

HP 3PAR StoreServ 7000 and 7000c Storage Troubleshooting Guide

Abstract

This guide is intended for experienced users and system administrators who troubleshoot HP 3PAR StoreServ 7000 and 7000c Storage systems and have a firm understanding of RAID schemes.



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1 Identifying Storage System Components

NOTE: The illustrations in this chapter are used examples only and may not reflect your storage system configuration.

Understanding Component Numbering

Due to the large number of possible configurations, component placement and internal cabling is standardized to simplify installation and maintenance. System components are placed in the rack according to the principles outlined in this chapter, and are numbered according to their order and location in the cabinet.

The Storage system includes the following types of drive and node enclosures:

- The HP M6710 Drive Enclosure (2U24) holds up to 24, 2.5 inch small form factor (SFF) Serial Attached SCSI (SAS) disk drives arranged vertically in a single row on the front of the enclosure. Two 580 W power cooling modules (PCMs) and two I/O modules are located at the rear of the enclosure.
- The HP M6720 Drive Enclosure (4U24) holds up to 24, 3.5 inch large form factor (LFF) SAS disk drives, arranged horizontally with four columns of six disk drives located on the front of the enclosure. Two 580 W PCMs and two I/O modules are located at the rear of the enclosure.
- The HP 3PAR StoreServ 7200 and 7400 (two-node configuration) storage enclosures hold up to 24, 2.5 inch SFF SAS disk drives arranged horizontally in a single row located on the front of the enclosure. Two 764 W PCMs and two controller nodes are located at the rear of the enclosure.

NOTE: In the HP 3PAR Management Console or CLI, the enclosures are displayed as DCS2 for 2U24 (M6710) , DCS1 (M6720) for 4U24, and DCN1 for a node enclosure.

Drive Enclosures

The maximum number of supported drive enclosures depends on the model and the number of nodes.

Disk Drive Numbering

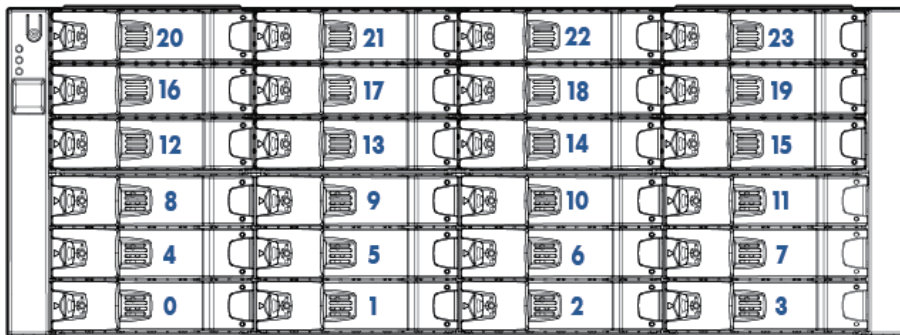
The disk drives are mounted on a drive carrier and reside at the front of the enclosures. There are two types of disk drives for specific drive carriers:

- Vertical, 2.5 inch SFF disks. The 2U24 enclosure numbering starts with 0 on the left and ends with 23 on the right. See [Figure 1 \(page 10\)](#).
- Horizontal, 3.5 inch LFF disks. The 4U24 enclosure are numbered with 0 on the lower left to 23 on the upper right, with six rows of four. See [Figure 2 \(page 10\)](#).

Figure 1 HP M6710 Drive Enclosure (2U24)



Figure 2 HP M6720 Drive Enclosure (4U24)



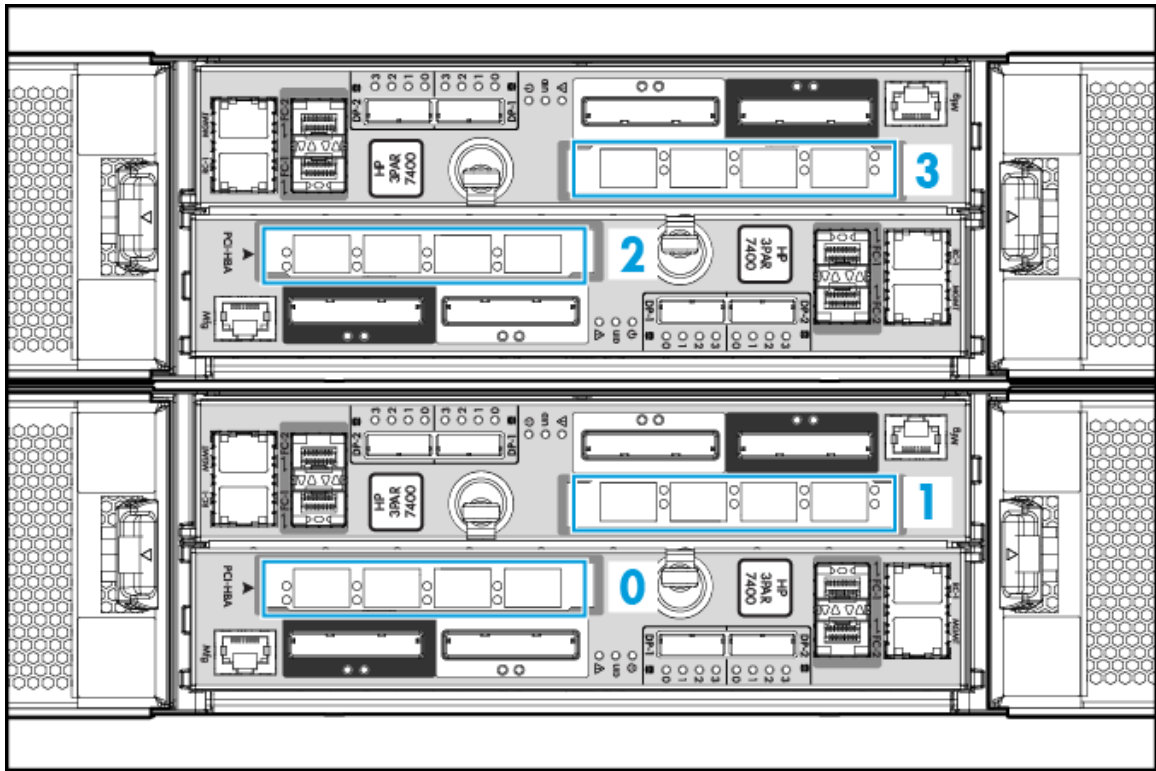
Nodes, Slots, and Ports

Controller Nodes

The controller node caches and manages data in a system providing a comprehensive, virtualized view of the data. The controller nodes are located at the rear of the node enclosure.

The HP 3PAR StoreServ 7200 Storage system contains two nodes numbered 0 and 1. The HP 3PAR StoreServ 7400 Storage system has either two nodes or four nodes. The four-node configuration is numbered 0 and 1 on the bottom, and 2 and 3 on the top (see [Figure 3 \(page 11\)](#)).

Figure 3 HP 3PAR StoreServ 7400 Controller Nodes



Node/Slot/Port Location Formats

The HP 3PAR CLI and the SSMC display the controller node FC, iSCSI, and Gigabit Ethernet port locations in the following format: **<node>:<slot>:<port>**. For example:

- 1:1:3 = Node 1: Slot 1: Port 3
- 2:3:1 = Node 2: Slot 3: Port 1
- **Node:** Valid node numbers are 0-3 depending on the number of nodes installed in your system. When viewing a system from the rear of a cabinet, nodes are numbered 0-1 or 0-3 from bottom to top.
- **Slot:** Valid node slot numbers are 0-3, depending on the class of nodes installed in your system.

HP 3PAR StoreServ 7000 Storage systems have one available slot per node for an optional HBA. Slot 0 is assigned for onboard SAS, slot 1 is assigned for onboard FC, slot 2 is available for the HBA, and slot 3 is assigned for the onboard GigE interface (port "RC-1" in [Figure 4 \(page 12\)](#)).
- **Port:** Valid node port numbers are 1, 1-2, or 1-4 depending on the slot and the type of optional HBA.
 - On nodes 0 and 2, ports are numbered starting with 1 and ordered from left to right. The FC ports are ordered from top to bottom.
 - On nodes 1 and 3, ports are numbered starting with 1 and ordered from right to left. The FC ports are ordered from bottom to top.

Legend for Node:Slot:Port Location

To locate a specific node:slot:port, see the following legend.

Figure 4 HP 3PAR StoreServ 7400 Node:Slot:Port Legend

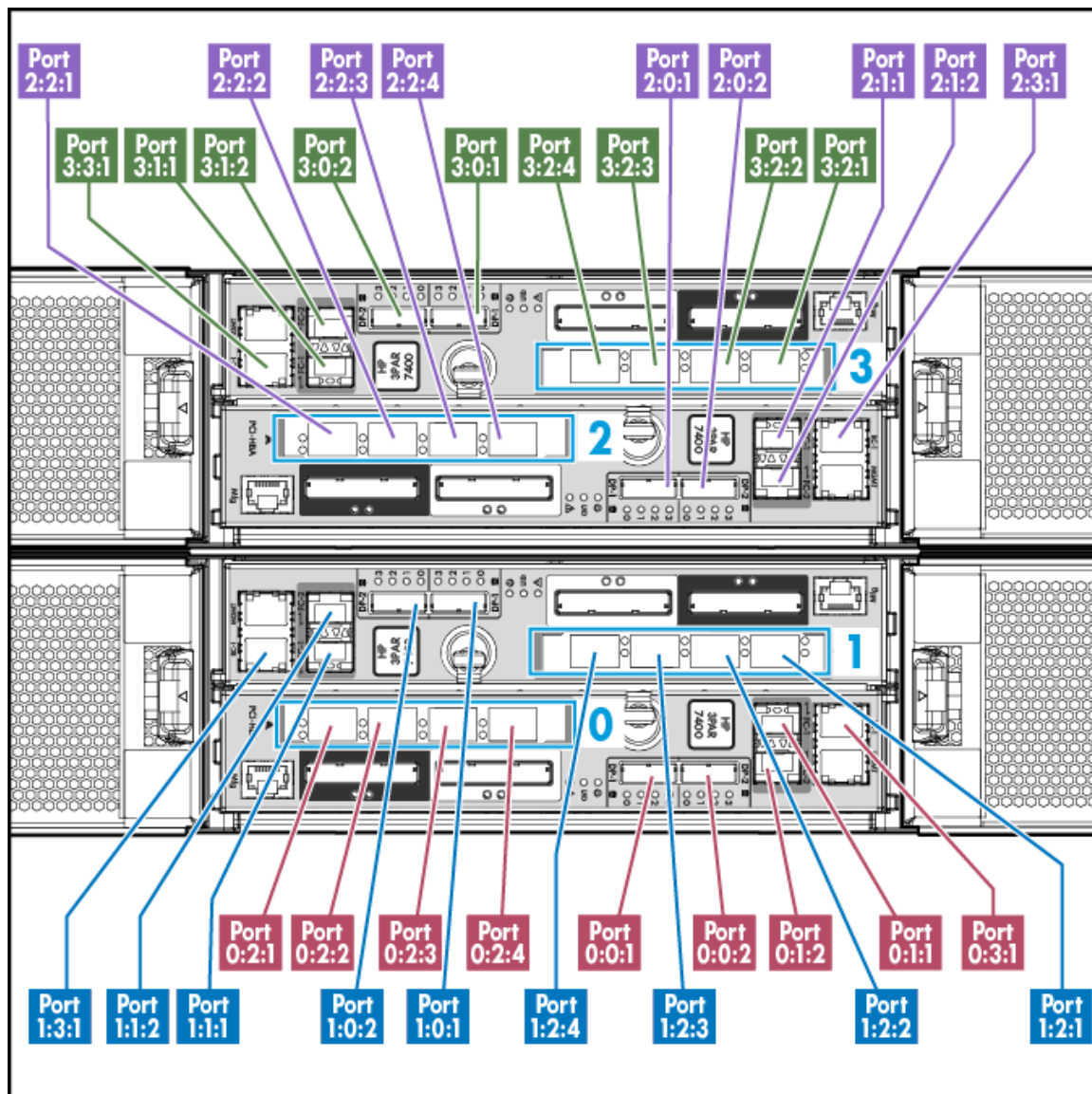


Table 1 describes the default port configurations for the HP 3PAR StoreServ 7000 and 7000c Storage systems.

Table 1 Storage System Expansion Cards

Expansion cards	Nodes 0 and 1	Nodes 2 and 3
2 FC HBAs only	1 FC HBA each	No expansion card
2 10 Gb/s (CNA) only	1 10 Gb/s CNA each	No expansion card
2 FC HBAs + 2 10 Gb/s CNAs	1 FC HBA each	1 10 Gb/s CNA each

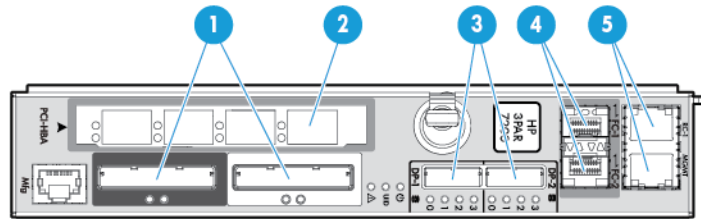
The following expansion cards are supported:

- 4-port 8Gb FC HBA
- 2-port 16Gb FC HBA
- 2-port 10Gb CNA
- 2-port 10Gb Ethernet NIC
- 4-port 1Gb Ethernet NIC

Each node enclosure must have matching PCIe cards. [Figure 5 \(page 13\)](#) and the table that follows show the locations and descriptions of the controller node ports.

NOTE: If you are upgrading from a two-node to a four-node configuration, you can have CNAs installed in node 0 and node 1, and FC HBAs installed in node 2 and node 3.

Figure 5 Location of Controller Node Ports



Note the following locations:

Table 2 Description of Controller Node Ports

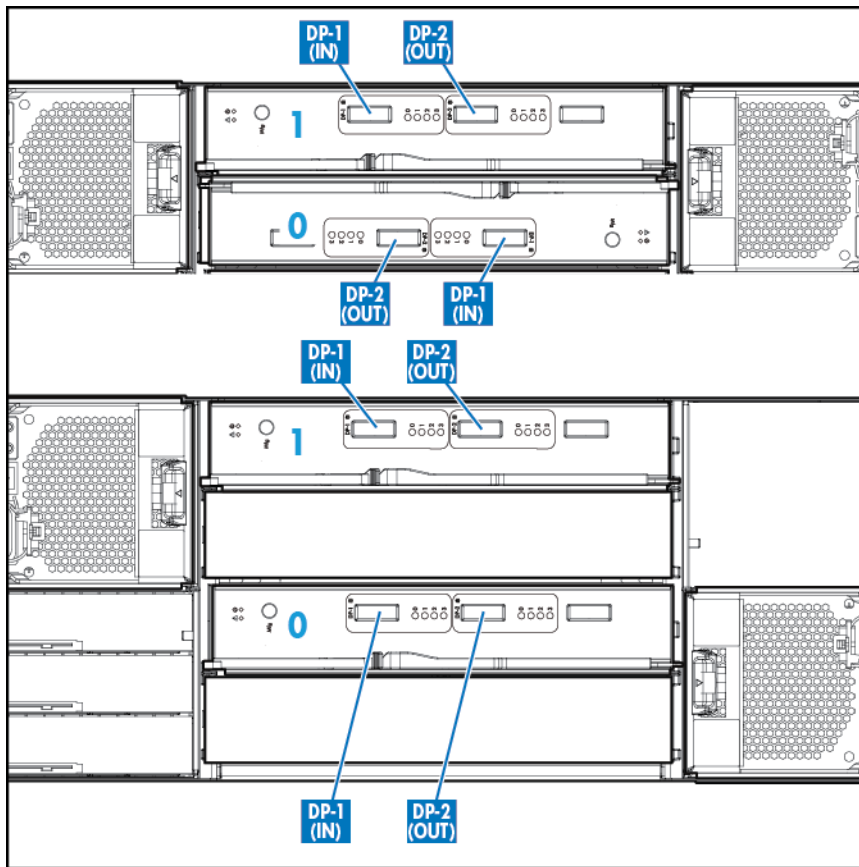
Item	Port
1	Node Interconnect: Connects four directional interconnect cables that connect the controller nodes (four node 7400 only)
2	PCIe slot for optional HBA adapters. Slot 2 is the HBA. Each HBA can have 2 or 4 ports. 4-port 1Gb Ethernet NIC 4-port 8Gb FC HBA 2-port 10Gb Ethernet NIC 2-port 16Gb Fibre Channel HBA 2-port 10Gb CNA
3	SAS (DP-2 and DP-1): Connects the drive enclosures and I/O modules using SAS cables. - Slot 0 is the built in SAS ports. - DP-1 is port 1 of slot 0. - DP-2 is port 2 of slot 0.
4	Fibre Channel (FC-1 and FC-2): Connects to host systems. - Slot 1 is the built in FC ports. - FC-1 is port 1 of slot 1. - FC-2 is port 2 of slot 1.
5	2 Ethernet RC: Connects to Remote Copy. (RC-1 port is port 1 of slot 3.) MGMT: Connects to the storage array management interfaces.

NOTE: The MFG port is used for console access to the node.

I/O Modules

The I/O modules connect the controller nodes to the hard drives using a SAS cable and enabling data transfer between the nodes, hard drives, PCMs, and enclosures. There are two I/O modules located at the rear of the drive enclosure. There are two I/O modules per enclosure, numbered 0 and 1 from bottom to top. See [Figure 6 \(page 14\)](#).

Figure 6 I/O Module Numbering for HP M6710 (2U) and HP M6720 (4U) Drive Enclosures



NOTE: The I/O modules are located in slots 0 and 1 of the HP M6710 and M6720 drive enclosures.

