

HP 3G Virtual SAS Manager User Guide

Abstract

This guide provides information about using the HP Virtual SAS Manager (VSM) application to configure and manage device zoning through HP SAS BL Switches. The VSM Graphical User Interface (GUI) and VSM Command Line Interface (CLI) are detailed.



© Copyright 2009, 2011 Hewlett-Packard Development Company, L.P.

Confidential computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Microsoft, Windows, Windows XP, Windows Vista, Windows 7, Windows 2008, Windows 2003, and Windows NT are U.S. registered trademarks of Microsoft Corporation.

Revision History

Revision # 3

February 2011

Clarified zoning requirements and expanded firmware updating methods

Contents

I Basic information and concepts.....	5
II VSM GUI.....	10
1 Getting started.....	12
Accessing the VSM GUI.....	12
Page description.....	14
System status information.....	15
Online help.....	16
Performing tasks.....	16
Configuring the switch (key steps).....	17
2 Example: Configuring shared SAS storage enclosures.....	18
3 Example: Configuring zoned SAS storage enclosures.....	27
4 Tasks in the VSM Zoning tab.....	34
More Information task.....	35
Clear Configuration task.....	35
Advanced Settings task.....	36
Create Zone Group task.....	37
Drive-bay zone groups.....	37
Switch-port zone groups.....	39
Modify task.....	41
Delete task.....	42
Modify Zone Access task.....	43
5 Tasks in the VSM Maintain tab.....	44
Update Firmware task.....	45
Prerequisites.....	45
Obtaining new firmware.....	46
Procedures.....	47
Reset Hardware task.....	49
Reset Software task.....	49
Update Storage Enclosure Firmware task.....	50
Prerequisites and notes.....	50
Obtaining new firmware.....	51
Procedures.....	51
Reset Storage Enclosure task.....	52
Network Settings task.....	54
SNMP Settings task.....	54
System Log task.....	54
6 Troubleshooting.....	55
Moving zone groups.....	55
Moving zone groups—zoned SAS storage enclosures.....	55

Moving zone groups—shared SAS storage enclosures.....	56
III VSM CLI.....	57
7 Getting started.....	59
Accessing the VSM CLI.....	59
Command syntax.....	61
Example command.....	61
About the target variable.....	61
About the command variable.....	62
About the parameter variable.....	63
Executing commands.....	64
Keyboard shortcuts and keyword abbreviations.....	64
Getting help.....	65
The help command.....	65
The show command.....	65
8 Performing common tasks.....	68
Enabling or disabling multi-initiator mode.....	69
Creating a switch-port zone group.....	70
Creating a drive-bay zone group.....	73
Assigning a zone group to a server device bay.....	75
Capturing the configuration.....	77
Inputting or restoring the configuration.....	78
Flashing switch firmware.....	79
Flashing storage enclosure firmware.....	80
Resetting the switch or attached storage enclosures.....	82
IV Support and other resources.....	83
Index.....	85

Part I Basic information and concepts

HP Virtual SAS Manager (VSM) is the software application used to configure HP SAS BL Switches, including tasks such as creating and managing hardware-based zone groups. These zone groups allocate resources for device load balancing purposes and for selectively allowing access to data. For planning purposes, zone groups and assignments can be pre-configured, even if servers or disk drives are not yet installed.

Embedded in the SAS BL Switch firmware, VSM can be deployed in two operating modes:

- Graphical User interface (GUI)—See “VSM GUI” (page 10)
- Command Line Interface (CLI)—See “VSM CLI” (page 57)

About this document

- This document assumes that all associated devices are physically installed and all required software components are installed on the servers. For hardware compatibility information, supported operating system versions, and supported Internet browser versions, see the SAS switch QuickSpecs. Review the QuickSpecs and verify that supported versions are installed on the devices.
- Examples in this document use dual SAS BL Switches installed in an HP BladeSystem c7000 enclosure.
- For information about installing and cabling the switch, see the following user documents, available on the 3Gb SAS BL Switch page of the HP Manuals website <http://www.hp.com/support/manuals>:
 - *HP StorageWorks 3Gb SAS BL Installation Instructions*
 - *HP StorageWorks 3Gb SAS BL User Guide*
 - *HP Direct-Connect External SAS Storage for HP BladeSystem Solutions Deployment Guide*
- Information is located as follows in this guide:
 - Example procedures: “Example: Configuring shared SAS storage enclosures” (page 18)
 - Example procedures: “Example: Configuring zoned SAS storage enclosures” (page 27)
 - Field details: “Tasks in the VSM Zoning tab” (page 34)
 - Field details: “Tasks in the VSM Maintain tab” (page 44)

About solutions using the SAS BL Switch

Consider the following:

- In dual-domain configurations with two switches in the same interconnect bay row of the HP BladeSystem c-Class enclosure, both switches can process I/O, but the VSM utility can be active on only one of the switches. Switch status (Active or Passive) is shown in the VSM navigation tree. If you log in to the switch with the passive VSM and want to make any zoning configuration changes, you must exit VSM for that switch and log back in to the switch with the active VSM.
- Zoning is created and managed through the VSM, but the storage is configured, formatted, and partitioned using software utilities such as the HP Array Configuration Utility (ACU), HP Storage Management Utility (SMU), and Microsoft Disk Manager.

one group concepts

Zone groups allocate resources for device load balancing purposes and for selectively allowing access to data. For planning purposes, zone groups and assignments can be pre-configured, even if servers or disk drives are not yet installed.

There are two types of zone groups:

- Drive bay zone groups—Group together drive bays, which can be chosen from one or more MDS600 storage enclosures or MDS600 storage enclosure drawers. Server bays assigned this type of zone group have access to the drive bays included in the zone group as if they were directly connected to those servers. Zoned storage environments such as those using the MDS600 use drive bay zoning.
- Switch port zone groups—Group together one or more SAS ports on the switch. Server bays assigned this type of zone group have access to the controller enclosures or tape devices connected to the ports included in the zone. Tape environments and shared storage environments such as those using the MSA2000sa use switch port zoning. All tape drives in a tape device will be accessible to any server that has access to the zone group. All LUNs in the controller enclosure will be accessible to the assigned servers, unless controlled through the storage management utility for the controller enclosure.

As shown in the following table, configuration (zoning type) procedures are the same for shared SAS storage enclosures and tape devices, but differ for zoned SAS storage enclosures:

Component	Zoning type
Shared SAS storage enclosures	Switch port
Zoned SAS storage enclosures	Drive bay
Tape devices	Switch port

IMPORTANT: When assigning zone groups to servers, restrictions apply. The zone groups must be associated with external storage enclosures that are connected to switch ports that are associated with those server device bays. For more information, see [“Zoning requirements and device mappings” \(page 7\)](#).

Zoning requirements and device mappings

- ① **IMPORTANT:** Depending on the BladeSystem c-Class enclosure model, server type, mezzanine slot used, BladeSystem server device bay, and BladeSystem interconnect bay, the zone groups that assigned to a server must be associated with storage enclosures connected to switch ports 1–4 or 5–8. Failure to follow these guidelines will result in an unsupported configuration.

The following tables show the interdependencies of components in an HP BladeSystem c-Class solution that includes an HP StorageWorks 3Gb SAS BL Switch connected to external SAS storage enclosures.

For the c3000 BladeSystem enclosure, use the following table to determine which external storage enclosures to use when zoning the external storage to the server blades.

For example, as shown in the table, if a full-height server blade is installed in device bay 1-8 of a c3000 enclosure, and the P700m SAS Controller is installed in server mezzanine slot 2; the 3Gb SAS BL Switch must be installed in BladeSystem interconnect bay 3 or 4 and it should be assigned a zone group that is in an external storage enclosure attached to 3Gb SAS BL Switch ports 1, 2, 3, or 4.

BladeSystem c-Class enclosure model	Server type	Mezzanine slot	BladeSystem c-Class device bay	BladeSystem c-Class interconnect bay	Zone groups must be in storage enclosures connected to these 3Gb SAS BL Switch ports
c3000	Half height	2	Any	3/4	1 – 4
	Full height	2	Any	3/4	1 – 4
		3	Any	3/4	5 – 8
	Half height Double dense (BL2x220c)	"A-side"	1A – 8A	3/4	1 – 4
		"B-side"	1B – 8B	3/4	5 – 8
	Full height Double wide (BL680c G7)	2	Any	3/4	1 – 4
		3	Any	3/4	5 – 8
		4	Any	3/4	5 – 8
		7	Any	3/4	1 – 4

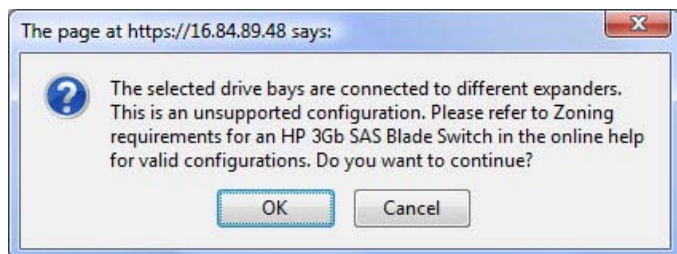
For the c7000 BladeSystem enclosure, use the following table to determine which external storage enclosures to use when zoning the external storage to the server blades.

For example, as shown in the table, if a full-height server blade is installed in device bay 1-8 of a c7000 enclosure, and the P700m Controller is installed in server mezzanine slot 2; the 3Gb SAS BL Switch must be installed in BladeSystem interconnect bay 5, 6, 7, or 8 and it should be assigned a zone group that is in an external storage enclosure attached to 3Gb SAS BL Switch ports 1, 2, 3, or 4.

BladeSystem c-Class enclosure model	Server type	Mezzanine slot	BladeSystem c-Class device bay	BladeSystem c-Class interconnect bay	Zone groups must be in storage enclosures connected to these 3Gb SAS BL Switch ports
c7000	Half height	1	1 – 8	3/4	1 – 4
			9 – 16	3/4	5 – 8
		2	1 – 8	5/6/7/8	1 – 4
			9 – 16	5/6/7/8	5 – 8
	Full height	1	Any	3/4	1 – 4
		2	Any	5/6/7/8	1 – 4
		3	Any	5/6/7/8	5 – 8
	Half height Double dense (BL2x220c)	Any	1A – 8A	5/6	1 – 4
			1B – 8B	7/8	1 – 4
			9A – 16A	5/6	5 – 8
			9B – 16B	7/8	5 – 8
	Full height Double wide (BL680c G7)	1	Any	3/4	1 – 4
		2	Any	5/6/7/8	1 – 4
		3	Any	5/6/7/8	5 – 8
		4	Any	5/6/7/8	1 – 4
		5	Any	3/4	5 – 8
		7	Any	5/6/7/8	5 – 8

As shown in the tables, each HP 3Gb SAS BL Switch is organized in two sets of connections. These two connection sets are based on the two SAS expanders housed in the switch. Each SAS expander provides four external SAS ports and is connected internally to eight blade bays. This organization may have implications for best system configuration practices according to the hardware in use.

The VSM GUI displays the following warning message if a configuration is attempted that violates these requirements. All such configurations are unsupported by HP.



When creating a zone group:

- When creating a drive bay based zone group, all the drives in the zone group should be attached to the switch through the same set of four ports shown in the table. For example, a zone group could include drives from three storage enclosures attached to ports 1, 3, and 4. However, creating a zone group using drives from two storage enclosures attached to ports 1 and 5 is not supported.
- When creating a switch port zone group, the group can include multiple ports in the range 1-4 or 5-8, but not from both ranges.

When assigning a zone group to a server device bay:

- When modifying zone access rights of a server blade, the zone group must be for storage that is connected to the same expander that the server device bay is associated with. For example, server device bay 9 should be assigned to storage that is attached to ports 5-8 of the HP 3Gb SAS BL Switch.
- When modifying zone access rights to drive-bay based zone groups, the server blades must first be taken offline. Restart them after completing the assignments and saving all changes in the VSM interface.
- For a newly created zone group, when assigning the zone group to a server device bay, if RAID 1+0 arrays will be created, you must first power off the server blades. Restart the servers after completing the assignments and saving all changes in the VSM.
- For an existing zone group, when changing the assignment to move the zone group to a different server, you must first stop all associated I/O with the zone group and power off the server blades. After completing the assignments and saving all changes in the VSM, restart the servers and resume I/O.
- In a c7000 BladeSystem enclosure, when using a full-height blade that occupies bays 1 and 9, and with the P700m Controller in mezzanine slot 3, be sure to assign the zone group to blade bay 9 (the subsumed bay). This will correctly provide the server with access to the storage.

Part II VSM GUI

Contents

1	Getting started.....	12
	Accessing the VSM GUI.....	12
	Page description.....	14
	System status information.....	15
	Online help.....	16
	Performing tasks.....	16
	Configuring the switch (key steps).....	17
2	Example: Configuring shared SAS storage enclosures.....	18
3	Example: Configuring zoned SAS storage enclosures.....	27
4	Tasks in the VSM Zoning tab.....	34
	More Information task.....	35
	Clear Configuration task.....	35
	Advanced Settings task.....	36
	Create Zone Group task.....	37
	Drive-bay zone groups.....	37
	Switch-port zone groups.....	39
	Modify task.....	41
	Delete task.....	42
	Modify Zone Access task.....	43
5	Tasks in the VSM Maintain tab.....	44
	Update Firmware task.....	45
	Prerequisites.....	45
	Obtaining new firmware.....	46
	Procedures.....	47
	Reset Hardware task.....	49
	Reset Software task.....	49
	Update Storage Enclosure Firmware task.....	50
	Prerequisites and notes.....	50
	Obtaining new firmware.....	51
	Procedures.....	51
	Reset Storage Enclosure task.....	52
	Network Settings task.....	54
	SNMP Settings task.....	54
	System Log task.....	54
6	Troubleshooting.....	55
	Moving zone groups.....	55
	Moving zone groups—zoned SAS storage enclosures.....	55
	Moving zone groups—shared SAS storage enclosures.....	56

1 Getting started

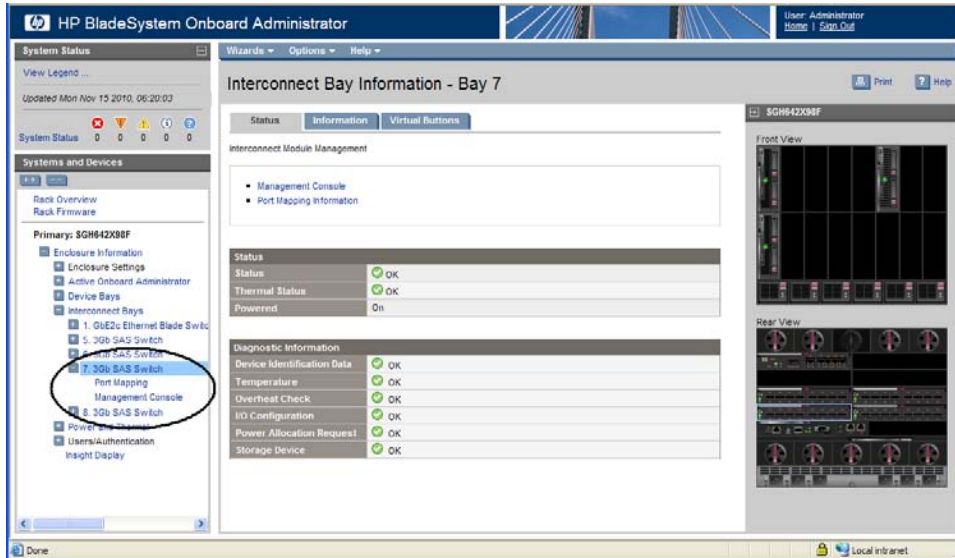
Accessing the VSM GUI

VSM is accessed through the Onboard Administrator (OA) application of the BladeSystem c-Class enclosure in which the switch is installed. (For the minimum supported OA version, see the 3Gb SAS BL Switch QuickSpecs.)

NOTE: To navigate directly to the VSM for a SAS switch, open the browser and enter the OA IP address or hostname followed by the interconnect variable. For example:
`https://10.10.1.254/interconnectX/` or `https://hostname/interconnectX/`,
where X specifies the interconnect bay number.

1. Install and connect the HP BladeSystem c-Class enclosure and the servers, controllers, switches, external storage enclosures, and other devices associated with your BladeSystem c-Class enclosure solution. These procedures are detailed in the user documents for each device.
For hardware compatibility information, supported operating system versions, and supported Internet browser versions, see the SAS BL Switch QuickSpecs. Review the QuickSpecs and verify that supported versions are installed on the devices.
2. Log in to Onboard Administrator for the BladeSystem c-Class enclosure.
 - a. Obtain and record the IP address or hostname assigned to the BladeSystem c-Class enclosure OA module. (The IP address or hostname may be recorded on worksheets provided with your system installation instructions.)
 - b. From a server or workstation with access to the system, open a browser and enter the OA address or hostname.
For example: `https://10.10.1.254` or `https://hostname`
 - c. Enter an OA username and password with administrative privileges, and then wait a few moments for OA to open.

3. In the OA Systems and Devices tree, expand Interconnect Bays, select the SAS BL Switch to manage, and click **Management Console** to access VSM.



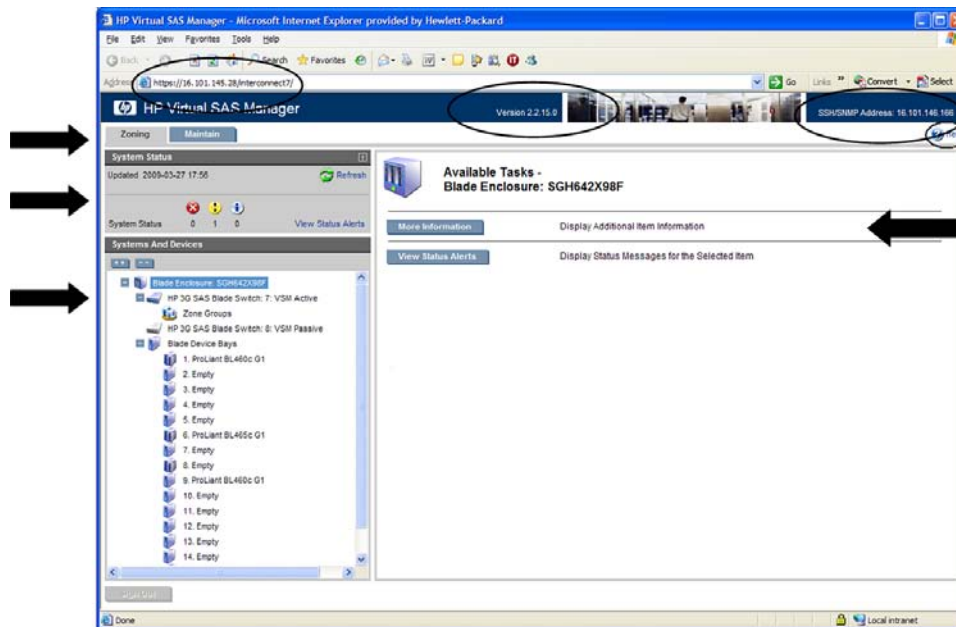
After a few moments, the VSM GUI is displayed.

