices identified by SAN discoveries and generating events supported by the Storage Management Appliance appear on the first page of the **Notification** page. See Chapter 4, “Monitoring the SAN” on page 55 for more information.

You must be assigned the Operator or Administrator privilege level to view the **Discovered Devices** page. A user with Administrator privileges can also add, delete, or modify discovery settings. See “User Privilege Levels” on page 27 for more information about privilege levels.



**Figure 33: Discovered Devices page**

From the **Discovered Devices** page, you can perform several tasks, including:

- Viewing and modifying discovered device settings, such as serial number and location
- Deleting a device’s record from the Storage Management Appliance
- Launching devices or applications that have separate management software
- Configuring notification for selected devices

Note that the **Notification** button on the **Discovered Devices** page (Figure 33) is unavailable if you choose an unsupported device such as a host computer. You can select multiple supported devices and view all event types generated by those devices. However, if any selected device is not supported, the **Notification** button is unavailable. See “[Notification for a Device or Application](#)” on page 69 for information about using this feature.

For further instructions on all of the tasks available on the **Discovered Devices** page, see the Storage Management Appliance online help.

## Command View EVA

HP StorageWorks Command View EVA is a Web-based software application residing on the Storage Management Appliance. Command View EVA lets you control and monitor the HSV storage system.

Launch Command View EVA in its own window from the **Devices** page (Figure 32 on page 51).

Refer to the Command View EVA documentation for further information.

## HSG Element Manager

The HP StorageWorks HSG Element Manager is a Web-based software application residing on the Storage Management Appliance. The HSG Element Manager lets you configure and monitor HSG80 and HSG60 storage subsystems (controller or controller pair) by using a compatible Web browser to access the application.

Launch the HSG Element Manager in its own window from the **Devices** page (Figure 32 on page 51).

Refer to the HSG Element Manager documentation for further information.



# Monitoring the SAN

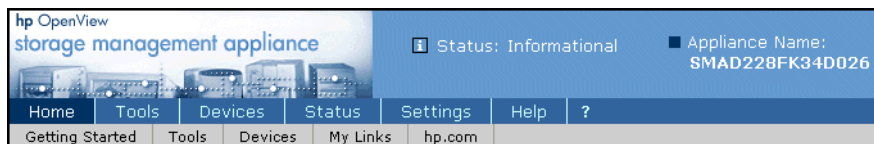
## 4

This chapter describes how to use the Storage Management Appliance software to monitor and manage events in the SAN. Through a combination of status logs and event notifications, the SMA software helps you evaluate system health and the need for remedial actions. The following topics are covered:

- [Storage Management Appliance Status](#), page 56
- [Storage Management Appliance Logs](#), page 58
- [SAN Events and Event Notification](#), page 62
- [About Notification Types](#), page 65
- [Enabling User Properties for Notification](#), page 67
- [Setting Up Notifications](#), page 69

## Storage Management Appliance Status

The Storage Management Appliance displays its current status in the Session pane at the top of the page. This status display is an accumulation of unacknowledged events in the Event and Audit logs. The status information is refreshed every 30 seconds.



**Figure 34: Session pane with current status**

The severity level shown for current status is the highest severity condition found among unacknowledged events received from devices and applications managed by the Storage Management Appliance. [Table 4](#) describes all the possible severity levels.

**Table 4: Possible Status Types**

Status	Description
Normal	All events have been acknowledged.
Unknown	The status of one or more devices is unknown.
Information	An informational event.
Warning	Further action is optional.
Minor	Further action is necessary, but the situation is not serious at this time.
Major	Further action is necessary immediately.
Critical	Further action is necessary immediately and the scope is broad.
Fatal	An error occurred, but it is too late to take remedial action.



Additional status information is displayed on the **Status** page (Figure 35). You can open this page by clicking the Status field in the Session pane or the **Status** button in the primary navigation bar.

**Status**

This page provides overall event and audit status for your managed storage environment. You can obtain additional system event details from log files or management agents.

**Overview**

**Logs**  
View, clear, download and configure log files.

**Management Agents**  
Tools to provide overall management of the appliance

**Details**

- SMAD666FK77D888 - 11 Informational Events**
- smad666fk77d888 - 1 Audit Failure**

**smad666fk77d888 - 1 Audit Failure**

To view these events in the Audit Log, choose [View Events](#).

To acknowledge these events, choose [Acknowledge Events](#).

**Figure 35: Status page with details**

The **Status** page offers the following options:

- Link to the **Logs** page, where you can inspect entries in the various log files. See “[Storage Management Appliance Logs](#)” on page 58 for details on the different log types.
- Link to **Management Agents** to view information about the Storage Management Appliance’s hardware elements.
- Click an item in the **Details** section to display information about the selected item on the lower part of the page (Figure 35).

The items displayed in the **Details** section of the **Status** page are from either the **Event** or **Audit** logs, which are the main logs for the Storage Management Appliance. See “[Using Event and Audit Logs](#)” on page 60 for more information.

The **Status** page list displays events in order of severity. You can view the events or acknowledge them.

- Clicking **View Events** opens the appropriate log file page.
- Clicking **Acknowledge Events** removes the events from the **Details** list. Acknowledging events of the highest severity changes the overall severity level displayed in the Session pane.

## Storage Management Appliance Logs

The Storage Management Appliance maintains the following logs that you can use to review system operation.

- **Event Log**—Contains events reported by the Storage Management Appliance, its core components and services, as well as by SAN devices and storage management applications. See [“Using Event and Audit Logs”](#) on page 60 for more information.
- **Application Log**—A Windows operating system log containing events reported by applications or programs. Each application determines which events to record. Management features are similar to the Event Log.
- **System Log**—A Windows operating system log containing events logged by the operating system components. For example, the log can report that a driver or other system component failed to load during startup. Management features are similar to the Event Log.
- **Security Log**—A Windows operating system log containing security events such as valid and invalid logon attempts as well as events related to resource use such as creating, opening, or deleting files. Management features are similar to the Event Log.
- **Web Administration Log**—A Windows operating system log containing a list of separate log files. These files contain events that are logged by the Web server about access to the administration website. Management features are similar to the Backup Log.
- **License Log**—Contains events logged by the Storage Management Appliance license server. You can download the file to your computer.
- **Backup Log**—Contains a list of separate log files—one for each backup operation. After selecting a file you can view the contents or download the file to your computer.

- **Restore Log**—Contains a list of separate log files—one for each restore operation. After selecting a file you can view the contents or download the file to your computer.

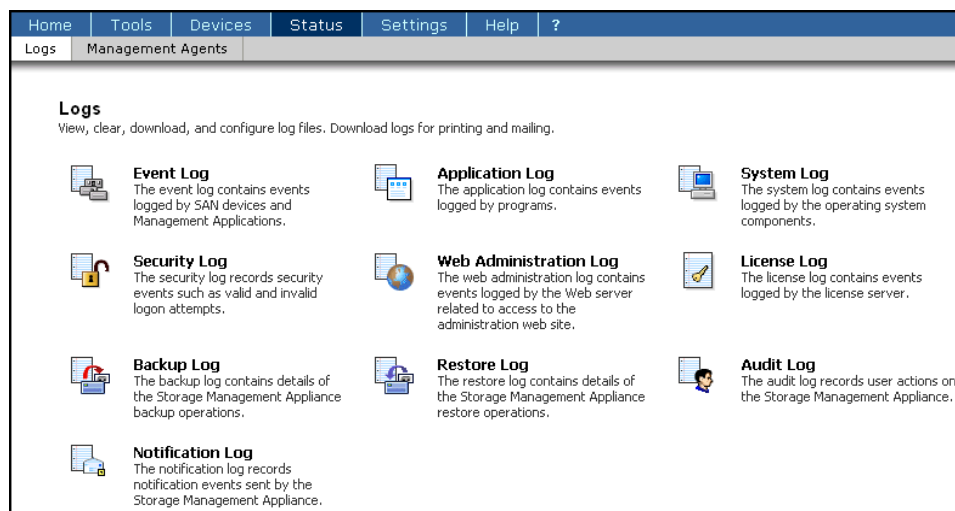
---

**Note:** These Backup and Restore logs record only those backup and restore processes completed with the Storage Management Appliance features—not those completed with another backup application.

---

- **Audit Log**—Used to record user actions on the Storage Management Appliance. The system logs all user actions. See “[Using Event and Audit Logs](#)” for more information.
- **Notification Log**—Used to record notification events sent by the Storage Management Appliance.

Access any log by opening the **Logs** page ([Figure 36](#)).



**Figure 36:** Logs page

The next section, “[Using Event and Audit Logs](#),” describes the two logs you are most likely to use. For complete information on all of the available logs, see the Storage Management Appliance online help.

## Using Event and Audit Logs

The Event and Audit logs record Storage Management Appliance events of different types. The Audit Log contains information about the activities of particular users while the Event Log contains information about device or application events. These two logs offer similar management features.

You can access the Event or Audit log page from the **Logs** page (Figure 36).

Figure 37 shows a sample Event Log.

<input type="checkbox"/>	Type	Date	Time	Source	Device	Ack	Event Cor	Tasks
<input type="checkbox"/>	Information	07/29/2003	6:04:55 PM	Management Appliance	16.129.78.182	No	880A03F6	Event Details...
<input type="checkbox"/>	Information	07/28/2003	4:46:00 PM	Management Appliance	16.129.78.182	No	880A03F6	Download Log...
<input type="checkbox"/>	Information	07/28/2003	4:45:57 PM	Management Appliance	16.129.78.182	No	880A03F6	Log Properties...
<input type="checkbox"/>	Information	07/28/2003	4:45:56 PM	Management Appliance	16.129.78.182	No	880A03F6	Clear Log
<input checked="" type="checkbox"/>	Information	07/28/2003	4:45:31 PM	Management Appliance	16.129.78.182	No	880A03F6	Acknowledge
<input type="checkbox"/>	Information	07/28/2003	4:44:22 PM	Management Appliance	16.129.78.182	No	880A03F6	Acknowledge All
<input type="checkbox"/>	Information	07/28/2003	4:43:35	Management	16.129.78.182	No	880A03F6	

**Figure 37: Event Log**

The basic display for the **Event** and **Audit Log** pages uses a list table that can extend over multiple pages, each holding a maximum of 100 log entries. See “[List Tables](#)” on page 19 for more information on this topic.