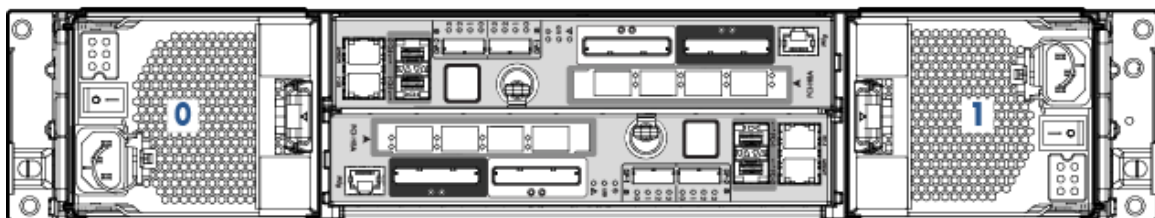
Power Cooling Modules

The PCM is an integrated power supply, battery, and cooling fan. There are two types of PCMs:

- The 580 W PCM is used in drive enclosures and does not include a battery.
- The 764 W PCM is used in node enclosures and includes a replaceable battery.

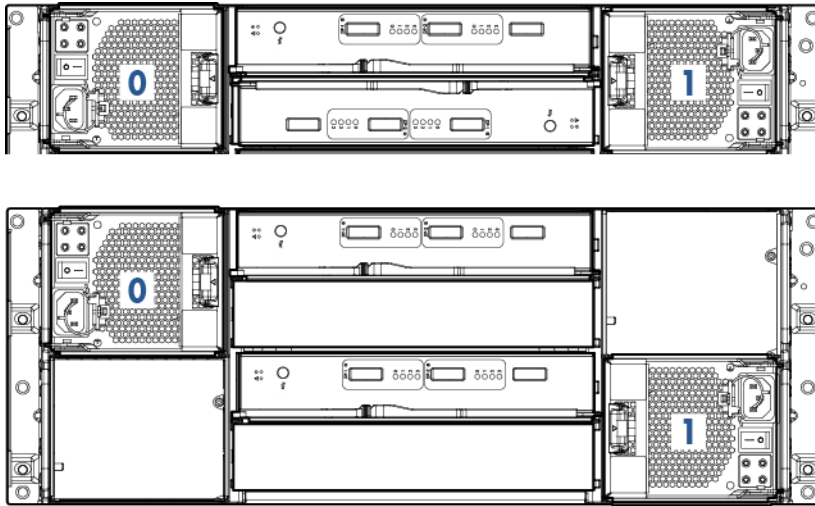
The PCMs are located at the rear of the storage system, and on the sides of the enclosure. There are two PCMs per enclosure. The PCMs are numbered 0 and 1 from left to right.

Figure 7 PCM Numbering



In the HP M6720 Drive Enclosure, the two PCMs are located diagonally from one another. The remaining PCM slots are blank. See [Figure 8 \(page 15\)](#).

Figure 8 PCMs in a HP M6710 (2U) and HP M6720 (4U) Drive Enclosures



Power Distribution Units

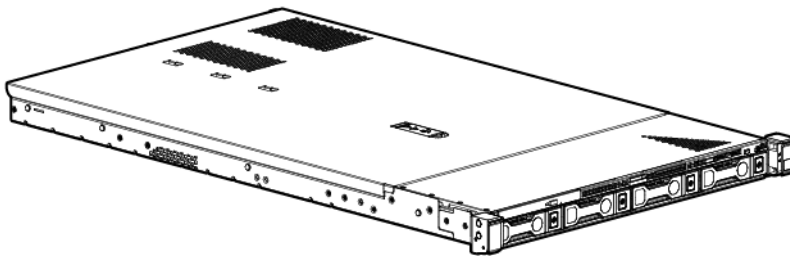
Two power distribution units (PDU) are mounted horizontally at the bottom of the rack. The PDUs are numbered 0 and 1 from bottom to top. The default configuration for the HP Intelligent Series Racks is two PDUs mounted vertically at the bottom of the rack so to provide a front-mounting unit space.

NOTE: Depending on configuration, PDUs can also be mounted vertically.

Service Processor

The HP 3PAR StoreServ 7000 and 7000c Storage system uses either a physical service processor (SP) or virtual service processor (VSP). If your configuration includes an SP, the SP rests at the bottom of the rack under the enclosures and above the PDUs.

Figure 9 HP 3PAR Service Processor DL 320e



2 Understanding LED Indicator Status

Storage system components have LEDs indicating status of the hardware. Use the LED indicators to help diagnose basic hardware problems. This chapter provides tables and illustrations of component LEDs.

Enclosure LEDs

Bezel LEDs

The bezel LEDs are located at the front of the system on each side of the drive enclosure. The bezels have three LED indicators. See [Figure 10 \(page 16\)](#).

Figure 10 Location of Bezel LEDs

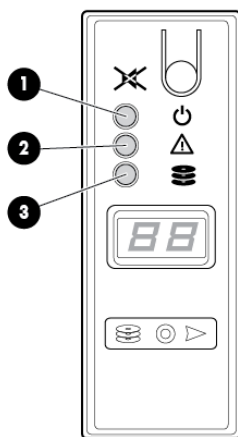


Table 3 Description of Bezel LEDs

Callout	LED	LED Appearance	Indicates
1	System Power	Green	On – System power is available.
		Amber	On – System is running on battery power.
2	Module Fault	Amber	On – System hardware fault to I/O modules or PCMs within the enclosure. At the rear of the enclosure, identify if the PCM or I/O module LED is also Amber.
3	Disk Drive Status	Amber	On – There is a disk fault on the system.

NOTE: Prior to running installation scripts, the numeric display located under the Disk Drive Status LED may not display the proper numeric order in relation to their physical locations. The correct sequence will be displayed after the installation script is completed.

Disk Drive LEDs

Disk Drive LEDs are located on the front of the disk drives. Disk drives have two LED indicators.

Figure 11 Location of Disk Drive LEDs

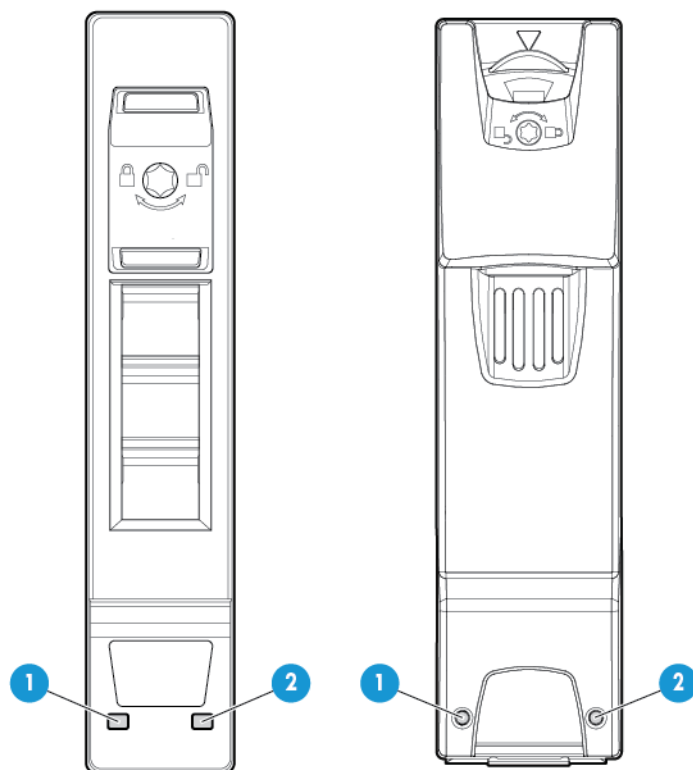


Table 4 Description of Disk Drive LEDs

Callout	LED	LED Appearance	Indicates
1	Activity	Green	On – Normal operation Flashing – Activity
2	Fault	Amber	On – Disk failed and is ready to be replaced. Flashing – The locatecage command is issued (which blinks all drive fault LEDs for up to 15 minutes (The I/O module Fault LEDs at the rear of the enclosure also blinks). Fault LEDs for failed disk drives do not blink.

Storage System Component LEDs

PCM LEDs

The 764 W PCMs are used in controller node enclosures and include six LEDs. The 580 W PCMs are used in drive enclosures and include four LEDs. The LEDs are located in the corner of the module.

See [Table 5 \(page 18\)](#) for details of PCM LEDs.

Figure 12 Location of Controller Node PCM LEDs

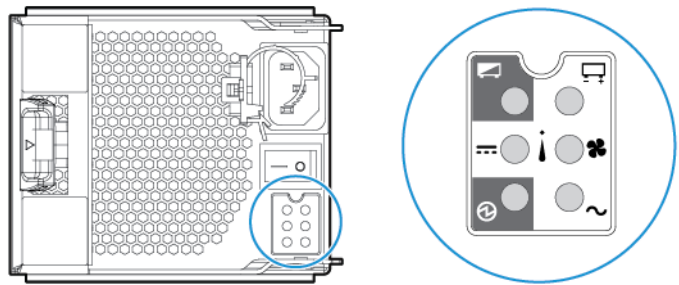


Table 5 Description of Controller Node PCM LEDs

Icon	Description	Appearance		Indicates
	AC input fail	Amber	On	No AC power or PCM fault
			Flashing	Firmware download
	PCM OK	Green	On	AC present and PCM On / OK
			Flashing	Standby mode
	Fan Fail	Amber	On	PCM fail or PCM fault
			Flashing	Firmware download
	DC Output Fail	Amber	On	No AC power, PCM fault or out of tolerance
			Flashing	Firmware download
	Battery Fail	Amber	On	Hard fault (not recoverable)
			Flashing	Soft fault (recoverable)

Table 5 Description of Controller Node PCM LEDs *(continued)*

Icon	Description	Appearance		Indicates
	Battery Good	Green	On	Present and charged
			Flashing	Charging or disarmed

Drive PCM LEDs

The following figure shows the location of drive 580 W PCM LEDs.

See [Table 6 \(page 19\)](#) for details of PCM LEDs..

Figure 13 Location of Drive PCM LEDs

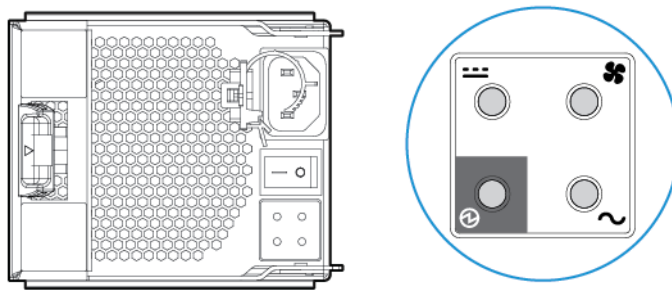


Table 6 Description of Drive PCM LEDs

Icon	Description	LED Appearance		Indicates
	AC input fail	Amber	On	No AC power or PCM fault
			Flashing	Firmware Download
	PCM OK	Green	On	AC Present and PCM On / OK
			Flashing	Standby mode
	Fan Fail	Amber	On	PCM fail or PCM fault
			Flashing	Firmware download

Table 6 Description of Drive PCM LEDs *(continued)*

Icon	Description	LED Appearance		Indicates
	DC Output Fail	Amber	On	No AC power, PCM fault or out of tolerance
			Flashing	Firmware download

I/O Module LEDs

I/O modules are located on the back of the system. I/O modules have two mini-SAS universal ports, which can be connected to HBAs or other ports. Each port includes External Port Activity LEDs, labeled 0 to 3. The I/O module also includes a Power and Fault LED.

Figure 14 Location of HP M6710/M6720 I/O Module LEDs

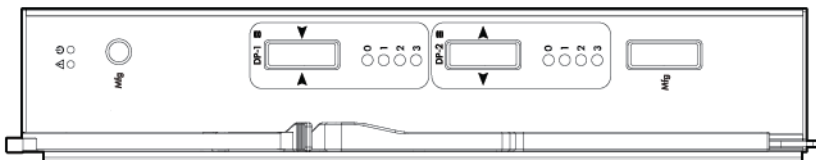


Figure 15 I/O Module Power and Fault LEDs

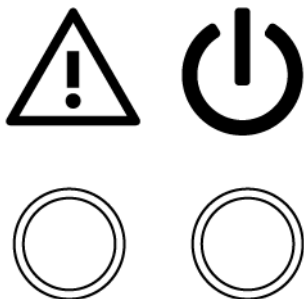


Table 7 Description of I/O module Power and Fault LEDs

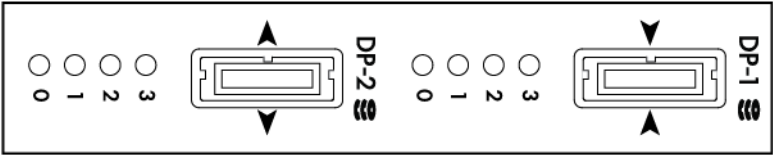
Icon	Function	Appearance	State	Indicates
	Power	Green	On	Power is on
			Off	Power is off

Table 7 Description of I/O module Power and Fault LEDs *(continued)*

Icon	Function	Appearance	State	Indicates
	Fault	Amber	On	Fault
			Off	Normal operation
			Flashing	Locate command issued

External Port Activity LEDs

Figure 16 Location of External Port Activity LEDs



Function	Appearance	State	Indicates
External Port Activity; 4 LEDs for Data Ports 0 through 3	Green	On	Ready, no activity
		Off	Not ready or no power
		Flashing	Activity

Controller Node and Internal Component LEDs

NOTE: Enter the `locatenode` command to flash the hotplug LED blue.

Figure 17 Location of Controller Node LEDs

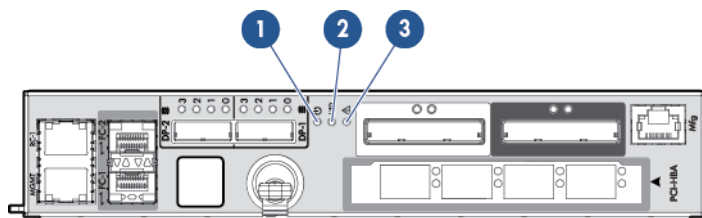


Table 8 Description of Controller Node LEDs

Callout	LED	Appearance	Indicates
1	Status	Green	Node status Good - On – No cluster - Quick Flashing – Boot - Slow Flashing – Cluster
2	Hotplug	Blue	Node FRU Indicator - On – OK to remove - Off – Not OK to remove - Flashing – <code>locatenode</code> command has been issued
3	Fault	Amber	Node status Fault - On – Fault - Off – No fault - Flashing – Node in cluster and there is a fault

Ethernet LEDs

The controller node has two built-in Ethernet ports. Each built-in Ethernet port has two LEDs.

Figure 18 Location of Ethernet LEDs

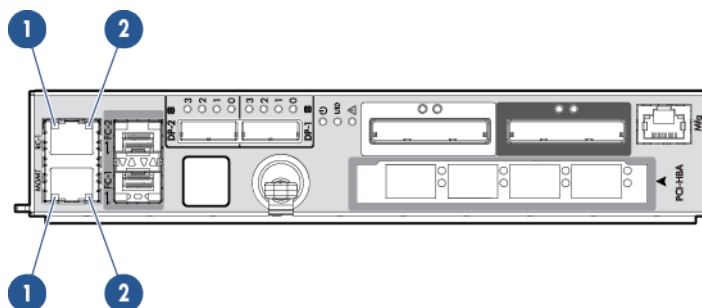


Table 9 Description of Ethernet LEDs

Callout	LED	Appearance	Indicates
1	Link Up Speed	Green	On – 1 GbE Link
		Amber	On – 100 Mb Link

Table 9 Description of Ethernet LEDs *(continued)*

			Off – No link established or 10 Mb Link
2	Activity	Green	On – No Link activity Off – No link established Flashing – Link activity

FC Port LEDs

The controller node has two FC ports. Each FC port has two LEDs. The arrow-head shaped LEDs point to the associated port.

Figure 19 Location of FC Port LEDs

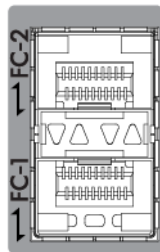


Table 10 Description of FC Port LEDs

Port	LED	LED Appearance	Indicates
All ports	No light	Off	Wake up failure (dead device) or power is not applied
FC-1	Amber	Off	Not connected
		3 fast blinks	Connected at 4 Gbs
		4 fast blinks	Connected at 8 Gbs
FC-2	Green	On	Normal/Connected – link up
		Flashing	Link down or nor connected

SAS Port LEDs

The controller node has two SAS ports. Each SAS port has four LEDs and numbered 0 to 3:

Figure 20 Location of SAS Port LEDs

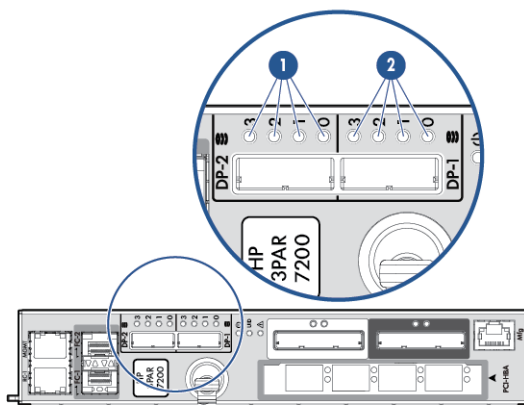


Table 11 Description of SAS port LEDs

Callout	LED	Appearance	Indicates
1	DP-1	Green	Off– SAS link is present or not, this LED does not remain lit Flashing–Activity on port
2	DP-2	Green	Off–SAS link is present or not, this LED does not remain lit Flashing–Activity on port

Interconnect Port LEDs

The controller node has two interconnect ports. Each interconnect port includes two LEDs.