NOTE: In dual-domain configurations with two switches in the same interconnect bay row of the HP BladeSystem c-Class enclosure, both switches can process I/O, but the VSM utility can be active on only one of the switches. Switch management status (Active or Passive) is shown in the VSM navigation tree (not the OA navigation tree). If you log in to the switch with the passive VSM and want to make any zoning configuration changes, you must exit VSM for that switch and log back in to the switch with the active VSM.

Page description

The VSM GUI page is divided as follows:

- **Tabs**—Immediately below the HP Virtual SAS Manager banner and at the top-left corner of the page, tabs are major groupings of VSM tasks.
 - Zoning tab—For creating and modifying hardware-based zone groups and granting servers access.
 - Maintain tab—For maintenance tasks, such as setting switch parameters and updating switch firmware.
- **System Status** section—At-a-glance system information.
- **Systems And Devices**—A navigation tree for selecting devices and accessing available tasks.
- **Task section**—Available task list for the selected device or data entry fields.






NOTE:

- In the browser `address` field, the IP address or URL of the VSM GUI associated with the selected switch is displayed.
 - In the center of the HP Virtual SAS Manager banner, the VSM firmware version is displayed.
 - At the far right of the HP Virtual SAS Manager banner, the IP address for VSM CLI access for the selected switch is displayed.
-

System status information

The **System Status** section displays the number and type of open status alerts.



Icon	Name	Description
	Critical	System is not operating properly
	Warning	Servicing is needed
	Informational	Helpful information

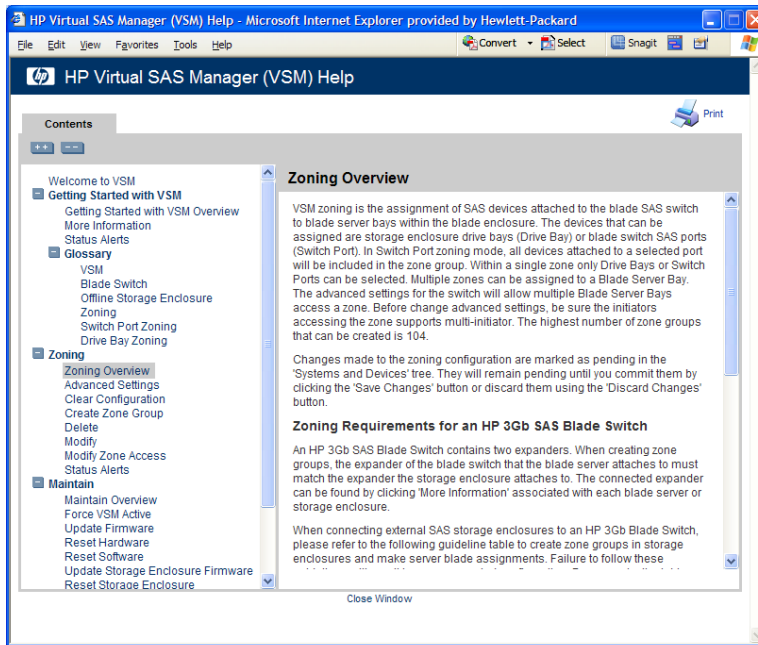
Status alert details may be viewed several different ways:

- *To view all status messages:* In the System Status section of the VSM page, click **View Status Alerts**.
- *To view status messages for a specific device:* In the navigation tree, select the device, and then click **View Status Alerts**.
- *To view a specific message:* Click the icon or message, whether it is in the navigation tree, an informational display, or elsewhere.

NOTE: Included in the System Status section of the VSM display, the **Refresh** option updates the information in the navigation tree.

Online help

Extensive online help is available. At any time, click the Help icon in the top right of the page. The following image is an example display of the online help.



Performing tasks

To perform any task in the VSM, observe the following key steps:

1. Select a tab at the top of the page.
2. Select a system component in the navigation tree on the left side of the page.
3. Select a task from the list on the right side of the page.
4. Enter the requested information.
5. Click **Save Changes**.

Configuring the switch (key steps)

After physically installing the switch (or switches) in the BladeSystem c-Class enclosure and cabling them to external SAS storage enclosures, do the following to initially configure the switches:

1. Go to the **Maintain** tab and enter all switch parameters. Key tasks include:
 - Enter network settings
 - Enter SNMP settings
 - Update switch firmware (if needed).
 - Update storage enclosure firmware (if needed).
2. Go to the **Zoning** tab and create zone groups and assign them to server device bays. Key tasks include:

NOTE: For firmware versions earlier than 2.0.0.0, no configuration tasks are available.

- Enable or disable Multi-initiator mode.
 - Create the zone groups.
 - For deployments with shared SAS storage enclosures and tape libraries, create switch-port zone groups.
 - For deployments with zoned SAS storage enclosures, create drive-bay zone groups.
 - Assign zone groups to servers.
3. Capture the configuration for safekeeping. HP strongly recommends this step, especially in single-domain configurations. (Available only in the VSM CLI.)

Configuration information is located as follows in this guide:

- Example procedures: [“Example: Configuring shared SAS storage enclosures”](#) (page 18)
- Example procedures: [“Example: Configuring zoned SAS storage enclosures”](#) (page 27)
- Field details [“Tasks in the VSM Zoning tab”](#) (page 34)
- Field details [“Tasks in the VSM Maintain tab”](#) (page 44)

2 Example: Configuring shared SAS storage enclosures

Configuring shared SAS storage enclosures includes the following tasks, *performed in sequence*:

1. Enabling Multi-initiator Mode.
2. Creating one or more switch port zone groups.
3. Assigning each zone group to each server device bay that needs access to the storage enclosures associated with that zone group.
4. Capturing the configuration for safekeeping. (Strongly recommended. Available only in VSM CLI.)
5. Configure disk drives in the storage enclosure into logical storage units (LUNs) using the management utility supported by the storage enclosure. Access to the LUNs is controlled through mappings or other presentation methods, which grant specific server device bays to specific LUNs.

NOTE:

- The MSA2000sa is an example of a shared SAS storage enclosure.
- The shared SAS storage enclosure includes a RAID array controller. A RAID controller is installed on the server, but not used for its RAID configuration capabilities.
- Use switch-port zone groups with shared SAS storage enclosures. The entire storage enclosure connected to that switch port is visible to all server device bays granted access to the zone group that includes that switch port.
- Each server device bay that needs access to the external storage must be assigned a zone group.
 - A server device bay can be assigned multiple zone groups.
 - A switch-port zone group can be assigned to more than one server device bay.
 - Unpopulated server device bays can be assigned a zone group.
- Disks in the enclosure are configured into logical storage units (LUNs) using one of the servers (or a designated management server) with access to the storage enclosure. Access to the LUNs is controlled through mappings or other presentation methods, which grant specific server device bays to specific LUNs.

The following example illustrates configuring a common shared SAS storage zoning configuration, with one large zone group, including all switch ports on a pair of switches. Assigning the zone group to each server device bay is also included. For more information about these tasks, see the following sections:

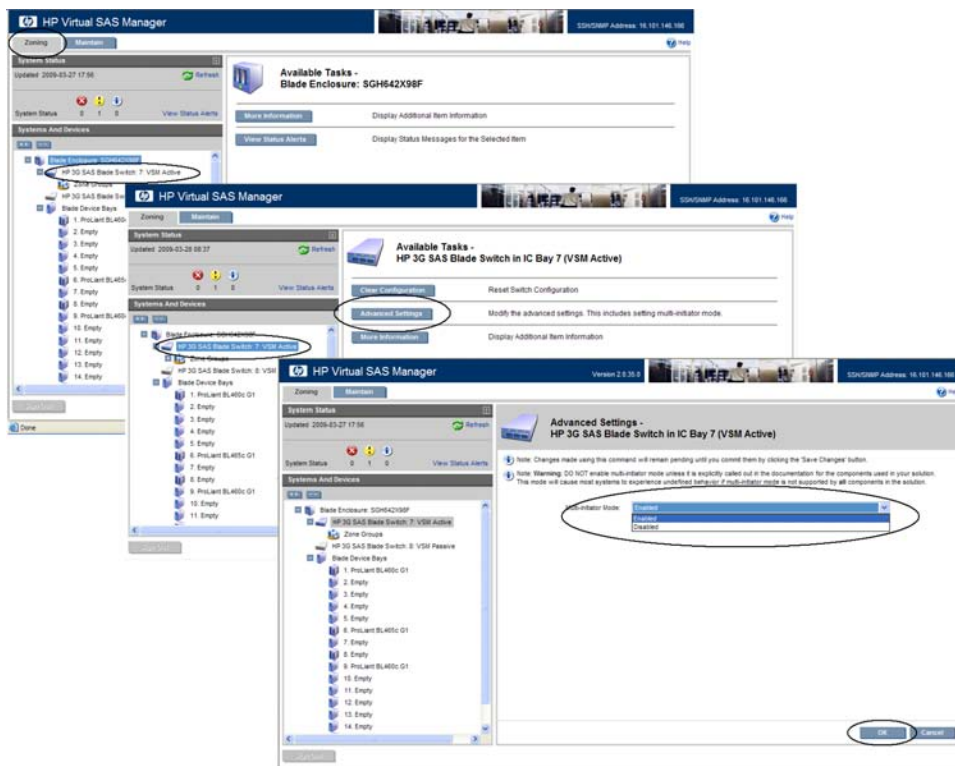
- [“Advanced Settings task” \(page 36\)](#)
- [“Create Zone Group task” \(page 37\)](#)
- [“Modify Zone Access task” \(page 43\)](#)

The following devices are used in this example:

Device type	Model
c-Class enclosure	c7000
Server blades	ProLiant BL 460c G1 and ProLiant BL 465c G1
SAS mezzanine cards	P700m
SAS switch blades	3Gb SAS BL Switch, installed in interconnect bays 7 and 8
External SAS storage enclosures	MSA2000sa

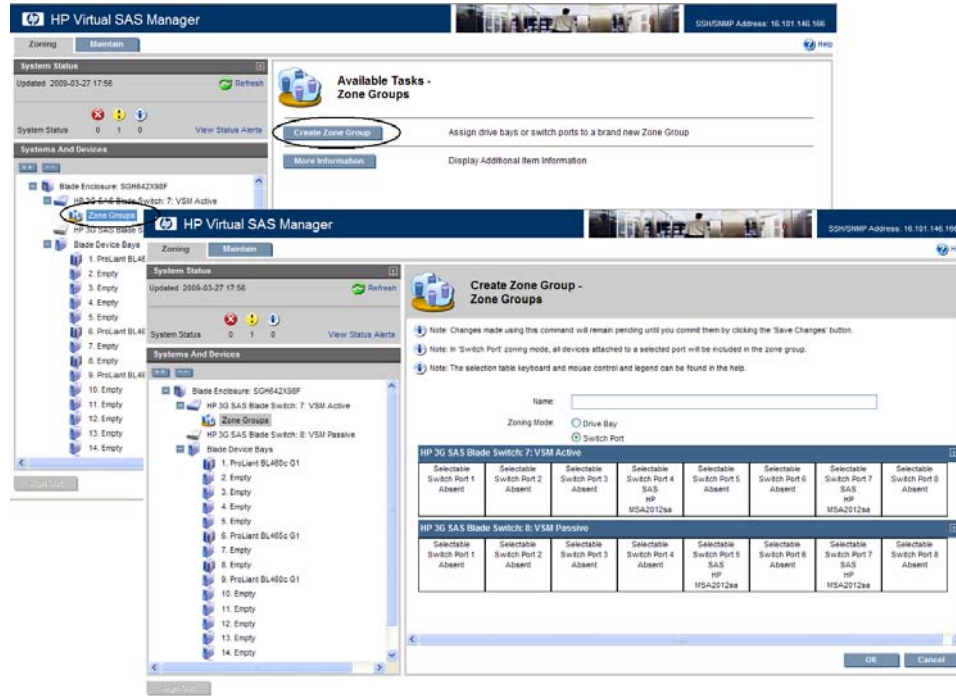
1. Change the Multi-initiator Mode setting to Enabled. This setting allows multiple servers to be assigned the same zone group and have access to the same storage enclosure.
 - a. Access VSM and select the **Zoning** tab.
 - b. Select the switch and click **Advanced Settings**.
 - c. When prompted, expand the Multi-initiator Mode drop-down box and change the setting to **Enabled**. Then, click **OK**.

NOTE: As shown in this example, if status alerts exist for an item selected in the navigation tree, the View Status Alerts button is displayed.



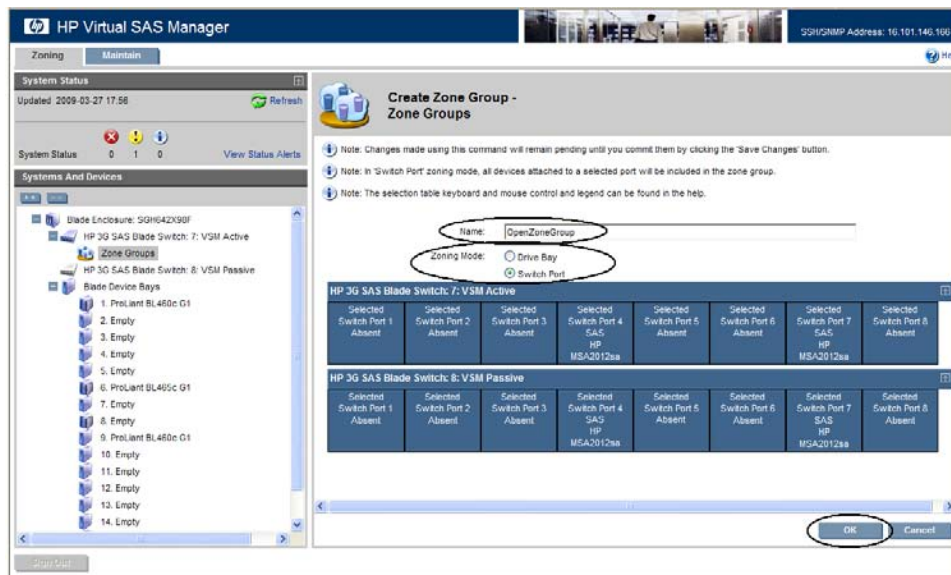
2. Create a switch port zone group.
 - a. In the navigation tree, select **Zone Groups** and click **Create Zone Group**.

NOTE: As shown in this example, when the Switch Port radio button is selected, information about devices connected to the switch ports is included in the display.



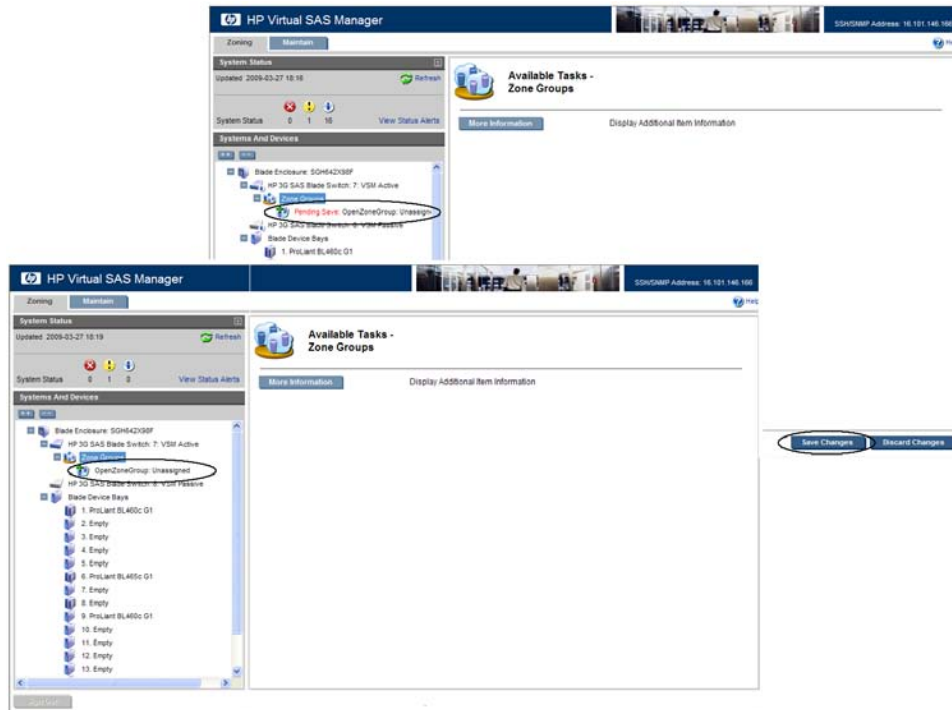
- b. Enter a Name for the zone group, select **Switch Port**, and click each port on the pair of switches to be included in the zone group. The following example creates one large zone group that includes all ports on the pair of switches. Then, click **OK**.

NOTE: As shown in this example, unused switch ports can be included in a zone group.

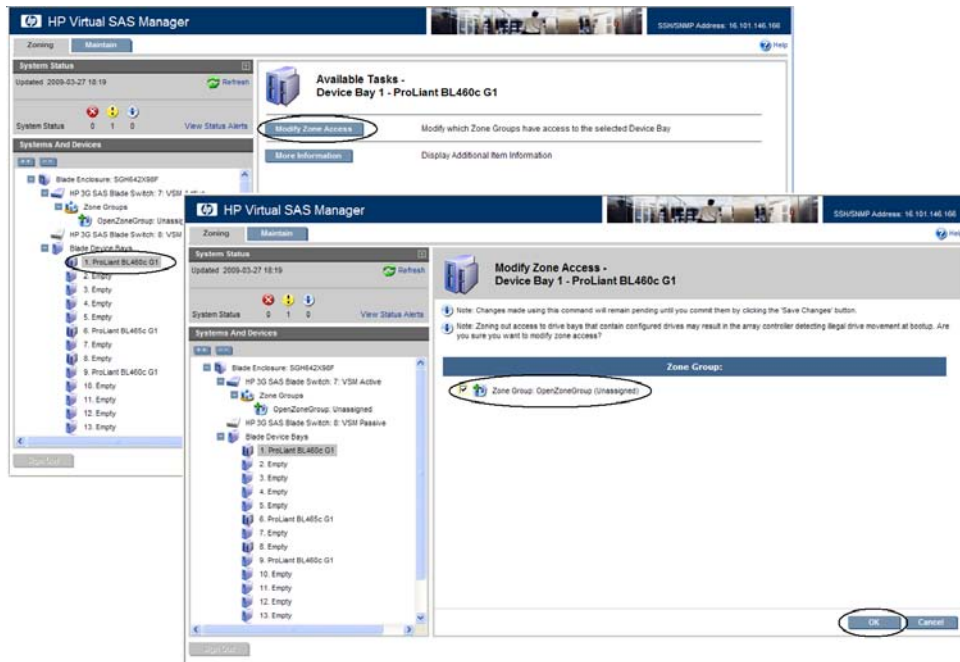


- c. After a moment, the display is refreshed, with the new, unsaved zone group displayed in the navigation tree. Click **Save Changes**. When the save is completed, the entry in the navigation tree is updated and shows that it is not assigned to any server device bays.

