

**hp command view sdm**  
**installation and user guide**  
**for software version 1.02**



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## Safety Instructions

	<b>Denotes:</b>
<b>WARNING</b>	<b>A hazard that can cause personal injury</b>
<b>Caution</b>	A hazard that can cause hardware or software damage

---

## Format Conventions

### Denotes

<b>Note</b>	Significant concepts or operating instructions
<i>this font</i>	Text to be typed verbatim: all commands, path names, file names, and directory names also, text displayed on the screen
< <i>this font</i> >	Variables used in commands

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## Revision History

### September 2001

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<b>Change</b>	<b>Page</b>
Added installation configuration drawings	<a href="#">24</a>
Added HP-UX 11.20 to natives supported operatings systems.	<a href="#">17, 24</a>
Changed procedure for implementing browser security	<a href="#">45</a>
Added command line task summary table	<a href="#">51</a>

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## Overview

HP Command View SDM (Storage Device Manager) software is designed to provide storage management for the HP SureStore Virtual Array family. Command View SDM provides simple yet sophisticated device management tools for the array. Some of the features and benefits offered by Command View SDM include:

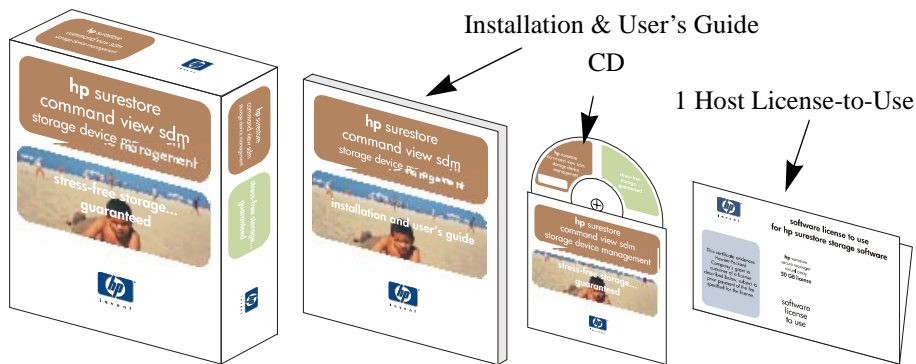
- Lets you manage an unlimited number of HP virtual arrays from a graphical user interface (GUI), command line user interface (CLUI), or web browser.
- Supports the entire HP virtual array family and future HP networked modular storage products.
- Provides secure device management in both direct-attach and SAN environments.
- Lets you manage and configure an unlimited number of HP virtual arrays.
- Easily spans your storage system as it grows from entry level to midrange and enterprise-wide.
- Goes from out-of-the-box to up-and-running faster than any other device management solution.
- Includes a one-host license to use - add additional host licenses as your network grows.
- Provides unlimited web-browser support.

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## Command View SDM Software

The Command View SDM product includes the following items:

- HP Surestore Command View SDM Installation and User's Guide
- CD-ROM (see [Command View SDM Software on page 10](#) for a list of the CD contents)
- License-to-Use (1 Host)



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## The Software Components

The *Command View SDM CD-ROM* contains all the software required to manage the HP Surestore Virtual Array product. The software components include:

- ♦ Installers
  - Install Shield (Windows NT 4.0 & 2000)
  - Swinstallable depot (for HP-UX 11.0 and 11.i)
  - Linux Red Hat Installation scripts and RPM files (for Red Hat 6.2)
- ♦ README files (contains updated information, install information, and more)
- ♦ Command View SDM Utilities
- ♦ User Interfaces
- ♦ SAN Host Agent & DIAL (Daemon/Services)
- ♦ Event Reporting
- ♦ Electronic copies of the product documentation

## Installation Software

Installation packages are provided for Windows (NT 4.0 and 2000), HP-UX, 11.0, 11.i and for Linux Red Hat 6.2. Installation instructions are provided in Chapter 2.

## Command View SDM Command Utilities

The Command View SDM utilities provide basic programs for managing the HP Surestore Virtual Array. These utilities provide management for operations such as configuration and management of LUNs, identifying array operating status and performance, managing rebuilds, providing access to array event logs, and more. Access to these utilities is provided through a Command Line User Interface (CLUI), and the Command View User Interface (CVUI). These interfaces are briefly described below. They are also described in detail in the related chapters of this document.

## Management User Interfaces

### Graphical User Interface and Launcher

The CVGUI provides a user interface that allows management of the array, using easy to use graphical screens. Information is logically organized onto sets of screens, making management fast and easy.

---

Most of the operations necessary to manage the array can be performed using this interface. Once Command View SDM is installed, this interface can be started from the Command View SDM Launcher. In addition to starting the graphical interface from the Launcher, it can also be accessed through a web browser. For information on starting and using this interface from either the Launcher or a web browser, see [Chapter 3, Graphical User Interface](#).

### **Command Line User Interface**

The Command Line User Interface (CLUI) consists of the set of commands that access the Command View SDM utilities. These utilities provide the management software for the virtual array. The commands are entered from a command line and provide complete management of the array. For more information, see [Chapter 4, Command Line User Interface](#).

### **Command View User Interface**

The Command View User Interface (CVUI) provides array management from a text, menu-based interface. This interface is provided primarily to allow access to the array management utilities from a remote location. The CVUI provides the same complete management as the Command Line User Interface. For more information, see [Chapter 5, Command View User Interface](#).

### **Command View Web Manager**

The Command View Web Manager (CVWM) allows access to the Command View SDM GUI from a browser (Netscape 4.7x or greater, Internet Explorer 5.0 or greater). By using the browser you will be able to perform all the operations available through the Command View SDM GUI. For additional information on Command View Web Management, see [Running Command View SDM from a Web Browser on page 45](#).

### **HostAgent and OpenDIAL (Daemons/Services)**

HostAgent and OpenDIAL provide basic operations required for array management. This software is installed as part of the Command View SDM installation. Both HostAgent and OpenDIAL are Daemons/ Services that need to be running (on the server) for other Command View SDM software to function. The HostAgent provides access to the array required by other Command View SDM applications. OpenDIAL performs discoveries and is also required for the operation of Command View SDM.

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## Event Reporting Software

The internal operation of the disk array is continually monitored and any significant events are recorded. Command View SDM's internal event reporting software retrieves event information from the array and reports it to the user. Command View SDM event software broadcasts these events to platform dependent targets, for example using SNMP applications with an SNMP agent to trap the events. Command View SDM also stores these events to system log files.

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**Note** Command View SDM does not support the SNMP set feature. Device information cannot be configured from a remote host.

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Event targets include:

- ♦ Windows
  - Event Viewer
  - HP OpenView (SNMP)
  - HP Top Tools (SNMP)
  - CA Unicenter TNG (SNMP)
  - BMC Patrol (SNMP)
  - Tivoli (SNMP)
- ♦ Linux
  - Syslog
- ♦ HP-UX
  - Syslog
  - HP EMS

Events are categorized as Information, Minor Warning, Major Warning, Serious, and Critical. These events also provide descriptions useful for troubleshooting. A current list of events is available from the HP web site:

<http://docs.hp.com/hpux/content/hardware/ems/RemoteMonitor.htm>

A typical event would appear as:

**Event 2026,**

Severity: Serious

Event Summary: Enclosure controller failed.

Event Description: The enclosure controller has failed.

Probable Cause/ Recommended Action: Replace the FRU (Field Replaceable Unit).

---

## **Virtual Front Panel**

Although not part of Command View SDM, the Virtual Front Panel (VFP) is another tool for managing the array and is included in this manual. The VFP is a set of commands that reside on the array controller and are accessed through a portable PC (or “dumb terminal”) connected to either array controller’s RS-232 connections. The VFP is used by HP qualified service representatives when installing and servicing the array. It is also required for some management operations, as described in this document.

## Modular Storage Software Products

Optional management software products are available for the HP virtual array. These optional products enhance the operation of the Command View SDM software by providing additional applications or capacity to existing features. This software can be purchased through your local HP authorized resellers or from HP sales offices. These optional products are listed in table 1. For the most up-to-date product information, refer to the HP web site (refer to [Web Support on page 20](#)).

**Table 1 Modular Storage Software Products**

SOFTWARE PRODUCTS	HP SALES OFFICE	HP RESELLERS
<b>Command View SDM:</b> Storage device management enables array device configuration and management, and value-added software products. Software Package and 1 Host LTU*	T1001A	T1020A
<b>Enterprise Management Smart Plug-Ins:</b> Enables Command View SDM in HP Openview NNM for HP-UX, Windows 2000 and Windows NT 4.0. It also enables Command View SDM for CA-Unicenter TNG and Tivoli. Software Package and 1 Host LTU*	T1002A	T1021A
<b>Business Copy Virtual Array:</b> Enables online data replication or LUN copying within the array for testing and backup, and requires the same physical space to be available in the array as the LUN(s) being copied. Software Package and 50 GB LTU* 500 Gbyte Upgrade LTU 1000 Gbyte Upgrade LTU 5000 Gbyte Upgrade LTU	T1007A T1008A T1009A T1010A	T1026A T1027A T1028A T1029A
*- License to use	<i>Continued on next page</i>	

**Table 1 Modular Storage Software Products** (cont'd)

SOFTWARE PRODUCTS <i>continued</i>	HP SALES OFFICE	HP RESELLERS
<p><b>Secure Manager Virtual Array:</b>            Enables LUNs to be locked into a secure shared environment.</p> <p style="padding-left: 40px;">Software Package and 50 GB LTU*            500 Gbyte Upgrade LTU            1000 Gbyte Upgrade LTU            5000 Gbyte Upgrade LTU</p>	<p>T1003A            T1004A            T1005A            T1006A</p>	<p>T1022A            T1023A            T1024A            T1025A</p>
<p><b>Auto Path Virtual Array</b> for Windows 2000:            Enables I/O path fail-over in MSCS Windows 2000 environments with the benefit of I/O load balancing in both failed and non-failed states.</p> <p style="padding-left: 40px;">Software Package and 1 Host LTU*            1 Host Upgrade LTU            5 Host Upgrade LTU            10 Host Upgrade LTU            25 Host Upgrade LTU</p>	<p>T1011A            T1012A            T1013A            T1014A            T1015A</p>	<p>T1030A            T1031A            T1032A            T1033A            T1034A</p>
<p><b>Auto Path Virtual Array</b> for Windows NT:            Enables I/O path fail-over in MSCS Windows NT environments with the benefit of I/O load balancing in both failed and non-failed states.</p> <p style="padding-left: 40px;">Software Package and 1 Host LTU*            1 Host Upgrade LTU            5 Host Upgrade LTU            10 Host Upgrade LTU            25 Host Upgrade LTU</p>	<p>T1039A            T1040A            T1041A            T1042A            T1043A</p>	<p>T1049A            T1050A            T1051A            T1052A            T1053A</p>

\* - License to Use



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## Operating System Support

The HP Command View SDM software is supported on the operating systems listed below.

- ♦ HP-UX 11.0, 11.i, and 11.20 (see the *HP Support Plus* web site for required patches)
- ♦ Windows NT 4.0 (Service Pack 6a or greater)
- ♦ Windows 2000 (Service Pack 1 or greater)
- ♦ Linux Red Hat 6.2/7.1 (Kernel versions 2.2.16 & 2.2.19)

Minimum system requirements for each operating system are identified in Chapter 2, Installation, for each operating system.

### Non-Native Supported Operating Systems

Hosts running the following operating systems are also supported on the HP SureStore Virtual Array family. However, Command View SDM is not supported on these operating systems. Consequently, array management must be done from a host running one of the supported operating systems listed above.

- ♦ Sun Solaris 7 and 8
- ♦ IBM AIX 4.3.3
- ♦ Novell NetWare 5.1

### HP-UX System Support Software

In addition to the software provided with Command View SDM, additional HP-UX system applications are available that support management of the array. These applications either incorporate the Command View SDM management application or they provide their own special management options. The Support Plus, June 2001 or greater software release CD-ROM provides these applications which include:

- ♦ System Administration Manager (SAM)
- ♦ Support Tools Manager (STM)
- ♦ Off-Line Diagnostic Environment (ODE)

---

## Sources of Support Information

For additional support requirements, refer to the README provided with the specific operating system located on the Command View SDM CD. In addition, it is important to refer to the HP technical support web site for the most current support information (for information on accessing this site, refer to [Web Support on page 20](#)). Also, refer to the Support Plus web site described in HP-UX installation section in Chapter 2 for required patches.

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## Warranty Statement

This software package comes with a 90 (ninety) day Media Defect Warranty. If you have any problems with the quality of the CD or the supporting documentation, you may return it for exchange through any HP Sales Office or authorized HP reseller.

## Technical Support

Technical support is provided for this product through an HP Support Contract at the time you purchased this product. For details regarding support information, refer to that contract.

For a list of the most current support phone numbers, access the following HP web site:

[www.hp.com/support/cvsdm](http://www.hp.com/support/cvsdm)

Select the **contact hp** link under the **technical support** heading for support phone numbers.

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## Web Support

New product offerings, product updates, support software, operating systems and other technical support information is continually becoming available. For the most current product information access the HP web site. Several sites are available following two general paths: one for general product information and the other for technical support information (software and updates, additional operating system support, and the latest documentation). To access this information, access the HP web page:

[www.hp.com](http://www.hp.com)

then follow the links, shown below, for either **technical support** information or **general product** information:

For **technical support** information:

(**Bold** identifies a web page; “→” represents the link to follow to another page.)

→ support

**Support Page**

→ disks, disk arrays

**HP Disk & Disk Arrays Page**

*then either:*

→ hp disk arrays

**HP Disk Arrays Page**

→ hp surestore VA7100 (**for VA 7100 hardware support information**)

→ hp surestore VA7400 (**for VA 7400 hardware support information**)

*OR*

→ hp modular storage software (**for software support information**)

The hardware support pages for the HP VA 7100 or the VA 7400 can be accessed directly from the URL:

[www.hp.com/support/va7100](http://www.hp.com/support/va7100)

*OR*

[www.hp.com/support/va7400](http://www.hp.com/support/va7400)

---

For **general product offerings** information:

(**Bold** identifies a web page; “→“represents the link to follow to another page.)

→ products & services

**products and services**

→ disks, disk arrays - storage

**disks, disk arrays**

*then either:*

→ HP Modular Storage Software (**for software product information**)

*OR,*

→ Midrange Arrays

**mid-range arrays**

→ hp surestore VA 7100 (**for VA7100 hardware product information**)

*OR,*

→ hp surestore VA 7400 (**for VA7400 hardware product information**)



## Overview

This chapter includes installation procedures for installing Command View SDM on each supported operating system. The installation process varies for each operating system, but once the software is installed, operation of Command View SDM is identical on all platforms.

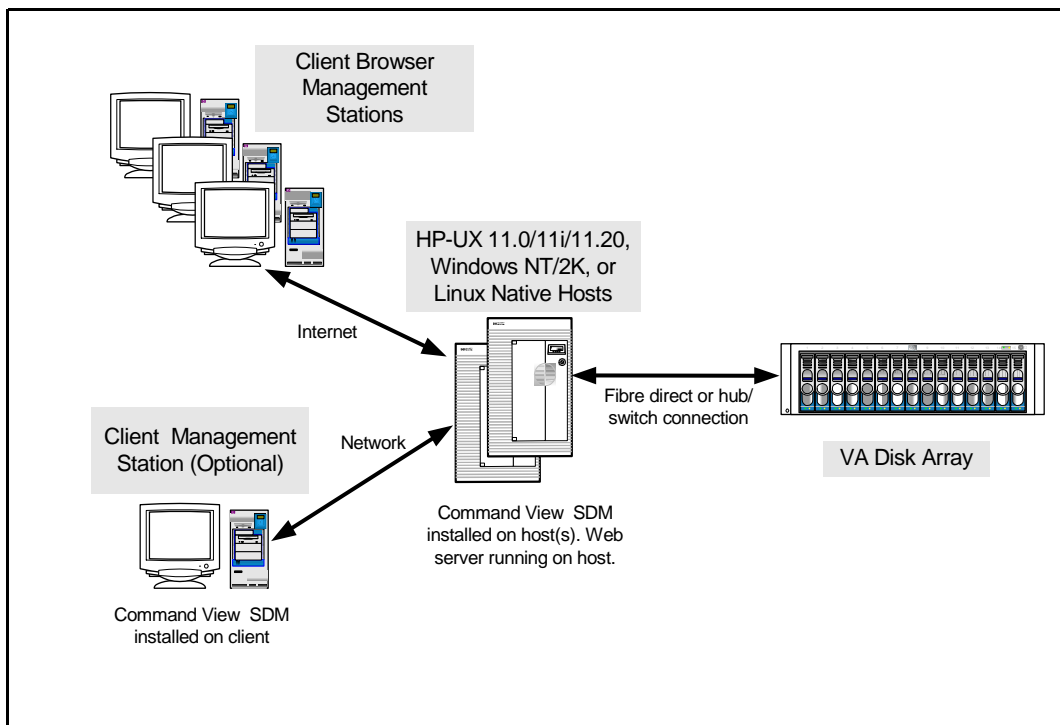
The Command View SDM software can be installed on both local hosts for direct management of the array, or on a client for remote management. Remote clients must be assigned access permission to the array from a host connected to the array.