Figure 21 Location Interconnect Port LEDs

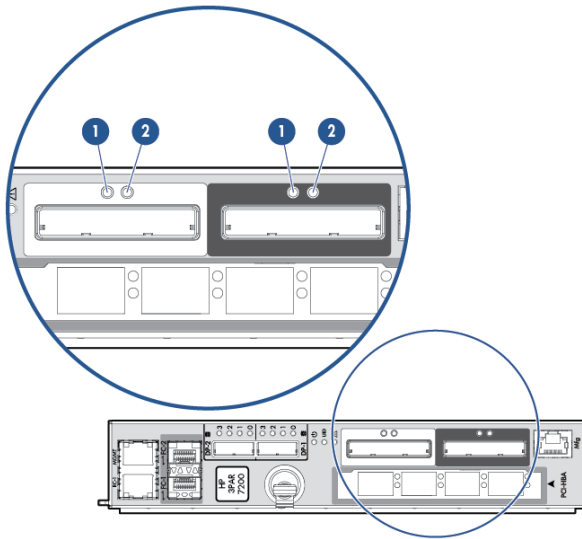


Table 12 Description of Interconnect Port LEDs

Callout	LED	Appearance	Indicates
1	Status	Green	On – Link established Off – Link not yet established
2	Fault	Amber	On – Failed to establish link connection Off – No errors currently on link Flashing – Cluster link cabling error, controller node in wrong slot, or serial number mismatch between controller nodes.

Fibre Channel Adapter Port LEDs

The Fibre Channel adapter in the controller node includes Fibre Channel port LEDs:

Figure 22 Location of Fibre Channel Adapter Port LEDs

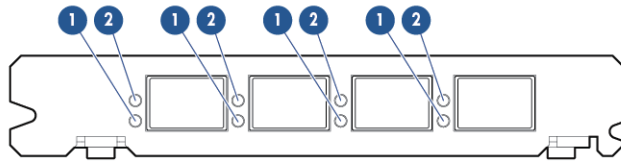


Table 13 Description of Fibre Channel Adapter Port LEDs

Callout	LED	Appearance	Indicates
	All ports	No light	Off – Wake up failure (dead device) or power is not applied
1	Port speed	Amber	Off – Not connected 3 fast blinks – Connected at 4 Gb/s. 4 fast blinks – Connected at 8 Gb/s.
2	Link status	Green	On – Normal/Connected - link up Flashing – Link down or not connected

Converged Network Adapter Port LEDs

The CNA in the controller node includes two ports. Each port has a Link and Activity LED.

Figure 23 Location of CNA Port LEDs

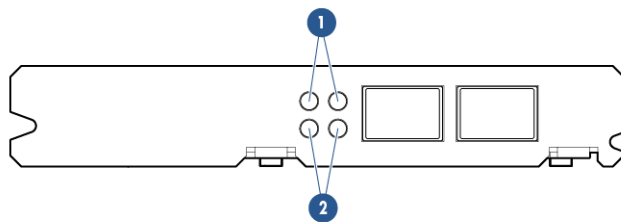


Table 14 Description of CNA Port LEDs

Callout	LED	Appearance	Indicates
1	Link	Green	Off – Link down On – Link up
2	ACT (Activity)	Green	Off – No activity On – Activity

16 G Fibre Channel (FC) Adapter LEDs

Figure 24 16 G FC Adapter LEDs

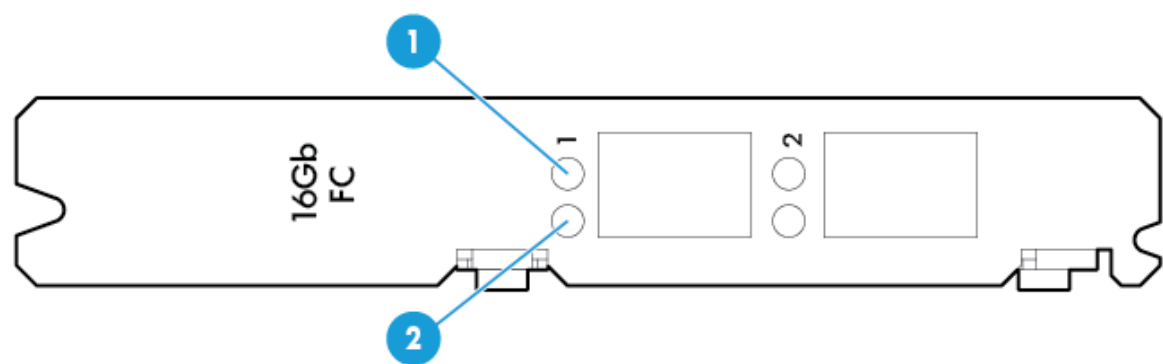


Table 15 16 G FC Adapter LEDs

1 – Green LED	2 – Yellow LED	State
Off	Off	Boot failure (dead board)
Off	On	POST failure (dead board)
Off	Slow blink	Boot failure after POST
Off	Fast blink	Not defined
Off	Flashing	POST processing in progress
On	Off	Failure in common code module
On	On	Failure in common code module
On	One fast blink	Normal (link up at 2G FC) (legacy compatibility only)
On	Two fast blinks	Normal (link up at 4G FC)
On	Three fast blinks	Normal (link up at 8G FC)
On	Four fast blinks	Normal (link up at 16G FC)
On	Flashing	Not defined
Slow blink	Off	Normal – link down
Slow blink	On	Not defined
Slow blink	Slow blink	Not defined
Slow blink	Fast blink	Not defined
Slow blink	Flashing	Not defined
Fast blink	Off	Not defined
Fast blink	On	Not defined
Fast blink	Slow blink	Not defined
Fast blink	Fast blink	Beaconing
Fast blink	Flashing	Not defined

10 G Ethernet Adapter LEDs

Figure 25 10 G Ethernet Adapter LEDs

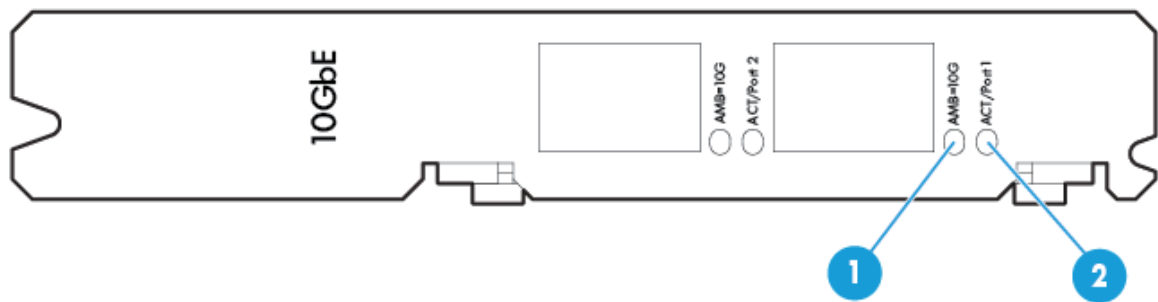


Table 16 10 G Ethernet Adapter LEDs

LED		State
1 – Amb= 10G	On	Link speed 10Gb/s
	Off	Link speed 1Gb/s
2 – ACT/Port	On	Link up
	Blinking	Link activity

1 G Ethernet Adapter LEDs

Figure 26 1 G Ethernet Adapter LEDs



Table 17 1 G Ethernet Adapter LEDs

LED		State
1 – Green LED	On	Link speed 1Gb/s
	Off	Link speed 100Mb/s
2 – Green LED	On	Link up
	Blinking	Link activity
	Off	Link down

Service Processor LEDs

The HP 3PAR SP (Proliant DL320e) LEDs are located at the front and rear of the SP.

Figure 27 Front Panel LEDs

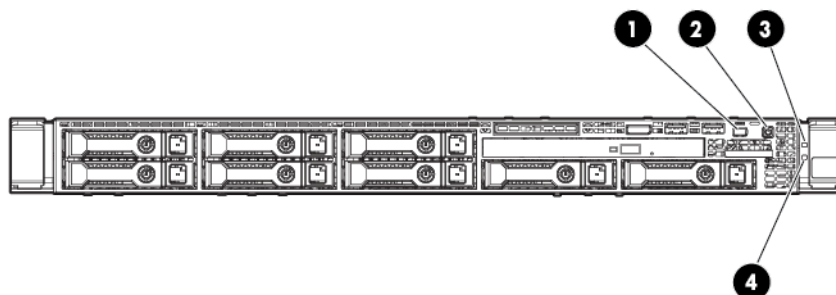


Table 18 Front panel LEDs

Item	LED	Appearance	Description
1	UID LED/button	Blue	Active
		Flashing Blue	System is being managed remotely
		Off	Deactivated
2	Power On/Standby button and system power	Green	System is on
		Flashing Green	Waiting for power
		Amber	System is on standby, power still on
		Off	Power cord is not attached or power supplied has failed
3	Health	Green	System is on and system health is normal
		Flashing Amber	System health is degraded
		Flashing Red	System health is critical
		Off	System power is off
4	NIC status	Green	Linked to network
		Flashing Green	Network activity
		Off	No network link

Figure 28 Rear Panel LEDs

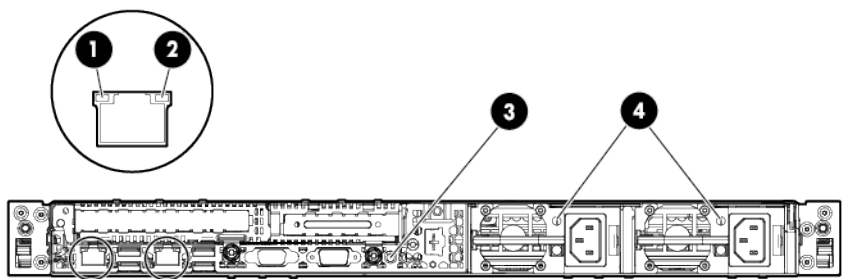


Table 19 Rear panel LEDs

Item	LED	Appearance	Description
1	NIC link	Green	Link
		Off	No link
2	NIC status	Green or Flashing Green	Activity
		Off	No activity
3	UID LED/button	Blue	Active
		Flashing Blue	System is being managed remotely
		Off	Deactivated
4	Power supply	Green	Normal
		Off	Off = one or more of the following conditions: • Power is unavailable • Power supply has failed • Power supply is in standby mode • Power supply error

3 Powering Off/On the Storage System

This chapter describes how to power the storage system on and off.

Powering Off the Storage System

NOTE: Power distribution units (PDU) in any expansion cabinets connected to the storage system may need to be shut off. Use the `locatesys` command to identify all connected cabinets before shutting down the system. The command blinks all node and drive enclosure LEDs.

Before you power off, use either SPmaint or SPOCC to shut down the system (see *Service Processor Onsite Customer Care* in the *HP 3PAR StoreServ 7000 and 7000c Storage Service Guide*).

The system must be shut down before powering off by using any of the following three methods:

Using SPOCC

1. Select **InServ Product Maintenance**.
2. Select **Halt an InServ cluster/node**.
3. Follow the prompts to shutdown a cluster. Do not shut down individual nodes.
4. Turn off power to the node PCMs.
5. Turn off power to the drive enclosure PCMs.
6. Turn off all PDUs in the rack.

Using SPmaint

1. Select option 4 (**InServ Product Maintenance**).
2. Select **Halt an InServ cluster/node**.
3. Follow the prompts to shutdown a cluster. Do not shut down individual nodes.
4. Turn off power to the node PCMs.
5. Turn off power to the drive enclosure PCMs.
6. Turn off all PDUs in the rack.

Using CLI Directly on the Controller Node if the SP is Inaccessible

1. Enter the CLI command `shutdownsys - halt`. Confirm all prompts.
2. Allow 2 to 3 minutes for the node to halt, then verify that the node Status LED is flashing green and the node hotplug LED is blue, indicating that the node has been halted. For information about LEDs status, see [“Understanding LED Indicator Status” \(page 16\)](#).

⚠ CAUTION: Failure to wait until all controller nodes are in a halted state could cause the system to view the shutdown as uncontrolled and place the system in a `checkld` state upon power up. This can seriously impact host access to data.

3. Turn off power to the node PCMs.
4. Turn off power to the drive enclosure PCMs.
5. Turn off power to all PDUs in the rack.

Powering On the Storage System

1. Set the circuit breakers on the PDUs to the ON position.
2. Set the switches on the power strips to the ON position.
3. Power on the drive enclosure PCMs.

NOTE: To avoid any cabling errors, all drive enclosures must have at least one or more hard drive(s) installed before powering on the enclosure.

4. Power on the node enclosure PCMs.
5. Verify the status of the LEDs. See [“Understanding LED Indicator Status”](#) (page 16).

4 Alerts

Alerts are triggered by events that require system administrator intervention. This chapter provides a list of alerts identified by message code, the messages, and what action should be taken for each alert. To learn more about alerts, see the *HP 3PAR StoreServ Storage Concepts Guide*.

For information about system alerts, go to HP Guided Troubleshooting at <http://www.hp.com/support/hpgt/3par> and select your server platform.

To view the alerts, use the `showalert` command. Alert message codes have seven digits in the schema AAABBBB, where:

- AAA is a 3-digit major code
- BBBB is a 4-digit sub-code
- 0x precedes the code to indicate hexadecimal notation

NOTE: Message codes ending in `de` indicate a degraded state alert. Message codes ending in `fa` indicate a failed state alert.

See the *HP 3PAR OS Command Line Interface Reference* for complete information on the display options on the event logs.

Table 20 Alert Severity Levels

Severity	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 determine whether action is necessary.
Informational	The event is informational. No action is required other than to acknowledge or remove the alert.

Getting Recommended Actions

For disk drive alerts, the component line in the right column lists the cage number, magazine number, and drive number (cage:magazine:disk). The first and second numbers are sufficient to identify the exact disk in an HP 3PAR StoreServ 7000 and 7000c Storage system, since there is always only a single disk (disk 0) in a single magazine.

1. Follow the link to alert actions under **Recommended Actions**.
2. At the HP Storage Systems Guided Troubleshooting website, follow the link for your product.
3. At the bottom of the HP 3PAR product page, click the link for HP 3PAR Alert Messages.
4. At the bottom of the Alert Messages page, choose the correct message code series based on the first four characters of the alert.
5. Choose the link that matches the first five characters of the message code.
6. On the next page, select the message code that matches the code in the alert.

The next page shows the message type based on the message code selected and provides a link to the suggested action.

7. Follow the link.

8. On the suggested actions page, scroll through the list to find the message state listed in the alert message. The recommended action is listed next to the message state.

5 Troubleshooting

Using the `checkhealth` Command

The HP 3PAR CLI `checkhealth` command checks and displays the status of storage system hardware and software components. For example, the `checkhealth` command can check for unresolved system alerts, display issues with hardware components, or display information about virtual volumes that are not optimal.

By default the `checkhealth` command checks most storage system components, but you can also check the status of specific components. For a complete list of storage system components analyzed by the `checkhealth` command, see [“The `checkhealth` Command” \(page 34\)](#).

The `checkhealth` Command

The `checkhealth` command checks and displays the status of system hardware and software components.

Command syntax is: `checkhealth [<options> | <component>...]`

Command authority is Super, Service.

Command options are:

- The `-list` option, which lists all components that `checkhealth` can analyze.
- The `-quiet` option, which suppresses the display of the item currently being checked
- The `-detail` option, which displays detailed information regarding the status of the system.

The `<component>` is the command specifier, which indicates the component to check. Use the `-list` option to get the list of components.

Using the `checkhealth` Command

Use the `checkhealth` command without any specifiers to check the health of all the components that can be analyzed by the `checkhealth` command.

The following example displays both summary and detailed information about the hardware and software components:

```
cli% checkhealth -detail
Checking alert
Checking ao
Checking cabling
Checking cage
Checking cert
Checking dar
Checking date
Checking file
Checking fs
Checking host
Checking ld
Checking license
Checking network
Checking node
Checking pd
Checking pdch
Checking port
Checking qos
Checking rc
Checking snmp
Checking task
Checking vlun
Checking vv
Checking sp
```

Component	-----Summary Description-----	Qty
Alert	New alerts	4
Date	Date is not the same on all nodes	1
LD	LDs not mapped to a volume	2
License	Golden License.	1
vlun	Hosts not connected to a port	5

	5 total	13

The following information is included when you use the `-detail` option:

Component	----Identifier----	-----Detailed Description-----
Alert	sw_port:1:3:1	Port 1:3:1 Degraded (Target Mode Port Went Offline)
Alert	sw_port:0:3:1	Port 0:3:1 Degraded (Target Mode Port Went Offline)
Alert	sw_sysmgr	Total available FC raw space has reached threshold of 800G (2G remaining out of 544G total)
Alert	sw_sysmgr Total	FC raw space usage at 307G (above 50% of total 544G)
Date	--	Date is not the same on all nodes
LD	ld:name.usr.0	LD is not mapped to a volume
LD	ld:name.usr.1	LD is not mapped to a volume
vlun	host:group01	Host wwn:2000000087041F72 is not connected to a port
vlun	host:group02	Host wwn:2000000087041F71 is not connected to a port
vlun	host:group03	Host iscsi_name:2000000087041F71 is not connected to a port
vlun	host:group04	Host wwn:210100E08B24C750 is not connected to a port
vlun	host:Host_name	Host wwn:210000E08B000000 is not connected to a port

	13 total	

If there are no faults or exception conditions, the `checkhealth` command indicates that the System is healthy:

```
cli% checkhealth
Checking alert
Checking cabling
...
Checking vlun
Checking vv
System is healthy
```

With the `<component>` specifier, you can check the status of one or more specific storage system components. For example:

```
cli% checkhealth node pd
Checking node
Checking pd
The following components are healthy: node, pd
```

Troubleshooting Storage System Components

Use the `checkhealth -list` command to list all the components that can be analyzed by the `checkhealth` command.

