Hewlett Packard Enterprise

HPE 3PAR OS 3.2.2 GA/EGA/MU1/MU2 Release Notes

This document describes the features and issues included in HPE 3PAR OS 3.2.2 GA/EGA/MU1/MU2 and is intended for use by Hewlett Packard Enterprise customers, partners, and field representatives.

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Online Upgrade Considerations

This feature allows upgrade of the OS concurrently with I/O activity on the attached hosts, provided certain conditions are met. For more information regarding the required order for upgrade and installation of software components, see the *HPE 3PAR OS 3.2.2 Upgrade Instructions*. For further information and pre-planning of online upgrades, refer to the latest version of the *HPE 3PAR OS Upgrade Pre-Planning Guide*. To obtain a copy of this documentation, go to www.hpe.com/info/enterprise/docs.

Supported Platforms

3PAR OS release supports 3PAR StoreServ Storage. For details, see the Single Point of Connectivity Knowledge (SPOCK) website at www.hpe.com/storage/spock.

End of Support Features

- None

Components

Component	Version
OS	3.2.2.290
CLI Client	3.2.2.290
SNMP Agent	1.8.0
File Persona	1.1.1.1-20150828
Drive Cage Firmware:	
DC4 Firmware	2.64
MCU Firmware (OKI)	4.8.28
MCU Firmware (STM)	5.2.49
DCN1 / DCN2 / DCS1 / DCS2 /DCS7 / DCS8 Firmware	403d
DCS5 / DCS 6 Firmware	1.90
HBA Firmware:	
QLogic QLA4052C HBA Firmware	03.00.01.77
QLogic QLE8242 CNA Firmware	04.15.05
QLogic 8300 HBA FC Firmware	08.01.05
QLogic 8300 HBA FCoE Firmware	08.01.05
QLogic 8300 HBA iSCSI Firmware	05.07.06
Emulex LP11002 HBA Firmware	02.82.x10
Emulex LPe12002 HBA Firmware	02.03.x02
Emulex LPe12004 HBA Firmware	02.03.x02
Emulex LPe16002 HBA Firmware	10.4.395.0
Emulex LPe16004 HBA Firmware	10.4.395.0

Component	Version
3PAR FC044X HBA Firmware	200A8
LSI 9201-16e HBA Firmware	17.11.00
LSI 9205-8e HBA Firmware	17.11.00
LSI 9300-8e HBA Firmware	07.00.00

Drive Firmware Details

Type	Capacity	3PAR Drive Model	Speed	Form Factor	3PAR StoreServ Model Supported				Encryption	Firmware
					10000	7000	8000	20000		
FC	300G	HVIPC0300GBFC15K	15K	3.5"	√					3P04
FC	300G	SEGLE0300GBFC15K	15K	3.5"	√					3P01
FC	600G	HVIPC0600GBFC15K	15K	3.5"	√					3P04
FC	600G	SEGLE0600GBFC15K	15K	3.5"	√					3P01
SATA	1000G	SMSKP0001TBAT07K	7.2K	3.5"	√					3P01
SATA	2000G	HMRSK0002TBAT07K	7.2K	3.5"	√					3P01
SATA	2000G	HUA722020ALA330	7.2K	3.5"	√					A3GG
SAS	1000G	SAVN1000S5xeN7.2	7.2K	2.5"		√				3P01
SAS	1000G	SAWK1000S5xnE7.2	7.2K	2.5"		√			SED	3P00
SAS	1000G	SAWK1000S5xnN7.2	7.2K	2.5"		√				3P00
SAS	2000G	HMRP2000S5xnN7.2	7.2K	3.5"	√	√				3P00
SAS	2000G	HMRSK2000GBAS07K	7.2K	3.5"	√	√				3P02
SAS	2000G	SAVN2000S5xeN7.2	7.2K	2.5"		√	√	√		3P01
SAS	2000G	SMEG2000S5xnF7.2	7.2K	3.5"	√	√			FIPS	3P00
SAS	2000G	SMEG2000S5xnN7.2	7.2K	3.5"	√	√				3P01
SAS	2000G	SMKR2000S5xeN7.2	7.2K	3.5"	√	√	√	√		3P01
SAS	3000G	HMRP3000S5xnN7.2	7.2K	3.5"		√				3P00
SAS	3000G	HMRSK3000GBAS07K	7.2K	3.5"		√				3P02
SAS	3000G	SMEG3000S5xnN7.2	7.2K	3.5"		√				3P01
SAS	4000G	HMRP4000S5xnN7.2	7.2K	3.5"	√	√				3P00
SAS	4000G	SMEG4000S5xnF7.2	7.2K	3.5"	√	√			FIPS	3P00
SAS	4000G	SMEG4000S5xnN7.2	7.2K	3.5"	√	√				3P01
SAS	4000G	SMKR4000S5xeN7.2	7.2K	3.5"	√	√	√	√		3P01
SAS	6000G	SMKR6000S5xeF7.2	7.2K	3.5"		√	√	√	FIPS	3P02
SAS	6000G	SMKR6000S5xeN7.2	7.2K	3.5"	√	√	√	√		3P01
SAS	300G	HKCF0300S5xeN015	15K	2.5"	√	√	√	√		3P02
SAS	300G	SYJKT0300GBAS15K	15K	2.5"	√	√				3P01