Once the software is installed, it may be necessary to perform some Command View SDM configuration, which is described under [Configuring Command View SDM on page 38](#). Also, if the installation includes multiple operating systems, you need to refer to [Setting Host Port Behavior on page 40](#).

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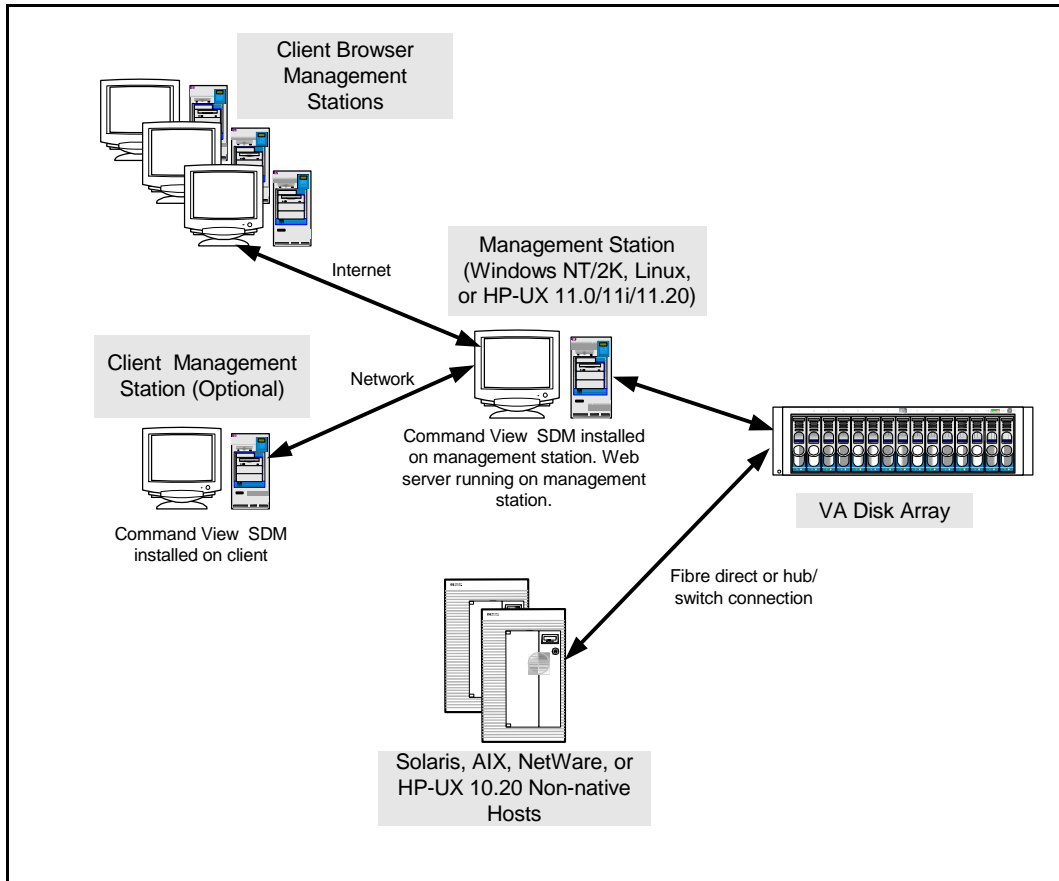
## Command View SDM Installation Configurations

The installation of Command View SDM will be influenced by the type of hosts connected to the array. If the host supports Command View SDM (a native host), it can be used as the management station. This configuration is shown in [Figure 1](#). If the host does not support Command View SDM (non-native), the software must be installed on a separate dedicated management station. This configuration is shown in [Figure 2](#).



**Figure 1** Command View SDM Installation - Native Host Configuration





**Figure 2** Command View SDM Installation - Non- Native Host Configuration

---

# HP-UX Installation

This section describes the installation of Command View SDM on HP-UX operating systems.

## Minimum System Requirements

Before installing the Command View SDM software, verify that your system meets the following minimum system requirements:

- ♦ HP Surestore Virtual Array with firmware version HP11 or greater
- ♦ HP-UX 11.0/11.i /11.20 (plus the Support Plus Hardware/Critical Patch Bundle version September 2001 or later)
- ♦ RAM: 256 Mbyte
- ♦ Screen Resolution: 800x600 (for the GUI)  
(Recommended 1024 X 768)
- ♦ Video Support: 64K colors or better
- ♦ Disk Space, Available: 60 Mbyte
- ♦ Disk Space for Logs: 16 Mbyte per 2 months

Support Plus Hardware/Critical Patch Bundle information can be found on the *HP-UX Support Plus* CD-ROM, or on the following web page:

[http://www.software.hp.com/SUPPORT\\_PLUS/hwcr.html](http://www.software.hp.com/SUPPORT_PLUS/hwcr.html)

To identify specific patch requirements, access the HP support web site (refer to [Web Support on page 20](#)).

---

## Installing HP Command View SDM on HP-UX

To install HP Command View SDM management software on HP-UX systems, complete the following steps. If you are reinstalling a new version of software, remove the current version prior to installing the new version. See [Removing HP Command View SDM from HP-UX on page 29](#). The following steps are typical. Installation for your system may vary depending on your system setup.

---

### Note Installation Tips.

- For the latest software updates, refer to the README file on the *Command View SDM* CD. The README is located in the corresponding operation system directory.

- When upgrading to a newer version of Command View SDM, always remove the previous version before installing the new software.

---

1. Log onto the system as root or superuser.
2. Insert the HP Command View SDM software CD into your CD-ROM drive.
3. Find the device file for the CD-ROM:

```
ioscan -fnC disk
```

4. Create a mount point directory:

```
mkdir /cdrom
```

5. Mount the CD device file:

```
mount -o ro /dev/dsk/c0t0d0 /cdrom
```

6. Run swinstall using the appropriate command:

```
swinstall -s /cdrom/hpux/cvsdm_11_00_v102xxxx.depot << HP-UX 11.0
```

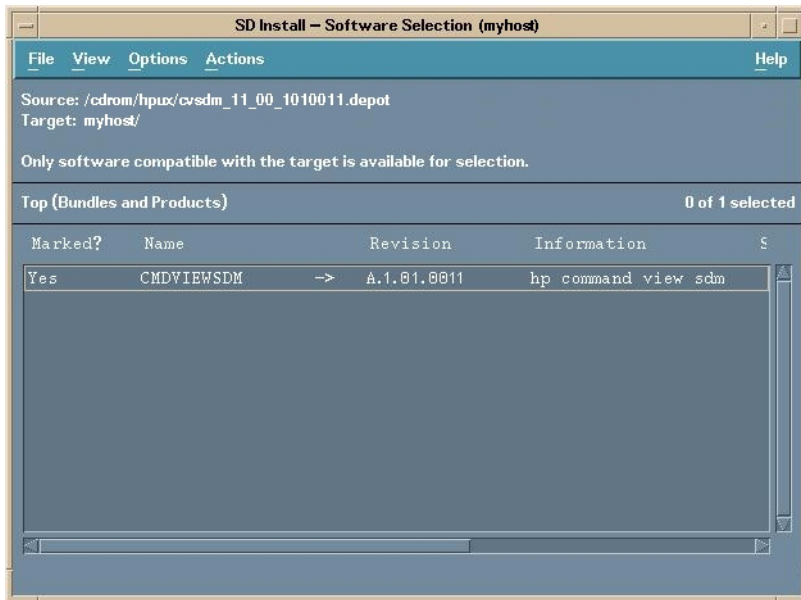
```
swinstall -s /cdrom/hpux/cvsdm_11_11_v102xxxx.depot << HP-UX 11.i
```

```
swinstall -s /cdrom/hpux/cvsdm_11_20_v102xxxx.depot << HP-UX 11.20
```

Check the appropriate /cdrom/hpux directory for the complete version name of the depot file.

7. Highlight **CMDVIEWSDM** from the list, then mark it for installation from the **Action** menu.

- 
- Start the installation by selecting **Install** from the **Action** menu.



- Complete the information requested on the `swinstall` screens.
- Once the software installation is complete, log out, then log back in to reset the path.

### What's Next?

- If the software was installed on a host, refer to [Configuring Command View SDM on page 38](#) for additional configuration information.
- If the software was installed on a client, see [Setting up Remote Client Access on page 38](#) for information on assigning client access rights.

---

**Note** Two Command View SDM services/daemons are running on the client that are only required for server operation. They may be shut down on the client. To shut these processes down, refer to [Starting/Stopping HostAgent and OpenDIAL on page 39](#).

---

---

## Removing HP Command View SDM from HP-UX

Removing the Command View SDM software involves two steps: the first removes the software, leaving the log files; the second step removes the log files. Certain array configuration information you have specified for your system will also be removed by this procedure. If you wish to retain this information for later use, you will need to save this configuration information. See [Saving Array Configuration Information on page 37](#).

To remove Command View SDM:

1. Log onto the system as root or superuser.
2. Run `swlist` to identify the software:

```
swlist
```

Identify the Command View SDM software in the list displayed.

3. Run `swremove` with the HP Command View SDM software name obtained from step 2:

```
swremove CMDVIEWSDM
```

This procedure does not delete the logs. If there has been a problem with the software or the array, the logs should be retained for reference for troubleshooting. However, if you are certain you will not need to access the logs, they can be removed.

To remove the logs and firmware files, sign on to the system as root and enter the following three commands:

```
rm -fR /opt/sanmgr
```

```
rm -fR /etc/opt/sanmgr
```

```
rm -fR /var/opt/sanmgr
```

---

# Windows Installation

This section describes the installation of HP Command View SDM software on hosts running Windows NT 4.0 and Windows 2000 operating systems.

## Minimum System Requirements

Before installing the Command View SDM software, verify that your system meets the following minimum system requirements:

- ♦ HP Surestore Virtual Array with firmware version HP11 or greater
- ♦ Administrator privileges (Required)
- ♦ Windows OS
  - Windows NT 4.0 Service Pack 6a (Required),
  - Windows 2000 Service Pack 1 (Required)
- ♦ 500 MHz processor speed or better
- ♦ 256 Mbyte RAM
- ♦ Screen resolution 800x600 (for GUI use)  
(Recommended resolution: 1024 X 768)
- ♦ Video support: 64K colors or better
- ♦ Disk space for logs: 16 Mbyte per 2 months
- ♦ Disk space: 60 Mbytes.

### Note

---

If you are installing on an alternate drive (drive other than the system drive: typically “C:”) an additional 45 Mbytes is required on the system drive during installation. Once installed, this drops to 15 Mbytes permanent on the system drive.

---

---

## Installing HP Command View SDM Software on Windows

To install HP Command View SDM management software on Windows NT4.0/2000, complete the following steps.

---

### Note

#### Installation Tips.

- For the latest software updates, refer to the README file on the *Command View SDM* CD. The README is located in the corresponding operation system directory.

- When upgrading to a newer version of Command View SDM, always remove the previous version before installing the new software.

---

1. Insert the *Command View SDM* CD into the CD-ROM drive on the host.
2. From the **Start** menu, select **Run**.
3. Enter the letter of your CD-ROM drive, followed by `win\setup.exe`. For example, if your CD-ROM drive is "E", enter:

```
E:\win\setup.exe
```

4. Follow the InstallShield screens to complete the installation.



hp command view sdm

Once the installation is complete, the HP Command View SDM Launcher icon will be placed on the desktop.

### What's Next?

- If the software was installed on a host, refer to [Configuring Command View SDM on page 38](#) for additional configuration information.
- If the software was installed on a client, continue with [Setting Up the Client Launcher on page 32](#).

---

### Note

Two Command View SDM services/daemons are running on the client that are only required for server operation. They may be shut down on the client. To shut these processes down, refer to [Starting/Stopping HostAgent and OpenDIAL on page 39](#).

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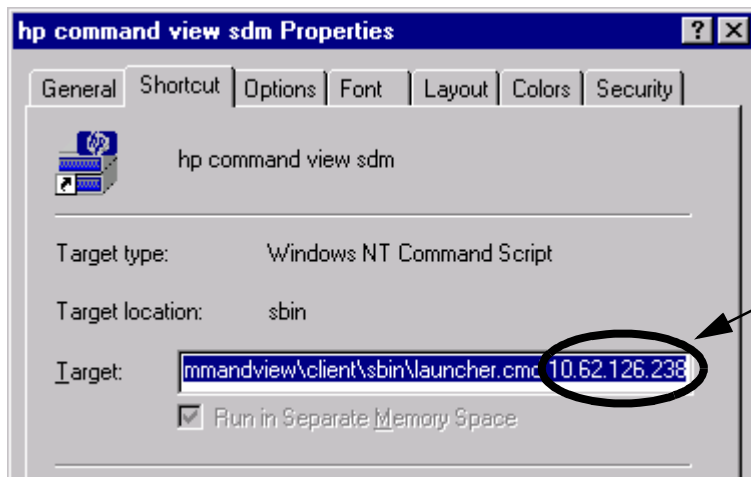
---

## Setting Up the Client Launcher

After installing Command View SDM on a client management station, you must identify which host to connect to when running the Launcher icon. This will be a host directly connected to the array(s) you want to manage. The client Launcher properties must be modified to identify the desired host.

To set up the client Launcher for remote access:

1. Right click on the Command View SDM Launcher desk top icon.
2. Select **Properties >> Short Cut**
3. In the **Target:** window, append a space and the host name to the end of the path displayed. The host name can be either the DNS name or IP address of the host directly connected to array(s). In the following figure, the IP address 10.62.126.238 is added to the target path.



Add the IP address  
or the DNS name of  
the host to the  
target path

4. Click **OK**.



---

**Note**

- To manage an array from a remote client, the client must be granted access by the Command View SDM host connected to the array. See [Setting up Remote Client Access on page 38](#)

- You can create additional Launcher icons connecting to different hosts by right clicking on the Launcher icon and selecting **Create Shortcut**. This will create a duplicate of the existing icon, which you can then modify to connect to a different host.

---

## Removing HP Command View SDM Software from Windows

This procedure describes removing the HP Command View SDM software. This should be performed before installing a new version of Command View SDM.

To remove the software:

1. Select **Start >> Settings >> Control Panel >> Add/Remove Programs**
2. Select **hp command view sdm** from the list of applications, and then click **Add/Remove...**  
InstallShield will start up. Follow the screens to remove Command View SDM.
3. Reboot the system.

This completes the removal of Command View SDM.

---

# Linux Red Hat Installation

This section describes the installation of HP Command View SDM software on hosts running the Linux Red Hat operating system.

---

**Note** It is only necessary to install Command View SDM on the Linux host if you wish to use it to manage the array. If you intend to manage the array from another host, you do not need to perform the steps in this section.

---

## Minimum System Requirements

Before installing the Command View SDM software, verify that your system meets the following minimum system requirements:

- ♦ HP Surestore Virtual Array with firmware version HP11 or greater
- ♦ Red Hat Linux 6.2 or 7.1 (plus patches, see web site mentioned below)
- ♦ Intel Pentium III 500 MHz processor
- ♦ RAM: 256 Mbyte
- ♦ Video Resolution: 800x600 (for GUI)  
(Recommended 1024 X 768)
- ♦ Video Support: 64K colors or better
- ♦ Disk Space: 60 Mbyte
- ♦ Disk Space for Logs: 16 Mbyte per 2 months

---

**Note** For the most current supported Linux Kernel version and required patches for the operation of the HP Surestore Command View SDM software, refer to the web documents, “Kernel Configuration” and “Linux Tips”. These documents can be found by going to the HP **technical support** web site (refer to [Web Support on page 20](#)) and linking to the “hp command view sdm” page (or use the shortcut: [www.hp.com/support/va7100](http://www.hp.com/support/va7100)) then going to “use and maintain”. This information is required for the operation of Command View SDM management features on Linux.

