HP StorageWorks Command View EVA user guide

Part number: T3724–96002
First edition: May 2005

HP StorageWorks Command View EVA user guide

Contents

Figures

Tables

Preface

About this guide

This guide describes how to configure and use the HP Command View EVA user interface to manage and monitor HP StorageWorks Enterprise Virtual Arrays (EVAs). Topics include:

- Configuring your browser
- Logging into the user interface
- Initializing arrays
- Managing user access (passwords, licenses)
- Configuring and managing events

This guide also describes how to use HP StorageWorks Command View EVAPerf.

Intended audience

This guide is intended for HP Command View EVA and HP Command View EVAPerf users and administrators.

Prerequisites

Using this guide requires basic knowledge of:

- Storage area networks (SANs)
- SAN fabrics
- HP StorageWorks Enterprise Virtual Array (EVA)
- Operating systems in your EVA and EVA management configuration

This guide assumes HP Command View EVA is installed on a supported management server.

Related documentation

The following documents provide additional information about this and related products:

- *HP StorageWorks Command View EVA installation guide*
- *HP StorageWorks Command View EVA compatibility reference*
- *HP StorageWorks Command View EVA 4.0 release notes*
- HP StorageWorks Command View EVA online help (accessible from the HP Command View EVA user interface)
- *HP StorageWorks Enterprise Virtual Array user guide*
- *HP StorageWorks Continuous Access EVA administrator guide*

You can find these documents on the following web sites:

- HP Command View EVA
  http://h18006.www1.hp.com/products/storage/software/cmdvieweva/index.html
- HP Continuous Access EVA
  http://h18006.www1.hp.com/products/storage/software/conaccesseva/index.html
- HP Enterprise Virtual Array
  http://h18006.www1.hp.com/storage/arraysystems.html

Document conventions and symbols

Table 1 Document conventions

Convention	Element
Medium blue text: Figure 1	Cross-reference links and e-mail addresses
Medium blue, underlined text (http://www.hp.com)	Web site addresses
Bold font	• Key names • Text typed into a GUI element • GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes
Italics font	Text emphasis
`Monospace font`	• File and directory names • System output • Code • Commands
`Monospace, italic font`	• Code variables • Command line variables

CAUTION:
Indicates that failure to follow directions could result in damage to equipment or data.

IMPORTANT:
Provides clarifying information or specific instructions.

NOTE:
Provides additional information.

HP technical support

Telephone numbers for worldwide technical support are listed on the HP web site: http://www.hp.com/support/.

Collect the following information 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

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

HP strongly recommends that customers sign up online using the Subscriber's choice web site: http://www.hp.com/go/e-updates.

- Subscribing to this service provides you with e-mail updates on the latest product enhancements, newest versions of drivers, and firmware documentation updates as well as instant access to numerous other product resources.
- After signing up, you can quickly locate your products by selecting **Business support** and then **Storage** under Product category.

Service tools

HP is constantly enhancing its service tools to keep pace with new product introductions. It is imperative that you check the service tools web site for the latest available downloads and install them on your system. This will ensure that the system tools work with your HP products effectively and efficiently. You can locate the services tools at the following web site: http://h18000.www1.hp.com/support/svctools/.

HP-authorized reseller

For the name of your nearest HP-authorized reseller:

- In the United States, call 1–800–282–6672.
- Elsewhere, visit the HP web site: http://www.hp.com. Then click **Contact HP** to find locations and telephone numbers.

Helpful web sites

For other product information, see the following web sites:

- http://www.hp.com
- http://www.hp.com/go/storage
- http://www.hp.com/support
- http://www.docs.hp.com

Providing feedback

We welcome your feedback!

For HP Command View EVA, please mail your comments and suggestions to CVfeedback@hp.com.

For HP Business Copy EVA and HP Continuous Access EVA, please mail your comments and suggestions to EVAReplication@hp.com.

1 Getting started

This chapter provides an overview of HP Command View EVA and describes procedures to start and configure the user interface after you install the software. It also provides an overview of the user interface layout and organization.

Overview

HP Command View EVA is the graphical user interface through which you can configure, manage, and monitor the Enterprise Virtual Array (EVA). HP StorageWorks Storage System Scripting Utility (SSSU) is a command line interface that also allows you to configure and control EVA arrays. Use the graphical user interface for simple or initial configuration tasks. Use SSSU to script and run repetitious and complex configuration tasks.

Before you begin, you must have installed HP Command View EVA on at least one of the following management server types:

- HP OpenView Storage Management Appliance (SMA)
- General-purpose server
- Dedicated management server
- HP ProLiant Storage Server

Each installation of HP Command View EVA software on a management server is called a management agent. One management agent can manage the following number of EVAs:

- Up to four arrays from a general-purpose server or HP ProLiant Storage Server
- Up to 16 arrays from the SMA or a dedicated management server

The software enables you to:

- Initialize the array.
- Create, modify, and monitor disk groups, virtual disks, logical unit numbers (LUNs), snapshots, and snapclones.
- Configure and monitor physical subsystem components, such as controllers, physical disks, power supplies, blowers, and network connections.
- Configure and view controller logs and events.

Configuring browser settings

This section describes the recommended browser settings for Internet Explorer and Mozilla. Ensure your browser is configured as described in this section to ensure that your view of HP Command View EVA is properly configured.

Internet Explorer settings

Table 2 describes the browser settings for Internet Explorer. The settings are not all-inclusive; only those settings that are applicable to HP Command View EVA are listed. If a settings appears in bold, it is particularly important to configure the setting as described.

Table 2 Internet Explorer settings

Menu option	Setting	Value
View	Text Size	Medium (This setting may interact with your screen resolution setting. If Medium causes distortion of HP Command View EVA page layouts, select a text size that enables text to fit appropriately within tables in the Content pane.)
Tools > Internet Options > General		
Temporary Internet Files > Settings	**Check for newer versions of stored pages**	• **Automatically—for a homogeneous EVA environment (no legacy arrays)** • Never—for a heterogeneous EVA environment
	Amount of disk space to use	**10 MB** (minimum)
Colors	Use Windows colors	Selected
	Use hover color	Selected
Fonts	Language script	Latin-based
Tools > Internet Options > Security > Local Intranet > Custom Level		
Downloads	Automatic prompting for file downloads	Enable
	File download	**Enable**
	Font download	Enable
Java VM	Java permissions	Low safety
Miscellaneous	Access data sources across domains	Prompt
	Allow META REFRESH	**Enable**
	Allow scripting of Internet Explorer Web browser controls	Enable
	Allow script-initiated windows without size or position constraints	Enable
	Allow Web pages to use restricted protocols for active content	Prompt
	Display mixed content	**Enable**
	Open files based on content, not file extension	Enable
	Software channel permissions	Low safety

Menu option	Setting	Value
	Submit nonencrypted form data	**Enable**
	Use pop-up blocker	**Disable**
	Userdata persistence	Disable
	Web sites in less privileged web content zone can navigate into this zone	Enable
Scripting	Active scripting	Enable
	Scripting of Java applets	Enable
User authentication	Logon	Automatic logon only in Intranet zone
Tools > Internet Options > Privacy		
Settings	Accept All Cookies	Bar at the very bottom of the scale
	Pop-up Blocker	Not selected
Tools > Internet Options > Connections		
Local Area Network (LAN) Settings	**Configure to enable browsing to the management server on which HP Command View EVA is installed.**	**Settings will vary based on your local network configuration.**
Tools > Internet Options > Advanced		
Browsing	Disable script debugging (Internet Explorer)	Selected
	Disable script debugging (Other)	Selected
	Display a notification about every script error	Not selected
	Enable third-party browser extensions (requires restart)	Selected
	Enable visual styles on buttons and controls in web pages	**Selected**
	Reuse windows for launching shortcuts	**Not selected**
	Show friendly HTTP error messages	Selected
Java Sun	Use Java 2 <JRE version> for <applet> (requires restart)	Ensure that the JRE version matches the supported version in the *HP StorageWorks EVA software compatibility reference*.
Multimedia	**Enable Automatic Image Resizing**	**Selected**
	Play animations in web pages	**Selected**
	Show pictures	Selected
	Smart image dithering	Selected
Security	Check for server certificate revocation	Not selected
	Check for signatures on downloaded programs	Selected
	Do not save encrypted pages to disk	**Not selected**
	Use SSL 2.0	**Selected**

Menu option	Setting	Value
	Use SSL 3.0	**Selected**
	Warn about invalid site certificates	Selected
	Warn if changing between secure and not secure mode	Selected
	Warn if forms submittal being redirected	Selected
VM	JIT compiler for virtual machine enabled (requires restart)	Selected

Mozilla browser settings

Table 3 describes the browser settings for Mozilla. The settings are not all-inclusive; only those settings that are applicable to HP Command View EVA are listed. If a settings appears in bold, it is particularly important to configure the setting as described.

Table 3 Mozilla browser settings

Menu option	Setting	Value
Edit > Preferences > Appearance		
Fonts	Allow documents to use other fonts:	Selected
Color	When a web page specifies its own colors and background, always use the colors and background specified by the web page	Selected
Edit > Preferences > Privacy & Security		
Cookies	**Cookie Acceptance Policy**	**Allow all cookies**
	Cookie Lifetime Policy	**Accept cookies normally**
Images	**Image Acceptance Policy**	**Accept all images**
	Animated images should loop	**As many times as the image specifies**
Pop-Up Windows	**Block unrequested pop-up windows**	**Not selected**
Forms > Forms Manager	Save form data from web pages when completing forms	Selected
Passwords > Encrypting versus Obscuring	**Use encryption when storing sensitive data**	**Not selected**
SSL > SSL Protocol Versions	**Enable SSL version 2**	**Selected**
	Enable SSL version 3	**Selected**
SSL > SSL Warnings	**All options**	**Not selected**
Validation > OCSP	**Set Mozilla to use OCSP as follows**	**Do not use OCSP for certificate validation**
Edit > Preferences > Advanced		
Features that help interpret web pages	**Java**	**Selected**

Menu option	Setting	Value
Scripts & Plug-Ins	**Enable Javascript for Navigator**	**Selected**
	Allow scripts to	**Select all options**
Cache > Set cache options	**Cache**	**10 MB**
	Compare the page in cache to the page on the network	• **When the page is out of date—for a homogeneous EVA environment (no legacy arrays)** • Never—for a heterogeneous EVA environment (with legacy arrays)
Link Pre-Fetching	Prefetch web pages when idle, so that links in web pages designed for prefetching can load faster	Not selected
Configure Proxies to Access the Internet	**Configure to enable browsing to the management server on which HP Command View EVA is installed.**	**Settings will vary based on your local network configuration.**
HTTP Networking > Direct Connection Options	**HTTP 1.0**	**Selected**
	Keep alive	**Selected**
HTTP Networking > Proxy Connection Options	**HTTP 1.0**	**Selected**
	Keep alive	**Selected**

Using the right-click menu

In some browser configurations, the right-click menu is disabled. If the right-click menu is enabled in your browser configuration, do not use the following Internet Explorer right-click menu options (or the Mozilla equivalents) when using the HP Command View EVA interface:

- Open Link in New Window
- Save Target As
- Set as Desktop Item
- Add to Favorites

Selecting any of these right-click menu options redirects you to the user interface without the proper context and causes incorrect information to appear.

Refreshing the browser

When you upgrade HP Command View EVA to load the latest client code, refresh the browser when the upgrade is complete:

- In Internet Explorer, press **Ctrl+F5**.
- In Mozilla, press **Shift** and click **Reload** simultaneously.

Configuring browser security

To ensure the security settings of your browser are properly configured to allow access to objects on the browser pages:

1. Click **Start > Control Panel**.

   The Control Panel window appears.

2. Click **Java Plug-in**.

   The Java Plug-in dialog box appears.

NOTE:

If Java Plug-in does not appear in your Control Panel window, click **Switch to Classic View** on the left side of the window.

3. Click the **Browser** tab.
4. Select the browser you plan to use with HP Command View EVA.
5. Click **Apply** to save your selection.
6. Click the **x** in the upper right corner to close the dialog box.

Starting HP Command View EVA

To start HP Command View EVA, you can browse to either the SMA or the other management server types (general-purpose server, dedicated management server, or ProLiant Storage Server) from a client machine.

Storage Management Appliance

To start HP Command View EVA that is installed on the SMA:

1. Open the browser.
2. Using the IP address or server name of the SMA as the *host_name*, enter one of the following and press **Enter**:

   `http://host_name`

   `https://host_name`

   The network login dialog box appears.

3. Enter the user name and password that you use to access the SMA and click **OK**.

   The Storage Management Appliance home page appears.

4. Select **Devices** from the home page.

   The Devices page appears.