NOTE: Until a server device bay is assigned a zone group, it cannot access the storage.



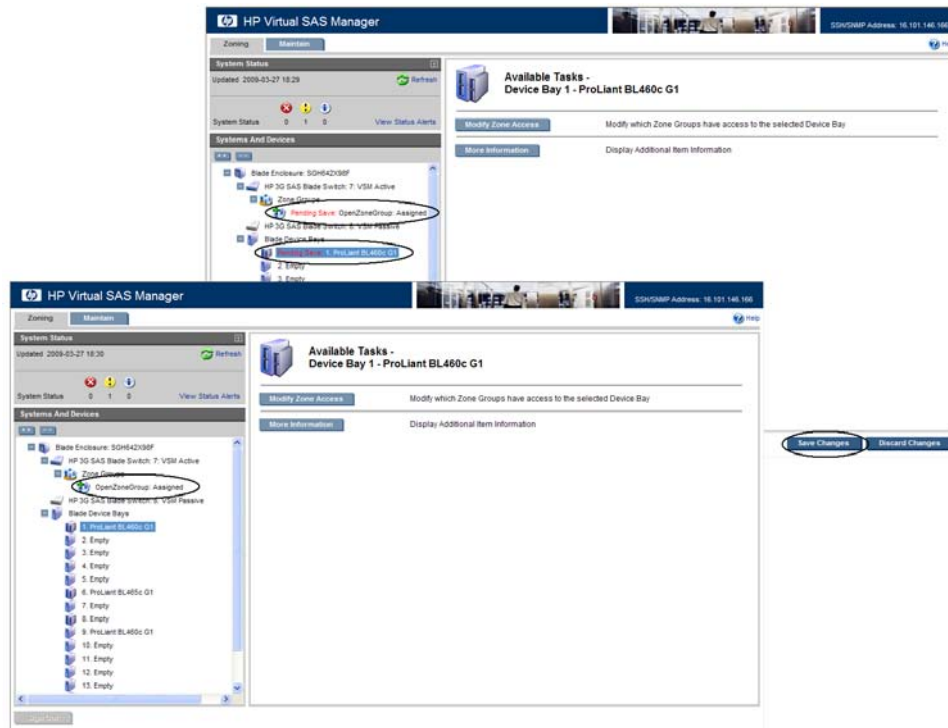
3. Assign the zone group to a server device bay that needs access.
 - a. In the navigation tree, select a server device bay that needs access to the storage associated with this zone group, and then click **Modify Zone Access**.
 - b. Check the box corresponding to the zone group that you want to assign to the server device bay and click **OK**.



NOTE: All available zone groups are displayed. As shown in this example, only one large zone group was created, so it is the only zone group displayed.

- c. After a moment, the display is refreshed. All items affected by the change (the zone group and the server device bay) are marked in the navigation tree. Click **Save Changes**.
When the save is complete, the entry in the navigation tree is updated.

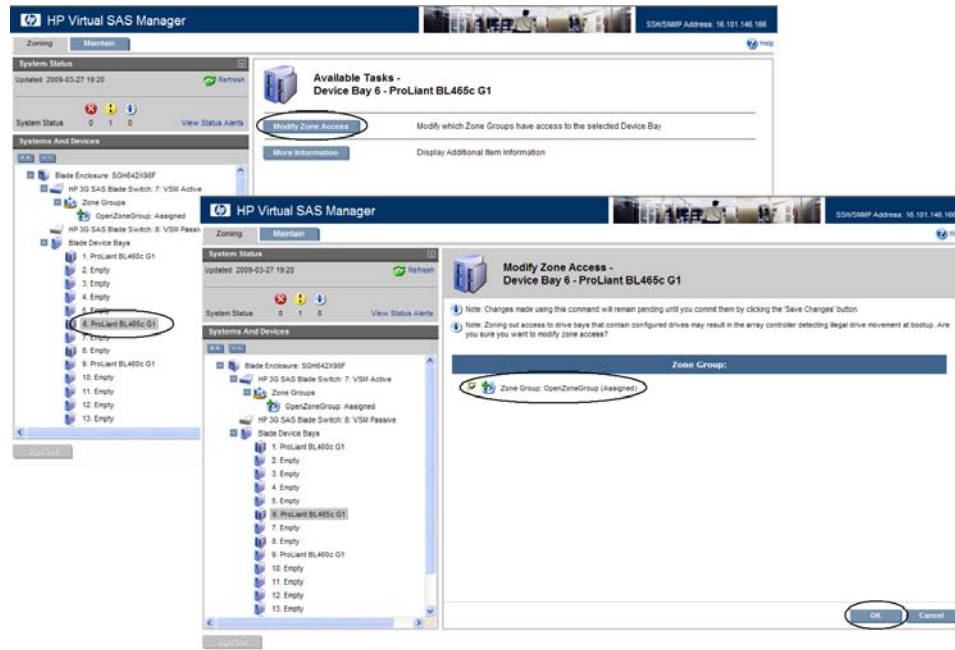
NOTE: The zone group entry in the navigation tree now states "Assigned".



NOTE: For illustration purposes, in this example, **Save Changes** was performed after each configuration task. When performing multiple configuration tasks, HP recommends completing all tasks and then committing all pending changes at one time.

4. Assign the zone group to another server device bay that needs access.
 - a. In the navigation tree, select another server device bay that needs to access the storage associated with this zone group, click **Modify Zone Access**, and then check the box for the zone group and click **OK**.

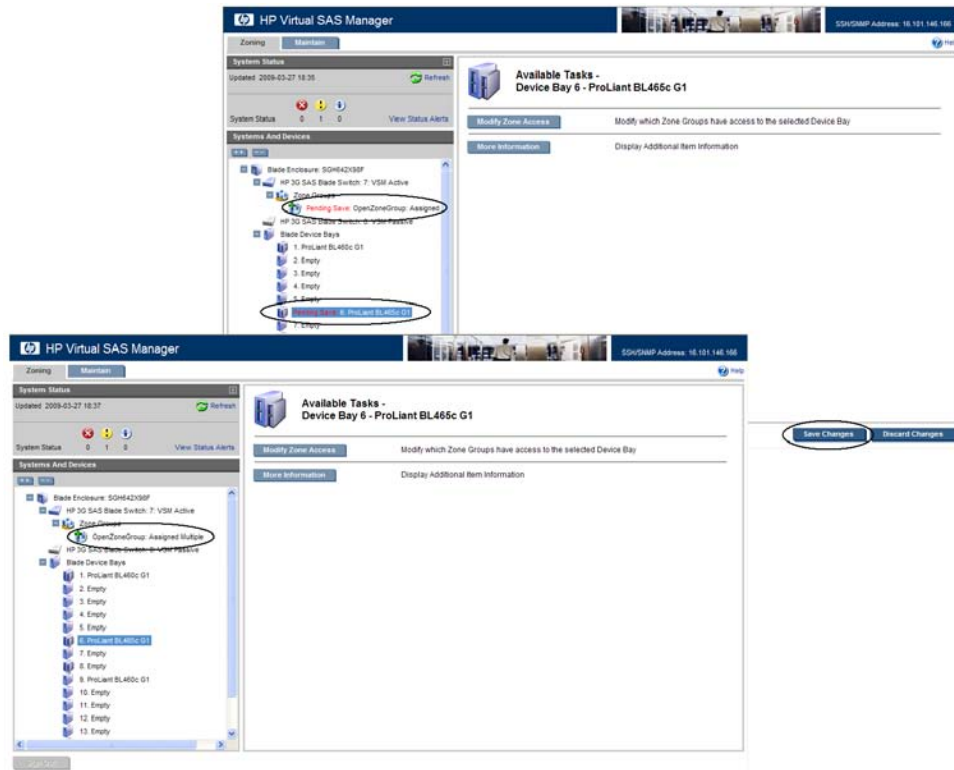
NOTE: Because this is switch-port based zoning for shared SAS storage enclosures with Multi-initiator mode enabled, the already assigned zone group is displayed and may also be assigned to this server device bay.



- b. All items affected by the change (the zone group and the server device bay) are marked in the navigation tree. Click **Save Changes**.

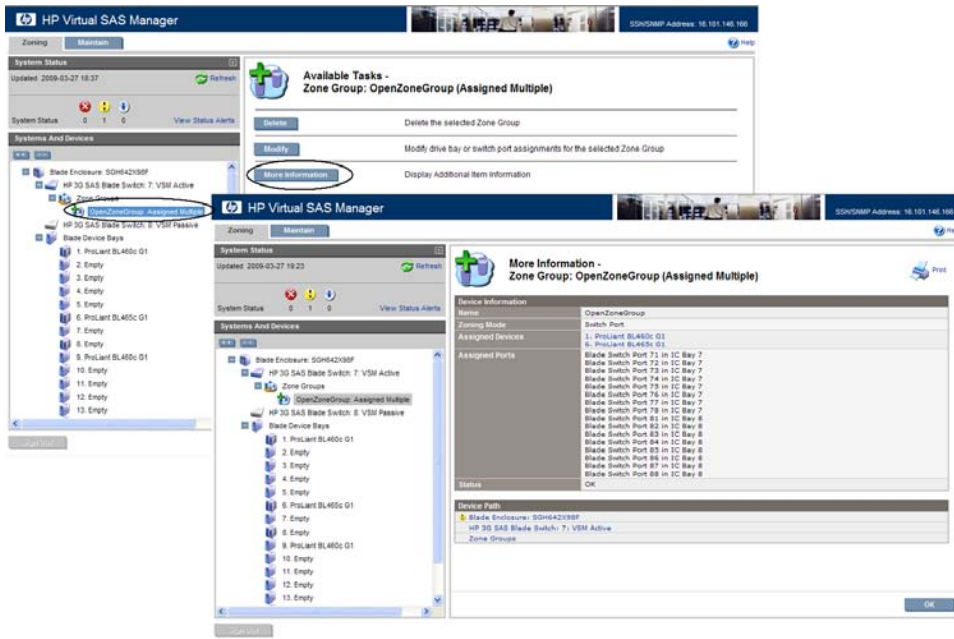
When the save is complete, the entry in the navigation tree is updated.

NOTE: The zone group entry in the navigation tree now states that it is assigned to multiple server device bays.



5. As needed, repeat step 4 for each server device bay (populated or unpopulated). This ensures that when servers are installed in the unpopulated device bays, they can immediately access the storage.

6. To see details about the zone group, select the zone group in the navigation tree and click **More Information**. As shown in this example, the display for the zone group shows that the servers in device bays 1 and 6 have been assigned this zone group.



7. After all server device bays have been granted access to the zone group, the zoning setup is complete.
 - a. In the VSM CLI, capture the configuration for safekeeping. (Strongly recommended)
 - b. Proceed to the user documents for the storage enclosure and configure the storage into logical units (LUNs).

3 Example: Configuring zoned SAS storage enclosures

Configuring zoned SAS storage enclosure includes the following tasks, *performed in sequence*:

1. Disabling Multi-initiator Mode.

NOTE: If tape autoloaders/libraries or shared SAS storage enclosures are also connected to the switch and multiple server device bays will need access to the same switch-port zone groups, Multi-initiator Mode must be Enabled.

2. Creating one or more drive-bay zone groups.
 3. Assigning each zone group to the server device bay that needs access to the storage associated with that zone group.
 4. Capturing the configuration for safekeeping. (Strongly recommended. Available only in VSM CLI.)
 5. Configuring disk drives in the storage enclosure into logical storage units (LUNs) using the management utility supported by the storage enclosure.
-

NOTE:

- The MDS600 is an example of a zone SAS storage enclosure.
 - A RAID controller is installed in the server and is used for its RAID configuration capabilities. The zoned SAS storage enclosure does not include a RAID array controller.
 - Use drive-bay zone groups to configure zoned SAS enclosures, so that the group of drive bays is presented to the server device bay as if it was directly connected to that server device bay.
 - Each server device bay that needs access to the external storage must be assigned a zone group.
 - A server device bay can be assigned multiple zone groups.
 - A drive-bay zone group can be assigned to only one server device bay.
 - Unpopulated enclosure server device bays can be assigned zone groups.
 - The disks in the enclosure are configured into logical storage units (LUNs) using host based configuration utilities (such as ACU or ACU CLI) running on the server with access to the zone group containing the drive bays.
-

The following example illustrates creating a zone group of 10 disk drive bays and then assigning that zone group to a server bay. For more information about these tasks, see the following sections:

- [“Advanced Settings task” \(page 36\)](#)
- [“Create Zone Group task” \(page 37\)](#)
- [“Modify Zone Access task” \(page 43\)](#)

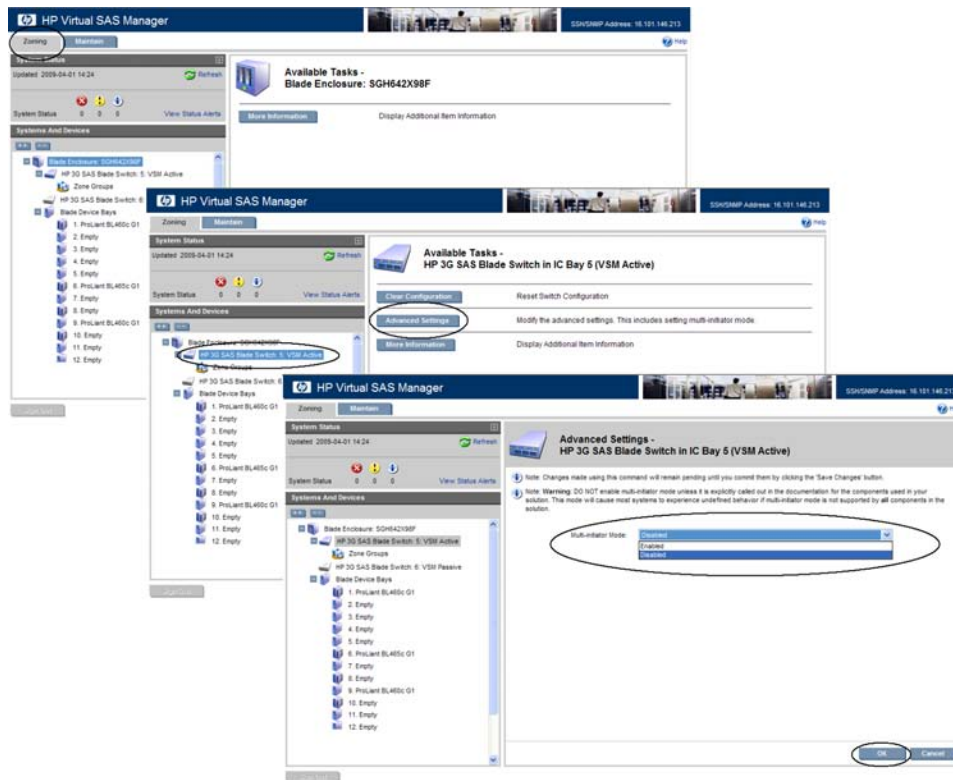
The following devices are used in this example:

Device type	Model
c-Class enclosure	c7000
Server blades	ProLiant BL 460c G1 and ProLiant BL 465c G1
SAS mezzanine cards	P700m
SAS switch blades	3Gb SAS BL Switch, installed in interconnect bays 5 and 6
External SAS storage enclosures	MDS600 storage enclosure

1. Change the Multi-initiator Mode setting to Disabled. This setting controls access to the zone group, permitting only one server to access each zone group and its associated disk drives.

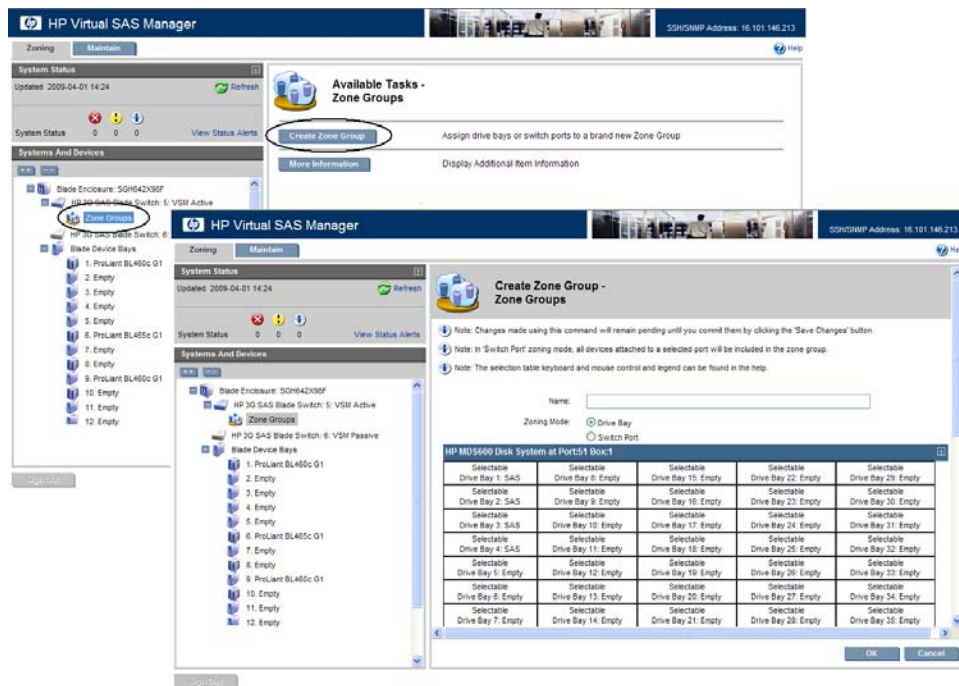
① **IMPORTANT:** If tape autoloaders/libraries or shared SAS storage enclosures are also connected to the switch and multiple server device bays will need access to the same switch-port zone groups, Multi-initiator Mode must be Enabled.

- a. Access VSM and select the **Zoning** tab.
- b. Select the switch and click **Advanced Settings**.
- c. When prompted, expand the Multi-initiator Mode drop-down box and change the setting to **Disabled**.