Information for each event appears in the following columns for each log.

<b>Event Log Information</b>	<b>Audit Log Information</b>
Type	Type
Date	Date
Time	Time
Source	User
Device	Device
Acknowledged (Yes - No)	Category
Event Code	Acknowledged (Yes - No)
	Event Code

Hold the cursor over an event code to display a short pop-up description as shown in [Figure 37](#).

The system automatically assigns an unacknowledged status when first recording an event in either log. As a user assigned the Administrator privilege level, you can change the status of any event to Acknowledged = Yes to indicate the event cause has been examined and no further action is required. The Storage Management Appliance displays system status information in the Session pane and the **Status** page based on unacknowledged entries in the Event and Audit logs.

Both the **Event Log** and **Audit Log** pages have the following **Tasks** buttons:

- **Event or Audit Details**—Displays a **Log Details** page with complete information about an entry selected on the Event or Audit Log page.
- **Download Log**—Displays a **Download Audit Log** or **Download Event Log** page.
- **Log Properties**—Displays the **Event Log Properties** or **Audit Log Properties** page. Both pages let you specify the size and contents of the logs. The maximum size you can set for the Event Log is 16 MB; the maximum Audit Log is 8 MB.
- **Clear Log**—Deletes all entries from the active log after you respond positively to a request for confirmation. To save existing log entries for future reference you must download the current log.
- **Acknowledge**—Changes the status of selected log entries to acknowledged after you respond positively to a request for confirmation.
- **Acknowledge All**—Changes the status of all log entries to acknowledged after you respond positively to a request for confirmation.

While users with Administrator privileges can use all log features, users assigned the Operator privilege level can only view and download the Event Log. See Appendix C, “[Menu Options and Access Requirements](#)” on page 101 for detailed information about privilege levels required to access log features.

## SAN Events and Event Notification

As described in [Chapter 3](#), the Storage Management Appliance identifies devices and applications in your storage environment through discovery processes. Many of the discovered devices and applications generate events that help you monitor SAN operations. An event can identify a routine occurrence, such as starting an application, or a critical occurrence, such as a hardware failure.

A discovered device or application forwards information about an event to the Storage Management Appliance where it is logged. See “[Storage Management Appliance Logs](#)” on page 58 for more information about available logs.

For most events, you can set notification parameters that specify how you want the Storage Management Appliance to distribute event information received from a device or application. You can send event information to specific people using standard e-mail or an e-mail pager. You also have the option to forward event information as an SNMP trap to another host.

## Application Events

You can configure the following management applications to send event information to the Storage Management Appliance:

- HP StorageWorks Command View EVA (element manager for HSV)
- HP StorageWorks HSG Element Manager
- HP OpenView Storage Provisioner
- HP StorageWorks Secure Path Manager

Installing the Storage Management Appliance software v2.1 update automatically configures the HSG element manager to send event information to the Storage Management Appliance.

To configure Command View EVA to send events to the Storage Management Appliance, add the SMA IP address or 127.0.0.1 to the Event Notification: Host Options for each storage cell in Command View EVA.

If Storage Provisioner and Secure Path Manager were forwarding event information to the Storage Management Appliance prior to the v2.1 update, they will continue to do so after the update without manual configuration.

If you install the Storage Provisioner or Secure Path Manager applications after the v2.1 update, be sure to configure those applications to send information to the Storage Management Appliance. See the application documentation for detailed information about this type of configuration.

---

**Note:** The Storage Management Appliance does not receive events from Secure Path Manager installed on other hosts.

---

## Device Events

Each device identified by an IP discovery must be manually configured to send event information to the Storage Management Appliance. Most devices send this information as an SNMP trap.

**Supported Devices** The Storage Management Appliance can decode SNMP trap information for some devices and as a result can provide a detailed description of what happened. Such devices are called *supported* devices. Supported devices have a detailed definition for each event type that the device can generate. See the *Storage Management Appliance Software Event Code Definitions Application Notes* for a complete list of supported devices and the event code definitions available for each device type. This document is available at the following website:

<http://h18006.www1.hp.com/products/sanworks/managementappliance/documentation.html>.

The following device types are currently supported with event code definitions:

- HP StorageWorks SAN and Brocade Switches
- HP StorageWorks and McData Switches
- NetApp Filers (Network Attached Storage - NAS - devices)

**Unsupported Devices** Discovered devices generating SNMP traps that cannot be decoded (have no event code definitions) are called *unsupported* devices and these include the following:

- Host computers
- Network Attached Storage (NAS) elements with the exception of NetApp Filer devices
- Hubs
- Modular Data Routers (MDR)

Only the following information is available for an SNMP trap received from an unsupported device.

- Source IP address
- Trap OID (MIB identifier)
- Generic trap type
- Specific trap type

When the Storage Management Appliance receives a trap from an unsupported device, the SMA generates an event (event code **880A02BC**; severity - **Information**), which includes the basic trap information plus the date and time. A Storage Management Appliance Administrator can then enable notifications of this event type.



## About Notification Types

You can use Storage Management Appliance notification features to send event information such as SNMP traps to a host or have the information sent to a number of users in an e-mail message or an e-mail pager alert. By default, the system logs events and does not send notifications.

### SNMP Trap Forwarding

For a supported device or discovered application you can select an event type and have the Storage Management Appliance forward basic information about each event of that type to another host. The SMA formats the information as an SNMP trap message and the destination host is called an *SNMP trap recipient*. You must identify each SNMP trap recipient by name or IP address. You can set up SNMP trap forwarding differently for each event type generated by a supported device or application.

For unsupported devices, you can enable or disable trap messages from each device. Unlike supported devices, you cannot specify that unsupported devices send trap messages to a particular recipient. If you enable trap forwarding from an unsupported device, the SMA forwards these traps to all listed trap recipients. Use the **Details** tab of the **Properties** page to set SNMP trap forwarding for unsupported devices.

### E-mail or E-mail Pager Notification

The Storage Management Appliance can notify a user of an event by sending an e-mail message to a standard e-mail address or to an e-mail pager address.

For applications and supported devices, each user can specify the type of events for which they want to receive a notification message. You can also select an event type generated by a particular device or application and have the Storage Management Appliance send an e-mail message and/or e-mail pager alert to any number of users for each event of that type.

You can set up e-mail notification differently for each event type generated by a supported device or application.

To receive e-mail notification about events from unsupported devices, you can enable notification for the Storage Management Appliance event type that is labeled with event code **880A02BC** and severity **Information**. This event is listed on the **Notification Events** page for the Storage Management Appliance.

**User Properties** The setup of user properties includes options that determine if a user is allowed to receive event notifications and the type they receive—e-mail and/or e-mail pager. Other options can filter the notifications a user receives by severity level and time of day.

---

**Note:** An SMTP server must be specified before the Storage Management Appliance can send e-mail notifications. See [“Mail Server Settings”](#) on page 38 for more information.

---

User properties take priority over any notification settings. For example, notification settings could specify that a user receive notification messages for three event types of severity type Warning. The system does not send those messages if the user property allowing notification is not selected or the property specifying delivery of Warning type messages is not selected. Be sure a user has the appropriate user properties selected before you attempt to designate that person as a recipient of standard e-mail or e-mail pager notification. See [“Enabling User Properties for Notification”](#) on page 67 for detailed information.

## Avoiding Duplicate Notification

The HSG Element Manager and Command View EVA have their own notification features that can be used to directly notify people or other hosts of an HSG or HSV event. It is possible to have both the Storage Management Appliance and the element managers send notification messages for one of these events.

To avoid duplicate notification, you need to select one of the following options.

- Receive notification directly from the HSV or HSG element managers. Set up or maintain direct notification settings for the element managers and do not set up the Storage Management Appliance for notification of these events.
- Receive notification through the Storage Management Appliance. Set up the Storage Management Appliance for notification of HSV and HSG events and do not set up the element managers for direct notifications.

## Enabling User Properties for Notification

In order to receive event notifications of any type, a user must first have appropriate options selected on their user properties page. A user assigned the Operator privilege level can change their own notification properties and a user assigned the Administrator privilege level can set notification properties for any user.

The following conditions must be satisfied before a user receives notification messages.

- User contact information must be filled in and notification must be enabled for the user.
- Notification settings for at least one device or application must specify that the user receive notifications for one or more event types.

Use the **Contact Info** (Figure 38) and **Notification Info** (Figure 39) tabs to enable notification for a selected user.

Home	Tools	Devices	Status	Settings	Help	?
Maintenance	Users	Discovery	Manage Tools	Network	Notification	License

**User Properties**

<b>General</b>	
<b>Contact Info</b>	Email Address: <input type="text"/>
<b>Access</b>	Email Pager Address: <input type="text"/>
<b>Default Page</b>	
<b>Notification Info</b>	

**Figure 38: Contact Info tab of a User Properties page set**

A valid e-mail or e-mail pager address are required if you want the user to receive any e-mail or e-mail pager notifications.

For the selected user to receive notifications, the **Enable Notification for this user** box must be checked on the **Notification Info** tab (Figure 39).

**Figure 39: Notification Info tab of a User Properties page set**

In addition, the **Notification Info** tab offers the following notification options for each of eight severity types:

- None
- Pager (e-mail pager)
- E-mail and Pager
- E-mail

For example, if you choose Pager for the Critical severity type, then events of this type will generate a message to the person's e-mail pager. Selecting **None** for a severity level blocks notification of events having that severity type.