Type	Capacity	3PAR Drive Model	Speed	Form Factor	3PAR StoreServ Model Supported				Encryption	Firmware
					10000	7000	8000	20000		
SAS	450G	HCBRE0450GBAS10K	10K	2.5"	√	√				3P02
SAS	450G	SLTN0450S5xnE010	10K	2.5"	√	√			SED	3P00
SAS	450G	SLTN0450S5xnF010	10K	2.5"	√	√			FIPS	3P00
SAS	450G	SLTN0450S5xnN010	10K	2.5"	√	√				3P01
SAS	600G	HCBF0600S5xeN010	10K	2.5"	√		√	√		3P02
SAS	600G	HKCF0600S5xeF015	15K	2.5"	√	√	√	√	FIPS	3P02
SAS	600G	HKCF0600S5xeN015	15K	2.5"	√	√	√	√		3P02
SAS	600G	SLTN0600S5xnN010	10K	2.5"		√				3P01
SAS	900G	HCBRE0900GBAS10K	10K	2.5"	√	√				3P02
SAS	900G	SLTN0900S5xnE010	10K	2.5"	√	√			SED	3P00
SAS	900G	SLTN0900S5xnF010	10K	2.5"	√	√			FIPS	3P00
SAS	900G	SLTN0900S5xnN010	10K	2.5"	√	√				3P01
SAS	1200G	HCBF1200S5xeF010	10K	2.5"		√	√	√	FIPS	3P02
SAS	1200G	HCBF1200S5xeN010	10K	2.5"	√	√	√	√		3P02
SAS	1200G	HCEP1200S5xnN010	10K	2.5"	√	√				3P00
SAS	1800G	HCBF1800S5xeN010	10K	2.5"	√	√	√	√		3P02
SSD	100G	HRALP0100GBASSLC	150K	3.5"		√				3P00
SSD	100G	HRALP0100GBASSLC	150K	2.5"		√				3P00
SSD	100G	HRALP0100GBFCSSD	150K	2.5"	√					3P05
SSD	200G	HRALP0200GBASSLC	150K	3.5"		√				3P00
SSD	200G	HRALP0200GBASSLC	150K	2.5"		√				3P00
SSD	200G	HRALP0200GBFCSSD	150K	2.5"	√					3P05
SSD	400G	HRLP0400S5xnEMLC	150K	2.5"	√	√			SED	3P01
SSD	400G	HRLP0400S5xnNMLC	150K	3.5"		√				3P02
SSD	400G	HRLP0400S5xnNMLC	150K	2.5"	√	√				3P02
SSD	480G	DOPA0480S5xnNMRI	150K	3.5"		√				3P03
SSD	480G	DOPA0480S5xnNMRI	150K	2.5"		√				3P03
SSD	480G	DOPE0480S5xnNMRI	100K	3.5"		√	√	√		3P04
SSD	480G	DOPE0480S5xnNMRI	100K	2.5"		√	√	√		3P04
SSD	480G	HSCP0480S5xnNMRI	150K	3.5"		√				3P02
SSD	480G	HSCP0480S5xnNMRI	150K	2.5"	√	√	√	√		3P02
SSD	480G	HSSC0480S5xnNMRI	150K	3.5"		√				3P02
SSD	480G	HSSC0480S5xnNMRI	150K	2.5"	√	√				3P02
SSD	920G	DOPA0920S5xnNMRI	150K	3.5"		√				3P03

Type	Capacity	3PAR Drive Model	Speed	Form Factor	3PAR StoreServ Model Supported				Encryption	Firmware
					10000	7000	8000	20000		
SSD	920G	DOPA0920S5xnNMRI	150K	2.5"		√				3P03
SSD	920G	HSCP0920S5xnFMRI	150K	2.5"	√	√	√	√	FIPS	3P02
SSD	920G	HSCP0920S5xnNMRI	150K	3.5"		√				3P02
SSD	920G	HSCP0920S5xnNMRI	150K	2.5"	√	√				3P02
SSD	920G	HSSC0920S5xnFMRI	150K	2.5"	√	√			FIPS	3P03
SSD	920G	HSSC0920S5xnNMRI	150K	3.5"		√				3P02
SSD	920G	HSSC0920S5xnNMRI	150K	2.5"	√	√				3P02
SSD	1920G	DOPE1920S5xnNMRI	100K	3.5"		√				3P04
SSD	1920G	DOPE1920S5xnNMRI	100K	2.5"		√	√	√		3P04
SSD	1920G	HSCP1920S5xnFMRI	100K	2.5"	√	√	√	√	FIPS	3P02
SSD	1920G	HSCP1920S5xnNMRI	100K	2.5"	√					3P02
SSD	3840G	DOPM3840S5xnNMRI	100K	2.5"		√	√	√		3P03

What's New in the OS

The new features available in 3PAR OS 3.2.2 address improved service levels and data protection with new support for end-to-end data integrity, availability and protection optimized for flash. 3PAR OS 3.2.2 also addresses the need for quick response with an elastic four-way resource pool that provides simple federated workload balancing.