2. Create a drive-bay zone group.
 - a. In the navigation tree, select **Zone Groups** and click **Create Zone Group**.

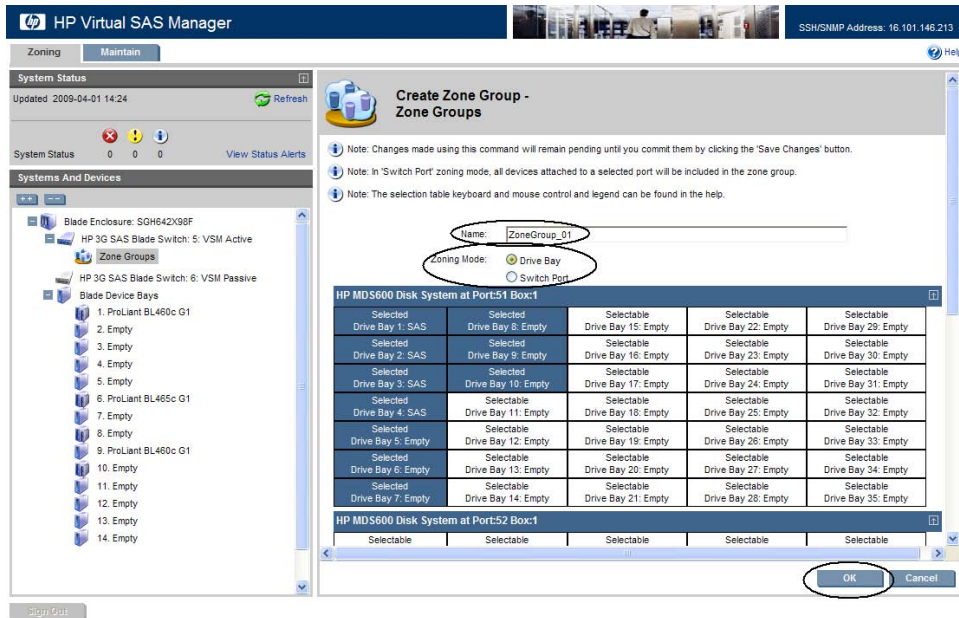
NOTE: As shown in this example, when the Drive Bay radio button is selected, discovered information about each drive bay in each connected storage enclosure is included in the display.



NOTE: As shown in this example, one MDS600 storage enclosure is connected to the 3Gb SAS BL switch. Displayed port information for the MDS600 indicates the cabling connections. For example, Port 51 indicates that one MDS600 drawer is connected to port 1 of the switch in interconnect bay 5. Port 52 indicates that the other MDS600 drawer is connected to port 2 of the switch in interconnect bay 5.

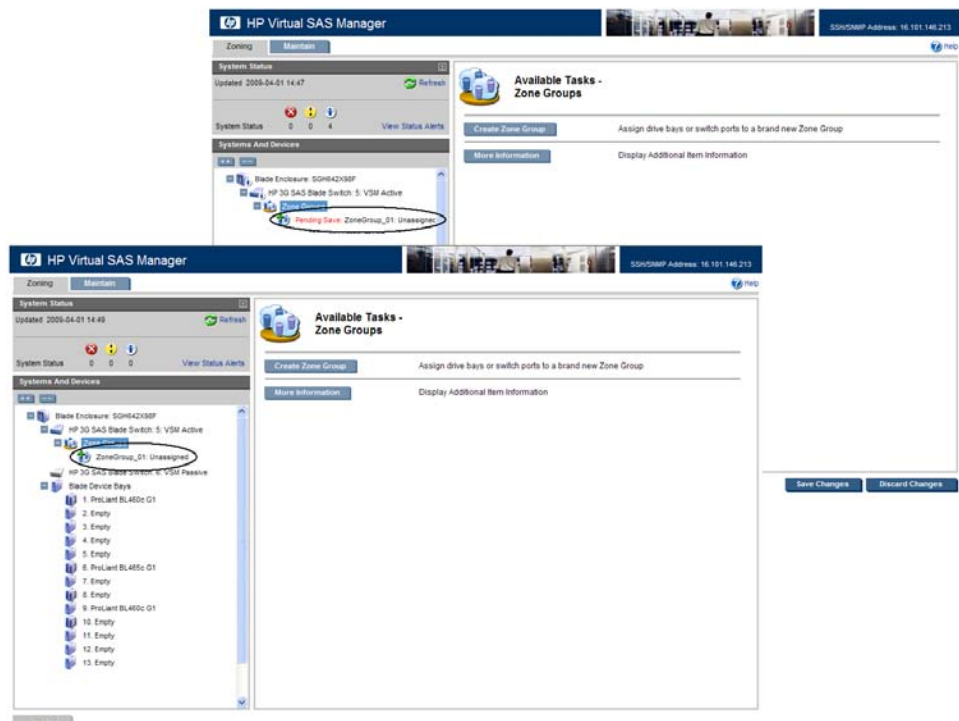
- b. Enter a Name for the zone group, select **Drive Bay**, and select drive bays to be included in the zone group. The following example creates one zone group that includes 10 disk drives. Then, click **OK**.

NOTE: As shown in this example, unpopulated drive bays can be included in a zone group.



- c. After a moment, the display is refreshed, with the new, unsaved zone group displayed in the navigation tree. Click **Save Changes**. After the save is completed, the entry in the navigation tree is updated and shows that it is not assigned to any server device bays.

NOTE: Until a server device bay is assigned a zone group, it cannot access the storage.

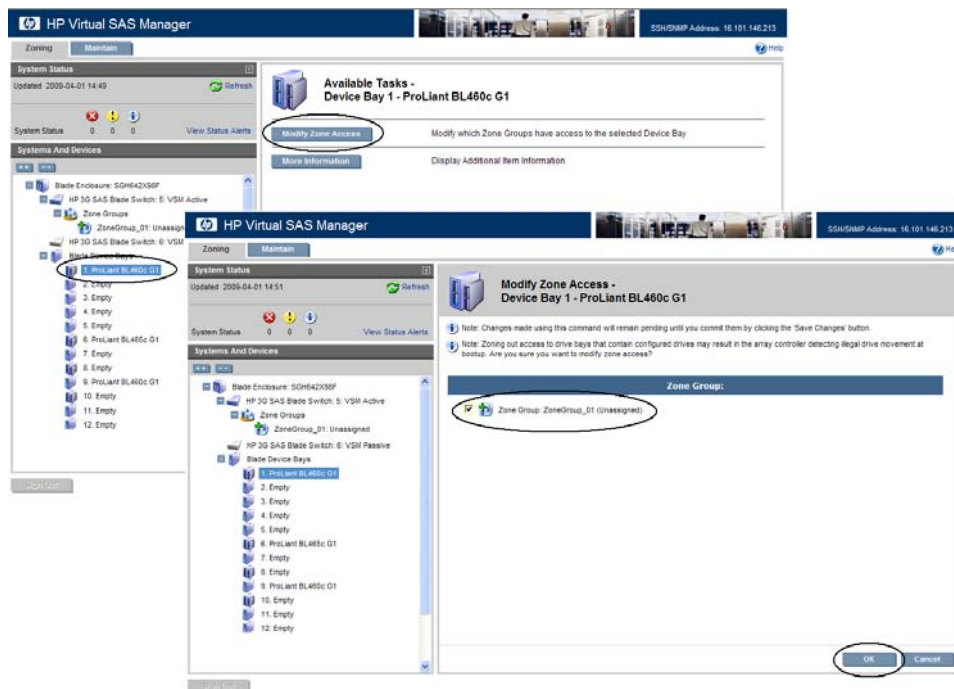


3. Assign the zone group to the server device bay that needs access.

① **IMPORTANT:** For drive-bay zone groups, restrictions apply:

- Server device bays 1–8: Can only be assigned zone groups associated with switch ports 1–4.
- Server device bays 9–16: can only be assigned zone groups associated with switch ports 5–8.

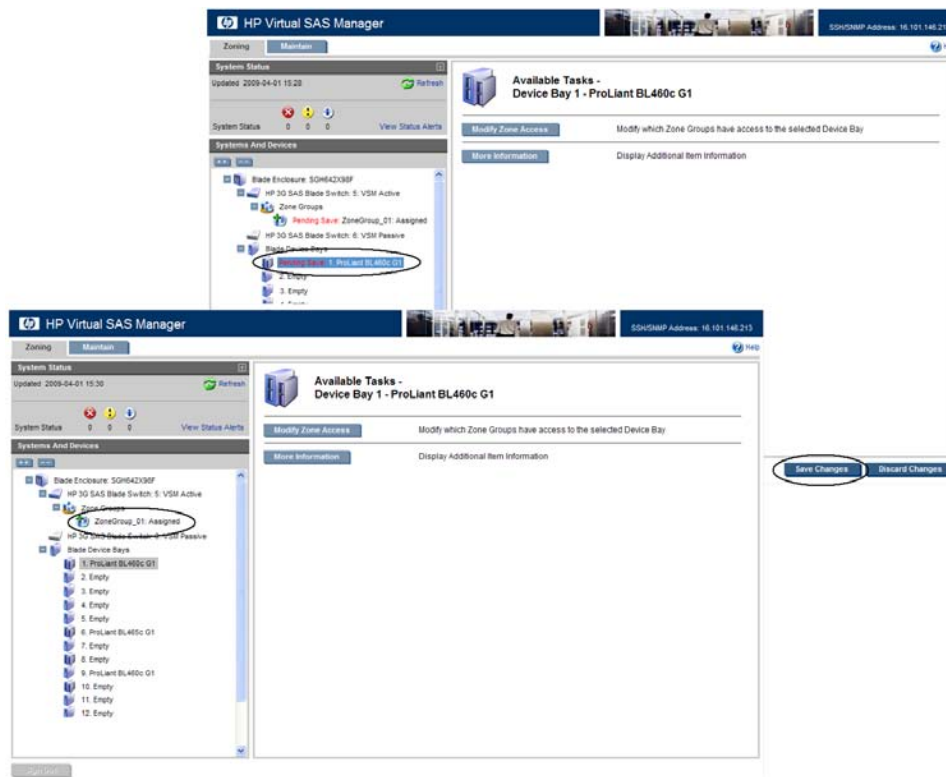
- a. In the navigation tree, select the server device bay that needs access to the storage associated with this zone group, and then click **Modify Zone Access**.
- b. Check the box corresponding to the zone group that you want to assign to the server device bay and click **OK**. (If the Multi-initiator mode is disabled, only unassigned zone groups are displayed. If a zone group has already been assigned to a server device bay, it is not displayed.)



NOTE: All available zone groups are displayed. As shown in this example, only one zone group was created, so it is the only zone group displayed.

- c. After a moment, the display is refreshed. All items affected by the change (the zone group and the server device bay) are marked in the navigation tree. Click **Save Changes**. When the save is complete, the entry in the navigation tree is updated.

NOTE: The zone group entry in the navigation tree now states “Assigned”.

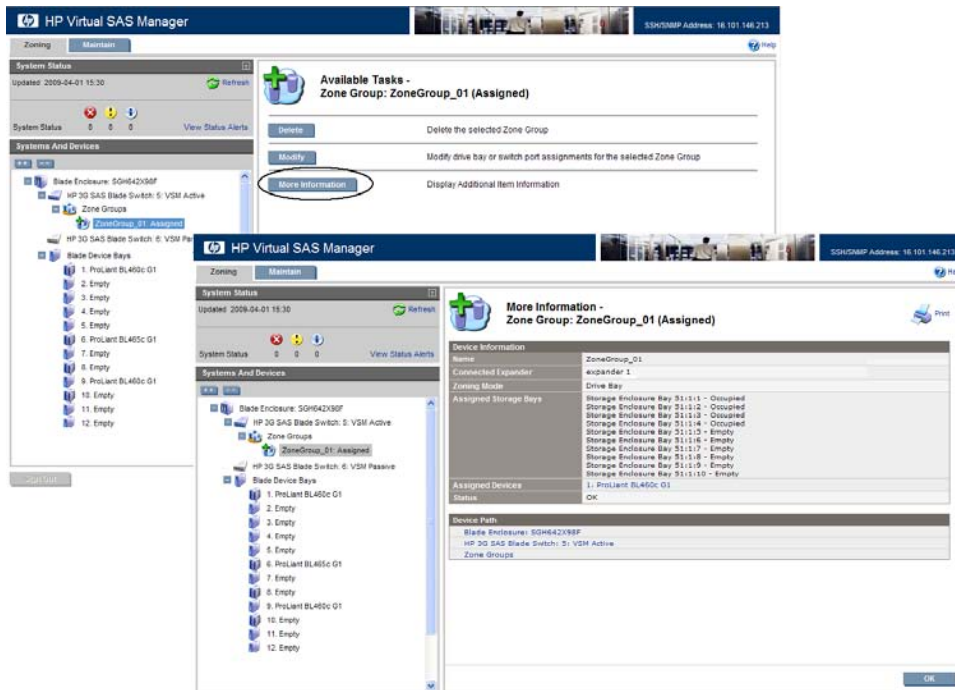


NOTE: For illustration purposes, in this example, **Save Changes** was performed after each configuration task. When performing multiple configuration tasks, HP recommends completing all tasks and then committing all pending changes at one time.

4. Repeat steps 2 and 3 to create additional zone groups and assign them to server device bays.

5. To see details about the zone group, select the zone group in the navigation tree and click **More Information**.

As shown in this example, the display for the zone group shows that the server device bay 1 is assigned this zone group.



6. After all zone groups are created and assigned to server device bays, the switch and the zoning setup is complete.
 - a. In the VSM CLI, capture the configuration for safekeeping. (Strongly recommended)
 - b. Proceed to the user documents for the storage enclosure to configure the storage into logical units (LUNs).

4 Tasks in the VSM Zoning tab

After selecting a component in the navigation tree, a unique task list for that component is displayed. The following table lists the possible tasks for each system component.

System component	Available tasks	Where documented
Blade Enclosure	More Information	" More Information task " (page 35)
HP 3G SAS Blade Switch (VSM Active)	Clear Configuration	" Clear Configuration task " (page 35)
	Advanced Settings	" Advanced Settings task " (page 36)
	More Information	
HP 3G SAS Blade Switch (VSM Passive)	More Information	
Zone Groups	Create Zone Group	" Create Zone Group task " (page 37)
	More Information	
Zone Group	Delete	" Delete task " (page 42)
	Modify	" Modify task " (page 41)
	More Information	
Blade Device Bays	More Information	
Blade Server	Modify Zone Access	" Modify Zone Access task " (page 43)
	More Information	

More Information task

To view detailed information about a device, select the device in the navigation tree and click **More Information**.

NOTE:

- The More Information task is available for each component in the navigation tree, in both the Zoning and the Maintain tabs.
 - If there are any status alerts for the device, they are included in the displayed information.
-

Clear Configuration task

Use this option to delete all user-defined zone groups and server device bay assignments.

- ① **IMPORTANT:** If zoned SAS storage enclosures are connected, before clearing the configuration, logical units associated with enclosures connected to the switch must be deleted. If a deleted zone group has disk drives in bays that are configured as part of a logical unit, there may be I/O problems and the controller may send error messages to the system logs about an illegal drive movement.
-

To perform this task, select the switch in the navigation tree, and click **Clear Configuration**.

NOTE:

- To clear information about a single zone group, use the Delete option. For more information, see [“Delete task” \(page 42\)](#).
-

Advanced Settings task

The Multi-initiator mode setting controls whether more than one server device bay can be assigned the same zone group.

To perform this task, select the active switch in the navigation tree, and click **Advanced Settings**.

Options for this task include:

- **Disabled**—(Default) Used when only zoned SAS storage enclosures are connected to the switch. When this option is selected, a zone group can be assigned to only one server device bay.
- **Enabled**—Used when shared SAS storage enclosures or tape autoloader/libraries are connected to the switch. When this option is selected, a zone group can be assigned to multiple server device bays.

NOTE:

- In dual-domain switch configurations (two switches installed in the same interconnect bay row of the HP BladeSystem c-Class enclosure), a change to this multi-initiator setting on the active management switch is automatically propagated to the redundant (passive) switch.
- When a tape autoloader or library is included in the solution, multi-initiator mode must be enabled, so that multiple servers can be assigned the zone group that includes the tape device. When using a tape device with zoned SAS storage enclosures, you must:
 - Create a switch-port zone group for the port connected to the tape device.
 - Assign that zone group to all server device bays that need access to the tape device.
 - Create drive-bay zone groups for the disk drive bays in the storage enclosures.
 - Assign each drive-bay zone group to the server device bay that needs access to those disk drives. Use caution to not assign the same drive-bay zone group to more than one server device bay.

Create Zone Group task

Zone groups allocate resources for device load balancing purposes and for selectively allowing access to data. There are two types of zone groups:

- Drive-bay zone groups—Group together disk drive bays, which can be chosen from across multiple storage enclosures. Server device bays assigned this type of zone group have access to the disk drive bays included in the zone group, as if they are directly connected to those servers. Zoned SAS storage enclosures such as the MDS600 use drive-bay zoning. For more information, see “Drive-bay zone groups” (page 37).
- Switch-port zone groups—Group together one or more SAS ports on the switch. Server device bays assigned this type of zone group have access to the array enclosures or tape devices connected to the ports included in the zone group. Tape libraries and shared SAS storage enclosures such as those using the MSA2000sa use switch-port zoning. All tape drives in a tape device will be accessible to any server that has access to the zone group. All LUNs in the array enclosure will be accessible to the assigned servers, unless controlled through the storage management utility for the array enclosure. For more information, see “Switch-port zone groups” (page 39).

Drive-bay zone groups

❗ **IMPORTANT:** The maximum supported number of drive bay zone groups is 104.

To perform this task, expand the display for the active switch in the navigation tree, select **Zone Group**, and then click **Create Zone Group**.

The screenshot shows the 'Create Zone Group' dialog in the HP Virtual SAS Manager. The 'Name' field is set to 'ZoneGroup_01'. The 'Zoning Mode' is set to 'Drive Bay'. There are two tables of drive bays, one for 'HP MDS600 Disk System at Port:51 Box:1' and one for 'HP MDS600 Disk System at Port:52 Box:1'. The drive bays are listed with their status (Selected, Empty, or Selectable).

HP MDS600 Disk System at Port:51 Box:1				
Selected Drive Bay 1: SAS	Selected Drive Bay 8: Empty	Selectable Drive Bay 15: Empty	Selectable Drive Bay 22: Empty	Selectable Drive Bay 29: Empty
Selected Drive Bay 2: SAS	Selected Drive Bay 9: Empty	Selectable Drive Bay 16: Empty	Selectable Drive Bay 23: Empty	Selectable Drive Bay 30: Empty
Selected Drive Bay 3: SAS	Selected Drive Bay 10: Empty	Selectable Drive Bay 17: Empty	Selectable Drive Bay 24: Empty	Selectable Drive Bay 31: Empty
Selected Drive Bay 4: SAS	Selectable Drive Bay 11: Empty	Selectable Drive Bay 18: Empty	Selectable Drive Bay 25: Empty	Selectable Drive Bay 32: Empty
Selected Drive Bay 5: Empty	Selectable Drive Bay 12: Empty	Selectable Drive Bay 19: Empty	Selectable Drive Bay 26: Empty	Selectable Drive Bay 33: Empty
Selected Drive Bay 6: Empty	Selectable Drive Bay 13: Empty	Selectable Drive Bay 20: Empty	Selectable Drive Bay 27: Empty	Selectable Drive Bay 34: Empty
Selected Drive Bay 7: Empty	Selectable Drive Bay 14: Empty	Selectable Drive Bay 21: Empty	Selectable Drive Bay 28: Empty	Selectable Drive Bay 35: Empty

HP MDS600 Disk System at Port:52 Box:1				
Selectable	Selectable	Selectable	Selectable	Selectable

Options for this task include:

- **Name**—Type a name to assign to the zone group (must be unique, up to 16 characters, with no spaces). HP recommends that the zone group name include the bay number or name of

the server that needs access the zone group. An effective naming strategy will help manage the assignment of drive-bay zone groups to servers.