## Setting Up Notifications

After you enable event notifications for users, as described in “[Enabling User Properties for Notification](#)” on page 67, you can use the Storage Management Appliance software to set up event notifications in two ways:

- Select a discovered device or registered application and specify how each event type should be handled. In this process you can specify both SNMP trap forwarding and e-mail notification for each supported event type generated by the device or application. See “[Notification for a Device or Application](#)” for more information.
- Select a user and specify the event types that generate an e-mail notification message to that person. Review the supported event types for all available devices and applications and select those that are to generate e-mail messages to the selected user. See “[Notification for a User](#)” on page 71 for more information.

### Notification for a Device or Application

Use the **Notification** page ([Figure 40](#)) to create notification settings for event types generated by a particular device or application.

The screenshot shows the 'Notification' page in the Storage Management Appliance software. The page has a navigation menu at the top with options: Home, Tools, Devices, Status, Settings, Help, and ?. Below the menu, there are tabs for Maintenance, Users, Discovery, Manage Tools, Network, Notification, Licensing, Automation, and Remote. The main content area is titled 'Notification' and contains a search bar and a table of devices and tools. The table has columns for Type, Sub-Type, Source, Recipient List, and Tasks. The 'Switch' row is selected, and the 'Tasks' column shows 'Events...'.

Type	Sub-Type	Source	Recipient List	Tasks
<input type="checkbox"/>	ManagementAppliance	hp OpenView storage management...	SMAD111FK22D333	(4):AdminAssist10, dougm2, ...
<input checked="" type="checkbox"/>	Switch	Brocade FibreChannel Switch	eosqa666	(1):AdminAssist10
<input type="checkbox"/>	Switch	Brocade FibreChannel Switch	eosqa777	
<input type="checkbox"/>	Switch	Brocade FibreChannel Switch	eosqa888	
<input type="checkbox"/>	Switch	Brocade FibreChannel Switch	eosqa999	(1):C-Garciad

**Figure 40: Notification page**

The **Notification** page contains a list of supported discovered devices and registered applications that generate events. Note that this page lists components identified by both IP and SAN discoveries.

For example, [Figure 40](#) on page 69 includes a Brocade Fibre Channel Switch eosqa666. When you select this switch and click **Events**, the **Notification Events** page opens ([Figure 41](#)).

The screenshot shows the 'Notification Events' page. At the top, there is a navigation bar with tabs: Home, Tools, Devices, Status, Settings, Help, and ?. Below this is a secondary navigation bar with tabs: Maintenance, Users, Discovery, Manage Tools, Network, Notification (selected), Licensing, Automation, and Remote. The main content area is titled 'Notification Events' and includes a sub-header: 'This page displays events for the devices and management tools you selected on the previous page. To configure notifications select one or more events and click Configure.'

Below the sub-header is a search bar with a dropdown menu set to 'Sub-Type', a text input field, and a 'Go' button. To the right of the search bar are two small buttons with up and down arrows. Below the search bar is a table with the following columns: Sub-Type, Source, Event Code, Severity, Recipient List, and Tasks. The table contains several rows of event data. The first row is selected, and a tooltip is displayed over the Event Code '88011771', showing the text 'HSGSubsystem object created.'

<input type="checkbox"/> Sub-Type ▾	Source	Event Code	Severity	Recipient List	Tasks
<input checked="" type="checkbox"/> StorageWorks HSG RAID Con...	ZG81000726...	88011771 ...	Information		Properties... Configure... Clear Configure All... Clear All
<input type="checkbox"/> StorageWorks HSG RAID Con...	ZG81000726...	88011772 ...	Information		
<input type="checkbox"/> StorageWorks HSG RAID Con...	ZG81000726...	88011773 ...	Information		
<input type="checkbox"/> StorageWorks HSG RAID Con...	ZG81000726...	88011774 ...	Major		
<input type="checkbox"/> StorageWorks HSG RAID Con...	ZG81000726...	88011775 ...	Information		
<input type="checkbox"/> StorageWorks HSG RAID Con...	ZG81000726...	88011776 ...	Major		
<input type="checkbox"/> StorageWorks HSG RAID Con...	ZG81000726...	88011777 ...	Information		

**Figure 41: Notification Events page**

The **Notification Events** page contains a list of supported event types generated by the selected device, in this case, the switch. Hold the cursor over an event code to display a short pop-up description. Use the buttons on this page to perform the following tasks for selected events:

- Configure notification settings by adding or removing recipients
- Specify logging
- Modify notification settings
- Clear notification settings

For complete instructions on configuring device notifications, see the Storage Management Appliance online help.

## Notification for a User

You can set and modify notification parameters based on the needs of a particular user. An individual assigned the Administrator privilege level can create notification settings for any user. Individuals with Operator privileges can only create settings for their own user accounts.

**Note:** User notification properties must be properly set for the person to receive notifications. See “[Enabling User Properties for Notification](#)” on page 67 for details.

Access the **User Event Notification** page (Figure 42) from the **Users** page (Figure 18 on page 26).

<input type="checkbox"/> Type	Sub-Type	Source	Tasks
<input type="checkbox"/> Switch	Brocade FibreChannel Switch	xxxx-dcentersw1	New...
<input checked="" type="checkbox"/> NASDevice	Network Appliance Filer	naf5000	Events...
<input type="checkbox"/> Subsystem	StorageWorks HSG RAID Controll...	ZG81000726_ZG0460895...	Transfer...
<input type="checkbox"/> Switch	McData FibreChannel Switch	xxxxlab46	

**Figure 42: User Event Notification page**

This page lists the discovered devices and registered applications that currently generate notifications to the selected user. The Storage Management Appliance notifies the user of at least one event type for each device or application listed.

If you are configuring a new user or completing an initial configuration of the Storage Management Appliance, the **User Event Notification** page could be empty.

The **User Event Notification** page lets you

- Set up new notifications for a selected user
- View and modify events currently reported to the user
- Transfer notification settings from one user to another

For complete instructions on configuring user notifications, see the Storage Management Appliance online help.



# SAN Maintenance

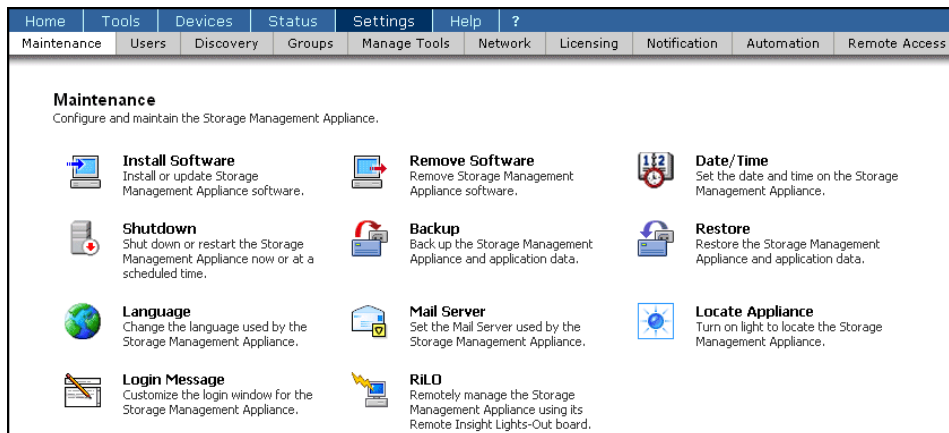
## 5

This chapter describes how to maintain the Storage Management Appliance environment. The following topics are covered:

- [Summary of Maintenance Features](#), page 74
- [Installing Software](#), page 75
- [Backing Up and Restoring Data Files](#), page 77
- [Managing Tools and Components](#), page 78
- [Managing Licenses](#), page 79
- [Diagnostic Tasks](#), page 80
- [Automating Maintenance](#), page 81

## Summary of Maintenance Features

You can use features available on the **Maintenance** page to complete a variety of administrative tasks.



**Figure 43: Maintenance page**

The **Maintenance** page provides the following options:

- **Install Software**—Install or update HP storage management software on the Storage Management Appliance. See “[Installing Software](#)” on page 75 for more information about this topic.
- **Remove Software**—Remove software from the Storage Management Appliance.
- **Date/Time**—Set the date and time on the Storage Management Appliance or synchronize the SMA and an SNTP Time Server. See “[Date and Time Settings](#)” on page 37 for more information about this topic.
- **Shutdown**—Restart or shut down the Storage Management Appliance, or plan a scheduled restart or shutdown.
- **Backup**—Back up database and application data files from the Storage Management Appliance to a network share. See “[Backing Up and Restoring Data Files](#)” on page 77 for more information about this topic.
- **Restore**—Restore database and application data files from a network share to the Storage Management Appliance. See “[Backing Up and Restoring Data Files](#)” on page 77 for more information about this topic.

- **Language**—Set the language that is displayed on the Storage Management Appliance software pages.
- **Mail Server**—Designate the SMTP mail server and provide sender information. See “[Mail Server Settings](#)” on page 38 for more information about this topic.
- **Locate Appliance**—Turn on LEDs to identify the Storage Management Appliance.
- **Login Message**—Customize the text in the Storage Management Appliance login window.
- **RiLO**—Use the Remote Insight Lights-Out (RiLO) board on the Storage Management Appliance to perform remote diagnostics. On the Storage Management Appliance III, this feature is called Integrated Lights Out (iLO).

For complete information and instructions on using all of the maintenance features, see the Storage Management Appliance online help. The following sections provide additional information on using the Storage Management Appliance’s features for software installation and backup and restore.

## Installing Software

You can install any value-added HP storage management application on the Storage Management Appliance using the Install Software feature. These optional management applications, which you purchase separately, include the following:

- HP StorageWorks Business Copy EVA
- HP StorageWorks Continuous Access EVA
- HP StorageWorks Secure Path Manager
- HP OpenView Storage Provisioner
- HP SANworks Network View

## Installation Process

The installation process registers each application with the Storage Management Appliance software so the Storage Management Appliance receives notification events and captures additional information in the system logs.

---

**Note:** Before you install an update to a previously installed application, you need to ensure that its services are stopped.

---

Should installation of an application fail for any reason, the Storage Management Appliance does not allow you to attempt another installation during the one-hour period following a failed attempt. Should you attempt another installation during this period the system displays an error message saying a previous installation is in progress.