---

---

## Installing HP Command View SDM Software on Linux Red Hat

Installation procedures for HP Command View SDM on Linux Red Hat consists of a set of shell scripts and rpm files that customize and install the necessary software. Prior to installing the software, the Linux Kernel must be updated using the Kernel Configuration document, described at the bottom of this page. If you are installing a new version of software, remove the current version (as described on page 36) prior to installing the new version.

---

### Note      **Installation Tips.**

- For the latest software updates, refer to the README file on the *Command View SDM* CD. The README is located in the corresponding operation system directory.

- When upgrading to a newer version of Command View SDM, always remove the previous version before installing the new software.

---

To install Command View SDM:

1. Log on to your system as root or superuser.
2. Launch the software installer:

```
install_cmdview -server
```

The installation will take several minutes.

---

### Note

The Host Agent installer writes a log file to /tmp/SanMgrInstall.log

The Command View installer writes a log file to /tmp/CommandViewInstall.log

---

This completes the Command View SDM software installation. Additional configuration may be required depending on your system setup (refer to [Configuring Command View SDM on page 38](#)). Once the configuration is complete, you can begin managing the array using any of the management interfaces (refer to [on page 42](#)). If you are operating as a client (not on the host directly connected to the array), client access rights must be assigned on the server before the client can access the array (refer to [Setting up Remote Client Access on page 38](#)).

---

## Removing Command View SDM from Linux

This procedure describes removing the HP Command View SDM software. The existing Command View SDM software should be removed before installing a new version of the software. The procedure is performed in two steps: the first step removes the software, the second step removes the logs.

1. Remove the HP Command View SDM software:

```
uninstall_cmdview
```

If there has been a problem with the software or the array, the logs should be retained and used to reference for troubleshooting. If you are certain you will not need to access the logs, they can be removed.

2. To remove the logs, sign on to the system as root and enter the following three commands:

```
rm -fR /opt/sanmgr  
rm -fR /etc/opt/sanmgr  
rm -fR /var/opt/sanmgr
```

If you are re-installing HP Command View SDM software, perform the installation procedures described under [Installing HP Command View SDM Software on Linux Red Hat on page 35](#).

---

## Saving Array Configuration Information

When removing HP Command View SDM software, prior to installing a new version or reinstalling the current version, most of the software directories and files will be removed (log files remain installed). Three files, PanConfigParams.txt, ContactInfo.txt and access.dat, containing customized information you may have modified specifically for your system, will also be deleted. These files should be copied to a temporary location (one that is not under the HP Command View SDM installation path) to prevent them from being deleted. Copying these files to a “safe” location ensures that the information will be saved and can be easily restored after installation of the new software. Once the new software has been installed, these files can be merged into the newly installed files. The locations of these files are:

### HP-UX and Linux

```
/opt/sanmgr/commandview/server/config/PanConfigParams.txt  
/opt/sanmgr/commandview/server/config/ContactInfo.txt  
/opt/sanmgr/hostagent/config/access.dat
```

### Windows

```
<drive>:\sanmgr\commandview\server\config\PanConfigParams.txt  
<drive>:\sanmgr\commandview\server\config\ContactInfo.txt  
<drive>:\sanmgr\hostagent\config\access.dat
```

It is also advisable to save some of the configuration information contained in the internal array tables. This information includes security information and Host Port Behavior information. To save this information it must be read into temporary files from the array. After Command View SDM software is reinstalled, it can be downloaded back into the array. For information on performing these operations for security information, refer to the [armsecure on page 93](#). For information on performing these operations for Host Port Behavior information, refer to the [armhost on page 76](#).

In addition, if you have downloaded any firmware update files stored within the Command View SDM installation path, and would like to save them, copy them to a temporary directory and restore after installation.

---

## Configuring Command View SDM

Once installed, it may be necessary to configure the operation of Command View SDM. Configuration is required to perform the following tasks:

- ♦ Adding client access (IP addresses)
- ♦ Creating LUN 0 for multi-host installations
- ♦ Stopping or restarting the Host Agent and Open DIAL
- ♦ Adding additional arrays after the installation of Command View SDM

### Setting up Remote Client Access

When using a remote client to manage arrays, each client must be granted access rights by the Command View SDM host connected to the array. Access rights are managed using a special access file (`access.dat`) which is maintained on the host. This file contains the IP addresses of clients that are allowed access to the array through the host.

---

**Note** Initially, the `access.dat` file contains a value of “127.0.0.1”. This entry is required for Command View SDM host operation and must remain in the file.

---

To set up remote client access:

1. On a Command View SDM host connected to the arrays, open the `access.dat` file in an ascii text editor. The file is located in the following directory:

`/opt/sanmgr/hostagent/config/` << **HP-UX and Linux**

`<drive>:\sanmgr\hostagent\config\` << **Windows**

2. Add the IP address for each client requiring access to the arrays connected to the host. Or remove the IP address for any clients you no longer want to have access.

Single client IP addresses can be added, or a range of IP addresses can be added using the wild card “\*”. For example; `10.62.128.*` grants access to any client on subnet 128.

3. Save the `access.dat` file.

---

## Creating LUN 0 for Multi-Host Environments

When the array is connected to more than one host, LUN 0 must be created for proper array/host operation. LUN 0 should meet the following requirements:

- ♦ Configure a LUN 0 of at least 10 MB.
- ♦ Assign it <DEFAULT, CONFIG\_WRITE> security permission
- ♦ Do not put any file system on LUN 0

---

**Note** When LUN 0 is created, the array automatically assigns it <DEFAULT, CONFIG\_WRITE> security permission. For detailed information about array security features, obtain the optional software product, HP SureStore Secure Manager Virtual Array.

---

## Starting/Stopping HostAgent and OpenDIAL

The HostAgent and OpenDIAL services/daemons are installed with Command View SDM. These services/daemons are started at installation and must be running on the host. If these components are not running on the host, they need to be started before Command View SDM will be operational. HostAgent and OpenDIAL are not needed on a remote Command View SDM client and can be stopped.

To start or stop HostAgent and OpenDIAL you must login as root or superuser (for HP-UX/Linux) or have Administrator Privileges (for Windows).

### HP-UX and Linux:

To stop HostAgent and OpenDIAL, enter the following commands:

```
/opt/sanmgr/hostagent/sbin/dial_trigger stop  
/opt/sanmgr/hostagent/sbin/HA_trigger stop
```

To start HostAgent and OpenDIAL, enter the following commands:

```
/opt/sanmgr/hostagent/sbin/HA_trigger start  
/opt/sanmgr/hostagent/sbin/dial_trigger start
```

---

## Windows NT 4.0:

1. Select **Start >> Settings >> Control Panel >> Services**
2. Select **HostAgent** and then click **Start** or **Stop**.
3. Select **OpenDial** and then click **Start** or **Stop**

## Windows 2000:

1. Open the Control Panel, and then select **Administrative Tools >> Services**.
2. Select **HostAgent** and then click **Start** or **Stop**.
3. Select **OpenDial** and then click **Start** or **Stop**

## Setting Host Port Behavior

The array is designed to communicate simultaneously with multiple hosts running any of the different supported operating systems. The array uses a different communication protocol, or host port behavior, for each operating system. The array must have some way of knowing which operating system each host is using to ensure that the correct behavior is invoked when communicating with the host.

The array has two methods of determining which host behavior to use: the default controller behavior assigned during installation, and the host port behavior table maintained on the array. The array will use the default controller behavior unless the host has been identified in the host port behavior table. The host port behavior table effectively overrides the default controller behavior.

The behavior table uses the host World Wide Name (WWN) to identify each host and then maps the host a specific behavior. This technique allows the array to switch behaviors automatically depending on the host operating system.

---

**Note** When setting the host port behavior, set the controllers for one behavior and use the table for the exceptions.

In multiple-host configurations where not all hosts have Command View SDM installed, ensure that the Host Port Behavior for that OS's with Command View SDM are set in either the controllers or the Host Port Behavior table. If Command View SDM host(s) is unable to access the array, no array management can be performed.

---



The procedure for setting the controller default behavior using the virtual front panel (VFP) is described below. The controller behavior settings should be made during the array hardware installation. The controller port behavior can also be set using the `armmgr` command. See [armmgr](#) on page 82. See [armhost](#) on page 76 for information on using the array's host port behavior table.

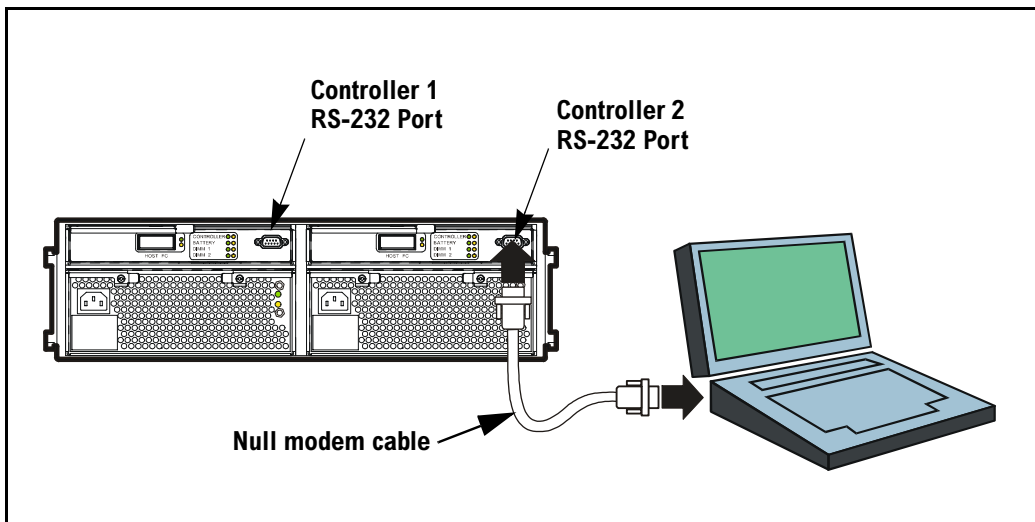
### Setting Controller Host Port Behavior Using the VFP

The controller's host port behavior can be configured using the VFP. The VFP is a set of commands in the array that are accessed from a PC connected to the RS-232 port on the back of the array controllers. Any device that supports RS-232 can be used to connect to the controllers (such as a portable PC).

To configure the host port behavior in the controllers:

**Note** The array must be powered up for this operation.

1. Connect one end of an RS-232 null modem cable to the RS-232 port on the back of either array controller (either, controller 1 or controller 2). The behavior for both controllers can be set from either controller connection.



**Figure 3** Virtual Front Panel Connection

- 
2. Connect the other end of the RS-232 null modem cable to the RS-232 port on a portable PC or terminal.
  3. Power up the portable PC or terminal.

The RS-232 settings should be:

- Port: Com 1 or Com 2 as appropriate
  - Baud: 9600
  - Data Bits: 8
  - Stop Bits: 1
  - FlowControl: none
4. On the portable PC or terminal, initiate a terminal emulation program (such as HyperTerminal).
  5. Press return. The array should display a <Ready> prompt.
  6. Enter the following command to set the controller host port behavior. Select the appropriate operating system value, and the controller (1 or 2). Repeat the command for both controllers.

```
vfpmgr -os hpux|nt|win2k|linux|solaris|AIX|NetWare -c 1/2
```

The VFP should display the following message:

```
Host Port Behavior is hpux (or,nt|win2k|linux|solaris|AIX|NetWare) .
```

7. Disconnect the portable PC or terminal.

## Adding Arrays to the Command View SDM Configuration

New arrays that are added to the system after Command View SDM is installed will not be automatically discovered by the software. To add any new arrays, an `armdiscover` command must be performed from the Command View SDM host to which the array is connected. See [armdiscover on page 62](#).

Depending on the system configuration, the discovery process may take some time to complete. When performed, this command lists the arrays that are connected to the host. It also updates a database on the host that is referenced by other array command operations.

## Overview

The Command View SDM Graphical User Interface (GUI) provides a convenient and familiar interface for managing the array. Although the GUI does not provide the full set of features available in the CLUI, it performs most of the tasks involved in normal operation of the array. This chapter describes how to start the GUI from the Command View SDM server, client, or using a web browser.

## Running the Command View SDM GUI

There are three methods for starting the Command View SDM GUI: from the Command View SDM Launcher, from a command line, or from a browser.

**Note****Accessing the array from a remote client requires the proper access!**

Regardless of the method you use to start the GUI, a remote client will need the proper access rights to manage an array remotely. See [Setting up Remote Client Access on page 38](#) for more information.

**Watch Your Case!**

When running on a HP-UX system, case is important. Launcher and cmdviewVA must be entered with an upper case L and VA, respectively. For example:

```
http://<hostname>:4096/Launcher.html
```

```
http://<hostname>:4096/cmdviewVA.html <hostname>:<array-id>
```

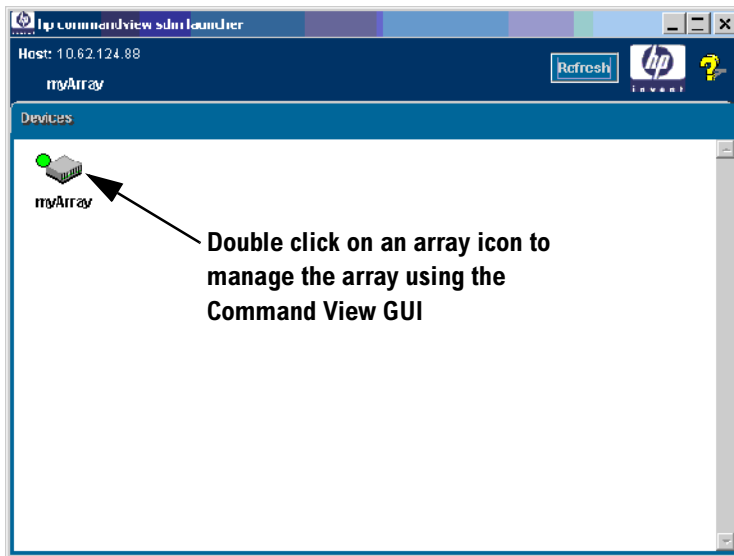
---

## Running the GUI from the Windows Launcher Icon



During installation on Windows, Command View SDM places a Command View SDM Launcher icon on the desktop. You can start the GUI from this icon.

1. Double click the Launcher icon. The Command View SDM Launcher window opens displaying each array connected to the host and the array status.



2. Double click on an array icon displayed in the Launcher window. The GUI for the array will be displayed, allowing you to begin managing the array.

---

## Running the Launcher Using a Command Line

If the Launcher icon is not displayed, the Launcher can be started from the command line.

1. Start the Launcher by entering:

```
launcher <hostname>
```

<hostname> is the name of the host to which the array is connected and is required only when running the command from a remote client.

If the operating system cannot find the launcher, add the path to the command as follows:

```
/opt/sanmgr/commandview/client/sbin/launcher <hostname> <<HP-UX or Linux
```

```
<drive>:\sanmgr\commandview\client\sbin\launcher <hostname> <<Windows
```

2. To start the Command View GUI, double click on any array icon displayed in the Launcher window.

## Running the GUI from the Command Line

If you know the ID of the array you want to manage, the GUI can be started directly from a command line by entering the following command:

```
cmdviewVA <hostname:><array-id>
```

<hostname> is the name of the host to which the array is connected and is required only when running this command from a remote client

<array-id> is the array's alias, serial number, device file, or world wide name.

## Running Command View SDM from a Web Browser

The Command View SDM GUI can be run from a web browser. This provides a convenient method of managing the array from a remote client that does not have the Command View SDM software installed.

---

### Note

Earlier versions of Command View SDM (1.0 and 1.01) required the installation of a certificate on the browser client for security. Later versions of Command View SDM (1.02 and later) no longer require the installation of the certificate. The applets are now authenticated with built-in certificates.

