

# HP 3PAR Management Console User Guide

## Abstract

The HP 3PAR Management Console and the topics in this Help system are for use by system and storage administrators who monitor and direct system configurations and resource allocation for HP 3PAR Storage Systems.



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# Part I Connecting to the System

This part contains information on connecting to the HP 3PAR StoreServ Storage System, managing users, configuring and managing ports, and using the Security Manager.

[“Connecting to Systems” \(page 18\)](#)

[“Configuring Ports” \(page 20\)](#)

[“Managing Ports” \(page 20\)](#)

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# 1 Connecting to Systems

The HP 3PAR Management Console allows authorized users to connect to a single system, or to multiple systems. In order to connect to a system, you must have the following information:

- System name or IP address
- Username
- Password

To connect to a system:

1. Start the HP 3PAR Management Console.

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**NOTE:** Any systems previously connected to are displayed in the text box under the **IP Address or Name** text box. To select multiple systems use **CTRL+click**. The username and password must be the same on all systems connected in this manner.

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2. In the **Connect** dialog box, enter:
  - a. The IP address or system name. (To enter more than one system name, separate by commas.)
  - b. Your user name.
  - c. Your password.
3. If you do not want a secured connection, uncheck the **Secure Connection** checkbox. Otherwise, click **OK**.
4. By clicking **Options**, you can modify the **Secure Data Port**, **Unsecured Data Port**, and **Event Port** check boxes as needed.

---

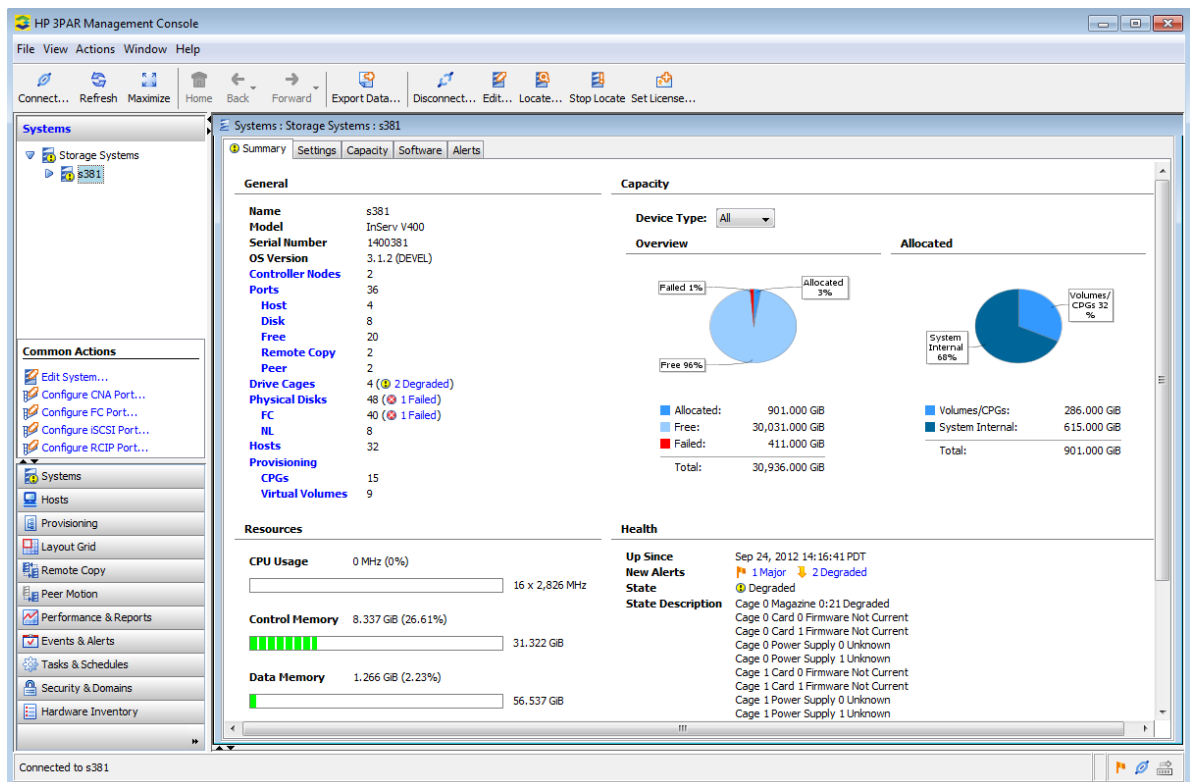
**NOTE:** A **Secure Data Port is not a valid integer** message will appear if attempting to log into multiple systems at once with different secure data ports. Systems with different secure data ports must be connected to one at a time.

---

## The System Dashboard

A different screen will appear in the Management Window depending on whether you log into a single system or multiple systems at the time you log in to the HP 3PAR Management Console.

Logging into a single-array environment will display Summary information for the system you are logged into, along with Settings, Capacity, Software, and Alerts tabs. For information on details displayed on these screens, see [“Viewing System Information” \(page 278\)](#).



Logging into a multiple-array environment will display the Summary tab for the Storage Systems node (or the Introduction tab if you haven't used Preferences to turn off that feature). Select a system name to get to the Summary tab for that particular system. (For information on removing Introduction tabs, see [“Configuring Interface, Dialog, and Tab Settings”](#) (page 413).)

**HP 3PAR Management Console**

File View Actions Window Help

Connect... Refresh Maximize Home Back Forward Export Data... Disconnect... Edit... Locate... Stop Locate Set License...

**Systems**

Storage Systems

s020  
s021  
s324  
s381

**Common Actions**

- Edit System...
- Configure CNA Port...
- Configure FC Port...
- Configure iSCSI Port...
- Configure RCIP Port...

**Systems**

Hosts

Provisioning

Layout Grid

Remote Copy

Peer Motion

Performance & Reports

Events & Alerts

Tasks & Schedules

Security & Domains

Hardware Inventory

**Systems : Storage Systems**

Introduction Summary Alerts

Summary 4 objects Filter Clear

Any column contains: Clear

Name	Serial Number	Model	OS Version	State	FC Total (GiB)	FC Allocated Percentage	FC Free (GiB)	NL Total (GiB)	NL Allocated Percentage	NL Free (GiB)	SSD Total (GiB)	SSD Allocated Percentage	SSD Free (GiB)	Up Since	Connection State
s020	1000020	InServ S200X	3.1.2 (DEVEL)	Degraded	5,450.000	21%	4,261.000	--	--	--	--	--	--	Sep 17, 2012 ...	Active
s021	1000021	InServ S200X	3.1.2	Degraded	2,316.250	17%	1,908.250	2,043...	15%	1,719...	2,043...	15%	1,719...	Sep 24, 2012 ...	Active
s324	1300324	InServ F400	3.1.1 (MU2)	Degraded	4,066.000	14%	1,997.750	14,89...	0%	14,896...	--	--	--	May 29, 2012 ...	Active
s381	1400381	InServ V400	3.1.2 (DEVEL)	Degraded	16,360.000	5%	15,455.000	14,57...	0%	14,576...	--	--	--	Sep 24, 2012 ...	Active
					28,192.250		23,622.000	31,51...		31,191...	2,043...		1,719...		

Connected to s381

---

## 2 Managing Ports

- [“Configuring Ports” \(page 20\)](#)
- [“Clearing Port Parameters” \(page 24\)](#)
- [“Editing a Port Label” \(page 24\)](#)
- [“Resetting a Port” \(page 24\)](#)
- [“Setting a Port Offline” \(page 24\)](#)
- [“Initializing a Port” \(page 25\)](#)
- [“Synchronizing a Port with the Name Server” \(page 25\)](#)
- [“Issuing an LIP Command” \(page 25\)](#)
- [“Enabling a Remote Copy Interface” \(page 25\)](#)
- [“Disabling a Remote Copy Interface” \(page 25\)](#)
- [“Pinging a Port” \(page 26\)](#)
- [“Viewing System Ports” \(page 26\)](#)

### Configuring Ports

The HP 3PAR Management Console allows you to configure the following types of ports:

- CNA
- Fibre Channel
- iSCSI
- Remote Copy over Fiber Channel (RCFC)
- Remote Copy over IP (RCIP)

To learn how to configure ports with the HP 3PAR Management Console, see the following:

- [“Configuring CNA Ports” \(page 20\)](#)
- [“Configuring Fibre Channel Ports” \(page 22\)](#)
- [“Configuring iSCSI Ports” \(page 22\)](#)
- [“Configuring a Remote Copy over Fibre Channel Port” \(page 23\)](#)
- [“Configuring a Remote Copy over IP Port” \(page 23\)](#)

### Configuring CNA Ports


To Configure a CNA port:

1. In the Manager Pane, click **Systems**.
2. Open the System tree and select **Ports**.
3. Start the CNA Port Configuration wizard using one of the following methods. (CNA must be supported and a CNA port present in the system for these actions to be available.)
  - Method 1 – In the CNA Summary tab in the Management Window, right click the CNA port you wish to configure, then click **Configure**.
  - Method 2 – Select **Configure CNA port** in the Common Actions Panel.
  - Method 3 – Select a CNA port in the Management Window, then click **Configure** in the Toolbar.

The CNA Port Configuration wizard appears.



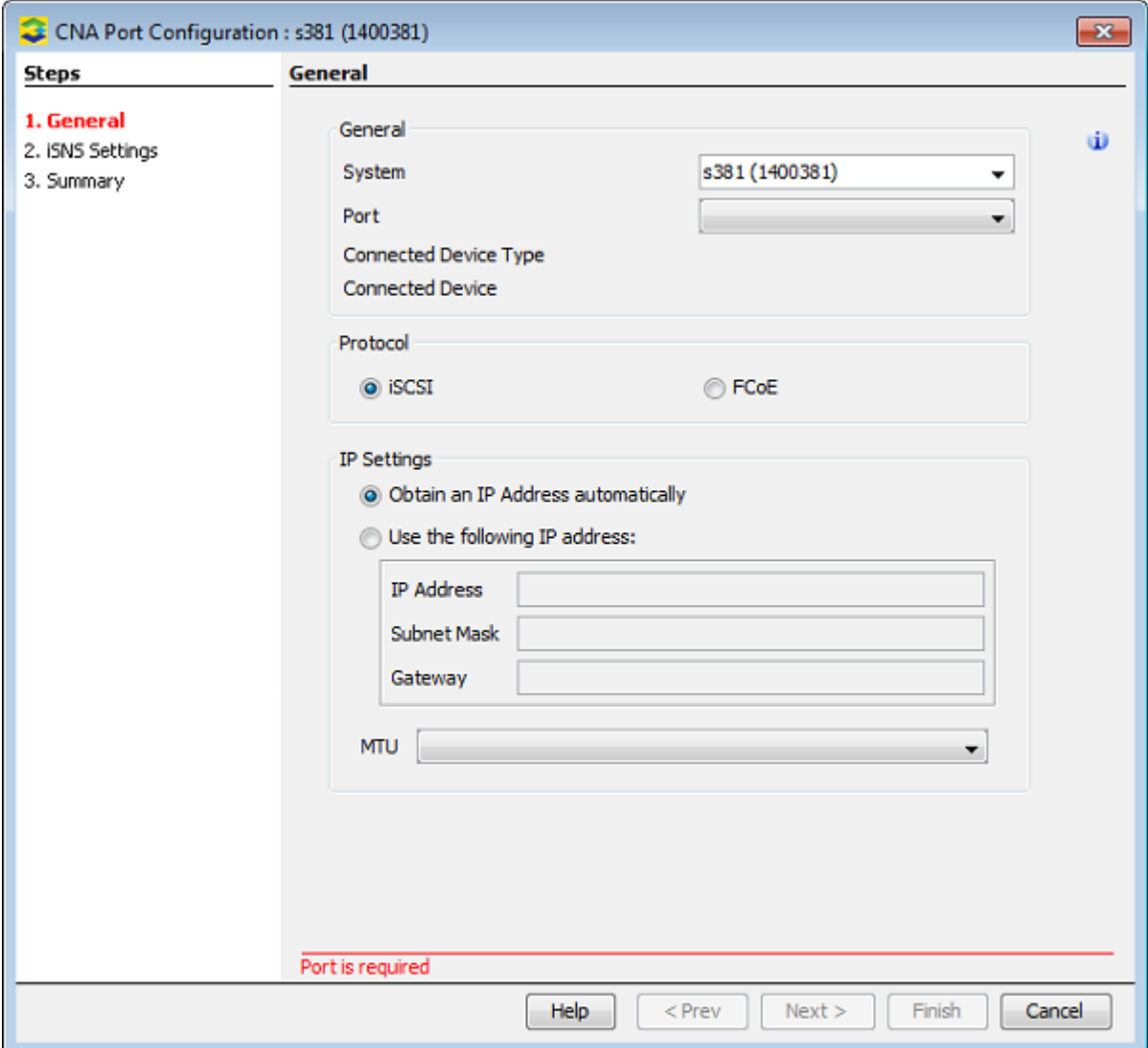
## General

1. (Optional) Click the  icon to view your settings details in a pane to the right of the screen. The details will update automatically as you enter your settings.
2. Select a **System** name from the list.
3. Select the **Port** you want to configure from the list.
4. Select the Protocol.
5. Follow the instructions for the selected protocol:  
“iSCSI” (page 21)

## iSCSI

To configure an iSCSI port:

1. Select **Obtain an IP address automatically** or **Use the following IP address**.



The image shows a screenshot of the "CNA Port Configuration: s381 (1400381)" window. The window has a "Steps" pane on the left with three steps: "1. General" (highlighted in red), "2. iSNS Settings", and "3. Summary". The main area is titled "General" and contains several sections. The "General" section has dropdown menus for "System" (set to "s381 (1400381)") and "Port". Below this are labels for "Connected Device Type" and "Connected Device". The "Protocol" section has two radio buttons: "iSCSI" (selected) and "FCoE". The "IP Settings" section has two radio buttons: "Obtain an IP Address automatically" (selected) and "Use the following IP address:". Below the second radio button are three text input fields for "IP Address", "Subnet Mask", and "Gateway". At the bottom of the IP Settings section is an "MTU" dropdown menu. A red error message "Port is required" is displayed at the bottom of the main area. At the very bottom of the window are buttons for "Help", "< Prev", "Next >", "Finish", and "Cancel".

2. If you selected **Obtain an IP address automatically**, skip the following step.
3. If you selected **Use the following IP address**, enter the **IP Address**, **Subnet Mask**, and **Gateway** address to use for the port.
4. Select an **MTU** (maximum transmission units) value from the list.

5. Click **Next**.  
The **iSNS Settings** page appears.

### iSNS Settings

1. (Optional) Enter the **Primary IP Address**.
2. (Optional) Enter the **TCP Port** number or accept the default.
3. Click **Next** to view the Summary page, or click **Finish** to complete the configuration wizard.

### Summary

Review your settings, then click **Finish** to complete the configuration wizard.

## Configuring Fibre Channel Ports

To configure a Fiber Channel port, access the Fibre Channel Port Configuration wizard:

1. In the Manager Pane, click **Systems**.
  2. In the Management Tree, select the system on which you wish to configure the port.
  3. In the Common Actions Panel, click **Configure FC Port**.  
The **Fibre Channel Port Configuration** wizard appears.
  4. In the **General** group box:
    - a. **System** list - Select the system on which the port will be configured.
    - b. **Port** list - Select the port to be configured as a Fibre Channel port.
  5. In the **Settings** group box:
    - a. **Connection Mode** list - Select the mode of the port as Disk, Host, or RCFC.
    - b. **Connection Type** list - Select whether the connection type is Loop, Point, or Loop-point.
    - c. **Unique Node WWN** - Enable or disable the node WWN.
    - d. **Configured Rate** - Select Auto (default), 1 Gbps, 2 Gbps, 4 Gbps, or \*8 Gbps.
    - e. **VLUN Change Notification (VCN)** - Enable or disable the VLUN change notification.
    - f. **Interrupt Coalesce** - Enable or disable the interrupt coalesce.
    - g. **Persona** list - The port persona will be preselected based on the current configuration.
  6. Click **OK**.
- \*8Gbps for V-Class Systems only.

## Configuring iSCSI Ports

To configure an iSCSI port, access the iSCSI Port Configuration wizard:

1. In the Manager Pane, click **Systems**.
2. In the Management Tree, select the system on which you wish to configure the port.
3. In the Common Actions Panel, click **Configure iSCSI Port**.  
The **iSCSI Port Configuration** wizard appears.

### General

1. In the **General** group box:
  - a. **System** list - Select the system on which the port will be configured.
  - b. **Port** list - Select the port to be configured as an RCIP port.
2. In the IP Settings group box, perform the following:
  - a. Select **Obtain an IP Address automatically**.
  - b. **MTU** list - Enter the MTU value (maximum transmission units).

or

- c. Select **Use the following IP address**.
- d. **IP Address** - Enter the iSCSI port's IP address.
- e. **Subnet Mask** - Enter the iSCSI port's subnet mask.
- f. **Gateway** - Enter the iSCSI port's gateway address.
- g. **MTU list** - Enter the MTU value (maximum transmission units).
3. Click **Finish** to complete the iSCSI port configuration, or click **Next** to enter iSNS settings.

### iSNS Settings

1. **Primary IP Address** - Enter the Internet Storage Name Service (iSNS) IP address.
2. **TCP Port** - Enter the iSNS TCP port. The default port is 3205.
3. Click **Finish** to complete the iSCSI port configuration, or click **Next** to view the configuration summary.

### Summary

Review the summary information. When satisfied, click **Finish**.

## Configuring a Remote Copy over Fibre Channel Port

To configure a Remote Copy over Fibre Channel (RCFC) port, access the Fibre Channel Port Configuration dialog:

1. In the Manager Pane, click **Systems**.
2. In the Management Tree, select the system on which you wish to configure the port.
3. In the Common Actions Panel, click **Configure FC Port**.  
The **Fibre Channel Port Configuration** wizard appears.
4. In the **General** group box:
  - a. **System** list - Select the system on which the port will be configured.
  - b. **Port** list - Select the port to be configured as a Fibre Channel port.
5. In the **Settings** group box:
  - a. **Connection Mode** list - Select the mode of the port as RCFC.
  - b. **Connection Type** list - Select whether the connection type is Loop or Point.
  - c. **Unique Node WWN** - Enable or disable the node WWN.
  - d. **Configured Rate** - Select Auto (default), 1 Gbps, 2 Gbps, or 4 Gbps.
  - e. **VLUN Change Notification (VCN)** - Enable or disable the VLUN change notification.
  - f. **Interrupt Coalesce** - Enable or disable the interrupt coalesce.
  - g. **Persona list** - The port persona we be preselected based on the current configuration.
6. Click **OK**.

## Configuring a Remote Copy over IP Port

To configure a Remote Copy over IP (RCIP) port, access the RCIP Port Configuration wizard:

1. In the Manager Pane, click **Systems**.
2. In the Management Tree, select the system on which you wish to configure the port.
3. In the Common Actions Panel, click **Configure RCIP Port**.  
The RCIP Port Configuration wizard appears.
4. In the **General** group box:
  - a. **System** list - Select the system on which the port will be configured.
  - b. **Port** list - Select the port to be configured as an RCIP port.
5. In the **IP Settings** group box:
  - a. **IP Address** - Enter the IP address of the RCIP port. The IP address is required.

- b. **Subnet Mask** - Enter the RCIP port's subnet mask. The subnet mask is required.
  - c. **Gateway** - Enter the RCIP port's gateway address.
  - d. **MTU list** - Enter the MTU value (maximum transmission units).
  - e. **Speed list** - Select the port speed as Auto (default), 10 Mbps, 100 Mbps, or 1 Gbps.
  - f. **Duplex list** - Select the port's duplex value of either Half or Full.
6. Click **OK**.

## Clearing Port Parameters

---

**NOTE:** This operation can only be performed on Remote Copy over Fibre Channel (RCFC), Remote Copy over IP (RCIP), and iSCSI ports.

---

To clear a port's parameters:

1. Access the ports **Summary** tab.
2. Right-click the port to be cleared and then click **Clear** in the menu that appears.  
The **Clear Port Configuration** dialog box appears.
3. Click **Yes**.

## Editing a Port Label

You may edit the designated label for all but RCIP and CNA ports. To edit a port label:

1. Access the port summary screen.
2. Right-click on the port whose label you want to change or click **Edit Label** in the toolbar.
3. Select **Edit Label**.  
The **Edit Port Label** dialog box appears.
4. Enter the new label name in the **Label** text box.
5. Click **OK**.

## Resetting a Port

---

**NOTE:** This operation cannot be performed on Remote Copy over IP (RCIP) ports.

---

To reset a port:

1. Access the ports **Summary** tab.
2. Right-click the port you wish to reset then click **Reset** in the menu that appears.  
The **Reset Port** dialog box appears.
3. (Optional) Select **Reload Firmware** if you wish to reload the port firmware upon reset.
4. Click **Yes**.

## Setting a Port Offline

---

**NOTE:** This operation cannot be performed on Remote Copy over IP (RCIP) ports.

---

To set a port offline:

1. Access the ports **Summary** tab.
2. Right-click the port you wish to set offline then click **Set Offline** in the menu that appears.  
The **Set Offline** dialog box appears.
3. Click **Yes**.

## Initializing a Port

---

**NOTE:** This operation can only be performed on Fibre Channel (FC) and Remote Copy over Fibre Channel (RCFC) ports.

---

To initialize a port:

1. Access the ports **Summary** tab.
2. Right-click the port you wish to initialize then click **Initialize** in the menu that appears.  
The **Initialize Port** dialog box appears.
3. Click **Yes**.

## Synchronizing a Port with the Name Server

---

**NOTE:** This operation can only be performed on Fibre Channel (FC) and Remote Copy over Fibre Channel (RCFC) ports.

---

To synchronize a port with the name server:

1. Access the ports **Summary** tab.
2. Right-click the port you wish to sync then click **Name Server Sync** in the menu that appears.  
The **Name Server Sync** dialog box appears.
3. Click **Yes**.

## Issuing an LIP Command

---

**NOTE:** This operation can only be performed on Fibre Channel (FC) and Remote Copy over Fibre Channel (RCFC) ports.

---

To issue an LIP command:

1. Access the ports **Summary** tab.
2. Right-click the port on which you wish to issue the LIP command then click **Issue LIP** in the menu that appears.  
The **Issue LIP** dialog box appears.
3. Click **Yes**.

## Enabling a Remote Copy Interface

---

**NOTE:** This operation can only be performed on Remote Copy over IP (RCIP) ports.

---

To enable a Remote Copy interface:

1. Access the ports **Summary** tab.
2. Right-click the disabled Remote Copy port you wish to enable then click **Enable Interface** in the menu that appears.  
The **Enable Interface** dialog box appears.
3. Click **Yes**.

## Disabling a Remote Copy Interface

---

**NOTE:** This operation can only be performed on Remote Copy over IP (RCIP) ports.

---

To disable a Remote Copy interface:

1. Access the ports **Summary** tab.

2. Right-click the Remote Copy port you wish to disable and then click **Disable Interface** in the menu that appears.  
The **Disable Interface** dialog box appears.
3. Click **Yes**.

## Pinging a Port

To ping an iSCSI or RCIP port:

1. Access the ports **Summary** tab.
2. Right-click the iSCSI or RCIP port you wish to ping then click **Ping** in the menu that appears.  
The **Ping Port** dialog appears.
3. In the **General** group box, enter the following:
  - a. **System** - Select a system from the list.
  - b. **Port** - Select the port from which you are initiating the ping.
  - c. **Destination IP Address** - Enter the destination port's IP address.
  - d. **Count** - The number of times (from 1 to 25) to ping the specified IP address.
  - e. **Wait Time** - Enter the wait time in seconds (5 to 30) for each ping. (For RCIP ports only.)
  - f. **Packet Size** - Enter the number of packets (1 to 65,507) to send with each ping.
  - g. (Optional) Select **Prevent fragmentation of packets**.
4. Click **Ping**.

The results of the ping operation will appear in the Result group box.

## Viewing System Ports

The system Ports screen provides information about all system ports.

To access the system Ports screen:

1. Click **Systems** in the Manager Pane.
2. In the Management Tree, select **Ports** under the system with the port information you wish to view.

The system Ports screen provides the following tabs, depending on what types of ports are supported by the selected system: **Summary**, **CNA**, **Fibre Channel**, **RCFC**, **iSCSI**, **RCIP**, **SAS**, and **Alerts**. For information about each, see:

["Viewing Port Summary Information" \(page 26\)](#)

["Viewing the Port Details Summary" \(page 28\)](#)

["Viewing CNA Ports" \(page 35\)](#)

["Viewing System Fibre Channel Ports" \(page 37\)](#)

["Viewing System RCFC Ports" \(page 41\)](#)

["Viewing System iSCSI Ports" \(page 45\)](#)

["Viewing System RCIP Ports" \(page 47\)](#)

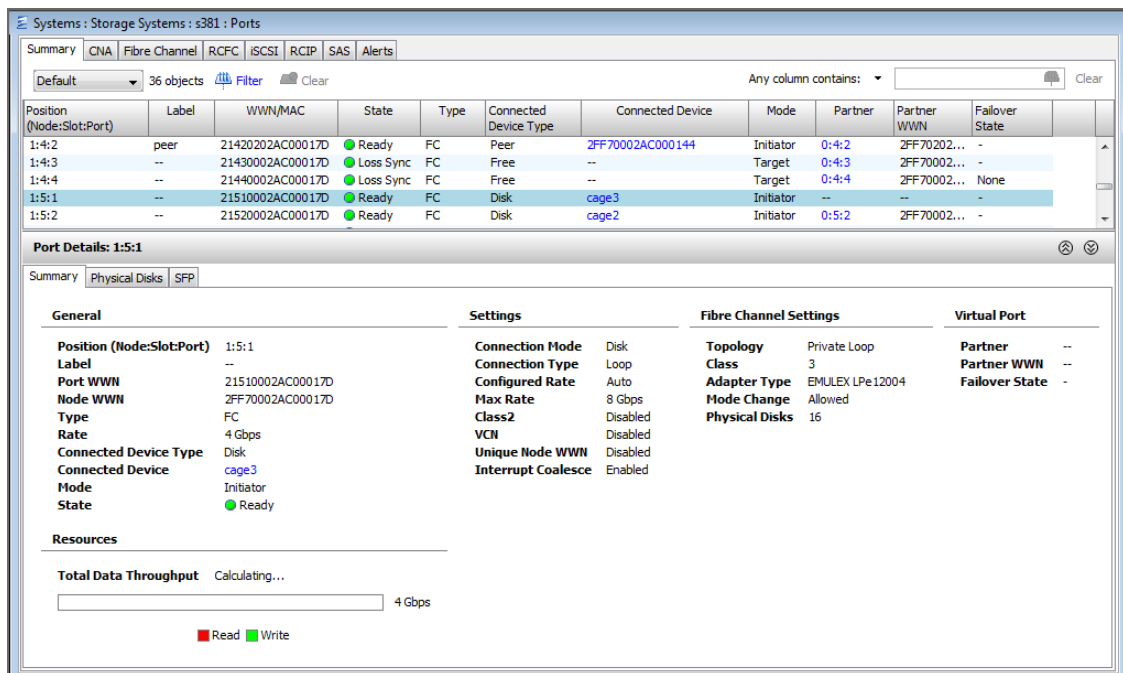
["Viewing SAS Details" \(page 49\)](#)

["Viewing System Port Alerts" \(page 52\)](#)

## Viewing Port Summary Information

To view the Port summary information:

1. Access the **Ports** screen.
2. In the Management Window, click the **Summary** tab.



The **Summary** tab is divided into a list pane and a detail pane. The list pane displays a summary of all system ports. The detail pane displays detailed information about a single port selected from the list pane.

**NOTE:** Port states indicating Loss Sync cannot be distinguished between being disconnected and a bad connection. The default display is a normal icon indicating the port is healthy. You can set the port feature to indicate a failed icon in the event of a Loss Sync as follows:

1. Go to the **View** menu.
2. Select **Preferences** and the **Advanced** tab.
3. Check the **Display ports in Loss Sync state as Failed** checkbox.

"List Pane" (page 27)

"Detail Pane" (page 28)

## List Pane

The list pane provides the following information:

Column	Description
<b>Position</b>	Port location in Node:Slot:Port format.
<b>Label</b>	The designated port label.
<b>WWN/MAC</b>	World Wide Name or Media Access Control address of the connected device.
<b>State</b>	The state of the port. See <a href="#">"System and Component Status Icons"</a> (page 407).
<b>Type</b>	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
<b>Connected Device Type</b>	Type of device that the port is connected to. Free, Disk, Host, Peer, RC, or InServ.
<b>Connected Device</b>	Name of device that the port is connected to, e.g., host1, cage0.
<b>Mode</b>	Port firmware mode setting—Initiator, Target, Peer, or Suspended. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.

Column	Description
<b>Partner</b>	The partner port.
<b>Partner WWN</b>	The WWN of the partner port.
<b>Failover State</b>	Indicates if the system is in a failover state.

## Detail Pane

The detail pane provides detailed information about a selected port from the list pane. Information is presented on up to four tabs, which include a **Summary** tab, and, depending on your system setup, **Physical Disks**, **SFP**, **Sessions**, or **Hosts**. Each are discussed in detail in the following :

“Viewing the Port Details Summary” (page 28)

“Physical Disks” (page 40)

“SFP” (page 44)

“Sessions” (page 35)

“Hosts” (page 35)

## Viewing the Port Details Summary

The port details summary is presented on the **Summary** tab.

Summary screen displaying FC port information:

The screenshot shows the 'Port Details: 1:5:2' summary screen. The top section is a table listing port details:

Position (Node:Slot:Port)	Label	WWN/MAC	State	Type	Connected Device Type	Connected Device	Mode	Partner	Partner WWN	Failover State
1:4:2	peer	21420202AC00017D	Ready	FC	Peer	2FF70002AC000144	Initiator	0:4:2	2FF70202...	-
1:4:3	--	21430002AC00017D	Loss Sync	FC	Free	--	Target	0:4:3	2FF70002...	-
1:4:4	--	21440002AC00017D	Loss Sync	FC	Free	--	Target	0:4:4	2FF70002...	None
1:5:1	--	21510002AC00017D	Ready	FC	Disk	cage3	Initiator	--	--	-
1:5:2	--	21520002AC00017D	Ready	FC	Disk	cage2	Initiator	0:5:2	2FF70002...	-

The bottom section, 'Port Details: 1:5:2', shows the 'Summary' tab with the following information:

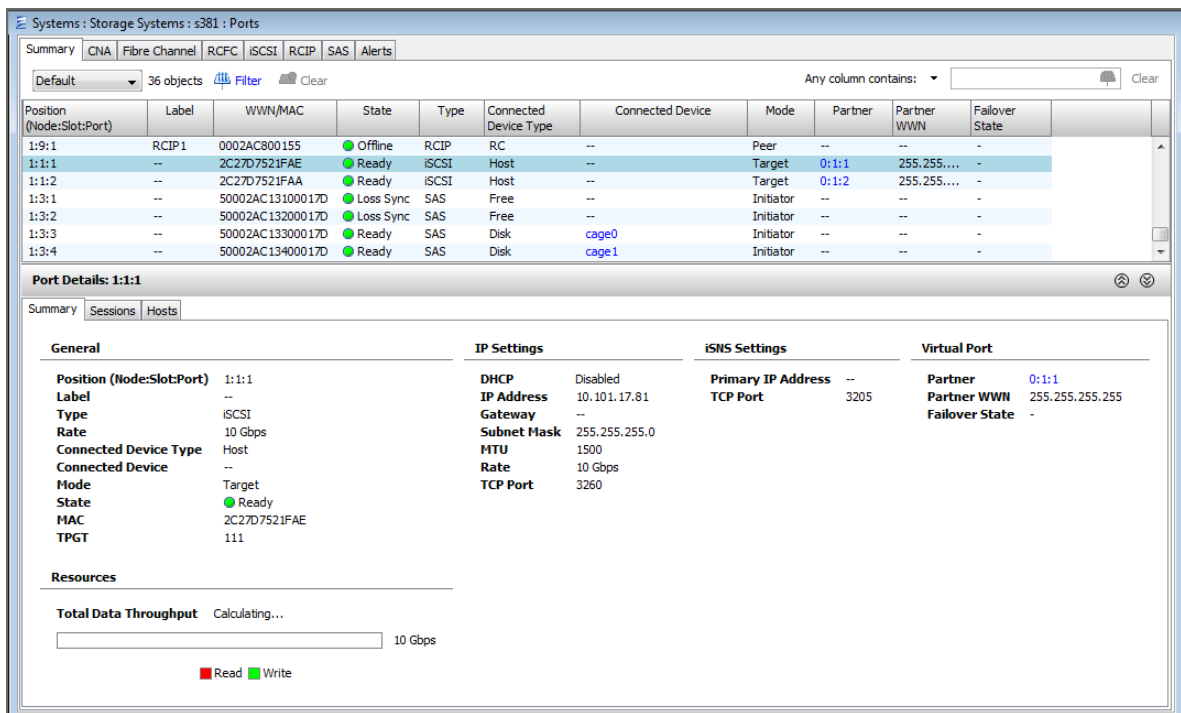
General	Settings	Fibre Channel Settings	Virtual Port
<b>Position (Node:Slot:Port)</b> 1:5:2 <b>Label</b> -- <b>Port WWN</b> 21520002AC00017D <b>Node WWN</b> 2FF70002AC00017D <b>Type</b> FC <b>Rate</b> 4 Gbps <b>Connected Device Type</b> Disk <b>Connected Device</b> cage2 <b>Mode</b> Initiator <b>State</b> Ready	<b>Connection Mode</b> Disk <b>Connection Type</b> Loop <b>Configured Rate</b> Auto <b>Max Rate</b> 8 Gbps <b>Class2</b> Disabled <b>VCN</b> Disabled <b>Unique Node WWN</b> Disabled <b>Interrupt Coalesce</b> Enabled	<b>Topology</b> Private Loop <b>Class</b> 3 <b>Adapter Type</b> EMULEX LPe12004 <b>Mode Change</b> Allowed <b>Physical Disks</b> 16	<b>Partner</b> 0:5:2 <b>Partner WWN</b> 2FF70002AC00017D <b>Failover State</b> -

Below the settings, there is a 'Resources' section showing 'Total Data Throughput' as 'Calculating...' with a bar chart for Read (red) and Write (green) operations, currently at 4 Gbps.

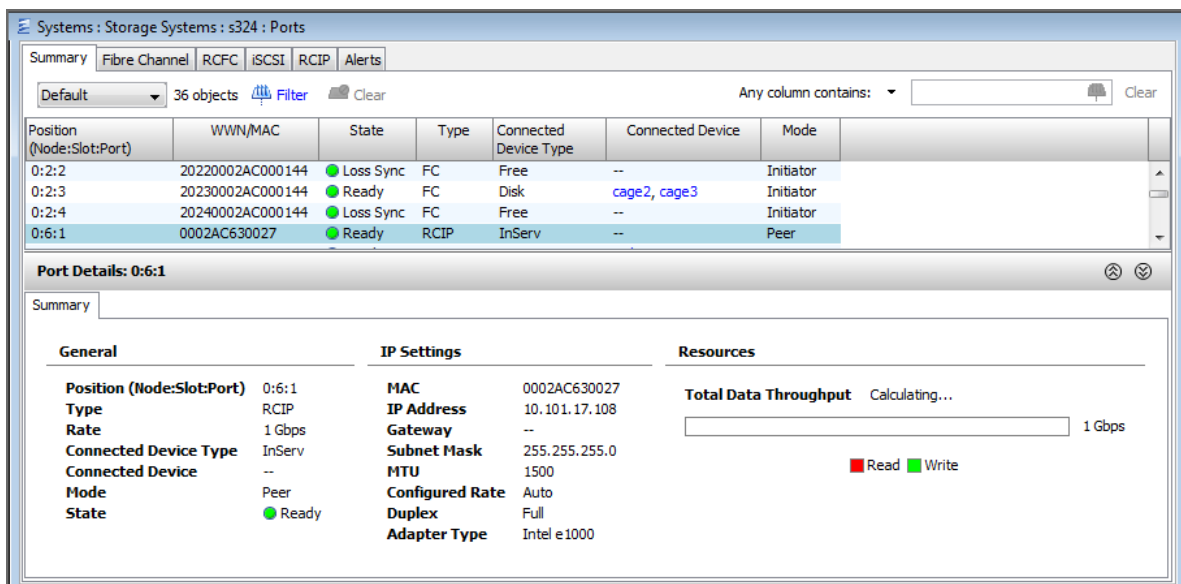
Summary screen displaying Persistence Port information for Target mode FC:







Summary screen displaying RCIP port information:



Summary screen displaying SAS port information:

Systems : Storage Systems : s381 : Ports

Summary CNA Fibre Channel RCFC iSCSI RCIP SAS Alerts

Default 36 objects Filter Clear Any column contains: Clear

Position (Node:Slot:Port)	Label	WWN/MAC	State	Type	Connected Device Type	Connected Device	Mode	Partner	Partner WWN	Failover State
0:9:1	RCIP0	0002AC80012F	Offline	RCIP	RC	--	Peer	--	--	-
0:3:1	--	50002AC03100017D	Ready	SAS	Disk	cage0	Initiator	--	--	-
0:3:2	--	50002AC03200017D	Ready	SAS	Disk	cage1	Initiator	--	--	-
1:4:1	--	21410002AC00017D	Ready	FC	Host	--	Target	0:4:1	2FF70002AC00017D	None
1:4:2	peer	21420202AC00017D	Ready	FC	Peer	2FF70002AC000144	Initiator	0:4:2	2FF70202AC00017D	-
1:4:3	--	21430002AC00017D	Loss Sync	FC	Free	--	Target	0:4:3	2FF70002AC00017D	-
1:4:4	--	21440002AC00017D	Loss Sync	FC	Free	--	Target	0:4:4	2FF70002AC00017D	None
1:5:1	--	21510002AC00017D	Ready	FC	Disk	cage3	Initiator	--	--	-
1:5:2	--	21520002AC00017D	Ready	FC	Disk	cage2	Initiator	0:5:2	2FF70002AC00017D	-
1:5:3	--	21530002AC00017D	Loss Sync	FC	Free	--	Target	0:5:3	2FF70002AC00017D	-

Port Details: 0:3:1

Summary Physical Disks

General		Settings		SAS Settings	
<b>Position (Node:Slot:Port)</b>	0:3:1	<b>Connection Mode</b>	Disk	<b>Topology</b>	Point-Point
<b>Label</b>	--	<b>Connection Type</b>	Point	<b>Adapter Type</b>	LST 9205-8e
<b>Port WWN</b>	50002AC03100017D	<b>Configured Rate</b>	6 Gbps	<b>Mode Change</b>	Prohibited
<b>Type</b>	SAS	<b>Max Rate</b>	6 Gbps	<b>Physical Disks</b>	8
<b>Rate</b>	6 Gbps	<b>Interrupt Coalesce</b>	Enabled		
<b>Connected Device Type</b>	Disk				
<b>Connected Device</b>	cage0				
<b>Mode</b>	Initiator				
<b>State</b>	Ready				

**Resources**

**Total Data Throughput** Calculating... 6 Gbps

Read Write

The **Summary** tab provides the following information:

Group	Field	Description
General	Position	Port location in Node:Slot:Port format.
	Label	The designated port label.
	Port WWN	Port World Wide Name.
	Node WWN	Node World Wide Name.
	Type	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
	Rate	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
	Connected Device Type	Type of device that the port is connected to: Free, Disk, Host, Peer, RC, or InServ.
	Connected Device	Name of device that the port is connected to, e.g. host1, cage0.
	Mode	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
	State	Current state of the port: Ready, Login Wait, Loss Sync, or Offline.
	MAC	For iSCSI ports. The Media Access Control address for the Ethernet interface.
	TPGT	For iSCSI ports. The Target Portal Group Tag for the iSCSI target portal group.
Resources	Total Data Throughput	The throughput in KB/sec. (Not shown for RCFC or Persistence ports.)
Settings (displayed for FC and RCFC ports)	Connection Mode	The type of port connection.
	Connection Type	Connection type or port connection setting (Loop, Point, or Loop-point). When the port is set to Loop-point, both loop and point-to-point connections are enabled.

Group	Field	Description
	<b>Configured Rate</b>	Data transfer rate setting (for example, 1 Gbps). Auto indicates that the system automatically selects the rate.
	<b>Max Rate</b>	Maximum rate of connection from the port.
	<b>Class 2</b>	Indicates whether Fibre Channel service Class 2 is <b>Disabled</b> , <b>Ack 1</b> or <b>Ack 0</b> .
	<b>VCN</b>	For fabric attached ports, indicates the VLUN change notification setting. When set to Enabled, notices are generated and sent to the fabric controller. When set to Disabled, no notification is sent.
	<b>Unique Node WWN</b>	Indicates whether the node's WWN is <b>Enabled</b> or <b>Disabled</b> .
	<b>Interrupt Coalesce</b>	If disabled, each I/O generates a separate interrupt to the HBA port driver rather than generating one interrupt for multiple I/O completion.
<b>IP Settings</b> (displayed for RCIP and iSCSI ports)	<b>MAC</b>	For RCIP ports. Media Access Control address of the Ethernet interface.
	<b>DHCP</b>	For iSCSI ports. Indicates if the Dynamic Host Configuration Protocol (DHCP) protocol is enabled.
	<b>IP Address</b>	IP address of the iSCSI or RCIP port.
	<b>Gateway</b>	The address of a local IP router on the same network as the system, used to forward traffic to destinations beyond the local network.
	<b>Subnet Mask</b>	Netmask address for the iSCSI or RCIP interface.
	<b>MTU</b>	Maximum Transmission Unit. The greatest amount of data or "packet" size that can be transferred at one time over a particular network connection without overburdening the connection. The default MTU setting for an iSCSI port is 1500. When supported by the network, an MTU value of 9000 should be used.
	<b>Configured Rate</b>	(For RCIP ports.) The configured data transfer rate. A value of 0 indicates that no data is being transferred.
	<b>Rate</b>	(For iSCSI ports.) Data transfer rate. A value of 0 indicates that no data is being transferred.
	<b>TCP Port</b>	(For iSCSI ports.) The TCP port number used by the iSCSI card.
	<b>Duplex</b>	(For RCIP ports.) The duplex speed, Half or Full.
	<b>Adapter Type</b>	(For RCIP ports.) Model of the adapter that contains the port (for example, Intel PRO/1000MT).
Fibre Channel Settings (displayed for FC and RCFC ports)	<b>Topology</b>	Type of connection (Private Loop, Public Loop, or Point-Point).
	<b>Class</b>	Identifies which Fibre Channel classes of service are enabled (2, 3, or 2/3). 2/3 indicates that both Class 2 and Class 3 are enabled.
	<b>Adaptor Type</b>	Model of the Fibre Channel adapter that contains the port (for example, QLOGIC 2302).
	<b>Remote Node WWN</b>	(For RCFC ports.) The node WWN.
	<b>Remote Port WWN</b>	(For RCFC ports.) The port WWN.
	<b>Mode Change</b>	Indicates whether port mode change from initiator to target or vice versa is Allowed or Prohibited. This setting is configured using the InForm CLI command <code>controlport</code> .
	<b>Hosts</b>	The number of hosts connected to the port. (This is only displayed if the port is connected to hosts.)
	<b>Physical Disks</b>	The number of physical disks connected to the port. This is only displayed if the port is connected to drive cages.

Group	Field	Description
	<b>Link State</b>	(For RCFC ports.) The current state of the link.
<b>iSNS Settings</b> (displayed for iSCSI ports)	<b>Primary IP Address</b>	Primary Internet Storage Name Service (iSNS) server IP address. iSNS protocol allows for automated discovery, management, and configuration of iSCSI.
	<b>Secondary IP Address</b>	Secondary Internet Storage Name Service (iSNS) server IP address.
	<b>TCP Port</b>	The port on the iSNS server with which to communicate.

## Physical Disks

The physical disk port information is presented on the **Physical Disks** tab.

The screenshot shows the 'Systems: Storage Systems: s381: Ports' window. The 'Physical Disks' tab is selected, showing a table of 16 objects. The table columns are AL\_PA, Device, Position (Cage:Magazine:Disk), I/O Error Count, and State. The data shows various disks from SEAGATE and HITACHI with their respective positions and error counts.

AL_PA	Device	Position (Cage:Magazine:Disk)	I/O Error Count	State
0xA6	SEAGATE	2:9:1	0	Normal
0xA7	SEAGATE	2:9:0	0	Normal
0xC9	HITACHI	2:4:0	0	Normal
0xE1	SEAGATE	2:0:0	0	Normal
0xC6	HITACHI	2:4:2	0	Normal
0xC7	HITACHI	2:4:1	0	Normal
0xBC	HITACHI	2:5:1	8	Normal
0xC5	HITACHI	2:4:3	0	Normal
0xA5	SEAGATE	2:9:2	0	Normal
0xA3	SEAGATE	2:9:3	0	Normal
0xC3	HITACHI	2:5:0	0	Normal
0xDA	SEAGATE	2:0:3	0	Normal
0xDC	SEAGATE	2:0:2	0	Normal
0xB9	HITACHI	2:5:3	0	Normal
0xE0	SEAGATE	2:0:1	0	Normal
0xBA	HITACHI	2:5:2	0	Normal

The following information is provided:

Column	Description
<b>AL_PA</b>	The arbitrated loop physical address of the device.
<b>Device</b>	The type of connected disk.
<b>Position</b>	The position of the disk in the system in C:M:D (Cage:Magazine:Disk) format.
<b>I/O Error Count</b>	The number of errors on the connected disk.
<b>State</b>	The state of the disk. See <a href="#">“System and Component Status Icons”</a> (page 407).

## SFP

The port SFP information is presented on the **SFP** tab.

Systems : Storage Systems : s381 : Ports

Summary CNA Fibre Channel ROFC iSCSI RCIP SAS Alerts

Default 36 objects Filter Clear Any column contains: Clear

Position (Node:Slot:Port)	Label	WWN/MAC	State	Type	Connected Device Type	Connected Device	Mode	Partner	Partner WWN	Fallover State
0:4:1	--	20410002AC00017D	Ready	FC	Host	--	Target	1:4:1	2FF70002AC00017D	None
0:4:2	peer	20420202AC00017D	Ready	FC	Peer	2FF70002AC000144	Initiator	1:4:2	2FF70202AC00017D	-
0:4:3	--	20430002AC00017D	Loss Sync	FC	Free	--	Initiator	1:4:3	2FF70002AC00017D	-
0:4:4	--	20440002AC00017D	Loss Sync	FC	Free	--	Target	1:4:4	2FF70002AC00017D	None
0:5:1	--	20510002AC00017D	Ready	FC	Free	--	Initiator	--	--	-
0:5:2	--	20520002AC00017D	Loss Sync	FC	Free	--	Target	1:5:2	2FF70002AC00017D	-
0:5:3	--	20530002AC00017D	Ready	FC	Disk	cage2	Initiator	1:5:3	2FF70002AC00017D	-
0:5:4	--	20540002AC00017D	Ready	FC	Disk	cage3	Initiator	--	--	-
0:8:1	--	20810002AC00017D	Ready	FC	Free	--	Target	1:8:1	2FF70002AC00017D	None
0:8:2	--	20820002AC00017D	Loss Sync	FC	Free	--	Initiator	--	--	-

Port Details: 0:5:3

Summary Physical Disks SFP

General		DDM						
Position (Node:Slot:Port)		Type	Unit	Value	Low Warning Threshold	High Warning Threshold	Low Alarm Threshold	High Alarm Threshold
State	Degraded	Temp	C	32	-5	85	-10	90
Manufacturer	FINISAR_CORP.	Voltage	mV	3237	3000	3600	2900	3700
Part Number	--	TX Bias	mA	7	2	14	1	17
Serial Number	PG35K48	TX Power	uW	457	158	562	125	631
Revision	A	RX Power	uW	402	15	1000	10	1258
Max Speed	8.3 Gbps							
Qualified	No							
TX Disable	No							
TX Fault	No							
RX Loss	No							
RX Power Low	No							
DDM Support	Yes							

The following information is provided:

Group	Field	Description
General	Position	The location of the SFP within the system.
	State	Current condition of the SFP.
	Manufacturer	Manufacturer of the SFP.
	Part Number	Part number of the SFP.
	Serial Number	Serial number of the SFP.
	Revision	SFP's revision level.
	Max Speed	Maximum speed allowed by the SFP.
	Qualified	Displays whether the SFP has been tested and if the SFP is supported.
	TX Disable	Displays whether the transmit laser is disabled.
	TX Fault	Displays whether the transmit laser has a problem.
	RX Loss	Displays whether the receive end of the SFP is experiencing a loss of signal from the host or drive cage.
	RX Power Low	Displays whether the SFP receive power is low.
	DDM Support	Displays whether the SFP is DDM-capable (Digital Diagnostic Monitoring).
DDM	Column	Description
	Type	Identifies the monitored parameters (temperature, voltage, TX bias, TX power, and RX power).
	Unit	The unit of measure used for the monitored parameters.
	Value	The current measured value.
	Low Threshold Warning	The manufacturer's recommended lower-limit warning level.
	High Threshold Warning	The manufacturer's recommended upper-limit warning level.

Group	Field	Description
	<b>Low Alarm Threshold</b>	The manufacturer's recommended lower-limit alarm level.
	<b>High Alarm Threshold</b>	The manufacturer's recommended upper-limit alarm level.

## Sessions

For iSCSI ports, session information is displayed on the **Sessions** tab.

The following information is provided:

Column	Description
<b>Position</b>	Location of the iSCSI port in Node:Slot:Port format.
<b>IP Address</b>	IP address of the host that initiated the connection.
<b>TSIH</b>	Identifier for the Target Session Identifying Handle (TSIH).
<b>iSCSI</b>	iSCSI name for the associated iSCSI host path.
<b>Connection Count</b>	Number of connections for this session.
<b>Start Time</b>	Time the session started.

## Hosts

The host port information is presented on the **Hosts** tab. Information differs for Fibre Channel and iSCSI ports.

The following information is provided for Fibre Channel ports:

Column	Description
<b>Host ID</b>	The ID of the host.
<b>Host Name</b>	The name of the host.
<b>Domain</b>	The domain in which the host resides.
<b>WWN</b>	The host's WWN.
<b>Port</b>	The hosts location in N:S:P (Node:Slot:Port) format.

The following information is provided for iSCSI ports:

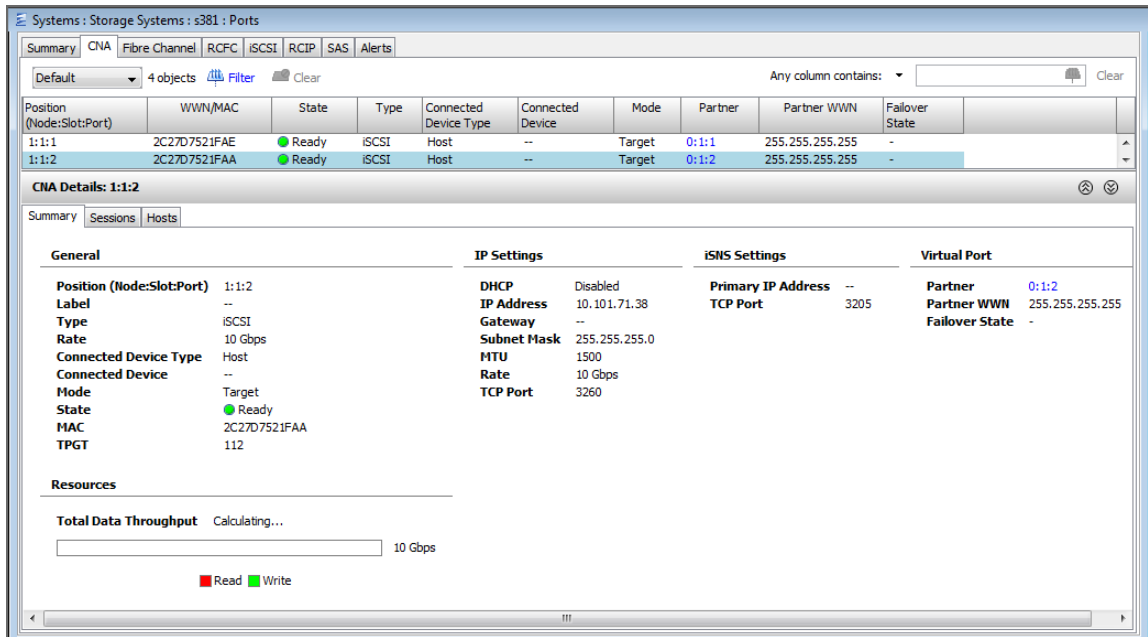
Column	Description
<b>Host ID</b>	The ID of the host.
<b>Host Name</b>	The name of the host.
<b>Domain</b>	The domain in which the host resides.
<b>iSCSI</b>	iSCSI name for the associated iSCSI host path.
<b>IP Address</b>	iSCSI port IP address.

## Viewing CNA Ports

To view CNA port information:

1. Access the Ports screen.

2. In the Management Window, click the **CNA** tab.



The **CNA** tab is divided into a list pane and a detail pane. The list pane displays a summary of all CNA ports in the system. The detail pane displays detailed information about a single port selected from the list pane.

“List Pane” (page 36)

“Detail Pane” (page 36)

## List Pane

The following information is provided:

Column	Description
<b>Position</b>	The port location in Node:Slot:Port format.
<b>WWN/MAC</b>	World Wide Name or Media Access Control address of the connected device.
<b>State</b>	The state of the port. See “ <a href="#">System and Component Status Icons</a> ” (page 407).
<b>Type</b>	The port protocol type.
<b>Connected Device Type</b>	Type of device that the port is connected to. Free, Disk, Host, Peer, RC, or InServ.
<b>Connected Device</b>	Name of device that the port is connected to, e.g. host1, cage0.
<b>Mode</b>	Port firmware mode setting—Initiator, Target, Peer, or Suspended. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
<b>Partner</b>	The partner port.
<b>Partner WWN</b>	The WWN of the partner port.
<b>Failover State</b>	Indicates if the system is in a failover state.

## Detail Pane

The detail pane provides detailed information about a selected CNA port from the list pane.



**Summary**, **Sessions**, and **Host** tabs are displayed for iSCSI-configured ports. The information on these tabs is identical to that displayed on corresponding tabs for iSCSI ports: “iSCSI Port Summary” (page 46), “Sessions Tab” (page 47), and “Hosts Tab” (page 47).

## Viewing System Fibre Channel Ports

To view system fibre channel port information:

1. Access the Ports screen.
2. In the Management Window, click the **Fibre Channel** tab.

The screenshot shows the 'Systems: Storage Systems: s381: Ports' window. The 'Fibre Channel' tab is selected. The list pane shows four ports with columns: Position (Node:Slot:Port), WWN, State, Mode, Topology, Rate (Gbps), Class, Type, Connected Device Type, Connected Device, Mode Change, Partner, Partner WWN, and Failover State. The detail pane for port 0:4:2 shows the following information:

General		Settings		Fibre Channel Settings		Virtual Port	
Position (Node:Slot:Port)	0:4:2	Connection Mode	Peer	Topology	Fabric Attached	Partner	1:4:2
Label	peer	Connection Type	Point	Class	3	Partner WWN	2FF70202AC00017D
Port WWN	20420202AC00017D	Configured Rate	Auto	Adapter Type	EMULEX LPe12004	Failover State	-
Node WWN	2FF70202AC00017D	Max Rate	8 Gbps	Mode Change	Allowed		
Type	FC	Class2	Disabled				
Rate	2 Gbps	VCN	Disabled				
Connected Device Type	Peer	Unique Node WWN	Disabled				
Connected Device	2FF70002AC000144	Interrupt Coalesce	Enabled				
Mode	Initiator						
State	Ready						

Resources: Total Data Throughput: Calculating... 2 Gbps. Legend: Read (red square), Write (green square).

The **Fibre Channel** tab is divided into a list pane and a detail pane. The list pane displays a summary of all fibre channel ports in the system. The detail pane displays detailed information about a single port selected from the list pane.

“List Pane” (page 37)

“Detail Pane” (page 38)

### List Pane

The list pane can be filtered to display Fibre Channel Summary and Settings information.

When **Summary** is selected, the following information is displayed:

Column	Description
<b>Position</b>	The port location in Node:Slot:Port format.
<b>WWN</b>	World Wide Name of the connected device.
<b>State</b>	The state of the port. See “System and Component Status Icons” (page 407).
<b>Mode</b>	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
<b>Topology</b>	Type of connection (Private Loop, Public Loop, or Point-Point).
<b>Rate</b>	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
<b>Class</b>	Identifies which Fibre Channel classes of service are enabled (2, 3, or 2/3). 2/3 indicates that both Class 2 and Class 3 are enabled.
<b>Connected Device Type</b>	Type of device that the port is connected to. Free, Disk, Host, Peer, or InServ.

Column	Description
<b>Connected Device</b>	Name of device that the port is connected to, e.g. host1, cage0.
<b>Mode Change</b>	Indicates whether port mode change from initiator to target or vice versa is Allowed or Prohibited. This setting is configured using the InForm CLI command <code>controlport</code> .
<b>Partner</b>	The partner port.
<b>Partner WWN</b>	The WWN of the partner port.
<b>Failover State</b>	Indicates if the system is in a failover state.

When **Settings** is selected, the following information is displayed:

Column	Description
<b>Position</b>	The port location in Node:Slot:Port format.
<b>Mode Change</b>	Indicates whether port mode change from initiator to target or vice versa is Allowed or Prohibited. This setting is configured using the InForm CLI command <code>controlport</code> .
<b>Partner</b>	The partner port.
<b>Partner WWN</b>	The WWN of the partner port.
<b>Failover State</b>	Indicates if the system is in a failover state.
<b>Connection Mode</b>	The type of port connection. Disk, Host, Peer, or RCFC.
<b>Connection Type</b>	Type of connection (Private Loop, Public Loop, or Point-Point).
<b>Configured Rate</b>	Data transfer rate setting in Gbps (for example, 1 Gbps). Auto indicates that the system automatically selects the rate.
<b>Max Rate</b>	Maximum rate of connection from the port.
<b>VCN</b>	For fabric attached ports, indicates the VLUN change notification setting. When set to Enabled, notices are generated and sent to the fabric controller. When set to Disabled, no notification is sent.
<b>Interrupt Coalesce</b>	If Disabled, each I/O generates a separate interrupt to the HBA port driver rather than generating one interrupt for multiple I/O completion. Not available for systems running HP 3PAR OS 2.2.4 or lower.

## Detail Pane

The detail pane provides detail information about a selected fibre channel port from the list pane. If the Fibre Channel port is connected to disks, information is presented on a **Summary** tab, a **Physical Disks** tab, and an **SFP** tab. If the Fibre Channel port is connected to hosts, information is presented on a **Summary** tab, a **Hosts** tab, and an **SFP** tab. Each are discussed in detail in the following sections:

[“Fibre Channel Summary” \(page 38\)](#)

[“Physical Disks” \(page 40\)](#)

[“SFP” \(page 44\)](#)

[“Hosts” \(page 41\)](#)

## Fibre Channel Summary

The fibre channel summary is displayed on the **Summary** tab.

The following information is provided:

Group	Field	Description
General	Position	The port location in Node:Slot:Port format.
	Label	The designated port label.
	Port WWN	Port World Wide Name.
	Node WWN	Node World Wide Name.
	Type	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
	Rate	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
	Connected Device Type	Type of device that the port is connected to. Free, Disk, Host, Peer, or InServ.
	Connected Device	Name of device that the port is connected to, e.g. host1, cage0.
	Mode	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
	State	Current state of the port.
Resources	Total Data Throughput	The throughput in KB/sec.
Settings	Connection Mode	The type of port connection.
	Connection Type	Connection type or port connection setting (Loop, Point, or Loop-point). When the port is set to Loop-point, both loop and point-to-point connections are enabled.
	Configured Rate	Data transfer rate setting (for example, 1 Gbps). Auto indicates that the system automatically selects the rate.
	Max Rate	Maximum rate of connection from the port.
	Class 2	Indicates whether Fibre Channel service Class 2 is Disabled, Ack 1 or Ack 0.
	VCN	For fabric attached ports, indicates the VLUN change notification setting. When set to Enabled, notices are generated and sent to the fabric controller. When set to Disabled, no notification is sent.
	Unique Node WWN	Indicates whether the node's WWN is Enabled or Disabled. Not available for systems running HP 3PAR OS 2.2.4 or lower.
	Interrupt Coalesce	If Disabled, each I/O generates a separate interrupt to the HBA port driver rather than generating one interrupt for multiple I/O completion. Not available for systems running HP 3PAR OS 2.2.4 or lower.
Fibre Channel Settings	Topology	Type of connection (Private Loop, Public Loop, or Point-Point).
	Class	Identifies which Fibre Channel classes of service are enabled (2, 3, or 2/3). 2/3 indicates that both Class 2 and Class 3 are enabled.
	Adaptor Type	Model of the Fibre Channel adaptor that contains the port (for example, QLOGIC 2302).

Group	Field	Description
	<b>Mode Change</b>	Indicates whether port mode change from initiator to target or vice versa is Allowed or Prohibited. This setting is configured using the InForm CLI command <code>controlport</code> .
	<b>Hosts</b>	The number of hosts connected to the port. This is only displayed if the port is connected to hosts.
	<b>Physical Disks</b>	The number of physical disks connected to the port. This is only displayed if the port is connected to drive cages.
	<b>Virtual Port</b>	<b>Partner</b> The partner port.
		<b>Partner WWN</b> The WWN of the partner port.
<b>Failover State</b>		Indicates if the system is in a failover state.
<b>Persona</b> (not displayed on systems using HP 3PAR OS 2.3.1 or higher)	<b>Persona</b>	Number for the current port persona setting.
	<b>Vendor</b>	Manufacturer of the host computers network adapter. This value is determined by the port persona.
	<b>Adapter Type</b>	Host computer's network adapter. This value is determined by the port persona.
	<b>OS</b>	Host computers operating system. This value is determined by the port persona.
	<b>Connection</b>	Indicates whether the connection is Direct Connect or Fabric Attached, as determined by the port persona.
	<b>Modified</b>	When a persona has been edited by a user, <b>Modified</b> appears in this column. Otherwise, this column remains blank (-).

## Physical Disks

The physical disk port information is presented on the **Physical Disks** tab.

The following information is provided:

Column	Description
<b>AL_PA</b>	The arbitrated loop physical address of the device.
<b>Device</b>	The type of connected disk.
<b>Position</b>	The position of the disk in the system.
<b>I/O Error Count</b>	The number of errors on the connected disk.
<b>State</b>	The state of the disk. See <a href="#">“System and Component Status Icons”</a> (page 407).

## SFP

The Fibre Channel port SFP information is presented on the **SFP** tab.

The following information is provided:

Group	Field	Description
General	Position	The location of the SFP within the system.
	State	Current condition of the SFP.
	Manufacturer	Manufacturer of the SFP.
	Part Number	Part number of the SFP.
	Serial Number	Serial number of the SFP.
	Revision	SFP's revision level.
	Max Speed	Maximum speed allowed by the SFP.
	Qualified	Displays whether the SFP has been tested and if the SFP is supported.
	TX Disable	Displays whether the transmit laser is disabled.
	TX Fault	Displays whether the transmit laser has a problem.
	RX Loss	Displays whether the receive end of the SFP is experiencing a loss of signal from the host or drive cage.
	RX Power Low	Displays whether the SFP receive power is low.
	DDM Support	Displays whether the SFP is DDM-capable (Digital Diagnostic Monitoring).
DDM	Type	Identifies the monitored parameters (temperature, voltage, TX bias, TX power, and RX power).
	Unit	The unit of measure used for the monitored parameters.
	Value	The current measured value.
	Low Threshold Warning	The manufacturer's recommended lower-limit warning level.
	High Threshold Warning	The manufacturer's recommended upper-limit warning level.
	Low Alarm Threshold	The manufacturer's recommended lower-limit alarm level.
	High Alarm Threshold	The manufacturer's recommended upper-limit alarm level.

## Hosts

The host port information is presented on the **Hosts** tab.

The following information is provided:

Column	Description
Host ID	The ID of the host.
Host Name	The name of the host.
Domain	The domain in which the host resides.
WWN	The hosts WWN.
Port	The hosts location in N:S:P (Node:Slot:Port) format.

## Viewing System RCFC Ports

To view system Remote Copy over Fibre Channel (RCFC) port information:

1. Access the Ports screen.
2. In the Management Window, click the **RCFC** tab.

The screenshot shows the 'Systems: Storage Systems: s020: Ports' window. The 'RCFC' tab is active. The list pane displays two ports:

Position (Node:Slot:Port)	State	Mode	Topology	Rate (Gbps)	Remote Port WWN	Remote Node WWN
0:2:1	Ready	Initiator	Fabric Attached	4	20310002AC000011	2FF70002AC000011
1:2:1	Ready	Initiator	Fabric Attached	4	21310002AC000011	2FF70002AC000011

The detail pane for port 0:2:1 shows the following information:

General		Settings		Fibre Channel Settings	
Position (Node:Slot:Port)	0:2:1	Connection Mode	RCFC	Topology	Fabric Attached
Label	--	Connection Type	Point	Class	3
Port WWN	20210002AC000014	Configured Rate	Auto	Adapter Type	EMULEX LP 11002
Node WWN	2FF70002AC000014	Max Rate	4 Gbps	Remote Port WWN	20310002AC000011
Type	RCFC	Class2	Disabled	Remote Node WWN	2FF70002AC000011
Rate	4 Gbps	VCN	Disabled	Mode Change	Allowed
Connected Device Type	RC	Unique Node WWN	Disabled	Link State	Ready
Connected Device	20310002AC000011	Interrupt Coalesce	Enabled		
Mode	Initiator				
State	Ready				

The Resources section shows 'Total Data Throughput' as 'Calculating...' with a bar chart showing 4 Gbps. A legend indicates Read (red) and Write (green).

The **RCFC** tab is divided into a list pane and a detail pane. The list pane displays a summary of all RCFC ports in the system. The detail pane displays detailed information about a single port selected from the list pane.

["List Pane" \(page 42\)](#)

["Detail Pane" \(page 42\)](#)

## List Pane

The list pane presents the following information:

Column	Description
<b>Position</b>	The port location in Node:Slot:Port format.
<b>State</b>	The state of the port. See <a href="#">"System and Component Status Icons" (page 407)</a> .
<b>Mode</b>	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
<b>Topology</b>	Type of connection (Private Loop, Public Loop, or Point-Point).
<b>Rate</b>	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
<b>Remote Port WWN</b>	World Wide Name of the remote port.
<b>Remote Node WWN</b>	World Wide Name of the remote node.

## Detail Pane

The detail pane provides detail information about a selected RCFC port from the list pane. Information is presented on a **Summary** tab, and depending on your system setup, an **SFP** tab. Each are discussed in detail in the following:

[“RCFC Port Summary” \(page 43\)](#)

[“SFP” \(page 44\)](#)

## RCFC Port Summary

The RCFC port summary is displayed on the **Summary** tab.

The following information is provided:

Group	Field	Description
General	Position	The port location in Node:Slot:Port format.
	Label	The designated port label.
	Port WWN	Port World Wide Name.
	Node WWN	Node World Wide Name.
	Type	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
	Rate	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
	Connected Device Type	Type of device that the port is connected to. Free, Disk, Host, Peer, or InServ.
	Connected Device	Name of device that the port is connected to, e.g. host1, cage0.
	Mode	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
	State	Current state of the port.
Resources	Total Data Throughput	The throughput in KB/sec.
Settings	Connection Mode	The type of port connection.
	Connection Type	Connection type or port connection setting (Loop, Point, or Loop-point). When the port is set to Loop-point, both loop and point-to-point connections are enabled.
	Configured Rate	Data transfer rate setting (for example, 1 Gbps). Auto indicates that the system automatically selects the rate.
	Max Rate	Maximum rate of connection from the port.
	Class 2	Indicates whether Fibre Channel service Class 2 is Disabled, Ack 1 or Ack 0.
	VCN	For fabric attached ports, indicates the VLUN change notification setting. When set to Enabled, notices are generated and sent to the fabric controller. When set to Disabled, no notification is sent.
	Unique Node WWN	Indicates whether the node's WWN is Enabled or Disabled. Not available for systems running HP 3PAR OS 2.2.4 or lower.
	Interrupt Coalesce	If Disabled, each I/O generates a separate interrupt to the HBA port driver rather than generating one interrupt for multiple I/O completion. Not available for systems running HP 3PAR OS 2.2.4 or lower.
Fibre Channel Settings	Topology	Type of connection (Private Loop, Public Loop, or Point-Point).
	Class	Identifies which Fibre Channel classes of service are enabled (2, 3, or 2/3). 2/3 indicates that both Class 2 and Class 3 are enabled.
	Adaptor Type	Model of the Fibre Channel adaptor that contains the port (for example, QLOGIC 2302).

Group	Field	Description
	<b>Remote Port WWN</b>	World Wide Name of the remote port.
	<b>Remote Node WWN</b>	World Wide Name of the remote node.
	<b>Mode Change</b>	Indicates whether port mode change from initiator to target or vice versa is Allowed or Prohibited. This setting is configured using the InForm CLI command <code>controlport</code> .
	<b>Link State</b>	The state of the link.
<b>Persona</b> (not displayed on systems using HP 3PAR OS 2.3.1 or higher)	<b>Persona</b>	Number for the current port persona setting.
	<b>Vendor</b>	Manufacturer of the host computers network adapter. This value is determined by the port persona.
	<b>Adapter Type</b>	Host computer's network adapter. This value is determined by the port persona.
	<b>OS</b>	Host computers operating system. This value is determined by the port persona.
	<b>Connection</b>	Indicates whether the connection is Direct Connect or Fabric Attached, as determined by the port persona.
	<b>Modified</b>	When a persona has been edited by a user, <b>Modified</b> appears in this column. Otherwise, this column remains blank (-).

## SFP

The RCFC SFP information is presented on the **SFP** tab.

The following information is provided:

Group	Field	Description
<b>General</b>	<b>Position</b>	The location of the SFP within the system.
	<b>State</b>	Current condition of the SFP.
	<b>Manufacturer</b>	Manufacturer of the SFP.
	<b>Part Number</b>	Part number of the SFP.
	<b>Serial Number</b>	Serial number of the SFP.
	<b>Revision</b>	SFP's revision level.
	<b>Max Speed</b>	Maximum speed allowed by the SFP.
	<b>Qualified</b>	Displays whether the SFP has been tested and if the SFP is supported.
	<b>TX Disable</b>	Displays whether the transmit laser is disabled.
	<b>TX Fault</b>	Displays whether the transmit laser has a problem.
	<b>RX Loss</b>	Displays whether the receive end of the SFP is experiencing a loss of signal from the host or drive cage.
	<b>RX Power Low</b>	Displays whether the SFP receive power is low.
	<b>DDM Support</b>	Displays whether the SFP is DDM-capable (Digital Diagnostic Monitoring).
<b>DDM</b>	<b>Type</b>	Identifies the monitored parameters (temperature, voltage, TX bias, TX power, and RX power).
	<b>Unit</b>	The unit of measure used for the monitored parameters.
	<b>Value</b>	The current measured value.



Group	Field	Description
	<b>Low Threshold Warning</b>	The manufacturer's recommended lower-limit warning level.
	<b>High Threshold Warning</b>	The manufacturer's recommended upper-limit warning level.
	<b>Low Alarm Threshold</b>	The manufacturer's recommended lower-limit alarm level.
	<b>High Alarm Threshold</b>	The manufacturer's recommended upper-limit alarm level.

## Viewing System iSCSI Ports

To view system iSCSI port information:

1. Access the Ports screen.
2. In the Management Window, click the **iSCSI** tab.

The screenshot displays the 'Systems : Storage Systems : s381 : Ports' window. The 'iSCSI' tab is selected, showing a list of two ports. The details pane for port 1:1:1 is expanded, showing the following information:

General	IP Settings	iSNS Settings	Virtual Port
Position (Node:Slot:Port): 1:1:1	DHCP: Disabled	Primary IP Address: --	Partner: 0:1:1
Label: --	IP Address: 10.101.17.81	TCP Port: 3205	Partner WWN: 255.255.255.255
Type: iSCSI	Gateway: --		Failover State: -
Rate: 10 Gbps	Subnet Mask: 255.255.255.0		
Connected Device Type: Host	MTU: 1500		
Connected Device: --	Rate: 10 Gbps		
Mode: Target	TCP Port: 3260		
State: Ready			
MAC: 2C27D7521FAE			
TPGT: 111			

Resources section shows Total Data Throughput as Calculating... with a bar chart for Read and Write operations.

The **iSCSI** tab is divided into a list pane and a detail pane. The list pane displays a summary of all iSCSI ports in the system. The detail pane displays detailed information about a single port selected from the list pane.

[“List Pane” \(page 45\)](#)

[“Detail Pane” \(page 46\)](#)

### List Pane

The list pane presents the following information:

Column	Description
<b>Position</b>	The port location in Node:Slot:Port format.
<b>MAC</b>	Media Access Control address of the connected device.
<b>State</b>	The state of the port. See <a href="#">“System and Component Status Icons” (page 407)</a> .
<b>IP Address</b>	IP address of the iSCSI port.
<b>Subnet Mask</b>	Netmask address for the iSCSI interface.
<b>Gateway</b>	The address of a local IP router on the same network as the system, used to forward traffic to destinations beyond the local network.

Column	Description
<b>MTU</b>	Maximum Transmission Unit. The greatest amount of data or "packet" size that can be transferred at one time over a particular network connection without overburdening the connection. The default MTU setting for an iSCSI port is 1500. When supported by the network, an MTU value of 9000 should be used.
<b>Partner</b>	The partner port.
<b>Partner WWN</b>	The WWN of the partner port.
<b>Failover State</b>	Indicates if the system is in a failover state.

## Detail Pane

The detail pane provides detailed information about a selected port from the list pane. Information is presented a **Summary** tab, a **Sessions** tab, and a **Hosts** tab. Each are discussed in detail in the following sections:

["iSCSI Port Summary" \(page 46\)](#)

["Sessions Tab" \(page 47\)](#)

["Hosts Tab" \(page 47\)](#)

## iSCSI Port Summary

The iSCSI port summary is displayed on the **Summary** tab.

The following information is provided:

Group	Field	Description
<b>General</b>	<b>Position</b>	The port location in Node:Slot:Port format.
	<b>Label</b>	The designated port label.
	<b>Type</b>	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
	<b>Rate</b>	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
	<b>Connected Device Type</b>	Type of device that the port is connected to. Free, Disk, Host, Peer, or InServ.
	<b>Connected Device</b>	Name of device that the port is connected to, e.g. host1, cage0.
	<b>Mode</b>	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
	<b>State</b>	Current state of the port.
	<b>MAC</b>	The Media Access Control address for the Ethernet interface.
	<b>TPGT</b>	The Target Portal Group Tag for the iSCSI target portal group.
<b>Resources</b>	<b>Total Data Throughput</b>	The throughput in KB/sec.
<b>IP Settings</b>	<b>DHCP</b>	For iSCSI ports. Indicates if the Dynamic Host Configuration Protocol (DHCP) protocol is enabled or disabled.
	<b>IP Address</b>	IP address of the iSCSI port.
	<b>Gateway</b>	The address of a local IP router on the same network as the Storage System, used to forward traffic to destinations beyond the local network.
	<b>Subnet Mask</b>	Netmask address for the iSCSI interface.

Group	Field	Description
	<b>MTU</b>	Maximum Transmission Unit. The greatest amount of data or "packet" size that can be transferred at one time over a particular network connection without overburdening the connection. The default MTU setting for an iSCSI port is 1500. When supported by the network, an MTU value of 9000 should be used.
	<b>Rate</b>	Data transfer rate. A value of 0 indicates that no data is being transferred.
	<b>TCP Port</b>	The TCP port number used by the iSCSI card.
<b>iSNS Settings</b>	<b>Primary IP Address</b>	Primary Internet Storage Name Service (iSNS) server IP address. iSNS protocol allows for automated discovery, management, and configuration of iSCSI.
	<b>TCP Port</b>	The port on the iSNS server with which to communicate.
<b>Virtual Port</b>	<b>Partner</b>	The partner port.
	<b>Partner WWN</b>	The WWN of the partner port.
	<b>Failover State</b>	Indicates if the system is in a failover state.

## Sessions Tab

The following information is provided:

Column	Description
<b>Position</b>	Location of the iSCSI port.
<b>IP Address</b>	IP address of the host that initiated the connection.
<b>TSIH</b>	Identifier for the Target Session Identifying Handle (TSIH).
<b>iSCSI</b>	iSCSI name for the associated iSCSI host path.
<b>Connection Count</b>	Number of connections for this session.
<b>Start Time</b>	Time the session started.

## Hosts Tab

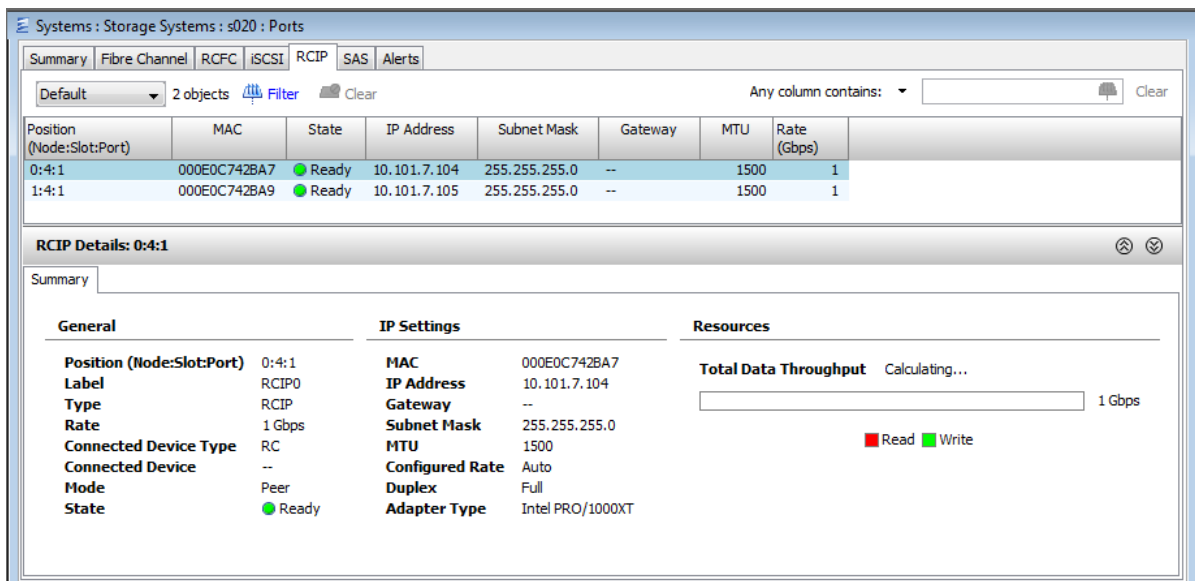
The following information is provided:

Column	Description
<b>Host ID</b>	Unique number for the port.
<b>Host Name</b>	Name of a host to which the target port connects.
<b>Domain</b>	Name of the domain associated with the host, if applicable.
<b>IP Address</b>	IP address of the iSCSI port.

## Viewing System RCIP Ports

To view system Remote Copy over IP (RCIP) port information:

1. Access the Ports screen.
2. In the Management Window, click the **RCIP** tab.



The **RCIP** tab is divided into a list pane and a detail pane. The list pane displays a summary of all RCIP ports in the system. The detail pane displays detailed information about a single port selected from the list pane.

The list pane provides the following information:

Column	Description
<b>Position</b>	The port location in Node:Slot:Port format.
<b>MAC</b>	Media Access Control address of the connected device.
<b>State</b>	The state of the port. See <a href="#">"System and Component Status Icons"</a> (page 407).
<b>IP Address</b>	IP address of the RCIP port.
<b>Subnet Mask</b>	Netmask address for the RCIP interface.
<b>Gateway</b>	The address of a local IP router on the same network as the Storage System, used to forward traffic to destinations beyond the local network.
<b>MTU</b>	Maximum Transmission Unit. The greatest amount of data or "packet" size that can be transferred at one time over a particular network connection without overburdening the connection. The default MTU setting for an iSCSI port is 1500. When supported by the network, an MTU value of 9000 should be used.
<b>Rate</b>	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.

The detail pane provides the following information:

Group	Field	Description
<b>General</b>	<b>Position</b>	The port location in Node:Slot:Port format.
	<b>Label</b>	The designated port label.
	<b>Type</b>	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
	<b>Rate</b>	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
	<b>Connected Device Type</b>	Type of device that the port is connected to. Free, Disk, Host, Peer, or InServ.

Group	Field	Description
	<b>Connected Device</b>	Name of device that the port is connected to, e.g. host1, cage0.
	<b>Mode</b>	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
	<b>State</b>	Current state of the port.
<b>IP Settings</b>	<b>MAC</b>	The Media Access Control address for the Ethernet interface.
	<b>IP Address</b>	IP address of the RCIP port.
	<b>Gateway</b>	The address of a local IP router on the same network as the system, used to forward traffic to destinations beyond the local network.
	<b>Subnet Mask</b>	Netmask address for the RCIP interface.
	<b>MTU</b>	Maximum Transmission Unit. The greatest amount of data or "packet" size that can be transferred at one time over a particular network connection without overburdening the connection. The default MTU setting for an iSCSI port is 1500. When supported by the network, an MTU value of 9000 should be used.
	<b>Configured Rate</b>	The duplex speed, Half or Full.
	<b>Duplex</b>	Model of the adapter that contains the port (for example, Intel PRO/1000MT).
	<b>Adapter Type</b>	The TCP port number used by the iSCSI or RCIP card.
<b>Resources</b>	<b>Total Data Throughput</b>	The throughput in KB/sec.

## Viewing SAS Details

If the system supports SAS cages, an SAS tab will be displayed in the Management Window. SAS ports accept disk attachments only.

To view SAS details:

1. Access the Ports screen.
2. In the Management Window, click the **SAS** tab.

**Systems : Storage Systems : s381 : Ports**

Summary | CNA | Fibre Channel | RCFC | iSCSI | RCIP | SAS | Alerts

Summary 6 objects Filter Clear Any column contains: Clear

Position (Node:Slot:Port)	WWN	State	Mode	Topology	Rate (Gbps)	Connected Device Type	Connected Device	Mode Change
1:3:4	50002AC13400017D	Ready	Initiator	Point-Point	6	Disk	cage1	Prohibited
1:3:3	50002AC13300017D	Ready	Initiator	Point-Point	6	Disk	cage0	Prohibited
1:3:2	50002AC13200017D	Loss Sync	Initiator	--	--	Free	--	Prohibited
1:3:1	50002AC13100017D	Loss Sync	Initiator	--	--	Free	--	Prohibited
0:3:2	50002AC03200017D	Ready	Initiator	Point-Point	6	Disk	cage1	Prohibited
0:3:1	50002AC03100017D	Ready	Initiator	Point-Point	6	Disk	cage0	Prohibited

**SAS Details: 1:3:3**

Summary | Physical Disks

**General**

Position (Node:Slot:Port) 1:3:3  
 Label --  
 Port WWN 50002AC13300017D  
 Type SAS  
 Rate 6 Gbps  
 Connected Device Type Disk  
 Connected Device cage0  
 Mode Initiator  
 State Ready

**Settings**

Connection Mode Disk  
 Connection Type Point  
 Configured Rate 6 Gbps  
 Max Rate 6 Gbps  
 Interrupt Coalesce Enabled

**SAS Settings**

Topology Point-Point  
 Adapter Type LSI 9201-16e  
 Mode Change Prohibited  
 Physical Disks 8

**Resources**

Total Data Throughput Calculating...  
 6 Gbps  
 Read Write

The SAS screen can be filtered by **Summary** and **Settings** information.

[“Summary Information” \(page 50\)](#)

[“Settings Information” \(page 52\)](#)

## Summary Information

The SAS summary screen is divided into a list pane and a detail pane. The list pane displays a summary of all SASs in the system. The detail pane displays detailed information about a single SAS selected from the list pane.

The list pane provides the following information:

Column	Description
<b>Position</b>	The position of the port (in node:slot:port format) in which the SAS is installed.
<b>WWN</b>	The World Wide Name of the server attached storage.
<b>State</b>	The current state of the SAS.
<b>Mode</b>	Port firmware mode setting—Initiator, Target, Peer, or Suspended. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
<b>Topology</b>	Type of connection (Private Loop, Public Loop, or Point-Point).
<b>Rate</b>	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
<b>Connected Device Type</b>	Type of device that the port is connected to. Free, Disk, Host, Peer, RC, or InServ.
<b>Connected Device</b>	Name of device that the port is connected to, e.g. host1, cage0.
<b>Mode Change</b>	Indicates whether port mode change from initiator to target or vice versa is Allowed or Prohibited.

The detail pane provides a “[Summary Tab](#)” (page 51), and if the connected device type is disk, it will also display a “[Physical Disks Tab](#)” (page 51).

## Summary Tab

The Summary detail tab provides the following information:

Group	Field	Description
General	Position	The position of the port (in node:slot:port format) in which the SAS is installed.
	Label	The designated port label.
	Port WWN	The World Wide Name of the port.
	Type	The type of port, e.g., SAS.
	Rate	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
	Connected Device Type	Type of device that the port is connected to. Free, Disk, Host, Peer, RC, or InServ.
	Connected Device	Name of device that the port is connected to, e.g., host1, cage0.
	Mode	Port firmware mode setting—Initiator, Target, Peer, or Suspended. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
	State	The current state of the SAS.
Resources	Total Data Throughput	The throughput in KB/sec.
Settings	Connection Mode	The type of port connection.
	Connection Type	Connection type or port connection setting
	Configured Rate	Data transfer rate setting (for example, 1 Gbps). Auto indicates that the system automatically selects the rate.
	Max Rate	Maximum rate of connection from the port.
	Interrupt Coalesce	If disabled, each I/O generates a separate interrupt to the HBA port driver rather than generating one interrupt for multiple I/O completion.
SAS Settings	Topology	The type of connection, e.g., Point.
	Adapter Type	The type of adapter used for the port.
	Mode Change	Indicates whether port mode change from initiator to target or vice versa is Allowed or Prohibited.
	Physical Disks	The number of physical disks connected to the port. This is only displayed if the port is connected to drive cages.

## Physical Disks Tab

The Physical Disks detail tab provides the following information:

Column	Description
Device	The type of connected disk.
Position	The position of the disk in the system.

Column	Description
<b>I/O Error Count</b>	The number of errors on the connected disk.
<b>State</b>	The state of the disk. See “System and Component Status Icons” (page 407).

## Settings Information

The SAS settings screen is divided into a list pane and a detail pane. The list pane displays a summary of all SASs in the system. The detail pane displays detailed information about a single SAS selected from the list pane.

The list pane provides the following information:

Column	Description
<b>Position</b>	The position of the port (in node:slot:port format) in which the SAS is installed.
<b>Connection Mode</b>	The type of port connection.
<b>Connection Type</b>	The connection type or port connection setting (Loop, Point, or Loop-point).
<b>Configured Rate</b>	The duplex speed, Half or Full.
<b>Max Rate</b>	Maximum rate of connection from the port.
<b>Interrupt Coalesce</b>	If disabled, each I/O generates a separate interrupt to the HBA port driver rather than generating one interrupt for multiple I/O completion.

The detail pane provides the same information as the detail pane for “Summary Information” (page 50).

## Viewing System Port Alerts

To view port alerts:

1. Access the Ports screen.
2. In the Management Window, click the **Alerts** tab.

Systems : Storage Systems : s020 : Ports

Summary | Fibre Channel | RCFC | iSCSI | RCIP | SAS | **Alerts**

Default 3 objects Filter Clear Any column contains: Clear

Severity	ID	State	Last Time	Message	Repeat Count	First Time
Minor	12	New	Sep 17, 2012 21:02:37 ...	Port (1:2:2) is used for host	5	Sep 17, 2012 21:02:22 ...
Minor	11	New	Sep 17, 2012 20:57:44 ...	Port (0:5:2) is used for host	0	Sep 17, 2012 20:57:44 ...
Minor	13	New	Sep 17, 2012 21:05:00 ...	Port (0:2:2) is used for host	3	Sep 17, 2012 21:04:54 ...

**Alert Details: 12**

**General**

Severity: Minor  
Type: All ports in the same FC card must be configured for RCFC  
Message: Port (1:2:2) is used for host  
ID: 12  
State: New  
Message Code: 0x0230005  
Sequence: 9585

**Component**

System: s020  
System SN: 1000020  
Node ID: 0  
Component: Port 1:2:2

**Frequency**

Repeat Count: 5  
Last Time: Sep 17, 2012 21:02:37 GMT  
First Time: Sep 17, 2012 21:02:22 GMT

**Recommended Action**

For alert actions, go to [www.hp.com/support/hpgt/3par](http://www.hp.com/support/hpgt/3par)  
For video repair instructions, go to [www.hp.com/go/sml](http://www.hp.com/go/sml)

The **Alerts** tab is divided into a list pane and a detail pane. The list pane displays a summary of all port alerts. The detail pane displays detailed information about a single alert selected from the list pane.



The list pane provides the following information:

Column	Description
<b>Severity</b>	The severity of the alert. See <a href="#">“Alert Severity Indicators” (page 406)</a> .
<b>ID</b>	The alert ID.
<b>State</b>	The alert state.
<b>Last Time</b>	The last occurrence of the alert.
<b>Message</b>	A brief description of the alert.
<b>Repeat Count</b>	The number of times the alert has been issued.
<b>First Time</b>	The first occurrence of the alert.

The detail pane provides the following information:

Group	Field	Description
<b>General</b>	<b>Severity</b>	The alert severity. See <a href="#">“Alert Severity Indicators” (page 406)</a> .
	<b>Type</b>	The alert type.
	<b>Message</b>	A brief description of the alert.
	<b>ID</b>	The alert ID.
	<b>State</b>	The alert state.
	<b>Message Code</b>	The alert message code.
	<b>Sequence</b>	The alert sequence.
<b>Resolved by Event (if resolved)</b>	<b>Node ID</b>	The controller node ID.
	<b>Component</b>	The component for which the alert was issued.
	<b>Severity</b>	The alert severity. See <a href="#">“Alert Severity Indicators” (page 406)</a> .
	<b>Type</b>	The alert type.
	<b>Sequence</b>	The alert sequence.
	<b>Time</b>	The time the alert was resolved.
	<b>Message</b>	A brief description of the alert.
<b>Component</b>	<b>System</b>	The name of the server that generated the alert.
	<b>System SN</b>	The system's serial number.
	<b>Node ID</b>	The node ID.
	<b>Component</b>	The affected system components.
<b>Frequency</b>	<b>Repeat Count</b>	The number of times the alert was issued.
	<b>Last time</b>	The last occurrence of the alert.
	<b>First time</b>	The first occurrence of the alert.

---

## Part II Managing Security

This part contains information on managing security for domains and users through the Security Manager.

[“Managing Users with Security Manager” \(page 55\)](#)

[“Managing Domains with Security Manager” \(page 59\)](#)

[“Managing LDAP with Security Manager” \(page 71\)](#)

[“The Security Manager” \(page 81\)](#)

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## 3 Managing Users with Security Manager

The Security Manager provides the functionality to view and work with HP 3PAR StoreServ Storage System users.

[“Creating Users” \(page 55\)](#)

[“Viewing Users” \(page 55\)](#)

[“Editing Users” \(page 56\)](#)

[“Removing Users” \(page 57\)](#)

[“Managing User Connections” \(page 57\)](#)

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**NOTE:** A user account is required to access a system via the HP 3PAR Management Console.

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### Creating Users

To create a user, access the **Create User** wizard:

1. Click **Security & Domains** in the Manager Pane.
2. Click **Create User** in the Common Actions Panel.

The **Create User** wizard appears.

### Authentication

1. From the **Systems** group box, select the system on which the user will be created.
2. In the **Credentials** group box, enter the user name, password, and confirm the password.

---

**NOTE:** The password must be between six and eight characters.

---

3. Click **Next**.

### Authorization

1. In the **Privilege** group box, select the following:
  - a. **Domain** - select a domain from the list.

---

**NOTE:** HP 3PAR Domains requires an HP 3PAR Domain license. For additional information about the license, and for information about 3PAR Domains and users, see the *HP 3PAR OS Concepts Guide*.

---

- b. **Role** - select the new user's privilege level in the selected domain.
2. Click **Add** to add the new user's selected privilege settings to the list in the **Domain** group box.
  3. (Optional) Repeat steps 1 and 2 to add access to other domains.
  4. (Optional) To remove a row from the **Domain** group box, select the row and click **Remove**.
  5. Click **Next** to view summary information, or click **Finish**.

### Summary

Review the summary information, then click **Finish**.

### Viewing Users

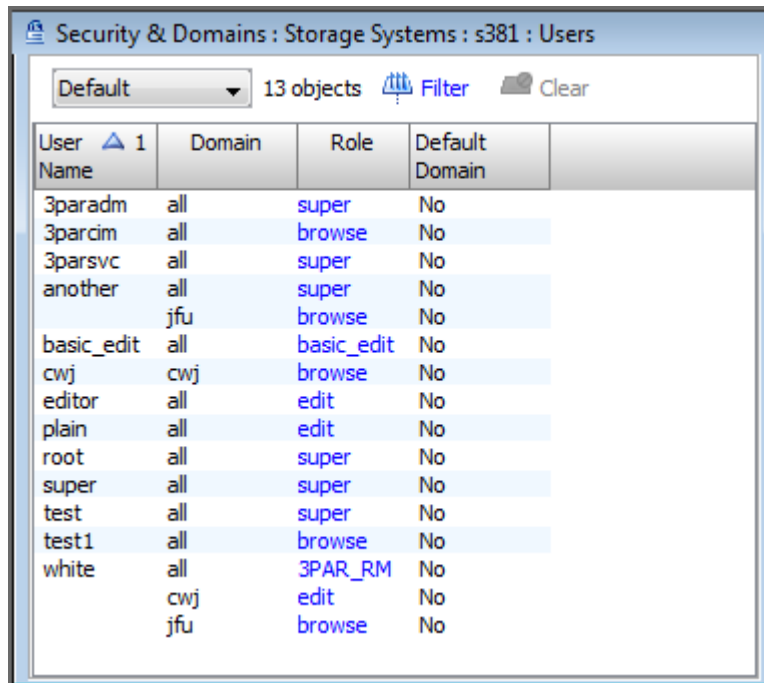
The Users summary screen provides an overview of a system's users.

To access the Users summary screen:

1. Click **Security & Domains** in the Manager Pane.

2. In the Management Tree, select the system with the user(s) you wish to view, then select the **Users** node.

The **Users** summary screen is displayed in the Management Window.



User Name	Domain	Role	Default Domain
3paradm	all	super	No
3parcim	all	browse	No
3parsvc	all	super	No
another	all	super	No
	jfu	browse	No
basic_edit	all	basic_edit	No
cwj	cwj	browse	No
editor	all	edit	No
plain	all	edit	No
root	all	super	No
super	all	super	No
test	all	super	No
test1	all	browse	No
white	all	3PAR_RM	No
	cwj	edit	No
	jfu	browse	No

The Users summary screen provides the following information:

Column	Description
User Name	The user name.
Domain	The domain to which the user belongs.
Role	The user's privilege level.
Default Domain	Whether or not the domain listed in the <b>Domain</b> column is the default domain for the user.

[“Management Window” \(page 404\)](#)

## Editing Users

To edit a user, access the **Edit User** wizard:

1. Click **Security & Domains** in the Manager Pane.
2. In the Management Tree, select the system with the user(s) you wish to edit, then select the **Users** node.
3. Right-click on the user you wish to edit in the User summary screen.
4. Click **Edit**.

The **Edit User** wizard appears.

## Authentication

**NOTE:** Steps 1 and 2 are optional. If you do not wish to change the user's password, click **Next** to go to [“Authorization” \(page 57\)](#).

1. From the **Credentials** group box, select the **Change Password** checkbox.

2. Enter the current password, new password, and then confirm the new password.

---

**NOTE:** The password must be between six and eight characters.

---

3. Click **Next**.

## Authorization

1. In the **Privilege** group box, select the following:
  - a. **Domain** - select a domain from the list.

---

**NOTE:** HP 3PAR Domains requires an HP 3PAR Domain license. For additional information about the license, and for information about 3PAR Domains and users, see the *HP 3PAR OS Concepts Guide*.

---

- b. **Role** - select the new user's privilege level in the selected domain.
2. Click **Add** to add the new user's selected privilege settings to the list in the **Domain** group box.
  3. (Optional) Repeat steps 1 and 2 to add access to other domains.
  4. (Optional) To remove a row from the **Domain** group box, select the row and click **Remove**.
  5. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Removing Users

To remove a user:

1. Click **Security & Domains** in the Manager Pane.
2. In the Management Tree, select the system with the user(s) you wish to remove, then select the **Users** node.
3. Right-click the user you wish to remove in the User summary screen.

---

**NOTE:** If you wish to remove multiple users (see [“Selecting Multiple Items” \(page 406\)](#) ), select the users you wish to remove before right-clicking.

---

4. Click **Remove**.
5. In the **Remove User** dialog box, click **OK**.

## Managing User Connections

The HP 3PAR Management Console allows you to view and remove user connections.

[“Viewing User Connections” \(page 57\)](#)

[“Removing User Connections” \(page 58\)](#)

## Viewing User Connections

To view user connections:

1. Click **Security & Domains** in the Manager Pane.
2. From the Management Tree, select the **Connections** node under the system with the connections you wish to view.

The **Connections** screen appears.

Connection ID	User Name	System	Domain	Role	Status	My Session	Client Type	Client Name	Client IP Address	Application Name	Application Version	Connected Since
21275	3paradm	s710	all	super	Active		remote	DL360...	10.112.61.7	IMC	4.3.0	Sep 26, 2012...
21280	3paradm	s710	all	super	Active		remote	DL360...	10.112.61.7	IMC	4.3.0	Sep 26, 2012...
23991	root	s710	all	super	Active		remote	VAU1	16.94.225.150	IMC	4.3.0	Sep 26, 2012...
23998	root	s710	all	super	Active		remote	VAU1	16.94.225.150	IMC	4.3.0	Sep 26, 2012...
25458	root	s710	all	super	Active	✓	remote	stu-cm...	192.168.29.96	IMC	4.3.0	Sep 26, 2012...
25463	root	s710	all	super	Active	✓	remote	stu-cm...	192.168.29.96	IMC	4.3.0	Sep 26, 2012...
25643	root	s710	all	super	Active	✓	remote	stu-cm...	192.168.29.96	IMC	4.3.0	Sep 26, 2012...

The **Connections** screen provides the following information:

Column	Description
<b>Connection ID</b>	The system ID.
<b>User Name</b>	The user name.
<b>System</b>	The system name.
<b>Domain</b>	The domain to which the user belongs.
<b>Role</b>	The authority level of the user.
<b>Status</b>	The user status on the system; either Active or Inactive.
<b>My Session</b>	Indicates with a check mark the connection for the current running management console instance.
<b>Client Type</b>	Indicates whether the client is remotely or locally connected.
<b>Client Name*</b>	The name of the computer connected to the system.
<b>Client IP Address</b>	The IP address where the connection exists.
<b>Application Name*</b>	The name of the application used to connect to the system.
<b>Application Version*</b>	The version level of the application on the client.
<b>Connected Since</b>	The connection duration since the displayed date and time.

\*Columns only shown in InForm 3.1.1 or higher.

## Removing User Connections

To remove a user connection:

1. Click **Security & Domains** in the Manager Pane.
2. From the Management Tree, select the system with the connection(s) you wish to remove, then select the **Connections** node.
3. In the Connections screen, right-click the connection you wish to remove.

**NOTE:** If you wish to remove multiple connections (see [“Selecting Multiple Items”](#) (page 406)), select the connections you wish to remove before right-clicking.

4. Click **Remove User Connection**.
5. In the **Remove User Connection** dialog box, click **OK**.

---

## 4 Managing Domains with Security Manager

The Security Manager provides functionality to view and work with domains and domain sets, as well as objects belonging to domains.

[“Creating Domains” \(page 59\)](#)

[“Viewing Domains” \(page 60\)](#)

[“Viewing the Domains Summary Tab” \(page 61\)](#)

[“Viewing the Domains Tab” \(page 62\)](#)

[“Editing Domains” \(page 65\)](#)

[“Adding a Domain to a Domain Set” \(page 65\)](#)

[“Removing Domains” \(page 65\)](#)

[“Creating Domain Sets” \(page 65\)](#)

[“Viewing Domain Sets” \(page 66\)](#)

[“Editing Domain Sets” \(page 69\)](#)

[“Removing Domain Sets” \(page 69\)](#)

[“Moving Objects from One Domain to Another Domain” \(page 70\)](#)

---

**NOTE:** A user account is required to access a system via the HP 3PAR Management Console.

**NOTE:** HP 3PAR Domains requires an HP 3PAR Domain license. For additional information about the license, and for information about 3PAR Domains and users, see the *HP 3PAR OS Concepts Guide*.

**NOTE:** For further information about HP 3PAR Domains and users, see the *HP 3PAR OS Concepts Guide*.

---

See also:

[“Manager Pane” \(page 396\)](#)

### Creating Domains

To create a domain, access the **Create Domain** wizard:

1. Click **Security & Domains** in the Manager Pane.
2. Click **Create Domain** in the Common Actions Panel.  
The **Create Domain** dialog appears.
3. Select a storage server on which the domain will be created from the **Storage Systems** list.
4. Enter a domain name.
5. (Optional) Select whether to impose a Maximum Volume Retention Time.  
The default retention time is 14 days.
  - a. If you wish to change the retention time, click **Override System**.
  - b. Select **Days** or **Hours**.
  - c. Enter a retention time: 1 to 1,825 for Days, 1 to 43,800 for Hours.
6. Enter any notes in the **Comments** field.
7. Click **Add**.  
The new domain appears in the **Domains** list.
8. Repeat steps 3 through 7 if you wish to create additional domains.
9. Click **OK**.

## Viewing Domains

You can view information about domains for all connected HP 3PAR StoreServ Storage Systems or a single system.

### Viewing Domains for All Storage Systems

To view domain information about all connected systems:

1. Click **Security & Domains** in the Manager Pane.
2. In the Management Tree, click **Storage Systems**.
3. In the Management Window, click the **Domains** tab.

The **Domains** tab can be filtered to display **Summary** and **Raw Capacity** information about the domains in all connected systems.

- Summary information includes:
  - The domain name.
  - The system on which each domain resides.
  - The domain's domain sets, if any.
  - The number of CPGs in that domain
  - The number of virtual volumes.
  - The number of hosts.
  - The number of host sets.
  - The number of Active VLUNs.
  - The domain's total capacity (in GiB).
  - Any user-entered notes when the domain was created.
- Raw Capacity (in GiB) information includes:
  - The name of the domain and the system on which it resides.
  - The size of each domain's base volume user, copy, and admin space.
  - The size of each domain's CPG user and admin space.
  - The size of each domain's unmapped space.
  - The total size of each domain.

### Viewing Domains for a Single Server

The Domains screen provides summary and detail information for a system's domains.

To access the Domain screen:

1. Click **Security & Domains** in the Manager Pane.
2. In the Management Tree, select the **Domains** node for the system having domain(s) you wish to view.

The Domains screen is displayed in the Management Window and provides a **Summary** tab (default) and a **Domains** tab.



## Viewing the Domains Summary Tab

After accessing the Domains screen, the **Summary** tab is displayed by default. The Domains **Summary** tab displays all objects and capacity information for all system domains (cumulative view). To view information about a single domain, see [“Viewing the Domains Tab” \(page 62\)](#).

The screenshot shows the 'Summary' tab of the 'Domains' screen. It is divided into two main sections: 'General' and 'Domain Capacity'.

**General Section:**

- Domains:** 6
- Objects in Domains:**
  - CPGs: 1
  - FC: 0
  - NL: 0
  - SSD: 1
  - Virtual Volumes: 1
    - Base Volumes: 1
      - Thinly Provisioned: 1
      - Fully Provisioned: 0
    - Virtual Copies: 0
    - Physical Copies: 0
    - Expired Volumes: 0
    - Unexported Volumes: 1
    - Remote Copy Volumes: 0
  - Virtual Volume Sets: 0
  - Active VLUNs: 0
  - Hosts: 0
  - Host Sets: 0

**Domain Capacity Section:**

- Total Size:** 88.000 GiB
- Domain Capacity Table:**

Domain	Size (GiB)
cmDom	88.000
dom	0.000
Eng	0.000
InServ_browse	0.000
InServ_edit	0.000
InServ_super	0.000

The Domains **Summary** tab provides the following information:

Group	Field	Description
General	Domains	The number of domains residing on the system.
Objects in Domains	CPGs	The number of CPGs associated with the domains in the system.
	FC	The number of Fast Class (Fibre Channel and SAS) objects associated with the domains in the system.
	NL	The number of Near Line objects associated with the domains in the system.
	SSD	The number of Solid State Disks associated with the domains in the system.
	Virtual Volumes	The total number of virtual volumes associated with the domains in the system.
	Base Volumes	The number of base volumes associated with the domains in the system.
	Thinly Provisioned	The number of Thinly Provisioned virtual volumes associated with the domains in the system.

Group	Field	Description
	<b>Fully Provisioned</b>	The number of fully provisioned virtual volumes associated with the domains in the system.
	<b>Virtual Copies</b>	The total number of virtual copies associated with the domains in the system.
	<b>Physical Copies</b>	The total number of virtual copies associated with the domains in the system.
	<b>Expired Volumes</b>	The total number of expired virtual volumes associated with the domains in the system.
	<b>Unexported Volumes</b>	The total number of unexported virtual volumes associated with the domains in the system.
	<b>Remote Copy Volumes</b>	The total number of Remote Copy virtual volumes associated with the domains in the system.
	<b>Virtual Volume Sets</b>	The total number of virtual volumes sets associated with the domains in the system.
	<b>Active VLUNs</b>	The total number of exported virtual volumes associated with the domains in the system.
	<b>Hosts</b>	The total number of hosts associated with the domains in the system.
	<b>Host Sets</b>	The total number of host sets associated with the domains in the system.
<b>Domain Capacity</b>	<b>Total Size</b>	The total size (in GiB) of all domains in the system.
	<b>Domain</b>	The name of the domain.
	<b>Size</b>	The size (in GiB) of the selected domain.
	<b>Top 10</b>	Checkbox (displayed when more than 10 domains exist on the system). If selected, only the largest (in GiB) 10 system domains are displayed.

## Viewing the Domains Tab

After accessing the Domains screen, the **Summary** tab is displayed by default.

Click the Domains tab to view its contents.

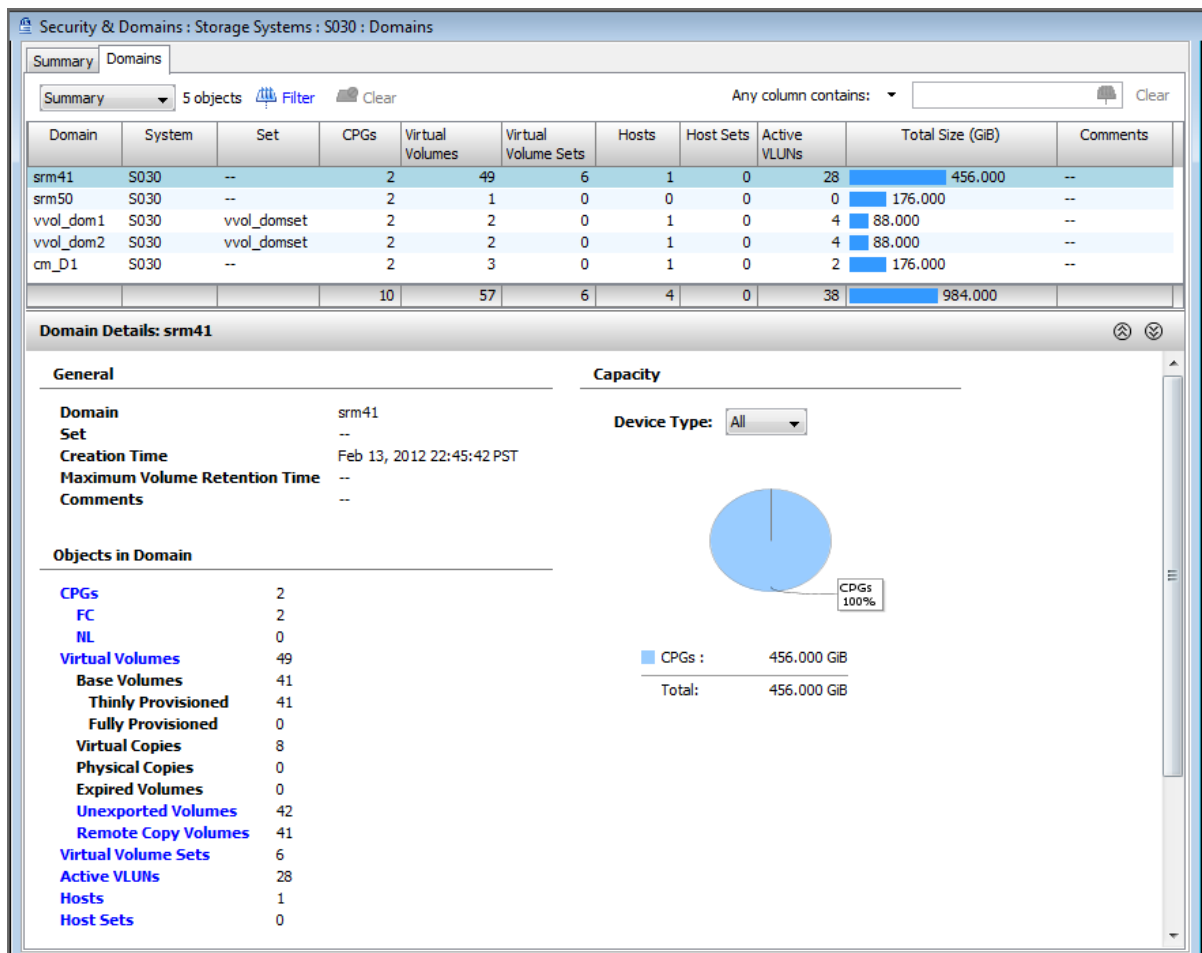
The **Domains** tab is divided into a list pane and a detail pane. The list pane can be filtered to display summary or capacity information. The detail pane displays the details of items selected in the list pane.

[“Summary Information” \(page 62\)](#)

[“Raw Capacity Information” \(page 64\)](#)

## Summary Information

To display summary information on the **Domains** tab, select **Summary** from the view list.



The list pane displays the following information:

Column	Description
<b>Domain</b>	The domain name.
<b>System</b>	The name of the system with which the domain is associated.
<b>Set</b>	The name of domain set with which the domain is associated, if any.
<b>CPGs</b>	The total number of CPGs associated with the domain.
<b>Virtual Volumes</b>	The total number of virtual volumes associated with the domain.
<b>Virtual Volume Sets</b>	The total number of virtual volume sets associated with the domain.
<b>Hosts</b>	The total number of hosts associated with the domain.
<b>Host Sets</b>	The total number of host sets associated with the domain.
<b>Active VLUNs</b>	The total number of exported virtual volumes associated with the domain.
<b>Total Size</b>	The total capacity (in GiB) of the domain.
<b>Comments</b>	Any user-entered notes when the domain was created.

The detail pane displays the following information:

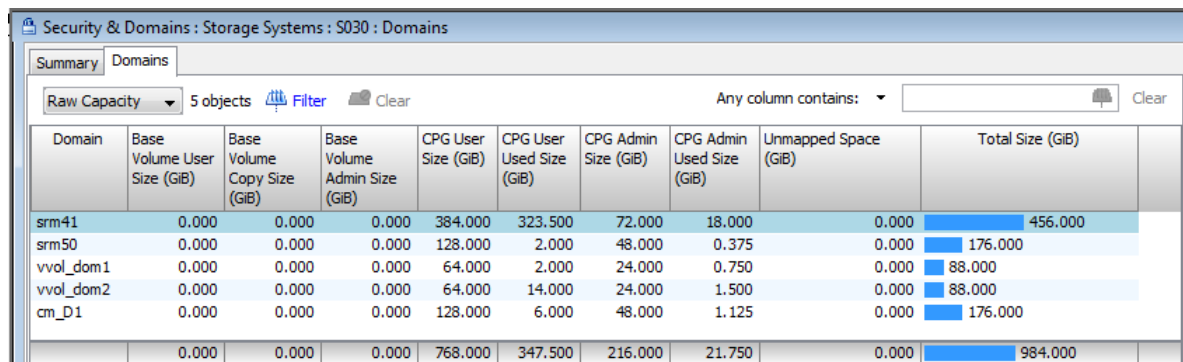
Group	Field	Description
<b>General</b>	<b>Domain</b>	The domain name.
	<b>Set</b>	The domain set name.

Group	Field	Description
	<b>Creation Time</b>	The date and time the domain was created.
	<b>Maximum Volume Retention Time</b>	The maximum time a volume will be retained in the domain.
	<b>Comments</b>	Any user-entered notes during the creation of the domain.
<b>Objects in Domains</b>	The information in the <b>Objects in Domains</b> group is identical to the information displayed in the <b>Objects in Domains</b> group of the <b>Domains Summary</b> tab, except the information listed here is per selected domain, rather than per all system domains (cumulative).	
<b>Capacity</b>	<b>Device Type</b>	List. Select the device type, Fast Class (FC), NearLine (NL), or Solid State Disk (SSD), for which the capacity chart is displayed.

“Viewing the Domains Summary Tab” (page 61)

## Raw Capacity Information

To display capacity information on the **Domains** tab, select **Raw Capacity** from the view list.



Domain	Base Volume User Size (GiB)	Base Volume Copy Size (GiB)	Base Volume Admin Size (GiB)	CPG User Size (GiB)	CPG User Used Size (GiB)	CPG Admin Size (GiB)	CPG Admin Used Size (GiB)	Unmapped Space (GiB)	Total Size (GiB)
srn41	0.000	0.000	0.000	384.000	323.500	72.000	18.000	0.000	456.000
srn50	0.000	0.000	0.000	128.000	2.000	48.000	0.375	0.000	176.000
vvol_dom1	0.000	0.000	0.000	64.000	2.000	24.000	0.750	0.000	88.000
vvol_dom2	0.000	0.000	0.000	64.000	14.000	24.000	1.500	0.000	88.000
cm_D1	0.000	0.000	0.000	128.000	6.000	48.000	1.125	0.000	176.000
	0.000	0.000	0.000	768.000	347.500	216.000	21.750	0.000	984.000

The list pane displays the following information:

Column	Description
<b>Domain</b>	The domain name.
<b>System</b>	The name of the system with which the domain is associated. (Only displayed when the Storage Systems node is selected in the Management Tree.)
<b>Base Volume User Size</b>	The size (in GiB) of the base volume's user space.
<b>Base Volume Copy Size</b>	The size (in GiB) of the base volume's copy space.
<b>Base Volume Admin Size</b>	The size (in GiB) of the base volume's admin space.
<b>CPG User Size</b>	The size (in GiB) of the Common Provisioning Group's (CPG's) user space.
<b>CPG User Used Size</b>	The size (in GiB) of the CPG's used user space.
<b>CPG Admin Size</b>	The size (in GiB) of the CPG's admin space.
<b>CPG Admin Used Size</b>	The size (in GiB) of the CPG's used admin space.
<b>Unmapped Space</b>	The size (in GiB) of unmapped space.
<b>Total Size</b>	The total size (in GiB) of the domain.

The detail pane displays the same information as the detail pane of the Summary Information screen.

## Editing Domains

To edit an existing domain, access the **Edit Domain** wizard:

1. Click **Security & Domains** in the Manager Pane.
2. From the Management Tree, select the **Domain** node under the system in which the domain resides.
3. In the Domains screen, as described in “[Viewing Domains](#)” (page 60), click the **Domains** tab, as described in “[Viewing the Domains Tab](#)” (page 62).
4. Right-click the domain you wish to edit and then click **Edit**.  
The **Edit Domain** dialog appears.
5. Enter a new domain name.
6. (Optional) Select whether to impose a Maximum Volume Retention Time.  
The default retention time is 14 days.
  - a. If you wish to change the retention time, click **Override System**.
  - b. Select **Days** or **Hours**.
  - c. Enter a retention time: 1 to 1,825 for Days, 1 to 43,800 for Hours.
7. Enter any notes in the **Comments** field.
8. Click **OK**.

## Adding a Domain to a Domain Set

To add a Domain to an existing Domain Set:

1. Click **Security & Domains** in the Manager Pane.
2. From the Management Tree, select the **Domain** node under the system containing the domain you want to add.
3. Access the **Domains** tab in the Management Window.
4. Right-click on the domain you want to add, and then select **Add to Domain Set**.  
The **Add to Domain Set** dialog box appears.
5. Select a **Domain Set** from the list, and then click **OK**.

## Removing Domains

To remove an existing domain:

1. Click **Security & Domains** in the Manager Pane.
2. From the Management Tree, select the **Domain** node under the system in which the domain resides.
3. In the Domains screen, as described in “[Viewing Domains](#)” (page 60), click the **Domains** tab, as described in “[Viewing the Domains Tab](#)” (page 62).
4. Right-click the domain you wish to remove.

---

**NOTE:** If you wish to remove multiple domains (see “[Selecting Multiple Items](#)” (page 406)), select the domains you wish to remove before right-clicking.

---

5. Click **Remove**.
6. In the **Remove Domain** dialog box, click **OK**.

## Creating Domain Sets

To create a domain set, access the **Create Domain Set** wizard:

1. Click **Security & Domains** in the Manager Pane.

2. Click **Create Domain Set** in the Common Actions Panel.  
The **Create Domain Set** wizard appears.

## General

1. Select a system on which the domain set will be created from the **System** list.
2. Enter a domain set name.
3. (Optional) Enter any notes in the **Comments** field.
4. Click **Next**.

## Domains

1. From the **Available** list, select the domains you wish to add to the domain set.

**NOTE:** You can select multiple domains at one time to add to the domain set (see [“Selecting Multiple Items”](#) (page 406) ).

2. Click the down arrow to move the selected domains to the **Assigned** list.
3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Viewing Domain Sets

To view information about domain sets residing in a system:

1. Click **Security & Domains** in the Manager Pane.
2. From the Management Tree, select the **Domain Sets** node under the system in where domain sets reside.

The **Domain Sets** screen appears.

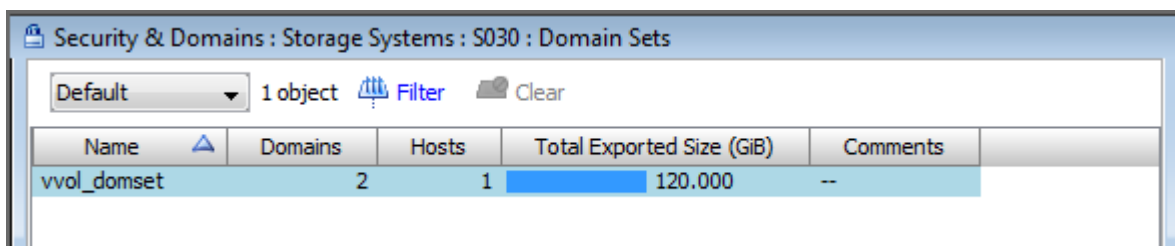
The **Domain Sets** screen is divided into a list pane, which displays a summary of all domain sets in the system, and a detail pane, which displays detailed information about a selected domain set from the list pane.

[“List Pane”](#) (page 66)

[“Detail Pane”](#) (page 67)

## List Pane

The list pane of the **Domain Sets** screen displays a summary of all domain sets in the system.



Security & Domains : Storage Systems : S030 : Domain Sets					
Default	1 object	Filter	Clear		
Name	Domains	Hosts	Total Exported Size (GiB)	Comments	
vvol_domset	2	1	120.000	--	

It provides the following information:

Column	Description
<b>Name</b>	The name of the domain set.
<b>Domains</b>	The number of domains belonging to the domain set.

Column	Description
<b>Hosts</b>	The number of hosts connected to the domain set.
<b>Total Exported Size</b>	The size (in GiB) of the domain set.
<b>Comments</b>	Any user entered notes when the domain set was created.

## Detail Pane

The detail pane of the **Domain Sets** screen displays detailed information about a selected domain set from the list pane. It contains a **Summary** tab and a **Domains** tab.

[“Summary Tab” \(page 67\)](#)

[“Domains Tab” \(page 67\)](#)

## Summary Tab

General		Active VLUNs		Capacity Exported	
<b>Name</b>	vvol_domset	<b>Average per Host</b>	4	<b>Total Exported Size</b>	0.000 GiB
<b>Domains</b>	2			<b>Average Virtual Size</b>	120.000 GiB
<b>Hosts</b>	1				
<b>Comments</b>	--				
		<b>Host</b>	<b>Active VLUNs</b>	<b>Host</b>	<b>Total Exported Size (GiB)</b>
		PE2950-19	4	PE2950-19	120.000

The **Domain Sets Summary** tab screen provides the following information:

Group	Field	Description
<b>General</b>	<b>Name</b>	The name of the domain set.
	<b>Domains</b>	The number of domains in the domain set.
	<b>Hosts</b>	The number of hosts in the domain set.
	<b>Comments</b>	Any user-created comments.
<b>Active VLUNs</b>	<b>Average per Host</b>	The average number of VLUNs per host.
	<b>Host</b>	The name of each host.
	<b>Active VLUNs</b>	The number of active VLUNs for each host.
<b>Capacity Exported</b>	<b>Total Exported Size</b>	The total exported size of all active VLUNs (in GiB).
	<b>Average Virtual Size</b>	The average virtual size of all active VLUNs (in GiB).
	<b>Host</b>	The name of each host.
	<b>Total Exported Size</b>	The total exported size (in GiB) of each host.

## Domains Tab

The **Domains** tab can be filtered by **Summary** and **Raw Capacity**.

[“Viewing Summary Information” \(page 68\)](#)

[“Viewing Raw Capacity Information” \(page 68\)](#)

## Viewing Summary Information

Domain Set Details: vvol_domset										
Summary Domains										
Summary		2 objects	Filter	Clear	Any column contains:					
Domain	System	Set	CPGs	Virtual Volumes	Virtual Volume Sets	Hosts	Host Sets	Active VLUNs	Total Size (GiB)	Comments
vvol_dom1	S030	vvol_...	2	2	0	1	0	4	88.000	--
vvol_dom2	S030	vvol_...	2	2	0	1	0	4	88.000	--
			4	4	0	2	0	8	176.000	

The **Summary** filter provides the following information:

Column	Description
<b>Domain</b>	The name of each domain within the domain set.
<b>System</b>	The system on which the domain resides.
<b>Set</b>	The name of the domain set in which the domain resides.
<b>CPGs</b>	The number of CPGs in the domain.
<b>Virtual Volumes</b>	The number of virtual volumes in the domain.
<b>Virtual Volume Sets</b>	The number of virtual volume sets in the domain.
<b>Hosts</b>	The number of hosts in the domain.
<b>Host Sets</b>	The number of host sets in the domain.
<b>Active VLUNs</b>	The number of active VLUNs in the domain.
<b>Total Size</b>	The volume size (in GiB) per Domain.
<b>Comments</b>	Any user-created comments.