## Installing Other Supported Applications

Selected other applications from HP and third-party vendors have been tested and are supported to run on the Storage Management Appliance. These include industry-standard products in the following software categories:

- Backup and Restore
- Antivirus Protection
- Uninterruptible Power Supply
- System Management

---

**Note:** Do not attempt to use the Storage Management Appliance Installation wizard to install these additional applications.

---

For more information about the supported applications, including installation and configuration instructions, refer to the following documents:

- *HP OpenView Storage Management Appliance Software Using Backup Software Application Notes*
- *HP OpenView Storage Management Appliance Software Using Antivirus Software Application Notes*
- *HP OpenView Storage Management Appliance Software Using System Management Software Application Notes*
- *HP OpenView Storage Management Appliance Software Using Uninterruptible Power Supply Software Application Notes*

These documents are available from the Storage Management Appliance website:  
<http://h18006.www1.hp.com/products/sanworks/managementappliance/documentation.html>.

---

**Note:** HP supports only those software products that have been tested, qualified, and documented by HP in published Application Notes. Any other software will not be supported by HP if installed directly on a Storage Management Appliance.

---

## Backing Up and Restoring Data Files

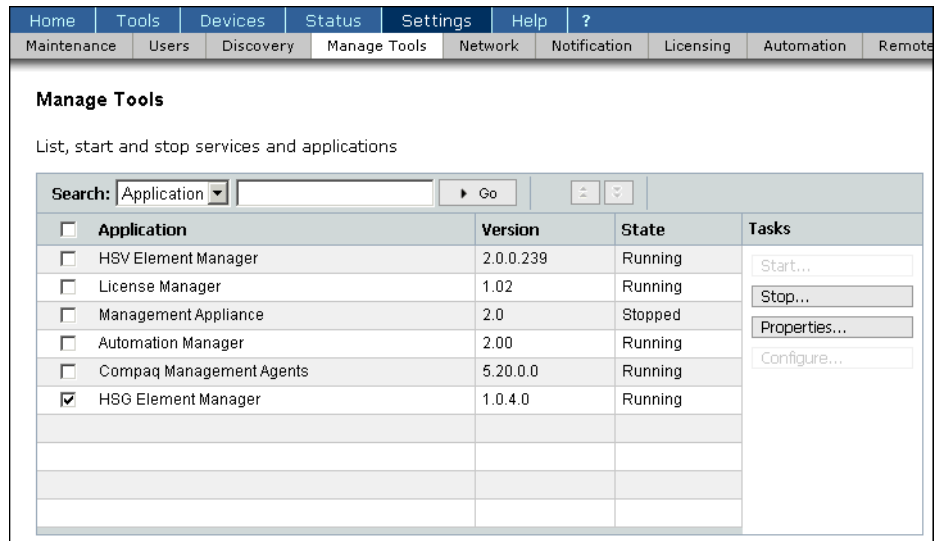
The Storage Management Appliance provides a built-in capability to back up and restore the database and application files. You have the option to use these features or another backup and recovery system, as described in “[Installing Other Supported Applications](#)” on page 76.

HP recommends that you perform regular backups of your Storage Management Appliance data.

For complete instructions on using the SMA backup and restore features, see the Storage Management Appliance online help.

## Managing Tools and Components

The **Manage Tools** page (Figure 44) lets you start or stop services and view selected properties for core components and added-value applications you have installed on the Storage Management Appliance. For example, you can use this feature to start and stop application services during software updates. Access this page from the **Settings** page (Figure 17 on page 24).



**Figure 44: Manage Tools page**

The **Manage Tools** page has the following **Tasks** buttons:

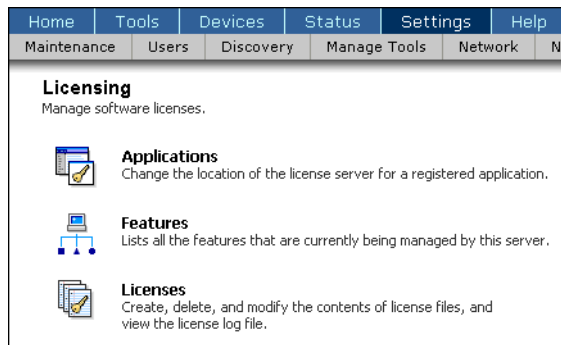
- **Start**—Starts the selected application or core component and all of its associated services.
- **Stop**—Stops the selected application or core component and all of its associated services.
- **Properties**—Displays a list of individual services associated with a selected application, including version number and state. You cannot stop individual services associated with an application.
- **Configure**—Provides additional configuration options. Currently, the **Configure** button becomes enabled only for Storage Area Manager.

For complete information and instructions on using the Managed Tools feature, see the Storage Management Appliance online help.

## Managing Licenses

The licensing feature lets you control installed applications that use the Globetrotter FLEXlm licensed manager software. The licensing feature allows you to manage the number of people using each application so you stay within the limits of the license agreement.

Access the **Licensing** page (Figure 45) from the **Settings** page (Figure 17 on page 24).



**Figure 45: Licensing page**

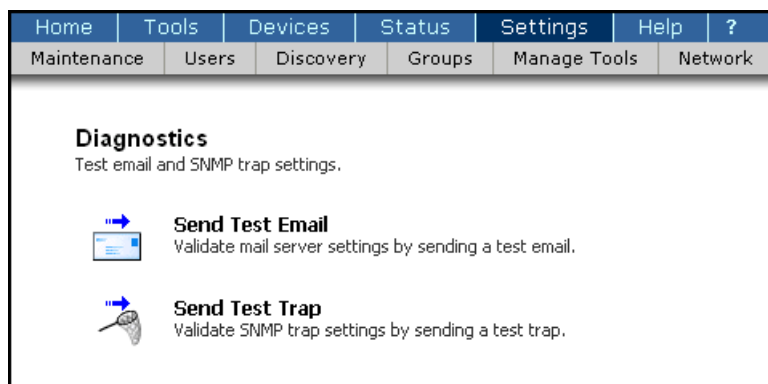
Use links on the **Licensing** page to display the following pages.

- **Applications**—Lists existing applications with the assigned license server for each application. Select an application and click **Properties** to change the assigned license server.
- **Licensing Features**—Lists existing features and allows you to display detailed information for a selection.
- **Licenses**—Lists existing license files and options files. You can use features on this page to view, create, modify, and delete license files.

For complete information and instructions on using the Licensing feature, see the Storage Management Appliance online help.

## Diagnostic Tasks

The Diagnostics page (Figure 46) offers the optional tasks of sending a test e-mail or a test trap.



**Figure 46: Diagnostics page**

You can send an e-mail as a test of your mail server settings. Performing this test verifies that your mail server is correctly configured and ensures accurate e-mail event notification from the Storage Management Appliance.

You can also send a trap as a test of your SNMP trap destination settings. Performing this test verifies that a specified device is correctly configured to receive traps from the Storage Management Appliance.

For complete information and instructions on sending test e-mails and traps, see the Storage Management Appliance online help.



## Automating Maintenance

The Storage Management Appliance lets you automate some maintenance tasks through one of its core components: HP OpenView Automation Manager. Automation Manager is a web-based tool that allows a storage administrator to automate Storage Area Network (SAN) procedures or enforce policies that usually require human intervention.

Automation Manager allows you to develop policies consisting of event and action scripts that can be run on any number of hosts. Event scripts run to monitor a system by comparing current conditions with established thresholds or identifying activities that warrant some maintenance action. Policies poll event scripts at regular intervals that you specify. Action scripts run when required to complete an appropriate maintenance action.

Automation Manager comes with a number of predefined scripts that you can use to create a variety of policies. You can also import scripts developed to meet local needs or export existing scripts for modification. See the *HP OpenView Automation Manager Script Development Guide* for detailed information about script development.

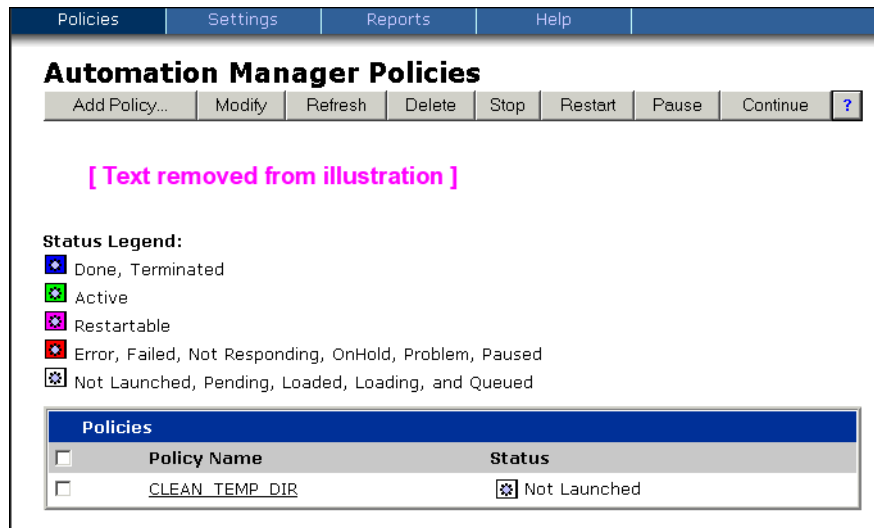
Access Automation Manager from the **Settings** page ([Figure 17](#) on page 24)

---

**Note:** When Automation Manager is launched, a Security Alert dialog box opens. Click **Yes** to proceed with using the application.

---

When you start Automation Manager, the **Policies** page opens in a separate browser window (Figure 47).



**Figure 47: Automation Manager Policies page**

The table at the bottom of the **Policies** page lists existing policies. Use the gray buttons at the top of the page to create a new policy or control a selected policy.