---

- 
1. Open a browser on a client management station.
  2. Type the following URL into the address field in the browser:

`http://<hostname>:4096/Launcher.html`

`<hostname>` is the name of the host to which the array is connected.

---

**Note** The Sun Java 1.3.1 plug in is required to run Command View SDM. If this component is not installed, you will be prompted to install it at this point. Follow the instructions to install the Java plug, and then continue with the next step.

---

3. If the Java Plug-in Security Warning is displayed, select **Grant Always** to avoid having the warning displayed again. If you select **Grant This Session**, the message is displayed for each signed jar file that is initially loaded in this session
4. When the Launcher window is displayed, double-click an array icon to start the Command View SDM GUI.

---

**Note** **Connecting directly to an array from a browser.**

If you know the ID of the specific array you want to manage, you can connect directly to the array using the following URL syntax:

`http://<hostname>:4096/cmdviewVA.html?<hostname>:<array-id>`

`<hostname>` is the name of the host to which an array is connected

`<array-id>` is the array's alias, serial number, device file, or world wide name.

---

## Configuring the Command View SDM Web Server

The Command View SDM software includes its own web server, which is installed along with the other software components. By default the web server is enabled on port 4096. If you need to disable the web server or change its port, you can do so using the following procedures.

---

## Disabling the Web Server

By default the web server is enabled to provide remote management capability. If security policies dictate that remote access be disabled, the web server can be disabled.

To disable the web server:

1. Open the web server configuration file, `PanConfigParams.txt`, in a text editor. The configuration file is located in the following directory:

`/opt/sanmgr/commandview/server/config/`      **HP-UX or Linux**

`<drive>:\sanmgr\commandview\server\config\`      **Windows**

2. Disable the web server by setting the web server enable entry as follows:

```
WEBSERVER_ENABLED=false
```

Should you need to re-enable the web server, set the value to true.

## Changing the Web Server Port

By default, the Web Server listens for http requests on port 4096. You can specify a different port depending upon your system configuration. The port is specified in the following parameter in the configuration file `PanConfigParams.txt`:

```
WEBSERVER_PORT=4096
```

Change the value to the desired port number.

## Restarting the Host Agent Service

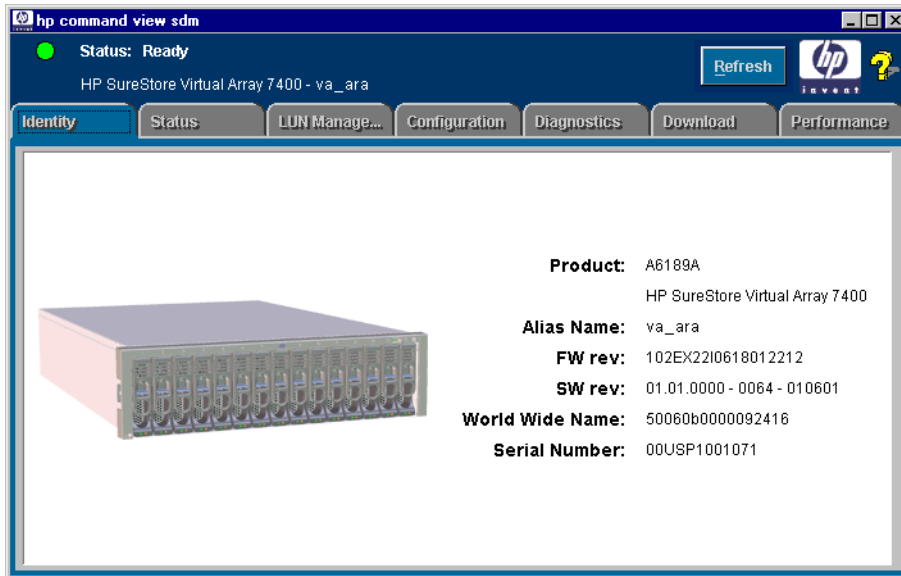
After making changes to the configuration parameters file, you need to restart the HostAgent service on the server with the Command View SDM software. For information on performing this operation, refer to [Starting/Stopping HostAgent and OpenDIAL on page 39](#).

---

## Using the Command View SDM GUI

Once Command View SDM GUI is started, you can perform array management tasks by selecting the various tabs and pages. For detailed information on the GUI, access the on-line help by clicking the “?” located in the upper right corner of the screen.

A list of the Command View SDM GUI tabs, pages, and page configuration selections are shown on the following page.





## Command View SDM GUI Settings

Identity Tab	Status Tab	LUN Management Tab	Configuration Tab
<ul style="list-style-type: none"> <li>- Product</li> <li>- Alias Name</li> <li>- FW Rev</li> <li>- SW Rev</li> <li>- World Wide Name</li> <li>- Serial Number</li> </ul>	<p><b>Array Status Page</b></p> <ul style="list-style-type: none"> <li>- Overall Array State</li> <li>- Warning States</li> <li>- Informational States</li> <li>- Redundancy Level</li> <li>- Secure Manager</li> <li>- Installed Feature List:               <ul style="list-style-type: none"> <li>- Status</li> <li>- Feature</li> <li>- License</li> </ul> </li> </ul> <p><b>Component Status Page</b></p> <ul style="list-style-type: none"> <li>- Enclosures</li> <li>- Disk Drives</li> <li>- Controllers</li> <li>- DIMMs and Batteries</li> <li>- Power Supplies/Fans</li> <li>- Front &amp; Back-End Ports</li> </ul> <p><b>Capacity Page (by Redundancy Group)</b></p> <ul style="list-style-type: none"> <li>- Logical Drives</li> <li>- Business Copies</li> <li>- Unallocated</li> <li>- Redundancy</li> <li>- Active Spare</li> <li>- Total</li> <li>- Non-included disks</li> </ul>	<p><b>Logical LUNs Page</b></p> <ul style="list-style-type: none"> <li>-Current LUN List:           <ul style="list-style-type: none"> <li>- LUN ID</li> <li>- Redundancy Group</li> <li>- Capacity</li> <li>- Size (GB)</li> </ul> </li> <li>- Create LUN</li> <li>- Permissions</li> <li>- Delete</li> <li>- Create Copy</li> <li>- Available Storage</li> </ul> <p><b>Business Copy Page</b></p> <ul style="list-style-type: none"> <li>- Business Copy LUN List           <ul style="list-style-type: none"> <li>- LUN ID</li> <li>- Parent LUN</li> <li>- Redundancy Group</li> <li>- Data</li> <li>- Capacity</li> <li>- Size (GB)</li> </ul> </li> <li>- Create</li> <li>- Permissions</li> <li>- Delete</li> <li>- Copy From Parent</li> <li>- Copy To Parent</li> <li>- Empty</li> </ul>	<p><b>General Settings Page</b></p> <ul style="list-style-type: none"> <li>- Alias Name</li> <li>- Data Resiliency</li> <li>- Auto Include</li> <li>- Auto Format Drive</li> <li>- RAID Level Control</li> <li>- Hot Spare</li> <li>- Secure Manager</li> <li>- Host Port Behavior Tbl           <ul style="list-style-type: none"> <li>- Controller FRU</li> <li>- Port IDs</li> <li>- Port Behavior</li> <li>- Port &amp; Topology</li> </ul> </li> <li>- Array Settings</li> <li>- Controller Settings</li> <li>- Secure Manager</li> </ul> <p><b>Rebuild Page</b></p> <ul style="list-style-type: none"> <li>- Priority</li> <li>- Type</li> <li>- Progress           <ul style="list-style-type: none"> <li>- Start Progress</li> <li>- Stop Progress</li> </ul> </li> </ul>
<p><i>Continued on next page</i></p>			

**Command View SDM GUI Settings** *(continued)*

Diagnostic Tabs	Download Tab	Performance Tab
<p><b>Array Page</b></p> <ul style="list-style-type: none"> <li>- Shutdown</li> <li>- Full Reset</li> <li>- Partial Reset</li> <li>- Restart</li> <li>- Info/status List:               <ul style="list-style-type: none"> <li>- Overall Array State</li> <li>- Warning States</li> <li>- Informational States</li> <li>- Redundancy Level</li> <li>- Secure Manager</li> </ul> </li> <li>- Feature List:               <ul style="list-style-type: none"> <li>- Status</li> <li>- Feature</li> <li>- License</li> </ul> </li> </ul> <p><b>Disk Page</b></p> <ul style="list-style-type: none"> <li>- Include</li> <li>- Down</li> <li>- Info/Status List:               <ul style="list-style-type: none"> <li>- Enclosure ID</li> <li>- Disk ID</li> <li>- Condition</li> <li>- State</li> <li>- Initial State</li> </ul> </li> </ul>	<p><b>Array Controller Page</b></p> <ul style="list-style-type: none"> <li>- Copy Firmware</li> <li>- Choose Firmware</li> <li>- Start OnLine Download</li> <li>- Start OffLine Download</li> <li>- Downloading to:               <ul style="list-style-type: none"> <li>- FRU ID</li> <li>- Vendor ID</li> <li>- Product ID</li> <li>- Firmware File</li> </ul> </li> <li>- Components List:               <ul style="list-style-type: none"> <li>- FRU</li> <li>- Vendor ID</li> <li>- Product ID</li> <li>- Current Firmware</li> <li>- Select for Download</li> </ul> </li> </ul> <p><b>LCC Controller Page</b></p> <ul style="list-style-type: none"> <li>- Choose Firmware</li> <li>- Select All Matches</li> <li>- Start Download</li> <li>- Stop Download</li> <li>- Downloading to:               <ul style="list-style-type: none"> <li>- FRU ID</li> <li>- Vendor ID</li> <li>- Product ID</li> <li>- Firmware File</li> </ul> </li> <li>- Components List:               <ul style="list-style-type: none"> <li>- FRU</li> <li>- Vendor ID</li> <li>- Product ID</li> <li>- Current Firmware</li> <li>- Select for Download</li> </ul> </li> </ul> <p><b>Disk Page</b> (same as LCC Controller Page)</p>	<ul style="list-style-type: none"> <li>- Add Metric</li> <li>- Modify Metric</li> <li>- Remove Metric(s)</li> <li>- Modify View</li> <li>- Open Settings</li> <li>- Save Settings</li> <li>- Export Data</li> <li>- Metric Legend:               <ul style="list-style-type: none"> <li>- Metric Name</li> <li>- Disk/LUN</li> <li>- Units</li> <li>- Scale Factor</li> <li>- Symbol</li> <li>- Color</li> </ul> </li> </ul>

## Overview

The Command View SDM Command Line User Interface (CLUI) is a set of command utilities that provide user management for the array. Each utility performs a different management task, such as configuring, reporting status information, and performing rebuilds. The operation of the commands is identical for all supported operating systems.

The CLUI provides access to all array management tasks. Tasks that are not available in the GUI are available in the CLUI.

Each command and the tasks it is used for are listed in [Table 2](#). Complete descriptions for each command are included in this chapter.

**Table 2** Command View SDM Command Summary

Command	Tasks
<a href="#">armcfg</a>	Create a LUN Delete a LUN Add a disk Down a disk
<a href="#">armcopy</a>	Manage Business Copy LUNs
<a href="#">armdiscover</a>	Discover all disks connected to the host
<a href="#">armdownload</a>	Download firmware Display firmware revisions Copy firmware
<a href="#">armdsp</a>	Display status information List disk array IDs
<a href="#">armfeature</a>	Install feature licenses
<a href="#">armfmt</a>	Format the disk array

---

**Table 2** Command View SDM Command Summary (cont'd)

Command	Tasks
<a href="#">armhost</a>	Manage host port behavior table
<a href="#">armlog</a>	View disk array logs
<a href="#">armmgr</a>	Configure hot spares Set array RAID level Set Auto Rebuild On/Off Set Auto Format On/Off Set Auto Include On/Off Set controller host port behavior Set resiliency level Set port loop ID Set fibre channel topology Break advisory lock Set array alias name Identify FRU location Reset the array Mange read and write cache settings Shutdown the array
<a href="#">armperf</a>	Display performance data
<a href="#">armrblid</a>	Enable/disable Auto Rebuild Display rebuild status/progress Set rebuild priority
<a href="#">armrecover</a>	Manage map recovery
<a href="#">armsecure</a>	Manage LUN security table
<a href="#">armtopology</a>	Display host and LUN information
<a href="#">logprn*</a>	Outputs log file information
<a href="#">logdel*</a>	Deletes log files
* These command are discussed in <a href="#">Chapter 6, Array Logs</a>	

---

## Command Syntax Conventions

The following symbols are used in the command descriptions and examples in this chapter.

**Table 3** Syntax Conventions

Symbol	Meaning
< >	Indicates a variable that must be entered by the user.
	Only one of the listed parameters can be used (exclusive OR).
[ ]	Values enclosed in these braces are optional.
{ }	Values enclosed in these braces are required.

## Command View SDM man pages

Online man pages are included for each Command View SDM command. The man page includes detailed information about the command and its usage.

To access the man page for an Command View SDM command, type:

```
man <command_name>
```

Substitute one of the Command View SDM utility names for **command\_name**. For example, to access the armdsp man page, type:

```
man armdsp
```

## Quick Help

A quick listing of the syntax and available options for a command can be displayed by using the “?” option with the command. For example, for quick information about the armmgr command, type:

```
armmgr -?
```

---

## Using Identification Variables

When using Command View SDM, you must select the disk array you will be managing. In addition, many commands also require you to identify the controller, disk, or LUN within the disk array that will be impacted by the command. The following paragraphs describe the identification variables and how they are used in a command. Before using the command, make sure you understand the use and structure of the identification variables. A lack of understanding may result in commands executed on an unintended component.

### Array Identifier

The array identifier specifies the array to which a command is directed. It has the formats:

```
<array-id>
```

```
<HostName:array-id>
```

When running Command View SDM on a remote client, *HostName* must be included to identify the host the array is connected to. *HostName* can be the IP address or DNS name of the host.

The four values listed in [Table 4](#) can be used as the array identifier.

**Table 4** Array Identifier Values

Value	Description
Array serial number	The unique serial number assigned to the array
Alias name	The alias name assigned to the array
Device file	The path to the array. The syntax is dependent on the operating system. For example, a device file can be /dev/dsk/c2t0d0 on HP-UX or \\.\PHYSICALDISK1 on Windows.
World wide name (WWN)	The Fibre Channel node WWN assigned to the host or one its adapters

---

**Note****How can I determine the array serial number or alias?**

Use the `armdsp -i` command to display a list of the arrays, including their serial numbers and aliases.

---

## FRU Identifiers

All the Field Replaceable Units (FRUs) within the array are identified using a FRU location identifier, `<FruLocation>`. The FRU location identifier specifies the component to which a command is directed. It has the format:

`<enclosure>/[component].[subcomponent]`

The values for the elements of the FRU location identifier are listed in

**Table 5** FRU Location Identifier Values

Element	Values
<code>&lt;enclosure&gt;</code>	<b>M</b> - main array enclosure <b>JA0 - JA5</b> - JBOD enclosures 0 through 5. Corresponds to switch setting on the JBOD enclosure
<code>&lt;component&gt;</code>	<b>D1 - D15</b> - disk modules in slots 1 through 15 <b>C1 - C2</b> - controller/LCC modules in slots* 1 or 2 <b>P1 - P2</b> - power supply/fan modules in slots* 1 or 2 <b>MP1</b> - midplane assembly
<code>&lt;subcomponent&gt;</code>	<b>B1 - B2</b> - battery located on controller C1 or C2 <b>M1 - M2</b> - DIMM in socket 1 or socket 2 <b>H1 - H2</b> - host port slots 1 or 2 <b>J1 - J2</b> - JBOD Enclosure port number 1 or 2 <b>PM1</b> - processor <b>G1 - G2</b> - GBIC in slot 1 or 2
* 1 is the left slot; 2 is the right slot, as viewed from the rear of the array	

---

## Example

The following command identifies the disk in slot 5 of JBOD 2 on the disk array identified by alias Array1.

```
armcfg -D JA2/D5 -a Array1
```

**Identifies disk 5 in JBOD 2**



**Identifies disk array with alias Array1**



## Command View SDM Commands

This section describes each Command View SDM command, its use, and its options. Examples are included showing the typical use of the command.