## Viewing Raw Capacity Information

Domain Set Details: vvol_domset										
Summary Domains										
Raw Capacity		2 objects	Filter	Clear	Any column contains:					
Domain	Base Volume User Size (GiB)	Base Volume Copy Size (GiB)	Base Volume Admin Size (GiB)	CPG User Size (GiB)	CPG User Used Size (GiB)	CPG Admin Size (GiB)	CPG Admin Used Size (GiB)	Unmapped Space (GiB)	Total Size (GiB)	
vvol_dom1	0.000	0.000	0.000	64.000	2.000	24.000	0.750	0.000	88.000	
vvol_dom2	0.000	0.000	0.000	64.000	14.000	24.000	1.500	0.000	88.000	
			0.000	128.000	16.000	48.000	2.250	0.000	176.000	

The **Raw Capacity** filter provides the following information:

Column	Description
<b>Domain</b>	The name of each domain within the domain set.
<b>System</b>	The system on which the domain resides. (Only displayed when the Storage Systems node in the Management Tree is selected.)
<b>Base Volume User Size</b>	The base volume size (in GiB) allocated for users.
<b>Base Volume Copy Size</b>	The base volume size (in GiB) allocated for copies.
<b>Base Volume Admin Size</b>	The base volume size (in GiB) allocated for admin use.



Column	Description
<b>CPG User Size</b>	The size (in GiB) of user CPGs.
<b>CPG User Use Size</b>	The size (in GiB) of used user CPGs.
<b>CPG Admin Size</b>	The size (in GiB) of admin CPGs.
<b>CPG Admin Used Size</b>	The size (in GiB) of used admin CPGs.
<b>Unmapped Space</b>	The amount of unmapped space (in GiB).
<b>Total Size</b>	The total size (in GiB).
<b>Active VLUNs</b>	The number of active VLUNs in the domain.
<b>Total Size</b>	The volume size (in GiB) per Domain.
<b>Comments</b>	Any user-created comments.

## Editing Domain Sets

To edit an existing domain set, access the **Edit Domain Set** wizard:

1. Click **Security & Domains** in the Manager Pane.
2. From the Management Tree, select the **Domain Sets** node under the system in which the domain set resides.
3. In the Domains Sets screen, as described in [“Viewing Domain Sets” \(page 66\)](#), right-click the domain set you wish to edit.

The **Edit Domain Sets** wizard appears.

### General

1. Enter a new domain set name.
2. (Optional) Enter any notes in the **Comments** field.
3. Click **Next**.

### Domains

1. From the **Available** list, select the domains you wish to add to the domain set.

---

**NOTE:** You can select multiple domains at one time to add to the domain set (see [“Selecting Multiple Items” \(page 406\)](#)).

---

2. Click the down arrow to move the selected domains to the **Assigned** list.
3. From the **Assigned** list, select the domains you wish to remove from the domain set.
4. Click the up arrow to move the selected domains to the **Available** list.
5. Click **Next** to view summary information, or click **Finish**.

### Summary

Review the summary information, then click **Finish**.

## Removing Domain Sets

To remove an existing domain set:

1. Click **Security & Domains** in the Manager Pane.
2. From the Management Tree, select the **Domain Sets** node under the system in which the domain set resides.
3. In the Domains screen, as described in [“Removing Domains” \(page 65\)](#), right-click the domain set you wish to remove.

---

**NOTE:** If you wish to remove multiple domain sets (see “[Selecting Multiple Items](#)” (page 406)), select the domain sets you wish to remove before right-clicking.

---

4. Click **Remove**.
5. In the **Remove Domain Sets** dialog box, click **OK**.

## Moving Objects from One Domain to Another Domain

To move objects from one domain to another domain, access the **Move to Domain** wizard:

1. Click **Security & Domains** in the Manager Pane.
2. Click **Move to Domain** in the Common Actions Panel.

The **Move to Domain** wizard appears.

### General

1. From the **Systems** list, select the system to which objects will be moved.
2. From the **Source Domain** list, select the domain on which the object to be moved currently resides.
3. From the **Destination Domain** list, select the domain to which the object will be moved.
4. From the **Type** list, select the type of object (Host, CPG, or Virtual Volume) to be moved.
5. From the **Object** list, select the object to be moved.
6. Click **Next**.

### Associated Objects

All objects (Hosts, CPGs, Virtual Volumes, and Virtual Volumes Sets) associated with the selected object, which will be affected by the domain move, are displayed.

Review the summary information, then click **Finish**.

---

## 5 Managing LDAP with Security Manager

The HP 3PAR Management Console supports the following types of LDAP authentication:

- Simple
  - Simple binding
  - Simple binding with SSL
  - Simple binding with SSL and certificate verification
  - Simple binding with SSL and StartTLS
  - Simple binding with SSL and StartTLS and certificate verification
- SASL (Simple Authentication and Security Layer)
  - PLAIN
  - GSSAPI
  - DIGEST-MD5

[“Configuring LDAP” \(page 71\)](#)

[“Viewing an LDAP Configuration” \(page 74\)](#)

[“Testing an LDAP Connection” \(page 79\)](#)

[“Removing an LDAP Configuration” \(page 79\)](#)

[“Adding Authorizations” \(page 79\)](#)

[“Removing Authorizations” \(page 80\)](#)

### Configuring LDAP

To configure LDAP:

1. Select **Security & Domains** in the Management Pane.
2. Select the system node on which you wish to configure LDAP.
3. Select **Configure LDAP** in the Common Actions Panel.

or

In the Main Menu Bar, click **Actions > Security & Domains > LDAP > Configure LDAP**.

The **Create LDAP Configuration** wizard will appear.

### Authentication

1. In the General groupbox, enter the **LDAP Server IP address**.

---

**NOTE:** If you are running HP 3PAR OS 3.1.2 or higher, the LDAP server name can be either an IP address or a DNS server name.

---

2. Enter the **Domain Name Attribute**.
3. Enter the **Domain Name Prefix**.
4. (Optional) Select the **Allow SSH Key** checkbox if you wish to enable LDAP users to set a publish SSH key using the CLI command `setsshkey`.
5. In the Binding groupbox, select a Binding: **Simple** or **SASL**.
6. (Optional) Select the **Use SSL** checkbox to use binding with SSL.

7. For **Simple** binding:

Binding

☒ Simple      ☐ SASL (Simple Authentication and Security Layer)

Simple binding uses the distinguished name to authenticate the user.      SASL binding uses the selected SASL mechanism to authenticate the user.

☐ Use SSL

Start-TLS: No

Group DN: ou=Group,dc=3pardata,dc=com

User Base DN: ou=People,dc=3pardata,dc=com

Group Object Class: posixGroup

Group Name Attribute: cn

User Attribute: uid

Member Attribute: memberUid

- Select a value in the **Start-TLS** list:
  - no** – The LDAP server does not use TLS protocol to create an encrypted connection (default).
  - try** – The LDAP server attempts to start the TLS protocol, but binding proceeds even if TLS cannot start.
  - require** – The LDAP server must start the TLS protocol to continue.
- Enter the **Group DN** (the Distinguished Name for groups).
- Enter the **User Base DN**. The authentication process attempts to bind the user to an entry in the server's DIT (directory information tree). The DN (distinguished name) of the entry is a concatenation of the value of user-attr, "=", the username, ",", and the value of user-dn-base. If group-obj is set to posixGroup, the value of the user-dn-base is also used as the base for searching for the user's posixAccount entry, regardless of binding type.
- Enter the **Group Object Class** attribute. The Active Directory default is **posixGroup**.
- Enter the **Group Name Attribute**. The Active Directory default is **cn**.
- Enter the **User Attribute** to form a DN for binding. The Active Directory default is **uid**.
- Enter the **Member Attribute** that contains the names of the users. The Active Directory default is **memberUid**.
- (Optional) Select the Use Certificate checkbox to require a valid server certificate. If you select the checkbox, the Enter Certificate button will be enabled. You will then be required to provide an LDAP server name.

☒ Use Certificate      Enter Certificate...

**Issued to:** CN=ldparh.3pardata.com, O=3pardata, L=Fremont, ST=CA, C=US  
**Issued by:** CN=ldparh.3pardata.com, O=3pardata, L=Fremont, ST=CA, C=US  
**Valid from** Mon Jun 14 10:09:08 PDT 2010 to Thu Jun 11 10:09:08 PDT 2020

LDAP Server Name

- Click the Enter Certificate button to display the Certificate dialog box. You may either select a local Certificate File or paste the copied certificate text into the textbox provided. For more information, see ["Enter Certificate"](#) (page 74).
- Enter the host **LDAP Server Name**.

8. For **SASL** binding:

Binding

☐ Simple  
Simple binding uses the distinguished name to authenticate the user.

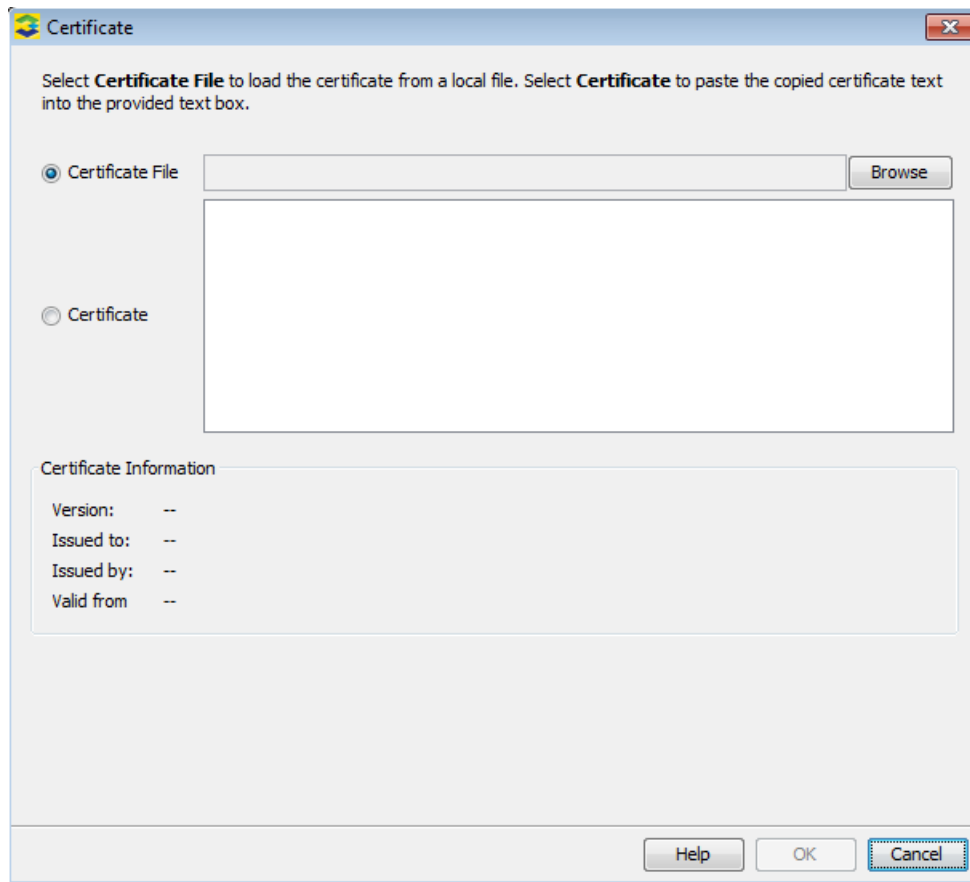
☒ SASL (Simple Authentication and Security Layer)  
SASL binding uses the selected SASL mechanism to authenticate the user.

☐ Use SSL

SASL Mechanism	GSSAPI	?
Accounts DN	CN=User,dc=ldaptest,dc=local	?
LDAP Server Name	ldapwin.ldaptest.local	?
Kerberos Realm	LDAPTEST.LOCAL	?
Kerberos Server IP		?
Group Object Class	group	?
Account Object Class	user	?
Account Name Attribute	sAMAccountName	?
Member Of Attribute	memberOf	?

- Select an **SASL Mechanism**: **PLAIN**, **DIGEST MD5**, or **GSSAPI**.
  - Enter the **Accounts DN** (the Distinguished Name for accounts).
  - Enter the host **LDAP Server Name**.
  - Enter the **Kerberos Realm** where the encryption data is stored.
  - If different from the LDAP Server address, enter the **Kerberos Server IP** address.
  - Enter the **Group Object Class** attribute. The Active Directory default is **group**.
  - Enter the **Account Object Class** attribute. The Active Directory default is **user**.
  - Enter the **Account Name Attribute** containing the username of the user. The Active Directory default is **sAMAccountName**.
  - Enter the **Member Of Attribute** containing the name of the group of which the user is a member. The Active Directory default is **memberOf**.
9. Click **Next** to go to the Authorization page, or click **Finish** to complete the wizard now and add authorizations later.

## Enter Certificate



1. Select **Certificate File** then click the Browse button to load a local certificate, or select **Certificate** if you wish to paste the copied certificate text into the textbox provided.
2. Click **OK** to return to the Authentication page.

## Authorization

1. Enter the **Group DN**.
2. Enter the **Authorization Group** to associate with the specified Group DN.
3. Click **Add**.
4. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

Review the settings you selected then click **Finish**.

## Viewing an LDAP Configuration

To view existing LDAP configurations:

1. Click **Security & Domains** in the Manager Pane.
2. In the Management Tree, select the LDAP node under the system node for which you wish to view an LDAP configuration.

A Summary tab and an Authorization tab will appear in the Management Window.

## The LDAP Summary Screen

The Summary screen provides different information depending on the type of LDAP configuration. When no LDAP configuration exists, parameters that can be set are displayed without corresponding values.

General		Authentication Parameters	
LDAP Server	10.112.1.78	Binding	simple
Port	636	Use SSL	Yes
Domain Name Attribute	description	Start-TLS	no
Domain Name Prefix	InservDomain=	Use Certificate	Yes
Allow SSH Key	No	LDAP Server Name	ldaprh.3pardata.com
		Group DN	ou=Group
		Group Name Attribute	cn
		User Base DN	ou=People,dc=3pardata,dc=com
		User Attribute	uid
		Member Attribute	memberUid
		Group Object Class	posixGroup

Certificate	
Version:	3
Issued to:	CN=ldparh.3pardata.com, O=3pardata, L=Fremont, ST=CA, C=US
Issued by:	CN=ldparh.3pardata.com, O=3pardata, L=Fremont, ST=CA, C=US
Valid from:	Valid from Mon Jun 14 10:09:08 PDT 2010 to Thu Jun 11 10:09:08 PDT 2020

For an LDAP configuration with Simple binding, the following information is provided:

Group	Field	Description
General	LDAP Server	The IP address of the LDAP server. (With HP 3PAR OS 3.1.2 or higher, the LDAP server name can be either an IP address or a DNS server name.)
	Port	Indicates the port of the LDAP server (default 389 for non-SSL, 636 for SSL)
	Domain Name Attribute	When the Domain Name Prefix is set, the value of the attribute specified by the Domain Name Attribute is a candidate domain name. The value of domain-name-prefix is a character string used to extract the domain name from the candidate. The value is an optional exclamation point (!) followed by a character string called the prefix. The exclamation point is a flag that means the presence of the prefix is required and is described more below.  The candidate domain name is searched for the presence of the prefix and if found, the domain name starts after the first occurrence of the prefix and stops before the first space or tab following it or at the end of the candidate domain name.  If the prefix is not found, the behavior depends on the flag. If the exclamation point was not used (there is no flag), the candidate domain name becomes the domain name. If the flag is present, the candidate domain name is rejected and there is no domain name. As a last step, and as described for the Domain Name Attribute, domain names can be truncated and have invalid characters replaced.
	Domain Name Prefix	When set, the mapping of groups to domains is enabled. For a user that is a member of a group that maps to a role, the

Group	Field	Description
		value of the Domain Name Attribute is used to look up an attribute in the group that holds the name of a domain. If the domain is too long or contains characters that are not allowed in a domain name, the name is truncated to the maximum length of a domain name and invalid characters are replaced with an underscore ('_').
	<b>Allow SSH Key</b>	Indicates whether LDAP users are allowed to set a publish SSH key using the CLI command setsshkey.
<b>Authentication Parameters</b>	<b>Binding</b>	Indicates the type of binding: Simple or SASL.
	<b>Use SSL</b>	Indicates whether binding with SSL is used.
	<b>Start-TLS</b>	Indicates whether TLS protocol is used to create an encrypted connection. <b>no</b> – The LDAP server does not use TLS protocol to create an encrypted connection (default). <b>try</b> – The LDAP server attempts to start the TLS protocol, but binding proceeds even if TLS cannot start. <b>require</b> – The LDAP server must start the TLS protocol to continue.
	<b>Use Certificate</b>	Indicates whether a valid server certificate should be required to in order to proceed.
	<b>LDAP Server Name</b>	The name of the host LDAP server.
	<b>Group DN</b>	(Group Distinguished Name) Indicates the base of the subtree in the DIT to search for objects that hold group information.
	<b>Group Name Attribute</b>	The attribute in the group object that holds the group's name. (The default is cn.)
	<b>User Base DN</b>	A concatenation of the value of the User Attribute, the username, and the value of the User Base DN.
	<b>User Attribute</b>	Used to form a DN for simple binding. When it ends with a backslash, the DN is the concatenation of the value of User Attribute and the username. When the attribute does not end with a backslash, it is as described for the User Base DN variable. (The default is uid.)
	<b>Member Attribute</b>	The attribute that holds the name of a group of which the user is a member. (The default is memberUid.)
	<b>Group Object Class</b>	Indicates the objectClass attribute of a group object. (The default is posixGroup.)
<b>Certificate</b> (shown if the value of the Use Certificate field is Yes.)	<b>Version</b>	The version number of the certificate.
	<b>Issued to</b>	Who the certificate is issued to.
	<b>Issued by</b>	Who the certificate is issued by.
	<b>Valid from</b>	Dates the certificate is valid.



Security & Domains : Storage Systems : s020 : LDAP

Summary Authorization

General		Authentication Parameters	
<b>LDAP Server</b>	192.168.29.112	<b>Binding</b>	sasl
<b>Port</b>	389	<b>Use SSL</b>	No
<b>Domain Name Attribute</b>	description	<b>SASL Mechanism</b>	PLAIN
<b>Domain Name Prefix</b>	InServDomain=	<b>LDAP Server Name</b>	ldapwin.ldaptest.local
<b>Allow SSH Key</b>	No	<b>Kerberos Realm</b>	LDAPTEST.LOCAL
		<b>Kerberos Server IP</b>	--
		<b>Accounts DN</b>	CN=users,DC=ldaptest,DC=local
		<b>Account Object Class</b>	user
		<b>Account Name Attribute</b>	sAMAccountName
		<b>Member Of Attribute</b>	memberOf
		<b>Group Object Class</b>	group

For an LDAP configuration with SASL binding, the following information is provided:

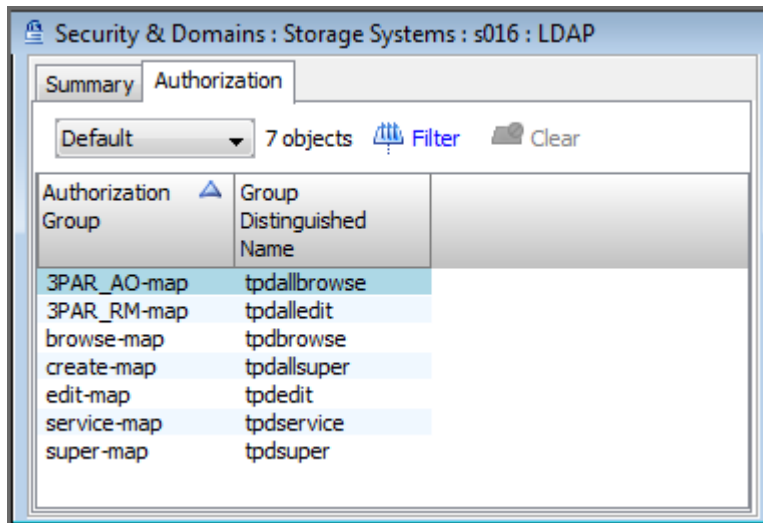
Group	Field	Description
General	<b>LDAP Server</b>	The IP address of the LDAP server. (With HP 3PAR OS 3.1.2 or higher, the LDAP server name can be either an IP address or a DNS server name.)
	<b>Port</b>	Indicates the port of the LDAP server (default 389 for non-SSL, 636 for SSL)
	<b>Domain Name Attribute</b>	<p>When the Domain Name Prefix is set, the value of the attribute specified by the Domain Name Attribute is a candidate domain name. The value of domain-name-prefix is a character string used to extract the domain name from the candidate. The value is an optional exclamation point ('!') followed by a character string called the prefix. The exclamation point is a flag that means the presence of the prefix is required and is described more below.</p> <p>The candidate domain name is searched for the presence of the prefix and if found, the domain name starts after the first occurrence of the prefix and stops before the first space or tab following it or at the end of the candidate domain name.</p> <p>If the prefix is not found, the behavior depends on the flag. If the exclamation point was not used (there is no flag), the candidate domain name becomes the domain name. If the flag is present, the candidate domain name is rejected and there is no domain name. As a last step, and as described for the Domain Name Attribute, domain names can be truncated and have invalid characters replaced.</p>
	<b>Domain Name Prefix</b>	When set, the mapping of groups to domains is enabled. For a user that is a member of a group that maps to a role, the value of the Domain Name Attribute is used to look up an attribute in the group that holds the name of a domain. If the domain is too long or contains characters that are not allowed in a domain name, the name is truncated to the maximum length of a domain name and invalid characters are replaced with an underscore ('_').
	<b>Allow SSH Key</b>	Indicates whether LDAP users are allowed to set a publish SSH key using the CLI command setsshkey.

Group	Field	Description
<b>Authentication Parameters</b>	<b>Binding</b>	Indicates the type of binding: Simple or SASL.
	<b>Use SSL</b>	Indicates whether binding with SSL is used.
	<b>SASL Mechanism</b>	Indicates the binding mechanism used. <b>PLAIN</b> – Similar to simple binding where the username and password are sent directly to the LDAP server for authentication (default). <b>DIGEST-MD5</b> – The LDAP server sends the LDAP client one-time data that is encrypted by the client and returned to the server using a method that proves the client knows the user's password without actually having to send the password. <b>GSSAPI</b> – Obtains a ticket from the Kerberos server that validates the user's identity. The ticket is then sent to the LDAP server for authentication.
	<b>LDAP Server Name</b>	The name of the host LDAP server.
	<b>Kerberos Realm</b>	Indicates the numeric IP Address of the Kerberos server if different from the LDAP server.
	<b>Kerberos Server IP</b>	The IP address of the Kerberos server, if different than the LDAP server.
	<b>Accounts DN</b>	Indicates the base of the subtree in the DIT to search for objects that hold account information. It is mutually exclusive with Group DN.
	<b>Account Object Class</b>	The objectClass attribute of an account object. (The default is user.)
	<b>Account Name Attribute</b>	The attribute of an account object that holds the user's username. (The default is sAMAccountName.)
	<b>Member Attribute</b>	The attribute that holds the name of a group of which the user is a member. (The default is memberOf.)
	<b>Group Object Class</b>	Indicates the objectClass attribute of a group object. (The default is group.)
<b>Certificate</b> (shown if the value of the Use Certificate field is Yes.)	<b>Version</b>	The version number of the certificate.
	<b>Issued to</b>	Who the certificate is issued to.
	<b>Issued by</b>	Who the certificate is issued by.
	<b>Valid from</b>	Dates the certificate is valid.

## The LDAP Authorization Screen

The Authorization screen displays the Authorization Group and Group Distinguished Name of all authorized LDAP users.

**NOTE:** This screen must be displayed in order to enable the Test LDAP Connection button on the toolbar.



## Testing an LDAP Connection

To test an LDAP connection:

1. In the Management Tree, select the LDAP node under the system containing the LDAP configuration you wish to test.
2. In the Management Window, click the **Authorization** tab.
3. Click **Test LDAP Connection** in the toolbar.

The Test LDAP Connection dialog box appears.

4. In the Credentials groupbox, enter your **User Name** and **Password**.
5. Click **Test Connection**.

The results of the test will be displayed in the Results groupbox.

## Removing an LDAP Configuration

The Remove LDAP feature is only available if the system has an existing LDAP configuration.

1. In the Management Tree, select the system containing the LDAP configuration you wish to remove.
2. In the Main Menu Bar, select **Actions > Security & Domains > LDAP > Remove LDAP Configuration**.
3. When the **Remove LDAP Configuration** dialog box appears, review the information displayed, then click **OK**.

You will receive a warning dialog indicating that removing the LDAP configuration will irretrievably destroy it and the LDAP user will no longer be allowed to connect to the system. Click **Delete** to delete the configuration, or **Don't Delete** to cancel.

## Adding Authorizations

To add an authorization:

1. Click **Security & Domains** in the Management Pane.
2. Right-click the LDAP node under the system containing the LDAP configuration to which you wish to add an authorization.

The **Add Authorization** dialog box appears

3. Enter the **Group DN**.
4. Enter the **Authorization Group**.
5. Click **Add**.
6. Click **OK**.

## Removing Authorizations

To remove an authorization:

1. Click **Security & Domains** in the Management Pane.
2. Select the LDAP node under the system containing the LDAP configuration to which you wish to remove an authorization.
3. Under the Authorization tab in the Management Window, right-click on the name of the Authorization Group you wish to remove, and select **Remove Authorization**.  
The **Remove Authorization** dialog box appears.
4. Review the information displayed, then click **OK**.

## 6 The Security Manager

The Security Manager allows you to create and manage users and domains, as well as view users, domains, and connections on the HP 3PAR StoreServ Storage System.

[“Viewing the Security System Summary Screen” \(page 81\)](#)

[“Managing Users with Security Manager” \(page 55\)](#)

[“Managing Domains with Security Manager” \(page 59\)](#)

[“Managing User Connections” \(page 57\)](#)

**NOTE:** HP 3PAR Domains requires an HP 3PAR Domain license. For additional information about the license, see the *HP 3PAR OS Concepts Guide*.

**NOTE:** For further information about HP 3PAR Domains and users, see the *HP 3PAR OS Concepts Guide*.

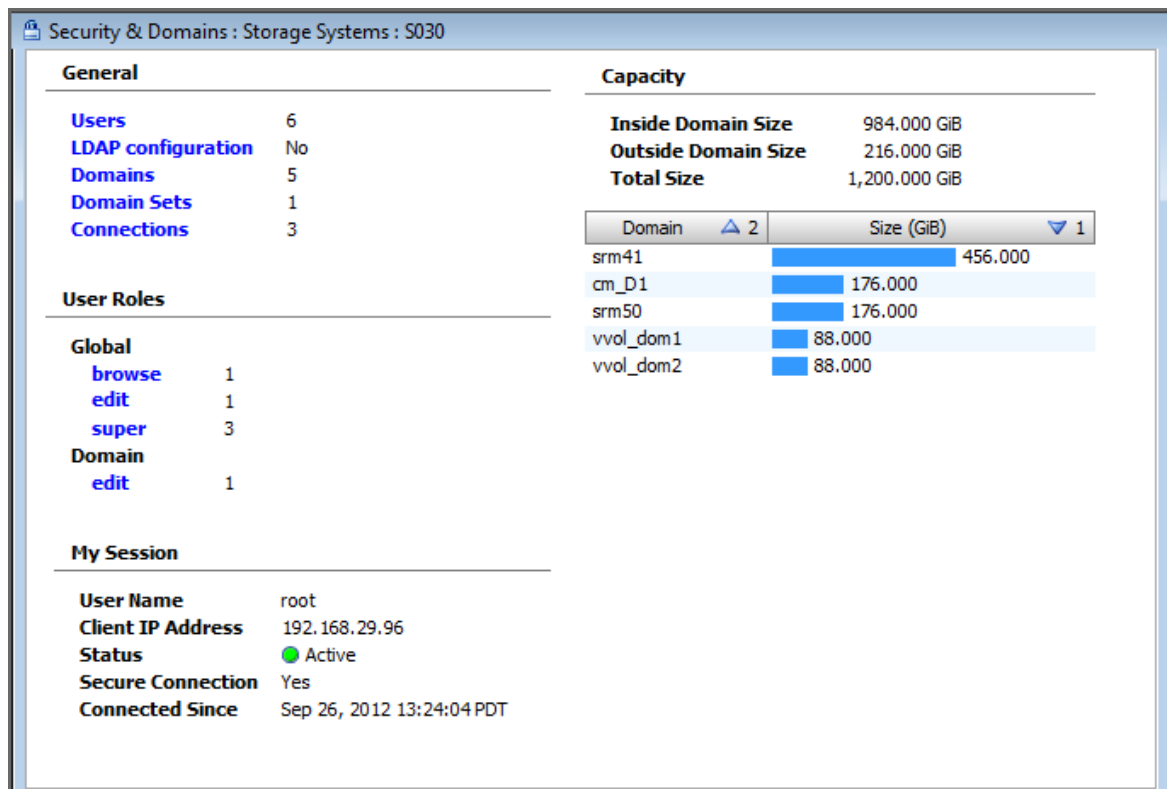
### Viewing the Security System Summary Screen

The Security System Summary screen provides an overview of all users, user connections, domains, domain sets, and connections.

To access the Security System summary screen:

1. Click **Security & Domains** in the Manager Pane.
2. In the Management Tree, select a system.

The System summary screen appears in the Management Window.



General	
Users	6
LDAP configuration	No
Domains	5
Domain Sets	1
Connections	3

Capacity	
Inside Domain Size	984.000 GiB
Outside Domain Size	216.000 GiB
Total Size	1,200.000 GiB

Domain	Size (GiB)
srm41	456.000
cm_D1	176.000
srm50	176.000
vvol_dom1	88.000
vvol_dom2	88.000

User Roles	
Global	
browse	1
edit	1
super	3
Domain	
edit	1

My Session	
User Name	root
Client IP Address	192.168.29.96
Status	Active
Secure Connection	Yes
Connected Since	Sep 26, 2012 13:24:04 PDT

The Security System summary screen provides the following information:

Group	Field	Description
<b>General</b>	<b>Users</b>	The total number of system users. The <b>Users</b> heading is a link to the Users Screen.
	<b>LDAP configuration</b>	Indicates whether or not LDAP is configured.
	<b>Domains</b>	The number of domains residing on the system. The <b>Domains</b> heading is a link to the Domains Screen.
	<b>Domain Sets</b>	The number of domain sets on the system. The <b>Domains Sets</b> heading is a link to the Domain Sets screen.
	<b>Connections</b>	The number of user connections to the system. The <b>Connections</b> heading is a link to the User Connections screen.
<b>Capacity</b>	<b>Inside Domain Size</b>	The size (in GiB) of all domains inside the selected system.
	<b>Outside Domain Size</b>	The size (in GiB) of all domains outside of the selected system.
	<b>Total Size</b>	The total size (in GiB) of all inside and outside domains.
	<b>Domain</b>	The domain name.
	<b>Size</b>	The size (in GiB) of the domain.
	<b>Top 10</b>	Checkbox (displayed when more than 10 domains exist on the system). If selected, only the largest (in GiB) 10 system domains are displayed.
<b>User Roles</b>	<b>Global</b>	The number of non-domain users. This is broken down by the number of users per access privilege type (super, edit, browse, basic_edit, create).
	<b>Domain</b>	The number of domain users. This is broken down by the number of users per domain access privilege type (edit, browse).
<b>My Session</b>	<b>User Name</b>	The user name for the current HP 3PAR Management Console session.
	<b>Client IP Address</b>	The client IP address.
	<b>Status</b>	The session status, either Active or Inactive.
	<b>Secure Connection</b>	Indicates whether a secure connection is being used.
	<b>Connected Since</b>	The date and time the current connected session was started.

---

## Part III Creating Storage

This part contains information on managing domains, hosts, provisioning, virtual volumes, and VLUNs.

["Managing Hosts" \(page 84\)](#)

["Managing Host Sets" \(page 102\)](#)

["Managing Common Provisioning Groups " \(page 107\)](#)

["Virtual Volumes" \(page 129\)](#)

["Viewing Virtual Volumes" \(page 152\)](#)

["Managing VLUNs" \(page 169\)](#)

# 7 Managing Hosts

The Host Manager allows the following operations:

["Creating Hosts" \(page 84\)](#)

["Editing Hosts" \(page 85\)](#)

["Removing Hosts" \(page 87\)](#)

["Viewing Hosts" \(page 87\)](#)

["Viewing Host Information" \(page 90\)](#)

["Viewing Paths" \(page 98\)](#)

["Viewing Unassigned Paths" \(page 100\)](#)

["Using the Host Manager" \(page 101\)](#)

---

**NOTE:** If you are a domain user, only information within the domain(s) you have access to, will be visible.

---

## Creating Hosts

To create a host in the Management Console:

1. Click **Hosts** in the Manager Pane.
2. Click **Create Host** in the Common Actions Panel.

The **Create Host** wizard appears.

## Host Settings

1. In the **General** group box:
  - a. **System** - Select the system to create the new host.
  - b. **Domain** - Select the domain in which to create the new host. Select **<none>** if not applicable.
  - c. **Name** - Enter the host name.
  - d. **Set Name** - Select the host set in which to create the new host. Select **<none>** if not applicable.
  - e. **Host OS** - Select the operating system running on the host.
  - f. **Persona** - The host persona will be visible and disabled. When **Host OS** is selected, the corresponding persona will be selected for the user, and the Operating System descriptor field will be filled with the Host OS automatically.
    - 1 = Generic (Unit Attention Report LUNs, Enable SES device)
    - 2 = Generic-ALUA (Unit Attention Report LUNs, Report Target Port Groups, Enable SES device)
    - 6 = Generic-legacy
    - 7 = HPUX-legacy (Volume Set Addressing)
    - 8 = AIX-legacy (Normal Auto Contingent Allegiance)
    - 9 = Egenera (Soft Inquiry Data)
    - 10 = ONTAP-legacy (Soft Inquiry Data)
    - 11 = VMware (Enable Sub-LUN Addressing, Asymmetric Logical Unit Access)
2. (Optional) In the **Descriptors** group box, enter the description information as desired in the **Location**, **IP Address**, **Operating System**, **Model**, **Contact**, and **Comments** fields.
3. Click **Next**, or click **Finish** to close the wizard and create the host with the information entered.



## Fibre Channel

1. To assign available WWNs:
  - a. Select one or more WWNs from the **Available WWNs** list. This list displays WWNs for all physically connected host paths not already assigned to hosts.
  - b. Click the left arrow to add the selected WWN(s) to the **Assigned WWNs** list.
2. To assign new WWNs, enter the WWN(s) for the host in the **New WWN** text box and click **Assign**.
3. Click **Next**, or click **Finish** to close the wizard and create the host with the information entered.

## iSCSI

1. In the **iSCSI Host Paths** group box:
  - a. Select one or more iSCSI names from the **Available iSCSI Names** list. This list displays iSCSI names for all physically connected host paths not already assigned to hosts.
  - b. Click the left arrow to add the selected iSCSI name(s) to the **Assigned iSCSI Names** list.
  - c. To assign new iSCSI names, enter the iSCSI name(s) in the **New iSCSI Name** text box and click **Assign**.

---

**NOTE:** Rules for the **CHAP** group box in the following step are as follows:

- When clicking the Initiator **CHAP** check box, CHAP Name is initialized with the host name (default).
  - The **Target CHAP** check box is enabled when the Initiator CHAP check box is selected.
  - The **CHAP Secret** text box is required if a CHAP Name is entered.
  - **Target CHAP** is optional.
  - **Target CHAP** can only be populated if **Initiator CHAP** is populated.
- 

2. In the **CHAP** group box:
  - a. Click the **Initiator CHAP** check box. The CHAP Name text box displays the host name.
  - b. Click the **Initiator CHAP** check box and enter the host name.
  - c. Enter a secret/password in the **CHAP Secret** text box.
  - d. If the **CHAP Secret** text box is entered in hexadecimal, click the **Hex** check box.
  - e. If required, click the **Target CHAP** check box. The **CHAP Name** text box displays the system name.
  - f. Enter a secret/password in the **CHAP Secret** text box.
3. Click **Next** to view summary information, or click **Finish** to close the wizard and configure the host with the information gathered.

## Summary

Review the summary information, then click **Finish**.

## Editing Hosts

To edit a host, access the **Edit Host** wizard:

1. Click **Hosts** in the Manager Pane.
2. In the Management Tree, click **Hosts** under the system where the host you wish to edit resides.
3. Click the **Hosts** tab in the **Hosts** screen.
4. Right-click the host you wish to edit and then click **Edit Host** in the menu that appears.  
The **Edit Host** wizard appears.

## Host Settings

1. In the **General** group box:
  - a. **Name** - Enter a new host name.
  - b. **Host OS** - Select the operating system running on the host.
  - c. **Persona** - The host persona will be visible and disabled. When **Host OS** is selected, the corresponding persona will be selected for the user, and the Operating System descriptor field will be filled with the Host OS automatically.
2. (Optional) In the **Descriptors** group box, edit the description information as desired in the **Location**, **IP Address**, **Operating System**, **Model**, **Contact**, and **Comments** fields.
3. Click **Next**, or click **Finish** to close the wizard and edit the host with the information entered.

## Fibre Channel

1. To assign available WWNs:
  - a. Select one or more WWNs from the **Available WWNs** list. This list displays WWNs for all physically connected host paths not already assigned to hosts.
  - b. Click the left arrow to add the selected WWN(s) to the **Assigned WWNs** list.
  - c. To remove assigned WWNs, select one or more WWNs from the **Assigned WWNs** list and click the right arrow.
2. To assign new WWNs, enter the WWN(s) for the host in the **New WWN** text box and click **Assign**.
3. Click **Next**, or click **Finish** to close the wizard and edit the host with the information entered.

## iSCSI

1. In the iSCSI Host Paths group box:
  - a. Select one or more iSCSI names from the **Available iSCSI Names** list. This list displays iSCSI names for all physically connected host paths not already assigned to hosts.
  - b. Click the left arrow to add the selected iSCSI name(s) to the **Assigned iSCSI Names** list.
  - c. To remove assigned iSCSI names, select one or more iSCSI names from the **Assigned iSCSI Names** list and click the right arrow.
  - d. To assign new iSCSI names, enter the iSCSI name(s) in the **New iSCSI Name** text box and click **Assign**.

---

**NOTE:** Rules for the **CHAP** group box in the following step are as follows:

- When clicking the **Initiator CHAP** check box, **CHAP Name** is initialized with the host name (default).
  - The **Target CHAP** checkbox is enabled when the **Initiator CHAP** check box is selected.
  - The **CHAP Secret** text box is required if a **CHAP Name** is entered.
  - **Target CHAP** is optional.
  - **Target CHAP** can only be populated if **Initiator CHAP** is populated.
- 

2. In the **CHAP** group box:
  - a. Click the **Initiator CHAP** check box. The **CHAP Name** text box displays the host name.
  - b. Enter a new secret/password in the **CHAP Secret** text box.
  - c. If the **CHAP Secret** text box is entered in hexadecimal, click the **Hex** check box.
  - d. If required, click the **Target CHAP** check box. The **CHAP Name** text box displays the system name.
  - e. Enter a new secret/password in the **CHAP Secret** text box.

- Click **Next** to view summary information, or click **Finish** to close the wizard and edit the host with the information gathered.

## Summary

Review the summary information, then click **Finish**.

## Removing Hosts

To remove a host or multiple hosts:

- Click **Hosts** in the Manager Pane.
- In the Management Tree, click **Hosts** under the system where the host(s) you wish to remove resides.
- Click the **Hosts** tab in the Hosts screen.
- Select the host(s) you wish to remove.
- Right-click and then click **Remove Host** in the menu that appears.

The **Remove Host** dialog appears.

- (Optional) In the **Remove Host** dialog box, select **Remove Host** even if there are exported volumes, and from host sets if applicable.
- Click **OK**.

## Viewing Hosts

The Host Manager allows you to view summary information and details about hosts for all connected systems or for a single system's hosts. Additionally, you can view information about host paths and host sets.

[“Overview of All Hosts” \(page 87\)](#)

[“Overview of a System's Hosts” \(page 88\)](#)

[“Viewing Host Information” \(page 90\)](#)

[“Viewing Paths” \(page 98\)](#)

[“Using the Host Manager” \(page 101\)](#)

## Overview of All Hosts

To display an overview of hosts in all connected systems:

- In the Manager pane, click **Hosts**.
- In the Management tree, click **Storage Systems**.
- Click the **Summary** tab.

General		Active VLUNs		Capacity Exported	
Hosts	70	Average per Host	0	Total Exported Size	375,000 GiB
Host Sets	17			Average Virtual Size	5,357 GiB
Operating Systems					
SunOS	2				
InForm	1				
Unknown	67				
Average Paths per Host	1				
		<input checked="" type="checkbox"/> Top 10		<input checked="" type="checkbox"/> Top 10	
Host	System	Active VLUNs	Host	System	Total Exported Size (GiB)
PE2950-17	S030	7	PE2950-17	S030	243,000
PE2950-19	S030	4	PE2950-19	S030	120,000
cm_host1	S030	1	cm_host1	S030	10,000
s381	s324	1	s381	s324	1,000
myhost	s324	1	myhost	s324	1,000
hpc7000-09-b7	s710	0	hpc7000-09-b7	s710	0,000
sqah2	s381	0	sqah2	s381	0,000
sqahost	s381	0	sqahost	s381	0,000
cmhost1	s381	0	cmhost1	s381	0,000
ds_797	s381	0	ds_797	s381	0,000

The following information is provided:

Group	Field	Description
General	Hosts	The total number of hosts.
	Host Sets	The total number of host sets.
	Operating Systems	Provides a breakdown of operating systems. If Host Explorer is not running, this field displays Unknown.
	Average Paths per Host	The average number of paths per host.
Active VLUNs	Average per Host	The average number of VLUNs per host.
	Top 10	Select to display only the top ten active VLUNs. (Displayed if more than 10 hosts exist on the system.)
	Host	The host name. Each name listed is a link to the Host screen.
	System	The system on which the host resides.
	Active VLUNs	The number of active VLUNs.
Capacity Exported	Total Exported Size	The total exported size in GiB.
	Average Virtual Size	The average virtual size in GiB.
	Top 10	Select to display only the top ten hosts with the greatest capacity exported. (Displayed if more than 10 hosts exist in the domain.)
	Host	The host name. Each name listed is a link to the Host screen.
	System	The system where the export originated.
	Total Exported Size	The total exported size in GiB.

## Overview of a System's Hosts

To access the overview of a single system's hosts:

1. In the Manager pane, click **Hosts**.
2. In the Management tree, click the system that contains the hosts you wish to view.

The systems hosts overview appears.

Host Details: s381

Summary
Host Explorer
VLUNs
Virtual Volumes
Link Errors

**General**

**Paths**

**Name** s381  
**ID** 45  
**Domain** --  
**Set** --  
**Host Ports** 2  
**Storage System Ports** 2  
**Node ID(s)** 0, 1  
**Volumes Exported** 1  
**Total Exported Size** 1.000 GiB

WWN/SCSI Name	Type	Port
21420202AC00017D	Fibre Channel	1:0:2
20420202AC00017D	Fibre Channel	0:0:2

**Descriptors**

**Persona**

**Location** --  
**IP Address** --  
**Operating System** --  
**Model** --  
**Contact** --  
**Comments** --

**Name** Generic  
**ID** 1  
**Capabilities** [Unit Attention Report LUNs, Enable SES device]

The following information is provided:

Group	Field	Description
General	Hosts	The total number of hosts. This is also a link to the Host screen.
	Host Sets	The total number of host sets. This is also a link to the Host Sets summary screen.
	Operating Systems	Provides a breakdown of operating systems. If Host Explorer is not running, this field displays Unknown.
	Paths	Total number of paths. This is also a link to the Paths screen.
	Unassigned	Total number of unassigned hosts. This is also a link to the Unassigned paths screen.
Active VLUNs	Average per Host	The average number of active VLUNs.
	Host	The host name. Each name listed is a link to the Host screen.
	Domain	The domain in which the host resides.
	Active VLUNs	The number of active VLUNs per host.
Initiators per Node	Node	The node number.
	Initiators	The number of initiators.
Capacity Exported	Total Exported Size	The exported size per host in GiB.
	Average Virtual Size	The average virtual size of exported capacity in GiB.
	Host	The host name. Each name listed is a link to the Host screen.
	Total Exported Size	The exported size per host in GiB.
Initiators per Port	Port	The host port location in Node:Slot:Port format.
	Type	The type of host port.
	Initiators	The number of initiators.

## Viewing Host Information

To view more in-depth information about hosts for a single system, perform the following:

1. In the Manager pane, click **Hosts**.
2. In the Management tree, click **Hosts** under the system that contains the hosts you wish to view.

The Hosts screen is divided into a list and a detail pane. The list pane provides general information about all hosts in a system. The detail pane provides detailed information about a specific host selected in the list pane.

[“List Pane” \(page 90\)](#)

[“Detail Pane” \(page 92\)](#)

## List Pane

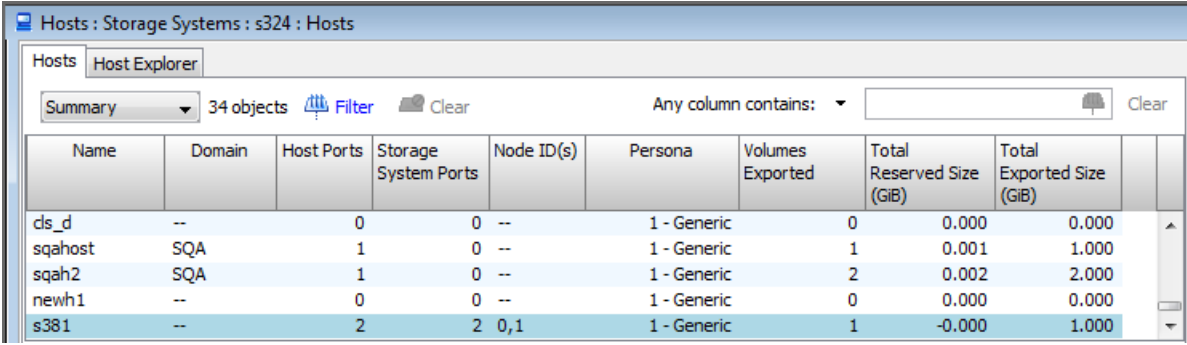
Information in the list pane is provided on two tabs: **Hosts** and **Host Explorer**.

[“Hosts Tab” \(page 90\)](#)

[“Host Explorer Tab” \(page 91\)](#)

## Hosts Tab

The **Hosts** tab can be set to show summary information or descriptor information.



The screenshot shows the 'Hosts' tab in the Manager pane. The title bar reads 'Hosts : Storage Systems : s324 : Hosts'. Below the title bar are two tabs: 'Hosts' (selected) and 'Host Explorer'. A toolbar shows 'Summary' (selected), '34 objects', a 'Filter' icon, a 'Clear' button, and a search field with the text 'Any column contains:'. The main area is a table with the following columns: Name, Domain, Host Ports, Storage System Ports, Node ID(s), Persona, Volumes Exported, Total Reserved Size (GiB), and Total Exported Size (GiB). The table contains five rows of data.

Name	Domain	Host Ports	Storage System Ports	Node ID(s)	Persona	Volumes Exported	Total Reserved Size (GiB)	Total Exported Size (GiB)
cls_d	--	0	0	--	1 - Generic	0	0.000	0.000
sqahost	SQA	1	0	--	1 - Generic	1	0.001	1.000
sqah2	SQA	1	0	--	1 - Generic	2	0.002	2.000
newh1	--	0	0	--	1 - Generic	0	0.000	0.000
s381	--	2	2	0,1	1 - Generic	1	-0.000	1.000

The following summary information is provided:

Column	Description
Name	The host name.
Domain	The domain in which the host resides.
Host Ports	The host port.
Storage System Ports	The system port(s) on which the host is visible.
Node ID(s)	The node(s) connected to the host.
Persona	One of the following host personas: <ul style="list-style-type: none"><li>• 1 = Generic (Unit Attention Report LUNs, Enable SES device)</li><li>• 2 = Generic-ALUA (Unit Attention Report LUNs, Report Target Port Groups, Enable SES device)</li><li>• 6 = Generic-legacy</li><li>• 7 = HPUX-legacy (Volume Set Addressing)</li><li>• 8 = AIX-legacy (Normal Auto Contingent Allegiance)</li><li>• 9 = Egenera (Soft Inquiry Data)</li></ul>
Volumes Exported	The number of volumes exported from the host.
Total Exported Size	The total size in GiB of exported data.

The screenshot shows the 'Hosts Explorer' tab in a software interface. At the top, it says 'Hosts : Storage Systems : s324 : Hosts'. Below this, there's a 'Hosts' tab and a 'Host Explorer' sub-tab. A dropdown menu shows 'Descriptors' and a count of '34 objects'. There are 'Filter' and 'Clear' buttons. The main table has columns: Name, Domain, Location, IP Address, Operating System, Model, Contact, and Comments. The data rows are:

Name	Domain	Location	IP Address	Operating System	Model	Contact	Comments
ds_c	--	--	--	--	--	--	--
ds_d	--	--	--	--	--	--	--
sqahost	SQA	--	--	--	--	--	--
sqah2	SQA	--	--	--	--	--	--
newh1	--	--	--	--	--	--	--
s381	--	--	--	--	--	--	--

The following descriptor information is provided:

Column	Description
<b>Name</b>	The host name.
<b>Domain</b>	The domain in which the host resides.
<b>Location</b>	The location of the host.
<b>IP Address</b>	The host's IP address.
<b>Operating System</b>	The operating system type.
<b>Model</b>	The model of the host HBA.
<b>Contact</b>	Any contact information.
<b>Comments</b>	Any notes.

## Host Explorer Tab

**NOTE:** The **Host Explorer** tab is displayed for systems running HP 3PAR OS 2.3.1 or higher. Additionally, host explorer information is displayed if the host was created from explorer information.

The screenshot shows the 'Host Explorer' tab with a more detailed table. The title bar says 'Hosts : Storage Systems : s324 : Hosts'. The sub-tab is 'Host Explorer'. There's a 'Default' dropdown, '3 objects', and 'Filter'/'Clear' buttons. A search bar says 'Any column contains:'. The table has columns: Host Name, Reported Host Name, Domain, OS, OS Version, OS Patch, IP, Multipath, Multipath Version, Cluster Software, Cluster Software Version, Cluster ID, and Cluster Name. The data rows are:

Host Name	Reported Host Name	Domain	OS	OS Version	OS Patch	IP	Multipath	Multipath Version	Cluster Software	Cluster Software Version	Cluster ID	Cluster Name
h5	unknown	jfu	SunOS	5.10	Generic_141445-09	--	MPXIO	5.10	--	--	--	--
s381	s381	--	InForm	3.1.2	228	--	--	--	--	--	--	--
unknown	unknown	--	SunOS	5.10	Generic_141445-09	--	MPXIO	5.10	--	--	--	--

The **Host Explorer** tab provides the following information:

Column	Description
<b>Host Name</b>	The host name.
<b>Reported Host Name</b>	The host name reported by the agent.
<b>Domain</b>	The domain in which the host resides.
<b>OS</b>	The operating system type.
<b>OS Version</b>	The version of the operating system.
<b>OS Patch</b>	The patch level of the operating system.
<b>IP</b>	The host's IP address.

Column	Description
<b>Multipath</b>	The multipathing software in use on the host.
<b>Multipath Version</b>	The version of the multipathing software.
<b>Cluster Software</b>	The host clustering software in use on the host.
<b>Cluster Software Version</b>	The version of the host clustering software.
<b>Cluster ID</b>	The host cluster ID.
<b>Cluster Name</b>	The host cluster name.

## Detail Pane

Information in the detail pane elaborates on specific hosts selected from the list pane. When selecting a host from the **Hosts** tab in the list pane, the detail pane provides four tabs, **Summary**, **VLUNs**, **Virtual Volumes**, and **Link Errors**, which provide details about the selected host. When selecting a host from the **Host Explorer** tab, the detail pane displays host explorer details.

[“Host Summary Details” \(page 92\)](#)

[“Host Explorer Details” \(page 93\)](#)

[“VLUN Details” \(page 94\)](#)

[“Virtual Volumes Details” \(page 96\)](#)

[“Link Errors Details” \(page 97\)](#)

## Host Summary Details

Summary details are displayed in the **Summary**.

**Host Details: s381**

Summary | Host Explorer | VLUNs | Virtual Volumes | Link Errors

General		Paths		
<b>Name</b>	s381	WWN/iSCSI Name	Type	Port
<b>ID</b>	45	21420202AC00017D	Fibre Channel	1:0:2
<b>Domain</b>	--	20420202AC00017D	Fibre Channel	0:0:2
<b>Set</b>	--			
<b>Host Ports</b>	2			
<b>Storage System Ports</b>	2			
<b>Node ID(s)</b>	0, 1			
<b>Volumes Exported</b>	1			
<b>Total Exported Size</b>	1.000 GiB			

Descriptors		Persona	
<b>Location</b>	--	<b>Name</b>	Generic
<b>IP Address</b>	--	<b>ID</b>	1
<b>Operating System</b>	--	<b>Capabilities</b>	[Unit Attention Report LUNs, Enable SES device]
<b>Model</b>	--		
<b>Contact</b>	--		
<b>Comments</b>	--		



The following information is displayed:

Group	Field	Description
General	Name	The host name.
	ID	The host ID.
	Domain	The domain in which the host resides.
	Set	The number of hosts in the host set.
	Host Ports	The host port.
	Storage System Ports	The system port on which the host is visible.
	Node ID(s)	The node(s) connected to the host.
	Volumes Exported	The number of volumes exported from the host.
	Total Exported Size	The total size in GiB of exported data.
Descriptors	Location	The location of the host.
	IP Address	The host's IP address.
	Operating System	The operating system type.
	Model	The model of the host HBA.
	Contact	Contact information.
	Comments	Any user-created notes.
Paths	WWN/iSCSI Name	The host's World-Wide Name (WWN) or iSCSI name.
	Type	The type of host port.
	Port	The host port location in Node:Slot:Port format.
Persona	Name	The persona name.
	ID	The persona ID.
	Capabilities	The persona capabilities.
CHAP (if applicable)	Initiator CHAP	Whether the initiator CHAP is enable or disabled.
	CHAP Name	Initiator CHAP name.
	Target Chap	Whether the target CHAP is enable or disabled.
	CHAP Name	Target CHAP name.

## Host Explorer Details

The host explorer detail screen in the detail pane provides detailed information about hosts selected from the **Host** tab in the list pane. (Displayed only if the selected Host was created with Host Explorer information.)

Host Details: s381								
Summary Host Explorer VLUNs Virtual Volumes Link Errors								
<b>General</b>			<b>Paths</b>					
<b>Host Name</b>	s381		WWN	Vendor	Model	Firmware Version	Driver Version	Speed
<b>ID</b>	45							Multiple Attach
<b>Domain</b>	--		20420202AC00017D	--	--	--	--	2 Gbps
<b>Reported Host Name</b>	s381		21420202AC00017D	--	--	--	--	2 Gbps
<b>OS</b>	InForm (3.1.2)							No
<b>OS Patch</b>	228							
<b>Architecture</b>	InServ V400							
<b>IP</b>	--							
<b>Multipath</b>	--							
<b>Cluster Software</b>	--							
<b>Cluster ID</b>	--							
<b>Cluster Name</b>	--							

The following information is provided:

Group	Field	Description
General	Host Name	The host name.
	ID	The host ID.
	Domain	The domain in which the host resides.
	Reported Host Name	The host name reported by the agent.
	OS	The operating system type.
	OS Patch	The patch level of the operating system.
	Architecture	The host's CPU.
	IP	The host's IP address.
	Multipath	The multipathing software in use on the host.
	Cluster Software	The host clustering software in use on the host.
	Cluster ID	The host cluster ID.
	Cluster Name	The host cluster name.
Paths	WWN	The WWN of the host HBA.
	Vendor	The vendor of the host HBA.
	Model	The model of the host HBA.
	Firmware Version	The firmware version on the host HBA.
	Driver Version	The host driver version.
	Speed	The host speed.
	Multiple Attach	Indicates if the host WWN is seen on multiple system ports.

## VLUN Details

VLUN details are displayed on three tabs: “VLUN Templates” (page 95), “Active VLUNs” (page 95), and “Path Summary” (page 96).

## VLUN Templates

**Host Details: s381**

Summary | Host Explorer | **VLUNs** | Virtual Volumes | Link Errors

VLUN Templates | Active VLUNs | Path Summary

Default 1 object Filter Clear

LUN	Domain	Virtual Volume	RAID Type	Host	Port (Node:Slot:Port)	Type	Active VLUNs
0	--	newone1.0116.0001.ro	RAID 1	s381	--	Host Sees	2

The following information is provided:

Column	Description
<b>LUN</b>	The exported LUN value. Each LUN is a link to the VLUN template.
<b>Domain</b>	The domain in which the VLUN belongs.
<b>Virtual Volume</b>	The exported volume. Each virtual volume is a link to the virtual volumes screen.
<b>RAID Type</b>	The volume's RAID type.
<b>Host</b>	The name of the host to which the VLUN is exported.
<b>Port</b>	The port to which the path is connected, in Node:Slot:Port format.
<b>Type</b>	The VLUN type.
<b>Active VLUNs</b>	The number of active VLUNs.

## Active VLUNs

**Host Details: s381**

Summary | Host Explorer | **VLUNs** | Virtual Volumes | Link Errors

VLUN Templates | **Active VLUNs** | Path Summary

Summary 2 objects Filter Clear Any column contains: Clear

LUN	Domain	Virtual Volume	RAID Type	Host	Port (Node:Slot:Port)	WWN/iSCSI Name	Exported Size (GiB)	Type
0	--	newone1.0116.0001.ro	RAID 1	s381	1:0:2	21420202AC00017D	1.000	Host Sees
0	--	newone1.0116.0001.ro	RAID 1	s381	0:0:2	20420202AC00017D	1.000	Host Sees
							2.000	

The following information is provided:

Column	Description
<b>LUN</b>	The exported LUN value.
<b>Domain</b>	The domain in which the VLUN belongs.
<b>Virtual Volume</b>	The exported volume.
<b>RAID Type</b>	The volume's RAID type.

Column	Description
Host	The name of the host to which the VLUN is exported.
Port	The port to which the path is connected, in Node:Slot:Port format.
Host WWN/iSCSI Name	The host's World-Wide Name (WWN) or iSCSI name.
Exported Size	The size of the VLUN in GiB.
Type	The VLUN type.

## Path Summary

LUN	Virtual Volume	Host	Host Ports	Inactive Ports	Storage System Ports	Available Paths	Healthy Paths	Multipath	Failed Path Policy	Monitoring Interval	Host Device Name
0	newone1.0116.0001.ro	s381	2	0	2	2	2	0	Unknown	Unknown	--

The following information is provided:

Column	Description
LUN	The exported LUN value.
Virtual Volume	The exported volume.
Host	The name of the host to which the VLUN is exported.
Inactive Ports	WWNs reported by the host, but not visible to the system.
Storage System Ports	The number of system ports that can see the host.
Available Paths	The total number of available distinct paths between the host and the system.
Healthy Paths	The number of paths seen by the system and reported "good" by the host.
Multipath	The multipathing method in use.
Failed Policy Path	The failed path monitoring method.
Monitoring Interval	The monitoring interval in seconds after which the host checks for failed paths.
Host Device Name	The device name for the selected VLUN on the host.

## Virtual Volumes Details

The virtual volumes detail screen in the detail pane provide detailed information about volumes selected from the **Host** tab in the list pane.

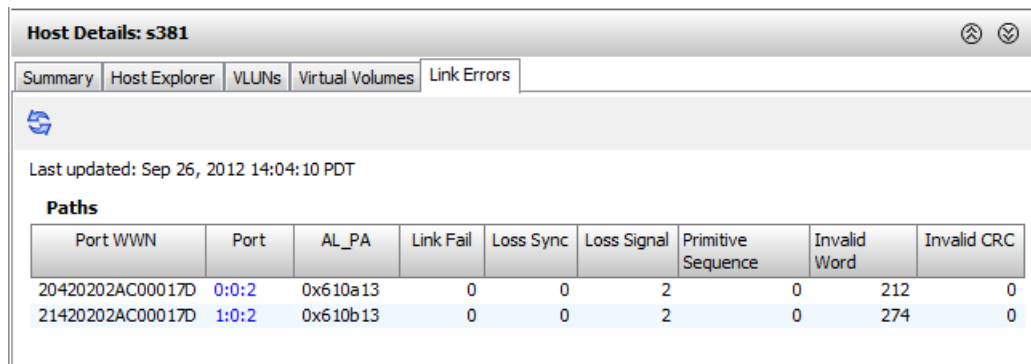
Name	Domain	Set	State	Type	Provisioning	RAID	Virtual Size (GB)	Reserved User Size (GB)	Reserved User Size (% Virtual)	Reserved Copy Size (GB)	Reserved Copy Size (% Virtual)	Exported To
sqaval	SQA	--	Normal	Base	Thin	RAID 1	1.000	1.000	100%	--	--	sqahost, s...
sqaval2	SQA	--	Normal	Base	Thin	RAID 1	1.000	1.000	100%	--	--	sqah2

The following information is provided:

Column	Description
<b>Name</b>	The volume name. Volume tree depth in parenthesis. Each name is a link to the virtual volume tab.
<b>Domain</b>	The domain to which the virtual volume belongs.
<b>Set</b>	The name of the host set to which the volume belongs.
<b>State</b>	The state of the system. See <a href="#">“System and Component Status Icons” (page 407)</a> .
<b>Type</b>	Indicates if the volume is a base volume, physical copy, or virtual copy.
<b>Provisioning</b>	Indicates if the volume is fully (Full) or thinly provisioned (TPVV).
<b>RAID</b>	The volume's RAID type.
<b>Virtual Size</b>	The size of the volume in GiB.
<b>Reserved User Size</b>	The size of the volume's reserved user space in GiB.
<b>Reserved User Size (% Virtual)</b>	The percentage of used user space.
<b>Reserved Copy Size</b>	The size of the volume's reserved copy space.
<b>Reserved Copy Size (% Virtual)</b>	The percentage of used copy space.
<b>Exported To</b>	The host to which the volume is exported. A red entry indicates an inactive VLUN. A blue entry indicates an active VLUN. Each host name is a link to the host summary tab.

## Link Errors Details

The link errors detail screen in the detail pane provide detailed information about hosts selected from the **Host** tab in the list pane.



Host Details: s381								
Summary Host Explorer VLUNs Virtual Volumes Link Errors								
Last updated: Sep 26, 2012 14:04:10 PDT								
Paths								
Port WWN	Port	AL_PA	Link Fail	Loss Sync	Loss Signal	Primitive Sequence	Invalid Word	Invalid CRC
20420202AC00017D	0:0:2	0x610a13	0	0	2	0	212	0
21420202AC00017D	1:0:2	0x610b13	0	0	2	0	274	0

The following information is provided:

Column	Description
<b>Port WWN</b>	The World Wide Name of the port.
<b>Port</b>	The number of the port. Each port is a link to the port summary screen.
<b>AL_PA</b>	The arbitrated loop physical address.
<b>Link Fail</b>	The fibre channel loop either has a loss of signal (electrical or optical) or a loss of synchronization that is greater than the time-out period.
<b>Loss Sync</b>	Fibre channel data is not valid though there is a signal (electrical or optical).
<b>Loss Signal</b>	Loss of signal (electrical or optical) to the receiver port of a fibre channel node.

Column	Description
<b>Primitive Sequence</b>	Primitive sequence protocol error. There were errors during the transmission of a fibre channel primitive sequence. This might indicate an error during the loop recovery or initialization.
<b>Invalid Word</b>	Invalid transmission word. Illegal fibre channel transmission word received.
<b>Invalid CRC</b>	Invalid cyclical redundancy check. Data corruption in the fibre channel frame.

## Viewing Paths

To view host paths:

1. In the Manager pane, click **Hosts**.
2. In the Management tree, click **Paths** under the system that contains the host paths you wish to view.

The **Paths** screen is divided into a list pane and a detail pane. The list pane displays a summary of all host paths in the system. The detail pane displays detailed information about a single host path selected from the list pane.

[“List Pane” \(page 98\)](#)

[“Detail Pane” \(page 98\)](#)

## List Pane

WWN/iSCSI Name	Host Name	Domain	Type	Port (Node:Slot:Port)	iSCSI IP Address
10000000C97D6613	PE2950-17	srm41	Fibre Channel	0:5:1	n/a
10000000C97D6613	PE2950-17	srm41	Fibre Channel	1:5:1	n/a
10000000C97D6614	PE2950-17	srm41	Fibre Channel	0:5:1	n/a
10000000C97D6614	PE2950-17	srm41	Fibre Channel	1:5:1	n/a

The list pane of the **Paths** screen provides the following information:

Column	Description
<b>Host WWN/iSCSI Name</b>	The host's World-Wide Name (WWN) or iSCSI name.
<b>Host Name</b>	The host name. If no name is displayed, the path is unassigned. Each host name is a link to the host <b>Summary</b> tab.
<b>Domain</b>	The domain in which the host resides.
<b>Type</b>	The type of path, Fibre Channel or iSCSI.
<b>Port</b>	The port to which the path is connected (in node:slot:port format). Each port is a link to the port summary.
<b>iSCSI IP Address</b>	The IP address if an iSCSI path.

## Detail Pane

The detail pane displays detailed information about a single host path selected from the list pane and is displayed on the following three tabs:

[“VLUN Templates Tab” \(page 99\)](#)

[“Active VLUNs Tab” \(page 99\)](#)

[“Path Summary Tab” \(page 100\)](#)

## VLUN Templates Tab

Path Details: 10000000C97D6613							
<div> <div>VLUN Templates</div> <div>Active VLUNs</div> <div>Path Summary</div> </div>							
<div> <div>Default</div> <div>7 objects</div> <div>Filter</div> <div>Clear</div> </div>							
LUN	Domain	Virtual Volume	RAID Type	Host	Port (Node:Slot:Port)	Type	Active VLUNs
0	srn41	srn_r5.2	RAID 1	PE2950-17	--	Host Sees	4
1	srn41	srn_r7.0	RAID 1	PE2950-17	--	Host Sees	4
2	srn41	srn_r6.0	RAID 1	PE2950-17	--	Host Sees	4
3	srn41	srn_r6.1	RAID 1	PE2950-17	--	Host Sees	4
4	srn41	srn_r6.2	RAID 1	PE2950-17	--	Host Sees	4
5	srn41	sql51_r	RAID 1	PE2950-17	--	Host Sees	4
6	srn41	vcsrn51_r	RAID 1	PE2950-17	--	Host Sees	4

The following information is provided on the **VLUN Templates** tab:

Column	Description
<b>LUN</b>	The exported LUN value.
<b>Domain</b>	The domain in which the VLUN belongs.
<b>Virtual Volume</b>	The exported volume.
<b>RAID Type</b>	The volume's RAID type.
<b>Host</b>	The name of the host to which the VLUN is exported.
<b>Port</b>	The port to which the path is connected (in node:slot:port format).
<b>Type</b>	The VLUN type.
<b>Active VLUNs</b>	The number of active VLUNs.

## Active VLUNs Tab

Path Details: 10000000C97D6613								
<div> <div>VLUN Templates</div> <div>Active VLUNs</div> <div>Path Summary</div> </div>								
<div> <div>Summary</div> <div>28 objects</div> <div>Filter</div> <div>Clear</div> </div>								
LUN	Domain	Virtual Volume	RAID Type	Host	Port (Node:Slot:Port)	WWN/iSCSI Name	Exported Size (GiB)	Type
0	srn41	srn_r5.2	RAID 1	PE2950-17	0:5:1	10000000C97D6613	20.000	Host Sees
0	srn41	srn_r5.2	RAID 1	PE2950-17	0:5:1	10000000C97D6614	20.000	Host Sees
0	srn41	srn_r5.2	RAID 1	PE2950-17	1:5:1	10000000C97D6613	20.000	Host Sees
0	srn41	srn_r5.2	RAID 1	PE2950-17	1:5:1	10000000C97D6614	20.000	Host Sees
1	srn41	srn_r7.0	RAID 1	PE2950-17	0:5:1	10000000C97D6613	2.000	Host Sees
1	srn41	srn_r7.0	RAID 1	PE2950-17	1:5:1	10000000C97D6613	2.000	Host Sees
1	srn41	srn_r7.0	RAID 1	PE2950-17	0:5:1	10000000C97D6614	2.000	Host Sees
1	srn41	srn_r7.0	RAID 1	PE2950-17	1:5:1	10000000C97D6614	2.000	Host Sees
							972.000	

The following information is provided on the **Active VLUNs** tab:

Column	Description
<b>LUN</b>	The exported LUN value. Each LUN is a link to the “Active VLUNs Tab” (page 170).
<b>Domain</b>	The domain in which the VLUN belongs.
<b>Virtual Volume</b>	The exported volume. Each virtual volume is a link to the virtual volume tab.
<b>RAID Type</b>	The volume's RAID type.
<b>Host</b>	The name of the host to which the VLUN is exported.
<b>Port</b>	The port to which the path is connected (in node:slot:port format).
<b>Host WWN/iSCSI Name</b>	The host's World-Wide Name (WWN) or iSCSI name.
<b>Exported Size</b>	The size of the VLUN (in GiB).
<b>Type</b>	The VLUN type.

## Path Summary Tab

Path Details: 10000000C97D6613

VLUN Templates Active VLUNs Path Summary

Default 7 objects Filter Clear Any column contains: Clear

LUN	Virtual Volume	Host	Host Ports	Inactive Ports	Storage System Ports	Available Paths	Healthy Paths	Multipath	Failed Path Policy	Monitoring Interval	Host Device Name
0	srn_r5.2	PE2950-17	2	0	2	4	0	Unknown	Unknown	0	--
1	srn_r7.0	PE2950-17	2	0	2	4	0	Unknown	Unknown	0	--
2	srn_r6.0	PE2950-17	2	0	2	4	0	Unknown	Unknown	0	--
3	srn_r6.1	PE2950-17	2	0	2	4	0	Unknown	Unknown	0	--
4	srn_r6.2	PE2950-17	2	0	2	4	0	Unknown	Unknown	0	--
5	sql51_r	PE2950-17	2	0	2	4	0	Unknown	Unknown	0	--
6	vsrm51_r	PE2950-17	2	0	2	4	0	Unknown	Unknown	0	--

The following information is provided on the **Path Summary** tab:

Column	Description
<b>LUN</b>	The exported LUN value.
<b>Virtual Volume</b>	The exported volume.
<b>Host</b>	The name of the host to which the VLUN is exported.
<b>Inactive Ports</b>	WWNs reported by the host, but not visible to the system.
<b>Storage Systems Ports</b>	The number of system ports that can see the host.
<b>Available Paths</b>	The total number of available distinct paths between the host and the system.
<b>Healthy Paths</b>	The number of paths seen by the system and reported "good" by the host.
<b>Multipath</b>	The multipathing method in use.
<b>Failed Policy Path</b>	The failed path monitoring method.
<b>Monitoring Interval</b>	The monitoring interval in seconds after which the host checks for failed paths.
<b>Host Device Name</b>	The device name for the selected VLUN on the host.

## Viewing Unassigned Paths

To view unassigned host paths:



1. In the Manager pane, click **Hosts**.
2. In the Management tree, click **Unassigned** under the **Paths** node of the system that contains the unassigned host paths you wish to view.

WWN/iSCSI Name	Host Name	Domain	Type	Port (Node:Slot:Port)	iSCSI IP Address
10000000C96EA29C	--	--	Fibre Channel	0:5:1	n/a
10000000C96EA29C	--	--	Fibre Channel	1:5:1	n/a
10000000C96EA29D	--	--	Fibre Channel	0:5:1	n/a
10000000C96EA29D	--	--	Fibre Channel	1:5:1	n/a

The information presented in the **Unassigned** paths screen is split into a list pane and a detail pane, and is identical to the information displayed in the **Paths** screen.

## Using the Host Manager

If you have installed HP 3PAR Host Explorer, each WWN or iSCSI name is categorized by its host, and as new hosts are physically connected to the storage system, the system is therefore able to automatically configure new host paths according to existing host assignments. For more information, see the *HP 3PAR Host Explorer User's Guide*.

You can also use the HP 3PAR Management Console to add new WWNs or iSCSI names for unestablished host paths and assign them to an existing host or use them to create a new host before the host systems are physically connected to the storage system. This allows a "plug-and-play" functionality that avoids the need for manual reconfiguration after establishing new host paths.

To work with the Host Manager, see:

["Viewing Host Information" \(page 90\)](#)

["Managing Hosts" \(page 84\)](#)

["Managing Host Sets" \(page 102\)](#)

---

**NOTE:** If you are a domain user, only information within the domain(s) you have access to will be visible.

---

If you are a domain user, you can perform any host task via the Domains node in the management tree. The information and procedures when working in the **Domains** node are identical to those under the **Storage Systems** node, except information is filtered by domain.

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## 8 Managing Host Sets

Host sets allow users to create a name for a group of hosts. This allows a virtual volume to be exported to the same set of hosts.

When working with host sets, the following operations are available:

[“Creating Host Sets” \(page 102\)](#)

[“Adding Hosts to Host Sets” \(page 102\)](#)

[“Editing Host Sets” \(page 103\)](#)

[“Removing Host Sets” \(page 103\)](#)

[“Viewing Host Sets” \(page 103\)](#)

[“Viewing Host Set Details” \(page 104\)](#)

---

**NOTE:** If you are a domain user, only information within the domain(s) you have access to will be visible.

---

### Creating Host Sets

To create a host set, access the **Create Host Set** wizard:

1. Click **Hosts** in the Manager Pane.
2. Click **Create Host Set** in the Common Actions Panel.

The **Create Host Set** wizard appears.

#### General

1. In the **General** group box:
  - a. **System** - Select the system to create the new host set.
  - b. **Domain** - Select the domain in which to create the new host set. Select **<none>** if not applicable.
  - c. **Name** - Enter the host set name.
  - d. **Comments** - Enter any notes.
2. Click **Next**, or click **Finish** to close the wizard and create the host set with the information entered.

#### Hosts

1. To assign available hosts:
  - a. Select one or more WWNs from the **Available hosts** list.
  - b. Click the down arrow to add the selected WWN(s) to the **Assigned hosts** list.
2. Click **Next**, or click **Finish** to close the wizard and create the host set with the information entered.

#### Summary

Review the summary information, then click **Finish**.

### Adding Hosts to Host Sets

Hosts can be added to existing host sets.

To add a host or multiple hosts to an existing host set, access the **Add to Host Set** dialog box:

1. Click **Hosts** in the Manager Pane.
2. In the Management Tree, click **Hosts** under the system where the host(s) resides.

3. Click the **Hosts** tab in the Hosts screen.
4. Select the host(s) you wish to add.
5. Right-click and then click **Add to Host Set** in the menu that appears.  
The **Add to Host Set** dialog box appears.
6. Select a host set from the host set list.
7. Click **OK**.

## Editing Host Sets

To edit a host set, access the **Edit Host Set** wizard:

1. Click **Hosts** in the Manager Pane.
2. In the Management Tree, click **Host Sets** under the system where the host set you wish to edit resides.
3. In the Host Sets screen, right-click the host set you wish to edit and then click **Edit** in the menu that appears.  
The **Edit Host Set** wizard appears.

## General

1. In the **General** group box:
  - a. **Name** - Enter a new host set name.
  - b. **Comments** - Enter any notes.
2. Click **Next**, or click **Finish** to close the wizard and edit the host set with the information entered.

## Hosts

1. To assign available hosts:
  - a. Select one or more WWNs from the **Available hosts** list.
  - b. Click the down arrow to add the selected WWN(s) to the **Assigned hosts** list.
  - c. To remove hosts from the **Assigned hosts** list, select one or more hosts from the **Assigned host** list and click the up arrow.
2. Click **Next**, or click **Finish** to close the wizard and edit the host set with the information entered.

## Summary

Review the summary information, then click **Finish**.

## Removing Host Sets

To remove a host set or multiple host sets:

1. Click **Hosts** in the Manager Pane.
2. In the Management Tree, click **Host Sets** under the system where the host set(s) you wish to remove resides.
3. In the Host Sets screen, select the host set(s) you wish to remove.
4. Right-click and then click **Remove** in the menu that appears.  
The **Remove Host Set** dialog box appears.
5. Click **OK**.

## Viewing Host Sets

To view a summary of host sets:

1. In the Manager pane, click **Hosts**.

2. In the Management tree, click **Host Sets** under the **Hosts** node for system that contains the host sets you wish to view.

Name	Domain	Hosts	Total Reserved Size (GiB)	Total Exported Size (GiB)	Comments
Set030CM	cm_D1	2	0.001	10.000	--
Set030...	--	1	0.000	0.000	--

The following information is provided:

Column	Description
<b>Name</b>	The name of the host set. Each name listed is a link to that <b>Host Set</b> details screen.
<b>Domain</b>	The domain in which the host set resides.
<b>Hosts</b>	The number of hosts belonging to the host set.
<b>Total Exported Size</b>	The total exported size of the host set, in GiB.
<b>Comments</b>	Any notes about the host set.

## Viewing Host Set Details

To view host set details:

1. In the Manager pane, click **Hosts**.
2. In the Management tree, click **<host set name>** under the **Host Sets** node for system that contains the host set you wish to view.

or

From the **Host Set** summary screen, click the name of the host set to view that host set's details.

The **Host Set Details** screen contains the **Summary**, **Hosts**, **Paths**, **Host Explorer**, and **Virtual Volumes** tabs.

["The Host Set Details Summary Tab" \(page 104\)](#)

["The Host Set Details Hosts Tab" \(page 105\)](#)

["The Host Set Details Paths Tab" \(page 106\)](#)

["The Host Set Details Virtual Volumes Tab" \(page 106\)](#)

## The Host Set Details Summary Tab

Host Set Details: Set030CM

Summary | Hosts | Paths | Host Explorer | Virtual Volumes

General		Active VLUNs				Capacity Exported																				
Name	Set030CM	Average per Host		1		Total Exported Size		10.000 GiB																		
Domain	cm_D1					Average Virtual Size		5.000 GiB																		
Hosts	2																									
Operating Systems																										
Unknown	2																									
Comments	--																									
		<table><tr><th>Host</th><th>Domain</th><th>Active VLUNs</th></tr><tr><td>Host0301</td><td>cm_D1</td><td>1</td></tr><tr><td>Host0302</td><td>cm_D1</td><td>0</td></tr></table>				Host	Domain	Active VLUNs	Host0301	cm_D1	1	Host0302	cm_D1	0	<table><tr><th>Host</th><th>Domain</th><th>Total Exported Size (GiB)</th></tr><tr><td>Host0301</td><td>cm_D1</td><td>10.000</td></tr><tr><td>Host0302</td><td>cm_D1</td><td>0.000</td></tr></table>			Host	Domain	Total Exported Size (GiB)	Host0301	cm_D1	10.000	Host0302	cm_D1	0.000
Host	Domain	Active VLUNs																								
Host0301	cm_D1	1																								
Host0302	cm_D1	0																								
Host	Domain	Total Exported Size (GiB)																								
Host0301	cm_D1	10.000																								
Host0302	cm_D1	0.000																								

The following information is provided:

Group	Field	Description
General	Name	The host set name.
	Domain	The domain in which the host set resides.
	Hosts	The number of hosts in the host set.
	Operating Systems	Provides a breakdown of operating systems. If Host Explorer is not running, this field displays Unknown.
	Comments	Any user-created notes.
Active VLUNs	Average per Host	The average number of active VLUNs.
	Host	The host name. Each name listed is a link to the Host screen.
	Domain	The domain name.
	Active VLUNs	The number of active VLUNs per host.
Capacity Exported	Total Exported Size	The exported size per host in GiB.
	Average Virtual Size	The average virtual size of exported capacity in GiB.
	Host	The host name. Each name listed is a link to the Host screen.
	Domain	The domain name.
	System	The system name.

## The Host Set Details Hosts Tab

The **Host Set Details** tab can be filtered by summary and descriptor information. The **Summary** screen provides basic information about each host within the selected host set. The **Descriptors** screen displays information from the descriptors group box at the time the host set was created or edited.

[“The Summary Filter” \(page 105\)](#)

[“The Descriptors Filter” \(page 106\)](#)

### The Summary Filter

The following information is provided:

Column	Description
Name	The name of the host.
Domain	The domain of which the host is a member.
Host Ports	The number of host ports.
Storage System Ports	The number of storage system ports associated with the host.
Node ID(s)	The number of Node ID(s) associated with the host.
Persona	The persona associated with the host.
Volumes Exported	The number of exported volumes.
Total Exported Size	The total size (in GiB) of exported volumes.

## The Descriptors Filter

For each host listed, the **Descriptors** screen displays the information entered in the **Location**, **IP Address**, **Operating System**, **Model**, **Contact**, and **Comments** fields in the Descriptors group box at the time the host was created or edited.

## The Host Set Details Paths Tab

This screen provides the following information:

Column	Description
<b>WWN/iSCSI Name</b>	The host's World-Wide Name (WWN) or iSCSI name.
<b>Host Name</b>	The name of the host.
<b>Domain</b>	The domain of which the host is a member.
<b>Type</b>	The type of host path (e.g. FC, iSCSI).
<b>Port</b>	The host port location in Node:Slot:Port format.
<b>iSCSI IP Address</b>	The iSCSI IP address, if applicable.

## The Host Set Details Host Explorer Tab

The information displayed on this screen is the same as that in ["Host Explorer Tab"](#) (page 91), minus a Space History filter.

## The Host Set Details Virtual Volumes Tab

The information displayed on this screen is the same as that in the list pane of ["Viewing the Virtual Volumes Tab"](#) (page 153).

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## 9 Managing Common Provisioning Groups

The Provisioning Manager allows you to perform all tasks associated with system Common Provisioning Groups (CPGs), from creation and maintenance to removal. The following sections are provided:

- [“Creating Common Provisioning Groups” \(page 107\)](#)
- [“Editing a Common Provisioning Group” \(page 108\)](#)
- [“Saving a Common Provisioning Group as a Template” \(page 109\)](#)
- [“Creating Similar Common Provisioning Groups” \(page 111\)](#)
- [“Compacting a Common Provisioning Group” \(page 112\)](#)
- [“Removing a Common Provisioning Group” \(page 112\)](#)
- [“Creating Common Provisioning Group Templates” \(page 113\)](#)
- [“Editing a Common Provisioning Group Template” \(page 115\)](#)
- [“Viewing Common Provisioning Groups” \(page 117\)](#)

### Creating Common Provisioning Groups

To create a Common Provisioning Group (CPG) access the **Create CPG** wizard:

1. In the Manager Pane, click **Provisioning**.
2. In the Common Actions panel, click **Create CPG**.

The **Create CPG** wizard appears.

#### General

1. **System** - Select the system where the CPG will be created.
2. **Domain** - Select the domain in which the CPG will reside. Select **<none>** if not applicable.
3. **Name** - Enter a name for the new CPG.
4. **Use Template** - Select the CPG template to apply to the new CPG. If not required, select **<none>**.
5. **Device Type** - Select **FC** for Fast Class drives, **NL** for Nearline drives, or **SSD** for Solid State drives.
6. **Device RPM** - Select the appropriate speed or **<default>**.

---

**NOTE:** The **Device RPM** number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account (in I/O per second), bandwidth, and the access time.

---

7. From the **Availability\*** list, select **Cage** (default), **Port**, or **Magazine**.
8. From the **Preferred Chunklets\*** list, select Fast (default) or Slow.
9. **RAID Type** - Select the RAID type for the volume.

---

**NOTE:** HP strongly recommends RAID 6 for high capacity Nearline drives.

---

10. **Set Size** - Select the set size.
11. From the **Step Size\*** list, select default, 32, 64, 128, 256, or 512 KiB. The default and available values depend on raid type and device type used. If FC or NL drives are used, the step size defaults to 256 KiB for RAID 0 and RAID 1, and 128 KiB for RAID 5. If SSD drives are used, the step size defaults to 32 KiB for RAID 0 and RAID 1, and 64 KiB for RAID 5. For RAID 6, the default is a function of the set size.

12. **Growth Increment\*** - Click the **Enabled** checkbox, enter the appropriate value, and click the unit list (MiB, GiB, TiB)
13. **Growth Limit\*** - Click the **Enabled** checkbox, enter the appropriate value, and click the unit list (MiB, GiB, TiB).
14. **Growth Warning\*** - Click the **Enabled** checkbox, enter the appropriate value, and click the unit list (MiB, GiB, TiB).
15. Click **Next** to use the **Disk Filter** (if **Show advanced options** is enabled), or click **Finish**.

\*Appears only if **Show advanced options** is selected.

## Disk Filter

The **Disk Filter** displays the physical disks used. Pattern displays the parameters of the disks used.

To modify the list of disks used:

1. Click the **Filter** icon.
2. See “[Filtering](#)” (page 410) for details.
3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Editing a Common Provisioning Group

To edit a Common Provisioning Group (CPG):

1. Access the **CPGs** tab.
2. Right-click the CPG you wish to edit.
3. In the menu that appears, click **Edit**.

The **Edit CPG** wizard appears.

## General

1. **Name** - Enter a new name for the CPG (31 character maximum).
2. **Device Type** - Select **FC** for Fast Class drives, **NL** for Nearline drives, or **SSD** for Solid State drives.
3. **Device RPM** - Select the appropriate speed or **<default>**.

---

**NOTE:** The **Device RPM** number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.

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4. From the **Availability\*** list, select **Cage** (default), **Port**, or **Magazine**.
5. From the **Preferred Chunklets\*** list, select Fast (default) or Slow.
6. **RAID Type** - Select the RAID type for the volume.

---

**NOTE:** HP strongly recommends RAID 6 for high capacity Nearline drives.

---

7. **Set Size** - Select the set size.
8. From the **Step Size\*** list, select default, 32, 64, 128, 256, or 512 KiB. The default and available values depend on raid type and device type used. If FC or NL drives are used, the step size defaults to 256 KiB for RAID 0 and RAID 1, and 128 KiB for RAID 5. If SSD drives are used,



the step size defaults to 32 KiB for RAID 0 and RAID 1, and 64 KiB for RAID 5. For RAID 6, the default is a function of the set size.

9. **Growth Increment\*** - Click the **Enabled** checkbox, enter the appropriate value, and click the unit list (MiB, GiB, TiB)
10. **Growth Limit\*** - Click the **Enabled** checkbox, enter the appropriate value, and click the unit list (MiB, GiB, TiB).
11. **Growth Warning\*** - Click the **Enabled** checkbox, enter the appropriate value, and click the unit list (MiB, GiB, TiB).
12. Click **Next** to use the **Disk Filter** (if **Show advanced options** is enabled), or click **Finish**.

\*Appears only if **Show advanced options** is selected.

## Disk Filter

The **Disk Filter** displays the physical disks used. **Pattern** displays the parameters of the disks used.

To modify the list of disks used:

1. Click the **Filter** icon.
2. See [“Filtering” \(page 410\)](#) for details.
3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Saving a Common Provisioning Group as a Template

You can save a Common Provisioning Groups (CPGs) as a template. To do this:

1. Access the **CPGs** tab.
2. Right-click the CPG you wish to save as a template.
3. In the menu that appears, click **Save as Template**.

The **Create CPG Template** wizard appears.

## General

1. In the **Template** group box:
  - a. From the **System** list, select the system you want to create the volume on.
  - b. In the **Name** text box, enter the name of the new volume (31 character maximum).
  - c. (Optional) In the **Description** text box, enter a description of the template (255 character maximum).
  - d. (Optional) Click the **Override Unincluded Properties** checkbox to allow users to set non-default values for unincluded properties when applying the template.

2. In the **General** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include:

Property	Include in the template in order to...		
Allocation Warning	Specify the percentage of used copy administration or copy space which results in an alert.		
Growth Increment	Set the growth increment, different than the default. The minimum growth increment and default varies according to the number of controller nodes in the system (see table):		
	# of Nodes	Default	Minimum
	1-2	32GB	8GB
	3-4	64GB	16GB
	5-6	96GB	24GB
	7-8	128GB	32GB
Growth Warning	Set the threshold when the LD space exceeds this amount.		
Growth Limit	Set the threshold at which the system stops creating additional LDs to support volumes that draw space from a CPG.		
Device Type	Set the disk type to Fast Class (FC), Nearline (NL), or Solid State (SSD).		
Device RPM	Set the disk speed.		
<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.			
RAID Type	Set the VV's RAID type.		
Set Size	Specify the VV's set size.		

3. Click **Next** to enter allocation settings information, or click **Finish**.

## Allocation Settings

1. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template (for example, a step size of 128 KB). Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.

2. Use the following table as a guide when choosing which properties to include in a **CPG template, Allocation Settings** screen:

Property	Include in the template in order to...
<b>Availability</b>	set the level of failure tolerance for a volume created with this template. Choices are <b>Cage - default</b> , <b>Port</b> , <b>Magazine</b> .
<b>Step Size</b>	determine the number of contiguous bytes that the system accesses before moving to the next chunklet within logical disks supporting volumes created with this template. From the <b>Step Size</b> list, select 32, 64, 128, 256, or 512 KiB. For RAID 6 you can select 32, 64, or 128.
<b>Preferred Chunklets</b>	indicate whether the logical disks supporting volumes created with this template should tend to use chunklets near the beginning of the physical disks or the end of the physical disks. Choices are <b>Fast- default</b> , <b>Slow</b> .

3. Click **Next** to enter disk filter information, or click **Finish**.

## Disk Filter

The **Disk Filter** displays the physical disks used. **Pattern** displays the parameters of the disks used. To modify the list of disks used:

1. Click the **Filter** icon.
2. See ["Filtering" \(page 410\)](#) for details.
3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Creating Similar Common Provisioning Groups

You can create new Common Provisioning Groups (CPGs) based on existing CPGs. To do this:

1. Access the **CPGs** tab.
2. Right-click the CPG you wish to use as the basis for your new CPG.
3. In the menu that appears, click **Create Similar**.

The **Create CPG** wizard appears.

## General

1. **System** - Select the system where the CPG will be created.
2. **Domain** - Select the domain in which the CPG will reside. Select **<none>** if not applicable.
3. **Name** - Enter a name for the new CPG.
4. **Use Template** - Select the CPG template to apply to the new CPG. If not required, select **<none>**.
5. **Device Type** - Select **FC** for Fast Class drives, **NL** for Nearline drives, or **SSD** for Solid State drives.
6. **Device RPM** - Select the appropriate speed or **<default>**.

**NOTE:** The **Device RPM** number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.

7. From the **Availability\*** list, select **Cage** (default), **Port**, or **Magazine**.

8. From the **Preferred Chunklets\*** list, select Fast (default) or Slow.
9. **RAID Type** - Select the RAID type for the volume.
10. **Set Size** - Select the set size.

---

**NOTE:** HP strongly recommends RAID 6 for high capacity Nearline drives.

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11. From the **Step Size\*** list, select default, 32, 64, 128, 256, or 512 KiB. The default and available values depend on raid type and device type used. If FC or NL drives are used, the step size defaults to 256 KiB for RAID 0 and RAID 1, and 128 KiB for RAID 5. If SSD drives are used, the step size defaults to 32 KiB for RAID 0 and RAID 1, and 64 KiB for RAID 5. For RAID 6, the default is a function of the set size.
12. **Growth Increment\*** - Click the **Enabled** checkbox, enter the appropriate value, and click the unit list (MiB, GiB, TiB)
13. **Growth Limit\*** - Click the **Enabled** checkbox, enter the appropriate value, and click the unit list (MiB, GiB, TiB).
14. **Growth Warning\*** - Click the **Enabled** checkbox, enter the appropriate value, and click the unit list (MiB, GiB, TiB).
15. Click **Next** to use the **Disk Filter** (if **Show advanced options** is enabled), or click **Finish**.

\*Appears only if **Show advanced options** is selected.

## Disk Filter

The **Disk Filter** displays the physical disks used. Pattern displays the parameters of the disks used.

To modify the list of disks used:

1. Click the **Filter** icon.
2. See [“Filtering” \(page 410\)](#) for details.
3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Compacting a Common Provisioning Group

To compact a Common Provisioning Group (CPG):

1. Access the **CPGs** tab.
2. Right-click the CPG you wish to compact.
3. In the menu that appears, click **Compact CPG**.

The **Compact CPG** dialog box appears.

4. Select either **Start now** or **Create Schedule**.  
(For information on scheduling this task, see [“Schedule Compact CPG” \(page 354\)](#)).
5. **System** - Select the system on which the CPG resides.
6. **Domain** - Select the domain in which the CPG resides. Select <none> if not applicable.
7. **CPG** - Select one or multiple CPGs to compact.
8. (Optional) Enable the **Trim only** option, which removes unused logical disk space without performing any region moves.
9. Click **OK**.

## Removing a Common Provisioning Group

To remove a Common Provisioning Group (CPG):

1. Access the **CPGs** tab.

2. Right-click the CPG you wish to remove.
3. In the menu that appears, click **Remove**.  
The **Remove CPG** dialog box appears.
4. Click **OK**.

## Creating Common Provisioning Group Templates

To create a Common Provisioning Group (CPG) template:

1. Access the **CPGs** tab.
2. Right-click the CPG from which you wish to create a template.
3. In the menu that appears, click **Save As Template**.  
or
4. After accessing the **CPGs** tab, in the Main Menu Bar, click **Actions > Provisioning > Template > Create CPG Template**.  
The **Create CPG Template** wizard appears.

### General

1. In the **Template** group box:
  - a. From the **System** list, select the system you want to create the volume on.
  - b. In the **Name** text box, enter the name of the new volume (31 character maximum).
  - c. (Optional) In the **Description** text box, enter a description of the template (255 character maximum).
  - d. (Optional) Click the **Override Unincluded Properties** checkbox to allow users to set non-default values for unincluded properties when applying the template.

2. In the **General** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include:

Property	Include in the template in order to...		
Allocation Warning	Specify the percentage of used copy administration or copy space which results in an alert.		
Growth Increment	Set the growth increment, different than the default. The minimum growth increment and default varies according to the number of controller nodes in the system (see table):		
	# of Nodes	Default	Minimum
	1-2	32GB	8GB
	3-4	64GB	16GB
	5-6	96GB	24GB
	7-8	128GB	32GB
Growth Warning	Set the threshold when the LD space exceeds this amount.		
Growth Limit	Set the threshold at which the system stops creating additional LDs to support volumes that draw space from a CPG.		
Device Type	Set the disk type to Fast Class (FC), Nearline (NL), or Solid State (SSD).		
Device RPM	Set the disk speed.		
<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.			
RAID Type	Set the VV's RAID type.		
Set Size	Specify the VV's set size.		

3. Click **Next** to enter allocation settings information, or click **Finish**.

## Allocation Settings

1. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template (for example, a step size of 128 KB). Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.

2. Use the following table as a guide when choosing which properties to include in a **CPG template, Allocation Settings** screen:

Property	Include in the template in order to...
<b>Availability</b>	set the level of failure tolerance for a volume created with this template. Choices are <b>Cage - default</b> , <b>Port</b> , <b>Magazine</b> .
<b>Step Size</b>	determine the number of contiguous bytes that the system accesses before moving to the next chunklet within logical disks supporting volumes created with this template. From the <b>Step Size</b> list, select 32, 64, 128, 256, or 512 KiB. For RAID 6 you can select 32, 64, or 128.
<b>Preferred Chunklets</b>	indicate whether the logical disks supporting volumes created with this template should tend to use chunklets near the beginning of the physical disks or the end of the physical disks. Choices are <b>Fast- default</b> , <b>Slow</b> .

3. Click **Next** to enter disk filter information, or click **Finish**.

## Disk Filter

The **Disk Filter** displays the physical disks used. **Pattern** displays the parameters of the disks used. To modify the list of disks used:

1. Click the **Filter** icon.
2. See [“Filtering” \(page 410\)](#) for details.
3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Editing a Common Provisioning Group Template

To edit a Common Provisioning Group (CPG) template:

1. Access the **Templates** screen.
2. Right-click the CPG template you wish to edit.
3. In the menu that appears, click **Edit**.

The **Edit CPG Template** wizard appears.

## General

1. In the **Template** group box:
  - a. (Optional) In the **Description** text box, enter a description of the template (255 character maximum).
  - b. (Optional) Click the **Override Unincluded Properties** checkbox to allow users to set non-default values for unincluded properties when applying the template.

2. In the **General** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include:

Property	Include in the template in order to...		
Allocation Warning	Specify the percentage of used copy administration or copy space which results in an alert.		
Growth Increment	Set the growth increment, different than the default. The minimum growth increment and default varies according to the number of controller nodes in the system (see table):		
	# of Nodes	Default	Minimum
	1-2	32GB	8GB
	3-4	64GB	16GB
	5-6	96GB	24GB
	7-8	128GB	32GB
Growth Warning	Set the threshold when the LD space exceeds this amount.		
Growth Limit	Set the threshold at which the system stops creating additional LDs to support volumes that draw space from a CPG.		
Device Type	Set the disk type to Fast Class (FC), Nearline (NL), or Solid State (SSD).		
Device RPM	Set the disk speed.		
<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.			
RAID Type	Set the VV's RAID type.		
Set Size	Specify the VV's set size.		

3. Click **Next** to enter allocation settings information, or click **Finish**.

## Allocation Settings

1. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template (for example, a step size of 128 KB). Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.



2. Use the following table as a guide when choosing which properties to include in a **CPG template, Allocation Settings** screen:

Property	Include in the template in order to...
<b>Availability</b>	set the level of failure tolerance for a volume created with this template. Choices are <b>Cage - default</b> , <b>Port</b> , <b>Magazine</b> .
<b>Step Size</b>	determine the number of contiguous bytes that the system accesses before moving to the next chunklet within logical disks supporting volumes created with this template. From the <b>Step Size</b> list, select 32, 64, 128, 256, or 512 KiB. For RAID 6 you can select 32, 64, or 128.
<b>Preferred Chunklets</b>	indicate whether the logical disks supporting volumes created with this template should tend to use chunklets near the beginning of the physical disks or the end of the physical disks. Choices are <b>Fast- default</b> , <b>Slow</b> .

3. Click **Next** to enter disk filter information, or click **Finish**.

## Disk Filter

The **Disk Filter** displays the physical disks used. **Pattern** displays the parameters of the disks used. To modify the list of disks used:

1. Click the **Filter** icon.
2. See [“Filtering” \(page 410\)](#) for details.
3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Viewing Common Provisioning Groups

To view a system's Common Provisioning Groups (CPGs):

1. In the Manager Pane, click **Provisioning**.
2. In the Management Tree, click **CPGs** under the system node you wish to view.

The **Provisioning-CPGs** screen appears in the Management Window. It provides information about system CPGs on three tabs: **Summary**, **CPGs**, and **Alerts**, which are explained in the following sections:

[“Viewing the Common Provisioning Group Summary Tab” \(page 117\)](#)

[“Viewing the CPGs Tab” \(page 118\)](#)

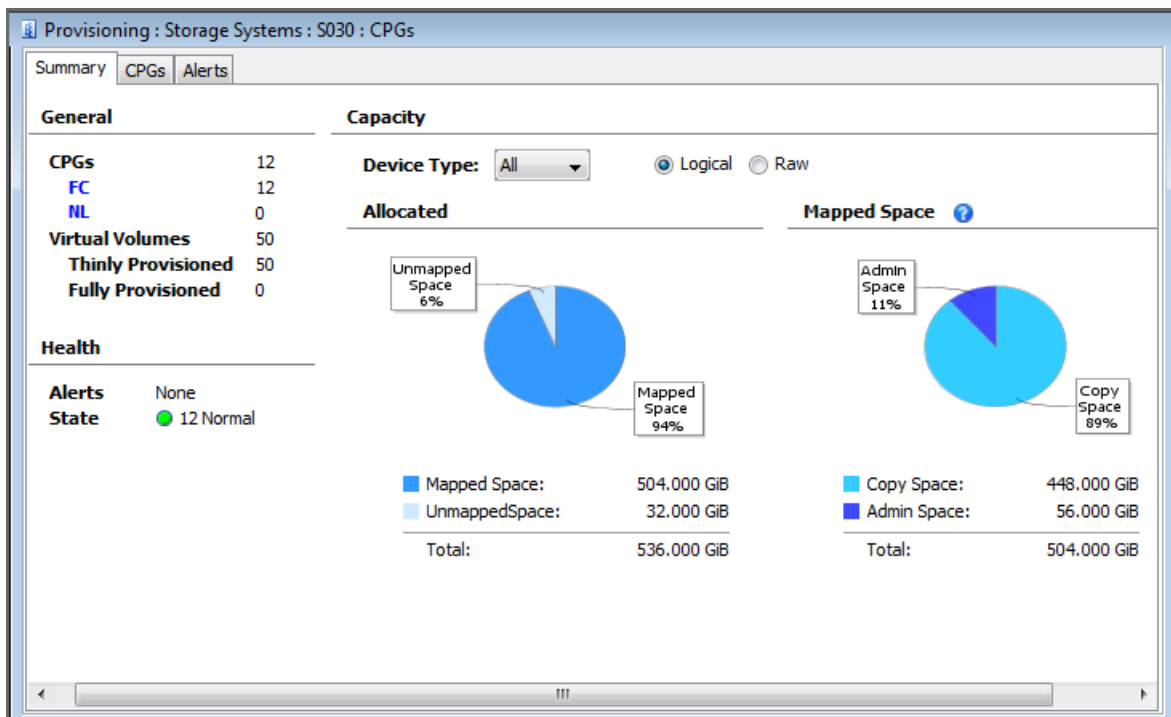
[“Viewing the Common Provisioning Group Alerts Tab” \(page 128\)](#)

## Viewing the Common Provisioning Group Summary Tab

To view the **Common Provisioning Group (CPG) Summary** tab:

1. Access the CPGs screen.
2. In the Management Window, click the **Summary** tab.

The **Summary** tab provides information about CPGs in the system.



The following information is displayed:

Group	Field	Description
General	CPGs	The total number of CPGs.
	FC	The total number of Fast Class (FC) drives.
	NL	The total number of Near Line (NL) drives.
	SSD	The total number of Solid State Devices (SSD).
	Virtual Volumes	The total number of virtual volumes.
	Thinly Provisioned	The total number of thinly provisioned virtual volumes.
	Fully Provisioned	The total number of fully provisioned virtual volumes.
Health	Alerts	The total number of alerts.
	State	The current state. See <a href="#">"System and Component Status Icons"</a> (page 407).
Capacity	Device Type	Select the device type, Fast Class (FC), Near Line (NL), or Solid State Device (SSD). The capacity and capacity usage of the selected device type is displayed in graphical form. You can also select All to display capacity and capacity usage for all device types.
	Logical	Select to display logical capacity.
	Raw	Select to display raw capacity.
	Allocated	Displays mapped and unmapped allocated space.
	Mapped Space	Displays the distribution of mapped space.

## Viewing the CPGs Tab

To view the CPGs tab:

1. Access the CPGs screen through the Provisioning Manager, by clicking the system in the Management Tree containing the CPGs you wish to view.

2. In the Management Window, click the **CPGs** tab.

The **CPGs** tab presents information in a list pane and a detail pane.

[“List Pane” \(page 119\)](#)

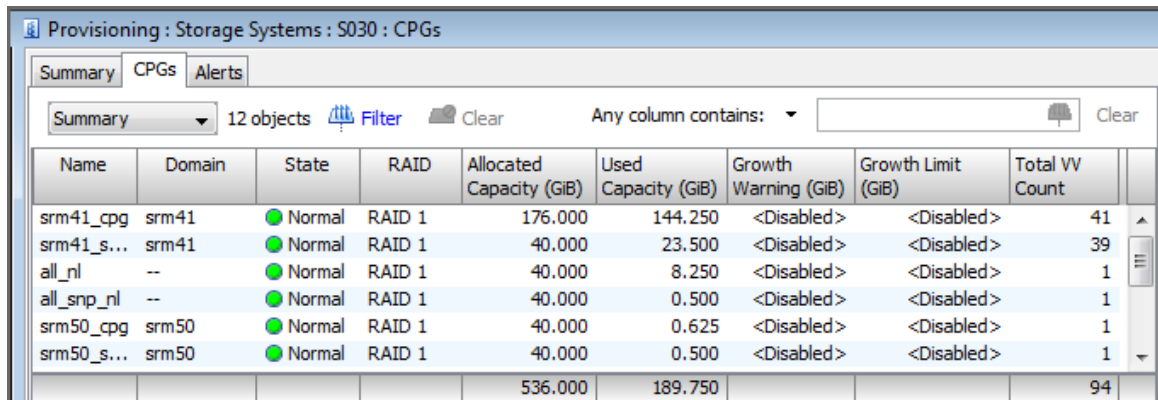
[“Detail Pane” \(page 123\)](#)

## List Pane

The table displayed in the list pane can be filtered for [“Displaying Summary Information” \(page 153\)](#), [“Displaying Allocation Information” \(page 154\)](#), [“Displaying Usage Information” \(page 120\)](#), [“Displaying Capacity Information” \(page 155\)](#), [“Displaying Raw Capacity Information” \(page 122\)](#), and [“Displaying Alert Information” \(page 122\)](#) information.

### Displaying Summary Information

To view summary information, select **Summary** from the filtering list.



Summary CPGs Alerts								
Summary 12 objects Filter Clear Any column contains: Clear								
Name	Domain	State	RAID	Allocated Capacity (GiB)	Used Capacity (GiB)	Growth Warning (GiB)	Growth Limit (GiB)	Total VV Count
srm41_cpg	srm41	Normal	RAID 1	176.000	144.250	<Disabled>	<Disabled>	41
srm41_s...	srm41	Normal	RAID 1	40.000	23.500	<Disabled>	<Disabled>	39
all_nl	--	Normal	RAID 1	40.000	8.250	<Disabled>	<Disabled>	1
all_snp_nl	--	Normal	RAID 1	40.000	0.500	<Disabled>	<Disabled>	1
srm50_cpg	srm50	Normal	RAID 1	40.000	0.625	<Disabled>	<Disabled>	1
srm50_s...	srm50	Normal	RAID 1	40.000	0.500	<Disabled>	<Disabled>	1
				536.000	189.750			94

The following information is displayed:

Column	Description
Name	The CPG name.
Domain	The domain to which the CPG belongs.
State	The state of the CPG.
RAID	The RAID type used.
Allocated Capacity	The CPG's total capacity (in GiB).
Used Capacity	The used amount of the CPG's capacity (in GiB).
Free Capacity	The amount of CPG space available in GiB.
Growth Warning	The CPG's growth size (in GiB) at which a warning alert is generated.
Growth Limit	The size limit (in GiB) after which the CPG will not grow.
Total VV Count	The total number of VVs using the CPG.

### Displaying Allocation Information

To view allocation information, select **Allocation** from the filtering list.

Provisioning : Storage Systems : S030 : CPGs										
Summary		CPGs	Alerts							
Allocation		12 objects		Filter	Clear		Any column contains:			
Name	Domain	State	RAID	Growth Warning (GiB)	Growth Limit (GiB)	Device Type	Device RPM (K)	Growth Increment (GiB)	Allocation Warning	Availability
srn41_cpg	srn41	Normal	RAID 1	<Disabled>	<Disabled>	FC	15	32.000	<Disabled>	cage
srn41_snp_cpg	srn41	Normal	RAID 1	<Disabled>	<Disabled>	FC	15	32.000	<Disabled>	cage
all_nl	--	Normal	RAID 1	<Disabled>	<Disabled>	FC	15	32.000	<Disabled>	cage
all_snp_nl	--	Normal	RAID 1	<Disabled>	<Disabled>	FC	15	32.000	<Disabled>	cage
srn50_cpg	srn50	Normal	RAID 1	<Disabled>	<Disabled>	FC	15	32.000	<Disabled>	cage
srn50_snp_cpg	srn50	Normal	RAID 1	<Disabled>	<Disabled>	FC	15	32.000	<Disabled>	cage

The following information is displayed:

Column	Description
<b>Name</b>	The CPG name.
<b>Domain</b>	The domain to which the CPG belongs.
<b>State</b>	The state of the CPG.
<b>RAID</b>	The RAID type used.
<b>Growth Warning</b>	The CPG's growth size (in GiB) at which a warning alert is generated.
<b>Growth Limit</b>	The size limit (in GiB) after which the CPG will not grow.
<b>Device Type</b>	The type of physical disk, either Fast Class (FC), Near Line (NL), or Solid State (SSD).
<b>Device RPM (K)</b>	Speed of the specified disk.
<p><b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.</p>	
<b>Growth Increment</b>	The CPG growth increment size in GB.
<b>Allocation Warning</b>	If enabled, the allocation warning percentage.
<b>Availability</b>	The level of failure tolerance for a volume created from this CPG: <b>&lt;System Default&gt;</b> , <b>Cage</b> , <b>Port</b> , or <b>Magazine</b> .

## Displaying Usage Information

To view usage information, select **Usage** from the filtering list.

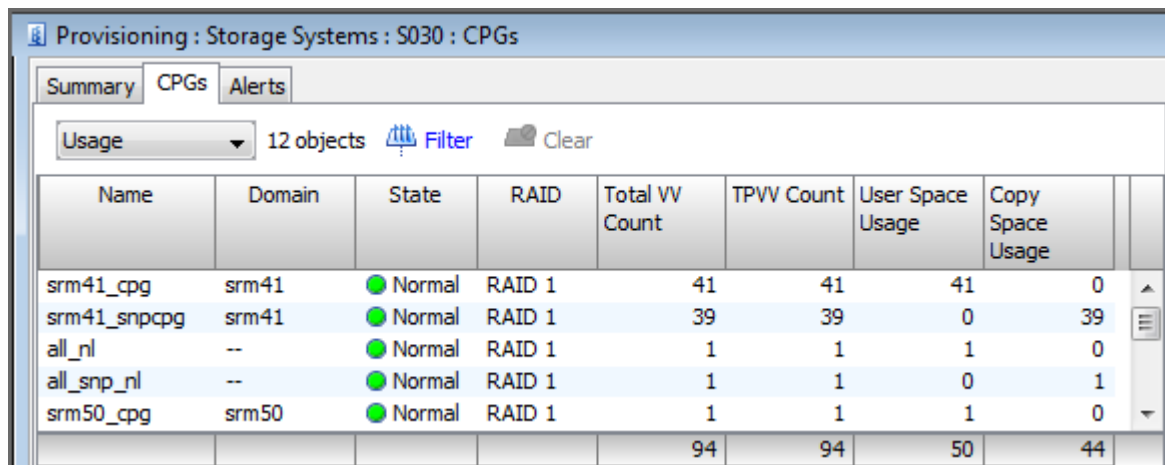
Provisioning : Storage Systems : S030 : CPGs							
Summary		CPGs	Alerts				
Usage		12 objects		Filter	Clear		
Name	Domain	State	RAID	Total VV Count	TPVV Count	User Space Usage	Copy Space Usage
srn41_cpg	srn41	Normal	RAID 1	41	41	41	0
srn41_snp_cpg	srn41	Normal	RAID 1	39	39	0	39
all_nl	--	Normal	RAID 1	1	1	1	0
all_snp_nl	--	Normal	RAID 1	1	1	0	1
srn50_cpg	srn50	Normal	RAID 1	1	1	1	0
				94	94	50	44

The following information is displayed:

Column	Descriptions
<b>Name</b>	The CPG name.
<b>Domain</b>	The domain to which the CPG belongs.
<b>State</b>	The state of the CPG.
<b>RAID</b>	The RAID type used.
<b>Total VV Count</b>	The total number of virtual volumes using the CPG.
<b>TPVV Count</b>	The total number of thinly provisioned virtual volumes.
<b>User Space Usage</b>	The total amount of user space used.
<b>Copy Space Usage</b>	The total amount of copy space used.

### Displaying Capacity Information

To view capacity information, select **Capacity** from the filtering list.



The screenshot shows a window titled "Provisioning : Storage Systems : S030 : CPGs". It has tabs for "Summary", "CPGs", and "Alerts". The "CPGs" tab is active. Below the tabs, there is a "Usage" dropdown menu, a "12 objects" label, a "Filter" button with a funnel icon, and a "Clear" button with an eraser icon. Below this is a table with the following columns: Name, Domain, State, RAID, Total VV Count, TPVV Count, User Space Usage, and Copy Space Usage. The table contains five rows of data, with a total row at the bottom.

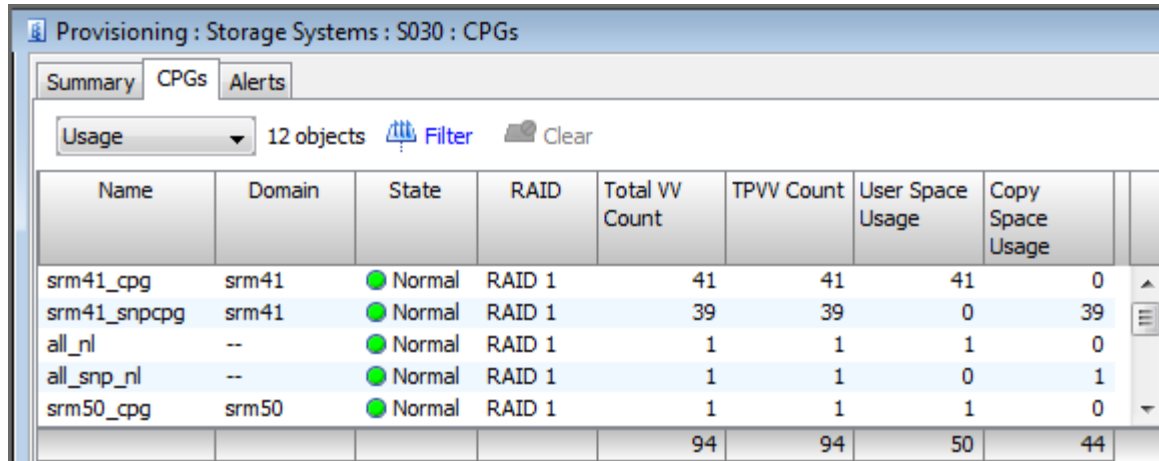
Name	Domain	State	RAID	Total VV Count	TPVV Count	User Space Usage	Copy Space Usage
srm41_cpg	srm41	● Normal	RAID 1	41	41	41	0
srm41_snpcpg	srm41	● Normal	RAID 1	39	39	0	39
all_nl	--	● Normal	RAID 1	1	1	1	0
all_snp_nl	--	● Normal	RAID 1	1	1	0	1
srm50_cpg	srm50	● Normal	RAID 1	1	1	1	0
				94	94	50	44

The following information is displayed:

Column	Description
<b>Name</b>	The CPG name.
<b>Domain</b>	The domain to which the CPG belongs.
<b>State</b>	The state of the CPG.
<b>Allocated Capacity</b>	The CPG's allocated capacity in GiB.
<b>Free Capacity</b>	The amount of CPG space available in GiB.
<b>Used Capacity</b>	The amount of CPG space used in GiB.
<b>User Size</b>	The user space size in GiB.
<b>Used User Size</b>	The amount of used user space in GiB.
<b>Copy Size</b>	The copy space size in GiB.
<b>Used Copy Size</b>	The amount of used copy space in GiB.
<b>Admin Size</b>	The total amount of admin space in GiB.
<b>Used Admin Size</b>	The total amount of used admin space in GiB.

## Displaying Raw Capacity Information

To view raw capacity information, select **Raw Capacity** from the filtering list.



The screenshot shows a web interface titled "Provisioning : Storage Systems : S030 : CPGs". It has tabs for "Summary", "CPGs", and "Alerts". Below the tabs is a filter section with a dropdown menu set to "Usage", showing "12 objects", and buttons for "Filter" and "Clear". The main content is a table with the following columns: Name, Domain, State, RAID, Total VV Count, TPVV Count, User Space Usage, and Copy Space Usage. The table lists five CPGs: srm41\_cpg, srm41\_snpcpg, all\_nl, all\_snp\_nl, and srm50\_cpg. The last row shows totals for each column.

Name	Domain	State	RAID	Total VV Count	TPVV Count	User Space Usage	Copy Space Usage
srm41_cpg	srm41	Normal	RAID 1	41	41	41	0
srm41_snpcpg	srm41	Normal	RAID 1	39	39	0	39
all_nl	--	Normal	RAID 1	1	1	1	0
all_snp_nl	--	Normal	RAID 1	1	1	0	1
srm50_cpg	srm50	Normal	RAID 1	1	1	1	0
				94	94	50	44

The following information is displayed:

Column	Description
Name	The CPG name.
Domain	The domain to which the CPG belongs.
State	The state of the CPG.
Raw Allocated Capacity	The CPG's allocated raw capacity in GiB.
Raw Free Capacity	The free amount of raw capacity in GiB.
Raw Used Capacity	The used amount of raw capacity in GiB.
Raw User Size	The raw user space size in GiB.
Raw Used User Size	The amount of used raw user space in GiB.
Raw Copy Size	The raw copy space size in GiB.
Raw Used Copy Size	The amount of used raw copy space in GiB.
Raw Admin Size	The total amount of raw admin space in GiB.
Raw Used Admin Size	The total amount of used raw admin space in GiB.

## Displaying Alert Information

To view alert information, select **Alerts** from the filtering list.

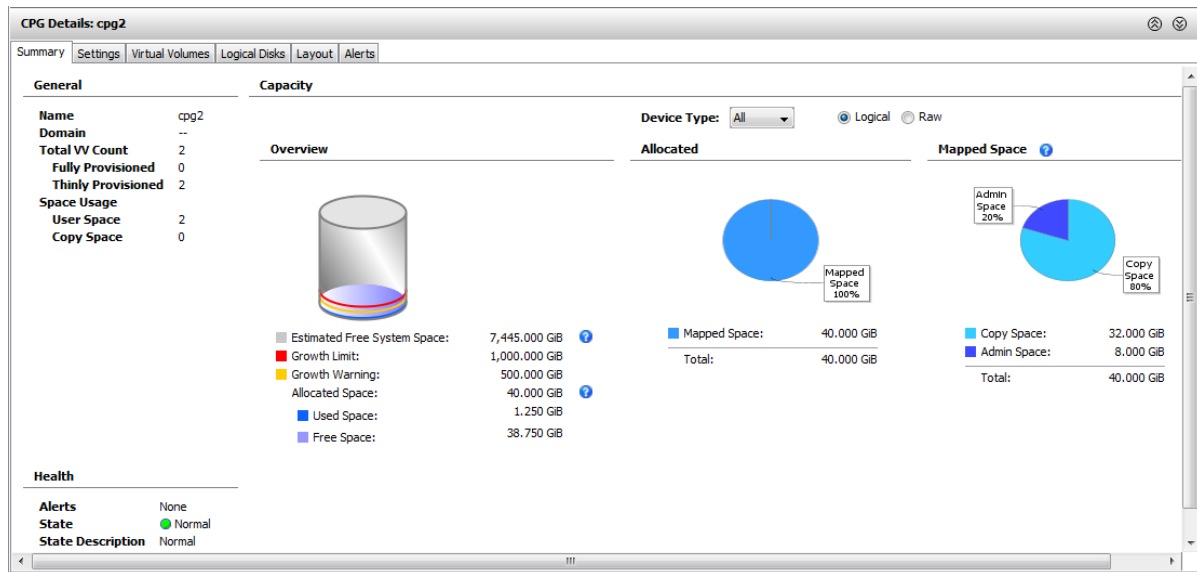
Provisioning : Storage Systems : s324 : CPGs						
Summary CPGs Alerts						
Default 5 objects Filter Clear Any column contains: Clear						
Severity	ID	State	Last Time	Message	Repeat Count	First Time
Degraded	13	New	May 29, 2012 11:44:11 PDT	CPG 0 (cpg1) could not grow wi...	0	May 29, 2012 11:44:11 PDT
Critical	16	New	Jul 17, 2012 10:22:19 PDT	CPG cpg1 SD and/or user spac...	0	Jul 17, 2012 10:22:19 PDT
Critical	17	New	Jul 17, 2012 10:34:35 PDT	CPG cpg1 SD and/or user spac...	0	Jul 17, 2012 10:34:35 PDT
Major	23	New	Sep 26, 2012 07:00:02 PDT	Free space allows CPG jfu to gr...	36	Aug 22, 2012 01:06:03 PDT
Info	24	New	Sep 13, 2012 16:56:46 PDT	CPG cwjcp2 SD and/or user sp...	0	Sep 13, 2012 16:56:46 PDT

Column	Description
<b>Name</b>	The CPG name.
<b>Domain</b>	The domain to which the CPG belongs.
<b>State</b>	The state of the CPG.
<b>Allocation Warning Alert</b>	The percentage of used copy space which results in an alert.
<b>Growth Warning Alert</b>	The volume size (in GiB) at which a warning alert is generated
<b>Growth Limit Alert</b>	The volume size (in GiB) which results in an alert indicating that all logical capacity for the CPG hs been consumed.
<b>Copy Space Failure</b>	The alert generated when a copy failed due to insufficient space.
<b>Admin Allocation Warning Alert</b>	The percentage of used copy administration space which results in an alert.
<b>Admin Growth Warning Alert</b>	The volume size (in GiB) of administration space at which a warning alert is generated
<b>Admin Growth Limit Alert</b>	The volume size (in GiB) of which results in an alert indicating that all logical capacity for administration spaces been consumed.
<b>Admin Space Failure</b>	The alert generated when a copy failed due to insufficient administration space.

## Detail Pane

The detail pane displays detailed information about a single CPG selected from the list pane. This pane displays information on six tabs: “Summary Tab” (page 124), “Settings Tab” (page 125), “Logical Disks Tab” (page 127), “Virtual Volumes Tab” (page 126), “Layout Tab” (page 128), and “Alerts Tab” (page 128).

## Summary Tab



The following information is displayed on the **Summary** tab:

Group	Field	Description
<b>General</b>	<b>Name</b>	The Common Provisioning Group's (CPG's) name.
	<b>Domain</b>	The domain in which the CPG resides.
	<b>Total VV Count</b>	The total number of TPVVs using the CPG.
	<b>Fully Provisioned</b>	The number of fully provisioned volumes.
	<b>Thinly Provisioned</b>	The number of thinly provisioned volumes.
	<b>User Space</b>	The total number of VVs whose user space is using the CPG.
	<b>Copy Space</b>	The total number of VVs whose copy space is using the CPG.
<b>Health</b>	<b>Alerts</b>	The number of new CPG alerts.
	<b>State</b>	The current state of the CPG. See <a href="#">"Alert Severity Indicators"</a> (page 406).
	<b>State Description</b>	Description of the CPG's state.
<b>Capacity</b>	<b>Device Type</b>	Select the device type, Fast Class (FC), Near Line (NL), or Solid State Device (SSD). The capacity and capacity usage of the selected device type is displayed in graphical form.
	<b>Logical</b>	Select to display logical capacity.
	<b>Raw</b>	Select to display raw capacity.
<b>Overview</b>	Displays a general overview of estimated free space, allocated space, used space, free space, growth limit, and growth warning.	