3PAR OS 3.2.2 includes new and enhanced features in the following areas:

- Support for 3PAR StoreServ 20000 Storage Systems

- Support for 3PAR StoreServ 8000 Storage Systems

- 3PAR StoreServ Management Console 2.2

- Support for Higher Scalability

- Persistent Checksum on 3PAR StoreServ 20000

- Remote Copy Asynchronous Streaming

- Peer Persistence for RHEL

- HPE StoreOnce Recovery Manager Central

- 3PAR File Persona

- Peer Motion Software

- Online Import Software

- Priority Optimization Software

- Adaptive Flash Cache

- iSCSI enhancements

- VMware VVOLs

- Autonomic Rebalance enhancements

- On-node System Reporter changes

- Adaptive Optimization new options
- LDAP improvements
- Smart SAN support

Hardware enablement

3PAR StoreServ 20000 series

The 3PAR StoreServ 20000 Storage family offers enterprise flash arrays ready for massive consolidation of most demanding workloads with greater than 3 million IOPS, sub-millisecond latencies, a 4X density advantage, and scalability to 15 PB of usable capacity. The flash-first architecture features the 3PAR Gen5 Thin Express ASIC for silicon-based hardware acceleration of thin technologies, including inline deduplication to reduce acquisition and operational costs by up to 75% without compromising performance. A choice of models provide a range of options that support true convergence of block and file protocols, all-flash array performance, and the use of SSDs (Solid State Drives) with spinning media for unmatched versatility. Enhanced Tier-1 storage capabilities for always-on data access and fine-grained QoS (Quality of Service) controls ensure predictable service levels for all workload types. Bidirectional data mobility enables virtually limitless elastic pools of storage to support the most rigorous on-demand infrastructure.

3PAR StoreServ 8000 series

3PAR StoreServ 8000 Storage offers enterprise Tier-1 storage at a midrange price. 3PAR StoreServ 8000 Storage delivers the performance advantages of a purpose-built, flash-optimized architecture without compromising resiliency, efficiency, or data mobility. The new 3PAR Gen5 Thin Express ASIC provides silicon-based hardware acceleration of thin technologies, including inline deduplication, to reduce acquisition and operational costs by up to 75% without compromising performance. With unmatched versatility, performance, and density, 3PAR StoreServ 8000 Storage gives you a range of options that support true convergence of block and file protocols, all-flash array performance, and the use of spinning media to further optimize costs. 3PAR StoreServ 8000 Storage offers rich, Tier-1 data services, quad-node resiliency, seamless data mobility between systems, high availability through a complete set of persistent technologies, and simple and efficient data protection with a flat backup to StoreOnce Backup appliances. 3PAR StoreServ 8000 series provides four models to choose from: 8200, 8400, 8440, and 8450. You can start with the entry level model and upgrade easily when required.

Software innovations

3PAR StorServ Management Console 2.2

3PAR SSMC (StoreServ Management Console) is a new management and reporting console that offers converged management of both File and Block on 3PAR StoreServ systems. 3PAR System Reporter is fully integrated in SSMC and offers reporting templates, scheduled reports, and threshold alerts.

Support for higher scalability

3PAR OS 3.2.2 enables higher scalability in terms of maximum numbers of volumes, snapshots and initiators. To know more, see 3PAR support matrix available on the SPOCK website www.hpe.com/storage/spock

Persistent Checksum on 3PAR StoreServ 20000

3PAR Persistent Checksum powered by 3PAR Gen5 ASIC ensures end-to-end Data Integrity via T-10 DIF (Data Integrity Field) enabled via integration with host HBAs and Hewlett Packard Enterprise drivers. This software provides data checks from the host to 3PAR StoreServ back-end media drives. It eliminates media and transmission errors caused by any component in the I/O

stack and provides end to end protection for all data stored on 3PAR StoreServ Storage systems via a completely agentless and application agnostic solution.

NOTE: This feature is available only on 3PAR GEN5 ASIC platforms. For a complete list of supported hosts and HBAs, see the SPOCK website www.hpe.com/storage/spock

3PAR Remote Copy

3PAR Remote Copy Synchronous mode supports extended round trip latency of up to 5 ms using either RCFC, FCIP or RCIP transports.

3PAR Peer Persistence

3PAR Peer Persistence extends the support for Linux Red Hat Enterprise and provides Oracle RAC support on RHEL and Windows Server. For more details, see the SPOCK website www.hpe.com/storage/spock

StoreOnce Recovery Manager Central 1.1

StoreOnce RMC (Recovery Manager Central) 1.1 integrates 3PAR StoreServ with StoreOnce Backup systems to provide a converged availability and flat backup service for 3PAR or VMware environments that augment traditional backup approaches. Combining the performance of snapshots with the protection of backups, StoreOnce RMC for VMware enables fast, efficient, reliable, and simple one click protection for VMDKs (VMware virtual machine disks) and data stores. Rapid online recovery allows VMware administrators to create hundreds of non-disruptive, application consistent VM (Virtual Machine) snapshots (local or remote or both) and initiate rapid online recovery. This solution provides a 17x faster backup and 5x faster restore of snapshot data with flat backup with RMC's Express Protect feature. This feature enables the flat backup of VM snapshot data from 3PAR to StoreOnce, independent of backup server software.

3PAR File Persona

3PAR File Persona is a licensed feature that enables a rich set of file protocols, file data services, and an Object Access (REST) API. It extends the spectrum of primary storage workloads natively addressed by 3PAR StoreServ Storage systems to include home directories and user shares; content management and collaboration; data preservation and governance; and custom cloud applications. 3PAR OS 3.2.2 doubles the aggregate usable file capacity supported per node pair from 64 TB to 128 TB. Network connectivity is increased to 12 x 10GbE ports per node pair on 3PAR StoreServ 20000 series systems. The on-board RCIP port can be used for file access on all File Persona supported 3PAR StoreServ systems. File storage efficiency is improved with support for Thin Deduplication. Trend Micro ServerProtect for Storage is supported for virus scanning.

Peer Motion Software

Peer Motion Software brings multi-array bidirectional peer motion capabilities across multiple systems. This solution allows customers to optimize the costs by setting up an elastic pool of capacity across any 3PAR StoreServ system—mapping their workload to the right resources and choosing between a midrange, an all flash, or enterprise flash storage system—as the requirements for that workload can change over time. It also provides features such as concurrent migrations, prioritization of migration tasks, and data mobility from multiple sources running legacy 3PAR OS releases to a single destination 3PAR StoreServ system.