---

# armcfg

## Description

The `armcfg` command is used to manage both LUNs (-L option), physical disks and Link Control Cards (LCCs - JBOD controllers, -D option) in the array. Management of the LUNs (logical unit number or logical drives) includes creating and deleting while management of the disk drives involves adding, downing, and resetting them.

---

**Caution** Deleting a LUN will delete all data on that LUN. If a LUN is to be deleted and the data needs to be retained, backup the LUN before deleting it.

---

## Syntax

```
armcfg {-D <FruLocation> { -a | -d [-v | -F] [-R | -Z] | -r { true|false }} <array-id>
armcfg {-L <LUN> { -a <capacity> -g <group> | -d | -x { true|false }}} <array-id>
armcfg -?
```

## Options

- |               |   |
|---------------|---|
| -L <LUN>      | Operation will be performed on LUN number <LUN>   |
| -a <capacity> | Create the LUN if -L specified. <capacity> is the size of the LUN that will be created.<br>If <capacity> is followed by "G" <capacity> is in Gigabytes.<br>If <capacity> is followed by "K" <capacity> is in Kilobytes.<br>If <capacity> is followed by "M" <capacity> is in Megabytes.<br>If no unit is specified, the default unit is in Mega bytes. The HP VA 7100 (firmware version HP11) and the VA 7400 (firmware version HP11) support up to 1024 LUNs (0-1023). |
| -d            | Delete the LUN if -L is specified.  |
| -g <group>    | Indicates the redundancy group the LUN will be created in. On the 7400, this number can be either 1 or 2. On the VA 7100 this value must be 1.  |

- 
- x { true | false }    Activates or deactivates the LUN specified with the -L option.
- D <FruLocation>    Operation will be performed on the disk or LCC specified in <FruLocation>
- a                    Add the disk if -D is specified.
- d [ -v | -F ] [-R | -Z ]    Down the disk if -D is specified. Additional options influence the downing operation.
- By default, the controller assumes that no valid data remains on the disk when it is reinserted.
- v - On reinsertion of this disk, the controller assumes disk data is valid except for data written to the array since the disk was removed, except for data written to the array.
  - F - Order the array to auto fail the disk specified by <FruLocation>.
- By default, the command will succeed, only if removal of the disk would not result in a loss of redundancy or data availability. This can be overridden with the following options:
- R - Allow the disk to be downed if doing so would result in a loss of redundancy but *not* data loss. Following this command the array will offer full data availability but will be unable to protect against any subsequent disk failure(s).
  - Z - Allow the disk to be downed even in the case where data will become unavailable. Caution should be exercised when using this option since data on the array may be lost.
- r { true | false }    Reset the disk specified by the -D parameter with additional options.
- If "true", a Loop Initialization reset L\_port loop primitive is used to reset the device
  - If "false", a Target Reset Task Management function is used to reset the device.
- ?                    Display extended help message. This option overrides all other switches.

---

## Examples

### Creating LUNs

To create a LUN numbered 17 with a capacity of 30 Mbytes associated with redundancy group 2, for an array with the alias of myArray, type the following command:

```
armcfg -L 17 -a 30 -g 2 myArray
```

### Deleting LUNs

To delete LUN 17 in the array with the alias of myArray, type the following command:

```
armcfg -L 17 -d myArray
```

### Adding Disks

After a disk is inserted into the array, it must be added to the array configuration. If auto-include and autoformat are enabled, the disk will be automatically added. If these options are disabled, you will need to manually add a disk. To add a disk that has just been installed into JBOD #2 , slot #5, type the following command:

```
armcfg -D JA2/D5 -a myArray
```

---

# armcopy

## Description

The `armcopy` command allows the user to manage the business copy feature of the array.

## Syntax

```
armcopy {-p <LUN1> -s <LUN2> [-a {true|false}]} <array-id>
armcopy {-s <lun> {-x {true|false} | {-a {true|false}}}} <array-id>
armcopy {-r <lun>} <array-id>
armcopy -?
```

## Options

- |                              |  |
|------------------------------|--|
| <code>-a {true false}</code> | This parameter will specify the state of the business copy.<br>true will create a business copy and copy the parent LUN's data.<br>False will create an empty business copy. This business copy will not have the parent LUN's data copied to it.<br>When used with the <code>-p</code> option, if this option is not provided on the command line, the default will be set to true.<br>If used without the <code>-p</code> option, a true value will copy data from the parent LUN. A false value will empty the business copy. |
| <code>-p &lt;lun&gt;</code>  | Parent LUN <code>&lt;lun&gt;</code> that is to be copied. The LUN must exist. The LUN may not be a business copy.  |
| <code>-r &lt;lun&gt;</code>  | Performs a copy of modified data on the business copy back to the parent LUN.  |
| <code>-s &lt;lun&gt;</code>  | LUN <code>&lt;lun&gt;</code> that is to be assigned or is assigned to the business copy.   |

---

-x { true | false }

True will indicate that the LUN is actively being used.

False will indicate that the LUN is inactive.

Note that deactivating a LUN does not make the LUN data inaccessible. Rather, it indicates that the LUN is less likely to be accessed than other, active, LUNs. This helps the array to determine how best to manage its resources.

-?

Display extended help message. Overrides all other switches.

## Examples

Create an empty business copy LUN 7 from parent LUN 3 on array serial number 00USP1001087.

```
armcopy -p 3 -s 7 -a false 00USP1001087
```

Copy the content of the parent LUN to business copy LUN 4 on array alias Array1.

```
armcopy -s 4 -a true Array1
```

Copy the content of the business copy LUN to parent LUN 6 on array alias Array1.

```
armcopy -r 6 Array1
```

---

# armdiscover

## Description

The `armdiscover` command performs a discovery that identifies all arrays attached to the local host, or to a remote host. In addition to being output to the screen, the results of this command are stored in a file which is accessed by the `armdsp -i` command to obtain array information.

## Syntax

```
armdiscover [-s ] [-v ] [-n ] [-f ] [HostName]  
armdiscover -?
```

## Options

- f                Resets the wait queue, then runs normally. This might be necessary if a previous `armdiscover` terminated abnormally. In that case, the queue would still show that a copy of `armdiscover` is running and new attempts to run `armdiscover` would wait or exit.
- n                Causes the command to skip the running of OpenDIAL. Instead the results of the last OpenDIAL scan are used. This makes the `armdiscover` process faster in those situations where the device configurations have not changed. This is also useful in trouble situations where OpenDIAL is down or not working correctly.
- s                Suppresses the display of discovered devices. You can use `armdsp -i` to display discovered devices at a later time.
- v                Displays additional information for each discovered device (see example below). The display consists of multiple lines per device.
- HostName*        Identifies the remote host the command will be run on. Only required when initiating the command from a remote client.
- ?                Display `armdiscover` help

---

## Examples

The following examples discovers the arrays connected to local host hpbs9011 and outputs the results. The -v option is used for displaying additional information about each array.

```
hpbs9011:# armdiscover -v
This could take several minutes ...
Product ID:          HP-A6189A
  Device Path:       /dev/dsk/c5t15d0
  Serial Number:     00USP1001119
  Alias Name:        green
  World Wide Name:   50060b000009736f
  Unique ID:         HPA6189A00USP1001119

Product ID:          HP-A6188A
  Device Path:       /dev/rscsi/c30t7d0
  Serial Number:     00SG04990114
  Alias Name:        blue
  World Wide Name:   50060b00000921d0
  Unique ID:         HPA6188A00SG04990114

Product ID:          HP-A6188A
  Device Path:       /dev/rscsi/c25t12d0
  Serial Number:     00SG04990103
  Alias Name:        yellow
  World Wide Name:   50060b00000921a3
  Unique ID:         HPA6188A00SG04990103

Product ID:          HP-A6189A
  Device Path:       /dev/dsk/c4t0d0
  Serial Number:     00USP1001083
  Alias Name:        white
  World Wide Name:   50060b00000970bb
```

---

# armdownload

## Description

The `armdownload` command is used to download the firmware to the array. Firmware can be downloaded to the array main controllers, battery control circuitry, Link Control Cards (LCC - in the array JBODS), and the disk mechanisms.

---

**Note** Always refer to the README file provided with the firmware for specific download requirements.

---

## Syntax

```
armdownload -l {C | D | L | B } <array-id>
armdownload { -C | -B } [-O ] <fwFileName> <array-id>
armdownload { -L | -D } <FruLocation> [, <FruLocation>, ... ] <fwFileName> <array-id>
armdownload {-L | -D } -P <productID> <fwFileName> <array-id>
armdownload -M <source_FRU> <array-id>
armdownload -?
```

## Options

- B Download firmware to the battery control circuitry.
- C Download firmware to the array main controllers at the location <FruLocation> (M/C1 or M/C2).
- D Download firmware to the disk modules.
- l Display a list of controllers (C), Disks (D), LCCs (L), or Battery controller (B) locations and firmware revision codes for the module type specified.
- L Download firmware to the array's JBOD LCC controller's (JAnn).



---

-M	Copy firmware from a source controller (either of the array's main, M, controllers) to the other.
-O	Perform the download in an offline mode. This is required for family firmware version changes. If you attempt to download a version family change with the array on-line, an error will be returned indicating that an off-line (-O) download is required. Note - during the download the array will not respond to I/O.
-P	Download firmware to all LCCs (C) or all disks (D) as identified by the product number of the module <productID>.
<fwFileName>	Identifies the file containing the firmware to be downloaded. The path must be included.  Command View creates the following default directories for firmware files, but firmware files may be placed in any directory. opt/sanmgr/commandview/client/fwdownload << <b>HP-UX or Linux</b> <drive>:sanmgr\commandview\client\sbin\fwdownload << <b>Windows</b>
<FruLocation>	Identifies the specific FRU that the operation is to be performed on.
<productID>	The product number of an array module. Can be identified using the display version of the command: armdownload -I {C   D   L   B}.
<source_FRU>	The source controller to copy firmware from.
?	Display extended usage message. This option overrides all other switches.

## A Word About Firmware Files

There are two types of firmware files, raw (.LOD) and wrapped (.FRM). Wrapped files contain header information that make it easier for the download utilities to verify that the firmware file matches the array module. Download either type to the array to upgrade the modules firmware.

Raw firmware file names identify the module (product ID) the firmware is intended for and the firmware revision code. (The “.lod” file extension may or may not be included in the name.) For example, for an array controller (product A6188A) the file name would be:

A6188A.xxxx or A6188A.xxxx.lod

---

where XXXX identifies the revision of the firmware. If the firmware file contains firmware revision HP10, the file name could be as follows:

A6188A.HP10 or A6188A.HP10.lod

Wrapped firmware file names will be similar to wrapped files, however, they do require that the “.frm” extension be included.

---

**Note** If the array aborts a download (or if the download fails to complete), the portions of the GUI may stop functioning due to an advisory lock being set. If this happens you will need to break the lock using the `armmgr -b` command. The advisory lock is the result of some error condition which must be resolved before the action can be completed without an advisory lock occurring.

---

## Examples

### Disk Module Download

This example illustrates one method for downloading new firmware to the disk modules.

1. Identify the current product numbers and firmware versions of the disk modules for the array with alias `MyArray`:

```
armdownload -I D MyArray
```

The following output will be produced:

Vendor	Product	ID	Rev	FRU	Location
HP	36.4G	ST336704FC	HPC1	M/D1	
HP	36.4G	ST336704FC	HPC1	M/D2	
HP	36.4G	ST336704FC	HPC1	M/D2	
HP	18.2G	ST318451FC	HPC0	M/D5	
HP	18.2G	ST318451FC	HPC0	M/D6	
HP	18.2G	ST318451FC	HPC0	M/D7	
HP	18.2G	ST318451FC	HPC4	M/D8	

2. Access the HP web site ([www.hp.com/support/va7400](http://www.hp.com/support/va7400)), or other source, for the firmware files and copy them to the host. In this example it will require two firmware files: one for ST336704FC and one for ST3184451FC disk module products.

- 
3. To update all similar product disk modules with a raw firmware file containing firmware revision HPC3, for an HP/Seagate ST336704 disk mechanism, the firmware file named ST336704FC.HPC3 must be used. To download the firmware to the array disks, send the download command:

```
armdownload -D -P ST336704FC opt/sanmgr/commandview/client/fwdownload
/ST336704.HPC3 MyArray
```

This will update three disk modules (ST336704FC).

4. Perform Step 3, for each disk module product ID in the array. In the above example the download would need to be performed a second time to update the ST318451FC disk modules, using the appropriate firmware file.

## Array Controller Firmware Download

This example downloads firmware to the controller. It uses the `armdownload` command to identify the controllers and then download the firmware.

1. Identify the current firmware versions of the array main controllers for array MyArray:

```
armdownload -I C MyArray
```

The following output will be produced:

Vendor	Product ID	Rev	FRU Location
HP	A6188A	HP02	M/C2
HP	A6188A	HP02	M/C2

2. Access the HP web site ([www.hp.com/support/va7100](http://www.hp.com/support/va7100)), or other source, for the firmware file and copy it for you product ID to your system.
3. Download the new firmware file (for example: A6188AHP10.frm) to either array controller by entering the following command:

```
armdownload -C opt/sanmgr/commandview/client/fwdownload/A6188AHP10.frm
MyArray
```

---

When one controller, or battery has been updated with a new version of firmware, that new version will be automatically copied to the other controller or battery. Also, if a family change version of firmware is being downloaded, an error message will be returned indicating that this is a family firmware version change and must be performed in an offline state. For off-line downloads, the off-line version of the command must be user, for example:

```
armdownload -C -O opt/sanmgr/commandview/client/fwdownload/A6188AHP10.frm  
MyArray
```

---

# armdsp

## Description

The `armdsp` command is used to display status and configuration information for the array identified by `<array-id>`. Logical configuration, physical configuration, and current status can all be displayed. A list of the array IDs of all the arrays connected to the host can also be displayed.

## Syntax

```
armdsp {-a | -c [<FruLocation>] | -d [<FruLocation>] | -e [<FruLocation>] |  
-f | -L [LUN] | -p [<FruLocation>] | -s | -t } <array-id>  
armdsp {-i [<HostName>] }  
armdsp <array-id>  
armdsp -?
```

## Options

None	Display general information about the array. This includes product and vendor information, array state, and capacity usage.
-a	Display the information presented by the -c, -d, -e, -L, -s, -t options. This is a quick way of displaying all configuration and status information about the array.
-c [<FruLocation>]	Display controller information. If <FruLocation> is not given, display detailed information for each controller. If <FruLocation> is given and specifies an enclosure (e.g., JA1), display detailed information for each controller. If <FruLocation> is given and specifies a controller (e.g., JA1/C1), display detailed information for the controller.

- 
- d** [*<FruLocation>*]      Display disk information.  
If *<FruLocation>* is not given, display detailed information for all disks installed in the array.  
If *<FruLocation>* is given and specifies an enclosure (e.g., JA1), display detailed information for all disks in the enclosure at *<FruLocation>*.  
If *<FruLocation>* is given and specifies a disk (e.g., JA1/D1), display detailed information for disk at *<FruLocation>* only.
- e** [*<FruLocation>*]      Display enclosure information.  
If *<FruLocation>* is not given, display a summary listing of all enclosures.  
If *<FruLocation>* is given and specifies an enclosure, display detailed information for the enclosure at *<FruLocation>* only.
- f**      Display a listing of FRUs in the array. Include FRU location, description of hardware, identification, and status.
- i** [*<HostName>*]      Display the serial number, alias, world wide name, device file name and unique name of all arrays connected to the host. *<HostName>* denotes the host for which the list is required. If no value is specified, local host will be assumed.
- L** [*<LUN>*]      Display LUN information.  
If *<LUN>* is not specified, display detailed information for all LUNs on the array.  
If *<LUN>* is specified, display information for only LUN *<LUN>*.  
If the LUN is a business copy, then business copy information will be displayed.  
If the LUN has one or more business copies, list how many and the corresponding LUN ID. Also, its active and its attachment states with its used capacity will be displayed. All listed LUNs will be shown with corresponding world wide names (WWN).
- p** [*<FruLocation>*]      Display the Port Loop ID for the host port denoted by *<FruLocation>*.  
If *<FruLocation>* is not provided, the Port Loop Id for all the host ports are displayed.