Group	Field	Description
Allocated		Displays mapped and unmapped allocated space.
Mapped Space		Displays the distribution of mapped space.

## Settings Tab

**CPG Details: cpg2**

Summary Settings Virtual Volumes Logical Disks Layout Alerts

Copy Growth		Copy Space Allocation	
Growth Increment	32.000 GiB	Device Type	FC
Growth Warning	500.000 GiB	Device RPM	<System Default>
Growth Limit	1,000.000 GiB	RAID Type	RAID 1
		Availability	
		Requested	cage
		Current	cage
		Set Size	2 data
		Step Size	32 KiB
		Preferred Chunklets	Fast
		Disk Filter	-tr1 -ha cage -ss 32 -ch first -p -devtype FC

Admin Growth		Admin Space Allocation	
Growth Increment	8.000 GiB	Device Type	FC
Growth Warning	<Disabled>	Device RPM	<System Default>
Growth Limit	<Disabled>	RAID Type	RAID 1
		Availability	
		Requested	cage
		Current	cage
		Set Size	2 data
		Step Size	256 KiB
		Preferred Chunklets	Fast
		Disk Filter	-ha cage -p -devtype FC

The following information is displayed on the detail pane's **Settings** tab:

Group	Field	Description
Copy Growth	Growth Increment	The Common Provisioning Group's (CPG's) copy space grow size in GiB.
	Growth Warning	If enabled, the CPG's growth size (in GiB) at which a warning alert is generated.
	Growth Limit	If enabled, the size limit (in GiB) after which the CPG will not grow.
Admin Growth	Growth Increment	The admin space grow size in GiB.
	Growth Warning	If enabled, the admin space's growth size (in GiB) at which a warning alert is generated.
	Growth Limit	If enabled, the size limit (in GiB) after which the admin space will not grow.
Copy Space Allocation and Admin Space Allocation	Device Type	Fast Class (FC), Nearline (NL), or Solid State (SSD) drives.
	Device RPM	Speed of the specified disk.

Group	Field	Description
	<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
	<b>RAID Type</b>	The CPG's RAID type.
	<b>Availability</b>	The requested and current level of failure tolerance for a volume created from this CPG: <b>&lt;System Default&gt;</b> , <b>Cage</b> , <b>Port</b> , or <b>Magazine</b> .
	<b>Set Size</b>	The set size.
	<b>Step Size</b>	The number of contiguous bytes in KB.
	<b>Preferred Chunklets</b>	The location on physical disks where chunklets are used: near the beginning (Fast) or near the end of the disk (Slow).
	<b>Disk Filter</b>	The filtering used for the disks making up the CPG.

## Virtual Volumes Tab

The **Virtual Volumes** tab displays the virtual volumes that make up the selected CPG.

Name	Domain	State	Type	Provisioning	User CPG	Copy CPG	RAID	Device Type	Device RPM (K)
sqavol	--	Normal	Base	Thin	cpg2	--	RAID 1	FC	10
sqavol2	--	Normal	Base	Thin	cpg2	--	RAID 1	FC	10

The following information is displayed:

Column	Description
<b>Name</b>	The name of the virtual volume.
<b>Domain</b>	The domain in which the volume resides.
<b>State</b>	The current state of the volume. See <a href="#">"System and Component Status Icons"</a> (page 407).
<b>Type</b>	The type of virtual volume.
<b>Provisioning</b>	Indicates if the selected volume is fully provisioned or a thinly provisioned virtual volume.
<b>User CPG</b>	The name of the Common Provisioning Group (CPG) from which user space is provisioned.
<b>Copy CPG</b>	The name of the CPG from which copy space is allocated.
<b>RAID</b>	The RAID type of the disk.
<b>Reserved User Size</b>	The size (in GiB) reserved for user space.
<b>Reserved Copy Size</b>	The size (in GiB) reserved for copy space.
<b>Exported To</b>	The host to which the virtual volume has been exported.
<b>Device Type</b>	The disk type, Fibre Channel (FC), Nearline (NL), or Solid State (SSD).

Column	Description
Device RPM	Speed of the specified disk.
	<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.

## Logical Disks Tab

**NOTE:** The Logical Disks tab only appears if you have set your preferences in the HP 3PAR Management

Console to show the logical disks. See [“Setting Global Preferences” \(page 412\)](#).

Name	Domain	State	Device Type	Device RPM (K)	RAID	Total Capacity (GiB)	Used Capacity (GiB)	Raw Capacity (GiB)	Write Through	Mapped to VV	Usage	Owner
tp-7-sa-0.0	--	Normal	FC	10	RAID 1	4.000	0.125	12.000	No	Yes	CPG Admin	0/1
tp-7-sa-0.1	--	Normal	FC	10	RAID 1	4.000	0.125	12.000	No	Yes	CPG Admin	1/0
tp-7-sd-0.0	--	Normal	FC	10	RAID 1	16.000	0.500	32.000	No	Yes	CPG Data	0/1
tp-7-sd-0.1	--	Normal	FC	10	RAID 1	16.000	0.500	32.000	No	Yes	CPG Data	1/0
						40.000	1.250	88.000				

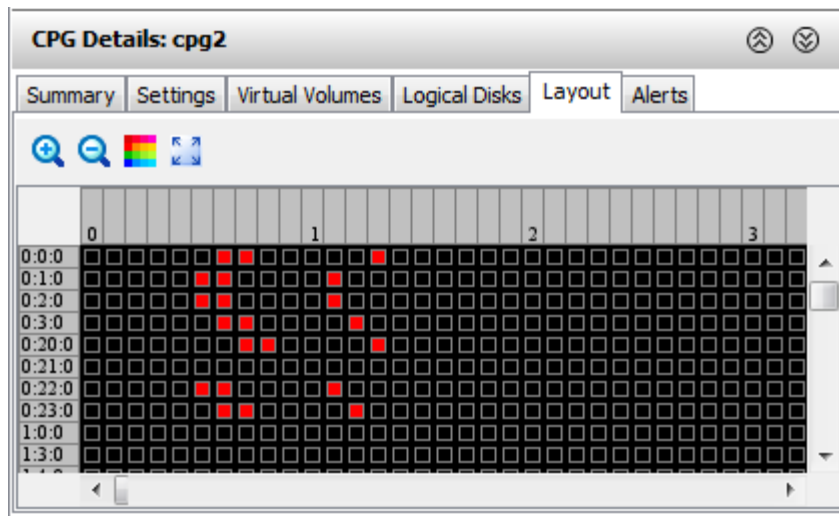
The following information is displayed on the **Logical Disks** tab:

Column	Description
Name	The name of the logical disk.
Domain	The domain in which the logical disk resides.
State	The current state of the logical disk. See <a href="#">“System and Component Status Icons” (page 407)</a> .
Device Type	The disk type, Fast Class (FC), Nearline (NL), or Solid State (SSD).
Device RPM	Speed of the specified disk.
<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
RAID	The logical disk's RAID type.
Total Capacity	The total logical disk size in GiB.
Used Capacity	The amount of logical disk space used in GiB.
Raw Capacity	The raw capacity of the logical disk in GiB.
Write Through	Indicates if the logical disk is in write-through mode.
Mapped to VV	Indicates if the logical disk is mapped to a virtual volume.
Usage	Indicates the purpose for which the logical disk is used.
Owner	Specifies the owning nodes.

## Layout Tab

The **Layout** tab displays which chunklets are used by the selected CPG.

**NOTE:** The Layout tab only appears if you have set your preferences in the HP 3PAR Management Console to show the provisioning layout tab. See [“Setting Global Preferences” \(page 412\)](#).



See also:

[“Managing Data Allocation” \(page 333\)](#)

## Alerts Tab

The **Alerts** tab displays a table containing alert information for a single CPG selected from the list pane. The information displayed is identical to the information displayed in system alerts table. See [“Viewing System Alerts” \(page 269\)](#) for additional information.

## Viewing the Common Provisioning Group Alerts Tab

To view the **Common Provisioning Group (CPG) Alerts** tab:

1. Access the CPG screen.
2. In the Management Window, click the **Alerts** tab.

The **Alerts** tab displays CPG-related alerts for the system. The information displayed in the provisioning **Alerts** tab is identical to the information contained in the systems **Alerts** tab.

The **Provisioning Alerts** tab displays only CPG-related alerts.

See [“Viewing System Alerts” \(page 269\)](#).

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## 10 Virtual Volumes

The Provisioning Manager allows you perform various tasks related to virtual volumes. Refer to the following sections for more information.

[“Creating Virtual Volumes” \(page 129\)](#)

[“Editing Virtual Volumes” \(page 131\)](#)

[“Creating Similar Virtual Volumes” \(page 132\)](#)

[“Saving a Virtual Volume as a Template” \(page 133\)](#)

[“Creating a Remote Copy Group from Virtual Volumes” \(page 135\)](#)

[“Adding a Virtual Volume to a Remote Copy Group” \(page 137\)](#)

[“Moving a Virtual Volume to Another Domain” \(page 137\)](#)

[“Repairing Virtual Volumes” \(page 137\)](#)

[“Removing Virtual Volumes” \(page 138\)](#)

[“Tuning Virtual Volumes” \(page 140\)](#)

[“Restarting Tuning a Virtual Volume” \(page 140\)](#)

[“Rolling Back a Tuned Virtual Volume” \(page 140\)](#)

[“Creating Virtual Volume Sets” \(page 141\)](#)

[“Exporting Virtual Volumes” \(page 149\)](#)

[“Unexporting Virtual Volumes” \(page 150\)](#)

[“Converting Virtual Volumes” \(page 150\)](#)

[“Viewing Virtual Volumes” \(page 152\)](#)

### Creating Virtual Volumes

To create a virtual volume in the Management Console, access the Create Virtual Volume wizard. This wizard allows you to create Thinly Provisioned and Fully Provisioned volumes.

1. In the Manager Pane, click **Provisioning**.
2. In the Common Actions panel, click **Create Virtual Volume**.

The **Create Virtual Volume** wizard appears.

### Configure Virtual Volume

1. In the **General** group box:
  - a. **System** - Select the system where the volume will be created.
  - b. **Domain** - Select the domain in which the volume will reside. Select **<none>** if not applicable.
  - c. **Name** - Enter a name for the new volume.
  - d. **ID** - Enter an ID for the new volume if you uncheck the **auto** box (option shown only if **Show advanced options** is selected).
  - e. **Use Template** - Select the volume template to apply to the new volume. If not required, select **<none>**.
  - f. **Comments** - Enter any notes about the volume.
2. In the **Allocation** group box:

- a. Select how the volume will be provisioned. Selecting **Thinly Provisioned** results in the creation of a Thinly Provisioned Virtual Volume (TPVV). Selecting **Fully Provisioned** results in the creation of a base volume.

---

**NOTE:** Creating Thinly Provisioned Virtual Volumes (TPVVs) requires the HP 3PAR Thin Provisioning Software license.

---

- b. **Size** - Enter the size of the volume. Change the **Size** list value to MiB or TiB as applicable. The default is GiB.

---

**NOTE:** Minimum permitted volume size is 256MiB, maximum is 16TiB. Minimum chunklet size for a V-Class system is 1 GiB; if 256MiB virtual volumes are created, the remaining space of the volume will be unused.

---

- c. If you selected **Thinly Provisioned**:
  - i. **User CPG** - Select a user CPG from the **CPG** list.
  - ii. **Copy CPG** - Select a copy CPG or **<none>**.
  - iii. In the **Allocation Warning** and **Allocation Limit** text boxes for **User CPG** and **Copy CPG**, enter the appropriate information. If you do not want these options used, uncheck the **Enabled** box. (The **Allocation Limit** text box appears only if **Show advanced options** is checked.)
- d. If you selected **Fully Provisioned**, select a CPG from the **CPG** list.
  - i. **User CPG** - Select a user CPG from the **CPG** list.
  - ii. **Copy CPG** - Select a copy CPG or **<none>** from the **CPG** list.
  - iii. In the **Allocation Warning** and **Allocation Limit** text boxes for **Copy CPG**, enter the appropriate information. If you do not want these options used, uncheck the **Enabled** box. (The **Allocation Limit** text box appears only if **Show advanced options** is checked.)
3. In the **Grouping** group box:
  - a. **Number of Volume(s)** - Enter the number of volumes to create. (If you enter 2 or higher, you have the option of checking **Attempt to share LDs**).
  - b. **Set Name** - Select a virtual volume set name or if not required, select **<none>**.
4. If you want to export the volumes after creation, check **Export Volume(s) after creation**, otherwise click **Next** to configure the virtual volumes policies and geometry (if **Show advanced options** is checked), or click **Finish**.  
(For more information on exporting volumes, see ["Exporting Virtual Volumes"](#) (page 149).)
5. In the **Grouping** group box:
  - a. **Count** - Enter the number of volumes to create.
  - b. **Set Name** - Select a virtual volume set name or, if not required, select **<none>**.
6. Click **Next** to configure **Copy Space Settings**, or click **Finish**.

## Policies and Geometry

This page is displayed only if **Show advanced options** was checked on the Configure Virtual Volume page.

1. In the **Policies** group box enable any of the following:
  - a. Allow stale snapshots.
  - b. Restrict export to one host.
  - c. Enable zero detect (default).
  - d. Retention Time. If enabled, enter a value in the corresponding text box and then select either day(s) or hour(s).
  - e. Expiration Time. If enabled, enter a value in the corresponding text box and the select either day(s) or hour(s).

2. In the **Geometry** group box:
  - a. Enter the number of sectors per track, or accept the default value.
  - b. Enter the number of heads per cylinder, or accept the default value.
3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Editing Virtual Volumes

To edit a virtual volume, access the **Edit Virtual Volume** wizard.

1. Access the **Virtual Volumes** tab.
  2. Right-click the volume you wish to edit.
  3. In the menu that appears, click **Edit**.
- The **Edit Virtual Volume** wizard appears.

## Configure Virtual Volume

1. In the **General** group box:
  - a. **Name** - Enter a new name for the volume.
  - b. **Comments** - Enter any notes about the volume.
2. In the **Allocation** group box:
  - a. **Size** - Enter the size of the volume. Change the **Size** list value to MiB or TiB as applicable. The default is GiB. The size entered must be more than the previous size.

---

**NOTE:** Minimum permitted volume size is 256MiB, maximum is 16TiB.

---

- b. If the volume is **Fully Provisioned**:
    - i. Select a CPG from the **Copy CPG** list, or select <none>.
    - ii. In the **Allocation Warning** and **Allocation Limit** text boxes, enter the appropriate information. If you do not want these options used, uncheck the **Enabled** box. (The **Allocation Limit** text box appears only if **Show advanced options** is checked.)
  - c. If the volume is **Thinly Provisioned**:
    - i. In the **Allocation Warning** and **Allocation Limit** text boxes under **User CPG**, enter the appropriate information. If you do not want these options used, uncheck the **Enabled** box. (The **Allocation Limit** text box appears only if **Show advanced options** is checked.)
    - ii. Select a CPG from the **Copy CPG** list, or select <none>.
    - iii. In the **Allocation Warning** and **Allocation Limit** text boxes under **Copy CPG**, enter the appropriate information. If you do not want these options used, uncheck the **Enabled** box. (The **Allocation Limit** text box appears only if **Show advanced options** is checked.)
3. If you wish to edit the virtual volume's policies and geometry, select **Show advanced options** and click **Next**, or click **Finish**.

## Policies and Geometry

This page is displayed only if **Show advanced options** was checked on the Configure Virtual Volume page.

1. In the **Policies** group box enable any of the following:
  - a. Allow stale snapshots.
  - b. Restrict export to one host.
  - c. Retention Time. If enabled, enter a value in the corresponding text box and then select either day(s) or hour(s).
  - d. Expiration Time. If enabled, enter a value in the corresponding text box and the select either day(s) or hour(s).
2. In the **Geometry** group box:
  - a. Enter the number of sectors per track, or accept the default value.
  - b. Enter the number of heads per cylinder, or accept the default value.
3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Creating Similar Virtual Volumes

You can create new virtual volumes based on existing virtual volumes. To do this:

1. Access the **Virtual Volumes** tab.
  2. Right-click the volume you wish to use as the basis for your new volume.
  3. In the menu that appears, click **Create Similar**.
- The **Create VV** wizard appears.

## Configure Virtual Volume

1. In the **General** group box:
  - a. **System** - Select the system where the volume will be created.
  - b. **Domain** - Select the domain in which the volume will reside. Select **<none>** if not applicable.
  - c. **Name** - Enter a name for the new volume.
  - d. **ID** - Enter an ID for the new volume if you uncheck the **auto** box (option shown only if **Show advanced options** is selected).
  - e. **Use Template** - Select the volume template to apply to the new volume. If not required, select **<none>**.
  - f. **Comments** - Enter any notes about the volume.
2. In the **Allocation** group box:
  - a. Select how the volume will be provisioned. Selecting **Thinly Provisioned** results in the creation of a Thinly Provisioned Virtual Volume (TPVV). Selecting **Fully Provisioned** results in the creation of a base volume.
  - b. **Size** - Enter the size of the volume. Change the **Size** list value to MiB or TiB as applicable. The default is GiB.

---

**NOTE:** Minimum permitted volume size is 256MiB, maximum is 16TiB. Minimum chunklet size for a V-Class system is 1 GB, if 256MiB virtual volumes are created, the remaining space of the volume will be unused.

---



- c. If you selected **Thinly Provisioned**:
  - i. **User CPG** - Select a user CPG from the **CPG** list.
  - ii. **Copy CPG** - Select a copy CPG or <none>.
  - iii. In the **Allocation Warning** and **Allocation Limit** text boxes for **User CPG** and **Copy CPG**, enter the appropriate information. If you do not want these options used, uncheck the **Enabled** box. (The **Allocation Limit** text box appears only if **Show advanced options** is checked.)
- d. If you selected **Fully Provisioned**:, select a CPG from the **CPG** list.
  - i. **User CPG** - Select a user CPG from the **CPG** list.
  - ii. **Copy CPG** - Select a copy CPG or <none> from the **CPG** list.
  - iii. In the **Allocation Warning** and **Allocation Limit** text boxes for **Copy CPG**, enter the appropriate information. If you do not want these options used, uncheck the **Enabled** box. (The **Allocation Limit** text box appears only if **Show advanced options** is checked.)
3. In the **Grouping** group box:
  - a. **Number of Volume(s)** - Enter the number of volumes to create. (If you enter 2 or higher, you have the option of checking **Attempt to share LDs**).
  - b. **Set Name** - Select a virtual volume set name or if not required, select <none>.
4. If you want to export the volumes after creation, check **Export Volume(s) after creation**, otherwise click **Next** to configure the virtual volumes policies and geometry (if **Show advanced options** is checked), or click **Finish**. (For more information on exporting volumes, see [“Exporting Virtual Volumes”](#) (page 149).)
5. In the **Grouping** group box:
  - a. **Count** - Enter the number of volumes to create.
  - b. **Set Name** - Select a virtual volume set name or if not required, select <none>.
6. Click **Next** to configure **Copy Space Settings**, or click **Finish**.

## Policies and Geometry

This page is displayed only if **Show advanced options** was checked on the Configure Virtual Volume page.

1. In the **Policies** group box enable any of the following:
  - a. Allow stale snapshots.
  - b. Restrict export to one host.
  - c. Retention Time. If enabled, enter a value in the corresponding text box and then select either day(s) or hour(s).
  - d. Expiration Time. If enabled, enter a value in the corresponding text box and the select either day(s) or hour(s).
2. In the **Geometry** group box:
  - a. Enter the number of sectors per track, or accept the default value.
  - b. Enter the number of heads per cylinder, or accept the default value.
3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Saving a Virtual Volume as a Template

You can save a virtual volume as a template. To do this:

1. Access the **Virtual Volumes** tab.

2. You may start the Create VV Template wizard using one of the following methods:  
 Method 1 –In the Main Menu Bar, click **Actions > Provisioning > Template > Create VV Template**.  
 Method 2 – Right-click the volume you wish save as a template. In the menu that appears, click **Save As Template**.  
 The **Create VV Template** wizard appears.

## General

1. In the **Template** group box:
  - a. (Optional) **Description** - Enter a template description.
  - b. (Optional) Click the **Override Unincluded Properties** checkbox to allow users to set non-default values for unincluded properties when applying the template.
2. In the **General** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include in a **VV template, User Space** group box:

Property	Include in the template in order to...
<b>Provisioning</b>	create a base volume template, select <b>Thinly Provisioned</b> .
<b>Size</b>	determine the size that the volume created with this template presents to the host.
<b>CPG</b>	select the CPG to use for user space.
<b>Allocation Warning</b>	generate an alert when the copy space of the VV exceeds the specified percentage of the VV size.
<b>Allocation Limit</b>	prevent the snapshot copy space from growing beyond the specified percentage of the VV size.

3. In the **Copy Space** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include in a **VV template, Copy Space** group box:

Property	Include in the template in order to...
<b>CPG</b>	select the CPG to use for copy space.
<b>Allocation Warning</b>	generate an alert when the copy space of the VV exceeds the specified percentage of the VV size.
<b>Allocation Limit</b>	prevent the copy space from growing beyond the specified percentage of the VV size.

4. Click **Next** to enter policies and geometry information, or click **Finish**.

## Policies and Geometry

1. In the **Policies** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include in a **VV template, Policies** group box:

Property	Include in the template in order to...
<b>Allow stale snapshots</b>	allows stale snapshots.
<b>Restrict export to one host</b>	indicate whether the VV can export to multiple hosts.
<b>Zero-fill on partially written data pages</b>	ensure that the host can never read old data from deleted volumes or snapshots.
<b>Heads Per Cylinder</b>	specify the number of heads to use per cylinder.

2. In the **Geometry** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Enter the number of sectors per track, or accept the default value.
  - c. Enter the number of heads per cylinder, or accept the default value.
  - d. Use the following table as a guide when choosing which properties to include in a **VV template, Geometry** group box:

Property	Include in the template in order to...
<b>Sectors Per Track</b>	specify the number of sectors to allow per track.
<b>Heads Per Cylinder</b>	specify the number of heads to use per cylinder.

3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information , then click **Finish**.

## Creating a Remote Copy Group from Virtual Volumes

**NOTE:** HP 3PAR Remote Copy Software requires an HP 3PAR Remote Copy Software license. For additional information about the license, see the *HP 3PAR OS Concepts Guide*.

To create a Remote Copy group from virtual volumes:

1. Access the **Virtual Volumes** tab.
2. Select the volumes from which you wish to create a Remote Copy group.
3. Right-click your selection.
4. In the menu that appears, click **Create Remote Copy Group**.  
The **Create Remote Group** wizard appears.

## Groups

1. In the **Source** group:
  - a. **System** - Select the primary (source) system on which the Remote Copy group will be created.
  - b. (Optional) **Domain** - Select the domain in which the Remote Copy group will reside.
  - c. **Group** - Enter a name for the group.
2. In the **Backup** groups:
  - a. **Name** - The system(s) NOT selected as the source system, automatically appears.
  - b. **Mode** - Select **Synchronous** or **Periodic**.
  - c. (Optional) **Sync Period** - If you selected **Periodic**, select this checkbox and select second(s), minute(s), hour(s), or day(s) and enter a numeric value for when you wish the source and backup groups to synchronize their data. If not selected, no period is used.
  - d. (Optional) **Start group after completion** - Select if you want the Remote Copy group to be started (start mirroring) after it is created.
  - e. (Optional) **Do not perform initial sync** - Select if you do not want the created Remote Copy group to be synchronized with its backup group. Before selecting this option verify both sides are synchronized or it may lead to data inconsistency. (This option is available if Show Tape Backup Options in Remote Copy Wizards was selected in the Preferences.)
  - f. (Optional) **Auto Recover** - Select if you want the group to be restarted automatically after Remote Copy links come back up should the links go down. (Displayed if **Show advanced options** is selected.)
  - g. (Optional) **Over Period Alert** - Select if you want an alert to be generated if the synchronization of a periodic group takes longer than its set synchronization period. This option is not available for groups in synchronous mode.
3. Click **Next** to configure Virtual Volumes or **Finish**.

## Virtual Volumes

1. In the **Source volume on** list, select a source virtual volume from the virtual volume list.
2. In the **Backup Volume on** list select a backup virtual volume from the virtual volume list, or click **New** to create a new backup volume.
3. If you clicked **New**:
  - a. Enter a volume name.
  - b. Select CPG for the user space.
  - c. Select a CPG for the copy space.

---

**NOTE:** When selecting volumes, you can filter the lists to include by clicking the down arrow and selecting **Virtual Volumes**, **Provisioning**, and **Virtual Size**. To clear the filter, click **Clear**.

---

4. Click **Add**.
5. Click **Next**.

---

**NOTE:** If an RW snapshot is added to the group all RW of the same volume family will be removed. The base parent will also be removed.

**NOTE:** If you are creating a Remote Copy group for a Synchronous Long Distance Remote Copy configuration, repeat steps 2 and 3 for the second **Backup Volume on** list of virtual volumes.

---

## Summary

Review the summary information, then click **Finish**.

## Adding a Virtual Volume to a Remote Copy Group

**NOTE:** HP 3PAR Remote Copy Software requires an HP 3PAR Remote Copy Software license. For additional information about the license, see the *HP 3PAR OS Concepts Guide*.

To add a virtual volume to a Remote Copy group:

1. Access the **Virtual Volumes** tab.
2. Select the volume(s) you wish to add to a Remote Copy group.
3. Right-click the selection.
4. In the menu that appears, click **Add to Remote Copy Group**.  
The **Add Volumes to Remote Group** dialog box appears.
5. Select the Remote Copy group(s) from the **Group** list.
6. (Optional) Select **Start group after adding volumes** if you wish to immediately start the Remote Copy group after adding the selected volume.
7. In the **Source Volume on** list, select the volume you are adding to the group.
8. In the **Backup Volume on** list, select an existing backup volume, or click **New** to create a new backup volume.

**NOTE:** When selecting volumes, you can filter the lists to include by clicking the down arrow and selecting Virtual Volumes, Provisioning, and Virtual Size. To clear the filter, click **Clear**.

**NOTE:** If an RW snapshot is added to the group all RW of the same volume family will be removed. The base parent will also be removed.

9. If you clicked **New**:
  - a. Enter a volume name.
  - b. Select CPG for the user space.
  - c. Select a CPG for the copy space.
  - d. (Optional) If you wish to enter an allocation warning percentage and/or allocation limit, click **Enabled** and enter a value.

**NOTE:** If you are creating a Remote Copy group for a Synchronous Long Distance Remote Copy configuration, repeat steps 8 and/or 9 for the second Backup Volume on list of virtual volumes.

10. Click **Add**.
11. Click **OK**.

## Moving a Virtual Volume to Another Domain

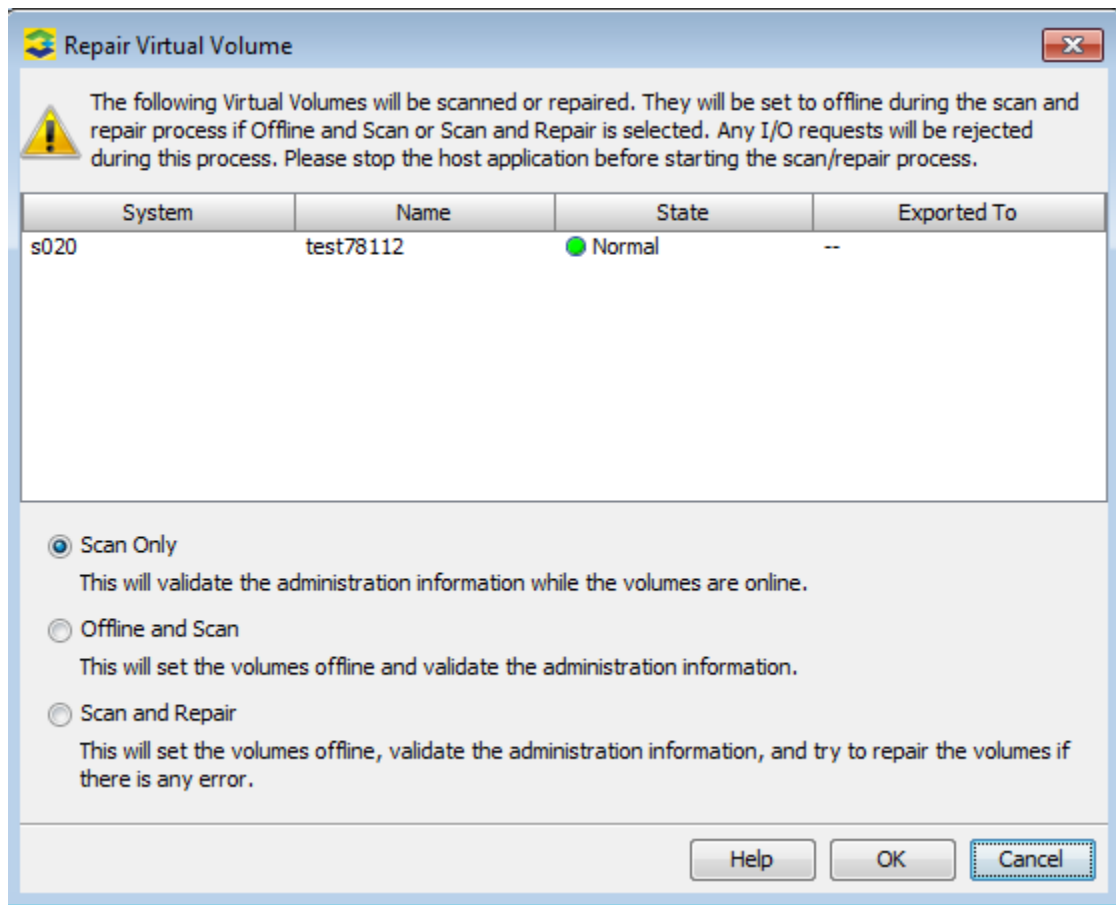
**NOTE:** HP 3PAR Domains requires an HP 3PAR Domain license. For additional information about the license, see the *HP 3PAR OS Concepts Guide*.

If you are using HP 3PAR Domains and wish to move a volume from one domain to another, follow the instructions in [“Moving Objects from One Domain to Another Domain” \(page 70\)](#).

## Repairing Virtual Volumes

To repair a virtual volume:

1. Access the **Virtual Volumes** tab.
2. Right-click the volume you wish to repair.  
The **Repair Virtual Volume** dialog box appears.



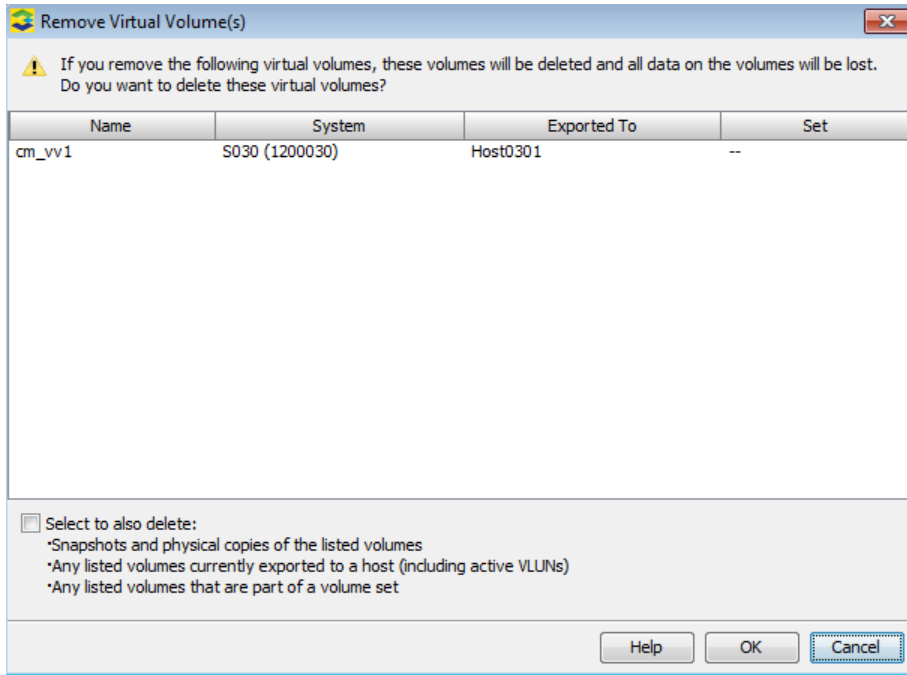
3. Select **Scan Only**, **Offline and Scan**, or **Scan and Repair**.  
 Scan Only – Validates the administration information while the volumes are online.  
 Offline and Scan – Sets the volumes offline then validates the administration information.  
 Scan and Repair – Sets the volumes offline, validates the administration information, and tries to repair the volume if there are any errors.
4. Click **OK**.

## Removing Virtual Volumes

To remove a virtual volume:

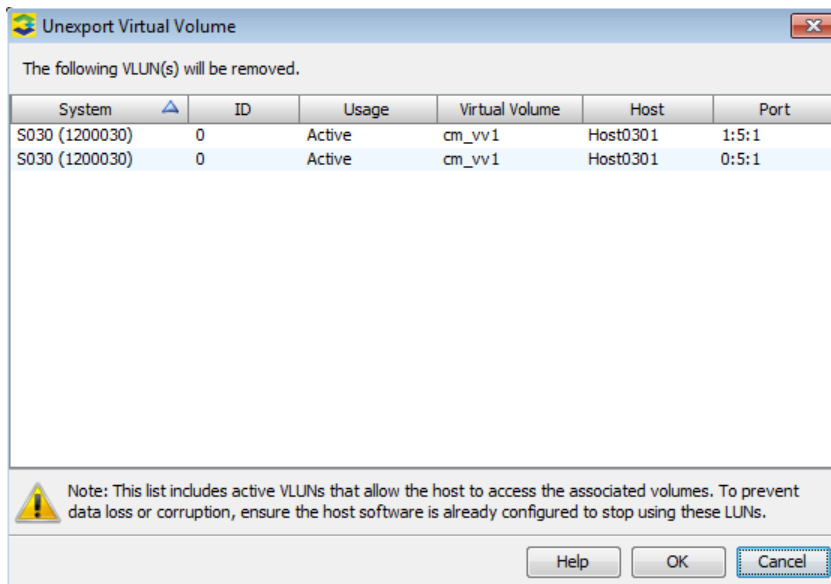
1. Access the **Virtual Volumes** tab.
2. Right-click the volume you wish to remove.
3. In the menu that appears, click **Remove**.

The **Remove Virtual Volume** dialog box appears.

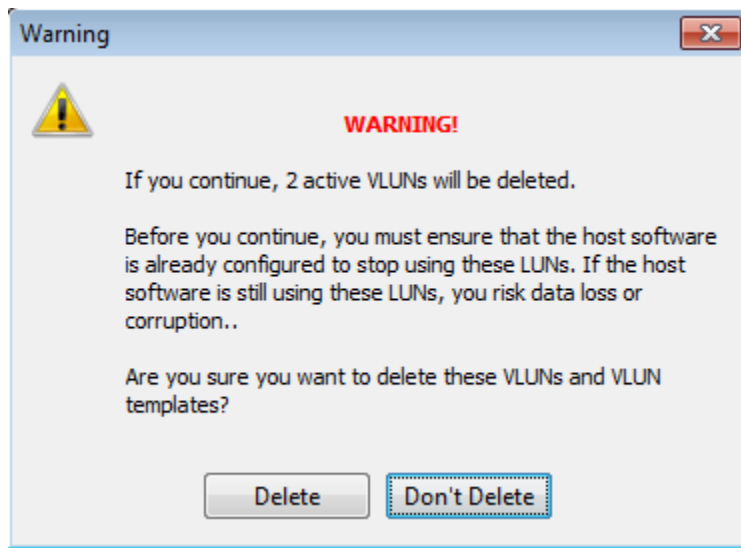


4. (Optional) Select to remove volumes and descendents without active VLUNs, associated with inactive VLUNs, and from volume sets.

When the volumes to be removed involve active VLUNs, clicking the checkbox will cause the Unexport Virtual Volume confirmation dialog to appear.



If you cancel the Unexport Virtual Volume dialog, the checkbox on the Remove Virtual Volume dialog will be unchecked. If you click OK on the Unexport Virtual Volume dialog, there will be a second warning message.



If you click **Yes**, the VLUNs will be removed along with the VVs after you click OK in the next step.

5. Click **OK** to remove the virtual volume(s).

See also:

[“Viewing the Virtual Volumes Tab” \(page 153\)](#)

## Tuning Virtual Volumes

To tune a virtual volume, access the **Tune Virtual Volume** wizard:

1. Access the **Virtual Volumes** tab.
2. Right-click the volume you wish to tune.
3. In the menu that appears, click **Tune Virtual Volume**.  
The **Tune Virtual Volume** dialog box appears.
4. In the **General** group box:
  - a. **System** - Select the system containing the volume to be tuned.
  - b. **Domain** - Select the domain containing the volume to be tuned. If not applicable, click **<none>**.
  - c. **Allocation Space** - Select User Space or Copy Space.
5. In the **Virtual Volumes** group box, select the virtual volume(s) to be tuned.
6. In the **Target** group box, select the target CPG from the **Target CPG** list.
7. Click **OK**.

## Restarting Tuning a Virtual Volume

To restart a previously interrupted tune task on a virtual volume:

1. Access the **Virtual Volumes** tab.
2. Right-click the volume for which you wish to restart the tuning task.
3. In the menu that appears, click **Restart Tune**.
4. Click **Yes**.

## Rolling Back a Tuned Virtual Volume

To roll back a previously tuned virtual volume to its previous state:

1. Access the **Virtual Volumes** tab.
2. Right-click the volume you wish to roll back.



3. In the menu that appears, click **Rollback Tune**.
4. Click **Yes**.

## Managing Virtual Volume Sets

When working with virtual volume sets, you can:

- “Creating Virtual Volume Sets” (page 141)
- “Editing a Virtual Volume Set” (page 141)
- “Adding a Virtual Volume to a Virtual Volume Set” (page 142)
- “Exporting Virtual Volume Sets” (page 142)
- “Removing a Virtual Volume Set” (page 143)
- “Viewing Virtual Volume Sets” (page 143)
- “Viewing a Single Virtual Volume Set” (page 144)

## Creating Virtual Volume Sets

To create a virtual volume set:

1. In the Manager Pane, click **Provisioning**.
2. In the Management Tree, click right-click **Virtual Volume Sets** under the system on which you wish to create the volume set.
3. In the menu that appears, click **Create Virtual Volume Set**.

The **Create Virtual Volume Set** wizard appears.

### General

1. **System** - Select the system to create the virtual volume set.
2. **Domain** - select the domain in which to create the new virtual volume set, or if not required, select **<none>**.
3. **Name** - Enter a name for the new set.
4. **Comments** - Enter any notes about the virtual volume set.
5. Click **Next** to assign virtual volumes to the set.

### Volumes

1. To assign available volumes:
  - a. Select one or more volumes from the **Available volumes** list.
  - b. Click the down arrow to add the selected volume(s) to the **Assigned volumes** list.
2. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

### Summary

Review the summary information, then click **Finish**.

## Editing a Virtual Volume Set

To edit a virtual volume set:

1. Access the **Virtual Volume Sets** screen.
2. Right-click the virtual volume set you wish to edit.
3. In the menu that appears, click **Edit**.

The **Edit Virtual Volume Set** wizard appears.

### General

1. **Name** - Enter a name for the set.

2. **Comments** - Enter any notes about the virtual volume set.
3. Click **Next** to assign/unassign virtual volumes to/from the set.

## Volumes

1. To assign available volumes:
  - a. Select one or more volumes from the **Available volumes** list.
  - b. Click the down arrow to add the selected volume(s) to the **Assigned volumes** list.
2. To unassign volumes:
  - a. Select one or more volumes from the **Assigned volumes** list.
  - b. Click the up arrow to add the selected volume(s) to the **Available volumes** list.
3. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

Review the summary information, then click **Finish**.

## Adding a Virtual Volume to a Virtual Volume Set

To add a virtual volume to an existing virtual volume set:

1. Access the **Virtual Volumes** tab.
2. Right-click the volume you wish to add to a virtual volume set. (If you wish to select multiple volumes see [“Selecting Multiple Items” \(page 406\)](#) for instructions.)
3. In the menu that appears, click **Add to Virtual Volume Set**.

The **Add to Virtual Volume Set** dialog box appears.

4. Select a virtual volume set from the list.
5. Click **OK**.

## Exporting Virtual Volume Sets

To export a virtual volume set:

1. Access the **Virtual Volume Sets** screen.
2. Right-click the virtual volume set you wish to export.
3. In the menu that appears, click **Export**.

The **Export Virtual Volume** wizard appears.

## Export

1. In the **General** group box:
  - a. **System** - Select a system from the list.
  - b. **Domain** - Select a domain from the list. If not applicable, select **<none>**.
2. In the Virtual Volume group box:
  - a. Select either **Virtual Volume** or **Virtual Volume Set**.
  - b. From the virtual volume or virtual volume set list, select the volume(s) to export.
3. In the **Export To** group box:
  - a. Select **Host (Host Sees)** or **Host Set (Host in Set)**. If **Show advanced options** is selected, **Host and Port (Matched Set)** and **Port (Port Present)** are added to the available selections.  
Port Presents will export the volumes to all hosts connected to the port. Matched Set will export the volumes to the specified host that is connected to the port.
  - b. From the host or host set list, select the host(s) you wish to export the virtual volumes to.
  - c. The Port box will be enabled if you selected Matched Set or Port Present.

- d. If **Show advanced options** is selected, you have the option of selecting the After Export, issue VLUN change notification (LIP or RSCN) checkbox.
4. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

Review the summary information, then click **Finish**.

## Removing a Virtual Volume Set

To remove a virtual volume set:

1. Access the **Virtual Volume Sets** screen.
2. Right-click the virtual volume set you wish to remove.

---

**NOTE:** If you wish to remove multiple virtual volume sets (see [“Selecting Multiple Items” \(page 406\)](#)), select the volume sets you wish to remove before right-clicking.

---

3. In the menu that appears, click **Remove**.  
The **Remove Virtual Volume Sets** dialog box appears.
4. Click **OK** or select the **Remove associated VLUNs if applicable** checkbox to run the Remove Virtual Volume Sets dialog.

## Remove Virtual Volume Sets

If there are associated VLUNs that can be removed, you have the option of selecting the **Remove associated VLUNs if applicable** checkbox. If you select this checkbox, the **Unexport Virtual Volume** confirmation screen will appear.

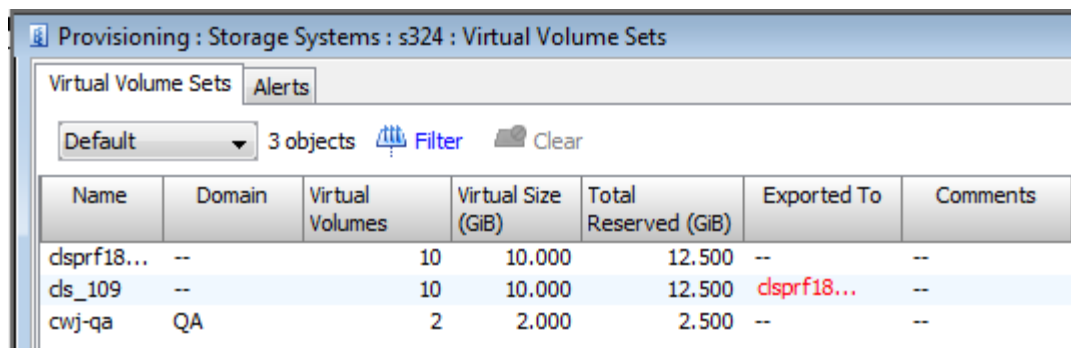
## Unexport Virtual Volume

Click **OK** to unexport the volume and return to the Remove Virtual Volume Sets dialog box.

## Viewing Virtual Volume Sets

To view a system's virtual volume sets:

1. In the Manager Pane, click **Provisioning**.
2. In the Management Tree, click **Virtual Volume Sets** under the system node you wish to view.



Name	Domain	Virtual Volumes	Virtual Size (GiB)	Total Reserved (GiB)	Exported To	Comments
dsprf18...	--	10	10.000	12.500	--	--
ds_109	--	10	10.000	12.500	dsprf18...	--
cwj-qa	QA	2	2.000	2.500	--	--

The following information is displayed:

Column	Description
Name	The name of the virtual volume set. Each name is a link to that virtual volume set's detail information. See <a href="#">“Viewing a Single Virtual Volume Set” (page 144)</a> .
Domain	The domain in which the virtual volume set resides.

Column	Description
<b>Virtual Volumes</b>	The number of virtual volumes belonging to the virtual volume set.
<b>Virtual Size</b>	The size of the volume in GiB.
<b>Total Reserved</b>	The total amount of reserved space in GiB.
<b>Exported To</b>	The host to which the volume is exported. A red entry indicates an inactive VLUN. A blue entry indicates an active VLUN.
<b>Comments</b>	Any user-created comments.

## Viewing a Single Virtual Volume Set

To view a single virtual volume set:

1. In the Manager Pane, click **Provisioning**.
2. In the Management Tree, click **Virtual Volume Sets** under the system node you wish to view.
3. Click the virtual volume set you wish to view under the **Name** column in the Management Window.
1. In the Manager Pane, click **Provisioning**.
2. In the Management Tree, click the virtual volume set under **Virtual Volume Sets** you wish to view.

The type of information displayed is identical to the information displayed for virtual volumes. See the “[Viewing Virtual Volumes](#)” (page 152) topic and its sub-topics for additional information.

## Creating Virtual Volume Templates

If you want to create virtual volumes with the same characteristics, you can create a virtual volume template to reuse, rather than having to re-enter all the characteristics for each of those virtual volumes. Additionally, you can edit an existing template, change the characteristics, and save it as a new template.

To create a virtual volume template:

1. Access the **Virtual Volumes** tab.
2. Right-click the volume from which you wish to create a template.
3. In the menu that appears, click **Save As Template**.
- or
4. After accessing the **Virtual Volumes** tab, in the Main Menu Bar, click **Actions > Provisioning > Template > Create VV Template**.

The **Create VV Template** wizard appears.

## General

1. In the Template group box:
  - a. **System** - Select the system on which the template will be created.
  - b. **Name** - Enter the template name.
  - c. (Optional) **Description** - Enter a template description.
  - d. (Optional) Click the **Override Unincluded Properties** checkbox to allow users to set non-default values for unincluded properties when applying the template.

2. In the **User Space** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include in a **VV template, User Space** group box:

Property	Include in the template in order to...
<b>Size</b>	Determine the size that the volume created with this template presents to the host.
<b>Provisioning</b>	Create a base volume template, select <b>Thin</b> or <b>Thin or Full</b> (Thin will be selected automatically if the system has a TPVV license). If no provisioning type is selected, it will be treated same as the "Thin or Full" type.
<b>CPG</b>	Select the CPG to use for user space.
<b>Allocation Warning (Thin only)</b>	Generate an alert when the copy space of the VV exceeds the specified percentage of the VV size. (The default warning is 80% when Allocation Warning is selected and enabled.)
<b>Allocation Limit (Thin only)</b>	Prevent the snapshot copy space from growing beyond the specified percentage of the VV size.

3. In the **Copy Space** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include in a **VV template, Copy Space** group box:

Property	Include in the template in order to...
<b>CPG</b>	Select the CPG to use for copy space (must be in the same domain as the user CPG). If you select a copy CPG first, then select a user CPG from a different domain, a warning dialog will be shown, the copy CPG will be cleared and you will need to select a copy CPG that is in the same domain as the user CPG.
<b>Allocation Warning</b>	Generate an alert when the copy space of the VV exceeds the specified percentage of the VV size.
<b>Allocation Limit</b>	Prevent the copy space from growing beyond the specified percentage of the VV size.

4. Click **Next** to enter policies and geometry information, or click **Finish**.

## Policies and Geometry

1. In the **Policies** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include in a **VV template, Policies** group box:

Property	Include in the template in order to...
<b>Allow stale snapshots</b>	Allow stale snapshots.
<b>Restrict export to one host</b>	Indicate whether the VV can export to multiple hosts.
<b>Zero-fill on partially written data pages</b>	Ensure that the host can never read old data from deleted volumes or snapshots. (Thin provisioning only.)
<b>Sectors Per Track</b>	Specify the number of sectors to allow per track.
<b>Heads Per Cylinder</b>	Specify the number of heads to use per cylinder.

2. In the **Geometry** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Enter the number of sectors per track, or accept the default value.
  - c. Enter the number of heads per cylinder, or accept the default value.
  - d. Use the following table as a guide when choosing which properties to include in a **VV template, Geometry** group box:

Property	Include in the template in order to...
<b>Sectors Per Track</b>	specify the number of sectors to allow per track.
<b>Heads Per Cylinder</b>	specify the number of heads to use per cylinder.

3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Editing a Virtual Volume Template

When editing a template, the HP 3PAR Management Console will check if there are unsupported properties in the existing template. If any unsupported properties are found, a warning message to that effect will be displayed. The unsupported properties will be dropped when the edited template is saved.

Properties no longer supported are:

- Fully Provisioned from physical disks
- Copy size
- Copy size percent

- Disk pattern
- RAID
- Set size
- Row size
- Step size
- Availability
- Preferred chunklets

If the existing template contains user and copy CPGs from different domains, a warning message will be displayed. The copy CPG will be cleared, and you will have to reselect a copy CPG from the same domain as the user CPG.

To edit a virtual volume template:

1. Access the Templates screen.
2. Right-click the virtual volume template you wish to edit.
3. In the menu that appears, click Edit.

The **Edit VV Template** wizard appears.

## General

1. In the **Template** group box:
  - a. (Optional) **Description** - Enter a template description.
  - b. (Optional) Click the **Override Unincluded Properties** checkbox to allow users to set non-default values for unincluded properties when applying the template.
2. In the **General** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include in a **VV template, User Space** group box:

Property	Include in the template in order to...
<b>Provisioning</b>	Create a base volume template, select <b>Thin</b> or <b>Thin or Full</b> (Thin will be selected automatically if the system has a TPVV license). If no provisioning type is selected, it will be treated same as the "Thin or Full" type.
<b>Size</b>	Determine the size that the volume created with this template presents to the host.
<b>CPG</b>	Select the CPG to use for user space.
<b>Allocation Warning (Thin only)</b>	Generate an alert when the copy space of the VV exceeds the specified percentage of the VV size. (Default is 80%.)
<b>Allocation Limit (Thin only)</b>	Prevent the snapshot copy space from growing beyond the specified percentage of the VV size.

3. In the **Copy Space** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include in a **VV template, Copy Space** group box:

Property	Include in the template in order to...
<b>CPG</b>	Select the CPG to use for copy space (must be in the same domain as the user CPG).
<b>Allocation Warning</b>	Generate an alert when the copy space of the VV exceeds the specified percentage of the VV size.
<b>Allocation Limit</b>	Prevent the copy space from growing beyond the specified percentage of the VV size.

4. Click **Next** to enter policies and geometry information, or click **Finish**.

## Policies and Geometry

1. In the **Policies** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Use the following table as a guide when choosing which properties to include in a **VV template, Policies** group box:

Property	Include in the template in order to...
<b>Allow stale snapshots</b>	Allows stale snapshots.
<b>Restrict export to one host</b>	Indicate whether the VV can export to multiple hosts.
<b>Zero-fill on partially written data pages</b>	Ensure that the host can never read old data from deleted volumes or snapshots. (Thin only.)
<b>Sectors Per Track</b>	Specify the number of sectors to allow per track.
<b>Heads Per Cylinder</b>	Specify the number of heads to use per cylinder.

2. In the **Geometry** group box:
  - a. In the **Include default value** column on the left, check the appropriate boxes to include properties in the template. The list of values for each property are listed in the **Defined default value** column on the right. Include any properties for which you wish to define specific values to be used by the template. Checking the **Allow override** checkbox allow users to modify that property's value when applying the template.
  - b. Enter the number of sectors per track, or accept the default value.
  - c. Enter the number of heads per cylinder, or accept the default value.



- d. Use the following table as a guide when choosing which properties to include in a **VV template, Geometry** group box:

Property	Include in the template in order to...
Sectors Per Track	Specify the number of sectors to allow per track.
Heads Per Cylinder	Specify the number of heads to use per cylinder.

3. Click **Next** to view summary information, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Exporting Virtual Volumes

To use the Management Console to export a virtual volume, access the **Export Virtual Volume** wizard:

1. Click **Hosts** or **Provisioning** in the Manager Pane.
2. In the Common Actions panel, click **Export Volume**.
3. If you are working in the Provisioning manager, you can:
  - a. Access the **Virtual Volumes** tab in the Management Window.
  - b. Right-click the volume you wish to export.
  - c. In the menu that appears, click **Export**.

The **Export Virtual Volume** wizard appears.

## Export

1. In the **General** group box:
  - a. **System** - Select a system from the list.
  - b. **Domain** - Select a domain from the list. If not applicable, select **<none>**.
2. In the Virtual Volume group box:
  - a. Select either **Virtual Volume** or **Virtual Volume Set**.
  - b. From the virtual volume or virtual volume set list, select the volume(s) to export.
3. In the **Export To** group box:
  - a. Select either **Host (Host Sees)** or **Host Set (Host in Set)**.
  - b. From the host or host set list, select the host(s) you wish to export the virtual volumes to.
4. If you make any change in the advanced options, then clear the **Show advanced options** checkbox, a warning dialog will be displayed to warn you that the selected advanced options will be lost.

If you click the Yes button, it will change back to basic mode and all advanced options will be set back to default. If port (Port Present) or Host and Port (Matched Set) was selected, it will be changed back to the default Host (Host Sees).

If you click the No button, it will stay in Advanced mode.
5. If you selected the **Override lower priority templates** checkbox and click Finish, a warning dialog is displayed. This operation can result in data loss.
6. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

Review the summary information, then click **Finish**.

## Unexporting Virtual Volumes

To unexport a volume, access the Virtual Volumes tab

1. Access the Virtual Volumes tab.
2. Right-click on the name of the volume you want to unexport.

---

**NOTE:** If you wish to select multiple volumes (see [“Selecting Multiple Items”](#) (page 406) ), select the volumes you wish to remove before right-clicking.

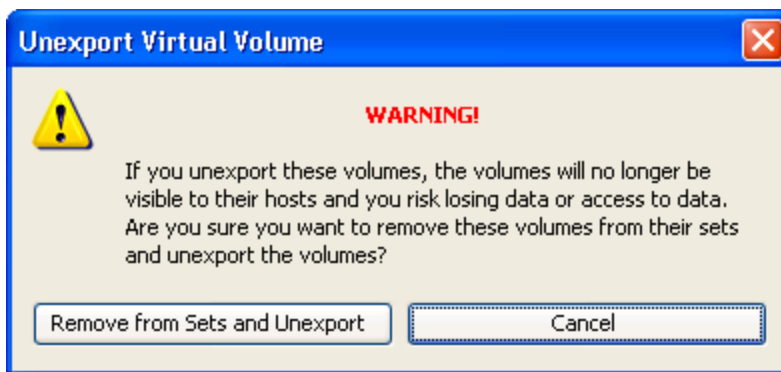
---

3. Select **Unexport** from the menu list that is displayed.

The Unexport Virtual Volume dialog box appears and displays the volume(s) to be unexported. If there is at least one volume in a set that is exported, you will be presented with an additional dialog.



If you select **Remove from Sets**, a confirmation dialog box will appear. If you then select OK, you will receive another warning.



If you select **Remove from Sets and Unexport**, you may need to confirm whether you want to remove other non-set unexports.

4. (Optional) Select the checkbox at the lower left corner of the dialog box if you do not want a VLUN change notification issued after removal.
5. Click **OK**.

## Converting Virtual Volumes

Converting virtual volumes from one type of provisioning to another allows you to balance space savings and cost. You can save storage space by converting little-used volumes to Thin volumes. Costs can be reduced by converting fully allocated volumes to Full volumes. Volumes can remain online and continue I/O operations during the conversion process.

To convert a virtual volume, access the Convert Virtual Volume wizard. This wizard allows you to convert Thinly Provisioned volumes to Fully Provisioned and Fully Provisioned volumes to Thinly provisioned.

The Convert Virtual Volume wizard is accessible through the In the Main Menu Bar (click **Actions** > **Performance** > **Edit Chart**), through the Convert button on the Toolbar when viewing the virtual volumes Summary tab, as a selection on the Toolbar under the Virtual Volume button when viewing the Virtual Volumes tab, and through the Provisioning Manager as described below:

1. In the Manager Pane, click **Provisioning**.
2. In the Management Tree, click **Virtual Volumes** under the system containing the volume(s) you wish to convert.
3. Under the Virtual Volumes tab in the Management Window, right-click on the volume you wish to convert and select **Convert Virtual Volume**.

The **Convert Virtual Volume(s)** dialog box appears.

## Convert Virtual Volumes

1. (Required) In the General groupbox, select the **System** where the volume resides.
2. Select the **Domain**, if any, of which the volume is a member.
3. (Required) Select the Conversion: **Full to Thin** or **Thin to Full**.

A list of all Fully or Thinly provisioned volumes, depending on the conversion you selected, will appear in the Virtual Volumes groupbox.

4. (Required) Select one or more virtual volumes from the list.)
5. (Required) In the CPG groupbox, select the Target CPG on which the conversion will be performed. (The default is the original CPG.)

If you select <original CPG> to convert volumes that provision space from different CPGs, the system converts each volume and retains the CPG currently used for each volume. If your selection includes virtual volumes that do not currently provision space from a CPG, you must select a CPG in order to continue. The system will convert and move all selected volumes to the selected target CPG

6. Click **OK** to start the conversion.

A task of type Convert Virtual Volume will be created. See [“Displaying Tasks” \(page 345\)](#) for information on tracking tasks.

# 11 Viewing Virtual Volumes

To view a system's virtual volumes:

1. In the Manager Pane, click **Provisioning**.
2. In the Management Tree, click **Virtual Volumes** under the system node you wish to view.

The Provisioning-Virtual Volumes screen appears in the Management Window. It provides information about virtual volumes on the **Summary**, **Virtual Volumes**, **CPG Space**, and **Alerts** tabs, which are explained in the following sections:

["Viewing the Virtual Volumes Summary Tab" \(page 152\)](#)

["Viewing the Virtual Volumes Tab" \(page 153\)](#)

["Viewing the CPG Space Tab" \(page 168\)](#)

["Viewing the Virtual Volumes Alerts Tab" \(page 168\)](#)

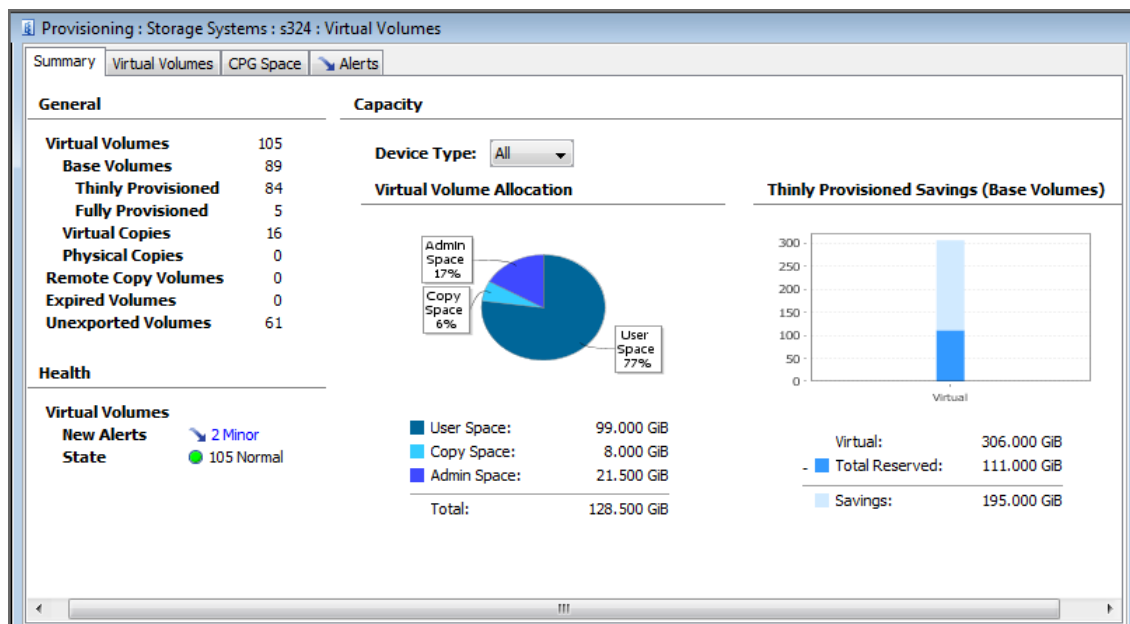
**NOTE:** In addition to providing comprehensive information about a system's virtual volumes, the HP 3PAR Management Console also allows you to view the same type of information for specific types of volumes. Each child node under the **Virtual Volumes** node in the Management Tree is a specific type of virtual volume. These include Remote Copy volumes, Exported volumes, Unexported volumes, volumes By Device Type, and volumes By RAID Type. The format and type of the information displayed is identical to that displayed under the **Virtual Volumes** node.

## Viewing the Virtual Volumes Summary Tab

To view the virtual volume Summary tab:

1. Access the virtual volume node in the Management Tree.
2. In the Management Window, click the **Summary** tab.

The **Summary** tab provides information about virtual volumes in the system.



The following information is displayed:

Group	Field	Description
General	Virtual Volumes	The total number of virtual volumes.
	Base Volumes	The total number of base volumes.
	Thinly Provisioned	The number of thinly provisioned virtual volumes.
	Fully Provisioned	The number of fully provisioned virtual volumes.
	Virtual Copies	The total number of virtual copies.
	Physical Copies	The total number of physical copies.
	Remote Copy Volumes	The total number of Remote Copy virtual volumes.
	Expired Volumes	The total number of expired virtual volumes.
	Unexported Volumes	The total number of unexported virtual volumes.
Health	New Alerts	The total number of new alerts.
	State	The current state. See <a href="#">“System and Component Status Icons” (page 407)</a> .
Capacity	Device Type	Select the device type, Fast Class (FC), Near Line (NL), or Solid State Device (SSD). The capacity and capacity usage of the selected device type is displayed in graphical form.
Virtual Volume Allocation	Displays the allocation of admin, copy, and user space.	
Thinly Provisioned Savings (Base Volumes)	Displays the amount of space saved through thinly provisioned virtual volumes.	

## Viewing the Virtual Volumes Tab

To view the Virtual Volumes tab:

1. Access the virtual volume screen.
2. In the Management Window, click the **Virtual Volumes** tab.

The **Virtual Volumes** tab presents information in a list pane and a detail pane.

[“List Pane” \(page 153\)](#)

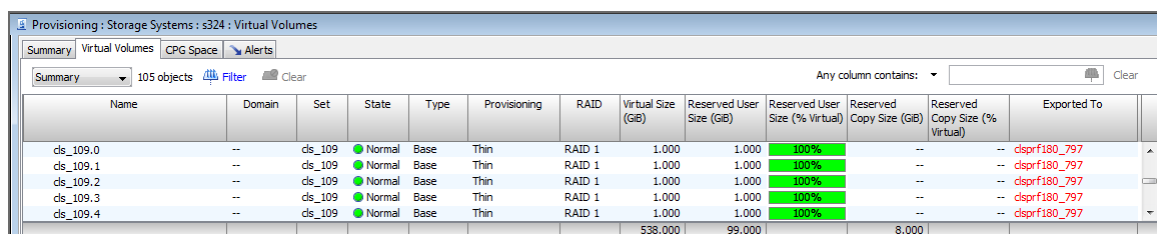
[“Detail Pane” \(page 158\)](#)

### List Pane

The table in the list pane can be filtered to display Summary, Allocation, Capacity, Raw Capacity, History, and Remote Copy information.

### Displaying Summary Information

To view summary information, select **Summary** from the filtering list.



The screenshot shows the 'Virtual Volumes' tab in the Provisioning: Storage Systems: s324 interface. The 'Summary' filter is selected, showing 105 objects. The table displays the following data:

Name	Domain	Set	State	Type	Provisioning	RAID	Virtual Size (GiB)	Reserved User Size (GiB)	Reserved User Size (% Virtual)	Reserved Copy Size (GiB)	Reserved Copy Size (% Virtual)	Exported To
ds_109.0	--	ds_109	Normal	Base	Thin	RAID 1	1,000	1,000	100%	--	--	dsprf180_797
ds_109.1	--	ds_109	Normal	Base	Thin	RAID 1	1,000	1,000	100%	--	--	dsprf180_797
ds_109.2	--	ds_109	Normal	Base	Thin	RAID 1	1,000	1,000	100%	--	--	dsprf180_797
ds_109.3	--	ds_109	Normal	Base	Thin	RAID 1	1,000	1,000	100%	--	--	dsprf180_797
ds_109.4	--	ds_109	Normal	Base	Thin	RAID 1	1,000	1,000	100%	--	--	dsprf180_797
							538,000	99,000		8,000		

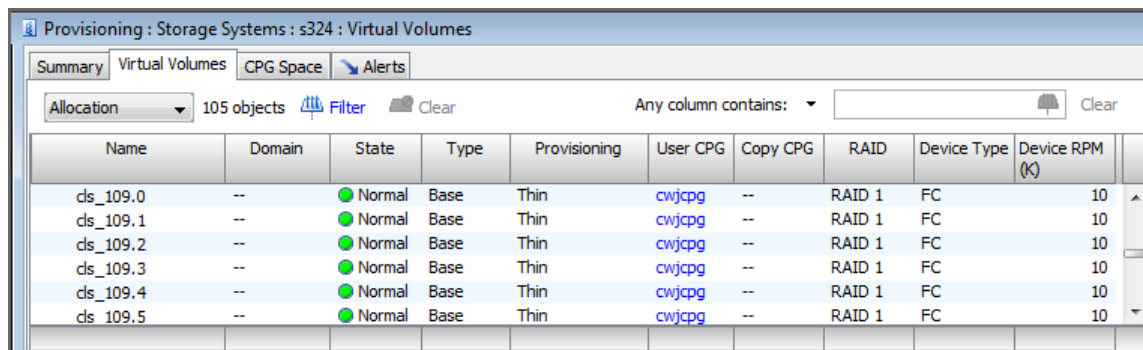
The following information is displayed:

Column	Description
<b>Name</b>	The volume name. Volume tree depth in parenthesis.
<b>Domain</b>	The domain to which the virtual volume belongs.
<b>Set</b>	The name of the virtual volume set containing the volume.
<b>State</b>	The state of the system. See “ <a href="#">System and Component Status Icons</a> ” (page 407).
<b>Type</b>	Indicates if the volume is a base volume, physical copy, or virtual copy.
<b>Provisioning</b>	Indicates if the volume is fully (Full) or thinly provisioned (TPVV).
<b>RAID</b>	The volume's RAID type.
<b>Virtual Size</b>	The size of the volume in GiB.
<b>Reserved User Size</b>	The size of the volume's reserved user space in GiB.
<b>Reserved User Size (% Virtual)</b>	The percentage of reserved user space.
<b>Reserved Copy Size</b>	The size of the volume's reserved copy space.
<b>Reserved Copy Size (% Virtual)</b>	The percentage of reserved copy space.
<b>Exported To</b>	The host to which the volume is exported. A red entry indicates an inactive VLUN. A blue entry indicates an active VLUN.

Virtual volumes are displayed in a parent/child hierarchy. A volume displayed with a plus (+) icon indicates that there are virtual or physical copies (children) of that volume. The child volumes can be displayed by clicking the plus icon.

## Displaying Allocation Information

To view allocation information, select **Allocation** from the filtering list.



The screenshot shows a software interface titled "Provisioning : Storage Systems : s324 : Virtual Volumes". It has tabs for "Summary", "Virtual Volumes", "CPG Space", and "Alerts". The "Virtual Volumes" tab is active. Below the tabs, there is a filter section with a dropdown menu set to "Allocation", showing "105 objects". To the right of the filter is a search bar labeled "Any column contains:" with a "Clear" button. Below the filter and search bar is a table with the following columns: Name, Domain, State, Type, Provisioning, User CPG, Copy CPG, RAID, Device Type, and Device RPM (K). The table contains six rows of data, all with a green status icon and "Normal" state.

Name	Domain	State	Type	Provisioning	User CPG	Copy CPG	RAID	Device Type	Device RPM (K)
cls_109.0	--	Normal	Base	Thin	cwjcpq	--	RAID 1	FC	10
cls_109.1	--	Normal	Base	Thin	cwjcpq	--	RAID 1	FC	10
cls_109.2	--	Normal	Base	Thin	cwjcpq	--	RAID 1	FC	10
cls_109.3	--	Normal	Base	Thin	cwjcpq	--	RAID 1	FC	10
cls_109.4	--	Normal	Base	Thin	cwjcpq	--	RAID 1	FC	10
cls_109.5	--	Normal	Base	Thin	cwjcpq	--	RAID 1	FC	10

The following information is displayed:

Column	Description
<b>Name</b>	The volume name. Volume tree depth in parenthesis.
<b>Domain</b>	The domain to which the virtual volume belongs.
<b>State</b>	The state of the system.
<b>Type</b>	Indicates if the volume is a base volume, physical copy, or virtual copy.
<b>Provisioning</b>	Indicates if the volume is fully (Full) or thinly provisioned (TPVV).

Column	Description
<b>User CPG</b>	The name of the Common Provisioning Group (CPG) used for user space.
<b>Copy CPG</b>	The name of the Common Provisioning Group (CPG) used for copy space.
<b>RAID</b>	The volume's RAID type.
<b>Device Type</b>	The type of physical disk, either Fast Class (FC), Near Line (NL), or Solid State (SSD).
<b>Device RPM</b>	The disk speed.
<p><b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.</p>	

## Displaying Capacity Information

To view capacity information, select **Capacity** from the filtering list.

Name	Domain	State	Type	Provisioning	RAID	Virtual Size (GiB)	Reserved User Size (GiB)	Reserved User Size (% Virtual)	Reserved Copy Size (GiB)	Reserved Copy Size (% Virtual)	Total Reserved (GiB)
cls_109.0	--	Normal	Base	Thin	RAID 1	1.000	1.000	100%	--	--	1.250
cls_109.1	--	Normal	Base	Thin	RAID 1	1.000	1.000	100%	--	--	1.250
cls_109.2	--	Normal	Base	Thin	RAID 1	1.000	1.000	100%	--	--	1.250
cls_109.3	--	Normal	Base	Thin	RAID 1	1.000	1.000	100%	--	--	1.250
cls_109.4	--	Normal	Base	Thin	RAID 1	1.000	1.000	100%	--	--	1.250
						538.000	99.000		8.000		128.500

The following information is displayed:

Column	Description
<b>Name</b>	The volume name. Volume tree depth in parenthesis.
<b>Domain</b>	The name of the domain.
<b>State</b>	The state of the system.
<b>Type</b>	Indicates if the volume is a base volume, physical copy, or virtual copy.
<b>Provisioning</b>	Indicates if the volume is fully (Full) or thinly provisioned (TPVV).
<b>RAID</b>	The volume's RAID type.
<b>Virtual Size</b>	The size of the volume in GiB.
<b>Reserved User Size</b>	The size of the volume's reserved user space in GiB.
<b>Reserved User Size (% Virtual)</b>	The percentage of reserved user space.
<b>Used User Size (%)</b>	The percentage of used user space.
<b>Reserved Copy Size</b>	The size of the volume's reserved copy space in GiB.
<b>Reserved Copy Size (% Virtual)</b>	The percentage of reserved copy space
<b>Used Copy Size (%)</b>	The percentage of used copy space.
<b>Total Reserved</b>	The total amount of reserved space in GiB.

## Displaying Raw Capacity Information

To view raw capacity information, select **Raw Capacity** from the filtering list. The raw capacity information appears.

Name	Domain	State	Type	Provisioning	RAID	Virtual Size (GiB)	Raw Reserved User Size (GiB)	Reserved User Size (GiB)	Raw Reserved Copy Size (GiB)	Reserved Copy Size (GiB)	Total Raw Reserved (GiB)	Total Reserved (GiB)
cls_109.0	--	Normal	Base	Thin	RAID 1	1,000	2,000	1,000	--	--	2,750	1,250
cls_109.1	--	Normal	Base	Thin	RAID 1	1,000	2,000	1,000	--	--	2,750	1,250
cls_109.2	--	Normal	Base	Thin	RAID 1	1,000	2,000	1,000	--	--	2,750	1,250
cls_109.3	--	Normal	Base	Thin	RAID 1	1,000	2,000	1,000	--	--	2,750	1,250
cls_109.4	--	Normal	Base	Thin	RAID 1	1,000	2,000	1,000	--	--	2,750	1,250
cls_109.5	--	Normal	Base	Thin	RAID 1	1,000	2,000	1,000	--	--	2,750	1,250
						538,000	198,000	99,000	16,000	8,000	278,500	128,500

The following information is displayed:

Column	Description
<b>Name</b>	The volume name. Volume tree depth in parenthesis.
<b>Domain</b>	The name of the domain.
<b>State</b>	The state of the system.
<b>Type</b>	Indicates if the volume is a base volume, physical copy, or virtual copy.
<b>Provisioning</b>	Indicates if the volume is fully (Full) or thinly provisioned (TPVV).
<b>RAID</b>	The volume's RAID type.
<b>Virtual Size</b>	The size of the volume in GiB.
<b>Raw Reserved User Size</b>	The size of the volume's reserved raw user space in GiB.
<b>Reserved User Size</b>	The size of the volume's reserved user space in GiB.
<b>Raw Reserved Copy Size</b>	The size of the volume's reserved raw copy space in GiB.
<b>Reserved Copy Size</b>	The size of the volume's reserved copy space in GiB.
<b>Total Raw Reserved</b>	The total amount of reserved raw space in GiB.
<b>Total Reserved</b>	The total amount of reserved space in GiB.

## Displaying History Information

To view history information, select **History** from the filtering list.

Name	Domain	State	Type	Provisioning	Creation Date	Retention Time	Expiration Time	Copy Space Calculation Date	Comments
cls_109.0	--	Normal	Base	Thin	Aug 21, 2012 17:05:09 PDT	--	--	--	--
cls_109.1	--	Normal	Base	Thin	Aug 21, 2012 17:05:10 PDT	--	--	--	--
cls_109.2	--	Normal	Base	Thin	Aug 21, 2012 17:05:10 PDT	--	--	--	--
cls_109.3	--	Normal	Base	Thin	Aug 21, 2012 17:05:10 PDT	--	--	--	--
cls_109.4	--	Normal	Base	Thin	Aug 21, 2012 17:05:11 PDT	--	--	--	--
cls_109.5	--	Normal	Base	Thin	Aug 21, 2012 17:05:11 PDT	--	--	--	--



The following information is displayed:

Column	Description
<b>Name</b>	The volume name. Volume tree depth in parenthesis.
<b>Domain</b>	The name of the domain.
<b>State</b>	The state of the system.
<b>Type</b>	Indicates if the volume is a base volume, physical copy, or virtual copy.
<b>Provisioning</b>	Indicates if the volume is fully (Full) or thinly provisioned (TPVV).
<b>Creation Date</b>	The date and time the volume was created.
<b>Retention Time</b>	If set during creation, the date and time the volume is retained.
<b>Expiration Time</b>	If set during creation, the date and time the volume expires.
<b>Copy Space Calculation Date</b>	The date and time copy space was calculated.
<b>Comments</b>	Any comments about the volume.

## Displaying Remote Copy Information

To view Remote Copy information, select **Remote Copy** from the filtering list.

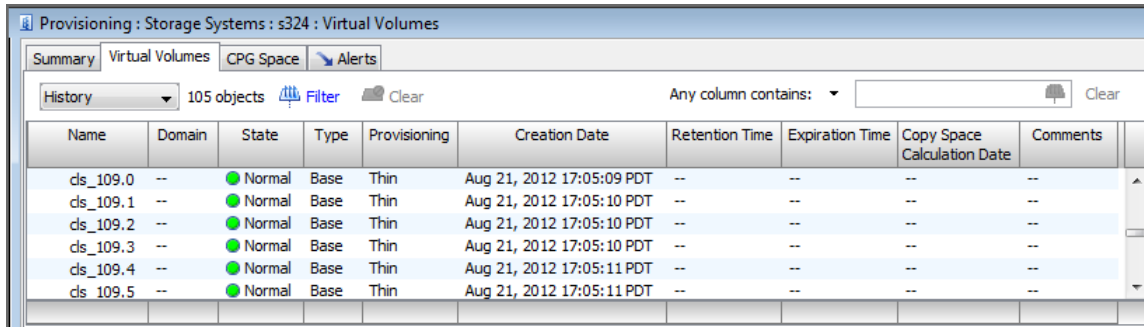
Provisioning: Storage Systems: s324: Virtual Volumes													
Summary Virtual Volumes CPG Space Alerts													
Remote Copy 105 objects Filter Clear													
Any column contains: Clear													
Name	System	Domain	State	Type	Provisioning	RAID	Virtual Size (GiB)	Exported To	RC Status	RC Group	Sync State	Writable LUNs	
cwj-full	s324	--	Normal	Base	Full	RAID 1	1.000	cwj_h	--	--	--	n/a	
cwj-qa.0	s324	QA	Normal	Base	Thin	RAID 1	1.000	--	--	--	--	n/a	
cwj-qa.1	s324	QA	Normal	Base	Thin	RAID 1	1.000	--	--	--	--	n/a	
cwj_pm600.0	s324	--	Normal	Base	Thin	RAID 1	1.000	cwj_h	--	--	--	n/a	
cwj_pm600.1	s324	--	Normal	Base	Thin	RAID 1	1.000	--	--	--	--	n/a	
cwj_pm600.2	s324	--	Normal	Base	Thin	RAID 1	1.000	cwj_h	--	--	--	n/a	
cwj_pm600.3	s324	--	Normal	Base	Thin	RAID 1	1.000	cwj_h	--	--	--	n/a	
cwj_pm600.4	s324	--	Normal	Base	Thin	RAID 1	1.000	cwj_h	--	--	--	n/a	
							538.000						

The following information is displayed:

Column	Description
<b>Name</b>	The volume name. Volume tree depth in parenthesis.
<b>System</b>	The storage system to which the virtual volume belongs.
<b>Domain</b>	The domain to which the virtual volume belongs.
<b>State</b>	The state of the system.
<b>Type</b>	Indicates if the volume is a base volume, physical copy, or virtual copy.
<b>Provisioning</b>	Indicates if the volume is fully (Full) or thinly provisioned (TPVV).
<b>RAID</b>	The volume's RAID type.
<b>Virtual Size</b>	The size of the volume in GiB.
<b>Exported To</b>	The host to which the volume is exported. A red entry indicates an inactive VLUN. A blue entry indicates an active VLUN.
<b>RC Status</b>	The volume's Remote Copy status.
<b>RC Group</b>	The Remote Copy group to which the volume belongs.
<b>Writable LUNs</b>	Writable LUNs, if any.

## Displaying Space History Information

To view Space History information, select **Space History** from the filtering list.



Name	Domain	State	Type	Provisioning	Creation Date	Retention Time	Expiration Time	Copy Space Calculation Date	Comments
cls_109.0	--	Normal	Base	Thin	Aug 21, 2012 17:05:09 PDT	--	--	--	--
cls_109.1	--	Normal	Base	Thin	Aug 21, 2012 17:05:10 PDT	--	--	--	--
cls_109.2	--	Normal	Base	Thin	Aug 21, 2012 17:05:10 PDT	--	--	--	--
cls_109.3	--	Normal	Base	Thin	Aug 21, 2012 17:05:10 PDT	--	--	--	--
cls_109.4	--	Normal	Base	Thin	Aug 21, 2012 17:05:11 PDT	--	--	--	--
cls_109.5	--	Normal	Base	Thin	Aug 21, 2012 17:05:11 PDT	--	--	--	--

The following information is displayed:

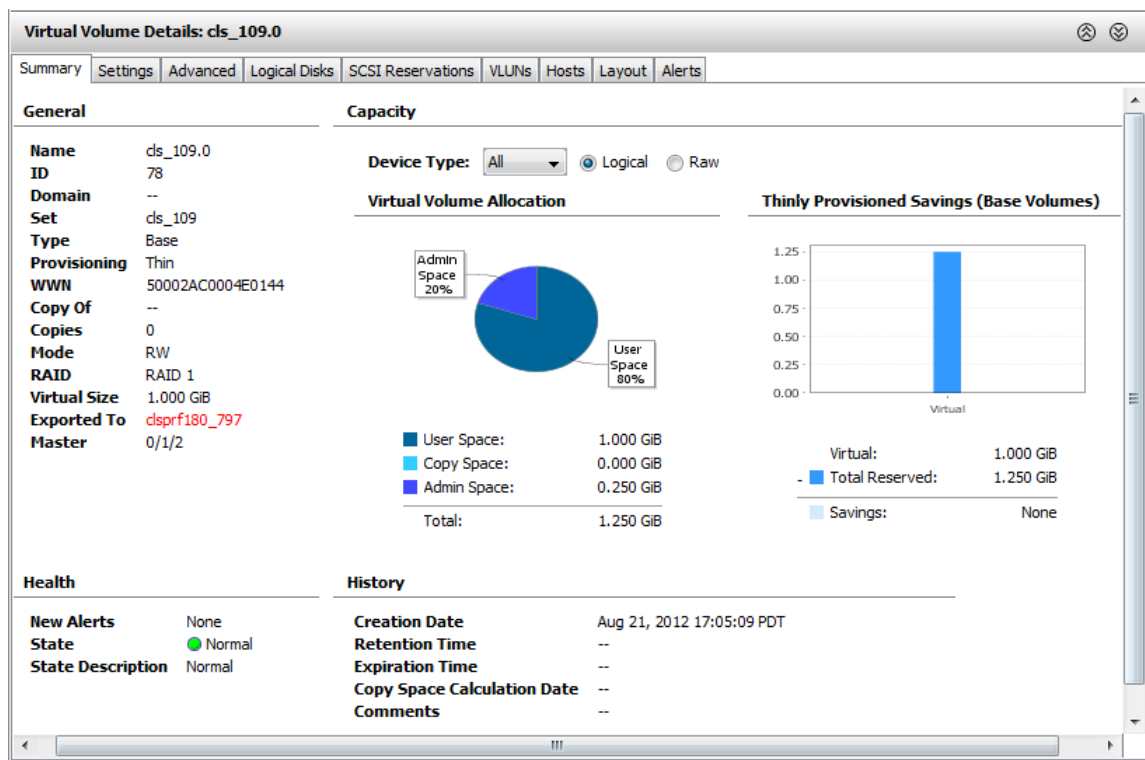
Column	Description
Name	The volume name. Volume tree depth in parenthesis.
State	The state of the system.
Type	Indicates if the volume is a base volume, physical copy, or virtual copy.
Provisioning	Indicates if the volume is fully (Full) or thinly provisioned (TPVV).
Grown User Space	The size of user space the virtual volume has grown in GiB.
Grown Copy Space	The size of copy space the virtual volume has grown in GiB.
Reclaimed User Space	The size of user space the virtual volume has reclaimed in GiB.
Reclaimed Copy Space	The size of copy space the virtual volume has reclaimed in GiB.

## Detail Pane

The detail pane displays detailed information about a single virtual volume selected from the list pane. The detail pane displays information on four tabs: “[Summary Tab](#)” (page 159), “[Settings Tab](#)” (page 160), “[Advanced Tab](#)” (page 162), “[SCSI Reservations Tab](#)” (page 163), “[VLUNs Tab](#)” (page 164), “[Hosts Tab](#)” (page 167), “[Layout Tab](#)” (page 167), and “[Alerts Tab](#)” (page 168).

**NOTE:** The **Advanced**, **Logical Disks**, **Layout**, and **SCSI Reservations** tabs are advanced features and are only displayed if they have been set to display in your preferences. See “[Setting Global Preferences](#)” (page 412).

## Summary Tab



The following information is displayed in the detail pane's **Summary** tab:

Group	Field	Description
General	Name	The virtual volume's name.
	ID	The virtual volume ID.
	Domain	The domain in which the volume resides.
	Set	The name of the volume set to which the volume belongs.
	Type	The type of volume (Base, Physical Copy, Virtual Copy).
	Provisioning	Indicates if the selected volume is fully provisioned or a thinly provisioned virtual volume.
	WWN	The volume's World Wide Name (WWN).
	Copy Of	The volume from which the selected volume was copied.
	Copies	The number of copies of the selected volume.
	Mode	Indicates if the volume is read-only (RO) or read-write (RW).
	RAID	The volume's RAID type.
	Virtual Size	The size of the volume (in GiB).
	Exported To	The host on which the volume is exported.
	Master	Specifies the owning node.
Health	New Alerts	The number of new virtual volume alerts.
	State	The current state of the virtual volume. See <a href="#">"Alert Severity Indicators"</a> (page 406).
	State Description	Description of the virtual volume's state.

Group	Field	Description
Capacity	Device Type	Select the device type, Fast Class (FC), Near Line (NL), or Solid State Device (SSD). The capacity and capacity usage of the selected device type is displayed in graphical form.
	Logical	Select to display logical capacity.
	Raw	Select to display raw capacity.
Virtual Volume Allocation	Displays the allocation of the volume's admin, copy, and user space.	
Thinly Provisioned Savings (Base Volumes)	Displays the amount of space saved through thinly provisioned virtual volumes.	
History	Creation Date	The volume's creation date.
	Retention Time	The volume's retention time, if any.
	Expiration Time	The volume's expiration date, if any.
	Copy Space Calculation Date	The date on which the volume's copy space was calculated.
	Comments	Any comments about the volume.
Remote Copy (displayed only for RC volumes)	RC Status	The volume's Remote Copy status.
	RC Group	The Remote Copy group to which the volume belongs.
	Sync State	The sync state of the remote copy (e.g., Synced, Stopped).
	Writable LUNs	Indicates if the LUN is writable from the host.

## Settings Tab

User Space Provisioning		Copy Space Provisioning	
Provisioning	Thinly Provisioned	Provisioning	Provisioned from CPG
CPG	cpq_sqa_01	CPG	cpq_sqa_02
Allocation Warning	90%	Allocation Warning	<disabled>
Allocation Limit	<disabled>	Allocation Limit	<disabled>
User Space Allocation		Copy Space Allocation	Admin Space Allocation
Device Type	FC	Device Type	FC
Device RPM	10 K	Device RPM	10 K
RAID Type	RAID 6	RAID Type	RAID 1
Configured Availability	Cage	Configured Availability	Cage
Availability	Port	Availability	Port
Set Size	8	Set Size	3
Step Size	64 KIB	Step Size	256 KIB

The following information is displayed in the detail pane's **Settings** tab:

Group	Field	Description
User Space Provisioning	Provisioning	Indicates if the selected volume is fully provisioned or a thinly provisioned virtual volume.
	CPG	The name of the Common Provisioning Group (CPG) from which user space is provisioned.
	Allocation Warning	If enabled, the allocation warning percentage.
	Allocation Limit	If enabled, the allocation limit.

Group	Field	Description
User Space Allocation	Device Type	The disk type, Fast Class (FC), Nearline (NL), or Solid State (SSD).
	Device RPM	The speed of the disk.
	<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
	RAID Type	The RAID type of the disk.
	Configured Availability	The availability characteristics.
	Availability	The level of failure tolerance for this volume: <b>&lt;System Default&gt;</b> , <b>Cage</b> , <b>Port</b> , or <b>Magazine</b> .
	Set Size	The set size.
Copy Space Provisioning	Step Size	The number of contiguous bytes in KB.
	Provisioning	Indicates if the selected volume is fully provisioned or a thinly provisioned virtual volume.
	CPG	The name of the Common Provisioning Group (CPG) from which user space is provisioned.
	Allocation Warning	If enabled, the allocation warning percentage.
Copy Space Allocation	Allocation Limit	If enabled, the allocation limit.
	Device Type	The disk type, Fast Class (FC), Nearline (NL), or Solid State (SSD).
	Device RPM	The speed of the disk.
	<b>NOTE:</b> The Device RPM number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
	RAID Type	The RAID type of the disk.
	Configured Availability	The availability characteristics.
	Availability	The level of failure tolerance for this volume: <b>&lt;System Default&gt;</b> , <b>Cage</b> , <b>Port</b> , or <b>Magazine</b> .
	Set Size	The set size.
	Step Size	The number of contiguous bytes in KB.
Admin Space Allocation	Device Type	The disk type, Fibre Channel (FC), Nearline (NL), or Solid State (SSD).
	Device RPM	The speed of the disk.

Group	Field	Description
	<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
	<b>RAID Type</b>	The RAID type of the disk.
	<b>Configured Availability</b>	The availability characteristics.
	<b>Availability</b>	The availability of Disk, Port, Cage, or Mag.
	<b>Set Size</b>	The set size.
	<b>Step Size</b>	The number of contiguous bytes in KB.

## Advanced Tab

Virtual Volume Details: vv.s.2					
Summary   Settings   <b>Advanced</b>   Logical Disks   SCSI Reservations   VLUNs   Hosts   Layout   Alerts					
Policies		Geometry		Zones	
System Volume	No	Sectors Per Track	304	Copy	4
Allow stale snapshots	Yes	Heads Per Cylinder	8	Free Copy	4
Restrict export to one host	No	Sector Size	512	Admin	4
Zero-fill on partially written data pages	Yes			Free Admin	4
Zero detect	No				
Caching Enabled	Yes				

The following information is displayed in the detail pane's **Advanced** tab:

Group	Field	Description
<b>Policies</b>	<b>System Volume</b>	Indicates if the volume is a system volume.
	<b>Allow stale snapshots</b>	Indicates if stale snapshots are allowed.
	<b>Restrict export to one host</b>	Indicates if exporting is restricted to only one host.
	<b>Zero-fill on partially written data pages</b>	Indicates if the zero-fill on partially written data pages policy is enabled.
	<b>Caching Enabled</b>	Indicates if read/write caching and read ahead has been enabled.
<b>Geometry</b>	<b>Sectors Per Track</b>	The number of sectors per track.
	<b>Heads Per Cylinder</b>	The number of heads per cylinder.
	<b>Sector Size</b>	The size of each sector in MB.
<b>Zones</b>	<b>Copy</b>	The number of copy zones.
	<b>Free Copy</b>	The number of free copy zones.
	<b>Admin</b>	The number of admin space zones.
	<b>Free Admin</b>	The number of free admin space zones.

## Logical Disks Tab

Virtual Volume Details: vv\_sqa\_71.3

Summary | Settings | Advanced | Logical Disks | SCSI Reservations | VLUUs | Hosts | Layout | Alerts

Default 6 objects Filter Clear <Any column> contains: Clear

Name	Domain	State	Device Type	Device RPM (K)	RAID	Total Capacity (GiB)	Used Capacity (GiB)	Raw Capacity (GiB)	Write Through	Mapped to VV	Usage	Owner
tp-3-sa-0.0	SQA	Normal	FC	10	RAID 1	4.000	0.250	12.000	No	Yes	CPG Admin	0/1/2/3
tp-3-sa-0.1	SQA	Normal	FC	10	RAID 1	4.000	0.250	12.000	No	Yes	CPG Admin	1/0/3/2
tp-3-sd-0.0	SQA	Normal	FC	10	RAID 5	15.750	1.500	21.000	No	Yes	CPG Data	0/1/2/3
tp-3-sd-0.1	SQA	Normal	FC	10	RAID 5	6.000	1.500	8.000	No	Yes	CPG Data	1/0/3/2
vv_sqa_7...	SQA	Normal	FC	10	RAID 6	1.500	1.000	2.000	No	Yes	CPG User	0/1/2/3
vv_sqa_7...	SQA	Normal	FC	10	RAID 6	1.500	1.000	2.000	No	Yes	CPG User	1/0/3/2
						32.750	5.500	57.000				

The following information appears in the detail pane's **Logical Disks** tab:

Column	Description
<b>Name</b>	The name of the logical disk.
<b>Domain</b>	The domain in which the logical disk resides.
<b>State</b>	The current state of the logical disk. See <a href="#">"System and Component Status Icons"</a> (page 407).
<b>Device Type</b>	The disk type, Fast Class (FC), Nearline (NL), or Solid State (SSD).
<b>Device RPM</b>	The speed of the disk in K RPM.
<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
<b>RAID</b>	The logical disk's RAID type.
<b>Total Capacity</b>	The total usable logical disk size in GiB.
<b>Used Capacity</b>	The amount of logical disk space used in GiB.
<b>Raw Capacity</b>	The total amount of usable disk space in GiB.
<b>Write Through</b>	Indicates if the logical disk is in write-through mode.
<b>Mapped to VV</b>	Indicates if the logical disk is mapped to a virtual volume.
<b>Usage</b>	Indicates the purpose for which the logical disk is used.
<b>Owner</b>	Specifies the owning nodes.

## SCSI Reservations Tab

The **SCSI Reservations** tab provides two sub-tabs, **SCSI-2 Reservations** and **SCSI-3 Reservations**.

### SCSI-2 Reservations Tab

SCSI-2 Reservations | SCSI-3 Reservations

Get Data Last Retrieval:

Default 0 objects Filter Clear <Any column> contains: Clear

Domain	Virtual Volume	Host	Port	Owner	Third Party	Third Party WWN

The following information is displayed in the **SCSI-2 Reservations** tab (click the **Get Data** button to retrieve data):

Column	Description
<b>Domain</b>	The domain to which the virtual volume belongs.
<b>Virtual Volume</b>	The name of the virtual volume.
<b>Host</b>	The name of the host with the SCSI-2 reservation.
<b>Port</b>	The port that received the SCSI-2 reservation.
<b>Owner</b>	Specifies the owning nodes.
<b>Third Party</b>	Indicates whether the SCSI reservation is a third party reservation.
<b>Third Party WWN</b>	The WWN of the initiator that has a third party reservation.

## SCSI-3 Reservations Tab

Domain	Virtual Volume	Host	Port	Owner	Reservation Key	Type	Persistent	Generation
domain1	testvv	tewst	--	210100E08B24C750	00000000000000123	Registration	--	--
domain1	testvv	tewst	--	210100E08B24C750	00000000000000123	Write Exclusive - Registrants Only	No	1

The following information is displayed in the **SCSI-3 Reservations** tab (Click the **Get Data** button to retrieve data):

Column	Description
<b>Domain</b>	The domain to which the virtual volume belongs.
<b>Virtual Volume</b>	The name of the virtual volume.
<b>Host</b>	The name of the host with the SCSI-3 reservation.
<b>Port</b>	The port with the SCSI-3 reservation.
<b>Owner</b>	Specifies the owning nodes.
<b>Reservation Key</b>	The service action reservation key.
<b>Type</b>	The persistent reservation type.
<b>Persistent</b>	Whether the reservation type is persistent.
<b>Generation</b>	the generation number of the most recent reservation.

## VLUNs Tab

The detail pane's **VLUNs** tab provides three sub-tabs, **VLUN Templates**, **Active LUNs**, and **Path Summary**.





## VLUN Templates Tab

Virtual Volume Details: dom1\_vv1

SummarySettingsAdvancedLogical DisksSCSI ReservationsVLUNsHostsLayoutAlerts

VLUN TemplatesActive VLUNsPath Summary



Default1 objectFilterClear

LUN	Domain	Virtual Volume	RAID Type	Host	Port (Node:Slot:Port)	Type	Active VLUNs
1	vvol_dom1	dom1_vv1	RAID 1	PE2950-19	--	Host Sees	2

The following information is displayed in the **VLUNs Templates** tab:

Column	Description
<b>LUN</b>	The exported Logical Unit Number (LUN) value.
<b>Domain</b>	The domain in which the VLUN resides.
<b>Virtual Volume</b>	The name of the exported virtual volume.
<b>RAID Type</b>	The VLUN RAID type.
<b>Host</b>	The name of the host to which the VLUN is exported.
<b>Port</b>	The system port on which the VLUN is exported (in Node:Slot:Port format).
<b>Type</b>	The VLUN type: Host Sees, Host In Set, or Matched Set.
<b>Active LUNs</b>	The number of active LUNs.

## Active LUNs Tab

Virtual Volume Details: dom1\_vv1

Summary

Settings

Advanced

Logical Disks

SCSI Reservations

VLUNs

Hosts

Layout

Alerts

VLUN Templates

Active VLUNs

Path Summary

Summary

2 objects

Filter

Clear

Any column contains:

Clear

LUN	Domain	Virtual Volume	RAID Type	Host	Port (Node:Slot:Port)	WWN/SCSI Name	Exported Size (GiB)	Type
1	vvol_dom1	dom1_vv1	RAID 1	PE2950-19	1:5:1	2100001B328B8FC3	30.000	Host Sees
1	vvol_dom1	dom1_vv1	RAID 1	PE2950-19	0:5:1	2100001B328B8FC3	30.000	Host Sees
							60.000	

The following information is displayed in the **Active VLUNs** tab:

Column	Description
<b>LUN</b>	The exported Logical Unit Number (LUN) value.
<b>Domain</b>	The domain in which the VLUN resides.
<b>Virtual Volume</b>	The name of the exported virtual volume.
<b>RAID Type</b>	The logical disk's RAID type.

Column	Description
<b>Host</b>	The name of the host to which the VLUN is exported.
<b>Port</b>	The Storage Server port on which the VLUN is exported.
<b>WWN/iSCSI Name</b>	The WWN or iSCSI name of the port.
<b>Exported Size</b>	The VLUN's exported size (in GiB).
<b>Type</b>	The VLUN type: Host Sees, Host In Set, or Matched Set.

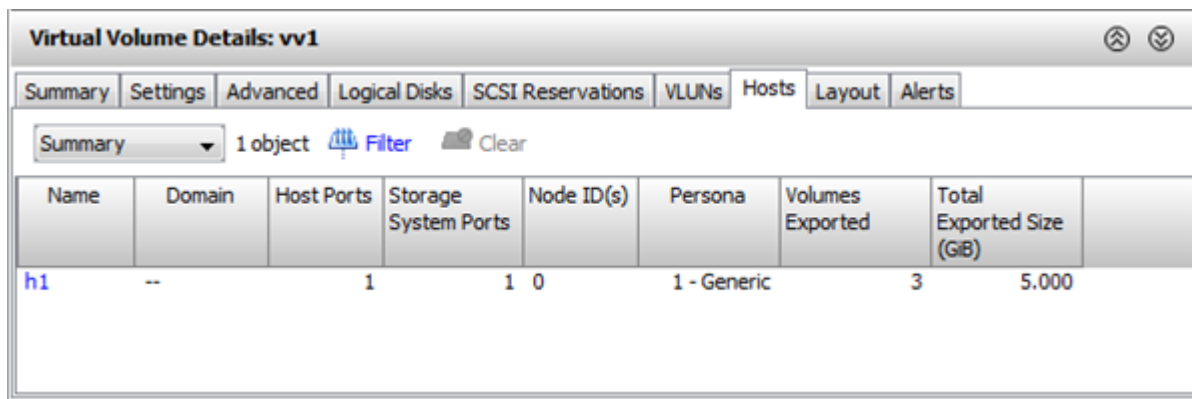
## Path Summary Tab

Summary   Settings   Advanced   Logical Disks   SCSI Reservations   <b>VLUNs</b>   Hosts   Layout   Alerts											
VLUN Templates   Active VLUNs   <b>Path Summary</b>											
Default ▼ 1 object Filter Clear Any column contains: ▼ Clear											
LUN	Virtual Volume	Host	Host Ports	Inactive Ports	Storage System Ports	Available Paths	Healthy Paths	Multipath	Failed Path Policy	Monitoring Interval	Host Device Name
1	dom1_vv1	PE2950-19	1	0	2	2	0	Unknown	Unknown	0	--

The following information is displayed in the **Path Summary** tab:

Column	Description
<b>LUN</b>	The exported Logical Unit Number (LUN) value.
<b>Virtual Volume</b>	The name of the exported virtual volume.
<b>Host</b>	The name of the host to which the VLUN is exported.
<b>Host Ports</b>	The number of host WWNs visible to the Storage Server.
<b>Inactive Ports</b>	WWNs reported by the host, but not visible to the Storage Server.
<b>Storage System Ports</b>	The number of system ports that can see the host.
<b>Available Paths</b>	The total number of distinct, available paths between the host and the system.
<b>Healthy Paths</b>	The number of paths seen by the system reported good by the host.
<b>Multipath</b>	The used multi-pathing method.
<b>Failed Path Policy</b>	The failed path monitoring method.
<b>Monitoring Interval</b>	The monitoring interval in seconds after which the host checks for failed paths.
<b>Host Device Name</b>	The device name for the selected VLUN on the host.

## Hosts Tab



Name	Domain	Host Ports	Storage System Ports	Node ID(s)	Persona	Volumes Exported	Total Exported Size (GiB)
h1	--	1	1	0	1 - Generic	3	5.000

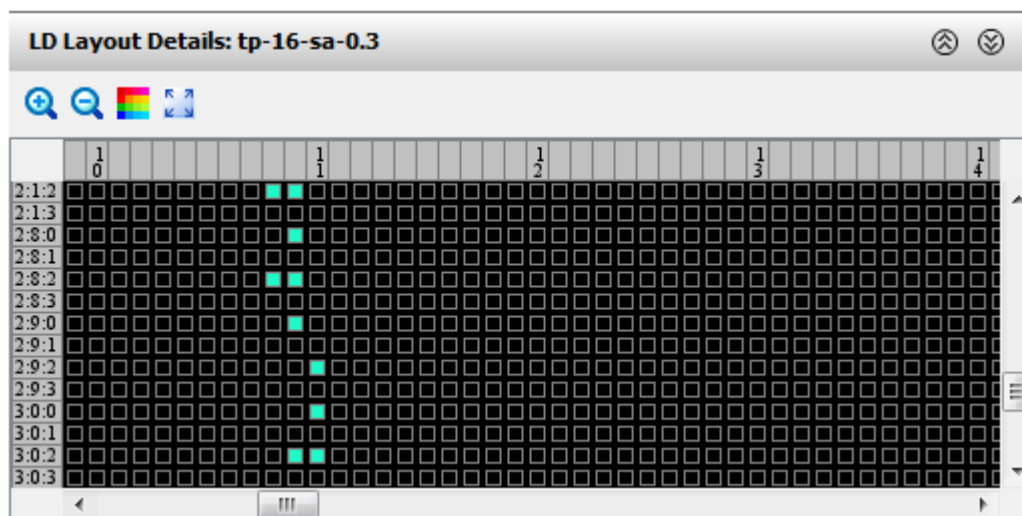
The following information is displayed:

Column	Description
Name	The volume name.
Domain	The domain the host is connected to.
Host Ports	The number of ports the host is connected to.
Storage System Ports	The number of ports on the system the host is connected to.
Node ID(s)	The node ID of the system connected to the host.
Persona	Indicates the persona setting for the host.
Volumes Exported	Indicates the number of virtual volumes that have been exported.
Total Exported Size	Indicates the total size of all virtual volumes exported (in GiB).

## Layout Tab

The **Layout** tab shows a visual representation of how chunklets are used by the selected logical disk.

**NOTE:** The **Layout** tab only appears if you have set your preferences in the HP 3PAR Management Console to show the provisioning layout tab. See [“Setting Global Preferences” \(page 412\)](#).



	1/0	1/1	1/2	1/3	1/4
2:1:2					
2:1:3					
2:8:0					
2:8:1					
2:8:2					
2:8:3					
2:9:0					
2:9:1					
2:9:2					
2:9:3					
3:0:0					
3:0:1					
3:0:2					
3:0:3					

## Alerts Tab

The **Alerts** tab displays a table containing alert information for a single volume selected from the list pane. The information displayed is identical to the information displayed in system alerts table. See [“Viewing System Alerts” \(page 269\)](#) and [“Viewing the Virtual Volumes Alerts Tab” \(page 168\)](#) for additional information.

## Viewing the CPG Space Tab

To view the **CPG Space** Tab:

1. Access the virtual volumes screen.
2. In the Management Window, click the **CPG Space** tab.

The **CPG Space** window is divided into a list pane and a detail pane.

The list pane displays the following information:

Column	Description
<b>Name</b>	The name of the volume.
<b>Domain</b>	The domain to which the volume belongs (if any).
<b>State</b>	The state of the system. See <a href="#">“System and Component Status Icons” (page 407)</a> .
<b>Type</b>	The volume type (e.g., Base).
<b>Provisioning</b>	Indicates if the volume is fully (Full) or thinly provisioned (TPVV).
<b>CPGs</b>	The CPG(s) to which the volume belongs.
<b>User Space</b>	The amount of space (in GiB) being used by the volume for user space.
<b>Copy Space</b>	The amount of space (in GiB) being used by the volume for copy space.
<b>New User Size</b>	The new user size if regions have been moved from one CPG to another.
<b>New Copy Size</b>	The new copy size if regions have been moved from one CPG to another.

Selecting a volume will display details in the detail pane. The available tabs are identical to those for the Virtual Volumes detail pane. For more information, see, [“Summary Tab” \(page 159\)](#), [“Settings Tab” \(page 160\)](#), [“Hosts Tab” \(page 167\)](#), and [“Alerts Tab” \(page 168\)](#).

## Viewing the Virtual Volumes Alerts Tab

To view the virtual volume Alerts tab:

1. Access the virtual volume screen.
2. In the Management Window, click the **Alerts** tab.

The **Alerts** tab displays virtual volume-related alerts for the system. The information displayed in the provisioning **Alerts** tab is identical to the information contained in the systems **Alerts** tab (see [“Viewing System Alerts” \(page 269\)](#)).

---

## 12 Managing VLUNs

When working with VLUNs, the following actions are available:

[“Exporting VLUNs” \(page 169\)](#)

[“Removing VLUNs” \(page 169\)](#)

[“Viewing VLUNs” \(page 169\)](#)

### Exporting VLUNs

To export a VLUN:

1. In the Manager Pane, click **Provisioning**.
2. In the Common Actions Panel, click **Export Volume**.

The **Export Virtual Volume** wizard appears.

### Export

1. In the **General** group box:
  - a. **System** - Select a system from the list.
  - b. **Domain** - Select a domain from the list. If not applicable, select **<none>**.
2. In the Virtual Volume group box:
  - a. Select either **Virtual Volume** or **Virtual Volume Set**.
  - b. From the virtual volume or virtual volume set list, select the volume(s) to export.
3. In the **Export To** group box:
  - a. Select either **Host (Host Sees)** or **Host Set (Host in Set)**.
  - b. From the host or host set list, select the host(s) you wish to export the virtual volumes to.
4. Click **Next** to go to the Summary page, or click Finish to complete the wizard.

### Summary

Review the summary information, then click **Finish**.

### Removing VLUNs

To remove a VLUN follow the instructions in [“Unexporting Virtual Volumes” \(page 150\)](#).

### Viewing VLUNs

To view system VLUNs:

1. In the Manager Pane, click **Provisioning**.
2. In the Management Tree, click **VLUNs** under the system node you wish to view.

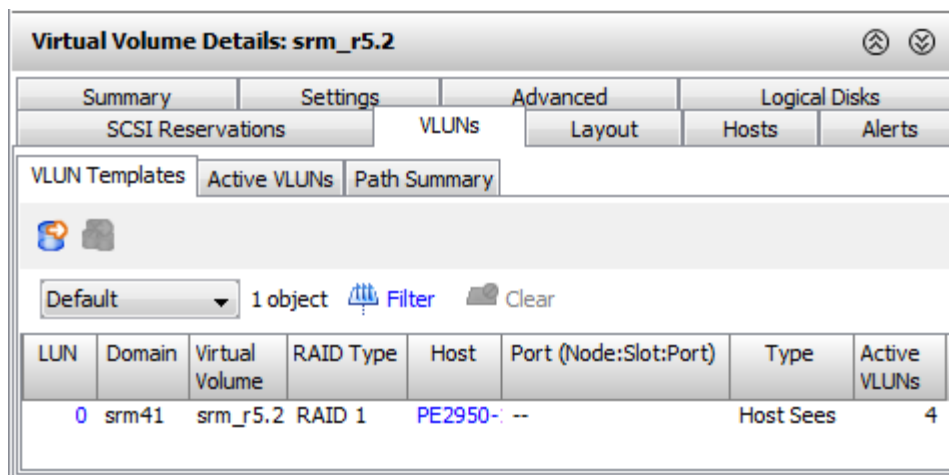
The VLUNs screen provides VLUN information on three tabs: [“VLUN Templates Tab” \(page 99\)](#), [“Active VLUNs Tab” \(page 99\)](#), and [“Path Summary Tab” \(page 100\)](#).

---

**NOTE:** In addition to providing comprehensive information about a system's VLUNs, the HP 3PAR Management Console also allows you to access the same type of information for Remote Copy VLUNs by selecting the **Remote Copy** child node under the **VLUNs** node in the Management Tree.

---

## VLUN Templates Tab



The **VLUN Templates** tab is split into a list pane and a detail pane. The list pane displays summary information about system VLUN templates. The detail pane displays active VLUN information about a selected template from the list pane.

### List Pane

The following information is displayed in the list pane:

Column	Description
<b>LUN</b>	The exported Logical Unit Number (LUN) value.
<b>Domain</b>	The domain in which the VLUN template resides.
<b>Virtual Volume</b>	The name of the virtual volume.
<b>RAID Type</b>	The VLUN RAID type.
<b>Host</b>	The name of the host to which the VLUN is exported.
<b>Port</b>	The system port on which the VLUN is exported.
<b>Host WWN/iSCSI Name</b>	The WWN or iSCSI name of the host.
<b>Exported Size</b>	The VLUN's exported size in GiB.
<b>Type</b>	The VLUN type, Host Sees, Host In Set, or Matched Set.
<b>Active VLUNs</b>	The number of active VLUNs.

### Detail Pane

The detail pane displays Active VLUNs for the selected template. See the [“Active VLUNs Tab”](#) (page 170) for details.

## Active VLUNs Tab

The **Active VLUNs** tab can be filtered to display Summary information and Remote Copy information.

## Displaying Summary Information

LUN	Domain	Virtual Volume	RAID Type	Host	Port (Node:Slot:Port)	WWN/iSCSI Name	Exported Size (GiB)	Type
0	srm41	srm_r5.2	RAID 1	PE2950-17	0:5:1	10000000C97D6613	20.000	Host Sees
0	srm41	srm_r5.2	RAID 1	PE2950-17	0:5:1	10000000C97D6614	20.000	Host Sees
0	srm41	srm_r5.2	RAID 1	PE2950-17	1:5:1	10000000C97D6613	20.000	Host Sees
0	srm41	srm_r5.2	RAID 1	PE2950-17	1:5:1	10000000C97D6614	20.000	Host Sees
							80.000	

The following information is displayed on the **Active VLUNs** tab:

Column	Description
<b>LUN</b>	The exported Logical Unit Number (LUN) value.
<b>Domain</b>	The domain (if any) to which the LUN belongs.
<b>Virtual Volume</b>	The name of the virtual volume.
<b>RAID Type</b>	The VLUN RAID type.
<b>Host</b>	The name of the host to which the VLUN is exported.
<b>Port</b>	The system port on which the VLUN is exported, in Node:Slot:Port format.
<b>WWN/iSCSI Name</b>	The WWN or iSCSI name of the host.
<b>Exported Size</b>	The VLUN's exported size in GiB.
<b>Type</b>	The VLUN type, Host Sees, Host In Set, Matched Set, or Port Presents.

## Displaying Remote Copy Information

LUN	Domain	Virtual Volume	RAID Type	Host	Port (Node:Slot:Port)	WWN/iSCSI Name	Exported Size (GiB)	Type	RC Status	RC Group	Writable LUNs
0	srm41	srm_r5.2	RAID 1	PE2950-17	0:5:1	10000000C97D6613	20.000	Host Sees	Primary	RCG_P1.2.r89	RW
0	srm41	srm_r5.2	RAID 1	PE2950-17	0:5:1	10000000C97D6614	20.000	Host Sees	Primary	RCG_P1.2.r89	RW
0	srm41	srm_r5.2	RAID 1	PE2950-17	1:5:1	10000000C97D6613	20.000	Host Sees	Primary	RCG_P1.2.r89	RW
0	srm41	srm_r5.2	RAID 1	PE2950-17	1:5:1	10000000C97D6614	20.000	Host Sees	Primary	RCG_P1.2.r89	RW
							80.000				

The following information is displayed on the **Active VLUNs** tab for Remote Copy information:

Column	Description
<b>System Name</b>	The name of the system.
<b>LUN</b>	The exported Logical Unit Number (LUN) value.
<b>Virtual Volume</b>	The name of the virtual volume.

Column	Description
<b>RAID Type</b>	The VLUN RAID type.
<b>Host</b>	The name of the host to which the VLUN is exported.
<b>Port</b>	The system port on which the VLUN is exported, in Node:Slot:Port format.
<b>Host WWN/iSCSI Name</b>	The WWN or iSCSI name of the host.
<b>Exported Size</b>	The VLUN's exported size in GiB.
<b>Type</b>	The VLUN type, Host Sees, Host In Set, or Matched Set.
<b>RC Status</b>	The Remote Copy Status
<b>RC Group</b>	The exported Remote Copy group.
<b>Writable LUNs</b>	The number of writable LUNs.

## Path Summary Tab

**NOTE:** Paths information is available for display for systems using HP 3PAR OS version 2.3.1 and later.

Virtual Volume Details: srm_r5.2											
Summary Settings Advanced Logical Disks SCSI Reservations VLUNs Layout Hosts Alerts											
VLUN Templates Active VLUNs Path Summary											
Default 1 object Filter Clear Any column contains: Clear											
LUN	Virtual Volume	Host	Host Ports	Inactive Ports	Storage System Ports	Available Paths	Healthy Paths	Multipath	Failed Path Policy	Monitoring Interval	Host Device Name
0	srm_r5.2	PE2950-17	2	0	2	4	0	Unknown	Unknown	0	--

The following information is displayed in the **Path Summary** tab:

Column	Description
<b>LUN</b>	The exported Logical Unit Number (LUN) value.
<b>Virtual Volume</b>	The name of the exported virtual volume. Each entry is a link to the Virtual Volumes tab.
<b>Host</b>	The name of the host to which the VLUN is exported. Each entry is a link to the Hosts tab.
<b>Host Ports</b>	The number of host WWNs visible to the system.
<b>Inactive Ports</b>	WWNs reported by the host, but not visible to the system.
<b>Storage System Ports</b>	The number of system ports that can see the host.
<b>Available Paths</b>	The total number of distinct, available paths between the host and the system.
<b>Healthy Paths</b>	The number of paths seen by the system reported good by the host.
<b>Multipath</b>	The used multi-pathing method.
<b>Failed Path Policy</b>	The failed path monitoring method.
<b>Monitoring Interval</b>	The monitoring interval in seconds after which the host checks for failed paths.
<b>Host Device Name</b>	The device name for the selected VLUN on the host.



## Managing AO Configuration

Adaptive Optimization (AO) makes it possible to perform cost and performance optimization by migrating busy regions to higher performance storage (e.g. RAID 1 on SSDs), and moving infrequently accessed regions to lower performance storage (e.g. RAID 6 on NL disks).

For storage systems which support the adaptive optimization feature, an AO Configurations node will appear in the Management Tree for both the Storage Systems and Domains tree nodes.

**NOTE:** An AO license is required in order to perform the actual tuning and optimization. If no AO license is present on the array, only an analysis of potential optimization can be performed.

The AO Configuration wizard is available through the Provisioning Manager. It allows you to create, edit, delete, start, and schedule AO configurations.

[“Creating an AO Configuration” \(page 173\)](#)

[“Editing an AO Configuration” \(page 175\)](#)

[“Deleting AO Configurations” \(page 175\)](#)

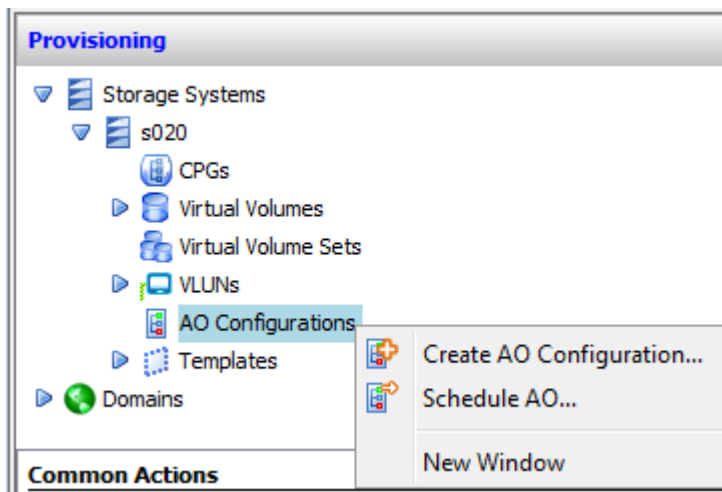
[“Starting an AO Configuration” \(page 175\)](#)

[“Viewing an AO Configuration” \(page 175\)](#)

## Creating an AO Configuration

To create an AO Configuration:

1. While in the Provisioning Manager, expand the arrow next to the name of the system on which you wish to create the configuration.
2. In the Management Tree, right-click on **AO Configurations**.



3. From the menu list, select **Create AO Configuration**.  
The **Create AO Configuration** wizard appears.

### General

1. Select the name of the **System** on which AO will be configured.
2. Select the **Domain** (if any) to which the CPGs to be tiered belong.
3. Enter a **Name** for the AO Configuration.

4. Select a performance **Mode** from the list. The options are as follows:
  - **Performance** – Moves more data to the high-performance tier.
  - **Balanced** – Moves data such that performance and cost are balanced.
  - **Cost** – Moves more data to the low-performance, less expensive tier.
5. In the Tier CPGs group box, select at least two CPGs to tier from the lists provided. Only CPGs in the selected domain that are not used in any other AO configuration will be displayed.
  - **Tier 0** – High-performance tier. Select a high-performance frequently accessed CPG, such as a RAID 1 SSD disk.
  - **Tier 1** – Mid-performance tier. Select a medium-performing CPG, such as RAID 1 FC disk.
  - **Tier 2** – Low performance tier. Select a low-performing, infrequently accessed CPG, such as a RAID 5 NL disk.
6. Click **Next** to go to the Schedule AO page.

## Schedule AO

1. If you wish to start or schedule the AO configuration at this time, select the **Start or schedule AO configuration** checkbox. Otherwise, click **Next** to go to the Summary page.
2. Select **Run Now** to start the data optimization process (or the analysis of potential optimization), or select **Create Schedule** to schedule the data optimization process (or analysis) for a later time.
3. In the General groupbox, select the **System** on which you're creating the schedule.
4. Select the **Domain** (if any) on which the AO configuration resides.
5. Select the **AO Configuration** to schedule.
6. In the Settings groupbox, select a **Max Run Time** from the list. This value is the time frame within which the system can move data regions each time the configuration executes. If the data-movement process is projected to run longer than the specified max run time, the system limits the amount of data to move. If the process runs longer than the specified max run time, the system stops data movement as soon after the time limit as possible and still maintain data integrity.
7. If you wish to analyze the potential data region movement without running the AO configuration, select **Analyze Only**.

---

**NOTE:** An AO license is required in order to perform the actual tuning and optimization. If no AO license is present on the array, only an analysis of potential optimization can be performed.

---

8. In the Measurement Interval groupbox, enter the **Start** time to begin analyzing the tiered CPGs. The analysis will begin the specified number of hours or days prior to the scheduled AO configuration. To determine an appropriate number of hours, consider the amount of time the performance of the tiered CPGs is important; for example, 3 hours at the end of each business day
9. Enter the time to **End** analyzing the tiered CPGs. The analysis will end the specified number of hours or days prior to the scheduled AO configuration.
10. If you selected Create Schedule:
  - a. In the Schedule groupbox, enter a **Name** for the schedule.
  - b. If you wish to be alerted if the task fails, select **Generate alert if task fails**.
  - c. Select the recurrence schedule as shown in ["The Common Schedule Panel"](#) (page 349).
11. Click **Next** to go to the Summary page.

## Summary

Review the summary information, then click **Finish**.

## Editing an AO Configuration

To edit an existing AO configuration:

1. Access the **AO Configurations** tab in the Management Window.
2. Right-click on the name of the AO configuration you wish to edit. then select **Edit** from the menu list.

The **Edit AO Configuration** dialog box appears.

3. You may change the Name, Mode, and/or up to two CPGs.

---

**NOTE:** Data moves resulting from your configuration changes can impact performance.

---

4. Click **OK** to accept the changes.

## Deleting AO Configurations

To delete an AO configuration:

1. Access the **AO Configurations** tab in the Management Window.
2. Right-click on the name of the AO configuration you wish to delete. then select **Remove** from the menu list. All schedules associated with this AO configuration will also be removed.

The **Remove AO Configuration(s)** confirmation dialog will appear.

3. Click **OK**.

## Starting an AO Configuration

To start an AO configuration, follow the instructions in [“Schedule AO” \(page 354\)](#), select **Run Now**, then enter the **Measurement Duration**.

## Viewing an AO Configuration

To view an AO Configuration:

1. Click on the **Provisioning Manager** in the Manager pane.
2. In the Management Tree, expand the name of the storage system containing the AO configuration you wish to view.
3. In the Management Tree, click on AO configurations.
4. The AO configurations window appears with the following tabs:

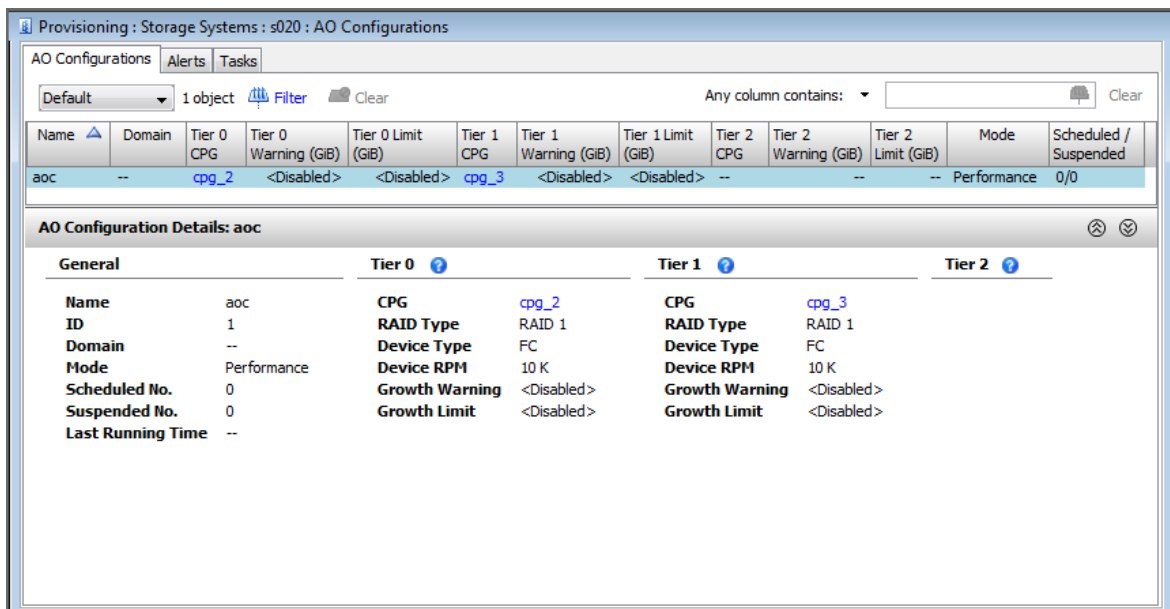
[“The AO Configurations Tab” \(page 175\)](#)

[“The Tasks Tab” \(page 178\)](#)

[“The Alerts Tab” \(page 177\)](#)

## The AO Configurations Tab

The AO Configurations tab is divided into a list pane and a detail pane.