For detailed troubleshooting information about specific components, examples, and suggested actions for correcting issues with components, refer to the section corresponding to the component name in [Table 21 \(page 35\)](#)

Table 21 Component Functions

Component	Function
alert	Displays unresolved alerts
ao	Displays Adaptive Optimization issues

Table 21 Component Functions *(continued)*

Component	Function
cabling	Displays drive cage cabling issues
cage	Displays drive cage issues
cert	Displays Certificate issues
dar	Display data encryption issues
date	Displays nodes having different date issues
file	Displays file system issues
fs	Displays Files Services health
host	Displays host configuration and port issues
ld	Displays LD issues
license	Displays license violations
network	Displays Ethernet issues
node	Displays node issues
pd	Displays PD states or condition issues
pdch	Displays chunklets state issues
port	Displays port connection issues
qos	Displays Quality of Service issues
rc	Displays Remote Copy issues
snmp	Displays issues with SNMP
task	Displays failed tasks
vlun	Displays VLUN issues
vv	Displays VV issues

The following sections provide details about troubleshooting specific components.

alert

Displays any unresolved alerts and shows any alerts that would be seen by `showalert -n`.

Format of Possible alert Exception Messages

```
Alert <component> <alert_text>
```

alert Example

```
Component -Identifier- -----Detailed Description-----
Alert      hw_cage:1      Cage 1 Degraded (Loop Offline)
Alert      sw_cli         11 authentication failures in 120 secs
```

alert Suggested Action

View the full Alert output using the SSMC (GUI) or the `showalert -d` CLI command.

ao

- Displays Adaptive Optimization issues
- Checks that all PD classes that exist on any node-pair are found on all node-pairs

Format of Possible ao Exception Messages

```
AO Nodes:<nodelist> "<PDclass> PDs need to be attached to this Node pair"
```

ao Example

```
Component -----Summary Description----- Qty
AO          Node pairs with unmatched PD types 1

Component -Identifier- -----Detailed Description-----
AO          Nodes:0&1      NL PDs need to be attached to this Node pair
```

ao Suggestion Action

Use the following CLI commands to view PD distribution: `showpd`, `showpd -p -devtype NL`, `showpd -p -devtype NL -nodes 0,1`, and `showcage`. In the example below, there are 72 NL PDs attached to nodes 2&3, but none attached to nodes 0&1. Contact HP support to request support for moving NL PDs (and possibly cages) from nodes 2&3 to nodes 0&1 for your system. See [“Contacting HP Support about System Setup” \(page 73\)](#).

```
cli% showpd -p -devtype NL -nodes 2,3
-----Size (MB)----- Ports-----
  Id CagePos  Type RPM State      Total      Free A      B      Capacity(GB)
200 12:0:0    NL   7 normal  1848320    1766400 3:0:1* 2:0:1      2000
201 12:1:0    NL   7 normal  1848320    1766400 3:0:1  2:0:1*      2000
202 12:2:0    NL   7 normal  1848320    1765376 3:0:1* 2:0:1      2000
...
303 17:22:0   NL   7 normal  1848320    1765376 3:0:2  2:0:2*      2000
-----
  72 total                133079040 127172608

cli% showpd -p -devtype NL -nodes 0,1
No PDs listed
```

cabling

Displays issues with cabling of drive enclosures.

- Cages cabled correctly to nodes
- Cages cabled correctly to cage I/O modules and ports
- Cages with broken cables
- Cable daisy-chain lengths balanced and supported length
- Cable daisy-chain order
- Cages with no PDs with primary path to nodes

NOTE: To avoid any cabling errors, all drive enclosures must have at least one or more hard drive(s) installed before powering on the enclosure.

Format of Possible cabling Exception Messages

```
Cabling <cageID> "Cabled to <nodelist>, remove a cable from <nodelist>"
Cabling <nodeID> "No cabling data for <nodeID>. Check status of <nodeID>"
Cabling <cageID> "Cage is connected to too many node ports (<portlist>)"
Cabling <cageID> "Cage has multiple paths to <portlist>, correct cabling"
Cabling <cageID> "I/O <moduleID> missing. Check status and cabling to <cageID> I/O <moduleID>"
Cabling <cageID> "Cage not connected to <nodeID>, move one connection from <nodeID> to <nodeID>"
Cabling <cageID> "Cage connected to different ports <node&portID> and <node&portID>"
Cabling <cageID> "Cage connected to non-paired nodes <node&portID> and <node&portID>"
Cabling <cageID> "Check connections or replace cable from (<cage,module,portID>) to (<cage,module,portID>) - failed links"
Cabling <cageID> "Check connections or replace cable from (<cage,module,portID>) to (<cage,module,portID>) - links at
<speed>"
Cabling <nodepairID> "<node&portID> has <count> cages, <node&portID> has <count> cages"
Cabling <cageID> "Cable in (<cage,module,portID>) should be in (<cage,module,portID>)"
Cabling <cageID> "No PDs installed in cage, cabling check incomplete"
Cabling <cageID> "<node&portID> has <count> cages connected, Maximum is <count> (<cagelist>)"
Cabling <cageID> "<node&portID> should be cabled in the order: (<cagelist>)"
```

cabling Example 1

```
Component -Summary Description- Qty
Cabling   Bad SAS connection      1

Component -Identifier- -----Detailed Description-----
Cabling   cage7                  Check connections or replace cable from (cage6, I/O 0, DP-2) to (cage7, I/O 0, DP-1) - links at
6Gbps
```

cabling Suggested Action 1

Use the CLI `showcage` command to verify that both cages are available through two ports, before replacing the cable specified in the error message.

```
cli% cli% showcage cage6 cage7
Id Name  LoopA Pos.A LoopB Pos.B Drives Temp  RevA RevB Model FormFactor
6 cage6  3:0:4    1 2:0:4    0    10 28-30 1.76 1.76 DCS4 SFF
7 cage7  3:0:4    0 2:0:4    1    10 27-30 1.76 1.76 DCS4 SFF
```

cabling Example 2

Cabling

```
checkhealth -detail cabling
Checking cabling
Component --Summary Description--- Qty
Cabling   Wrong I/O module or port  2
-----
1 total                                     2

Component -Identifier- -----Detailed Description-----
Cabling   cage2          Cable in (cage2, I/O 0, DP-2) should be in (cage2, I/O 0, DP-1)
Cabling   cage2          Cable in (cage2, I/O 0, DP-1) should be in (cage2, I/O 0, DP-2)
-----
2 total

root@jnodec103288:~# showcage cage2
Id Name  LoopA Pos.A LoopB Pos.B Drives Temp  RevA RevB Model FormFactor
2 cage2  1:0:2    1 0:0:2    0    10 13-34 402e 402e DCS1 LFF
```

cabling Suggested Action 2

For cables that should be moved to different ports in the same I/O module: Use the CLI `showcage` command to verify that the cage is available through two ports, before moving the cable(s) to the specified ports. For cables that should be moved between different I/O modules and/or cages, contact HP support to request support for changing the cabling of your system. See [“Contacting HP Support about System Setup” \(page 73\)](#). Moving cables on a running system can cause degraded PDs and LDs.

```
cli% showcage cage2
Id Name  LoopA Pos.A LoopB Pos.B Drives Temp  RevA RevB Model FormFactor
2 cage2  1:0:2    1 0:0:2    0    10 13-34 402e 402e DCS1 LFF
```

cage

Displays drive cage conditions that are not optimal and reports exceptions if any of the following do not have normal states:

- Ports
- SFP signal levels (RX power low and TX failure)
- Power supplies
- Cage firmware (is not current)
- Reports if a servicecage operation has been started and has not ended.
- Cages are supported for hardware platform

Format of Possible cage Exception Messages

```
Cage cage:<cageid> "Missing A loop" (or "Missing B loop")
Cage cage:<cageid>,mag:<magpos> "Magazine is <MAGSTATE>"
Cage cage:<cageid> "Power supply <X>'s fan is <FANSTATE>"
Cage cage:<cageid> "Power supply <X> is <PSSTATE>" (Degraded, Failed, Not_Present)
Cage cage:<cageid> "Power supply <X>'s AC state is <PSSTATE>"
Cage cage:<cageid> "Cage is in "servicing" mode (Hot-Plug LED may be illuminated)"
Cage cage:<cageid> "Firmware is not current"
Cage cage:<cageid> "Cage type <Model> is not supported on this platform"
Cage cage:<cageid> "Missing both A and B loops"
Cage cage:<cageid> "Cage state information is unavailable"
```

cage Example 1

```
Component -Summary Description- Qty
Cage      Cages missing A loop    1

Component -Identifier- -Detailed Description--
Cage      cage:1          Missing A loop
```

cage Suggested Action 1

Check the connection/path to the SFP in the cage and the level of signal the SFP is receiving. An RX Power reading below 100 μ W signals the RX Power Low condition; typical readings are between 300 and 400 μ W. Helpful CLI commands are `showcage -d` and `showcage -sfp ddm`.

At least two connections are expected for drive cages, and this exception is flagged if that is not the case.

```
cli% showcage -d cage1

Id Name  LoopA Pos.A LoopB Pos.B Drives Temp  RevA RevB Model FormFactor
1 cage1 1:0:1  1 0:0:1  1      8 21-23 402e 402e DCS2  SFF

-----Cage detail info for cage1 -----

Position: ---

Interface Board Info Card0          Card1
Firmware_status      Current      Current
Product_Rev          402e        402e
State(self,partner)  OK,OK       OK,OK
VendorId,ProductId   HP,DCS2     HP,DCS2
Master_CPU            Yes         No
SAS_Addr              50050CC1178EA0BE 50050CC1178E6BBE
Link_Speed(DP1,DP2)  6.0Gbps,Unknown 6.0Gbps,Unknown

PS PSState ACState DCState Fan State Fan0_Speed Fan1_Speed
```

ps0	OK	OK	OK	OK	Low	Low
ps1	Failed	Failed	Failed	OK	Low	Low

-----Drive Info-----				--PortA--	--PortB--
Drive	DeviceName	State	Temp (C)	LoopState	LoopState
0:0	5000c500720387e0	Normal	21	OK	OK
1:0	5000c50072039188	Normal	21	OK	OK
2:0	5000c500720387b0	Normal	21	OK	OK
3:0	5000c500720395b4	Normal	21	OK	OK
4:0	5000c50072036fbc	Normal	21	OK	OK
5:0	5000c50072039fc0	Normal	21	OK	OK
6:0	5000c50072037250	Normal	22	OK	OK
7:0	5000c5005737cc0c	Normal	23	OK	OK

cage Example 2

Component	-----Summary Description-----	Qty
Cage	Degraded or failed cage power supplies	2
Cage	Degraded or failed cage AC power	1

Component	-Identifier-	-----Detailed Description-----
Cage	cage:1	Power supply 0 is Failed
Cage	cage:1	Power supply 0's AC state is Failed
Cage	cage:1	Power supply 2 is Off

cage Suggested Action 2

A cage power supply or power supply fan is failed, is missing input AC power, or the switch is turned OFF. The showcage -d cageX and showalert commands provide more detail.

```
cli% showcage -d cage1
```

Id	Name	LoopA	Pos.A	LoopB	Pos.B	Drives	Temp	RevA	RevB	Model	FormFactor
1	cage1	1:0:1		1 0:0:1		1	8 21-23	402e	402e	DCS2	SFF


```
-----Cage detail info for cage1 -----
```

```
Position: ---
```

Interface	Board	Info	Card0	Card1
Firmware_status			Current	Current
Product_Rev			402e	402e
State(self,partner)			OK,OK	OK,OK
VendorId,ProductId			HP,DCS2	HP,DCS2
Master_CPU			Yes	No
SAS_Addr			50050CC1178EA0BE	50050CC1178E6BBE
Link_Speed (DP1,DP2)			6.0Gbps,Unknown	6.0Gbps,Unknown

PS	PSState	ACState	DCState	Fan	State	Fan0_Speed	Fan1_Speed
ps0	OK	OK	OK	OK		Low	Low
ps1	Failed	Failed	Failed	OK		Low	Low

-----Drive Info-----				--PortA--	--PortB--
Drive	DeviceName	State	Temp (C)	LoopState	LoopState
0:0	5000c500720387e0	Normal	21	OK	OK
1:0	5000c50072039188	Normal	21	OK	OK
2:0	5000c500720387b0	Normal	21	OK	OK
3:0	5000c500720395b4	Normal	21	OK	OK
4:0	5000c50072036fbc	Normal	21	OK	OK
5:0	5000c50072039fc0	Normal	21	OK	OK
6:0	5000c50072037250	Normal	22	OK	OK
7:0	5000c5005737cc0c	Normal	23	OK	OK

cage Example 3

Component	-Identifier-	-----Detailed Description-----
Cage	cage:1	Cage is in "servicing" mode (Hot-Plug LED may be illuminated)

cage Suggested Action 3

When a servicecage operation is started, it puts the targeted cage into servicing mode, and routing I/O through another path. When the service action is finished, the servicecage endfc command should be issued to return the cage to normal status. This checkhealth exception is reported if the I/O module cage is in servicing mode. If a maintenance activity is currently occurring on the drive cage, this condition can be ignored.

NOTE: The primary path can be seen by an asterisk (*) in showpd's Ports columns.

```
cli% showcage -d cage1

Id  Name    LoopA  Pos.A  LoopB  Pos.B  Drives  Temp  RevA  RevB  Model  FormFactor
1   cage1   ---    1      0:0:1  1      8        20-23  402e  -      DCS2   SFF

-----Cage detail info for cage1 -----

Position: ---

Interface Board Info  Card0          Card1
Firmware_status      Current
Product_Rev          402e
State(self,partner)  OK,OK          -,-
VendorID,ProductID   HP,DCS2        -,-
Master_CPU            Yes
SAS_Addr              50050CC1178EA0BE
Link_Speed(DP1,DP2)  6.0Gbps,Unknown -,-

PS   PSState  ACState  DCState  Fan State  Fan0_Speed  Fan1_Speed
ps0  OK       OK       OK       OK         Low         Low
ps1  OK       OK       OK       OK         Low         Low

-----Drive Info-----
Drive  DeviceName      State  Temp (C)
0:0    5000c500720387e0 Normal  20
0:1    5000c50072039188 Normal  21
0:2    5000c500720387b0 Normal  21
0:3    5000c500720395b4 Normal  21
0:4    5000c50072036fbc Normal  21
0:5    5000c50072039fc0 Normal  21
0:6    5000c50072037250 Normal  21
0:7    5000c5005737cc0c Normal  23

-----PortA-----  -----PortB-----
LoopState  LoopState
0:0        -         OK
0:1        -         OK
0:2        -         OK
0:3        -         OK
0:4        -         OK
0:5        -         OK
0:6        -         OK
0:7        -         OK

cli% showpd -s
Id  CagePos  Type  --State--  -----Detailed State-----
20  1:0:0    FC    degraded   disabled_A_port,servicing
21  1:0:1    FC    degraded   disabled_A_port,servicing
22  1:0:2    FC    degraded   disabled_A_port,servicing
23  1:0:3    FC    degraded   disabled_A_port,servicing

cli% showpd -p -cg 1

Id  CagePos  Type  Speed(K)  State  ---Size(MB)---  ---Ports---
    A      B
20  1:0:0    FC    10        degraded  139520  119808  0:0:2-  1:0:2*
21  1:0:1    FC    10        degraded  139520  122112  0:0:2-  1:0:2*
22  1:0:2    FC    10        degraded  139520  119552  0:0:2-  1:0:2*
23  1:0:3    FC    10        degraded  139520  122368  0:0:2-  1:0:2*
```

cage Example 4

SComponent	-----Summary Description-----	Qty
Cage	Cages not on current firmware	1

Component	-Identifier-	-----Detailed Description-----
Cage	cage:3	Firmware is not current

cage Suggested Action 4

Check the drive cage firmware revision using the commands `showcage` and `showcage -d cageX`. The `showfirmwaredb` command indicates what the current firmware level should be for the specific drive cage type.

NOTE: Use the `upgradecage` command to upgrade the firmware.

```
cli% showcage

Id  Name    LoopA  Pos.A  LoopB  Pos.B  Drives  Temp  RevA  RevB  Model  FormFactor
0   cage0    1:0:1  0      0:0:1  0      16      13-22  402d  402d  DCN1   SFF
1   cage1    1:0:1  0      0:0:1  4      16      13-22  402d  402d  DCN2   SFF

cli% showcage -d cage2

Id  Name    LoopA  Pos.A  LoopB  Pos.B  Drives  Temp  RevA  RevB  Model  FormFactor
2   cage2    1:0:1  3      0:0:1  2      16      14-22  402d  402d  DCS2   SFF

-----Cage detail info for cage2 -----

Position: ---

Interface Board Info  Card0          Card1
Firmware_status      Old            Old
Product_Rev          402d          402d
State(self,partner)  OK,OK         OK,OK
VendorID,ProductID   HP,DCS2       HP,DCS2
Master_CPU           Yes           No
SAS_Addr             50050CC1177A50FE  50050CC117739CFE
Link_Speed(DP1,DP2)  6.0Gbps,6.0Gbps  6.0Gbps,6.0Gbps
.
.
.

cli% showfirmwaredb
Vendor Prod_rev Dev_Id Fw_status Cage_type Firmware_File
...
HP      [402e]  DCS2   Current  DCS2      /opt/tpd/fw/cage/ebod/hp_e6ebd_canister_local_combined_v402e.gff
```

cert

- Displays Certificate issues
- Reports SSL certificates that have expired, will expire in less than 30 days, and certificates that will not be valid until a future date

Format of Possible cert Exception Messages

```
cert -- "Certificate <DNSname> for Service:<servicename> will expire in <count> days"
cert -- "Certificate <DNSname> for Service:<servicename> expired on <date&time>"
cert -- "Certificate <DNSname> for Service:<servicename> not valid until <date&time>"
```

cert Example

```
cli% checkhealth -detail cert
Checking cert
Component -----Summary Description----- Qty
cert          Certificates that have expired      1

Component -Identifier- -----Detailed Description-----
cert      --          Certificate example.com for Service:wsapi expired on Jul 20 22:36:26 2014 GMT
```

cert Suggested Action

Use the CLI `showcert` command to display the current SSL certificates. Use the CLI `removecert` command to remove the expired SSL certificate and the CLI `createcert` command to create a SSL certificate with a valid date range.

dar (Data Encryption at Rest)

Checks for issues with Data Encryption. If the system is not licensed for Data Encryption.