- **Zoning Mode**—Select **Drive Bay**.
- **Drive bays**—In the grid representing the storage enclosures, select the disk drive bays to be included in the zone group.

To select a drive bay, click an available (white) drive bay. (The bay status is automatically updated, changing the color from white to blue.) To clear a selection, click the selected (blue) drive bay. (The bay status is automatically updated, changing the color from blue to white).

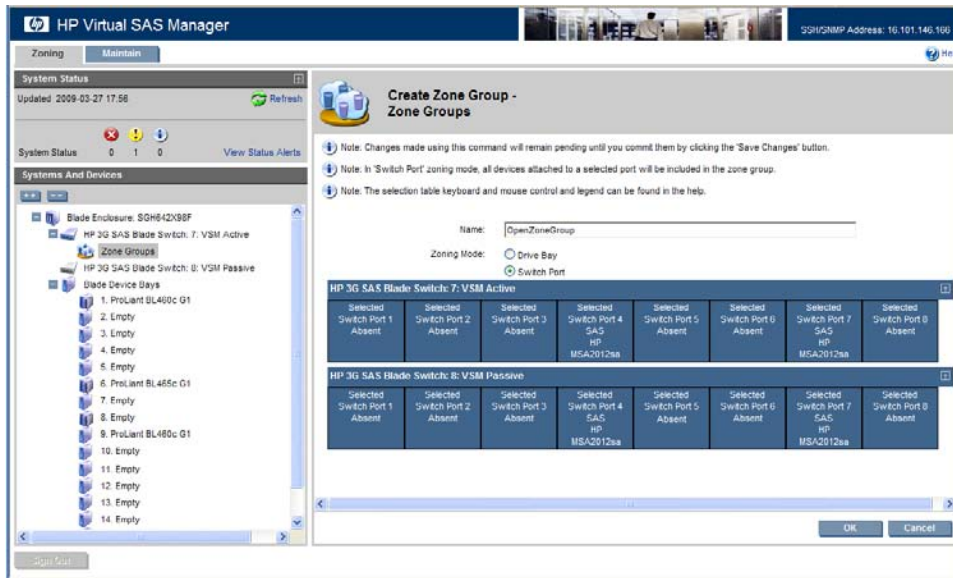
Color	Status
White	Selectable—Not yet assigned to a zone group and can be added to this zone group.
Blue	Selected—Selected in this session or already a member of this zone group.
Gray	Not Selectable—Assigned to a different zone group. Can not be selected.

NOTE:

- To expand or contract the display for each storage enclosure, click the arrow at the far right of the display.
 - In addition to the mouse, the tab, arrow keys, and space bar can be used to select or clear drives from the zone group.
 - Information about the drive bay is shown in the display. For example, if the bay is populated with a disk drive, information about the disk drive type is presented.
 - Empty drive bays can be assigned to a zone group. This allows you to set up zone groups for the storage enclosures and populate the bays with disk drives at a later time.
 - A drive bay can belong to only one zone group.
 - When selecting drive bays to be included in a zone group, consider your plans for creating logical units (LUNs) from those drives.
 - The following words may be displayed in the navigation tree by the zone group:
 - Pending Save—until the configuration is saved.
 - Unassigned—until a server device bay is granted access to the zone group.
 - To assign this zone group to a server device bay, select the server device bay in the navigation tree and click **Modify Zone Access**. For more information, see [“Modify Zone Access task” \(page 43\)](#)
-

Switch-port zone groups

To perform this task, expand the display for the active switch in the navigation tree, select **Zone Group**, and then click **Create Zone Group**.



Options for this task include:

- **Name**—Type a name to assign to the zone group (must be unique, up to 16 characters, with no spaces).
- **Zoning Mode**—Select **Switch Port**.
- **Switch ports**—In the grid representing the switches, select the ports to be included in the zone group.

To select a switch port, click an available (white) port. (The port status is automatically updated, changing the color from white to blue.) To clear a selection, click the selected (blue) port. (The port status is automatically updated, changing the color from blue to white).

Color	Status
White	Selectable—Not yet assigned to a zone group and can be added to this zone group.
Blue	Selected—Selected in this session or already a member of this zone group.
Gray	Not Selectable—Assigned to a different zone group or attached to storage enclosures without port-based zoning capabilities. Can not be selected.

NOTE:

- To expand or contract the display for each switch, click the arrow at the far right of the display.
 - In addition to the mouse, the tab, arrow keys, and space bar can be used to select or clear drives from the zone group.
 - Information about the switch port is included in the display. If the port is connected to a device, information about the device is displayed. If a tape device is connected to a switch port, information is shown only for the first tape drive.
 - In dual-domain (redundant switch) environments, select ports on both switches, to provide access through both switches in the pair.
 - Switch ports without attached storage enclosures can be assigned to a zone group. This allows you to pre-configure the zone groups and connect additional storage enclosures at a later time.
 - The following words may be displayed in the navigation tree by the zone group:
 - Pending Save—until the configuration is saved.
 - Unassigned—until a server device bay is granted access to the zone group.
 - To assign this zone group to a server device bay, select the server device bay in the navigation tree and click **Modify Zone Access**. For more information, see [“Modify Zone Access task”](#) (page 43)
-

Modify task

Use this task to make changes to an existing zone group, including changing the zone group name, and adding or removing disk drives or ports.

- ⓘ **IMPORTANT:** When using zoned SAS storage enclosures, before deleting disk drives from a zone group, logical units associated with disk drives in that zone group must be deleted. If the zone group has disk drives in bays that are configured as part of a logical unit, there may be I/O problems and the controller may send error messages to the system logs about an illegal drive movement.

To perform this task, expand the display for the active switch in the navigation tree, select a zone group, and then click **Modify**.

Options for this task include:

- **Name**—Type the new name for the zone group (must be unique, up to 16 characters, no spaces).
- **Zoning Mode**—Select Switch Port or Drive Bay to change the zoning mode.
- **Switch ports or drive bays**—Depending on the type of zone group, select the ports or drive bays to add or remove them from the zone group. To add an item to the zone group, click an available (white) item. (The status is automatically updated, changing the color from white to blue.) To remove an item from the zone group, click the already included (blue) item. (The status is automatically updated, changing the color from blue to white).

Color	Status
White	Selectable—Not yet assigned to a zone group and can be added to this zone group.
Blue	Selected—Selected in this session or already a member of this zone group.
Gray	Not Selectable—Can not be selected.

NOTE:

- To expand or contract the display, click the arrow at the far right of the display.
- For zoned SAS storage enclosures, if populated drive bays are added to a zone group, they will now be available for configuration and use with the array configuration utility.

Delete task

Use this task to delete an existing zone group. After the zone group is deleted, the drive bays or ports associated with the deleted zone group will be available for selection and inclusion in a different or new zone group.

-
- ⓘ **IMPORTANT:** When using zoned SAS storage enclosures, before deleting a zone group, logical units associated with disk drives in that zone group must be deleted. If a deleted zone group has disk drives in bays that are configured as part of a logical unit, there may be I/O problems and the controller may send error messages to the system logs about an illegal drive movement.
-

To perform this task, expand the display for the active switch in the navigation tree, select a zone group and click **Delete**.

NOTE:

- To delete ALL zone groups, use the Clear Configuration option. For more information, see [“Clear Configuration task” \(page 35\)](#)
-

Modify Zone Access task

For each server device bay, use this task to grant or remove access to a zone group. This task is displayed only if zone groups have already been created (“[Create Zone Group task](#)” (page 37))

ⓘ **IMPORTANT:**

- Depending on the BladeSystem c-Class enclosure model, server type, mezzanine slot used, BladeSystem server device bay, and BladeSystem interconnect bay, zone groups assigned to a server must be associated with storage enclosures connected to switch ports 1–4 or 5–8. Failure to follow these guidelines will result in an unsupported configuration.
- Before assigning a zone group to a server device bay, the server blades may need to be taken offline. Restart them after completing the assignments and saving all changes in the VSM interface.
- For more information, see “[Zoning requirements and device mappings](#)” (page 7).

To perform this task, expand the Blade Device Bays in the navigation tree and select a server device bay. Then click **Modify Zone Access**.

From the displayed list of zone groups, check or clear the zone groups that this server device bay can access.

NOTE:

- The zone groups that are displayed will differ depending on the Multi-initiator mode setting:
 - If Multi-initiator mode is *Enabled*, all zone groups are displayed, allowing multiple server device bays to be assigned the same zone group (used for configurations that include shared SAS storage enclosures or tape devices).
 - If the multi-initiator mode is *Disabled*, only unassigned zone groups are displayed, permitting a zone group to be assigned to only one server device bay. If a zone group is already assigned to a different server device bay, it is not displayed.
- The status of each zone group is included in the display:
 - **Assigned**— Already assigned to one server device bay.
 - **Assigned Multiple**— Already assigned to more than one server device bay.
 - **Unassigned**— Not yet assigned to a server device bay.
 - **This is an unsupported configuration**— The assignment does not obey zoning rules. For drive-bay zone groups, the server device bay must be associated with the switch ports used by the zone group.
- In mixed environments that include zoned SAS storage enclosures, shared SAS storage enclosures, and tape devices, use the displayed status information and keep detailed records of the drive-bay zone groups and their assignments. This will help prevent accidentally assigning drive-bay zone groups to multiple servers or to servers that are not associated with the switch ports used by the zone group.
- If a zone group is assigned to a server that is not associated with the switch port to which the external storage enclosure is connected, a warning message is displayed.
- In a c7000 BladeSystem enclosure, when using a full-height blade with the P700m controller installed in mezzanine slot 3, the zone group must be assigned to the subsumed server device bay to allow the server to access the storage.
- Server bays cannot access the zone group until assigned that zone group.
- Until the configuration is saved, the words `Pending Save` are displayed in the navigation tree next to the zone. After the configuration is saved, the word `Assigned` is displayed.

5 Tasks in the VSM Maintain tab

After selecting a the switch in the navigation tree, a task list is displayed. The following table lists the available tasks.

System component	Available tasks	Where documented
Blade Enclosure	More Information	
	View Status Alerts	
HP 3G SAS Blade Switch (VSM Active)	Update Firmware	" Update Firmware task " (page 45)
	Reset Hardware	" Reset Hardware task " (page 49)
	Reset Software	" Reset Software task " (page 49)
	Update Storage Enclosure Firmware	" Update Storage Enclosure Firmware task " (page 50)
	Reset Storage Enclosure	" Reset Storage Enclosure task " (page 52)
	Network Settings	" Network Settings task " (page 54)
	SNMP Settings	" SNMP Settings task " (page 54)
	System Log	" System Log task " (page 54)
	More Information	
HP 3G SAS Blade Switch (VSM Passive)	More Information	

NOTE: The following tasks are common to most components, self explanatory, and not described in this section:

- **More Information**
- **View Status Alerts**

Update Firmware task

Use this task to install new firmware on the SAS BL Switch. Firmware is pre-installed in the factory, but an updated, alternative, or preferred version may be available.

After selecting this task, the currently-installed firmware version of each SAS BL Switch in the c-Class enclosure is displayed in the task section of the screen.

Prerequisites

- Before updating firmware, review system requirements and other information in the firmware release notes, device QuickSpecs, and other user documents.
- Before updating firmware, refresh the VSM display to ensure displayed information is current. Correct any issues before proceeding.
- The switch must be reset to activate newly installed firmware. Switch resetting may disrupt the I/O transaction between servers and storage enclosures.
 - In single-domain configurations, schedule a maintenance window to power off and then restart all associated solution devices.
 - In dual-domain configurations, if both switches have been updated, restart the active switch and wait for it to complete its power on sequence and I/O to resume before restarting the passive switch. A maintenance window is not required in dual-domain configurations, because, when one of the switches is restarted, all I/O will automatically be passed through the partner switch.
- After updating firmware, refresh the VSM display to ensure displayed information is up-to-date.
- After updating firmware, be sure to check the status of the device for unexpected issues. Correct any issues.

ⓘ **IMPORTANT:** When two SAS BL Switches are installed in the same interconnect bay row of a BladeSystem c-Class enclosure, make sure that they are running the same firmware version.

Obtaining new firmware

Two types of firmware packages are available for download:

- SmartComponent—Used when performing offline updates using the HP Smart Update Firmware DVD ISO.
- Image file—Used with the VSM update process.

Firmware can be obtained from several HP websites, including:

- **HP BladeSystem Firmware Maintenance:**
<http://h18004.www1.hp.com/products/blades/components/c-class.html> (SmartComponents only)

This BladeSystem site provides tested, compatible sets of firmware for components included in BladeSystem solutions and is designed to help manage firmware inter-dependencies between HP BladeSystem c-Class components.

Select the **Compatibility** tab and use the provided table to view version information and download firmware for individual components.

- HP Support **Download drivers and software:**
<http://www.hp.com/support/downloads> (SmartComponents and Image files)

This Support site includes download pages for all HP products.

To locate the 3Gb SAS BL Switch page, select bladesystem>BladeSystem Interconnects>HP StorageWorks 3Gb SAS BL Switch.

- **HP Support:** <http://www.hp.com/support> (SmartComponents and Image files)

The Technical Support home page is the gateway to a variety of support strategies (for all HP products), including driver, software, and firmware downloads, troubleshooting information, support forums, support agreements, warranty information, and replacement parts.

After selecting your region and language, select **Download drivers and software (and firmware)** and enter 3Gb SAS BL Switch in the provided box to navigate to the 3Gb SAS BL Switch page.

NOTE:

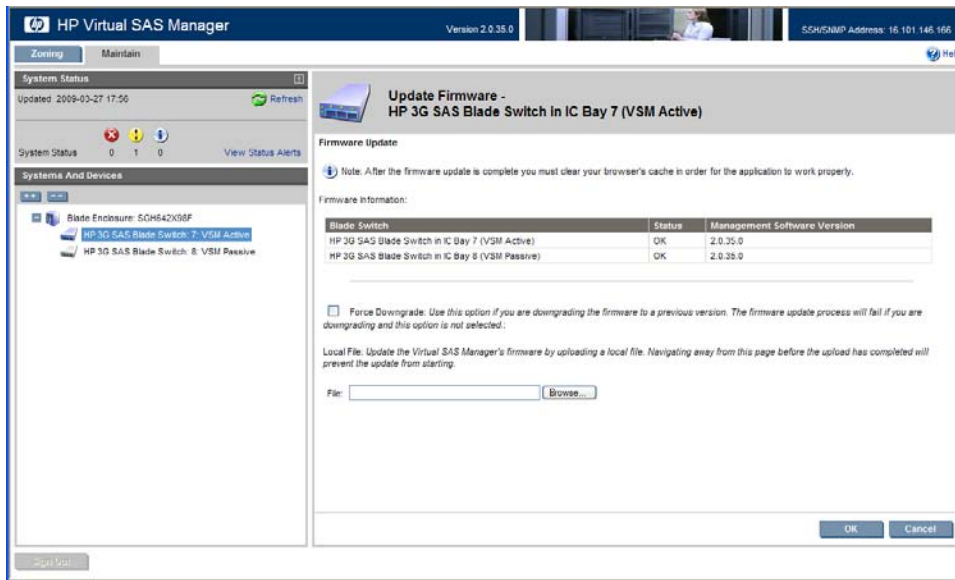
In the HP Support websites:

- If you are not yet registered, click **Register with the Business Support Center now** to receive email notifications about firmware or hardware, driver and support alerts, advisories, and notifications. This alert notification system is a one-way broadcasting method to distribute important notices about HP products.
 - Before clicking the **Download** button, click the title in the **Description** column to access important information about the update. Be sure to read information in the following tabs:
 - Click the **Description** tab for a brief overview about the download.
 - Click the **Release Notes** tab for detailed information about the download, including version information, compatibility information, a summary of changes, important notes, service considerations, and installation precautions.
-

Procedures

To update SAS BL Switch firmware using the VSM, do the following:

1. Obtain the latest firmware files and save to a temporary location on the host that has network access to the device you want to update. For more information, see [“Obtaining new firmware” \(page 46\)](#).
2. From the workstation with access to both the firmware file and the BladeSystem c-Class enclosure, access the VSM for the switch. Click the refresh icon to ensure that you are viewing the latest status information. Correct any issues before proceeding.
3. In the VSM, select the **Maintain** tab, and then click **Update Firmware**.



4. Click **Browse** and navigate to the location of the previously-obtained firmware file. When downgrading to an older version of firmware than what is currently installed on the switch, check **Force Downgrade**. Then, click **OK**.
 5. Wait for a completion message to display.
-
- ❗ **IMPORTANT:** Do not interfere with or cancel the flashing process. Interrupting the flashing process may corrupt the firmware. This process may take up to 15 minutes.
-
6. In single-domain configurations, schedule a maintenance window to power off associated solution devices and restart the switch.
 - a. Stop host traffic.
 - b. Power off servers.
 - c. Power off storage enclosures.
 7. Restart the switch. From the VSM Maintain tab, select the switch that was just updated, and then click **Reset Hardware**. For more information, see [“Reset Hardware task” \(page 49\)](#). During the reset process, you are automatically logged out of the VSM and may also be logged out of OA.
 8. Wait a few minutes for the switch to reset.
 9. Clear all temporary Internet files from the browser cache.
 10. Log back in to VSM and confirm that the firmware installed successfully with no issues.
 11. In dual-domain configurations, repeat steps 3–10 to update the firmware on the second switch.

12. In single-domain configurations, after the update is complete, restart the devices. Apply power in the following sequence:
 - a. Restart storage enclosures.
 - b. Restart server blades.
 - c. Restart I/O.

Reset Hardware task

Because the switch does not have a power button, use this option to restart the switch.

- ⓘ **IMPORTANT:** This task will disrupt host I/O to the storage enclosures.
-

To perform this task, expand the display for the switch in the navigation tree, and then click **Reset Hardware**.

NOTE:

- This task is required after updating switch firmware.
 - In single-domain configurations, before resetting a switch, make sure that all I/O to the switch is halted, and, if possible, power down all hosts, restarting them after the switch completes the reset.
 - During the reset process, you are automatically logged out of VSM and may also be logged out of OA.
 - After resetting the switch, clear the browser cache.
-

Reset Software task

Use this task to restart the VSM software utility.

To perform this task, expand the display for the active switch in the navigation tree, and then click **Reset Software**.

NOTE: This task is required when updating switch network settings.

Update Storage Enclosure Firmware task

Use this task to install new firmware on MDS600 storage enclosures that are directly connected to the SAS BL Switch. Firmware is pre-installed in the factory, but an updated, alternative, or preferred version may be available.

In dual-domain deployments, if the secondary MDS600 I/O module is cabled to the second switch in the BladeSystem c-Class interconnect bay row, the primary I/O module is updated first, and then replicated to any additional I/O modules in the enclosure.

After selecting this task, the currently-installed firmware version of each external storage enclosure connected to the SAS BL Switch is displayed.