The list pane displays the names of all AO configurations on the selected system and related information:

Column	Description
<b>Name</b>	The name of the AO Configuration.
<b>Domain</b>	The domain (if any) to which the tiered CPGs belong.
<b>Tier 0 CPG</b>	The high-performance tier.
<b>Tier 0 Warning</b>	The growth warning (in GiB) for Tier 0 CPG.
<b>Tier 0 Limit</b>	The growth limit (in GiB) for Tier 0 CPG.
<b>Tier 1 CPG</b>	The mid-performance tier.
<b>Tier 1 Warning</b>	The growth warning (in GiB) for Tier 1 CPG.
<b>Tier 1 Limit</b>	The growth limit (in GiB) for Tier 1 CPG.
<b>Tier 2 CPG</b>	The low-performance tier.
<b>Tier 2 Warning</b>	The growth warning (in GiB) for Tier 2 CPG.
<b>Tier 2 Limit</b>	The growth limit (in GiB) for Tier 2 CPG.

The detail pane provides the following information:

Group	Field	Description
<b>General</b>	<b>Name</b>	The name of the AO configuration.
	<b>ID</b>	The configuration ID.
	<b>Domain</b>	The domain (if any) to which the tiered CPGs belong.
	<b>Mode</b>	Indicates whether the AO configuration mode is Performance, Balanced, or Cost.
	<b>Scheduled No.</b>	The number of scheduled tasks for the AO configuration
	<b>Suspended No.</b>	The number of scheduled, but currently suspended tasks for the AO configuration

Group	Field	Description
	<b>Last Running Time</b>	The latest running time from this AO configuration's scheduled tasks
<b>Tier 0/Tier 1/Tier 2</b>	<b>CPG</b>	The CPG used for the tier.
	<b>RAID Type</b>	The CPG's RAID type.
	<b>Device Type</b>	Indicate the type of device (e.g., SSD, FC).
	<b>Device RPM</b>	The disk speed.
	<b>NOTE:</b> The Device RPM number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
	<b>Growth Warning</b>	The growth warning for the specified CPG.
	<b>Growth Limit</b>	The growth limit for the specified CPG.

## The Alerts Tab

The AO configuration Alerts tab is divided into a list pane and a detail pane. The list pane displays any AO-related alerts within the array. The detail pane displays details about a selected alert.

The list pane displays the following information:

Column	Description
<b>Severity</b>	The severity of the problem.
<b>ID</b>	The task ID.
<b>State</b>	The task state (e.g. New).
<b>Last Time</b>	The last time the AO configuration was run.
<b>Message</b>	Text message describing the reason for the alert.
<b>Repeat Count</b>	The number of times the AO configuration task has been run.

The detail pane displays the following information:

Group	Field	Description
<b>General</b>	<b>Severity</b>	The severity of the problem.
	<b>Type</b>	The type of alert.
	<b>Message</b>	Text message describing the reason for the alert.
	<b>ID</b>	The task ID.
	<b>State</b>	The task state (e.g. New).
	<b>Message Code</b>	The code related to the alert message.
	<b>Sequence</b>	The alert sequence.
<b>Component</b>	<b>System</b>	The system for which the alert was generated.
	<b>System SN</b>	The system's serial number.
	<b>Node ID</b>	The system's node ID).

Group	Field	Description
	<b>Component</b>	The node component for which the alert was generated.
<b>Frequency</b>	<b>Repeat Count</b>	The number of times the AO configuration task has been run.
	<b>Last Time</b>	The last time the AO configuration task was run.
	<b>First Time</b>	The first time the AO configuration task was run.

## The Tasks Tab

The AO configuration Tasks tab is divided into a list pane and a detail pane. The list pane displays any AO-related tasks within the array. The detail pane displays details about a selected task.

The list pane displays the following information:

Column	Description
<b>ID</b>	The task ID
<b>Type</b>	The type of task (e.g., Scheduled Task).
<b>Name</b>	The name of the task.
<b>Status</b>	The status of the task (e.g., Completed).
<b>Progress</b>	The task progress, if currently running.
<b>Start Time</b>	The time the task started.
<b>Finish Time</b>	The time the task finished.
<b>Duration</b>	The amount of time it took to complete the task.

The detail pane displays the following information:

Group	Field	Description
<b>General</b>	<b>System Name</b>	The name of the system on which the task was started.
	<b>System SN</b>	The system's serial number.
	<b>ID</b>	The task ID.
	<b>Type</b>	The task type.
	<b>Status</b>	Indicates whether a task is Running, Canceled, Failed, or Completed.
	<b>Progress</b>	The task progress, if currently running.
	<b>Start Time</b>	The time the task started.
	<b>Finish Time</b>	The time the task finished.
	<b>Duration</b>	The amount of time it took to complete the task.
<b>Detailed Status</b>	Provides detailed information for the task by time increments.	

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## Part IV Creating Backup

This part contains information on creating copies and using the remote copy manager.

[“Creating Copies” \(page 180\)](#)

[“Configuring and Managing Remote Copy” \(page 188\)](#)






## Creating a Virtual Copy

To create a virtual copy:

1. In the Manager Pane, click **Provisioning**.
2. In the Common Actions Panel, click **Create Virtual Copy**.  
The **Create Virtual Copy** dialog box appears.
3. **Start now** will be preselected. You may instead choose to select **Create schedule**.  
(For information on creating a schedule for this task, see [“Schedule Create Virtual Copy” \(page 352\)](#)).
4. **System** - Select the system on which the virtual copy will be created.
5. (Optional) **Domain** - Select the domain in which the virtual copy will reside.
6. **Parent Volume** - Select the virtual copy's parent volume.
7. **Destination Name** - Enter the destination volume's name.

---

**NOTE:** The **Destination Name** field is automatically populated with `@vvname@.@y@@m@@d@@H@@M@@S@`, meaning that `@vvname@` is replaced with the name of the source volume set and a timestamp containing the year, month, day, hour, minute, and second is appended to that name. If you wish to edit the way the destination volumes are named, click the **Edit** button () to the right of the **Destination Name** field to access the **Edit Volume Set Name** dialog box. You can select from predetermined volume name patterns or enter your own. (For more information, see [“Edit Volume Set Name Dialog” \(page 353\)](#)).

---

8. **ID** - Enter an ID for the new virtual copy if you uncheck the Auto box. (Displayed only when the **Show advanced options** checkbox is selected.)
9. **Comments** - Enter any notes.
10. If you wish to set a retention time, click the **Retention Time** checkbox, enter a value in the corresponding field, and select a unit of measure, day(s) or hour(s). (Displayed only when the **Show advanced options** checkbox is selected.)
11. If you wish to set an expiration time, click the **Expiration Time** checkbox, enter a value in the corresponding field, and select a unit of measure, day(s) or hour(s). (Displayed only when the **Show advanced options** checkbox is selected.)
12. Click **OK**.

## Editing a Virtual Copy

To edit a virtual copy:

1. Access the **Virtual Volumes** tab by clicking on the Virtual Volumes node in Provisioning management tree under the system containing the virtual copy you wish to edit.
2. Right-click the virtual copy you wish to edit and select **Edit**.  
The **Edit Virtual Copy** dialog box appears.
3. **Destination** - Enter a new destination volume.
4. **Comments** - Enter any notes about the virtual copy.
5. **Retention Time** - (Available when the **Show advanced options** checkbox is selected.) Select day(s) or hour(s) and then enter a value from 1 to 14, or 1 to 366, respectively. (Displayed only when the **Show advanced options** checkbox is selected.)
6. **Expiration Time** - (Available when the **Show advanced options** checkbox is selected.) Select day(s) or hour(s) and then enter a value from 1 to 1,825, or 1 to 43,800, respectively. (Displayed only when the **Show advanced options** checkbox is selected.)
7. Click **OK**.

## Removing a Virtual Copy

To remove a virtual copy:

1. Access the **Virtual Volumes** tab.
2. Right-click the virtual copy you wish to remove.
3. In the menu that appears, click **Remove**.

The **Remove Virtual Volume(s)** dialog box appears.

4. (Optional) Select to remove snapshots and physical copies of the listed volumes, listed volumes currently exported to a host (including active VLUNs), and any listed volumes that are part of a volume set.
5. Click **OK**.

## Creating a Consistency Group Virtual Copy

To create a consistency group virtual copy:

1. Access the **Virtual Volumes** tab.
2. Select two or more virtual volumes with copy space.
3. Right-click the selected volumes.
4. In the menu that appears, click **Create Consistency Group Virtual Copies**.

The **Create Consistency Group Virtual Copies** wizard appears.

### Select Parent Volumes

1. Select **Start now** or **Create schedule**.  
(For information on creating a schedule for this task, see [“Schedule Create Consistency Group Virtual Copies” \(page 353\)](#)).
2. Your selected volumes will be highlighted. At this point, you may add additional volumes.  
(For information on selecting multiple items, see [“Selecting Multiple Items” \(page 406\)](#))

- Click **Next**.  
The **Configure Virtual Copies** page appears.

## Configure Virtual Copies

- If you wish to modify the name of a copy, double-click any name in the **Name** column and then enter a new name.
- The **Generate volume ID automatically** option is the default, deselecting this option will require you to double-click the **ID** column to enter a name.
- If you wish to set a retention time, select the **Retention Time** checkbox, enter a value in the corresponding field, and select a unit of measure, day(s) or hour(s). (Displayed only when the **Show advanced options** checkbox is selected.)
- If you wish to set an expiration time, select the **Expiration Time** checkbox, enter a value in the corresponding field, and select a unit of measure, day(s) or hour(s). (Displayed only when the **Show advanced options** checkbox is selected.)
- Enter any notes in the **Comments** text box.
- Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

Review your selections then click **Finish** to complete the wizard.

## Creating a Batch Virtual Copy

To create a batch virtual copy:

- Access the **Virtual Volumes** tab.
- Select two or more virtual volumes with copy space.

3. Right-click the selected volumes.
4. In the menu that appears, click **Create Batch Virtual Copy**.  
The **Create Batch Virtual Copies** dialog box appears.
5. If you wish to modify the name of a copy, double-click any name in the Name column and then enter a new name.
6. The **Generate volume ID automatically** option is the default, deselecting this option will require you to double-click the **ID** column to enter a name.
7. Click the appropriate option button (**Read Only** or **Read/Write**).
8. (Optional) In the **Suffix** text box, enter a suffix to append the existing volume name if you did not modify previously the name.
9. If you wish to set a retention time, select the **Retention Time** checkbox, enter a value in the corresponding field, and select a unit of measure, day(s) or hour(s).
10. If you wish to set an expiration time, select the **Expiration Time** checkbox, enter a value in the corresponding field, and select a unit of measure, day(s) or hour(s).
11. Enter any notes in the **Comments** text box.
12. Click **OK**.

## Promoting a Virtual Copy

To promote a virtual copy to a base volume:

1. Access the **Virtual Volumes** tab to view the system's virtual copies.
2. Right-click the virtual copy you wish to promote.
3. In the menu that appears, click **Promote Virtual Copy**.  
The **Promote Virtual Copy** dialog box appears.
4. Select a target volume from the **Target Virtual Volume** list.
5. Click **OK**.
6. When prompted for confirmation to continue, click **Yes**.

## Creating Physical Copies

The HP 3PAR Management Console allows you to view, create, edit, and manage physical copies.

["Viewing Physical Copies" \(page 184\)](#)

["Creating a Physical Copy" \(page 185\)](#)

["Editing a Physical Copy" \(page 185\)](#)

["Removing a Physical Copy" \(page 185\)](#)

["Creating a Consistency Group Physical Copy" \(page 186\)](#)

["Stopping a Physical Copy" \(page 186\)](#)

["Resynchronizing a Physical Copy" \(page 187\)](#)

["Promoting a Physical Copy" \(page 187\)](#)

## Viewing Physical Copies

Physical copies are displayed on the Virtual Volumes tab.

A virtual copy name displaying a plus (+) sign to the left indicates that at least one physical copy exists. Clicking the plus sign expands the virtual copy displaying the physical copy.

Name	Domain	Set	State	Type	Provisioning	RAID	Virtual Size (GiB)	Reserved User Size (GiB)	Reserved User Size (% Virtual)	Reserved Copy Size (GiB)	Reserved Copy Size (% Virtual)	Exported To
cm_vvF1 (2)	--	--	Normal	Base	Full	RAID 1	1.000	1.000	100%	0.500	50%	--
vvcv.161.162	--	--	Normal	Virtual Copy	--	RAID 1	1.000	--	--	--	--	--
cm_vvF2	--	--	Normal	Physical Copy	Full	RAID 1	1.000	1.000	100%	0.500	50%	--
							51,342.000	104.000		31.500		

See “Viewing the Virtual Volumes Tab” (page 153).

## Creating a Physical Copy

To create a physical copy:

1. In the Manager Pane, click **Provisioning**.
2. In the Common Actions Panel, click **Create Physical Copy**.  
The **Create Physical Copy** dialog box appears.
3. From the **System** list, select the system on which the physical copy will be created.
4. (Optional) From the **Domain** list, select the domain in which the copy will reside.
5. From **Parent Volume** list, select the volume to copy from.
6. From **Destination Volume** list, select the volume to copy to.
7. From the **Task Priority** list, select the importance of this physical copy task in relation to other tasks running concurrently: High, Medium (default), or Low.
8. (Optional) If you want to save a snapshot of the physical copy, in order to resynchronize the base volume and physical copy at a later point in time, click **Save snapshot for later resync**.
9. Click **OK**.

## Editing a Physical Copy

To edit a physical copy:

1. Access the **Virtual Volumes** tab.
2. Right-click the physical copy you wish to edit and select **Edit**.  
The **Edit Physical Copy** dialog box appears.
3. Enter a new name in the **Name** field.
4. If you have selected the **Show advanced options** checkbox, select a **Retention Time** and an **Expiration Time** for the snapshot.

---

**NOTE:** An HP 3PAR Virtual Lock license is required for setting a retention time.

---

5. If you wish to save the snapshot for resynchronization, select **Save snapshot for later resync**.
6. Click **OK**.

## Removing a Physical Copy

To remove a physical copy:

1. Access the **Virtual Volumes** tab.
2. Right-click the physical copy you wish to remove.
3. In the menu that appears, click **Remove**.  
The **Remove Virtual Volume** dialog box appears.
4. (Optional) Select to remove snapshots and physical copies of the listed volumes, listed volumes currently exported to a host (including active VLUNs), and any listed volumes that are part of a volume set.
5. Click **OK**.

## Creating a Consistency Group Physical Copy

To create a consistency group physical copy:

1. Access the **Virtual Volumes** tab.
2. Select two or more virtual volumes with copy space. (These volumes will be preselected when you launch the Schedule Consistency Group Virtual Copies Creation wizard.)
3. Right-click the selected volumes then click **Create Consistency Group Physical Copies** from the selection list that appears.

The **Create Consistency Group Physical Copies** dialog box appears.

4. From the **System** list, select the system on which the physical copy will be created.
5. (Optional) From the **Domain** list, select the domain in which the physical copy will reside.
6. From **Parent Volume** list, select the volume to copy from.
7. From **Destination Volume** list, select the volume to copy to.
8. Click **Add**.
9. From the **Task Priority** list, select the importance of this physical copy task in relation to other tasks running concurrently.
10. (Optional) If you want to save a snapshot of the physical copy, in order to resynchronize the base volume and physical copy at a later point in time, click **Save snapshot for later resync**.
11. Add additional groups or click **OK**.

### Select Parent Volumes

1. Your preselected volumes will appear. At this point you may select additional volumes (optional).
2. Click **Next** to go to the Configure Virtual Copies page.

### Configure Virtual Copies

1. If you wish to modify the name of a copy, double-click any name in the **Name** column and then enter a new name.
2. The **Generate volume ID automatically** option is the default, deselecting this option will require you to double-click the **ID** column to enter a name.
3. If you wish to set a retention time, select the **Retention Time** checkbox, enter a value in the corresponding field, and select a unit of measure, day(s) or hour(s). (Displayed only when the **Show advanced options** checkbox is selected.)
4. If you wish to set an expiration time, select the **Expiration Time** checkbox, enter a value in the corresponding field, and select a unit of measure, day(s) or hour(s). (Displayed only when the **Show advanced options** checkbox is selected.)
5. Enter any notes in the **Comments** text box.
6. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

### Summary

Review your selections then click **Finish** to complete the wizard.

## Stopping a Physical Copy

To stop a physical copy in progress:

1. Access the **Virtual Volumes** tab.
2. Select the physical copy in progress that you wish to stop.
3. Right-click on the selected copy, then select **Stop Physical Copy** from the selection list that appears.
4. Click **Yes**.

## Resynchronizing a Physical Copy

To resynchronize a physical copy:

1. Access the **Virtual Volumes** tab.
2. Right-click the physical copy you wish to resynchronize.
3. In the menu that appears, click **Resync Physical Copy**.  
The **Resync Physical Copy** dialog box appears.
4. From the **System** list, select the system on which the copy resides.
5. (Optional) From the **Domain** list, select the domain in which the copy is resynchronized.
6. From the **Physical Copy** list, select the physical copy to which you wish to resynchronize.
7. (Optional) If you want to save a snapshot of the physical copy, in order to resynchronize the base volume and physical copy at a later point in time, click the **Save snapshot for later resync** checkbox.
8. Click **OK**.

## Promoting a Physical Copy

To promote a physical copy:

1. Access the **Virtual Volumes** tab to view the system's physical copies.
2. Right-click the physical copy you wish to promote.
3. In the menu that appears, click **Promote Physical Copy**.  
The **Promote Physical Copy** dialog box appears.
4. Click **Yes** to confirm the copy promotion.

---

## 14 Configuring and Managing Remote Copy

The Remote Copy Manager of the HP 3PAR Management Console allows you to create and manage HP 3PAR Remote Copy configurations on your HP 3PAR StoreServ Storage Systems. Consult the following topics for more information:

[“Viewing Remote Copy Information” \(page 209\)](#)

[“Configuring Remote Copy” \(page 188\)](#)

[“Creating and Managing Remote Copy Volume Groups” \(page 199\)](#)

[“Creating Remote Copy Links” \(page 202\)](#)

[“Managing Remote Copy Targets” \(page 203\)](#)

[“Using Remote Copy for Disaster Recovery” \(page 206\)](#)

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**NOTE:** HP 3PAR Remote Copy Software requires an HP 3PAR Remote Copy Software license. For additional information about the license, see the *HP 3PAR OS Concepts Guide*.

**NOTE:** Working with HP 3PAR Remote Copy requires that all systems are connected.

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### Configuring Remote Copy

The HP 3PAR Management Console allows you to setup several different configurations of HP 3PAR Remote Copy, as well as configure Remote Copy ports. The following types of Remote Copy are supported:

- 1-to-1 Remote Copy - Data is mirrored between two storage systems.
- 1-to-N Remote Copy - A single storage system uses multiple storage systems as backup systems.
- N-to-1 Remote Copy - Multiple storage systems use the same storage systems as backup systems.
- Synchronous Long Distance Remote Copy - A single Remote Copy volume group is copied to volume groups on two other storage systems by admitting the volumes to groups with two targets. One copy is in synchronous Remote Copy mode, which is updated during each write. The other copy is in asynchronous periodic Remote Copy mode, and is updated according to a user-defined schedule.

Use the Remote Copy configuration best suited to your needs. For setup information, refer to the following sections:

[“Configuring Remote Copy Ports” \(page 188\)](#)

[“Configuring 1-to-1 Remote Copy” \(page 189\)](#)

[“Configuring 1-to-N Remote Copy” \(page 191\)](#)

[“Configuring N-to-1 Remote Copy” \(page 194\)](#)

[“Configuring Synchronous Long Distance Remote Copy” \(page 196\)](#)

[“Pinging the Remote Copy Links” \(page 203\)](#)

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**NOTE:** HP 3PAR Remote Copy Software requires an HP 3PAR Remote Copy Software license. For additional information about the license, see the *HP 3PAR OS Concepts Guide*.

---

### Configuring Remote Copy Ports

To configure a Remote Copy over Fibre Channel (RCFC) port or a Remote Copy over IP (RCIP) port:

1. In the Manager Pane, click **Remote Copy**.



2. In the Common Actions Panel, click **Configure RC Port**.  
The **<Port Type> Configuration** dialog box appears.
3. Select a system from the **System** list.  
The remaining fields in the wizard change to reflect RCFC or RCIP set up, depending on the system selected.
4. Select a port from the **Port** list.
5. The remaining fields are populated with the selected port's information.
6. Follow the directions in [“Configuring a Remote Copy over Fibre Channel Port” \(page 23\)](#) or [“Configuring a Remote Copy over IP Port” \(page 23\)](#) to edit the port information.
7. Click **OK**.

---

**NOTE:** Due to the limited number of ports on some systems, shared Host/RC adapter ports are allowed. That is, one port may be used for both a Host and Remote Copy.

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## Configuring 1-to-1 Remote Copy

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**NOTE:** HP 3PAR Remote Copy Software requires an HP 3PAR Remote Copy license. For additional information about the license, see the *HP 3PAR OS Concepts Guide*.

---

A 1-to-1 Remote Copy relationship involves two systems. Depending on how the 1-to-1 Remote Copy relationship is configured, one system can serve as the primary (source) system and the other the backup system (unidirectional), or both systems can serve as both the primary and backup systems (bidirectional).

---

**NOTE:** In order to configure 1-to-1 Remote Copy, you must have two available systems with configured Remote Copy ports.

---

To configure 1-to-1 Remote Copy:

1. In the Manager Pane, click **Remote Copy**.
2. In the Common Actions panel, click **New Configuration**.  
The **New Remote Copy Configuration** wizard appears.

### Targets

1. Under **Select a Configuration**, click **1-1**.
2. Under **Assign a System to Each Target**, click a storage system graphic. In the menu that appears, select a storage system to assign. Repeat for the other storage system graphic.

---

**NOTE:** Only available systems, which satisfy requirements appear. See the *HP 3PAR Remote Copy Software User's Guide* for additional information.

---

3. (Optional) Under **Label Location**, enter a location for each storage server, e.g. Lab 1, New York.
4. (Optional) Under **Name the Target Systems**, the **Target Name** fields are automatically populated with the storage server names. You can enter an alternate name if you wish.
5. If both assigned systems are running supported HP 3PAR OS, the checkbox to Create additional targets for simultaneous synchronous and periodic operations will be enabled.

When **Additional Targets for Multimode** is selected, an additional target pair is presented with the default target name of system followed by **\_1** and **\_2**. You can change the target name as desired, and there will be validation to make sure the target names on the same system are unique.

At this point, if you reassign a system to one that runs a non-supported HP 3PAR OS, the **Additional Targets for Multimode** will be deselected and disabled, and the additional target pair will be removed.

6. Click **Next**.

## Links

1. A graphical representation of each system's Remote Copy ports appears under **Create Links Between Systems**. Click and drag from one port on one system to a port on the other system. Repeat for a second port.
2. For IP links, in the **IP Settings** groups for each system/port, all fields are automatically populated based on the link relationship you established under **Create Links Between Systems**.
  - a. (Optional) Enter the gateway address for each system/port.
  - b. (Optional) Click **Apply** to test the link configuration, or **Ping** to test the communication between the links.
3. For Fibre Channel links, in the **Settings** groups for each system/port:
  - a. **Connection Type** - Select Point for point-to-point mode or Loop for arbitrated loop mode.
  - b. **Configured Rate** - Select 1, 2, 4 Gbps, or Auto (default).
  - c. Click **Apply** to test the link configuration, or Ping to test the communication between the links.
4. Click **Next**.

---

**NOTE:** If Fibre Channel ports are not displayed, the ports may not be zoned correctly, or may not be physically connected. See Configuring Fibre Channel Ports for RCFC for additional information.

---

## Groups

1. In the **Source** group:
  - a. **System** - Select the system on which the Remote Copy group will reside.
  - b. (Optional) **Domain** - Select the domain in which the Remote Copy group will reside.
  - c. **Group** - Enter a name for the Remote Copy group.
  - d. (Optional) **Start group after completion** - Select if you want the Remote Copy group to be started (start mirroring) after it is created.
  - e. (Optional) **Do not perform initial sync** - Select if you do not want the created Remote Copy group to be synchronized with its backup group. Before selecting this option verify both sides are synchronized or it may lead to data inconsistency. This option is available if Show Tape Backup Options in Remote Copy Wizards was selected in the Preferences.
2. In the **Backup** group:
  - a. **Name** - The system NOT selected as the source system, automatically appears.
  - b. **Mode** - Select Synchronous or Periodic.
  - c. **Sync Period** - If you selected Periodic, select second(s), minute(s), hour(s), or day(s) and enter a numeric value for when you wish the source and backup groups to synchronize.
  - d. (Optional) **Auto Recover** - Select if you want the group to be restarted automatically after Remote Copy links come back up should the links go down. (Displayed only if **Show advanced options** is selected.)
  - e. (Optional) **Over Period Alert** - Select if you want an alert to be generated if the synchronization of a periodic group takes longer than its set synchronization period. This option is not available for groups in synchronous mode. (Displayed only if **Show advanced options** is selected.)
3. Click **Add**.
4. (Optional) Repeat steps 1 through 3 to create additional Remote Copy groups.

---

**NOTE:** When creating additional groups, if you select a server other than the server selected during the first instance of group creation, you will create a bidirectional Remote Copy relationship where each storage server will be both the primary and backup servers to the other.

---

5. Click **Next**.

## Virtual Volumes

1. Select a Remote Copy group from the **Group** list.
2. Under the **Source Volume on** list, select a virtual volume.
3. Under the **Backup Volume on** list:
  - a. Select either **Existing** or **New**.
  - b. If you selected **Existing**, select a backup virtual volume.
  - c. If you selected **New**:
    - i. **Name** - Enter a name for the backup virtual volume.
    - ii. **CPG under User CPG** - Select a CPG from which the volume's user space is allocated.
    - iii. **CPG under Copy CPG** - Select a CPG from which the volume's copy space is allocated.
    - iv. (Optional) In the **Allocation Warning** and **Allocation Limit** text boxes under User CPG and Copy CPG, enter the appropriate information. You must check the **Enabled** checkbox if you want you use these options.

---

**NOTE:** When selecting volumes, you can filter the lists to include by clicking the down arrow and selecting **Virtual Volumes**, **Provisioning**, and **Virtual Size**. To clear the filter, click **Clear**.

**NOTE:** If an RW snapshot is added to the group all RW of the same volume family will be removed. The base parent will also be removed.

---

4. Click **Add**.
5. (Optional) Repeat steps 1 through 4 to add additional virtual volumes to your Remote Copy group(s).
6. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

Review your settings then click **Finish** to complete the wizard.

## Configuring 1-to-N Remote Copy

---

**NOTE:** HP 3PAR Remote Copy Software requires an HP 3PAR Remote Copy license. For additional information about the license, see the *HP 3PAR OS Concepts Guide*.

---

In a 1-to-N Remote Copy relationship, a single primary (source) system uses multiple systems as backup systems. 1-to-N Remote Copy configurations can operate in either a combination of unidirectional and bidirectional (for a single Remote Copy group pair), or in complete unidirectional functionality. For the current release, a 1-to-N Remote Copy configuration can have a maximum of two backup systems.

---

**NOTE:** In order to configure 1-to-N Remote Copy, you must have at least two available systems with configured Remote Copy ports.

---

To configure 1-to-N Remote Copy:

1. In the Manager Pane, click **Remote Copy**.

2. In the Common Actions panel, click **New Configuration**.  
The **New Remote Copy Configuration** wizard appears.

## Targets

1. Under **Select a Configuration**, click **1-N**.
2. Under **Assign a System to Each Target**:
  - a. Select the total number of systems you are configuring for the 1-to-N setup.
  - b. Click a storage system graphic. In the menu that appears, select a storage system to assign. Repeat for the other storage system graphics.

---

**NOTE:** Only available systems, which satisfy requirements appear. See the *HP 3PAR Remote Copy Software User's Guide* for additional information.

---

3. (Optional) Under **Label Locations**, enter a location for each storage server, e.g. Lab 1, New York.
4. (Optional) Under **Name the Target Systems**, the **Target Name** fields are automatically populated with the storage server names. You can enter an alternate name if you wish.
5. Click **Next**.

## Links

1. A graphical representation of each system's Remote Copy ports appears under **Create Links Between Systems**. Click and drag from one port on one system to a port on the other system. Repeat for the other Remote Copy ports.
2. For IP links, in the **IP Settings** groups for each system/port, all fields are automatically populated based on the link relationship you established under **Create Links Between Systems**.
  - a. (Optional) Enter the gateway address for each system/port.
  - b. (Optional) Click **Apply** to test the link configuration, or **Ping** to test the communication between the links.
3. For Fibre Channel links, in the **Settings** groups for each system/port:
  - a. **Connection Type** - Select **Point** for point-to-point mode or **Loop** for arbitrated loop mode.
  - b. **Configured Rate** - Select 1, 2, 4 Gbps, or Auto (default).
  - c. Click **Apply** to test the link configuration, or **Ping** to test the communication between the links.
4. Click **Next**.

---

**NOTE:** If Fibre Channel ports are not displayed, the ports may not be zoned correctly, or may not be physically connected. See *Configuring Fibre Channel Ports for RCFC* for additional information.

---

## Groups

1. In the **Source** group:
  - a. **System** - Select the system on which the Remote Copy group will reside.
  - b. (Optional) **Domain** - Select the domain in which the Remote Copy group will reside.
  - c. **Group** - Enter a name for the Remote Copy group.
  - d. (Optional) **Start group after completion** - Select if you want the Remote Copy group to be started (start mirroring) after it is created.
  - e. (Optional) **Do not perform initial sync** - Select if you do not want the created Remote Copy group to be synchronized with its backup group. Before selecting this option verify both sides are synchronized or it may lead to data inconsistency. This option is available if Show Tape Backup Options in Remote Copy Wizards was selected in the Preferences.

2. In the **Backup** group:
  - a. **Name** - The system(s) NOT selected as the source system, automatically appears. Select a system.
  - b. **Mode** - Select Synchronous or Periodic.
  - c. **Sync Period** - If you selected Periodic, select second(s), minute(s), hour(s), or day(s) and enter a numeric value for when you wish the source and backup groups to synchronize.
  - d. (Optional) **Auto Recover** - Select if you want the group to be restarted automatically after Remote Copy links come back up should the links go down. (Displayed only if **Show advanced options** is selected.)
  - e. (Optional) **Over Period Alert** - Select if you want an alert to be generated if the synchronization of a periodic group takes longer than its set synchronization period. This option is not available for groups in synchronous mode. (Displayed only if **Show advanced options** is selected.)
3. Click **Add**.
4. (Optional) Repeat steps 1 through 3 to create additional Remote Copy groups.

---

**NOTE:** When creating additional groups, if you select a server other than the server selected during the first instance of group creation, you will create a bidirectional Remote Copy relationship where each storage server will be both the primary and backup servers to the other. For N-to-1 Remote Copy, you can only create a bidirectional configuration for one Remote Copy group pair.

---

5. Click **Next**.

## Virtual Volumes

1. Select a Remote Copy group from the **Group** list.
2. Under the **Source Volume on** list, select a virtual volume.
3. Under the **Backup Volume on** list:
  - a. Select either **Existing** or **New**.
  - b. If you selected **Existing**, select a backup virtual volume.
  - c. If you selected **New**:
    - i. **Name** - Enter a name for the backup virtual volume.
    - ii. **CPG under User CPG** - Select a CPG from which the volume's user space is allocated.
    - iii. **CPG under Copy CPG** - Select a CPG from which the volume's copy space is allocated.
    - iv. (Optional) In the **Allocation Warning** and **Allocation Limit** text boxes under User CPG and Copy CPG, enter the appropriate information. You must check the **Enabled** checkbox if you want you use these options.

---

**NOTE:** When selecting volumes, you can filter the lists to include by clicking the down arrow and selecting **Virtual Volumes**, **Provisioning**, and **Virtual Size**. To clear the filter, click **Clear**.

**NOTE:** If an RW snapshot is added to the group all RW of the same volume family will be removed. The base parent will also be removed.

---

4. Click **Add**.
5. (Optional) Repeat steps 1 through 4 to add additional virtual volumes to your Remote Copy group(s).
6. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

Review your settings then click **Finish** to complete the wizard.

## Configuring N-to-1 Remote Copy

**NOTE:** HP 3PAR Remote Copy Software requires an HP 3PAR Remote Copy license. For additional information about the license, see the *HP 3PAR OS Concepts Guide*.

In an N-to-1 Remote Copy relationship, a maximum of four primary (source) systems use the same system as backup system. N-to-1 Remote Copy configurations can operate in either a combination of unidirectional and bidirectional (for a single Remote Copy group pair), or in complete unidirectional functionality.

**NOTE:** In order to configure N-to-1 Remote Copy, you must have at least two available systems with configured Remote Copy ports.

To configure N-to-1 Remote Copy:

1. In the Manager Pane, click **Remote Copy**.
2. In the Common Actions panel, click **New Configuration**.  
The **New Remote Copy Configuration** wizard appears.

### Targets

1. Under **Select a Configuration**, click **N-1**.
2. Under **Assign a System to Each Target**:
  - a. Select the total number of systems you are configuring for the N-to-1 setup.
  - b. Click a storage system graphic. In the menu that appears, select a storage system to assign. Repeat for the other storage system graphics.

**NOTE:** Only available systems, which satisfy requirements appear. See the *HP 3PAR Remote Copy Software User's Guide* for additional information.

3. (Optional) Under **Label Locations**, enter a location for each storage server, e.g. Lab 1, New York.
4. (Optional) Under **Name the Target Systems**, the **Target Name** fields are automatically populated with the storage system names. You can enter an alternate name if you wish.
5. Click **Next**.

### Links

1. A graphical representation of each system's Remote Copy ports appears under **Create Links Between Systems**. Click and drag from one port on one system to a port on the other system. Repeat for the other Remote Copy ports.
2. For IP links, in the **IP Settings** groups for each system/port, all fields are automatically populated based on the link relationship you established under **Create Links Between Systems**.
  - a. (Optional) Enter the gateway address for each system/port.
  - b. (Optional) Click **Apply** to test the link configuration, or **Ping** to test the communication between the links.
3. For Fibre Channel links, in the **Settings** groups for each system/port:
  - a. **Connection Type** - Select **Point** for point-to-point mode or **Loop** for arbitrated loop mode.
  - b. **Configured Rate** - Select 1, 2, 4 Gbps, or Auto (default).
  - c. Click **Apply** to test the link configuration, or **Ping** to test the communication between the links.
4. Click **Next**.

---

**NOTE:** If Fibre Channel ports are not displayed, the ports may not be zoned correctly, or may not be physically connected. See Configuring Fibre Channel Ports for RCFC for additional information.

---

## Groups

1. In the **Source** group:
  - a. **System** - Select the system on which the Remote Copy group will reside.
  - b. (Optional) **Domain** - Select the domain in which the Remote Copy group will reside.
  - c. **Group** - Enter a name for the Remote Copy group.
  - d. (Optional) **Start group after completion** - Select if you want the Remote Copy group to be started (start mirroring) after it is created.
  - e. (Optional) **Do not perform initial sync** - Select if you do not want the created Remote Copy group to be synchronized with its backup group. Before selecting this option verify both sides are synchronized or it may lead to data inconsistency. This option is available if Show Tape Backup Options in Remote Copy Wizards was selected in the Preferences.
2. In the **Backup** group:
  - a. **Name** - The system NOT selected as the source system, automatically appears.
  - b. **Mode** - Select Synchronous or Periodic.
  - c. **Sync Period** - If you selected Periodic, select second(s), minute(s), hour(s), or day(s) and enter a numeric value for when you wish the source and backup groups to synchronize.
  - d. (Optional) **Auto Recover** - Select if you want the group to be restarted automatically after Remote Copy links come back up should the links go down. (Displayed only if **Show advanced options** is selected.)
  - e. (Optional) **Over Period Alert** - Select if you want an alert to be generated if the synchronization of a periodic group takes longer than its set synchronization period. This option is not available for groups in synchronous mode. (Displayed only if **Show advanced options** is selected.)
3. Click **Add**.
4. (Optional) Repeat steps 1 through 3 to create additional Remote Copy groups.

---

**NOTE:** When creating additional groups, if you select a server other than the server selected during the first instance of group creation, you will create a bidirectional Remote Copy relationship where each storage server will be both the primary and backup servers to the other. For 1-to-N Remote Copy, you can only create a bidirectional configuration for one Remote Copy group pair.

---

5. Click **Next**.

## Virtual Volumes

1. Select a Remote Copy group from the **Group** list.
2. Under the **Source Volume** on list, select a virtual volume.



3. Under the **Backup Volume on** list:
  - a. Select either **Existing** or **New**.
  - b. If you selected **Existing**, select a backup virtual volume.
  - c. If you selected **New**:
    - i. **Name** - Enter a name for the backup virtual volume.
    - ii. **CPG under User CPG** - Select a CPG from which the volume's user space is allocated.
    - iii. **CPG under Copy CPG** - Select a CPG from which the volume's copy space is allocated.
    - iv. (Optional) In the **Allocation Warning** and **Allocation Limit** text boxes under User CPG and Copy CPG, enter the appropriate information. You must check the **Enabled** checkbox if you want you use these options.

---

**NOTE:** When selecting volumes, you can filter the lists to include by clicking the down arrow and selecting **Virtual Volumes**, **Provisioning**, and **Virtual Size**. To clear the filter, click **Clear**.

**NOTE:** If an RW snapshot is added to the group all RW of the same volume family will be removed. The base parent will also be removed.

---

4. Click **Add**.
5. (Optional) Repeat steps 1 through 4 to add additional virtual volumes to your Remote Copy group(s).
6. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

Review your settings then click **Finish** to complete the wizard.

## Configuring Synchronous Long Distance Remote Copy

---

**NOTE:** HP 3PAR Remote Copy Software requires an HP 3PAR Remote Copy license. For additional information about the license, see the *HP 3PAR OS Concepts Guide*.

---

In a Synchronous Long Distance Remote Copy configuration, a single Remote Copy group is copied directly to volumes on two other systems by admitting the volumes to groups with two targets. Synchronous mode Remote Copy is used between the primary (source) and backup system that are physically closer to each other where a high bandwidth/low latency connection is shared. Asynchronous periodic (periodic) Remote Copy is used between the primary system and backup system that are physically farther apart and sharing a lesser connection. The synchronous connection must be a Fibre Channel connection, while the asynchronous periodic connection can be either all Fibre Channel (over an IP network) or all IP. Only unidirectional functionality is allowed between Remote Copy pairs.

---

**NOTE:** In order to configure Synchronous Long Distance Remote Copy, you must have three available systems with configured Remote Copy ports. At least two of the systems must have Fibre Channel ports.

---

To configure Synchronous Long Distance Remote Copy:

1. In the Manager Pane, click **Remote Copy**.
2. In the Common Actions panel, click **New Configuration**.  
The **New Remote Copy Configuration** wizard appears.

## Targets

1. Under **Select a Configuration**, click **Synchronous Long Distance**.



2. Under **Assign a System to Each Target:**
  - Click a storage system graphic. In the menu that appears, select a storage system to assign. Repeat for the other storage system graphics.

---

**NOTE:** Only available systems, which satisfy requirements appear. See the *HP 3PAR Remote Copy Software User's Guide* for additional information.

---
3. (Optional) Under **Label Locations**, enter a location for each storage server, e.g. Lab 1, New York.
4. (Optional) Under **Name the Target Systems**, the **Target Name** fields are automatically populated with the storage server names. You can enter an alternate name if you wish.
5. Click **Next**.

## Links

1. A graphical representation of each system's Remote Copy ports appears under Create Links. Click and drag from one port on one system to a port on the other system. Repeat for the other Remote Copy ports.

---

**NOTE:** You must use Fibre Channel links for the systems you plan to configure with synchronous mode Remote Copy.

---
2. For IP links, in the **IP Settings** groups for each system/port, all fields are automatically populated based on the link relationship you established under Create Links.
  - a. (Optional) Enter the gateway address for each system/port.
  - b. (Optional) Click **Apply** to test the link configuration, or **Ping** to test the communication between the links.
3. For Fibre Channel links, in the **Settings** groups for each system/port:
  - a. **Connection Type** - Select **Point** for point-to-point mode or **Loop** for arbitrated loop mode.
  - b. **Configured Rate** - Select 1, 2, 4 Gbps, or Auto (default).
  - c. Click **Apply** to test the link configuration, or **Ping** to test the communication between the links.
4. Click **Next**.

---

**NOTE:** If Fibre Channel ports are not displayed, the ports may not be zoned correctly, or may not be physically connected. See Configuring Fibre Channel Ports for RCFC for additional information.

---

## Groups

1. In the **Source** group:
  - a. **System** - Select the system on which the Remote Copy group will reside.
  - b. (Optional) **Domain** - Select the domain in which the Remote Copy group will reside.
  - c. **Group** - Enter a name for the Remote Copy group.
  - d. (Optional) **Start group after completion** - Select if you want the Remote Copy group to be started (start mirroring) after it is created.
  - e. (Optional) **Do not perform initial sync** - Select if you do not want the created Remote Copy group to be synchronized with its backup group. Before selecting this option verify both sides are synchronized or it may lead to data inconsistency. This option is available if Show Tape Backup Options in Remote Copy Wizards was selected in the Preferences.
2. In the first **Backup** group:
  - a. **Name** - The system NOT selected as the source system, automatically appears.
  - b. **Mode** - Select **Synchronous** or **Periodic**.

- c. **Syn Period** - If you selected **Periodic**, select second(s), minute(s), hour(s), or day(s) and enter a numeric value for when you wish the source and backup groups to synchronize.
  - d. (Optional) **Auto Recover** - Select if you want the group to be restarted automatically after Remote Copy links come back up should the links go down. (Displayed only if **Show advanced options** is selected.)
  - e. (Optional) **Over Period Alert** - Select if you want an alert to be generated if the synchronization of a periodic group takes longer than its set synchronization period. This option is not available for groups in synchronous mode. (Displayed only if **Show advanced options** is selected.)
3. In the second **Backup** group:
    - a. **Name** - The system NOT selected as the source system, automatically appears.
    - b. **Mode** - Select **Synchronous** or **Periodic**.
    - c. **Syn Period** - If you selected **Periodic**, select second(s), minute(s), hour(s), or day(s) and enter a numeric value for when you wish the source and backup groups to synchronize.

---

**NOTE:** The synchronous connection must be a Fibre Channel connection.

---

4. Click **Add**.
5. (Optional) Repeat steps 1 through 4 to create additional Remote Copy groups.
6. Click **Next**.

## Virtual Volumes

1. Select a Remote Copy group from the **Group** list.
2. Under the **Source Volume on** list, select a virtual volume.
3. Under the first **Backup Volume on** list:
  - a. Select either **Existing** or **New**.
  - b. If you selected **Existing**, select a backup virtual volume.
  - c. If you selected **New**:
    - i. **Name** - Enter a name for the backup virtual volume.
    - ii. **CPG under User CPG** - Select a CPG from which the volume's user space is allocated.
    - iii. **CPG under Copy CPG** - Select a CPG from which the volume's copy space is allocated.
    - iv. (Optional) In the **Allocation Warning** and **Allocation Limit** text boxes, enter the appropriate information. You must check the **Enabled** checkbox if you want you use these options.
4. Under the second **Backup Volume on** list:
  - a. Select either **Existing** or **New**.
  - b. If you selected **Existing**, select a backup virtual volume.
  - c. If you selected **New**:
    - i. **Name** - Enter a name for the backup virtual volume.
    - ii. **CPG under User CPG** - Select a CPG from which the volume's user space is allocated.
    - iii. **CPG under Copy CPG** - Select a CPG from which the volume's copy space is allocated.
    - iv. (Optional) In the **Allocation Warning** and **Allocation Limit** text boxes, enter the appropriate information. You must check the **Enabled** checkbox if you want you use these options.

---

**NOTE:** When selecting volumes, you can filter the lists to include by clicking the down arrow and selecting **Virtual Volumes**, **Provisioning**, and **Virtual Size**. To clear the filter, click **Clear**.

---

5. Click **Add**.

6. (Optional) Repeat steps 1 through 5 to add additional virtual volumes to your Remote Copy group(s).
7. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

Review your settings then click **Finish** to complete the wizard.

## Creating and Managing Remote Copy Volume Groups

When you have created a Remote Copy relationship between your HP 3PAR Storage Servers, you can add and create new Remote Copy groups, as well as edit and manage existing Remote Copy groups.

[“Creating Remote Copy Groups” \(page 199\)](#)

[“Starting Remote Copy Groups” \(page 200\)](#)

[“Stopping Remote Copy Groups” \(page 200\)](#)

[“Editing Remote Copy Groups” \(page 201\)](#)

[“Removing Remote Copy Groups” \(page 202\)](#)

## Creating Remote Copy Groups

To create a Remote Copy group:

1. In the Manager Pane, click **Remote Copy**.
2. In the Management Tree, select the **Remote Copy Configuration** to which you want to add a Remote Copy group.
3. In the Common Actions Panel, click **Create Remote Copy Group**.  
The **Create Remote Copy Group** wizard appears.

## Groups

1. In the **Source** group:
  - a. **System** - Select the primary (source) system on which the Remote Copy group will be created.
  - b. (Optional) **Domain** - Select the domain in which the Remote Copy group will reside.
  - c. **Group** - Enter a name for the group.
2. In the **Backup** groups:
  - a. **Name** - The system(s) NOT selected as the source system, automatically appears.
  - b. **Mode** - Select **Synchronous** or **Periodic**.
  - c. (Optional) **Sync Period** - If you selected **Periodic**, select this checkbox and select second(s), minute(s), hour(s), or day(s) and enter a numeric value for when you wish the source and backup groups to synchronize their data. If not selected, no period is used.
  - d. (Optional) **Start group after completion** - Select if you want the Remote Copy group to be started (start mirroring) after it is created.
  - e. (Optional) **Do not perform initial sync** - Select if you do not want the created Remote Copy group to be synchronized with its backup group. Before selecting this option verify both sides are synchronized or it may lead to data inconsistency. (This option is available if Show Tape Backup Options in Remote Copy Wizards was selected in the Preferences.)
  - f. (Optional) **Auto Recover** - Select if you want the group to be restarted automatically after Remote Copy links come back up should the links go down. (Displayed if **Show advanced options** is selected.)
  - g. (Optional) **Over Period Alert** - Select if you want an alert to be generated if the synchronization of a periodic group takes longer than its set synchronization period. This option is not available for groups in synchronous mode.

3. Click **Next** to configure Virtual Volumes or **Finish**.

## Virtual Volumes

1. In the **Source volume on** list, select a source virtual volume from the virtual volume list.
2. In the **Backup Volume on** list select a backup virtual volume from the virtual volume list, or click **New** to create a new backup volume.
3. If you clicked **New**:
  - a. Enter a volume name.
  - b. Select CPG for the user space.
  - c. Select a CPG for the copy space.

---

**NOTE:** When selecting volumes, you can filter the lists to include by clicking the down arrow and selecting **Virtual Volumes**, **Provisioning**, and **Virtual Size**. To clear the filter, click **Clear**.

---

4. Click **Add**.
5. Click **Next**.

---

**NOTE:** If an RW snapshot is added to the group all RW of the same volume family will be removed. The base parent will also be removed.

**NOTE:** If you are creating a Remote Copy group for a Synchronous Long Distance Remote Copy configuration, repeat steps 2 and 3 for the second **Backup Volume on** list of virtual volumes.

---

## Summary

Review the summary information , then click **Finish**.

## Starting Remote Copy Groups

Starting a stopped Remote Copy group resumes mirroring of the selected group between systems.

To start a Remote Copy group:

1. Access the Remote Copy Groups screen.
2. In the list pane, select the stopped group(s) you wish to start.
3. Right-click the selection and click **Start Remote Copy Group(s)**.  
The **Start Remote Copy Group(s)** dialog box appears.
4. Click **OK**.

## Stopping Remote Copy Groups

Stopping a Remote Copy group stops mirroring of the selected group between systems.

To stop a Remote Copy group:

1. Access the Remote Copy Groups screen.
2. In the list pane, select the group(s) you wish to stop.
3. Right-click the selection and click **Stop Remote Copy Group(s)**.  
The **Stop Remote Copy Group(s)** dialog box appears.
4. Click **OK**.

## Syncing Remote Copy Groups

To synchronize source and backup Remote Copy groups:

1. Access the Remote Copy Groups screen.
2. In the list pane, select the group(s) you wish to synchronize.

3. Right-click the selection and select **Sync Remote Copy Group(s)**.  
The **Sync Remote Copy Group(s)** dialog box appears.
4. Click **OK**.

## Editing Remote Copy Groups

To edit a Remote Copy group:

1. Access the Remote Copy Groups screen.
2. In the list pane, right-click the group you wish to edit.
3. Click **Edit Remote Copy Group**.

The **Edit Remote Copy Group** wizard appears.

## Groups

1. (Optional) If you wish to display advanced editing options, select **Show advanced options**.
2. In the **Backup** group:
  - a. **Mode** - Select **Synchronous** or **Periodic**.
  - b. (Optional) **Sync Period** - If you selected **Periodic**, select this checkbox and then select second(s), minute(s), hour(s), or day(s) and enter a numeric value for when you wish the source and backup groups to synchronize their data. If not selected, no period is used.
  - c. **Stop group** - Select to stop the Remote Copy group (stop mirroring) for editing.
  - d. (Optional) **Start group after completion** - Select if you want the Remote Copy group to be started (start mirroring) after it is created.
  - e. \*(Optional) **Auto Recover** - Select if you want the group to be restarted automatically after Remote Copy links come back up should the links go down.
  - f. \*(Optional) **Over Period Alert** - Select if you want an alert to be generated if the synchronization of a periodic group takes longer than its set synchronization period. This option is not available for groups in synchronous mode.
3. Click **Next**.

\*Displayed if **Show advanced options** is selected.

## Virtual Volumes

1. In the **Source Volume on** list, select a source virtual volume from the virtual volume list.
2. In the **Backup Volume on** list, select a backup virtual volume from the virtual volume list, or click **New** to create a new backup volume.

---

**NOTE:** When selecting volumes, you can filter the lists to include by clicking the down arrow and selecting **Virtual Volumes**, **Provisioning**, and **Virtual Size**. To clear the filter, click **Clear**.

---

3. If you clicked **New**:
  - a. Enter a volume name.
  - b. Select CPG for the user space.
  - c. Select a CPG for the copy space.
  - d. (Optional) If you wish to enter an allocation warning percentage and/or allocation limit, click **Enabled** and enter a value.

---

**NOTE:** If you are creating a Remote Copy group for a Synchronous Long Distance Remote Copy configuration, repeat steps 2 and 3 for the second **Backup Volume on** list of virtual volumes.

---

**NOTE:** If an RW snapshot is added to the group all RW of the same volume family will be removed. The base parent will also be removed.

---

4. Click **Add**.
5. If you wish to remove a volume from the group, select a volume from the volume list at the bottom of the wizard and click **Remove**.
6. Click **Next** to review a summary of changes, or click **Finish**.

## Summary

Review the summary information , then click **Finish**.

## Removing Remote Copy Groups

To remove a Remote Copy group:

1. Access the Remote Copy Groups screen.
2. In the list pane, select the group(s) you wish to remove.
3. Right-click the selection and click **Remove Remote Copy Group(s)**.  
The **Remove Remote Copy Group(s)** dialog box appears.
4. Click **Stop group(s)** in order to remove the associated Remote Copy targets.
5. When prompted for confirmation, click **Yes** to continue.
6. Click **OK**.

## Creating Remote Copy Links

The HP 3PAR Management Console allows you to create and remove Remote Copy links.

[“Creating Remote Copy Links” \(page 202\)](#)

[“Removing Remote Copy Links” \(page 203\)](#)

[“Pinging the Remote Copy Links” \(page 203\)](#)

## Creating Remote Copy Links

---

**NOTE:** Only two Remote Copy links are allowed.

---

To add a Remote Copy link:

1. Access the Remote Copy Links screen.
2. In the right pane, right-click in the table of the system on which you wish to create a link and select **Create Link**.  
The **Create Remote Copy Link** dialog box appears.
3. A graphical representation of each system's Remote Copy ports appears under **Create Links Between Systems**. Click and drag from one port on one system to a port on the other system. Repeat for a second port.
4. For IP links, in the **IP Settings** groups for each system/port, all fields are automatically populated based on the link relationship you established under **Create Links**.
  - a. (Optional) Enter the gateway address for each system/port.
  - b. (Optional) Click **Apply** to test the link configuration, or **Ping** to test the communication between the links.
5. For Fibre Channel links, in the **Settings** groups for each system/port:
  - a. **Connection Type** - Select **Point** for point-to-point mode or **Loop** for arbitrated loop mode.
  - b. **Configured Rate** - Select 1, 2, 4 Gbps, or Auto (default).
  - c. Click **Apply** to test the link configuration.
6. Click **OK**.

## Removing Remote Copy Links

To remove a Remote Copy link:

1. Access the Remote Copy Links screen.
2. In the right pane, select the link(s) you wish to remove.
3. Right-click the selection and then click **Remove Link**.  
The **Remove Remote Copy Link(s)** dialog box appears.
4. (Optional) If you wish to remove the selected link and its peers at the same time, select **Remove peer Remote Copy links**.
5. Click **OK**.

## Pinging RCIP Links

When creating Remote Copy over IP (RCIP) links, you are provided the opportunity to configure and ping the link ports to verify their validity and communication.

When pinging RCIP link ports:

- You can click **Details** in the **Port Configuration** or **Ping** dialog boxes to show or hide details about the configuration or ping operation, respectively.
- If the MTU value (maximum transmission unit) of the ports is different, for example one value 1500 and the other value 9000, the lower packet size (1500) is used during the ping operation.
- If both ports' MTU values are 9000, **Jumbo Ping** is displayed as the **Ping** group box title.

## Configuring and Pinging the Remote Copy Links

Clicking **Apply** after entering or changing the requested link information during Remote Copy link creation results in the entered configuration first being tested to check its validity, and then proceeding with the ping operation to check communication between the link ports. The ping is not executed if the configuration fails.

## Pinging the Remote Copy Links

Clicking **Ping** after entering or changing the requested link information during Remote Copy link creation results in a ping operation on the entered link ports.

## Managing Remote Copy Targets

Remote Copy target definitions are descriptors on one Remote Copy system that identify another a Remote Copy system. In a Remote Copy server pair, the systems are each defined as targets, relative to each other, for Remote Copy operations. The HP 3PAR Management Console allows you to perform the following operations:

[“Creating Remote Copy Targets” \(page 203\)](#)

[“Editing Remote Copy Targets” \(page 206\)](#)

[“Removing Remote Copy Targets” \(page 206\)](#)

## Creating Remote Copy Targets

You can add Remote Copy targets to your existing Remote Copy configuration(s).

- If you add a new target to an existing 1-to-1 Remote Copy configuration, you will effectively create a 1-to-N, or N-to-1 Remote Copy configuration.
- If you add a new target to an existing 1-to-N or N-to-1 Remote Copy configuration, you will be adding an additional backup or primary target, respectively.



- You cannot add new targets to a Synchronous Long Distance Remote Copy configuration.
- The following restrictions apply:
  - A 1-to-N Remote Copy configuration can have a maximum of two backup systems.
  - In an N-to-1 Remote Copy relationship, a maximum of four primary (source) systems use the same system as backup server.
  - In order to configure Synchronous Long Distance Remote Copy, at least two of the systems must have Fibre Channel ports. The synchronous connection must be a Fibre Channel connection, while the asynchronous periodic connection can be either all Fibre Channel (over an IP network) or all IP. Only unidirectional functionality is allowed between Remote Copy pairs.

To create a Remote Copy target:

1. Select **Remote Copy** in the Manager Pane.
2. Select the Remote Copy Configuration node in the Management Tree.
3. In the Common Actions panel, click **Add to Configuration**.

The **Create Remote Copy Target** wizard appears.

## Targets

1. Under **Select a Configuration**, the current remote copy type will be selected.
2. Under **Assign a System to Each Target**, click a storage system graphic. In the menu that appears, select a storage system to assign. Repeat for the other storage system graphic.

---

**NOTE:** Only available systems, which satisfy requirements appear. See the *HP 3PAR Remote Copy Software User's Guide* for additional information.

---

3. (Optional) Under **Label Location**, enter a location for each storage server, e.g. Lab 1, New York.
4. (Optional) Under **Name the Target Systems**, the **Target Name** fields are automatically populated with the storage server names. You can enter an alternate name if you wish.
5. If both assigned systems are running supported HP 3PAR OS, the checkbox to Create additional targets for simultaneous synchronous and periodic operations will be enabled and selected.

When **Additional Targets for Multimode** is selected, an additional target pair is presented with the default target name of system followed by \_1 and \_2. You can change the target name as desired, and there will be validation to make sure the target names on the same system are unique.

At this point, if you reassign a system to one that runs a non-supported HP 3PAR OS, the **Additional Targets for Multimode** will be deselected and disabled, and the additional target pair will be removed.

6. Click **Next**.

## Links

1. A graphical representation of each system's Remote Copy ports appears under **Create Links Between Systems**. You will see the new target on the link.
2. For IP links, in the **IP Settings** groups for each system/port, all fields are automatically populated based on the link relationship you established under **Create Links Between Systems**.
  - a. (Optional) Enter the gateway address for each system/port.
  - b. (Optional) Click **Apply** to test the link configuration, or **Ping** to test the communication between the links.



3. For Fibre Channel links, in the **Settings** groups for each system/port:
  - a. **Connection Type** - Select Point for point-to-point mode or Loop for arbitrated loop mode.
  - b. **Configured Rate** - Select 1, 2, 4 Gbps, or Auto (default).
  - c. Click **Apply** to test the link configuration, or Ping to test the communication between the links.
4. Click **Next**.

---

**NOTE:** If Fibre Channel ports are not displayed, the ports may not be zoned correctly, or may not be physically connected. See Configuring Fibre Channel Ports for RCFC for additional information.

---

## Groups

1. In the **Source** group:
  - a. **System** - Select the system on which the Remote Copy group will reside.
  - b. (Optional) **Domain** - Select the domain in which the Remote Copy group will reside.
  - c. **Group** - Enter a name for the Remote Copy group.
  - d. (Optional) **Start group after completion** - Select if you want the Remote Copy group to be started (start mirroring) after it is created.
  - e. (Optional) **Do not perform initial sync** - Select if you do not want the created Remote Copy group to be synchronized with its backup group. Before selecting this option verify both sides are synchronized or it may lead to data inconsistency. This option is available if Show Tape Backup Options in Remote Copy Wizards was selected in the Preferences.
2. In the **Backup** group:
  - a. **Name** - The system NOT selected as the source system, automatically appears.
  - b. **Mode** - Select Synchronous or Periodic.
  - c. **Sync Period** - If you selected Periodic, select second(s), minute(s), hour(s), or day(s) and enter a numeric value for when you wish the source and backup groups to synchronize.
  - d. (Optional) **Auto Recover** - Select if you want the group to be restarted automatically after Remote Copy links come back up should the links go down. (Displayed only if **Show advanced options** is selected.)
  - e. (Optional) **Over Period Alert** - Select if you want an alert to be generated if the synchronization of a periodic group takes longer than its set synchronization period. This option is not available for groups in synchronous mode. (Displayed only if **Show advanced options** is selected.)
3. Click **Add**.
4. (Optional) Repeat steps 1 through 3 to create additional Remote Copy groups.

---

**NOTE:** When creating additional groups, if you select a server other than the server selected during the first instance of group creation, you will create a bidirectional Remote Copy relationship where each storage server will be both the primary and backup servers to the other.

---

5. Click **Next**.

## Virtual Volumes

1. Select a Remote Copy group from the **Group** list.
2. Under the **Source Volume on** list, select a virtual volume.

3. Under the **Backup Volume on** list:
  - a. Select either **Existing** or **New**.
  - b. If you selected **Existing**, select a backup virtual volume.
  - c. If you selected **New**:
    - i. **Name** - Enter a name for the backup virtual volume.
    - ii. **CPG under User CPG** - Select a CPG from which the volume's user space is allocated.
    - iii. **CPG under Copy CPG** - Select a CPG from which the volume's copy space is allocated.
    - iv. (Optional) In the **Allocation Warning** and **Allocation Limit** text boxes under User CPG and Copy CPG, enter the appropriate information. You must check the **Enabled** checkbox if you want you use these options.

---

**NOTE:** When selecting volumes, you can filter the lists to include by clicking the down arrow and selecting **Virtual Volumes**, **Provisioning**, and **Virtual Size**. To clear the filter, click **Clear**.

**NOTE:** If an RW snapshot is added to the group all RW of the same volume family will be removed. The base parent will also be removed.

---

4. Click **Add**.
5. (Optional) Repeat steps 1 through 4 to add additional virtual volumes to your Remote Copy group(s).
6. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

Review your settings then click **Finish** to complete the wizard.

## Editing Remote Copy Targets

To edit a Remote Copy target:

1. Access the Remote Copy Targets screen.
2. Right-click the Remote Copy target you wish to edit, and then select **Edit Target**.  
The **Edit Remote Copy Target** dialog box appears.
3. Click **Advanced**.
4. Enter a value in the **Bandwidth** field.
5. Enter a value in the **Latency** field.
6. Click **OK**.

## Removing Remote Copy Targets

To remove a Remote Copy target:

1. Access the Remote Copy Targets screen.
2. Select one or more Remote Copy targets to remove.
3. Right-click the selection, and then select **Remove Target**.  
The **Remove Remote Copy Target** dialog box appears.
4. (Optional) If you wish to remove Remote Copy groups associated with the selected target(s), and dismiss the target(s) from groups with additional targets, select **Remove or dismiss targets from groups**.
5. Click **OK**.

## Using Remote Copy for Disaster Recovery

When a system in a Remote Copy setup becomes unavailable, you can perform disaster recovery operations to continue writing data to the available system(s).

The disaster recovery sequence is as follows:

1. Failover Remote Copy groups to the backup system.
2. Recover the Remote Copy groups to the primary (source) system once the source server has been brought back up and is running normally.
3. Restore the Remote Copy groups to their normal operation.

The following topics provide instructions on performing disaster recovery:

[“Failover Remote Copy Groups” \(page 207\)](#)

[“Switch Failover Remote Copy Groups” \(page 207\)](#)

[“Recover Remote Copy Groups” \(page 208\)](#)

[“Restore Remote Copy Groups” \(page 209\)](#)

The HP 3PAR Management Console also provides the flexibility to "undo" a disaster recovery failover operation. This is described in [“Revert Remote Copy Groups” \(page 208\)](#).

## Failover Remote Copy Groups

When the source system in a Remote Copy setup becomes unavailable, you can perform a failover operation on the Remote Copy groups in order to continue your normal operations on the backup system(s) while the primary system is down.

To failover Remote Copy groups:

1. Navigate to the Remote Copy Groups screen.
2. In the right pane, select the Remote Copy group(s) you wish to failover.
3. Right-click and select **Stop Remote Copy Group(s)**.
4. Select the stopped groups.
5. Right-click and select **Failover Remote Copy Group(s)**.

The **Remote Copy Failover** dialog box appears.

When performing failover on Remote Copy groups, the groups on the backup system reverse roles to become primary groups, i.e. data is written directly to those groups as data would normally be written to groups on the primary system.

6. (Optional only in SLD configuration) Click **Advanced** to display additional failover options. If you do not want to check for newer data, select Do not check other targets for newer data.
7. Click **OK**.
8. Click **Yes** when prompted for confirmation.

In the right pane of the Remote Copy Groups screen:

- **Primary-Rev** is displayed under the **Backup Role** column indicating that the groups on the backup system are currently acting as the primary groups. Any data is written to the groups on the backup system.
- The **DR state** column displays **Failover**.

## Switch Failover Remote Copy Groups

---

**NOTE:** The switch failover operation is only allowed for Synchronous Long Distance Remote Copy setups.

---

For Synchronous Long Distance Remote Copy, the HP 3PAR Management Console allows you to switch failover of Remote Copy groups from one backup system to the other backup system. For example, in a Synchronous Long Distance Remote Copy setup where source system A is backed up to backup systems B and C, if Remote Copy groups are failed over from source system A to backup system B, you can switch failover from backup system B to backup system C.

---

**NOTE:** The following procedure assumes that failover has already been performed on one backup system.

---

To switch failover Remote Copy groups:

1. Navigate to the Remote Copy Groups screen.
2. In the left pane, right-click the graphic of the system on which you wish to switch failover and select **Switch Failover Groups from <original failover system>**.

The **Remote Copy Switch Failover** dialog box appears.

3. Click **OK**.
4. Click **Yes** when prompted for confirmation.

In the right pane of the Remote Copy Groups screen:

- **Primary-Rev** is displayed under the **Backup Role** column for the system you switched failover to, indicating that the groups on the backup system are currently acting as the primary groups. Any data is written to the groups on the backup system.
- The **DR state** column displays **Failover**.

## Revert Remote Copy Groups

You can undo a failover operation by reverting the Remote Copy groups to their normal state. For example, you may wish to revert the groups if you have failed over the groups to the backup system, but the source system has come back online and there has not been any new data written to the backup system.

To revert Remote Copy groups:

1. Navigate to the Remote Copy Groups screen.
2. In the right pane, select the Remote Copy group(s) on which you performed failover.
3. Right-click and select **Revert Failover Remote Copy Group(s)**.

The **Remote Copy Revert Failover** dialog box appears.

4. Click **OK**.
5. Click **Yes** when prompted for confirmation.

In the right pane of the Remote Copy Groups screen:

- **Primary** is displayed under the **Source Role** column and **Secondary** is displayed under the **Backup Role** column indicating that the Remote Copy groups have been restored to their original roles.
- The **DR state** column displays **Normal**.
- A green arrow is displayed under the **Replication** column indicating the original direction of data replication.

## Recover Remote Copy Groups

If you performed failover on your Remote Copy groups due to a source system failure, you must recover the groups to the source system once the source system is brought back up.

To recover Remote Copy groups:

1. Navigate to the Remote Copy Groups screen.
2. In the right pane, select the Remote Copy group(s) on which you performed failover.
3. Right-click and select **Recover Remote Copy Group(s)**.

The **Remote Copy Recover** dialog box appears.

4. Click **OK**.
5. Click **Yes** when prompted for confirmation.

In the right pane of the Remote Copy Groups screen:

- **Secondary-Rev** is displayed under the **Source Role** column indicating that the groups on the source system are currently acting as backup to the groups on the backup system. Any data is written to the groups on the backup system and then replicated on the source system.
- The **DR state** column displays **Recover**.
- A yellow arrow is displayed under the **Replication** column indicating the reversed direction of data replication.

To restore the original source/backup system relationship where data is written to the groups on the source system, you must restore the Remote Copy groups.

## Restore Remote Copy Groups

If you recovered your Remote Copy groups, you must restore the groups in order to restore the original Remote Copy relationship between your source and backup system(s).

To restore Remote Copy groups:

1. Navigate to the Remote Copy Groups screen.
2. In the right pane, select the recovered Remote Copy group(s).
3. Right-click and select **Restore Remote Copy Group(s)**.

The **Remote Copy Restore** dialog box appears.

4. Click **OK**.
5. Click **Yes** when prompted for confirmation.

In the right pane of the Remote Copy Groups screen:

- **Primary** is displayed under the **Source Role** column and **Secondary** is displayed under the **Backup Role** column indicating that the Remote Copy groups have been restored to their original roles.
- The **DR state** column displays **Normal**.
- A green arrow is displayed under the **Replication** column indicating the original direction of data replication.

## Viewing Remote Copy Information

The HP 3PAR Management Console allows you to view information about connected systems using HP 3PAR Remote Copy Software. Use the HP 3PAR Management Console to view the following:

[“Viewing Available Remote Copy Systems” \(page 209\)](#)

[“Viewing Remote Copy System Ports” \(page 210\)](#)

[“Viewing Configured Remote Copy Systems” \(page 216\)](#)

[“Viewing Remote Copy Groups” \(page 219\)](#)

[“Viewing Remote Copy Virtual Volumes” \(page 219\)](#)

[“Viewing Remote Copy Links” \(page 220\)](#)

[“Viewing Remote Copy Targets” \(page 221\)](#)

---

**NOTE:** HP 3PAR Remote Copy Software requires an HP 3PAR Remote Copy Software license. For additional information about the license, see the *HP 3PAR OS Concepts Guide*.

---

## Viewing Available Remote Copy Systems

Remote Copy-ready systems are displayed under the **Available Storage Systems** node in the Management Tree.

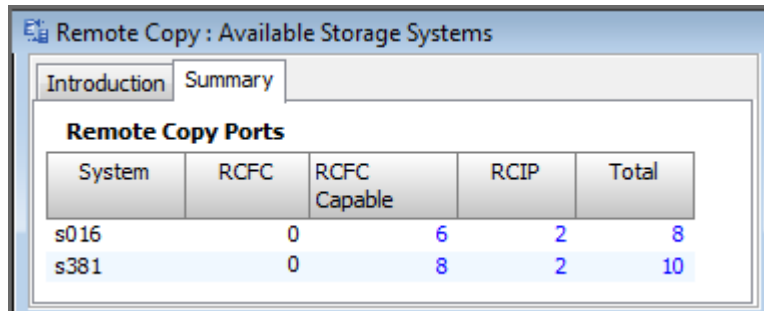
---

**NOTE:** A Remote Copy-ready system means that the system has a Remote Copy license, and has Remote Copy over Fibre Channel (RCFC) or Remote Copy over IP (RCIP) ports, but has not yet set up Remote Copy.

---

To view available Remote Copy systems:

1. In the Manager Pane, click **Remote Copy**.
2. In the Management Tree, click **Available Storage Systems**.



Remote Copy Ports				
System	RCFC	RCFC Capable	RCIP	Total
s016	0	6	2	8
s381	0	8	2	10

The **Available Storage Systems** screen displays systems with available Remote Copy over Fibre Channel and/or Remote Copy over IP ports. Each numeric value displayed in blue under the **RCFC**, **RCIP**, and **Total** columns is a link to that system's Remote Copy port information.

See also:

[“Manager Pane” \(page 396\)](#)

[“Management Tree” \(page 395\)](#)

[“Viewing Remote Copy System Ports” \(page 210\)](#)

## Viewing Remote Copy System Ports

To view a system's available Remote Copy ports:

Access the **Available Storage Systems** screen then click the numeric value under the **RCFC**, **RCIP**, or **Total** column.

or

1. In the Manager Pane, click **Remote Copy**.
2. In the Management Tree, under **Available Storage Systems**, click the **Ports** node under the system whose Remote Copy ports you wish to view.

Information about a system's Remote Copy ports is displayed on four tabs, **RC Ports**, **RCIP**, **RCFC**, and **Inventory**.

## RC Ports Tab

The screenshot shows the 'Remote Copy: Available Storage Systems: s020: Ports' window. It has tabs for 'RC Ports', 'RCIP', 'RCFC', and 'Inventory'. The 'RC Ports' tab is active, showing a list of 4 objects. Below the list is a 'Summary' section with 'General', 'Settings', and 'Fibre Channel Settings' tabs. The 'General' tab is selected, showing details for port 0:2:1.

Position (Node:Slot:Port)	Label	WWN/MAC	State	Type	Connected Device Type	Connected Device	Mode
0:4:1	RCIP0	000E0C742BA7	Ready	RCIP	RC	--	Peer
1:4:1	RCIP1	000E0C742BA9	Ready	RCIP	RC	--	Peer
0:2:1	--	20210002AC000014	Ready	RCFC	RC	20310002AC000011	Initiator
1:2:1	--	21210002AC000014	Ready	RCFC	RC	21310002AC000011	Initiator

**RC Ports Details: 0:2:1**

Summary

General		Settings		Fibre Channel Settings	
<b>Position (Node:Slot:Port)</b>	0:2:1	<b>Connection Mode</b>	RCFC	<b>Topology</b>	Fabric Attached
<b>Label</b>	--	<b>Connection Type</b>	Point	<b>Class</b>	3
<b>Port WWN</b>	20210002AC000014	<b>Configured Rate</b>	Auto	<b>Adapter Type</b>	EMULEX LP11002
<b>Node WWN</b>	2FF70002AC000014	<b>Max Rate</b>	4 Gbps	<b>Remote Port WWN</b>	20310002AC000011
<b>Type</b>	RCFC	<b>Class2</b>	Disabled	<b>Remote Node WWN</b>	2FF70002AC000011
<b>Rate</b>	4 Gbps	<b>VCN</b>	Disabled	<b>Mode Change</b>	Allowed
<b>Connected Device Type</b>	RC	<b>Unique Node WWN</b>	Disabled	<b>Link State</b>	Ready
<b>Connected Device</b>	20310002AC000011	<b>Interrupt Coalesce</b>	Enabled		
<b>Mode</b>	Initiator				
<b>State</b>	Ready				

**Resources**

**Total Data Throughput** 0 KBps (0%)

4 Gbps

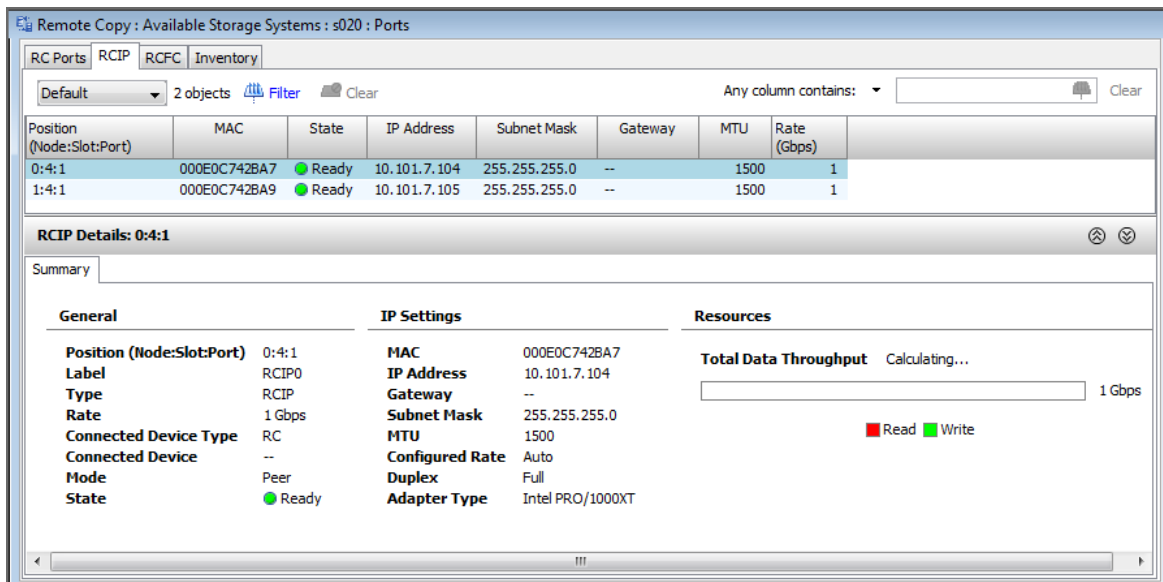
Read Write

The list pane of the **RC Ports** tab displays summary information about the system's Remote Copy ports. The detail pane displays details about a selected port from the list pane.

The following information is displayed in the list pane:

Column	Description
<b>Position</b>	The location of the port in node:slot:port format.
<b>WWN/MAC</b>	The World Wide Name (WWN) or Media Access Control (MAC) address of the connected device.
<b>State</b>	The state of the port. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Type</b>	The type of port, either Remote Copy over IP (RCIP) or Remote Copy over Fibre Channel (RCFC).
<b>Connected Device Type</b>	Type of device that the port is connected to. Free, Disk, Host, Peer, RC, or InServ.
<b>Connected Device</b>	Name of device that the port is connected to, e.g. host1, cage0.
<b>Mode</b>	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.

For information about the detail pane, see [“RCIP Tab”](#) (page 212) and [“RCFC Tab”](#) (page 213).



The list pane of the **RCIP** tab displays summary information about the system's RCIP ports. The detail pane displays details about a selected RCIP port from the list pane.

The following information is displayed in the list pane:

Column	Description
<b>Position</b>	The location of the port in node:slot:port format.
<b>MAC</b>	The Media Access Control (MAC) address of the connected device.
<b>State</b>	The state of the port. See <a href="#">"System and Component Status Icons"</a> (page 407).
<b>IP Address</b>	IP address of the RCIP port.
<b>Subnet Mask</b>	Netmask address for the RCIP interface.
<b>Gateway</b>	The address of a local IP router on the same network as the system, used to forward traffic to destinations beyond the local network.
<b>MTU</b>	Maximum Transmission Unit. The greatest amount of data or "packet" size that can be transferred at one time over a particular network connection without overburdening the connection. The default MTU setting for an iSCSI port is 1500. When supported by the network, an MTU value of 9000 should be used.
<b>Rate</b>	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.

The following information is displayed in the detail pane:

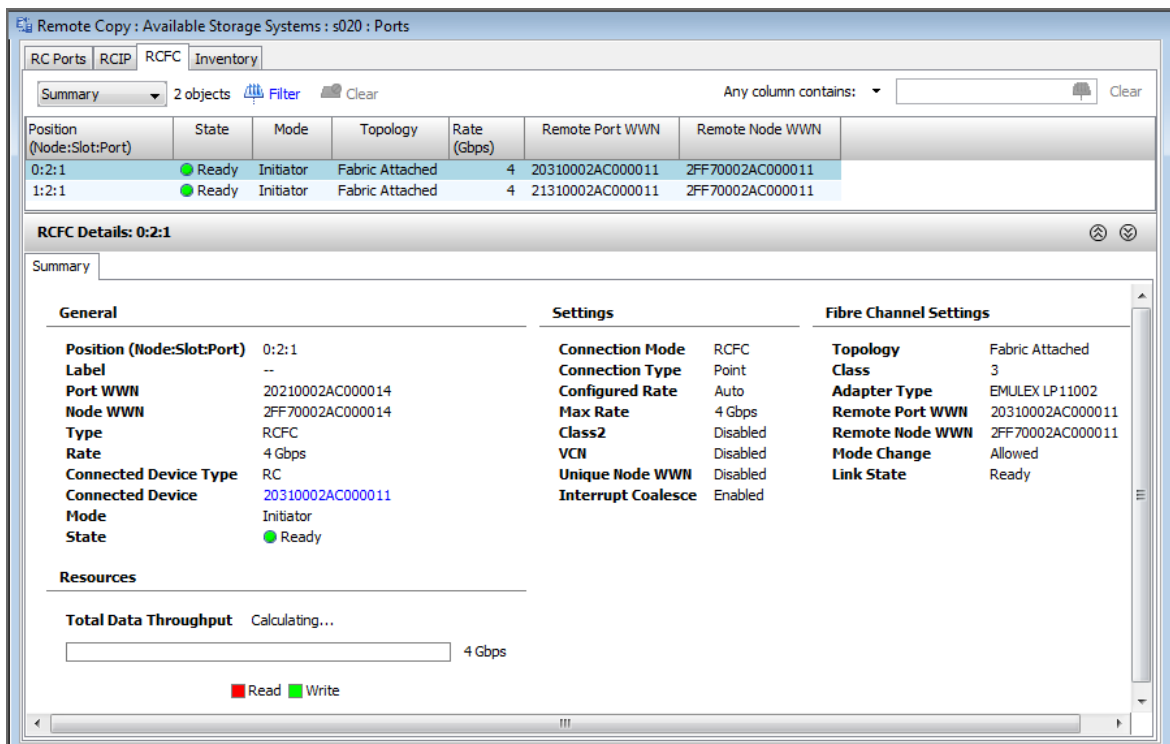
Group	Field	Description
<b>General</b>	<b>Location</b>	The port location in Node:Slot:Port format.
	<b>Type</b>	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
	<b>Rate</b>	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
	<b>Connected Device Type</b>	Type of device that the port is connected to. Free, Disk, Host, Peer, or InServ.



Group	Field	Description
	<b>Connected Device</b>	Name of device that the port is connected to, e.g. host1, cage0.
	<b>Mode</b>	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
	<b>State</b>	Current state of the port.
<b>IP Settings</b>	<b>MAC</b>	The Media Access Control address for the Ethernet interface.
	<b>IP Address</b>	IP address of the RCIP port.
	<b>Gateway</b>	The address of a local IP router on the same network as the Storage System, used to forward traffic to destinations beyond the local network.
	<b>Subnet Mask</b>	Netmask address for the RCIP interface.
	<b>MTU</b>	Maximum Transmission Unit. The greatest amount of data or "packet" size that can be transferred at one time over a particular network connection without overburdening the connection. The default MTU setting for an iSCSI port is 1500. When supported by the network, an MTU value of 9000 should be used.
	<b>Configured Rate</b>	The duplex speed, Half or Full.
	<b>Duplex</b>	Model of the adapter that contains the port (for example, Intel PRO/1000MT).
	<b>Adapter Type</b>	The TCP port number used by the iSCSI or RCIP card.
<b>Resources</b>	<b>Total Data Throughput</b>	The throughput in KB/sec.

## RCFC Tab

The **RCFC** tab displays a summary of all Remote Copy over Fibre Channel (RCFC) ports on a system.



The list pane of the **RCFC** tab displays summary information about the system's RCFC ports. The detail pane displays details about a selected RCFC port from the list pane.

The following information is displayed in the list pane:

Column	Description
<b>Position</b>	The port location in Node:Slot:Port format.
<b>State</b>	The state of the port. See <a href="#">"System and Component Status Icons"</a> (page 407).
<b>Type</b>	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
<b>Mode</b>	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
<b>Topology</b>	Type of connection (Private Loop, Public Loop, or Point-Point).
<b>Rate</b>	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
<b>Remote Port WWN</b>	World Wide Name of the remote port.
<b>Remote Node WWN</b>	World Wide Name of the remote node.

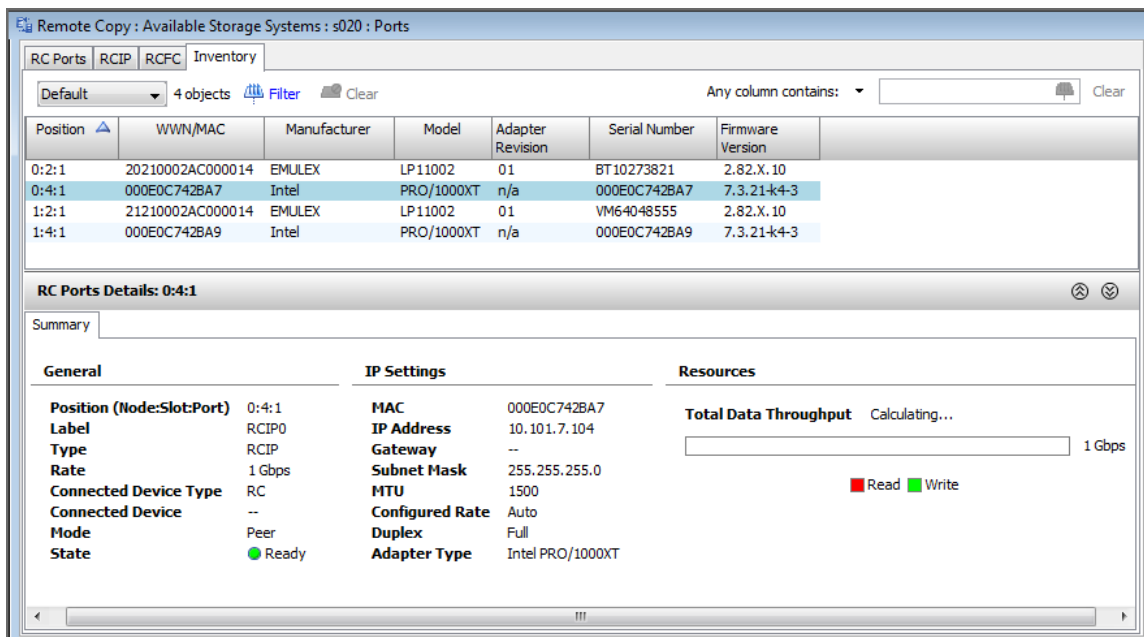
The following information is displayed in the detail pane:

Group	Field	Description
<b>General</b>	<b>Location</b>	The port location in Node:Slot:Port format.
	<b>Port WWN</b>	Port World Wide Name.
	<b>Node WWN</b>	Node World Wide Name.
	<b>Type</b>	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
	<b>Rate</b>	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.

Group	Field	Description
	<b>Connected Device Type</b>	Type of device that the port is connected to. Free, Disk, Host, Peer, or InServ.
	<b>Connected Device</b>	Name of device that the port is connected to, e.g. host1, cage0.
	<b>Mode</b>	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (rare). Peer mode is for Ethernet ports.
	<b>State</b>	Current state of the port.
<b>Resources</b>	<b>Total Data Throughput</b>	The throughput in KB/sec.
<b>Settings</b>	<b>Connection Mode</b>	The type of port connection.
	<b>Connection Type</b>	Connection type or port connection setting (Loop, Point, or Loop-point). When the port is set to Loop-point, both loop and point-to-point connections are enabled.
	<b>Configured Rate</b>	Data transfer rate setting (for example, 1 Gbps). Auto indicates that the system automatically selects the rate.
	<b>Max Rate</b>	Maximum rate of connection from the port.
	<b>Class 2</b>	Indicates whether Fibre Channel service Class 2 is Disabled, Ack 1 or Ack 0.
	<b>VCN</b>	For fabric attached ports, indicates the VLUN change notification setting. When set to Enabled, notices are generated and sent to the fabric controller. When set to Disabled, no notification is sent.
	<b>Unique Node WWN</b>	Indicates whether the node's WWN is Enabled or Disabled.
<b>Fibre Channel Settings</b>	<b>Interrupt Coalesce</b>	If Disabled, each I/O generates a separate interrupt to the HBA port driver rather than generating one interrupt for multiple I/O completion.
	<b>Topology</b>	Type of connection (Private Loop, Public Loop, or Point-Point).
	<b>Class</b>	Identifies which Fibre Channel classes of service are enabled (2, 3, or 2/3). 2/3 indicates that both Class 2 and Class 3 are enabled.
	<b>Adaptor Type</b>	Model of the Fibre Channel adaptor that contains the port (for example, QLOGIC 2302).
	<b>Remote Port WWN</b>	World Wide Name of the remote port.
	<b>Remote Node WWN</b>	World Wide Name of the remote node.
	<b>Mode Change</b>	Indicates whether port mode change from initiator to target or vice versa is Allowed or Prohibited. This setting is configured using the InForm CLI command <code>controlport</code> .
	<b>Link State</b>	The state of the link.

## Inventory Tab

The **Inventory** tab displays information about the Remote Copy ports on a system such as the ports' manufacturer and firmware version. The list pane of the **Inventory** tab displays summary information about the system's RCFC and RCIP ports. The detail pane displays details about a selected RCFC or RCIP port from the list pane. For information about the detail pane, see ["RCIP Tab" \(page 212\)](#) and ["RCFC Tab" \(page 213\)](#).



See also:

“Manager Pane” (page 396)

“Management Tree” (page 395)

“Viewing Remote Copy Links” (page 220)

“Viewing Remote Copy Targets” (page 221)

## Viewing Configured Remote Copy Systems

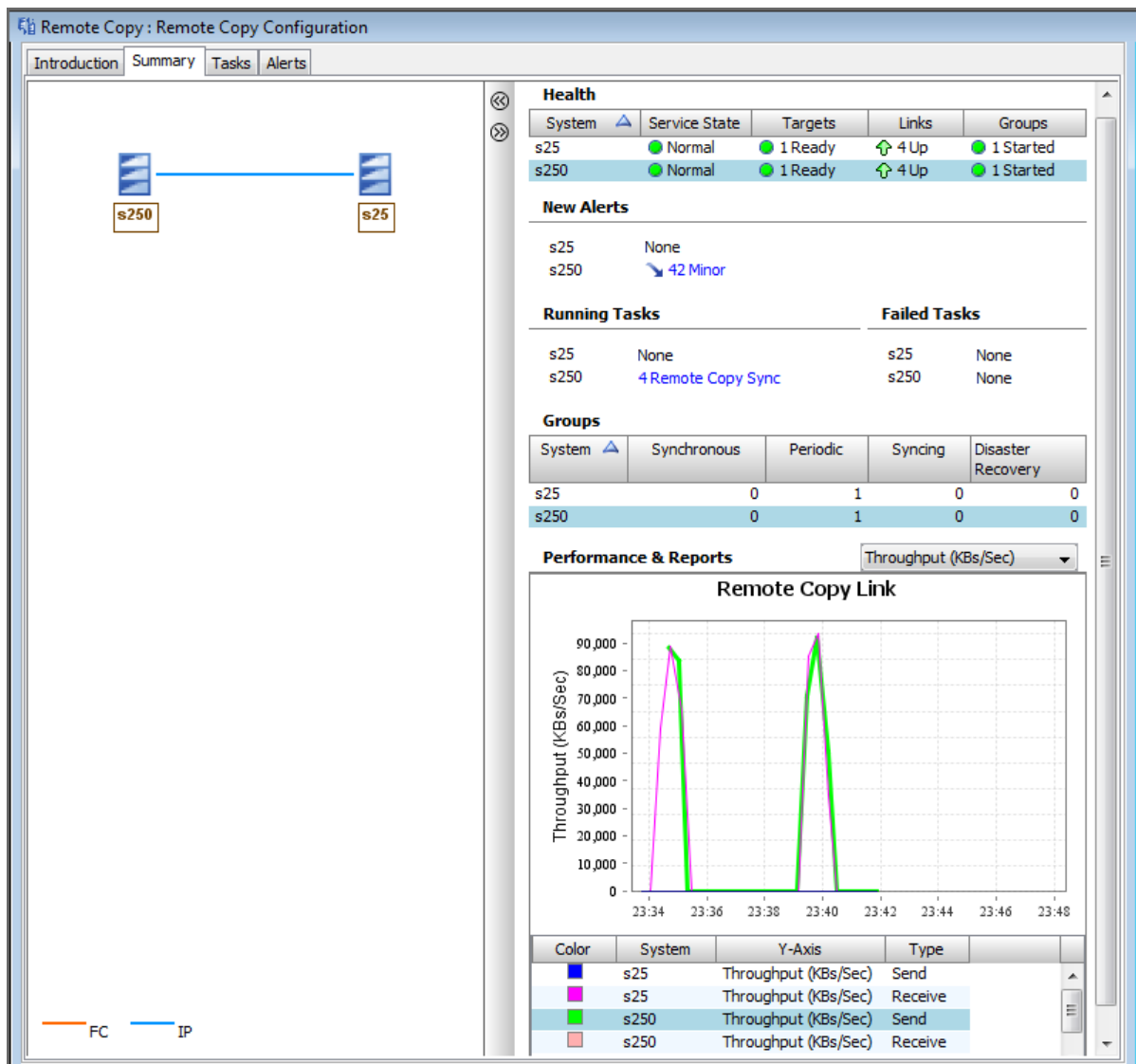
To view configured Remote Copy systems:

1. In the Manager Pane, click **Remote Copy**.
2. In the Management Tree, click **Remote Copy Configuration** node for the Remote Copy configuration you wish to view.

Information about the selected configured Remote Copy systems appears on three tabs: **Summary**, **Tasks**, and **Alerts**, in the Management Window.

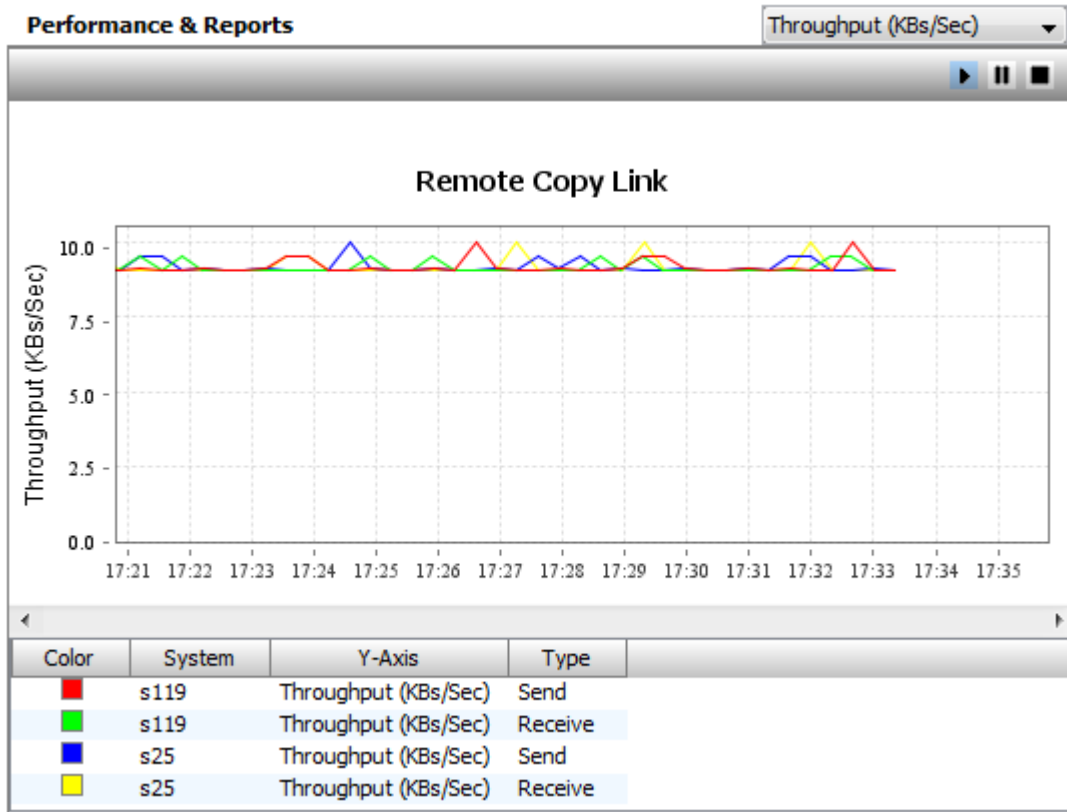
### Summary Tab

The **Summary** tab is divided into a left pane and right pane. The left pane presents a graphical representation of Remote Copy setup between the systems. The right pane displays the health of each system in the Remote Copy setup, any new alerts, running tasks, a summary of the Remote Copy groups, and a Remote Copy Link performance chart.

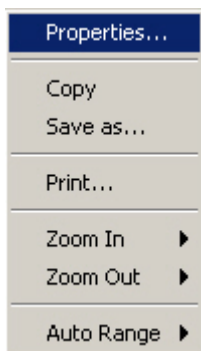


## Remote Copy Link Performance Chart

The **Remote Copy Link** performance chart can be set to graph the throughput (KBs/Sec) or heartbeat (round trip in ms). The graph's legend is displayed in tabular format. Clicking any of the rows in the legend results in that row's line becoming bold in the graph. Like other charts in the HP 3PAR Management Console, you can customize the colors displayed in the graph by clicking a color in the **Color** column and then selecting a new color from the color palette that appears. At any time, you can play, pause, or stop the graph. Clicking pause or stop causes data plotting to stop; however, data collection continues in the background.



Right-clicking the graph displays a menu, which allows you to perform actions such as viewing and setting the chart's properties, copying the chart, and saving the chart.



## Tasks Tab

The **Tasks** tab is divided into a list pane and a detail pane. The list pane displays a summary of all Remote Copy tasks for the Remote Copy systems. The detail pane displays details about a selected system from the list pane. The format is similar to the format described in [“Displaying Tasks”](#) (page 345).

## Alerts Tab

The **Alerts** tab is divided into a list pane and a detail pane. The list pane displays all Remote Copy-related alerts. The detail pane displays the details about an alert selected from the list pane. The format is similar to the format described in [“Viewing System Alerts”](#) (page 269).

See also:

[“Manager Pane”](#) (page 396)

[“Management Tree”](#) (page 395)

[“Viewing Remote Copy Links”](#) (page 220)

[“Displaying Tasks” \(page 345\)](#)

[“Viewing System Alerts” \(page 269\)](#)

## Viewing Remote Copy Groups

A Remote Copy group is a group of virtual volumes on the same storage server that are logically related, and on which Remote Copy operations are performed.

To view Remote Copy groups:

1. In the Manager Pane, click **Remote Copy**.
2. In the Management Tree, click **Groups** under the **Remote Copy Configuration** node for the Remote Copy configuration you wish to view.

Group	Source VV Name	Source System	Source Role	Mode	DR state	Group state	Writable LUNs	Replication	Target Name	Backup System	Backup Role
group1	s250	Primary	Periodic	Normal	Started	s250	RC025IP	s25	Secondary		

Group	Source VV Name	Source System	Sync State	Target	Backup VV Name	Backup System	Sync Percent	Last Sync
group1	vv_2G.1	s250	✓ Synced	RC025IP	vs_2G.1	s25	--	Sep 26, 2012 23:45:13 PDT
group1	vv_2G.2	s250	✓ Synced	RC025IP	vs_2G.2	s25	--	Sep 26, 2012 23:45:13 PDT
group1	vv_5G.1	s250	✓ Synced	RC025IP	vs_5G.1	s25	--	Sep 26, 2012 23:44:25 PDT
group1	vv_5G.2	s250	✓ Synced	RC025IP	vs_5G.2	s25	--	Sep 26, 2012 23:44:25 PDT

Information about Remote Copy groups appears on three panes in the Management Window:

- The left pane displays a graphical representation of the selected Remote Copy configuration. The image includes the type of Remote Copy relationship (Remote Copy over IP or Remote Copy over Fibre Channel) between the servers in the Remote Copy configuration, the direction of replication (indicated with an arrow) between the servers, the synchronization and Remote Copy status of the Remote Copy groups, and the number of volumes being replicated. This image is updated for the Remote Copy group selected from the upper right pane.
- The upper right pane displays a table of the Remote Copy groups in the selected Remote Copy configuration.
- The lower right pane displays a table of the virtual volume(s) belonging to the selected Remote Copy group from the upper right pane. The table can be filtered to display information about virtual volume Pairs, the Source virtual volume, or the Backup virtual volume.

**NOTE:** You can additionally view only synchronous Remote Copy groups or asynchronous periodic Remote Copy groups by clicking either **Synchronous** or **Periodic**, respectively, under the Groups node in the Management Tree.

See also:

[“Manager Pane” \(page 396\)](#)

[“Management Tree” \(page 395\)](#)

[“Viewing Configured Remote Copy Systems” \(page 216\)](#)

## Viewing Remote Copy Virtual Volumes

To view Remote Copy virtual volumes:

1. In the Manager Pane, click **Remote Copy**.
2. In the Management Tree, click **Virtual Volumes** under the **Remote Copy Configuration** node for the Remote Copy volumes you wish to view.

**Remote Copy: Remote Copy Configuration: Virtual Volumes**

Name	System	Domain	State	Type	Provisioning	RAID	Virtual Size (GiB)	Exported To	RC Status	RC Group	Sync State	Writable LUNs
vs_SG.1	s25	--	Normal	Base	Thin	RAID 1	10,000	--	Secondary	group1.r250	✓ Synced	RO
vs_SG.2	s25	--	Normal	Base	Thin	RAID 1	10,000	--	Secondary	group1.r250	✓ Synced	RO
vv_2G.1 (1)	s250	--	Normal	Base	Thin	RAID 1	6,000	--	Primary	group1	✓ Synced	RW
vv_2G.2 (1)	s250	--	Normal	Base	Thin	RAID 1	6,000	--	Primary	group1	✓ Synced	RW
vv_SG.1 (1)	s250	--	Normal	Base	Thin	RAID 1	10,000	--	Primary	group1	✓ Synced	RW
							96,000					

**Virtual Volume Details: vv\_2G.1**

Summary | Settings | Advanced | Logical Disks | SCSI Reservations | VLUNs | Hosts | Layout | Alerts

**General**

Name: vv\_2G.1  
ID: 2184  
Domain: --  
Set: --  
Type: Base  
Provisioning: Thin  
WWN: 60002AC0000000006000888000000FA  
Copy Of: --  
Copies: 1  
Mode: RW  
RAID: RAID 1  
Virtual Size: 6,000 GiB  
Exported To: 1/0/--  
Master: 1/0/--

**Capacity**

Device Type: All (Logical selected, Raw unselected)

**Virtual Volume Allocation**

Admin Space: 4%  
Copy Space: 52%  
User Space: 44%

■ User Space: 3,000 GiB  
■ Copy Space: 3,500 GiB  
■ Admin Space: 0,250 GiB  
Total: 6,750 GiB

**Thinly Provisioned Savings (Base Volumes)**

Virtual: 6,000 GiB  
Total Reserved: 6,750 GiB  
Savings: None

**Health**

New Alerts: None  
State: Normal  
State Description: Normal

**History**

Creation Date: Sep 20, 2012 03:54:36 PDT  
Retention Time: --  
Expiration Time: --  
Copy Space Calculation Date: --  
Comments: --

**Remote Copy**

RC Status: Primary  
RC Group: group1  
Sync State: ✓ Synced  
Writable LUNs: RW

Information about Remote Copy virtual volumes appears on two panes in the Management Window:

- All virtual volumes associated with the Remote Copy configuration you selected are displayed in a table in the list pane of the Management Window. The table displays Remote Copy information such as where the volumes are exported, the volume's Remote Copy status (if the volume is a primary or secondary volume), and to which Remote Copy group the volume belongs.
- The detail pane displays details about a single volume selected from the list pane. The detailed information is displayed on eight tabs, **Summary**, **Settings**, **Advanced**, **Logical Disks**, **SCSI Reservations**, **VLUNs**, **Layout**, and **Alerts**. See “Viewing the Virtual Volumes Tab” (page 153).

See also:

“Manager Pane” (page 396)

“Management Tree” (page 395)

“Viewing Configured Remote Copy Systems” (page 216)

“Viewing the Virtual Volumes Tab” (page 153)

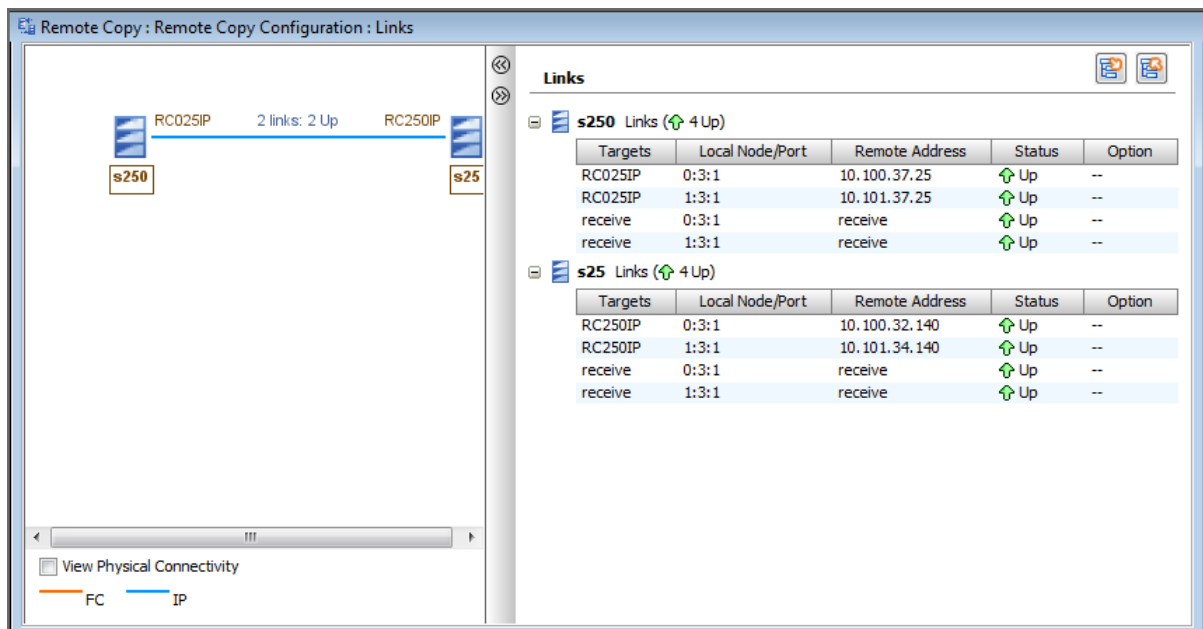
## Viewing Remote Copy Links

Remote Copy links are associated with Remote Copy target definitions, and are used to transmit and receive data between Remote Copy systems.

To view Remote Copy links:

1. In the Manager Pane, click **Remote Copy**.
2. In the Management Tree, click **Links** under the **Remote Copy Configuration** node for the Remote Copy links you wish to view.





Information about the Remote Copy links appears on two panes in the Management Window:

- The left pane displays a graphical representation of the selected Remote Copy configuration. The image includes the type of Remote Copy relationship (Remote Copy over IP or Remote Copy over Fibre Channel) between the servers in the Remote Copy configuration, the number of links between the Remote Copy systems, and the current state of the links (whether the links are up or down).

You can optionally view the systems' physical connectivity by selecting the **View Physical Connectivity** checkbox at the lower left side of the pane. When selected, the image displays the Remote Copy systems' port locations, the link IP addresses, and how the ports are connected.

- The right pane displays information about the Remote Copy links for each Remote Copy system in tabular format. Transmitting links are displayed as the target system's name under the **Targets** column. Receiving links are displayed as receive under the **Targets** column. Additional information includes each link's port location, IP address, and status.

See also:

["Manager Pane" \(page 396\)](#)

["Management Tree" \(page 395\)](#)

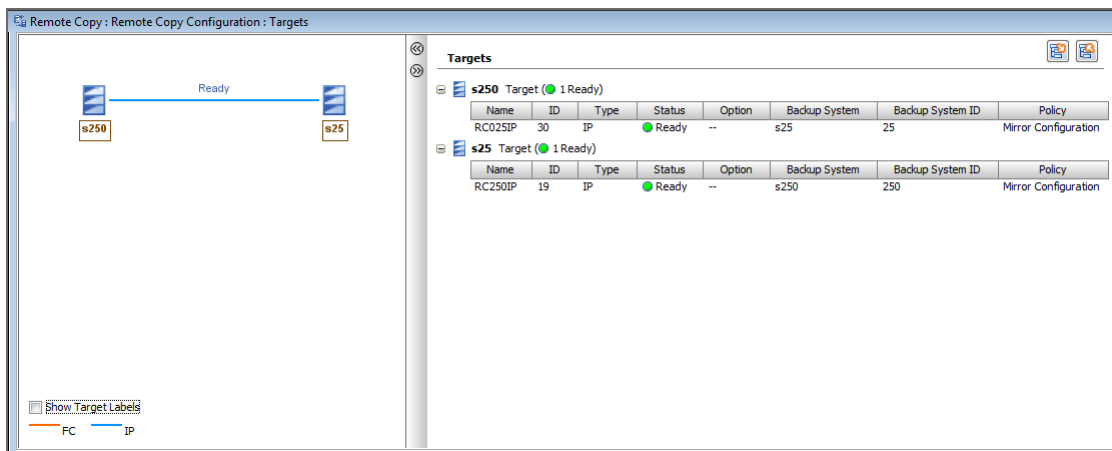
["Viewing Configured Remote Copy Systems" \(page 216\)](#)

## Viewing Remote Copy Targets

Remote Copy target definitions are descriptors on one Remote Copy system that identify another a Remote Copy system. In a Remote Copy server pair, the servers are each defined as targets, relative to each other, for Remote Copy operations.

To view Remote Copy targets:

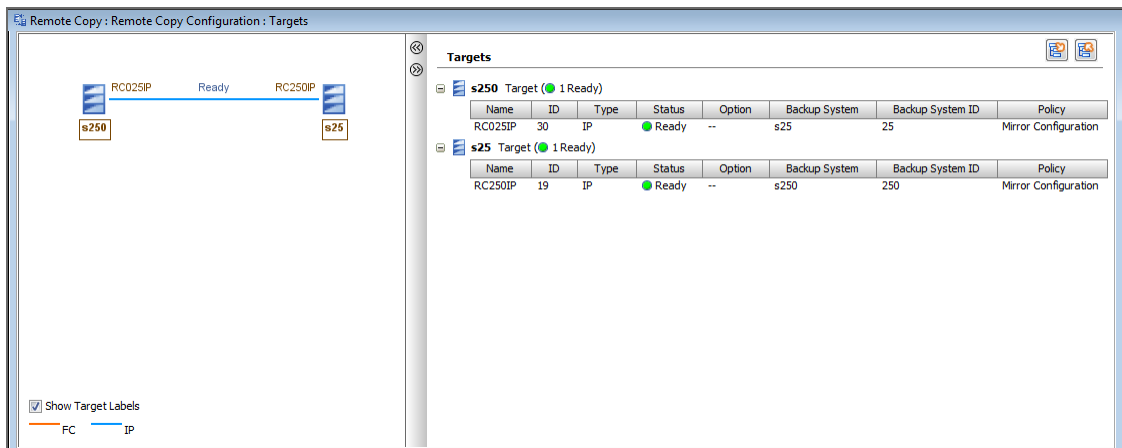
- In the Manager Pane, click **Remote Copy**.
- In the Management Tree, click **Targets** under the **Remote Copy Configuration** node for the Remote Copy targets you wish to view.



Information about the Remote Copy targets appears on two panes in the Management Window:

- The left pane displays a graphical representation of the selected Remote Copy configuration. The image includes the type of Remote Copy relationship (Remote Copy over IP or Remote Copy over Fibre Channel) between the servers in the Remote Copy configuration, the names of the Remote Copy systems, and the current state of the targets.

You can optionally view the systems' target labels by selecting the **Show Target Labels** checkbox at the lower left side of the pane. When selected, the image displays the Remote Copy systems' target labels adjacent to the graphic representing each system.



- The right pane displays information about the Remote Copy targets for each Remote Copy system in tabular format. Information displayed for each system's targets includes the target's name, target ID, connection type, status, backup system information, and active policy.

See also:

["Manager Pane" \(page 396\)](#)

["Management Tree" \(page 395\)](#)

["Viewing Configured Remote Copy Systems" \(page 216\)](#)

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## Part V Migrating Data

The HP 3PAR Peer Motion feature controls the migration of data from a source system to a destination system. A user can copy the virtual volumes and system configuration information to a new system without changing host configurations or interrupting access to the volumes. Any available free port can be used for Peer Motion.

There are three types of migration: online migration, minimally disruptive migration, and offline migration:

- **Online** – Used to migrate virtual volumes that are exported to a host. This migration type requires unzoning the host system from the source system.
- **Minimally Disruptive** – Used to migrate virtual volumes that are exported to a host. This migration type requires shutting down the host system for a short period of time. Additionally, the destination system must be running OS version 3.1.2 or higher.
- **Offline** – Used to migrate virtual volumes that are not exported to a host. Exported volumes that you want to migrate must first be unexported to use offline migration. No unzoning or system shutdown is required.

After the data migration is complete, the source system can be disconnected from the hosts and repurposed.

[“Using the Peer Motion Manager” \(page 224\)](#)

[“Migrating Data ” \(page 231\)](#)

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## 15 Using the Peer Motion Manager

The HP 3PAR Peer Motion Manager is an environment within the HP 3PAR Management Console that enables users to perform Peer Motion operations and to display the status of the Peer Motion feature.

The following features are supported by the Peer Motion Manager:

- Displays the source and destination configurations.
- Displays volumes that are to be migrated, admitted, and imported.
- Displays hosts, users, and domains that are to be migrated.
- Displays the LDAP configuration if it is available.
- Creates a Peer Motion configuration.
- Copies storage settings and configurations from the source system to the destination system.
- Migrates Data.
- Imports Volumes.
- Removes Peer Volumes.
- Removes a Peer Motion configuration.
- Provides all the functionality of the Peer Motion Manager 1.2 CLI script.

The following are the limitations of the Peer Motion Manager:

- It is not an end-to-end wizard; some operations are needed to perform Peer Motion.
- There are no automatic steps for zoning and un zoning the source and destination systems.
- Peer Motion Manager does not display source system data if the source system is not an HP 3PAR Storage System.
- You must connect to both systems to perform most of the Peer Motion Manager operations.
- EVA-to-3PAR data migration is not supported.

All commands and wizards require the user to have the Super user role on the source and destination systems, a Peer Motion License, and other applicable licenses.

[“Creating a Peer Motion Configuration” \(page 225\)](#)

[“Copying Storage Settings and Configurations” \(page 229\)](#)

[“Migrating Data ” \(page 231\)](#)

[“Importing Volumes” \(page 235\)](#)

[“Removing Peer Volumes ” \(page 237\)](#)

[“Post Migration Cleanup ” \(page 238\)](#)

[“Removing a Peer Motion Configuration ” \(page 238\)](#)

[“Viewing a Peer Motion Configuration” \(page 241\)](#)

[“Viewing Port Information” \(page 245\)](#)

[“Viewing Storage Settings and Configurations” \(page 248\)](#)

[“Viewing Migration Data Information” \(page 252\)](#)

[“Viewing Source and Destination Systems” \(page 260\)](#)

[“Viewing Available Storage Systems” \(page 265\)](#)

## Creating a Peer Motion Configuration

To use the Create PM Configuration wizard, the following conditions are required:

- Verify that your storage systems meet all the requirements in the *HP 3PAR-to-3PAR Data Migration Guide* (<http://www.hp.com>).
- Super user role.
- At least one available source system and destination system that are not in a Peer Motion configuration.

Perform the following tasks before using the wizard:

- Decide on the two host ports on the source system you will use. (You will need this information to zone the source and destination systems.)
- Configure the two host ports if not already configured.

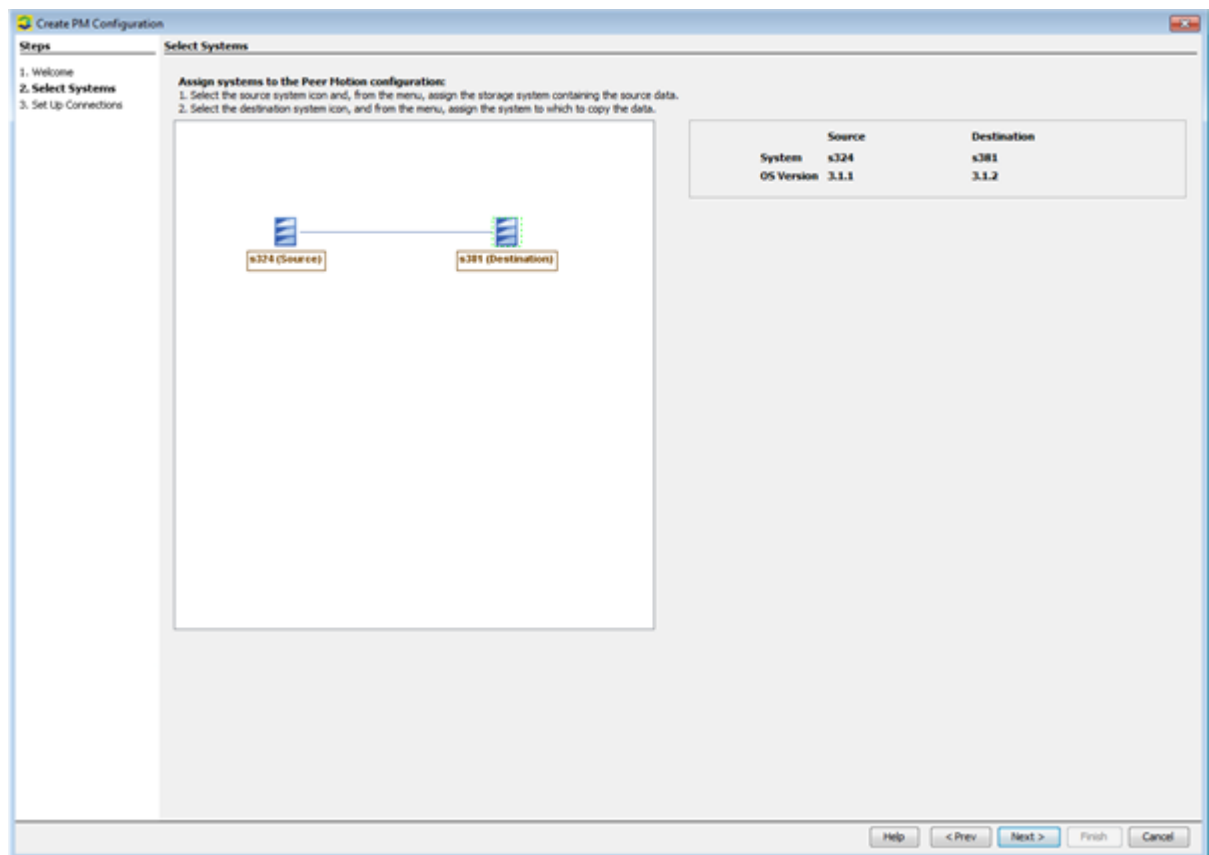
The Create PM Configuration wizard guides you in configuring two peer ports on the destination system and in zoning two systems into a Peer Motion configuration.

To create a Peer Motion Configuration:

1. Select **Peer Motion** in the Manager Pane.
2. Select **Available Storage Systems** in the Management Tree.
3. In the Common Actions Panel, click **Create PM Configuration**.

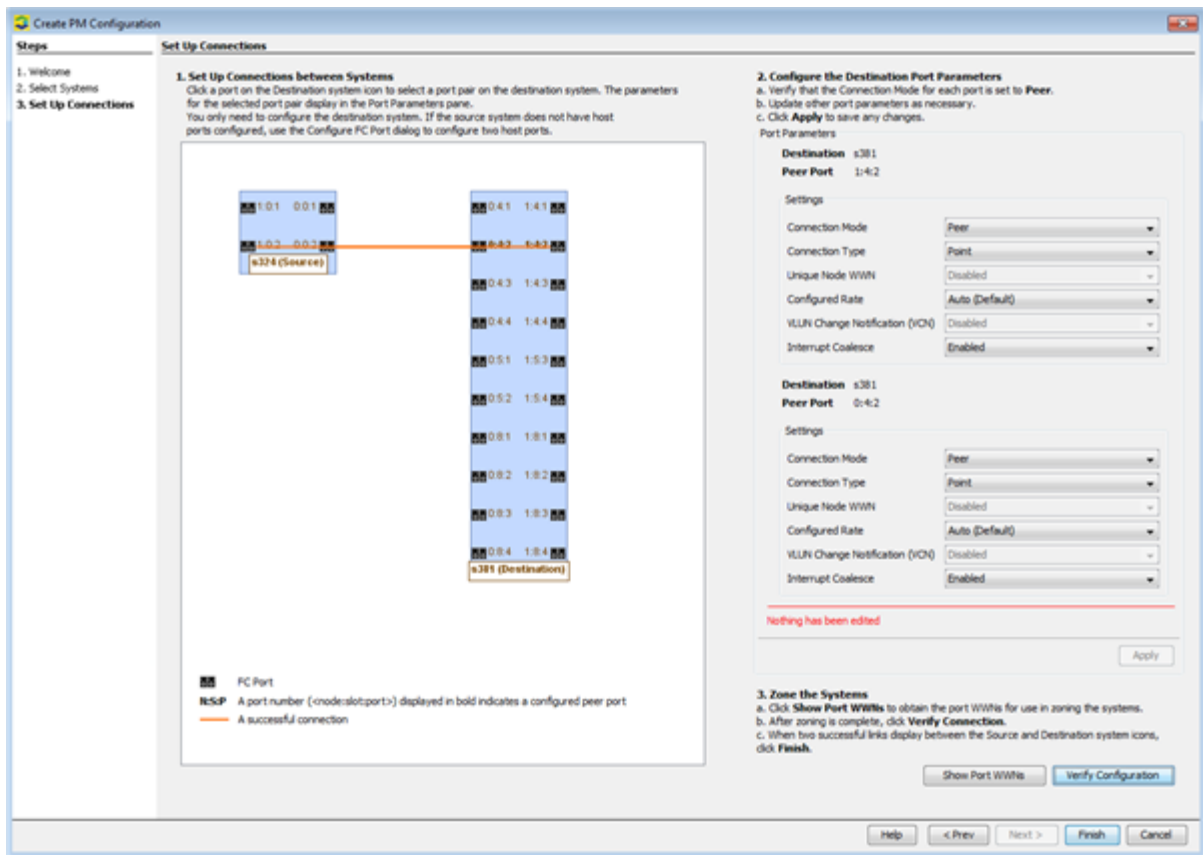
The **Create PM Configuration** wizard appears.

## Select Systems

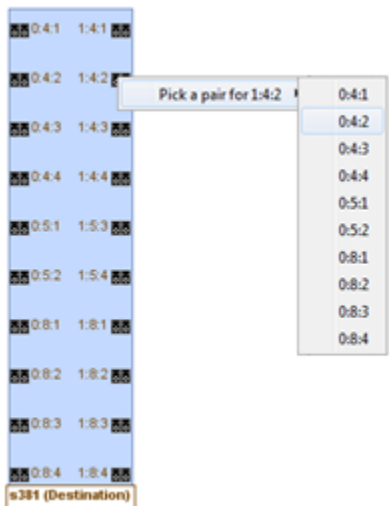


1. Click on the <Source> icon and select a source system.
2. Click on the <Destination> icon and select a destination system.
3. Click **Next** to go to the Set Up Connections page.

## Set Up Connections



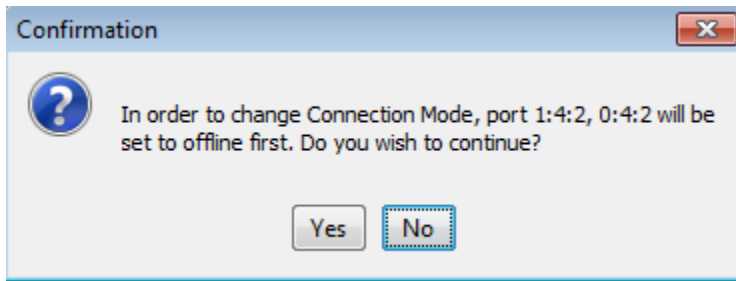
1. Click on a port in the destination system.
2. Select **Pick a pair for <destination port>**, and then select the port you want paired with the destination port. (Peer ports will display as bold.)