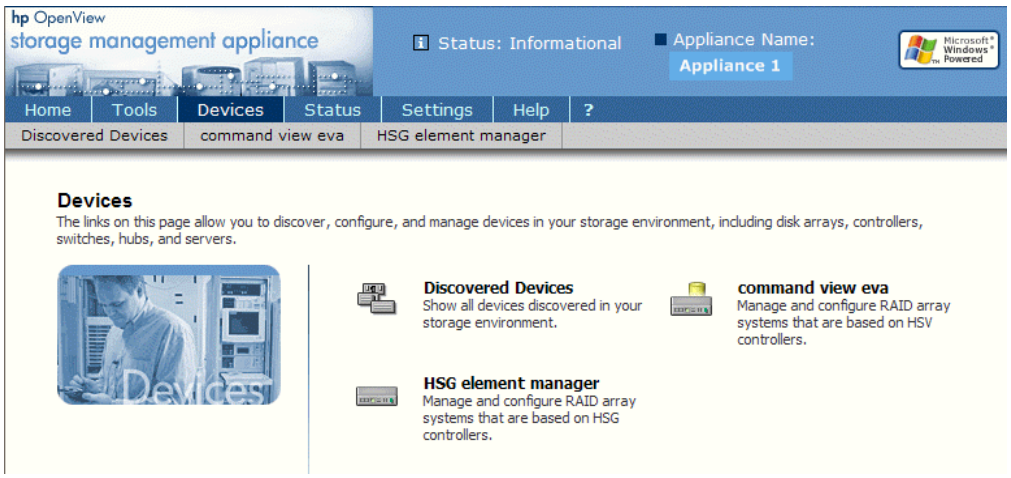

Figure 1 Devices page

5. Select **command view eva**.

   The HP StorageWorks Command View EVA user interface appears.

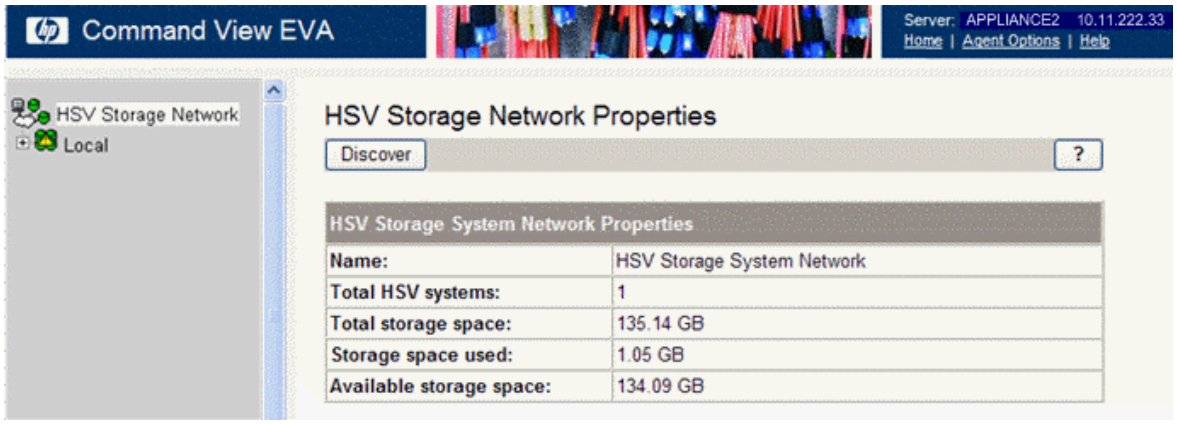

Figure 2 HP Command View EVA user interface

Other management servers

To start HP Command View EVA that is installed on any of the other management server types:

1. Open the browser.
2. Using the server name or IP address as the *host_name*, enter the following and press **Enter**:

   `https://host_name:2381`

   The System Management Homepage appears.

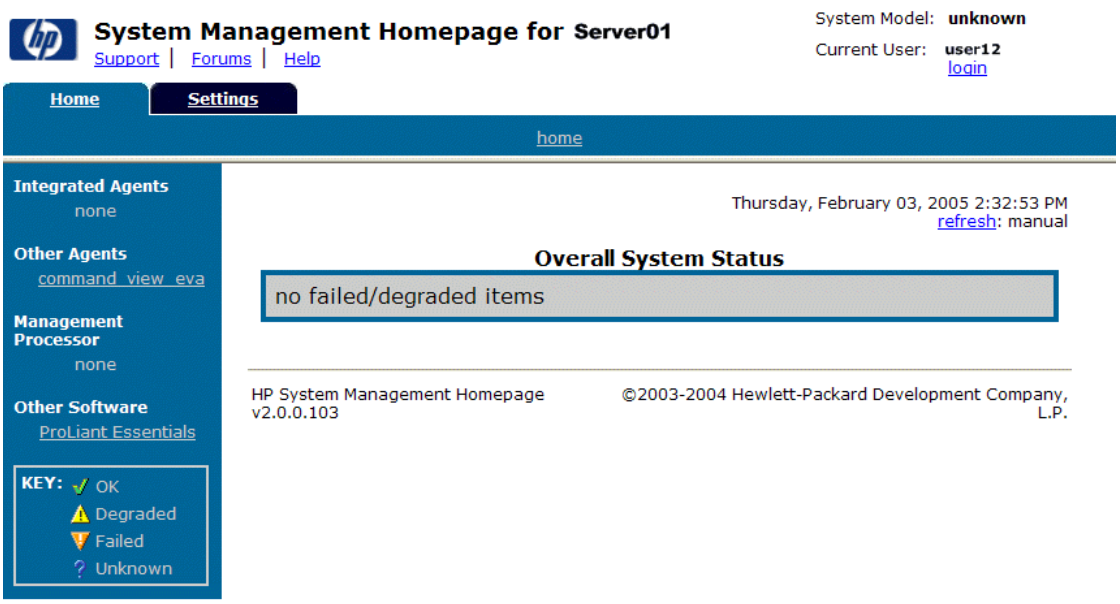

Figure 3 System Management Homepage

3. Under Other Agents in the left column, right-click **command view eva** and select **Open in a new window**.

NOTE:

If **command view eva** does not appear under Other Agents, restart the HP Command View EVA service.

4. Select **Yes** if any security messages appear.

   The login window for the System Management Homepage appears.

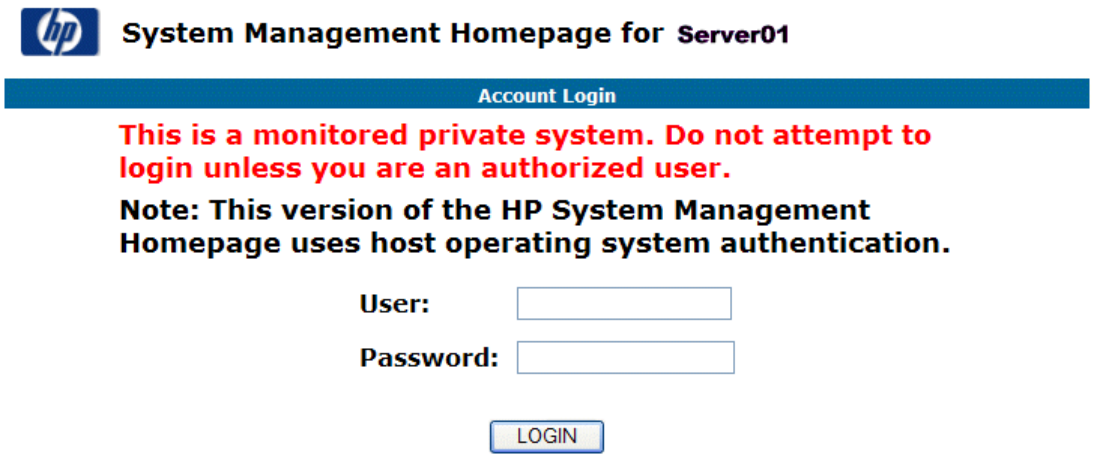

Figure 4 System Management Homepage login window

5. Enter the user name and password you use to access the HP Command View EVA user interface and click **LOGIN**. The login information you enter depends on the following:

   - If you set up the management server using SmartStart 7.1, the default user is **administrator**. The password is the password you entered when the HP Command View EVA API was installed during the management server setup.

- If you set up the management server using SmartStart 7.2, enter the operating system user name and password of an administrator account on the management server.

The HP StorageWorks Command View EVA user interface appears.

User interface organization

The HP Command View EVA user interface contains the following panes:

- Session
- Navigation
- Content

Session pane

The Session pane contains the following information:

- Software application name (HP Command View EVA)
- Name and IP address of the SMA or other management server to which you are connected
- The following links:
  - **Home**—Displays the home view of the HP Command View EVA user interface with the trees collapsed.
  - **Agent Options**—Displays the Management Agent Options window, which contains options to manage and customize the operation of the management agent.
  - **Help**—Opens the HP Command View EVA online help window.

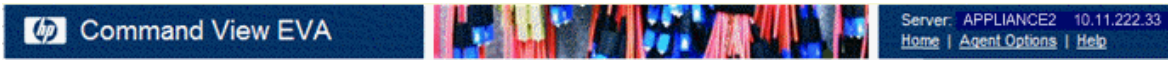

Figure 5 Session pane

Navigation pane

The Navigation pane is an expandable tree of folders that represent the components in the logical structure of the array. This structure enables you to configure and monitor the following components:

- Virtual disks
- Hosts
- Disk groups
- Data replication
- Hardware

NOTE:
You can configure and manage multiple arrays within the HSV Storage Network.

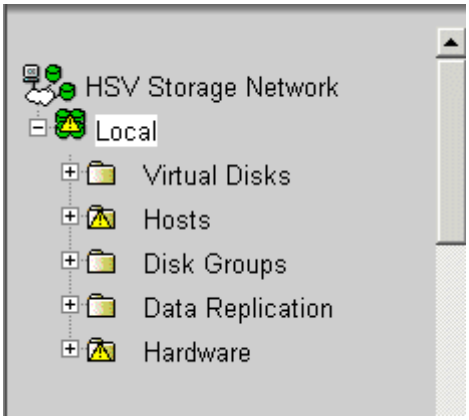

Figure 6 Navigation pane

Content pane

The Content pane displays information related to the component you selected in the Navigation pane and presents actions you can perform.

The Page Help (?) icon, located in the upper right corner of the Content pane, displays help for the current page.

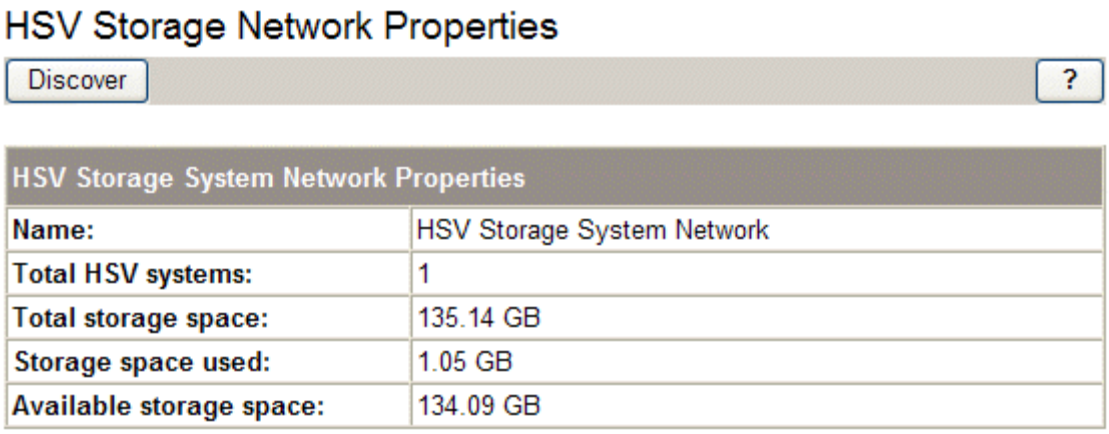

Figure 7 Content pane

Initializing arrays

When you install EVAs, they appear as an `Uninitialized Storage System`. Initializing an array makes it ready for use, binds the controllers together as an operational pair, and establishes preliminary data structures on the array. Initializing also sets up the first disk group, which is called the Default Disk Group.

NOTE:

If you are upgrading an existing version of HP Command View EVA, the arrays remain initialized and any other existing components are retained.

Figure 8 Uninitialized array

The minimum tasks you must perform when initializing an array are:

- Entering a name for the array.
- Entering the number of disks to be included in the default disk group.
- Setting the drive type to **Near-online**.

NOTE:

Setting the drive type to **Near-online** is only required if the array you are initializing contains near-online disks. Click **Advanced Options** and then click **Next** to access the window containing the drive type selection box.

The other tasks you can complete when you select Advanced Options are:

- Setting the array date and time.
- Entering a console LUN ID.
- Selecting a disk failure protection level.
- Entering comments.