Online Import software

Online Import software allows customers to move data from legacy non-3PAR storage to 3PAR StoreServ systems with minimal or no disruption. 3PAR Online Import software provides an easy

way to modernize EVA, EMC VMAX, EMC VNX, VNX2, CLARiiON CX4, and HDS storage infrastructure with a simple migration process. The following HDS platforms are supported:

- HDS TagmaStore NSC
- HDS TagmaStore USP
- HDS USP V
- HDS USP VM
- HDS VSP

3PAR Online Import allows data mobility from multiple source systems to a single destination system in a single configuration. Users can migrate a subset of a volume exported to the host, if they do not wish to migrate the entire host in one go. Migration tasks can be prioritized, and migration of the volumes with the critical data can be assigned a higher priority.

Priority Optimization software

Priority Optimization software enables customer to set latencies goals down to 500 microseconds on all-flash configurations.

Adaptive Flash Cache

Adaptive Flash Cache will now use RAID 0 as a default layout on 3PAR StoreServ 7000, 8000 and 20000 series storage systems.

iSCSI enhancements

3PAR OS 3.2.2 provides the following iSCSI enhancements:

- Support for Persistent Ports loss_sync recovery, automatic failover in case of a failure due to loss of signal or link down between the array and the switch.
- Enhanced SendTarget discovery to return multiple target portals.
- Support for 256 iSCSI initiators (maximum) per port on 3PAR StoreServ 8000 and 20000 Storage systems.
- Support for iSCSI VLAN tagging on 3PAR StoreServ 8000 and 20000 Storage systems.
- Support for Enterprise iSCSI (iSCSI over DCB/lossless Ethernet) on 3PAR StoreServ 8000 and 20000 Storage systems.
- Support for iSCSI IPv6 on 3PAR StoreServ 8000 and 20000 Storage systems.

VMware VVols

VMware VVols support provided in 3PAR OS 3.2.2 enables higher VVols scalability, provides support for multiple storage containers, and provides ability to use the same array with multiple vCenters and vCenter Clusters. With the new command line options, the storage administrator gets more visibility into the capacity and the performance for individual VMs.

Autonomic Rebalance enhancements

Autonomic Rebalance enhancements trigger automatic rebalancing of existing volumes as new drives are added on 3PAR 7200 systems. All other classes of system rebalance manually by running the `tunesys` operation. This release provides several optimizations for improving performance of rebalancing activity and reporting of the rebalancing activity.

On-Node System Reporter

On-Node System Reporter provides the ability to grow the size of the .srdata volume to allow longer retention of historical data collections. You can protect .srdata volumes using snapshots via Virtual Copy.

Adaptive Optimization

Adaptive Optimization in 3PAR OS 3.2.2 provides the user more control over the space distribution within AOCFG CPGs. You can define a minimum and maximum space utilization of each tier in an AOCFG. You can also define minimum space utilization of the T0 CPG (SSD tier) such that the SSDs remain mostly full, making full use of the SSD performance.

LDAP improvement

3PAR OS 3.2.2 brings following LDAP improvements:

- Support for multiple LDAP servers — This version allows an unlimited numbers of LDAP servers to be defined.

- Support multiple domains — This version allows any users defined in domains that fall under the same root domain.

- Ability to lookup servers in DNS.

- Load balancer support via a new LDAP-type option.

3PAR Smart SAN

3PAR Smart SAN enables you to automate peer zoning which results in the creation of fewer zones and enables configuration of zones in minutes through its TDPZ (Target Driven Peer Zoning) feature. Through automation, it reduces the probability of errors and potential downtime.

Without 3PAR Smart SAN, an administrator must pre-configure zones on the switch before configuring hosts and VLUNs on the 3PAR StoreServ Storage system. With 3PAR Smart SAN, the administrator can configure and control zoning directly from the 3PAR CLI. 3PAR Smart SAN also supports standards-based device registrations and diagnostics data collection for better configuration visibility and diagnostic purposes.

Interoperability

3PAR OS 3.2.2 is the last major 3PAR OS release to support Host Persona 1 with any version of Citrix XenServer 6. Subsequent 3PAR OS versions will exclusively use Host Persona 2 for any version of Citrix XenServer 6 and later.

Modifications to the OS

The following items are addressed in this release:

Issue ID	Description
49957	If the admin interface is non-functional, an alert is reported but management of other network ports is not affected.
80418	Addresses an issue where an SFP event/alert does not work correctly when the SFP error is cleared.
80428	Resolved an issues where details of a fully provisioned volume split between tiers by Adaptive Optimization might display the wrong RAID type and device type (SSD, FC, NL) information. This also affects the tier from which any new space is allocated to the VV using the `growvv` command. **NOTE:** Changing the primary CPG for a fully provisioned volume must be done by using the `setvv` command with options `-usr_cpg` or `-snp_cpg`.
83509	If repeated attempts to clean a chunklet fail, mark the chunklet as media failed and go on to the next chunklet.
92692	The TOC information for an iSCSI port might become incorrect if an FC adapter is replaced with a CNA adapter. The iSCSI port might intermittently come up in config_wait state following node reboot or node panic. Resetting the port clears the config_wait state. To resolve the inconsistency in the TOC, switch the port to FCoE mode and then switch it back to iSCSI mode.