**NOTE:** If the host ports are not already configured, the user can configure them in the **Port Parameters** area.

**NOTE:** At any time, you can check host and peer port WWNs by clicking “[Show Port WWNs](#)” (page 227) on the Set Up Connections screen.

3. Select **Apply**. (This is enabled when the port parameters are modified.)  
If the paired port is online, a confirmation dialog box will appear, indicating the port must be set to offline. Click **Yes** to continue.



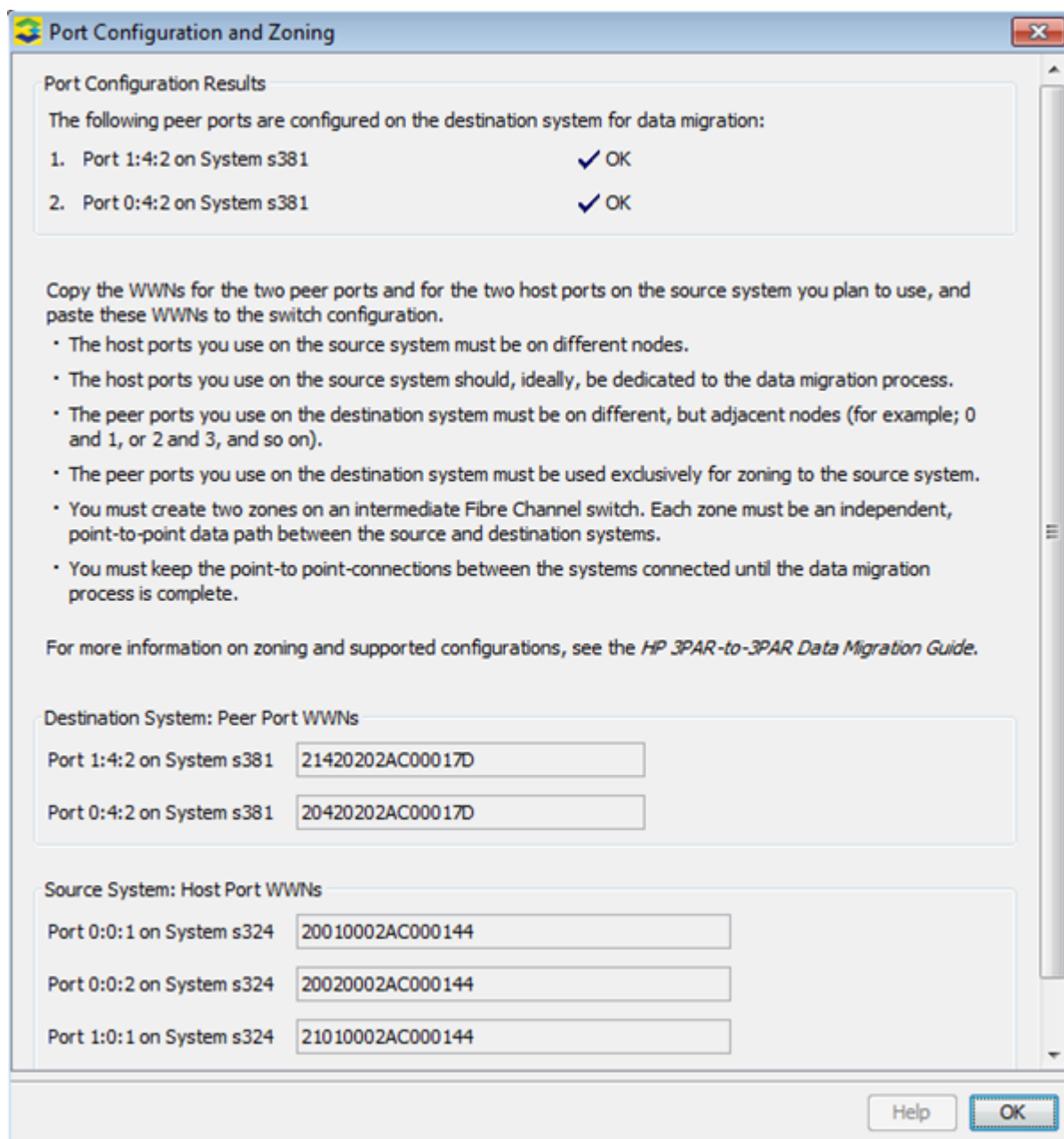
The **Port Configuration and Zoning** dialog box appears.

See also ["Managing Ports"](#) (page 20).

### Show Port WWNs

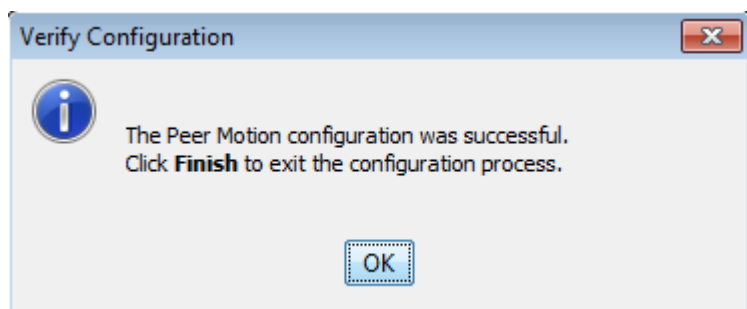
This dialog box displays the source system's system host port WWNs and the destination systems' peer port WWNs. Use this information to zone the peer ports to the host ports.

## Port Configuration and Zoning



After zoning is complete, click **OK**, and then click **Verify Configuration** when you are returned to the Set Up Connections screen.

If the configuration is successful, you will receive a message to that effect.



If the configuration was not successful, you will receive a message that describes the issue.



# Copying Storage Settings and Configurations

To use the Copy Storage Settings and Configurations wizard, the following conditions are required:

- Super user role
- At least one storage system to copy
- Any valid Peer Motion configuration that has source and destination systems

This wizard guides the user in copying the following storage settings and configurations from the source system to the destination system:

- Domain sets
- Domains
- Host sets
- Hosts
- Users
- LDAP configuration
- NTP configuration
- Syslog parameters
- SNMP configuration

When there is no domain license on the destination system and the source system has domains, a warning message is displayed that indicates that host sets, hosts, and users will be copied to the <none> domain, and domain sets and domains will not be displayed.

---

## NOTE:

- Copying the NTP configuration is supported only when the user is configuring HP 3PAR Storage Systems.
- Syslog parameters are copied from the source system to the destination system, but the HP 3PAR Management Console has no syslog parameters management functionality.
- The SNMP configuration is copied from the source system to the destination system, but the HP 3PAR Management Console has no SNMP management functionality. Additionally, the user settings are not copied.

---

If the simple copy operation does not meet your needs, the user can modify settings and configurations on the destination system. The following existing HP 3PAR Management Console commands might be used:

- Create/Edit domain
- Create/Edit domain set
- Create/Edit host
- Create/Edit host set
- Create/Edit user
- Create/Edit LDAP configuration

To copy storage settings and configurations:

1. Select **Peer Motion** in the Manager Pane.
2. Select **Peer Motion Configuration** in the Management Tree.
3. In the Common Actions Panel, click **Copy Storage Settings and Configurations**.

The **Copy Storage Settings and Configurations** wizard appears.

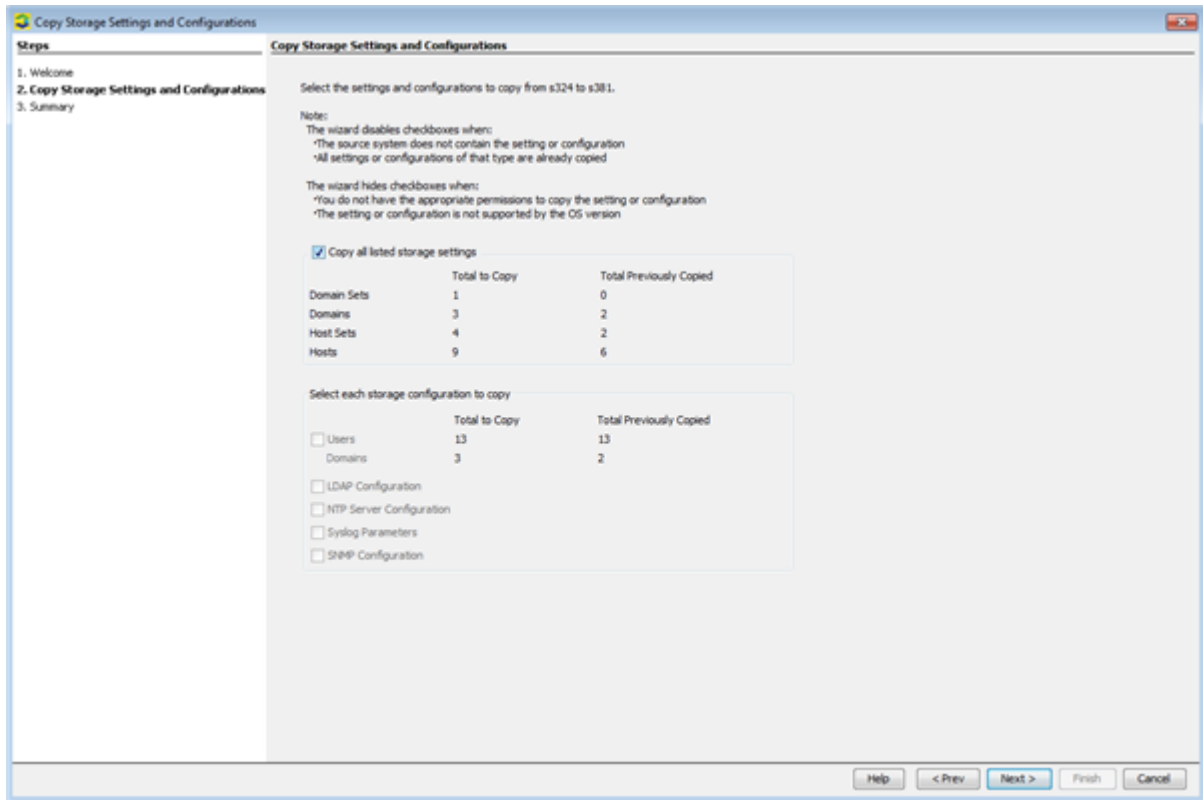
## Copy Storage Settings and Configurations

This wizard allows you to copy storage settings for:

- Domains
- Domain sets
- Hosts
- Host sets

The wizard allows you to copy storage configurations for:

- Users
- Domains
- LDAP
- NTP server
- DNS server (OS version 3.1.2 and higher)
- SNMP
- Syslog parameters



To copy storage settings and configurations from the source system to the destination system:

1. To copy storage settings, select the **Copy all listed storage settings** checkbox.
2. Select each storage configuration you wish to copy, if enabled.
3. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

In this step, the settings and configurations that you have chosen to copy and that have previously been copied are displayed.

Once you are satisfied with your copy selections, click **Finish** to complete the wizard.

## Migrating Data

To use the Migrate Data wizard, the following conditions are required:

- Super user role
- Peer Motion license
- Any Peer Motion configuration that includes a source and destination system whose status is Normal and that has no other admitted or importing volumes.

Perform the following tasks before using the wizard:

- Configure the data migration process by using the **Create PM Configuration** wizard.
- Copy the desired settings from the source system to the destination system using the **Copy Storage Settings and Configurations** wizard.
- Determine the best time to do the data migration. (A period of low usage is best, as migration incurs I/O latency.)

The Migrate Data wizard guides you in migrating volumes from the source system to the destination system. The types of migration are as follows:

- **Online** – Used to migrate virtual volumes that are exported to a host. This migration type requires unzoning the host system from the source system.
- **Minimally Disruptive** – Used to migrate virtual volumes that are exported to a host. This migration type requires shutting down the host system for a short period of time. Additionally, the destination system must be running OS version 3.1.2 or higher.
- **Offline** – Used to migrate virtual volumes that are not exported to a host. Exported volumes that you want to migrate must first be unexported to use offline migration. No unzoning or system shutdown is required.



**WARNING!** On Windows Server 2012, Windows Server 2008 R2 and non-R2, do not use the mpclaim CLI command or attempt to display the MPIO information via the Disk Management GUI during the Peer Motion migration admitvv stage. Doing so will result in the host becoming unresponsive.

---

The default migration type is online.

---

**NOTE:** You will receive a warning message if either of the following licenses is missing:

- Thin provisioning (which is needed to create a thin volume)
  - Domain (which is needed to add the volumes to a domain that is not the <none> domain)
- 

When the migration host exists, there will be a warning to clean it up.

To migrate data:

1. Select **Peer Motion** in the Manger Pane.
2. In the Common Actions Panel, click **Migrate Data**.

The **Migrate Data** wizard appears.

## Create Peer Volumes

1. Select **Online Migration**, **Minimally Disruptive Migration**, or **Offline Migration**.

- If you selected Online Migration or Minimally Disruptive Migration, select the **Host** or **Host Set** | **Linked Hosts** for which you wish to migrate virtual volumes to the destination system.

**NOTE:** All virtual volumes exported to overlapping hosts (Linked Hosts) must be exported. For example: VV1 is exported to Host1, VV2 is exported to Host2 and Host3, and VV3 is exported to Host1 and Host3. To migrate VV1, you must also migrate VV2 and VV3 because the hosts they are exported to overlap.

**NOTE:** If a volume being exported is a member of a domain, all volumes in that domain must be exported.

- If you selected offline migration, click **Virtual Volumes** to select virtual volumes to migrate to the destination system. If one volume is a member of a domain, all selected volumes must belong to the same domain.
- Click **Verify source volumes** to verify the source volumes to be used.
- Click **Next** to go to the Import Volumes page (recommended), or click **Finish** if you want to check the configuration and run the Import Volumes wizard later. If you click **Finish**, the peer volumes will be created but will not contain any data until the Import Volumes step or wizard has been completed. (To run the Import Volumes wizard, see [“Importing Volumes”](#) (page 235).)

## Import Volumes

- Under **1. Select the virtual volumes to be configured during import to <destination system>**, select one or more volumes in the same domain.
- Under **2. Select Allocation Settings**, select the **Provisioning** you want to assign to the virtual volumes being imported. You have the option of selecting **Same As Source**, **Thin**, or **Full**. The default is Thin.
  - Same As Source – Each source volume will retain its current provisioning type when imported. If you are importing virtual copies, this option assigns the parent volume's

provisioning type to each copy. If your list of volumes contains a mix of Thin and fully provisioned volumes, that mix is retained upon import.

- Thin – All source volumes will be migrated as thinly provisioned.
  - Full – All source volumes will be migrated as fully provisioned.
3. Select a **User CPG** (required) and **Copy CPG** (optional).

---

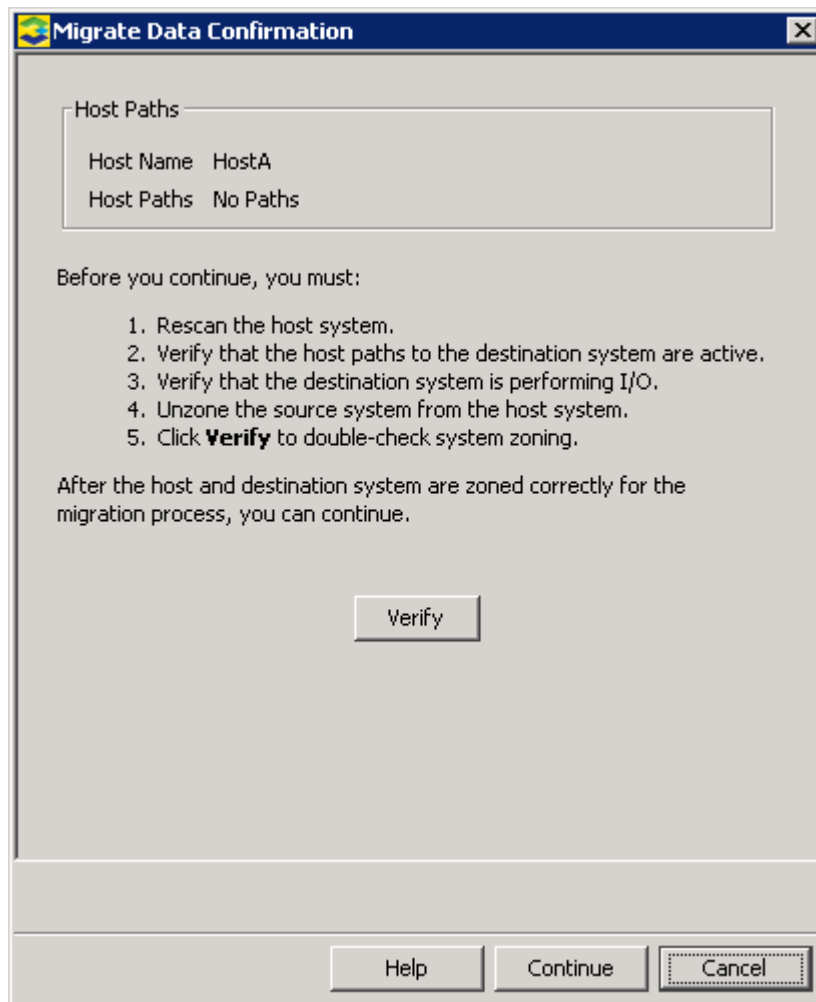
**NOTE:** If there is no CPG available for the specified domain, you must exit the wizard and create the CPG first.

---

4. If you selected Copy CPG, you have the option of selecting the **Create virtual copies after importing volumes** check box.
  - a. Select **Suffix** or **Full Name**.
  - b. Enter a suffix or name in the text box.
5. If not already selected, select the virtual volumes in the **1. Select the virtual volumes to be configured during import to <destination system>** window, and then click **Add**. (You can also add the virtual volumes one at a time.)
6. If you are using offline migration, click **Finish** to create the peer volumes and begin the migration.
7. If you are using online migration or minimally disruptive migration, click **Finish** to create the peer volumes. You will receive one of the following confirmation dialogs, depending on the migration type:

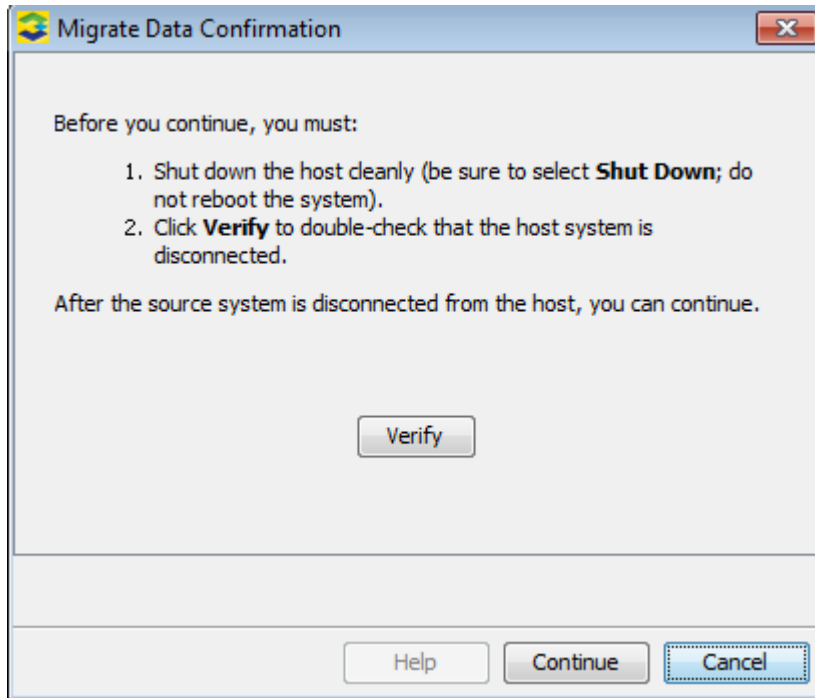
[“Online Data Confirmation” \(page 234\)](#)

[“Minimally Disruptive Data Migration Confirmation” \(page 235\)](#)



1. Configure the switch to unzone the source system.
  2. Click **Verify**.  
If the system zoning is correct, you will receive a confirmation message. If the zoning is incorrect, you will receive a message that describes the issue.
  3. Click **OK** to exit the Verify dialog box.
- After the systems are zoned correctly, the importing tasks start.

## Minimally Disruptive Data Migration Confirmation



1. Shut down the host system. (You must use Shut Down, not Restart.)
2. Click **Verify**.
3. Click **Continue**.
4. After the import task starts, you will receive an information dialog box. Click **OK**.

## Importing Volumes

To use the Import Volumes wizard, the following conditions are required:

- Super user role.
- Peer Motion license.
- Any Peer Motion configuration that includes a source and destination system whose status is Normal.
- There are admitted (peer) volumes to be imported and no importing volumes.

This wizard guides the user in importing peer volumes to the destination system. The types of migration are Online, Minimally Disruptive, and Offline. The wizard automatically selects a migration type based on your system setup and the data migration selections you made for this Peer Motion configuration.

- **Online** – Used to migrate virtual volumes that are exported to a host. Requires un zoning the host system from the source system.
- **Minimally disruptive** – Used to migrate virtual volumes that are exported to a host. Requires shutting down the host system for a short period of time. Additionally, the destination system must be running OS version 3.1.2 or higher.
- **Offline** – Used to migrate virtual volumes that are not exported to a host. Exported volumes you wish to migrate must first be unexported to use offline migration. No un zoning or system shutdown is required.

The default migration type is online.

---

**NOTE:** You will receive a warning message if either of the following licenses is missing:

- Thin provisioning (which is needed to create a thin volume)
  - Domain (which is needed to add the volumes to a domain that is not the <none> domain)
- 

When the migration host exists, there will be a warning to clean it up.

To import a volume:

1. Select **Peer Motion** in the Manger Pane.
2. In the Common Actions Panel, click **Import Volume**.

The **Import Volume** wizard appears.

See also:

[“Create Peer Volumes” \(page 231\)](#)

## Select Peer Volumes

1. The type of migration is preselected based on the system set up and the settings you configured in the Create PM Configuration wizard.
2. For Online or Minimally Disruptive Migration, select the **Host** or **Host Set|Linked Hosts** for which you wish to import peer virtual volumes to the destination system. If you select one volume that is a member of a domain, you must migrate all volumes in that domain.

For Offline Migration, select the **Virtual Volumes** to migrate to the destination system. If one volume is a member of a domain, all selected volumes must belong to the same domain.

---

**NOTE:** Only one group of source volumes can be imported to their peer volumes on the destination system at the same time.

**NOTE:** You must finish the import process completely before you can either migrate additional volumes or remove admitted (peer) volumes.

---

3. Click **Verify peer volumes** to verify the peer volumes to be used.
4. Click **Next** to go to the Import Volumes page.

## Import Volumes

1. Select the virtual volumes to be configured on the destination system.
2. Under **Select Allocation Settings**, select the **Provisioning** you want to assign to the virtual volumes being imported. You have the option of selecting **Same As Source**, **Thin**, or **Full**.
3. Select a **User CPG** and **Copy CPG**.
4. (Optional.) Select the **Create virtual copies after importing volumes** check box.
  - a. Select **Suffix** or **Full Name**.
  - b. Enter a suffix or name in the text box.
5. If you are using offline migration, click **Finish** to create the peer volumes and start the import volumes task.
6. If you are using online or minimally disruptive migration, click **Finish** to create the peer volumes. You will receive one of the following confirmation dialogs, depending on the migration type:

[“Online Data Confirmation” \(page 234\)](#)

[“Minimally Disruptive Data Migration Confirmation” \(page 235\)](#)

After the systems are zoned correctly, the importing tasks start.



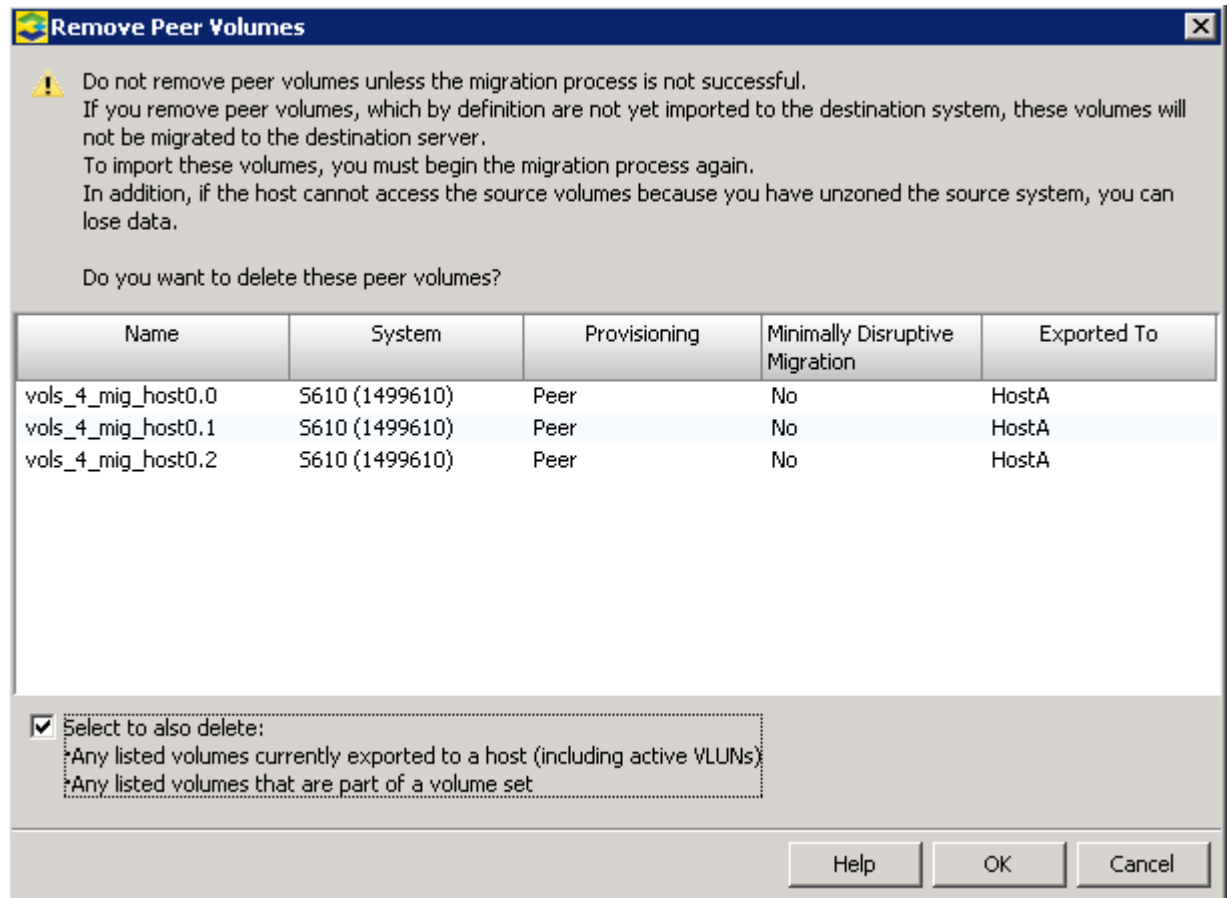
## Removing Peer Volumes

To use the Remove Peer Volumes command, the following conditions are required:

- Super user role
- A Peer Motion configuration that has a source and destination system
- Admitted (peer) volumes

During data migration, you can use the Remove Peer Volumes command to remove peer volumes that are not yet in the Importing state. You cannot removed exported volumes. You must first unexport them if you wish to remove them.

**NOTE:** The command does not display volumes in the Importing state because they cannot be removed. Any importing volumes that fail are removed by the system manager.

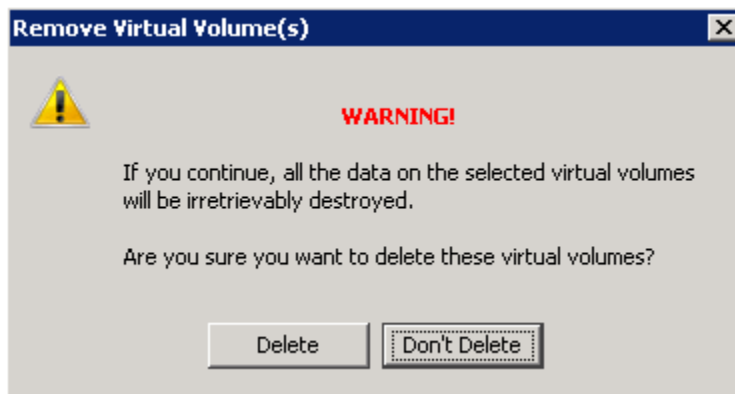


To remove peer volumes:

1. Select **Peer Motion** in the Manger Pane.
2. In the Common Actions Panel, click **Remove Peer Volumes**.

The **Remove Peer Volumes** dialog box appears.

3. Select the **Select to also delete** check box if you wish to delete any listed volumes not exported to a host and listed volumes that are part of a volume set. If this check box is selected, you will receive a warning dialog. Click **Delete** to remove the volumes.



4. Click **OK**.

## Post Migration Cleanup

The Post Migration Cleanup feature will:

- Unexport all Peer Motion-migrated volumes from the migration host.
- Remove the VLUNs associated with the volumes being unexported.
- Remove the migration host from the source system.

---

**NOTE:** The migration host is an interim host created by the Peer Motion process. Therefore, migration cleanup will not be complete until the migration host is removed from the source system.

---

To use the Post Migration Cleanup command, the following conditions are required:

- Super user role.
- A Peer Motion configuration that has a source and destination system.
- No admitted (peer) volumes or importing volumes on the destination system .
- A migration host exists.

After the system completes the post-migration cleanup, you can start a new migration using the existing Peer Motion configuration and the current peer ports, if desired. To delete the existing Peer Motion configuration and, if desired, reconfigure the peer ports as host ports, use the Remove PM Configuration dialog.

You must complete post-migration cleanup after each migration (import task) finishes.

To remove the migration host after the data migration process is complete:

1. Select **Peer Motion** in the Manger Pane.
2. In the Common Actions Panel, click **Post Migration Cleanups**.

The **Post Migration Cleanup** dialog box appears.

3. Click **OK** to remove the migration host on the source system.

## Removing a Peer Motion Configuration

This feature enables you to remove the Peer Motion configuration. It will also remove the migration host if one exists on the source system. You can keep the peer ports for later use or change them to host ports.

To use the Remove PM Configuration command, the following conditions are required:

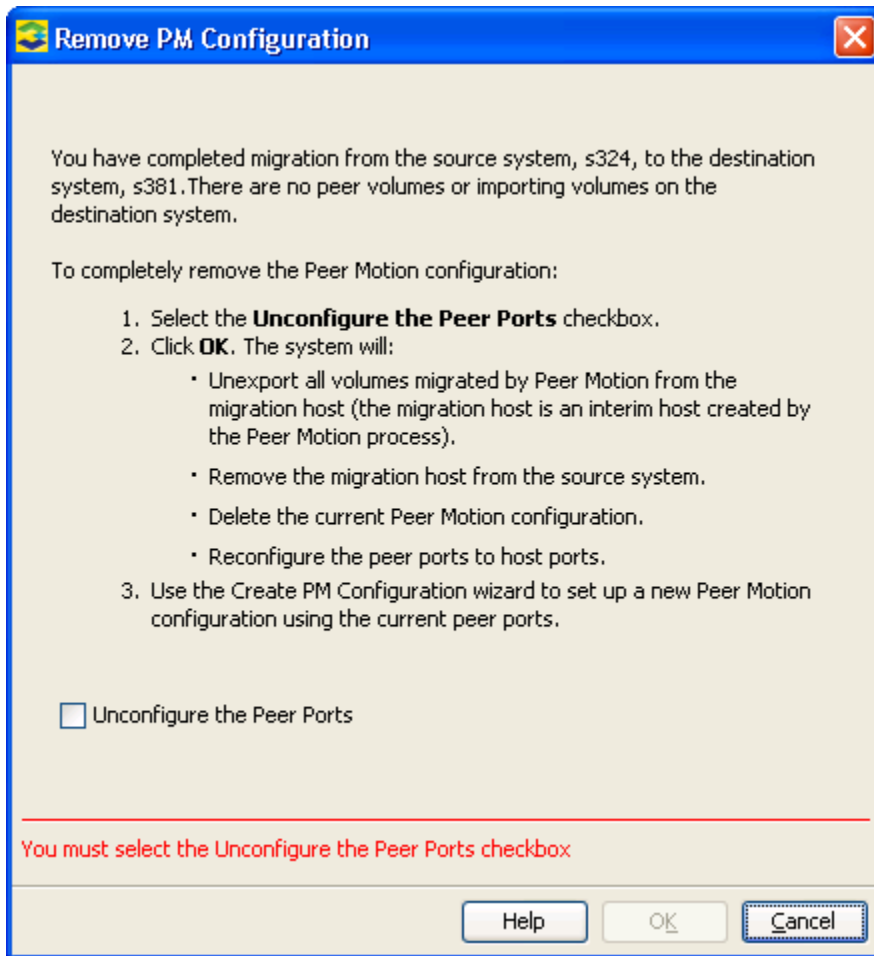
- Super user role
- A Peer Motion configuration that has a source and destination system
- No admitted (peer) volumes or importing volumes on the destination system

To remove a PM Configuration:

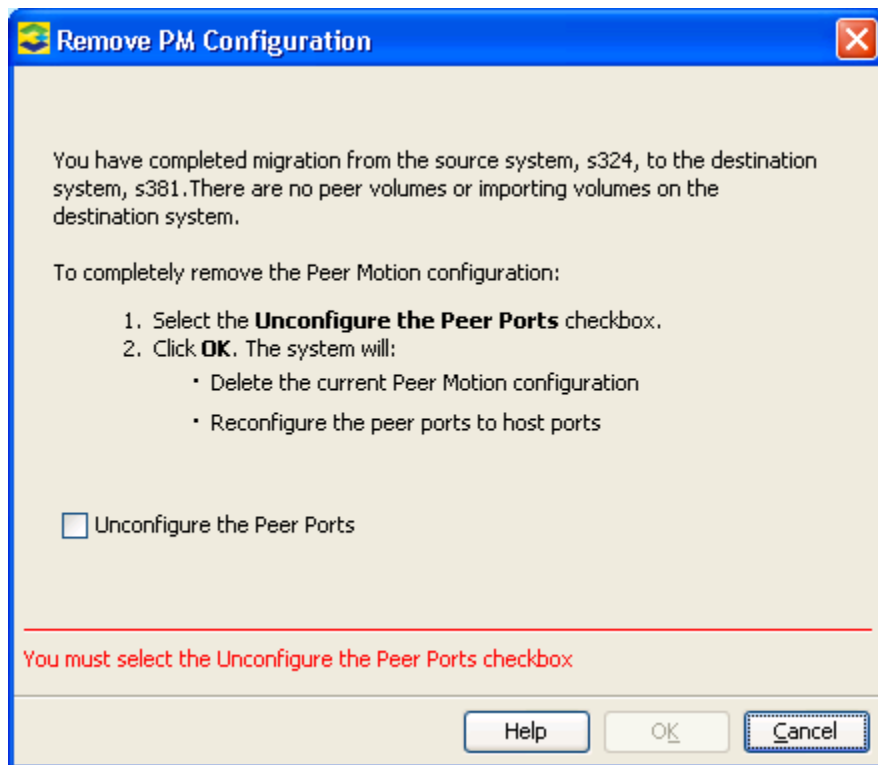
1. Select **Peer Motion** in the Manger Pane.
2. In the Common Actions Panel, click **Remove PM Configuration**.  
The **Remove PM Configuration** dialog box appears.
3. Select the **Unconfigure the Peer Ports** check box. (This step is required.)

4. Click **OK**. When the migration host exists on the source system, clicking **OK** also removes the migration host on the source system. (The dialog box that appears will vary depending on whether the migration host exists on the source system.)

Remove PM Configuration dialog when the migration host exists on the source system:



Remove PM Configuration dialog when the migration host does not exist on the source system:

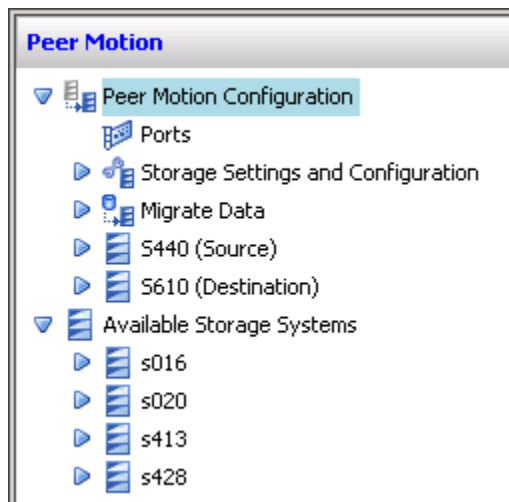


## Viewing a Peer Motion Configuration

To view the current Peer Motion configuration:

1. Select a storage system in the Management Tree.
2. Select **Peer Motion** in the Manager Pane.

The Peer Motion Configuration tree node appears.



3. The Peer Motion Configuration window contains a Summary tab, a Tasks tab, and an Alerts tab.

## Summary Tab

The Summary tab is divided into a left pane and a right pane. The left pane displays the Peer Motion topology in either Overview or Physical connectivity view.

- **Overview** – Displays the source and destination systems, the direction of data migration, the number of ports and their status, and the View Physical Connectivity check box.
- **Physical Connectivity View** – Displays the source and destination systems, the host and peer ports, and port connectivity.

The right pane displays a summary of the current migration information.

Group	Field	Description
General	<b>Hosts</b>	
	<b>Available</b>	The number of available hosts. (Select to go to the Peer Motion Host: Available panel.)
	<b>Admitted</b>	The number of hosts in an admitted (peer) state. (Select to go to the Peer Motion Host: Admitted panel.)
	<b>Importing</b>	The number of hosts in an importing state. (Select to go to the Peer Motion Host: Importing panel.)
	<b>Imported</b>	The number of imported hosts. (Select to go to the Peer Motion Host: Imported panel.)
	<b>Virtual Volumes</b>	
	<b>Available</b>	The number of available volumes. (Select to go to the Peer Motion Virtual Volumes: Available panel.)
	<b>Admitted</b>	The number of volumes in an admitted (peer) state. (Select to go to the Peer Motion Virtual Volumes: Admitted panel.)
	<b>Importing</b>	The number of volumes in an importing state. (Select to go to the Peer Motion Virtual Volumes: Importing panel.)
	<b>Imported</b>	The number of imported volumes. (Select to go to the Peer Motion Virtual Volumes: Imported panel.)
	<b>Task</b>	(Select to go to the Peer Motion Tasks screen.)
	<b>Running Tasks</b>	The number of currently running Peer Motion tasks. (Select to go to the Peer Motion Tasks screen.)
	<b>Failed Tasks</b>	The number of failed Peer Motion tasks. (Select to go to the Peer Motion Tasks screen.)
Health	<b>System</b>	The names of the source and destination systems.
	<b>System State</b>	Indicates the state of each system: Normal, Degraded, or Failed.
	<b>Port</b>	The Peer Motion ports associated with each system.
	<b>Port State</b>	<p>The Peer Motion connection status, which can be one of the following:</p> <ul style="list-style-type: none"> <li>• Normal</li> <li>• Incorrect number of Peer Motion paths</li> <li>• Peer Motion ports are not on adjacent nodes</li> <li>• Peer Motion port modes are not point-to-point</li> <li>• Source host ports are on the same node</li> <li>• Source host port is not a host port</li> <li>• Source port is not ready</li> <li>• Incompatible source system version</li> </ul>

Group	Field	Description
		<ul style="list-style-type: none"> <li>• Incompatible destination system version</li> <li>• Unsupported version of source or destination system</li> <li>• Unknown</li> <li>• Normal</li> </ul>
<b>New Alerts</b>	Displays the number of new alerts and their severity for both source and destination systems. The severity state can be one of the following: <ul style="list-style-type: none"> <li>• Fatal</li> <li>• Critical</li> <li>• Major</li> <li>• Minor</li> <li>• Degraded</li> <li>• Info</li> <li>• None</li> </ul> Select the alert severity to go to the Peer Motion Alerts screen.	
<b>Performance &amp; Reports</b>	Shows read/write throughput statistics of the source and destination ports.	

## Tasks Tab

The Tasks screen is divided into a list pane and a detail pane. The list pane displays complete, running, and failed tasks that are associated with the selected Peer Motion Configuration. The detail pane displays the details related to a selected task.

The list pane displays the following information:

Column	Description
<b>System</b>	The name of the system on which the task is running.
<b>ID</b>	The task ID
<b>Type</b>	The type of task (such as Scheduled Task).
<b>Name</b>	The name of the task.
<b>Status</b>	The status of the task (such as Completed).
<b>User</b>	The user running the task.
<b>Progress</b>	The task progress, if currently running.
<b>Start Time</b>	The time the task started.
<b>Finish Time</b>	The time the task finished.
<b>Duration</b>	The amount of time it took to complete the task.

The detail pane displays the following information:

Group	Field	Description
<b>General</b>	<b>System Name</b>	The name of the system on which the task was started.
	<b>System SN</b>	The system's serial number.
	<b>ID</b>	The task ID.
	<b>Type</b>	The task type.

Group	Field	Description
	<b>Status</b>	Indicates whether a task is Running, Canceled, Failed, or Completed.
	<b>Progress</b>	The task progress, if currently running.
	<b>Start Time</b>	The time the task started.
	<b>Finish Time</b>	The time the task finished.
	<b>Duration</b>	The amount of time it took to complete the task.
<b>Detailed Status</b>	Provides detailed information for the task by time increments.	

## Alerts Tab

The Alerts screen is divided into a list pane and a detail pane. The list pane displays alert information associated with the selected Peer Motion Configuration. The detail pane displays details for the selected alert.

The list pane displays the following information:

Column	Description
<b>System</b>	The name of the system for which the alert was generated.
<b>Severity</b>	The severity of the problem.
<b>ID</b>	The task ID.
<b>State</b>	The task state (such as New).
<b>Last Time</b>	The last time the task was run.
<b>Message</b>	Text message describing the reason for the alert.
<b>Repeat Count</b>	The number of times the task has been run.
<b>First Time</b>	The first time the task was run.

The detail pane displays the following information:

Group	Field	Description
<b>General</b>	<b>Severity</b>	The severity of the problem.
	<b>Type</b>	The type of alert.
	<b>Message</b>	Text message describing the reason for the alert.
	<b>ID</b>	The task ID.
	<b>State</b>	The task state (such as New).
	<b>Message Code</b>	The code related to the alert message.
	<b>Sequence</b>	The sequence number of the task.
<b>Component</b>	<b>System</b>	The system for which the alert was generated.
	<b>System SN</b>	The system's serial number.
	<b>Node ID</b>	The system's node ID.
	<b>Component</b>	The node component for which the alert was generated.
<b>Frequency</b>	<b>Repeat Count</b>	The number of times the task has been run.



Group	Field	Description
	Last Time	The last time the task was run.
	First Time	The first time the task was run.

## Viewing Port Information

To view the Ports screen:

1. Select **Peer Motion** in the Manager Pane.
2. Select **Ports** under **Peer Motion Configuration** in the Peer Motion tree.

The Ports screen shows the topology between the source and destination system ports, a list pane, and a detail pane.

The port topology area displays the source and destination systems, the host and peer ports, and the ports connectivity.

The list pane provides the following information:

Column	Description
Position	The port location in Node:Slot:Port format.
Label	Indicates whether the port is a peer port.
WWN/MAC	World Wide Name or Media Access Control address of the connected device.
State	The state of the port. See <a href="#">“System and Component Status Icons”</a> (page 407).
Type	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
Connection Mode	Indicates whether the connection mode is Host or Peer.
Connected Device Type	Indicates whether the connection device type is Host or Peer.
Connected Device	Name of device that the port is connected to.
Mode	Port firmware mode setting—Initiator, Target, Peer, or Suspended. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (this is rare). Peer mode is for Ethernet ports.
Partner	The partner port.
Partner WWN	The WWN of the partner port.
Failover State	Indicates if the system is in a failover state.

The detail pane contains a Summary tab. If the connected device type is "Host," there will also be a Hosts tab.

## The Summary Screen Detail Pane

The detail pane of the Summary screen displays the following information.

Group	Field	Description
<b>General</b>	<b>Position</b>	The port location in Node:Slot:Port format.
	<b>Port WWN</b>	Port World Wide Name.
	<b>Node WWN</b>	Node World Wide Name.
	<b>Type</b>	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
	<b>Rate</b>	Rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
	<b>Connected Device Type</b>	Type of device that the port is connected to: Host or Peer.
	<b>Connected Device</b>	The name of the system associated with the selected port.
	<b>Mode</b>	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (this is rare). Peer mode is for Ethernet ports.
	<b>State</b>	Current state of the port.
	<b>MAC</b> (not shown)	For iSCSI ports. The Media Access Control address for the Ethernet interface.
	<b>TPGT</b> (not shown)	For iSCSI ports. The Target Portal Group Tag for the iSCSI target portal group.
<b>Resources</b>	<b>Total Data Throughput</b>	The throughput in KBps.
<b>Settings</b> (displayed for FC and RCFC ports)	<b>Connection Mode</b>	The type of port connection: Host or Peer.
	<b>Connection Type</b>	Connection type or port connection setting: Loop or Point.
	<b>Configured Rate</b>	Data transfer rate setting (for example, 1 Gbps). Auto indicates that the system automatically selects the rate.
	<b>Max Rate</b>	Maximum rate of connection from the port.
	<b>Class 2</b>	Indicates whether Fibre Channel service Class 2 is <b>Disabled</b> , <b>Ack 1</b> or <b>Ack 0</b> .
	<b>VCN</b>	For fabric attached ports, indicates the VLUN change notification setting. When set to Enabled, notices are generated and sent to the fabric controller. When set to Disabled, no notification is sent.
	<b>Unique Node WWN</b>	Indicates whether the node's WWN is <b>Enabled</b> or <b>Disabled</b> .
	<b>Interrupt Coalesce</b>	If disabled, each I/O generates a separate interrupt to the HBA port driver rather than generating one interrupt for multiple I/O completion.
<b>IP Settings</b> (displayed for RCIP and iSCSI ports - not shown)	<b>MAC</b>	For RCIP ports. Media Access Control address of the Ethernet interface.
	<b>DHCP</b>	For iSCSI ports. Indicates if the Dynamic Host Configuration Protocol (DHCP) protocol is enabled.
	<b>IP Address</b>	IP address of the iSCSI or RCIP port.
	<b>Gateway</b>	The address of a local IP router on the same network as the system, used to forward traffic to destinations beyond the local network.
	<b>Subnet Mask</b>	The netmask address for the iSCSI or RCIP interface.

Group	Field	Description
	<b>MTU</b>	Maximum Transmission Unit. The greatest amount of data or "packet" size that can be transferred at one time over a particular network connection without overburdening the connection. The default MTU setting for an iSCSI port is 1500. When supported by the network, an MTU value of 9000 should be used.
	<b>Configured Rate</b>	For RCIP ports. The configured data transfer rate. A value of 0 indicates that no data is being transferred.
	<b>Rate</b>	For iSCSI ports. Data transfer rate. A value of 0 indicates that no data is being transferred.
	<b>TCP Port</b>	The TCP port number used by the iSCSI card.
	<b>Duplex</b>	(For RCIP) The duplex speed, Half or Full.
	<b>Adapter Type</b>	For RCIP ports. Model of the adapter that contains the port (for example, Intel PRO/1000MT).
Fibre Channel Settings (displayed for FC and RCFC ports)	<b>Topology</b>	Type of connection (such as Fabric Attached).
	<b>Class</b>	Identifies which Fibre Channel classes of service are enabled (2, 3, or 2/3). 2/3 indicates that both Class 2 and Class 3 are enabled.
	<b>Adaptor Type</b>	Model of the Fibre Channel adapter that contains the port (for example, QLOGIC 2302).
	<b>Remote Node WWN</b>	The node WWN. Displayed if the port is an RCFC port.
	<b>Remote Port WWN</b>	The port WWN. Displayed if the port is an RCFC port.
	<b>Mode Change</b>	Indicates whether port mode change from initiator to target or vice versa is Allowed or Prohibited. This setting is configured using the CLI <code>controlport</code> command.
	<b>Hosts</b>	The number of hosts connected to the port. This is only displayed if the port is connected to hosts.
	<b>Physical Disks</b>	The number of physical disks connected to the port. This is only displayed if the port is connected to drive cages.
iSNS Settings (displayed for iSCSI ports - not shown)	<b>Link State</b>	The current state of the link. Displayed if the port is an RCFC port.
	<b>Primary IP Address</b>	Primary Internet Storage Name Service (iSNS) server IP address. iSNS protocol allows for automated discovery, management, and configuration of iSCSI.
	<b>TCP Port</b>	The port on the iSNS server with which to communicate.

Clicking the highlighted value for **Connected Device** in the **General** area displays the Host Summary screen or the System screen, depending on the connected device type.

## The Hosts Screen Detail Pane

The detail pane of the Hosts screen displays the following:

Column	Description
<b>Host ID</b>	The ID of the host associated with the selected port.
<b>Host Name</b>	The name of the host system.
<b>Domain</b>	The domain the host is associated with (if any).
<b>WWN</b>	The World Wide Name of the port.
<b>Port</b>	The port location in Node:Slot:Port format.

Clicking the highlighted value under **Host Name** displays the Host Summary screen or the System screen, depending on the connected device type.

## Viewing Storage Settings and Configurations

The Storage Settings and Configurations portion of the Peer Motion tree node contains nodes for **Hosts** and **Security & Domains**.

### Hosts Node

When the Hosts node is selected in the Peer Motion tree, a Hosts tab and a Host Sets tab will be displayed in the Management Window.

[“Storage Settings and Configuration Hosts Screen” \(page 248\)](#)

[“Storage Settings and Configurations Host Sets Screen” \(page 248\)](#)

### Storage Settings and Configuration Hosts Screen

The Hosts screen displays source hosts and destination hosts side by side. The source system must be connected for the source hosts screen to be displayed.

Peer Motion : Peer Motion Configuration : Storage Settings and Configuration : Hosts

Hosts

Host Sets

Source System: 5440

Any column contains:  Clear

Name	Domain	Set	Storage System Ports	Volumes Exported	Total Exported Size (GiB)
dl360g7-100	SQA	LinuxHostSet	0	0	0.000
dl360g7-112	SQA	W2kHostSet	1	0	0.000
dl360g7-113	SQA	W2kHostSet	1	0	0.000
dl360g7-115	SQA	LinuxHostSet	0	0	0.000
HostA	SQA	--	0	3	3.000

Destination System: S610

Any column contains:  Clear

Name	Domain	Set	Storage System Ports	Volumes Exported	Total Exported Size (GiB)
dl360g7-94	--	--	0	0	0.00
dl360g7-93	--	--	0	0	0.00
dl360g7-112	SQA	W2kHostSet	0	0	0.00
dl360g7-113	SQA	W2kHostSet	0	0	0.00
dl360g7-hostA	SQA	--	0	0	0.00
HostA	SQA	--	0	0	0.00
dl360g7-100	SQA	LinuxHostSet	1	6	12.00
dl360g7-115	SQA	LinuxHostSet	1	6	12.00

The following information is displayed for both Source and Destination systems:

Column	Description
<b>Name</b>	The host name.
<b>Domain</b>	The domain (if any) the host is associated with.
<b>Set</b>	The host set (if any) the host is associated with.
<b>Storage System Ports</b>	The number of storage system ports associated with the host.
<b>Volumes Exported</b>	The number of exported volumes on the host.
<b>Total Exported Size</b>	The total size of the exported volumes (in GiB).

### Storage Settings and Configurations Host Sets Screen

The Hosts screen displays source hosts and destination hosts side by side. The source system must be connected for the source hosts screen to be displayed.

Peer Motion : Peer Motion Configuration : Storage Settings and Configuration : Hosts

Hosts

Host Sets

Source System: 5440

Destination System: 5610

Any column contains:  Clear

Name	Domain	Hosts	Total Reserved Size (GiB)	Total Exported Size (GiB)	Comments
EmptyHostSet	SQA	0	0.000	0.000	--
LinuxHostSet	SQA	2	0.000	0.000	--
W2kHostSet	SQA	2	0.000	0.000	--

Any column contains:  Clear

Name	Domain	Hosts	Total Reserved Size (GiB)	Total Exported Size (GiB)	Comments
EmptyHostSet	SQA	0	0.000	0.000	--
LinuxHostSet	SQA	2	16.500	12.000	--
W2kHostSet	SQA	2	0.000	0.000	--

The following information is displayed for both Source and Destination systems:

Column	Description
<b>Name</b>	The host set name.
<b>Domain</b>	The domain (if any) the host set is associated with.
<b>Hosts</b>	The number of hosts in the host set.
<b>Total Exported Size</b>	The total size of the exported volumes (in GiB).
<b>Comments</b>	Any user-created comments.

## Security & Domains Node

The Security & Domains screen displays the security settings of the source and destination systems. It includes Summary, Users, Domains, and Domain Sets tabs.

### Security & Domains Node Summary Tab

Peer Motion : Peer Motion Configuration : Storage Settings and Configuration : Security & Domains

Summary | Users | Domains | Domain Sets | LDAP

**Source System: S440**

**General**

Users	12
LDAP configuration	Yes
Domains	4
Domain Sets	0

**User Roles**

**Global**

basic_edit	1
browse	3
create	1
edit	1
service	1
super	4

**Domain**

edit	1
browse	1

**Capacity**

Inside Domain Size	312.000 GiB
Outside Domain Size	404.000 GiB
Total Size	716.000 GiB

Domain	Size (GiB)
SQA	224.000
QA	88.000
RMV-domain	0.000
rmv21_jpn-domainupto31cha...	0.000

**Destination System: S610**

**General**

Users	16
LDAP configuration	Yes
Domains	5
Domain Sets	0

**User Roles**

**Global**

basic_edit	1
browse	3
create	2
edit	2
service	3
super	5

**Capacity**

Inside Domain Size	188.000 GiB
Outside Domain Size	40.000 GiB
Total Size	228.000 GiB

Domain	Size (GiB)
SQA	188.000
IMC_Local	0.000
QA	0.000
RMV-domain	0.000
rmv21_jpn-domainupto31cha...	0.000

The Summary Tab displays the following information for the Source and Destination systems:

Group	Field	Description
General	Users	The number of users on the system.
	LDAP configuration	Whether the system is configured for LDAP authentication.
	Domains	The number of domains on the system
	Domain Sets	The number of domain sets on the system.
User Roles	Global/Domain	
	Browse	The number of users with Browse permission.
	Create	The number of users with Create permission.
	Edit	The number of users with Edit permission.
	Super	The number of users with Super permission.
	Service	The number of users with Service permission.
Capacity	Inside Domain Size	The capacity associated with domains.
	Outside Domain Size	The capacity outside of domains.
	Total Size	The total capacity.
	Domain	The name of each domain. (Select the Top 10 check box if you only want to display the top 10 domains.)
	Size	The size (in GiB) of each listed domain.

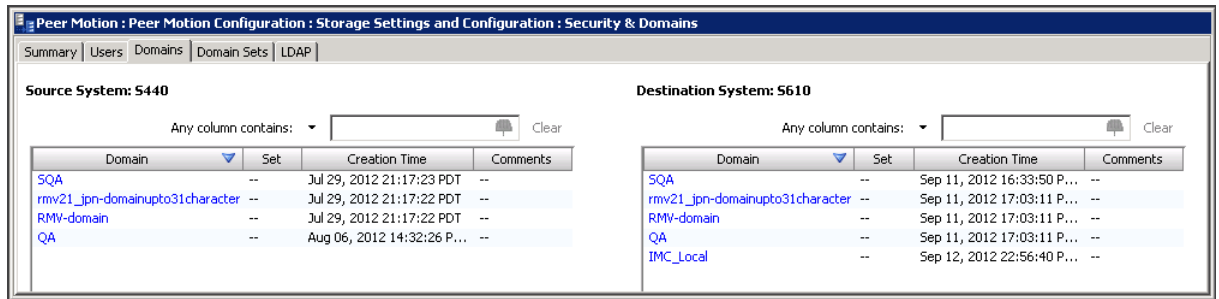
## Security & Domains Node Users Tab

Peer Motion : Peer Motion Configuration : Storage Settings and Configuration : Security & Domains						
Summary Users Domains Domain Sets LDAP						
Source System: 5440						
Any column contains: <input type="text"/> Clear						
User Name	System	Domain	Role	Default Domain		
3paradm	5440	all	super	No		
3parcim	5440	all	browse	No		
3parsvc	5440	all	super	No		
ramesh1	5440	all	browse	No		
ramesh2	5440	all	edit	No		
ramesh3	5440	all	basic_edit	No		
ramesh4	5440	all	create	No		
ramesh5	5440	all	service	No		
root	5440	all	super	No		
root2	5440	all	super	No		
test1	5440	all	browse	No		
test1	5440	QA	edit	No		
user1	5440	SQA	browse	No		
Destination System: 5610						
Any column contains: <input type="text"/> Clear						
User Name	System	Domain	Role	Default Domain		
3paradm	5610	all	super	No		
3parcim	5610	all	browse	No		
3parsvc	5610	all	super	No		
amit-create	5610	all	create	No		
gforce	5610	all	service	No		
ramesh1	5610	all	browse	No		
ramesh2	5610	all	edit	No		
ramesh3	5610	all	basic_edit	No		
ramesh4	5610	all	create	No		
ramesh5	5610	all	service	No		
root	5610	all	super	No		
root2	5610	all	super	No		
test	5610	all	super	No		
test1	5610	all	browse	No		
test2	5610	all	service	No		
test3	5610	all	edit	No		

Displays user information for the source and destination systems.

Column	Description
User Name	User names on the specified system.
Domain	Domains on the specified system.

## Security & Domains Node Domains Tab



Source System: 5440				Destination System: 5610			
Domain	Set	Creation Time	Comments	Domain	Set	Creation Time	Comments
SQA	--	Jul 29, 2012 21:17:23 PDT	--	SQA	--	Sep 11, 2012 16:33:50 P...	--
rmv21_jpn-domainupto31character	--	Jul 29, 2012 21:17:22 PDT	--	rmv21_jpn-domainupto31character	--	Sep 11, 2012 17:03:11 P...	--
RMV-domain	--	Jul 29, 2012 21:17:22 PDT	--	RMV-domain	--	Sep 11, 2012 17:03:11 P...	--
QA	--	Aug 06, 2012 14:32:26 P...	--	QA	--	Sep 11, 2012 17:03:11 P...	--
				IMC_Local	--	Sep 12, 2012 22:56:40 P...	--

The following information is displayed for both Source and Destination systems:

Column	Description
Domain	The domains on each system.
Set	The domain sets on each system.
Creation Time	The date and time the specified domain was created.
Comments	Any user-created comments.

## Security & Domains Node Domain Sets Tab

**NOTE:** This tab is hidden if the source and destination systems do not have a domain license or do not support the object set feature.

The following information is displayed for both Source and Destination systems:

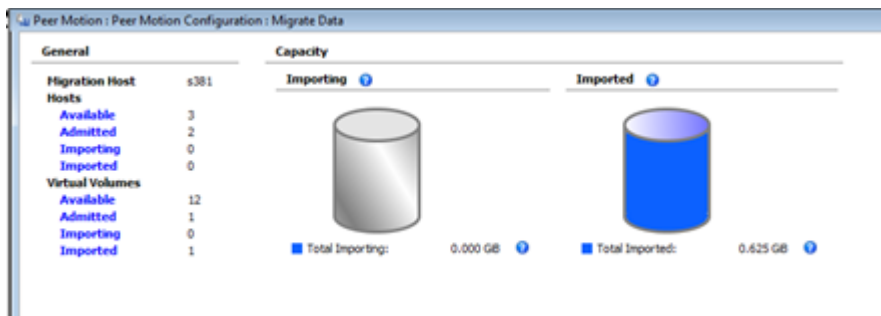
Column	Description
Name	The name of a domain set on the specified system.
Domains	The number of domains in the specified domain set.
Hosts	The number of hosts.
Comments	Any user-created comments.

## Security & Domains Node LDAP Tab

This tab displays all LDAP properties and their associated values for both Source and Destination systems.

Peer Motion : Peer Motion Configuration : Storage Settings and Configuration : Security & Domains		
Summary   Users   Domains   Domain Sets   LDAP		
Source System: 5440		Destination System: 5610
Any column contains: <input type="text"/> Clear		
Property	Value	
LDAP Server	10.112.1.178	
User Attribute	uid	
User Base DN	ou=People dc=3pardata dc=com	
Use Certificate	No	
Group Name Attribute	cn	
Domain Name Attribute	description	
Domain Name Prefix	inservDomain=	
Group Object Class	posixGroup	
Start-TLS	no	
Binding	simple	
Port	389	
Member Attribute	memberUid	
Allow SSH Key	No	
Group DN	ou=Group dc=3pardata dc=com	
Use SSL	No	
browse-map	browse-map	

## Viewing Migration Data Information



To view migration data:

1. Select **Peer Motion** in the Manager Pane.
2. Select **Migrate Data** under Peer Motion Configuration in the Peer Motion tree.

The Management window displays the available, admitted (peer), importing, and imported hosts and virtual volumes for the migration host system, along with capacity information for volumes in imported and importing states. Clicking a highlighted item will take you to the corresponding screen. For example, clicking **Available** under **Hosts** will take you to the **Available Hosts** summary screen.

[“Available/Imported Hosts Screen” \(page 252\)](#)

[“Available/Imported Host Sets Screen” \(page 253\)](#)

[“Available/Imported Linked Hosts Screen” \(page 254\)](#)

[“Admitted/Importing Hosts Screen” \(page 254\)](#)

[“Admitted/Importing Host Sets Screen” \(page 255\)](#)

[“Admitted/Importing Linked Hosts Screen” \(page 256\)](#)

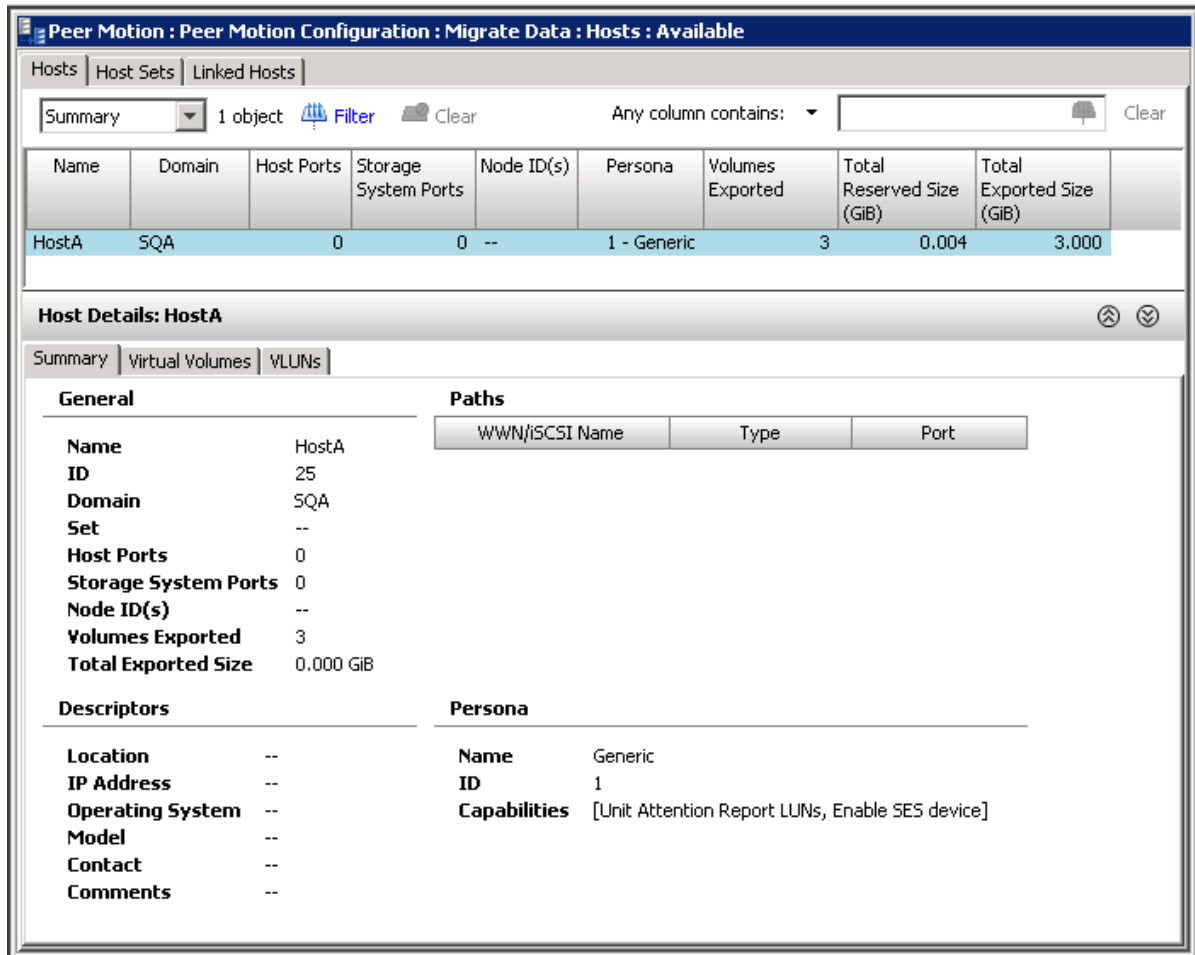
[“Available/Imported Volumes Screen” \(page 256\)](#)

[“Admitted/Importing Volumes Screen” \(page 257\)](#)

## Available/Imported Hosts Screen

The Hosts screen displays the hosts that can be migrated. It is divided into a list pane and a detail pane.





The list pane provides the following information:

Column	Description
<b>Name</b>	The name of a host on the source system.
<b>Domain</b>	The domain (if any) of which the host is a member.
<b>Host Ports</b>	The number of host ports on the system.
<b>Storage System Ports</b>	The number of storage system ports.
<b>Node ID(s)</b>	The port node IDs.
<b>Persona</b>	The persona information for the specified port (e.g. 1–Generic).
<b>Volumes Exported</b>	The number of exported volumes on the system.
<b>Total Exported Size</b>	The total size (in GiB) of the exported volumes.

The detail pane contains a Summary tab, a VLUNs tab, and a Virtual Volumes tab.

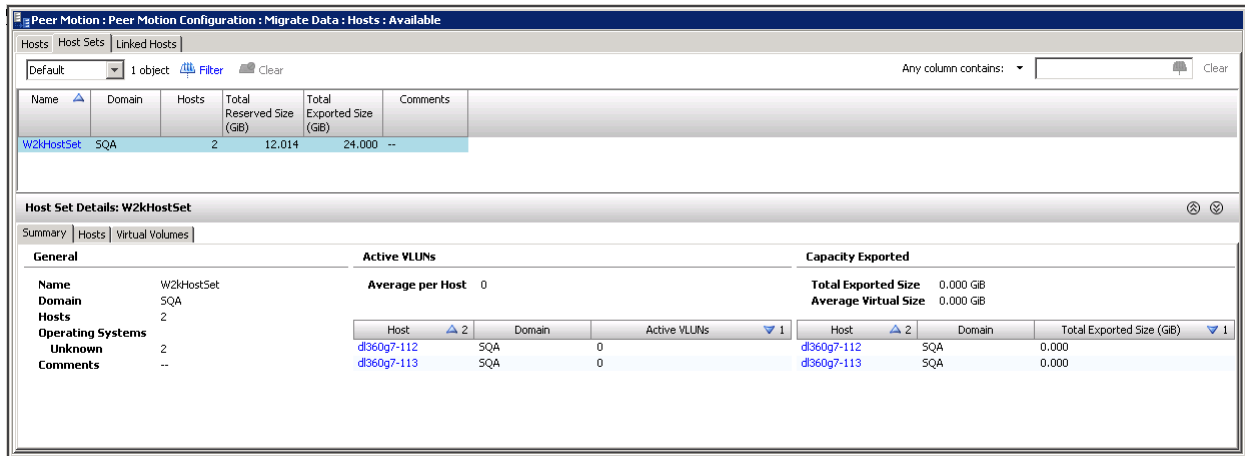
“Host Summary Details” (page 92)

“VLUN Details” (page 94)

“Virtual Volumes Details” (page 96)

## Available/Imported Host Sets Screen

The Host Sets screen is divided into a list pane and a detail pane.



The list pane provides the following information:

Column	Description
<b>Name</b>	The name of a host set on the source system.
<b>Domain</b>	The domain (If any) to which the host set belongs.
<b>Hosts</b>	The number of host on the system.
<b>Total Exported Size</b>	The total size (in GiB) of the exported volumes.
<b>Comments</b>	Any user-created comments.

For information on detail pane screens, see [“The Host Set Details Hosts Tab” \(page 105\)](#).

## Available/Imported Linked Hosts Screen

The Linked Hosts screen is divided into a list pane and a detail pane.

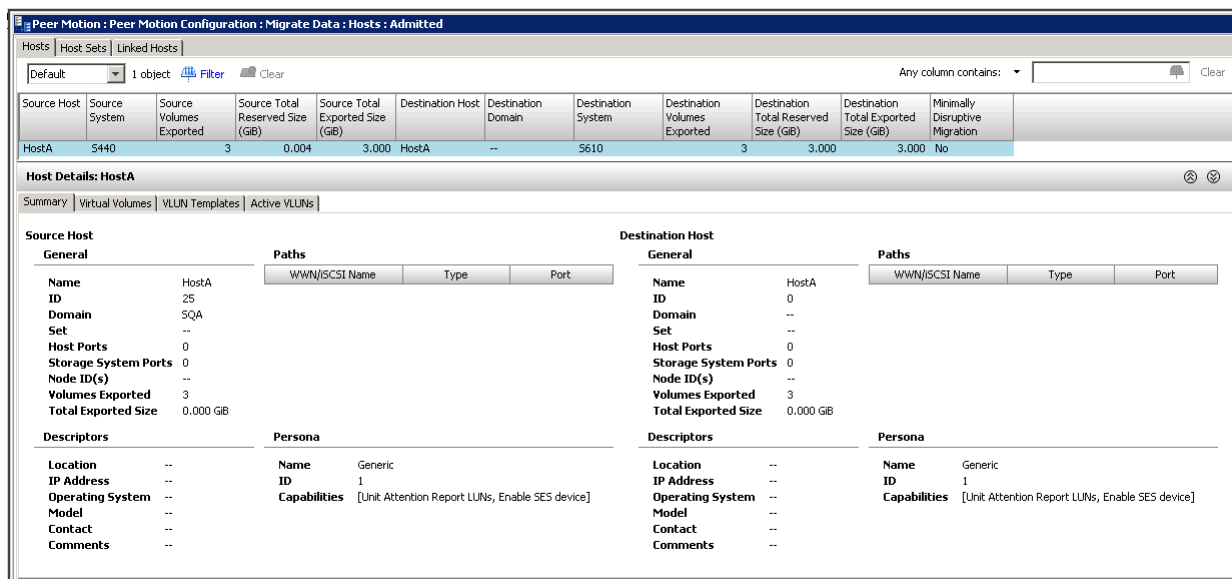
The list pane provides the following information:

Column	Description
<b>Name</b>	The name of a host set on the source system.
<b>Domain</b>	The domain (If any) to which the host set belongs.
<b>Host Ports</b>	The number of host ports on the system.
<b>Volumes Exported</b>	The number of exported volumes.
<b>Total Exported Size</b>	The total size (in GiB) of the exported volumes.
<b>Total Reserved Size</b>	The total amount of reserved space in GiB.
<b>Persona</b>	The persona information for the specified port (e.g. 1–Generic).
<b>Comments</b>	Any user-created comments.

The detail pane contains a VLUNs tab and a Virtual Volumes tab. For details see, [“VLUN Details” \(page 94\)](#), [“Virtual Volumes Details” \(page 96\)](#).

## Admitted/Importing Hosts Screen

The Admitted Hosts screen displays hosts that have volumes that are in the Admitted (peer) state. The Importing Hosts screen displays hosts that have volumes that are in the Importing state. This screen is divided into a list pane and a detail pane.



The list pane displays a 1:1 mapping between the source and destination hosts. (The source system must be connected for the source information to be displayed.)

Column	Description
<b>Source Host</b>	The name of the source host.
<b>Source System</b>	The name of the source system.
<b>Source Volumes Exported</b>	The number of volumes exported from the source system.
<b>Source Total Exported Size</b>	The total size (in GiB) of the volumes exported from the source system.
<b>Destination Host</b>	The name of the destination host.
<b>Destination Domain</b>	The name of the destination domain (if any).
<b>Destination System</b>	The name of the destination system.
<b>Destination Volumes Exported</b>	The number of volumes exported to the destination system.
<b>Destination Total Exported Size</b>	The total size (inGiB) of the volumes exported to the destination system.
<b>Minimally Disruptive Migration</b>	Indicates if the migration is minimally disruptive.

The detail pane provides Summary, Active VLUNs, and Virtual Volume information for both the source and destination hosts. (The source system must be connected for the source information to be displayed.) For information on the detail pane screens, see [“Host Summary Details”](#) (page 92), [“Active VLUNs”](#) (page 95), and [“Virtual Volumes Details”](#) (page 96).

## Admitted/Importing Host Sets Screen

The Admitted Host Sets screen displays host sets that have volumes that are in the Admitted (peer) state.

The Importing Host Sets screen displays host sets that have volumes that are in the Importing state.

Column	Description
<b>Source Host Set</b>	The name of the source host set.
<b>Source System</b>	The name of the source system.
<b>Source Host</b>	The number of source hosts in the source system host set.

Column	Description
<b>Source Total Exported Size</b>	The total size (in GiB) of the volumes exported from the source system.
<b>Destination Host Set</b>	The name of the destination host set.
<b>Destination Domain</b>	The name of the destination domain (if any).
<b>Destination Host</b>	The number of destination hosts.
<b>Destination Total Exported Size</b>	The total size (in GiB) of the volumes exported to the destination system.
<b>Minimally Disruptive Migration</b>	Indicates if the migration is minimally disruptive..

The detail pane provides Summary, Hosts, Paths, and Virtual Volume information for both the source and destination hosts. The source system must be connected for the source information to be displayed. For information on the detail pane screens, see [“The Host Set Details Summary Tab” \(page 104\)](#), [“The Host Set Details Paths Tab” \(page 106\)](#), [“The Host Set Details Hosts Tab” \(page 105\)](#), and [“The Host Set Details Virtual Volumes Tab” \(page 106\)](#).

## Admitted/Importing Linked Hosts Screen

The Linked Hosts screen is divided into a list pane and a detail pane.

The list pane provides the following information:

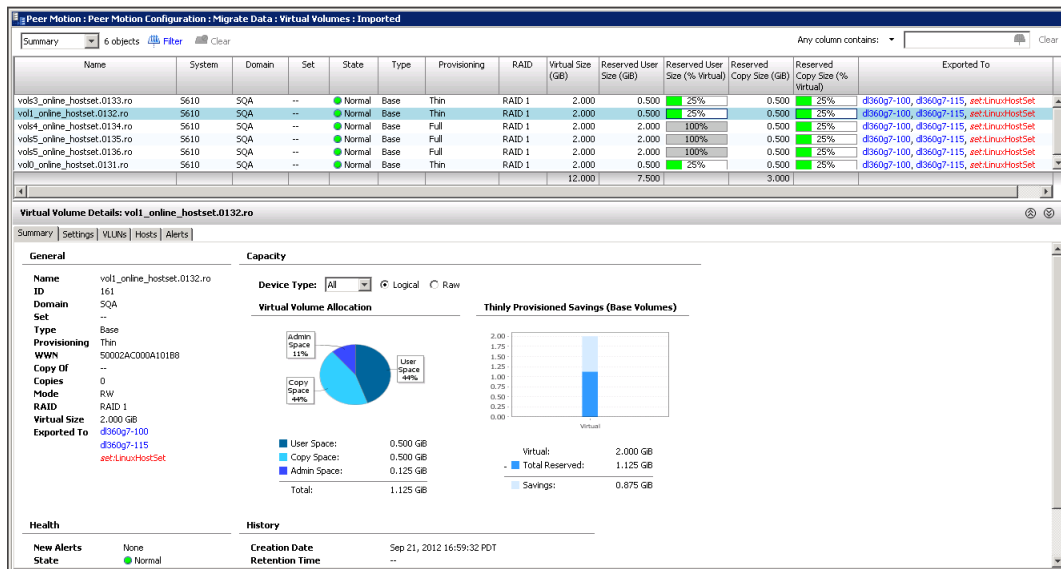
Column	Description
<b>Name</b>	The name of a host set on the source system.
<b>Domain</b>	The domain (If any) to which the host set belongs.
<b>Host Ports</b>	The number of host ports on the system.
<b>Volumes Exported</b>	The number of exported volumes.
<b>Total Exported Size</b>	The total size (in GiB) of the exported volumes.
<b>Total Reserved Size</b>	The total amount of reserved space in GiB.
<b>Persona</b>	The persona information for the specified port (e.g. 1–Generic).
<b>Comments</b>	Any user-created comments.

The detail pane contains a VLUNs tab and a Virtual Volumes tab. For details see, [“VLUN Details” \(page 94\)](#), [“Virtual Volumes Details” \(page 96\)](#).

## Available/Imported Volumes Screen

The Available Volumes screen displays the volumes that are visible to the source and destination storage system but that have not yet been admitted.

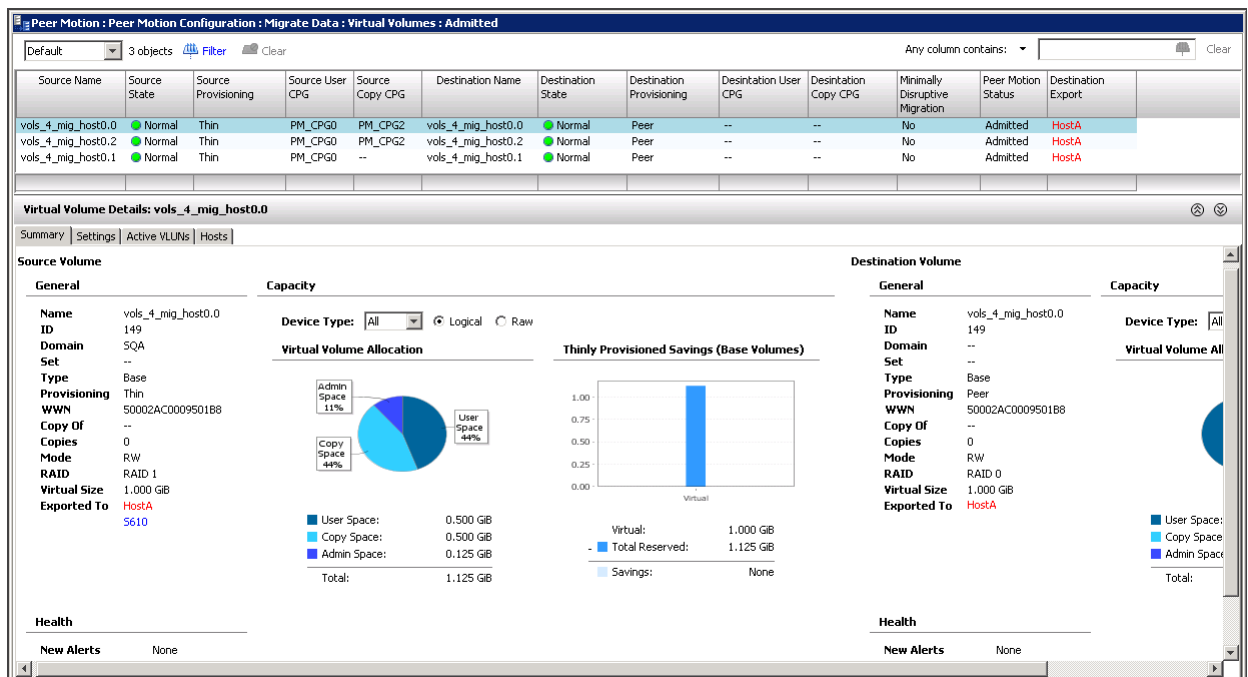
The Imported Volumes screen displays the volumes that have been imported to the destination storage system.



The screen is divided into a list pane and a detail pane. A blue arrow icon to the left of a volume name in the list pane indicates the I/O endpoint on the Available Volumes screen. A green arrow represents the I/O endpoint on the Imported Volumes screen. For information on items that are displayed in both the list and detail panes, see “Viewing the Virtual Volumes Tab” (page 153).

## Admitted/Importing Volumes Screen

The Admitted Volumes screen displays the volumes that have been admitted. The Importing Volumes screen displays the volumes that are currently in an importing state.



The screen is divided into a list pane and a detail pane. A blue arrow icon to the left of a volume name in the list pane indicates the I/O endpoint. The summary screen displays a side-by-side mapping between the source and destination volumes. The source system must be connected to display source volume information.

The list pane displays the following information:

Column	Description
<b>Source Name</b>	The name of the source volume
<b>Source State</b>	The state of the source volume.
<b>Source Provisioning</b>	The type of provisioning of the source volume (such as Thin or Full).
<b>Source User CPG</b>	The name of the user CPG associated with the source volume.
<b>Source Copy CPG</b>	The name of the copy CPG associated with the source volume.
<b>Destination Name</b>	The name of the destination volume.
<b>Destination State</b>	The state of the destination volume.
<b>Destination Provisioning</b>	The type of provisioning of the destination volume (such as Thin or Full).
<b>Destination User CPG</b>	The name of the user CPG associated with the destination volume.
<b>Destination Copy CPG</b>	The name of the copy CPG associated with the source volume.
<b>Peer Motion Status</b>	The current peer motion status of the volume such as Admitted or Importing).
<b>Destination Export</b>	The name of the destination host.

The detail pane displays Summary, Settings, Active VLUNs, and Hosts information. For details, see [“Summary Screen” \(page 258\)](#), [“Settings Screen” \(page 259\)](#), [“Active VLUNs Screen” \(page 259\)](#), and [“Hosts Screen” \(page 260\)](#).

## Summary Screen

The summary screen provides following information for both the source and destination systems.

Group	Field	Description
<b>General</b>	<b>Name</b>	The virtual volume's name.
	<b>ID</b>	The virtual volume ID.
	<b>Domain</b>	The domain in which the volume resides.
	<b>Set</b>	The name of the volume set to which the volume belongs.
	<b>Type</b>	The type of volume (base, physical copy, virtual copy).
	<b>Provisioning</b>	Indicates whether the selected volume is fully provisioned or a thinly provisioned virtual volume.
	<b>WWN</b>	The volume's World Wide Name (WWN).
	<b>Copy Of</b>	The volume from which the selected volume was copied.
	<b>Copies</b>	The number of copies of the selected volume.
	<b>Mode</b>	Indicates whether the volume is read-only (RO) or read-write (RW).
	<b>RAID</b>	Indicates the volume's RAID type.
	<b>Virtual Size</b>	Indicates the volume's size (in GiB).
	<b>Exported To</b>	The host to which the volume is exported.
<b>Health</b>	<b>New Alerts</b>	The number of new virtual volume alerts.
	<b>State</b>	The current state of the virtual volume. See <a href="#">“Alert Severity Indicators” (page 406)</a> .

Group	Field	Description
	<b>State Description</b>	Description of the virtual volume's state.
<b>Capacity</b>	<b>Device Type</b>	Select the device type, Fast Class (FC), Near Line (NL), or Solid State Device (SSD). The capacity and capacity usage of the selected device type is displayed in graphical form.
	<b>Logical</b>	The logical capacity.
	<b>Raw</b>	The raw capacity.
<b>Virtual Volume Allocation</b>	The allocation of the volume's admin, copy, and user space.	

## Settings Screen

The Settings screen displays a side-by-side comparison of source and destination volume settings.

Group	Field	Description
<b>User Space Provisioning</b>	<b>Provisioning</b>	The type of provisioning of the volume.
	<b>CPG</b>	The name of the CPG associated with the volume.
<b>User Space Allocation / Copy Space Allocation</b>	<b>Device Type</b>	The device type of the volume (such as FC).
	<b>Device RPM</b>	The disk speed. <b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.
	<b>RAID Type</b>	The RAID configuration of the volume.
	<b>Configured Availability</b>	The current volume configuration (such as cage).
	<b>Availability</b>	The level of failure tolerance for this volume: <System Default>, <b>Cage</b> , <b>Port</b> , or <b>Magazine</b> .
	<b>Set Size</b>	The set size of the volume.
	<b>Step Size</b>	The step size of the volume.
<b>Copy Space Provisioning</b>	<b>Provisioning</b>	The type of provisioning of the volume.
	<b>CPG</b>	The name of the CPG associated with the volume.
	<b>Allocation Warning</b>	Indicates whether Allocation Warning is enabled or disabled.
	<b>Allocation Limit</b>	Indicates whether Allocation Limit is enabled or disabled.

## Active VLUNs Screen

The Active VLUNs screen provides the following information for both the source and destination systems.

Column	Description
<b>LUN</b>	The exported LUN value.
<b>Virtual Volume</b>	The exported volume.
<b>Host</b>	The name of the host to which the VLUN is exported.

Column	Description
<b>Port</b>	The port to which the path is connected.
<b>Host WWN/iSCSI Name</b>	The host's World-Wide Name (WWN) or iSCSI name.
<b>Exported Size</b>	The size of the VLUN in GiB.

## Hosts Screen

The Hosts screen provides the following information for both the source and destination systems.

Column	Description
<b>Name</b>	The name of the host.
<b>System</b>	The name of the system
<b>Node ID(s)</b>	The number of Node ID(s) associated with the host.
<b>Persona</b>	The persona associated with the host.
<b>Volumes Exported</b>	The number of exported volumes.
<b>Total Exported Size</b>	The total size (in GiB) of exported volumes.

## Viewing Source and Destination Systems

The Source and Destination systems screens contain a [“Summary Tab”](#) (page 261) and an [“Alerts Tab”](#) (page 263). The summary screen provides information for both the source and destination systems. The Alerts screen displays alerts that are associated with the specified system.



## Summary Tab

Peer Motion : Peer Motion Configuration : S440 (Source)			
Summary		Alerts	
General		Provisioning	
<b>Name</b>	S440	<b>CPGs</b>	7
<b>Model</b>	InServ T400	<b>Virtual Volumes</b>	62
<b>Serial Number</b>	1200440	<b>Base Volumes</b>	34
<b>OS Version</b>	3.1.1 (MU2)	<b>Thinly Provisioned</b>	21
<b>SNMP Configuration</b>	No	<b>Fully Provisioned</b>	13
<b>NTP Server Configuration</b>	15.199.208.21	<b>Virtual Copies</b>	25
<b>Ports</b>		<b>Physical Copies</b>	3
<b>Host</b>	4	<b>Remote Copy Volumes</b>	0
<b>Free</b>	12	<b>Expired Volumes</b>	0
<b>Physical Disks</b>	32	<b>Unexported Volumes</b>	53
<b>FC</b>	32	<b>Active VLUNs</b>	0
Host		Security & Domains	
<b>Hosts</b>	5	General	
<b>Host Sets</b>	3	<b>Users</b>	12
<b>Operating Systems</b>		<b>LDAP configuration</b>	Yes
<b>Windows</b>	2	<b>Domains</b>	4
<b>Linux</b>	2	<b>Domain Sets</b>	0
<b>InForm</b>	1	<b>User Roles</b>	
<b>Paths</b>	11	<b>Global</b>	
<b>Unassigned</b>	7	<b>basic_edit</b>	1
		<b>browse</b>	3
		<b>create</b>	1
		<b>edit</b>	1
		<b>service</b>	1
		<b>super</b>	4
		<b>Domain</b>	
		<b>edit</b>	1
		<b>browse</b>	1

The Summary screen provides the following information. Clicking on any highlighted text will take you the corresponding screen so that you can view more detailed information.

Group	Field	Description
General	<b>Name</b>	The virtual volume's name.
	<b>Model</b>	The model number of the storage system.
	<b>Serial Number</b>	The serial number of the storage system.
	<b>OS Version</b>	The operating system version in use by the system.
	<b>SNMP Configuration</b>	Indicates whether the system is configured with SNMP.
	<b>NTP Server Configuration</b>	Displays the IP address of the NTP server, if available.
	<b>DNS Server</b>	Displays IP address of the DNS server, if available.
	<b>Ports</b>	Click to view the system's Ports screen.
	<b>Host</b>	The number host ports on the system.
	<b>Peer</b>	The number of peer ports on the system.
	<b>Free</b>	The number of free ports on the system.
	<b>Physical Disks</b>	The total number of physical disks in the system, followed by the type and number of each type of disk (such as FC, NL, SSD).
Host	<b>Hosts</b>	The number hosts on the system.

Group	Field	Description
	<b>Host Sets</b>	The number of host sets on the system.
	<b>Operating Systems</b>	Lists current operating systems in use.
	<b>Paths</b>	The total number of paths on the system and the number of unassigned paths.
<b>Provisioning</b>	<b>CPGs</b>	The number of CPGs on the system.
	<b>Virtual Volumes</b>	The number of virtual volumes on the system.
	<b>Base Volumes</b>	The number of base volumes on the system.
	<b>Thinly Provisioned</b>	The number of thinly provisioned volumes on the system.
	<b>Fully Provisioned</b>	The number of fully provisioned volumes on the system.
	<b>Virtual Copies</b>	The number of virtual copies on the system.
	<b>Physical Copies</b>	The number of physical copies on the system.
	<b>Remote Copy Volumes</b>	The number of remote copy volumes on the system.
	<b>Expired Volumes</b>	The number of expired volumes on the system.
	<b>Unexported Volumes</b>	The number of unexported volumes on the system.
	<b>Active VLUNs</b>	The number of active VLUNs on the system.
<b>Security &amp; Domains</b>	<b>General</b>	
	<b>Users</b>	The number of user accounts on the system.
	<b>LDAP configuration</b>	Indicates whether the system is configured for LDAP.
	<b>Domains</b>	The number of domains on the system.
	<b>Domain Sets</b>	The number of domain sets on the system.
	<b>User Roles</b>	
	<b>Global</b>	Lists the global user roles on the system, itemized by role and the number of users having the specified role.
	<b>Domain</b>	Lists the domain user roles on the system, itemized by role and the number of users having the specified role.

## Alerts Tab

The screenshot shows the 'Peer Motion : Peer Motion Configuration : S440 (Source)' window. The 'Alerts' tab is active, displaying a list of 7 objects. The list has columns for System, Severity, ID, State, Last Time, and Message. Alert 39 is highlighted, showing a 'Major' severity and 'Cage 0 Failed (Inaccessible)' message.

**Alert Details: 39**

General		Component	
<b>Severity</b>	Major	<b>System</b>	S440
<b>Type</b>	Component state change	<b>System SN</b>	1200440
<b>Message</b>	Cage 0 Failed (Inaccessible)	<b>Node ID</b>	2
<b>ID</b>	39	<b>Component</b>	Cage 0
<b>State</b>	Resolved by System	<b>Frequency</b>	
<b>Message Code</b>	0x01e00fa	<b>Repeat Count</b>	0
<b>Sequence</b>	1838	<b>Last Time</b>	Sep 05, 2012 15:31:47 PDT
		<b>First Time</b>	Sep 05, 2012 15:31:47 PDT

**Resolved By Event**

<b>Node ID</b>	2
<b>Component</b>	Cage 0
<b>Severity</b>	Info
<b>Type</b>	Component state change
<b>Sequence</b>	1918
<b>Time</b>	Sep 05, 2012 15:31:47 PDT
<b>Message</b>	Cage 0 Normal

**Recommended Action**

For alert actions, go to [www.hp.com/support/hpgt/3par](http://www.hp.com/support/hpgt/3par)  
 For video repair instructions, go to [www.hp.com/go/sml](http://www.hp.com/go/sml)

The Alerts screen is divided into a list pane and a detail pane. For details about the information displayed in both panes, see [“Alerts Tab” \(page 244\)](#).

## Ports Screen

The Ports screen contains a **Peer Capable Ports** tab and a **Host Ports** tab when viewing both source and destination systems. When viewing the destination system, a third tab, the **Peer Ports** tab is included.

All three tabs are divided into a list pane and a detail pane and provide similar information. The list pane provides the following information:

Column	Description
<b>Position</b>	The port location in Node:Slot:Port format.
<b>Label</b>	The port label. (Displayed only on destination systems.)
<b>WWN/MAC</b>	World Wide Name or Media Access Control address of the connected device.
<b>State</b>	The state of the port. See <a href="#">“System and Component Status Icons” (page 407)</a> .
<b>Type</b>	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
<b>Connected Device Type</b>	Indicates whether the connection device type is Host or Peer.
<b>Connected Device</b>	The name of device that the port is connected to.

Column	Description
<b>Mode</b>	Port firmware mode setting: Initiator, Target, Peer, or Suspended. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (this is rare). Peer mode is for Ethernet ports.
<b>Partner</b>	xThe partner port, in Node:Slot:Port format. (Displayed only on destination systems.)
<b>Partner WWN</b>	The WWN of the partner port. (Displayed only on destination systems.)
<b>Failover State</b>	Indicates whether the system is in a failover state. (Displayed only on destination systems.)

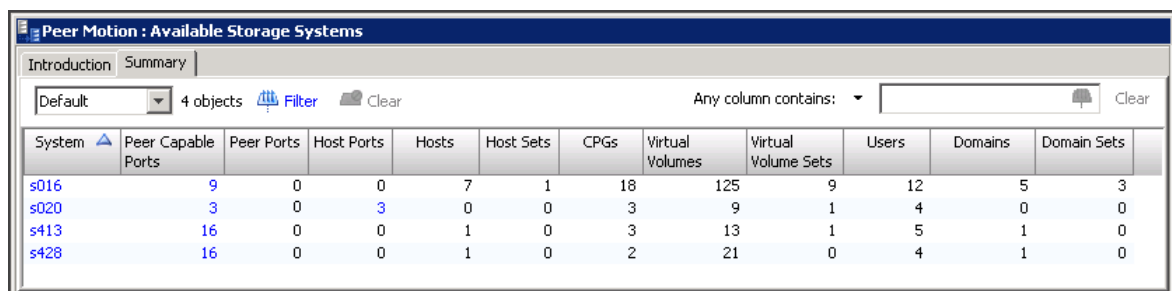
The detail pane contains the following information:

Group	Field	Description
<b>General</b>	<b>Position</b>	The port location in Node:Slot:Port format.
	<b>Port WWN</b>	Port World Wide Name.
	<b>Node WWN</b>	Node World Wide Name.
	<b>Type</b>	Indicates whether the port is FC, iSCSI, RCIP, or RCFC.
	<b>Rate</b>	The rate that data can be transferred over the port (1 Gbps, 2 Gbps or 4 Gbps). When there is no specified value, no connection exists.
	<b>Connected Device Type</b>	The type of device that the port is connected to: Host or Peer.
	<b>Connected Device</b>	The name of the system associated with the selected port.
	<b>Mode</b>	Port firmware mode setting. Ports in Initiator mode are connected to drive cages and ports in Target mode export to hosts. Suspended mode is for target ports that have not yet been initialized by the system (this is rare). Peer mode is for Ethernet ports.
	<b>State</b>	The current state of the port.
	<b>MAC</b> (not shown)	For iSCSI ports. The Media Access Control address for the Ethernet interface.
	<b>TPGT</b> (not shown)	For iSCSI ports. The Target Portal Group Tag for the iSCSI target portal group.
<b>Settings</b> (displayed for FC and RCFC ports)	<b>Connection Mode</b>	The type of port connection: Host or Peer.
	<b>Connection Type</b>	Connection type or port connection setting: Loop or Point.
	<b>Configured Rate</b>	Data transfer rate setting (such as 1 Gbps). Auto indicates that the system automatically selects the rate.
	<b>Max Rate</b>	Maximum rate of connection from the port.
	<b>Class 2</b>	Indicates whether Fibre Channel service Class 2 is <b>Disabled</b> , <b>Ack 1</b> or <b>Ack 0</b> .
	<b>VCN</b>	For fabric attached ports, indicates the VLUN change notification setting. When set to Enabled, notices are generated and sent to the fabric controller. When set to Disabled, no notification is sent.
	<b>Unique Node WWN</b>	Indicates whether the node's WWN is <b>Enabled</b> or <b>Disabled</b> .
	<b>Interrupt Coalesce</b>	If disabled, each I/O generates a separate interrupt to the HBA port driver rather than generating one interrupt for multiple I/O completion.
<b>IP Settings</b> (displayed for RCIP and iSCSI ports - not shown)	<b>MAC</b>	For RCIP ports, the Media Access Control address of the Ethernet interface.
	<b>DHCP</b>	For iSCSI ports, indicates whether the Dynamic Host Configuration Protocol (DHCP) protocol is enabled.
	<b>IP Address</b>	IP address of the iSCSI or RCIP port.

Group	Field	Description
	<b>Gateway</b>	The address of a local IP router on the same network as the system, used to forward traffic to destinations beyond the local network.
	<b>Subnet Mask</b>	The netmask address for the iSCSI or RCIP interface.
	<b>MTU</b>	Maximum Transmission Unit. The greatest amount of data or "packet" size that can be transferred at one time over a particular network connection without overburdening the connection. The default MTU setting for an iSCSI port is 1500. When supported by the network, an MTU value of 9000 should be used.
	<b>Configured Rate</b>	For RCIP ports. The configured data transfer rate. A value of 0 indicates that no data is being transferred.
	<b>Rate</b>	For iSCSI ports. Data transfer rate. A value of 0 indicates that no data is being transferred.
	<b>TCP Port</b>	The TCP port number used by the iSCSI card.
	<b>Duplex</b>	For RCIP, the duplex speed: Half or Full.
	<b>Adapter Type</b>	For RCIP ports, the model of the adapter that contains the port (for example, Intel PRO/1000MT).
Fibre Channel Settings (displayed for FC and RCFC ports)	<b>Topology</b>	The type of connection (such as Fabric Attached).
	<b>Class</b>	Identifies which Fibre Channel classes of service are enabled (2, 3, or 2/3). A value of 2/3 indicates that both Class 2 and Class 3 are enabled.
	<b>Adaptor Type</b>	Model of the Fibre Channel adapter that contains the port (such as QLOGIC 2302).
	<b>Mode Change</b>	Indicates whether port mode change from initiator to target or vice versa is Allowed or Prohibited. This setting is configured using the CLI <code>controlport</code> command.
iSNS Settings (displayed for iSCSI ports - not shown)	<b>Primary IP Address</b>	Primary Internet Storage Name Service (iSNS) server IP address. iSNS protocol allows for automated discovery, management, and configuration of iSCSI.
	<b>TCP Port</b>	The port on the iSNS server with which to communicate.

## Viewing Available Storage Systems

The Available Storage tree node list the names of all available storage systems that can be used for data migration and provides summary information in the Management Window.



The screenshot shows the 'Peer Motion : Available Storage Systems' window. It has tabs for 'Introduction' and 'Summary'. Below the tabs is a search bar with 'Default' selected, showing '4 objects'. There are 'Filter' and 'Clear' buttons. A dropdown menu says 'Any column contains:'. Below this is a table with the following columns: System, Peer Capable Ports, Peer Ports, Host Ports, Hosts, Host Sets, CPGs, Virtual Volumes, Virtual Volume Sets, Users, Domains, and Domain Sets. The table lists four systems: s016, s020, s413, and s428.

System	Peer Capable Ports	Peer Ports	Host Ports	Hosts	Host Sets	CPGs	Virtual Volumes	Virtual Volume Sets	Users	Domains	Domain Sets
s016	9	0	0	7	1	18	125	9	12	5	3
s020	3	0	3	0	0	3	9	1	4	0	0
s413	16	0	0	1	0	3	13	1	5	1	0
s428	16	0	0	1	0	2	21	0	4	1	0

The following information is displayed for each available system. Clicking a system name displays, on separate subtabs, available storage system summary information and alerts that are associated with the system. For information on the separate subtabs, see [“Viewing Source and Destination](#)

[Systems” \(page 260\)](#). For information about Peer Capable, Peer, and Host ports on an available system, see [“Ports Screen” \(page 263\)](#).

Column	Description
<b>System</b>	The name of an available system.
<b>Peer Capable Ports</b>	The number of available peer capable ports on the system.
<b>Peer Ports</b>	The number of peer ports on the system.
<b>Host Ports</b>	The number of host ports on the system.
<b>Hosts</b>	The number of hosts on the system.
<b>Host Sets</b>	The number of host sets on the system.
<b>CPGs</b>	The number of CPGs on the system.
<b>Virtual Volumes</b>	The number of virtual volumes on the system.
<b>Virtual Volume Sets</b>	The number of virtual volume sets on the system.
<b>Users</b>	The number of user accounts on the system.
<b>Domains</b>	The number of domains on the system.
<b>Domain Sets</b>	The number of domain sets on the system.

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## Part VI Maintaining the System

This part contains information on managing and maintaining the HP 3PAR StoreServ Storage System.

[“Responding to Alerts” \(page 268\)](#)

[“Locating a System” \(page 275\)](#)

[“Viewing System Information” \(page 278\)](#)

[“Working with Controller Nodes” \(page 287\)](#)

[“Managing Drive Cages” \(page 299\)](#)

[“Managing Physical Disks” \(page 315\)](#)

[“Managing Fans” \(page 326\)](#)

[“Managing Provisioning” \(page 328\)](#)

[“Managing Data Allocation” \(page 333\)](#)

[“Tracking Performance” \(page 338\)](#)

[“Tracking and Scheduling Tasks” \(page 344\)](#)

[“Creating Templates” \(page 357\)](#)

# 16 Responding to Alerts

## Managing Alerts

Once you have accessed and viewed the system alerts, either from the “Alert/Task/Connection Pane” (page 404) or from the **Alerts** tab on the Systems screen, you can apply the following actions to any selected alert.

- Acknowledge the alert
- Mark the alert as fixed
- Mark the alert as new
- Remove the alert

To apply an action to an alert:

If you accessed the alert from the “Alert/Task/Connection Pane” (page 404), right-click the alert and click **Acknowledge**, **Mark as Fixed**, **Remove**, or **Show Details**.

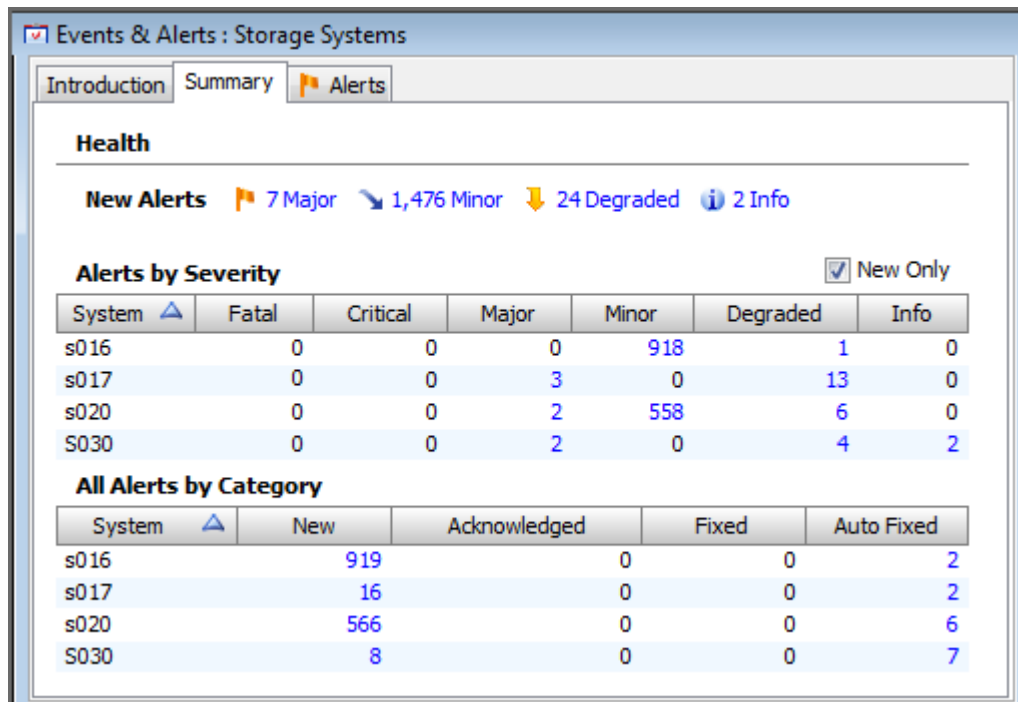
If you accessed the alert from the **Alerts** tab on the Systems screen, right-click the alert and click **Acknowledge**, **Mark as Fixed**, **Mark as New**, **Remove**, or **Show Details**.

## Viewing the Alert Summary

To view a summary of alerts for all connected storage systems:

1. In the Manager Pane, click **Events & Alerts**.
2. In the Management Tree, click the **Storage Systems** node or a system node.
3. In the Management Window, click the **Summary** tab.

The following figure displays the **Summary** tab for all connected systems.





The Summary tab displays the following information:

Group	Field	Description
Health	New Alerts	The number of new alerts.
Alerts by Severity	New Only	Check this box to view the number of new alerts only.
	System	The name of the system which generated the alert.
	Fatal	The number of fatal alerts.
	Critical	The number of critical alerts.
	Major	The number of major alerts.
	Minor	The number of minor alerts.
	Degraded	The number of degraded alerts.
	Info	The number of info alerts.
Alerts by Category	System	The name of the system which generated the alert.
	New	The number of new alerts.
	Acknowledged	The number of alerts that have been acknowledged by the user.
	Fixed	The number of alerts which have had the situation which produced alert fixed by the user.
	Auto Fixed	The number of alerts which have had the situation which produced alert automatically fixed by the system.

## Viewing System Alerts

To view system alert information:

1. In the Manager Pane, click **Events & Alerts**.
2. In the Management Tree, click the **Storage Systems** node or a system node.
3. In the Management Window, click the **Alerts** tab.

The **Alerts** tab is split into a list pane and a detail pane. The list pane display a summary of the alerts. The detail pane displays the details of an alert selected in the list pane.

The information displayed in the **Alerts** tab is nearly identical between the information displayed for all connected systems and information displayed for a single system, with the only exception being an additional **System** column appears in the list pane for all connected systems.

The following figure displays the **Alerts** tab for all connected systems.

Events & Alerts : Storage Systems

IntroductionSummaryAlerts

Default63 objectsFilterClear

Any column contains:

System	Severity	ID	State	Last Time	Message	Repeat Count	First Time
s017	Major	361	Acknowledged	Sep 12, 2012 17:29:46 PDT	Disk 2000001862702864 Failed (Vacated, P...	0	Sep 12, 2012 17:29:46 PDT
s017	Major	367	Resolved by System	Sep 25, 2012 11:56:52 PDT	Remote Copy Link 49(s020_0_3_1) Failed (...)	0	Sep 25, 2012 11:56:52 PDT
s017	Major	368	Resolved by System	Sep 25, 2012 11:56:52 PDT	Remote Copy Link 50(s020_1_3_1) Failed (...)	0	Sep 25, 2012 11:56:52 PDT
s017	Degraded	369	New	Sep 25, 2012 16:23:05 PDT	Port 0:5:2 Degraded (Target Mode Port We...	0	Sep 25, 2012 16:23:05 PDT
s017	Degraded	370	Fixed	Sep 25, 2012 16:23:05 PDT	Port 1:5:2 Degraded (Target Mode Port We...	0	Sep 25, 2012 16:23:05 PDT
s020	Degraded	1	Resolved by System	Sep 17, 2012 20:19:10 GMT	The PR is currently getting data from the in...	0	Sep 17, 2012 20:19:10 GMT
s020	Major	2	New	Sep 17, 2012 20:19:32 GMT	Unable to retrieve the constant value for c...	0	Sep 17, 2012 20:19:32 GMT
s020	Major	3	Resolved by System	Sep 17, 2012 20:19:15 GMT	TPD system is waiting for manual startup. U...	0	Sep 17, 2012 20:19:15 GMT
s020	Minor	4	Resolved by System	Sep 17, 2012 20:37:24 GMT	Preserved data LDs have not been started ...	10	Sep 17, 2012 20:28:35 GMT

Alert Details: 1

General

Severity

Degraded

Type

PR transition

Message

The PR is currently getting data from the internal drive on node 0, not the admin volume. Previously recorded alerts will not be visible until the PR transitions to the admin volume.

ID

1

State

Resolved by System

Message Code

0x00d0002

Sequence

287

Component

System

s020

System SN

1000020

Node ID

0

Component

Persistent Repository 0

Frequency

Repeat Count

0

Last Time

Sep 17, 2012 20:19:10 GMT

First Time

Sep 17, 2012 20:19:10 GMT

Resolved By Event

Node ID

0

Component

Persistent Repository 0

Severity

Info

Type

PR transition

Sequence

1448

Time

Sep 17, 2012 20:29:48 GMT

Message

PR is on the admin volume

Recommended Action

For alert actions, go to [www.hp.com/support/hpgt/3par](http://www.hp.com/support/hpgt/3par)  
For video repair instructions, go to [www.hp.com/go/sml](http://www.hp.com/go/sml)

The list and the detail panes are described in greater detail below:

“List Pane” (page 270)

“Detail Pane” (page 271)

List Pane

The list pane of the Alerts tab displays the following:

Column	Description
System	The system on which the alert occurred. (Displayed only when viewing the Storage Systems node.)
Severity	The severity of the alert. See “Alert Severity Indicators” (page 406).
ID	The alert ID.
State	The alert state.
Last Time	The last occurrence of the alert.
Message	A brief description of the alert.
Repeat Count	The number of times the alert has been issued.
First Time	The first occurrence of the alert.

## Detail Pane

The detail pane of the **Alerts** tab displays detailed information about an alert selected in the list pane. The detail pane displays the following information:

Group	Field	Description
General	Severity	The alert severity. See “Alert Severity Indicators” (page 406).
	Type	The alert type.
	Message	A brief description of the alert.
	ID	The alert ID.
	State	The alert state.
	Message Code	The alert message code.
	Sequence	The alert sequence.
Resolved by Event	Node ID	The controller node ID.
	Component	The component for which the alert was issued.
	Severity	The alert severity. See “Alert Severity Indicators” (page 406).
	Type	The alert type.
	Sequence	The alert sequence.
	Time	The time the alert was resolved.
Component	Message	A brief description of the alert.
	System	The name of the system that generated the alert.
	System SN	The system's serial number.
	Node ID	The node ID.
	Component	The affected system components.
Frequency	Repeat Count	The number of times the alert was issued.
	Last time	The last occurrence of the alert.
	First time	The first occurrence of the alert.

## Removing System Alerts

To remove system alerts:

1. Access the system **Alerts** tab.
2. Select the alert(s) you wish to remove.
3. Right-click your selection and click **Remove**.

The **Remove Alert(s)** dialog box appears.

4. Click **OK**.

See also:

[“Viewing System Alerts” \(page 269\)](#)

[“Selecting Multiple Items” \(page 406\)](#)

## Viewing and Forwarding Error Log Files

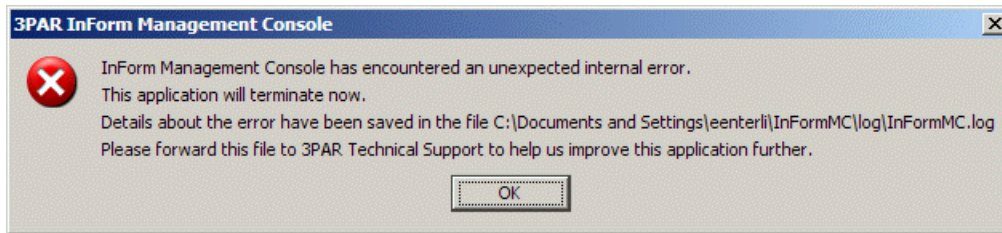
If an internal error results in the termination of the HP 3PAR Management Console, an error log file is created in your home directory with the following path and file name:

C:\...\InFormMC\log\InFormMC.log (for Windows)

or:

informmc/log/informmc.log (for Solaris)

An error dialog box similar to the following appears:



If you experience an unexpected internal error while using the HP 3PAR Management Console:

1. Record the exact path and filename specified in the dialog box.
2. Note the action or sequence of actions that you were performing prior to receiving the error message.
3. Contact your local service provider for technical support and services for instructions on forwarding the error log file.

## Managing Events

The Event Manager allows you to view system alerts for individual systems and all connected systems, and individual system events.

[“Viewing Events” \(page 272\)](#)

[“Filtering Events” \(page 273\)](#)

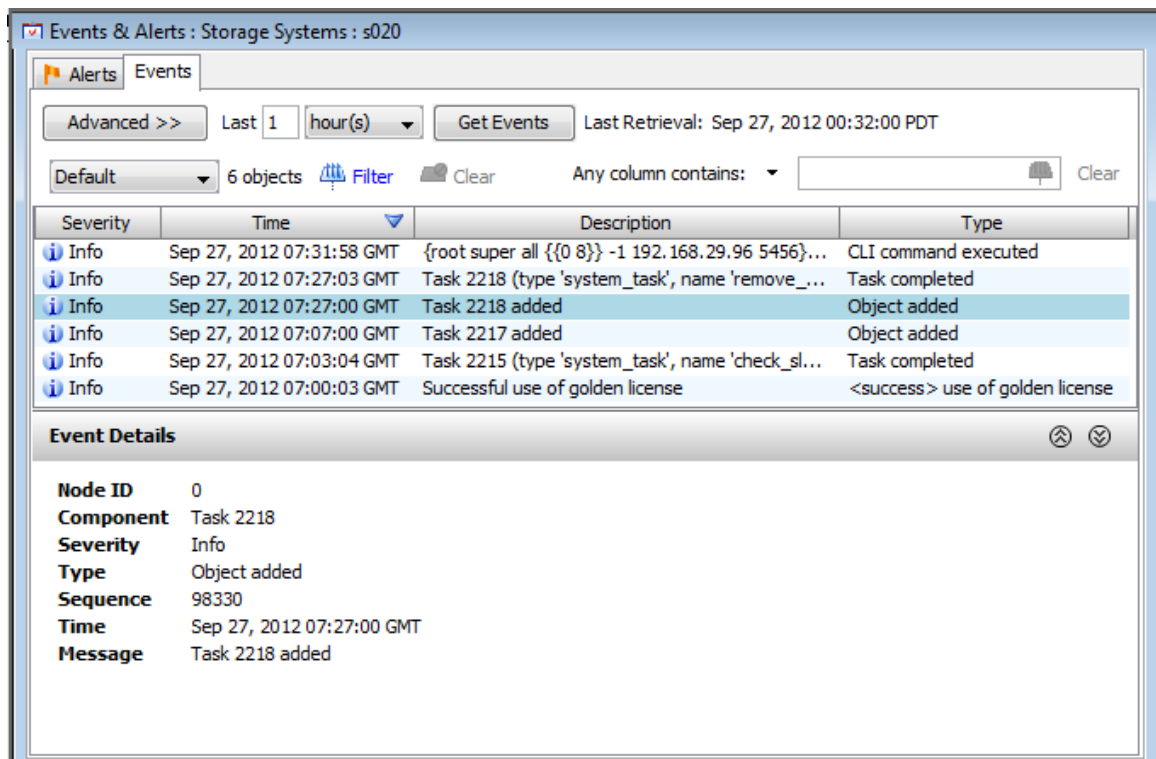
## Viewing Events

The Events screen provides an overview of the health of all connected systems.

To view the Events screen:

1. In the Manager Pane, click **Events & Alerts**.
2. In the Management Tree, click **Storage Systems**.
3. In the Management Tree, click the name of the system you wish to view.
4. In the Management Window, click the **Events** tab.
5. Select the time frame for which you want to view events, then click **Get Events**.

The Events screen appears as follows:



The list pane displays the following information:

Column	Description
Severity	The severity of the event.
Time	The time the event occurred.
Description	A description of the event.
Type	The type of event.

The detail pane displays the following information:

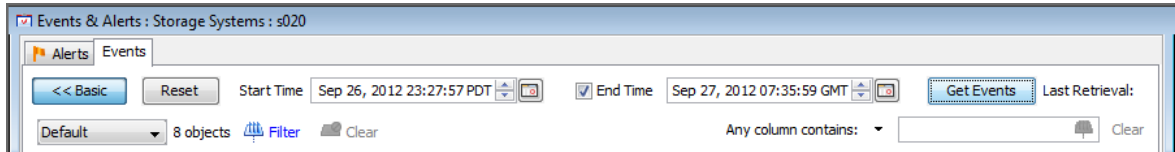
Field	Description
Node ID	The ID number assigned to the node.
Component	The component associated with the event.
Severity	The severity of the event.
Type	The type of event.
Sequence	The sequence number of the event.
Time	The time the event occurred.
Message	A description of the event.

## Filtering Events

To view a events with finer granularity:

1. In the Manager Pane, click **Events & Alerts**.
2. In the Management Tree, click the system node for which you wish to view events.
3. In the Management Window, click the **Events** tab.
4. Click **Advanced>>**.

5. In the **Start Time** box, enter a date and time (the entered value will display events greater than or equal to this time).



6. (Optional) Click the **End Time** checkbox and enter a date and time (the entered value will display events less than or equal to this time).
7. Click **Get Events**.

# 17 Locating a System

This operation helps locate a system by oscillating the node status LEDs amber and green on all nodes of the system. If desired, the LEDs in all connected drive cages are also set to amber or oscillate, depending on the drive cage type.

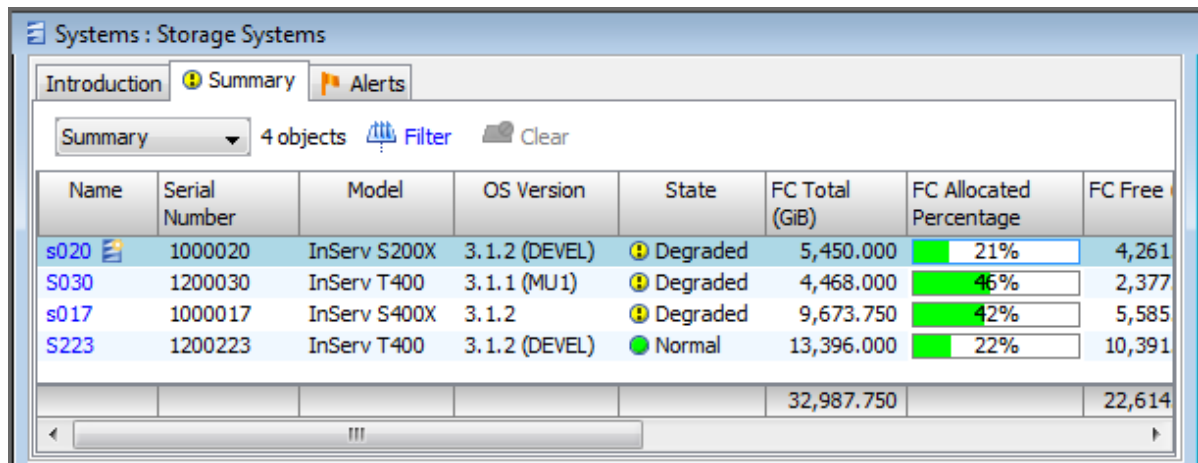
**NOTE:** This operation can only be performed by users with Super, Service, or Edit privilege levels.

To locate a system:

1. Click **Systems** in the Manager Pane.
2. From the Management Tree, right-click the system you wish to locate and then click **Locate System**.
3. Specify a **Duration for the LED(s) to oscillate**. For EOS systems, the range is 1–3600 seconds, with a default duration of 900 seconds. For other systems prior to EOS, the range is from 1 and 255 seconds, with a default of 60 seconds.
4. Optionally, if you want the drive cage LEDs to turn amber or oscillate as well, click the **Include Cage(s)** checkbox.
5. Click **OK** to start the locate.

Once you have selected the Locate action, the Storage Systems tree node will be displayed and the Storage Systems summary screen will list the currently connected systems. The locate icon will flash next to the system being located for the duration specified.

You can stop a Locate operation by selecting **Stop Locate** instead of Locate System in [Step 2](#).



Name	Serial Number	Model	OS Version	State	FC Total (GiB)	FC Allocated Percentage	FC Free
s020	1000020	InServ S200X	3.1.2 (DEVEL)	Degraded	5,450.000	21%	4,261
S030	1200030	InServ T400	3.1.1 (MU1)	Degraded	4,468.000	46%	2,377
s017	1000017	InServ S400X	3.1.2	Degraded	9,673.750	42%	5,585
S223	1200223	InServ T400	3.1.2 (DEVEL)	Normal	13,396.000	22%	10,391
					32,987.750		22,614

See also:

- “Manager Pane” (page 396)
- “Management Tree” (page 395)
- “Locating Controller Nodes” (page 287)

## Editing a System

You can edit the identification, identification information, properties, and alert settings for any system connected to the HP 3PAR Management Console.

**NOTE:** Editing systems can only be performed by users with Super, Service, and Edit privilege levels.

To edit a system, access the Edit System wizard.

1. In the Manager Pane, click **Systems**.
2. In the Management Tree, click the system you wish to edit.
3. In the Common Actions Panel, click **Edit System**.  
The **Edit System** dialog box appears.
4. In the **General** group box, select the following:
  - a. **Name** - enter a new system name.
  - b. **FC Raw Space Alert** - Select whether to enable or disable the raw space alert for Fiber Channel drives. If Enabled, enter a value from 100 to 100,000 GiB.
  - c. **NL Raw Space Alert** - Select whether to enable or disable the raw space alert for Nearline drives. If Enabled, enter a value from 100 to 100,000 GiB.
  - d. **SSD Raw Space Alert** - Select whether to enable or disable the raw space alert for SSD drives. If Enabled, enter a value from 100 to 100,000 GiB.

---

**NOTE:** These fields only appear for devices installed on the system. For example, if your system contains no SSD drives, the SSD Raw Space Alert field will not be present.