NOTE:

These tasks are optional, as is selecting the drive type if the array contains online disks. See the online help for instructions to complete all tasks.

Viewing array properties

When you select an initialized array in the Navigation pane, the Initialized Storage System window appears. This window displays the following information about the array:

- **Identification**—Displays the name, node world wide name, and unique universal identifier (UUID) of the array. You can edit the Name box in this window.
- **Licensed features**—Indicates the EVA software you are licensed to use (for more information, see "Managing licenses"):
  - Basic—HP Command View EVA
  - Snapshot—HP Business Copy EVA
  - Data replication—HP Continuous Access EVA
- **Device policies**—Displays the policy settings for:
  - Device addition—Governs whether newly installed disks are manually or automatically added to a disk group.
  - Disk replacement delay—The amount of time between a disk failure and the point at which the controllers incorporate an unused disk into the disk group to replace it. The minimum setting is one minute. Disk replacement should not being immediately in case the failure occurred because of a temporary condition.
- **Condition/state**—Displays the operational state of the array. The states are Good, Attention, and Failed.
- **System**—Displays the controller type, firmware version, console LUN ID, and time. You can edit the Console LUN ID box in this window.
- **Capacity**—Lists the total, used, and available space on the array.
- **Comments**—Displays comments entered when the array was initialized. You can add or edit the Comments box in this window.

NOTE:

If you modify a box in this window, be sure to click **Save changes** before you exit this window.

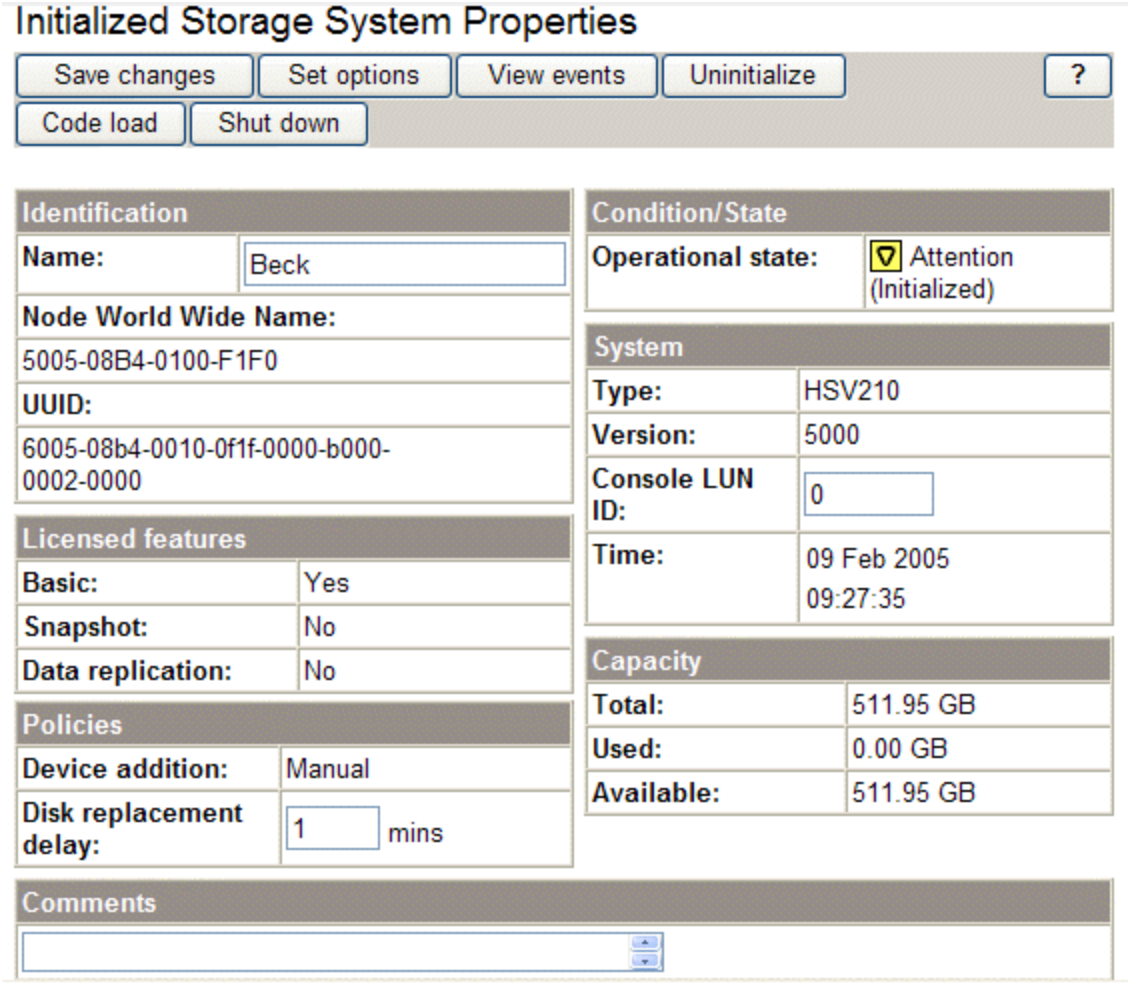

Figure 9 Initialized Storage System Properties window

From the Initialized Storage System Properties window, you can:

- Set additional array options, such as the device addition policy and the array date and time (see the online help for instructions)
- Configure and view events (for more information, see "Managing events")
- Uninitialize an array
- Upgrade the controller firmware (code load)
- Shut down or start up an array

Uninitializing an array

You should only uninitialize an array under specific circumstances, such as:

- Performing maintenance on the array controllers
- Preparing array controllers in a test environment

CAUTION:

If you uninitialize an array, you will lose all virtual disks, associated data, and host presentations that you have created for the array.

Updating the controller firmware

For more information and instructions for updating the controller firmware, see the *HP StorageWorks Enterprise Virtual Array updating product software instructions*.

Shutting down the array

To shut down the array:

CAUTION:

Ensure that any active commands or functions (SSSU, HP Continuous Access EVA, HP Business Copy EVA, or HP Replication Solutions Manager) have completed before you begin this procedure. Stopping the HP Command View EVA service while these command or functions are running causes a corrupt MLD. This should not cause data loss but recovery may be difficult.

1. Select the appropriate array in the Navigation pane.

   The Initialized Storage System Properties window for the selected array appears.

2. Click **Shut down**.

   The Shutdown Options window appears.

3. Under System Shutdown, click **Power down**. If a delayed shutdown is desired, enter a value in the Shutdown delay box to set a time delay (in minutes) to preface system shutdown initiation.

   The controllers complete an orderly shutdown and then power off. Then, the disk enclosures power off. Wait for the shutdown to complete.

4. Turn off the power switch on the rear of each controller.

5. Turn off the circuit breakers on both of the rack power distribution units (PDU).

6. If your management server is an SMA and you are not using it to manage other storage arrays, shut down the SMA. From the SMA user interface, click **Settings > Maintenance > Shutdown**.

Starting the array

To start the array:

1. Verify that each fabric switch to which the controllers are connected is powered up and fully booted.

   The LED power indicator on each switch should be on. If you must power up the SAN switches, wait for them to complete their power on boot process before proceeding. This may take several minutes.

2. If you shut down the SMA, power it on and wait for it to completely boot. Verify the SMA is running by logging into it using the web interface.

NOTE:

Before applying power to the rack, ensure that the power switch on each controller is off.

3. Power on the circuit breakers on both rack power distribution units (PDUs). Verify that all drive enclosures are operating properly. The status indicator and the power indicator should be on (green).

4. Wait three minutes and then verify that all disk drives are ready. The drive ready indicator and the drive online indicator should be on (green). If the storage system does not include back-end

Fibre Channel (FC) loop switches, the drive fault indicator on the bay 1 disk drive in all the drive enclosures may be on.

5. Power on the upper controller. It assumes the role of primary controller.
6. Wait 10 seconds and then power on the lower controller. It assumes the role of secondary controller.
7. Verify that the operator control panel (OCP) on each controller displays the array name and world wide ID.
8. Start HP Command View EVA and verify connection to the array. If the array is not visible, click **HSV Storage Network** in the Navigation pane and then click **Discover** in the Content pane to discover the array.

NOTE:

If the array is still not visible, reboot the SMA to re-establish the communication link.

9. Check the array status using HP Command View EVA to ensure everything is operating properly. If any status indicator is not normal, check the log files or contact your HP service provider for assistance.

2 Configuring HP Command View EVA

A *management agent* is the installation of the HP Command View EVA software on a management server. The Management Agent Options menu contains the following tasks that you may perform most often when using HP Command View EVA:

- Set or change password access to the arrays, including remote access
- Enter license keys for related software
- Set viewing options for the user interface, including page footers

This chapter describes how to configure the management agent for use. To access the Management Agent Options menu, select **Agent Options** in the Session pane.

Managing passwords

A password is a security feature that allows you to use your HP Command View EVA session to access specified arrays. A management agent can control multiple arrays, and multiple management agents can control a single array, but only one agent can actively control an array at a time. The password you enter in HP Command View EVA must match the array password that is entered on the operator control panel (OCP) of the controller. See the *HP StorageWorks Enterprise Virtual Array user guide* for information about using the OCP panel.

The password functions are:

- Enable
- Change
- Disable

Enabling passwords

If you have already set the array password on the OCP panel, you must enable it in HP Command View EVA to see that array. If the array password has not been set on the OCP panel, you can use the Enable function to create that array password. However, the password is not enabled until you enter it on the OCP.

To enable a password:

1. From the Management Agent Options window, select **Storage system password access**.

   The Storage System Password Access window appears.

2. Click **Enable**.

   The Enable Password Access to a Storage System window appears.

3. Select the array to be enabled in the **Storage System World Wide Node Name List** box.

NOTE:

Only world wide names that do not have an enabled password are displayed.

4. Enter the array password (eight numeric characters) in the **Password** box. Enter the password again in the **Confirm Password** box.

NOTE:
This password must match the one set on the OCP.

5. Click **Enable Password**.

   The Enable password access dialog box appears.

6. Click **OK**.

   A status window appears, indicating success or failure.

7. Click **OK** to return to the Storage System Password Access window.

Changing passwords

If you change the array password on the OCP panel, you must change it in HP Command View EVA to ensure management agent access to the array.

To change a password:

1. From the Management Agent Options window, select **Storage system password access**.

   The Storage System Password Access window appears.

2. Click **Change**.

   The Change a Storage System Password window appears.

3. Select the array to be changed in the **Storage System World Wide Node Name List** box.

4. Enter the new password, previously changed on the OCP panel of the array controller in the **Password** box. Enter the password again in the **Confirm Password** box.

NOTE:
This password must match the one set on the OCP.

5. Click **Change Password**.

   The Change password access dialog box appears.

6. Click **OK**.

   A status window appears, indicating success or failure.

7. Click **OK** to return to the Storage System Password Access window.

Disabling passwords

To disable an array from the list of arrays that the management agent can access:

1. From the Management Agent Options window, select **Storage system password access**.

   The Storage System Password Access window appears.

2. Click **Disable**.

   The Disable Password Access to Storage System window appears.

3. Select the array to be deleted in the **Storage System World Wide Node Name List** box.
4. Click **Disable Password**.

   The Disable password access dialog box appears.
5. Click **Yes** to disable access.

   A status window appears.
6. Click **OK** to return to the Storage System Password Access window.

Managing remote access passwords

The **Remote access password options** function enables you to change the HP Command View EVA API user name and password. Applications such as SSSU and SMI-S EVA use this API for authentication. This API password is established in one of the following scenarios:

- If you set up the management server using SmartStart 7.1, you can choose to install the HP Command View EVA API and enter a user name and password when prompted. If you choose note to install the API, it is installed automatically when you install HP Command View EVA. The default user name is administrator, but you will be prompted to enter a password.
- If you set up the management server using SmartStart 7.2, and installed HP Command View EVA for the first time, the API is automatically installed with a random, unknown password. The *HP StorageWorks Command View EVA installation guide* lists instructions to reset the API password during HP Command View EVA installation.

If you have forgotten the API password, or you install another application after installing HP Command View EVA, you can use the **Remote access password options** feature in the HP Command View EVA user interface to change it.

If your management server is running SmartStart 7.1, follow this procedure:

1. From the Management Agent Options window, select **Remote access password options**.

   The System Management Homepage login window appears.
2. Enter your user name and password and click **OK**.

   The System Management Homepage window appears.