NOTE: If the **Update Storage Enclosures** task is not displayed, consider the following:

- Only supported storage enclosures can be updated.
 - All server blades that map to this storage enclosure must be powered off.
 - If the switch status is a value other than Active or Not Redundant, firmware updates are not allowed.
 - If the VSM GUI or VSM CLI is already processing a firmware update on a switch or storage enclosure, this task request cannot be processed.
-

Prerequisites and notes

- Before updating firmware, the firmware must first be obtained from the HP website and saved to a local directory on the workstation with access to the switch.
- Before updating firmware, review system requirements and other information in the firmware release notes, device QuickSpecs, and other user documents.
- Before updating firmware, refresh the VSM display to ensure displayed information is current. Correct any issues before proceeding.
- Because firmware updates require a restart of the device, update firmware only during a scheduled maintenance window.
- Before updating firmware, make sure that all server blades with access to the storage enclosure are powered off. This Update Storage Enclosure Firmware task is displayed only if the servers are offline.
- After updating firmware, you must reset the device to activate the new firmware.
- After updating firmware, refresh the VSM display to ensure displayed information is up-to-date.
- After updating firmware, be sure to check the status of the device for unexpected issues. Correct any issues.

Obtaining new firmware

1. From a workstation with access to the Internet, go to the Hewlett Packard Technical Support website <http://www.hp.com/support>.
2. Select your region and language and navigate to the page for the device.

NOTE: If you are not yet registered, click **Register with the Business Support Center now** to receive email notifications about firmware or hardware, driver and support alerts, advisories, and notifications. This alert notification system is a one-way broadcasting method used to distribute important notices about HP products.

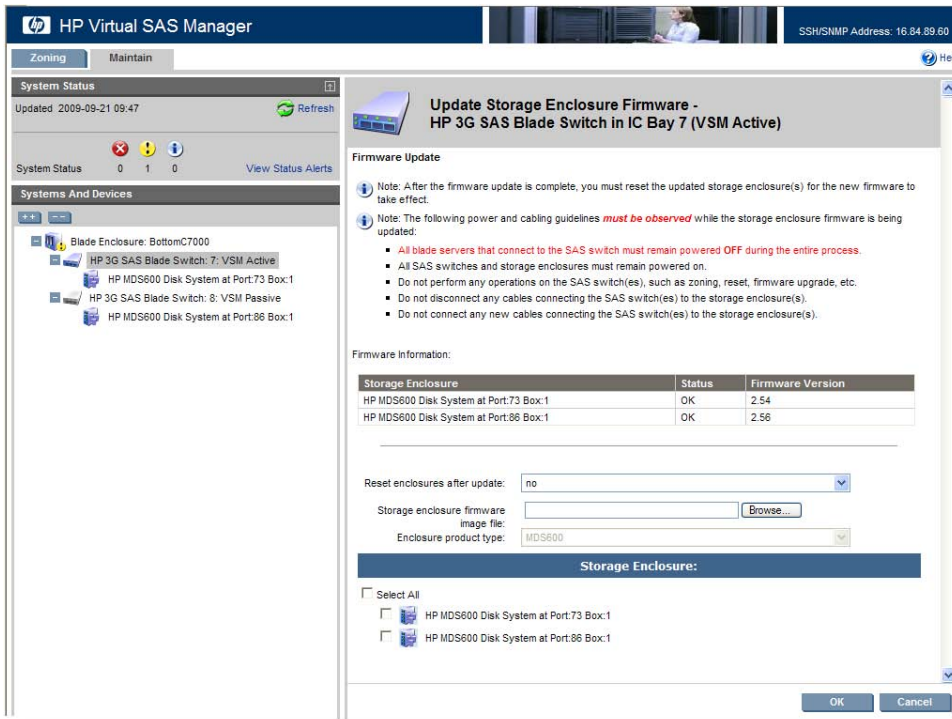
3. Click **Download drivers and software** and select your product from the displayed list.
4. Select your language and operating system.
5. Before clicking the **Download** button, click the title in the **Description** column to access important information about the update. Be sure to read information in the following tabs:
 - Click the **Description** tab for a brief overview about the download.
 - Click the **Release Notes** tab for detailed information about the download, including version information, compatibility information, a summary of changes, important notes, service considerations, and installation precautions.

NOTE: Firmware files are provided in both SmartComponent and Image file formats; but the Image file format must be used when the storage enclosure is connected to a BladeSystem solution.

6. After reviewing available information about the update, click **Download** and follow the on-screen instructions to save the download bundle to a temporary directory on the server.

Procedures

1. Obtain the latest firmware files and save to a temporary location on the host that has network access to the device you want to update. For more information, see [“Obtaining new firmware” \(page 51\)](#).
2. Schedule a maintenance window for the update.
 - a. Stop host traffic.
 - b. Power off servers.
3. From the workstation with access to both the firmware file and the BladeSystem c-Class enclosure, access the VSM for the Active or Not Redundant switch. Click the refresh icon to ensure that you are viewing the most recent status information. Correct any issues before proceeding.
4. In VSM, select the **Maintain** tab, and then click **Update Storage Enclosure Firmware**.



5. Expand the **Reset enclosures after update** drop-down box and select an option.
6. Click **Browse** and navigate to the location of the previously-obtained firmware file.
7. Expand the **Enclosure product type** drop-down box and select an option.
8. In the Storage Enclosures section, check each enclosure to update.
9. Click **OK** to begin the update.
10. Wait for a completion message to display.

❗ **IMPORTANT:** Do not interfere with or cancel the flashing process. Interrupting the flashing process may corrupt the firmware. This process may take up to 15 minutes.

11. If not performed with the updating process, restart the storage enclosures. From the VSM Maintain tab, select the enclosure that was just updated, and then click **Reset Storage Enclosure**. For more information, see [“Reset Storage Enclosure task”](#) (page 52).
12. Wait a few minutes for the storage enclosures to reset.
13. Clear all temporary Internet files from the browser cache.
14. Log back in to VSM and confirm that the firmware installed successfully with no issues.
15. After the update is complete, restart the devices. Apply power in the following sequence:
 - a. Restart storage enclosures.
 - b. Restart server blades.
 - c. Restart I/O.

NOTE: In configurations with two switches installed in the same BladeSystem c-Class enclosure interconnect bay row, if storage enclosures connected to the passive switch are not automatically updated at the same time as the storage enclosures connected to the active switch, log out of the VSM of the active switch. Log into the VSM of the passive switch, use the Force VSM Active option, and then use the outlined procedures to update the storage enclosures connected to that switch.

Reset Storage Enclosure task

Use this option to restart one or more storage enclosures connected to the switch.

NOTE: If the **Reset Storage Enclosure** task is not displayed, consider the following:

- Storage enclosure model—Only supported storage enclosures can be reset.
- Switch status—If the status is a value other than Active or Not Redundant, resetting the storage enclosures is not allowed. Also, if the switch is in the process of a firmware update, that process must complete and the switch return to an operational state before any storage enclosures can be reset.
- Server blade status—All server blades in the c-Class enclosure must be powered off to perform this task.

To perform this task, expand the display for the active switch in the navigation tree, and then click **Reset Storage Enclosure**.

NOTE:

- Before resetting a storage enclosure, make sure that all I/O to the enclosure is halted. Power down all hosts and restart them after the enclosure completes the reset.
 - This task is required after updating storage enclosure firmware.
 - After the reset is complete, click the refresh icon to ensure that you are viewing the most recent status information. Confirm that the status of the storage enclosure is acceptable. Correct any issues as needed.
-

Network Settings task

Use this task to enter or modify information about the external network.

To perform this task, expand the display for the active switch in the navigation tree, and then click **Network Settings**.

Options for this task include:

- **Host Name**—16 character user-defined name for the switch. Can be any combination of numbers, letters, or special characters, but can not include spaces. In OA, is referred to as the User Assigned Name of the switch.
- **IP Configuration**—Internet Protocol (IP) address configuration options include:
 - **DHCP – Automatic**—The switch is assigned an IP address automatically from a Dynamic Host Configuration Protocol (DHCP) server on the network.
 - **Manual**—The IP address must be assigned manually.

NOTE: When the Manual option is selected, the display changes and fields are provided for entering the IP Address, Subnet Mask, Gateway, Primary DNS Server, and Secondary DNS server.

SNMP Settings task

Use this task to enable, disable, and configure SNMP alerts.

To perform this task, expand the display for the switch in the navigation tree, and then click **SNMP Settings**.

Options for this task include:

- **Disabled**—Do not allow SNMP alerts.
- **Enabled**—Allow SNMP alerts.

NOTE: When the Enabled option is selected, the display changes and fields are provided for entering the System Location, System Contact, Read Community, Alert Community, and Alert Community IP Address.

System Log task

Use this task to view the system log for the selected switch.

To perform this task, expand the display for the active switch in the navigation tree, and then click **System Log**.

Options for this task include:

- **Download**—Save the log file to a location on the system. The default file name is `syslog.zip`.
- **Print**—Print a hardcopy of the log.

6 Troubleshooting

Moving zone groups

In some circumstances you may need to move zone groups from one server (origin) to a different server (destination). For example:

- Server or other device failure requiring movement of zone groups to a different server
- Server profile move

Moving zone groups—zoned SAS storage enclosures

When using zoned SAS storage enclosures, do the following to move zone groups from one server (original server device bay) to a different server (destination server device bay):

1. Open Virtual SAS Manager (VSM).
2. Identify all zone group assignments for the original server device bay.
 - a. In the navigation tree, select the original server device bay and click **Modify Zone Access**.
 - Zone groups assigned to the server device bay are displayed, indicated with a check.
 - All available, unassigned zone groups are displayed, but without a check.
 - b. Record the names of all zone groups assigned to the original server device bay (zone groups with checks).
3. Stop all I/O associated with those zone groups and servers. Then, power off all of the associated servers.
4. In the VSM navigation tree, select the original server device bay and click **Modify Zone Access**. Clear the check next to each zone group to remove access to the zone group. Click **Save Changes** when done.
5. Assign the zone groups to the destination server device bay.
 - a. In the navigation tree, select the destination server device bay and click **Modify Zone Access**.
 - If the server device bay has any zone groups assigned, they are displayed.
 - In addition, all available, unassigned zone groups are displayed, including the zone groups made available in step 2.
 - b. Check each zone group that needs to be assigned to this destination server device bay. Click **Save Changes** when done.
6. Power on each server and resume I/O.
7. Back up the configuration to an FTP server. (Strongly recommended)

Moving zone groups—shared SAS storage enclosures

When using shared SAS storage enclosures, do the following to move zone groups from one server (original server device bay) to a different server (destination server device bay):

1. Open Virtual SAS Manager (VSM).
2. Identify all zone group assignments for the original server device bay.
 - a. In the navigation tree, select the original server device bay and click **Modify Zone Access**.
 - Zone groups assigned to that server device bay are displayed, indicated with a check.
 - All available, unassigned zone groups are displayed, but without a check.
 - b. Record the names of all zone groups assigned to the original server device bay (zone groups with checks).
3. Determine if the destination server device bay already has access to the same zone groups as the original server device bay.
 - a. In the navigation tree, select the destination server device bay and click **Modify Zone Access**.
 - Zone groups assigned to that server device bay are displayed, indicated with a check.
 - All available, unassigned zone groups are displayed, but without a check.
 - b. Record the names of all zone groups assigned to the destination server device bay (zone groups with checks).
4. Determine if further action is needed.
 - If the destination server device bay is already assigned access to the zone groups identified in step 2, no changes are necessary.
 - If the destination server device bay is not assigned access to the zone groups identified in step 2, proceed to step 5.
5. Stop all I/O associated with those zone groups and servers. Then, power off all of the associated servers.
6. In the VSM navigation tree, select the original server device bay and click **Modify Zone Access**. Clear the check next to each zone group to remove access to the zone group. Click **Save Changes** when done.
7. Assign the zone groups to the destination server device bay.
 - a. In the navigation tree, select the destination server device bay and click **Modify Zone Access**.
 - If the server device bay has any zone groups assigned, they are displayed.
 - In addition, all available, unassigned zone groups are displayed, including the zone groups made available in step 2.
 - b. Check each zone group that needs to be assigned to this server device bay. Click **Save Changes** when done.
8. Power on each server and resume I/O.
9. Capture the configuration for safekeeping. (Strongly recommended)

Part III VSM CLI

Contents

7 Getting started.....	59
Accessing the VSM CLI.....	59
Command syntax.....	61
Example command.....	61
About the target variable.....	61
About the command variable.....	62
About the parameter variable.....	63
Executing commands.....	64
Keyboard shortcuts and keyword abbreviations.....	64
Getting help.....	65
The help command.....	65
The show command.....	65
8 Performing common tasks.....	68
Enabling or disabling multi-initiator mode.....	69
Creating a switch-port zone group.....	70
Creating a drive-bay zone group.....	73
Assigning a zone group to a server device bay.....	75
Capturing the configuration.....	77
Inputting or restoring the configuration.....	78
Flashing switch firmware.....	79
Flashing storage enclosure firmware.....	80
Resetting the switch or attached storage enclosures.....	82

7 Getting started

The VSM Command Line Interface (CLI) is an interactive command console that provides instant feedback and is functionally equivalent to the VSM graphical user interface (GUI). However, the following capabilities are unique to the VSM CLI:

- Capturing the configuration for safekeeping.
- Inputting (or restoring) the saved configuration on a switch.

Commands are entered at a command prompt (=>) and must follow a specific, preset syntax. After a command is entered and executed, the returned results are instantly displayed on the CLI console.

Accessing the VSM CLI

A Secure Shell (SSH) connection provides secure access to the VSM CLI over a network, because data transmitted through SSH is encrypted. Before using SSH, you must download and install an SSH connection utility.

NOTE: The following procedure demonstrates accessing the VSM CLI using the PuTTY connection utility.

1. Obtain and record the switch IP address for VSM CLI access.

Try one of the following methods to obtain the switch VSM CLI IP address:

- The VSM CLI IP address may be recorded on worksheets provided with your system installation instructions.
- The VSM CLI IP address is displayed in the VSM GUI.

From a server or workstation with access to the system, open your web browser and enter the OA IP address or hostname followed by the interconnect bay number.

For example: `https://10.10.1.2/interconnectX/`

10.10.1.2 represents the OA IP address and X specifies the enclosure interconnect bay number of the switch. In the VSM GUI, the VSM CLI IP address is displayed at the far-right side of the VSM page banner, in the SSH/SNMP Address: XXX.XXX.XXX.XXX, where XXX.XXX.XXX.XXX is the VSM CLI IP address.

- Access the webpage `ipaddr.htm` to display the VSM CLI IP address.

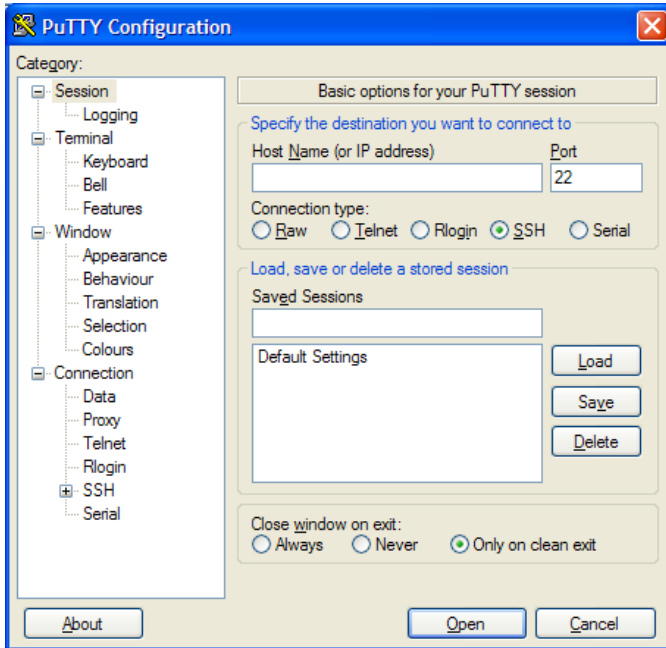
From a server or workstation with access to the system, open your web browser and enter the OA IP address or hostname followed by the interconnect variable and `ipaddr.htm`.

For example: `https://10.10.1.2/interconnectX/ipaddr.htm`

10.10.1.2 represents the OA IP address, X specifies the enclosure interconnect bay number of the switch, and `ipaddr.htm` is the name of the webpage. The VSM CLI access IP address of the switch is displayed.

2. If necessary, install an SSH connection utility.

3. Launch the SSH utility on a PC that can access the same LAN as the BladeSystem c-Class enclosure. The following example illustrates using the PuTTY utility.



- a. Enter the VSM CLI IP addresses in the **Host Name (or IP address)** field.
 - b. Verify that the **SSH** radio button is selected.
 - c. Click **Open**. The SSH shell opens.
4. When prompted, enter an OA username and password with administrative privileges.
After a successful log in, the HP Virtual SAS Manager CLI banner is displayed, with firmware version information shown in the display. The VSM CLI prompt is displayed and ready for input.

The following example shows the display after initially accessing the VSM CLI. In this example, the OA username is "Administrator".

```
login as: Administrator
Administrator@16.11.22.33's password:
```

```
HP Virtual SAS Manager CLI 2.2-15.0 (SEP 1 FW 2.82) (SEP 2 FW 2.82)
```

```
=>
```

Command syntax

A typical VSM CLI command string consists of three variables: a target device, a command, and a clarifying parameter. The syntax of a VSM CLI command line is as follows:

```
target command [parameter=<option>]
```

The following conventions apply to all VSM CLI command strings:

- A basic command string includes identifying information about the target, along with a command word and clarifying parameters, if required or desired.
- Commands are not case sensitive.
- Some target names can be abbreviated.
- The VSM CLI does not support line-continuation characters. If all characters of a command cannot fit on one line of the VSM CLI, the command wraps to the next line on the screen. The maximum command length is 255 characters.

Example command

The following example shows the use of target, command, and parameter variables in a VSM CLI command string to update network settings on a switch:

```
=> switch local network hostname=XXX dhcp=on gateway=XXX.XXX.XXX.XXX
```

- Target variable: `switch local`
- Command variable: `network`
- Required parameter: `hostname=XXX`
- Optional parameter: `dhcp=off | on`
- Optional parameter: `gateway=XXX.XXX.XXX.XXX`

About the target variable

The target variable provides the path to the device you want to configure. The device can be a c-Class BladeSystem enclosure, an enclosure device bay, an enclosure interconnect bay, an external storage enclosure, or a zone group.