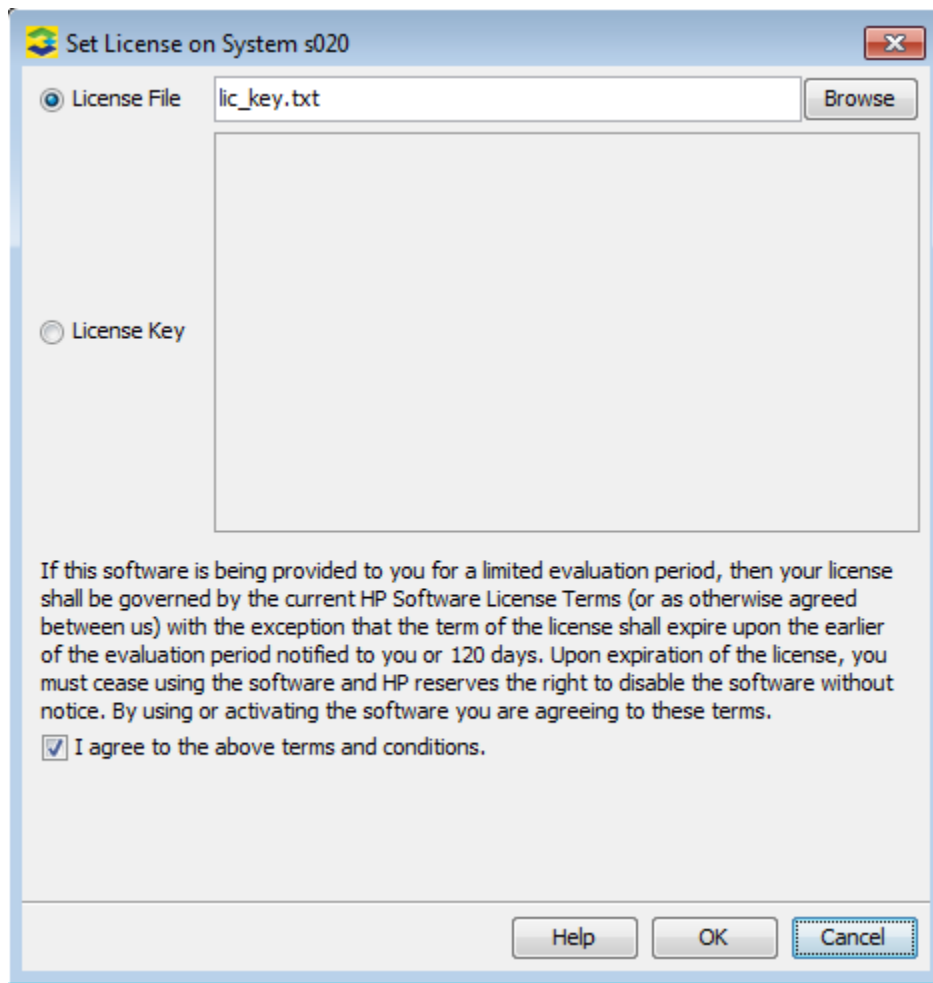
  - e. To select a **Maximum Volume Retention** time, select **Enabled**, select hour(s) or day(s), and then enter a value of 1 to 1,825 (days) or 1 to 43,800 (hours).
5. In the **Descriptors** group box, enter the following:
  - a. **Location** - Enter the physical location of the storage system; for example, Lab 1.
  - b. **Owner** - Enter the owner of the storage system.
  - c. **Contact** - Enter any contact information.
  - d. **Comments** - Enter any relevant notes about the storage system.
6. Click **OK**.

## Setting the License

1. In the Management Tree, right-click on the name of the system for which you want to set the license.  
or  
In the Main Menu Bar, click **Actions > Systems > Set License**.  
The **Set License** dialog box appears for the selected system.



2. You have the option of selecting the license from a file or pasting the license key into the dialog. To select the license from a file, click the browse button and select the license key file. The license key file should contain only the license key.



3. You are required to accept the terms and conditions agreement in order to enable the OK button. If you delete the entry next to a selected radio button, the agree to terms checkbox will be reset, and you will have to select it again in order to re-enable the OK button.
4. Click **OK** to set the license.

An error will be generated for any of the following conditions:

- A license file cannot be found.
- The license key is invalid.
- The system license key is identical to the entered license key.
- The license key corresponds to a different storage system.

See also:

[“Viewing System Information” \(page 278\)](#)

## 18 Viewing System Information

Information about your system's provisioning and network settings, capacity, current software level, and system alerts are displayed in tabular format in the Systems screen. Information can be displayed for all connected systems, or per selected system.

To view the Systems screen for all connected systems:

1. Click **Systems** in the Manager Pane.
2. From the Management Tree, click **Storage Systems**.

To view the Systems screen for a specific system:

1. Click **Systems** in the Manager Pane.
2. From the Management Tree, click the system you wish view.

For information about each tab displayed in the Systems screen, see:

[“Viewing System Summary Information” \(page 278\)](#)

[“Viewing System Settings” \(page 281\)](#)

[“Viewing System Capacity” \(page 283\)](#)

[“Viewing System Software” \(page 285\)](#)

[“Viewing System Alerts” \(page 269\)](#)

### Viewing System Summary Information

To view system summary information, access the Systems screen, then click the **Summary** tab.

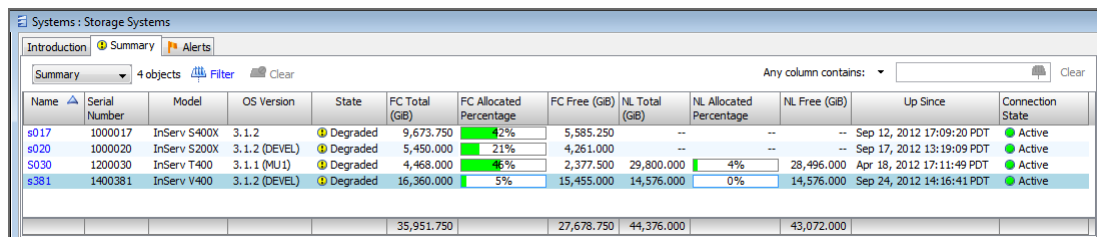
The contents displayed in the **Summary** tab differs for all connected systems and for a single system.

[“Viewing all Connected Systems” \(page 278\)](#)

[“Viewing a Single System” \(page 280\)](#)

### Viewing all Connected Systems

If you are viewing information for all connected systems, the **Summary** tab is displayed as follows:



The screenshot shows the 'Systems: Storage Systems' window with the 'Summary' tab selected. The table displays the following data:

Name	Serial Number	Model	OS Version	State	FC Total (GB)	FC Allocated Percentage	FC Free (GB)	NL Total (GB)	NL Allocated Percentage	NL Free (GB)	Up Since	Connection State
s017	1000017	InServ S400X	3.1.2	Degraded	9,673.750	2%	5,585.250	--	--	--	Sep 12, 2012 17:09:20 PDT	Active
s020	1000020	InServ S200X	3.1.2 (DEVEL)	Degraded	5,450.000	21%	4,261.000	--	--	--	Sep 17, 2012 13:19:09 PDT	Active
S030	1200030	InServ T400	3.1.1 (MU1)	Degraded	4,468.000	6%	2,377.500	29,800.000	4%	28,496.000	Apr 18, 2012 17:11:49 PDT	Active
s381	1400381	InServ V400	3.1.2 (DEVEL)	Degraded	16,360.000	5%	15,455.000	14,576.000	0%	14,576.000	Sep 24, 2012 14:16:41 PDT	Active
					35,951.750		27,678.750	44,376.000		43,072.000		

The **Summary** tab can be filtered to display Summary information and Descriptor information for all connected systems.

The following information is displayed when filtering by Summary information:

Column	Description
<b>Name</b>	The system name. Each name displayed is a link to that server's Summary information.
<b>Serial Number</b>	The system serial number.
<b>Model</b>	The system model number.
<b>OS Version</b>	The HP 3PAR OS version running on the system.
<b>State</b>	The current state of the storage server, Normal, Degraded, or Failed.

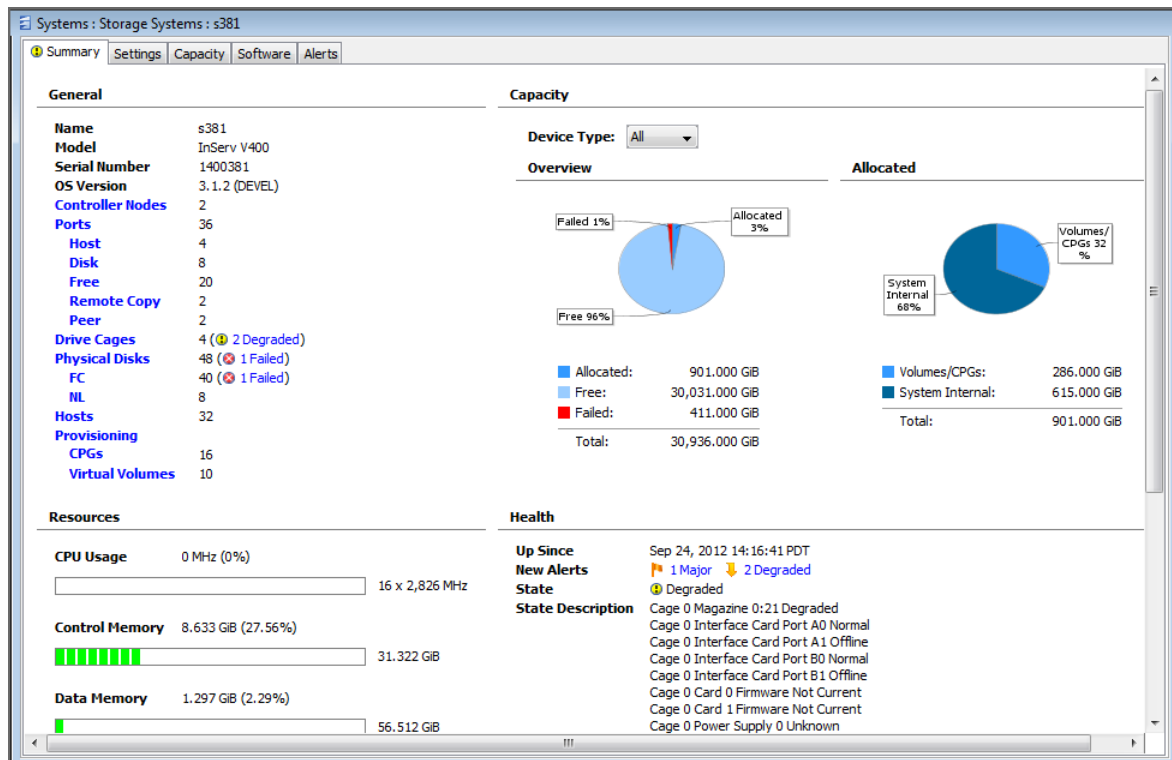
Column	Description
<b>FC Total</b>	The total amount of space available from Fast Class devices (in GiB).
<b>FC Allocated Percentage</b>	The percentage of used allocated Fast Class device space.
<b>FC Free</b>	The amount of free Fast Class device capacity (in GiB).
<b>NL Total</b>	The total amount of space available from Near Line devices (in GiB).
<b>NL Allocated Percentage</b>	The percentage of used allocated Near Line device space.
<b>NL Free</b>	The amount of free Near Line device capacity (in GiB).
<b>SSD Total</b>	The total amount of space available from SSD devices (in GiB).
<b>SSD Allocated Percentage</b>	The percentage of used allocated SSD device space.
<b>SSD Free</b>	The amount of free SSD device capacity (in GiB).
<b>Up Since</b>	The date and time the system was brought online.
<b>Connection State</b>	The current connection state, either Active or Inactive.

**NOTE:** The HP 3PAR Management Console displays the devices currently installed in your system. For example, if you do not have Fast Class drives installed, the FC entries will not appear.

The following information is displayed when filtering by Descriptor information:

Column	Description
<b>Name</b>	The system name. Each name displayed is a link to that system's summary information.
<b>Serial Number</b>	The system serial number.
<b>Model</b>	The system model number.
<b>Location</b>	The physical location of the system (if entered during system setup).
<b>Owner</b>	The owner of the system (if entered during system setup).
<b>Contact</b>	Contact information for the system owner (if entered during system setup).
<b>Comments</b>	Any notes about the system (if entered during system setup).

## Viewing a Single System



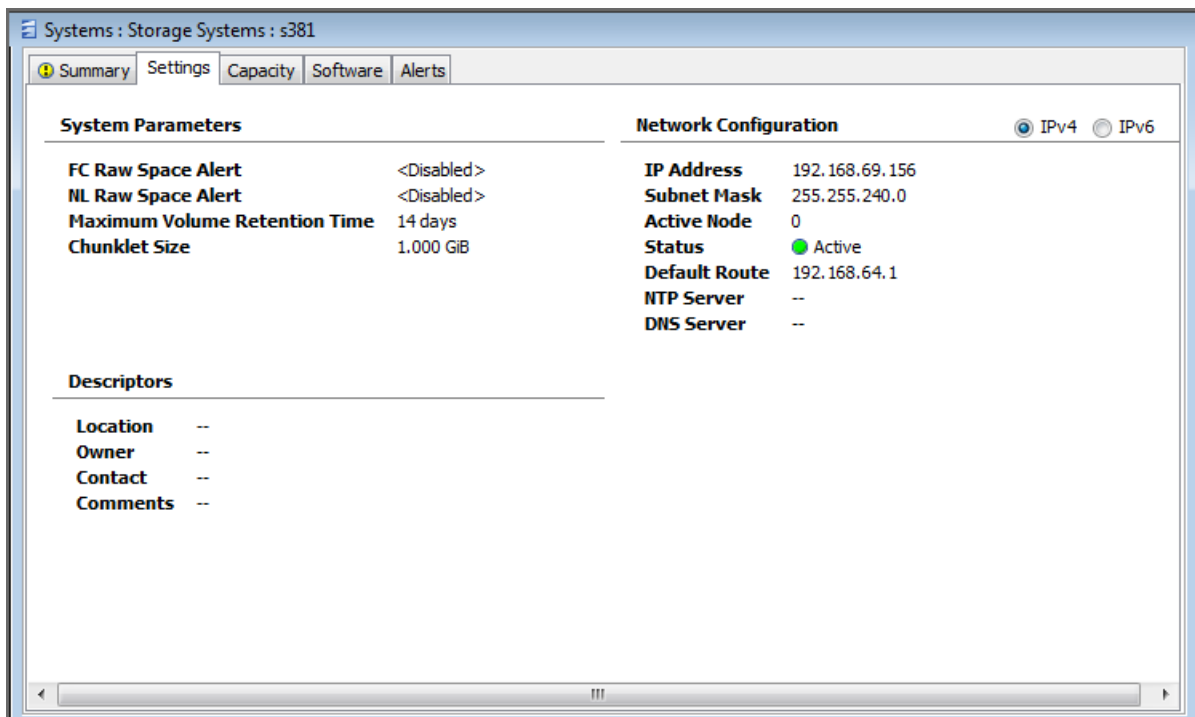
The Summary tab for a single system displays the following information. Fields that are highlighted on the summary screen are links that will take you to the panel corresponding to that field.

Group	Field	Description
General	Name	The system's name.
	Model	The model number of the system.
	Serial Number	The system's serial number.
	OS Version	The current HP 3PAR OS version.
	Controller Nodes	The total number of controller nodes.
	Ports	The total number of ports in the system.
	Host	The number of host ports.
	Disk	The number of disk ports.
	Free	The number of free ports.
	Remote Copy	The number of Remote Copy ports.
	Drive Cages	The total number of drive cages.
	Physical Disks	The total number of physical disk drives. If the license is limited for the number of disk drives in the array, the licensed limit will be displayed next to the number of physical disks present.
	FC	The number of Fast Class (Fibre Channel and SAS) drives.
	NL	The number of Near Line drives.
	SSD	The number of SSD drives.

Group	Field	Description
	<b>NOTE:</b> The HP 3PAR Management Console displays the devices currently installed in your system. For example, if you do not have Fast Class drives installed, the FC field will not appear on the <b>Summary</b> tab.	
	<b>Hosts</b>	The total number of hosts.
	<b>Provisioning</b>	
	<b>CPGs</b>	The total number of CPGs.
	<b>Virtual Volumes</b>	The total number of virtual volumes.
<b>Resources</b>	<b>CPU Usage</b>	The current CPU usage in MHz and percentage.
	<b>Control Memory</b>	The current control memory usage in GiB and percentage.
	<b>Data Memory</b>	The current data memory usage in GiB and percentage.
<b>Capacity</b>	<b>Device</b>	List of device types. The selected device type affects the display of the data displayed in the Overview and <b>Allocated</b> fields.
	<b>Overview</b>	The overview of allocated and free space per device type in the system displayed graphically, in percentage, and in GiB.
	<b>Allocated</b>	The amount of allocated space used by provisioning, sparing, and internal system structures and processes (such as logging logical disks, admin volume, etc.) displayed graphically, in percentage, and in GiB.
<b>Health</b>	<b>Up Since</b>	The date and time the storage system was brought online.
	<b>New Alerts</b>	Any new alerts. Any displayed alerts are links to the <b>Systems</b> alert tab.
	<b>State</b>	The state of the storage system; Normal, Degraded, or Failed. See <a href="#">“System and Component Status Icons”</a> (page 407).
	<b>State Description</b>	A description of the displayed state.

## Viewing System Settings

To view a specific system's settings information, access the Systems screen and then click the **Settings** tab.



The Settings tab displays the following information:

Group	Field	Description
System Parameter	FC Raw Space Alert	The raw space alert threshold (in GiB) for Fast Class devices.
	NL Raw Space Alert	The raw space alert threshold (in GiB) for Near Line devices.
	SSD Raw Space Alert	The raw space alert threshold (in GiB) for SSD devices.
	<b>NOTE:</b> The HP 3PAR Management Console displays the devices currently installed in your system. For example, if you do not have Fast Class drives installed, the <b>FCRaw Space Alert</b> field will not appear on the <b>Settings</b> tab.	
	Copy Space Reclaim	Indicates if the copy space reclaim feature is <b>Enabled</b> or <b>Disabled</b> .
	Maximum Volume Retention Time	The set maximum volume retention time.
	Chunklet Size	The set size of the chunklet (in GiB) of the physical disk.
Descriptors	Location	Location of the system (if entered).
	Owner	The owner of the system (if entered).
	Contact	Contact information (if entered).
	Comments	Any notes about the system (if entered).
Network Configuration	IPv4/IPv6	Radio buttons indicating if you wish to view either IPv4 or IPv6 network configuration information. If your system is not configured for IPv6, the IPv6 button is disabled.
	IP Address	The system's IP address.
	Subnet Mask	(If IPv4 was selected) The subnet mask.
	Prefix	(If IPv6 was selected) The decimal value indicating the number of contiguous, higher-order bits of the address that make up the network portion of the address.
	Active Node	The active system node.

Group	Field	Description
	Status	The status of the system.
	Default Route	The default routing IP address.
	NTP Server	The NTP server, if any.

## Viewing System Capacity

To view a single system's capacity information, Access the Systems screen and then click the **Capacity** tab.

Systems : Storage Systems : s381		
Summary Settings Capacity Software Alerts		
▼ Total	30,936.000 GiB	100.00%
▶ Allocated	901.000 GiB	2.91%
▶ Free	30,031.000 GiB	97.07%
Failed	411.000 GiB	1.33%
▼ Fast Class	16,360.000 GiB	100.00%
▶ Allocated	901.000 GiB	5.51%
▶ Free	15,455.000 GiB	94.47%
Failed	411.000 GiB	2.51%
▼ Near Line	14,576.000 GiB	100.00%
▼ Allocated	0.000 GiB	0.00%
▼ Volumes	0.000 GiB	0.00%
▼ Base Volumes	0.000 GiB	0.00%
User	0.000 GiB	0.00%
Copy	0.000 GiB	0.00%
Admin	0.000 GiB	0.00%
▼ CPGs	0.000 GiB	0.00%
▼ Copy	0.000 GiB	0.00%
Used	0.000 GiB	0.00%
Unused	0.000 GiB	0.00%
▼ Admin	0.000 GiB	0.00%
Used	0.000 GiB	0.00%
Unused	0.000 GiB	0.00%
Unmapped	0.000 GiB	0.00%
▶ System	0.000 GiB	0.00%
▼ Free	14,576.000 GiB	100.00%
Initialized	14,576.000 GiB	100.00%
Uninitialized	0.000 GiB	0.00%
Failed	0.000 GiB	0.00%

Raw capacity for the selected system is displayed for Total, Fast Class, Near Line, and Solid State capacities. Each of these top level capacity items can be further expanded.

**NOTE:** In the normal situation, the capacity displays show you the space that is consumed by provisioning (e.g. CPGs, Volumes, and underlying LDs) and the space that is reserved by the system for spares.

When chunklets or PDs fail, the data that was on those chunklets is moved onto the spares. The total amount of space consumed by provisioning does not change, nor does the total amount of spares in the system. However, there is an overlap in the numbers because the used spares are counted in the total number of spares (total spares = unused + used spares) AND in the provisioning (because parts of the LDs/CPGs/Volumes) are now using those spares. In this case, an asterisk (\*) appears to indicate that the numbers will not add up due to this shared space.

Field	Description
+ Total	Total amount of usable storage on the system.
+ Allocated	Amount of storage capacity currently allocated.
+ Volumes	Amount of storage allocated to volumes.
+ Base Volumes	Amount of volume space allocated to base volumes.
- User	Amount allocated for base volume user space, copy space and admin space.
- Copy	
- Admin	
+ CPGs	Amount of volume space allocated to CPGs.
+ Copy	Amount of CPG space allocated to Copy.
- Used	Amount of Copy space that is used or not used.
- Unused	
+ Admin	Amount of CPG space allocated to admin.
- Used	Amount of admin space that is used or not used.
- Unused	
- Unmapped	Amount of volume space that is not mapped.
+ System	Amount of allocated space used by the system.
- Internal	Amount of system space used internally.
+ Spares	Amount of space allocated to spares.
- Used	Spare space allocated for LDs when underlying PDs have failed.
- Unused	Unused space.
+ Free	Amount of free space on the system, regardless of initialized or not.
- Initialized	Amount of initialized free space on the system.
- Uninitialized	Amount of uninitialized free space on the system. This includes any chunklets that are currently being cleaned.
- Failed	Amount of failed space.
+ Fast Class	Total amount of Fast Class (FC) storage on the system.
	<b>NOTE:</b> Subcontents of the Fast Class Total display are identical to the Total display at the top of this table.
+ Nearline	Total amount of Nearline (NL) storage on the system.



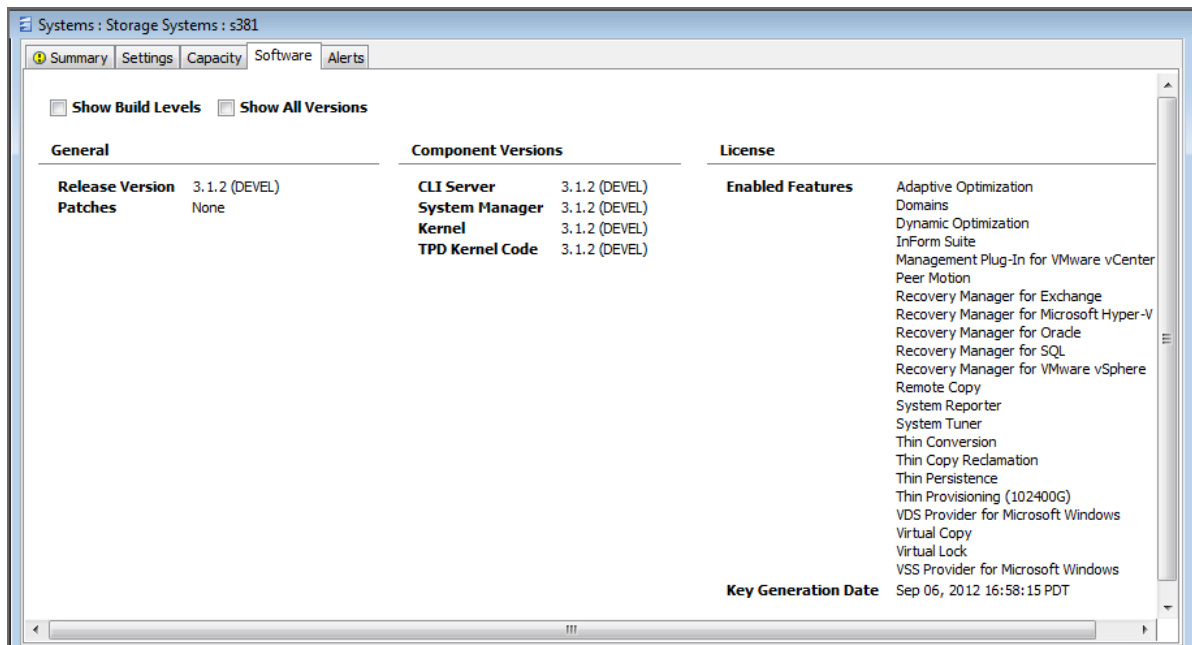
Field	Description
	<b>NOTE:</b> Subcontents of the Nearline Total display are identical to the Total display at the top of this table.
+ SSD	Total amount of Solid State (SSD) storage on the system.
	<b>NOTE:</b> Subcontents of the Solid State Total display are identical to the Total display at the top of this table.

**NOTE:** Only device types (Fast Class, Nearline, and Solid State) that are on your system are displayed. For example, if your system contains only Fast Class drives, only Fibre Channel capacity is displayed.

## Viewing System Software

To view a single system's software information, access the Systems screen through the System Manager and then click the **Software** tab.

The **Software** tab displays information about the operating system, components, and licensing.



The Software screen displays the following information by default. If you wish to view the build level of the component versions, select the **Show Build Levels** checkbox. If you wish to view versions of all system software, select **Show All Versions**.

Group	Field	Description
General	Released Version	The version of the operating system running on the storage server.
	Patches	Indicates patches that have been applied.
Component Versions	CLI Server	The version of the CLI Server component.
	System Manager	The version of the System Mnager component.
	Kernel	The version of the Kernel component.
	TPD Kernel Code	The version of the TPD Kernel Code component.

Group	Field	Description
License	Enabled Features	Indicates which features are enabled by licenses.
	Key Generation Date	The date the license key was generated.

# 19 Working with Controller Nodes

[“Locating Controller Nodes” \(page 287\)](#)

[“Viewing Controller Nodes” \(page 288\)](#)

[“Editing Controller Node Power Supplies” \(page 297\)](#)

[“Editing Controller Node Batteries” \(page 298\)](#)

[“Recharging Controller Node Batteries” \(page 298\)](#)

## Locating Controller Nodes

To launch the Locate Node dialog:

1. Right-click on a node from the list under the Controller Nodes summary tab.
2. Select **Locate**.

The **Locate Node** dialog box appears.

3. Specify the **Duration** (from 1–255 seconds). For EOS systems, the range is 1–3600 seconds, with a default duration of 900 seconds. For other systems prior to EOS, the range is from 1 and 255 seconds, with a default of 60 seconds.
4. Select the **Target Component** of the selected node from the list:
  - Node (Default)
  - Battery\*
  - Internal Drive\*
  - Adapter Card\*
  - Fan\*
  - Power Supply\*

\*Available for Titan InServ only.

5. Click **OK**.

When the Locate Node operation begins, a locate icon will display next to the selected node for the duration specified. A detailed message will be displayed in the status bar and will be updated when the locate operation has completed.

When locating subcomponents, once the Locate operation begins, the detail screen will automatically switch to the tab corresponding to the subcomponent being located.

The Locate Batteries subcomponent screen is displayed below:

The screenshot shows the 'Systems: Storage Systems : s381 : Controller Nodes' window. The 'Summary' tab is active, displaying a table of controller nodes. Below this, the 'Controller Node Details: 0' section is visible, with the 'Batteries' subtab selected. The 'Batteries' subtab shows a table of battery details for the selected node.

System SN	ID	Name	State	Status LED	Service LED	Ports	Control Memory (GiB)	Data Memory (GiB)	Cache Availability	Up Since
1400381	0	inoded1066	Normal	Green Blinking	Off	17	16.000	32.000	100%	Sep 24, 2012 14:12:42 PDT
1400381	1	inoded1079	Normal	Green Blinking	Off	19	16.000	32.000	100%	Sep 24, 2012 14:11:56 PDT

Node ID	Serial Number	State	Service LED	Charge State	Charge Level	Maximum Battery Life	Test In Progress	Expiration Time
0	00000...	Normal	Off	Charging	93%	15 minutes	No	Apr 24, 2013

You can stop a Locate operation by selecting **Stop Locate** instead of **Locate** in [Step 2](#).

See also:

[“Locating a System” \(page 275\)](#)

## Viewing Controller Nodes

The Controller Nodes screen displays summary information about system controller nodes and node components. The Controller Nodes screen is divided into a list pane, which displays summary information about the nodes, and a detail pane, which displays detailed information about the nodes and node components.

To access the Controller Nodes screen:

1. Click **Systems** in the Manager Pane.
2. In the Management Tree, select **Controller Nodes** under the system with the controller node information you wish to view.

The list pane of the Controller Nodes screen is provided with two tabs; **Summary** and **Alerts**.

The detail pane of the Controller Nodes screen provides five tabs: **Summary**, **Ports**, **Power Supplies**, **Batteries**, and **Alerts**.

For information about the list pane, see:

[“Viewing the Controller Nodes Summary Screen” \(page 288\)](#)

[“Viewing Controller Node Alerts” \(page 289\)](#)

For information about the detail pane, see:

[“Viewing Controller Nodes Details” \(page 290\)](#)

[“Viewing Controller Node Ports Details” \(page 291\)](#)

[“Viewing Controller Node Power Supplies Details” \(page 292\)](#)

[“Viewing Controller Node Batteries Details” \(page 293\)](#)

[“Viewing Controller Node Alerts Details” \(page 297\)](#)

See also:

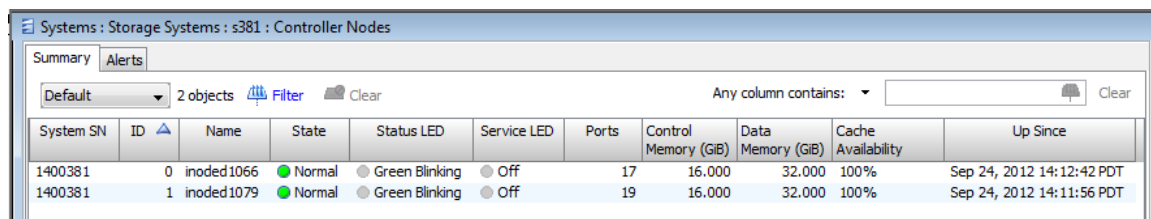
[“Manager Pane” \(page 396\)](#)

[“Management Tree” \(page 395\)](#)

## Viewing the Controller Nodes Summary Screen

To view the Controller Nodes Summary screen:

1. Access the Controller Nodes screen.
2. In the list pane, click the **Summary** tab.



System SN	ID	Name	State	Status LED	Service LED	Ports	Control Memory (GiB)	Data Memory (GiB)	Cache Availability	Up Since
1400381	0	inoded1066	Normal	Green Blinking	Off	17	16.000	32.000	100%	Sep 24, 2012 14:12:42 PDT
1400381	1	inoded1079	Normal	Green Blinking	Off	19	16.000	32.000	100%	Sep 24, 2012 14:11:56 PDT

The **Summary** tab provides the following information:

Column	Description
<b>System SN</b>	Serial number of the system.
<b>ID</b>	The node ID.
<b>Name</b>	The node name.

Column	Description
<b>State</b>	The current state of the node; either Normal, Degraded, or Failed. See “System and Component Status Icons” (page 407).
<b>Status LED</b>	The current status of the node, as indicated by the node LED.
<b>Service LED</b>	LED indicating when the node power supply can be replaced. (Displayed for V-Class system only.)
<b>Ports</b>	The total number of ports on the node.
<b>Control Memory</b>	The amount of control memory (in GiB).
<b>Data Memory</b>	The amount of data memory (in GiB).
<b>Cache Availability</b>	The percentage of available cache space.
<b>Up Since</b>	The date indicates how long the node has been operating.

## Viewing Controller Node Alerts

To view the Controller Node alerts screen:

1. Access the Controller Nodes screen.
2. In the list pane, click the **Alerts** tab.

**Systems : Storage Systems : S030 : Controller Nodes**

Summary Alerts

Default 12 objects Filter Clear

Any column contains: Clear

System	Severity	ID	State	Last Time	Message	Repeat Count	First Time
S030	Major	112	New	Apr 18, 2012 17:12:01 PDT	Node 1, Power Supply 0 Failed (Invalid Firm...	2	Apr 10, 2012 19:19:51 PDT
S030	Major	115	New	Apr 18, 2012 17:12:05 PDT	Node 1, Power Supply 1 Failed (Invalid Firm...	2	Apr 10, 2012 19:19:56 PDT
S030	Degraded	116	New	Jul 25, 2012 05:32:34 PDT	Node 1, Power Supply 0, Battery 0 Degrade...	5	Apr 10, 2012 19:19:56 PDT
S030	Degraded	117	New	Jul 25, 2012 06:32:55 PDT	Node 1, Power Supply 1, Battery 0 Degrade...	3	Apr 10, 2012 19:19:56 PDT
S030	Degraded	122	Resolved by System	Apr 24, 2012 17:19:28 PDT	Port 1:2:1 Degraded (Target Mode Port We...	0	Apr 24, 2012 17:19:28 PDT
S030	Info	124	New	May 10, 2012 19:20:27 PDT	Node 1 PS 0 Battery 0 will expire in 59 days ...	0	May 10, 2012 19:20:27 PDT
S030	Info	125	New	May 10, 2012 19:20:27 PDT	Node 1 PS 1 Battery 0 will expire in 59 days ...	0	May 10, 2012 19:20:27 PDT

**Alert Details: 124**

**General**

Severity: Info  
Type: Battery expiration  
Message: Node 1 PS 0 Battery 0 will expire in 59 days [Replace Battery soon]  
ID: 124  
State: New  
Message Code: 0x0220001  
Sequence: 1959548

**Component**

System: S030  
System SN: 1200030  
Node ID: 0  
Component: Node 1, Power Supply 0, Battery 0

**Frequency**

Repeat Count: 0  
Last Time: May 10, 2012 19:20:27 PDT  
First Time: May 10, 2012 19:20:27 PDT

**Recommended Action**

For alert actions, go to [www.hp.com/support/hpgt/3par](http://www.hp.com/support/hpgt/3par)  
For video repair instructions, go to [www.hp.com/go/sml](http://www.hp.com/go/sml)

The **Alerts** tab provides the following information:

Column	Description
<b>Severity</b>	The severity of the alert. See “Alert Severity Indicators” (page 406).
<b>ID</b>	The alert ID.
<b>State</b>	The alert state.
<b>Last Time</b>	The last occurrence of the alert.
<b>Message</b>	A brief description of the alert.

Column	Description
Repeat Count	The number of times the alert has been issued.
First Time	The first occurrence of the alert.

## Viewing Controller Nodes Details

To view the Controller Node details screen:

1. Access the Controller Nodes screen in the Management Tree.
2. In the list pane, click the **Summary** tab.
3. Select a node.
4. In the detail pane, click the **Summary** tab.

The screenshot displays the 'Systems : Storage Systems : s381 : Controller Nodes' window. The 'Summary' tab is selected, showing a list of two controller nodes. The first node, ID 0, is selected. Below the list, the 'Controller Node Details: 0' section is visible, with the 'Summary' sub-tab active. This section is divided into three main areas: General, Physical Memory, and Health.

General	
Position	0
Name	inoded1066
Online	Yes
HP 3PAR OS Version	3.1.2
Slots	10
Free	4
Ports	17
Control Memory	16.000 GiB
Data Memory	32.000 GiB
Cache Availability	100%
Status LED	Green Blinking
Service LED	Off

Physical Memory	
Control Memory	4.068 GiB (25.97%)
	15.661 GiB
Data Memory	0.290 GiB (1.02%)
	28.258 GiB

CPU	
CPU Usage	0 MHz (0%)
	8 x 2,826 MHz

Health	
Up Since	Aug 17, 2012 10:08:13 PDT
New Alerts	None
State	Normal
State Description	Normal

The **Summary** tab provides the following information:

Group	Field	Description
General	Position	The position of the node in the node chassis.
	Name	The node name.
	Online	Indicates if the node is online.

Group	Field	Description
	<b>HP 3PAR OS Version</b>	The HP 3PAR OS version currently running on the system.
	<b>Slots</b>	The total number of slots on the node.
	<b>Free</b>	The number of unused slots on the node.
	<b>Ports</b>	The total number of ports on the node.
	<b>Control Memory</b>	The amount of control memory, in GiB.
	<b>Data Memory</b>	The amount of data memory, in GiB.
	<b>Cache Availability</b>	The percentage of available cache.
	<b>Status LED</b>	The current status of the node, as indicated by the node LED.
	<b>Service LED</b>	LED indicating when the node power supply can be replaced. (Displayed for V-Class system only.)
<b>Health</b>	<b>Up Since</b>	The date indicates how long the node has been operating.
	<b>New Alerts</b>	Any new alerts. See <a href="#">“Alert Severity Indicators”</a> (page 406).
	<b>State</b>	Current state of the node, either Normal, Degraded, or Failed. See <a href="#">“System and Component Status Icons”</a> (page 407).
	<b>State Description</b>	Description of the node state.
<b>Physical Memory</b>	<b>Control Memory</b>	The amount of used control memory, displayed in GiB and percentage.
	<b>Data Memory</b>	The amount of used data memory, displayed in GiB and percentage.
<b>CPU</b>	<b>CPU Usage</b>	The current CPU usage, displayed in MHz and percentage.

## Viewing Controller Node Ports Details

To view the Controller Node Ports detail screen:

1. Access the Controller Nodes screen.
2. In the list pane, click the **Summary** tab.
3. Select a node.
4. In the detail pane, click the **Ports** tab.

Controller Node Details: 0							
Summary		Ports	Power Supplies	Batteries	Microcontroller Unit	Fans	Adapter Cards
		Internal Drive	Alerts				
Cards				Ports			
Type ▲ 1	Position ▲ 2 (Node:Slot)	Ports	Max Rate	Type ▲ 1	Connected Device Type ▲ 2	Speed ▲ 3	Count
CNA	0:1	2	10 Gbps	FC	Disk	4 Gbps	2
Ethernet	0:9	1	1 Gbps	FC	Free	8 Gbps	1
FC	0:4	4	8 Gbps	FC	Free	--	7
FC	0:5	4	8 Gbps	FC	Host	2 Gbps	1
FC	0:8	4	8 Gbps	FC	Peer	2 Gbps	1
SAS	0:3	2	6 Gbps	FCoE	Free	--	2
				RCIP	RC	--	1
				SAS	Disk	6 Gbps	2

The **Ports** tab provides the following information:

Group	Column	Description
<b>Cards</b>	<b>Type</b>	The type of interface card, either Ethernet or Fast Class (FC).
	<b>Position</b>	The position of the card in node:slot format.
	<b>Ports</b>	The number of ports on the interface.
	<b>Max Rate</b>	The maximum rate in Gbps.
<b>Ports</b>	<b>Type</b>	The port type, Fibre Channel (FC), iSCSI, Remote Copy over IP (RCIP), Remote Copy over Fibre Channel (RCFC), or SAS.
	<b>Connected Device Type</b>	The connected device type, Free, Disk, Host, or InServ.
	<b>Speed</b>	The speed of the port in Gbps.
	<b>Count</b>	The number of ports.

## Viewing Controller Node Power Supplies Details

To view the Controller Node Power Supplies details screen:

1. Access the Controller Nodes screen.
2. In the list pane, click the **Summary** tab.
3. Select a node.
4. In the detail pane, click the **Power Supplies** tab.

**Power Supplies** tab for a non-V-Class system:

Controller Node Details: 0						
<div> <span>Summary</span> <span>Ports</span> <span>Power Supplies</span> <span>Batteries</span> <span>Adapter Cards</span> <span>Internal Drive</span> <span>Alerts</span> </div>						
Node ID	Power Supply ID	Serial Number	State	Fan State	Fan Speed	Battery State
0	0	FFFFFFFF	Normal	Normal	Normal	Not Present
0	1	FFFFFFFF	Normal	Normal	Normal	Not Present

**Power Supplies** tab for a V-Class system:

Controller Node Details: 0						
<div> <div> <div>Microcontroller Unit</div> <div>Fans</div> <div>Adapter Cards</div> <div>Internal Drive</div> <div>Alerts</div> </div> <div> <div>Summary</div> <div>Ports</div> <div>Power Supplies</div> <div>Batteries</div> </div> </div>						
Node ID	Power Supply ID	Serial Number	State	Service LED	Fan State	Fan Speed
0	0	091392-00FPR	Normal	Off	Normal	Normal
0	1	091392-00FNP	Normal	Off	Normal	Normal



The **Power Supplies** tab provides the following information:

Column	Description
<b>Node ID</b>	The node ID.
<b>Power Supply ID</b>	The power supply ID.
<b>Serial Number</b>	The power supply serial number.
<b>State</b>	The state of the power supply. See “System and Component Status Icons” (page 407).
<b>Service LED*</b>	LED indicating when the node power supply can be replaced.
<b>Fan State</b>	The fan state, Normal, Degraded, or Failed. See “System and Component Status Icons” (page 407).
<b>Fan Speed</b>	The current fan speed.
<b>Battery State**</b>	The power supply battery state, Normal, Degraded, or Failed. See “System and Component Status Icons” (page 407).

\*Indicates the column is for V-Class systems.

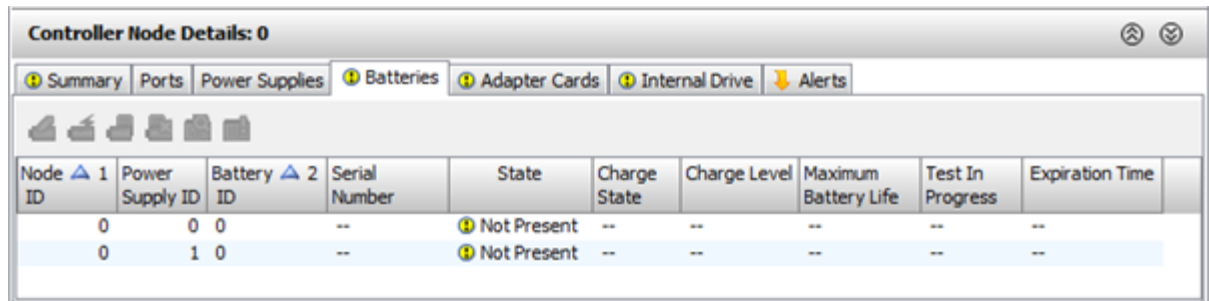
\*\*Indicates for systems other than V-Class.

## Viewing Controller Node Batteries Details

To view the Controller Node Batteries details screen:

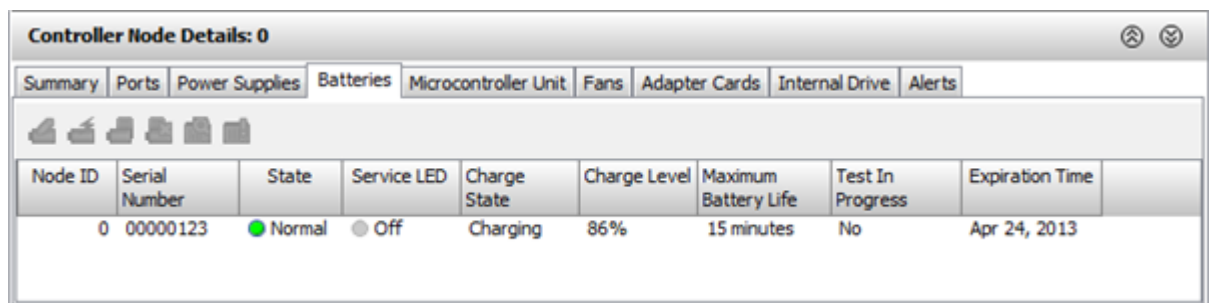
1. Access the Controller Nodes screen.
2. In the list pane, click the **Summary** tab.
3. Select a node.
4. In the detail pane, click the **Batteries** tab.

The **Batteries** tab for non-V-Class systems:



Node ID	Power Supply ID	Battery ID	Serial Number	State	Charge State	Charge Level	Maximum Battery Life	Test In Progress	Expiration Time
0	0	0	--	⚠ Not Present	--	--	--	--	--
0	1	0	--	⚠ Not Present	--	--	--	--	--

The **Batteries** tab for V-Class systems:



Node ID	Serial Number	State	Service LED	Charge State	Charge Level	Maximum Battery Life	Test In Progress	Expiration Time
0	00000123	● Normal	● Off	Charging	86%	15 minutes	No	Apr 24, 2013

The **Batteries** tab provides the following information:

Column	Description
<b>Node ID</b>	The node ID.
<b>Power Supply ID**</b>	The power supply ID.
<b>Battery ID**</b>	The battery ID.
<b>Serial Number</b>	The battery serial number.
<b>State</b>	The state of the battery. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Service LED*</b>	LED indicating when the node battery can be replaced.
<b>Charge State</b>	The charge state of the battery.
<b>Charge Level</b>	The charge level of the battery.
<b>Maximum Battery Life</b>	The battery's maximum life.
<b>Test In Progress</b>	Indicates if any tests are in progress.
<b>Expiration Time</b>	The battery expiration date.

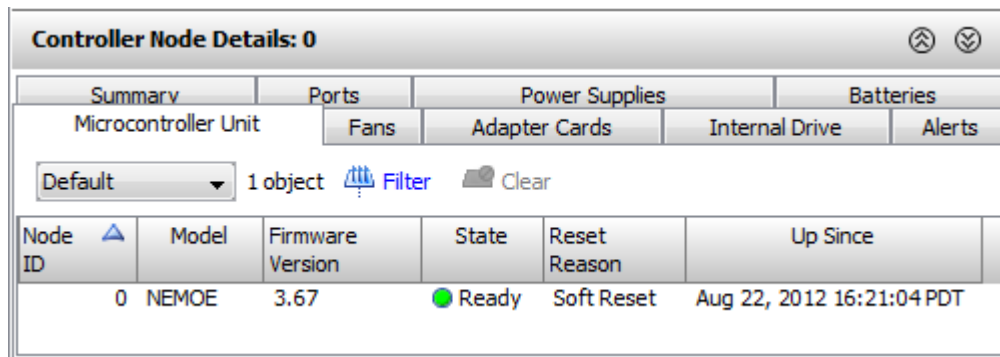
\*Indicates the column is for V-Class systems.

\*\*Indicates for systems other than V-Class.

## Viewing Controller Node Microcontroller Unit Details

This tab is specific to V-Class systems. To view the Microcontroller Unit details screen:

1. Access the Controller Nodes screen.
2. In the list pane, click the **Summary** tab.
3. Select a node.
4. In the detail pane, click the **Microcontroller Unit** tab.



The **Microcontroller Unit** tab displays the following information:

Column	Description
<b>Node ID</b>	The node ID.
<b>Model</b>	The model of the unit.
<b>Firmware Version</b>	The firmware version used by the unit.
<b>State</b>	The current state of the unit; either Normal, Degraded, or Failed. See <a href="#">“System and Component Status Icons”</a> (page 407).

Column	Description
<b>Reset Reason</b>	The reason for resetting the unit.
<b>Up Since</b>	The date and time since the unit was reset.

## Viewing Controller Node Fans Details

This tab is specific to V-Class systems. To view the Fans details screen:

1. Access the Controller Nodes screen.
2. In the list pane, click the **Summary** tab.
3. Select a node.
4. In the detail pane, click the **Fans** tab.

Controller Node Details: 0

Summary

Ports

Power Supplies

Batteries

Microcontroller Unit

Fans

Adapter Cards

Internal Drive

Alerts

Node ID	Fan Module	State	Status LED	Service LED	Fan 0 Speed	Fan 1 Speed
0 0		<div></div> Normal	<div></div> Green	<div></div> Off	Normal	Normal
0 1		<div></div> Normal	<div></div> Green	<div></div> Off	Normal	Normal

The **Fans** tab displays the following information:

Column	Description
<b>Node ID</b>	The node ID.
<b>Fan Module</b>	The fan position.
<b>State</b>	Power supply fan operational status. See <a href="#">“System and Component Status Icons” (page 407)</a> .
<b>Status LED</b>	The current status, as indicated by the node LED.
<b>Service LED</b>	LED indicating when the node battery can be replaced.
<b>Fan 0 Speed</b>	Speed of the power supply fan 0.
<b>Fan 1 Speed</b>	Speed of the power supply fan 1.

## Viewing Controller Node Adapter Cards Details

This tab is specific to V-Class systems. To view the Adapter Cards details screen:

1. Access the Controller Nodes screen.
2. In the list pane, click the **Summary** tab.
3. Select a node.
4. In the detail pane, click the **Adapter Cards** tab.

Controller Node Details: 0								
<div>Summary Ports Power Supplies Batteries Microcontroller Unit Fans Adapter Cards Internal Drive Alerts</div>								
Slot	Type	Manufacturer	Model	Serial Number	Service LED	Revision	Firmware Version	
1	CNA	QLOGIC	QLE8242	PCGLT0ARC1K3SX	Off	58	4.8.113	
3	SAS	LSI	9205-8e	SP12430164	Off	01	11.00.00.00	
4	FC	EMULEX	LPe12004	BT01818957	Off	03	2.01.X.9	
5	FC	EMULEX	LPe12004	BT93408460	Off	03	2.01.X.9	
8	FC	EMULEX	LPe12004	BT93744935	Off	03	2.01.X.9	
9	Ethernet	Intel	e1000e	Onboard	--	--	1.3.10-k2	

The **Adapter Cards** tab displays the following information:

Column	Description
Slot	The position of the card in the node.
Type	The type of card (e.g., FC, SAS).
Manufacturer	The manufacturer of the card.
Model	The model of the card.
Serial Number	The serial number of the card.
Service LED	LED indicating when the node battery can be replaced.
Revision	The card's revision level.
Firmware Version	The firmware version used by the card.

## Viewing Controller Node Internal Drive Details

To view the Internal Drive details screen:

1. Access the Controller Nodes screen.
2. In the list pane, click the **Summary** tab.
3. Select a node.
4. In the detail pane, click the **Internal Drive** tab.

Controller Node Details: 0								
<div>Summary Ports Power Supplies Batteries Microcontroller Unit Fans Adapter Cards Internal Drive Alerts</div>								
ID	Manufacturer	Model	Serial Number	Service LED	Type	Firmware Version	Size (GiB)	
0	Samsung	MMCRE28G5MXP...	DCF2E00944SE9...	Off	SATA	VBM1801Q	119.242	

The **Internal Drive** tab displays the following information:

Column	Description
ID	The drive ID.
Manufacturer	The manufacturer of the drive.
Model	The model of the drive.

Column	Description
<b>Serial Number</b>	The serial number of the drive.
<b>Service LED</b>	LED indicating when the node battery can be replaced.
<b>Type</b>	The type of drive (e.g., ATA, SATA).
<b>Firmware Version</b>	The firmware version used by the drive.
<b>Size</b>	The size of the drive, in GiB.

## Viewing Controller Node Alerts Details

To view the Controller Node Alerts details screen:

1. Access the Controller Nodes screen.
2. In the list pane, click the **Summary** tab.
3. Select a node.
4. In the detail pane, click the **Alerts** tab.

The screenshot shows the 'Controller Node Details: 0' window with the 'Alerts' tab selected. The table below represents the data shown in the screenshot.

Severity	ID	State	Last Time	Message	Repeat Count	First Time
Degraded	8567	New	Aug 31, 2012 17:09:01 PDT	Node 0, Power Supply 0, Battery 0 Degraded (Not Present)	2	Aug 30, 2012 16:37:07 PDT
Degraded	8568	New	Aug 31, 2012 17:09:01 PDT	Node 0, Power Supply 1, Battery 0 Degraded (Not Present)	2	Aug 30, 2012 16:37:07 PDT

The **Alerts** tab provides the following information for a specific node as selected in the list pane:

Column	Description
<b>Severity</b>	The severity of the alert. See <a href="#">“Alert Severity Indicators”</a> (page 406).
<b>ID</b>	The alert ID.
<b>State</b>	The alert state.
<b>Last Time</b>	The last occurrence of the alert.
<b>Message</b>	A brief description of the alert.
<b>Repeat Count</b>	The number of times the alert has been issued.
<b>First Time</b>	The first occurrence of the alert.

## Editing Controller Node Power Supplies

The HP 3PAR Management Console allows you to edit the serial number of a controller node power supply.

**NOTE:** V-Class controller node power supply serial numbers cannot be edited.

1. In the Manager Pane, click **Systems**.
2. In the Management Tree, click **Controller Nodes** under the system whose power supply you wish to edit.
3. In the lower Controller Node Details pane displayed in Management Window, select the **Power Supplies** tab.
4. Right-click the power supply whose serial number you wish to edit and click **Edit**.

5. Enter a new alphanumeric serial number in the **Serial Number** field using numeric characters 0 to 9 and alphabetic characters A to F.
6. Click **OK**.

## Editing Controller Node Batteries

The HP 3PAR Management Console allows you to edit controller node batteries.

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**NOTE:** V-Class controller node battery serial numbers cannot be edited.

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1. In the Manager Pane, click **Systems**.
2. In the Management Tree, click **Controller Nodes** under the system with the batteries you wish to edit.
3. In the lower Controller Node Details pane displayed in Management Window, select the **Batteries** tab.
4. Right-click the battery you wish to edit and click **Edit**.
5. Enter a new alphanumeric serial number in the **Serial Number** field using numeric characters 0 to 9 and alphabetic characters A to F.
6. Enter a new battery expiration date in the **Expiration Time** field. You can alternately click the calendar button to the right of the field and select a date from the calendar that appears.
7. Click **OK**.

## Viewing the Controller Node Battery Test Log

To view the controller node battery test log:

1. In the Manager Pane, click **Systems**.
2. In the Management Tree, click **Controller Nodes** under the system with the batteries you wish to edit.
3. In the lower Controller Node Details pane displayed in Management Window, select the **Batteries** tab.
4. Right-click the battery with the test log you wish to view and click **Show Test Log**.

## Resetting the Controller Node Battery Test Log

To reset the controller node battery test log:

1. In the Manager Pane, click **Systems**.
2. In the Management Tree, click **Controller Nodes** under the system with the batteries you wish to edit.
3. In the lower Controller Node Details pane displayed in Management Window, select the **Batteries** tab.
4. Right-click the battery with the test log you wish to reset and click **Reset Test Log**.
5. Click **Yes** when prompted for confirmation.

## Recharging Controller Node Batteries

The HP 3PAR Management Console allows you to recharge controller node batteries.

1. In the Manager Pane, click **Systems**.
2. In the Management Tree, click **Controller Nodes** under the system with the batteries you recharge.
3. In the lower Controller Node Details pane displayed in Management Window, select the **Batteries** tab.
4. Right-click the battery you wish to recharge and click **Re-charge**.
5. Click **Yes** when the battery recharge confirmation dialog box appears.

## 20 Managing Drive Cages

[“Viewing Drive Cages” \(page 299\)](#)

[“Editing Drive Cages” \(page 313\)](#)

[“Locating Drive Cages” \(page 313\)](#)

[“Editing Drive Cage Power Supplies” \(page 313\)](#)

### Viewing Drive Cages

The Drive Cages screen displays summary information about system drive cages and drive cage components.

To access the Drive Cages screen:

1. Click **Systems** in the Manager Pane.
2. In the Management Tree, select **Drive Cages** under the system with the drive cage information you wish to view.

The Drive Cages screen provides four tabs: **Summary**, **Power Supplies**, **SFPs**, and **Alerts**. For information about each, see:

[“Viewing the Drive Cage Summary” \(page 299\)](#)

[“Viewing Drive Cage Power Supplies” \(page 302\)](#)

[“Viewing Drive Cage SFPs” \(page 303\)](#)

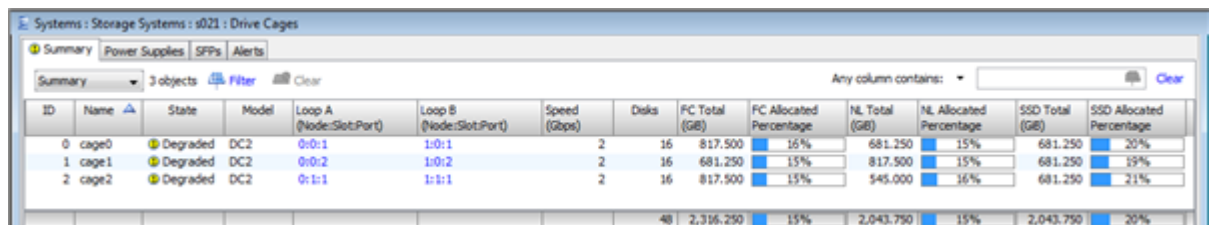
[“Viewing Drive Cage Alerts” \(page 304\)](#)

To view drive cage details. See [“Viewing Drive Cage Details” \(page 305\)](#).

### Viewing the Drive Cage Summary

To view the Drive Cage Summary screen:

1. Access the Drive Cages screen.
2. In the list pane, click the **Summary** tab.



ID	Name	State	Model	Loop A (Node:Slot:Port)	Loop B (Node:Slot:Port)	Speed (Gbps)	Disks	FC Total (GB)	FC Allocated Percentage	NL Total (GB)	NL Allocated Percentage	SSD Total (GB)	SSD Allocated Percentage
0	cage0	Degraded	DC2	0:0:1	1:0:1	2	16	817.500	16%	681.250	15%	681.250	20%
1	cage1	Degraded	DC2	0:0:2	1:0:2	2	16	681.250	15%	817.500	15%	681.250	19%
2	cage2	Degraded	DC2	0:1:1	1:1:1	2	16	817.500	15%	545.000	16%	681.250	21%

The **Summary** tab provides the following information:

Column	Description
<b>ID</b>	The drive cage ID.
<b>Name</b>	The drive cage name.
<b>State</b>	The drive cage state. See <a href="#">“System and Component Status Icons” (page 407)</a> .
<b>Model</b>	The drive cage model.
<b>Loop A</b>	The port on the system to which the A loop is connected.
<b>Loop B</b>	The port on the system to which the B loop is connected.
<b>Speed</b>	The port speed in Gbps.

Column	Description
<b>Disks</b>	The number of disks in the drive cage. The bottom of the Disks column displays a total disk count.
<b>FC Total</b>	The total Fast Class capacity in GiB. The bottom of the FC Total column displays total FC capacity for all cages.
<b>FC Allocated Percentage</b>	The percentage of used Fast Class capacity. The bottom of the FC Allocated Percentage column displays the total used percentage.
<b>NL Total</b>	The total NL capacity, in GiB. The bottom of the NL Total column displays total FC capacity for all cages.
<b>NL Allocated Percentage</b>	The percentage of used NL capacity.
<b>SSD Total</b>	The total SSD capacity in GiB. The bottom of the SSD Total column displays total SSD capacity for all cages.
<b>SSD Allocated Percentage</b>	The percentage of used SSD capacity. The bottom of the SSD Allocated Percentage column displays the total used percentage.
<b>NOTE:</b> The device types displayed in the summary are dependent on the devices installed in your system. For example, if you have Near Line and disk drives installed, the summary will display <b>NL (Near Line) Total</b> , <b>NL Allocated Percentage</b> columns.	

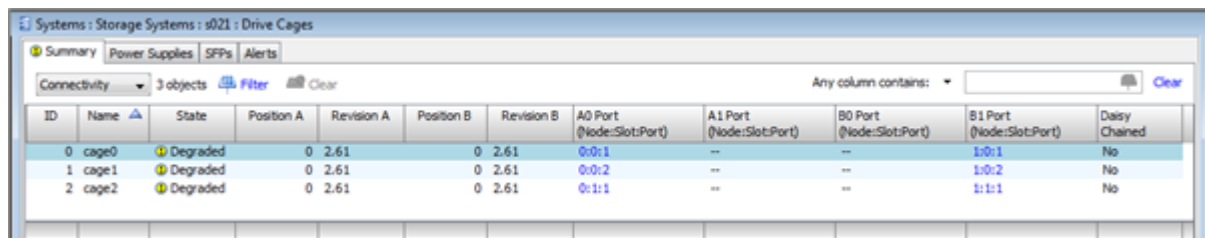
The Summary tab can be further filtered to view drive cage connectivity and drive cage capacity.

[“Viewing Drive Cage Connectivity” \(page 300\)](#)

[“Viewing Drive Cage Capacity” \(page 301\)](#)

## Viewing Drive Cage Connectivity

To view drive cage connectivity information, select **Connectivity** from the filter list.



ID	Name	State	Position A	Revision A	Position B	Revision B	A0 Port (Node:Slot:Port)	A1 Port (Node:Slot:Port)	B0 Port (Node:Slot:Port)	B1 Port (Node:Slot:Port)	Daisy Chained
0	cage0	Degraded	0	2.61	0	2.61	0:0:1	---	---	1:0:1	No
1	cage1	Degraded	0	2.61	0	2.61	0:0:2	---	---	1:0:2	No
2	cage2	Degraded	0	2.61	0	2.61	0:1:1	---	---	1:1:1	No

The following information is provided:

Column	Description
<b>ID</b>	The drive cage ID.
<b>Name</b>	The drive cage name.
<b>State</b>	The drive cage state. See <a href="#">“System and Component Status Icons” (page 407)</a> .
<b>Position A</b>	Distance the drive cage is from the controller node port. (0 = directly connected to system ports, 1 = there is one device between the node and this drive cage, etc).
<b>Revision A</b>	Version of firmware running on the controller for the A loop.
<b>Position B</b>	Distance the drive cage is from the controller node port. (0 = directly connected to system ports, 1 = there is one device between the node and this drive cage, etc).
<b>Revision B</b>	Version of firmware running on the controller for the B loop.
<b>A0 Port</b>	Controller node initiator port connected to drive cage port A0.
<b>A1 Port</b>	Controller node initiator port connected to drive cage port A1.



Column	Description
<b>A2 Port</b> (for DC3 drive cages)	Controller node initiator port connected to drive cage port A2.
<b>A3 Port</b> (for DC3 drive cages)	Controller node initiator port connected to drive cage port A3.
<b>B0 Port</b>	Controller node initiator port connected to drive cage port B0.
<b>B1 Port</b>	Controller node initiator port connected to drive cage port B1.
<b>B2 Port</b> (for DC3 drive cages)	Controller node initiator port connected to drive cage port B2.
<b>B3 Port</b> (for DC3 drive cages)	Controller node initiator port connected to drive cage port B3.
<b>Daisy Chained</b>	Indicates whether the drive cages are daisy chained.

## Viewing Drive Cage Capacity

To view drive cage capacity information, select **Capacity** from the filter list.

ID	Name	State	FC Total (GiB)	FC Free (GiB)	FC Allocated (GiB)	FC Allocated Percentage	NL Total (GiB)	NL Free (GiB)	NL Allocated (GiB)	NL Allocated Percentage	SSD Total (GiB)	SSD Free (GiB)	SSD Allocated (GiB)	SSD Allocated Percentage
0	cage0	Degraded	817.500	685.500	132.000	16%	681.250	575.250	106.000	15%	681.250	543.000	138.250	20%
1	cage1	Degraded	681.250	574.250	107.000	15%	817.500	688.500	129.000	15%	681.250	550.000	131.250	19%
2	cage2	Degraded	817.500	689.000	128.500	15%	545.000	455.750	89.250	16%	681.250	538.000	143.250	21%
			2,316.250	1,948.750	367.500	15%	2,043.750	1,719.500	324.250	15%	2,043.750	1,631.000	412.750	20%

The following information is provided:

Column	Description
<b>ID</b>	The drive cage ID.
<b>Name</b>	The drive cage name.
<b>State</b>	The drive cage state. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>FC Total</b>	The total Fast Class capacity in GiB. The bottom of the FC Total column displays total FC capacity.
<b>FC Free</b>	The amount of free Fast Class space in GiB. The bottom of the FC Free column displays total free FC capacity.
<b>FC Allocated</b>	The amount of allocated Fast Class space in GiB. The bottom of the FC Allocated column displays total allocated FC capacity for all cages.
<b>FC Allocated Percentage</b>	The percentage of used Fast Class capacity. The bottom of the FC Allocated Percentage column displays the total used percentage for all cages.
<b>NL Total</b>	The total NL capacity, in GiB. The bottom of the NL Total column displays total FC capacity for all cages. The bottom of the NL Free column displays total free NL capacity for all cages.
<b>NL Free</b>	The amount of free NL space in GiB. The bottom of the NL Free column displays total free NL capacity for all cages.
<b>NL Allocated</b>	The amount of allocated NL space in GiB. The bottom of the NL Allocated column displays total allocated NL capacity for all cages.
<b>NL Allocated Percentage</b>	The percentage of used NL capacity. The bottom of the NL Allocated Percentage column displays total used percentage for all cages.
<b>SSD Total</b>	The total SSD capacity in GiB. The bottom of the SSD Total column displays total SSD capacity for all cages.

Column	Description
<b>SSD Free</b>	The amount of free SSD space in GiB. The bottom of the SSD Free column displays total free SSD capacity for all cages.
<b>SSD Allocated</b>	The amount of allocated SSD space in GiB. The bottom of the SSD Allocated column displays total allocated SSD capacity for all cages.
<b>SSD Allocated Percentage</b>	The percentage of used SSD capacity. The bottom of the SSD Allocated Percentage column displays the total used percentage for all cages.
<b>NOTE:</b> The device types displayed in the summary are dependent on the devices installed in your system. For example, if you have Near Line and disk drives installed, the summary will display <b>NL</b> (Near Line) <b>Total</b> , <b>NL Allocated Percentage</b> , etc. columns.	

## Viewing Drive Cage Power Supplies

To view the Drive Cage power supply information:

1. Access the Drive Cages screen.
2. In the list pane, click the **Power Supplies** tab.

Cage	ID	State	Model	AC State	Fan State	Fan Speed
cage0	0	Normal	800-0011-50.0A	Normal	Normal	Normal
cage1	0	Normal	800-0011-50.0A	Normal	Normal	Normal
cage2	0	Failed	000-0000-00.	Failed	Normal	Normal
cage0	1	Normal	800-0011-50.0A	Normal	Normal	Normal
cage1	1	Failed	000-0000-00.	Failed	Normal	Normal
cage2	1	Normal	800-0011-50.0A	Normal	Normal	Normal
cage0	2	Normal	800-0011-50.0A	Normal	Normal	Normal
cage1	2	Normal	800-0011-50.0A	Normal	Normal	Normal
cage2	2	Normal	800-0011-50.0A	Normal	Normal	Normal
cage0	3	Normal	800-0011-50.0A	Normal	Normal	Normal
cage1	3	Normal	800-0011-50.0A	Normal	Normal	Normal
cage2	3	Normal	800-0011-50.0A	Normal	Normal	Normal

The following information is provided:

Column	Description
<b>Cage</b>	The drive cage name.
<b>ID</b>	The cage ID.
<b>State</b>	The drive cage state. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Model</b>	The drive cage model.
<b>AC State</b>	Indicates the presence of AC power to the power supply. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Fan State</b>	Power supply fan operational status. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Fan Speed</b>	The fan speed.

## Viewing Drive Cage SFPs

To view the Drive Cage SFP information:

1. Access the Drive Cages screen.
2. In the list pane, click the **SFPs** tab.

**SFPs Tab Table:**

Cage	Interface Card	SFP	State	Manufacturer	Max Speed (Gbps)	TX Disable	TX Fault	RX Loss	RX Power Low	DDM Support
0	0	0	Normal	FINISAR CORP.	2.1	No	No	No	No	Yes
1	0	0	Normal	FINISAR CORP.	2.1	No	No	No	No	Yes
2	0	0	Normal	FINISAR CORP.	2.1	No	No	No	No	Yes
0	1	1	Normal	FINISAR CORP.	2.1	No	No	No	No	Yes
1	1	1	Normal	FINISAR CORP.	2.1	No	No	No	No	Yes
2	1	1	Normal	FINISAR CORP.	2.1	No	No	No	No	Yes

**SFP Details: 0:0**

General		DDM						
Property	Value	Type	Unit	Value	Low Warning Threshold	High Warning Threshold	Low Alarm Threshold	High Alarm Threshold
Cage	0	Temp	C	29	-20	90	-25	95
Interface Card	0	Voltage	mV	3195	2900	3700	2700	3900
SFP	0	TX Bias	mA	6	2	14	1	17
State	Normal	TX Power	uW	355	79	631	67	631
Manufacturer	FINISAR CORP.	RX Power	uW	280	15	794	10	1259
Part Number	--							
Serial Number	PE74220							
Revision	A							
Max Speed	2.1 Gbps							
Qualified	Yes							
TX Disable	No							
TX Fault	No							
RX Loss	No							
RX Power Low	No							
DDM Support	Yes							

The list pane of the **SFPs** tab displays summary SFP information. The detail pane of the **SFPs** tab displays detailed information about a selected SFP from the list pane.

The following information appears in the line page:

Column	Description
<b>Cage</b>	The position in the drive cage.
<b>Interface Card</b>	Interface card number, as assigned by the system.
<b>SFP</b>	SFP number, as assigned by the system.
<b>State</b>	The drive cage state. See <a href="#">"System and Component Status Icons"</a> (page 407).
<b>Manufacturer</b>	The SFP manufacturer.
<b>Max Speed</b>	The maximum speed of the SFP in Gbps.
<b>TX Disable</b>	Displays whether the transmit laser is disabled.
<b>TX Fault</b>	Displays whether the transmit laser has a problem.
<b>RX Loss</b>	Displays whether the receive end of the SFP is experiencing a loss of signal from the host or drive cage.
<b>RX Power Low</b>	Displays whether the SFP receive power is low.
<b>DDM Support</b>	Displays whether the SFP is DDM-capable (Digital Diagnostic Monitoring).

The following information appears in the detail pane:

Group	Field	Description
General	Cage	The position in the drive cage.
	Interface Card	Interface card number, as assigned by the system.
	SFP	SFP number, as assigned by the system.
	State	Current condition of the SFP.
	Manufacturer	Manufacturer of the SFP.
	Part Number	Part number of the SFP.
	Serial Number	Serial number of the SFP.
	Revision	SFP's revision level.
	Max Speed	Maximum speed allowed by the SFP.
	Qualified	Displays whether the SFP has been tested and if the SFP is supported.
	TX Disable	Displays whether the transmit laser is disabled.
	TX Fault	Displays whether the transmit laser has a problem.
	RX Loss	Displays whether the receive end of the SFP is experiencing a loss of signal from the host or drive cage.
	RX Power Low	Displays whether the SFP receive power is low.
	DDM Support	Displays whether the SFP is DDM-capable (Digital Diagnostic Monitoring).
	Column	Description
DDM	Type	Identifies the monitored parameters (temperature, voltage, TX bias, TX power, and RX power).
	Unit	The unit of measure used for the monitored parameters.
	Value	The current measured value.
	Low Threshold Warning	The manufacturer's recommended lower-limit warning level.
	High Threshold Warning	The manufacturer's recommended upper-limit warning level.
	Low Alarm Threshold	The manufacturer's recommended lower-limit alarm level.
	High Alarm Threshold	The manufacturer's recommended upper-limit alarm level.

## Viewing Drive Cage Alerts

To view the Drive Cage alerts:

1. Access the Drive Cages screen.
2. In the list pane, click the **Alerts** tab.

The list pane of the **Alerts** tab displays summary alert information. The detail pane of the **Alerts** tab displays detailed information about a selected alert from the list pane.

Severity	ID	State	Last Time	Message	Repeat Count	First Time
Degraded	8572	New	Aug 31, 2012 17:09:45 PDT	Cage 1 Degraded (Firmware CPU Old)	4	Aug 30, 2012 16:37:07 PDT
Major	8574	New	Aug 31, 2012 17:09:45 PDT	Cage 1, Power Supply 1 Failed (Power Supply Failed, Power Supply AC Failed)	3	Aug 30, 2012 16:39:07 PDT
Degraded	8571	New	Aug 31, 2012 17:09:46 PDT	Cage 0 Degraded (Firmware CPU Old)	4	Aug 30, 2012 16:37:07 PDT
Degraded	8573	New	Aug 31, 2012 17:09:45 PDT	Cage 2 Degraded (Firmware CPU Old)	4	Aug 30, 2012 16:37:07 PDT
Major	8575	New	Aug 31, 2012 17:09:47 PDT	Cage 2, Power Supply 0 Failed (Power Supply Failed, Power Supply AC Failed)	3	Aug 30, 2012 16:39:08 PDT

Alert Details: 8574	
<b>General</b>	<b>Component</b>
<b>Severity</b> Major	<b>System</b> s021
<b>Type</b> Component state change	<b>System SN</b> 1000021
<b>Message</b> Cage 1, Power Supply 1 Failed (Power Supply Failed, Power Supply AC Failed)	<b>Node ID</b> 0
<b>ID</b> 8574	<b>Component</b> Cage 1, Power Supply 1
<b>State</b> New	<b>Frequency</b>
<b>Message Code</b> 0x02b00fa	<b>Repeat Count</b> 3
<b>Sequence</b> 1620	<b>Last Time</b> Aug 31, 2012 17:09:45 PDT
	<b>First Time</b> Aug 30, 2012 16:39:07 PDT

The information displayed in the **Alerts** tab is identical to the information displayed in the Systems Alerts screen, except the **Drive Cage Alerts** tab does not display a **Systems** column. See [“Viewing System Alerts”](#) (page 269) for details.

## Viewing Drive Cage Details

The Drive Cage detail screens display details about a specific drive cage selected from the **Drive Cage Summary** tab.

To view drive cage details, access the Drive Cages screen.

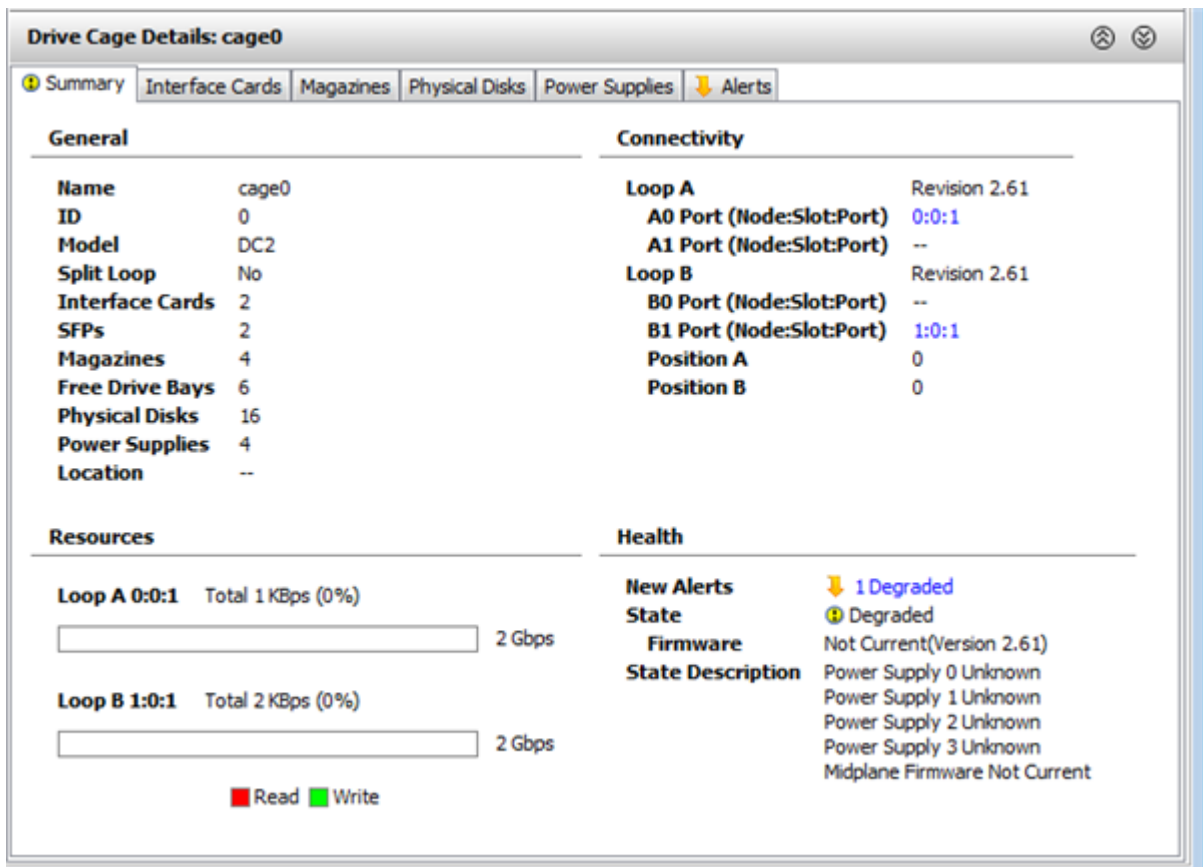
Drive cage details are displayed on six tabs in the detail pane of the Drive Cages screen. For information about each, see the following sections:

- “Viewing the Drive Cage Details Summary Tab” (page 305)
- “Viewing the Drive Cage Interface Card Details” (page 307)
- “Viewing the Drive Cage Magazine Details” (page 309)
- “Viewing Drive Cage Physical Disks Details” (page 310)
- “Viewing Drive Cage Power Supply Details” (page 311)
- “Viewing Drive Cage Alerts Details” (page 312)

## Viewing the Drive Cage Details Summary Tab

The Drive Cage details **Summary** tab displays detailed information about a drive cage selected from the **Summary** tab in the list pane of the Drive Cages screen.

1. To view drive cage details, access the Drive Cages screen.
2. In the list pane of the Drive Cages screen, click the **Summary** tab and then click a drive cage.
3. In the detail pane, click the **Summary** tab.



The following information is provided:

Group	Field	Description
General	<b>Name</b>	The drive cage name.
	<b>ID</b>	The drive cage ID number.
	<b>Model</b>	The drive cage model.
	<b>Serial Number (for DC3 drive cages)</b>	The drive cage serial number.
	<b>Node WWN</b> (for DC1 and DC3 drive cages)	The World-Wide Name of the controller node.
	<b>Split Loop</b> (for DC2 and DC4 drive cages)	Whether the drive cage is in split loop mode.
	<b>ID Switch</b> (for DC3 drive cages)	The number of ID switches.
	<b>Interface Cards</b>	The number of interface cards.
	<b>SFPs</b>	The number of SFPs.
	<b>Magazines</b>	The number of drive magazines.
	<b>Free Drive Bays</b>	The number of available drive magazine bays.
	<b>Physical Disks</b>	The number of physical disks.
	<b>Power Supplies</b>	The number of power supplies.
Resources	<b>Location</b>	The location of the drive cage.
	<b>Loop A</b>	The throughput in KB/sec for the Loop A port.

Group	Field	Description
	<b>Loop B</b>	The throughput in KB/sec for the Loop B port.
<b>Connectivity</b>	<b>Loop A</b>	Revision of firmware running on the FC-AL for port A.
	<b>A0 Port</b>	Controller node initiator port connected to drive cage port A0.
	<b>A1 Port</b>	Controller node initiator port connected to drive cage port A1.
	<b>A2 Port</b> (for DC3 drive cages)	Controller node initiator port connected to drive cage port A2.
	<b>A3 Port</b> (for DC3 drive cages)	Controller node initiator port connected to drive cage port A3.
	<b>Loop B</b>	Revision of firmware running on the FC-AL for port B.
	<b>B0 Port</b>	Controller node initiator port connected to drive cage port B0.
	<b>B1 Port</b>	Controller node initiator port connected to drive cage port B1.
	<b>B2 Port</b> (for DC3 drive cages)	Controller node initiator port connected to drive cage port B2.
	<b>B3 Port</b> (for DC3 drive cages)	Controller node initiator port connected to drive cage port B3.
	<b>Daisy Chained</b>	Displays if the selected drive cage is connected to another drive cage, i.e. daisy chained.
	<b>Position A</b>	Distance the drive cage is from the controller node port (0 = directly connected to system ports, 1 = there is one device between the node and this drive cage, etc).
	<b>Position B</b>	Distance the drive cage is from the controller node port (0 = directly connected to system ports, 1 = there is one device between the node and this drive cage, etc).
<b>Health</b>	<b>New Alerts</b>	Any alerts.
	<b>State</b>	Current state of the drive cage, either Normal, Degraded, or Failed. See <a href="#">“System and Component Status Icons”</a> (page 407).
	<b>Temperature Sensor Value</b> (for DC3 drive cages)	The temperature value of the drive cage.
	<b>Firmware</b> (for DC2 and DC4 drive cages)	The firmware version on the drive cage.
	<b>State Description</b>	Description of the drive cage state.

## Viewing the Drive Cage Interface Card Details

To view interface card details:

1. Access the Drive Cages screen.
2. In the list pane of the Drive Cages screen, click the **Summary** tab and then click a drive cage.
3. In the detail pane, click the **Interface Cards** tab.

The **Interface Cards** tab appears as follows (the following image depicts information for a DC2 drive cage. Your screen may differ depending on the drive cage type in your system):

Drive Cage Details: cage0											
<span>Summary</span> <span>Interface Cards</span> <span>Magazines</span> <span>Physical Disks</span> <span>Power Supplies</span> <span>Alerts</span>											
Default 2 objects Filter Clear Any column contains: Clear											
Name	Ports	Link A RX LED	Link A TX LED	Link B RX LED	Link B TX LED	System LED	Link A Speed	Link B Speed	Link A SFP State	Link B SFP State	
Card 0	A0, B0	Green	Green	Off	Off	Green	2 Gbps	--	Normal	--	
Card 1	A1, B1	Off	Off	Green	Green	Green	--	2 Gbps	--	Normal	

The following information for DC2 and DC4 drive cages is provided:

Column	Description
<b>Name</b>	The interface card name.
<b>Ports</b>	Four ports for each FC-AL. For FC-AL A, that is A0 through A3, and for FC-AL B, that is B0 through B3.
<b>Link A RX LED</b>	The status of Link A's fibre channel receiver of the SFP. Green if receiving signal; off if not receiving signal.
<b>Link A TX LED</b>	The status of Link A's SFP transmitter. Green if sending signal; off if not sending signal.
<b>Link B RX LED</b>	The status of Link B's fibre channel receiver of the SFP. Green if receiving signal; off if not receiving signal.
<b>Link B TX LED</b>	The status of Link B's SFP transmitter. Green if sending signal; off if not sending signal.
<b>System LED</b>	The system status.
<b>Link A Speed</b>	Link A speed.
<b>Link B Speed</b>	Link B speed.
<b>Link A SFP State</b>	The state of Link A's SFP.
<b>Link B SFP State</b>	The state of Link B's SFP.

The following information for DC3 drive cages is provided:

Column	Description
<b>Name</b>	The interface card name.
<b>Ports</b>	Four ports for each FC-AL. For FC-AL A, that is A0 through A3, and for FC-AL B, that is B0 through B3.
<b>Port 0 State</b>	Current state of port 0.
<b>Port 1 State</b>	Current state of port 1.
<b>Port 2 State</b>	Current state of port 2.
<b>Port 3 State</b>	Current state of port 3.
<b>Port 0 Link Speed</b>	Link speed for port 0.
<b>Port 1 Link Speed</b>	Link speed for port 1.
<b>Port 2 Link Speed</b>	Link speed for port 2.
<b>Port 3 Link Speed</b>	Link speed for port 3.
<b>Firmware State</b>	Drive cage firmware status (Current, Not Current, Unknown).
<b>State</b>	Current state of the interface card.
<b>ESH State</b>	The current state of the Enhanced Switch Hub.



The following information for DC1 drive cages is provided:

Column	Description
<b>Name</b>	The interface card name.
<b>Ports</b>	Ports for each FC-AL. For FC-AL A, that is A0 and A1, and for FC-AL B, that is B0 and B1.
<b>Loop LED (Port 0)</b>	Current state of port 0.
<b>Loop LED (Port 1)</b>	Current state of port 1.
<b>Loop Split</b>	Current state of daisy-chained drive cages (Unknown, Normal, Off, Green, Green blink, Amber, Amber blink).
<b>Status LED</b>	Current state of interface card.
<b>Link Speed</b>	Link speed.
<b>Firmware State</b>	Drive cage firmware status (Current, Not Current, Unknown).
<b>CPU State (Self)</b>	Current state of the current loop's CPU (Unknown, Normal, Failed, Degraded).
<b>CPU State (Partner)</b>	Current state of other loop's CPU (Unknown, Normal, Failed, Degraded).

The following information for DCS1 and DCS2 drive cages is provided:

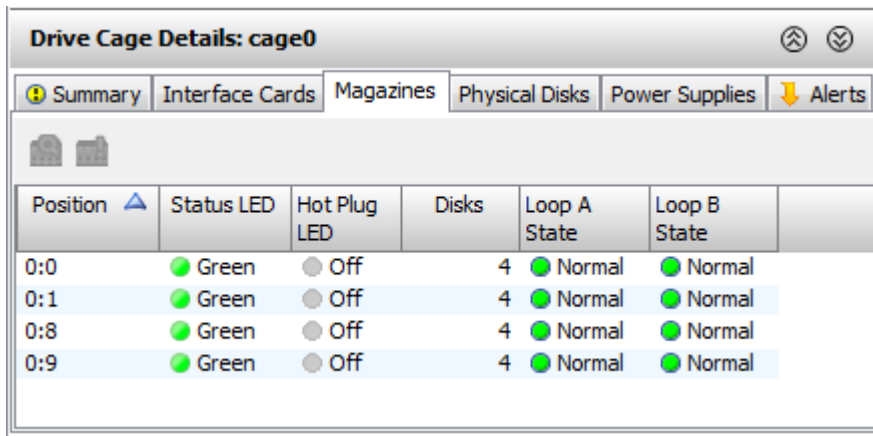
Column	Description
<b>Name</b>	The interface card name.
<b>Ports</b>	Ports for each FC-AL. For FC-AL A, that is A0 and A1, and for FC-AL B, that is B0 and B1.
<b>Port A State</b>	Current state of port A.
<b>Port V State</b>	Current state of port B.
<b>Port A Link Speed</b>	Link speed of port A (in Gbps).
<b>Port B Link Speed</b>	Link speed of port B (in Gbps).
<b>Firmware State</b>	Drive cage firmware status (Current, Not Current, Unknown).
<b>State</b>	Current state of the cage.

## Viewing the Drive Cage Magazine Details

To view drive magazine details:

1. Access the Drive Cages screen.
2. In the list pane of the Drive Cages screen, click the **Summary** tab and then click a drive cage.
3. In the detail pane, click the **Magazines** tab.

The **Magazine** tab appears as follows (the following image depicts information for a DC2 drive cage. Your screen may differ depending on the drive cage type in your system):



The following information is displayed:

Column	Description
<b>Position</b>	Position of the drive magazine within the drive cage.
<b>State</b> (for DCS1 and DCS2 drive cages)	The current stage of the drive cage.
<b>Status LED</b> (for DC2 and DC4 drive cages)	The current state of the drive magazine. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Hot Plug LED</b> (for DC2 and DC4 drive cages)	The current state of the hot plug LED.
<b>Disks</b>	Number of disks in the drive magazine.
<b>Loop A State</b>	Status of the Interface Card loop (A) to the node.
<b>Loop B State</b>	Status of the Interface Card loop (B) to the node.

## Viewing Drive Cage Physical Disks Details

To view physical disk details:

1. Access the Drive Cages screen.
2. In the list pane of the Drive Cages screen, click the **Summary** tab and then click a drive cage.
3. In the detail pane, click the **Physical Disks** tab.

The **Physical Disks** tab appears as follows (the following image depicts information for a DC2 drive cage. Your screen may differ depending on the drive cage type in your system):

ID	Position (Cage:Magazine:Disk)	WWN	Status LED	Temperature	Loop A AL_PA	Loop A State	Loop B AL_PA	Loop B State
0	0:0:0	2000001D38245655	Green	38° C ( 100.4° F )	0xE1	Normal	0xE1	Normal
1	0:0:1	2000001D38245272	Green	37° C ( 98.6° F )	0xE0	Normal	0xE0	Normal
2	0:0:2	2000001D382458E9	Green	34° C ( 93.2° F )	0xDC	Normal	0xDC	Normal
3	0:0:3	2000001D38245A13	Green	32° C ( 89.6° F )	0xDA	Normal	0xDA	Normal
4	0:1:0	2000001862B89088	Green	37° C ( 98.6° F )	0xD9	Normal	0xD9	Normal
5	0:1:1	2000001D38245723	Green	36° C ( 96.8° F )	0xD6	Normal	0xD6	Normal
6	0:1:2	2000001D38245691	Green	33° C ( 91.4° F )	0xD5	Normal	0xD5	Normal
7	0:1:3	2000001D382456A9	Green	32° C ( 89.6° F )	0xD4	Normal	0xD4	Normal
8	0:8:0	2000001D38245A48	Green	34° C ( 93.2° F )	0xAC	Normal	0xAC	Normal
9	0:8:1	2000001D38245B24	Green	33° C ( 91.4° F )	0xAB	Normal	0xAB	Normal
10	0:8:2	2000001D38246D03	Green	32° C ( 89.6° F )	0xAA	Normal	0xAA	Normal
11	0:8:3	2000001D38245AA6	Green	32° C ( 89.6° F )	0xA9	Normal	0xA9	Normal
12	0:9:0	2000001D382452A7	Green	35° C ( 95° F )	0xA7	Normal	0xA7	Normal
13	0:9:1	2000001D3824516E	Green	36° C ( 96.8° F )	0xA6	Normal	0xA6	Normal
14	0:9:2	2000001D3824509E	Green	34° C ( 93.2° F )	0xA5	Normal	0xA5	Normal
15	0:9:3	2000001D3815F62E	Green	32° C ( 89.6° F )	0xA3	Normal	0xA3	Normal

The following information is provided:

Column	Description
<b>ID</b>	Physical disk ID, as assigned by the system. For unadmitted disks, this columns is blank (-).
<b>Position</b>	Location of the disk in C:M:D (Cage:Magazine:Disk) format..
<b>WWN</b> (for non-SAS drives)	The World Wide Name (WWN) assigned to the disk.
<b>WWN/Device Name</b> (for DCS1 and DCS2 drive cages)	The device name assigned to the disk.
<b>Status LED</b> (for DC1, DC2, and DC4 drive cages)	Current state of the disks.
<b>Temperature</b>	Current internal temperature of the disk drive.
<b>Loop A AL_PA</b>	The loop A arbitrated loop physical address of the disk.
<b>Loop A State</b>	Status of the Interface Card loop to the node. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Loop B AL_PA</b>	The loop B arbitrated loop physical address of the disk.
<b>Loop B State</b>	Status of the Interface Card loop to the node. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>State</b> (for DCS1 and DCS2 drive cages).	Status of the physical disk. See <a href="#">“System and Component Status Icons”</a> (page 407) .

## Viewing Drive Cage Power Supply Details

To view power supply details:

1. Access the Drive Cages screen.
2. In the list pane of the Drive Cages screen, click the **Summary** tab and then click a drive cage.
3. In the detail pane, click the **Power Supplies** tab.

The **Power Supplies** tab appears as follows (the following image depicts information for a DC2 drive cage. Your screen may differ depending on the drive cage type in your system):

Drive Cage Details: cage0						
Summary	Interface Cards	Magazines	Physical Disks	Power Supplies	Alerts	
Cage	ID	State	Model	AC State	Fan State	Fan Speed
cage0	0	Normal	800-0011-50.0A	Normal	Normal	Normal
cage0	1	Normal	800-0011-50.0A	Normal	Normal	Normal
cage0	2	Normal	800-0011-50.0A	Normal	Normal	Normal
cage0	3	Normal	800-0011-50.0A	Normal	Normal	Normal

The following information is provided for non-SAS drive cages:

Column	Description
<b>Cage</b>	The drive cage to which the power supply belongs.
<b>ID</b>	Numeric ID of the power supply.
<b>State</b>	Status of the physical disk. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Model</b>	Model name of the power supply.
<b>AC State</b>	Indicates the presence of AC power to the power supply.
<b>Fan State</b>	Power supply fan operational status.
<b>Fan Speed</b>	Speed of the power supply fan.

The following information is provided for DCS1 and DCS2 drive cages:

Column	Description
<b>Cage</b>	The drive cage to which the power supply belongs.
<b>ID</b>	Numeric ID of the power supply.
<b>State</b>	Status of the physical disk. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Model</b>	Model name of the power supply.
<b>AC State</b>	Indicates the presence of AC power to the power supply.
<b>DC State</b>	Indicates the presence of DC power to the power supply.
<b>Fan 0 State</b>	Power supply fan 0 operational status.
<b>Fan 0 Speed</b>	Speed of the power supply fan 0.
<b>Fan 1 State</b>	Power supply fan 1 operational status.
<b>Fan 1 Speed</b>	Speed of the power supply fan 1.

## Viewing Drive Cage Alerts Details

The Alerts detail tab provides the following information:

Column	Description
<b>Severity</b>	The severity of the alert. See <a href="#">“Alert Severity Indicators”</a> (page 406).
<b>ID</b>	The alert ID.
<b>State</b>	The alert state.

Column	Description
<b>Last Time</b>	The last occurrence of the alert.
<b>Message</b>	A brief description of the alert.
<b>Repeat Count</b>	The number of times the alert has been issued.
<b>First Time</b>	The first occurrence of the alert.

## Editing Drive Cages

To edit a drive cage:

1. In the Manager Pane, click **Systems**.
2. In the Management Tree, click **Drive Cages** under the system with the drive cage you wish to edit.
3. In the **Summary** tab of the list pane displayed in Management Window, right-click the drive cage you wish to edit and click **Edit**.  
The **Edit Cage Location** dialog box appears.
4. Enter the drive cage location the **Location** field.
5. Click **OK**.

## Locating Drive Cages

This operation locates a drive cage, or components of the drive cage such as drive magazines or ports in the storage server, by setting the related LED(s) to amber or oscillate.

1. In the Manager Pane, click **Systems**.
2. In the Management Tree, click **Drive Cages** under the system with the drive cage you wish to locate.
3. In the **Summary** tab of the list pane displayed in Management Window, right-click the drive cage you wish to locate and click **Locate**.  
The **Locate Cage** dialog box appears.  
To locate a magazine component, select the Magazine tab in the Drive Cage Details screen, then right-click the magazine you wish to locate. In this case the Locate Magazine dialog box appears.
4. In the **Duration** field, enter a value of 1 to 255 seconds. For EOS systems, the range is 1–3600 seconds, with a default duration of 900 seconds. For other systems prior to EOS, the range is from 1 and 255 seconds, with a default of 60 seconds.
5. In the **Target Component** list, select the cage, magazine, or port you wish to locate. (The subcomponents available depend on the InServ model.)
6. Click **OK**.

When the Locate operation begins, a locate icon will display next to the selected node for the duration specified. A detailed message will be displayed in the status bar and will be updated when the locate operation has completed. If a subcomponent was selected, the detail pane will automatically display the tab associated with that subcomponent.

You can stop a Locate operation by selecting **Stop Locate** instead of **Locate** in Step [Step 3](#).

## Editing Drive Cage Power Supplies

To edit a drive cage power supply:

1. In the Manager Pane, click **Systems**.
2. In the Management Tree, click **Drive Cages** under the system with the drive cage you wish to edit.

3. In the **Power Supplies** tab displayed in Management Window, right-click the drive cage power supply you wish to edit and click **Edit**.
4. Enter the drive cage power supply model number in the **Model** field.
5. Click **OK**.

---

## 21 Managing Physical Disks

The Systems Manager allows you perform various tasks related to physical disks. Refer to the following sections for more information.

[“Locating Physical Disks” \(page 315\)](#)

[“Viewing Physical Disks” \(page 315\)](#)

[“Viewing the Physical Disks Summary Tab” \(page 316\)](#)

[“Viewing the Physical Disks Tab” \(page 317\)](#)

[“Displaying Summary Information” \(page 317\)](#)

[“Displaying Capacity Information” \(page 318\)](#)

[“Displaying Chunklet Usage Information” \(page 319\)](#)

[“Displaying Inventory Information” \(page 320\)](#)

[“Displaying Environmental Information” \(page 321\)](#)

[“Displaying State Information” \(page 322\)](#)

[“Displaying Paths Information” \(page 323\)](#)

[“Viewing the Physical Disks Spares Tab” \(page 324\)](#)

[“Viewing the Physical Disks Alerts Tab” \(page 325\)](#)

### Locating Physical Disks

To locate a magazine from the Physical Disks tab:

1. Select Physical Disks in the Management Tree under the system using the disk you want to locate.
2. Under the Physical Disks tab in the Management Window, right-click on the ID of a cage, then select **Locate**.

The Locate Magazine dialog box appears.

3. In the **Duration** field, enter a value of 1 to 255 seconds.
4. In the **Target Component** list, select the magazine you wish to locate.
5. Click **OK**.

A detailed message will be displayed in the status bar and will be updated when the locate operation has completed. The detail pane will automatically display the magazine tab for the Drive Cages screen, and a locate icon will display next to the selected position in the selected magazine for the duration specified.

You can stop a Locate operation by selecting **Stop Locate** instead of Locate in [Step 2](#).

### Viewing Physical Disks

The Physical Disks screen displays summary information about system physical disks.

To access the Drive Cages screen:

1. Click **Systems** in the Manager Pane.
2. In the Management Tree, select **Physical Disks** under the system whose physical disk information you wish to view.

The Physical Disks screen provides four tabs: **Summary**, **Physical Disks**, **Spares**, and **Alerts**. For information about each, see:

[“Viewing the Physical Disks Summary Tab” \(page 316\)](#)

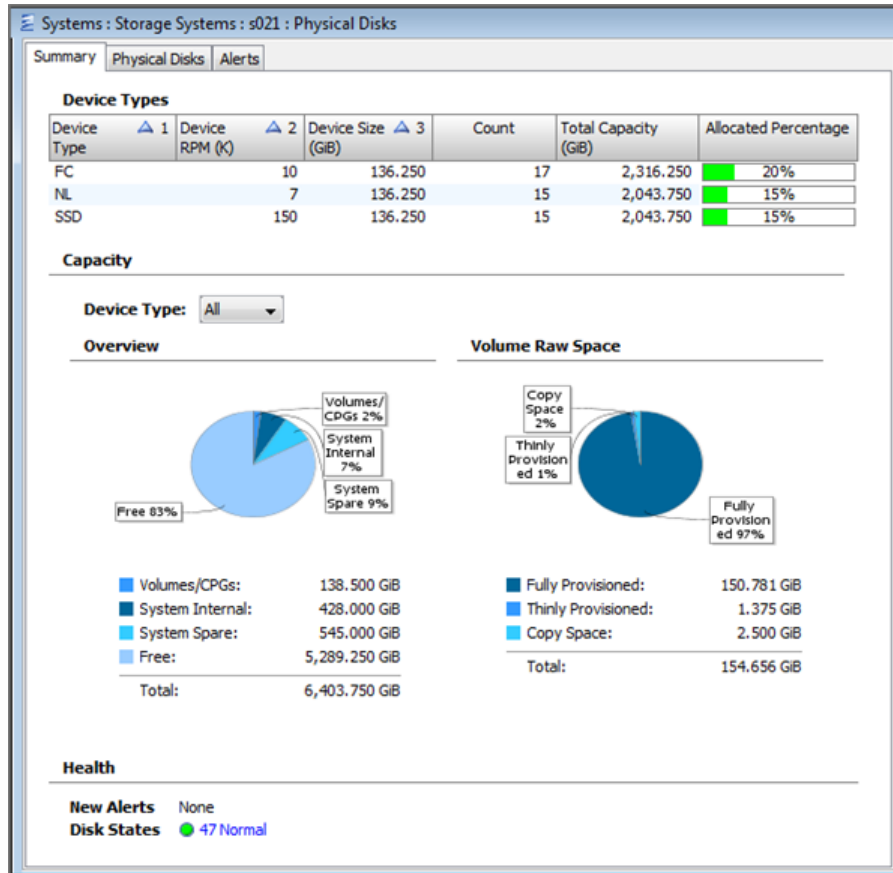
[“Viewing the Physical Disks Tab” \(page 317\)](#)

[“Viewing the Physical Disks Spares Tab” \(page 324\)](#)

## Viewing the Physical Disks Summary Tab

To view the physical disks **Summary** tab:

1. Access the Physical Disks screen.
2. Click the **Summary** tab.



The following information is displayed:

Group	Field	Description
Device Types	<b>NOTE:</b> If the license is limited for the number of disk drives in an array, the licensed limit will be displayed next to the Device Types group heading.	
	Device Type	The type of physical disk, either Fast Class (FC), Near Line (NL), or Solid State (SSD).
	Device RPM	The disk speed.
	<b>NOTE:</b> The Device RPM number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
	Device Size	The disk size in GiB.
	Count	The number of each type of disk.
	Total Capacity	The total capacity (in GiB) for each type of disk.



Group	Field	Description
	<b>Allocated Percentage</b>	Amount of storage (in percent) consumed by the disk drive.
<b>Capacity</b>	<b>Device Type</b>	Select the device type, Fast Class (FC), Near Line (NL), or Solid State Device (SSD), or All. The capacity and capacity usage of the selected device type is displayed in graphical form.
	<b>Overview</b>	Displays the physical disks' free and used space (in GiB).
	<b>Volume Raw Space</b>	Displays the physical disks' fully provisioned space and thinly provisioned space.
<b>Health</b>	<b>New Alerts</b>	The number of new physical disk alerts.
	<b>Disk State</b>	The current state of the system's physical disks. See <a href="#">“System and Component Status Icons”</a> (page 407).

## Viewing the Physical Disks Tab

To view the **Physical Disk** tab:

1. Access the Physical Disks screen.
2. Click the **Physical Disks** tab.

The **Physical Disks** tab can be filtered to display **Summary**, **Capacity**, **Chunklet Usage**, **Inventory**, **Environmental**, **State**, and **Paths** information.

**NOTE:** In the following sections, where shown, the **Device RPM** number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.

## Displaying Summary Information

To view physical disk summary information, select **Summary** from the filtering list.

ID	Cage	Cage Location	Position (Cage-Magazine-Disk)	Device Type	Device Protocol	Device RPM (Q)	State	Total Capacity (GB)	Free Capacity (GB)	Allocated Capacity (GB)	Allocated Percentage	Part A (Node:Slot:Port)	Part B (Node:Slot:Port)	Manufacturer	Media Type	Life Remaining (%)
0	cage0	--	0:0:0	FC	FC	10	Normal	136,250	109,000	27,250	20%	0:0:1*	1:0:1	SEAGATE	Magnetic	--
1	cage0	--	0:0:1	NL	FC	7	Normal	136,250	114,000	22,250	16%	0:0:1*	1:0:1*	SEAGATE	Magnetic	--
2	cage0	--	0:0:2	SSD	FC	150	Normal	136,250	114,750	21,500	16%	0:0:1*	1:0:1	SEAGATE	S.L.C	--
3	cage0	--	0:0:3	FC	FC	10	Normal	136,250	108,500	27,750	20%	0:0:1*	1:0:1*	SEAGATE	Magnetic	--
4	cage0	--	0:1:0	NL	FC	7	Normal	136,250	113,000	23,250	17%	0:0:1*	1:0:1	SEAGATE	Magnetic	--
5	cage0	--	0:1:1	SSD	FC	150	Normal	136,250	117,000	19,250	14%	0:0:1*	1:0:1*	SEAGATE	S.L.C	--
6	cage0	--	0:1:2	FC	FC	10	Normal	136,250	106,250	30,000	22%	0:0:1*	1:0:1	SEAGATE	Magnetic	--
7	cage0	--	0:1:3	NL	FC	7	Normal	136,250	117,500	18,750	14%	0:0:1*	1:0:1*	SEAGATE	Magnetic	--
8	cage0	--	0:8:0	SSD	FC	150	Normal	136,250	115,500	20,750	15%	0:0:1*	1:0:1	SEAGATE	S.L.C	--
9	cage0	--	0:8:1	FC	FC	10	Normal	136,250	108,500	27,750	20%	0:0:1*	1:0:1*	SEAGATE	Magnetic	--
10	cage0	--	0:8:2	NL	FC	7	Normal	136,250	115,000	21,250	16%	0:0:1*	1:0:1	SEAGATE	Magnetic	--
11	cage0	--	0:8:3	SSD	FC	150	Normal	136,250	114,750	21,500	16%	0:0:1*	1:0:1*	SEAGATE	S.L.C	--
12	cage0	--	0:9:0	FC	FC	10	Normal	136,250	107,500	28,750	21%	0:0:1*	1:0:1	SEAGATE	Magnetic	--
13	cage0	--	0:9:1	NL	FC	7	Normal	136,250	115,750	20,500	15%	0:0:1*	1:0:1*	SEAGATE	Magnetic	--
14	cage0	--	0:9:2	SSD	FC	150	Normal	136,250	115,750	24,500	18%	0:0:1*	1:0:1	SEAGATE	S.L.C	--
15	cage0	--	0:9:3	FC	FC	10	Normal	136,250	110,750	25,500	19%	0:0:1*	1:0:1*	SEAGATE	Magnetic	--
16	cage1	--	1:0:0	NL	FC	7	Normal	136,250	115,500	20,750	15%	0:0:2*	1:0:2	SEAGATE	Magnetic	--
								6,403,750	5,399,250	1,114,500	17%					

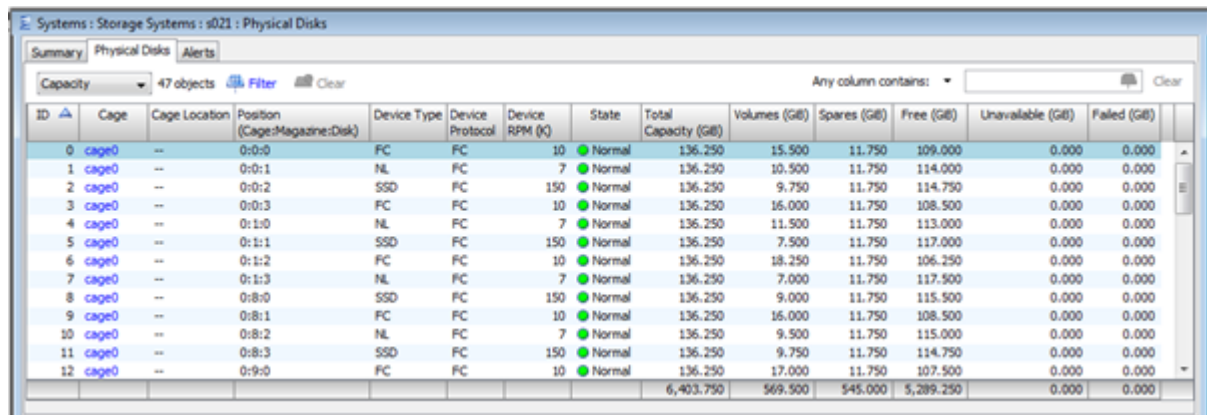
The following information is displayed:

Column	Description
<b>ID</b>	Physical disk ID, as assigned by the system. Physical disks are numbered contiguously during system installation beginning with 0.
<b>Cage</b>	The drive cage in which the disk resides.
<b>Cage Location</b>	A description of the physical location of the drive cage.

Column	Description
<b>Position</b>	Location of the disk in the format in Cage:Magazine:Disk format.
<b>Device Type</b>	Indicates whether a physical disk is a Fast Class (FC), Nearline (NL), or Solid State (SSD) drive.
<b>Device Protocol</b>	The protocol used by the device, e.g., FC or Serial Attached SCSI (SAS).
<b>Device RPM</b>	Speed of the specified disk.
<p><b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.</p>	
<b>State</b>	State of the disk as identified by the kernel.
<b>Total Capacity</b>	Total amount of usable storage for this disk drive.
<b>Free Capacity</b>	Amount of free space (in GiB) in the disk drive, regardless of initialized or not.
<b>Allocated Capacity</b>	Amount of storage remaining (in GiB) for use on the disk drive.
<b>Allocated Percentage</b>	Amount of storage (as a percentage) consumed by the disk drive.
<b>Port A</b>	Location of the primary initiator port to which the disk is attached, in Node:Slot:Port format.
<b>Port B</b>	Location of the secondary initiator port to which the disk is attached, in Node:Slot:Port format.
<b>Manufacturer</b>	The name of the disk manufacturer.
<b>Media Type</b>	Media type of as SSD device, such as Magnetic or Single-Level Cell (MLC or SLC).
<b>Life Remaining</b>	The estimated remaining life of an SSD, as a percentage. The threshold limit is 95%. If the remaining life exceeds the threshold (that is, 5% or less life remaining), the bar will change from green to red.

## Displaying Capacity Information

To view physical disk capacity information, select **Capacity** from the filtering list.



The screenshot shows a software interface for managing storage systems. The 'Physical Disks' tab is active, displaying a table with 12 columns: ID, Cage, Cage Location, Position (Cage:Magazine:Disk), Device Type, Device Protocol, Device RPM (K), State, Total Capacity (GiB), Volumes (GiB), Spares (GiB), Free (GiB), Unavailable (GiB), and Failed (GiB). The table lists 12 disks, all in 'Normal' state. The 'Total Capacity' column shows values ranging from 136.250 to 17.000 GiB. The 'Free' column shows values ranging from 109.000 to 107.500 GiB. The 'Unavailable' and 'Failed' columns show 0.000 GiB for all disks. The interface includes a 'Filter' button and a search bar at the top.

ID	Cage	Cage Location	Position (Cage:Magazine:Disk)	Device Type	Device Protocol	Device RPM (K)	State	Total Capacity (GiB)	Volumes (GiB)	Spares (GiB)	Free (GiB)	Unavailable (GiB)	Failed (GiB)
0	cage0	--	0:0:0	FC	FC	10	Normal	136.250	15.500	11.750	109.000	0.000	0.000
1	cage0	--	0:0:1	NL	FC	7	Normal	136.250	10.500	11.750	114.000	0.000	0.000
2	cage0	--	0:0:2	SSD	FC	150	Normal	136.250	9.750	11.750	114.750	0.000	0.000
3	cage0	--	0:0:3	FC	FC	10	Normal	136.250	16.000	11.750	108.500	0.000	0.000
4	cage0	--	0:1:0	NL	FC	7	Normal	136.250	11.500	11.750	113.000	0.000	0.000
5	cage0	--	0:1:1	SSD	FC	150	Normal	136.250	7.500	11.750	117.000	0.000	0.000
6	cage0	--	0:1:2	FC	FC	10	Normal	136.250	18.250	11.750	106.250	0.000	0.000
7	cage0	--	0:1:3	NL	FC	7	Normal	136.250	7.000	11.750	117.500	0.000	0.000
8	cage0	--	0:8:0	SSD	FC	150	Normal	136.250	9.000	11.750	115.500	0.000	0.000
9	cage0	--	0:8:1	FC	FC	10	Normal	136.250	16.000	11.750	108.500	0.000	0.000
10	cage0	--	0:8:2	NL	FC	7	Normal	136.250	9.500	11.750	115.000	0.000	0.000
11	cage0	--	0:8:3	SSD	FC	150	Normal	136.250	9.750	11.750	114.750	0.000	0.000
12	cage0	--	0:9:0	FC	FC	10	Normal	136.250	17.000	11.750	107.500	0.000	0.000
								6,403.750	569.500	545.000	5,289.250	0.000	0.000

The following information is displayed:

Column	Description
<b>ID</b>	Physical disk ID, as assigned by the system. Physical disks are numbered contiguously during system installation beginning with 0.
<b>Cage</b>	The drive cage in which the disk resides.
<b>Cage Location</b>	A description of the physical location of the drive cage.
<b>Position</b>	Location of the disk in Cage:Magazine:Disk format.
<b>Device Type</b>	Indicates whether a physical disk is a Fast Class (FC), Nearline (NL), or Solid State (SSD) drive.
<b>Device Protocol</b>	The protocol used by the device, e.g., FC or Serial Attached SCSI (SAS).
<b>Device RPM</b>	Speed of the specified disk. (RPM)
<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
<b>State</b>	State of the disk as identified by the kernel.
<b>Total Capacity</b>	Total amount of usable storage for this disk drive.
<b>Volumes</b>	Amount of storage on the physical disk being utilized by volumes.
<b>Spares</b>	Amount of storage allocated as spares by the physical disk.
<b>Free</b>	Amount of free space on the physical disk, regardless of initialized or not.
<b>Unavailable</b>	Amount of unavailable space on the physical disk.
<b>Failed</b>	Amount of failed space on the physical disk.

## Displaying Chunklet Usage Information

To view physical disk chunklet usage information, select **Chunklet Usage** from the filtering list.

Systems | Storage Systems | x021 | Physical Disks

SummaryPhysical DisksAlerts

Chunklet Usage47 objectsFilterClear

Any column contains:Clear

ID	Cage	Cage Location	Position (Cage:Magazine:Disk)	Device Type	Device Protocol	Device RPM (R)	State	Total Chunklets	Normal Used OK	Normal Used Failed	Normal Unused Free	Normal Unused Uninit	Normal Unused Unavailable	Normal Unused Failed	Spare Used OK	Spare Used Failed	Spare Unused Free	Spare Unused Uninit	Spare Unused Failed
0	cage0	--	0:0:0	FC	FC	10	Normal	545	62	0	436	0	0	0	0	0	47	0	0
1	cage0	--	0:0:1	NL	FC	7	Normal	545	42	0	456	0	0	0	0	0	47	0	0
2	cage0	--	0:0:2	SSD	FC	150	Normal	545	39	0	459	0	0	0	0	0	47	0	0
3	cage0	--	0:0:3	FC	FC	10	Normal	545	64	0	434	0	0	0	0	0	47	0	0
4	cage0	--	0:1:0	NL	FC	7	Normal	545	46	0	452	0	0	0	0	0	47	0	0
5	cage0	--	0:1:1	SSD	FC	150	Normal	545	30	0	468	0	0	0	0	0	47	0	0
6	cage0	--	0:1:2	FC	FC	10	Normal	545	73	0	425	0	0	0	0	0	47	0	0
7	cage0	--	0:1:3	NL	FC	7	Normal	545	28	0	470	0	0	0	0	0	47	0	0
8	cage0	--	0:0:0	SSD	FC	150	Normal	545	36	0	462	0	0	0	0	0	47	0	0
9	cage0	--	0:0:1	FC	FC	10	Normal	545	64	0	434	0	0	0	0	0	47	0	0
10	cage0	--	0:0:2	NL	FC	7	Normal	545	38	0	460	0	0	0	0	0	47	0	0
11	cage0	--	0:0:3	SSD	FC	150	Normal	545	39	0	459	0	0	0	0	0	47	0	0
								25615	2278	0	21157	0	0	0	0	0	2180	0	0

The following information is displayed:

Column	Description
<b>ID</b>	Physical disk ID, as assigned by the system. Physical disks are numbered contiguously during system installation beginning with 0.
<b>Cage</b>	The drive cage in which the disk resides.
<b>Cage Location</b>	A description of the physical location of the drive cage.

Column	Description
<b>Position</b>	Location of the disk in (Cage:Magazine:Disk format).
<b>Device Type</b>	Indicates whether a physical disk is a Fibre Channel (FC), Nearline (NL), or Solid State (SSD) drive.
<b>Device Protocol</b>	The protocol used by the device, e.g., FC or Serial Attached SCSI (SAS).
<b>Device RPM</b>	Speed of the specified disk.
<p><b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.</p>	
<b>State</b>	State of the disk as identified by the kernel.
<b>Total Chunklets</b>	Number of chunklets on the physical disk, excluding those reserved by the system, such as for the TOC.
<b>Normal Used OK</b>	Number of chunklets allocated to logical disks and containing data that is currently accessible to the system.
<b>Normal Used Failed</b>	Number of chunklets allocated to logical disks and containing data but currently inaccessible because they have failed.
<b>Normal Unused Free</b>	Number of chunklets currently free and available for use by logical disks.
<b>Normal Unused Uninit</b>	Number of chunklets being cleaned. A chunklet that is clean has been set to all zeros, and therefore does not contain any data.
<b>Normal Unused Unavailable</b>	Number of unavailable chunklets.
<b>Normal Unused Failed</b>	Number of initialized but unallocated chunklets that do not contain data and have failed.
<b>Spare Used OK</b>	Number of chunklets currently used for sparing and containing data that is accessible by the system.
<b>Spare Used Failed</b>	Number of chunklets used for sparing but containing data that is currently inaccessible to the system because they have failed.
<b>Spare Unused Free</b>	Number of chunklets currently free and available for use, but only as spares.
<b>Spare Unused Uninit</b>	Number of spare chunklets being cleaned. A chunklet that is clean has been set to all zeros, and therefore does not contain any data.
<b>Spare Unused Failed</b>	Number of uninitialized chunklets reserved as spares but currently unusable because they have failed.

## Displaying Inventory Information

To view physical disk inventory information, select **Inventory** from the filtering list.

ID	Cage	Cage Location	Position (Cage:Magazine:Disk)	Device Type	Device Protocol	Device RPM (K)	State	WWN	Manufacturer	Model	Serial Number	Firmware Version
0	cage0	--	0:0:0	FC	FC	10	Normal	200000 ID 38245655	SEAGATE	ST3146707FC	3K576RZ7	XR36
1	cage0	--	0:0:1	NL	FC	7	Normal	200000 ID 38245272	SEAGATE	ST3146707FC	3K576R09	XR36
2	cage0	--	0:0:2	SSD	FC	150	Normal	200000 ID 382458E9	SEAGATE	ST3146707FC	3K57310X	XR36
3	cage0	--	0:0:3	FC	FC	10	Normal	200000 ID 38245A13	SEAGATE	ST3146707FC	3K576P96	XR36
4	cage0	--	0:1:0	NL	FC	7	Normal	200000 1862889088	SEAGATE	ST3146707FC	3K56M1R5	XR36
5	cage0	--	0:1:1	SSD	FC	150	Normal	200000 ID 38245723	SEAGATE	ST3146707FC	3K576QEN	XR36
6	cage0	--	0:1:2	FC	FC	10	Normal	200000 ID 38245691	SEAGATE	ST3146707FC	3K576QKA	XR36
7	cage0	--	0:1:3	NL	FC	7	Normal	200000 ID 382456A9	SEAGATE	ST3146707FC	3K576QF7	XR36
8	cage0	--	0:8:0	SSD	FC	150	Normal	200000 ID 38245A48	SEAGATE	ST3146707FC	3K579M2V	XR36
9	cage0	--	0:8:1	FC	FC	10	Normal	200000 ID 38245824	SEAGATE	ST3146707FC	3K57757C	XR36
10	cage0	--	0:8:2	NL	FC	7	Normal	200000 ID 38246D03	SEAGATE	ST3146707FC	3K577313	XR36
11	cage0	--	0:8:3	SSD	FC	150	Normal	200000 ID 38245AA6	SEAGATE	ST3146707FC	3K576PGR	XR36
12	cage0	--	0:9:0	FC	FC	10	Normal	200000 ID 382452A7	SEAGATE	ST3146707FC	3K576RCF	XR36

The following information is displayed:

Column	Description
<b>ID</b>	Physical disk ID, as assigned by the system. Physical disks are numbered contiguously during system installation beginning with 0.
<b>Cage</b>	The drive cage in which the disk resides.
<b>Cage Location</b>	A description of the physical location of the drive cage.
<b>Position</b>	Location of the disk in Cage:Magazine:Disk format.
<b>Device Type</b>	Indicates whether a physical disk is a Fast Class (FC), Nearline (NL), or Solid State (SSD) drive.
<b>Device Protocol</b>	The protocol used by the device, e.g., FC or Serial Attached SCSI (SAS).
<b>Device RPM</b>	Speed of the specified disk.
<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
<b>State</b>	State of the disk as identified by the kernel.
<b>WWN</b>	The World Wide Name (WWN) assigned to the disk.
<b>Manufacturer</b>	Name of the disk manufacturer (for example, SEAGATE).
<b>Model</b>	Disk model number.
<b>Serial Number</b>	Disk manufacturer's serial number.
<b>Firmware Version</b>	Disk manufacturer's firmware revision tracking string.

## Displaying Environmental Information

To view physical disks' environmental information, select Environmental from the filtering list.

ID	Cage	Cage Location	Position (Cage:Magazine:Disk)	Device Type	Device Protocol	Device RPM (K)	State	Correctable Read Errors	Uncorrectable Read Errors	Correctable Write Errors	Uncorrectable Write Errors	Temperature
0	cage0	--	0:0:0	FC	FC	10	Normal	0	0	0	0	39° C ( 102.2° F )
1	cage0	--	0:0:1	NL	FC	7	Normal	0	0	0	0	38° C ( 100.4° F )
2	cage0	--	0:0:2	SSD	FC	150	Normal	0	0	0	0	35° C ( 95° F )
3	cage0	--	0:0:3	FC	FC	10	Normal	0	0	0	0	33° C ( 91.4° F )
4	cage0	--	0:1:0	NL	FC	7	Normal	0	0	0	0	37° C ( 98.6° F )
5	cage0	--	0:1:1	SSD	FC	150	Normal	0	0	0	0	36° C ( 96.8° F )
6	cage0	--	0:1:2	FC	FC	10	Normal	0	0	0	0	33° C ( 91.4° F )
7	cage0	--	0:1:3	NL	FC	7	Normal	0	0	0	0	32° C ( 89.6° F )
8	cage0	--	0:8:0	SSD	FC	150	Normal	0	0	0	0	34° C ( 93.2° F )
9	cage0	--	0:8:1	FC	FC	10	Normal	0	0	0	0	33° C ( 91.4° F )
10	cage0	--	0:8:2	NL	FC	7	Normal	0	0	0	0	32° C ( 89.6° F )
11	cage0	--	0:8:3	SSD	FC	150	Normal	1	0	0	0	32° C ( 89.6° F )
12	cage0	--	0:9:0	FC	FC	10	Normal	0	0	0	0	35° C ( 95° F )

The following information is displayed:

Column	Description
<b>ID</b>	Physical disk ID, as assigned by the system. Physical disks are numbered contiguously during system installation beginning with 0.
<b>Cage</b>	The drive cage in which the disk resides.
<b>Cage Location</b>	A description of the physical location of the drive cage.
<b>Position</b>	Location of the disk in Cage:Magazine:Disk format.
<b>Device Type</b>	Indicates whether a physical disk is a Fast Class (FC), Nearline (NL), or Solid State (SSD) drive.
<b>Device Protocol</b>	The protocol used by the device, e.g., FC or Serial Attached SCSI (SAS).
<b>Device RPM</b>	Speed of the specified disk.
<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
<b>State</b>	State of the disk as identified by the kernel.
<b>Correctable Read Errors</b>	Identified correctable read errors.
<b>Uncorrectable Read Errors</b>	Identified uncorrectable read errors.
<b>Correctable Write Errors</b>	Identified correctable write errors.
<b>Uncorrectable Write Errors</b>	Identified uncorrectable write errors.
<b>Temperature</b>	Internal temperature of the disk.

## Displaying State Information

To view physical disk state information, select **State** from the filtering list.

Systems : Storage Systems : s021 : Physical Disks

Summary Physical Disks Alerts

State 47 objects Filter Clear

ID	Cage	Cage Location	Position (Cage:Magazine:Disk)	Device Type	Device Protocol	Device RPM (K)	State	State Description
0	cage0	--	0:0:0	FC	FC	10	Normal	Normal
1	cage0	--	0:0:1	NL	FC	7	Normal	Normal
2	cage0	--	0:0:2	SSD	FC	150	Normal	Normal
3	cage0	--	0:0:3	FC	FC	10	Normal	Normal
4	cage0	--	0:1:0	NL	FC	7	Normal	Normal
5	cage0	--	0:1:1	SSD	FC	150	Normal	Normal
6	cage0	--	0:1:2	FC	FC	10	Normal	Normal
7	cage0	--	0:1:3	NL	FC	7	Normal	Normal
8	cage0	--	0:8:0	SSD	FC	150	Normal	Normal
9	cage0	--	0:8:1	FC	FC	10	Normal	Normal
10	cage0	--	0:8:2	NL	FC	7	Normal	Normal
11	cage0	--	0:8:3	SSD	FC	150	Normal	Normal
12	cage0	--	0:9:0	FC	FC	10	Normal	Normal

The following information is displayed:

Column	Description
<b>ID</b>	Physical disk ID, as assigned by the system. Physical disks are numbered contiguously during system installation beginning with 0.
<b>Cage</b>	The drive cage in which the disk resides.
<b>Cage Location</b>	A description of the physical location of the drive cage.
<b>Position</b>	Location of the disk in Cage:Magazine:Disk format.
<b>Device Type</b>	Indicates whether a physical disk is a Fast Class (FC), Nearline (NL), or Solid State (SSD) drive.
<b>Device Protocol</b>	The protocol used by the device, e.g., FC or Serial Attached SCSI (SAS).
<b>Device RPM</b>	Speed of the specified disk.
<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
<b>State</b>	State of the disk as identified by the kernel.
<b>State Description</b>	Description of the drive state.