Issue ID	Description
93554	The user can input multiple DNS addresses when running OOTB (Out-of-the-Box).
94331	Resolved an issue where the 3PAR Management Console Volume Raw Space pie chart on the Physical Disks Summary tab incorrectly displays value on StoreServ with Adaptive Optimization software active.
95780	The `updatevv` command algorithm is revised so that the structures around the snapshot need not be recreated and chances of losing the snapshot on failures are reduced.
96308	For 3PAR StoreServ 7000 storage systems, the `locatecage` command turns on the enclosure LED and all the drives LEDs to locate an entire cage. To locate an entire cage for 3PAR StoreServ 20000 storage systems, only the enclosure LED is turned on. The `locatecage` command requires the `-t` option which specifies the number of seconds to turn on the LED. For 3PAR StoreServ 7000 storage systems, the default time is 15 minutes with a maximum of 1 hour. For all other systems, the default time is 60 seconds with a maximum of 255 seconds. The jbod_monitor checks this time every 2 minutes if it has elapsed and turns off the LED. To turn off LED before the time has elapsed, use 0 for seconds for the `-t` option.
98668	Resolved an issue of potential deadlocks while stopping Remote copy function.
99402	The `controlport logout` command can be run for FCoE ports.
100837	For remote copy traffic, Remote copy links must have a minimum of 5 Mbps throughput available to them.
102997	Low priority rules can only throttle low priority rules, and normal priority rules can only throttle normal and low priority rules.
104176	During system manager startup, cage component state is observed for more time before posting cage component state change alerts for loop being offline.
104239	Support is provided for 10G SFPs for QLogic EP8324.
105680	Using the command `controlsr grow <size>`, it is possible to grow the volume used to store SR data and increase the retention time of all SR data categories such as hires, hourly, daily, and AO ldrg.
106651	Resolved an issue where a region move on a remote node could cause instability.
108365	The system manager synchronization locks are released before making remote procedure calls to the quorum announcer processes. This applies only to Peer Persistence configurations.
108932	LDCK retry speed is enhanced. When ldck failures are added to a retry queue, the whole queue is retried after a period of time instead of just the head of the queue.
109217	If the maximum number of initiators exceeds for a Qlogic CNA port, an alert is raised.
111310	For Windows Peer Persistence support, the recovery procedure must be updated to include a manual disk rescan from Windows Disk Management.
111320	Resolved an issue where local variables in the Quorum Announcer process are overwritten when error message strings from the Quorum Witness are greater than 100 characters in length. When this occurs the Quorum Announcer process restarts.
111321	Releases system manager synchronization locks before making remote procedure calls to the quorum announcer processes. This applies only to Peer Persistence configurations.
112313	During online upgrades, the execution of scheduled tasks is paused. If an upgrade fails during the load phase, the scheduled tasks remain paused even when the system indicates that no upgrade is in progress. This is resolved and the scheduled tasks resume normally if upgrade fails.
112889	Provides support for the `<n:s:p>` and `<wwn>` options for the `servicehost remove` command to remove dead connections listed by the `servicehost list` command.
113074	Provides support for the Subject Alternative Name certificate extension to the certificate handling tools. SANs can be added to CSRs and self-signed certificates with the -SAN option. The `showcert` command can be used to view the extension.

Issue ID	Description
113301	Resolved an issue where certificate generated by earlier version of 3PAR OS were flagged by OPENSSL as having a unsupported certificate purpose.
113374	The `compactcpg` command runs automatically.
113514	Temperature Under_Warning_Threshold alerts are changed to informational events.
114460	Resolves an issue where a general protection fault might occur in the SCSI code when running the `updatevv` command for a VV multiple times in a short period of time.
114947	The volume capacity limit for DR operations is increased to 4096 TB.
115302	When a remote copy volume is undergoing a region move, retry timeout period id 5 minutes. If the volume is not currently involved in a region move, the retry timeout is the default.
115505	The `-online` option is supported with the `creategroupvvcopy` command and multiple copies can be created at the same time.
115523	To simplify the configuration and setup of 3PAR systems, the `admithw` and `ootb` commands reconfigure the free fibre channel ports to `host` connection mode and `point` connection type.
116034	When running OOTB (Out-of-the-Box), the user can configure RCIP and File Persona ports.
116685	Added the capability to authenticate with multiple LDAP servers behind a load balancer.
117021	The `updatevv` command is revised so that the structures, VLUNs and VV sets, around the snapshot need not be recreated and risk of losing the snapshot on failures is reduced.
117892	The default UDID for snapshots is set to VV ID.
118170	Resolved an issues where node shuts down unexpectedly if the `controlport cli` commands are issued in a particular sequence.
118875	Downgrade to earlier version does not require the on-node System Reporter database to be recreated. Downgrading to earlier versions will still require the re-creation steps in many cases.
119221	An STSG (SendTargets Port Tag) is provided for each iSCSI port. Information of all the ports sharing the same STGT is part of the SendTargets All response.
119332, 126103	The task manager correctly processes all completed tasks regardless of the general load and the AO load on the system. All completed tasks are successfully displayed when the `showtask` command is issued.
119734	If iSCSI initiators limit is exceeded, an alert is raised.
120838	Space free up operations are made parallel and asynchronous.
120895	Resolved an issue where the `checkhealth host` commands becomes unresponsive if the SAN provides incomplete data from the port.
121146	Resolved an issues where the failover is not removed correctly if the connection mode of an FC port is changed while a persistent ports failover is active on that port.
121260	By default, the Hyper Threading is disabled.
121830	Resolved a concurrency issue between region mover and nup_post_process_th.
121955	For 3PAR StoreServ 20000 Storage Systems, use the cage info from the SES page to determine the domain of the I/O module and assign the correct LoopA / LoopB port.
122676	Resolved an issue where after a cage reset, drives in an encrypted system remain degraded for a few hours. Now, drives return to the normal state immediately after a cage reset.
122840	Invalid Region Move VL map entries are discovered and automatically removed from the system configuration database. An alert is generated to inform that the situation has been resolved, and events are generated with more specific details.
123901	The dedup garbage collector (ddcscan) is changed so that the master node ddcscan triggers ddcscan runs on other nodes even when there is 1 TB of reuse pages queued up on a node.