- 
- s Display Array Status, Warnings and Subsystem Parameter information for the array. This includes the configuration settings that control the operation of the entire array.
  - t Display topology of back end loops showing controllers, ports, and disks.
  - ? Display extended Usage message. This option overrides all other switches.

## Examples

### FRU Information

Display the FRU information for disk array alias yellow.

```
hpbs9011:# armdsp -f yellow
```

```
Vendor ID:_____HP
Product ID:_____A6188A
Array World Wide Name:_____50060b00000921a3
Array Serial Number:_____00SG04990103
Alias:_____yellow
```

```
-----
```

FRU	HW COMPONENT	IDENTIFICATION	ID	STATUS
M	Enclosure	00SG04990103		Good
M/P1	Power Supply	82004EK00319		Good
M/P2	Power Supply	82004EK00348		Good
M/MP1	MidPlane	000484710194		Good
M/C1	Controller	00USP1001286		Good
M/C1.H1	Host Port	<none>		Good
M/C1.J1	BackEnd Port	<none>		Good
M/C1.G1	Host GBIC	A282Y2M		Good
M/C1.B1	Battery	441:MOLTECHPS:NI2040:2000/10/31		Good
M/C1.PM1	Processor	HP:A6188A:HP11		Good
M/C1.M1	DIMM	512		Good
M/C2	Controller	00USP1001294		Good
M/C2.H1	Host Port	<none>		Good

---

M/C2.J1	BackEnd Port	<none>	Good
M/C2.G1	Host GBIC	A150033	Good
M/C2.B1	Battery	163:MOLTECHPS:NI2040:2000/9/29	Good
M/C2.PM1	Processor	HP:A6188A:HP11	Good
M/C2.M1	DIMM	512	Good
M/D1	Disk	3CC03RX50000	Good
M/D2	Disk	3CC03V4Y0000	Good
M/D3	Disk	3CC03S3F0000	Good
M/D4	Disk	3CC03Q470000	Good
M/D5	Disk	3CC03RJ00000	Good
M/D6	Disk	3CC03S770000	Good
M/D7	Disk	3CC03BCS0000	Good

## Disk Information

Display the information for disk 2 in the main enclosure on array with alias green.

```
hpbs9011:# armdsp -d M/D2 green
```

```
Vendor ID:_____HP
Product ID:_____A6189A
Array World Wide Name:_____50060b000009736f
Array Serial Number:_____00USP1001119
Alias:_____green
-----
```

Disk at M/D2:

```
Status:_____Good
Disk State:_____Included
Vendor ID:_____HP 36.4G
Product ID:_____ST336704FC
Product Revision:_____HPC3
Data Capacity:_____33.378 GB (70,000,000 blocks)
Block Length:_____520 bytes
Address:_____112
Node WWN:_____2000002037e70ba7
Initialize State:_____Ready
Redundancy Group:_____2
Volume Set Serial Number:_____0000FFEE00000031
Serial Number:_____3CD1NRP5
Firmware Revision:_____HPC3
```



---

# armfeature

## Description

The `armfeature` command installs upgrade licenses for increasing the capacity limits for Business Copy VA and Secure Manager VA. Entitlement licenses are purchased as separate options. With the purchase of an option, you receive a license key which is installed using this command.

---

**Note** The license key used to implement the feature is case sensitive. Make sure the key is entered exactly as generated. If the key is entered incorrectly, the feature will indicate a status of Disabled.

---

## Syntax

```
armfeature {-r} <array-id>
armfeature {-a -f <featurestring> -k <key>} <array-id>
armfeature -?
```

## Options

- |                    |  |
|--------------------|--|
| -a                 | Specifies that the new feature indicated by the -f parameter, with a key value indicated by the -k parameter is to be written to the array. The <featurestring> and the <key> values are taken from the Enablement License certificate (or as provided by the supplier). |
| -f <featurestring> | Specifies the string corresponding to the feature to be added. This string is obtained during the product registration process.  |
| -k <key>           | Specifies the key value for the new feature to be added. This value is generated during the product registration process.  |
| -r                 | This specifies that the feature table should be read from the device and displayed on the standard output. If no features are installed, the table will be empty.  |
| -?                 | Display extended help message. Overrides all other switches.   |

---

## Examples

Display the feature table for array alias Array1. A 500 GB feature has been installed for both Business Copy and Secure Manager LUN security on the array.

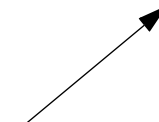
```
hpbs9011:# armfeature -r Array1
```

FEATURE	LICENSE KEY	STATE
BUSINESS_COPY_500GB	0210E8AD9FD8	Enabled
LUN_SECURITY_500GB	FD47411C79C7	Enabled

Display the feature table for array alias green. A 5000 GB feature has been successfully installed for Secure Manager LUN security, but the key for the 2000 GB Business Copy feature was incorrectly entered, causing the feature to have a status of Disabled.

```
hpbs9011:# armfeature -r green
```

FEATURE	LICENSE KEY	STATE
BUSINESS_COPY_2000GB	C854CE3C3D99	Disabled
LUN_SECURITY_5000GB	A91833AC76F6	Enabled



**Disabled status indicates the license key for this upgrade was entered incorrectly**

---

# armfmt

## Description

---

**Caution** This is a destructive command. Data on array will be destroyed following successful completion of this command. Backup all vital data before performing a format.

---

The `armfmt` command allows a user to format the array. The entire array identified by `<array-id>` is formatted.

## Syntax

```
armfmt { -f [ -h ] } <array-id>
armfmt -?
```

## Options

- |                        |   |
|------------------------|---|
| <code>-f [ -h ]</code> | Format the entire array identified by <code>&lt;array-id&gt;</code> .<br>The <code>-f</code> option formats all disks that are currently included in the array configuration. If the <code>-h</code> option is specified, disks that are installed in the array but are not included in the array configuration are also formatted. |
| <code>-?</code>        | Display extended help message. Overrides all other switches.  |

## Examples

Format array serial number 00USP1001083 . Format all disks, even those not included in the array configuration.

```
armfmt -f -h 00USP1001083
```

---

# armhost

## Description

The `armhost` command is used to manage the array's host port behavior table. This table maps each host to an associated operating system-dependent communication protocol or behavior. Each operating system communicates differently with the array, so the array must be aware of what operating system each host is running. The host port behavior table is the mechanism by which the array identifies the host operating system.

## Syntax

```
armhost {-r -f <filename>} <array-id>
armhost {-w -f <filename>} <array-id>
armhost {-d <nodeWWN>} <array-id>
armhost {-c [-w ] -f <filename>} <array-id>
armhost -?
```

## Options

- |               |  |
|---------------|--|
| -c            | Clears the entries in the array's host port behavior table. It may be used alone or, in combination with the -w option to clear the table just prior to a write.   |
| -d <nodeWWN > | Deletes all entries in the array's host port behavior table for the host specified by <nodeWWN>.   |
| -f <filename> | Identifies the file which contains (or will contain) the host port behavior table information. Table information read from the array is written to this file, or the content of this file is written to the array to update the table information. Relative or absolute file paths are allowed. If a path is not specified the current working directory will be used. |
| -r            | Reads the host port behavior table from the array and writes the contents to the file specified by the -f <filename>.  |

- 
- w This specifies that the host port behavior information should be read from the file specified by the `-f <filename>` parameter and written to the array.
  - ? Display extended help message. Overrides all other switches.

The host port behavior defines the communication protocol the array uses to communicate with each supported operating system. To determine which behavior to select for communication, the array maintains a table that maps a specific behavior to a host, identified by its WWN. When the array receives a communication from a host, it uses the host's WWN to select a behavior from the table. Entries in the behavior array table are made by downloading a user created file to the array using the `armhost` command. If a behavior for a host is not include in the table, the default controller behavior will be used.

## Creating the Host Port Behavior File

The host port behavior file is a user created file. This file, when downloaded to the array places entries in the array's host port behavior table. The file contains two values per line, as shown below: one for the WWN of a host, and one for the host operating system.

File entries use the following format:

```
<node_WWN> <host_port_behavior>
```

`<node_WWN>` is the node WWN of the host

`<host_port_behavior>` identifies the host operating system. The values for each OS are listed in the following table>

Host Operating System	<host_port_behavior> Value
HP-UX	HPUX
Windows 2000	Win2000
Windows NT	WinNT
Linux	Linux
Solaris	Solaris
Novel Netware	NetWare
IBM AIX	AIX

---

<node\_WWN> identifies the WWN connection to the host. A host connection may be the host node WWN or it may be the host adapter WWN. For hosts that have multiple host adapters, more than one entry (WWN) per host may be required in the host port behavior table. Depending on the operating system, a host's node WWN may not be passed through multiple host adapters to the array. In this case, the array will see the host's multiple host adapter WWNs. When this occurs, multiple host adapter WWNs must be entered into the table to represent the host.

## Example

In an environment with three hosts, one HP-UX (with two host adapters), one Windows NT (with two host adapters), and one Linux (with one host adapter) perform the following operation to install host port behavior for each host. If the controllers host port behavior is set to the default (HP-UX) behavior, entries for HP-UX operating systems will not be required in the table, but are included in the example.

1. Log on as system administrator.
2. Obtain the World Wide Name for each host or host adapter in the host. Since the default controller behavior is set to HPUX, this may not be required for the HP-UX systems.
3. To use the existing array table settings as a base for the updates, read the host port behavior from the array, for example:

```
armhost -r -f HPBset.txt xyzArray
```

HPBset.txt is the filename that the table settings will be read into and xyzArray is the array alias name.

4. Using a text editor, edit the file HPBset.txt. Delete or add entries, as required. In this case we are adding entries to an empty file (initially this table in the array is blank). Add entries that identify the node WWN and the host port behavior for each system, for example (the parenthetical text in the example file below is for clarification and should not be added to an actual file.):

```
00a05032243f1106 WinNt << Windows NT host adapter 1
7d876a1243d090a3 WinNt << Windows NT host adapter 2
200a6b34b7894284 Linux << Linux host adapter
20a60088g132ca32 HPUX << HP-UX host adapter 1
20a4208c0132c06b HPUX << HP-UX host adapter 2
```

5. Save the file, for example, to HPBset.txt.

- 
6. Download the updated file to the array using the armhost command:

```
armhost -w -f HPBset.txt xyzArray
```

The path for the file is not shown for this example, but must be included if required.

This completes the setup of the host port behavior for the array. If you wish to verify the setup operation, read the file from the array:

```
armhost -r -f HPBsetVerfy.txt xyzArray
```

---

# armlog

## Description

The `armlog` command allows a user to read the controller and disk logs maintained by the array. These logs contain information useful for diagnosing and troubleshooting the array. This command provides only event logs and does not include performance logs.

## Syntax

```
armlog {-e [-t <StartDateTime>] | -d <FruLocation> [-p <pagenumber>]} <array-id>  
armlog -?
```

## Options

<code>-d &lt;FruLocation&gt;</code> <code>[-p &lt;pagenumber&gt;]</code>	Display the contents of the log for the disk installed in <code>&lt;FruLocation&gt;</code> .  The <code>-p</code> option returns the log information identified by <code>&lt;pagenumber&gt;</code> . In hex <code>&lt;pagenumber&gt;</code> can be either in decimal or hex when prefixed with "0x". The use of the <code>-p</code> option is intended primarily for accessing logs on unsupported disks.
<code>-e</code>	Display the contents of the array's controller event log.
<code>-t &lt;StartDateTime&gt;</code>	Display controller logs that occurred on and after <code>&lt;StartDateTime&gt;</code> . The format for <code>&lt;StartDateTime&gt;</code> is "MMDDhhmm[YYYY]". Without <code>-t</code> , all controller events are displayed.
<code>-?</code>	Display extended help message. Overrides all other switches.



---

## Examples

Display the controller event log for disk array serial number 00786b5c0000. Limit the entries to those that occurred after 0800 on May 15 of this year.

```
armlog -e -t 05150800 00786b5c0000
```

Display the log information for the disk installed in slot 3 of JBOD 2 on disk array identified by device file /dev/dsk/c2t0d0.

```
armlog -d JA2/D3 /dev/dsk/c2t0d0
```

---

# armmgr

## Description

The `armmgr` command manages the configuration parameters of the array. These settings control the operation of the entire array, consequently, every LUN on the array will be affected by any changes made using this command. This command also allows you to shutdown, restart, and reset the array.

Changing some of the array settings may require that the array be reset using the `-R` option. The user will be prompted to initiate a reset if the modified setting requires this action.

---

### Note

Several of the `armmgr` options are used to set the array FC-AL operating parameters. These parameters control the transfer of data between the host and array and typically do not need to be changed. Before changing a FC-AL setting, make sure you understand what effect it will have on array operation. Selecting an incorrect setting may make it impossible for the host to access the array.

---

## Syntax

```
armmgr {-a <on | off> |  
-b {CreateLun | FwDownload | Security | Select | PassThru | HostPort} |  
-c <FruLocation> |  
-d |  
-D <alias>} |  
-f {on | off} |  
-i {on | off} |  
-J {SingleController | Secure | Normal | RestrictedNormal |  
HighPerformance}  
-l <FruLocation> <value> |  
-n <value> |  
-p {start | disable}|  
-r {on | off} |  
-R {full | partial} |  
-s {shut | start} |  
-t <value> |  
-w {on | off} |
```

---

```

-x {on | off} |
  <array-id>
armmgr -B {HPUX | WinNT | Win2000 | Linux | Solaris | AIX | NetWare} <controller> |
-C {raid1+0 | hpautoraid} |
-h {None | Automatic | LargestDisk | LargestTwoDisks} |
-l <FruLocation> {on | off} |
-y {private | public | fabric} <controller>
  <array_id>
armmgr -?

```

## Options

- |  |   |
|--|---|
| -a {on   off }   | Sets Auto Rebuild on or off. A value of on indicates that redundancy should be rebuilt automatically whenever a drive becomes unavailable. A value of off indicates that rebuilds should not occur until explicitly stated.   |
| -b { CreateLun  <br>FwDownload  <br>Security  <br>Select  <br>PassThru  <br>HostPort } | Break the advisory lock <lock>. If the array aborts a download (or if the download fails to complete), the portions of the GUI may stop functioning due to an advisory lock being set. If this happens you will need to break the lock using the armmgr -b command. The advisory lock is the result of some error condition which must be resolved before the action can be completed without an advisory lock occurring. |
| -B {Hpux   Win2000  <br>WinNT   Linux  <br>Solaris   AIX  <br>NetWare} <controller>    | Sets the controller host port behavior.<br><br><controller> is the controller number whose host port behavior is to be changed. Use either "1" for controller 1, or "2" for controller 2.   |
| -c <FruLocation>   | Instructs the device to perform a reset to one of its internal fibre channel links specified by <FruLocation>. This command is used when the array is an unknown state.   |
| -C {raid1+0   hpautoraid}  | Sets the RAID level for the array. Raid0+1 attempts to store all data in a RAID0+1 storage mode. Some failure conditions may force the data into other RAID modes temporarily.<br><br>hpautoraid - attempts to maintain the best performance while maximizing storage efficiency.   |
| -d   | Set the fibre channel to its default settings.  |

---

-D < <i>alias</i> >	Set the array alias name.
-f {on off}	Set Auto Format Drive on or off.
-h {None Automatic  LargestDisk   LargestTwoDisks}	Specify Hot Spare operation: None - no hot spare. Automatic - the array will determine the appropriate amount of hot spare space. LargestDisk - reserve enough space to complete a rebuild after a failure or removal of the largest drive in the redundancy group. LargestTwoDisks - reserve enough space to complete a rebuild after a failure or removal of the largest two drives in the redundancy group
-i {on off}	Set Auto Include on or off: On allows the array to automatically include any disk when it is installed into the array: Off requires the disk to be manually included after it is installed.
-I < <i>FruLocation</i> > {on off}	Identify an FRU location by flashing the FRU LED: on - flash an LED on the FRU, if possible off - stop flashing the LED.
-J {SingleController   Secure   Normal   RestrictedNormal   HighPerformance}	Set Resiliency Level. This option sets the level of protection offered by data resiliency. It determines how often the contents of the controller maps are copied to the disk. Keeping the map information on the disks protects against controller map loss. SingleController is used if the array is operating with only one controller. This suppresses the single controller warning messages that are normally generated when only one controller is operating. Secure continually updates the disks at regular intervals. This option offers both data protection and good performance. Normal is the standard resilient map processing. This results in higher performance than Secure, but the risk of map loss is less than the HighPerformance configuration. RestrictedNormal has higher performance than Secure, but less than Normal, but the risk of map loss is less than the HighPerformance and Normal configuration. HighPerformance updates the disk maps only during shutdown of the array. This is the lowest level of data protection, but it offers the highest level of performance.