Format of Possible dar Exception Messages

```
DAR -- "DAR Encryption status is unavailable"
DAR -- "DAR Encryption is enabled but not licensed"
DAR -- "DAR Encryption key needs backup"
DAR -- "There are <number> disks that are not Self Encrypting"
DAR -- "DAR Encryption status: <dar state>"
DAR -- "DAR EKM status is: <EKM status>"
```

dar Example 1

```
DAR -- "There are 5 disks that are not self-encrypting"
```

dar Suggested Action 1

Remove the drives that are not self-encrypting from the system because the non-encrypted drives cannot be admitted into a system that is running with data encryption. Also, if the system is not yet enabled for data encryption, the presence of these drives prevents data encryption from being enabled.

dar Example 2

```
Dar -- "DAR Encryption key needs backup"
```

dar Suggested Action 2

Issue the `controlencryption backup` command to generate a password-enabled backup file.

dar Example 3

```
DAR -- DAR EKM status is: Error: Unable to access EKM.
Configuration or connection issue.
```

dar Suggested Action 3

Use the `controlencryption status -d` and `controlencryption checkekm cli` commands to view more status about encryption. Check network status for nodes with `shownet` and `shownet -d cli` commands. Check the EKM server's status and the network connections and status.

date

Checks the date and time on all nodes and reports an error if they are not the same.

Format of Possible date Exception Messages

```
Date -- "Date is not the same on all nodes"
```

date Example

Component	-Identifier-	-----Detailed Description-----
Date	--	Date is not the same on all nodes

date Suggested Action

The time on the nodes should stay synchronized whether there is an NTP server or not. Use `showdate` to see if a node is out of sync. Use `shownet` and `shownet -d` to see the network and NTP information. NTP will not adjust the time for significant time differences, use the `setdate cli` command to set the time, date and time zone on all nodes.

```
cli% showdate

Node Date
0      2010-09-08 10:56:41 PDT (America/Los_Angeles)
1      2010-09-08 10:56:39 PDT (America/Los_Angeles)

cli% shownet
IP Address      Netmask/PrefixLen    Nodes    Active Speed
192.168.56.209  255.255.255.0        0123     0      100
Duplex AutoNeg Status
Full   Yes      Active

Default route: 192.168.56.1
NTP server: 192.168.56.109

cli% showdate
Node Date
0      2015-05-21 14:31:19 PDT (America/Los_Angeles)
1      2015-05-21 14:31:19 PDT (America/Los_Angeles)

cli% setdate -tz America/Denver
Timezone set successfully.

cli% setdate 05211532
You specified the date as 2015-05-21 15:32:00 MDT
Is this correct?
select y=yes n=no: y
Node 0 time set to 2015-05-21 15:32:00 MDT
Node 1 time set to 2015-05-21 15:32:00 MDT

cli% showdate
Node Date
0      2015-05-21 15:32:08 MDT (America/Denver)
1      2015-05-21 15:32:08 MDT (America/Denver)
```

file

Displays file system conditions that are not optimal:

- Checks that required system volumes are mounted
- Checks for process, kernel and HBA cores on node disk drives
- Checks for node file systems that are too full
- Checks for behavior altering files on the node disk drives
- Checks if an online upgrade is in progress

Many issues reported by the `file` component will require you to contact HP support to request support your system. See [“Contacting HP Support about System Setup” \(page 73\)](#).

Format of Possible file Exception Messages

```
File <nodeID> "Filesystem <filesystem> mounted on "<mounted on>" is over <count>% full"
File <nodeID> "Behavior altering file "<filename>" exists, created on <date&time>"
File <nodeID> "Dump or HBA core files found"
File <nodeID> "sr_mnt is full"
File -- "sr_mnt not mounted"
File -- "Admin Volume is not mounted"
File -- "An online upgrade is in progress"
```

file Example 1

```
File    node:2    Behavior altering file "manualstartup" exists created on Oct 7 14:16
```

file Suggested Action 1

After understanding why the files are present, the file should be removed to prevent unwanted behavior. As root on a node, remove the file using the UNIX `rm` command.

Known condition: some undesirable touch files are not being detected (bug 45661).

file Example 2

```
Component -----Summary Description----- Qty
File      Admin Volume is not mounted          1
```

file Suggested Action 2

Each node has a file system link so that the admin volume can be mounted if that node is the master node. This exception is reported if the link is missing or if the System Manager (sysmgr) is not running at the time. For example, **sysmgr** might have been restarted manually, due to error or during a change of master-nodes. If sysmgr was restarted, it tries to remount the admin volume every few minutes.

Every node should have the following file system link so that the admin volume can be mounted, should that node become the master node:

```
root@1001356-1~# onallnodes ls -l /dev/tpd_vvadmin
Node 0:
lrwxrwxrwx 1 root root 12 Oct 23 09:53 /dev/tpd_vvadmin -> tpddev/vvb/0
Node 1:
ls: /dev/tpd_vvadmin: No such file or directory
```

The corresponding alert when the admin volume is not properly mounted is as follows:

```
Message Code: 0xd0002
Severity      : Minor
Type         : PR transition
Message      : The PR is currently getting data from the internal drive on node 1, not the admin volume. Previously recorded
               alerts will not be visible until the PR transitions to the admin volume.
```

If a link for the admin volume is not present, it can be recreated by rebooting the node.

file Example 3

```
Component -----Summary Description----- Qty
File      Nodes with Dump or HBA core files    1

Component ----Identifier----- ----Detailed Description-----
File      node:1                Dump or HBA core files found
```

file Suggested Action 3

This condition might be transient because the Service Processor retrieves the files and cleans up the dump directory. If the SP is not gathering the dump files, check the condition and state of the SP.

file Example 4

```
Component -----Summary Description----- Qty
License   An online upgrade is in progress    1

Component -Identifier- -----Detailed Description-----
File      --                An online upgrade is in progress
```

file Suggested Action 4

Use the CLI `upgradesys -status` command to determine the status of the online upgrade in progress. Use the CLI `upgradesys -node <nodeID>` command to reboot the next node shown in the status or the CLI `upgradesys -finish` command to complete the upgrade after all nodes have been rebooted to the new version of software. Be very careful with aborting or reverting an offline upgrade. Contact HP support to request support for aborting or reverting the upgrade of your system. See [“Contacting HP Support about System Setup” \(page 73\)](#).

fs

Displays File Services health and checks the following File Services items:

- Check the health of File Services and the failover/health of each Storage Pool
- Check the health of each Virtual File Server
- Check the health of the node IP Addresses for File Services
- Check the health of the File Services gateway

Format of Possible fs Exception Messages

```
fs fpg          "<error text>"
fs <poolname>   "<poolname> is degraded: Failed over from <primaryowner> to <currentowner>"
fs <poolname>   "<poolname>: <associatedMessage>. Corrective Action: <correctiveAction>"
fs vfs         "<error text>"
fs <server>     "IP address failed to activate"
fs <server>     "Missing fsip for VFS"
fs <server>     "Missing cert for VFS"
fs fshareobj    "<error text>"
fs <sharename>  "<fpg/vfs/store/sharename>: <associatedMessage>. Corrective Action: <correctiveAction>"
fs nodeip      "<error text>"
fs <nodeaddr>   "<nodecid:nodeaddr>: <associatedMessage>. Corrective Action: <correctiveAction>"
fs gw          "<error text>"
fs <gatewayaddr> "<gatewayaddr>: <associatedMessage>"
fs dns         "<error text>"
fs <dnssuffixlist> "<dnssuffixlist>: <associatedMessage>"
```

fs Example

```
Component -----Summary Description----- Qty
fs          File Services provisioning group issues    1

Component -Identifier- -----Detailed Description-----
fs         fsp2          fsp2: FPG is not activated. Corrective Action: Activate FPG
```

fs Suggested Action

Use the CLI `showfpg` command to determine the state of the listed FPG. Use the CLI `setfpg` and `setfpg -activate` commands to start the listed FPG or the CLI `removefpg` command to remove

the FPG if no longer wanted. For other File Services issues, use the CLI `showfs`, `showvfs`, `showvfs` commands (and the associated `set` and `stop` commands) to investigate and solve issues.

host

- Displays Adaptive Optimization issues
- Checks that all PD classes that exist on any node-pair are found on all node-pairs
- Checks that FC Fabric connected host ports are configured to support Persistent Ports
- Checks that the FC switch ports are configured for NPIV support
- Checks that FC Fabric connected host partner ports are found on same FC SAN
- Checks that VLUNs are visible to their configured host through more than one node

Format of Possible host Exception Messages

```
Host <portID> "Port failover state is <failoverstate>, port state is <state>"
Host <portID> "Port not connected to fabric like <portID>"
Host <portID> "Port not configured as host like <portID>"
Host <portID> "Port not FC like <portID>"
Host <portID> "Port state is <state>, not ready like <portID>"
Host <portID> "Port WWN not found on FC Fabric attached to <portID>"
Host <portID> "Host port connected to FC Fabric switch port without NPIV support"
Host <portID> "Host is not seen by multiple nodes, only seen from node <nodeID>"
```

host Example 1

```
Component -----Summary Description----- Qty
Host      Ports not configured symmetrically    1

Component -Identifier- -----Detailed Description-----
Host      Port:0:1:1   Port not connected to fabric like Port:1:1:1
```

host Action 1

Use the CLI `showport`, `showport -par`, and `controlport` commands to configure port 0:1:1 for point mode (fabric connect) or configure port 1:1:1 to loop mode (for direct connect).

```
showport -par 0:1:1 1:1:1
N:S:P Connmode ConnType CfgRate MaxRate Class2 UniqNodeWwn VCN      IntCoal  TMWO    Smart_SAN
0:1:1 host      loop      auto    8Gbps  disabled disabled disabled disabled enabled n/a
1:1:1 host      point     auto    8Gbps  disabled disabled disabled disabled enabled n/a
```

host Example 2

```
Component -----Summary Description----- Qty
host      Hosts not seen by multiple nodes    1

Component -Identifier- -----Detailed Description-----
host      testhost      Host is not seen by multiple nodes, only seen from node 3
```

host Action 2

Use CLI `showvln -v` and `showhost` commands to determine what issue is reported. If the host is defined with only connections from one node, use the CLI `createhost -add` command to add host connections for an additional to the host definitions. If the host is defined with ports from

multiple nodes, use the CLI `showport` command to determine if a port is offline or misconfigured. A missing or rebooting node will cause a port to be offline.

```
cli% showvlnun -v testvv
Active VLUNs
Lun VVName HostName -Host_WWN/iSCSI_Name- Port Type Status ID
  2 testvv testhost 10000000C9E5E0B9      3:1:1 host active  1

cli% showhost testhost

Id Name      Persona      -WWN/iSCSI_Name- Port
  0 testhost Generic-ALUA 10000000C9E5E0B9 3:1:1

cli% createhost -add testhost 10000000C9E5E0B8

cli% showhost testhost
Id Name      Persona      -WWN/iSCSI_Name- Port
  0 testhost Generic-ALUA 10000000C9E5E0B9 3:1:1
                                10000000C9E5E0B8 2:1:1
```

ld

Checks the following and displays Logical Drives (LDs) that are not optimal:

- Preserved LDs
- Verifies that current and created availability are the same
- Owner and backup are correct
- Verifies preserved data space (`pdsld`) is the same as total data cache
- Size and number of logging LDs
- LDs that are in failed or degraded state
- LDs are mapped to volumes
- LDs that are in write-through mode

Format of Possible ld Exception Messages

```
LD ld:<ldname> "LD is not mapped to a volume"
LD ld:<ldname> "LD is in write-through mode"
LD ld:<ldname> "LD has <X> preserved RAID sets and <Y> preserved chunklets"
LD ld:<ldname> "LD has reduced availability. Current: <cavail>, Configured: <avail>"
LD ld:<ldname> "LD does not have a backup"
LD ld:<ldname> "LD does not have owner and backup"
LD ld:<ldname> "Logical Disk is owned by <owner>, but preferred owner is <powner>"
LD ld:<ldname> "Logical Disk is backed by <backup>, but preferred backup is <pbackup>"
LD ld:<ldname> "A logging LD is smaller than 20G in size"
LD ld:<ldname> "Detailed State:<ldstate>" (degraded or failed)
LD -- "Number of logging LD's does not match number of nodes in the cluster"
LD -- "Preserved data storage space does not equal total node's Data memory"
```

ld Example 1

```
Component -----Summary Description----- Qty
LD          LDs not mapped to a volume          1

Component -Identifier-- -----Detailed Description-----
LD          ld:vv.9.usr.3  LD is not mapped to a volume
```

ld Suggested Action 1

Examine the identified LDs using CLI commands such as `showld`, `showld -d`, `showldmap`, `showvvmap`, and other such commands.

LDs are normally mapped to (used by) VVs but they can be disassociated with a VV if a VV is deleted without the underlying LDs being deleted, or by an aborted tune operation. Normally, you would remove the unmapped LD to return its chunklets to the free pool.

```
cli% showld vv.9.usr.3

Id Name          RAID -Detailed_State- Own      SizeMB UsedMB Use Lgct LgId WThru MapV
-----
57 vv.9.usr.3    1 normal  1/0      8192      0 C,V 0 --- N   N
-----
1                8192      0

cli% showldmap vv.9.usr.3
Ld space not used by any vv
```

1d Example 2

```
Component -----Summary Description----- Qty
LD          LDs in write through mode          3

Component -Identifier-- -----Detailed Description-----
LD          ld:Ten.usr.12 LD is in write-through mode
```

1d Suggested Action 2

Examine the identified LDs using CLI commands such as `showld`, `showld -d`, `showldch`, and `showpd` for any failed or missing drives. Write-through mode (WThru) indicates that host I/O operations must be written through to the drive before the host I/O command is acknowledged. This is usually due to a node-down condition, when node batteries are not working, or where drive redundancy is not optimal.

```
cli% showld Ten*

Id Name          RAID -Detailed_State- Own      SizeMB UsedMB Use Lgct LgId
WThru
MapV
91 Ten.usr.3      0 normal  1/0/3/2 13824      0 V      0 --- N   N
92 Ten.usr.12     0 normal  2/3/0/1 28672      0 V      0 --- Y   N

cli% showldch Ten.usr.12

Ldch Row Set PdPos PdId Pdch State Usage Media Sp From To
0      0 0 3:3:0 108 6 normal ld valid N --- ---
11     0 11 --- 104 74 normal ld valid N --- ---

cli% showpd 104

-Size(MB)-- ----Ports----
Id CagePos Type Speed(K) State Total Free A      B
104 4:9:0? FC      15 failed 428800 0 ---- ----
```

1d Example 3

```
Component -----Summary Description----- Qty
LD          LDs with reduced availability          1

Component --Identifier-- -----Detailed Description-----
LD          ld:R1.usr.0 LD has reduced availability. Current: ch, Configured: cage
```

1d Suggested Action 3

LDs are created with certain high-availability characteristics, such as `-ha` `-cage`. If chunklets in an LD get moved to locations where the Current Availability (CAvail) is not at least as good as the desired level of availability (Avail), this condition is reported. Chunklets might have been

manually moved with `movech` or by specifying it during a tune operation or during failure conditions such as node, path, or cage failures. The HA levels from highest to lowest are `port`, `cage`, `mag`, and `ch` (disk).

Examine the identified LDs using CLI commands such as `showld`, `showld -d`, `showldch`, and `showpdc` for any failed or missing drives. In the example below, the LD should have cage-level availability, but it currently has chunklet (drive) level availability (the chunklets are on the same drive).

```
cli% showld -d R1.usr.0

Id Name      CPG RAID Own      SizeMB RSizeMB RowSz StepKB SetSz Refcnt Avail CAvail
32 R1.usr.0 --- 1 0/1/3/2 256 512 1 256 2 0 cage ch

cli% showldch R1.usr.0
Ldch Row Set PdPos Pdid Pdch State Usage Media Sp From To
0 0 0 0:1:0 4 0 normal ld valid N --- ---
1 0 0 0:1:0 4 55 normal ld valid N --- ---
```

1d Example 4

```
Component -Identifier-- -----Detailed Description-----
LD -- Preserved data storage space does not equal total node's Data memory
```

1d Suggested Action 4

Preserved data LDs (`pdsld`) are created during system initialization (OOTB) and after some hardware upgrades (via `admithw`). The total size of the `pdsld` should match the total size of all data-cache in the storage system (see below). This message appears if a node is offline because the comparison of LD size to data cache size does not match. This message can be ignored unless all nodes are online. If all nodes are online and the error condition persists, determine the cause of the failure. Use the `admithw` command to correct the condition.

```
cli% shownode

Node --Name--- -State- Master InCluster ---LED--- Control Data Cache
0 1001335-0 OK Yes Yes GreenBlink 2048 4096 100
1 1001335-1 OK No Yes GreenBlink 2048 4096 100

cli% showld pdsld*
Id Name RAID -Detailed_State- Own SizeMB UsedMB Use Lgct LgId WThru MapV
19 pdsld0.0 1 normal 0/1 256 0 P,F 0 --- Y N
20 pdsld0.1 1 normal 0/1 7680 0 P 0 --- Y N
21 pdsld0.2 1 normal 0/1 256 0 P 0 --- Y N
-----
3 8192 0
```

license

Displays license violations. Returns information if a license is temporary or if it has expired.