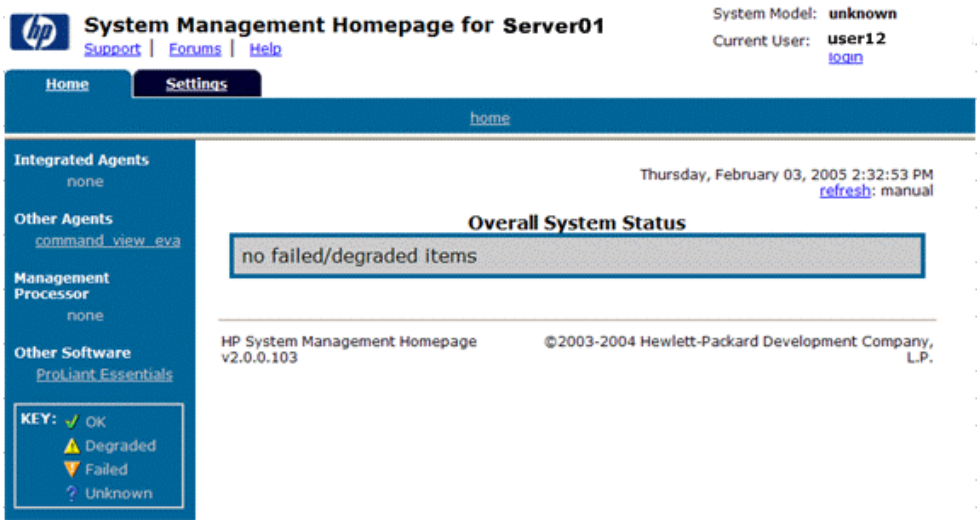

Figure 10 System Management Homepage

3. Click **Settings**.

The Settings window appears.

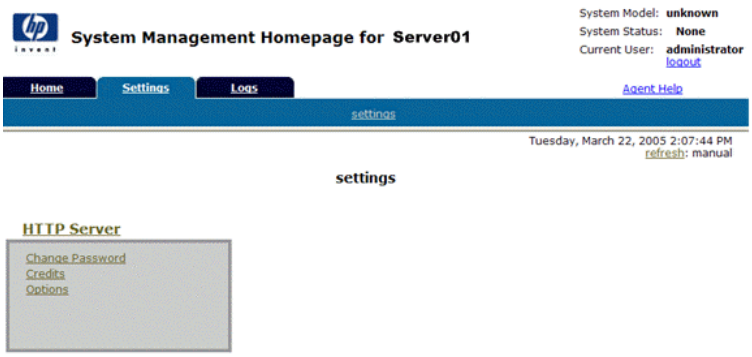

Figure 11 Settings window

4. In the HTTP Server box, click **Change Password**.

   The Change HTTP Server Password window appears.

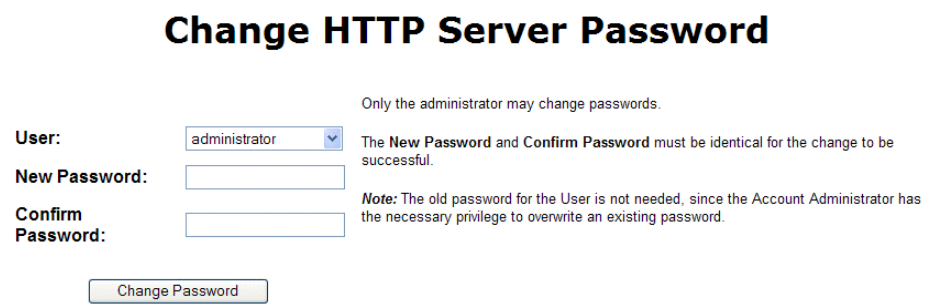

Figure 12 Change HTTP Server Password window

5. Select the user and enter a new password in the **User** and **New Password** boxes. Enter the new password again in the **Confirm Password** box.
6. Click **Change Password**.

   A status window appears. The new password should now be effective.

If your management server is running SmartStart 7.2, follow this procedure:

1. Open the Services window on the management server on which HP Command View EVA is installed. If you are not performing this procedure from that management server, use Terminal Services to enable remote access.
2. Right-click the **System Management Homepage 2.0** service and select **Stop**.
3. Complete steps 1 through 6 from the procedure for SmartStart 7.1.
4. Return to the Services window.
5. Right-click the **System Management Homepage 2.0** service and select **Restart**.
6. Select **HP Command View EVA** and restart the service.

   The new password should now be effective.

Using multiple management servers to manage arrays

If you have configured two or more management servers to manage arrays, you can change the management server that is currently managing a specific array.

To change the management server managing an array:

1. Log in to HP Command View EVA on the management server that you want to manage the array.
2. Click **Discover** and then click **OK**. The array icons in the Navigation pane appear in gray to indicate that another server is managing the array.
3. Select an array in the Navigation pane. The Storage System Managed by Another Agent window appears.

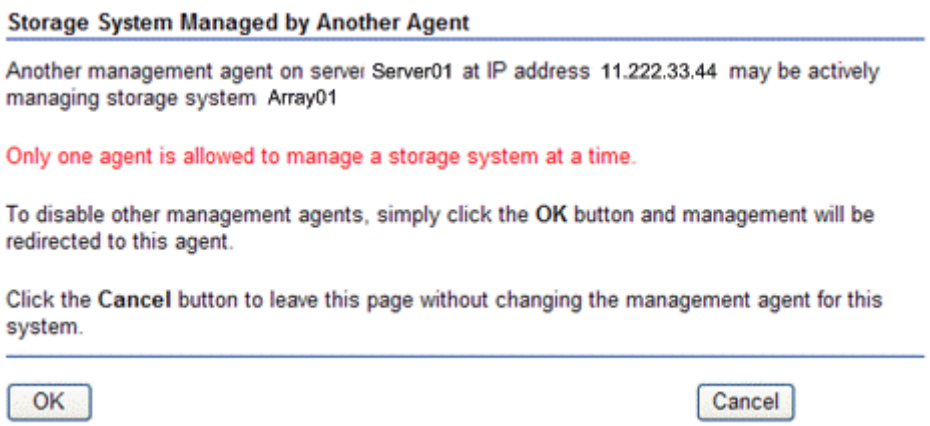

Figure 13 Storage System Managed by Another Agent window

4. Click **OK**. A message displays about assuming management of the array.

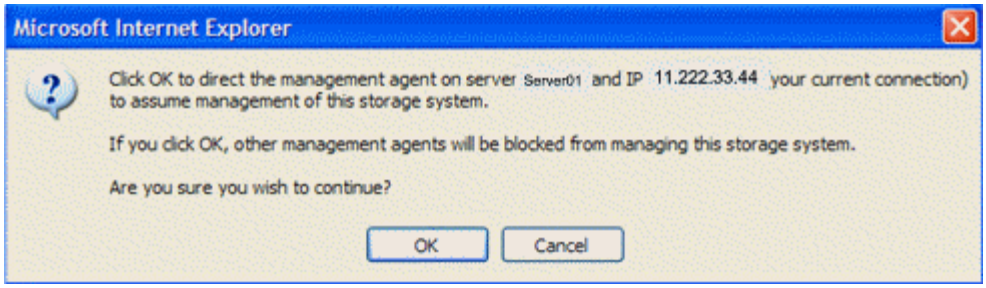

Figure 14 Assuming management of the array message

5. Click **OK**. The array icon in the Navigation pane becomes green to indicate that the server you are logged in to has control of this array. The color change may take time to occur.
6. If you wish to change management for another array, repeat steps 3 through 5.

If the management server now managing the array is in a Continuous Access environment, refer to the *HP StorageWorks Continuous Access EVA administrator guide* for information about coordinating active and standby management servers on multiple sites.

Managing licenses

A basic license key is no longer required to activate the Virtual Controller Software (VCS) firmware. However, the Command View EVA Licensed features box on the Initialized Storage System Properties window still contains a basic license entry and always displays Yes.

License keys are required for the array to operate with snapshot, snapclone, and data replication capabilities. A Business Copy EVA license key activates snapshot and Business Copy EVA functionality. A Continuous Access EVA license key activates data replication functionality. These licenses are sold as part of the individual product software kits. You can add either license before or after initializing the array.

Use the **Licensing Options** feature to:

- View previously entered license keys.
- Enter new license keys for EVA software, such as HP Business Copy EVA.

Viewing licenses

You can view all license keys known to the current management agent. This can include license keys entered through other management agents that previously managed the same arrays.

To view existing license keys:

1. Click **Agent Options** in the Session pane.

   The Management Agent Options window appears.

2. Click **Licensing options**.

   The Licensing Options window appears.

3. Click **View previously entered license**.

   The View License Keys window appears.

4. Click **Cancel** to return to the Licensing Options window.

Adding a license key

You can enter multiple license keys for the arrays that a management agent is controlling. However, you can only obtain a maximum of ten licenses from the web site at one time.

To enter a license key:

1. Click **Agent Options** in the Session pane.

   The Management Agent Options window appears.

2. Click **Licensing options**.

   The Licensing Options window appears.

NOTE:

To avoid text entry errors, HP recommends that you copy and paste license keys from an e-mail message or online source. Avoid manual entry if possible or ensure it is absolutely correct.

3. Click **Enter new license key**.

   The Add a license window appears.

4. Copy the license key from your e-mail message or other online source.

CAUTION:

The e-mail message from the License Key Retrieval web site contains the following statement: `This message in its entirety may be placed into your license file.` Do not copy this message as part of the license key or it will be rejected by HP Command View EVA. Ensure that you only copy the actual license key.

5. Paste the license key in the text box.
6. Click **Add license** to save the information.
7. From the host on which the license was installed, select the icon for the array in the Navigation pane. This ensures the license key is written to the MLD and is available to another management agent.

Repeat this process for each additional license key.

Setting user interface options

To set user interface options:

1. Click **Agent Options** in the Session pane.

   The Management Agent Options window appears.

2. Click **User interface options**.

   The User Interface Options window appears.

3. Edit or select the desired settings:

   - **Use wizards for creating Vdisks and hosts**—Select this check box to view the tasks for creating virtual disks (called Vdisks in the user interface) and hosts on multiple pages. If you do not select this check box, the tasks are presented on one page.
   - **Tree objects displayed**—Set the maximum number of objects that can be displayed in the Navigation pane. The default number of tree objects displayed is 100.
     If you have a small number of objects, set the **Tree objects displayed** value to a number higher than the number of objects in the SAN. This ensures that the management agent sends the complete tree structure to your browser when you select the tree.

     If you have more than 100 objects, set the **Tree objects displayed** value to a number lower than the number of objects in the SAN, such as 20 or 50. This optimizes performance and ensures that the management agent sends a limited number of objects to the browser when you select the tree. A special page with navigation buttons appears in the browser, enabling you to request other tree objects.
   - **Default operating system for new hosts**—Select an operating system from those listed in the drop-down menu. The selected operating systems is set as the default when you add a host.

4. Click **Save changes**.

Setting page footer message options

Use the Set Page Footer Message options to enter or edit a text message to display at the bottom of each Content pane. The message can be a security message or can contain other applicable information. The maximum length is 64 characters and the text displays in red.

To set a page footer message:

1. Click **Agent Options** in the Session pane.

   The Management Agent Options window appears.

2. Click **Page footer message options**.

   The Set Page Footer Message window appears.

3. Enter text or edit the existing message in the text box.

4. Click **Save changes**.

   The new message appears in red text at the bottom of the Content pane.

Optimizing performance

Consider the following tips to optimize performance:

- If you installed HP Command View EVA on multiple servers, only use one server at a time to manage an array.
- Minimize the number of non-administrative users connected to the array.
- Only use one SSSU session at time in HP Command View EVA.
- Do not use the user interface if you are using SSSU to run controller failovers.

3 Using HP Command View EVA

Use HP Command View EVA to configure the following components for array management:

- Disk groups
- Hosts
- Host folders
- Virtual disks
- Virtual disk folders
- Containers
- Snapclones and snapshots

See the HP Command View EVA online help for detailed procedures about creating and deleting these components. This chapter provides conceptual information about these components.

Disk groups

A disk group is a set of physical disks that form storage pools from which virtual disks can be created. When you initialize an array, a default disk group is created. In addition to the default disk group, you can create up to 16 additional disk groups.

Folders

When you install HP Command View EVA, an initial folder structure for an array is created in the Navigation pane. The initial folders are Virtual Disks, Hosts, Disk Groups, Data Replication, and Hardware. You can create subfolders to further organize and manage your hosts and virtual disks.

Hosts

Hosts connect to a fabric through Fibre Channel adapters (FCAs) and access storage through the array controllers. Use HP Command View EVA to add a host and make it known to an array. After a host is added, it must be online and connected to the fabric to write I/O to the array.

To add a host:

- The host does not have to be online to be added.
- Enter the name, IP address, Fibre Channel adapter (FCA) world wide name, and the operating system of the host. Enter comments, if desired.
- You can define any number of ports for a host.
- The maximum number of hosts is 256.

Virtual disks

A virtual disk (called a Vdisk in the user interface) is a simulated disk drive created within a disk group. You can assign a combination of characteristics to a virtual disk, such as a name, redundancy level, and size.