- **Add Policy**—Displays the first page of the **Add Policy** wizard.
- **Modify**—Displays the first page of the **Modify Policy** wizard.
- **Refresh**—Updates the status of listed policies.
- **Delete**—Deletes selected policies.
- **Stop**—Stops the routine execution of the event scripts for selected policies.
- **Restart**—Starts any selected scripts.
- **Pause**—Stops selected running policies temporarily by putting them in a paused state that anticipates continued operation in the near future.
- **Continue**—Starts any selected policies currently in a paused state.

For complete instructions on using these features, see the Automation Manager online help.

# Migrating Event Notification Settings



Appendix A describes how to migrate event notifications from version 1.0C of the Storage Management Appliance software to version 2.1. If you had version 1.0C of the SMA software configured to send event notifications to specific recipients, you can migrate these settings to the updated SMA software v2.1. This migration procedure is necessary to ensure that the users continue to receive notifications.

If you did not use the event notification features in v1.0C, the procedure is unnecessary and the **Migrate Event Notification Settings** link does not appear on the **Getting Started** page.

---

**Note:** This migration process is not necessary for users who upgrade from Storage Management Appliance software v2.0 to v2.1. In this case, event notification settings are updated automatically.

---

This appendix contains the following major sections:

- [Using the Migration Wizard](#), page 84
- [Creating a New Notification Recipient Account](#), page 85
- [Sending Notifications to an Existing Account](#), page 90

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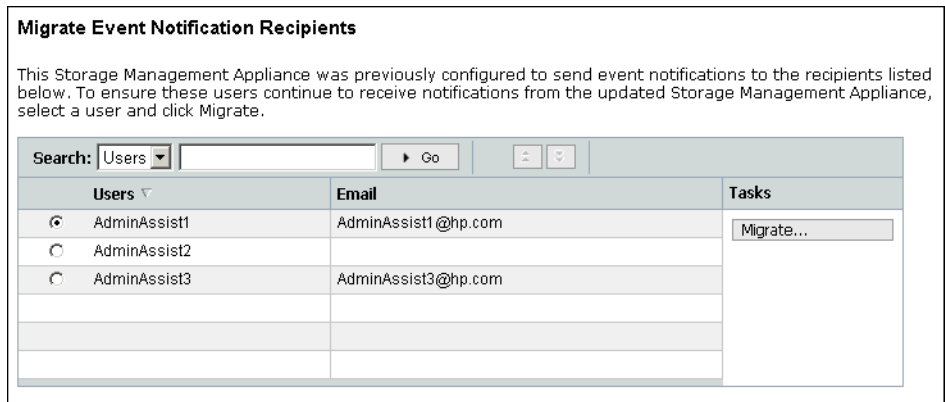
**Note:** You must migrate all previous notification settings before changing the Storage Management Appliance name. Migration cannot be done after changing the SMA name.

---

## Using the Migration Wizard

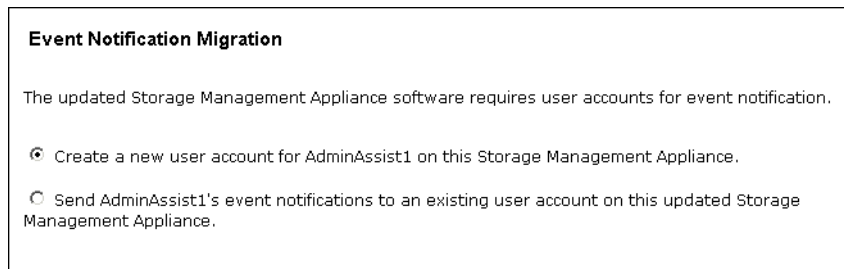
Use this procedure to migrate event notification settings from your v1.0C installation of the Storage Management Appliance software.

1. Click **Home** on the primary navigation bar.
2. Click **Getting Started**, and then click **Migrate Notification Settings** to display the **Migrate Event Notification Recipients** page (Figure 48). This page lists each recipient with their settings from your previous version of the Storage Management Appliance software.



**Figure 48: Migrate Event Notification Recipients page**

3. Select a user, and then click **Migrate**. You complete the migration process for one user at a time.
4. Click **Next** to display the **Event Notification Migration** wizard second page (Figure 49).



**Figure 49: Event Notification Migration page: choose method**

5. Choose where to send the previously configured notification settings.

Either create a new user account, or send the notifications to an existing user account. You can choose only one of these destinations for each previous recipient's settings. You cannot migrate previous settings to both a new and an existing user.

To continue, follow the instructions in the appropriate section:

- See “[Creating a New Notification Recipient Account](#)” on page 85
- See “[Sending Notifications to an Existing Account](#)” on page 90

## Creating a New Notification Recipient Account

When you migrate notification settings from a previous installation, you can create a new recipient who will receive the notifications. By default, this new Storage Management Appliance user has a disabled status and a disabled user account cannot receive notifications. As a user assigned the Administrator privilege level, you can change the status to enabled at a later time. See “[Setting Additional User Properties](#),” on page 31 for detailed information.

---

**Note:** Remember, if you want greater security while working with users and their passwords during the notification migration, change http to https in the browser address box and press Enter. The Notification Migration wizard restarts as a secure site. You can then continue with the procedure below.

Clicking Secure site (at the bottom of the Create New User page) also sets the browser to https, but it opens the Storage Management Appliance Home page as a secure site in a separate browser window and you must start over.

---

Use this procedure to create a new notification recipient account.

1. If necessary, display the **Event Notification Migration** wizard second page (Figure 50). See “Using the Migration Wizard,” on page 84.

**Event Notification Migration**

The updated Storage Management Appliance software requires user accounts for event notification.

Create a new user account for AdminAssist1 on this Storage Management Appliance.

Send AdminAssist1's event notifications to an existing user account on this updated Storage Management Appliance.

**Figure 50: Event Notification Migration page: choose create a new user account**

2. Choose **Create a new user account for <name> on this Storage Management Appliance** and click **Next** to display a wizard third page (Figure 51).

**Event Notification Migration**

Enter the following information to create a new account for AdminAssist1 on this updated Storage Management Appliance.

User name:

Full name:

Description:

Password:

Confirm password:

Disable this user account

Select user privilege level:

User

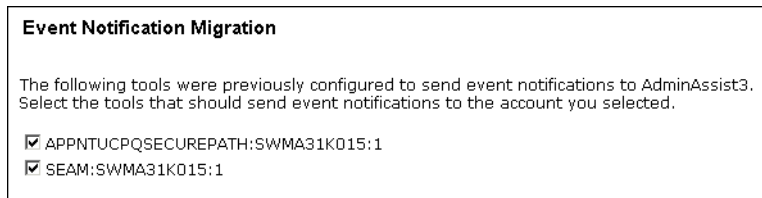
Operator

Administrator

**Figure 51: Migration wizard: create new account**

3. Enter the requested user information.
  - Type a User name (required) and Full name (optional).
  - Enter a description (optional).
  - Enter and confirm a password for the new user.

4. Specify that the new user account have a disabled or enabled status.
  - Accepting the default (disabled), prevents the new recipient from logging on locally to the Management Appliance through the Web browser.
  - Clearing the checkbox allows the recipient to log on and receive notifications.
5. Select a privilege level for this user. See “[User Privilege Levels](#),” on page 27 for a description of each type.
6. Click **Next** to display a wizard fourth page showing the devices and applications previously configured to send event notifications to the recipient you specified. [Figure 52](#) is an example of this page showing two previous notifications—one for Secure Path and one for Automation Manager.



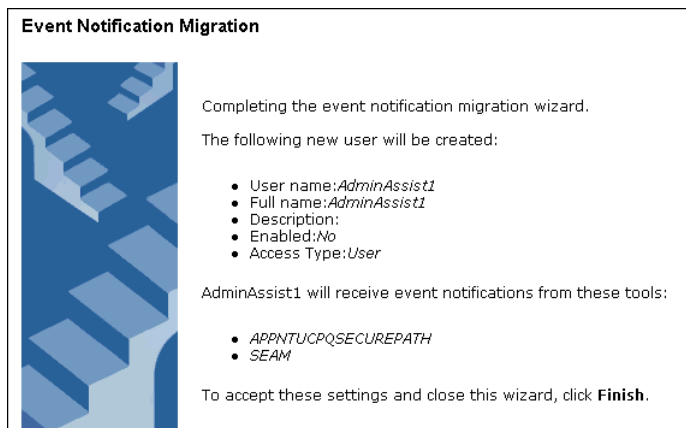
**Figure 52: Migration wizard: choose tools for notifications**

---

**Note:** Be sure to select all applications that you want to migrate because the migration process can only be done once for each user.

---

7. Select the devices and applications that should send event notifications to the new user account, and click **Next** to display a summary of the information for the new recipient's account (Figure 53).



**Figure 53: Migration wizard: new account summary page**

---

**Note:** While user properties for v2.1 allow you to specify delivery by standard e-mail and/or e-mail pager, the migration process specifies delivery by standard e-mail only.

---

8. Click **Finish** to complete the notification migration for the selected user and return to the **Migrate Event Notification Recipients** page.

If there are more users to migrate, choose another user and click **Migrate** to complete the process again. When there are no more users with notification settings to migrate, the **Migrate Notification Settings** icon disappears from the **Getting Started** page.

The new Storage Management Appliance user created in this process has the same e-mail address as the previous version user. If the new user account is enabled, that person receives notification messages from the same devices and applications as the migrated user.

---

**Note:** If the previous version user had notification settings for particular devices or applications with e-mail notification disabled, the new v2.1 user has similar notification settings with notification disabled. You can change this by using the **Notification Info** tab of the **User Properties** page.

---



By default, the new user receives notification for all event types generated by the same devices and applications as the previous user. The Storage Management Appliance v2.1 software provides two ways an administrator can reduce the number of notification messages received by the new user. One way is to disable notification for particular severity types using the **Notification Info** tab of the **User Properties** page. See “[Enabling User Properties for Notification](#),” page 67 for detailed information. The other way is to disable unwanted event types listed on the **Events Summary** page for the user. See “[Notification for a User](#),” page 71 for detailed information.