## Displaying Paths Information

**NOTE:** Paths information is available for display for systems using HP 3PAR OS version 2.3.1 and later.

To view physical disks' paths information, select **Paths** from the filtering list.



ID	Cage	Cage Location	Position (Cage:Magazine:Disk)	State	Path A (Node:Slot:Port)	Path B (Node:Slot:Port)	A State	B State	Order
0	cage0	--	0:0:0	Normal	0:0:1	1:0:1	Normal	Normal	0/1
1	cage0	--	0:0:1	Normal	0:0:1	1:0:1	Normal	Normal	1/0
2	cage0	--	0:0:2	Normal	0:0:1	1:0:1	Normal	Normal	0/1
3	cage0	--	0:0:3	Normal	0:0:1	1:0:1	Normal	Normal	1/0
4	cage0	--	0:1:0	Normal	0:0:1	1:0:1	Normal	Normal	0/1
5	cage0	--	0:1:1	Normal	0:0:1	1:0:1	Normal	Normal	1/0
6	cage0	--	0:1:2	Normal	0:0:1	1:0:1	Normal	Normal	0/1
7	cage0	--	0:1:3	Normal	0:0:1	1:0:1	Normal	Normal	1/0
8	cage0	--	0:8:0	Normal	0:0:1	1:0:1	Normal	Normal	0/1
9	cage0	--	0:8:1	Normal	0:0:1	1:0:1	Normal	Normal	1/0
10	cage0	--	0:8:2	Normal	0:0:1	1:0:1	Normal	Normal	0/1
11	cage0	--	0:8:3	Normal	0:0:1	1:0:1	Normal	Normal	1/0
12	cage0	--	0:9:0	Normal	0:0:1	1:0:1	Normal	Normal	0/1

The following information is displayed:

Column	Description
<b>ID</b>	Physical disk ID, as assigned by the system. Physical disks are numbered contiguously during system installation beginning with 0.
<b>Cage</b>	The drive cage in which the disk resides.
<b>Cage Location</b>	A description of the physical location of the drive cage.
<b>Position</b>	Location of the disk in Cage:Magazine:Disk format.
<b>State</b>	State of the disk as identified by the kernel.
<b>Path A</b>	The port location of the physical disk's A port in <node>:<slot>:<port> format.
<b>Path B</b>	The port location of the physical disk's B port in <node>:<slot>:<port> format.
<b>A State</b>	The state of the A port; Normal, Degraded, New, or Failed.
<b>B State</b>	The state of the B port; Normal, Degraded, New, or Failed.
<b>Order</b>	Displays the order of which node takes over if the primary node fails. <ul style="list-style-type: none"> <li>For a two node system, displays the primary/secondary path.</li> <li>For a four node system, displays the primary/secondary/third/fourth path.</li> </ul>

## Viewing the Physical Disks Spares Tab

**NOTE:** In order to view the **Spares** tab, you must enable spares information in preferences. See “Setting Global Preferences” (page 412).

To view the physical disks **Spares** tab:

1. Access the Physical Disks screen.
2. Click the **Spares** tab.
3. Click the **Get Data** button. This updates the list with the latest spares shown.



PD ID	PD Chunklet	LD Name	LD Chunklet	State	Usage	Media	User Reserved	Clean	Initial Location	Destination
0	462	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--
0	463	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--
0	464	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--
0	465	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--
0	466	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--
0	467	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--
0	468	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--
0	469	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--
0	470	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--
0	471	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--
0	472	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--
0	473	--	--	Normal	Available	pd.spare.label.valid	Yes	Yes	--	--

The following information is displayed:

Column	Description
PD ID	Physical disk ID, as assigned by the system. Physical disks are numbered contiguously during system installation beginning with 0.
PD Chunklet	Chunklet ID, which indicates the location of the chunklet on the physical disk. Chunklets are numbered contiguously beginning with 0
LD Name	Name of the logical disk that is using the spare chunklet.
LD Chunklet	The position of the chunklet in the logical disk.
State	State of the chunklet as identified by the kernel. See <a href="#">“System and Component Status Icons”</a> (page 407).
Usage	Indicates whether the chunklet is reserved by a logical disk or available for use.
Media	Current status of the physical disk media for the chunklet (Valid or Failed).
User Reserved	The spare status of the chunklet. Yes indicates the chunklet is reserved as a spare and No indicates a free chunklet that has been selected by the system as a spare.
Clean	Clean status of the chunklet. Yes indicates that the chunklet is free of data and ready for use. No indicates that it is currently in use, and Cleaning denotes that the chunklet is being cleaned of all data (reset to all zeros).
Initial Location	Location of the chunklet prior to relocation, expressed as <PD ID> : <chunklet ID>.
Destination	The destination of the chunklet during relocation, expressed as <PD ID> : <chunklet ID>.

### Viewing the Physical Disks Alerts Tab

To view the physical disks **Alerts** tab:

1. Access the Physical Disks screen.
2. Click the **Alerts** tab.

The **Alerts** tab displays physical disk-related alerts for the system. The information displayed in the physical disks **Alerts** tab is identical to the information contained in the systems **Alerts** tab.

The **Alerts** tab displays only physical disk-related alerts.

See [“Viewing System Alerts”](#) (page 269).

## 22 Managing Fans

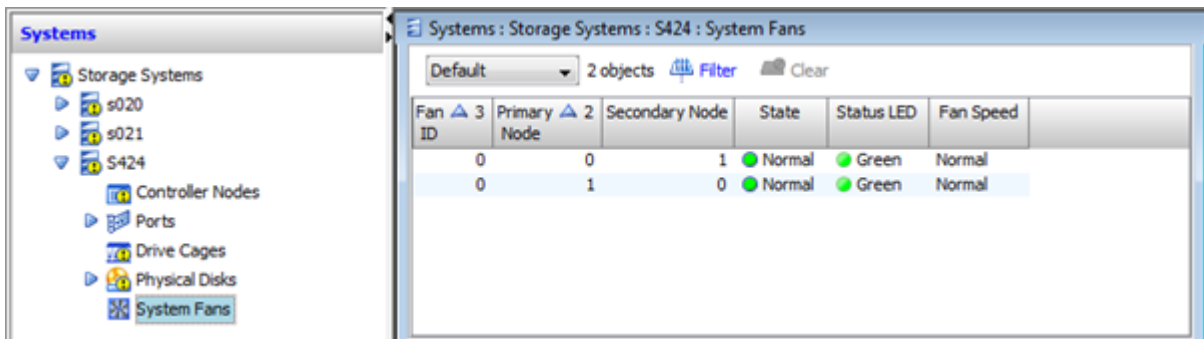
The Systems Manager allows you to view system fan information for physical disks. For more information see “Viewing System Fans” (page 326).

### Viewing System Fans

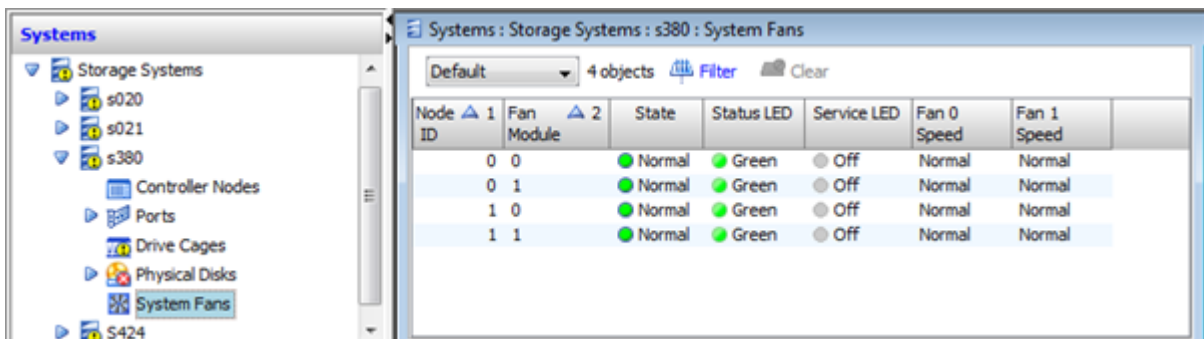
To view information about system fans:

1. Click **Systems** in the Manager Pane.
2. In the Management Tree, select **System Fans** under the system with the information you wish to view.

The **System Fans** screen for E-Class systems appears as follows:



The **System Fans** screen for V-Class systems appears as follows:



The following information is displayed:

Column	Description
<b>Node ID*</b>	The node ID.
<b>Fan ID**</b>	Fan ID, as assigned by the system.
<b>Fan Module*</b>	Fan ID, as assigned by the system.
<b>Primary Node**</b>	Node that has primary control over the fan.
<b>Secondary Node**</b>	Node that has secondary control over the fan.
<b>State</b>	Current state of the fan. See “System and Component Status Icons” (page 407).
<b>Status LED</b>	The current status of the fan, as indicated by the fan LED.
<b>Service LED*</b>	LED indicating when the system fan can be replaced.
<b>Fan Speed</b>	Current fan speed.

- \*Indicates the column is for V-Class systems only.
- \*\*Indicates the column is for E-Class systems only.

## 23 Managing Provisioning

The Provisioning Manager allows you to perform all provisioning tasks for your HP 3PAR StoreServ Storage System. These tasks include:

- Creating, editing, and maintaining virtual volumes, virtual volume sets, and virtual volume templates, as well as exporting virtual volumes.
- Creating, editing, and maintaining Common Provisioning Groups (CPGs) and CPG templates.
- Additionally, the Provisioning manager provides several ways to monitor the health of your system's provisioning.

To learn how to use the Provisioning manager, see the following:

[“Viewing Provisioning for All Systems” \(page 328\)](#)

[“Viewing Provisioning for a Single System” \(page 329\)](#)

[“Managing Common Provisioning Groups ” \(page 107\)](#)

[“Virtual Volumes” \(page 129\)](#)

[“Creating Virtual Volume Sets” \(page 141\)](#)

[“Managing VLUNs” \(page 169\)](#)

[“Creating Templates” \(page 357\)](#)

**NOTE:** If you are a domain user, only information within the domain(s) you have access to, will be visible.

If you are a domain user, you can perform any provisioning task via the **Domains** node in the management tree. The information and procedures when working in the **Domains** node are identical to those under the **Storage Systems** node, except information is filtered by domain.

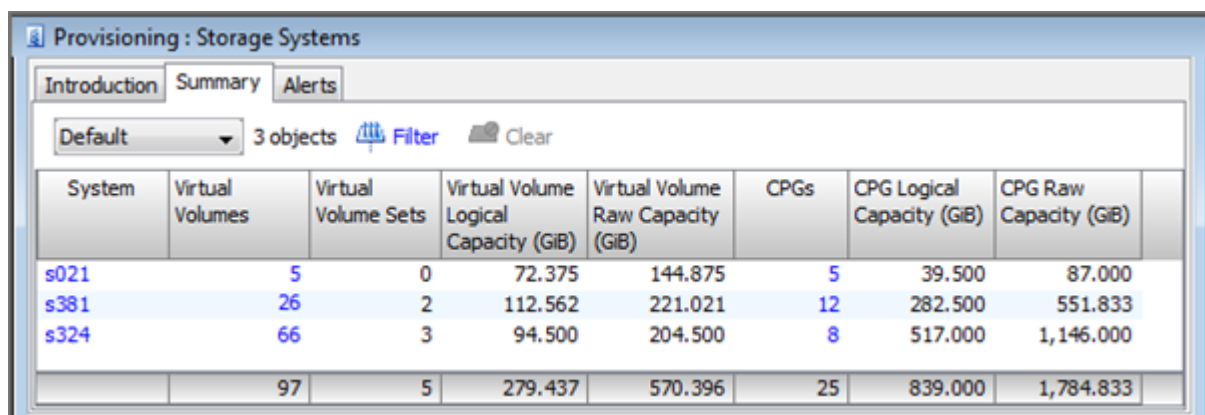
### Viewing Provisioning for All Systems

To view provisioning for all connected systems:

1. In the Manager Pane, click **Provisioning**.
2. In the Management Tree, click **Storage Systems**.

The Provisioning screen provides information on two tabs: [“Summary Tab” \(page 328\)](#) and [“Alerts Tab” \(page 329\)](#).

### Summary Tab



The screenshot shows the 'Provisioning : Storage Systems' window with the 'Summary' tab selected. It displays a table with 8 columns: System, Virtual Volumes, Virtual Volume Sets, Virtual Volume Logical Capacity (GiB), Virtual Volume Raw Capacity (GiB), CPGs, CPG Logical Capacity (GiB), and CPG Raw Capacity (GiB). The table lists three systems: s021, s381, and s324, along with their respective metrics. A summary row at the bottom totals the values for all three systems.

System	Virtual Volumes	Virtual Volume Sets	Virtual Volume Logical Capacity (GiB)	Virtual Volume Raw Capacity (GiB)	CPGs	CPG Logical Capacity (GiB)	CPG Raw Capacity (GiB)
s021	5	0	72.375	144.875	5	39.500	87.000
s381	26	2	112.562	221.021	12	282.500	551.833
s324	66	3	94.500	204.500	8	517.000	1,146.000
	97	5	279.437	570.396	25	839.000	1,784.833

The **Summary** tab displays the general provisioning of all connected systems. The following information is included:

Column	Description
<b>System</b>	The system name.
<b>Virtual Volumes</b>	The number of virtual volumes on the system. Each value is a link to that system's <b>Virtual Volume</b> screen.
<b>Virtual Volume Sets</b>	The number of virtual volume sets on the system.
<b>Virtual Volume Logical Capacity</b>	The total amount of virtual volume logical capacity in GiB.
<b>Virtual Volume Raw Capacity</b>	The total amount of virtual volume raw capacity in GiB.
<b>CPGs</b>	The number CPGs on the system. Each value is a link to that system's <b>CPGs</b> screen.
<b>CPG Logical Capacity</b>	The total amount of CPG logical capacity in GiB.
<b>CPG Raw Capacity</b>	The total amount of CPG raw capacity in GiB.
The bottom row of the table displays the column totals.	

## Alerts Tab

The **Alerts** tab displays provisioning-related alerts for all connected systems. The information displayed in the provisioning **Alerts** tab is identical to the information contained in the systems **Alerts** tab.

The **Provisioning Alerts** tab displays only provisioning-related alerts. For information on system alerts, see [“Viewing System Alerts” \(page 269\)](#).

## Viewing Provisioning for a Single System

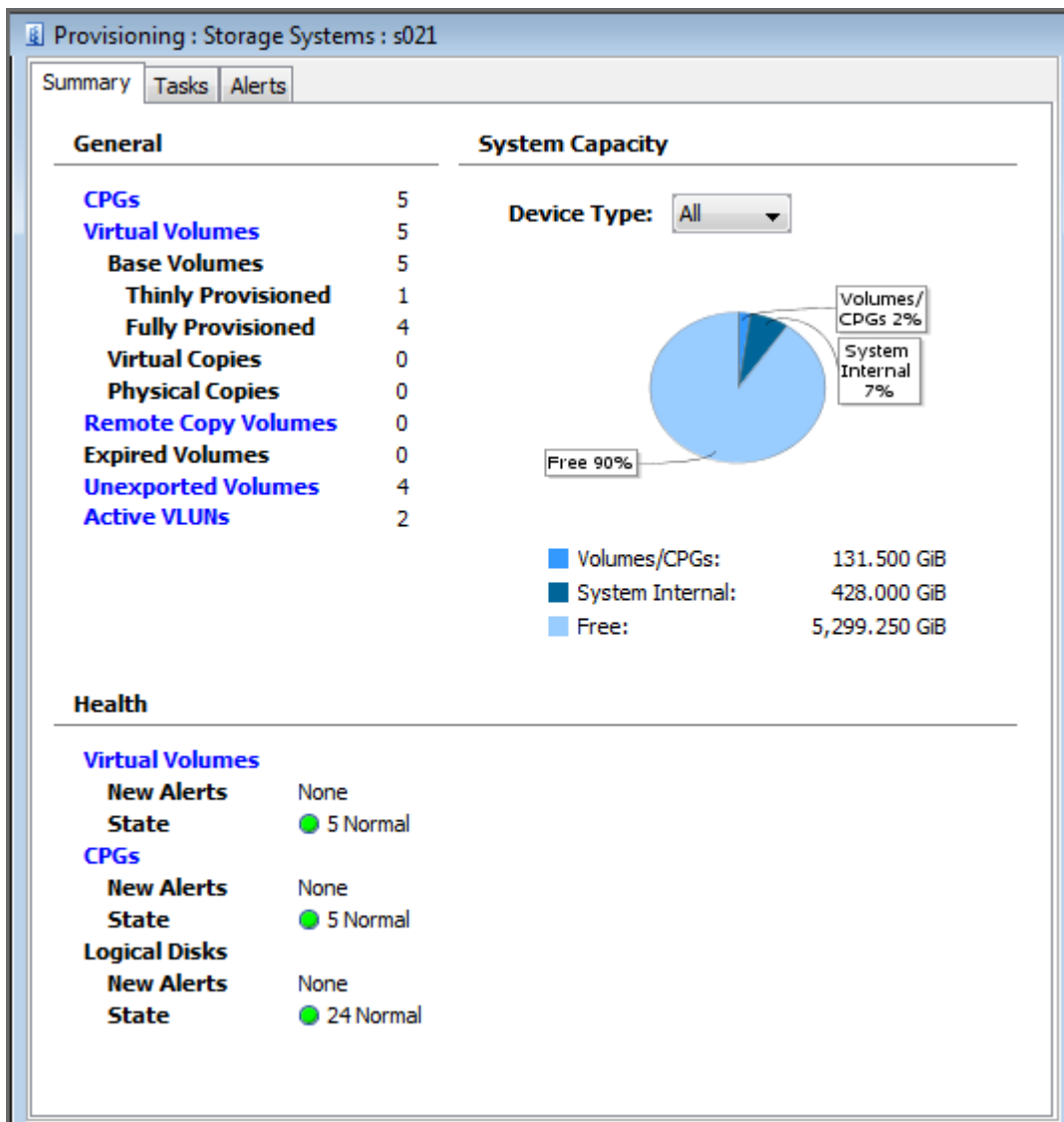
To view the provisioning for a single system:

1. In the Manager Pane, click **Provisioning**.
2. In the Management Tree, click the system under the **Storage Systems** node you wish to view.

The Provisioning screen appears in the Management Window, and provides information on three tabs: [“Summary Tab” \(page 329\)](#), [“Tasks Tab” \(page 331\)](#), and [“Alerts Tab” \(page 332\)](#).

## Summary Tab

The **Summary** tab provides information about all provisioning in the system.



The following information is displayed:

Group	Field	Description
General	CPGs	The total number of CPGs.
	Virtual Volumes	The total number of virtual volumes.
	Base Volumes	The total number of base volumes.
	Thinly Provisioned	The total number of thinly provisioned virtual volumes.
	Fully Provisioned	The total number of fully provisioned virtual volumes.
	Virtual Copies	The total number of virtual copies.
	Physical Copies	The total number of physical copies.
	Remote Copy Volumes	The total number of Remote Copy virtual volumes.
	Expired Volumes	The total number of expired virtual volumes.
	Unexported Volumes	The total number of unexported virtual volumes.
	Active VLUNs	The total number of active exported virtual volumes.
System Capacity	Device Type	Select the device type, Fast Class (FC), Near Line (NL), or Solid State Device (SSD). The capacity and capacity usage

Group	Field	Description
		of the selected device type is displayed in graphical form. You can also select All to display capacity and capacity usage for all device types.
Health	Virtual Volumes	
	New Alerts	The number of new virtual volume alerts.
	State	The current state of the system's virtual volumes. See the <a href="#">“Alert/Task/Connection Pane” (page 404)</a> for new alerts.
	CPGs	
	New Alerts	The number of new CPG alerts.
	State	The current state of the system's CPGs. See the <a href="#">“Alert/Task/Connection Pane” (page 404)</a> for new alerts.
	Logical Disks	
	New Alerts	The number of new logical disk alerts.
	State	The current state of the system's logical disks. See the <a href="#">“Alert/Task/Connection Pane” (page 404)</a> for new alerts.

## Tasks Tab

The **Tasks** tab displays information about running and completed system provisioning tasks.

The screenshot shows the 'Provisioning: Storage Systems: s021' window with the 'Tasks' tab selected. The top pane displays a list of tasks, and the bottom pane shows the details for task 1671.

ID	Type	Name	Status	User	Progress	Start Time	Finish Time	Duration	Priority
1668	System Task	check_slow_disk	✓ Completed	3parsvc	--	Sep 04, 2012 14:07:00 PDT	Sep 04, 2012 15:03:01 PDT	56 minutes 1 second	--
1670	System Task	check_slow_disk	✓ Completed	3parsvc	--	Sep 04, 2012 15:07:00 PDT	Sep 04, 2012 16:03:01 PDT	56 minutes 1 second	--
1671	System Task	remove_expired_vvvs	✓ Completed	3parsvc	--	Sep 04, 2012 15:27:00 PDT	Sep 04, 2012 15:27:01 PDT	1 second	--
1672	System Task	check_slow_disk	✓ Completed	3parsvc	--	Sep 04, 2012 16:07:00 PDT	Sep 04, 2012 17:03:01 PDT	56 minutes 1 second	--
1673	System Task	remove_expired_vvvs	✓ Completed	3parsvc	--	Sep 04, 2012 16:27:00 PDT	Sep 04, 2012 16:27:01 PDT	1 second	--
1674	System Task	check_slow_disk	✓ Completed	3parsvc	--	Sep 04, 2012 17:07:00 PDT	Sep 04, 2012 18:03:01 PDT	56 minutes 1 second	--

Task Details: 1671	
General	Detailed Status
System Name: s021	
System SN: 1000021	
ID: 1671	
Type: System Task	
Name: remove_expired_vvvs	2012-09-04 15:27:00 PDT Created task.
Status: ✓ Completed	2012-09-04 15:27:00 PDT Updated Executing "remove_expired_vvvs" as 1:19808
User: 3parsvc	2012-09-04 15:27:01 PDT Updated no vv removed
Progress: --	2012-09-04 15:27:01 PDT Completed scheduled task.
Start Time: Sep 04, 2012 15:27:00 PDT	
Finish Time: Sep 04, 2012 15:27:01 PDT	
Duration: 1 second	
Priority: --	

The **Tasks** tab is divided into a list pane and a detail pane. The list pane displays a summary of provisioning tasks for the storage server. The detail pane displays details about a selected task from the list pane.

[“List Pane” \(page 332\)](#)

[“Detail Pane” \(page 332\)](#)

## List Pane

The list pane provides the following information:

Column	Description
<b>ID</b>	The task ID.
<b>Type</b>	The task type.
<b>Name</b>	The virtual volume name on which the task was performed.
<b>Status</b>	The status of the task.
<b>Progress</b>	A graphical representation of the percentage of the task that has completed.
<b>Start Time</b>	The time the task started.
<b>Finish Time</b>	The time the task finished.
<b>Duration</b>	The amount of time the task took to complete.

## Detail Pane

The detail pane provides the following information:

Group	Field	Description
<b>General</b>	<b>System Name</b>	The name of the system.
	<b>System SN</b>	The serial number of the system.
	<b>ID</b>	The task ID.
	<b>Type</b>	The task type.
	<b>Name</b>	The virtual volume name on which the task was performed.
	<b>Status</b>	The status of the task.
	<b>Progress</b>	A graphical representation of the percentage of the task that has completed.
	<b>Start Time</b>	The time the task started.
	<b>Finish Time</b>	The time the task finished.
<b>Detailed Status</b>	<b>Duration</b>	The amount of time the task took to complete.
	Displays any details about the task as the task is running.	

## Alerts Tab

The **Alerts** tab displays provisioning-related alerts for the system. The information displayed in the provisioning **Alerts** tab is identical to the information contained in the systems **Alerts** tab, except that it displays only provisioning-related alerts. (For information on system alerts, see [“Viewing System Alerts”](#) (page 269).)



## 24 Managing Data Allocation

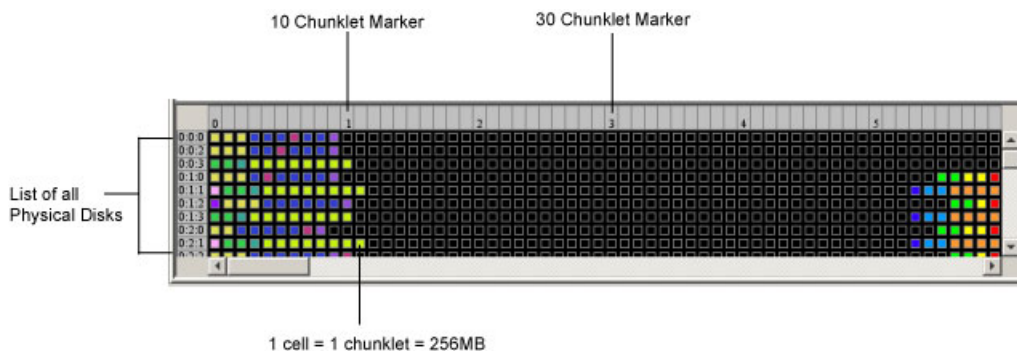
The Layout Grid Manager allows you to view layout grids showing patterns of virtual volume, Common Provisioning Group (CPG), logical disk, and physical disk usage. These grids can be used to monitor resource allocation.

**NOTE:** Logical disk information only appears if you have set your preferences in the HP 3PAR Management Console to display logical disk information. See [“Setting Global Preferences”](#) (page 412).

The following topics discuss each layout grid:

[“Viewing Layout Information for All Systems in the Layout Grid Manager”](#) (page 333)

The following figure describes the structure of each layout grid:



All types of chunklet grid screens share the same basic features:

The far left column lists all physical disks in the storage server using the format:

**<cage\_ID>:<magazine\_position>:<disk\_position>**

<cage\_ID> can be 0 (left side of the drive chassis) or 1 (right side of the drive chassis).

<magazine\_position> can be 0, 1, 2, 3, or 4.

<disk\_position> can be 0, 1, 2, 3, or 4, where 0 is the position closest to the backplane.

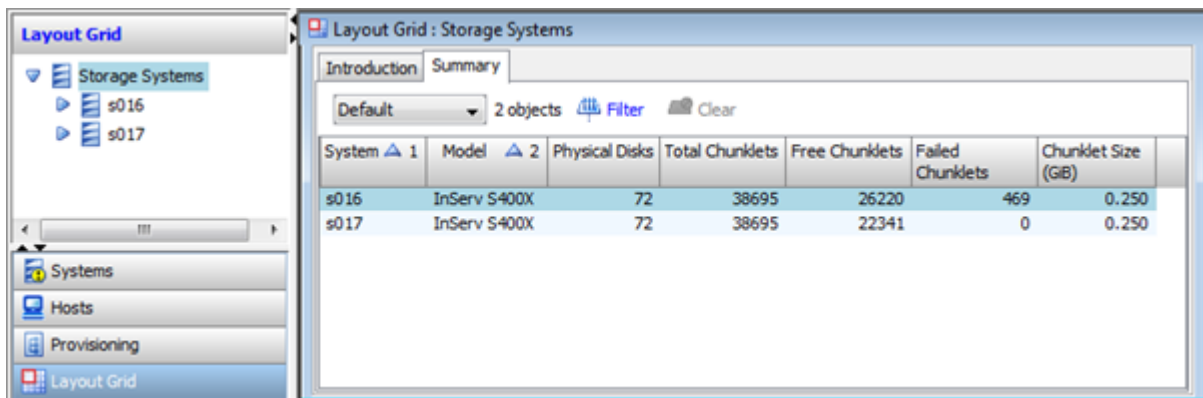
Each row represents the storage space of the disk indicated in the left column, with each cell in the grid representing one chunklet, or 256 megabytes.

Markers indicating the quantity of chunklets in multiples of 10 appear along the top of the grid.

### Viewing Layout Information for All Systems in the Layout Grid Manager

To view layout information for all connected HP Storage Systems:

1. In the Manager Pane, click **Layout Grid**.
2. In the Management Tree, click **Storage Systems**.



The following information is displayed:

Column	Description
<b>System</b>	The name of the system.
<b>Model</b>	The model number of the system.
<b>Physical Disks</b>	The number of physical disks in the system.
<b>Total Chunklets</b>	The total number of chunklets on the disk.
<b>Free Chunklets</b>	The number of chunklets on the disk available for use.
<b>Failed Chunklets</b>	The number of failed chunklets.
<b>Chunklet Size</b>	The size of each chunklet.

## Viewing the Layout Grid for a Single System

When you select a system in the Management Tree, **Virtual Volumes**, **CPGs**, and **Logical Disks** are automatically displayed. Selecting one of these options will display a list of all virtual volumes, CPGs, or logical disks in the Management Window. The information displayed in the list pane depends on your selection in the Management Tree.

**NOTE:** The **Logical Disks** and **Layout** tabs only appear if you have set your preferences in the HP 3PAR Management Console to display logical disk information. See [“Setting Global Preferences”](#) (page 412).

[“Viewing the Virtual Volumes Layout Screen”](#) (page 334)

[“Viewing the CPG Layout Screen”](#) (page 335)

[“Viewing the Logical Disk Layout Screen”](#) (page 337)

## Viewing the Virtual Volumes Layout Screen

The virtual volumes layout screen allows you to see the distribution of virtual volumes across physical disks and which chunklets are used by each virtual volume. The virtual volume layout screen is split into a list pane, which shows a summary of virtual volumes in the system, and a detail pane, which shows the chunklet layout details for a selected volume from the list pane.

To view the virtual volume layout for a single system:

1. In the Manager Pane, click **Layout Grid**.
2. In the Management Tree, select the system with the volumes you wish to view.
3. In the Management Tree, select **Virtual Volumes**.

- In the Management Window, select the Virtual Volume you wish to view. You may also select multiple volumes. The usage blocks will be a different color for each virtual volume. The color assigned to each volume is displayed next to the name in the list pane. (For information on selecting multiple items, see [“Selecting Multiple Items”](#) (page 406).)

Name	Domain	State	Grid Cell Color	Type	Provisioning	RAID	Virtual Size (GiB)	Reserved User Size (GiB)	Reserved User Size (% Virtual)	Reserved Copy Size (GiB)	Reserved Copy Size (% Virtual)	Exported To
cm_vvF1	--	Normal		Base	Full	RAID 1	1,000	1,000	100%	0,500	50%	--
cm_vvF2	--	Normal		Physical Copy	Full	RAID 1	1,000	1,000	100%	0,500	50%	--
cmTemp2	--	Normal		Base	Thin	RAID 1	1,000	1,000	100%	1,000	100%	--
cmTempV	--	Normal		Base	Thin	RAID 1	1,000	1,000	100%	1,000	100%	--
cmVV1	cmDomain1	Normal		Base	Thin	RAID 1	1,000	1,000	100%	--	--	--
cmVVFull	--	Normal		Base	Thin	RAID 1	1,000	1,000	100%	1,000	100%	--
cmVVThin	--	Normal		Base	Full	RAID 1	1,000	1,000	100%	1,000	100%	--
d_stevebnp	--	Normal		Base	Full	RAID 0	1,000	1,000	100%	--	--	--
jfu	--	Normal		Base	Thin	RAID 0	0,250	1,000	400%	1,000	400%	host, host1
jm10	--	Normal		Base	Thin	RAID 0	1,000	1,000	100%	1,000	100%	setset1
							51,306,....	103,000		31,500		

The following information is displayed in the list pane:

Column	Description
<b>Name</b>	The name of the Virtual Volume. (Clicking on the name will take you to the Provisioning Manager's Virtual Volume's tab.)
<b>Domain</b>	The domain (if any) to which the volume belongs.
<b>State</b>	The state of the system. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Grid Cell Color</b>	The color used to identify chunklets for the specified volume.
<b>Type</b>	Indicates if the volume is a base volume, physical copy, or virtual copy.
<b>Provisioning</b>	Indicates if the volume is fully (Full) or thinly provisioned (TPVV).
<b>RAID</b>	The volume's RAID type.
<b>Virtual Size</b>	The size of the volume in GiB.
<b>Reserved User Size</b>	The size of the volume's reserved user space in GiB.
<b>Reserved User Size (% Virtual)</b>	The percentage of used user space.
<b>Reserved Copy Size</b>	The size of the volume's reserved copy space.
<b>Reserved Copy Size (% Virtual)</b>	The percentage of used copy space.
<b>Exported To</b>	The host to which the volume is exported. A red entry indicates an inactive VLUN. A blue entry indicates an active VLUN. Each host name is a link to the host summary tab.

## Viewing the CPG Layout Screen

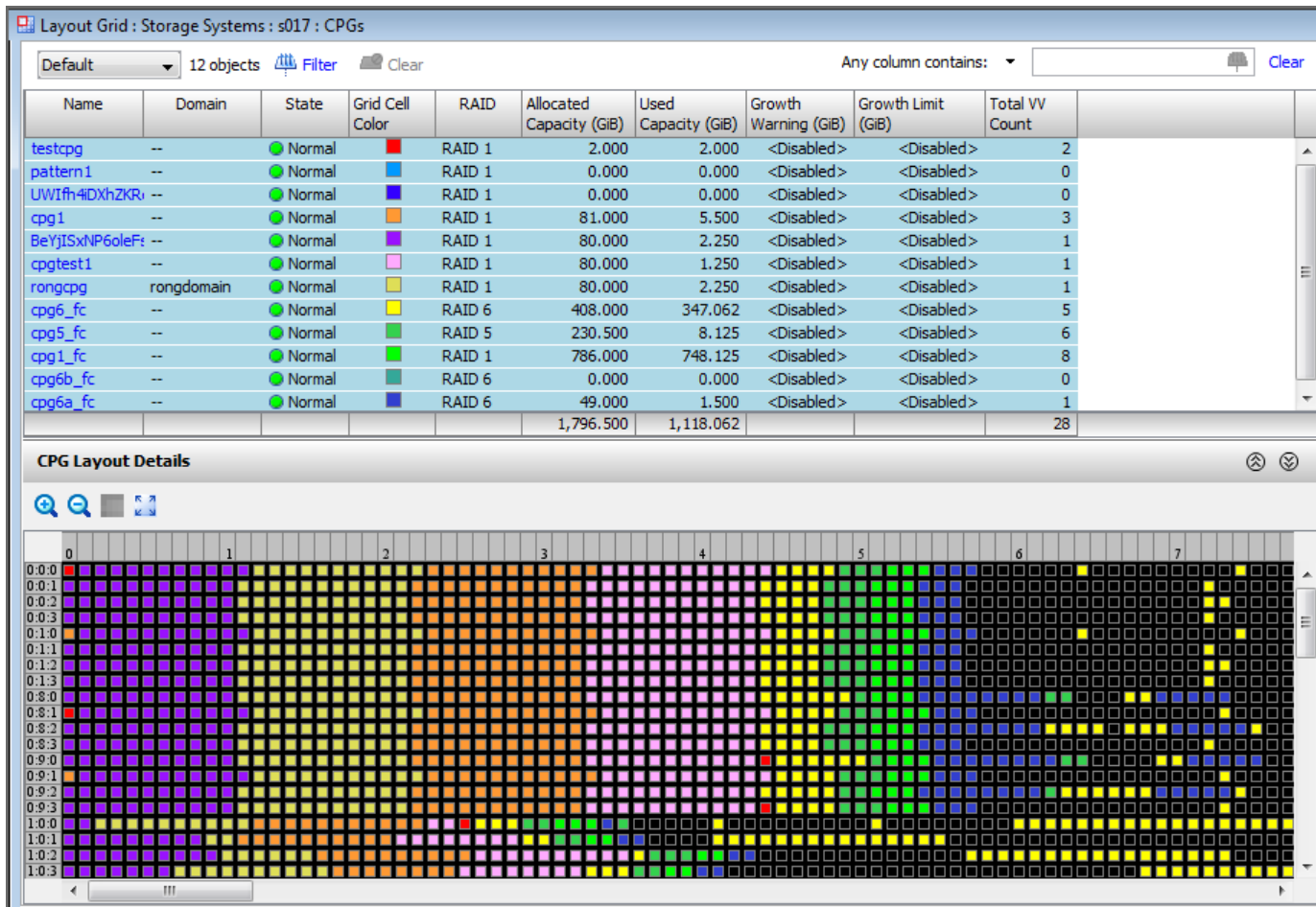
The Common Provisioning Groups (CPGs) layout screen allows you to see the distribution of CPGs across physical disks and which chunklets are used by each CPG. The CPG layout screen is split into a list pane, which shows a summary of CPGs in the system, and a detail pane, which shows the chunklet layout details for a selected CPG from the list pane.

To view the CPG layout for a single system:

- In the Manager Pane, click **Layout Grid**.
- In the Management Tree, click the system with the CPGs you wish to view.
- In the Management Tree, select **CPGs**.

- In the Management Window, select the CPG you wish to view. You may also select multiple CPGs to view. The usage blocks will be a different color for each CPG. The color assigned to each CPG is displayed next to the CPG name in the list pane. (For information on selecting multiple items, see [“Selecting Multiple Items”](#) (page 406).)

The following image displays the layout grid for multiple CPGs:



The following information is displayed in the list pane:

Column	Description
<b>Name</b>	The name of the CPG. (Clicking on the name will take you to the Provisioning Manager's layout tab for that CPG.)
<b>Domain</b>	The domain (if any) to which the CPG belongs.
<b>State</b>	The state of the system. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Grid Cell Color</b>	The color used to identify chunklets for the specified CPG.
<b>RAID</b>	The RAID type of the CPG.
<b>Allocated Capacity</b>	The amount of disk space allocated to the CPG (in GiB).
<b>Used Capacity</b>	The amount of allocated capacity used by the CPG (in GiB).
<b>Growth Warning</b>	The CPG's growth size (in GiB) at which a warning alert is generated.
<b>Growth Limit</b>	The size limit (in GiB) after which the CPG will not grow.
<b>Total VV Count</b>	The total number of VVs using the CPG.

## Viewing the Logical Disk Layout Screen

The logical disks layout screen allows you to see how chunklets are used by the logical disks in the system. The logical disks layout screen is split into a list pane, which shows a summary of logical disks in the system, and a detail pane, which shows the chunklet layout details for a selected logical disk from the list pane.

To view the logical disk layout for a single system:

1. In the Manager Pane, click **Layout Grid**.
2. In the Management Tree, select the system with the logical disks you wish to view.
3. In the Management Tree, select **Logical Disks**.
4. In the Management Window, select the Logical Disk you wish to view. You may also select multiple disks. The usage blocks will be a different color for each disk. The color assigned to each disk is displayed next to the name in the list pane. (For information on selecting multiple items, see [“Selecting Multiple Items”](#) (page 406).)

Name	Domain	State	Grid Cell Color	Device Type	Device RPM	RAID	Total Capacity (GiB)	Used Capacity (GiB)	Raw Capacity (GiB)	Write Through	Mapped to VV	Usage	Owner
pdsd1.1	---	Normal		FC	10	RAID 1	2,000	0.000	6,000	Yes	No	Preserved Data	2/3/1/0
pdsd1.2	---	Normal		FC	10	RAID 1	13,750	0.000	41,250	Yes	No	Preserved Data	2/3/0/1
slog0.0	---	Normal		FC	15	RAID 1	10,000	0.000	20,000	Yes	No	VV	0/-/-/-*
slog1.0	---	Normal		FC	15	RAID 1	10,000	0.000	20,000	Yes	No	VV	1/-/-/-*
slog2.0	---	Normal		FC	10	RAID 1	10,000	0.000	20,000	Yes	No	VV	2/-/-/-*
slog3.0	---	Normal		FC	10	RAID 1	10,000	0.000	20,000	Yes	No	VV	3/-/-/-*
tp-0-sa-0.0	---	Normal		FC	15	RAID 1	1,500	1,250	4,500	No	Yes	CPG Admin	0/1/2/3
tp-0-sa-0.1	---	Normal		FC	15	RAID 1	2,500	0.000	7,500	No	No	CPG Admin	0/1/3/2
							1,226,500	152,875	2,484,000				

The following information is displayed in the list pane:

Column	Description
<b>Name</b>	The name of the logical disk.
<b>Domain</b>	The domain (if any) to which the disk belongs.
<b>State</b>	The state of the system. See <a href="#">“System and Component Status Icons”</a> (page 407).
<b>Grid Cell Color</b>	The color used to identify chunklets for the specified logical disk.
<b>Device Type</b>	The disk type, Fast Class (FC), Nearline (NL), or Solid State (SSD).
<b>Device RPM</b>	Speed of the specified disk.
<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
<b>RAID</b>	The logical disk's RAID type.
<b>Total Capacity</b>	The total logical disk size in GiB.
<b>Used Capacity</b>	The amount of logical disk space used in GiB.
<b>Raw Capacity</b>	The raw capacity of the logical disk in GiB.
<b>Write Through</b>	Indicates if the logical disk is in write-through mode.
<b>Mapped to VV</b>	Indicates if the logical disk is mapped to a virtual volume.
<b>Usage</b>	Indicates the purpose for which the logical disk is used.
<b>Owner</b>	Specifies the owning nodes.

---

## 25 Tracking Performance

The **Performance & Reports** Manager allows you to:

- Create charts from predefined performance charts for physical disks, host ports, and disk ports.
- Create, edit, and save your own customized performance charts.
- Create reports that measure activity on AO Configurations and CPGs.

[“Viewing Performance” \(page 338\)](#)

[“Creating a New Chart” \(page 340\)](#)

[“Saving a Chart” \(page 341\)](#)

[“Editing a Chart” \(page 341\)](#)

### Viewing Performance

The HP 3PAR Management Console provides pre-defined performance charts for physical disk usage, disk port, and host ports.

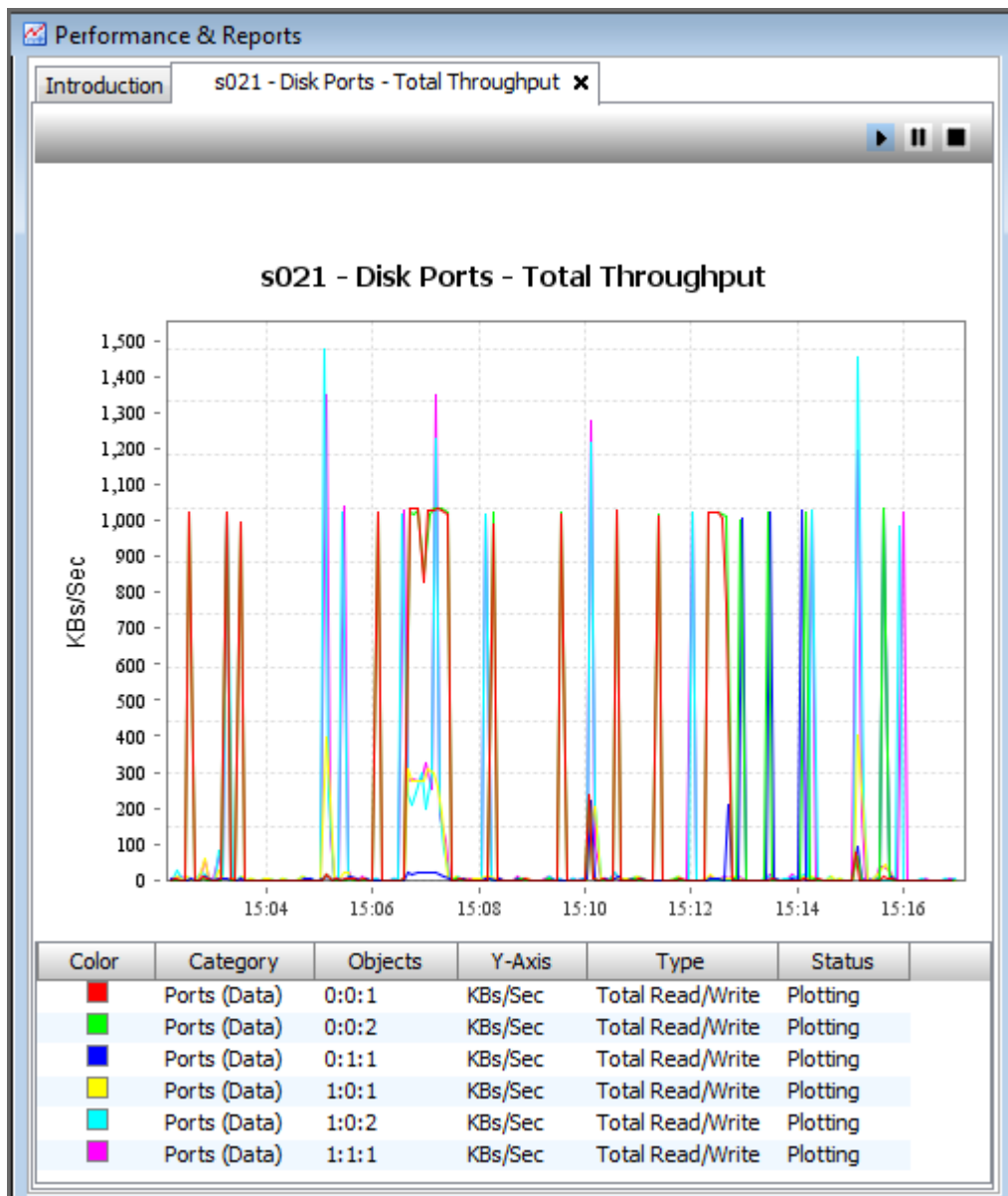
To view a pre-defined performance chart:

1. In the Manager Pane, click **Performance & Reports**.
2. In the Management Tree, click either the **Physical Disks** or **Ports (Data)** node under the system for which you wish to view performance.
3. Click **PD Usage - Total IOPS**, **Disk Ports - Total Throughput**, or **Hosts Ports - Total Throughput**.
4. Repeat steps 2 and 3 for any additional performance charts you wish to view.

A performance chart for each selected chart type is displayed in the Management window and data collection and chart generation begins.

### Viewing Performance Over Time

The **Disk Ports** and **Host Ports** charts display line graphs, which show performance over time.



Each started chart is tabbed at the top of the Management window. Simply click the tab for the chart you wish to view.

At any time, you can use the controls at the upper right corner of each chart to pause or stop the generation of the performance chart.

- Pausing the chart will stop the plotting of data, but data collection will still occur in the background.
- Stopping the chart stops both data collection and plotting.

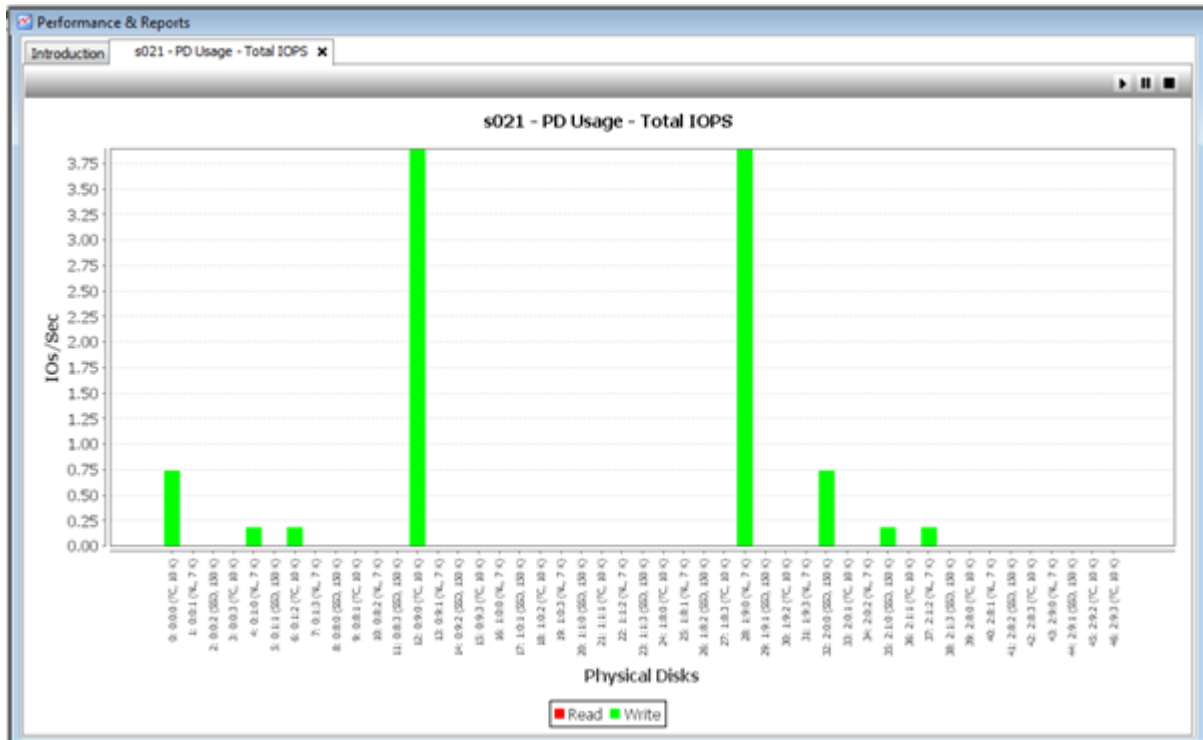
The detail pane of the chart provides a legend indicating color/plot association. Clicking a row in the legend results in the corresponding plot becoming highlighted.

If you wish to change the color of a plot, click the color under the **Color** column and then choose a new color in the menu that appears.

## Viewing Instantaneous Statistics

The **PD Usage** performance chart displays the latest updated physical disk IOPS statistics. Instead of a line graph, a bar graph is displayed, which shows the physical disk performance at the moment.





## Creating a New Chart

To create a new performance chart, access the **Chart Configuration** wizard:

1. In the Manager Pane, click **Performance & Reports**.
2. In the Common Tasks panel, click **New Chart**.

## Chart Selection

1. Select either **Template** or **Custom**.
2. If you selected **Template**, select the type of objects to plot by choosing **PD Usage** under **Physical Disk**, or **Disk Ports**, **Host Ports**, **RCFC Ports**, or **RCIP Ports** under **Ports (Data)**.
3. If you selected **Custom**:
  - a. **Name** - Enter a name for your chart.
  - b. (Optional) **Description** - Enter a description.
  - c. **Polling Interval** - Enter a value from 5 to 3,600 seconds.
4. Click **Next**.

## Object Selection

1. Select a system from the **System** list.
2. By default, all objects will be plotted in the chart. If you wish to choose objects, deselect the **All** checkbox and then select objects to plot in the objects list.
3. Click **Next** to view the summary, or click **Finish**.

If you previously selected **Custom** in **Chart Selection**:

1. Select a system from the **System** list.
2. Select an object from the **Category** list.
3. By default, all objects will be plotted in the chart. If you wish to choose objects, deselect the **All** checkbox and then select objects to plot in the objects list.



4. If you selected individual objects:
  - a. (Optional) If you do not want a plot that combines all selected objects, uncheck the **Create a plot that aggregate all selected objects** checkbox.
  - b. (Optional) If you want to display the aggregate, but not an individual plot for the selected objects, uncheck the **Create an individual plot for each selected object** checkbox.
5. From the **Y-Axis** list, select a performance metric.
6. From the **Type** list, select a value. (**Total Read/Write** = plot both reads and writes, **Read** = plot reads only, **Write** = plot writes only)
7. To change the default color shown, click the **Color** button and select a new color for the plot.
8. Click **Add** to add the new plot to the **Plots** list.
9. If you wish to add additional plots, repeat steps 1 through 8.
10. Click **Next** to view the summary, or click **Finish**.

## Summary

Review the summary information. When satisfied, click **Finish**.

## Saving a Chart

To save a chart:

1. Create a new chart.
2. In the Main Menu Bar, click **Actions > Performance > Save Chart**.
3. Enter a name for the chart and select a save location.
4. Click **Save**.

The saved chart will appear under the **Save Charts** tree node once saved.

---

**NOTE:** When saving a chart, only the chart configuration data is saved. The plot data is not saved.

---

## Editing a Chart

To edit a chart, access the **Edit Chart Configuration** wizard:

1. In the Manager Pane, click **Performance**.
2. In the Management Tree, select a chart under the **Saved Charts** node.
3. In the Main Menu Bar, click **Actions > Performance > Edit Chart**.

## Chart Selection

1. Enter a new **Name**, **Description**, and/or **Polling Interval**.
2. Click **Next**.

## Object Selection

1. Select a system from the **System** list.
2. By default, all objects will be plotted in the chart. If you wish to choose objects, deselect the **All** checkbox and then select objects to plot in the objects list.
3. Click **Next**.

If you are editing a custom chart:

1. Select a system from the **System** list.
2. Select an object from the **Category** list.
3. By default, all objects will be plotted in the chart. If you wish to choose objects, deselect the **All** checkbox and then select objects to plot in the objects list.

4. If you selected individual objects:
  - a. (Optional) If you do not want a plot that combines all selected objects, uncheck the **Create a plot that aggregate all selected objects** checkbox.
  - b. (Optional) If you want to display the aggregate, but not an individual plot for the selected objects, uncheck the **Create an individual plot for each selected object** checkbox.
5. From the **Y-Axis** list, select a performance metric.
6. From the **Type** list, select a value. (**Total Read/Write** = plot both reads and writes, **Read** = plot reads only, **Write** = plot writes only)
7. To change the default color shown, click the **Color** button and select a new color for the plot.
8. Click **Add** to add the new plot to the **Plots** list.
9. If you wish to add additional plots, repeat steps 1 through 8.
10. Click **Next** to view the summary, or click **Finish**.

## Summary

Review the summary information, then click **Finish**.

## Creating a Report

To create a Report, select **Performance & Reports** in the Manager Pane.

The Create New Report wizard appears.

## Select Report

When this wizard is invoked from the Performance & Reports Manager, no tree node will be selected by default. You will need to select either the AO configuration or the CPG tree node in order to proceed. When this wizard is invoked from the CPG table panel, the CPG tree node will be pre-selected. When invoked from the AO configurations table panel, the AO configuration tree node will be pre-selected.

A Region IO density report for a given AO configuration or CPG will be displayed. When the AO configuration tree node is selected, a sample stacked bar chart will be displayed.

Once you select the type of report you want to generate, a default report Name and Description will appear to the right side of the page. You may keep the default text or provide your own.

**Name** – (Required) The name to be assigned to the report.

**Description** – (Optional) A description of the report.

To create a new report:


1. Select the type of report to run from the Region IO Density tree: AO Configuration or CPG.
2. Keep the default Name and Description, or enter your own.
3. Click **Next** to go to the Object Selection page.

## Object Selection

1. In the General groupbox, select the **System** to be analyzed.
2. Select the **Domain** (if any) in which the AO Configuration or CPG resides.
3. Select the name of the **AO Configuration** or **CPG** to be analyzed.
4. Select the **Chart Detail** (Fine, Medium, or Coarse).
5. (Optional) In the Time Interval groupbox, select a **Start Time** and **End Time**. If you keep the default End Time as the current date and time, you may select the start time to be a specific number of hours prior to the end time. You also have the option to select a specific date and time for both the start and end times.

To create your own start and end times:

- a. Select the radio button to the left of the Start Time textbox.

- b. Click the  icon and select a date.
  - c. To change the date or time now displayed, click on any portion of the date or time, then click the up or down arrow.
  - d. Repeat the above steps for setting a specific End Time.
6. Click **Next** to go to the Summary page, or click **Finish** to complete the wizard.

## Summary

Review your settings, then click **Finish** to complete the wizard.

## 26 Tracking and Scheduling Tasks

The **Task & Schedules** Manager allows you to retrieve, remove, cancel, and schedule tasks on HP 3PAR StoreServ Storage Systems.

[“Viewing the Tasks Summary” \(page 344\)](#)

[“Displaying Tasks” \(page 345\)](#)

[“Removing Tasks” \(page 345\)](#)

[“Cancelling Tasks” \(page 345\)](#)

### Viewing the Tasks Summary

The HP 3PAR Management Console allows you to view a summary of tasks for all connected systems or for a single connected system.

To view the tasks summary:

1. In the Manager Pane, click **Tasks & Schedules**.
2. In the Management Tree, click **Storage Systems**.
3. (Optional) If you wish to view tasks for a single system, select a system under the **Storage Systems** node.
4. In the Management Window, click the **Summary** tab.
5. If you wish to view tasks from the last hour, select **Last Hour Only**. If you wish to view system tasks, select **Include System Tasks**.

Tasks & Schedules : Storage Systems

IntroductionSummaryTasksSchedules

☒ Last Hour Only☒ Include System Tasks

Tasks by System

System	Running	Completed	Canceled	Failed
s021	1	2	0	0
s324	1	2	0	0
s381	1	2	0	0

Tasks by Type

Type	Running	Completed	Canceled	Failed	Last Failure
System Task	3	6	0	0	--

**NOTE:** If you selected a specific system under the **Storage Systems** node in the Management Tree, the **Tasks by System** group will not be displayed on the tasks **Summary** tab.

### Viewing the Tasks Tab

When the Tasks tab is selected, you can display tasks according to selected criteria, and remove and cancel tasks.

[“Displaying Tasks” \(page 345\)](#)

[“Removing Tasks” \(page 345\)](#)

[“Cancelling Tasks” \(page 345\)](#)

## Displaying Tasks

You can display completed, running, failed, and canceled tasks within a specified time period.

To display tasks:

1. In the Manager Pane, click **Tasks & Schedules**.
2. In the Management Tree, click **Storage Systems**.
3. (Optional) If you wish to display tasks for a single system, select a system under the **Storage Systems** node.
4. In the Management Window, click the **Tasks** tab.
5. In the **Show tasks that are** list, select **in any state**, **Completed**, **Running**, **Canceled**, or **Failed**.
6. In the **within last** text box and list, enter the number and select either hour(s) or day(s).
7. (Optional). Select **Include System Tasks** to also retrieve system tasks.
8. Click the **Get Tasks** button.

The list pane of the **Tasks** tab displays task information per your entered parameters. The detail pane of the **Tasks** tab displays detailed information about a selected task from the list pane.

ID	Type	Name	Status	User	Progress	Start Time	Finish Time	Duration
4841	Scheduled Task	secondsccheduleforsav_v2	Failed	3paradm	--	Aug 20, 2012 13:00:00 PDT	Aug 20, 2012 13:00:03 PDT	3 seconds
4842	Scheduled Task	sav_v2_createvcopyschedule	Failed	3paradm	--	Aug 20, 2012 13:00:00 PDT	Aug 20, 2012 13:00:03 PDT	3 seconds
4843	Convert Virtual Volume	cmVFull	Completed	root	--	Aug 20, 2012 13:06:09 PDT	Aug 20, 2012 13:06:21 PDT	12 seconds
4845	Convert Virtual Volume	cmVFull	Running	root	100%	Aug 20, 2012 13:11:46 PDT	--	--
4845	Convert Virtual Volume	cmVFull	Completed	root	--	Aug 20, 2012 13:11:46 PDT	Aug 20, 2012 13:12:08 PDT	22 seconds

**Task Details: 4845**

General	Detailed Status
<b>System Name</b> s016	2012-08-20 13:11:46 PDT Created task.
<b>System SN</b> 1000016	2012-08-20 13:11:46 PDT Converting VV 'cmVFull' to thinly provisioned.
<b>ID</b> 4845	2012-08-20 13:11:46 PDT Scheduled region move of 256MB from (cmVFull.usr.1:0MB) to (cmVFull.ldev.0:256MB).
<b>Type</b> Convert Virtual Volume	2012-08-20 13:11:46 PDT Scheduled region move of 256MB from (cmVFull.usr.0:0MB) to (cmVFull.ldev.0:256MB).
<b>Name</b> cmVFull	2012-08-20 13:11:46 PDT Scheduled region move of 256MB from (cmVFull.usr.1:256MB) to (cmVFull.ldev.0:512MB).
<b>Status</b> Running	2012-08-20 13:11:46 PDT Scheduled region move of 256MB from (cmVFull.usr.0:256MB) to (cmVFull.ldev.0:768MB).
<b>User</b> root	2012-08-20 13:11:46 PDT Storing task data for later restarts.
<b>Progress</b> 100%	2012-08-20 13:11:46 PDT Started region move of 256MB from (cmVFull.usr.1:0MB) to (cmVFull.ldev.0:0MB).
<b>Start Time</b> Aug 20, 2012 13:11:46 PDT	2012-08-20 13:11:46 PDT Started region move of 256MB from (cmVFull.usr.0:0MB) to (cmVFull.ldev.0:256MB).
<b>Finish Time</b> --	2012-08-20 13:11:46 PDT Started region move of 256MB from (cmVFull.usr.1:256MB) to (cmVFull.ldev.0:512MB).
<b>Duration</b>	2012-08-20 13:11:46 PDT Started region move of 256MB from (cmVFull.usr.0:256MB) to (cmVFull.ldev.0:768MB).
	2012-08-20 13:12:01 PDT Waiting to switch regions to their new locations.
	2012-08-20 13:12:07 PDT Switching regions to their new locations.
	2012-08-20 13:12:07 PDT Converting cmVFull.
	2012-08-20 13:12:08 PDT Reclaiming unused LD space.
	2012-08-20 13:12:08 PDT Deleted LD cmVFull.usr.1. Reclaimed 512MB.
	2012-08-20 13:12:08 PDT Deleted LD cmVFull.usr.0. Reclaimed 512MB.
	2012-08-20 13:12:08 PDT Cleaning up task data for later restarts.
	2012-08-20 13:12:08 PDT Completed region moves. Moved 4 regions for a total of 1024 MB in 22 seconds.

## Removing Tasks

To remove tasks:

1. Access the **Tasks** tab.
2. In the list pane of the **Tasks** tab, select the task(s) you wish to remove.
3. Right-click the selection and then click **Remove Task** in the menu that appears.  
The **Remove Task(s)** dialog box appears.
4. Click **OK**.

## Cancelling Tasks

To cancel tasks:

1. Access the **Tasks** tab.
2. In the list pane of the **Tasks** tab, select the task(s) you wish to cancel.

- Right-click the selection and then click **Cancel Task** in the menu that appears.  
The **Cancel Task(s)** dialog box appears.
- Click **OK**.

## Viewing the Schedules Tab

The HP 3PAR Management Console provides the ability to schedule virtual volume and virtual volume set snapshot creation, consistency group snapshot creation, CPG compaction, and Adaptive Optimization configuration.

The Schedules tab contains a list pane and a detail pane. The columns displayed in the list pane for both Storage Systems and system nodes are the same, with the exception that when the Storage Systems node is selected, there is an additional column indicating the system name on which the task is scheduled.

List and detail panes for Storage Systems node:

**Tasks & Schedules : Storage Systems**

Introduction Summary Tasks Schedules

Default 16 objects Filter Clear Any column contains: Clear

System	Name	Type	Created by	Status	Alert on Failure	Next Run	
s020	compacthourly	Compact CPG	root	Active	✓	Nov 28, 2011 14:45:00 PST	45 minutes past ev
s020	cotest.compact	Compact CPG	root	Active	✓	Nov 28, 2011 15:16:00 PST	16 minutes past ev
s020	demo.hourly	Create Consistency Group Virtual Copies	root	Active	✓	Nov 28, 2011 14:50:00 PST	50 minutes past ev
s020	ff	Create Consistency Group Virtual Copies	root	Active	✓	Nov 28, 2011 14:36:00 PST	6, 21, 36, and 51 m
s020	move_back_chunklet	System Task	3parsvc	Active		Dec 04, 2011 02:17:00 PST	02:17 on Sunday in
s020	remove_expired_vvvs	System Task	3parsvc	Active		Nov 28, 2011 15:27:00 PST	27 minutes past ev
s020	xyz.hourly	Create Virtual Copy	root	Active	✓	Nov 28, 2011 14:40:00 PST	40 minutes past ev

**Schedule Details: compacthourly**

System Name: s020  
 System SN: 1000020  
 Name: compacthourly  
 Type: Compact CPG  
 Command: compactpg -f cotest  
 Created by: root  
 Status: Active  
 Alert on Failure: Yes  
 Next Run: Nov 28, 2011 14:45:00 PST  
 Recurrence: 45 minutes past every hour of every day in every month

List and detail panes for systems node:

**Tasks & Schedules : Storage Systems : s020**

Summary Tasks Schedules

Default 16 objects Filter Clear Any column contains: Clear

Name	Type	Created by	Status	Alert on Failure	Next Run	Rec
b	Compact CPG	root	Active	✓	Nov 28, 2011 15:00:00 PST	15:00 on every day in every mont
compacthourly	Compact CPG	root	Active	✓	Nov 28, 2011 14:45:00 PST	45 minutes past every hour of ev
cotest.compact	Compact CPG	root	Active	✓	Nov 28, 2011 15:16:00 PST	16 minutes past every hour of ev
c	Create Consistency Group Virtual Copies	root	Active	✓	Nov 28, 2011 15:03:00 PST	3 minutes past every hour of ev
demo.hourly	Create Consistency Group Virtual Copies	root	Active	✓	Nov 28, 2011 14:50:00 PST	50 minutes past every hour of ev
ade	Create Consistency Group Virtual Copies	root	Active	✓	Nov 28, 2011 15:30:00 PST	30 minutes past every hour of ev
ff	Create Consistency Group Virtual Copies	root	Active	✓	Nov 28, 2011 14:36:00 PST	6, 21, 36, and 51 minutes past ev

**Schedule Details: compacthourly**

System Name: s020  
 System SN: 1000020  
 Name: compacthourly  
 Type: Compact CPG  
 Command: compactpg -f cotest  
 Created by: root  
 Status: Active  
 Alert on Failure: Yes  
 Next Run: Nov 28, 2011 14:45:00 PST  
 Recurrence: 45 minutes past every hour of every day in every month

The list pane provides the following information:

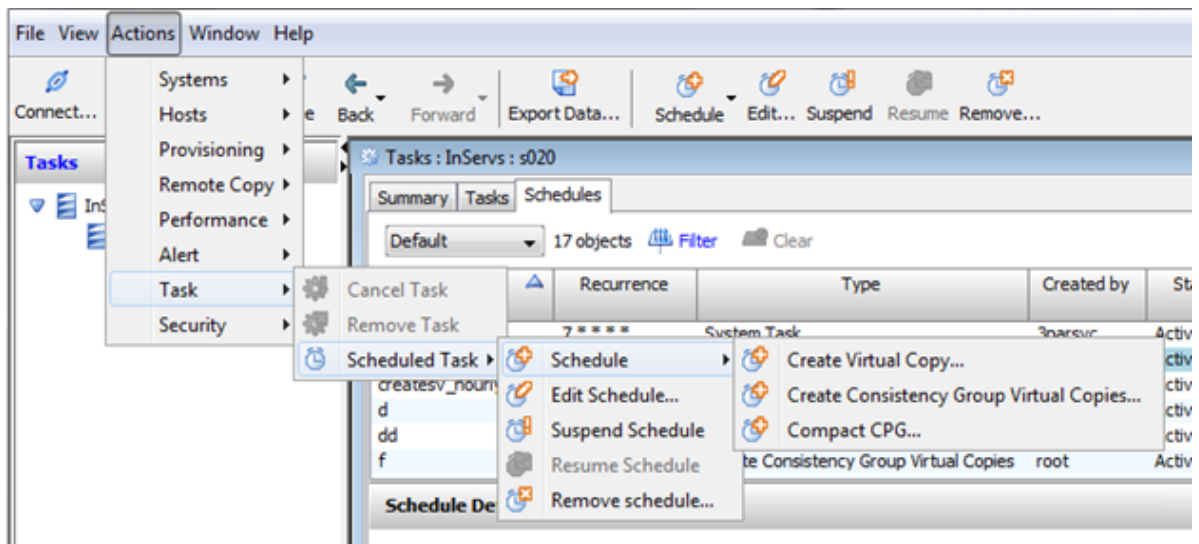
Column	Description
<b>System</b>	The name of the system on which the task is scheduled (Storage Systems node only.)
<b>Name</b>	The schedule name.
<b>Type</b>	The type of task scheduled, such as Compact CPG or Create Virtual Copy.
<b>Created by</b>	The user who created the scheduled task.
<b>Status</b>	The status of the scheduled task.
<b>Alert on Failure</b>	Indicates whether an alert will be generated if the scheduled task fails.
<b>Next Run</b>	Indicates the next time the task will be executed.
<b>Recurrence</b>	Text description of the tasks recurring schedule.

The detail pane provides the same information as the list pane with the addition of the following information:

**Command** – The corresponding CLI command to run the scheduled task.

You can access the scheduler using any of the following methods:

- **Main Actions Menu** – On the Main Actions menu, there is a submenu called Scheduled Task under the Task menu. This will allow you to schedule a task, edit, suspend, resume or remove an existing schedule.

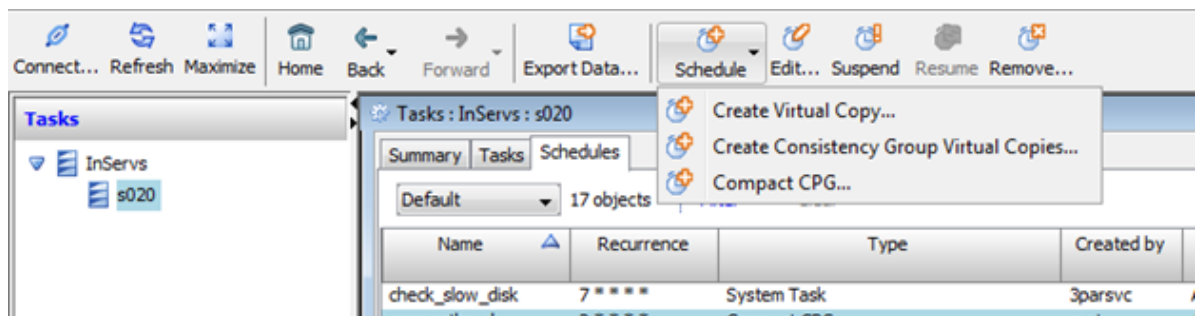


- **Tasks & Schedules Manager**

- **Common Actions Panel** – Contains options for creating a schedule to create a virtual copy, create a consistency group virtual copy, compact a common provisioning group, or adaptive optimization



- **The Toolbar** – Contains options to create a schedule and to edit, suspend, resume, and remove a schedule. At least one row in the table displayed in the Management Window must be selected to enable the Edit, Suspend, Resume, and Remove actions. These four actions will also be on the table right-click popup menu.



- **Common Schedule Panel** – The schedule panel is a common panel that is embedded across all dialogs and wizards for operations that can be scheduled. For example, if you choose to create a virtual copy from the Common Actions Panel under the Provisioning Manager, the Create Virtual Copy dialog box gives you the option of either creating the virtual copy immediately or selecting a time to schedule the creation. For more information, see [“The Common Schedule Panel”](#) (page 349).



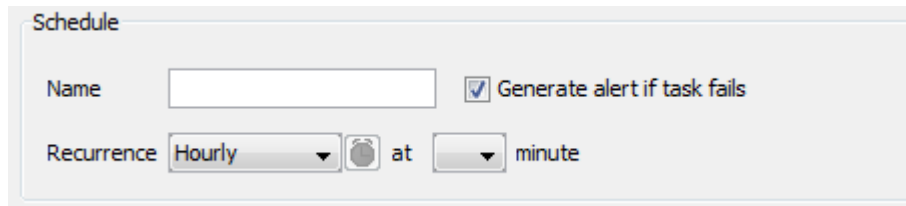
## Scheduling Tasks

The following scheduling actions are available:

- “Schedule Create Virtual Copy” (page 352)
- “Schedule Create Consistency Group Virtual Copies” (page 353)
- “Schedule Compact CPG” (page 354)
- “Schedule AO” (page 354)
- “Edit a Schedule” (page 355)
- “Suspend a Schedule” (page 355)
- “Resume a Schedule” (page 355)
- “Remove a Schedule” (page 356)

## The Common Schedule Panel

The Common Schedule Panel offers numerous options for creating a schedule. Required and optional parameters are entered in the **Schedule** group box.

The image shows a screenshot of a software dialog box titled "Schedule". It contains a "Name" text input field, a checked checkbox labeled "Generate alert if task fails", a "Recurrence" dropdown menu currently set to "Hourly", a circular icon with a dot inside, the word "at", another dropdown menu, and the word "minute".

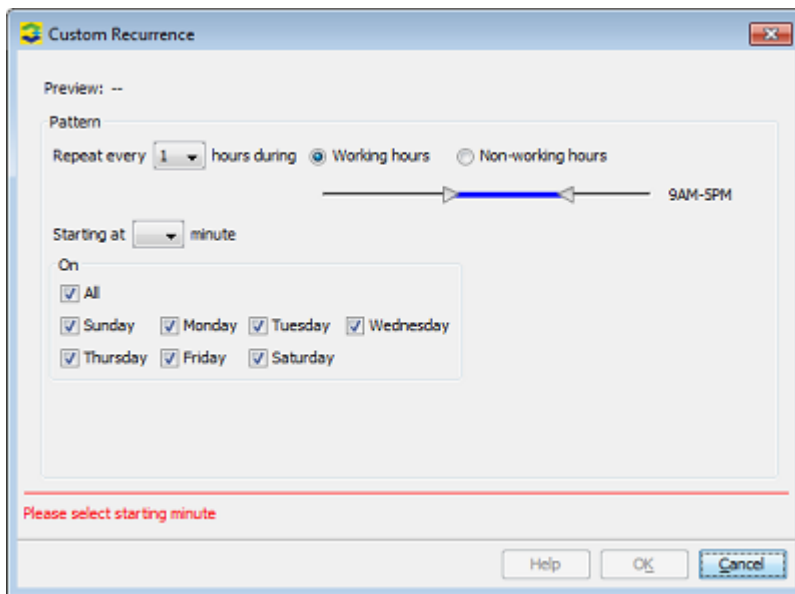
The available fields are as follows:

**Name** – The name of the schedule (required). An empty Name field will result in a validation error.

**Generate alert if task fails** – Select this checkbox if you want to generate an alert when the scheduled task fails.

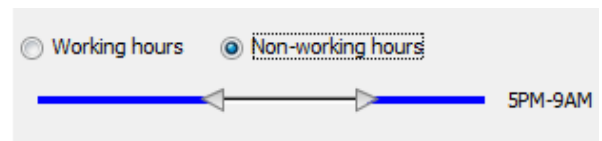
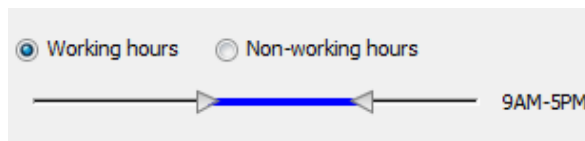
**Recurrence** – How often you want the schedule to run. The possible values are:

- **Hourly** – Run every hour at the specified minute. The starting minute is required. In this way tasks can be scheduled at different times to maintain optimal system performance.
- **Daily** – Run everyday at specified hour. The default value for the hour is rounded up to the top of the next hour.
- **Once** – Run once at the specified time and date. The default value for the time is rounded up to the top of the next hour.
- **Multiple Daily** – When Multiple Daily is selected, the Custom Recurrence dialog opens. The recurrence button to the right of the combo box is enabled when Multiple Daily is selected so that the dialog can be reopened to edit the recurrence.



This recurrence option allows you to specify:

- How often to repeat within an hour range. By default, the task recurs during working hours of 9AM-5PM. To change the interval, you can select the desired value. Possible values are: 1, 2, 3, 4, 6, 8, and 12. To limit to working hours only, you can adjust using the range slider component. To limit to non-working hours, you can select the Non-working hours radio button.



The following hour ranges are invalid and will produce a validation error:

- When the starting and ending hours for Working hours are the same.
- When the starting and ending hours for Non-working hours encompass the entire time span from 11PM-0AM.
- The starting minute within the hour. The **Preview** field will display the recurrence schedule after you specify this option, and will automatically update the display as you select different criteria for the schedule.
- The number of days per week to run the task. By default, all days are selected. Deselecting the All checkbox clears the selections. Deselecting any day when the All checkbox is selected will also deselect the All checkbox.
- Advanced** – When Advanced is selected, the Custom Recurrence dialog opens with options which allow you to specify combinations for Minutes, Hours, Months, Days of Months, and Days of Week. The Days of Months and Days of Week selections are mutually exclusive. The recurrence button to the right of the combo box is enabled when Advanced is selected so that the dialog can be reopened to edit the recurrence.

Custom Recurrence

Preview: --

Pattern

☒ Minutes: Every minute

Interval between minutes must be 15 or more

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19

☐ 20 ☐ 21 ☐ 22 ☐ 23 ☐ 24 ☐ 25 ☐ 26 ☐ 27 ☐ 28 ☐ 29

☐ 30 ☐ 31 ☐ 32 ☐ 33 ☐ 34 ☐ 35 ☐ 36 ☐ 37 ☐ 38 ☐ 39

☐ 40 ☐ 41 ☐ 42 ☐ 43 ☐ 44 ☐ 45 ☐ 46 ☐ 47 ☐ 48 ☐ 49

☐ 50 ☐ 51 ☐ 52 ☐ 53 ☐ 54 ☐ 55 ☐ 56 ☐ 57 ☐ 58 ☐ 59

☐ Hours

☐ Months

☐ Days of Month

☐ Days of Week

Please select starting minute

Help OK Cancel

This recurrence option allows you to specify:

- **Minutes** – (Required) The Minutes checkbox is selected and disabled. By default, none of the minutes is selected. The interval between minutes must be 15 or more. Therefore, when a minute is selected, the checkboxes for the 14 minutes before and after it are disabled to enforce this rule. If only minutes are selected and no other options, the recurrence will be at the selected minutes of every hour, every day, every month.
- **Hours** – When the Hours checkbox is selected, the Hours panel is expanded. By default, all hours are selected. Deselecting the All checkbox clears the selections. Deselecting any hour when the All checkbox is selected will also deselect the All checkbox.
- **Months** – When the Months checkbox is selected, the Months panel is expanded. By default, all months are selected. Deselecting the All checkbox clears the selections. Deselecting any month when the All checkbox is selected will also deselect the All checkbox.
- **Days of Month** – (Disabled if the Days of Week checkbox is selected.) When the Days of Month checkbox is selected, the Days of Month panel is expanded. By default, all days are selected. Deselecting the All checkbox clears the selections. Deselecting any day when the All checkbox is selected also deselects the All checkbox.  
The Days of Month and Months panels are linked so that days and months are disabled depending on day and month selected:
  - If February is selected, the checkboxes for days 29, 30, and 31 are disabled.
  - If April, June, September, or November is selected, the checkbox for day 31 is disabled.

- If day 31 is selected, the checkboxes for February, April, June, September, and November are disabled.
- If day 29, 30, or 31 is selected, the checkbox for February is disabled.
- **Days of Week** – (Disabled if the Days of Month checkbox is selected.) When the Days of Week checkbox is selected, the Days of Week panel is expanded. By default, all days are selected. Deselecting the All checkbox clears the selections. Deselecting any day when the All checkbox is selected also deselects the All checkbox.

## Schedule Create Virtual Copy

The Schedule Create Virtual Copy is an extension of the Create Virtual Copy wizard, with the additional Schedule box at the bottom. When you open the Schedule Create Virtual Copy dialog, the Create Schedule radio button is preselected.


When creating a schedule, the next available snapshot ID will always be used. Therefore, the Auto checkbox for the id and the id field itself are hidden when the Show advanced options checkbox is deselected and disabled when both a Parent Volume and the Show advanced options checkbox are selected.

Read Only and Read/Write radio buttons are also hidden, as the procedure creates the intermediate volume if making a RO from RO or RW from RW. The radio buttons will be selected accordingly depending on the Parent Volume. Read Only will be selected if the parent is RW and Read/Write will be selected if the parent is RO.

To schedule a Create Virtual Copy task:

1. Selection **Tasks & Schedules** in the Manager Pane.
2. In the Common Actions Panel, select **Schedule Create Virtual Copy**.  
The **Create Virtual Copy** wizard appears.
3. The **Create Schedule** radio button will be preselected.
4. **System** – Select the system on which the virtual copy will be created.
5. (Optional) **Domain** – Select the domain in which the virtual copy will reside.
6. **Parent Volume** – Select the virtual copy's parent volume.
7. **Destination Volume** – Enter the destination volume's name.

---

**NOTE:** If you selected a virtual volume set from the **Parent Volume** list, the **Destination Volume** field is automatically populated with **@vvname@.copy**, meaning that **@vvname@** is replaced with the names of the virtual volumes belonging to the selected virtual volume set. For example, if your virtual volume set contains virtual volumes named VV1, VV2, and VV3, the destination virtual volumes will be named VV1.copy, VV2.copy, and VV3.copy. If you wish to edit the way the destination volumes are named, click the **Edit** button (  ) to the right of the **Destination Volume** field to access the **Edit Volume Set Name** dialog box. (For more information, see [“Edit Volume Set Name Dialog” \(page 353\)](#).)

---

8. **Comments** – Enter any notes.
9. If you wish to set a retention time, select **Show advanced options**, click the **Retention Time** checkbox, enter a value in the corresponding field, and select a unit of measure, day(s) or hour(s).
10. If you wish to set an expiration time, select **Show advanced options**, click the **Expiration Time** checkbox, enter a value in the corresponding field, and select a unit of measure, day(s) or hour(s).
11. **Name** – Enter the name of the schedule.
12. If you wish to be alerted if a task fails, check the **Generate alert if task fails** checkbox.
13. Follow the directions under [“The Common Schedule Panel” \(page 349\)](#) to set the recurrence schedule.

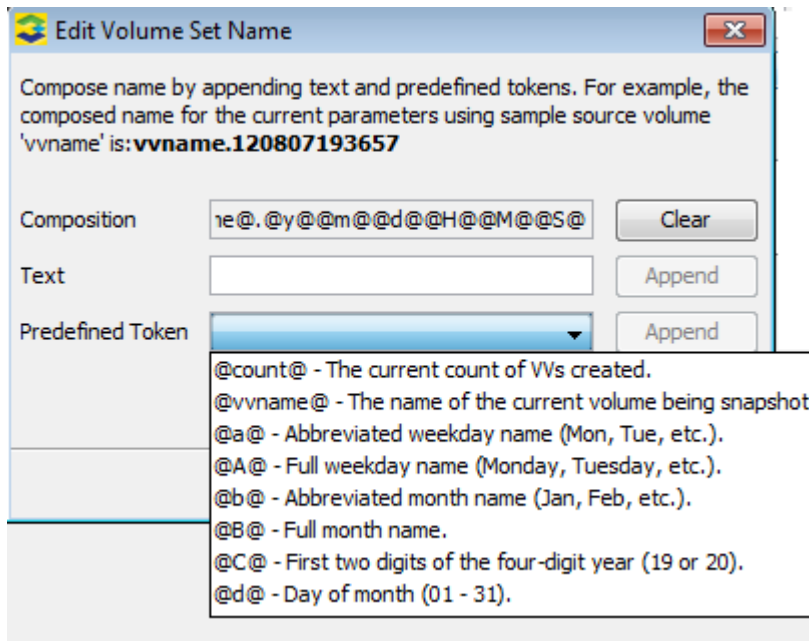
14. Click **OK**.

## Edit Volume Set Name Dialog

When editing the volume set name, you can compose the name by appending your own text or predefined tokens to the default name in the Composition textbox. Or you may completely clear the default name and create your own.

To create your own volume set name:

1. (Optional) Click Clear to the right of the **Composition** text box.
2. (Optional) Enter your name for the volume set in the **Text** textbox, then click **Append**.
3. (Optional) Select a token from the **Predefined Token** list, then click **Append**.
4. Click **OK**.



## Schedule Create Consistency Group Virtual Copies

Schedule Create Consistency Group Virtual Copies is a two step wizard that is an extension of the Create Consistency Group Virtual Copies wizard. The Create Schedule radio button is selected by default when you open Schedule Create Consistency Group Virtual Copies dialog.

To schedule a Create Consistency Group Virtual Copies task:

1. Selection **Tasks & Schedules** in the Manager Pane.
2. In the Common Actions Panel, select **Schedule Create Consistency Group Virtual Copies**.  
The **Create Consistency Group Virtual Copies** wizard appears.

## Select Parent Volumes

1. On the **Select Parent Volumes** page, the **Create Schedule** radio button will be preselected.
2. **System** – Select the system on which the consistency group virtual copies will be created.
3. Select two or more volumes for which you want to create snapshots.
4. Click **Next** to go to the Configure Virtual Copies page.

## Configure Virtual Copies

1. **Name** – On the Configure Virtual Copies page, enter a name for the schedule.
2. **Recurrence** – Set the recurrence as described in [“The Common Schedule Panel” \(page 349\)](#).
3. Click **Next** to view the Summary page, or click **Finish** to complete the wizard.

## Summary

Review your settings, then click Finish to complete the wizard.

## Schedule Compact CPG

The Schedule Compact CPG wizard is similar to the Compact CPG wizard, with the addition of a **Schedule** groupbox at the bottom of the page.

To schedule a Compact CPG task:

1. Selection **Tasks & Schedules** in the Manager Pane.
2. In the Common Actions Panel, select **Schedule Compact CPG**.  
The **Compact CPG** dialog box appears. The **Create Schedule** radio button will be preselected.
3. **System** – Select the name of the system on which the CPG(s) will be compacted.
4. (Optional) **Domain** — Select the name of the Domain on which the CPG(s) reside.
5. **CPG** – Select one or more CPGs to compact. (For information on selecting multiple items, see [“Selecting Multiple Items” \(page 406\)](#)).
6. If you don’t wish to perform any region moves, but only want to remove unused logical disk space, select the **Trim only** checkbox.
7. **Name** – In the Schedule groupbox, enter a name for the Schedule.
8. **Recurrence** – Set the recurrence as described in [“The Common Schedule Panel” \(page 349\)](#).
9. Click **OK**.

## Schedule AO

The Schedule AO dialog allows you to schedule Adaptive Optimization (AO) configuration. You may create, edit, or analyze potential data region movement without an AO license. However, an AO license is required to perform the actual tuning and optimization.

To schedule an AO Configuration:

1. In the Management Pane, click **Task & Schedules**.
2. In the Management Tree, select the system on which you want to create the schedule.
3. In the Common Actions Panel, click **Schedule AO**.  
The **Schedule AO** dialog box appears.
4. **Create Schedule** will automatically be selected.
5. In the General groupbox, select the **System** on which you're creating the schedule.
6. Select the **Domain** (if any) on which the AO configuration resides.
7. Select the **AO Configuration** to schedule.
8. In the Settings groupbox, select a **Max Run Time** from the list. This value is the time frame within which the system can move data regions each time the configuration executes. If the data-movement process is projected to run longer than the specified max run time, the system limits the amount of data to move. If the process runs longer than the specified max run time, the system stops data movement as soon after the time limit as possible and still maintain data integrity.
9. If you wish to analyze the potential data region movement without running the AO configuration, select **Analyze Only**.

---

**NOTE:** An AO license is required in order to perform the actual tuning and optimization. If no AO license is present on the array, only an analysis of potential optimization can be performed.

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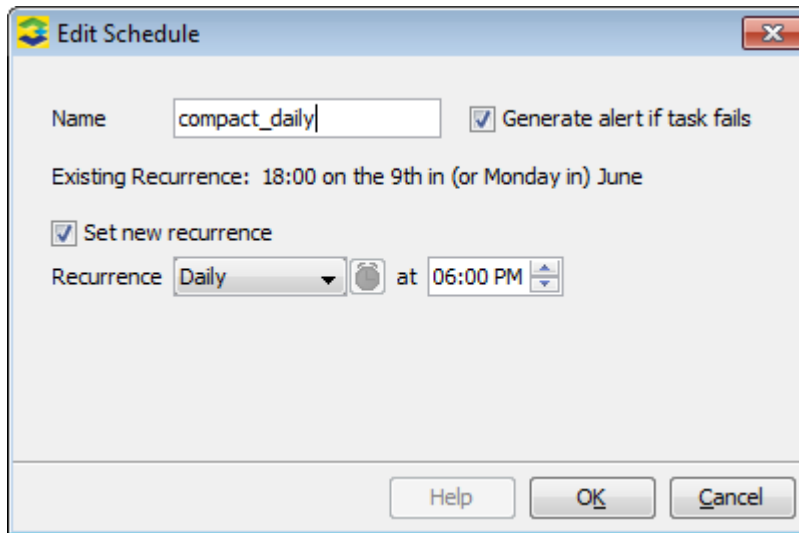
10. In the Measurement Interval groupbox, enter the **Start** time to begin analyzing the tiered CPGs. The analysis will begin the specified number of hours or days prior to the scheduled AO configuration. To determine an appropriate number of hours, consider the amount of time the

performance of the tiered CPGs is important; for example, 3 hours at the end of each business day

11. Enter the time to **End** analyzing the tiered CPGs. The analysis will end the specified number of hours or days prior to the scheduled AO configuration.
12. In the Schedule groupbox, enter a **Name** for the schedule.
13. If you wish to be alerted if the task fails, select **Generate alert if task fails**.
14. Select the recurrence schedule as shown in “The Common Schedule Panel” (page 349).
15. Click **OK**.

## Edit a Schedule

The Edit Schedule wizard allows you to change the schedule name, alert option, and specify a different recurrence.



To edit an existing schedule:

1. Selection **Tasks & Schedules** in the Manager Pane.
2. Select the **Schedules** tab in the Management Window.
3. Right-click on the name of the schedule to want to edit, then select **Edit Schedule** from the menu list that appears.
4. Make your changes to the schedule, then click **OK**.

## Suspend a Schedule

To suspend a schedule:

1. Selection **Tasks & Schedules** in the Manager Pane.
2. Select the **Schedules** tab in the Management Window.
3. Right-click on the name of the schedule to want to suspend, then select **Suspend Schedule** from the menu list that appears.
4. The Suspend Schedules confirmation dialog box appears. Click **Yes** to suspend the selected schedule(s), or **No** to cancel the suspension.

## Resume a Schedule

To resume a schedule that has been suspended:

1. Selection **Tasks & Schedules** in the Manager Pane.
2. Select the **Schedules** tab in the Management Window.
3. Right-click on the name of the schedule to want to resume, then select **Resume Schedule** from the menu list that appears.

4. The schedule will automatically resume.

## Remove a Schedule

To remove a schedule:

1. Selection **Tasks & Schedules** in the Manager Pane.
2. Select the **Schedules** tab in the Management Window.
3. Right-click on the name of the schedule to want to remove, then select **Remove Schedule** from the menu list that appears.
4. The Remove Schedule confirmation dialog box appears. Click **OK** to remove the selected schedule(s), or **Cancel** to cancel the removal.



---

## 27 Creating Templates

The HP 3PAR Management Console allows you to create templates that enable you to apply a set of parameters again and again to create virtual volumes or Common Provisioning Groups (CPGs) with the same, or similar characteristics.

The following general rules apply to templates:

- A property can either be included in a template or not included (unincluded). Properties are Virtual Volume (VV) or Common Provisioning Group (CPG) attributes such as set size.
- A property included in a template can have a defined value or have a value that is left unspecified. A property with a defined value has had a specific value assigned to it (for example, a set size of 2). A property with an unspecified value does not have a specific value assigned to it. When you apply a template that includes a property with one or more unspecified values, the system will either use the default value (when applicable) or calculate the optimized setting for you.
- For all templates, you can either allow overrides of property values, or not. When you allow overrides of a property, users can modify that property's value when applying the template. When you do not allow overrides of a property, it is not possible to modify the defined value, system default, or system-calculated value for that property when applying the template.

Once you create a template, that template is saved on the system and can then be applied to create new virtual volumes or common provisioning groups.

Instructions are provided for the following:

[“Viewing Templates” \(page 358\)](#)

[“Creating Virtual Volume Templates” \(page 144\)](#)

[“Editing a Virtual Volume Template” \(page 146\)](#)

[“Creating Common Provisioning Group Templates” \(page 113\)](#)

[“Editing a Common Provisioning Group Template” \(page 115\)](#)

[“Copying a Template” \(page 357\)](#)

[“Creating Similar Templates” \(page 358\)](#)

[“Removing a Template” \(page 358\)](#)

### Copying a Template

To copy a Common Provisioning Group (CPG) or virtual volume template:

1. Access the Templates screen.
2. Right-click the CPG or virtual volume template you wish to copy.
3. In the menu that appears, click **Copy Template**.

The **Copy Template** dialog box appears.

---

**NOTE:** In the **Source** group box, the **System** and **Template** fields are populated from the template you selected to copy from. You can choose a different template to copy.

---

4. In the **Destination** group box:
  - a. Select the system where you wish to copy the template.
  - b. Enter a name for the new template (31 character maximum) in the **Template Name** text box.
5. Click **OK**.

## Creating Similar Templates

You can create new Common Provisioning Group (CPG) and Virtual Volume templates based on existing templates. To do this:

1. Access the Templates screen.
2. Right-click the CPG or virtual volume template you wish to use as the basis for your new template.
3. In the menu that appears, click **Create Similar**.

The **Create CPG Template** or **Create VV Template** wizard appears.

4. Follow the instructions in [“Creating Common Provisioning Group Templates”](#) (page 113) or [“Creating Virtual Volume Templates”](#) (page 144).

## Removing a Template

To remove a template:

1. Access the Templates screen.
2. Right-click the template you wish to remove.
3. In the menu that appears, click **Remove**.

The **Remove Template** dialog box appears.

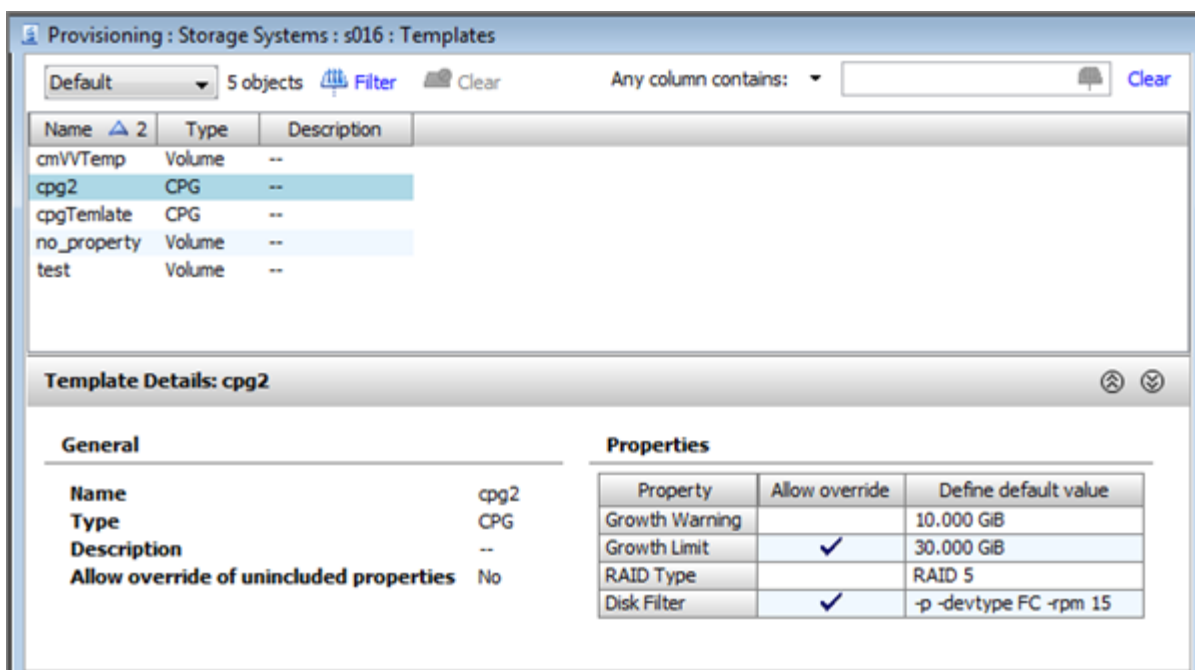
4. Click **OK**.

## Viewing Templates

To view templates:

1. In the Manager Pane, click **Provisioning**.
2. In the Management Tree, click **Templates** under the system node you wish to view.

**NOTE:** In addition to providing comprehensive information about a system's templates, the HP 3PAR Management Console also allows you to the same type of information for specific types of templates. Each child node under the **Templates** node in the Management Tree is a specific type of template. These include CPG templates, Virtual Volume templates, and LD (logical disk) templates. In order to view logical disk template information, you must first set your preferences to view logical disk information; see [“Setting Global Preferences”](#) (page 412).



Provisioning : Storage Systems : s016 : Templates

Default 5 objects Filter Clear Any column contains: Clear

Name	Type	Description
cmVVTmp	Volume	--
cpg2	CPG	--
cpgTemplate	CPG	--
no_property	Volume	--
test	Volume	--

Template Details: cpg2

**General**

Name	cpg2
Type	CPG
Description	--
Allow override of unincluded properties	No

**Properties**

Property	Allow override	Define default value
Growth Warning		10.000 GiB
Growth Limit	✓	30.000 GiB
RAID Type		RAID 5
Disk Filter	✓	-p -devtype FC -rpm 15

The Templates screen is divided into a list pane and a detail pane. The [“List Pane” \(page 359\)](#) displays summary information about the system's templates. The [“Detail Pane” \(page 359\)](#) displays details about a template selected from the list pane.

## List Pane

The following information is displayed in the list pane:

Column	Description
<b>System</b>	The name of the system.
<b>Name</b>	The template name.
<b>Type</b>	The template type.
<b>Description</b>	User entered information about the template.

## Detail Pane

The following information is displayed in the detail pane:

Group	Field	Description
<b>General</b>	<b>Name</b>	The template name.
	<b>Type</b>	The template type.
	<b>Description</b>	User entered information about the template.
	<b>Allow override of unincluded properties</b>	Indicates if non-default values for unincluded properties when applying the template can be set.
<b>Properties</b>	<b>Property</b>	The attributes of the object.
	<b>Allow Override</b>	Indicates if template overrides are allowed.
	<b>Defined Value</b>	The value specified in the template for the corresponding property.

## 28 Tuning the System

Whether new nodes are added or there are cage, magazine, or disk upgrades, the **Tune System** feature allows you optimize system performance by reallocating space for virtual volumes and logical disks, and reallocating chunklets across physical disks.

Tune System runs only for those domains for which the user is authorized. If the user does not have authorization for all domains, intranode and chunklet level tuning will fail.

There are three possible types of tunes, all of which run as a background task:

- **“Tune System”** (page 360) – Detects physical disk space usage imbalance between nodes and rebalances virtual volumes between nodes, detects newly added disks and rebalances chunklets from a node's existing physical disks to its under-allocated ones, and performs a re-layout of LDs whose characteristics do not match their parent CPG.

---

**NOTE:** Tuning a system can take anywhere from a few hours to several days. If the System Manager has restarted during that time, you may not see the task information, and you should check the log for failures.

---

- **“Tune CPGs”** (page 365) – Performs the same task as Tune system but limits the retuning to a specific CPG.
- **“Tune Physical Disk Chunklets Only”** (page 366) – (Option available for 3.1.2 systems only.) Rebalances a node's physical disks at the chunklet level. This option is aimed at systems where new disks have been added to a node. It is run on a per-node basis.

### Tune System

The tuning process is slightly difference for 3.1.1 and 3.1.2 systems. Procedural instructions for both systems are provided.

To access the Tune system feature:

1. Select Provisioning in the Manager Pane.
2. Click Tune System in the Common Actions panel.

The **Tune System** wizard appears.

3. Select the system you want to tune from the **System** list.
4. Select the **Tune system** radio button.

Follow the instructions related to your system:

[“Tuning 3.1.2 Systems”](#) (page 360)

[“Tuning 3.1.1 Systems”](#) (page 363)

### Tuning 3.1.2 Systems

With 3.1.2 systems there are three types of tunes available: **Tune system**, **Tune CPGs**, and **Tune physical disk chunklets only**.

When **Tune system** is selected, you have the option of changing the following settings:

- **Volume Allocation Imbalance Threshold** – The percentage above the average space allocated across nodes at which a volume is considered out of balance.
- **Chunklet Allocation Imbalance Threshold** – The percentage above the average (for physical disks of one device type on a single node) at which the number of chunklets allocated to a physical disk is considered out of balance.

- **Max Chunklets Moved Simultaneously** – The maximum number of chunklets to be moved from one physical disk to another during the reallocation operation. The value must be in the range of 1 to 8.  
As new nodes, cages, or disks are added to a system, the new component is under-allocated. Therefore, the system looks for under-allocated space or chunklets to trigger the tune.
- **Maximum Simultaneous Tasks** – The maximum number of individual tuning tasks allowed to run at the same time. The value must be in the range of 1 to 8.

Additionally, the **Tune System** wizard gives you the following option:

**Analyze only** – By selecting this checkbox, you have the option of viewing an analysis of the tuning tasks that would be performed according to your specified values, without running the tuning task. This analysis is displayed in the Tasks management window.

**Tune System**

Reallocate space usage on the system to take advantage of additional resources such as added hardware or updated CPGs. The defaults are optimized for the majority of systems.

Tuning the system does not affect volumes that are split between CPGs by adaptive optimization; these volumes must be tuned manually.

System:

☒ Tune system ?
 ☐ Tune CPGs ?
 ☐ Tune physical disk chunklets only ?

Reallocate space for virtual volumes, logical disks, and physical disks that have reached or exceeded the thresholds for volume and chunklet allocation.

Enter the percent at which the virtual volume space allocated to a node is too far below the average of the volume space allocated to all the volume's nodes.

Volume Allocation Imbalance Threshold  % ?

Enter the percent at which the chunklets allocated to any one physical disk is too far below the average of the chunklets allocated to all physical disks of that device type on that node.

Chunklet Allocation Imbalance Threshold  % ?

Enter the highest number of chunklets that the system can move from one physical disk to another at one time.

Max Chunklets Moved Simultaneously (1-8)  ?

Enter the highest number of tuning tasks that the system can run at one time.

Maximum Simultaneous Tasks (1-8)  ?

☐ Analyze only ?

Restore Defaults

Help OK Cancel

To change the allocation settings:

1. Enter a value for the **Volume Allocation Imbalance Threshold** percentage.
2. Enter a value for the **Chunklet Allocation Imbalance Threshold** percentage.
3. Enter a value for the **Max Chunklets Moved Simultaneously**.
4. Enter a value for the **Maximum Simultaneous Tasks** allowed.

5. Select the **Analyze only** checkbox if you want to view an analysis instead of running the tuning task.
  6. When you are ready to run the task (or see the analysis), click **OK**.
- The results will appear in the Task Details pane of the Task tab under **Tasks & Schedules**. For details about the Task tab, see [“Tasks Tab” \(page 331\)](#).


### Tuning 3.1.1 Systems

When **Tune system** is selected, you have the option of specifying the following:

- **Volume Allocation Imbalance Threshold** – The percentage above the average space allocated across nodes at which a volume is considered out of balance.
- **Chunklet Allocation Imbalance Threshold** – The percentage above the average (for physical disks of one device type on a single node) at which the number of chunklets allocated to a physical disk is considered out of balance.
- **Physical Disk Tuning Limit** – The number of physical disks (of one device type on one node) that have reached or exceeded the Chunklet Allocation Imbalance Threshold.  
The system looks for over-allocated space or chunklets to trigger the tune.
- **Maximum Simultaneous Tasks** – The maximum number of individual tuning tasks allowed to run at the same time. The value must be in the range of 1 to 8.

Additionally, the **Tune System** wizard gives you the following option:

**Analyze only** – By selecting this checkbox, you have the option of viewing an analysis of the tuning tasks that would be performed according to your specified values, without running the tuning task. This analysis is displayed in the Tasks management window.

 **Tune System** X

Reallocate space usage on the system to take advantage of additional resources such as added hardware or updated CPGs. The defaults are optimized for the majority of systems.

Tuning the system does not affect volumes that are split between CPGs by adaptive optimization; these volumes must be tuned manually.

System: s324 (1300324) ▼

☒ Tune system ?
☐ Tune CPGs ?

Reallocate space for virtual volumes, logical disks, and physical disks that have reached or exceeded the thresholds for volume and chunklet allocation.

Enter the percent at which the virtual volume space allocated to a node is too far above the average of the volume space allocated to all the volume's nodes.

Volume Allocation Imbalance Threshold 3 % ?

Enter the percent at which the chunklets allocated to any one physical disk is too far above the average of the chunklets allocated to all physical disks of that device type on that node.

Chunklet Allocation Imbalance Threshold 5 % ?

Enter the percent of physical disks of one device type on one node that must be at or above the Chunklet Allocation Imbalance Threshold before the system reallocates chunklets across all the physical disks of that device type on that node.

Physical Disk Tuning Limit 10 % ?

Enter the highest number of tuning tasks that the system can run at one time.

Maximum Simultaneous Tasks (1-8) 2 ?

☐ Analyze only ?

Restore Defaults

Help
OK
Cancel

To change the allocation settings:

1. Enter a value for the **Volume Allocation Imbalance Threshold** percentage.
2. Enter a value for the **Chunklet Allocation Imbalance Threshold** percentage.
3. Enter a value for the **Physical Disk Tuning Limit**.
4. Enter a value for the **Maximum Simultaneous Tasks** allowed.
5. Select the **Analyze only** checkbox if you want to view an analysis instead of running the tuning task.
6. When you are ready to run the task (or see the analysis), click **OK**.



The results will appear in the Task Details pane of the Task tab under **Tasks & Schedules**. For details about the Task tab, see “Tasks Tab” (page 331).

## Tune CPGs

This task performs the same function as **Tune systems**, but it limits tuning to the selected CPGs. For more information, see “Tuning the System” (page 360).

When **Tune CPGs** is selected, you can select specific CPGs to tune, and specify the Volume Allocation Imbalance Threshold and Maximum Simultaneous Tasks that can be performed. As with the Tune Systems task, you can also choose an analysis only.

**Tune System**

System: **s016 (1000016)**

☐ Tune system ☒ **Tune CPGs** ☐ Tune physical disk chunklets only

Reallocate virtual volume and logical disk space for specified CPGs that have reached or exceeded the threshold for volume allocation.

Enter the percent at which the virtual volume space allocated to a node is too far below the average of the volume space allocated to all the volume's nodes.

Volume Allocation Imbalance Threshold:  %

Select up to 20 CPGs to tune.

4 objects Any column contains:  Clear

CPG	Domain	User Space Usage	Copy Space Usage
cpq	--	7	1
cpq1	--	1	1
FC_r1	--	16	7
FC_r6	--	0	5

Enter the highest number of tuning tasks that the system can run at one time.

Maximum Simultaneous Tasks (1-8):

☐ Analyze only

Restore Defaults

Please select at least one CPG

Help OK Cancel

To tune CPGs:

1. Select Provisioning in the Manager Pane.
2. Click Tune System in the Common Actions panel.  
The **Tune System** wizard appears.
3. Select the system you want to tune from the **System** list.
4. Select the **Tune CPGs** radio button.
5. Enter a value for the **Volume Allocation Imbalance Threshold** percentage.

6. Select at least one CPG. (For information on selecting more than one item, refer to [“Selecting Multiple Items”](#) (page 406).
7. Enter a value for the **Maximum Simultaneous Tasks** allowed.
8. Select the **Analyze only** checkbox if you want to view an analysis instead of running the tuning task.
9. When you are ready to run the task (or see the analysis), click **OK**.

The results will appear in the Task Details pane of the Task tab under **Tasks & Schedules**. For details about the Task tab, see [“Tasks Tab”](#) (page 331).

## Tune Physical Disk Chunklets Only

This task is available only on 3.1.2 systems. Its sole purpose is to rebalance the physical disks at the chunklet level in an attempt to balance usage between existing and newly added physical disks.

The screenshot shows the 'Tune System' dialog box with the following configuration:

- System:** s016 (1000016)
- Options:** ☐ Tune system, ☐ Tune CPGs, ☒ Tune physical disk chunklets only
- Description:** Reallocate chunklets for physical disks that have reached or exceeded the threshold for chunklet allocation.
- Chunklet Allocation Imbalance Threshold:** 10 %
- Max Chunklets Moved Simultaneously (1-8):** (empty field)
- Maximum Simultaneous Tasks (1-8):** 2
- Analyze only:** ☐
- Buttons:** Restore Defaults, Help, OK, Cancel

To tune only physical disk chunklets:

1. Select Provisioning in the Manager Pane.
2. Click Tune System in the Common Actions panel.  
The **Tune System** wizard appears.
3. Select the system you want to tune from the **System** list.
4. Select the **Tune physical disk chunklets only** radio button.
5. Enter a value for the **Chunklet Allocation Imbalance Threshold** percentage.
6. Enter a value for the **Maximum Chunklets Moved Simultaneously**.
7. Select the **Analyze only** checkbox if you want to view an analysis instead of running the tuning task.
8. When you are ready to run the task (or see the analysis), click **OK**.

The results will appear in the Task Details pane of the Task tab under **Tasks & Schedules**. For details about the Task tab, see [“Tasks Tab” \(page 331\)](#).

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## Part VII Taking Inventory of the Storage System Hardware

This part contains information on using the Hardware Inventory Manager to gather data related to hardware connected to the HP 3PAR StoreServ Storage System.

[“Using the Hardware Inventory Manager” \(page 369\)](#)

[“Viewing the Hardware Inventory Summary Tab” \(page 370\)](#)

[“Viewing the Node Subsystems Tab” \(page 372\)](#)

[“Viewing the Cage Subsystems Tab” \(page 380\)](#)

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## 29 Using the Hardware Inventory Manager

The Hardware Inventory Manager provides information about all hardware used in the connected HP 3PAR StoreServ Storage Systems.

The Hardware Inventory screen provides four tabs: **Summary**, **Node Subsystems**, **Cage Subsystems**, and **All**. These tabs are discussed further in the following sections:

[“Viewing the Hardware Inventory Summary Tab” \(page 370\)](#)

[“Viewing the Node Subsystems Tab” \(page 372\)](#)

[“Viewing the Cage Subsystems Tab” \(page 380\)](#)

[“Viewing the All Tab” \(page 386\)](#)

To access the Hardware Inventory screen:

1. Click Hardware Inventory in the Manager Pane.
2. From the Management Tree, select either the **Storage Systems** node to view the hardware inventory for all connected systems, or select one of system nodes (for example, s424) to view hardware inventory for that server.

## 30 Viewing the Hardware Inventory Summary Tab

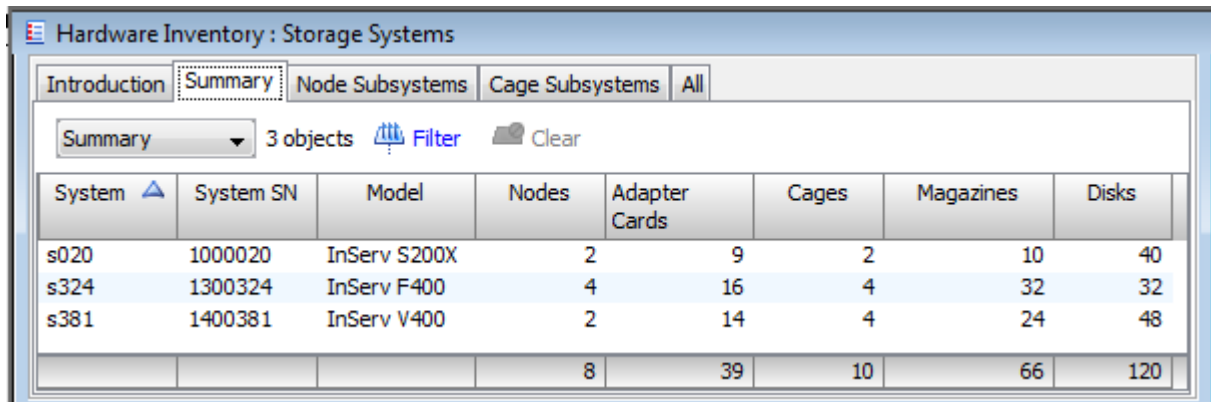
The **Hardware Inventory Summary** tab provides quick summary information about hardware used in all connected HP 3PAR StoreServ Storage Systems.

To access the **Hardware Inventory Summary** tab;

1. Click **Hardware Inventory** in the “[Manager Pane](#)” (page 396).
2. In the “[Management Tree](#)” (page 395), select the **Storage Systems** node.

The **Hardware Inventory Summary** tab appears in the “[Management Window](#)” (page 404).

**NOTE:** The **Hardware Inventory Summary** tab is only available if the **Storage Systems** node is selected in the Management Tree.



System	System SN	Model	Nodes	Adapter Cards	Cages	Magazines	Disks
s020	1000020	InServ S200X	2	9	2	10	40
s324	1300324	InServ F400	4	16	4	32	32
s381	1400381	InServ V400	2	14	4	24	48
			8	39	10	66	120

The **Hardware Inventory Summary** tab can be filtered by Summary and Descriptor information. The **Summary** filter provides the following information:

Column	Description
<b>System Name</b>	The system name.
<b>System SN</b>	The system serial number.
<b>Model</b>	The system model type.
<b>Nodes</b>	The number of controller nodes in the system.
<b>Adapter Cards</b>	The number of adapter cards in the system.
<b>Cages</b>	The number of drive cages in the system.
<b>Magazines</b>	The number of drive magazines in the system.
<b>Disks</b>	The number of disk drives in the system.

The **Descriptors** filter displays the following information:

Column	Description
<b>Name</b>	The system name. Each name displayed is a link to that system's summary information.
<b>System SN</b>	The system serial number.
<b>Model</b>	The system model number.
<b>Location</b>	The physical location of the system (if entered during system setup).
<b>Owner</b>	The owner of the system (if entered during system setup).

Column	Description
<b>Contact</b>	Contact information for the system owner (if entered during system setup).
<b>Comments</b>	Any notes about the system (if entered during system setup).

## 31 Viewing the Node Subsystems Tab

The Hardware Inventory Node Subsystems tab provides information about controller node components. The information is included on eight additional tabs, which are discussed in the following sections:

“Viewing the Node Subsystems Controller Nodes Tab” (page 372)

“Viewing the Node Subsystems CPUs Tab” (page 373)

“Viewing the Node Subsystems Internal Drives Tab” (page 374)

“Viewing the Node Subsystems Physical Memory Tab” (page 374)

“Viewing the Node Subsystems Adapter Cards Tab” (page 375)

“Viewing the Node Subsystems SFPs Tab” (page 376)

“Viewing the Node Subsystems Power Supplies Tab” (page 377)

“Viewing the Node Subsystems Batteries Tab” (page 378)

To access the **Hardware Inventory Node Subsystems** tab:

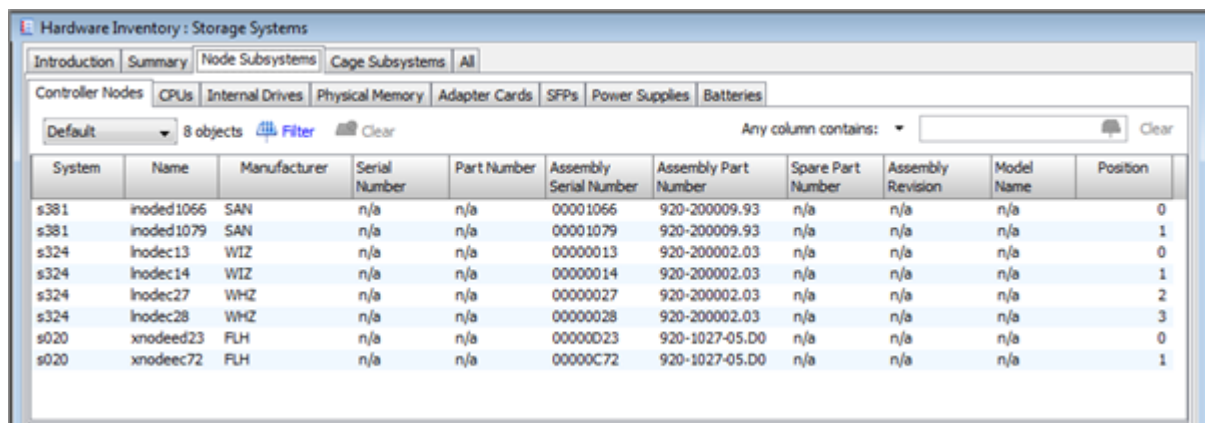
1. Click **Hardware Inventory** in the Manager Pane.
2. In the Management Tree, select the **Storage Systems** node, or select a specific system node (for example, s424).
3. In the Management Window, click the **Node Subsystems** tab.

### Viewing the Node Subsystems Controller Nodes Tab

The Node Subsystems **Controller Nodes** tab displays information about the system's controller node pairs.

To access the Node Subsystems **Controller Nodes** tab, click the **Controller Nodes** tab after accessing the **Node Subsystem** tab.

1. Click **Hardware Inventory** in the Manager Pane.
2. In the Management Tree, select the **Storage Systems** node, or select a specific system node (for example, s424).
3. In the Management Window, click the **Controller Nodes** tab.



System	Name	Manufacturer	Serial Number	Part Number	Assembly Serial Number	Assembly Part Number	Spare Part Number	Assembly Revision	Model Name	Position
s381	inoded1066	SAN	n/a	n/a	00001066	920-200009.93	n/a	n/a	n/a	0
s381	inoded1079	SAN	n/a	n/a	00001079	920-200009.93	n/a	n/a	n/a	1
s324	inodec13	WIZ	n/a	n/a	00000013	920-200002.03	n/a	n/a	n/a	0
s324	inodec14	WIZ	n/a	n/a	00000014	920-200002.03	n/a	n/a	n/a	1
s324	inodec27	WHZ	n/a	n/a	00000027	920-200002.03	n/a	n/a	n/a	2
s324	inodec28	WHZ	n/a	n/a	00000028	920-200002.03	n/a	n/a	n/a	3
s020	xnodeed23	FLH	n/a	n/a	00000023	920-1027-05.D0	n/a	n/a	n/a	0
s020	xnodeec72	FLH	n/a	n/a	00000072	920-1027-05.D0	n/a	n/a	n/a	1

The Node Subsystems **Controller Nodes** tab displays the following information:

Column	Description
<b>System*</b>	The name of the storage system.
<b>Name</b>	The controller node name.



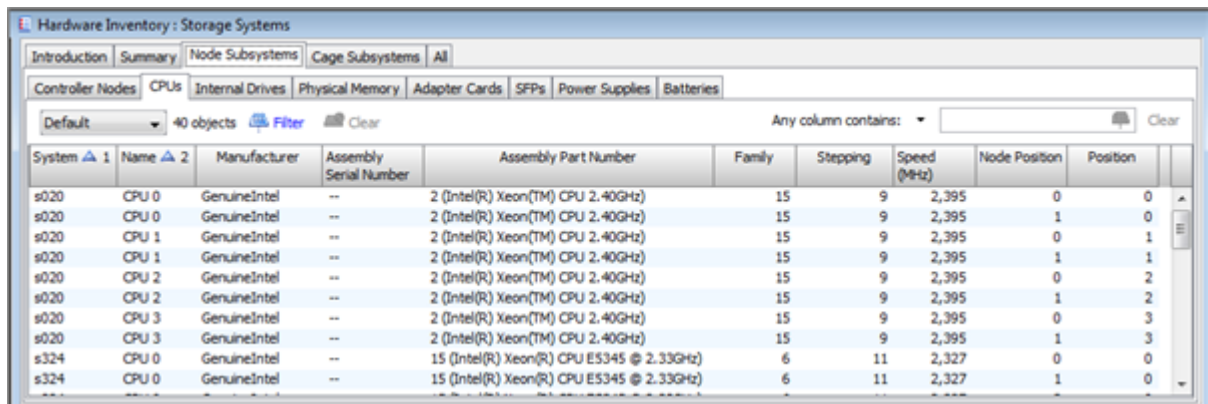
Column	Description
<b>Manufacturer</b>	The manufacturer of the controller node.
<b>Serial Number*</b>	The controller node serial number.
<b>Part Number*</b>	The part number of the controller node.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Spare Part Number*</b>	The spare part number, if applicable.
<b>Assembly Revision*</b>	The assembly revision, if applicable.
<b>Model Name*</b>	The model name, if applicable.
<b>Position</b>	The position of the controller node in the node chassis.

\*Not displayed when viewing information for an individual system.

## Viewing the Node Subsystems CPUs Tab

The Node Subsystems **CPUs** tab displays information about the system's controller node CPUs.

To access the Node Subsystems **CPUs** tab, click the **CPUs** tab after “Viewing the Node Subsystems Tab” (page 372).



System	Name	Manufacturer	Assembly Serial Number	Assembly Part Number	Family	Stepping	Speed (MHz)	Node Position	Position
s020	CPU 0	GenuineIntel	--	2 (Intel(R) Xeon(TM) CPU 2.40GHz)	15	9	2,395	0	0
s020	CPU 0	GenuineIntel	--	2 (Intel(R) Xeon(TM) CPU 2.40GHz)	15	9	2,395	1	0
s020	CPU 1	GenuineIntel	--	2 (Intel(R) Xeon(TM) CPU 2.40GHz)	15	9	2,395	0	1
s020	CPU 1	GenuineIntel	--	2 (Intel(R) Xeon(TM) CPU 2.40GHz)	15	9	2,395	1	1
s020	CPU 2	GenuineIntel	--	2 (Intel(R) Xeon(TM) CPU 2.40GHz)	15	9	2,395	0	2
s020	CPU 2	GenuineIntel	--	2 (Intel(R) Xeon(TM) CPU 2.40GHz)	15	9	2,395	1	2
s020	CPU 3	GenuineIntel	--	2 (Intel(R) Xeon(TM) CPU 2.40GHz)	15	9	2,395	0	3
s020	CPU 3	GenuineIntel	--	2 (Intel(R) Xeon(TM) CPU 2.40GHz)	15	9	2,395	1	3
s324	CPU 0	GenuineIntel	--	15 (Intel(R) Xeon(R) CPU E5345 @ 2.33GHz)	6	11	2,327	0	0
s324	CPU 0	GenuineIntel	--	15 (Intel(R) Xeon(R) CPU E5345 @ 2.33GHz)	6	11	2,327	1	0

The Node Subsystems **CPUs** tab displays the following information:

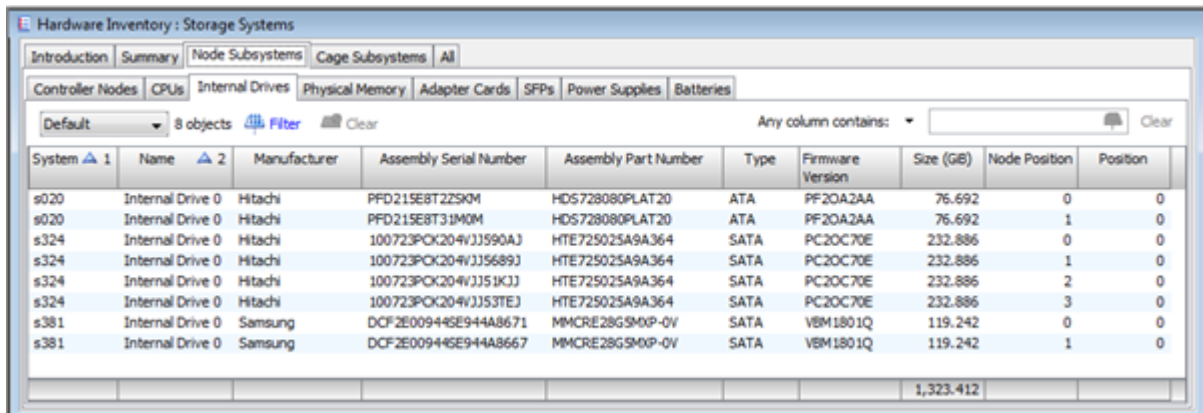
Column	Description
<b>System*</b>	The name of the system.
<b>Name</b>	The CPU name.
<b>Manufacturer</b>	The manufacturer of the CPU.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Family*</b>	The family, as noted by the manufacturer, to which the CPU belongs.
<b>Stepping*</b>	The number of design changes, as noted by the manufacturer, to which the CPU has advanced from its original design.
<b>Speed*</b>	The speed (in MHz) of the CPU.
<b>Node Position*</b>	The position (0 or 1) of the controller node in the node chassis.
<b>Position</b>	The position of the CPU (0, 1, 2, or 3) in the controller node.