Issue ID	Description
124117	Resolves an issue in node up integration that might lead to data unavailability.
124185	The ability to authenticate users in subdomains is provided.
124232	Resolved an issues where single node goes down when recovering meta data on RO snapshot.
124528	Resolved the issues with CPG capacity efficiency displayed by the `showcpg -space` command.
124556	Resolved an issue where in certain network environments, it takes more time than the timeout period to configure the network interface making the array inaccessible from an administration standpoint.
124648	Resolved an issue of reclamation of unreferenced space in systems with dedup volumes so that snapshot creation and deletion during such activity does not cause the space reclamation to be abandoned.
125106	Resolves an issue that causes DNS resolution to fail.
125257	Provide a command to trigger the system to update the dedup statistics of any given CPG or TDVV.
125283	The WSAPI startup checks that both parts of the key pair are present and are correct.
125546	After an all nodes down node rescue, select the console option Load network configuration to reload the network configuration.
125733	Provides support for Enterprise iSCSI, iSCSI DCBX information is displayed.
125912	Resolved an issue in DDS space recycle handler that could result in unresponsive system when another thread holds the write lock.
126112	If a power event causes a two node system to go down and a hardware failure prevents one of the nodes from coming back after the power is restored, the system does not start. This is resolved and if the second node does not join the cluster 30 minutes after the first node boot, it proceeds with recovery automatically.
126134	Resolves mismanagement of a token cluster mask that might cause an invalid token consistency check across nodes.
126524	Resolved an issue where if the admin interface changes frequently, the netc process reports an error message due to an unwanted increase in memory usage.
126568	No limitation on the number of LUNs that can be exported to a given host initiator at one time.
126825	The cage firmware image size is increased.
126837	Resolved a SCSI command ID mistmatch assert in the FCoE driver.
126987	A new feature is provided to check if ingress and egress DMA operations are within an address range.
127444	Resolved an issue where single node goes down when a region move and I/O operation is going on
127727	P3P firmware is upgraded to 4.15.2.
127849	VASA Provider does not generate an event to notify the vSphere environment if the flash-cache configuration has changed for the VVol storage containers.
128035	When a fully provisioned volume is in an AO configuration, the primary CPG for USR space can be changed to any other AO tier CPG.
128039	The `createsv` command can be used for creating snapshots of .srdata volume. The `promotesv` command can be used to promote this snapshot after stopping SR.
128104	Addresses a data integrity issue when migrating virutal machines.
128116, 132299	Resolved an issue where rolling upgrades beyond the 3PAR OS 3.1.3.MU1 fail when preserved data is created during the upgrade.
128178	Default engine ID is used in ContextEngineId field in SNMPv3 scoped PDU.
128243	Support is provided for 10G ethernet port with SFP - AVAGO AFBR-703SDZ-HP1.

Issue ID	Description
128312	Simple LDAP configuration is provided.
129033	Spare chunklets used as the destination for a chunklet move are unmapped after the data is moved.
129674	If less than half of the admitted disks to maintain TOC quorum are present, the `setsysmgr` command does not start the system.
129818	Resolved an issue where a lack of resources cause host I/O to become unresponsive.
129940	Resolved an issue where completed offline copies cannot resume other operations as the temporary snapshot created is not deleted.
130063, 130654	Resolved an issue where accessing invalid memory address causes snmpagent process failure.
130118	Prior to 3PAR OS 3.2.2, a createsralertcrit criterion could be configured with a name that exceeds 31 characters. When the name exceeded 31 characters, no alerts were reported even if the defined criterion should have flagged the defined condition. To address this issue in 3PAR OS 3.2.2, new createsralertcrit definitions can no longer be created using a name that exceeds 31 characters. Hewlett Packard Enterprise recommends that you verify the length of the name of any existing createsralertcrit definitions. When found, these must be replaced by new createsralertcrit definitions with a name not exceeding this 31 character length limit. Previous definitions must be removed manually.
130663	Both LPe16002 and LPe16004 use two new SFPs from Avago and Finisar Manufacturer : HP-A Part Number : E7Y10A Manufacturer : HP-F Part Number : E7Y10A
130677	Resolved an issue where system manager might become unresponsive when a node battery test starts on an expired battery.
130836	Resolved an issue where the SNMPAgent initialization process fails and a function checking an I/O might encounter a timing issue when a node is shutting down or becoming unavailable
131115	The `showcpg -space` command displays accurate CPG dedup ratio as data size stored in private space is included in CPG dedup ratio calculation.
131158	Resolved an issue where request for space from L1 bitmap might be incorrect After the volume growth, the data pattern in L1 bitmap page and L2 bitmap reserve area signature might be same. This might cause incorrect result when requesting space from L1 bitmap. This is resolved.
131239	Enhancements to the VASA Provider and VMware VVol support, including: • Support for multiple VVol storage containers, including new CLIs to manage them. • Support for migrating from 3PAR OS 3.2.1 based storage containers to the multi-storage container model. **NOTE:** The downgrade from 3PAR OS 3.2.2 to an earlier release is not supported without first removing storage containers. • Support for connecting multiple vCenters to the VASA provider simultaneously, using the server-side certificate management mode controlled with the `setvasa` command. • Support and certification for VASA 2.0 as a block device storage provider. • Usability enhancements into several CLIs for viewing VVols
131349	Resolved a condition where 16 Gbps FC driver code might dereference a null pointer when a request to get a node name fails. This can happen during FC link events such as link down, link up, port reset, and so on.
131378	If an SFP not listed in the database is plugged in, it is flagged as not qualified.
131549	Prevents unexpected system manager restarts when moving regions.
132350	Resolved an issue where during node reboots, a `ping` or `statiscsi` command might induce an erroneous firmware core on iSCSI ports.
132475	Resolved an issue of SNMPAgent failure due to invalid memory access.
132619	SFP database is updated for 12G SAS connectors.