This migration process adds any SNMP trap recipients or hosts to the Storage Management Appliance database; however, the associated settings for event forwarding are not migrated. See “[SNMP Trap Forwarding](#),” on page 65 for detailed information.

## Sending Notifications to an Existing Account

When you migrate notification settings from a previous installation of the Storage Management Appliance, you can specify that the notifications be assigned to an existing or target user account.

You may want to set up user accounts on the Storage Management Appliance before migrating existing notifications. This makes it easier to send the previous notifications to accounts you have created on the SMA. See “[Working with Users](#),” on page 26 for information on setting up users.

Use this procedure to migrate notification settings to a target user account.

1. If necessary display the **Event Notification Migration** wizard second page ([Figure 54](#)). See “[Using the Migration Wizard](#),” on page 84.

**Event Notification Migration**

The updated Storage Management Appliance software requires user accounts for event notification.

Create a new user account for AdminAssist3 on this Storage Management Appliance.

Send AdminAssist3's event notifications to an existing user account on this updated Storage Management Appliance.

**Figure 54: Event Notification Migration page: choose to send to existing account**

2. Select **Send <name> event notifications to an existing user account on this Storage Management Appliance** and click **Next** to display a wizard third page containing a list of default user accounts and any additional accounts you have created ([Figure 55](#)).

**Event Notification Migration**

The following user account currently exists on this Storage Management Appliance. Select an account to receive notifications previously sent to AdminAssist3.

NewU

AdminAssist10

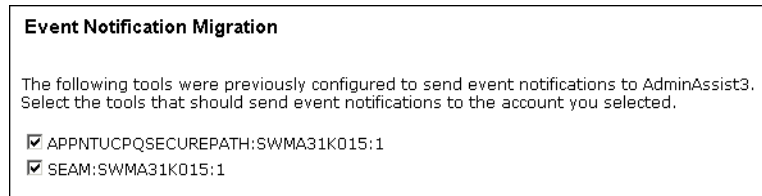
dougm2

AdminAssist1

Administrator

**Figure 55: Migration wizard: choose existing account**

3. Select the target user who is to receive the migrated user's notifications, and click **Next** to display a wizard fourth page showing the devices and applications previously configured to send event notifications to the migrated user. [Figure 56](#) is an example of this page showing two previous notifications—one for Secure Path and one for Automation Manager.



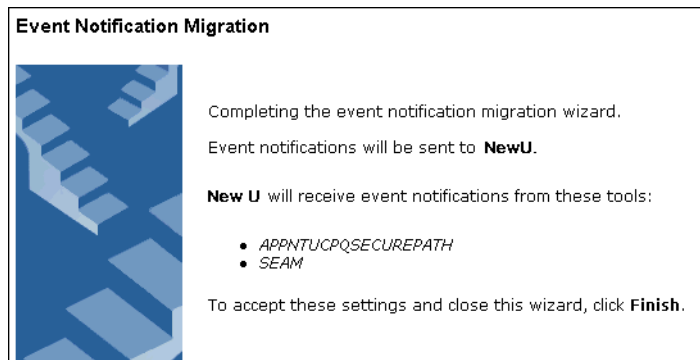
**Figure 56: Migration wizard: choose tools for notifications**

---

**Note:** Be sure to select all applications that you want to migrate because the migration process can only be done once for each user.

---

4. Select the devices and applications that should send event notifications to the target user account you selected in step 3.
5. Click **Next** to display a summary of the information for the new recipient's account ([Figure 57](#)).



**Figure 57: Migration wizard: existing account summary page**

6. Click **Finish** to complete the notification migration and return to the **Migrate Event Notification Recipients** page.

If there are more users to migrate, choose another user and click **Migrate** to complete the process again. When there are no more users with notification settings to migrate, the **Migration Notification Settings** icon disappears from the **Getting Started** page.

If the target user account has an assigned e-mail address or e-mail pager address, the migration process does not change that address. The same is true if the target user had e-mail notification disabled for any reason. If the target user has no e-mail address (standard or e-mail pager), the migration process assigns the e-mail address of the previous user.

In all cases, notification settings are migrated and notification is enabled. The target user receives notification messages for all event types generated by the same devices and applications as the previous user.

The Storage Management Appliance software v2.1 provides two ways an administrator can reduce the number of notification messages received by the target user. One way is to disable notification for particular severity types using the **Notification Info** tab of the **User Properties** page. See “[Enabling User Properties for Notification](#),” page 67 for more information. The other way is to disable unwanted event types listed on the **Events Summary** page for the user. See “[Notification for a User](#),” page 71 for more information.

This migration process adds any SNMP trap recipients or hosts to the Storage Management Appliance database, however the associated settings for event forwarding are not migrated. See “[SNMP Trap Forwarding](#),” on page 65 for detailed information.

# Restoring the Software



## B

Appendix B describes how to use the Storage Management Appliance software restore features to recover from a catastrophic system failure and how to migrate data from one SMA to another. The following topics are covered:

- [Steps for Restoring the Storage Management Appliance](#), page 94
- [Restoring the Software with a QuickRestore CD](#), page 95
- [Reinstalling Optional Storage Management Applications](#), page 96
- [Installing the v2.1 Software Update](#), page 97
- [Reinstalling Optional Backup Software](#), page 97
- [Restoring the Database and Configuration Data](#), page 97
- [Migrating to a New Storage Management Appliance](#), page 98
- [Recovering and Migrating from a Previous Software Version](#), page 99

## Steps for Restoring the Storage Management Appliance

If your Storage Management Appliance has a catastrophic failure, the basic steps for restoring the SMA and bringing it back into operation are as follows:

- Restore the SMA software by using an appropriate version of the QuickRestore CD to do one of the following:
  - Restore the SMA to software version 2.1 (recommended)
  - Restore the SMA to its factory-installed state
- Reinstall any optional HP storage management applications.
- Install the Storage Management Appliance software v2.1 update, if necessary.
- Reinstall optional third-party backup software on the Storage Management Appliance if used to complete the most recent system backup.
- Restore the database and application files from a recent v2.1 backup. You can only restore from a backup of the current SMA software version.

These steps are further explained in the other sections of this appendix.

To complete this restore process you must have a recent backup of the v2.1 system. You can use the Storage Management Appliance backup feature on the **Maintenance** page or use another backup application to back up the system. See the *Storage Management Appliance Software Using Backup Software Application Notes* for more information about compatible backup software. This document is available at the following website:

<http://h18006.www1.hp.com/products/sanworks/managementappliance/documentation.html>.

If you use a backup product that produces an up-to-date and stable backup image of your entire SMA system, you can use the image to restore a failed SMA instead of using the recovery procedures described in this section. See the *Storage Management Appliance Software Using Backup Software Application Notes* for complete information.



**Caution:** If your network is vulnerable to viruses, HP recommends that you remove the SMA from the network during the restore, upgrade, and installation procedures. Version 2.1 of the SMA software includes all known Microsoft patches; therefore, you can reconnect to the network after upgrading to v2.1.

---

## Restoring the Software with a QuickRestore CD

You can restore the Storage Management Appliance software in one of the two following ways:

- [Restore the SMA to Software Version 2.1](#), described below
- [Restore the SMA to its Factory-Installed State](#), described on page 96

### Restore the SMA to Software Version 2.1

HP recommends that you restore the Storage Management Appliance software to version 2.1 using a Storage Management Appliance QuickRestore CD that corresponds to your SMA hardware (Appliance I, II, or III). If you do not have this CD, you can order the appropriate QuickRestore CD for your hardware version from the following website:

<http://h18006.www1.hp.com/products/sanworks/softwaredrivers/managementappliance/>.

HP recommends that you check this website periodically for the most up-to-date QuickRestore CDs.

---

**Note:** The Storage Management Appliance I hardware (previously called SANworks Management Appliance) did not come with a QuickRestore CD. HP recommends that you restore to version v2.1 by using the Storage Management Appliance I QuickRestore CD (part number 260427-B26), which you can order from:

<http://h18006.www1.hp.com/products/sanworks/softwaredrivers/managementappliance/>.

---

After restoring the SMA with software version 2.1, follow the instructions for:

1. [Reinstalling Optional Storage Management Applications](#), page 96
2. [Reinstalling Optional Backup Software](#), page 97
3. [Restoring the Database and Configuration Data](#), page 97

## Restore the SMA to its Factory-Installed State

If you do not use a QuickRestore CD that restores to the v2.1 software level, use one of the following methods, depending on your SMA hardware:

- Storage Management Appliance III hardware—Currently, the QuickRestore CD included with the SMA III hardware restores to software version 2.1. However, if your SMA III came with an earlier QuickRestore CD (labelled version 3.0), follow the instructions for the CD. This installs Storage Management Appliance software v2.0.
- Storage Management Appliance II hardware—Use the QuickRestore CD v2.0 that came with your SMA. Follow the instructions to install version v1.0C of the software. If you use this QuickRestore CD, you do not need to install service packs before installing the v2.1 update.

After restoring the SMA to its factory-installed state, follow the instructions for:

1. [Reinstalling Optional Storage Management Applications](#), page 96
2. [Installing the v2.1 Software Update](#), page 97
3. [Reinstalling Optional Backup Software](#), page 97
4. [Restoring the Database and Configuration Data](#), page 97

## Reinstalling Optional Storage Management Applications

Install any value-added HP storage management applications that you had running on the Storage Management Appliance prior to installing the v2.1 software update. These applications could include any from the following list:

- HP StorageWorks Business Copy EVA
- HP StorageWorks Continuous Access EVA
- HP StorageWorks Secure Path Manager
- HP OpenView Storage Provisioner
- HP SANworks Network View



## Installing the v2.1 Software Update

Installing the v2.1 software is not necessary if you used a QuickRestore CD that restores the Storage Management Appliance with version 2.1 of the software.

If you used any other version of the QuickRestore CD, install the v2.1 software update after you have restored the factory-installed software and reinstalled all value-added HP storage management applications.

See the *HP OpenView Storage Management Appliance Software Update Installation Card* for details on installing the Storage Management Appliance software v2.1.