Syntax for the target portion of a command is as follows:

Target syntax	Supported parameters	Device
bladeenclosure	[all] [local] [serialnumber=serial_number] [chassisname=chassis_name]	c-Class BladeSystem enclosure
bladebay	[all] [#]	Device bay in a BladeSystem enclosure
switch	[all] [#] [local] [remote] [wwid]	Switch in a BladeSystem enclosure
bladeswitchport	[all] [#]	Switch port (must be preceded by a blade enclosure or switch target)
storageenclosure	[all] [#]	External storage enclosure connected to a SAS switch blade
storageenclosurebay	[all] [#]	Storage enclosure drive bay (must be preceded by a blade enclosure or switch target)
zonegroup	[all] [#]	Zone group (must be preceded by a blade enclosure or switch target)

Example target entries in a command string:

```
bladeenclosure ABC command [parameter=value]
bladebay 6 command [parameter=value]
switch local command [parameter=value]
storageenclosure all command [parameter=value]
```

About the command variable

The command variable instructs the system to perform a task. The following commands are supported:

Command syntax	Command description
add	Add an entry to an existing configuration element.
advance	Modify advanced settings, such as the multi-initiator mode.
capture	Back up the switch configuration for safekeeping.
clear	Clear the current zoning configuration.
clearupdate	Discard configuration changes made by commands entered since the last <code>startupdate</code> command.
create	Create new configuration elements.
delete	Remove configuration elements.
diags	Run diagnostic tests on the system.
flash	Update switch or storage enclosure firmware.
forceactive	Force the switch to active (from passive)
help	Display all supported VSM CLI commands or a detailed description of a specified command.
input	Restore a previously backed up configuration on the switch.
modify	Update configuration elements.
network	Update network settings.
rescan	Update system status.
reset	Restart the switch or external storage enclosures. This command is used after flashing firmware (on switches or attached storage enclosures) or updating network settings.
retrysave	Retry the <code>saveupdate</code> command.
saveupdate	Process (commit) all commands entered since the last <code>startupdate</code> command.
shorthand	Display available keyword abbreviations.
show	Display detailed information about a configuration element or all configuration elements in a table.
showadvance	Display advanced settings, such as the multi-initiator mode.
shownetwork	Display current network settings.
showsnmp	Display current SNMP settings.
showsyslog	Displays the system log.
snmp	Update SNMP settings.
startupdate	Initialize the execution process for transaction-based commands.

For more information about the syntax or how to use these commands, use the VSM CLI help command. For more information about the help command, see [“The help command” \(page 65\)](#).

About the parameter variable

Most commands require a parameter to clarify the action. Some parameters are optional and, if not entered for a command, the default value is used.

The specific parameters and values that are valid for a given command depend on the target to which you apply the command. To determine the valid parameters for a particular command, use the `help` command. For more information about the help command, see [“The help command” \(page 65\)](#).

Executing commands

Configuration changes are made on a transaction basis. To prevent conflict with another administrator making changes through a different VSM GUI or CLI session, you must indicate when you are starting, saving, or clearing your changes by using the following commands:

```
<target> startupdate
```

```
<target> saveupdate
```

```
<target> clearupdate
```

- Before entering add, create, delete, or modify commands, enter `startdate` to start the transaction.
- After entering the add, create, delete, or modify commands, enter `saveupdate` to commit the transaction.

Keyboard shortcuts and keyword abbreviations

When using the VSM CLI, the following keystrokes have special functions:

Keyboard key	Arrow key	Function
Ctrl+B	Left arrow	Moves the cursor back one character
Ctrl+F	Right arrow	Moves the cursor forward one character
Ctrl+P	Up arrow	Recalls the previous command in the command buffer

Commonly used keywords in the VSM CLI have acceptable abbreviations:

Keyword	Abbreviation
bladebay	bb
bladeenclosure	be
bladeswitchport	bsp
chassisname	cn
serialnumber	sn
storageenclosure	se
storageenclosurebay	seb
switch	sw
zonegroup	zg
hardware	hard
software	soft

Getting help

The `help` and the `show` commands provide detailed information about system devices and how to use VSM CLI commands to perform configuration tasks.

The `help` command

The `help` command displays information about a VSM CLI command, including a definition, required syntax, available parameters, the number of characters for a command option value, or a list of allowed/disallowed characters. If `help` is followed by a command or a command with parameters, the display is limited to information about that specific command.

Syntax `help command [parameter]`

Example: The following example displays the results when `help` is entered with the `create` command.

```
=> help create
```

The following documentation pertains to your search:

```
<target> create type=zg zonegroupname=abc [seb=21:1:12,21:1:13] [bsp=31,32]
  The type parameter specifies the device type that is being created. A zone
  group is the only device type supported at this time.
  You may only specify either the storageenclosurebays or the bladeswitchport
  parameter when creating a zone group. Please consult the product
  documentation to determine what type of zoning your storage enclosures
  support.
  The storageenclosurebays (seb) parameter specifies the physical drives to be
  used for creating a zonegroup.
  The bladeswitchport (bsp) parameter specifies the ports to be used for
  creating a zonegroup.
  The target can be a blade switch in the system.
```

Examples:

```
switch local create type=zg zonegroupname=BladeBayZone1
  seb=41:2:22,41:2:23,41:2:24
switch local create type=zg zonegroupname=BladyBayZone2 seb=51:1:1-51:1:35
switch local create type=zg zonegroupname=BladeSwitchPortZone1 bsp=31
```

The `show` command

The `show` command displays information about a device. Use this command to view the current status of a device and its configuration.

Syntax `<target> show [detail] [config]`

Operands	detail	Forces a more detailed display, including information for other items such as zone groups.
	config	Forces the display to include configuration information about the specified target device.

Example 1: The following example displays the results of the `show` command for a blade enclosure.

```
=> bladeenclosure local show
```

```
Blade Enclosure at BottomC7000
Rack Name: RightRack
Version: 1.00
Blade Bay Count: 16
Fan Bay Count: 10
Power Supply Bay Count: 6
Thermal Sensors Count: 3
Interconnect Bay Count: 8
OA Bay Count: 2
Serial Number: USE814A00T
Status: OK
```

Example 2: The following example displays the results of the `show` command for an HP BladeSystem enclosure when the `config` parameter is specified.

```
=> bladeenclosure local show config
```

```
Blade Enclosure at BottomC7000 (sn: USE814A00T)
```

```
Blade Bay: 1 (Empty)
Blade Bay: 2 (Empty)
Blade Bay: 3 (Empty)
Blade Bay: 4 (Empty)
Blade Bay: 5 (ProLiant BL465c G1)
Blade Bay: 6 (Empty)
Blade Bay: 7 (Empty)
Blade Bay: 8 (Empty)
Blade Bay: 9 (Empty)
Blade Bay: 10 (Empty)
Blade Bay: 11 (Empty)
Blade Bay: 12 (Empty)
Blade Bay: 13 (Empty)
Blade Bay: 14 (Empty)
Blade Bay: 15 (Empty)
Blade Bay: 16 (Empty)
Switch in Interconnect Bay: 7
  Location: Local
  Management Software Version: 2.2.4.0
  Redundancy State: VSM Active
  Management IP Address: 16.84.89.107
  UID LED: OFF
Switch in Interconnect Bay: 8
  Location: Remote
  Redundancy State: VSM Passive
  Blade Switch Port: 71
  Blade Switch Port: 72
  Blade Switch Port: 73
  Blade Switch Port: 74
  Blade Switch Port: 75
  Blade Switch Port: 76
  .
  .
  .
  Blade Switch Port: 88
  Storage Enclosure: 500110A00068F680, PortBox=73:1 (OK)
  Storage Enclosure: 5001438002866100, PortBox=71:1 (OK)
```

Example 3: The following example displays the results of the `show` command for a blade enclosure device bay.

```
=> bladebay 5 show
```

```
Blade Enclosure at BottomC7000
Blade Bay: 5 (ProLiant BL465c G1)
  Blade: ProLiant BL465c G1 (SN: USM73702LR)
    Type: Server Blade
    Manufacturer: HP
    Part Number: 407234-B21
    Serial Number: USM73702LR
    ROM Version: A13 04/05/2007
    CPU Count: 2
    Memory [MB]: 2048
    NIC Count: 5
    Power: On
```

8 Performing common tasks

Example commands and system responses shown in this section are provided only as a general reference and may differ from the commands used and system responses in your environment. For more information on the available options for each command, see VSM CLI online help.

Examples are provided for the following common tasks:

- [“Enabling or disabling multi-initiator mode” \(page 69\)](#)
- [“Creating a switch-port zone group” \(page 70\)](#)
- [“Creating a drive-bay zone group” \(page 73\)](#)
- [“Assigning a zone group to a server device bay” \(page 75\)](#)
- [“Capturing the configuration” \(page 77\)](#)
- [“Inputting or restoring the configuration” \(page 78\)](#)
- [“Flashing switch firmware” \(page 79\)](#)
- [“Flashing storage enclosure firmware” \(page 80\)](#)
- [“Resetting the switch or attached storage enclosures” \(page 82\)](#)

Enabling or disabling multi-initiator mode

Multi-initiator mode controls whether more than one server device bay can be assigned the *same* zone group.

- **Disabled**—(Default) Used when only zoned SAS storage enclosures are connected to the switch. When this option is selected, a zone group can be assigned to only one server device bay.
- **Enabled**—Used when shared SAS storage enclosures or tape autoloader/libraries are connected to the switch. When this option is selected, a zone group can be assigned to multiple server device bays.

Syntax <target> advance [multi=<on|off>]

Example 1: This example shows how to enable multi-initiator mode:

```
=> sw local startupdate
Success
```

```
=> sw local advance multi=on
Success
```

```
=> sw local saveupdate
Success
```

Example 2: This example shows how to disable multi-initiator mode:

```
=> sw local startupdate
Success
```

```
=> sw local advance multi=off
Success
```

```
=> sw local saveupdate
Success
```

Creating a switch-port zone group

Used with shared SAS storage enclosures or tape autoloaders or libraries, switch port zone groups are comprised of one or more SAS ports on the switch. Server device bays assigned this type of zone group have access to the array enclosures or tape devices connected to the ports included in the zone group. Access to specific LUNs in the array enclosures must be controlled through the storage management utility for the array enclosure.

NOTE:

- Creating a switch-port zone group for a switch port connected to a zoned SAS storage enclosure such as the MDS600, is not allowed. Zoned SAS storage enclosures can only be included in drive-bay zone groups.
 - When a tape autoloader or library is included in the solution, do the following:
 - Create a switch-port zone group for the port connected to the tape device.
 - Create switch-port zone groups for ports connected to shared SAS storage enclosures.
 - Create drive-bay zone groups for disk drive bays in zoned SAS storage enclosure.
 - Carefully record the zone group names, included disk drives, and server device bay assignments to prevent accidentally assigning the same drive-bay zone group to more than one server device bay.
-

Before creating a zone group, ensure that all storage enclosures are physically connected to the switch and ready for use.

1. [Optional] Verify the status of the switch and switch ports. Use the show command to determine which switch ports are available.

NOTE: The `bsp` parameter specifies that you want to show “blade switch port” information.

The display of this example is abbreviated, retaining key details. The display shows information for the switch installed in interconnect bay 7, that none of the switch ports are already included in a zone group, and that a shared SAS storage enclosure is connected to switch ports 1 and 2.

```
=> sw local bsp all show detail
```

```
Blade Enclosure at BottomC7000
Switch: Local
  Blade Switch Port: 71
    Port Number: 1
    Zoning Status: OK
    Presence: Present
    Attached Device Type: SAS
    Product ID: MSA2012sa
    LED Status: Green
  Blade Switch Port: 72
    Port Number: 2
    Zoning Status: OK
    Presence: Present
    Attached Device Type: SAS
    Product ID: MSA2012sa
    LED Status: Green
  Blade Switch Port: 73
    Port Number: 3
    Zoning Status: OK
    Presence: Absent
    LED Status: Off
  Blade Switch Port: 74
    Port Number: 4
    Zoning Status: OK
    Presence: Absent
    LED Status: Off
  .
  .
  .
  Blade Switch Port: 77
    Port Number: 7
    Zoning Status: OK
    Presence: Absent
    LED Status: Off
  Blade Switch Port: 78
    Port Number: 8
    Zoning Status: OK
    Presence: Absent
    LED Status: Off
```

2. Create the zone group.

This example shows how to create a zone group named `OpenZone` that includes ports 1 and 2 on switches in interconnect bays 7 and 8.

```
=> sw local startupdate
Success
```

```
=> sw local create type=zg zonegroupname=OpenZone bsp=71,72,81,82
Success
```

```
=> sw local saveupdate
Success
```

NOTE: Entering a range of port numbers is not supported. Each port must be entered individually, separated by a comma.

3. [Optional] Verify that the zone group was created as intended.

For example, use one of the following commands:

```
=> sw local bsp all show detail
=> sw local zg OpenZone show
```

The display of this example is abbreviated, retaining key details. The display shows information for the switch installed in interconnect bay 7, and that ports 1 and 2 are included in zone group named OpenZone.

```
=> sw local bsp all show detail
```

```
Blade Enclosure at BottomC7000
Switch: Local
  Blade Switch Port: 71
    Port Number: 1
    Zoning Status: OK
    Presence: Present
    Attached Device Type: SAS
    Product ID: MSA2012sa
    LED Status: Green
    Zone Groups: OpenZone
  Blade Switch Port: 72
    Port Number: 2
    Zoning Status: OK
    Presence: Present
    Attached Device Type: SAS
    Product ID: MSA2012sa
    LED Status: Green
    Zone Groups: OpenZone
  Blade Switch Port: 73
    Port Number: 3
    Zoning Status: OK
    Presence: Absent
    LED Status: Off
  Blade Switch Port: 74
    Port Number: 4
    Zoning Status: OK
    Presence: Absent
    LED Status: Off
  .
  .
  .
  Blade Switch Port: 77
    Port Number: 7
    Zoning Status: OK
    Presence: Absent
    LED Status: Off
  Blade Switch Port: 78
    Port Number: 8
    Zoning Status: OK
    Presence: Absent
    LED Status: Off
```


Creating a drive-bay zone group

Used with zoned SAS storage enclosures such as the MDS600, drive-bay zone groups group together disk drive bays, which can be chosen from across multiple storage enclosures. Server device bays assigned this type of zone group have access to the disk drive bays included in the zone, as if they were directly connected to those servers.

Before creating a zone group, ensure that all storage enclosures are physically connected to the switch and ready for use.

NOTE:

- When a tape autoloader or library is included in the solution, do the following:
 - Create a switch-port zone group for the port connected to the tape device.
 - Create switch-port zone groups for ports connected to shared SAS storage enclosures.
 - Create drive-bay zone groups for drive bays in zoned SAS storage enclosure.
 - Carefully record the zone group names, included disk drives, and server device bay assignments to prevent accidentally assigning the same drive-bay zone group to more than one server device bay.

-
1. [Optional] Verify that the external storage enclosure is detected by the system. Use the show command to determine which drive bays are available.

NOTE:

- The `seb` parameter specifies that you want to show “storage enclosure bay” information
- When the `detail` variable is included in the command, information about the drive bay, such as disk drive type, is displayed.

The display of the following example is abbreviated, retaining key details. Drive bays 1 through 7 are already included in a zone group named `zone1` and drive bays 29 through 35 are unassigned.

```
=> sw local seb all show detail
```

```
Blade Enclosure at BottomC7000
```

```
Switch: Local
```

```
Storage Enclosure: 5001438002866100, PortBox=71:1 (OK)
```

```
Bay: 1, ID: 71:1:1, SAS, OK, ZoneGroup: zone1
```

```
Bay: 2, ID: 71:1:2, SAS, OK, ZoneGroup: zone1
```

```
Bay: 3, ID: 71:1:3, SAS, OK, ZoneGroup: zone1
```

```
Bay: 4, ID: 71:1:4, SAS, OK, ZoneGroup: zone1
```

```
Bay: 5, ID: 71:1:5, SAS, OK, ZoneGroup: zone1
```

```
Bay: 6, ID: 71:1:6, SAS, OK, ZoneGroup: zone1
```

```
Bay: 7, ID: 71:1:7, SAS, OK, ZoneGroup: zone1
```

```
.
```

```
:
```

```
.
```

```
Bay: 29, ID: 71:1:29, SAS, OK
```

```
Bay: 30, ID: 71:1:30, SAS, OK
```

```
Bay: 31, ID: 71:1:31, SAS, OK
```

```
Bay: 32, ID: 71:1:32, SAS, OK
```

```
Bay: 33, ID: 71:1:33, SAS, OK
```

```
Bay: 34, ID: 71:1:34, SAS, OK
```

```
Bay: 35, ID: 71:1:35, SAS, OK
```

2. Create the zone group.

This example shows how to create a zone group named zone5, using drive bays 29 through 35 on a storage enclosure connected to port 1 of a switch in interconnect bay 7.

```
=> sw local startupdate
Success
```

```
=> sw local create type=zg zonegroupname=zone5 seb=71:1:29,71:1:30,71:1:31,
71:1:32,71:1:33,71:1:34,71:1:35
Success
```

```
=> sw local saveupdate
Success
```

3. [Optional] Verify that the zone group was created as intended.

For example, use one of the following commands:

```
=> sw local seb all show detail
=> sw local zg zone5 show
```

The display of this example is abbreviated, retaining key details. Drive bays 29 through 35 are now included in the zone group zone5.

```
=> sw local seb all show detail
```

Blade Enclosure at BottomC7000

Switch: Local

Storage Enclosure: 5001438002866100, PortBox=71:1 (OK)

Bay: 1, ID: 71:1:1, SAS, OK, ZoneGroup: zone1

Bay: 2, ID: 71:1:2, SAS, OK, ZoneGroup: zone1

Bay: 3, ID: 71:1:3, SAS, OK, ZoneGroup: zone1

Bay: 4, ID: 71:1:4, SAS, OK, ZoneGroup: zone1

Bay: 5, ID: 71:1:5, SAS, OK, ZoneGroup: zone1

Bay: 6, ID: 71:1:6, SAS, OK, ZoneGroup: zone1

Bay: 7, ID: 71:1:7, SAS, OK, ZoneGroup: zone1

.

.

Bay: 29, ID: 71:1:29, SAS, OK, ZoneGroup: zone5
Bay: 30, ID: 71:1:30, SAS, OK, ZoneGroup: zone5
Bay: 31, ID: 71:1:31, SAS, OK, ZoneGroup: zone5
Bay: 32, ID: 71:1:32, SAS, OK, ZoneGroup: zone5
Bay: 33, ID: 71:1:33, SAS, OK, ZoneGroup: zone5
Bay: 34, ID: 71:1:34, SAS, OK, ZoneGroup: zone5
Bay: 35, ID: 71:1:35, SAS, OK, ZoneGroup: zone5

Assigning a zone group to a server device bay

Server bays cannot access external storage connected to the switch until assigned a zone group.

❗ IMPORTANT:

- Depending on the BladeSystem c-Class enclosure model, server type, mezzanine slot used, BladeSystem server device bay, and BladeSystem interconnect bay, zone groups assigned to a server must be associated with storage enclosures connected to switch ports 1–4 or 5–8. Failure to follow these guidelines will result in an unsupported configuration. For more information, see [“Zoning requirements and device mappings” \(page 7\)](#).
- For a newly created zone group, when assigning the zone group to a server device bay, if RAID 1+0 arrays will be created, you must first power off the server blades. Restart the servers after completing the assignments and saving all changes in the VSM.
- For an existing zone group, when changing the assignment to move the zone group to a different server device bay, you must first stop all associated I/O with the zone group and power off the server blades. After completing the assignments and saving all changes in the VSM, restart the servers and resume I/O.

1. [Optional] Verify the status of the enclosure server device bays. Use the show command to display all configured zone groups.