- 
- l *<FruLocation>* *<value>* Set the Port Loop ID of the Controller Port denoted by *<FruLocation>* to the ID specified by *<value>*. The valid range of IDs is 0-125.
  - n *<value>* Set a limit on the number of LUNs that may be created. This number will be rounded up to the nearest power of two within the device.
  - p *<start | disable>* Set the current state of the scrubbing policy *<setting>* can take any one of the following values: start, disable.
  - r {on|off} Change the apparent state of read cache on or off. This switch only changes the read cache setting presented to the operating system and does not affect the operation of the array, which always has read cache enabled. This switch is provided for operating system interpretability.
  - R {full | partial} Perform either a “full” reset of the array or a “partial” reset
  - s {shut|start} Shutdown (shut) or restart (start) the array. A shutdown takes the array offline, making all data on the array unavailable to the host. A restart brings the array back online.
  - t *<value>* Set Capacity Threshold warning to the percentage specified by *<value>*. The capacity threshold warning generates an alert when the percentage of array capacity specified by *<value>* is in use.
  - w {on|off} Change the apparent state of write cache on or off. This switch only changes the write cache setting presented to the operating system and does not affect the operation of the array, which always has write cache enabled. The array write cache is stored in NVRAM which eliminates the need to disable write cache for protection against power loss. This switch is provided for interpretability with those operating systems that require write cache be turned off.
  - x {on|off} Disable NVRAM on UPS absent. When set to on, NVRAM is disabled when no operational UPS is present and when set to off, NVRAM is enabled unless some other condition inhibits it.
  - y {private | public | fabric } *<controller>* Set the topology for the controller host port to one of the accepted values.
  - ? Display extended help message. (overrides all other switches.

---

## Examples

Set port behavior for controller 1 to NetWare on array serial number 00786b5c0000.

```
armmgr -B NetWare 1 00786b5c0000
```

Assign an alias of AutoRAID1 to array serial number 00USP1001087.

```
armmgr -D AutoRAID1 00USP1001087
```

Select RAID level 1+0 for array identified by device file /dev/dsk/c2t0d0.

```
armmgr -C raid1+0 /dev/dsk/c2t0d0
```

Identify disk 6 in JBOD 3 on array AutoRAID3 by flashing its LED.

```
armmgr -I JA3/D6 on AutoRAID3
```

---

# armperf

## Description

The `armperf` command displays array performance data.

## Syntax

```
armperf {-c <category>} [-u <unit> [,<unit>, . . .]]  
        [-m "<metric> [,<metric>, . . .]"]  
        [-s <starttime>] [-e <endtime>]  
        [-n <number of intervals>] [-x COMMA] <array-id>  
  
armperf -i <array-id>  
armperf -?
```

## Options

- |                                 |  |
|---------------------------------|--|
| -c <category>                   | Enter one of the metric categories returned from the -i option. This option is required.   |
| -u <unit> [<unit> . . . ]       | If the unit is specified and the category is LUN, <unit> will specify a LUN number(s); if the category is OPAQUE then <unit> will specify a controller number(s).  |
| -m "<metric> [,<metric . . . ]" | Causes the listed metrics to be output. If more than one metric is wanted the metrics should be listed, separated with commas. The entire metric name list needs to be in quotes.  |
| -s <starttime>                  | The starting time of the range for which metrics will be displayed. Default is the earliest available record in the performance logs. Format of the time option: MMDDhhmm[YYYY] where MM=month, DD=day of month, hh=hour in 24 hour format, mm=minutes, YYYY=year. |
| -e <endtime>                    | The end time of the range for which metrics will be displayed. Default is the latest available records in the performance logs. Format of the time option: MMDDhhmm[YYYY] where MM=month, DD=day of month, hh=hour in 24 hour format, mm=minutes, YYYY=year.       |

- 
- |                          |   |
|--------------------------|---|
| -n <number of intervals> | This optional is used to specify the number of sampling intervals to use for a metric data average. The default is the sampling frequency of the performance server software. If a value is given that is less than or equal to one, the default sample interval will be used. A value greater than one will result in a metric data average for the number of intervals specified. For example, a value of 4 will result in a metric data average of every 4 sampling periods recorded by the performance server software. |
| -x COMMA                 | This option produces a comma separated output instead of a tabular output.  |
| -i                       | This option causes all the available metric names and all available LUNs to be printed. It will also print the earliest starttime and the latest endtime of the available data for each LUN. The option is used by itself and has no options.   |
| -?                       | Display extended help message. Overrides all other switches.  |

## Examples

List all available metric options and available LUNs on array alias Array1.

```
armperf -i Array1
```

Display the LUN based metrics of the 3 types identified by the -m option for the time period of August 5 from 7:00 am to 8:30 am from the array alias Array1.

```
armperf -c LUN -s 08050700 -e 0805830 -m Total I/O,RAID 1+0 Allocation,  
RAID 5 DP Allocation Array1
```



---

# armrbld

## Description

The `armrbld` command allows a user to initiate, cancel, monitor the progress of, or modify the characteristics of, a rebuild for an array. `armrbld` manages the rebuild process on the array identified by `<array-id>`.

---

**Note** The virtual array rebuilds data online. Performing a rebuild should not impact array availability or overall array performance.

---

## Syntax

```
armrbld {-r | -c | -p | -a {on|off} | -P {high|low}} <array-id>
```

```
armrbld -?
```

## Options

- a {on|off} Enable (on) or disable (off) Auto Rebuild. When enabled, the array automatically begins a rebuild in the event of a disk failure. When disabled, a rebuild must be started manually.
- c Cancel a rebuild currently in progress. A rebuild started by Auto Rebuild cannot be canceled.
- p Display information about the rebuild currently in progress on the disk array. The information includes the disk array's vendor and product ID and the current setting for Auto Rebuild and Rebuild Priority. The information also indicates one of the following:  
rebuild completion rate, no rebuild in progress, or rebuild failed.
- P {high|low} Set Rebuild Priority. High sets the rebuild to the same priority as host I/Os. This allows the rebuild to complete as quickly as possible, but slows down the servicing of I/Os. Low sets the rebuild priority lower than host I/Os. This ensures that host I/Os are serviced first, but it delays the completion of the rebuild.

- 
- r Start a rebuild on the array.
  - ? Display extended help message. Overrides all other switches.

## Examples

Display the current state of a rebuild on host with alias blue. In this example the host is not currently performing a rebuild.

```
hpbs9011:# armrbld -p blue
Rebuild status:
  Vendor ID           = HP
  Product ID          = A6188A
  Rebuild progress    = No rebuild in progress

  Auto Rebuild is     = ENABLED
  Rebuild priority is = LOW

The array is not currently rebuilding.
```

---

# armrecover

## Description

The `armrecover` reconstructs data mapping and array configuration in the event of the loss of NVRAM contents. The data maps are reconstructed using the latest copy of mapping information stored on the disk drives. Part of the recovery operation includes performing a parity scan on the contents of the entire array to validate the accuracy of the maps and to correct any drive parity inconsistencies. This process can take up to several hours depending on the amount of data on the array.

## Syntax

```
armrecover {[ -s | -p | -v <volume-set-id> ]} [-c] [-override] <array-id>  
armrecover -?
```

## Options

None	Begin the recovery in interactive mode. The utility will display all recoverable volume sets, then prompt the user for the number of the volume sets to recover.
-c	This will cause continuous polling during the recovery. The recovery is monitored and the current progress is displayed at regular intervals.
-p	Begin the recovery in non-interactive mode. If there are multiple volume sets on the array, a list of the volume set numbers will be displayed. If there is only one volume set on the array, the recovery will be done on it. This option provides a mechanism to pass volume set information to a script designed to perform a recovery.
-s	Returns the recover ability status of the array, as well as the status of a recovery in progress. The status indicates if recovery is needed, and what percentage of the entire recovery has been completed. When used with the <code>-c</code> option, status will be returned at regular intervals allowing continuous monitoring of the recovery progress.

---

-v <volume-set-id>	Starts a recovery on the volume set indicated by volume-set-id. The volume set serial number is 16 ASCII characters in size. This option is intended for use only in environments where there are multiple volume sets on the array.
-override	When specified with other options this will bypass checks on warning states and allow a recovery command to be issued. This option should be used with caution.
-?	Display expanded usage message. This option overrides all other switches.

## Examples

Perform a recovery on the default volume set on array alias AutoRAID3.

```
armrecover -p AutoRAID3
```

Retrieve status for the recovery in progress on array serial number 00786b5c0000. Also have the status continually updated until completion.

```
armrecover -s -c 00786b5c0000
```

---

# armsecure

## Description

The `armsecure` command provides command operations for the array security features. For detailed information about array security, refer to the HP Surestore Secure Manager Virtual Array product documentation (the Secure Manager VA product is available as upgrade, refer to Chapter 1, Modular Storage Software Products, for information on how to obtain this product). The security provided with the array is a 50 Gbyte “demo” version. It allows LUN security to be set for a total capacity of 50 Gbytes. Additional capacity can be added by purchasing the Secure Manager VA upgrade products identified in Chapter 1.

---

### Note

For detailed information on using and managing the virtual array security operations, obtain a copy of the HP Secure Manager Virtual Array software product. For product information, refer to [page 15](#).

---

## Syntax

```
armsecure {-r -f <filename> -p <password>} <array-id>
armsecure {-w [-c] -f <filename> -p <password>} <array-id>
armsecure {-c | -e | -d } {-p <password>} <array-id>
armsecure {-n <newPassword> -p <oldpassword>} <array-id>
armsecure -?
```

## Options

- c This specifies that the secure manager table in the array is to be cleared and the Secure Manager feature is to be disabled. It may be used alone, or it may be combined with the `w` option to clear the table and disable Secure Manager feature just prior to a write. The user will have to explicitly enable the Secure Manager feature after using the `-w -c` option combination.

- 
- |                  |  |
|------------------|--|
| -d               | This disables the secure manager feature of the device. The table is not altered. If secure manager is disabled, all LUNs are accessible to all hosts.   |
| -e               | This enables the secure manager feature of the device.   |
| -f <filename>    | This specifies the file which contains (or will contain) the secure manager table (described below). This file will be read and written to the device table, or the table read from the device and written to this file. Relative or absolute file paths are allowed. If a path is not specified the current working directory will be used.   |
| -n <newPassword> | This sets the password in the device to <newPassword>.   |
| -p <password>    | <p>Specify the password needed to run the command. This command will present the given &lt;password&gt; to the device during the operation. The password given must match the one known to the device, or the command will fail. This is required for all forms of the command.</p> <p>The password &lt;password&gt; can be from one to eight characters long. Any printing character is legal, but it is best to avoid blanks and other special characters.</p> <p>The password "AUTORAID" is special. This password denotes the initial password as set at the factory. This is also the password set from the front panel whenever the real password is lost.</p> |
| -r               | This specifies that the secure manager table should be read from the device and written to the file specified by the -f parameter.   |
| -w               | This specifies that the secure manager table should be read from the file specified by the -f parameter and written to the device.   |
| -?               | Display help message. Overrides all other switches.  |

## Examples

Read the current content of the secure manager table into file secure.txt on hots with alias green. The password is the default value, AUTORAID.

```
hpb9011:# armsecure -r -f secure.txt -p AUTORAID green
Secure Manager data has been read into the file : secure.txt
```

---

# armtopology

## Description

The `armtopology` command provides topology information about hosts and attached virtual arrays connected to the hosts for each LUN in the array. The command displays associated path information for each LUN which includes: host name (DNS or IP), host Node WWN, Port WWN, array product number, array serial number, array controller (1 or 2), redundancy group (1 or 2), LUN number, and device path (from host to LUN). This command provides this information only for hosts which have HP Command View SDM installed; if one of the specified hosts does not have Command View SDM installed, information will not be provided for that host.

---

**Note**      Operation of this command requires CONFIG permission.

---

## Syntax

```
armtopology [ <HostName-1> <HostName-2> ...<HostName-n> ]  
armtopology -?
```

## Option

<i>&lt;HostName-1&gt;</i>	To specify specific hosts, use the <code>&lt;HostName&gt;</code> option. Use either the DNS name or IP address of the hosts. Separate multiple HostNames with a space. If no HostName options are specified, all hosts discovered on the subnet with arrays will be displayed, provided they have Command View SDM installed.
<i>&lt;HostName-2&gt; ...</i>	
<i>&lt;HostName-n&gt;</i>	
-?	Display extended help message. Overrides all other switches.

---

## Examples

This example displays information for three hosts: host1 and host2 connected to one array with two LUNs (0 and 1) and a third host connected to a second array, also with two LUNs (0 and 1). The command could be entered as:

```
armtopology host1 host2 host3
```

The following example output would be produced for this command:

```
Host  Host Node WWN      Host Port WWN      Product  SerialNumber C RG LUN  Device path
-----
host1 50060b000005aed6 50060b000005aed7 A6188A 00USP1001064 1 1 1  \\.\PHYSICALDRIVE1
host2 50060b000005cde7 50060b000005cde8 A6188A 00USP1001064 2 2 0  /dev/rdisk/c0t0d0
host3 50060b000005fgh8 50060b000005fgh9 A6189A 00USP1001234 1 1 0  /dev/rdisk/c1t0d0
host3 50060b000005ijk6 50060b000005ijk7 A6189A 00USP1001234 2 2 1  /dev/rdisk/c2t0d1
```

---

### Note

If array LUN security is enabled, only LUNs visible to the host will be displayed for that host.

---



---

# 5

# COMMAND VIEW USER INTERFACE

## Overview

The Command View User Interface (CVUI) adds a simple, text menu-based interface as a front end to the Command View SDM commands. application for use over a modem or remote connection. The CVUI provides the same management capability as the Command Line User Interface (CLUI). The menu structure relieves you of the need to memorize command syntax, making the CVUI ideal for use over a modem or remote connection.