Format of Possible `license` Exception Messages

```
License <feature_name> "License has expired"
```

license Example

```
Component -Identifier-- -----Detailed Description-----
License -- System Tuner License has expired
```

license Suggested Action

If desired, request a new or updated license from your Sales Engineer.

network

Displays Ethernet issues for the Administrative, File Services, and Remote Copy over IP (RCIP) networks that have been logged in the previous 24-hour sampling window. Reports if the storage system has fewer than two nodes with working admin Ethernet connections.

- Check whether the number of collisions is greater than 5% of total packets in previous day's log.
- Check for Ethernet errors and transmit (TX) or receive (RX) errors in previous day's log.

Format of Possible network Exception Messages

```
Network -- "IP address change has not been completed"
Network "Node<node>:<type>" "Errors detected on network"
Network "Node<node>:<type>" "There is less than one day of network history for this node"
Network -- "No nodes have working admin network connections"
Network -- "Node <node> has no admin network link detected"
Network -- "Nodes <nodelist> have no admin network link detected"
Network -- "checkhealth was unable to determine admin link status"
```

network Example 1

```
Network -- "IP address change has not been completed"
```

network Suggested Action 1

The `setnet` command was issued to change some network parameter, such as the IP address, but the action has not been completed. Use `setnet finish` to complete the change, or `setnet abort` to cancel. Use `shownet` to examine the current condition.

```
cli% shownet
IP Address      Netmask/PrefixLen  Nodes  Active  Speed  Duplex  AutoNeg  Status
192.168.56.209  255.255.255.0      0123   0       100    Full    Yes      Changing
192.168.56.233  255.255.255.0      0123   0       100    Full    Yes      Unverified
```

network Example 2

```
Component ---Identifier---- -----Detailed Description-----
Network   Node0:Admin          Errors detected on network
```

network Suggested Action 2

Network errors have been detected on the specified node and network interface. Commands such as `shownet` and `shownet -d` are useful for troubleshooting network problems. These commands display current network counters as `checkhealth` compares error with the last logging sample.

NOTE: The error counters shown by `shownet` and `shownet -d` cannot be cleared except by rebooting a controller node. Because `checkhealth` is comparing network counters with a history log, `checkhealth` stops reporting the issue if there is no increase in error in the next log entry.

```
cli% shownet -d
IP Address: 192.168.56.209  Netmask 255.255.255.0
Assigned to nodes: 0123
Connected through node 0
Status: Active
```

```

Admin interface on node 0
MAC Address:      00:02:AC:25:04:03
RX Packets:      1225109   TX Packets:      550205
RX Bytes:        1089073679 TX Bytes:      568149943
RX Errors:        0       TX Errors:      0
RX Dropped:      0       TX Dropped:    0
RX FIFO Errors:  0       TX FIFO Errors: 0
RX Frame Errors: 60      TX Collisions: 0
RX Multicast:    0       TX Carrier Errors: 0
RX Compressed:   0       TX Compressed: 0

```

node

Checks the following node conditions and displays nodes that are not optimal:

- Offline nodes
- Power supply, fan, and battery problems
- Differences between hardware, software, and firmware between nodes
- Process memory usage, stuck processes, and node memory usage
- Configuration of PCI devices between node-pairs
- Node environmental issues

The following checks are performed only if the `-svc` option is used.

- Symmetry of components between nodes such as Control-Cache and Data-Cache size, OS version, bus speed, MCU version, and CPU speed.
- Diagnostics such as `ioload` are running on any of the nodes.
- Suck-threads, such as I/O operations that cannot complete.

Format of Possible node Exception Messages

```

Node node:<nodeID> "Node is not online"
Node node:<nodeID> "Power supply <psID> detailed state is <status>"
Node node:<nodeID> "Power supply <psID> AC state is <acStatus>"
Node node:<nodeID> "Power supply <psID> DC state is <dcStatus>"
Node node:<nodeID> "Power supply <psID> battery is <batStatus>"
Node node:<nodeID> "Node <nodeID> battery is <batStatus>"
Node node:<nodeID> "Power supply <psID> battery is expired"
Node node:<nodeID> "Fan is <fanID> is <status>"
Node node:<nodeID> "Power supply <psID> fan module <fanID> is <status>"
Node node:<nodeID> "Fan module <fanID> is <status>"
Node node:<nodeID> "Detailed State <state>" (degraded or failed)
Node node:<nodeID> "PCI card in Slot:<slot> is empty, but is not empty in Node:<pair-node>"
Node node:<nodeID> "PCI card model in Slot:<slot> is not the same as Node:<pair-node>"
Node -- "There is at least one active servicenode operation in progress"
Node node:<nodeID> "Process <ps_name> has reached 90% of maximum size"
Node node:<nodeID> "Node has less than 100MB of free memory"
Node node:<nodeID> "Environmental factor <item_string> is <state>"
Node node:<nodeID> "Flusher speed set incorrectly to: <flush_speed> (should be 0)"
Node node:<nodeID> "ioload is running"
Node node:<nodeID> "VV <vvid> has <stuck_num> outstanding <command> with a maximum wait time of <slptime>"
Node node:<nodeID> "<item> is not the same on all nodes"
(where <item> is: BIOS version, NEMOE version, Control memory, Data memory, CPU Speed, CPU Bus Speed, HP 3PAR OS version,
Package list)

```

Suggested node Action, General

For node error conditions, examine the node and node-component states with commands such as `shownode`, `shownode -s`, `shownode -d`, `showbattery`, and `showsys -d`.

node Example 1

```

Component -Identifier- -----Detailed Description-----
Node      node:0      Power supply 1 detailed state is DC Failed
Node      node:0      Power supply 1 DC state is Failed

```

```

Node      node:1      Power supply 0 detailed state is AC Failed
Node      node:1      Power supply 0 AC state is Failed
Node      node:1      Power supply 0 DC state is Failed

```

node Suggested Action 1

Examine the states of the power supplies with commands such as `shownode`, `shownode -s`, `shownode -ps`, and the like. Turn on or replace the failed power supply.

NOTE: In the example below, the battery state is considered Degraded because the power supply is Failed; this is normal.

```

cli% shownode
Node  --Name---  -State--  Master  InCluster  ---LED---  Control  Data  Cache
      0 1001356-0  Degraded  Yes      Yes      AmberBlnk  2048   8192  100
      1 1001356-1  Degraded  No       Yes      AmberBlnk  2048   8192  100

cli% shownode -s
Node  -State--  -Detailed_State-
      0 Degraded PS 1 Failed
      1 Degraded PS 0 Failed

cli% shownode -ps
Node  PS  -Serial-  -PSState-  FanState  ACState  DCState  -BatState-  ChrgLvl(%)
      0 0  FFFFFFFF  OK          OK        OK        OK          100
      0 1  FFFFFFFF  Failed      --        OK        Failed     Degraded    100
      1 0  FFFFFFFF  Failed      --        Failed    Failed     Degraded    100
      1 1  FFFFFFFF  OK          OK        OK        OK        OK          100

```

node Example 2

```

Component -Identifier-  -----Detailed Description-----
Node      node:3       Power supply 1 battery is Failed

```

node Suggested Action 2

Examine the state of the battery and power supplies with commands such as `shownode`, `shownode -s`, `shownode -ps`, `showbattery` (and `showbattery` with `-d`, `-s`, `-log`), and the like. Turn on, fix, or replace the battery backup unit.

```

cli% shownode
Node  --Name---  -State--  Master  InCluster  ---LED---  Control  Data  Cache
      2 1001356-2  OK        No       Yes      GreenBlnk  2048   8192  100
      3 1001356-3  Degraded  No       Yes      AmberBlnk  2048   8192  100

cli% shownode -s
Node  -State--  -Detailed_State-
      2 OK        OK
      3 Degraded PS 1 Degraded

cli% shownode -ps
Node  PS  -Serial-  -PSState-  FanState  ACState  DCState  -BatState-  ChrgLvl(%)
      2 0  FFFFFFFF  OK          OK        OK        OK        OK          100
      2 1  FFFFFFFF  OK          OK        OK        OK        OK          100
      3 0  FFFFFFFF  OK          OK        OK        OK        OK          100
      3 1  FFFFFFFF  Degraded    OK        OK        OK        Failed      0

cli% showbattery
Node  PS  Bat  Serial  -State--  ChrgLvl(%)  -ExpDate--  Expired  Testing
      3 0   0  100A300B  OK          100  07/01/2011  No       No
      3 1   0  12345310  Failed      0  04/07/2011  No       No

```

Displays Physical Drives (PDs) with states or conditions that are not optimal:

- Checks for failed and degraded PDs
- Checks for an imbalance of PD ports, for example, if Port-A is used on more drives than Port-B
- Checks for an Unknown Sparing Algorithm. For example, when it hasn't been set
- Checks for drives experiencing a high number of IOPS
- Reports if a servicemag operation is outstanding (servicemag status)
- Reports if there are PDs that do not have entries in the firmware DB file
- Reports PDs with slow SAS connections
- Reports minimum number of PDs in a cage and behind a node pair
- Reports PDs that are not admitted to the system

Format of Possible pd Exception Messages

```
PD disk:<pdid> "Degraded States: <showpd -s -degraded>"
PD disk:<pdid> "Failed States: <showpd -s -failed>"
PD -- "Sparing algorithm is not set"
PD disk:<pdid> "Disk is experiencing a high level of I/O per second: <iops>"
PD File: <filename> "Folder not found on all Nodes in <folder>"
PD File: <filename> "Folder not found on some Nodes in <folder>"
PD File: <filename> "File not found on all Nodes in <folder>"
PD File: <filename> "File not found on some Nodes in <folder>"
PD Disk:<pdID> "<pdmodel> PD for cage type <cagetype> in cage position <pos> is missing from firmware database"
PD Cage:<cageID> "There must be at least 1 PD with primary path to Node:<nodeID>"
PD Cage:<cageID> "PDs <class/rpm/cap> unbalanced. Primary path: <p_count> on Node:<nodeID>, <c_count> on Node:<nodeID>"
PD Nodes:<nodelist> "Only <count> <class/rpm/cap> PDs are attached to these nodes; the minimum is <MINDISKCNT>"
PD pd:<pdID> "PD SAS speed is <speed> instead of <speed> on both ports"
PD pd:<pdID> "PD SAS speed is <speed> instead of <speed> from port <0|1>"
PD disk:<pdWWN> "Unadmitted PD in cage position <CagePos> Type <devType>"
PD cage:<cageID>,mag:<magID> "Magazine has a failed servicemag operation"
PD cage:<cageID>,mag:<magID> "Magazine is being serviced"
PD cage:<cageID>,mag:<magID> "Magazine has an active servicemag operation in progress"
```

pd Example 1

```
Component -----Summary Description----- Qty
PD          PDs that are degraded or failed          40

Component -Identifier- -----Detailed Description-----
PD          disk:48          Detailed State: missing_B_port,loop_failure
PD          disk:49          Detailed State: missing_B_port,loop_failure
...
PD          disk:107         Detailed State: failed,notready,missing_A_port
```

pd Suggested Action 1

Both degraded and failed drives show up in this report. When an FC path to a drive cage is not working, all drives in the cage have a state of Degraded due to the non-redundant condition. Use commands such as showpd, showpd -s, showcage, showcage -d.

```
cli% showpd -degraded -failed
      Id CagePos Type Speed(K) State      Total      Free A      B
48 3:0:0   FC      10 degraded  139520   115200  2:0:2* -----
49 3:1:0   FC      10 degraded  139520   121344  2:0:2* -----
...
107 4:9:3  FC      15 failed   428800      0 -----  3:0:1*

cli% showpd -s -degraded -failed
      Id CagePos Type -State-- -----Detailed_State-----
48 3:0:0   FC    degraded missing_B_port,loop_failure
```

```

49 3:1:0    FC    degraded missing_B_port,loop_failure
...
107 4:9:0    FC    failed    prolonged_not_ready,missing_A_port,relocating

cli% showcage -d cage3
Id Name  LoopA Pos.A LoopB Pos.B Drives Temp  RevA RevB Model Side
1 cage3 ---      1 0:0:1      1      8 20-23 402e -   DCS2  SFF

-----Cage detail info for cage3 -----

Position: ---

Interface Board Info  Card0                      Card1
Firmware_status       Current                      -
Product_Rev           402e                      -
State(self,partner)   OK,OK                      -, -
VendorID,ProductID    HP,DCS2                    -, -
Master_CPU            Yes                        -
SAS_Addr              50050CC1178EA0BE          -
Link_Speed(DP1,DP2)   6.0Gbps,Unknown          -, -

PS   PSState ACState DCState Fan State Fan0_Speed Fan1_Speed
ps0  OK      OK      OK      OK      Low      Low
ps1  OK      OK      OK      OK      Low      Low

-----Drive Info-----
Drive      DeviceName      State  Temp (C)
0:0        5000c500720387e0 Normal  20
0:1        5000c50072039188 Normal  21
0:2        5000c500720387b0 Normal  21
0:3        5000c500720395b4 Normal  21
0:4        5000c50072036fbc Normal  21
0:5        5000c50072039fc0 Normal  21
0:6        5000c50072037250 Normal  21
0:7        5000c5005737cc0c Normal  23

-----PortA-----
LoopState
-
-
-
-
-
-
-
-

-----PortB-----
LoopState
OK
OK
OK
OK
OK
OK
OK
OK

```

pd Example 2

```

cli% checkhealth -detail pd
Checking pd
Component -----Summary Description----- Qty
PD      Unbalanced PD types in cages              1
PD      PDs that a degraded                        1
-----
2 total                                         2

Component --Identifier-- -----Detailed Description-----
PD      Cage:0          PDs FC/10K/450GB unbalanced. Primary path: 5 on Node:0,3 on Node:1
PD      disk:0          Degraded States: missing_A_port,servicing
-----
2 total

```

pd Suggested Action 2

The primary and secondary I/O paths for drives (PDs) are balanced between nodes. The primary path is indicated in the `showpd -path` output and by an asterisk in the `showpd` output. An imbalance of active ports is usually caused by a non-functioning path/loop to a cage, or because an odd number of drives is installed or detected, or drives were installed in the wrong slots. To diagnose further, use CLI commands such as `showpd`, `showpd -path`, `showcage`, and `showcage -d`.

```

cli% showcage -d cage0
Id Name  LoopA Pos.A LoopB Pos.B Drives Temp  RevA RevB Model FormFactor
0 cage0 1:0:1      0 0:0:1      0      8 20-22 402e 402e DCN1  SFF

-----Cage detail info for cage3 -----

```

```

Position: ---

Interface Board Info      Card0      Card1
Firmware_status          Current
Product_Rev              402e      402e
State(self,partner)      OK,OK     OK,OK
VendorID,ProductID       HP,DCN1   HP,DCN1
Master_CPU               Yes       No
SAS_Addr                 50050CC10230567E  50050CC10230567E
Link_Speed(DP1,Internal) 6.0Gbps,6.0Gbps  6.0Gbps,6.0Gbps

PS   PSState ACState DCState Fan State Fan0_Speed Fan1_Speed
ps0  OK      OK      OK      OK      Low      Low
ps1  OK      OK      OK      OK      Low      Low

-----Drive Info-----
Drive      DeviceName      State      Temp (C)      LoopState      LoopState
0:0        5000c500725333e0    Normal    20             OK             OK
0:1        5000c50072533d24    Normal    21             OK             OK
0:2        5000c500725314a0    Normal    21             OK             OK
0:3        5000c50072531bf4    Normal    22             OK             OK
0:4        5000c50072531c74    Normal    22             OK             OK
0:5        5000c50072531ec8    Normal    21             OK             OK
0:6        5000c50072531384    Normal    22             OK             OK
0:7        5000c5005f4848bc    Normal    22             OK             OK

cl% showpd

-----Size (MB)-----
Id  CagePos  Type  RPM  State      Total  Free  A  B  Capacity (GB)
0   0:0:0    FC    10   degraded  417792 381952 1:0:1- 0:0:1* 450
1   0:1:0    FC    10   normal    417792 381952 1:0:1  0:0:1* 450
2   0:2:0    FC    10   normal    417792 381952 1:0:1* 0:0:1  450

```

pd Example 3

```

Component -----Summary Description----- Qty
PD          Disks experiencing a high level of I/O per second          93

Component --Identifier-- -----Detailed Description-----
PD          disk:100          Disk is experiencing a high level of I/O per second: 789.0

```

pd Suggested Action 3

This check samples the I/O per second (IOPS) information in `statpd` to see if any drives are being overworked, and then it samples again after five seconds. This does not necessarily indicate a problem, but it could negatively affect system performance. The IOPS thresholds currently set for this condition are:

- NL drives < 75
- FC 10K RPM drives < 150
- FC 15K RPM drives < 200
- SSD < 12000