Issue ID	Description
132644	The internal function to create unique snapshots is modified so that 65K snapshots can be made off of VVs with a similar name.
132748	Resolved an issue where block allocation map for RW snapshots reports incorrect information when data is written to the base VV
132791	Resolved an issue where DCS1 drive cage reports incorrect status.
133245	Resolved an issue where the VASA provider might terminate while updating vSphere trusted certificates.
133457	Resolved an issue where under heavy load, the VASA Provider might abort while performing VVol operations.
133567	The `checkhealth` and `eventlog` commands report PDs with FRU or UPG firmware.
133643	Resolved an issue where odd fields are found at the tail of the SNMP trap OIDs which might cause errors for clients when processing incoming traps.
133679	Resolved an issue where `rsh` command fails to complete during online upgrades to 3PAR OS 3.2.1.MU3 and later.
133844	Support is provided for 10 GB SR SFP+(FCI) for QLE8242
134067	To prevent issues when reading the TOC, the system ensures that the entire TOC area of a PD is readable before admitting the PD.
134292	Resolved an issue with Adaptive Optimization data movement depending on the execution limit.
134481	The VASA provider log file, inside an insplore, could generate incorrect log messages. For example: [Fri May 1 15:33:05 2015].688 session_data.cpp:966: WARN getVVFromVvolId, getVVCache returned empty for wwn:60002ac000000000c27ea87b9ebc4033 These log messages can be ignored.
134738	SFP verification process does not use HBA serial numbers as it might make SFP disqualified.
134963	The VASA provider logs warning messages as below `[Tue May 5 11:52:24 2015].088 https_gw.c:210: WARN Received premature EOF` These warnings can be ignored.
134966	Resolved an issue where the VASA Provider generate incorrect log messages in the Insplore such as `remove_abandoned_trace_files unable to find tracer parent directory.`
135072	An alert is generated for 16G FC if the initiator count exceeds the maximum allowed value.
135384	Resolves an issue where certain host SCSI writes to the primary volumes receive good status, instead of a check condition UA, when Remote Copy writes cannot be replicated to the secondary volumes during a Peer Persistence automatic failover.
136536	QLE8362 CNA and QLE2662 FC HBA firmware is updated to version 5.7.3.
136631	The 16 GB adapter port becomes unresponsive, then resets. This issue is resolved in firmware by increasing the high priority firmware task time-out values, as well as introducing software locking mechanisms.
137079	Resolved an issue where registration of the VASA Provider with a vSphere environment might fail if the array has VV set names longer than 24 characters.
137488	Resolved an issue where after rebooting the primary node (node 0) of the array, occationally the VASA Provider reports Rescan Error in the vCenter Storage Providers status window.
138743	Provided an ability in 3PAR OS 3.2.2 to use an alias to point to multiple LDAP servers in.
138816	If the system shuts down for powerfail save and no disks are visible to the system when it starts up or only a minority of the disks become visible later, it would automatically start despite having less

Issue ID	Description
	than 60% of the disks available. This could lead to a repeated powerfail save. This is resolved and the system starts only when appropriate.
140869	Resolved a performance issue in the VASA Provider when configurations have several large VLUNs.

Known Issues with the OS

Issue ID	Description
113925	Live Migrations of Clustered VMs using vFC (virtual Fibre Channel) adapters is not supported.
114158	The `setlicense` command requires a reboot if a license key with HPE SSN serial number is entered.
119997	The time period for which the `tunesys -cleanwait` command waits for cleaning of the chunklets is half of the time specified by the `-cleanwait` option. **Workaround**: Provide twice the expected time delay value to the `-cleanwait` option. The maximum cleaning delay can be 360 minutes. Provide a value of 720 to get maximum time delay of 360 minutes.

125767	Attempts to upgrade a StoreServ cluster running versions earlier than 3PAR OS 3.2.1 to version later than 3.2.1 might fail.
	Workaround: The system manager process must be restarted before the upgrade is resumed or retried.
	To restart the system manager process, issue the following commands from the master node:
	`# setsysmgr quiet_restart`
	`# onothernodes killall -9 sysmgr`
	If the cluster contains more than two nodes, the system manager process on all other nodes must be restarted as well. From the master node, issue the following command:
	`onothernodes killall -9 sysmgr`