\*Not displayed when viewing information for an individual system.

## Viewing the Node Subsystems Internal Drives Tab

The Node Subsystems **Internal Drives** tab displays information about the system's controller node internal disk drives.

To access the Node Subsystems **Internal Drives** tab, click the **Internal Drives** tab after accessing the **Node Subsystem** tab.



System	Name	Manufacturer	Assembly Serial Number	Assembly Part Number	Type	Firmware Version	Size (GiB)	Node Position	Position
s020	Internal Drive 0	Hitachi	PFD215E8T22SQM	HDS728080PLAT20	ATA	PF20A2AA	76.692	0	0
s020	Internal Drive 0	Hitachi	PFD215E8T31M0M	HDS728080PLAT20	ATA	PF20A2AA	76.692	1	0
s324	Internal Drive 0	Hitachi	100723POK204VJ3590AJ	HTE725025A9A364	SATA	PC20C70E	232.886	0	0
s324	Internal Drive 0	Hitachi	100723POK204VJ35689J	HTE725025A9A364	SATA	PC20C70E	232.886	1	0
s324	Internal Drive 0	Hitachi	100723POK204VJ351KJ3	HTE725025A9A364	SATA	PC20C70E	232.886	2	0
s324	Internal Drive 0	Hitachi	100723POK204VJ353TEJ	HTE725025A9A364	SATA	PC20C70E	232.886	3	0
s381	Internal Drive 0	Samsung	DCF2E00944SE944A8671	MMCRE28GSM0P-0V	SATA	VBM1801Q	119.242	0	0
s381	Internal Drive 0	Samsung	DCF2E00944SE944A8667	MMCRE28GSM0P-0V	SATA	VBM1801Q	119.242	1	0
							1,323.412		

The Node Subsystems **Internal Drives** tab displays the following information:

Column	Description
<b>System*</b>	The system on which the drive resides.
<b>Name</b>	The drive name.
<b>Manufacturer</b>	The manufacturer of the drive.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Type*</b>	The type of drive, either SATA or ATA.
<b>Firmware Version*</b>	The drive firmware version.
<b>Size*</b>	The size (in GiB) of the drive.
<b>Node Position*</b>	The position of the controller node in the node chassis.
<b>Position</b>	The position of the drive in the controller node.

\*Not displayed when viewing information for an individual system.

## Viewing the Node Subsystems Physical Memory Tab

The Node Subsystems **Physical Memory** tab displays information about the system's physical memory.

To access the Node Subsystems **Physical Memory** tab, click the **Physical Memory** tab after accessing the **Node Subsystem** tab.

System	Name	Manufacturer	Assembly Serial Number	Assembly Part Number	Riser	Slot ID	Usage	Type	Size (GB)	Revision	Node Position
s020	DIMM7	SimpleTech/STEC	0E70D802	SL72R4L128M8H1-A7V	8-slot	30702	Data	SDRAM	1.000	01FF	1
s324	DIMM0	Micron Technology	D8341CB2	18HF25672FD667E1D4	n/a	34200	Control	FB-DIMM	2.000	4531	0
s324	DIMM0	Micron Technology	D333189F	36VDDF25672Y-40BF3	n/a	35801	Data	DDR SDRAM	2.000	0300	0
s324	DIMM0	Micron Technology	D8341CAF	18HF25672FD667E1D4	n/a	34200	Control	FB-DIMM	2.000	4531	1
s324	DIMM0	Micron Technology	D3331883	36VDDF25672Y-40BF3	n/a	35801	Data	DDR SDRAM	2.000	0300	1
s324	DIMM0	Micron Technology	E713BD49	36VDDF25672Y-40BF3	n/a	35801	Data	DDR SDRAM	2.000	0300	2
s324	DIMM0	Micron Technology	D8341D95	18HF25672FD667E1D4	n/a	34200	Control	FB-DIMM	2.000	4531	2
s324	DIMM0	Micron Technology	D8341D96	18HF25672FD667E1D4	n/a	34200	Control	FB-DIMM	2.000	4531	3
s324	DIMM0	Micron Technology	E713B0FE	36VDDF25672Y-40BF3	n/a	35801	Data	DDR SDRAM	2.000	0300	3
									156.000		

The Node Subsystems **Physical Memory** tab displays the following information:

Column	Description
<b>System*</b>	The system on which the adapter resides.
<b>Name</b>	The DIMM name.
<b>Manufacturer</b>	The manufacturer of the DIMM.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Riser*</b>	The riser card type on which the DIMM is connected. V-Class Systems will show "n/a".
<b>Slot ID*</b>	The slot in which the DIMM is connected.
<b>Usage*</b>	The DIMM's usage, either Data cache or Control cache.
<b>Type*</b>	The type of DIMM, either FB-DIM or DDR SDRAM.
<b>Size*</b>	The size of the DIMM (in GiB).
<b>Revision*</b>	The revision level of the DIMM.
<b>Node Position*</b>	The position of the controller node in the node chassis.
<b>Position**</b>	The position of the drive in the controller node.

\*Not displayed when viewing information for an individual system.

\*\*Not displayed when viewing information for all storage systems.

## Viewing the Node Subsystems Adapter Cards Tab

The Node Subsystems **Physical Memory** tab displays information about the system's adapter cards.

To access the Node Subsystems **Adapter Cards** tab, click the **Adapter Cards** tab after accessing the **Node Subsystem** tab.

System	Name (Node:Slot)	Manufacturer	Assembly Serial Number	Assembly Part Number	Type	Revision	Firmware Version	Max Rate (Gbps)
s020	0:5	QLOGIC	C31046	2300	FC	01	0.0.0	1
s020	1:0	LSI	5923242003	44929	FC	02	2.00.22.00	2
s020	1:2	EMULEX	VM64048555	LP11002	FC	01	2.82.X.8	4
s020	1:4	Intel	000E0C742BA9	PRO/1000XT	Ethernet	n/a	7.3.21-k4-3	1
s020	1:5	QLOGIC	D36194	2300	FC	01	3.3.22	1
s324	0:0	EMULEX	VM81946656	LP11002	FC	01	2.80.X.12	4
s324	0:1	EMULEX	VM64709841	LP11002	FC	01	2.80.X.12	4
s324	0:2	3PAR	0869c8180009433d	FC044X	FC	09	1.32.A.5	4
s324	0:6	Intel	Onboard	e1000	Ethernet	n/a	7.3.21-k4.1	1
s324	1:0	EMULEX	VM82061902	LP11002	FC	01	2.80.X.12	4

The Node Subsystems **Adapter Cards** tab displays the following information:

Column	Description
<b>System*</b>	The system on which the adapter resides.
<b>Name</b>	The adapters name, shown in node:slot format.
<b>Manufacturer</b>	The manufacturer of the adapter.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Type</b>	The type of adapter, either FC (Fast Class), Ethernet, or iSCSI.
<b>Revision</b>	The revision level of the adapter.
<b>Firmware Revision</b>	The firmware revision on the adapter.
<b>Max Rate</b>	The SFP's maximum speed, in Gbps.

\*Not displayed when viewing information for an individual system.

## Viewing the Node Subsystems SFPs Tab

The Node Subsystems **SFPs** tab displays information about the system's SFPs.

To access the Node Subsystems **SFPs** tab, click the **SFPs** tab after accessing the **Node Subsystem** tab.

System	Name (Node:Slot:Port)	Manufacturer	Assembly Serial Number	Assembly Part Number	Max Rate (Gbps)
s324	2:0:2	--	--	--	--
s324	2:2:1	FINISAR_CORP.	PE71ABD	FTLF8524P2BNV	4.2
s324	2:2:2	FINISAR_CORP.	PE70K0C	FTLF8524P2BNV	4.2
s324	2:2:3	FINISAR_CORP.	PE70QTG	FTLF8524P2BNV	4.2
s324	2:2:4	FINISAR_CORP.	PE71AK9	FTLF8524P2BNV	4.2
s324	3:0:1	--	--	--	--
s324	3:0:2	PICOLIGHT	425EF1ES	PL-XPL-VE-S24-31	2.1
s324	3:2:1	FINISAR_CORP.	PE7112D	FTLF8524P2BNV	4.2
s324	3:2:2	FINISAR_CORP.	PE71AAA	FTLF8524P2BNV	4.2
s324	3:2:3	FINISAR_CORP.	PE71BGR	FTLF8524P2BNV	4.2

The Node Subsystems **SFPs** tab displays the following information:

Column	Description
<b>System*</b>	The name of the system.
<b>Name</b>	The SFP's name, shown in node:slot:port format.
<b>Manufacturer</b>	The manufacturer of the SFP.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Max Rate</b>	The maximum rate (in Gbps) of the SFP.

\*Not displayed when viewing information for an individual system.

## Viewing the Node Subsystems Power Supplies Tab

The Node Subsystems **Power Supplies** tab displays information about the system's power supplies.

To access the Node Subsystems **Power Supplies** tab, click the **Power Supplies** tab after accessing the **Node Subsystem** tab.

System	Name	Manufacturer	Serial Number	Part Number	Assembly Serial Number	Assembly Part Number	Spare Part Number	Assembly Revision	Model Name	Node Position	Position
s381	Power Supply 0	POWER-ONE	n/a	n/a	091392-00FPR	SFP650-128S102G	n/a	n/a	n/a	0	0
s381	Power Supply 1	POWER-ONE	n/a	n/a	091392-00FNP	SFP650-128S102G	n/a	n/a	n/a	0	1
s381	Power Supply 0	POWER-ONE	n/a	n/a	091392-00PL2	SFP650-128S102G	n/a	n/a	n/a	1	0
s381	Power Supply 1	POWER-ONE	n/a	n/a	091392-00FNC	SFP650-128S102G	n/a	n/a	n/a	1	1
s324	Power Supply 0	PO1	n/a	n/a	AABCCDD	800-0015-50.0A	n/a	n/a	n/a	0	0
s324	Power Supply 1	PO1	n/a	n/a	00A182C3	800-0015-50.0A	n/a	n/a	n/a	1	1
s324	Power Supply 2	PO1	n/a	n/a	821D0544	800-0015-50.0A	n/a	n/a	n/a	2	2
s324	Power Supply 3	PO1	n/a	n/a	821D0549	800-0015-50.0A	n/a	n/a	n/a	3	3
s020	Power Supply 0	--	n/a	n/a	FFFFFFFF	--	n/a	n/a	n/a	0	0
s020	Power Supply 1	--	n/a	n/a	FFFFFFFF	--	n/a	n/a	n/a	0	1

The Node Subsystems **Power Supplies** tab displays the following information:

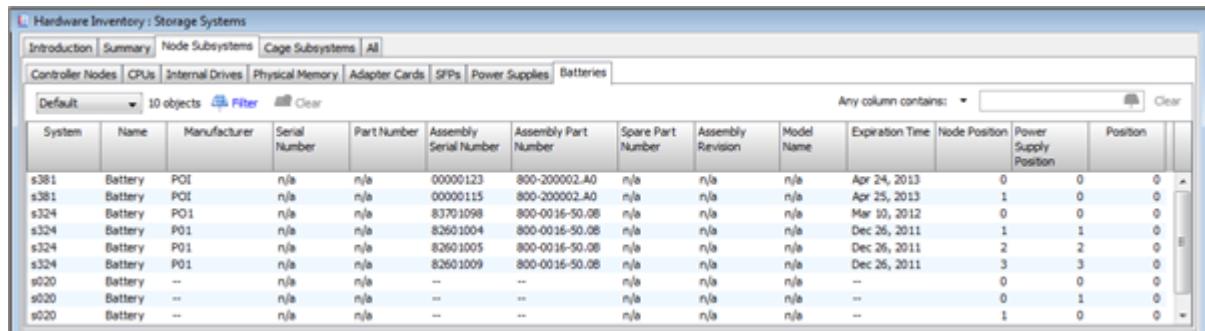
Column	Description
<b>System*</b>	The system on which the power supply resides.
<b>Name</b>	The power supply's name.
<b>Manufacturer</b>	The manufacturer of the power supply.
<b>Serial Number*</b>	The power supply's serial number.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Spare Part Number*</b>	The spare part number, if applicable.
<b>Assembly Revision*</b>	The assembly revision, if applicable.
<b>Model Name*</b>	The model name, if applicable.
<b>Node Position</b>	The position of the node in the node chassis.
<b>Position</b>	The position of the power supply in the node chassis.

\*Not displayed when viewing information for an individual system.

## Viewing the Node Subsystems Batteries Tab

The Node Subsystems **Batteries** tab displays information about the system's batteries.

To access the Node Subsystems **Batteries** tab, click the **Batteries** tab after accessing the **Node Subsystem** tab.



System	Name	Manufacturer	Serial Number	Part Number	Assembly Serial Number	Assembly Part Number	Spare Part Number	Assembly Revision	Model Name	Expiration Time	Node Position	Power Supply Position	Position
s381	Battery	POI	n/a	n/a	00000123	800-200002.A0	n/a	n/a	n/a	Apr 24, 2013	0	0	0
s381	Battery	POI	n/a	n/a	00000115	800-200002.A0	n/a	n/a	n/a	Apr 25, 2013	1	0	0
s324	Battery	PO1	n/a	n/a	83701098	800-0016-50.08	n/a	n/a	n/a	Mar 10, 2012	0	0	0
s324	Battery	PO1	n/a	n/a	82601004	800-0016-50.08	n/a	n/a	n/a	Dec 26, 2011	1	1	0
s324	Battery	PO1	n/a	n/a	82601005	800-0016-50.08	n/a	n/a	n/a	Dec 26, 2011	2	2	0
s324	Battery	PO1	n/a	n/a	82601009	800-0016-50.08	n/a	n/a	n/a	Dec 26, 2011	3	3	0
s020	Battery	--	n/a	n/a	--	--	n/a	n/a	n/a	--	0	0	0
s020	Battery	--	n/a	n/a	--	--	n/a	n/a	n/a	--	0	1	0
s020	Battery	--	n/a	n/a	--	--	n/a	n/a	n/a	--	1	0	0

The Node Subsystems **Batteries** tab displays the following information:

Column	Description
<b>System*</b>	The system on which the battery resides.
<b>Name</b>	The battery's name.
<b>Manufacturer</b>	The manufacturer of the battery.
<b>Serial Number*</b>	The battery's serial number.
<b>Part Number*</b>	The battery's part number.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Spare Part Number*</b>	The spare part number, if applicable.
<b>Assembly Revision*</b>	The assembly revision, if applicable.

Column	Description
<b>Model Name*</b>	The model name, if applicable.
<b>Expiration Time**</b>	The battery's expiration date.
<b>Node Position**</b>	The position of the node in the node chassis.
<b>Power Supply Position</b>	The position of the power supply in the node chassis.
<b>Position</b>	The position of the battery in the system.

\*Not displayed when viewing information for an individual system.

\*\*Not displayed when viewing information for more than one system.



## 32 Viewing the Cage Subsystems Tab

The **Hardware Inventory Cage Subsystems** tab provides information about system drive cage components. The information is included on six additional tabs, which are discussed in the following sections:

“Viewing the Cage Subsystems Drive Cages Tab” (page 380)

“Viewing the Cage Subsystems Interface Cards Tab” (page 381)

“Viewing the Cage Subsystems SFPs Tab” (page 382)

“Viewing the Cage Subsystems Magazines Tab” (page 382)

“Viewing the Cage Subsystems Physical Disks Tab” (page 383)

“Viewing the Cage Subsystems Power Supplies Tab” (page 384)

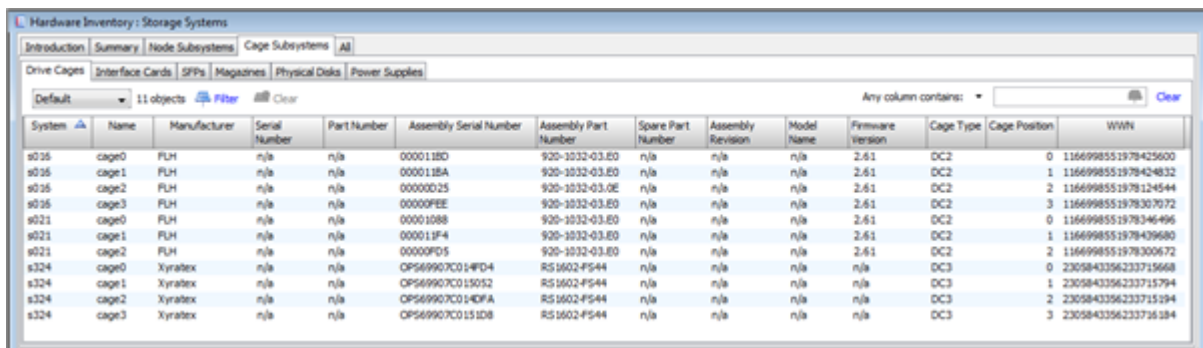
To access the **Hardware Inventory Cage Subsystems** tab:

1. Click **Hardware Inventory** in the Manager Pane.
2. In the Management Tree, select the **Storage Systems** node, or select a specific system node (for example, s424).
3. In the Management Window, click the **Cage Subsystems** tab.

### Viewing the Cage Subsystems Drive Cages Tab

The Cage Subsystems **Drive Cages** tab displays information about the system's drive cages.

To access the Cage Subsystems **Drive Cages** tab, click the **Drive Cages** tab after accessing the **Cage Subsystem** tab.



System	Name	Manufacturer	Serial Number	Part Number	Assembly Serial Number	Assembly Part Number	Spare Part Number	Assembly Revision	Model Name	Firmware version	Cage Type	Cage Position	WWN
s035	cage0	PLH	n/a	n/a	0000118D	920-1032-03.60	n/a	n/a	n/a	2.61	DC2	0	1166998551978425600
s035	cage1	PLH	n/a	n/a	0000118A	920-1032-03.60	n/a	n/a	n/a	2.61	DC2	1	1166998551978424832
s035	cage2	PLH	n/a	n/a	00000025	920-1032-03.0E	n/a	n/a	n/a	2.61	DC2	2	1166998551978124544
s035	cage3	PLH	n/a	n/a	00000FEE	920-1032-03.60	n/a	n/a	n/a	2.61	DC2	3	1166998551978307972
s021	cage0	PLH	n/a	n/a	00001088	920-1032-03.60	n/a	n/a	n/a	2.61	DC2	0	1166998551978346496
s021	cage1	PLH	n/a	n/a	00001F4	920-1032-03.60	n/a	n/a	n/a	2.61	DC2	1	1166998551978439680
s021	cage2	PLH	n/a	n/a	00000FD5	920-1032-03.60	n/a	n/a	n/a	2.61	DC2	2	1166998551978300672
s324	cage0	Xyratec	n/a	n/a	OPS69907C014FD4	RS16024F544	n/a	n/a	n/a	n/a	DC3	0	2305843356233715668
s324	cage1	Xyratec	n/a	n/a	OPS69907C015052	RS16024F544	n/a	n/a	n/a	n/a	DC3	1	2305843356233715794
s324	cage2	Xyratec	n/a	n/a	OPS69907C014DFA	RS16024F544	n/a	n/a	n/a	n/a	DC3	2	2305843356233715194
s324	cage3	Xyratec	n/a	n/a	OPS69907C0151D8	RS16024F544	n/a	n/a	n/a	n/a	DC3	3	2305843356233716184

The Cage Subsystems **Drive Cages** tab displays the following information:

Column	Description
<b>System*</b>	The system name.
<b>Name</b>	The drive cage name.
<b>Manufacturer</b>	The manufacturer of the drive cage.
<b>Serial Number*</b>	The drive cage serial number.
<b>Part Number*</b>	The part number of the drive cage.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Spare Part Number*</b>	The spare part number, if applicable.
<b>Assembly Revision*</b>	The assembly revision, if applicable.



Column	Description
<b>Model Name*</b>	The model name, if applicable.
<b>Firmware Version</b>	The drive cage firmware version.
<b>Cage Type</b>	The type of drive cage (DC2, DC3, DC4, DCS1, or DCS2)
<b>Cage Position</b>	The position of the drive cage in the drive chassis.
<b>WWN</b>	The World Wide Name of the drive cage.

\*Not displayed when viewing information for an individual system.

## Viewing the Cage Subsystems Interface Cards Tab

The Cage Subsystems **Interface Cards** tab displays information about the system's interface cards. To access the Cage Subsystems **Interface Cards** tab, click the **Interface Cards** tab after accessing the **Cage Subsystem** tab.

System	Cage	Name	Manufacturer	Serial Number	Part Number	Assembly Serial Number	Assembly Part Number	Spare Part Number	Assembly Revision	Model Name	Firmware Version	Cage Type	Cage Position
s381	cage0	SAS A	XIRATEX	n/a	n/a	2450944239G02H1	0956780-02	n/a	n/a	n/a	n/a	DCS2	0
s381	cage0	SAS B	XIRATEX	n/a	n/a	2450944239G02VX	0956780-02	n/a	n/a	n/a	n/a	DCS2	0
s381	cage1	SAS A	XIRATEX	n/a	n/a	2450944239G0266	0956780-02	n/a	n/a	n/a	n/a	DCS1	1
s381	cage1	SAS B	XIRATEX	n/a	n/a	2450944239G02PC	0956780-02	n/a	n/a	n/a	n/a	DCS1	1
s381	cage2	FC-AL 0	FUH	n/a	n/a	000015AD	920-1061-03.C1	n/a	n/a	n/a	n/a	DC4	2
s381	cage2	FC-AL 1	FUH	n/a	n/a	00001580	920-1061-03.C1	n/a	n/a	n/a	n/a	DC4	2
s381	cage3	FC-AL 0	FUH	n/a	n/a	00001580	920-1061-03.C1	n/a	n/a	n/a	n/a	DC4	3
s381	cage3	FC-AL 1	FUH	n/a	n/a	00001585	920-1061-03.C1	n/a	n/a	n/a	n/a	DC4	3
s324	cage0	FC-AL A	Xyratex	n/a	n/a	2456594331456A3	n/a	n/a	n/a	n/a	08	DC3	0

The Cage Subsystems **Interface Cards** tab displays the following information:

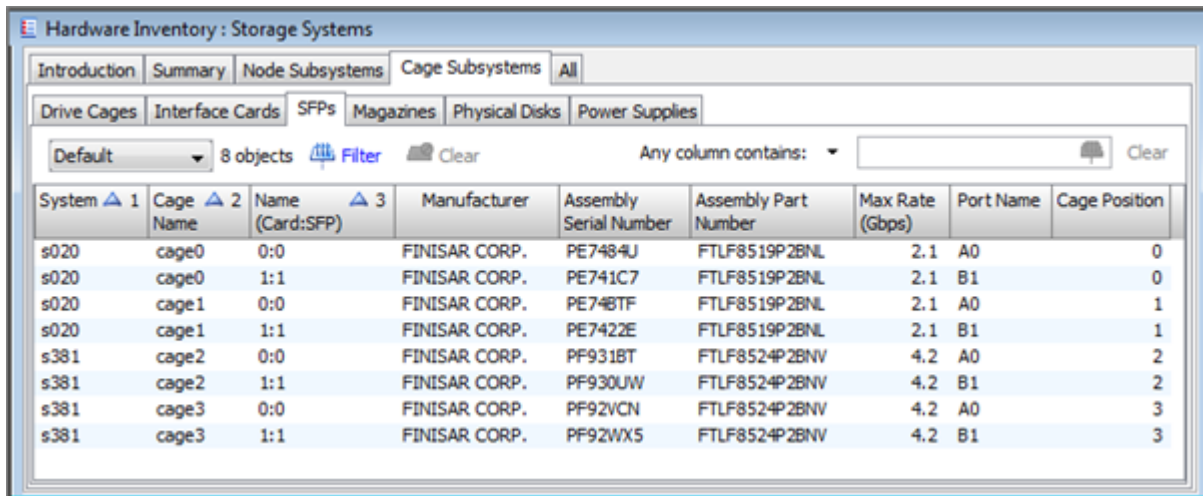
Column	Description
<b>System*</b>	The name of the system.
<b>Cage</b>	The drive cage in which the interface card resides.
<b>Name</b>	The interface card name.
<b>Manufacturer</b>	The manufacturer of the interface card.
<b>Serial Number*</b>	The interface card serial number.
<b>Part Number*</b>	The part number of the interface card.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Spare Part Number*</b>	The spare part number, if applicable.
<b>Assembly Revision*</b>	The assembly revision, if applicable.
<b>Model Name*</b>	The model name, if applicable.
<b>Firmware Version</b>	The interface card firmware version.
<b>Cage Type</b>	The type of drive cage (DC2, DC3, DC4, DCS1, or DCS2)
<b>Cage Position</b>	The position of the drive cage in the drive chassis.

\*Not displayed when viewing information for an individual system.

## Viewing the Cage Subsystems SFPs Tab

The Cage Subsystems **SFPs** tab displays information about the system's SFPs.

To access the Cage Subsystems **SFPs** tab, click the **SFPs** tab after accessing the **Cage Subsystem** tab.



System	Cage Name	Name (Card:SFP)	Manufacturer	Assembly Serial Number	Assembly Part Number	Max Rate (Gbps)	Port Name	Cage Position
s020	cage0	0:0	FINISAR CORP.	PE7484U	FTLF8519P2BNL	2.1	A0	0
s020	cage0	1:1	FINISAR CORP.	PE741C7	FTLF8519P2BNL	2.1	B1	0
s020	cage1	0:0	FINISAR CORP.	PE748TF	FTLF8519P2BNL	2.1	A0	1
s020	cage1	1:1	FINISAR CORP.	PE7422E	FTLF8519P2BNL	2.1	B1	1
s381	cage2	0:0	FINISAR CORP.	PF931BT	FTLF8524P2BNV	4.2	A0	2
s381	cage2	1:1	FINISAR CORP.	PF930UW	FTLF8524P2BNV	4.2	B1	2
s381	cage3	0:0	FINISAR CORP.	PF92VCN	FTLF8524P2BNV	4.2	A0	3
s381	cage3	1:1	FINISAR CORP.	PF92WX5	FTLF8524P2BNV	4.2	B1	3

The Cage Subsystems **SFPs** tab displays the following information:

Column	Description
<b>System*</b>	The name of the system.
<b>Cage Name</b>	The drive cage in which the SFP resides.
<b>Name</b>	The SFP name in Card:SFP format.
<b>Manufacturer</b>	The manufacturer of the SFP.
<b>Assembly Serial Number</b>	The SFP serial number.
<b>Assembly Part Number</b>	The part number of the SFP.
<b>Max Rate</b>	The SFP's maximum speed, in Gbps.
<b>Port Name</b>	The name of the port on which the SFP resides.
<b>Cage Position</b>	The position of the drive cage in the drive chassis.

\*Not displayed when viewing information for an individual system.

## Viewing the Cage Subsystems Magazines Tab

The Cage Subsystems **Magazines** tab displays information about the system's drive magazines.

To access the Cage Subsystems **Magazines** tab, click the **Magazines** tab after accessing the **Cage Subsystem** tab.

System	Name (Cage:Magazine)	Manufacturer	Assembly Serial Number	Assembly Part Number	Cage Type
s020	0:0	n/a	n/a	n/a	DC2
s020	0:1	n/a	n/a	n/a	DC2
s020	0:7	n/a	n/a	n/a	DC2
s020	0:8	n/a	n/a	n/a	DC2
s020	0:9	n/a	n/a	n/a	DC2
s020	1:0	n/a	n/a	n/a	DC2
s020	1:1	n/a	n/a	n/a	DC2
s020	1:7	n/a	n/a	n/a	DC2
s020	1:8	n/a	n/a	n/a	DC2

The Cage Subsystems **Magazines** tab displays the following information:

Column	Description
<b>System*</b>	The name of the system.
<b>Name</b>	The drive magazine name, in node:slot format.
<b>Manufacturer</b>	The manufacturer of the drive magazine.
<b>Assembly Serial Number</b>	The SFP serial number.
<b>Assembly Part Number</b>	The part number of the SFP.
<b>Cage Type</b>	The drive cage type (DC2, DC3, DC4, DCS1, or DCS2) in which the drive magazine resides.

\*Not displayed when viewing information for an individual system.

## Viewing the Cage Subsystems Physical Disks Tab

The Cage Subsystems **Physical Disks** tab displays information about the system's physical disk drives.

To access the Cage Subsystems **Physical Disks** tab, click the **Physical Disks** tab after accessing the **Cage Subsystem** tab.

System	Name (Cage:Magazine:Disk)	Manufacturer	Assembly Serial Number	Assembly Part Number	Firmware Version	Device Type	Device Protocol	Device RPM (R)	Total Capacity (GB)	Media Type	Life Remaining (%)
s381	0:0:0	SEAGATE	3X00737H	ST945040455	XRFA	FC	SAS	10	409.000	Magnetic	--
s381	0:1:0	SEAGATE	3X0072T0	ST945040455	XRFA	FC	SAS	10	409.000	Magnetic	--
s381	0:2:0	SEAGATE	3X0074H4	ST945040455	XRFA	FC	SAS	10	409.000	Magnetic	--
s381	0:3:0	SEAGATE	3X00747F	ST945040455	XRFA	FC	SAS	10	409.000	Magnetic	--
s381	0:20:0	SEAGATE	3X007325	ST945040455	XRFA	FC	SAS	10	409.000	Magnetic	--
s381	0:21:0	SEAGATE	3X00735G	ST945040455	XRFA	FC	SAS	10	409.000	Magnetic	--
s381	0:22:0	SEAGATE	3X0073CB	ST945040455	XRFA	FC	SAS	10	409.000	Magnetic	--
s381	0:23:0	SEAGATE	3X0073FX	ST945040455	XRFA	FC	SAS	10	409.000	Magnetic	--

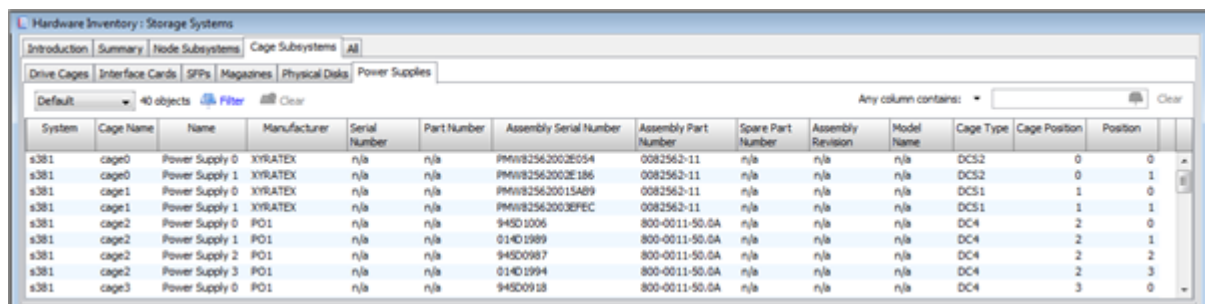
The Cage Subsystems **Physical Disks** tab displays the following information:

Column	Description
<b>System*</b>	The system name.
<b>Name</b>	The disk name in Cage:Magazine:Disk format.
<b>Manufacturer</b>	The manufacturer of the disk.
<b>Assembly Serial Number</b>	The SFP serial number.
<b>Assembly Part Number</b>	The part number of the SFP.
<b>Firmware Version</b>	The disk's firmware version.
<b>Device Type</b>	The type of physical disk: Fast Class (FC), Solid State (SSD), or Nearline (NL).
<b>Device Protocol</b>	The protocol used by the device, e.g., FC or Serial Attached SCSI (SAS).
<b>Device RPM</b>	Speed of the specified disk.
<b>NOTE:</b> The <b>Device RPM</b> number does not represent a rotational speed for the drives without spinning media (SSD). It is meant as a rough estimation of the performance difference between the drive and the other drives in the system. For FC and NL drives, the number corresponds to both a performance measure and actual rotational speed. For an SSD drive, the number is to be treated as relative performance benchmark that takes into account in I/O per second, bandwidth, and the access time.	
<b>Total Capacity</b>	The total capacity of the disk, in GiB.
<b>Media Type</b>	Media type of as SSD device, such as Magnetic or Single-Level Cell (MLC or SLC).
<b>Life Remaining</b>	The estimated remaining life of an SSD, as a percentage. The threshold limit is 95%. If the remaining life exceeds the threshold (that is, 5% or less life remaining), the bar will change from green to red.

\*Not displayed when viewing information for an individual system.

## Viewing the Cage Subsystems Power Supplies Tab

The Cage Subsystems **Power Supplies** tab displays information about the system's power supplies. To access the Cage Subsystems **Power Supplies** tab, click the **Power Supplies** tab after accessing the **Cage Subsystem** tab.



System	Cage Name	Name	Manufacturer	Serial Number	Part Number	Assembly Serial Number	Assembly Part Number	Spare Part Number	Assembly Revision	Model Name	Cage Type	Cage Position	Position
s381	cage0	Power Supply 0	XVRATEX	n/a	n/a	PMN82563002E054	0082562-11	n/a	n/a	n/a	DC52	0	0
s381	cage0	Power Supply 1	XVRATEX	n/a	n/a	PMN82563002E186	0082562-11	n/a	n/a	n/a	DC52	0	1
s381	cage1	Power Supply 0	XVRATEX	n/a	n/a	PMN825630015A89	0082562-11	n/a	n/a	n/a	DC51	1	0
s381	cage1	Power Supply 1	XVRATEX	n/a	n/a	PMN82563003EPEC	0082562-11	n/a	n/a	n/a	DC51	1	1
s381	cage2	Power Supply 0	PO1	n/a	n/a	94501006	800-0011-50.0A	n/a	n/a	n/a	DC4	2	0
s381	cage2	Power Supply 1	PO1	n/a	n/a	01401989	800-0011-50.0A	n/a	n/a	n/a	DC4	2	1
s381	cage2	Power Supply 2	PO1	n/a	n/a	94500987	800-0011-50.0A	n/a	n/a	n/a	DC4	2	2
s381	cage2	Power Supply 3	PO1	n/a	n/a	01401994	800-0011-50.0A	n/a	n/a	n/a	DC4	2	3
s381	cage3	Power Supply 0	PO1	n/a	n/a	94500918	800-0011-50.0A	n/a	n/a	n/a	DC4	3	0

The Cage Subsystems **Power Supplies** tab displays the following information:

Column	Description
<b>System*</b>	The name of the system.
<b>Cage Name</b>	The drive cage name.
<b>Name</b>	The power supply name.

Column	Description
<b>Manufacturer</b>	The manufacturer of the power supply.
<b>Serial Number*</b>	The power supply's serial number.
<b>Part Number*</b>	The part number of the power supply.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Spare Part Number*</b>	The spare part number, if applicable.
<b>Assembly Revision*</b>	The assembly revision, if applicable.
<b>Model Name*</b>	The model name, if applicable.
<b>Cage Type</b>	The type of drive cage (DC2, DC3, DC4, DCS1, or DCS2).
<b>Cage Position</b>	The position of the drive cage in the drive chassis.
<b>Position</b>	The position of the power supply.

\*Not displayed when viewing information for an individual system.

## 33 Viewing the All Tab

The **Hardware Inventory All** tab provides an overview of all hardware components used in all connected HP 3PAR StoreServ Storage Systems.

To access the **Hardware Inventory All** tab:

1. Click **Hardware Inventory** in the Manger Pane.
2. In the Management Tree, select the **Storage Systems** node or an individual storage system.
3. In the Management Window, click the **All** tab.

System	Name	Manufacturer	Serial Number	Part Number	Assembly Serial Number	Assembly Part Number	Spare Part Number	Assembly Revision	Model Name	Type
s020	0:0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Magazine
s020	0:0	PINISAR CORP.	n/a	n/a	PE7484UJ	FTLUF8519P2894	n/a	n/a	n/a	Cage SFP
s020	0:0	PINISAR CORP.	n/a	n/a	PE7484TP	FTLUF8519P2894	n/a	n/a	n/a	Cage SFP
s020	0:0	QLOGIC	n/a	n/a	C83008	2300	n/a	n/a	n/a	PCI Card
s020	0:0:0	SEAGATE	n/a	n/a	3KS6WE58	ST3146707FC	n/a	n/a	n/a	Physical Disk
s020	0:0:1	SEAGATE	n/a	n/a	3KS70NM1	ST3146707FC	n/a	n/a	n/a	Physical Disk
s020	0:0:2	SEAGATE	n/a	n/a	3KS72WST	ST3146707FC	n/a	n/a	n/a	Physical Disk
s020	0:0:3	SEAGATE	n/a	n/a	3KS70PDP	ST3146707FC	n/a	n/a	n/a	Physical Disk
s020	0:1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Magazine
s020	0:1:0	SEAGATE	n/a	n/a	3KS0PG84	ST3146707FC	n/a	n/a	n/a	Physical Disk
s020	0:1:1	SEAGATE	n/a	n/a	3KS73L4M	ST3146707FC	n/a	n/a	n/a	Physical Disk
s020	0:1:2	SEAGATE	n/a	n/a	3KS72T3V	ST3146707FC	n/a	n/a	n/a	Physical Disk
s020	0:1:3	SEAGATE	n/a	n/a	3KS73L8B	ST3146707FC	n/a	n/a	n/a	Physical Disk
s020	0:2	EMULEX	n/a	n/a	BT10273821	LP11002	n/a	n/a	n/a	PCI Card
s020	0:3	QLOGIC	n/a	n/a	F520548812725	QLA4052C	n/a	n/a	n/a	PCI Card
s020	0:4	Intel	n/a	n/a	00060C7428A7	PRO/1000XT	n/a	n/a	n/a	PCI Card
s020	0:5	QLOGIC	n/a	n/a	C31046	2300	n/a	n/a	n/a	PCI Card

The **Hardware Inventory All** tab provides the following information:

Column	Description
<b>System*</b>	The name of the system
<b>Name</b>	The name of the hardware component.
<b>Manufacturer</b>	The manufacture of the hardware component.
<b>Serial Number</b>	The serial number of the hardware component.
<b>Part Number</b>	The part number of the hardware component.
<b>Assembly Serial Number</b>	The assembly's serial number.
<b>Assembly Part Number</b>	The assembly's part number.
<b>Spare Part Number</b>	The spare part number, if applicable.
<b>Assembly Revision</b>	The assembly revision, if applicable.
<b>Model Name</b>	The model name, if applicable.
<b>Type</b>	The type of hardware component.

\*Not displayed when viewing information for an individual system.

# 34 Support and Other Resources

## Contacting HP

For worldwide technical support information, see the HP support website:

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

Before contacting HP, collect the following information:

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

Specify the type of support you are requesting:

HP 3PAR storage system	Support request
HP 3PAR StoreServ 7200 and 7400 Storage systems	StoreServ 7000 Storage
HP 3PAR StoreServ 10000 Storage systems HP 3PAR T-Class storage systems HP 3PAR F-Class storage systems	3PAR or 3PAR Storage

## HP 3PAR documentation

For information about:	See:
Supported hardware and software platforms	The Single Point of Connectivity Knowledge for HP Storage Products (SPOCK) website: <a href="http://www.hp.com/storage/spock">http://www.hp.com/storage/spock</a>
Locating HP 3PAR documents	The HP 3PAR support website: <a href="http://www.hp.com/3par/support_manuals">http://www.hp.com/3par/support_manuals</a>
<b>HP 3PAR storage system software</b>	
Storage concepts and terminology	<i>HP 3PAR StoreServ Storage Concepts Guide</i>
Using the HP 3PAR Management Console (GUI) to configure and administer HP 3PAR storage systems	<i>HP 3PAR Management Console User's Guide</i>
Using the HP 3PAR CLI to configure and administer storage systems	<i>HP 3PAR Command Line Interface Administrator's Manual</i>
CLI commands	<i>HP 3PAR Command Line Interface Reference</i>
Analyzing system performance	<i>HP 3PAR System Reporter Software User's Guide</i>
Installing and maintaining the Host Explorer agent in order to manage host configuration and connectivity information	<i>HP 3PAR Host Explorer User's Guide</i>
Creating applications compliant with the Common Information Model (CIM) to manage HP 3PAR storage systems	<i>HP 3PAR CIM API Programming Reference</i>
Migrating data from one HP 3PAR storage system to another	<i>HP 3PAR-to-3PAR Storage Peer Motion Guide</i>

<b>For information about:</b>	<b>See:</b>
Configuring the Secure Service Custodian server in order to monitor and control HP 3PAR storage systems	<i>HP 3PAR Secure Service Custodian Configuration Utility Reference</i>
Using the CLI to configure and manage HP 3PAR Remote Copy	<i>HP 3PAR Remote Copy Software User's Guide</i>
Updating HP 3PAR operating systems	<i>HP 3PAR Upgrade Pre-Planning Guide</i>
Identifying storage system components, troubleshooting information, and detailed alert information	<i>HP 3PAR F-Class, T-Class, and StoreServ 10000 Storage Troubleshooting Guide</i>
Installing, configuring, and maintaining the HP 3PAR Policy Server	<i>HP 3PAR Policy Server Installation and Setup Guide</i> <i>HP 3PAR Policy Server Administration Guide</i>



For information about:	See:
<b>Planning for HP 3PAR storage system setup</b> Hardware specifications, installation considerations, power requirements, networking options, and cabling information for HP 3PAR storage systems	
HP 3PAR 7200 and 7400 storage systems	<i>HP 3PAR StoreServ 7000 Storage Site Planning Manual</i>
HP 3PAR 10000 storage systems	<i>HP 3PAR StoreServ 10000 Storage Physical Planning Manual</i> <i>HP 3PAR StoreServ 10000 Storage Third-Party Rack Physical Planning Manual</i>
<b>Installing and maintaining HP 3PAR 7200 and 7400 storage systems</b>	
Installing 7200 and 7400 storage systems and initializing the Service Processor	<i>HP 3PAR StoreServ 7000 Storage Installation Guide</i> <i>HP 3PAR StoreServ 7000 Storage SmartStart Software User's Guide</i>
Maintaining, servicing, and upgrading 7200 and 7400 storage systems	<i>HP 3PAR StoreServ 7000 Storage Service Guide</i>
Troubleshooting 7200 and 7400 storage systems	<i>HP 3PAR StoreServ 7000 Storage Troubleshooting Guide</i>
Maintaining the Service Processor	<i>HP 3PAR Service Processor Software User Guide</i> <i>HP 3PAR Service Processor Onsite Customer Care (SPOCC) User's Guide</i>
<b>HP 3PAR host application solutions</b>	
Backing up Oracle databases and using backups for disaster recovery	<i>HP 3PAR Recovery Manager Software for Oracle User's Guide</i>
Backing up Exchange databases and using backups for disaster recovery	<i>HP 3PAR Recovery Manager Software for Microsoft Exchange 2007 and 2010 User's Guide</i>
Backing up SQL databases and using backups for disaster recovery	<i>HP 3PAR Recovery Manager Software for Microsoft SQL Server User's Guide</i>
Backing up VMware databases and using backups for disaster recovery	<i>HP 3PAR Management Plug-in and Recovery Manager Software for VMware vSphere User's Guide</i>
Installing and using the HP 3PAR VSS (Volume Shadow Copy Service) Provider software for Microsoft Windows	<i>HP 3PAR VSS Provider Software for Microsoft Windows User's Guide</i>
Best practices for setting up the Storage Replication Adapter for VMware vCenter	<i>HP 3PAR Storage Replication Adapter for VMware vCenter Site Recovery Manager Implementation Guide</i>
Troubleshooting the Storage Replication Adapter for VMware vCenter Site Recovery Manager	<i>HP 3PAR Storage Replication Adapter for VMware vCenter Site Recovery Manager Troubleshooting Guide</i>
Installing and using vSphere Storage APIs for Array Integration (VAAI) plug-in software for VMware vSphere	<i>HP 3PAR VAAI Plug-in Software for VMware vSphere User's Guide</i>

# Typographic conventions

**Table 1 Document conventions**

Convention	Element
<b>Bold text</b>	<ul style="list-style-type: none"><li>• Keys that you press</li><li>• Text you typed into a GUI element, such as a text box</li><li>• GUI elements that you click or select, such as menu items, buttons, and so on</li></ul>
Monospace text	<ul style="list-style-type: none"><li>• File and directory names</li><li>• System output</li><li>• Code</li><li>• Commands, their arguments, and argument values</li></ul>
<Monospace text in angle brackets>	<ul style="list-style-type: none"><li>• Code variables</li><li>• Command variables</li></ul>
<b>Bold monospace text</b>	<ul style="list-style-type: none"><li>• Commands you enter into a command line interface</li><li>• System output emphasized for scannability</li></ul>



**WARNING!** Indicates that failure to follow directions could result in bodily harm or death, or in irreversible damage to data or to the operating system.



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

**NOTE:** Provides additional information.

## Required

Indicates that a procedure must be followed as directed in order to achieve a functional and supported implementation based on testing at HP.

## HP 3PAR branding information

- The server previously referred to as the "InServ" is now referred to as the "HP 3PAR StoreServ Storage system."
- The operating system previously referred to as the "InForm OS" is now referred to as the "HP 3PAR OS."
- The user interface previously referred to as the "InForm Management Console (IMC)" is now referred to as the "HP 3PAR Management Console."
- All products previously referred to as "3PAR" products are now referred to as "HP 3PAR" products.

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## 35 Documentation feedback

HP is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback ([docsfeedback@hp.com](mailto:docsfeedback@hp.com)). Include the document title and part number, version number, or the URL when submitting your feedback.

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## Part VIII Appendices

This part contains additional information related to the HP 3PAR Storage System.

[“Interface Components” \(page 393\)](#)

[“Interface Tools” \(page 405\)](#)

# A Interface Components

“Components of the Interface” (page 393)

“Interface Tools” (page 405)

## Components of the Interface

The HP 3PAR Management Console is made up of the following components:

“Main Menu Bar” (page 393)

“Main Toolbar” (page 394)

“Management Tree” (page 395)

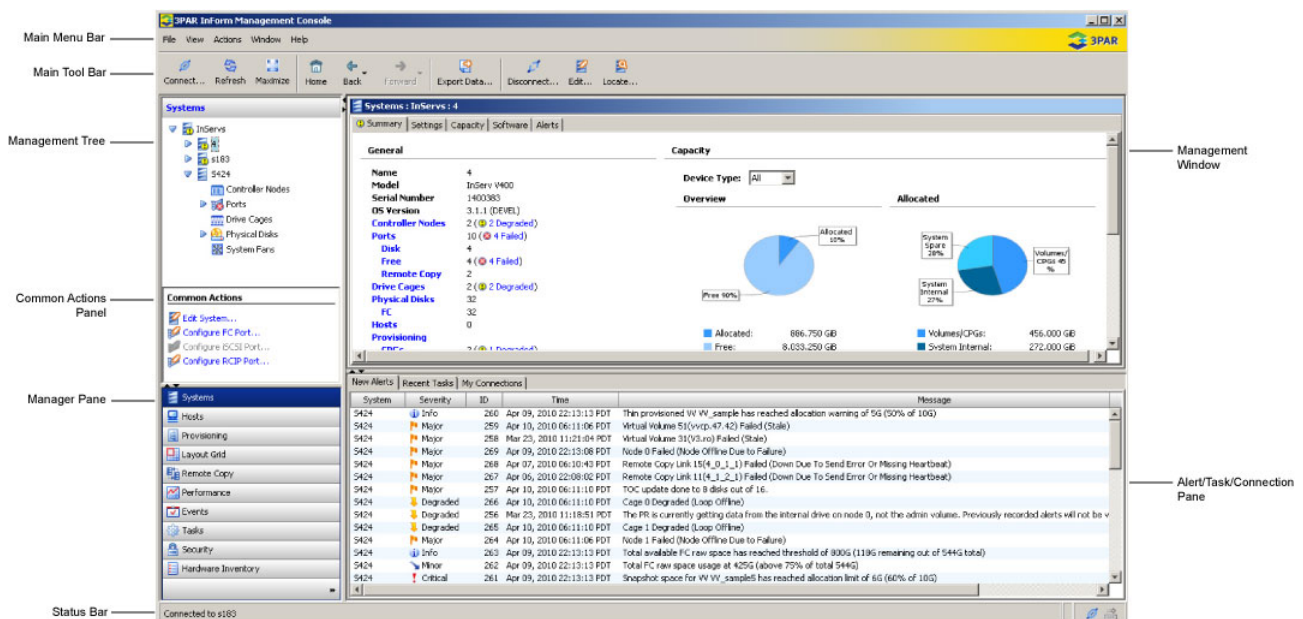
“Common Actions Panel” (page 396)

“Manager Pane” (page 396)

“Management Window” (page 404)

“Alert/Task/Connection Pane” (page 404)

“Status Bar” (page 404)



## Main Menu Bar

The following items are available from the Main Menu Bar:

Menu	Command	Description
File	Connect	Displays the <b>Connect</b> dialog box, allowing you to connect additional storage server(s).
	Disconnect	Displays the <b>Disconnect</b> dialog box, allowing you to disconnect from storage server(s).
	Exit	Closes all windows and exits the InForm GUI.
View	Refresh	Refreshes the HP 3PAR Management Console.
	Auto-Refresh	Automatically refreshes the HP 3PAR Management Console. By default, <b>Auto-Refresh</b> is selected.

Menu	Command	Description
	<b>Maximize</b>	Expands the Application window so it consumes the entire HP 3PAR Management Console window.
	<b>Export Data</b>	Displays the Export Data window, allowing you to save table data as CSV or HTML format.
	<b>Grid</b>	Displays a submenu for setting the <b>Zoom</b> , <b>&lt;Set   Clear&gt; Grid Sticky</b> , <b>&lt;Show   Hide&gt; Details Table</b> .
	<b>Preferences</b>	Opens the Preferences window, allowing you to define <b>Data Format</b> and <b>Look</b> and <b>Feel</b> options for determining how data is displayed.
<b>Actions</b>	<b>Systems</b>	Displays a submenu providing access to system level options.
	<b>Hosts</b>	Displays a submenu providing access to host creation, edit, and removal functions.
	<b>Provisioning</b>	Displays a submenu providing access to all aspects for provisioning storage, including VVs, VLUNs, CPGs, LDs, and Templates.
	<b>Remote Copy</b>	Displays a submenu providing access to set up and edit Remote Copy configurations.
	<b>Alert</b>	Displays a submenu for working with the selected alert. See Managing Events and Alerts.
	<b>Performance</b>	Displays a submenu providing options to performance charting, including new, open, save, and edit functions.
	<b>Task</b>	Displays a submenu allowing you to cancel and remove tasks.
	<b>Security &amp; Domains</b>	Displays a submenu providing access for working with users and domains.
<b>Window</b>	<b>Cascade</b>	Arranges Application windows so they overlap one another, but every window is visible within the desktop.
	<b>Tile</b>	Arranges and resizes all Application windows to fit inside the desktop.
	<b>Tile Horizontally</b>	Tiles all Application windows horizontally in the desktop.
	<b>Tile Vertically</b>	Tiles all Application windows vertically in the desktop.
	<b>Restore</b>	Restores the selected Application window from the Taskbar to the desktop.
	<b>Minimize</b>	Minimizes the selected Application window.
	<b>Maximize</b>	Maximizes the selected Application window.
	<b>1...&lt;List of Open Windows&gt;</b>	Restores the selected Application from the Taskbar to the Desktop.
<b>Help</b>	<b>Topics</b>	Opens the Help Navigator and the Help Topic Window, providing access to the HP 3PAR Management Console Online Help system.
	<b>About 3PAR HP 3PAR Management Console</b>	Displays the <b>About 3PAR HP 3PAR Management Console</b> dialog box, which contains version number, software patch, and copyright information.

## Main Toolbar

The following default items are available from the Main Toolbar:



Command	Description
<b>Connect</b>	Displays the Connect dialog box, allowing you to connect additional storage server(s).
<b>Refresh</b>	Refreshes the HP 3PAR Management Console.
<b>Maximize</b>	Expands the Management window so it consumes the entire HP 3PAR Management Console window.
<b>Restore</b>	Restores the Management window to its original size.
<b>Home</b>	Returns all panes, the Management Tree, and Management window to the default view (Systems Introduction).
<b>Back/Forward</b>	Returns backward or forward to the previously selected Manager Pane, Management Tree item, and Management window display.
<b>Export Data</b>	Displays the Export Data window, allowing you to save table data as CSV or HTML format.

Additional actions are displayed on the Main Toolbar depending on the selected manager, node selected from the Management Tree, and item selected from the Management window.

## Management Tree

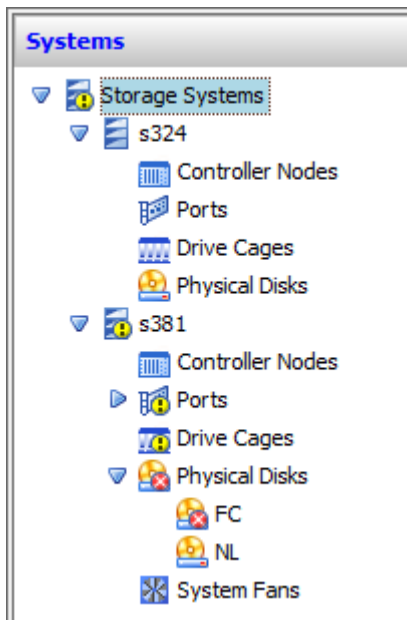
The Management Tree displays information relevant to the selected manager from the “[Manager Pane](#)” (page 396). At its most basic, the Management Tree displays which storage servers are connected to the HP 3PAR Management Console. Additional icons displayed on the Management Tree are specific to the manager selected. For example, in the figure below, the Management Tree displays icons specific to the Systems manager. The Management Tree also has shortcut menus that contain useful commands.

### Management Tree Structure

When you click an icon on the Management Tree, the associated data is displayed in the “[Management Window](#)” (page 404). For example, if you click the Ports icon, information about a system's ports is displayed.

Each icon displayed with an expandable triangle (▶) to its left is called a node. An expandable triangle also indicates that that node can be expanded to display additional information. The Management Tree nodes are displayed in a parent/child relationship. For example, in the figure below the connected storage servers (s183 and S424) are displayed as child nodes of the InServs parent node. Ports and Physical Disks are further displayed as child nodes of the connected servers.

Also included for quick visual reference, Normal 🟢, Degraded 🟡, or Failed 🔴 status icons are displayed in the tree to quickly identify systems or related system components that may require attention.



## Common Actions Panel

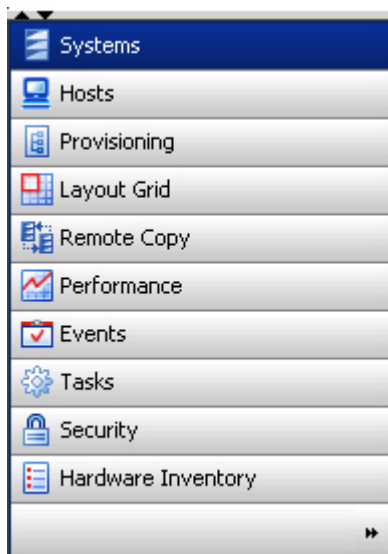
The Common Actions panel provides quick access to functions commonly performed with each manager in the Manager Pane. Clicking an action listed in the Common Action panel launches that action's wizard. As with the ["Management Tree" \(page 395\)](#), the functions provided in the Common Actions panel are specific to the selected manager from the ["Manager Pane" \(page 396\)](#). Unavailable functions are displayed in grey. For example, in the figure below, the actions displayed in the Common Actions panel are specific to the Systems manager selected in the Manager Pane.



## Manager Pane

Managers are groups of displays and actions, which are specific to different systems' areas of management. The selected manager affects the ["Management Tree" \(page 395\)](#) display, data displayed in the ["Management Window" \(page 404\)](#), and, if applicable, the actions in the ["Common Actions Panel" \(page 396\)](#).





The following managers are contained in the Manager Pane:

[“System Manager” \(page 397\)](#)

[“Host Manager” \(page 398\)](#)

[“Provisioning Manager” \(page 399\)](#)

[“Layout Grid Manager” \(page 399\)](#)

[“Remote Copy Manager” \(page 400\)](#)

[“Performance & Reports Manager” \(page 401\)](#)

[“Events & Alerts Manager” \(page 402\)](#)

[“Tasks & Schedules Manager” \(page 402\)](#)

[“Security & Domains Manager” \(page 403\)](#)

[“Hardware Inventory Manager” \(page 403\)](#)

For instructions on modifying the display of the Manager Pane, see [“Setting Manager Pane Preferences” \(page 414\)](#) and [“Customizing the Manager Pane Display” \(page 415\)](#).

## System Manager

The System Manager allows you to view and perform system-level actions and information:

[“Viewing System Information” \(page 278\)](#)

[“Managing Alerts” \(page 268\)](#)

[“Locating a System” \(page 275\)](#)

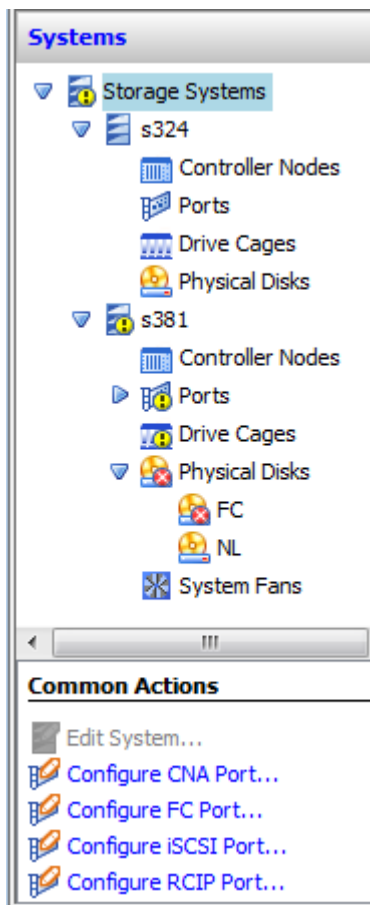
[“Editing a System” \(page 275\)](#)

[“Working with Controller Nodes” \(page 287\)](#)

[“Managing Drive Cages” \(page 299\)](#)

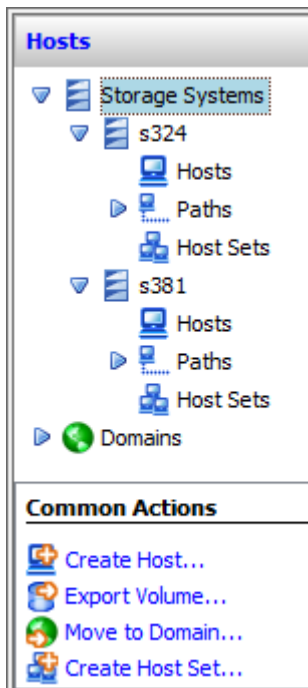
[“Managing Ports” \(page 20\)](#)

When the System Manager is selected, the Management Tree and Common Actions panel appear as follows:



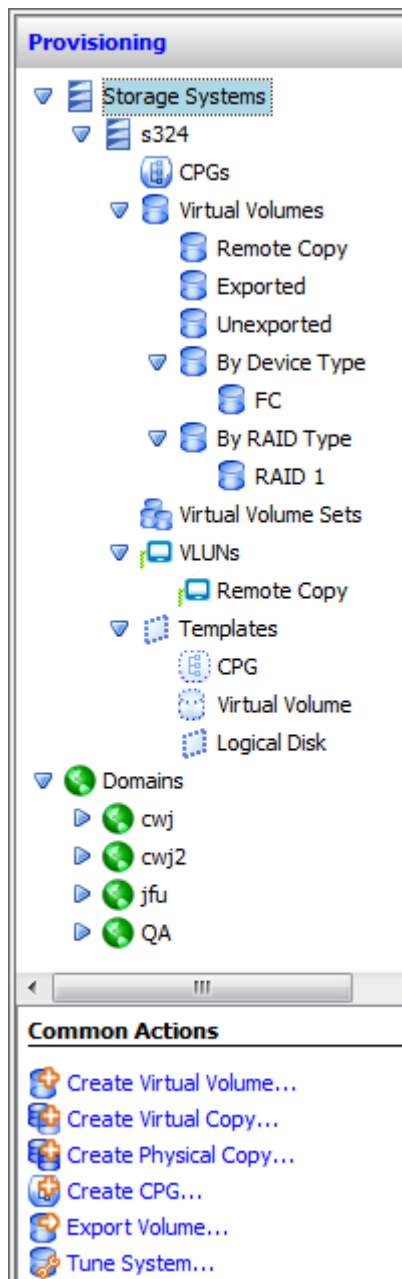
## Host Manager

The Host Manager allows you to view and perform host-specific actions and information. When the Host Manager is selected, the Management Tree and Common Actions panel appear as follows:



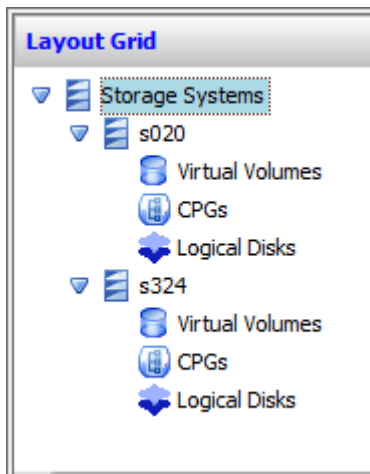
## Provisioning Manager

The Provisioning Manager allows you to view and perform system provisioning actions and information. When the Provisioning Manager is selected, the Management Tree and Common Actions panel appear as follows:



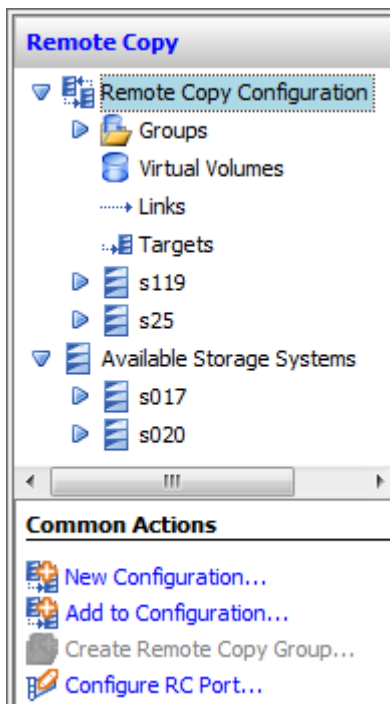
## Layout Grid Manager

The Layout Grid Manager allows you to view the layout of virtual volumes, Common Provisioning Groups (CPGs), and logical disks of systems. When the Layout Grid Manager is selected, the Management Tree appears as follows:



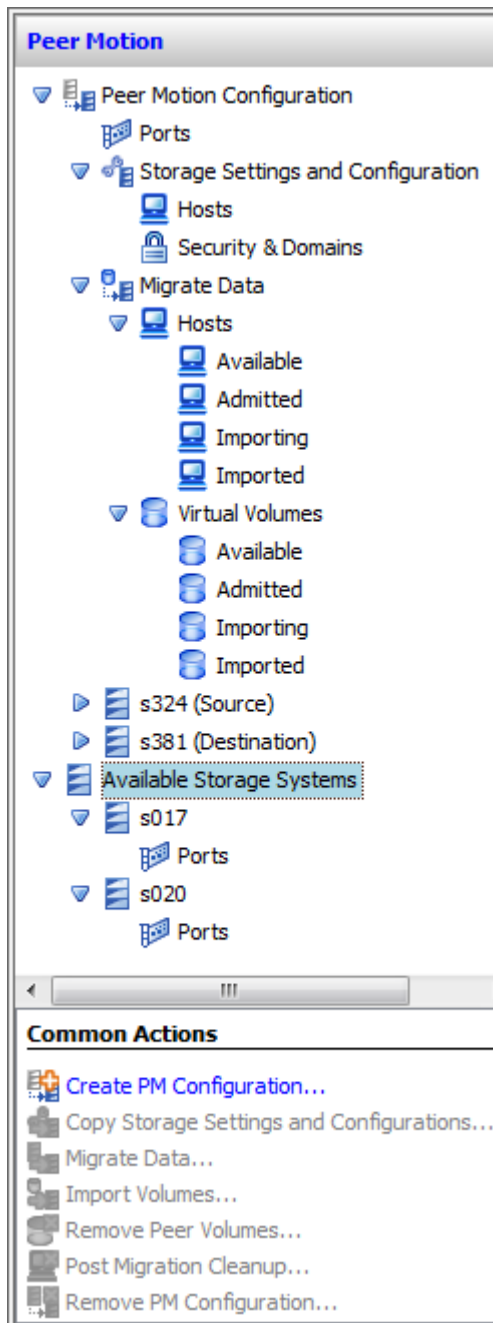
## Remote Copy Manager

The Remote Copy Manager allows you to view and perform Remote Copy actions and information. When the Remote Copy Manager is selected, the Management Tree and Common Actions panel appear as follows:



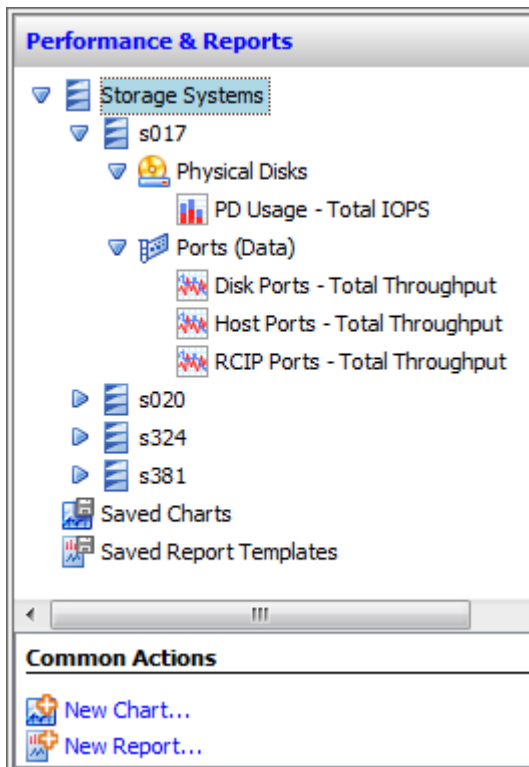
## Peer Motion Manager

The Peer Motion Manager allows you to view and create PM Configurations, migrate data, import volumes, and perform other peer motion-related tasks. When the Peer Motion Manager is selected, the Management Tree and Common Actions panel appear as follows:



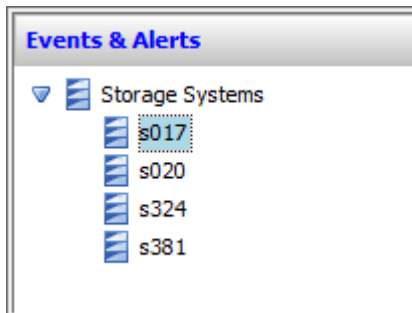
## Performance & Reports Manager

The Performance & Reports Manager allows you to view system performance information and work with performance charts. When the Performance Manager is selected, the Management Tree and Common Actions panel appear as follows:



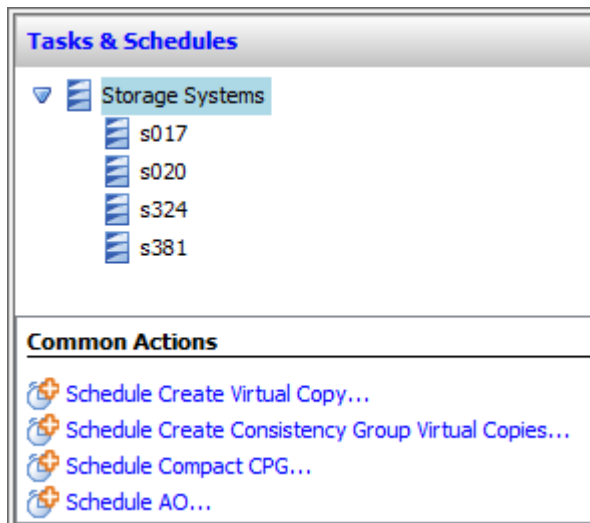
## Events & Alerts Manager

The Events & Alerts Manager allows you to view system alerts and events. When the Event Manager is selected, the Management Tree appears as follows:



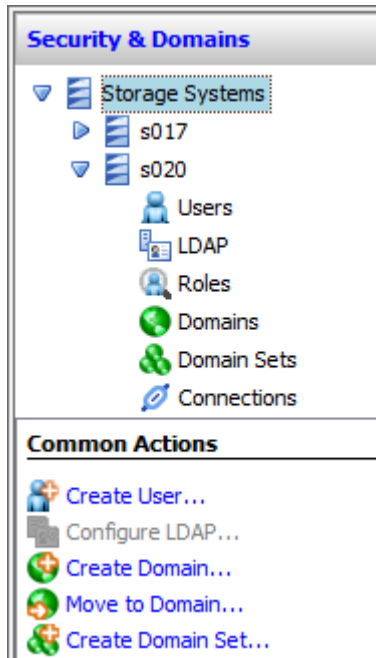
## Tasks & Schedules Manager

The Tasks & Schedules Manager allows you to view and perform system task actions and information. When the Task Manager is selected, the Management Tree and Common Actions Panel appear as follows:



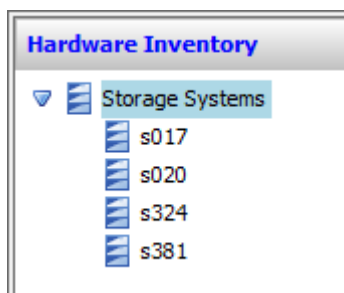
## Security & Domains Manager

The Security & Domains Manager allows you to view and work with system users, domains, and connections. When the Security Manager is selected, the Management Tree and Common Actions Panel appear as follows:






## Hardware Inventory Manager

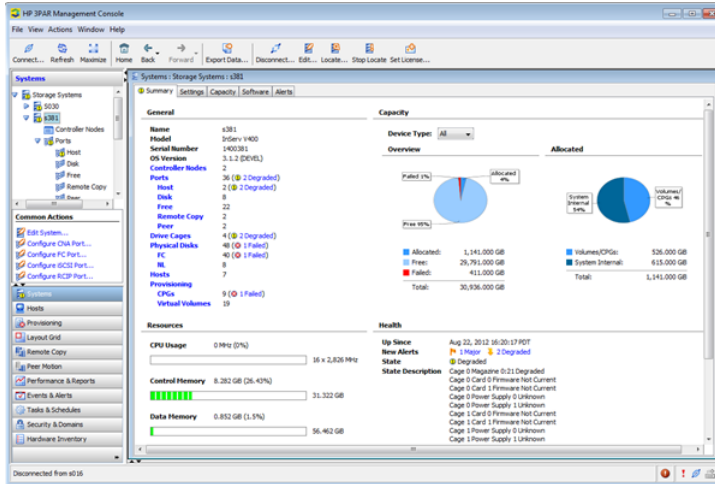
The Hardware Inventory Manager allows you to view system hardware components. When the Hardware Inventory Manager is selected, the Management Tree appears as follows:



## Management Window

The Management Window displays data, as well as additional options for viewing data. The data displayed in the Management Window is dependent on the selected manager from the “Manager Pane” (page 396) and the selected node from the “Management Tree” (page 395).

Also included for quick visual reference, Normal , Degraded , or Failed  status icons are displayed in the tree to quickly identify systems or related system components that may require attention.



## Alert/Task/Connection Pane

The Alert/Task/Connection pane is provided for quick reference to new system alerts, recent tasks, and user connections. Each set of information is displayed on its own tab within the pane.

New Alerts				
System	Severity	ID	Time	Message
s183	Major	46	Jan 01, 2010 17:58:10 PST	Error in Track:mkinofile: Internal error: Could not close file /tmp/_tpdtcl_conninfo/18786: no spa
s183	Minor	47	Jan 11, 2010 11:15:52 PST	Port (0:5:1) is used for disk or host
S424	Degraded	221	Oct 15, 2009 15:23:32 PDT	Port 1:3:1 Degraded (Target Mode Port Went Offline)
S424	Degraded	222	Oct 15, 2009 15:23:32 PDT	Port 0:3:1 Degraded (Target Mode Port Went Offline)
S424	Info	219	Jan 13, 2010 10:19:38 PST	Total available FC raw space has reached threshold of 800G (236G remaining out of 544G total)
S424	Info	223	Jan 13, 2010 10:18:34 PST	Total FC raw space usage at 307G (above 50% of total 544G)

## Status Bar

The Status bar is located at the bottom of the HP 3PAR Management Console.

The left side of the Status bar displays the last action performed with the HP 3PAR Management Console.

The right side of the Status bar displays icons representing the highest alert level, connection status, and data retrieval process status.



The right side of the Status bar also displays an icon for any runtime exceptions. The icon can be clicked to view details about the exception.





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## B Interface Tools

### Navigating the Management Console Interface

This chapter outlines how to use the HP 3PAR Management Console and provides an overview of the major tasks you can perform.

The HP 3PAR Management Console interface contains a menu bar, toolbar, management tree, common actions panel, manager pane, management window, alert/task/connection pane, and status bar. See [“Components of the Interface” \(page 393\)](#) for further information.

When starting the HP 3PAR Management Console and logging into an HP 3PAR StoreServ Storage System, or multiple Storage Systems, the interface appears displaying the Systems overview screen, as well as the management tree and alert pane. The status bar is located at the bottom of the interface.

Topics discussed here include:

[“About Introduction Tabs” \(page 405\)](#)

[“Selecting Multiple Items” \(page 406\)](#)

[“Refreshing the HP 3PAR Management Console” \(page 409\)](#)

[“Exporting Data” \(page 409\)](#)

[“Filtering” \(page 410\)](#)

[“Setting Preferences” \(page 412\)](#)

[“Understanding Icons” \(page 406\)](#)

### About Introduction Tabs

Managers are groups of displays and actions, which are specific to different system areas of management. The selected manager affects the [“Management Tree” \(page 395\)](#) display, data displayed in the [“Management Window” \(page 404\)](#), and, if applicable, the actions in the [“Common Actions Panel” \(page 396\)](#). Each manager is provided with an Introduction tab in the Management window. Each Introduction tab contains topical overview information about the selected manager. For example, when selecting the Remote Copy Manager, the Introduction tab provides overview information about HP 3PAR Remote Copy and about tasks that can be performed in the Remote Copy Manager. The left side of the Introduction tabs provide links to help topics relevant to the selected manager.

### Removing the Introduction Tab

A manager's Introduction tab can be closed at any time by clicking **Close Tab** in the upper right corner of the tab.

If you wish to hide all Introduction tabs in the managers:

1. Access the **Preferences** dialog box from the Main Menu bar by clicking **View > Preferences**.
2. Click the **Settings** tab.
3. In the **Introduction Tabs** group box, click **Remove All Tabs**.
4. Click **Apply**.
5. Click **OK** to exit the **Preferences** dialog box.

---

**NOTE:** Once an Introduction tab is closed or hidden, it will not appear again until you manually restore the tab via **Preferences**.

---

### Restoring the Introduction Tab

If you wish to restore closed or hidden Introduction tabs:

1. Access the **Preferences** dialog box from the Main Menu bar by clicking **View > Preferences**.
2. Click the **Settings** tab.
3. In the **Introduction Tabs** group box, click **Restore All Tabs**.

4. Click **Apply**.
5. Click **OK** to exit the **Preferences** dialog box.

## Selecting Multiple Items

The HP 3PAR Management Console supports the standard **Shift+click** functionality to select a contiguous block of items, and the standard **Ctrl+click** functionality to select several non-contiguous items. These functions can be used in most of the managers listed in the “[Manager Pane](#)” (page 396) to facilitate actions.

For example, when creating a virtual volume set, you can use specific virtual volumes to form the set by either using the **Shift+click** or **Ctrl+click** function to select a group of virtual volumes.

**NOTE:** If you try to select more than the maximum number of allowed objects, you will receive an error message. To increase the number allowed, select **View > Preferences > Advanced Tab**, then in the **Maximum selected objects allowed** box under Layout Grid, enter a new number. You may deselect the Enabled checkbox so that no selection limit is enforced, however doing so may affect system memory and performance if a large number of objects is selected.

## Understanding Icons

The HP 3PAR Management Console uses icons for quick visual reference of alerts, system status, and system components and objects status.







“[Alert Severity Indicators](#)” (page 406)

“[Status Bar Icons](#)” (page 406)

“[System and Component Status Icons](#)” (page 407)

### Alert Severity Indicators







The alert pane and status bar use the following icons to indicate alert severity levels. On the status bar, the alert severity indicator tells you the severity level of the most serious alert for all systems currently connected to the HP 3PAR Management Console.

Icon	Name	Description
	Fatal	A fatal event has occurred. It is no longer possible to take remedial action.
	Critical	The event is critical and requires immediate action.
	Major	The event requires immediate action.
	Minor	An event has occurred that requires action, but the situation is not yet serious.
	Degraded	An aspect of performance or availability may have become degraded. You must decide if action is necessary.
	Informational	The event is informational. No action is required other than acknowledging or removing the alert.

### Status Bar Icons




The status bar displays an alert severity indicator, as well as information about your connection status and the progress of system operations.

The following icons are used:

Icon	Name	Description
See <a href="#">“Alert Severity Indicators”</a> (page 406)	Alert Severity	The status bar displays only the highest severity level found on connected systems.
	Auto-update not working	Appears when auto-refresh is lost. The HP 3PAR Management Console will not receive any updated events from the InServ Storage Server.
	Connected	Appears if at least one system is connected.
	Disconnected	Appears if at least one system is being disconnected or rebooted.
	No connection	Appears when there are no systems connected.
	Operation progress	Animated icon that indicates the progress of an operation.
	Exception Detected	Appears if a runtime exception has occurred.

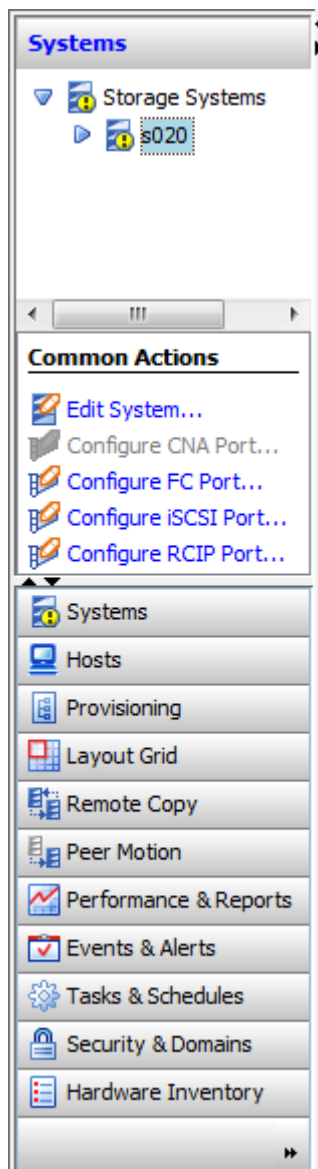
## System and Component Status Icons

The HP 3PAR Management Console provides icons for quick reference, which display the status of connected systems, system hardware, and system objects in the Management Tree and the Management Window.

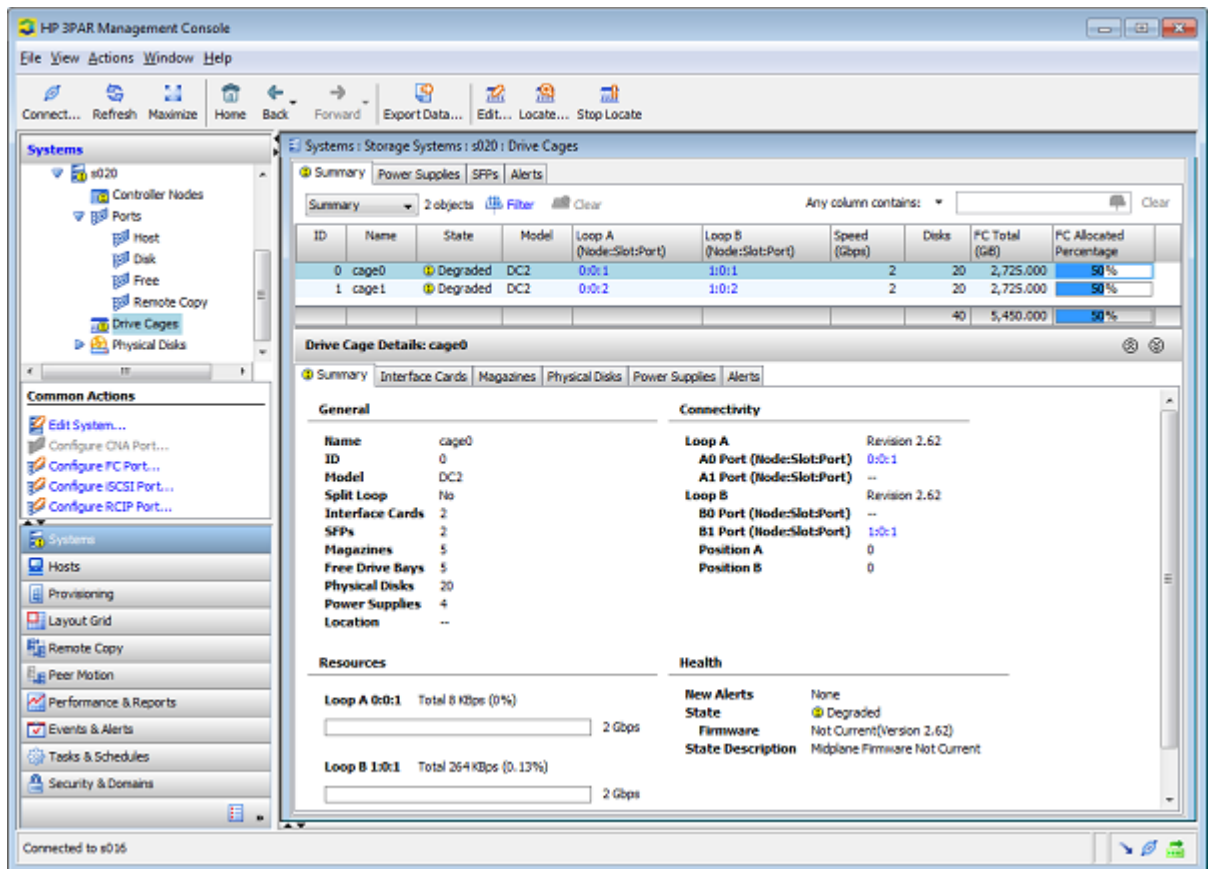
Icon	Name	Description
	Normal	Indicates that the component or object is in a healthy state and is operating normally.
	Degraded	Indicates that the component or object is still operational, however either the performance of the object is degraded or there is a single point of failure of a dependent component. A degraded component's status is also reflected in the status of other components where the degraded component is used. This is further reflected in the status of the system. For example, if a physical disk loses one path it can still serve data, but it is marked as degraded because the loss of the other path would cause it to fail. Because this component is degraded, this status is reflected in the components (e.g. drive cage, system) that contain that disk.
	Failed	Indicates that the component or object is not operational. Like a degraded status, the failed status is also reflected in components and objects where the failed component or object is used.

## Accordion Control

At times, a system may not be operating at normal levels. A storage system can be in one of the following states: Normal, Degraded, or Failed (see [“System and Component Status Icons”](#) (page 407)). If a system is in a degraded or failed state and you select the Systems or Provisioning manager, the state's icon displays on the system icon in the navigation tree in the Management pane.



Expand the management tree for an individual system to see details about the various states.



## Refreshing the HP 3PAR Management Console

To refresh the data displayed in the Management window and Alert/Task/Connection panel, click **Refresh** in the Main Toolbar.



## Exporting Data

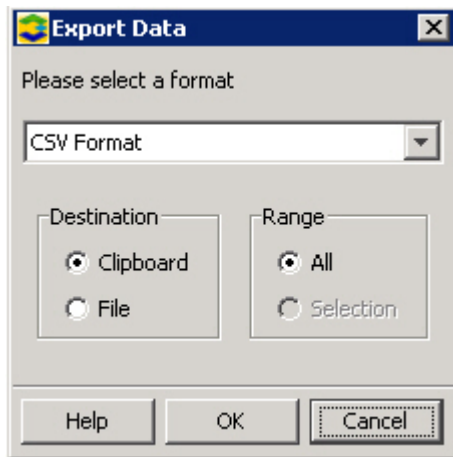
You can export data as a Comma Separated Variable (CSV) or HTML file from all HP 3PAR Management Console displays (except for Performance).

The **Export Data** dialog can be accessed by performing one of the following:

- Clicking **View > Export Data**.
- Clicking **Export Data** from the Main Toolbar

To export data in a currently displayed table in the Management Window:

1. Access the **Export Data** dialog.



2. From the **Select a format** list, select either **CSV Format** or **HTML Format**.
3. From the **Destination** group box, select either **Clipboard** (default) or **File**.
4. If more than one row was selected from the table containing the data to be saved, from the **Range** group box, select either **All** (default) or **Selection**.
5. Click **OK**.
6. If you selected **File** as the save destination, the **Save Chart** dialog appears. Navigate and save the file.

## Filtering

The HP 3PAR Management Console provides a filtering panel, which is located at the top of most Management window displays.

Summary		9 rows	Filter	Clear	<Any column> contains: <input type="text"/>					Clear
Name	Domain	Set	Host Ports	InServ Ports	Node ID(s)	Persona	Volumes Exported	Total Exported Size (GiB)		
HostJeff	domain1	hostset2	0	0	--	0 - Unset	0	1,000		
TestHost2	domain1	hostset2	0	0	--	0 - Unset	0	0,000		
test01	--	--	1	0	--	0 - Unset	0	0,000		
test02	--	--	1	0	--	0 - Unset	0	0,000		
test03	--	--	1	0	--	0 - Unset	0	0,000		
testwst	domain1	--	1	0	--	0 - Unset	0	1,000		
Host_TechPubs	Cougar	--	1	0	--	0 - Unset	0	2,000		

The filtering panel provides two filtering options:

[“Using the Complex Filter” \(page 411\)](#)

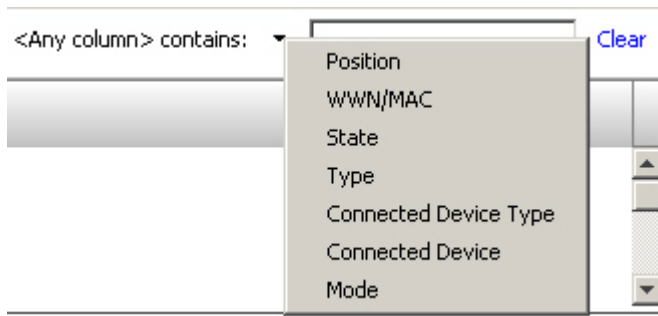
[“Using the Quick Filter” \(page 410\)](#)

## Using the Quick Filter

The quick filter allows you to define a quick filter based on what filter text is typed in the top-right text box. The default behavior is to display rows that have rows matching the input text.

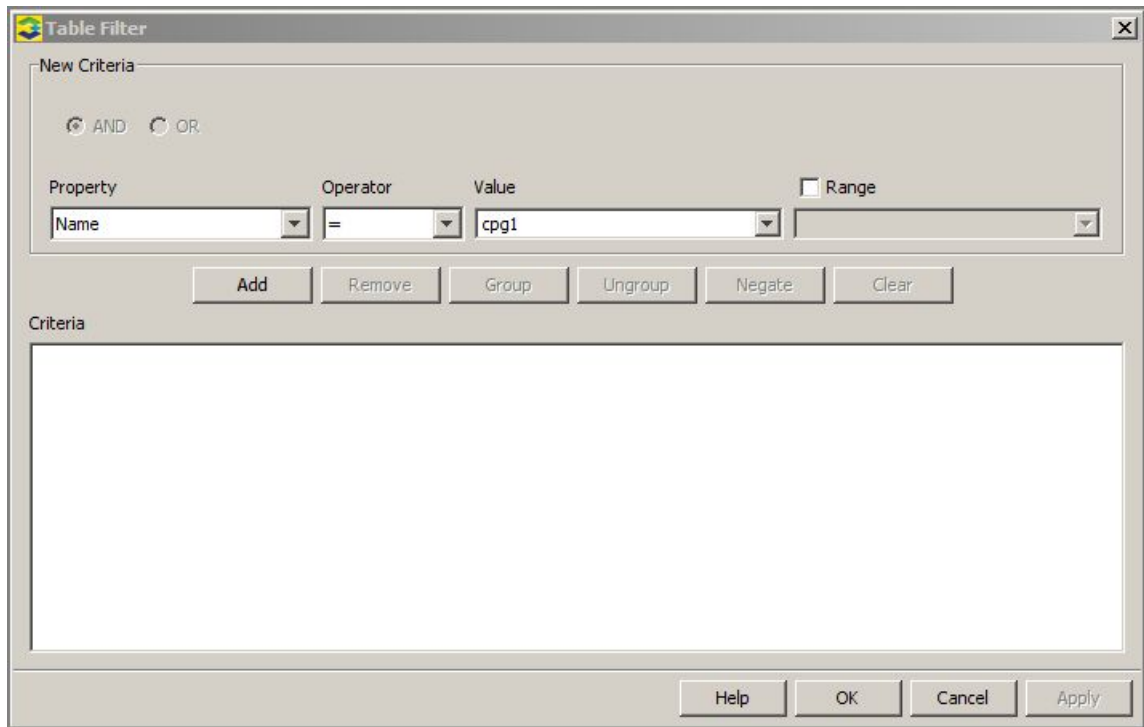
You can choose to have only certain columns matching the input text by clicking the down arrow, which is located immediately to the left of the simple filter text box.

**NOTE:** The columns displayed in the filter list are dependent on the contents of the table you are currently viewing, for example ports, physical disks, etc.



## Using the Complex Filter

The complex filter allows you to define specific criteria by which to search. Access the complex filter by clicking **Filter** on the filtering panel.



**NOTE:** The entries listed under the **Property** list correspond to the table headings displayed in the Management window.

## Adding and Applying New Criteria

1. Select a property from the **Property** list.
2. Select an operator from the **Operator** list.
3. Select a value from the **Value** list.
4. (Optional) Select the **Range** checkbox to define a second value to compare against the first value. This is the same as selecting in range from the **Operator** list.
5. Click **Apply** to apply the criteria.
6. Continue to add additional criteria as needed. Repeat steps 1 through 5.

## Removing Criteria

To remove criteria defined in the **Criteria** field, select the criteria and click **Remove**.

## Grouping and Ungrouping Criteria

To group criteria defined in the **Criteria** field, select two or more criteria and click **Group**.

To ungroup a criteria group defined in the **Criteria** field, select the grouped criteria and click **Ungroup**.

## Negating Criteria

To negate criteria defined in the **Criteria** field, select the criteria and click **Negate**.

## Clearing Criteria

To clear criteria, select the criteria and click **Clear**.

## Setting Preferences

The HP 3PAR Management Console allows you to set global preferences, set preferences for each table, and set Manager Pane viewing preferences.

["Setting Global Preferences" \(page 412\)](#)

["Setting Individual Table Preferences" \(page 413\)](#)

["Setting Manager Pane Preferences" \(page 414\)](#)

## Setting Global Preferences

The **Preferences** dialog box allows you to set global preferences for all systems displayed on the HP 3PAR Management Console. These preferences are saved on the system and remembered the next time you log in using the HP 3PAR Management Console. The **Preferences** dialog box contains three tabs; **Data Format**, **Settings**, and **Advanced**.

This section provides procedures for the following:

["Setting the Display Unit" \(page 412\)](#)

["Setting the WWN Format" \(page 412\)](#)

["Setting the Date and Time Format" \(page 412\)](#)

["Resetting Per-Table Format Settings to Default Settings" \(page 413\)](#)

["Configuring Interface, Dialog, and Tab Settings" \(page 413\)](#)

["Setting Advanced Display Options" \(page 413\)](#)

Access the Preferences dialog box from the Main Menu Bar by clicking View > Preferences.

## Setting the Display Unit

To set the display unit:

1. Select the **Data Format** tab on the **Preferences** dialog box.
2. From the **Display Unit** group box, select the desired option (GB is the default display unit).
3. If you do not want to display the selected unit on the table heading row, uncheck the **Display Unit on Header** checkbox.
4. Click **Apply** to continue modifying preferences, or click **OK** when finished.

## Setting the WWN Format

To set the WWN format:

1. Select the **Data Format** tab on the **Preferences** dialog box.
2. From the **WWN** group box, select the desired WWN format (OFOFOFOFOFOFOFOF is the default format).
3. Click **Apply** to continue modifying preferences, or click **OK** when finished.

## Setting the Date and Time Format

To set the date and time format:

1. Select the **Data Format** tab on the **Preferences** dialog box.
2. From the **Data Time** group box, select the desired data and time format (**Long Display** is the default format).



3. Click **Apply** to continue modifying preferences, or click **OK** when finished.

## Resetting Per-Table Format Settings to Default Settings

To set reset per-table format settings to their default settings:

1. Select the **Data Format** tab on the **Preferences** dialog box.
2. Select the **Reset Per-Table Format Preferences to Default** checkbox.
3. Click **OK**.

## Configuring Interface, Dialog, and Tab Settings

To configure interface and dialog settings:

1. Select the **Settings** tab on the **Preferences** dialog box.
2. Select the user interface elements and dialog boxes you wish to view in the HP 3PAR Management Console Interface by selecting the appropriate checkboxes.
3. Select whether to view Introduction tabs by clicking **Remove All Tabs** or **Restore All Tabs**.
4. Click **Apply** to continue modifying preferences, or click **OK** when finished.

## Setting Advanced Display Options

To set advanced display options:

1. Select the **Advanced** tab on the **Preferences** dialog box.
2. Select whether to view the **Port State of loss sync** as failed.
3. Select whether to enable or disable the number of objects allowed in the Layout Grid.
4. Select whether to view physical disk spares, advanced volume properties, logical disks, provisioning layout, SCSI reservations and tape backup options by selecting the appropriate checkboxes.
5. Select the number of data socket connections to the Storage System (default is 6).
6. Click **Apply** to continue modifying preferences, or click **OK** when finished.

## Setting Individual Table Preferences

The HP 3PAR Management Console allows you to set per-table preferences. These preferences are saved on the system and remembered the next time you log in using the HP 3PAR Management Console.

---

**NOTE:** The per-table preferences and changes made by manually dragging and sorting tables override any preferences specified when [“Setting Global Preferences” \(page 412\)](#).

---

This section provides procedures for the following:

[“Column Resizing” \(page 413\)](#)

[“Column Ordering” \(page 413\)](#)

[“Column Visibility” \(page 414\)](#)

[“Choosing Columns” \(page 414\)](#)

[“Table View” \(page 414\)](#)

### Column Resizing

To resize a table column:

1. Place your mouse on the right edge of a table heading row.
2. When the resize pointer appears, click and drag the mouse to resize the column.

### Column Ordering

To quickly rearrange the order of displayed table columns, click and drag any column to a different location in the table.

---

**NOTE:** See [“Setting Global Preferences” \(page 412\)](#) to learn how to make global changes to tables and HP 3PAR Management Console display properties using the Preferences dialog box. Changes made by clicking and dragging columns (as described in this topic) override any preferences set in the **Preferences** dialog box.

---

## Column Visibility

To hide a column in a table, right-click the table column heading you wish to hide and click **Hide**.

**NOTE:** The HP 3PAR Management Console does not allow hiding of all columns in a table.

To show a column in a table, right-click any table column heading and click **Show > <column heading>**.

## Choosing Columns

To show, hide, or reorder multiple table columns at one time:

1. Right-click any table heading column and click **Choose Columns**.
2. To hide columns, select the column from the **Show** list and click the right arrow button.
3. To show columns, select the column from the **Hide** list and click the left arrow button.
4. To reorder columns, select the column from the **Show** list and click the up or down arrow button.
5. Click **OK**.

## Table View

To apply a saved table view, right-click any table heading column and click **Table View > <table view name>**.

To save the current table view as it has been edited by the previous procedures:

1. Right-click any table heading column and click **Table View > Save As**.
2. Enter a name for the table view you wish to save.
3. Click **OK**.

To remove a saved table view:

1. Right-click any table heading column and click **Table View > Remove**.
2. Enter the table view you wish to remove.
3. Click **OK**.

## Setting Manager Pane Preferences

The HP 3PAR Management Console allows you to set Manager Pane display preferences. These preferences are saved on the system and remembered the next time you log in using the HP 3PAR Management Console.

This section provides procedures for the following:

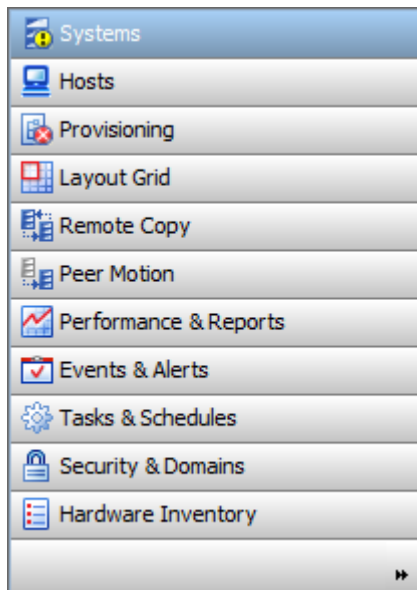
[“Minimizing and Maximizing the Manager Pane” \(page 414\)](#)

[“Resizing the Manager Pane” \(page 415\)](#)

## Minimizing and Maximizing the Manager Pane

- To minimize the Manager Pane, click the down arrow located at the top of the Manager Pane. When minimized, each manager in the Manager Pane changes to an icon.
- To maximize the Manager Pane, click the up arrow located at the top of the minimized Manager Pane. When maximized, the manager icons are restored to buttons.

The following figure displays the Manager Pane maximized:



The following figure displays the Manager Pane minimized:



## Resizing the Manager Pane

To resize the Manager Pane:

1. Place your mouse on the top edge of the Manager Pane.
2. When the resize pointer appears, click and drag the mouse to resize the column.

---

**NOTE:** When making the Manager Pane smaller, the Manager buttons located at the bottom of the pane change to icons. The icons are restored to buttons when enlarging the Manager Pane.

---

## Customizing the Manager Pane Display

The HP 3PAR Management Console allows you to customize the Manager buttons that appear in the Management Pane. This allows you to set up the Manager Pane to display only commonly used Managers. Additionally, it allows you to reduce the amount of space used by the Manager Pane, which can be useful if you have a large Management Tree.

[“Showing Fewer Manager Buttons” \(page 415\)](#)

[“Showing More Manager Buttons” \(page 416\)](#)

[“Selecting Manager Buttons to Display” \(page 417\)](#)

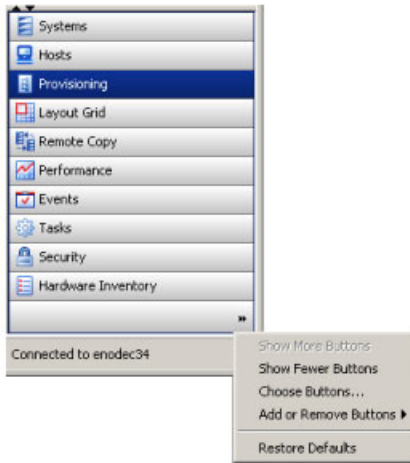
[“Adding and Removing Manager Buttons” \(page 417\)](#)

[“Restoring Defaults” \(page 418\)](#)

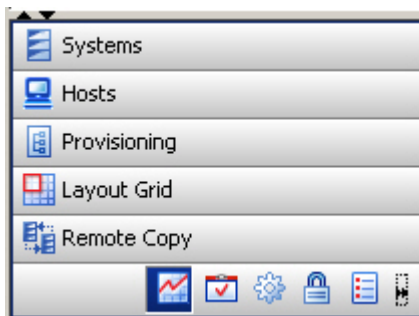
## Showing Fewer Manager Buttons

By default, all Manager buttons are displayed in the Manager Pane. To display fewer buttons:

1. Click the right arrow button at the bottom of the Manager Pane.
2. Click **Show Fewer Buttons**.



The last Manager button in the Manager Pane is minimized and is displayed as an icon at the bottom of the Manager Pane.



Repeating steps 1 and 2 continues to minimize Manager buttons and display them as icons at the bottom of the Manager Pane. For example, if the Hardware Manager button is minimized, the next Manager button to be minimized is the Security Manager button, followed by the Tasks Manager button, etc.

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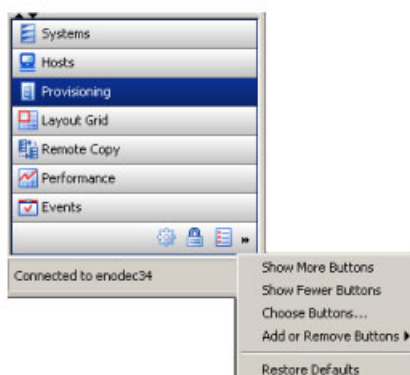
**NOTE:** The minimized Manager is still functional. Click the minimized Manager's icon to invoke that Manager's functionality.

---

## Showing More Manager Buttons

If you have modified the Manager Pane to display fewer Manager buttons, to show more Manager buttons:

1. Click the right arrow button at the bottom of the Manager Pane.
2. Click **Show More Buttons**.



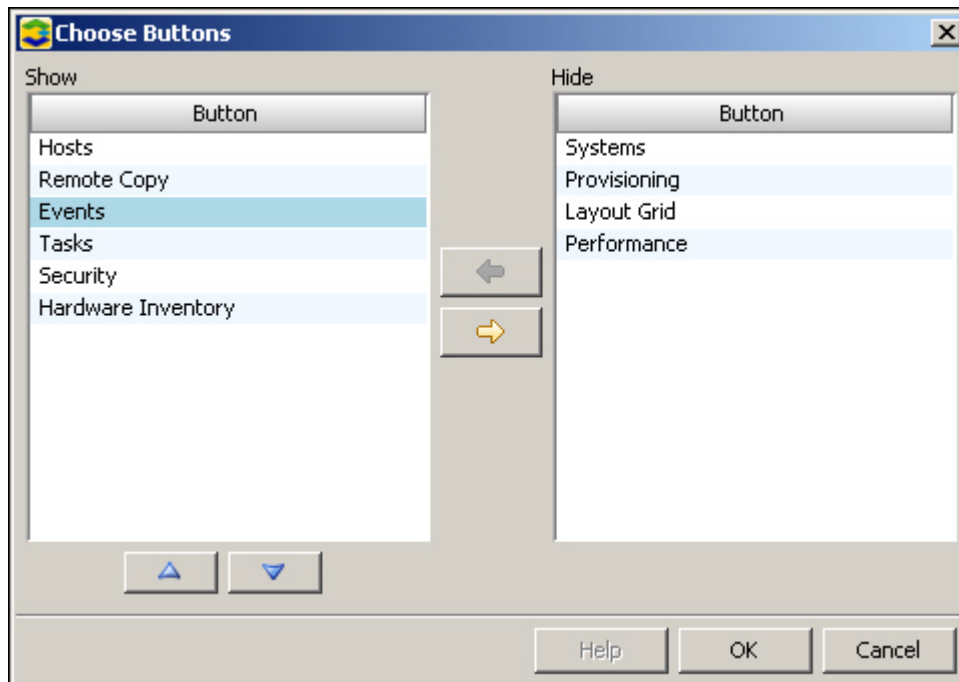
The most recently minimized Manager button is restored to the Manager Pane (the left-most displayed Manager icon).

Repeating steps 1 and 2 continues to restore Manager buttons in the order in which they were last minimized from the Manager Pane. For example, if the Tasks Manager button was restored, the next Manager button to be restored is the Security Manager button, followed by the Hardware Inventory Manager button.

## Selecting Manager Buttons to Display

To select Manager buttons to show and hide in the Manager Pane:

1. Click the right arrow button at the bottom of the Manager Pane.
2. Click **Choose Buttons**.
3. In the **Choose Buttons** dialog box, select the Manager buttons to display by clicking one or more Manager and moving to the **Show** and **Hide** lists using the right and left arrow buttons.



1. Select the order in which the Manager buttons in the **Show** list are displayed by selecting a Manager and then clicking the up and down arrow buttons to move the Manager to its display location.
2. Click **OK**.

The Manager buttons that you chose to display are displayed in the Manager Pane in the order you specified. The Manager buttons that you chose to hide are not displayed as buttons or icons in the Manager Pane.

## Adding and Removing Manager Buttons

To remove Manager buttons from the Manager Pane:

1. Click the right arrow button at the bottom of the Manager Pane.
2. Click **Add or Remove Buttons** > uncheck the Manager button you wish to remove.

**NOTE:** After removing a Manager button, the Manager Pane automatically resizes itself to equal the total length of displayed Manager buttons.

To add Manager buttons to the Manager Pane:

1. Click the right arrow button at the bottom of the Manager Pane.
2. Click **Add or Remove Buttons** > check the Manager button you wish to add.

---

**NOTE:** When adding a Manager button back to the Manager Pane, you must manually resize the Manager Pane in order for all Manager buttons to display. See [“Resizing the Manager Pane”](#) (page 415).

---

## Restoring Defaults

To restore the default view of the Manager Pane:

1. Click the right arrow button at the bottom of the Manager Pane.
2. Click **Restore Defaults**.

---

# Glossary

<b>active VLUN</b>	The connection of a virtual volume and a LUN for a particular host on a particular port. An active VLUN is created when a VLUN template is applied to the current system state. See also VLUN template.
<b>admin space</b>	See snapshot administration space.
<b>admin volume</b>	The base volume that is used by the system to store administration data such as the system event log. The admin volume is created as part of the storage system installation and setup process.
<b>administration space</b>	See snapshot administration space.
<b>alert</b>	A system event requiring immediate operator activity.
<b>alert pane</b>	The alert pane, located at the bottom of the HP 3PAR Management Console main window, displays information about system alerts.
<b>allocation limit</b>	User-defined threshold that can be set for thinly provisioned virtual volumes (TPVVs) to cap their potential size. See also allocation warning.
<b>allocation warning</b>	User-defined threshold that can be set for thinly provisioned virtual volumes (TPVVs) to alert users when they reach a certain size. See also allocation limit.
<b>availability</b>	Level of fault tolerance for a logical disk. For example, Magazine level availability means that the logical disk can tolerate a drive magazine failure. Cage availability level means that the logical disk can tolerate a drive cage failure.
<b>backup system</b>	In a Remote Copy setup, the storage system on which the copied volume groups reside.
<b>base volume</b>	Virtual volume type that forms the root of all virtual and physical snapshot functionality. Base volumes are the only type of volume that have snapshot data space and snapshot administration space used by snapshots to track changes to the base volume. See also thinly provisioned virtual volumes (TPVVs).
<b>cache memory page (CMP)</b>	A 16-KB block of control cache memory where I/O requests are stored.
<b>Cage availability</b>	Creates a virtual volume that can tolerate a drive cage failure because its RAID sets use chunklets from different drive cages.
<b>child volume</b>	A virtual volume (virtual or physical copy) made from a parent volume.
<b>chunklet</b>	A 256MB block of contiguous space on a physical disk.
<b>clean chunklet</b>	A chunklet to which no data has been written.
<b>cluster</b>	A group of controller nodes connected via the same storage server backplane. The nodes in a cluster operate as a unified system, separate from any other clusters that may share the same service processor.
<b>CMP</b>	See cache memory page.
<b>common provisioning group (CPG)</b>	A set of logical disks from which you can create virtual volumes and virtual copies that are capable of allocating storage on demand.
<b>control cache</b>	Memory modules that support the microprocessors located in a controller node.
<b>controller node</b>	An individual device that works together with other controller nodes to cache and manage data in a storage system and to provide hosts with a coherent, virtualized view of the storage.
<b>copy data</b>	Data that occupies the snapshot data space on a virtual volume. See also snapshot data space.
<b>Copy of RCIP</b>	Remote Copy over IP. The use of HP 3PAR Remote Copy Software with two storage servers that are connected via Ethernet ports. See also HP 3PAR Remote Copy.
<b>copy size</b>	The size of the snapshot data space in a virtual volume, which is the amount of logical disk space reserved for snapshots. See also snapshot data space.
<b>CPG template</b>	Common provisioning group template. The template contains a set of common provisioning group and logical disk parameters that can be applied again and again to create common provisioning groups with the same characteristics using the HP 3PAR Management Console.

<b>data cache</b>	The dual in-line memory modules (DIMMs) that support the 3PAR ASIC located in a controller node.
<b>data space</b>	See snapshot data space.
<b>DC2 drive cage</b>	A storage system component consisting of a drive cage midplane, two drive cage FCAL modules, four power supplies, and up to 40 physical disks in a maximum of ten drive magazines.
<b>DC3 drive cage</b>	A storage system component consisting of a drive cage, two drive cage FCAL modules, two power supplies, and up to 16 physical disks.
<b>DC4 drive cage</b>	A storage system component consisting of a drive cage midplane, two drive cage FCAL modules, four power supplies, and up to 40 physical disks in a maximum of ten drive magazines.
<b>destination volume</b>	The virtual volume to which data is copied during a physical copy operation.
<b>drive cage</b>	See DC2, DC3, and DC4 drive cage.
<b>drive cage FCAL</b>	An interface module, located in a drive chassis, connecting a drive cage to a controller node or to another drive cage.
<b>enclosure services interface</b>	Interface on the DC2 and DC4 drive cages through which the node software communicates to the cage enclosure services controller to obtain status and control the cage behaviors.
<b>ESI</b>	See enclosure services interface.
<b>event</b>	Logs created by the system which allow you to view the day-to-day health of your system.
<b>export</b>	To make a virtual volume available to a particular instance of a host (that is, a host WWN that is actually present on a port) by creating an association between the name of the virtual volume and a LUN for that host on that port. See also LUN, VLUN, and VLUN template.
<b>FCAL</b>	Fibre Channel-Arbitrated Loop. FCAL is a fast serial bus interface standard used to connect storage devices to systems.
<b>Fibre Channel adapter</b>	A Fibre Channel PCI host bus adapter (HBA) located in a controller node. The Fibre Channel adapter connects a controller node to a host or to a drive chassis.
<b>filtering</b>	In the HP 3PAR Management Console, filtering a table temporarily removes table entries that do not meet the specified criteria.
<b>grow</b>	To expand a base volume manually by increasing the user space, snapshot administration space, or snapshot data space.
<b>growth increment</b>	The unit of storage by which additional logical disks are created and allocated to a common provisioning group (CPG). The growth increment is used to automatically create and allocate space on demand as additional resources are required by the volumes that draw from the logical disk pool. The default growth increment is fixed at 32 GB, but the minimum growth increment varies according to the number of controller nodes in the system (from 8 GB for a two-node system to 32 GB for a four-node system).
<b>growth limit</b>	User-defined threshold that can be set for common provisioning groups (CPGs) to cap their potential size. See also growth warning.
<b>growth warning</b>	User-defined threshold that can be set for common provisioning groups (CPGs) to alert users when they reach a certain size. See also growth limit.
<b>host</b>	A set of WWNs of the physical ports on a system.
<b>host port</b>	See target port.
<b>HP 3PAR Domains</b>	An HP 3PAR feature that is used to create distinct domains with domain-specific users and objects in an HP 3PAR Storage System.
<b>HP 3PAR Remote Copy</b>	An HP 3PAR product that allows you to copy virtual volumes from one HP 3PAR Storage System to another. The copy can be used for disaster recovery, backup, or data migration.
<b>HP 3PAR Thin Provisioning</b>	An HP 3PAR product that allows the user to allocate only the physical resources that are actually needed while presenting an arbitrarily large volume that can have its physical resources allocated on demand.
<b>initiator, initiator port</b>	A port that is connected to a drive cage. Also known as a disk port because it sends commands to the physical disks.
<b>Internet Storage Name Service</b>	See iSNS



<b>iSCSI adaptor</b>	An iSCSI PCI host bus adapter (HBA) located in a controller node. The iSCSI adapter connects a controller node to a host.
<b>iSCSI name</b>	A value used to identify iSCSI channel devices on an arbitrated loop.
<b>iSNS</b>	Internet Storage Name Service. Protocol that allows automated discovery, management, and configuration of iSCSI.
<b>LD template</b>	Logical disk template. The template contains a set of logical disk parameters that can be applied again and again to create logical disks or volumes with the same characteristics using the HP 3PAR Management Console.
<b>Logical Unit Number</b>	See LUN.
<b>LUN</b>	Stands for Logical Unit Number. A number used to access a virtual volume that has been assigned to a particular host on a particular port. See also export, VLUN, and VLUN template.
<b>Magazine availability</b>	Creates a virtual volume that can tolerate a drive magazine failure because its RAID sets use chunklets from different drive magazines.
<b>matched-set VLUN template</b>	A rule that allows a particular host connected to a particular port to see a virtual volume as a specified LUN. See also VLUN template.
<b>Maximum Transmission Unit</b>	See MTU.
<b>mirror</b>	One member of a group of mirrored chunklets, which is also known as a RAID 1 set.
<b>mirror depth</b>	See set size.
<b>mirroring</b>	A data redundancy technique used by some RAID levels and in particular RAID 1 to provide data protection on a storage array.
<b>MTU</b>	Maximum Transmission Unit. Maximum Transmission Unit. The greatest amount of data or "packet" size that can be transferred at one time over a particular network connection without overburdening the connection.
<b>No One Host policy</b>	Use when exporting a VV to multiple hosts for use by a cluster-aware application, or if using port presents VLUNs.
<b>No Stale Snapshot</b>	System can halt writing data to the base volume so as to prevent loss of sync between the base volume and its snapshots.
<b>no stale snapshots</b>	Virtual copy policy that prevents changes being written to a base volume when it does not have enough snapshot data or administration space to prevent virtual copies from becoming invalid, or stale, as a result. See also stale snapshots, virtual copy policy.
<b>One Host policy</b>	Constrains the export of a volume to one host or one host cluster (when cluster names may be used as a host name.) This protects the volume from accidental export to multiple hosts which could lead to data corruption if both hosts are writing to the volume.
<b>original parent base volume</b>	The original base volume from which a series of virtual and/or physical copies has been created. Any volume can be the parent from which one or more virtual copies is created, but for each set of related copies there is only one original parent base volume.
<b>parent volume</b>	A virtual volume from which a virtual or physical copy is made. See also original parent base volume.
<b>parity</b>	A data redundancy technique used by some RAID levels and in particular RAID 5 to provide data protection on a storage array.
<b>parity set</b>	See RAID 5 set.
<b>parity set position</b>	The group of chunklets that occupy the same position within a RAID 5 logical disk parity set.
<b>physical copy</b>	A physical copy is a snapshot that duplicates all the data from one base volume to another base volume (the destination volume) for use, should the original become unavailable.
<b>physical copy, promoting</b>	Promoting a virtual copy copies the changes from a virtual copy back onto the base volume.
<b>physical parent</b>	The source volume for a physical copy.
<b>Port availability</b>	Creates a virtual volume that can tolerate two port failures because its RAID sets use chunklets from devices on different cage loops.

<b>port-presents VLUN template</b>	A VLUN template that allows any host connected to a particular port to see a virtual volume as a specified LUN. See also VLUN template.
<b>primary system</b>	In a Remote Copy setup, the storage system on which the primary volume groups originate.
<b>primary volume group</b>	In Remote Copy, the set of volumes on the storage system to be copied.
<b>promote</b>	For physical copies: to break the association between a physical copy and a base volume by changing the physical copy into an independent base volume. For virtual copies: to copy the changes from a virtual copy back onto the base volume, therefore overwriting the base volume with the virtual copy.
<b>RAID 0 set</b>	Striped rows of chunklets on two or more physical disks. A RAID 0 set offers no data redundancy.
<b>RAID 10 (RAID 1) set</b>	A group of mirrored chunklets.
<b>RAID 50 (RAID 5) set</b>	A group of parity-protected chunklets. Also known as a parity set.
<b>RAID set</b>	A grouping of mirrored or parity-protected chunklets.
<b>RCFC</b>	Remote Copy over Fibre Channel. The use of HP 3PAR Remote Copy Software with two storage systems that are connected via Fibre Channel ports. See also HP 3PAR Remote Copy.
<b>RCIP</b>	Remote Copy over IP. The use of HP 3PAR Remote Copy Software with two storage systems that are connected via Ethernet ports. See also HP 3PAR Remote Copy.
<b>registered state change notification (RSCN)</b>	A Fibre Channel switch function that allows notification to registered nodes if a change occurs to other specified nodes.
<b>Remote Copy links</b>	The method by which information is sent and received between Remote Copy targets.
<b>Remote Copy pair</b>	The pair of storage systems on which Remote Copy operations are performed.
<b>Remote Copy target</b>	The description of a Remote Copy system on one system in the Remote Copy pair. Each system in a Remote Copy pair must have a target definition for the other system.
<b>Remote Copy volume group</b>	A group of virtual volumes that are logically related and for which there is a cross-volume ordering or writes.
<b>resynch, resynchronize</b>	To copy changes from one volume in a physical copy pair to the other because that volume was modified at some point after the physical copy operation took place. See also physical copy.
<b>row</b>	A grouping of RAID sets. Data is striped across the rows of RAID 10 and RAID 50 logical disks.
<b>row size</b>	The number of sets in a row. A row is a grouping of RAID sets. Data is striped across the rows of RAID 10 and RAID 50 logical disks.
<b>RSCN</b>	See registered state change notification.
<b>SCSI reservation/registration</b>	Allows multiple hosts to share a SCSI interface to access exported volumes. Multiple hosts can have registrations to a single volume, but only one host can have the reservation.
<b>secondary volume group</b>	In Remote Copy, the set of copied volumes on the storage system.
<b>set</b>	See set size.
<b>set size</b>	The number of chunklets in a set. Also known as mirror depth for RAID 1 sets and parity set for RAID 5 sets.
<b>SFP</b>	High-speed data transceiver, small in size and hot pluggable, allowing for an individual SFP connector to be replaced without replacing the entire module.
<b>small form-factor pluggable optical transceiver</b>	See SFP.
<b>snapshot</b>	A virtual or physical copy of a virtual volume.

<b>snapshot administration space</b>	The space on a virtual volume that is used to track changes to the data since a snapshot of a virtual volume was created.
<b>snapshot data</b>	Data written to the base volume's snapshot data space to record changes to the base volume after the first virtual copy of that volume was created.
<b>snapshot data space</b>	The space on a virtual volume that holds the data that has been changed since the first virtual copy was created.
<b>solid state drive</b>	A data storage device that uses solid-state memory to store persistent data.
<b>source system</b>	See primary system.
<b>source volume</b>	The virtual volume from which a copy is made.
<b>spare, spare chunklet</b>	A chunklet that is reserved for use in case of a failure in the system. A certain number of chunklets are reserved for use as spares during the system setup and installation process. However, the system may temporarily set aside additional spares even though these chunklets are not permanently designated for use as spares.
<b>SSD</b>	See solid state drive.
<b>stale snapshot</b>	A snapshot that does not track the most recent changes to its base volume. The No Stale Snapshots virtual copy policy halts writing data to the base volume so as to prevent loss of sync between the volume and any snapshots. See also virtual copy policy and no stale snapshots.
<b>step size</b>	The number of contiguous bytes that the system accesses before moving to the next chunklet.
<b>system manager</b>	Software component that negotiates between the storage system and the user interfaces such as the HP 3PAR Management Console and InForm CLI.
<b>target mode</b>	The firmware setting for a port that is connected to a host.
<b>target, target port</b>	The port that is connected to and receives commands from a host computer. Also known as a host port.
<b>template</b>	See VLUN template.
<b>thin provisioning</b>	See HP 3PAR Thin Provisioning.
<b>Thinly Provisioned Virtual Volume (TPVV)</b>	A virtual volume that maps to logical disk space associated with a common provisioning group (CPG) and is therefore capable of growing on demand.
<b>TPVV</b>	See Thinly Provisioned Virtual Volume.
<b>unspecified property</b>	When using the HP 3PAR Management Console, a property that has been included in a template but does not have a defined value. When applying the template, the system will either use the default value (when applicable) or calculate the optimized setting for you.
<b>user data</b>	For standard base volumes, the data that is written to the user space.
<b>user size</b>	The amount of user space in a virtual volume, or the size of the volume as presented to the host.
<b>user space</b>	The space on a virtual volume that represents the size of the virtual volume as presented to the host. For standard base volumes, the user space holds all user data. For thinly provisioned virtual volumes, no storage is actually allocated to user space, so the user space represents the volume's virtual size. See also virtual size.
<b>virtual copy</b>	A snapshot, or copy-in-time, of another volume (a base volume or another virtual copy) created using copy-on-write techniques.
<b>virtual copy consistency group</b>	A group of snapshots created from multiple virtual volumes at the same time in order to ensure consistency.
<b>virtual size</b>	The size that the volume presents to the host. For standard base volumes, the virtual size is equal to the user space. For thinly provisioned virtual volumes, no storage is actually allocated to user space, so the virtual size is determined by whatever value is assigned to the user space. See also user space.
<b>virtual volume</b>	A virtual storage unit created by mapping data from one or more logical disks. See also logical disk, mapping.
<b>VLUN</b>	A pairing between a virtual volume and a Logical Unit Number (LUN), expressed as either a VLUN template or an active VLUN.

<b>VLUN template</b>	Sets up an association between a virtual volume and a LUN-host, LUN-port, or LUN-host-port combination by establishing the export rule, or the manner in which the volume is exported.
<b>VV template</b>	Virtual volume template. The template contains a set of virtual volume parameters that can be applied again and again to create volumes with the same characteristics using the HP 3PAR Management Console.
<b>World-Wide Name (WWN)</b>	A unique 64-bit value used to identify Fibre channel devices on an arbitrated loop. The WWN consists of a prefix issued by the IEEE to uniquely identify the company and a suffix that is issued by the company.
<b>WWN</b>	See World-Wide Name.
<b>zone</b>	A unit of physical disk space reserved by a controller node for snapshot or snapshot administration data. A single zone may occupy space on more than one disk.