Operations such as `servicemag` and `tunevv` can cause this condition. If the IOPS rate is very high and/or a large number of drives are experiencing very heavy I/O, examine the system further using statistical monitoring commands/utilities such as `statpd`, the OS SSMC (GUI) and System Reporter. The following example reports drives whose total I/O is 150/sec or more.

```

cli% statpd -filt curs,t,iops,150
14:51:49 11/03/09 r/w I/O per second      KBytes per sec ... Idle %
      ID      Port      Cur  Avg  Max      Cur  Avg  Max ... Cur Avg
      100      3:2:1      t   658  664  666 172563 174007 174618 ...   6   6

```

pd Example 4

```
Component --Identifier-- -----Detailed Description-----  
PD          disk:3          Detailed State: old_firmware
```

pd Suggested Action 4

The identified drive does not have firmware that the storage system considers current. When a drive is replaced, the `servicemag` operation should upgrade the drive's firmware. When drives are installed or added to a system, the `admithw` command can perform the firmware upgrade. Check the state of the drive using CLI commands such as `showpd -s`, `showpd -i`, and `showfirmwaredb`.

```
cli% showpd -s 3  
Id CagePos Type -State-- -Detailed_State- --SedState  
3 0:3:0 FC degraded old_firmware fips_capable  
-----  
1 total  
  
cli% showpd -i 3  
Id CagePos State ----Node_WWN---- --MFR-- ---Model--- -Serial- -FW_Rev- Protocol Media Type ----AdmissionTime-----  
3 0:3:0 degraded 5000C50072531BF4 SEAGATE SLTN0450S5xnF010 SOL05GTE 3P00 SAS Magnetic 2015-05-19 20:51:17  
PDT  
-----  
1 total  
  
cli% showfirmwaredb  
Vendor Prod_rev Dev_Id Fw_status Cage_type  
...  
SEAGATE [3P01] SLTN0450S5xnF010 Current DCS1.DCS2.DCN1 /opt/tpd/fw/drive/Lightning_SAS_FIPS_3P01 lod
```

pd Example 5

```
Component --Identifier-- -----Detailed Description-----  
PD          --          Sparing Algorithm is not set
```

pd Suggested Action 5

Check the system's Sparing Algorithm value using the CLI command `showsys -param`. The value is normally set during the initial installation (OOTB). If it must be set later, use the command `setsys SparingAlgorithm`; valid values are Default, Minimal, Maximal, and Custom. After setting the parameter, use the `admithw` command to programmatically create and distribute the spare chunklets.

```
cli% showsys -param  
System parameters from configured settings  
  
----Parameter----- --Value--  
RawSpaceAlertFC      :          0  
RawSpaceAlertNL      :          0  
RawSpaceAlertSSD     :          0  
RemoteSyslog         :          0  
RemoteSyslogHost     :      0.0.0.0  
SparingAlgorithm     :      Unknown
```

pd Example 6

```
Component --Identifier-- -----Detailed Description-----  
PD Disk:32 ST3400755FC PD for cage type DCS2 in cage position 2:0:0 is missing from the firmware database
```

pd Suggested Action 6

Check the release notes for mandatory updates and patches to the HP 3PAR OS version that is installed and install as needed to support this PD in this cage.

pdch

- Displays chunklets state issues
- Checks LD connection paths, remote chunklets, and remote disks

Format of Possible pdch Exception Messages

```
pdch LD:<ldid> "Connection path is not the same as LD ownership"
pdch ch:<initpdid>:<initpdpos> "Chunklet is on a remote disk"
pdch LD:<ldid> "LD has <count> remote chunklets"
```

pdch Example 1

```
Component -----Summary Description----- Qty
pdch      LDs wwith connection path different than ownership  1

Component -Identifier- -----Detailed Description-----
pdch      ld:tp-0-sd-0.1 Connection path is not the same as LD ownership
```

pdch Suggested Action 1

Use the CLI `showld`, `showpd`, and `shownode` commands. If the ownership issue is not created due to a node missing or failed PD, Contact HP support to request support for moving the LDs to the desired location for your system. See [“Contacting HP Support about System Setup” \(page 73\)](#).

```
cli% showld
Id Name      RAID -Detailed_State- Own SizeMB UsedMB Use Lgct LgId WThru MapV
19 pdsld0.0   1 normal      1/0  256    0 P,F  0 ---  Y   N
20 pdsld0.1   1 normal      1/0 7680    0 P    0 ---  Y   N
21 pdsld0.2   1 normal      1/0  256    0 P    0 ---  Y   N
```

pdch Example 2

```
Component -----Summary Description----- Qty
pdch      LDs with connection path different than ownership  23
pdch      LDs with chunklets on a remote disk                18

Component -Identifier- -----Detailed Description-----
pdch      LD:35      Connection path is not the same as LD ownership
pdch      ld:35      LD has 1 remote chunklet
```

pdch Suggested Action 2

The primary I/O paths for drives are balanced between the two nodes that are physically connected to the drive cage. The node that normally has the primary path to a drive is considered the owning node. If the secondary node's path has to be used for I/O to the drive, that is considered remote I/O.

These messages usually indicate a node-to-cage FC path problem because the drives (chunklets) are being accessed through their secondary path. These are usually a by product of other conditions such as drive-cage/node-port/FC-loop problems; focus on troubleshooting those. If a node is offline

due to a service action, such as hardware or software upgrades, these exceptions can be ignored until that action has finished and the node is online.

In this example, LD 35, with a name of R1.usr.3, is owned (Own) by nodes 3/2/0/1, respectively, and the primary/secondary physical paths to the drives (chunklets) in this LD are from nodes 3 and 2, respectively. However, the FC path (Port B) from node 3 to PD 91 is failed/missing, so node 2 is performing the I/O to PD 91. When the path from node 3 to cage 3 gets fixed (N:S:P 3:0:4 in this example), this condition should disappear.

```
cli% showld
Id Name      RAID -Detailed_State- Own      SizeMB UsedMB Use  Lgct LgId WThru MapV
35 R1.usr.3   1 normal          3/2/0/1    256   256 V    0  ---   N    Y

cli% showldch R1.usr.3
Ldch Row Set PdPos Pdid
Pdch  State Usage Media Sp From  To    0    0    0 2:2:3   63
    0 normal  ld valid N    --- ---    1    0    0 3:8:3   91
    0 normal  ld valid N    --- ---

cli% showpd 91 63

-----Size(MB)----- ----Ports----
Id CagePos Type Speed(K) State      Total    Free A      B
63 2:2:3   FC      10 normal    139520   124416 2:0:3* 3:0:3
91 3:8:3   FC      10 degraded 139520   124416 2:0:4* -----

cli% showpd -s -failed -degraded
Id CagePos Type -State-- -----Detailed_State-----
91 3:8:3   FC    degraded missing_B_port,loop_failure

cli% showcage
Id Name  LoopA Pos.A LoopB Pos.B Drives Temp RevA RevB Model Side
2 cage2 2:0:3  0 3:0:3  0    24 29-42 2.37 2.37 DC2  n/a
3 cage3 2:0:4  0 ----- 0    32 28-40 2.37 2.37 DC2  n/a
```

Normal condition (after fixing):

```
cli% showpd 91 63

-----Size(MB)----- ----Ports----
Id CagePos Type Speed(K) State      Total    Free A      B
63 2:2:3   FC      10 normal    139520   124416 2:0:3* 3:0:3
91 3:8:3   FC      10 normal    139520   124416 2:0:4  3:0:4*
```

port

Checks for the following port connection issues:

- Ports in unacceptable states
- Mismatches in type and mode, such as hosts connected to initiator ports, or host and Remote Copy over Fibre Channel (RCFC) ports configured on the same FC adapter
- Degraded SFPs and those with low power; perform this check only if this FC Adapter type uses SFPs
- Ports listed as hosts in "showhost" that are not ready or not configured as host
- Host ports or systems with too many initiators connected

Format of Possible port Exception Messages

```
Port port:<nsp> "Port mode is in <mode> state"
Port port:<nsp> "is offline"
Port port:<nsp> "Mismatched mode and type"
Port port:<nsp> "Port is <state>"
Port port:<nsp> "SFP is missing"
Port port:<nsp> "SFP is <state>" (degraded or failed)
Port port:<nsp> "SFP is disabled"
Port port:<nsp> "Receiver Power Low: Check FC Cable"
```

```
Port port:<nsp> "Transmit Power Low: Check FC Cable"
Port port:<nsp> "SFP has TX fault"
Port port:<portID> "Port listed as host path but is State:<state>, Mode:<mode> and Type:<type>"
Port port:<portID> "<count> initiators attached exceeds the supported limit of <max port count>"
Port -- "Connected <protocol> host initiators of <count> exceeds the supported limit of <max system count>"
```

port Suggested Actions, General

Some specific examples are displayed below, but in general, use the following CLI commands to check for these conditions:

- For port SFP errors, use commands such as `showport`, `showport -sfp`, and `showport -sfp -ddm`.

port Example 1

```
Component -----Summary Description----- Qty
Port          Degraded or failed SFPs          1

Component -Identifier- --Detailed Description--
Port      port:0:1:1   SFP is Degraded
```

port Suggested Action 1

An SFP in a Node-Port is reporting a degraded condition. This is most often caused by the SFP receiver circuit detecting a low signal level (RX Power Low), and that is usually caused by a poor or contaminated FC connection, such as a cable. An alert should identify the condition, such as the following:

```
Port 0:1:1, SFP Degraded (Receiver Power Low: Check FC Cable)
```

Check SFP statistics using CLI commands such as `showport -sfp`, `showport -sfp -ddm`.

```
cli% showport -sfp 0:1:1
N:S:P -State-- -Manufacturer- MaxSpeed(Gbps) TXDisable TXFault RXLoss DDM
0:1:1 OK      HP-F          8.5 No      No      No      Yes
-----
1
```

In the following example an RX power level of 522 microwatts (uW) for Port 0:1:1 DDM is a good reading; and 12 uW for Port 1:1:1 is a weak reading (< 15 uW). Normal RX power level readings are 300-700 uW.

```
cli% showport -sfp -ddm 0:1:1 1:1:1
-----Port 0:1:1 DDM-----
--Warning-- --Alarm--
--Type-- Units Reading Low High Low High
Temp    C    29      -5  85 -10  90
Voltage mV   3339    3000 3600 2900 3700
TX Bias  mA    8       2   14  1   17
TX Power uW  478     158  562 125  631
RX Power uW  522     15   1000 10  1258

-----Port 1:1:1 DDM-----
--Warning-- --Alarm--
--Type-- Units Reading Low High Low High
Temp    C    33      -5  85 -10  90
Voltage mV   3332    3000 3600 2900 3700
TX Bias  mA    7       2   14  1   17
```

TX Power uW	476	158	562	125	631
RX Power uW	98	15	1000	10	1258

port Example 2

```

Component -Summary Description- Qty
Port      Missing SFPs           1

Component -Identifier- -Detailed Description--
Port      port:0:3:1      SFP is missing

```

port Suggested Action 2

FC node-ports that normally contain SFPs will report an error if the SFP has been removed. The condition can be checked using the `showport -sfp` command. In this example, the SFP in 1:1:1 has been removed from the adapter:

```

cli% showport -sfp
N:S:P -State- -Manufacturer- MaxSpeed(Gbps) TXDisable TXFault RXLoss DDM
0:1:1 OK      HP-F          8.5 No        No      No      Yes
0:1:2 OK      HP-F          8.5 No        No      Yes     Yes
1:1:1 -       -            - -        -       -       -
1:1:2 OK      HP-F          8.5 No        No      Yes     Yes

```

port Example 3

```

cli% checkhealth -detail port
Checking port
Component -Summary Description- Qty
Port      Offline ports           1
-----
1 total                                     1

Component -Identifier- --Detailed Description--
Port      port:0:1:2      is offline
-----
1 total

```

port Suggested Action 3

Check the state of the port with `showport`. If a port is offline, it was deliberately put in that state using the `controlport offline` command. Offline ports might be restored using `controlport rst`.

```

cli% showport
N:S:P      Mode      State ----Node_WWN---- -Port_WWN/HW_Addr- Type Protocol Label Partner FailoverState
...
0:1:1      target      ready 2FF70002AC00006E 20110002AC00006E host FC - 1:1:1 none
0:1:2      target      offline 2FF70002AC00006E 20120002AC00006E free FC - 1:1:2 none
...

```

port Example 4

```

Component -----Summary Description----- Qty
Port      Ports with mismatched mode and type           1

Component -Identifier- -----Detailed Description-----
Port      port:2:0:3      Mismatched mode and type

```

port Suggested Action 4

This output indicates that the port's mode, such as an initiator or target, is not correct for the connection type, such as drive, host, ISCSI, FCoE, or RCFC. Useful CLI commands are `showport`, `showport -c`, `showport -par`, `showport -rcfc`, `showcage`, etc.

```
cli% showport
N:S:P      Mode      State  ----Node_WWN---- -Port_WWN/HW_Addr-  Type
2:0:1 initiator ready  2FF70002AC000591   22010002AC000591   disk
2:0:2 initiator ready  2FF70002AC000591   22020002AC000591   disk
2:0:3 target  ready  2FF70002AC000591   22030002AC000591   disk
2:0:4 target  loss_sync 2FF70002AC000591   22040002AC000591   free
```

```
Component -Identifier- -----Detailed Description-----
Port      port:0:1:1    Mismatched mode and type
```

```
cli% showport
N:S:P      Mode      State  ----Node_WWN---- -Port_WWN/HW_Addr-  Type
0:1:1 initiator ready  2FF70002AC000190   20110002AC000190   rcfc
0:1:2 initiator loss_sync 2FF70002AC000190   20120002AC000190   free
0:1:3 initiator loss_sync 2FF70002AC000190   20130002AC000190   free
0:1:4 initiator loss_sync 2FF70002AC000190   20140002AC000190   free
```

qos

- Displays Quality of Service (QOS) issues
- Checks for Quality of Service rejects over the previous 24 hours

Format of Possible qos Exception Messages

```
QOS <vvsetname> "VVSet has logged <count> rejects in 24 hours"
```

qos Example

```
Component -----Summary Description----- Qty
QoS      VVSets with non-zero reject counts    1

Component -Identifier- -----Detailed Description-----
QoS      vvset6      VVSet has logged 1756.0 rejects in 24 hours
```

qos Suggested Action

Use the CLI `showqos` command to determine if the QOS rules fit the needs of the host and application access. If the QOS rules for this `vvset` need to be adjusted or removed, use the CLI `setqos` command to set new limits, to remove or disable the QOS rules for this `vvset`. If the QOS rules appear correct, use the CLI `statvv` command to determine if there are other VVs that are causing QOS to reject I/O requests for this `vvset`. Either change the QOS rules to match the host/application load or adjust the load to the VVs on this system.

rc

Checks for the following Remote Copy issues.

- Remote Copy targets
- Remote Copy links
- Remote Copy Groups and VVs

- Remote Copy internal structure
- Too many Remote Copy targets configured as sync

Format of Possible rc Exception Messages

```
RC rc:<name> "All links for target <name> are down but target not yet marked failed."
RC rc:<name> "Target <name> has failed."
RC rc:<name> "Link <name> of target <target> is down."
RC rc:<name> "Group <name> is not started to target <target>."
RC rc:<vvname> "VV <vvname> of group <name> is stale on target <target>."
RC rc:<vvname> "VV <vvname> of group <name> is not synced on target <target>."
RC Structure "Remote Copy internal structure is incompatible."
RC rc: "Target" "More than 8 sync targets have been setup."
```

rc Example

```
Component --Detailed Description-- Qty
RC      Stale volumes                1

Component --Identifier--- -----Detailed Description-----
RC      rc:yush_tpvv.rc VV yush_tpvv.rc of group yush_group.r1127
                                is stale on target S400_Async_Primary.
```

rc Suggested Action

Perform remote copy troubleshooting such as checking the physical links between the storage system, and using CLI commands such as `showrcopy`, `showrcopy -d`, `showport -rcip`, `showport -rcfc`, `shownet -d`, `controlport rcip ping`, etc.

snmp

Displays issues with SNMP. Attempts the `showsnmpmgr` command and reports errors if the CLI returns an error.

Format of Possible snmp Exception Messages

```
SNMP -- <err>
```

snmp Example

```
Component -Identifier- -----Detailed Description-----
SNMP      --          Could not obtain snmp agent handle. Could be
                                misconfigured.
```

snmp Suggested Action

Any error message that can be produced by `showsnmpmgr` might be displayed.

sp

Checks the status of the Ethernet connection between the Service Processor (SP) and nodes. This can only be run from the SP because it performs a short Ethernet transfer check between the SP and the storage system.

Format of Possible `sp` Exception Messages

```
Network SP->InServ "SP ethernet Stat <stat> has increased too quickly check SP network settings"
```

`sp` Example

```
Component -Identifier- -----Detailed Description-----
SP         ethernet      "State rx_errs has increased too quickly check SP network
                        settings"
```

`sp` Suggested Action

The `<stat>` variable can be any of the following: `rx_errs`, `rx_dropped`, `rx_fifo`, `rx_frame`, `tx_errs`, `tx_dropped`, `tx_fifo`.

This message is usually caused by customer network issues, but might be caused by conflicting or mismatching network settings between the SP, customer switch(es), and the storage system. Check the SP network interface settings using `SPMAINT` or `SPOCC`. Check the storage system settings using commands such as `shownet` and `shownet -d`.

`task`

Displays failed tasks. Checks for any tasks that have failed within the past 24 hours. This is the default time frame for the `showtask -failed all` command.