You can create a maximum of 1,024 virtual disks on the HSV200 series of controllers and a maximum of 512 virtual disks on the HSV100 series of controllers.

Some operating systems require a logical unit number. You can change the OS unit ID when you create a virtual disk. For OpenVMS and Tru64 UNIX, enter a unique OS unit ID for each virtual disk.

Selecting a preferred path

When creating a virtual disk, you can select a preferred path. This means that host I/O to a virtual disk will go to the controller you designate, as long as the paths to that controller are available. The preferred path settings are:

- None (default setting)
- Path A—Failover only
- Path B—Failover only
- Path A—Failover/failback
- Path B—Failover/failback

If you are running an operating system that requires Secure Path software (HP-UX, IBM AIX, Linux, Novell NetWare, Sun Solaris, or Microsoft Windows) and want to designate a preferred path, use the Failover only settings. The Failover/failback settings are not supported with Secure Path. The Failover only settings allow the host to control when a virtual disk moves to a preferred path. For example, if Path A is preferred, and that path becomes unavailable, Path B is used. The host will then return control to Path A when it becomes available.

If you are running an operating system that does not require Secure Path software (OpenVMS or Tru64 UNIX), all preferred path settings are supported. The Failover/failback settings allow the controller to manage the path movement of I/O to the virtual disk. All operating systems require a logical unit number.

NOTE:

If you are using DR groups, all virtual disk members in a DR group must be preferred to the same controller and host FCA port pair because they must fail over together. See the *HP StorageWorks Continuous Access EVA administrator guide* for more information about DR groups.

Presenting virtual disks to hosts

Before a virtual disk can be used by the array, it must be presented to a specific host or hosts. Presenting a virtual disk to a host means that you make the virtual disk visible to the host. You can present a virtual disk to a host during or after virtual disk creation. The virtual disk must be completely created before the host presentation can occur. If you choose host presentation during virtual disk creation, the management agent cannot complete any other task until that virtual disk is created and presented. Therefore, HP recommends that you wait until a virtual disk is created before presenting it to a host.

Creating containers

When you create a snapclone (a copy of a virtual disk), the first step is to allocate the same amount of space as the source virtual disk for the copy. Depending on the size of the source virtual disk, the space allocation may take several minutes to complete. However, you can allocate the required space before you create a snapclone, using a container, which is an empty virtual disk. Using this optional method is called creating a pre-allocated snapclone.

Creating a pre-allocated snapclone requires the following steps:

1. Create the container.
2. Clear the write cache.
3. Attach the container to the source virtual disk.

When you create a container, you assign a name to it, select a disk group, and select a Vraid level and size. That space is then reserved until you are ready to create the snapclone. You can create multiple containers to have ready when you need them.

Clearing the write cache means that you set the write cache policy of the source virtual disk (on the Virtual Disk window) to **write through** before you create the pre-allocated snapclone. This ensures that the controller writes data directly to the virtual disk and bypasses the cache while the host is writing data to the virtual disk. When you attach the container, you are copying the data from the source virtual disk to the container.

Snapshot and snapclone Vraid recommendations

For snapshots, only a Vraid level of equal or lower redundancy than the source virtual disk is allowed. For snapclones, a Vraid level with higher redundancy than the source is allowed. Table 4 shows the recommended Vraid selections for snapshots and snapclones based on the Vraid of the source virtual disk.

Table 4 Recommend Vraid selections for snapshots and snapclones

Source Vraid	Source redundancy level	Recommended snapshot Vraid	Recommend snapclone Vraid
Vraid0	Lowest	Vraid0*	Vraid0*, 5, 1
Vraid5	Medium	Vraid5	Vraid5, 1
Vraid1	Highest	Vraid1, 5	Vraid5, 1
*Source and destination virtual disks must be in the same disk group.			

The ability to create a snapshot or snapclone with less redundancy than the source virtual disk allows you to save space. You cannot create a snapshot with greater redundancy than its source because a snapshot contains only changed data and refers to the source for unchanged data. Consequently, if the source becomes inoperative, the snapshot also becomes inoperative. You can create a snapclone with greater redundancy than its source because a snapclone is an independent copy of the source.

Naming conventions

When creating names for arrays and other components, consider the following conventions:

- **Arrays**—Names may contain a maximum of 20 characters. The name may contain any printable character except for the following:
  `< > | : , * ? “ & + % / \`

NOTE:

These characters are not allowed in any text box.

- **Objects**—Names may contain a maximum of 32 characters. Special characters are allowed, but spaces are not. Names are case-sensitive. For example, you can have two virtual disks named `Disk1` and `disk1`, but this is not recommended.
  With the exception of the DR group comment box, which is limited to 64 characters, all comment boxes allow a maximum of 128 characters.
- **Folders**—Organize data in folders when using the HP Command View EVA user interface. Use names and descriptions that are easily recognizable so all users can quickly locate and manage data. Those involved in disaster planning should know specific folder names and the type of information in each folder.

4 Managing events

This chapter describes how to manage events using HP Command View EVA.

Overview

Events track the progress of actions, both normal or exceptional, that occur on the array. Examples of normal events are creating virtual disks or initializing an array. Examples of exceptional events are an incomplete function or a reduction in the array's capabilities. Normal events are more common than significant events. You can use HP Command View EVA to configure and view these events. Managing events from the HP Command View EVA user interface is especially useful when you are monitoring multiple EVAs.

Events are captured in one or more of the following event logs:

- Management agent
- Controller
- Controller termination

All event logs are stored in the `C:\hsvmafiles` directory on the management server.

Management agent event log

A management agent is the installation of HP Command View EVA on a management server. Management agent events are triggered by:

- Changes to the HP Command View EVA software
- Changes to the initialized array that you are monitoring and controlling through HP Command View EVA (such as creating a disk group)

Controller event log

A controller event is a normal or significant action on any hardware or software component within the array. Examples of controller events are:

- Drive or drive enclosure changes
- Configuration changes (such as creating a disk group)
- Controller reboots
- Changes detected by the environmental monitoring unit (EMU) within the array

An example of a normal event would be the controller updating the mapping of the physical disks. An example of a significant event would be a drive enclosure that is unable to communicate with the EMU.

The controller logs are not deleted, which means there could be hundreds of events that exist for a controller. Events are displayed in groups to enable easier viewing. You can select a specific range in the Display Range list or click **Previous group** or **Next group** to move between the ranges.

CAUTION:

If you uninitialize an array, you will delete all of the controller events. HP strongly recommends that you not uninitialize an array.

Controller termination event log

Controller termination events report that a controller ceased operation.

NOTE:
Controller termination events do not include information about uninitialized controllers.

Viewing events

To view events:

1. From the Initialized Storage System Properties window, click **View events**.

   The View Events menu appears.

2. Select an event log (management agent, controller, controller termination).

   The selected event log appears.

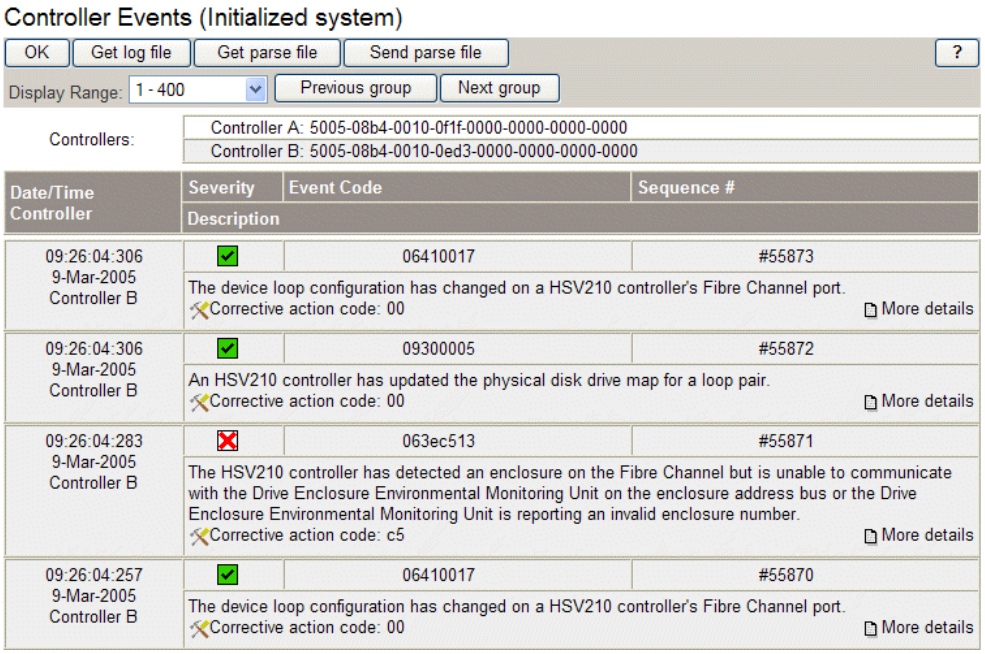

Figure 15 Controller events window

The following information is provided for each event:

- Date/Time Controller—The date and time that the event occurred and the name and world wide ID of the controller on which the event occurred.
- Severity—The severity types are informational, critical, warning, and undetermined.
- Event Code—A hexadecimal number assigned to the event. See "Event code format" for more information.
- Sequence number—The sequence number assigned to the event. Some tasks generate a series of events. The sequence number helps you identify the order in which related events occurred.
- Description—The text description of the event. See "Viewing additional information" for more information.

Viewing additional information

The Description box contains the following links to view additional information about the event:

- More details
- Corrective action code

More details

The **More details** link provides specific details about the event. Depending on your host operating system, you will be directed to open or save the `GetSCEventAddData.bri` file. Follow the prompts provided to complete this task.

The `GetSCEventAddData.bri` file is generated from the controller firmware and pulls the appropriate information from the various event log descriptions to help you pinpoint the event details. Applicable descriptions include a number that corresponds to the appropriate controller port. See the HSV controller cabling section in the *HP StorageWorks Enterprise Virtual Array user guide* for identification of these ports.

Corrective action code

Select **Corrective action code** (CAC) to view the recommended action to resolve the event. If the event severity is informational, the CAC is `00` and there is no corrective action to take.

Event code format

Controller and controller termination event codes appear as 32–bit hexadecimal numbers (for example, `060f4013`). The bits within the event code differ slightly for the two controller event types. The bits of a controller event have the following format:

Table 5 Controller event code bits

31.....24	23.....16	15.....8	7.....1
Software component ID	Event number	Corrective action code	Event information packet type

The bits of a controller termination event have the following format:

Table 6 Controller termination event code bits

31.....24	23.....16	15.....8	.....7.....	6.....5	4.....0
Software component ID	Event number	Corrective action code	Couple crash control code	Dump/restart control code	Parameter count

The following table provides the interpretation of each bit.

Table 7 Event code bit interpretation

Bit	Interpretation
24:31	The software component ID (SCID or SCWID) identifies the software component that generated the event. The ID ranges from 0x00 to 0xFF.
16:23	The event number is unique number for each software component and ranges from 0x00 to 0xFF. Each event code is uniquely identifiable by the combination of the SCID and the event number in bits 16:23.
8:15	The corrective action code is in the range of 0x00 to 0xFF.
0:7	(Controller events only) The event information packet type contains a reason for the event and a template that defines the meaning of the data in the packet. It is in the range of 0x00 to 0x2F.
7	(Controller termination events only) The coupled crash control code specifies whether both controllers are terminating operation.
5:6	(Controller termination events only) The dump/restart control code specifies whether a crash dump is occurring as part of the termination and whether the controllers will restart following termination.
0:4	The termination parameter count specifies the number of entries in the Termination Parameters array that are valid for this termination. If the parameter count is greater than zero, the termination code description in the parse file will describe the meaning of each parameter.

The following table describes the code types.

Table 8 Code types and descriptions

Code	Description
Software component ID	The software component IDs are: • 1—Executive Services • 2—Cache Management Component • 3—Storage System State Services • 4—Fault Management • 6—Fibre Channel Services • 7—Container Services • 8—Raid Services • 9—Storage System Management Interface • b—System Services • c—Data Replication Manager Component • d—Disk Enclosure Environmental Monitoring Unit Services • e—System Data Center • 42—Host Port • 80—Metadata Utilities • 83—Diagnostic Operations Generator • 84—Diagnostic Runtime Services
Corrective action code	You can view the complete list of corrective action codes when you select Corrective action code within an event description.