## Reinstalling Optional Backup Software

If you used optional, third-party backup software to complete the most recent backup of the Storage Management Appliance, you must now install that software on the SMA. Many backup products require an agent to be installed on the SMA.

See the *Storage Management Appliance Software Using Backup Software Application Notes* for more information about compatible backup software. This document is available from the following website:

<http://h18006.www1.hp.com/products/sanworks/managementappliance/documentation.html>.

## Restoring the Database and Configuration Data

You can now restore the Storage Management Appliance database and configuration data.

If you completed the most recent backup using the Storage Management Appliance Backup feature on the **Maintenance** page (**Settings > Maintenance**) then use the Restore feature available on the same page. See “[Backing Up and Restoring Data Files](#)” on page 77 for more information.

If you completed the most recent backup using another backup product, use that product’s procedures for restoring the Storage Management Appliance database and configuration data.

---

**Note:** You cannot restore the Storage Management Appliance software v2.1 using backup data from a previous version of the software.

---

## Migrating to a New Storage Management Appliance

You can transfer backup data from one SMA to another. Use this procedure if you are setting up a new SMA.

The prerequisites for migrating data between two SMAs are as follows:

- Storage Management Appliance software v2.1 must be installed on both SMAs
- You must have a valid backup of the SMA with software v2.1 installed



**Caution:** If the current SMA fails before you have installed software v2.1, you must perform additional steps before migrating data to a new SMA running software v2.1. See [“Recovering and Migrating from a Previous Software Version”](#) on page 99 for additional information.

---

To migrate from one SMA to another:

1. Disconnect the current SMA from the SAN.
2. Install the new SMA hardware and connect the host bus adapters (HBAs) from the new SMA to the SAN.
3. Use the Storage Management Appliance Quick Restore CD that corresponds to your SMA hardware (Appliance I, II, or III) to restore the new SMA to v2.1.
4. If required, configure TCP/IP network settings (IP, Default Gateway, DNS, WINS) to those used by the SMA you are replacing.
5. Rename the new SMA using the name of the SMA you are replacing.
6. Reboot the SMA after renaming it.
7. Install any value-added HP storage management applications that you had running on the SMA you are replacing.



**Caution:** Storage Allocation Reporter is not supported on the SMA with software version 2.1. Installing SMA software v2.1 removes existing installations of SAR. Do not reinstall SAR on SMA software v2.1 as this may cause unexpected results.

---

8. Install any third-party backup software that you had running on the SMA you are replacing.
9. After you complete steps 1 through 8, restore the SMA using data that was previously backed up. For complete instructions on using the SMA backup and restore features, see the Storage Management Appliance online help. If you are using a third-party backup and restore application, refer to the product's documentation for more information.

After the restore, the new SMA has the same configuration as the SMA that you replaced.

## Recovering and Migrating from a Previous Software Version

As stated in “[Migrating to a New Storage Management Appliance](#)” on page 98, you must have Storage Management Appliance software v2.1 installed before you can migrate to a new SMA. If you are running a previous version of the software and your SMA fails, you must restore the SMA to the previous software version and then upgrade to version 2.1.

To recover the SMA and migrate to version 2.1:

1. If you are using Storage Management Appliance II, use the Quick Restore CD v2.0 to restore your SMA II with v1.0C software.

If you are using Storage Management Appliance I (previously called SANworks Management Appliance), which did not come with a restore CD, restore to version v1.0C by using the Storage Management Appliance I QuickRestore CD (part number 260427-B22), which you can order from the following website:

<http://h18006.www1.hp.com/products/sanworks/softwaredrivers/managementappliance>.

2. If previously you were running Storage Management Appliance software v2.0, upgrade to v2.0.
3. Install any value-added HP storage management applications that you had running on the SMA you are replacing.



**Caution:** Storage Allocation Reporter is not supported on the SMA with software version 2.1. Installing SMA software v2.1 removes existing installations of SAR. Do not reinstall SAR on SMA software v2.1 as this may cause unexpected results.

---

4. Install any third-party backup software that you had running on the SMA you are replacing.
5. After you complete steps 1 through 3, restore the SMA using data that was previously backed up. For complete instructions on using the SMA backup and restore features, see the Storage Management Appliance online help. If you are using a third-party backup and restore application, refer to the product's documentation for more information.
6. Install Storage Management Appliance software v2.1 using the update CD. Refer to the *HP OpenView Storage Management Appliance Software Update v2.1 Installation Card* for complete instructions.
7. Back up the new software configuration using the SMA backup feature or a third-party backup product.

When complete, this procedure provides the required backup of the SMA with software version 2.1. To migrate to a new SMA, you can now proceed with the steps in [“Migrating to a New Storage Management Appliance”](#) on page 98.

# Menu Options and Access Requirements



Appendix C describes the feature structure of the Storage Management Appliance software. You can access all software features through options on the primary and secondary navigation bars. Selecting an option on the primary navigation bar determines the options available on the secondary navigation bar. See “[Session Pane](#)” on page 15 for more detailed information.

Any user assigned the Administrator privilege level assigns each Storage Management Appliance user a privilege level that determines the features that person can use. This appendix shows the privilege level(s) required to access major features.

One of three privilege levels can be assigned—User, Operator, and Administrator. See “[User Privilege Levels](#)” on page 27 for more information.

[Table 5](#) in this appendix uses the following symbols to indicate the privilege levels that are required to access each feature.

- all All privilege levels (only these features are available to the User level)
- o-a Only Operator and Administrator levels
- a Only the Administrator level

**Table 5: Storage Management Appliance Menu Options**

Primary Navigation bar	Secondary Navigation bar	Description or Options
<input type="checkbox"/> Home	<input type="checkbox"/> Get Started	<input type="checkbox"/> Welcome <input type="checkbox"/> Set SMTP Server <input type="checkbox"/> Remote Access <input type="checkbox"/> Discovery <input type="checkbox"/> Date/Time <input type="checkbox"/> Migrate Notification Settings
	<input type="checkbox"/> Tools	<input type="checkbox"/> Tools page
	<input type="checkbox"/> Devices	<input type="checkbox"/> Devices page
	<input type="checkbox"/> My Links	Displays the My Links page containing a personal list of URLs.
	<input type="checkbox"/> hp.com	Displays page on HP website.
<input type="checkbox"/> Tools	<input type="checkbox"/> Business Copy EVA	Starts optional HP storage management application.
	<input type="checkbox"/> Continuous Access EVA	Starts optional HP storage management application.
	<input type="checkbox"/> Network View	Starts optional HP storage management application.
	<input type="checkbox"/> Secure Path Manager	Starts optional HP storage management application.
	<input type="checkbox"/> Storage Area Manager	Starts optional HP storage management application.
	<input type="checkbox"/> Storage Provisioner	Starts optional HP storage management application
<input type="checkbox"/> Devices	<input type="checkbox"/> Discovered Devices	<p>Displays a list of discovered devices with task buttons. While Administrators can use all features, Operators are restricted as described below.</p> <p>Operators can view all device data; however, they cannot change device properties.</p> <p>Operators can view all event types; however, they can only change their own e-mail notification settings.</p> <p>Operators cannot change SNMP trap forwarding for an event type.</p>
	<input type="checkbox"/> Command View EVA (HSV element manager)	Starts a major sub-system (application).
	<input type="checkbox"/> HSG Element Manager	Starts a major sub-system (application).

Table 5: Storage Management Appliance Menu Options (Continued)

Primary Navigation bar	Secondary Navigation bar	Description or Options
<input type="checkbox"/> Status	<input type="checkbox"/> Logs	Event Log <input type="checkbox"/> View Event Details <input type="checkbox"/> Download <input type="checkbox"/> Set Log Properties <input type="checkbox"/> Clear Log <input type="checkbox"/> Acknowledge <input type="checkbox"/> Application Log <input type="checkbox"/> System Log <input type="checkbox"/> Security Log <input type="checkbox"/> Web Adm Log <input type="checkbox"/> License Log <input type="checkbox"/> Audit Log Backup Log <input type="checkbox"/> View Log <input type="checkbox"/> Download <input type="checkbox"/> Clear Log Restore Log <input type="checkbox"/> View Log <input type="checkbox"/> Download <input type="checkbox"/> Clear Log Notification <input type="checkbox"/> View Log Log <input type="checkbox"/> Download <input type="checkbox"/> Clear Log
	<input type="checkbox"/> Management Agents	Starts a major sub-system (application).
	<input type="checkbox"/> Detail	Displays additional information about events and audits. <input type="checkbox"/> Events <input type="checkbox"/> Audits
<input type="checkbox"/> Settings	<input type="checkbox"/> Maintenance	<input type="checkbox"/> Install Software <input type="checkbox"/> Remove Software <input type="checkbox"/> Date/Time <input type="checkbox"/> Shutdown <input type="checkbox"/> Backup <input type="checkbox"/> Restore <input type="checkbox"/> Language <input type="checkbox"/> Set SMTP Server
	<input type="checkbox"/> Users	Displays a list of users with task buttons. Individuals with User and Operator privileges see only their own name listed. They can change most of their user properties but not the assigned privilege level.
	<input type="checkbox"/> Groups	Displays a list of user groups with task buttons.

**Table 5: Storage Management Appliance Menu Options (Continued)**

Primary Navigation bar	Secondary Navigation bar	Description or Options
<input type="checkbox"/> Settings	<input type="checkbox"/> Discovery	Displays a Discovery list with task buttons.
	<input type="checkbox"/> Manage Tools	Displays an application list with task buttons.
	<input type="checkbox"/> Network	<input type="checkbox"/> Appliance Name <input type="checkbox"/> Domain Membership <input type="checkbox"/> Global Settings <input type="checkbox"/> Interfaces <input type="checkbox"/> Admin Web Site <input type="checkbox"/> Telnet <input type="checkbox"/> SNMP Properties <input type="checkbox"/> Fibre Channel <input type="checkbox"/> File and Printer Sharing
	<input type="checkbox"/> Notification	Displays a list of devices with <b>Events</b> task button. Operators view data and access selected features.
	<input type="checkbox"/> Licensing	<input type="checkbox"/> Applications <input type="checkbox"/> Features <input type="checkbox"/> Licenses
	<input type="checkbox"/> Automation	Starts a major sub-system (application).
	<input type="checkbox"/> Remote Access	Displays a list of applications with task buttons.