Format of Possible `task` Exception Messages

```
Task Task:<Taskid> "Failed Task"
```

`task` Example

```
Component --Identifier--- -----Detailed Description-----
Task      Task:6313        Failed Task
```

In this example, `checkhealth` also showed an Alert. The task failed, because the command was entered with a syntax error:

```
Component -Identifier- -----Detailed Description-----
Alert     sw_task:6313      Task 6313 (type 'background_command', name 'upgradecage -a -f') has failed (Task Failed). Please
                        see task status for details.
```

`task` Suggested Action

The CLI command `showtask -d Task_id` will display detailed information about the task. To clean up the Alerts and the Alert-reporting of `checkhealth`, you can delete the failed-task alerts if they are of no further use. They will not be auto-resolved and they will remain until they are manually removed with the SSMC (GUI) or CLI with `removealert` or `setalert ack`. To display system-initiated tasks, use `showtask -all`.

```
cli% showtask -d 6313
  Id Type                Name                Status Phase Step
6313 background_command upgradecage -a -f failed  ---  ---
```

Detailed status is as follows:

```
2010-10-22 10:35:36 PDT Created      task.
2010-10-22 10:35:36 PDT Updated      Executing "upgradecage -a -f" as 0:12109
2010-10-22 10:35:36 PDT Errored      upgradecage: Invalid option: -f
```

vlun

- Displays inactive Virtual LUNs (VLUNs) and those which have not been reported by the host agent
- Reports VLUNs that have been configured but are not currently being exported to hosts or host-ports
- Displays when too many VLUNs have been created

Format of Possible vlun Exception Messages

```
vlun vlun:<vvID>, <lunID>, <hostname>)"Path to <wwn> is not is not seen by host" vlun
vlun:<vvID>, <lunID>, <hostname>) "Path to <wwn> is failed"
vlun host:<hostname> "Host <ident>(<type>):<connection> is not connected to a port"
vlun -- "<count> active VLUNs exceeds the supported limit of <max count>"
```

vlun Example

```
Component -----Summary Description----- Qty
vlun          Hosts not connected to a port          1

Component -----Identifier----- -----Detailed Description-----
vlun          host:cs-wintec-test1 Host wwn:10000000C964121D is not connected to a port
```

vlun Suggested Action

Check the export status and port status for the VLUN and HOST with CLI commands such as showvlun, showvlun -pathsum, showhost, showhost pathsum, showport, servicehost list, etc. For example:

```
cli% showvlun -host cs-wintec-test1
Active VLUNs
Lun VVName HostName          -Host_WWN/iSCSI_Name-  Port Type
  2 BigVV  cs-wintec-test1 10000000C964121C      2:5:1 host
-----
  1 total

VLUN Templates
Lun VVName HostName          -Host_WWN/iSCSI_Name-  Port Type
  2 BigVV  cs-wintec-test1 -----  --- host

cli% showhost cs-wintec-test1
Id Name          Persona -WWN/iSCSI_Name-  Port
  0 cs-wintec-test1 Generic 10000000C964121D ---
                               10000000C964121C 2:5:1

cli% servicehost list
HostName -WWN/iSCSI_Name-  Port
host0    10000000C98EC67A 1:1:2
host1    210100E08B289350 0:5:2

Lun VVName          HostName          -Host_WWN/iSCSI_Name-  Port      Type
  2 BigVV           cs-wintec-test1 10000000C964121D      3:5:1 unknown
```

VV

Displays Virtual Volumes (VV) that are not optimal. Checks for VVs and Common Provisioning Groups (CPG) whose State is not normal.

Format of Possible vv Exception Messages

```
VV vv:<vvname>      "IO to this volume will fail due to no_stale_ss policy"
VV vv:<vvname>      "Volume has reached snapshot space allocation limit"
VV vv:<vvname>      "Volume has reached user space allocation limit"
VV vv:<vvname>      "VV has expired"
VV vv:<vvname>      "Detailed State: <state>" (failed or degraded)
VV cpg:<cpg>         "CPG is unable to grow SA (or SD) space"
VV cpg:<cpgname>     "CPG growth increment is below threshold"
```

vv Suggested Action

Check status with CLI commands such as `showvv`, `showvv -d`, `showvv -cpg`.

Troubleshooting Storage System Setup

If you are unable to access the SP setup wizard, SP, or the Storage System Setup wizard:

1. Collect the SmartStart log files. See ["Collecting SmartStart Log Files" \(page 72\)](#).
2. Collect the SP log files. See ["Collecting Service Processor Log Files" \(page 72\)](#).
3. Contact HP support and request support for your HP 3PAR StoreServ 7000 or 7000c Storage system. See ["Contacting HP Support about System Setup" \(page 73\)](#).

Storage System Setup Wizard Errors

This section describes possible error messages that may display while using the Storage System Setup Wizard.

Common error strings that appear in multiple places

- The specified system is currently in the storage system initialization process. Only one initialization process can run at one time.

This message displays when the wizards of two users try to initialize the same storage system on the same SP. Only one wizard can initialize a storage system.

Two options are available when this error displays in a dialog box; you can click **Retry** or **Cancel**. When the error does not display in a dialog box, look for another SP by serial number or wait a while and try again later.

- Could not communicate with the server. Make sure you are currently connected to the network.

This message displays when the client computer that is running the wizard cannot communicate with the SP, such as when network connectivity is lost.

The error can occur for one of the following reasons:

- Network connectivity is lost.
- The SP is no longer running.

- The SP is not plugged into the network.
- The SP IP address has been changed.
- Could not communicate with the storage system. Make sure it is running and connected to the network.
This message can display if the HP 3PAR OS loses network connectivity, either by becoming unplugged or by going down for some other reason.
This message displays either in a dialog box or inline. If the message displays in a dialog box, you can click **Retry** or **Cancel** in the wizard. If the message appears inline, you can only click **Next** in the wizard.
- Setup encountered an unknown error ({0}). Contact HP support for help.
This message displays in a dialog box with **Retry** and **Cancel** buttons, where {0} is the error number.
For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

Errors that appear on the Enter System to Setup page

- Unable to execute the command. All required data was not sent to the SP server. Contact HP support for help.
This message displays as an inline error on the bottom of the wizard page.
For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).
- No uninitialized storage system with the specified serial number could be found. Make sure the SP is on the same network as the specified storage system.
This message displays as an inline error on the bottom of the wizard page. In order for the Storage System Setup Wizard to work, the storage system must be on the same network as the SP, and you must type in the serial number of the storage system in order for the SP to find it. If either of these conditions is not met, this error message displays.
Verify that the serial number you entered for the SP is correct, and then do one of the following:
 - Move the SP or storage system so that they are on the same network.
 - Use a different SP to set up the storage system.
- Unable to gather the storage system information. Make sure the specified storage system is running HP 3PAR OS 3.1.2 or later. For more help, contact HP support.
This message displays as an inline error on the bottom of the wizard page. The error might be caused by a defect in the Storage System Setup Wizard code or by unexpected information being returned in the CLI.
For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).
- The SP encountered an unknown error while finding the specified storage system. Contact HP support for help.
This message displays as an inline error on the bottom of the wizard page.
For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

- The SP does not have a suitable HP 3PAR OS version installed for the specified storage system. Use SPOCC to install HP 3PAR OS version {0}.

This message displays as an inline error on the bottom of the wizard page. The SP needs to have the same Major.Minor.Patch TPD package as the storage system's HP 3PAR OS. If the package is not the same, then the SP cannot communicate with the HP 3PAR OS.

{0} will be the version of the TPD package that the user must install so that the SP will work with the storage system.

- The SP does not have an HP 3PAR OS version installed. Use SPOCC to install an HP 3PAR OS package.

This message displays as an inline error on the bottom of the wizard page when no TPD package is installed. The SP needs a TPD package installed in order to communicate with an HP 3PAR StoreServ Storage system.

Error strings specific to the prepare storage system progress step

The following errors occur during the Progress and Results page:

- The storage system has not yet discovered all the drive types. Make sure there are no cage problems.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. It occurs when the HP 3PAR StoreServ Storage is unable to determine all the drive types that are connected to the cage. Wait for about 5 minutes for drive discovery to complete. If the error persists, contact HP Support.

For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

- The storage system has not yet discovered all the drive positions. Make sure there are no cage problems.

Wait for about 5 minutes for drive position discovery to complete. If the error persists, contact HP Support.

For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

Error strings specific to the check hardware health progress step

- The storage system found an error while checking node health. Details are listed below. {0} appears to be offline. Make sure the node is plugged in all the way and powered on.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. {0} is the name of the node that appears to be offline. Turn the storage system on and make sure the node is plugged into the backplane.

- The storage system found an error while checking node health. Details are listed below.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. {0} is the port location with the problem. Make sure the port is plugged into the node.

- The storage system found an error while checking port health. Details are listed below. Port {0} appears to be offline.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. Information listed below the message is the CLI output for the `checkhwconfig` command, which occurs when the SP does not recognize the command, allowing you to see the output.

For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

- The storage system found an error while checking port health. Details are listed below.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. {0} is the location of the port with the problem.

- The storage system found an error while checking cabling health. Details are listed below.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. The message is followed by a list of errors. The errors may include:

- Cage {0} is connected to the same node twice through ports {1} and {2}. Re-cable this cage.

This error displays if a cage is connected to the same node twice. {0} will be the name of the cage and {1} and {2} will be the port locations where the cage is connected. Re-cable the cage using best practices.

- Cage {0} appears to be missing a connection to a node. It does have a connection on port {1}. Connect the loop pair.

This message displays if a cage is connected to only one node. {0} will be the name of the cage, and {1} will be the single port to which the cage is connected. Re-cable the cage using best practices.

- Cage {0} is not connected to the same slot and port on the nodes it is connected to. Re-cable this cage.

This message displays if a cage is connected to different slots, ports, and nodes. {0} will be the name of the cage with the problem. Re-cable the cage using best practices.

- The storage system found an error while checking cabling health. Details are listed below.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. Information listed below the message is the CLI output for the `checkhwconfig` command, which occurs when the SP does not recognize the command, allowing you to see the output.

For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

- The storage system found an error while checking cage health. The firmware upgrade succeeded, but cage {0} has not come back. Contact HP support for help.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. This error might occur after the drive cages have had a firmware upgrade. {0} will be the name of the cage with the problem. Although the firmware upgrade may have succeeded, this error might occur if the cage does not boot back up. Contact HP Support.

For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

- The storage system found an error while checking cage health. Details are listed below.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. Information listed below the message is the CLI output for the `checkhwconfig` command, which occurs when the SP does not recognize the command, allowing you to see the output.

For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

- The storage system found an error while checking cage health. There is a problem with a drive cage that has had a firmware upgrade. Cage {0} did not come back after the firmware upgrade. Contact HP support for help.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. This error might occur after the drive cages have had a firmware upgrade. {0} will be the name of the cage with the problem. Contact HP Support.

For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

- The storage system found an error while checking disk health. Details are listed below.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. Information listed below the message is the CLI output for the `checkhwconfig` command, which occurs when the SP does not recognize the command, allowing you to see the output.

For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

Error Strings specific to network progress step

- Unable to set the storage system network configuration. The storage system's admin volume has not been created. This must be created before any networking information is set. Contact HP support for help.

This message displays in a dialog box with **Retry** and **Cancel** buttons. This error occurs if a previous command failed and the wizard did not detect the error, or if the system is rebooted for any reason during the installation. Click **Cancel** to close the wizard, and then begin the setup process again.

For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

- Unable to set the storage system network configuration. An invalid name was specified. A storage system name must start with an alphanumeric character followed by any combination of the following characters: a-z, A-Z, 0-9, period (.), hyphen (-), or underscore (_).

This message displays in a dialog box with **Retry** and **Cancel** buttons. A storage system name must contain at least 6 characters, must begin with an alphanumeric character, and must include at least one of each of the following characters: lowercase letters (a-z); uppercase letters (A-Z); numbers (0-9); and a period (.), a hyphen (-), or an underscore (_).

Click **Cancel** to close the wizard, and then begin the setup process again.

- Unable to set the storage system network configuration. An invalid IPv4 address was specified.

This message displays in a dialog box. The error occurs if the storage system detects that the defined storage system name is invalid.

Click **Back** and specify a valid IPv4 address.

- Unable to set the storage system network configuration. An invalid subnet was specified.

This message displays in a dialog box. The error occurs if the storage system detects that the defined subnet address is invalid.

Click **Back** and specify a valid subnet address.
- Unable to set the storage system network configuration. An invalid IPv4 gateway was specified.

This message displays in a dialog box. The error occurs if the storage system detects that the defined IPv4 gateway address is invalid.

Click **Back** and specify a valid IPv4 gateway address.
- Unable to set the storage system network configuration. The specified IPv4 gateway address is not reachable by using the specified storage system IPv4 address.

This message displays in a dialog box. The error occurs if the storage system detects that the defined IPv4 gateway address could not be reached.

Click **Back** and specify a valid IPv4 gateway address. If the error persists, contact HP Support. For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).
- Unable to set the storage system network configuration. The storage system IPv4 address cannot be the same as the IPv4 gateway.

This message displays in a dialog box. The error occurs if the storage system detects that the defined IPv4 gateway address is the same as the configured IPv4 address.

Click **Back** and specify a different address for the IPv4 gateway address.
- Unable to set the storage system network configuration. The specified address is already in use by another machine.

This message displays in a dialog box. The error occurs if the storage system detects that the defined IPv4 address is already in use by another machine.

Click **Back** and specify a different IPv4 address.
- Unable to set the storage system network configuration. The storage system could not be reached at the new IP address. Make sure your network settings are configured correctly.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. This error displays when the SP is unable to reach the storage system at the new IP address.

Click **Cancel** to close the wizard, and then begin the setup process again.
- Unable to set the storage system network configuration. The storage system did not recognize its new IP address as being validated.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. This error displays when the SP reaches the storage system at the new IP but fails to recognize that the SP was able to do this.

Click **Back** and specify a valid IP address. If the error persists, contact HP Support. For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

Errors strings for the time setup progress step

- Unable to set the storage system NTP server. An invalid address was specified.

This error message displays in a dialog box. This error displays if the storage system detects that the NTP address is invalid.

Click **Cancel** to close the wizard, and then begin the setup process again.

- Unable to set the storage system NTP server. The storage system's admin volume has not been created. This must be created before any networking information is created. Contact HP support for help.

This error message displays in a dialog box with **Retry** and **Cancel** buttons. This error occurs if a previous command failed and the wizard did not detect the error, or if the system was rebooted for any reason during installation.

Click **Cancel** to close the wizard, and then begin the setup process again.

For information about contacting HP Support, see [“Contacting HP Support about System Setup” \(page 73\)](#).

- Unable to set the storage system time zone. An invalid time zone was specified.

This error message displays in a dialog box. This error occurs if the storage system detects that an unfamiliar time zone was selected.

Click **Back** and specify a valid time zone.

- Unable to set the storage system time zone. The storage system saw the time zone as invalid.

This error message displays in a dialog box. This error occurs if the storage system detects that an unfamiliar time zone was selected.

Click **Back** and specify a valid time zone.

- Unable to set the storage system time. An invalid time was specified.

This error message displays in a dialog box. This error occurs if the storage system detects that an unfamiliar time zone was selected.

Click **Back** and specify a valid time zone.

- Unable to set the storage system time. The storage system saw the time as invalid.

This error message displays in a dialog box. This error occurs if the storage system detects that an invalid time zone was selected.

Click **Back** and specify a valid time zone.

Collecting SmartStart Log Files

To collect the SmartStart log files for HP support, zip all the files in this folder: C:\Users\
<username>\SmartStart\log.

NOTE: You can continue to access the SmartStart log files in the `Users` folder after you have removed SmartStart from your system.

Collecting Service Processor Log Files

To collect the SP log files for HP support:

1. Connect to SPOCC.
2. Type the SP IP address in a browser.

3. From the navigation pane, click **Files**.
4. Click the folder icons for **files > syslog > apilogs**.
5. In the **Action** column, click **Download** for each log file:

SPSETLOG.log	Service Processor setup log
ARSETLOG.system_serial_number.log	Storage System setup log
errorLog.log	General errors

6. Zip the downloaded log files.

Contacting HP Support about System Setup

For worldwide technical support information, see the HP support website:

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

Before contacting HP about accessing the SP Setup wizard or the Storage System Setup Wizard, collect the following information:

- SmartStart log files
- SP log files
- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

When contacting HP, specify that you are requesting support for your HP 3PAR StoreServ 7000 or 7000c Storage system.

6 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 7000 Storage	StoreServ 7000 Storage
HP 3PAR StoreServ 8000 Storage	StoreServ 8000 Storage
HP 3PAR StoreServ 10000 Storage	3PAR or 3PAR Storage
HP 3PAR StoreServ 20000 Storage	StoreServ 20000 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: SPOCK (http://www.hp.com/storage/spock)
Locating HP 3PAR documents	The HP Storage Information Library: Storage Information Library (http://www.hp.com/go/storage/docs/) By default, HP 3PAR Storage is selected under Products and Solutions .
Customer Self Repair procedures (media)	The HP Customer Self Repair Services Media Library: Customer Self Repair Services Media Library (http://h20464.www2.hp.com/index.html) Under Product category , select Storage . Under Product family , select 3PAR StoreServ Storage for HP 3PAR StoreServ 7000, 8000, 10000, and 20000 Storage systems.
All HP products	HP Support Center: HP Support Center (http://h20564.www2.hp.com/portal/site/hpsc)

Typographic conventions

Table 22 Document conventions

Convention	Element
Bold text	• Keys that you press • Text you typed into a GUI element, such as a text box • GUI elements that you click or select, such as menu items, buttons, and so on
Monospace text	• File and directory names • System output • Code • Commands, their arguments, and argument values
<Monospace text in angle brackets>	• Code variables • Command variables
Bold monospace text	• Commands you enter into a command line interface • System output emphasized for scannability

 **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.

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). Include the document title and part number, version number, or the URL when submitting your feedback.