Code	Description
Event information packet (EIP) type	The EIP types are: • 01—Fault Manager Termination Processing Recursive Entry Event A machine check occurred while a termination event was being processed. • 02—Fault Manager Termination Processing Unexpected Event An unexpected event occurred while a termination event was being processed. • 03—Fault Manager Management Event An event that affects Fault Manager operation occurred. • 04—Fibre Channel Services Physical Disk Drive Error An error was encountered while accessing a physical disk drive. • 05—Storage System Management Interface Entity State Change The state of a Storage System Management Interface entity was changed. • 07—Fibre Channel Services Fibre Channel Port Link Error Excessive link errors were detected on a Fibre Channel port. • 08—Fibre Channel Services Fibre Channel Port Link Failure A Fibre Channel port link has failed or a Drive Enclosure Environmental Monitoring Unit task has failed. • 09—Fibre Channel Services Physical Disk Drive/Mirror Port Error An error was encountered while attempting to access a physical disk drive or the mirror port. • 0A—Storage System State Services State Change A Storage System state change occurred. • 0B—Storage System State Services Physical Disk Drive State Change A physical disk drive state change occurred. • 0C—Data Replication Manager State Change A Data Replication Manager state change occurred. • 0D—Executive Services System Time Change A change in system time occurred. • 0E—Storage System Management Interface Entity Creation or Deletion A Storage System Management Interface entity was created or deleted. • 0F—Storage System Management Interface Entity Attribute Change An attribute of a Storage System Management Interface entity has changed. • 10—System Services HSV210 Controller State Change A controller state change occurred. • 11—Disk Enclosure Environmental Monitoring Unit Services Status Change Status of a disk enclosure element has changed. • 12—Fibre Channel Services Physical Disk Drive/Mirror Port Unexpected Work Encountered Unexpected work was received from a physical disk drive or the mirror port.

Code	Description
Event information packet (EIP) type (cont'd)	The EIP types are: • 13—Fibre Channel Services Physical Disk Drive/Mirror Port/Drive Enclosure Environmental Monitoring Unit Error Summary Summary of errors encountered while attempting to access a physical disk drive, the mirror port, or a Drive Enclosure Environmental Monitoring Unit. • 14—Diagnostic Operations Generator Detected Failure A failure was detected during the execution of a diagnostic. • 15—Container Services Management Operation has started or completed An operation on a Disk Group has started or completed. • 16—Data Replication Manager Time Report An HSV210 controller has received a time report message. • 17—Fibre Channel Services Fibre Channel Port Loop Config A new device map has been generated on a Fibre Channel port. • 18—Storage System State Services Redundant Storage Set State Change A Redundant Storage Set state change occurred. • 19—System Data Center Services Status Change Status of a System Data Center element has changed. • 1A—System Services Code Load Operation Update A code load operation has occurred. • 1C—Fault Manager Termination Event HSV210 controller operation was terminated due to an unrecoverable event detected by either software or hardware or due to an action initiated via the Storage System Management Interface. • 1D—Fault Manager Termination Event (old Termination Event Information Header) HSV210 controller operation was terminated due to an unrecoverable event detected by either software or hardware or due to an action initiated via the Storage System Management Interface. • 1E—General Storage System State Services State Information Event General Storage System state information to be reported.
Coupled crash control code	The coupled crash control codes are: • 0—Other controller should not perform a coupled crash. • 1—Other controller should perform a coupled crash.
Dump/restart control code	The dump/restart action codes are: • 0—Perform crash dump then restart. • 1—Do not perform crash dump, just restart. • 2—Perform a crash dump and do not restart. • 3—Do not perform crash dump and do not restart.

Configuring event notification

HP Command View EVA uses a default configuration file to provide event notification. The event logs contain chunks of data for events that have occurred. You can format this data so that when events of a particular type occur, notification is sent to the host(s) you specify. For example, you can customize an event configuration file, using an SNMP-compliant product such as Insight Manager, Trivoli, or EMC Patrol. Using one of these products, you can create conditional instructions for your event configuration file to ensure the event notification is appropriate for your environment. The instructions to create an event configuration file is beyond the scope of this guide. For more information, see the documentation for the product you are using to create the event configuration file.

You can format the event data by:

- Selecting all events of a severity level
- Selecting individual events within a severity level
- Applying a customized event configuration file

Selecting a severity level

The severity levels are:

- 0—Normal (informational in nature)
- 1—Undetermined (more information needed to determine severity)
- 2—Warning (not failed but attention recommended or required)
- 3—Critical (failure or failure imminent)

To configure event notification by severity level:

1. From the Initialized Storage System Properties window, click **Set options**.

   The System Options menu appears.

2. Select **Configure event notification**.

   The Configure Event Notification window appears.

3. Under **Configure events individually**, select one or more of the following options:

   - All events
   - Critical events
   - Warning events
   - Normal events

4. If you are finished configuring event notification, click **OK**.

   The System Options menu appears. You will now receive only events of the severity you selected.

Selecting individual events

You can further customize event notification by selecting individual events:

1. Complete steps 1 through 3 from "Selecting a severity level."
2. Under **Configure events individually**, click **Configure**.

   The Set Event Notification Options window appears. The events that appear on this window are determined by your selection of a severity level.

3. From this window, you can:
   - Select individual events for notification.
   - Click **Notify all** to automatically select all events listed.
   - Click **Notify none** to clear the event selections.
   - Click **Restore defaults** to reset the default events set during HP Command View EVA installation.
4. When you finish making your selections, click **Save changes**.

   The Configure Event Notification window appears.
5. Click **OK**.

   The System Options menu appears. You must configure host notification for your event configuration to take effect.

Applying a customized event configuration file

To apply your customized event configuration file to HP Command View EVA:

1. From the Initialized Storage System Properties window, click **Set options**.

   The System Options menu appears.
2. Select **Configure event notification**.

   The Configure Event Notification window appears.
3. Under **Configure events using a configuration file**, click **Browse**.
4. Locate and select the event configuration file you created.
5. On the Configure Event Notification window, click **Configure**.
6. Click **OK**.

Configuring host notification

You can specify the hosts that receive the SNMP traps that the management agent generates for events. Any SNMP-enabled host in the same network as the array can be used.

You can enter individual hosts or you can apply a customized host notification list to HP Command View EVA.

Entering hosts individually

To enter hosts individually:

1. From the Initialized Storage System Properties window, click **Set options**.

   The System Options menu appears.
2. Select **Configure host notification**.

   The Configure Host Notification window appears.
3. Click **Modify host list**.

   The Modify Host Notification window appears.

4. In the Host Name box, enter the fully qualified domain name or IP address of the host.
5. In the Notify Port box, enter `162`.
6. Click **Save changes**.

The designated host should begin receiving SNMP traps. If the host is not receiving traps, restart the HP Command View EVA service.

Applying a customized host notification list

To apply a customized host notification list to HP Command View EVA:

1. From the Initialized Storage System Properties window, click **Set options**.

   The System Options menu appears.
2. Select **Configure host notification**.

   The Configure Host Notification window appears.
3. Under **To replace the host notification list**, click **Browse**.
4. Locate and select the host notification list you created.
5. On the Configure Host Notification window, click **Send list file**.
6. Click **OK**.

The hosts in the notification list should begin receiving SNMP traps. If the hosts are not receiving traps, restart the HP Command View EVA service.

Obtaining the parse file

The parse file is a means through which the HP Command View EVA software deciphers the information received from the array controllers. The parse file contains the hexadecimal event code and event description, an explanation of the event, and the array component to which the event refers. Every release of the controller firmware contains an updated parse file.

If the event description displays `Description not found in parse file`, you must update the parse file that the controller uses to populate the event description. This issue can occur if you upgrade or install HP Command View EVA on a management server that has not previously run this software.

To obtain the updated parse file:

1. Contact HP Support and request an updated parse file.
2. HP Support will e-mail the parse file to you and instruct you where to store it on the management server.
3. From the Initialized Storage System Properties window, click **View events**.

   The View Events menu appears.
4. Select either **Controller Event Log** or **Controller Termination Event Log** as the event type.
5. In the event log window, click **Send parse file**.

   The Send Event Parse File window appears.
6. Click **Browse** and locate the path in which HP Support instructed you to save the parse file (step 2).
7. Click **Send parse file**.

The parse file you received from HP Support is uploaded to the management agent. When the action has completed, the `Operation succeeded` message appears.

8. Click **OK** to close the window.

The appropriate event descriptions should now display in the event log window.

Downloading the MIB

You can use the HP Command View EVA MIB with your monitoring tools (such as Insight Manager) to translate the hexadecimal event code into decimal format. You can then use the decimal format to locate the corresponding information in the parse file.

NOTE:

The format of the HP Command View EVA MIB is SEMI.

To download the MIB:

1. From the Initialized Storage System Properties window, click **Set options**.

   The System Options menu appears.

2. Select **Configure event notification**.

   The Configure Event Notification window appears.

3. Click **Download MIB**.

   The File Download dialog box appears.

4. Click **Save** and put the MIB on the server where Insight Manager (or other monitoring tool) resides.

5. When finished, click **OK** twice to return to the Initialized Storage Systems Properties window.

Sending the event file

If you contact HP Support for assistance, the support technician may request a copy of the current event file, which is the current output translated from the controller.

To send the event file to HP Support:

1. Go to the appropriate event log for the controller.

2. Click **Get event file**.

3. When prompted, save the file to your local hard drive. (The file name format for the event file is `GetEventfile.xxxxx`.)

4. E-mail the file to the support technician.

5 Troubleshooting HP Command View EVA

This chapter describes possible issues you may encounter and information to resolve them.

Failed connection warning for empty controller host ports

Symptom: The Connection state box on the Controller Properties window displays `Connection failed` for an empty host port.

Cause: The firmware for the HSV200 series of controllers cannot differentiate between an empty host port and a failed host port in a direct connect configuration.

Solution: Insert an optical loop-back connector into the empty host port. Then the Connection state will display Connected. For more information about optical loop-back connectors, contact your HP-authorized service provider.

Failure of virtual disk deletion

Symptom: A disk group does not have the expected capacity or a disk group cannot be deleted. For the latter, an `Object in use` message may appear.

Cause: Deleting a virtual disk may partially fail, resulting in the virtual disk being deleted from the HP Command View EVA user interface, but still occupying space within the disk group.

Solution: Restart the HP Command View EVA service. The service will discover the partially deleted virtual disk and request that the array delete the remainder of the virtual disk.

Failed controller reported after reboot

Symptom: When you reboot a controller, it may either appear in the Unmappable Hardware folder or the Hardware Rack folder in the Navigation pane with a red "X". If you attempt to select the other controller, the `Lock Busy Error` message appears.

Solution: Click the red "X" of the rebooted controller to move the controller to the Unmappable Hardware folder and to remove the red "X".

Failed entities reported on the disk enclosure

Symptom: Failed entities on a disk enclosure may cause a red "X" to appear on the entire shelf in the Navigation pane.

Solution: Use the following information to help determine the entity that is causing the failure.

Failed transceiver (or GBIC)

The symptoms of a failed transceiver (or GBIC) are:

- The controller event log contains the following entries:
  - `0d8d9001 <Transceiver error>`
  - `0df00011 <Status Change on one or more drive enclosures>`
  - `09d50005 <Transitioned to Single Port on Fibre State>`
- The Disk Enclosure Properties window displays the following information:
  - On the Power tab, the operational state displays `Good`.
  - On the Cooling tab, the status of the sensors displays `OK`.
  - On the I/O-Comm tab, one or more Fibre Channel ports displays `Bad` or `Not Installed`.

Failed I/O module

The symptoms of a failed I/O module are:

- The controller event log contains the following entries:
  - `0ddd9311 <A drive enclosure I/O module error has occurred.>`
  - `061e4c13 <An HSV210 Controller has detected only one port of a Fibre Channel service.>`
  - `0df00011 <Status change of one or more drive enclosures.>`
- The Disk Enclosure Properties window displays the following information:
  - On the Power tab, the operational state displays `Good`.
  - On the Cooling tab, the status of the sensors displays `OK`.
  - On the I/O-Comm tab, the operational state of the I/O modules displays `Not Installed` or `Failed`.

Failed blower power supply

The symptoms of a failed blower power supply are:

- The controller event log contains the following entry:
  `0d330911 <AC Input to drive enclosure power supply has been lost.>`
- The Disk Enclosure Properties window displays the following information:
  - On the Power tab, the operational state of a power supply displays `Unknown`.
  - On the Cooling tab, the operational state of a blower displays `Unknown` and the status of the `Pstemp` sensor displays `Not Available`.

Disk names are greater than disk count

Symptom: Adding and removing disks or changing the Device Addition policy from Manual to Automatic may cause disks to be renamed.

Cause: Working as designed – HP Command View EVA ensures that disk names are distinct by changing the last three digits of the name. This naming method may result in disks being identified by a number that is higher than the total disk count for an array.

For example, you have five disks named `disk001` through `disk005`, and you remove `disk003` and `disk004`. When you re-insert `disk003` and `disk004`, HP Command View EVA renames them `disk006` and `disk007`.

Unable to change default values during DR group creation

Symptom: When creating a DR group, an attempt to change the Failsafe or Write modes to values other than the defaults may fail.