This glossary defines terms used in this guide or related to this product.

**administrator (privilege level)**

One of three privilege levels, one of which is assigned to each Storage Management Appliance user. A person assigned the Administrator privilege level can use all system features and can add, delete, and modify users. See “[Working with Users](#)” on page 26 for more information about assigning privilege levels.

**community string**

A string of characters used to access an SNMP agent. The string is placed in the SNMP query message sent to an agent. Different community strings allow different types of access. One string can be used to have the agent forward accumulated data while a different string is usually required to change the agent configuration or operating status. The community string is case sensitive and the default string is *public*.

**content pane**

Lower portion of a Storage Management Appliance page containing information in any of the following formats:

- Links page
- Wizard page
- Properties page
- List table

See “[Content Pane](#)” on page 16 for more information.

**controller (storage element)**

Control device used to configure a storage element and determine the element’s operating status. Management applications such as the HSG Element Manager allow an administrator to access and configure multiple controllers.

**controller pair**

Two interconnected controller modules that control a single disk array to improve performance and maximize availability.

### **device (SAN)**

A host computer or a storage element connected to a Storage Area Network (SAN). A device is usually connected to a user port on a Fibre Channel Switch (FCS) or hub. The Storage Management Appliance discovers devices on the local SAN. See [Chapter 3, “Discovering Devices and Applications”](#) on page 45 for information about devices and discoveries.

### **discovery**

Process used by the Storage Management Appliance to identify devices and applications associated with a SAN. To locate all such components you must use both IP and SAN discoveries. See [Chapter 3, “Discovering Devices and Applications”](#) on page 45 for information about discoveries.

### **element manager**

A software application used to manage several storage elements of the same type. The HSG Element Manager and Command View EVA are element managers that are installed with the Storage Management Appliance software. Access the element managers on the **Devices** page ([Figure 32](#) on page 51).

### **event**

A condition change on any network device or host computer that generates a log entry or message. For example, a device going offline is an event. Information about an event is useful for managing a network and especially troubleshooting. An SNMP agent usually has the ability to report a number of defined events by generating a SNMP trap message. See [Chapter 4, “Monitoring the SAN”](#) on page 55 for more information about events and logs.

### **fabric**

That part of a Storage Area Network (SAN) consisting of switches, hubs and links that allow hosts to exchange data with storage elements. With multiple switches, the fabric includes the Inter-Switch Links (ISLs) used to interconnect switches. The Storage Management Appliance uses discoveries to identify both hosts and fabric components of a SAN.

### **Inter-Switch Link (ISL)**

A fibre cable connecting a port on one Fibre Channel switch to a port on another switch.

### **IP discovery**

A discovery type that identifies LAN-connected SAN devices with an enabled SNMP agent. The IP discovery process queries every IP address in one or more specified IP ranges using one or more community strings. See [“About Discoveries”](#) on page 46 for more information.

**links page**

One of several display types found in the content pane of the Storage Management Appliance interface. A links page consists of two or more hypertext links to features or subsystems. Each link consists of a graphic and a title and often includes a short description. See “[Content Pane](#)” on page 16 for information about different display types.

**list table**

One of several display types found in the content pane of the Storage Management Appliance interface. List items appear on rows of a table and can be sorted based on the values in any column. The list table format includes a number of task buttons that you use to view or change the attributes of a selected list item. The table displays items on pages with each page containing a maximum of 100 items. See “[Content Pane](#)” on page 16 for information about different display types.

**migrate (notification settings)**

Process of moving the notification parameters for a user from a prior version of the Storage Management Appliance software to the currently installed version. Migration is an optional part of the general update process that you can complete after installing a new version of the Storage Management Appliance software. See Appendix A, “[Migrating Event Notification Settings](#)” on page 83 for detailed information.

**notification**

Process of sending a message in response to an event. The Storage Management Appliance can send a notification message to a user at both a standard e-mail address and an e-mail pager address. An administrator specifies the delivery methods available for each user. The appliance can also send messages to hosts in the form of SNMP traps. See “[Monitoring the SAN](#)” on page 55 for detailed information about notification types and settings.

**operator (privilege level)**

One of three privilege levels, one of which is assigned to each Storage Management Appliance user. A person assigned the Operator privilege level can view and modify their own user properties with the exception of their assigned privilege level. With Operator privileges, a user can also modify their own notification settings. See “[Working with Users](#)” on page 26 for more information about assigning privilege levels.

**policy**

An automated procedure triggered by an event or condition. A policy is implemented with a script and Storage Management Appliance users can use the Automation feature on the Settings page to create such scripts. For example, a policy could delete a log file or log entries when available disk space diminishes to a specified level. See “[Automating Maintenance](#)” on page 81 for more information.

### **privilege level**

An attribute of each Storage Management Appliance user account that determines what system features the person can use. The available privilege levels are User, Operator, and Administrator. See “[User Privilege Levels](#)” on page 27 for and [Appendix C](#) on page 101 for more information.

### **properties page**

One of several display types found in the content pane of the Storage Management Appliance interface. A properties page is one of a set that displays information about a selected item such as a discovery or a user. Each page contains tabs down the left side that provide links to other pages in the set. See “[Content Pane](#)” on page 16 for information about different display types.

### **remote access**

Feature that allows the Storage Management Appliance software to store access information required by one management application to initiate communication with another application—called a *target* application. An administrator can create an access profile for each of several target applications. For example, you can create a profile for an HSV controller that allows the Network View application to obtain information about HSV devices from the controller.

An access profile identifies the host computer and includes a user name and password. See “[Remote Access](#)” on page 36 for detailed information.

### **SAN discovery**

A discovery type that identifies devices and applications connected to the SAN fabric. A SAN discovery identifies devices that cannot be identified by an IP discovery. See “[About Discoveries](#)” on page 46 for more information.

### **Secure Sockets Layer (SSL)**

A protocol that allows secure communication over the Internet using data encryption. SSL uses RSA public-key encryption between specific TCP/IP ports and a program layer located between HTTP and TCP layers. By convention, URLs requiring an SSL connection start with https: instead of http:. See “[Security Features](#)” on page 21 for more information.

### **session pane**

Top portion of a Storage Management Appliance page containing the following information:

- Product name
- System status
- Appliance name
- Primary navigation bar
- Secondary navigation bar

See “[Session Pane](#)” on page 15 for more information.

**severity code**

String of characters used to describe an event. The severity code indicates the relative impact the event could have on network operations and the priority a network manager should place on investigating the event. The following are common severity codes.

Fatal	Critical	Major
Minor	Warning	Information
Other	Unknown	

Each event is assigned a severity code and Management Appliance users can filter event notifications to include only specified severity codes. See [“Enabling User Properties for Notification”](#) on page 67 for more information.

**SMTP Server (for Management Appliance)**

The outgoing mail server used by the Storage Management Appliance to send e-mail notification to a standard e-mail address or an e-mail pager address. See [“Mail Server Settings”](#) on page 38 for more information.

**SNMP Trap**

Message or unsolicited response from an SNMP agent indicating the occurrence of a particular event. The MIB module for each agent defines the trap messages the device can generate. The Storage Management Appliance learns of an event when it receives a trap message from an SNMP agent. The Management Appliance can decode SNMP traps from supported devices and generate detailed notification messages or simply forward SNMP traps to another host. The Management Appliance can generate SNMP traps that can be decoded by other devices using the Storage Management Appliance MIB module. See [“Setting Up Notifications”](#) on page 69 for more information.

**SNMP trap forwarding**

A type of Storage Management Appliance notification that relays the SNMP trap message received from a SAN component to any number of hosts. Each host is called a *trap recipient* and must be identified by host name and IP address. See [“Network Settings”](#) on page 39 for more information.

**Storage Area Network (SAN)**

A high-speed network that interconnects different kinds of storage elements with data servers on behalf of a larger network of users, typically using Fibre Channel technology.

**storage element**

A storage system connected to a Storage Area Network (SAN) that is administered as a single unit. A storage element usually has a single controller or controller pair operating to ensure continuity of service. A network administrator can use an element manager application to manage several storage elements of the same type.

### **Storage Management Appliance (SMA)**

An HP product consisting of a rack-mounted computer processor running software used to manage a Storage Area Network (SAN). Users interact with the software using a browser-based interface.

#### **supported device**

A device that generates an SNMP trap message that the Storage Management Appliance can decode and then send a detailed notification message to selected users. Supported devices have event code definitions that allow the Storage Management Appliance to decode trap messages. For each supported device, a Management Appliance user can specify the event types for which they are notified. See “[Device Events](#)” on page 63 for more information.

#### **user (privilege level)**

One of three privilege levels, one of which is assigned to each Storage Management Appliance user. A user assigned the user level can view and modify most parts of their own user properties. With User privileges, a user can receive notifications, but cannot view or change discovered devices or notification settings. See “[Working with Users](#)” on page 26 for more information about assigning privilege levels.

#### **value-added HP storage management application**

One of several optional HP applications that can be installed on the Storage Management Appliance hardware and accessed through the Storage Management Appliance software. These additional management applications include:

- HP StorageWorks Business Copy EVA
- HP StorageWorks Continuous Access EVA
- HP StorageWorks Secure Path Manager
- HP OpenView Storage Area Manager
- HP OpenView Storage Provisioner
- HP SANworks Network View

See “[Tools Page](#)” on page 11 for more information.

#### **wizard page**

One of several display types found in the content pane of the Storage Management Appliance interface. A wizard page is one of a series used to complete a specific task. You make selections or entries on a wizard page and click **Next** to display the next page in the series or click **Finish** on the last page to exit the wizard series. See “[Content Pane](#)” on page 16 for information about different display types.

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