## Starting the Command View SDM CVUI

The Command View User Interface is started from a command line. To start the interface, enter the appropriate command:

```
cvui << From a local host
```

```
cvui -h <hostname> << From a remote client
```

```
cvui -h <hostname> {array_id} << From a remote client - connects to specified array
```

---

## CVUI Example

The following example illustrates the process of starting the CVUI and selecting an array to manage. The process involves inputting the value for the desired selection. In this example, a connection is made to remote host hpbs9011 and the array “blue” is selected for management.

```
hpbs4251:# cvui -h hpbs9011 << Run CVUI on remote host hpbs9011
```

```
CVUI version 1.01.0011
```

```
Storage Device Selection
```

```
Host: hpbs9011
```

```
Choice Device Id Alias Device Type
=====
  1 50060b00000921d0 blue HP Storage Array
  2 50060b000009736f green HP Storage Array
  3 50060b00000921a3 yellow HP Storage Array
  4 Refresh
```

```
(1-4=Choice, a=App menu, h=Help, x=eXit)>1 << Array “ blue” selected
```

```
Storage->HpArrayMain
```

```
DeviceID: hpbs9011:50060b00000921d0
```

```
DevicePath: /dev/rscsi/c30t7d0 Alias: blue
```

```
DeviceType: HP Storage Array DeviceSn: 00SG04990114
```

```
Product: HPA6188A00SG04990114
```

```
Choice Description
```

```
=====
  1 Create/Delete LUNs
  2 View properties
  3 Diagnostics
  4 Configure operating parameters
  5 Configure fibre channel
  6 Security
  7 Licensed features
  8 Firmware
```

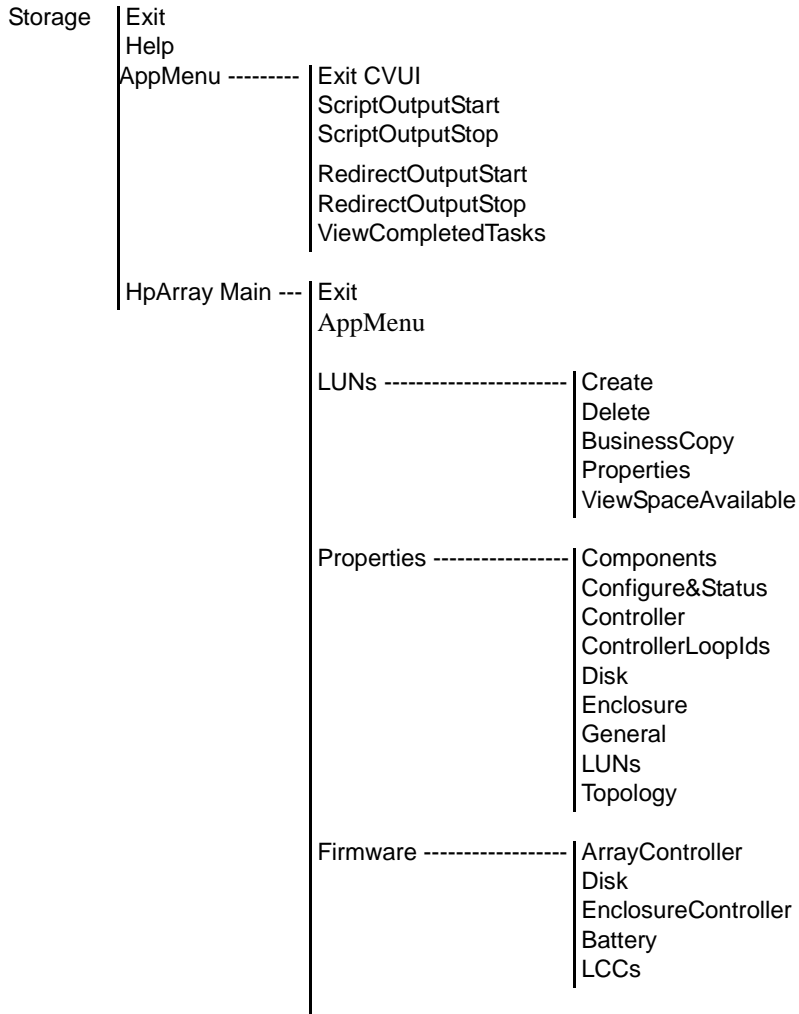
```
(1-8=Choice, a=App menu, b=Back, h=Help, x=eXit)> << Enter value for the desired task
```

---

Several levels of menus are required to execute a command. Continue entering the number of the operation until the action is performed. A menu showing the various menu selections is provided on the following page (some additional levels are not shown). For additional help on the operation of the CVUI interface, select “h” from any CVUI screen.

---

## CVUI Menu Map



HP Array Main ---	Diagnostic-----	<ul style="list-style-type: none"> <li>ArrayLogs</li> <li>ArchivedLogs</li> <li>ResetArray</li> <li>ShtudownArray</li> <li>RestartArray</li> <li>Rebuild</li> <li>ResetFRU</li> <li>DownFRU</li> <li>IncludeFRU</li> <li>FormatDisks</li> <li>Scrubbing</li> <li>RecoverNVRAM</li> <li>BreakAdvisoryLock</li> </ul>
	Configure -----	<ul style="list-style-type: none"> <li>SetAlias</li> <li>AutoFormatDrive</li> <li>CapacityThreshold</li> <li>ReadCacheState</li> <li>RebuildPriority</li> <li>WriteCacheState</li> <li>NvramWithoutUps</li> <li>PerformanceGoal</li> <li>AutoInclude</li> <li>AutoRebuild</li> <li>HotSpareDesired</li> <li>LunCreationLimit</li> </ul>
	Configure Fibre.....	<ul style="list-style-type: none"> <li>C1HostPortBehavior</li> <li>C2HostPortBehavior</li> <li>C1Topology</li> <li>C2Topology</li> <li>SetLoopID</li> <li>DefaultFc</li> <li>HostPortBehavior Table</li> </ul>
	Security -----	<ul style="list-style-type: none"> <li>ClearTable</li> <li>Disable</li> <li>Enable</li> <li>SetSecurityTable</li> <li>GetSecurityTable</li> <li>ChangePassword</li> </ul>
	LicensedFeatures -----	<ul style="list-style-type: none"> <li>AddFeature, ListFeatures</li> </ul>



## Overview

The array continually monitors and records information reflecting the current operating state of the array. This information is stored by the array in its internal memory. The Command View SDM software reads this information and stores it in log database files on the host. An overview of array log management is shown in [Figure 4](#).

There are two types of log files:

- **Controller (Device) Logs** - All internal array actions or events are monitored by the controller and saved as event messages in the array's internal memory. The Command View SDM software periodically polls (every 15 minutes, the default) the array and stores these events as entries in the controller log database file.
- **Usage (State) Logs** - Command View SDM software periodically (every 24 hours, the default) runs the `armdsp -a` command to obtain the current state configuration of the array. It copies the output of this command into the usage log file.

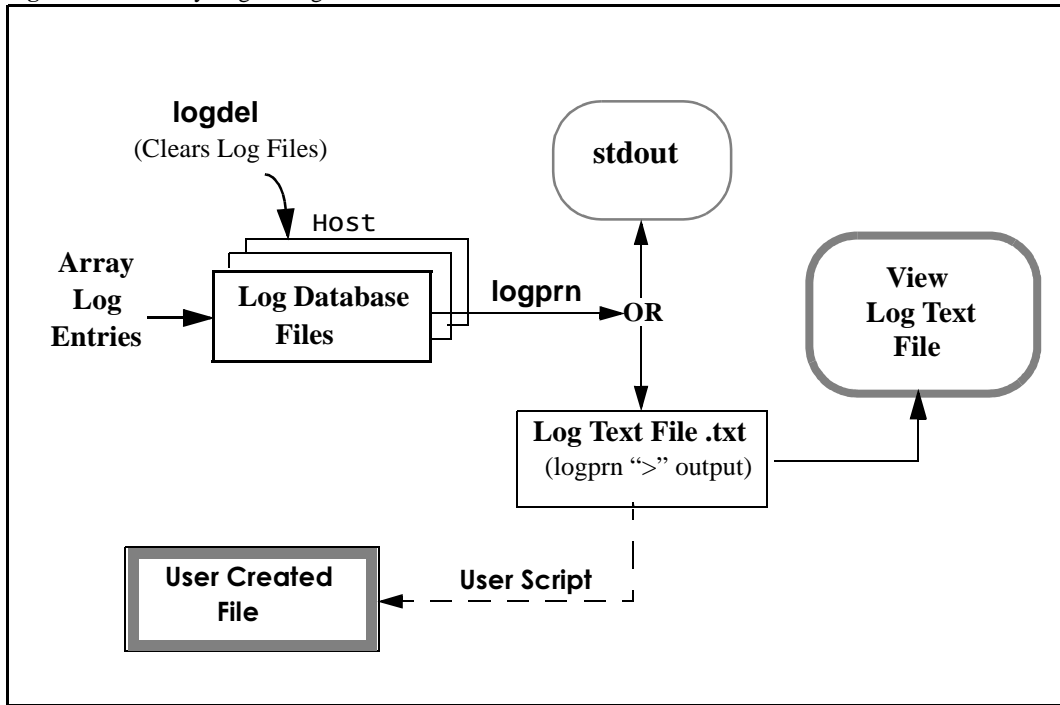
Log files are stored in a directory structure that identifies the file by date and file type, as described in [About Log Files on page 112](#).

---

**Note** The log database files can become quite large and over time some will need to be deleted or moved to another storage media. The `logdel` command must be used to delete a log file. For more information on the `logdel` command, refer to [logdel on page 109](#).

---

**Figure 4** Array Log Management





---

## Log Commands

Three utilities and their associated commands are available for managing the array logs. These utilities include `logprn` (to view logs), `logdel` (to delete logs), and `armlog` (to read the logs). These commands and some detail on the format and structure of the log files is discussed in this section.

---

# logprn

## Description

The `logprn` command reads log entries from log database files and directs them to stdout (screen). The output can also be redirected to a text file, which is required for the command view log tool operation. The log entries retrieved can be limited by setting the start and stop range option. A filter option (-t) can be used to define the exact type of log entries to retrieve.

## Syntax

```
logprn -a <array-id> [-s <start_time>] [-e <stop_time>] [-d <dir>] [-t <log_type>]
      [-b | -v] [-?]
```

## Options

- |                          |  |
|--------------------------|--|
| -a <array-id>            | The array ID which can be the: serial number, alias, device path, or world wide name.  |
| -a <hostname:><array-id> |  |
| -d <dir>                 | Directory where the log files are located. If not specified, this directory is obtained from the system configuration file settings.   |
| -s <start_time>          | Specifies the oldest log entry to view. If not specified, viewing starts with the oldest log entry. The format for entering time is:<br>mmdhMM[yyyy]<br>where:<br>mm = month (01-12)<br>dd = day (01-31)<br>hh = hour (01-23)<br>MM = minute (01-59)<br>yyyy = year (such as 2001), if not specified current year is used. |
| -e <stop_time>           | Specifies the newest log entry to view. If not specified, viewing ends with the newest entry. Uses same time format as <i>start_time</i> .   |

---

-t <log_type>	Specifies the type of log entries to view. Valid types are: TargetDeviceEvent HostEvent ControllerEvent ChangeEvent AbtermEvent Device = Controller log files, only State = Usage log files only All = Both Controller (Device) and Usage (State) log files.
-b	Output is brief format. If neither -b or -v are specified, unformatted output is used.
-v	Output is verbose format. If neither -b or -v are specified, unformatted output is used.
-?	Displays the help message. Overrides all other switches.

## Examples

### Verbose output

Display the entries for the device logs (`dd-ctrlr.log`) for the array, `myarray`, between the times Nov 19, 8:30 am, 2000 and Jan 01, 3:30 pm, 2001 with verbose output, by entering:

```
logprn -a myarray -s 111908302000 -e 010115302001 -t Device -v
```

This command will produce the following output (only one entry shown):

```
DeviceUniqueName    = 50060B000008A085
Date                = October 13, 2000
Time               = 8:27:34 AM EDT
DeviceName          = HP VA7100
DeviceType          = VirtualArray
DeviceSequence      = 90339
FruIdentifier        =
FruLocation         = M/C1
LogCode             = 374
Count               = 1
Sequence            = 2447
Type                = Controller Event
```

---

Text :

The text description of the error provided here.

### **Standard Output**

Display all log entries to standard out for the local host.

```
logprn
```

This command produces the following output (only one entry shown):

```
October 13, 2000 8:27:34 AM EDT HP VA7100
VirtualArray 50060B000008A085
The text description of the error will be provided here.
BUS: Local
```

### **Brief output**

Display all log entries in brief output for array Array1 on remote host server6.

```
logprn -a server6:Array1 -b
```

This command will produce the following output (only one entry shown):

```
50060B000008A085_ October 13, 2000_8:27:34 AM EDT_HP
VA7100_VirtualArray_90339_M/C1_374_1_2447_1_The text description of the
error will be provided here...
```

### **Limit Log Type**

Get only Abnormal Termination events for an array with an alias of DevArray connected to the local host. Find the logs in the directory /temp/logs.

```
logprn -a DevArray -t AbtermEvent -d /temp/logs
```

---

# logdel

## Description

The `logdel` command deletes log database files. Only files older than two months old can be deleted; two full-calendar months of files are always saved and cannot be deleted. This command also allows you to delete specific log file types or to delete all log file types. See [About Log Files on page 112](#) for information about log file types).

## Syntax

```
logdel -a <array-id> [-d <dir>] -e <stop_time> -t <log_type>
```

## Options

- |                        |   |
|------------------------|---|
| -a <array-id>          | The array-id can be: array serial number, alias, device path, or world wide name of the array.  |
| -a <hostname:array-id> |   |
| -d <dir>               | Directory of the log files to be deleted. If not specified, this directory is obtained from the system configuration file settings:<br><br><code>/opt/sanmgr/commandview/server/config/PanConfigParams.txt</code>   |
| -e <stop_time>         | Specifies the newest log file to delete. The format for entering time is:<br><code>mmddhhMM[yyyy]</code><br>where:<br><code>mm</code> = month (01-12)<br><code>dd</code> = day (01-31)<br><code>hh</code> = hour (01-23)<br><code>MM</code> = minute (01-59)<br><code>yyyy</code> = year (such as 2001), if not specified current year is used<br><br>Although all time fields are required, only the month and year are used by the command. |

---

`-t <log_type>` Identifies the type(s) of log files to delete. Valid types are:  
Device (controller)  
State (usage)  
Software  
All

`-?` Display help message. Overrides all other switches.

## Examples

Delete all the logs on array serial number 00USP1001089. Delete all entries up to August 2001.

```
logdel -a 00USP1001089 -e 080100002001 -t All
```

---

## armlog Command

The `armlog` command, as described in Chapter 3, CLUI, reads controller event log messages directly from the array. For more information on the this command, refer to chapter 3, `armlog` Command.

---

## About Log Files

There are three types of log database files, as mentioned earlier, generated by the array: controller, usage, and software. Each type of entry is stored in its own log database file.

- **Controller (Device) Logs** - Controller log entries are generated from the internal array events. The HP Command View SDM software polls the array every 15 minutes to retrieve log entries. These log entries are stored in controller log database file.

The poll interval is controlled by the Controller Log Polling Interval setting (default = 15 minutes) in the array software configuration file:

```
/opt/sanmgr/commandview/server/config/PanConfigParams.txt
```

- **Usage (State) Logs** - Entries for the usage log database are generated from the output of the `armdsp -a` command. See [armdsp on page 69](#) for more information. The Command View SDM log software runs the `armdsp -a` command and stores the output as entries in the usage log file. The interval at which this occurs is determined by the State Log Polling Interval setting in the array configuration file. The default setting is 24 hours but can be changed.



## Directory Structure

The array software creates the log directories on a daily basis. The directory structure for the controller database, usage database, and the software database log files is shown below:

```

/<BaseLogDirectory>/device/<arrayWWN>/2000-01/01-ctrlr.log
                               /01-usage.log
                               /02-ctrlr.log
                               /02-usage.log
                               .
                               .
                               2000-02/01-ctrlr.log
                               /01-usage.log

```

All log files are located under a user specified directory `<BaseLogDirectory>` determined at installation. The Controller and Usage log files are located under the `device` directory. The `arrayWWN` directory is determined by the world wide name of the array. The next directory specifies the year and month (yyyy-MM) the file was created for entries. The file name consists of the creation day (dd) followed by the file type name (ctrlr for controller, usage, or sw for software).

## Log Entry Format

If you wish to create your own user file filtered on specific entries from the Log Text File, you can create a script to generate the desired output. An entry in the log text file consists of one line with multiple data fields containing the following information:

```

DeviceUniqueName, Date, Time, DeviceName, DeviceType,
DeviceSequence, FruIdentifier, FruLocation, LogCode, Count;
Sequence, Type, Text

```

Each field in the line entry is separated by a field separator with the end of the line terminated by a record separator:

```
[Field 1] [FS] [TAB] [Field 2] [FS] [Field 2] [FS] [TAB]...[field n] [FS] [Tab] [RS] [CRLF]
```

The field separator (FS) is a CTRL \_ (0x001f) character and the record separator (RS) is a CTRL ^ (0x001e) character.

If a field [Field n] is missing, the FS and TAB for that field will still be present.

```
[Field 1] [FS] [TAB] [FS] [TAB] [Field 3] [FS] [TAB]...[field n] [FS] [Tab] [RS] [CRLF]
```

---

Using the information provided here, it is possible to create a script file to access the log text files and sort on any number of the log entries to produce a user sorted log file.

## Performance Logs

In addition to the event logs, array performance data is logged. Performance data is stored in a log structure similar to the event logs described above. Performance data is logged continually while the array is in operation. A new performance log is created every 24 hours beginning at 12:00 a.m. The array directory structure is shown below:

```
/userDefinedBase/logs/performance/YYYY-MM/dd/arrayuniqueName.log
```

An example of this directory structure for an array with a unique name of “W6000123”, for February 28, 2000, would be:

```
/userDefinedBase/logs/performance/2000-02/28/W6000123.log
```

For information on reading these logs, refer to the `armperf` command described in chapter 4.

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