The display of this example is abbreviated, retaining key details. Drive bays 1 through 7 are included in the zone group named *zone1*, which is assigned to server device bay 1; drive bays 8 through 14 are included in the zone group named *zone2*, which is assigned to server device bay 2, and drive bays 29 through 35 are included in the zone group named *zone5*, which is not yet assigned to a server device bay.

```
=> sw local zg all show detail
```

```
Blade Enclosure at BottomC7000
Switch: Local
Zone Group: zone1
  Zoned Storage Enclosure Bay: 71:1:1
  Zoned Storage Enclosure Bay: 71:1:2
  Zoned Storage Enclosure Bay: 71:1:3
  Zoned Storage Enclosure Bay: 71:1:4
  Zoned Storage Enclosure Bay: 71:1:5
  Zoned Storage Enclosure Bay: 71:1:6
  Zoned Storage Enclosure Bay: 71:1:7
  Assigned Blade Bay: 1
Zone Group: zone2
  Zoned Storage Enclosure Bay: 71:1:8
  Zoned Storage Enclosure Bay: 71:1:9
  Zoned Storage Enclosure Bay: 71:1:10
  Zoned Storage Enclosure Bay: 71:1:11
  Zoned Storage Enclosure Bay: 71:1:12
  Zoned Storage Enclosure Bay: 71:1:13
  Zoned Storage Enclosure Bay: 71:1:14
  Assigned Blade Bay: 2
.
.
.
Zone Group: zone5
  Zoned Storage Enclosure Bay: 71:1:29
  Zoned Storage Enclosure Bay: 71:1:30
  Zoned Storage Enclosure Bay: 71:1:31
  Zoned Storage Enclosure Bay: 71:1:32
  Zoned Storage Enclosure Bay: 71:1:33
  Zoned Storage Enclosure Bay: 71:1:34
  Zoned Storage Enclosure Bay: 71:1:35
```

2. Assign the zone group to the server device bay.

This example shows how to assign ozone group `zone5` to server device bay 5.

```
=> sw local startupdate
Success
```

```
=> bb 5 add zg=zone5
Success
```

```
=> sw local saveupdate
Success
```

3. [Optional] Verify that the zone group was assigned as intended.

For example, use one of the following commands:

```
=> bb all show detail
=> sw local zg all show detail
```

The display of this example is abbreviated, retaining key details. Zone group `zone5` is now assigned to server device bay 5.

```
=> sw local zg all show detail
```

```
Blade Enclosure at BottomC7000
```

```
Switch: Local
```

```
Zone Group: zone1
```

```
  Zoned Storage Enclosure Bay: 71:1:1
  Zoned Storage Enclosure Bay: 71:1:2
  Zoned Storage Enclosure Bay: 71:1:3
  Zoned Storage Enclosure Bay: 71:1:4
  Zoned Storage Enclosure Bay: 71:1:5
  Zoned Storage Enclosure Bay: 71:1:6
  Zoned Storage Enclosure Bay: 71:1:7
  Assigned Blade Bay: 1
```

```
Zone Group: zone2
```

```
  Zoned Storage Enclosure Bay: 71:1:8
  Zoned Storage Enclosure Bay: 71:1:9
  Zoned Storage Enclosure Bay: 71:1:10
  Zoned Storage Enclosure Bay: 71:1:11
  Zoned Storage Enclosure Bay: 71:1:12
  Zoned Storage Enclosure Bay: 71:1:13
  Zoned Storage Enclosure Bay: 71:1:14
  Assigned Blade Bay: 2
```

```
-
-
-
```

```
Zone Group: zone5
```

```
  Zoned Storage Enclosure Bay: 71:1:29
  Zoned Storage Enclosure Bay: 71:1:30
  Zoned Storage Enclosure Bay: 71:1:31
  Zoned Storage Enclosure Bay: 71:1:32
  Zoned Storage Enclosure Bay: 71:1:33
  Zoned Storage Enclosure Bay: 71:1:34
  Zoned Storage Enclosure Bay: 71:1:35
  Assigned Blade Bay: 5
```

Capturing the configuration

After initially configuring the switch or after making changes to an existing configuration, HP strongly recommends backing up the configuration for safekeeping.

NOTE: The configuration can be backed up to an FTP server or temporarily saved to the switch and then transferred to a different location using a secure copy tool. Example secure copy tools include `pscp.exe` for Windows and `scp` for Linux.

Syntax <target> capture [file=<filename.txt>] [ftp]
 [ipaddr=<xxx.xxx.xxx.xxx>] [user=<ftp_username>]
 [password=<ftp_password>]

Example 1: This example demonstrates backing up the configuration to an FTP server.

```
=> sw local capture file=commands.txt ftp ipaddr=111.222.333.444
```

Example 2: This example demonstrates capturing the configuration to a temporary location on the switch and then copying to a Windows system.

1. Enter the following to create a file named `config.txt` and save it in the `/var/tmp` directory on the switch:

```
=> sw local capture file=/var/tmp/config.txt
```

2. Enter the following to copy the `config.txt` file from the temporary directory on the switch to a folder on the server:

In Windows environments, enter a command similar to the following:

```
pscp -scp Administrator@111.222.333.444:/var/tmp/config.txt c:\backup
```

In Linux environments, enter a command similar to the following:

```
scp Administrator@111.222.333.444:/var/tmp/config.txt /home/userXXX/.
```

Inputting or restoring the configuration

To restore a previously saved configuration of a switch, use the following command description:

NOTE: A configuration can be installed on a switch directly from an FTP server or by using a secure copy tool to temporarily save the configuration to the switch and then install it. Example secure copy tools include `pscp.exe` for Windows and `scp` for Linux.

Syntax <target> input [file=<filename.txt>] [ftp] [ipaddr=<xxx.xxx.xxx.xxx>]
 [user=<ftp_username>] [password=<ftp_password>]

Example 1: This example demonstrates inputting a configuration that was previously captured on an FTP server.

```
=> sw local input file=config.txt ftp ipaddr=111.222.333.444
```

Example 2: This example demonstrates inputting a configuration that was previously captured and saved to the server.

1. Enter the following to copy the configuration file `config.txt` from the server to the `/var/tmp` directory on the switch:

In Windows environments, enter a command similar to the following:

```
pscp -scp c:\backup\config.txt Administrator@111.222.333.444:/var/tmp/config.txt
```

In Linux environments, enter a command similar to the following:

```
scp /home/userXXX/config.txt Administrator@111.222.333.444:/var/tmp/.
```

2. From the VSM CLI prompt, enter the following to install the configuration on the switch.

```
=> sw local input file=/var/tmp/config.txt
```

Flashing switch firmware

To update firmware on a switch, use the following command description:

NOTE:

- Firmware must first be obtained from the HP website and saved to an FTP server or local directory on the workstation with access to the switch.
 - Before updating firmware, review system requirements and other information in the firmware release notes, device QuickSpecs, and other user documents.
 - Before updating firmware, issue the `rescan` command to ensure displayed information is current. Correct any issues before proceeding.
 - Because firmware updates require a restart of the device, update firmware only during a scheduled maintenance window.
 - After updating firmware, you must reset the device to activate the new firmware. For more information, see online help.
 - After updating firmware, issue the `rescan` command to ensure displayed information is up-to-date.
 - After updating firmware, be sure to check the status of the device for unexpected issues. Correct any issues before proceeding.
-

Syntax <target> flash [file=<file_location/filename>] [forced]
 [username=<user>] [password=<password>]

Example 1: This example demonstrates locating the file `2.2.x.x.img` on the `X.X.X.X` FTP server and then flashing the firmware onto the switch.

1. From the VSM CLI prompt, enter the following command to locate the file on the FTP server and flash the firmware onto the switch:

```
=> sw local flash file=ftp://X.X.X.X/2.2.x.x.img
```

2. Then, enter the following command to reset the switch:

```
=> sw local reset hardware forced
```

Example 2: This example demonstrates locating the file `2.2.x.x.img` in the VSM local directory and then flashing the firmware onto the switch.

1. From the VSM CLI prompt, enter the following command to locate the file on the local drive and flash the firmware onto the switch:

```
=> sw local flash file=/var/tmp/2.2.x.x.img
```

2. Then, enter the following command to reset the switch:

```
=> sw local reset hardware forced
```

Flashing storage enclosure firmware

To update firmware on an attached zoned SAS storage enclosure such as the MDS600, use the following command description:

NOTE:

- Firmware must first be obtained from the HP website and saved to an FTP server or a local directory on the workstation with access to the switch.
- Before updating firmware, review system requirements and other information in the firmware release notes, device QuickSpecs, and other user documents.
- Before updating firmware, issue the `rescan` command to ensure displayed information is current. Correct any issues before proceeding.
- Because firmware updates require a restart of the device, update firmware only during a scheduled maintenance window.
- Before updating firmware, make sure that all server blades with access to the storage enclosure are powered off.
- After updating firmware, you must reset the device to activate the new firmware.
- After updating firmware, issue the `rescan` command to ensure displayed information is up-to-date.
- After updating firmware, be sure to check the status of the device for unexpected issues. Correct any issues before proceeding.

Syntax <target> flash [file=<file_location/filename>] [forced]
 [username=<user>] [password=<password>]

Example: This example demonstrates locating the file `StorageEnclosureImage.fuf` on the X.X.X.X FTP server and flashing the firmware onto the storage enclosures connected to ports 3 and 4 of the switch in interconnect bay 7.

1. From the VSM CLI prompt, enter the following command to locate the file on the FTP server and flash the firmware onto the specified storage enclosures:

```
=> sw local se portbox=73:1,74:1 flash file=ftp://X.X.X.X/StorageEnclosureImage.fuf
```

2. Then, enter the following command to reset the storage enclosure:

```
=> sw local se portbox=73:1,74:1 reset hardware forced
```

NOTE: In dual-domain configurations with two switches installed in the same interconnect bay row of the BladeSystem c-Class enclosure, if storage enclosures connected to the passive switch are not updated at the same time as the storage enclosures connected to the active switch, log out of the CLI session of the active switch. Log into the CLI of the passive switch and change its status to active by entering the command `sw local force active`. Then, use the outlined procedures to update the storage enclosures connected to the now-active switch.

NOTE: If the `flash` or `reset` command do not execute successfully or display an error message, consider the following:

- Only supported storage enclosures can be updated.
- All server blades that map to this storage enclosure must be powered off.
- If the switch status is a value other than Active or Not Redundant, firmware updates are not allowed.
- If the VSM GUI or VSM CLI is already processing a firmware update on a switch or storage enclosure, this task request cannot be processed.

Issue the `rescan` command to ensure displayed information is up-to-date. Correct any issues before proceeding.

Resetting the switch or attached storage enclosures

To restart the switch or an attached zoned SAS storage enclosure such as the MDS600, use the following command description:

Syntax <target> reset [hardware|software] [forced]

Example 1: This example demonstrates restarting the switch:

```
=> sw local reset hardware
```

Example 2: This example demonstrates restarting the VSM application on the switch (required after updating switch network settings):

```
=> sw local reset software
```

Example 3: This example demonstrates restarting storage enclosures connected to ports 3 and 4 of the switch in interconnect bay 7:

```
=> sw local se portbox=73:1,74:1 reset hardware
```

Example 4: This example demonstrates restarting all storage enclosures connected to the switch:

```
=> sw local se all reset hardware
```

NOTE: If the `reset` command does not execute successfully or displays an error message, consider the following:

- Storage enclosure model—Only supported storage enclosures can be reset.
- Switch status—If the status is a value other than Active or Not Redundant, resetting the storage enclosure is not allowed.
- Server blade status—All server blades in the c-Class enclosure must be powered off to perform this task.
- VSM activity—If the VSM GUI or VSM CLI is already processing a firmware update on a switch or storage enclosure, this command request cannot be processed.

Issue the `rescan` command to ensure displayed information is up-to-date. Correct any issues before proceeding.

Part IV Support and other resources

Contacting HP

Before you contact HP

Be sure to have the following information available before you call or contact HP:

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Product identification number
- Applicable error message
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

HP contact information

For the name of the nearest HP authorized reseller:

- See the Contact HP worldwide (in English) website <http://welcome.hp.com/country/us/en/wwcontact.html>.

For HP technical support:

- In the United States, for contact options see the Contact HP United States website http://welcome.hp.com/country/us/en/contact_us.html. To contact HP by phone:
 - Call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
 - If you have purchased a Care Pack (service upgrade), call 1-800-633-3600. For more information about Care Packs, refer to the HP website <http://www.hp.com/hps>.
- In other locations, see the Contact HP worldwide (in English) website <http://welcome.hp.com/country/us/en/wwcontact.html>.

Subscription service

HP recommends that you register your product at the Subscriber's Choice for Business website: <http://www.hp.com/go/e-updates>.

After registering, you will receive email notification of product enhancements, new driver versions, firmware updates, and other product resources.

Documentation feedback

HP welcomes your feedback.

To make comments and suggestions about product documentation, please send a message to storagedocsFeedback@hp.com. All submissions become the property of HP.

Document conventions and symbols

Convention	Element
Blue text: Document conventions and symbols	Cross-reference links and e-mail addresses
Blue, underlined text: http://www.hp.com	Website addresses
Bold text	<ul style="list-style-type: none">• Keys that are pressed• Text typed into a GUI element, such as a box• GUI elements that are clicked or selected, such as menu and list items, buttons, tabs, and check boxes
<i>Italic</i> text	Text emphasis
Monospace text	<ul style="list-style-type: none">• File and directory names• System output• Code• Commands, their arguments, and argument values
<i>Monospace, italic</i> text	<ul style="list-style-type: none">• Code variables• Command variables
Monospace, bold text	Emphasized monospace text

 **WARNING!** Indicates that failure to follow directions could result in bodily harm or death.

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

 **IMPORTANT:** Provides clarifying information or specific instructions.

NOTE: Provides additional information.

 **TIP:** Provides helpful hints and shortcuts.

Websites

- HP
<http://www.hp.com>
- HP storage
<http://www.hp.com/go/storage>
- HP BladeSystem
<http://www.hp.com/go/bladesystem>
- HP support
<http://www.hp.com/support>
- HP manuals
<http://www.hp.com/support/manuals>
- HP downloads
<http://www.hp.com/support/downloads>

Index

A

- accessing the CLI, 59
- accessing the VSM GUI, 12
- advance CLI command, 69
- Advanced Settings GUI task, 36
- assigning zone group to server
 - CLI, 75
 - GUI, 43

C

- capture CLI command, 77
- Clear Configuration GUI task, 35
- clearupdate CLI command, 64
- Command Line Interface (CLI)
 - accessing, 59
 - advance command, 69
 - assigning zone group to server, 75
 - capture command, 77
 - command syntax, 61
 - command variable, described, 62
 - create type=zg command, 71, 74
 - creating a drive-bay port zone group, 73
 - creating a switch-port zone group, 70
 - example CLI command, 61
 - flash command, 79, 80
 - getting started, 59
 - help command, 65
 - input command, 78
 - keyword abbreviations, 64
 - overview of, 59
 - parameter variable, described, 63
 - reset command, 82
 - saveupdate command, 64
 - show command, 65
 - special keystrokes, 64
 - startupupdate command, 64
 - target variable, described, 61
- command syntax in the CLI, 61
- command variable, described, 62
- commands, in the CLI
 - advance, 69
 - basic types of, 64
 - capture, 77
 - clearupdate, 64
 - create type=zg, 71, 74
 - flash, 79, 80
 - help, 65
 - input, 78
 - reset, 82
 - saveupdate, 64
 - show, 65
 - startupupdate, 64
- configuring
 - storage, 5
- conventions

- document, 84
 - text symbols, 84
- create type=zg CLI command, 71, 74
- Create Zone Group GUI task, 37
- creating a drive-bay port zone group
 - CLI, 73
- creating a switch-port zone group
 - CLI, 70

D

- Delete GUI task, 42
- document
 - conventions, 84
- documentation
 - providing feedback, 83

E

- example of configuration tasks
 - shared SAS storage enclosures, 18
 - zoned SAS storage enclosures, 27

F

- firmware
 - obtaining, 46, 51
 - prerequisites for updating, 45, 50, 79, 80
- flash CLI command, 79, 80

G

- getting started
 - CLI, 59
 - GUI, 5
- Graphical User Interface (GUI), 12
 - Advanced Settings task, 36
 - Clear Configuration task, 35
 - Create Zone Group task, 37
 - Delete task, 42
 - Maintain tab, 44
 - Modify task, 41
 - Modify Zone Access task, 43
 - More Information command, 35
 - Network Settings task, 54
 - Reset Hardware task, 49
 - Reset Management Software task, 49
 - Reset Storage Enclosure task, 52
 - SNMP Settings task, 54
 - System Log task, 54
 - Update Firmware task, 47
 - Update Storage Enclosure Firmware task, 51
 - Zoning tab, 34

H

- help
 - obtaining, 83
- help CLI command, 65
- HP
 - technical support, 83

I

icons, descriptions of , 15
input CLI command, 78
introduction, 5

L

logging on to VSM GUI, 12

M

Maintain GUI tab
 available tasks, 44
Modify GUI task, 41
Modify Zone Access GUI task, 43
More Information GUI task, 35
moving zone groups, 55

N

navigation tree, in the GUI, 14
Network Settings GUI task, 54

O

obtaining firmware, 46, 51
online help
 CLI, 65
 GUI, 16

P

page description, 14
parameter variable, described, 63
PuTTY utility, 59

R

reset CLI command, 82
Reset Hardware GUI task, 49
Reset Management Software GUI task, 49
Reset Storage Enclosure GUI task, 52

S

saveupdate CLI command, 64
Secure Shell (SSH) connection, 59
shared SAS storage enclosures
 example of configuration tasks, 18
show CLI command, 65
SNMP Settings GUI task, 54
startupupdate CLI command, 64
status
 alerts, viewing of, 15
 icons, 15
 locating , 15
storage configuration, 5
Subscriber's Choice, HP, 83
symbols in text, 84
System Log GUI task, 54
system status section, in the GUI, 14
systems and devices section, in the GUI, 14

T

tabs, in the GUI, 14
target variable, described, 61

tasks

 performing tasks in the GUI, 16
tasks section, in the GUI, 14
tasks, in the GUI
 Advanced Settings, 36
 Clear Configuration, 35
 Create Zone Group, 37
 Delete, 42
 in Maintain tab, 44
 in the Zoning tab, 34
 Modify, 41
 Modify Zone Access, 43
 More Information, 35
 Network Settings, 54
 Reset Hardware, 49
 Reset Management Software, 49
 Reset storage enclosures, 52
 SNMP Settings, 54
 System Log, 54
 Update Firmware, 47
 Update Storage Enclosure Firmware, 51
technical support
 HP, 83
 service locator website, 84
text symbols, 84

U

Update Firmware GUI task, 47
Update Storage Enclosure Firmware GUI task, 51

W

websites
 HP , 84
 HP Subscriber's Choice for Business, 83

Z

zoned SAS storage enclosures
 example of configuration tasks, 27
Zoning tab, in the GUI
 available tasks, 34