Solution: After creating the DR group, verify the settings for Failsafe mode and Write mode. If they do not have the desired values, change and save the values again.

6 Using HP Command View EVAPerf

This chapter describes how to use HP Command View EVAPerf.

Overview

HP StorageWorks Command View EVAPerf enables you to monitor and display the following EVA performance metrics:

- Arrays
- Array controllers
- Host connections
- Host port statistics
- Physical disks
- Port status
- Replication
- Virtual disks

When you install HP Command View EVAPerf, the software components are stored in the following directory:

```
c:\Program Files\Hewlett-Packard\HP Command View EVAPerf
```

Components

HP Command View EVAPerf includes the following components:

- `evapdcs.exe`
  `evapdcs.exe` is the EVA Data Collection Service, which gathers data from the EVAs that are visible to the host and stores it in memory cache. You can then use either `evaperf.exe` or `evapmext.dll` to retrieve and view the information. The service is set to manual when you install HP Command View EVAPerf. When you run evaperf.exe, the service will start and remains running until you reboot the host. You can also start and stop the service using Windows Service Manager.
- `evaperf.exe`
  `evaperf.exe` is the utility you can use to view performance metrics in a command line interface. Ensure that you run `evaperf.exe` from the directory in which it was installed or it will not find the necessary configuration files.
- `evapmext.dll`
  `evapmext.dll` is the DLL extension for Windows Perfmon, which is the utility you can use to view performance metrics in a graphical user interface.

  If you use Windows Perfmon for background logging, HP recommends that you set the EVA Data Collection Service to start automatically. If you execute logging before starting this service, the startup time for the service may exceed the time that Windows Perfmon waits for the first data samples.

The EVA Data Collection service uses TCP port 860. You may need to open this port on your firewall.

NOTE:

You can also view performance metrics in an external application, such as Microsoft Excel, after you export the date in either a CSV (comma-separated value) or TSV (tab-separated value) format.

Enabling access to password-protected arrays

If the arrays you want to monitor for performance are password-protected, you must identify the array's worldwide name (WWN) and password in the HP Command View EVAPerf command line interface.

NOTE:

The array password is first entered on the operator control panel (OCP) of the array controller. When you enter the array WWN, you can use upper or lower case letters and either include or eliminate hyphen separators. For example, `5000-1FE1-5000-CD30`, `5000-1fe1-5000-cd30`, and `50001FE15000cd30` are all valid WWN entries.

To set the array password in HP Command View EVAPerf:

1. Open a command prompt window.
2. Change to the directory in which HP Command View EVAPerf is installed.
3. Enter the following command:

   `evaperf spw` *`array_WWN array_password`*

   where:

   - *array_WWN* is the WWN of the array.
   - *array_password* is the password entered on the OCP of the array controller.

   HP Command View EVAPerf verifies that it can access the array before adding the information in encrypted form to the `arraypass.conf` file.

```
C:\evapmt>evaperf spw 5000-1FE1-5000-A9F0 RSGHSVxx
Setting the password for array WWN: 5000-1FE1-5000-A9F0
Password set
```

Figure 16 Using the spw command

To verify the array password, enter the following command:

`evaperf vpw`

Passwords are verified before they are added to the `arraypass.conf` file. The only way you can enter an incorrect password is if it was changed on the array.

Friendly names

In HP Command View EVA, you can associate the WWNs of objects, such as arrays, virtual disks, and hosts, with more easily readable identifiers called *friendly names*. For example, you can identify an array that is known by its WWN of 5000-1FE1-5000-A9F0 as RSG14HSV1.

If you choose, you can extract this information from HP Command View EVA and use it in HP Command View EVAPerf. To do so, you must know the user name and password used to access the HP Command View EVA user interface. The access information you enter depends on the following:

- If you set up the management server using SmartStart 7.1, the default user is **administrator**. The password is the password you entered when the HP Command View EVA API was installed during the management server setup.
- If you set up the management server using SmartStart 7.2, enter the operating system user name and password of an administrator account on the management server.

Enabling HP Command View EVA access

Before you add friendly name information for an array, you must configure HP Command View EVA access to the array:

1. Open a command prompt window.
2. Change to the directory in which HP Command View EVAPerf is installed.
3. Enter the following command and press **Enter**:

   ```
   evaperf fnh [hostname] [username] [password]
   ```

   where:

   - *hostname* is the name of the host running HP Command View EVA.
   - *username* is the HP Command View EVA user interface user name.
   - *password* is the HP Command View EVA user interface password.

   HP Command View EVAPerf verifies that it can access HP Command View EVA before adding the information to the `fnamehosts.conf` file.

NOTE:

If you enter the `fnh` command without parameters, HP Command View EVAPerf displays a list of known hosts running HP Command View EVA.

Adding friendly names

To add friendly name information for the arrays configured with the `fnh` command:

1. Open a command prompt window.
2. Change to the directory in which HP Command View EVAPerf is installed.
3. Enter the following command and press **Enter**:

   ```
   evaperf fn
   ```

   The `fnames.conf` file is created. Any friendly name information that exists for the hosts running HP Command View EVA and listed in the `fnamehosts.conf` file is extracted from HP Command View EVA and stored in the `fnames.conf` file.

   Update the `fnames.conf` file when you make changes to the arrays.

NOTE:

The `fnames.conf` file must reside in the directory in which HP Command View EVAPerf was installed.

Adding friendly names manually

You can create and maintain the `fnames.conf` file manually using a standard text editor.

Each line in the file contains a WWN that uniquely identifies an object, followed by the friendly name of the object. When reading this file, HP Command View EVAPerf ignores blank lines and lines that begin with #. Below is a listing from a manually created file.

```
#·Sample·friendly·names·file¶
¶
#·Storage·Cells·managed·by·http:\\hadtma1:2301¶
5000-1FE1-0013-A100·EVA3_V3¶
5000-1FE1-0015-0B50·Array1¶
¶
#·VDisks·on·Array1¶
6005-08B4-0000-0046-0002-4000-113B-0000·Nigel-001¶
¶
#·Storage·Cells·managed·by·http:\\rsg9ma4:2301¶
5000-1FE1-5000-A9F0·RSG14HSV1¶
5000-1FE1-0015-0EE0·test¶
5000-1FE1-0000-00D0·RGS11HSV2_new¶
```

Figure 17 Sample friendly names file

Using short names

If the friendly names you created for objects in HP Command View EVA are lengthy, it may be difficult to view these long names using HP Command View EVAPerf. In the HP Command View EVAPerf command line interface, you can substitute contractions for full names.

When you install HP Command View EVAPerf, the `fnames_sample.dict` file is also installed. You can either:

- Rename this file to `fnames.dict` and modify its contents to include the short names.
- Create a separate file called `fnames.dict` using a standard editor.

Within the `fnames.dict` file, enter a short name for each long friendly name as follows:

```
<long name> <short name>
```

Consider the following when creating names:

- If either the long or short name contains spaces, enclose the name in quotes.
- If a backslash character occurs within a string enclosed in quotes, you must add another backslash.
- Enter one long and short name combination per line.

```
#·Sample·contractions·dictionary:¶
"Vasu\\Copy·of·Vasu"·Vasu-c¶
chienchi·cc¶
Vasu\Vasu·VV¶
"Vasu·Vasu"·VV¶
```

Figure 18 Sample fnames.dict file

To use the short name you have entered in this file, add the `-cn` modifier to any command you enter in the HP Command View EVAPerf command line interface. The short name is substituted when a long name is encountered.

Using Windows Perfmon

This section describes how to display and manage EVA performance metrics using the graphical user interface, Windows Perfmon. It assumes that you are familiar with Windows Perfmon and how to access and configure it to display EVA performance metrics.

Windows Perfmon does not permit more than a single object level of hierarchy. Therefore, objects, such as virtual disks, are grouped as a single list of instances, even though they may be located on different EVAs. For example, the instance name indicate the array on which the virtual disk is located.

Physical disks use the friendly name (if available) of the array plus the enclosure and bay number of the disk (for example, `HSV_CD20:Q700H – en:1 – bay:1`).

Objects and counters

The following table lists the EVA objects and performance counters you can select for monitoring. For more information, see the *Performance Analysis of the HP StorageWorks Enterprise Virtual Array storage systems using HP StorageWorks Command View EVAPerf* white paper, which is available from the white papers web site (http://h18006.www1.hp.com/storage/arraywhitepapers.html) and the HP Command View EVA web site (http://h18006.www1.hp.com/products/storage/software/cmdvieweva/index.html).

HP EVA Continuous Access Tunnels	**HP EVA Host Connection**	**HP EVA Host Port Statistics**
• Copy retries • Round trip delay • Write retries • Copy in KB/s • Copy out KB/s • Write in KB/s • Write out KB/s	• Queue depth	• Av Queue Depth • Read KB/s • Read Latency (µ sec) • Read Req/s • Write KB/s • Write Latency (µ sec) • Write Req/s
HP EVA Physical Disk	**HP EVA Storage Array**	
• Drive Latency (ms) • Drive Queue Depth • Read KB/s • Read Req/s • Write KB/s • Write Req/s	• Total Host KB/s • Total Host Req/s	
HP EVA VDisk	**HP EVA Storage Controller**	
• Read Hit KB/s • Read Hit Latency (ms) • Read Hit Req/s • Read Miss KB/s • Read Miss Latency (ms) • Read Miss Req/s • Write KB/s • Write Latency (ms) • Write RP/s	• % Data Transfer Time • % Processor Time	
KB/s = kilobytes per second RP/s = requests per second.		

NOTE:

The Drive Latency counter for the HP EVA Physical Disk object reports different information, depending on the controller. On the HSV200 series of controllers, this counter reports total latency only. On the HSV100 series controllers, this counter reports both read and write latency.

Displaying metrics

To display EVA performance metrics using Windows Perfmon:

1. Start Windows Perfmon.

   The Perfmon window appears.

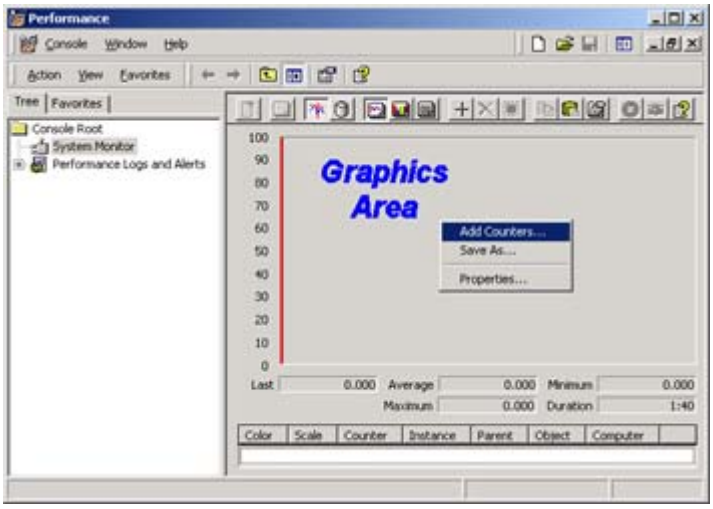

Figure 19 Perfmon window

2. Right-click in the graphics area (a menu appears). Select **Add Counters** and click **OK**.

   The Add Counters dialog box appears.

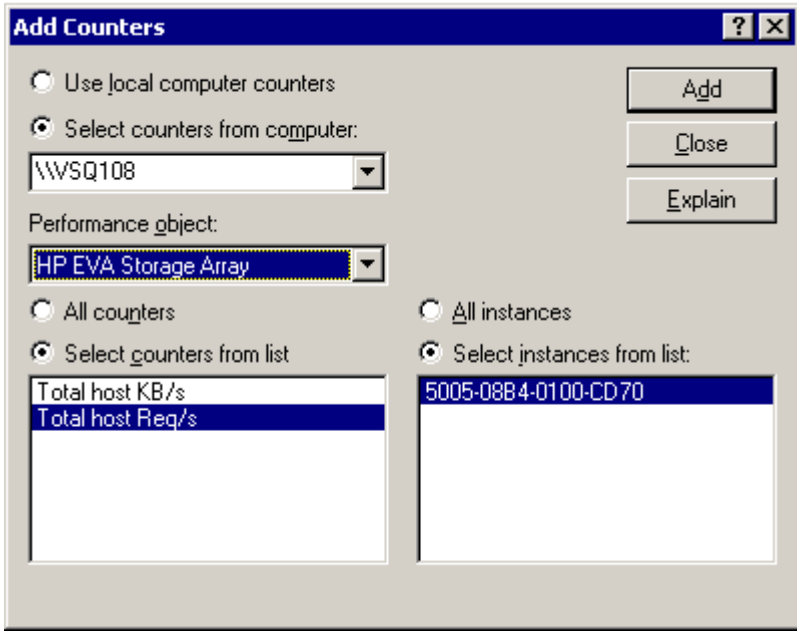

Figure 20 Add Counters dialog box

NOTE:
To view a description of a counter, select a counter and click **Explain**.

3. In the **Select counters from computer** box, select the host on which HP Command View EVAPerf is running.
4. From the **Performance object** list box, select an HP EVA object to monitor (for example, HP EVA Storage Array).
5. Click **All counters**, or select the counters you wish to view. Click **Explain** to view descriptions of the EVA counters.
6. Click **All instances**, or select the instances you wish to view.
7. Click **Add** to add the counters to the window. The utility begins displaying the performance metrics of the selected EVA object.
8. To add other objects, repeat the steps. To remove metrics, select the metric from the list and click the remove icon ( ).
9. To close the utility, click **Close**.

Using the command line interface

You can use a command prompt window to display EVA performance data in a tabular format. The following example assumes that you are familiar with command prompt use.

To display EVA performance metrics using the command line interface:

1. Open a command prompt window.
2. Change to the directory in which HP Command View EVAPerf is installed.
3. To display a list of arrays visible to HP Command View EVAPerf, enter `evaperf ls` and press **Enter**.

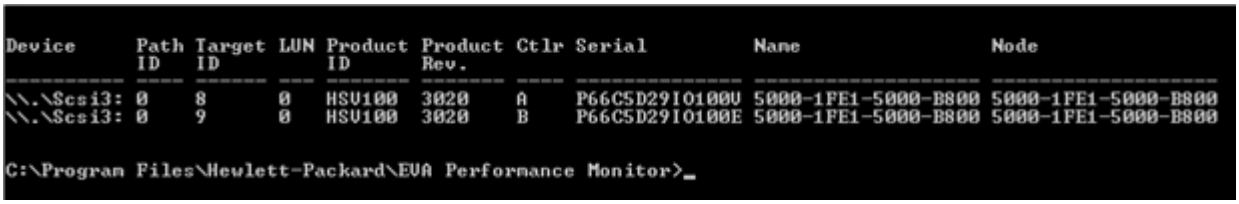

Figure 21 Arrays visible to HP Command View EVAPerf

The output that displays is not updated automatically while you are viewing it. To continuously display refreshed array data, enter the following command and press **Enter**:

```
evaperf as -cont
```

The output is refreshed every second or you can use the `-cont` *n* parameter to specify the refresh frequency.

You can also control the amount of data that is collected and presented, which can be useful if your configuration includes a large quantity of arrays, physical disks, and virtual disks.

- To limit the arrays for which HP Command View EVAPerf collects data, use the `-sz` modifier as shown in the following example:

  ```
  evaperf as -sz array1 array10 array32
  ```

  The output contains data for the specified arrays only.

- To limit the virtual disks for which HP Command View EVAPerf collects data, use the `-fvd` modifier as shown in the following example:

  ```
  evaperf vd -fvd disk2 disk4 disk8
  ```

  The output contains data for the specified virtual disks only.

- To filter the data that is collected for specific information, such as a host port name, use the `-fd` modifier as shown in the following example:

  ```
  evaperf as array1 array2 -fd test
  ```

  The output shows where *test* appears anywhere on array1 or array2.

NOTE:

MB/s values are based on 1 MB = 1,000,000 bytes.

KB/s values are based on 1 KB = 1,024 bytes.

Commands

The general syntax for commands is:

```
evaperf <command> [options]
```

NOTE:

You can specify the options in any order.

Table 9 lists the available commands and corresponding descriptions.

Table 9 HP Command View EVAPerf commands

Command	Description
`all`	Displays a summary of the array status by running the following commands together: `ls`, `as`, `cs`, `vd`, `vdg`,`hc`, `ps`, `hps`, `pd`, `pdg`, and `drt`.
`as`	Displays array status.
`cs`	Displays controller status.
`drt`	Displays data replication tunnel statistics.
`dpw wwn`	Deletes the password for the specified array from the host's Windows registry. The password is not deleted on the array.
`fnh`	Manages friendly name hosts as follows: • Displays a list of known hosts running HP Command View EVA. • Adds a host to the friendly name host list.
`fn`	Performs the following series of tasks: • Scans the friendly name host list. • Queries HP Command View EVA about the hosts on this list for all friendly name hosts known to HP Command View EVA. • Adds the friendly name information found to the `fnames.conf` file.
`h`, `help`, or `evaperf` without an argument	Displays help for HP Command View EVAPerf.
`hc`	Displays host connection information. The Port column in the output does not display data for the HSV200 series of controllers. Therefore, a hyphen (–) appears in the Port column.
`hps`	Displays host port statistics.
`ls`	Displays a list of EVAs that are visible to the host.
`luns`	Displays LUNs visible to the host.
`pd`	Displays physical disk data.
`pda`	Displays statistics for physical disk activity.
`pdg`	Displays the total physical disk data by disk group.
`ps`	Displays port status.
`rc`	Resets the error counters reported by the `ps` command.
`spw WWN password`	Sets the password for the specified array so HP Command View EVAPerf can access the array for performance metrics. This password must match the password entered on the OCP of the array controller.

Command	Description
vd	Displays virtual disk statistics. Only virtual disks that have been presented to a host are displayed.
vdg	Displays the total virtual disk data by disk group.
vdts	Displays virtual transfer size histograms. This command is only available on the HSV200 series of controllers.
vdtsg [lunwwn]	Graphs virtual disk transfer size histograms for all LUNs or a given WWN. This command is only available on the HSV200 series of controllers.
vdrl	Displays virtual disk read latency histograms. This command is only available on the HSV200 series of controllers.
vdrlg [lunwwn]	Graphs virtual disk read latency histograms for all LUNs or a specific WWN. This command is only available on the HSV200 series of controllers.
vdwl	Displays virtual disk write latency histograms. This command is only available on the HSV200 series of controllers.
vdwlg [lunwwn]	Graphs virtual disk write latency histograms for all LUNS or a specific WWN. This command is only available on the HSV200 series of controllers.
vpw	Verifies array passwords for use with HP Command View EVAPerf.

Command modifiers

Table 10 lists the modifiers you can use in the command line interface. Modifiers must be preceded by the minus sign (-).

Table 10 Command modifiers

Modifier	Description
`-cn`	Substitutes contractions from the `fnames.dict` file.
`-cont` *n*	Runs an HP Command View EVAPerf command continuously. You can specify the interval by adding a number (*n*). Otherwise, the default interval is one second. Press **Ctrl+C** to exit from this mode.
`-csv`	Displays data in CSV (comma-separated value) format and automatically includes a time stamp. The time stamp format can be modified using the `-ts1` or `-ts2` modifiers.
`-dur` *n*	Specifies the duration of a continuous mode session. For example, if you enter `evaperf vd -csv -cont -dur 30`, virtual disk data is displayed in CSV format at one second intervals for a total of 30 seconds.
`-fd` *keyword*	Displays data that contains the specified keywords. You must enter at least one keyword. To enter multiple keywords, separate each keyword with a space. For example, if you enter `evaperf -fd test preliminary good`, the data that displays contains the words *test*, *preliminary*, and *good*.
`-fo` *filename*	Copies output to a file as well as displaying it in the command prompt. You can combine this modifier with `-cont` and `-dur` for a fixed-time data capture. For example, if you enter `evaperf vd -cont 5 -dur 30 -fo capture.log`, virtual disk data is displayed in CSV at five second intervals for a total of 30 seconds and is also written to the `capture.log` file.
`-fvd` *vdisk [vdisk]**	Limits virtual disk data collection to the specified virtual disk(s). You must enter at least one virtual disk. You can also combine this modifier with `-sz` to limit data collection to the specified array(s). For example, if you enter `evaperf vd -fvd test1 test2 -sz server1`, data is collected for virtual disks test1 and test2 on array server1 only. You can use this modifier with the `vd`, `vdrl`, `vdwl`, and `vdts` commands.
`-KB`	Displays output data in kilobytes per second (1024). The default is megabytes per second (1,000,000).
`-nfn`	Specifies that friendly names should *not* be used.
`-nh`	Specifies that no headings be included in CSV (comma-separated value) output.
`-nots`	Specifies that a time stamp not be included in the CSV output.
`-sz` *array [array]**	Limits array data collection to the specified array(s). You must enter at least one array and you can use this modifier with any command. When specifying arrays, you can use either the array's WWN or friendly name. For example, if you enter `evaperf as -sz server1 server3`, data is displayed for arrays server1 and server3 only. If you do not include this modifier, data is collected from all arrays visible to the host.
`-tsv`	Displays output in tab-separated variable format with a time stamp.
`-ts1`	Adds a time stamp to the `-csv` output in the following format: `Fri Jul 23 16:23:05 2004`.
`-ts2`	Adds a time stamp to the `-csv` output in the following format: `23/Jul/2004 16:23:05 2004`. This is the default format.
`-us`	Display times in microseconds (the default is milliseconds). Latencies are displayed in milliseconds (ms) by default. Use the `-us` option to show times in microseconds for more accuracy.

Glossary

This glossary defines terms that are used in this guide or are related to the software.

array — *See* virtual array and storage system.

client — An intelligent device that requests services from other intelligent devices. In the context of HP Replication Solutions Manager, a client is a computer that is used to access the software remotely using a supported browser.

default disk group — The disk group that is created when the array is initialized. The minimum number of disks the group can contain is eight. The maximum is the number of installed disks.

disk group — A named group of disks selected from all the available disks in an array. One or more virtual disks can be created from a disk group.

DR group — Data replication group. A named group of virtual disks selected from one or more disk groups so that they replicate to the same destination, fail over together if a member virtual disk fails, and preserve write order within the group.

EVA — Enterprise Virtual Array. An HP StorageWorks product that consists of one or more virtual arrays.
See also virtual array.

failover — An operation that reverses replication direction so that the destination becomes the source and the source becomes the destination. Failovers can be planned or unplanned and can occur between DR groups, managed sets, fabrics or paths, and array controllers.

general-purpose server — A server on which HP StorageWorks Enterprise Virtual Array (EVA) management software is installed, including HP Command View EVA and HP Replication Solutions Manager, if used. Other management servers are dedicated management servers, HP ProLiant Storage Server models, and the Storage Management Appliance. When there are multiple management servers in a SAN, two active instances of HP Command View EVA are allowed, but each array will only be managed by one instance. The active management server actively manages the array, while the standby management server takes control of the array if there is a failure on the active management server. There is only one active management server at a time for any given management zone in a SAN.

host — A computer that runs user applications and uses (or potentially uses) one or more virtual disks that are created and presented by the array controller.

management agent — The installation of HP Command View EVA on a management server.

management server — A server on which HP StorageWorks Enterprise Virtual Array (EVA) management software is installed, including HP Command View EVA and HP Replication Solutions Manager, if used. A dedicated management server runs EVA management software exclusively. Other management servers are general-purpose servers, HP ProLiant Storage Server models, and the Storage Management Appliance. When there are multiple management servers in a SAN, two active instances of HP Command View EVA are allowed, but each array will only be managed by one instance. The active management server actively manages the array, while the standby management server takes control of the array if there is a failure on the active management server. There is only

	one active management server at a time for any given management zone in a SAN.
near-online storage	On-site storage of data on media that takes only slightly longer to access than online storage kept on high-speed disk drives.
online storage	An allotment of storage space that is available for immediate use, such as a peripheral device that is turned on and connected to a server.
SAN	Storage area network, a network of storage devices and the initiators that store and retrieve information on those devices, including the communication infrastructure.
snapclone	A copy that begins as a fully allocated snapshot and becomes an independent virtual disk. Applies only to the HP StorageWorks EVA.
snapshot	A nearly instantaneous copy of the contents of a virtual disk created without interruption of operations on the source virtual disk. Snapshots are typically used for short-term tasks such as backups.
Storage Management Appliance (SMA)	HP OpenView Storage Management Appliance, an HP hardware-software product designed to run SAN management applications such as HP Command View EVA and HP Replication Solutions Manager.
storage system	Synonymous with virtual array. The HP Enterprise Virtual Array consists of one or more storage systems. *See also* virtual array.
UUID	Unique Universal Identifier, a unique 128–bit identifier for each component of an array. UUIDs are internal system values that users cannot modify.
VCS	Virtual Controller Software. The software in the HP StorageWorks Enterprise Virtual Array controller. Controller software manages all aspects of array operation, including communication with HP Command View EVA.
virtual array	Synonymous with disk array and storage system, a group of disks in one or more disk enclosures combined with control software that presents disk storage capacity as one or more virtual disks. *See also* virtual disk.
Virtual Controller Software	*See* VCS.
virtual disk	Variable disk capacity that is defined and managed by the array controller and presentable to hosts as a disk.

Index

U

V

W