125812	If an attempt is made to tune an SA space LD on a system which has PDs of the target devtype on less than 3 cages on the owner node of the LD, the tune fails. Tuneld assumes that SA space is always RAID 1, set size 3, cage availability.
129428	The `statvlun` command might not work when system has subLUN configured. It returns zero statistics if any wildcard query is used or multiple VLUN IDs are specified.
131304	Regular VV cannot be added to VVol storage container VVset.
131710	All interfaces into the on-node System Reporter reports timeout when requesting large data sets and experience slow performance.
131813	When an incorrect DNS is set using the Service Processor setup wizard, or if the SP and StoreServ initialization is done on a private network with any DNS settings, the SP is unable to establish a CLI connection to the StoreServ and the SP installation process fails. **Workaround**: To avoid this issue, do not configure DNS using the SP setup wizard; instead, manually configure DNS using the 3PARCUST account after successfully completing the installation: 1. In SPOCC, click the **SPMAINT** tab. 2. Select Option 2 — Network Configuration. 3. Select Option 9 — DNS Configuration. If you configure DNS using the SP setup wizard, you must reinstall the Service Processor software.
138175	Storage vMotion will become unresponsive and timeout if 3PAR OS system manager is restarted while storage vMotion is in progress. **Workaround**: When Storage vMotion timeouts, verify that 3PAR OS system manager starts successfully by running the `showsysmgr` command on array, and then initiate storage vMotion again.

Issue ID	Description
138582	The `showvvolsc` and `showvvolvm -sc <storage container>` displays incorrect information on VM in a storage container (VVol datastore) if a VM has one or more virtual disks or RDMs stored in a different storage container.
140288	Downgrade from 3PAR OS 3.2.2 must ensure that RW snapshot is not more than 256. 3PAR OS 3.2.2 supports 2K snapshots.
140776	The 16G Emulex ports do not report the latest SFP information if the port is in a loss_sync state.
141277	vCenter and ESX 6 hosts might intermittently report 0 MB of storage capacity and free space for VVol datastores for a period of up to 20 minutes after 3PAR array node reboot. No user action is required to resolve the issue. vCenter will successfully re-establish full connectivity with the 3PAR VAASA provider and then update the vCenter VVol VASA storage report.
142013	Volumes formatted with the JFS file system cannot be migrated online via Peer Motion. Hosts using the JFS file system must stop the I/O and the file system must be unmounted before proceeding with the migration. JFS2 and other supported AIX file systems do not have any impact.

Modifications to File Persona

Issue ID	Description
54914 (56736, 60558)	Resolved an issue where a file with actual size of 1 KB is reported as 1 MB 'Size on Disk' from an SMB3 clients and 4 KB 'Size on Disk' from SMB2 clients.
56242	Resolved an issue where quotas cannot be deleted if they are set for a deleted user or group.
57316 (57329, 61080)	Resolved an issue where LDAP user authentication fails when some nodes lose the ability to communicate with the LDAP server.
58579	Resolved an issue where if the filesystem get unmounted during an active NDMP backup or restore session, the filesystem goes in FREEZED condition as NDMP is holding file handles from the filesystem.
59013	Resolved an issue where the request to delete an object share might display `Request failed` message even if the the object share is deleted successfully.
59046	Resolved an issue where if the File Provisioning Group (FPG) names are not specified in correct case when creating or listing shapshots, showfsnap displays `No shapshots listed` message instead of the FPG not found message.
59193 (61173)	Resolved an issue where if the AV scan policy is set to OFF, it might cause unwanted increase in memory leading to node going down and causing failover.
60018 (60047, 60048)	Resolved an issue where deleting and or adding a VFS with the same IP but with two different subnet masks can cause the VFS to enter a degraded state.
60526	Resolved an issue where creating or growing multiple FPGs in parallel might result in an error message.
60681 (60739, 60740)	Resolved an issue where, on some occasions such as the combination of a node failure and failover, SMB firewall ports might not be configured for a FPG upon recovery and prevent user access to shares on that FPG.
60765	Resolved an issue where an offline upgrade from 3.2.1 MU2 with Patch 08 (P08) with File Persona enabled might leave failover in a disabled state and a future failure might not trigger a failover correctly.
61460	Resolved an issue where using unsupported locale settings during file creations might cause problem during file removal operation.
61795	Resolved an issue where an upgrade might fail if an upgrade pre-check is run during the upgrade.
62025	Resolved an issue where under certain SW failure conditions, all FPGs do not fail over successfully to the backup node.

Issue ID	Description
118770	The output of the `showfsav pol` command is changed to have a single consistent header for the virtual file server and file store sections.
123354	Resolved an issue where file shares might become inaccessible if multiple PDs containing File Persona volume data go offline due to disk drive failures or service operations.
126831	The `createfpg` CLI command supports the `-tdvv` option to create FPGs with thin deduplicated virtual volumes.
130873	Resolved an issue where CPG Out of Space condition causes deactivation of FPG.
134044	The `setfshare` and `showfshare` commands provide new options such as `-acl`, `-mode`, `-owner`, `-group` and `-dirperm` for file share directory permissions management. For more details, see the *HPE 3PAR File Persona User Guide*.
135466	The role for the commands `setfs`, `setfsuser`, `setfsgroup`, `createfsuser`, `createfsgroup`, `removefsuser`, and `removefsgroup` is changed to SUPER.

Known Issues with File Persona

NOTE: The known issues for 3PAR OS 3.2.1 MU3 File persona are still present in 3PAR OS 3.2.2 unless otherwise listed as addressed in 3PAR OS 3.2.2.

Issue ID	Description
37406,37422	SMB and FPG read and write statistics reported in the `statfs` command do not account for the data transferred via ODX.
42322	3PAR File Persona does not currently support NBNS (NetBIOS Name Server) resolution. The NetBIOS name of a File Persona cluster node cannot be resolved from Windows clients using the `nbtstat` command. Issuing the `nbtstat - A <HP SMB server IP address>` command from a Windows client returns a `host not reachable` error.
42454	CIFS connection lost intermittently and new connections are not allowed. **Workaround**: Set *Smb2Enabled* parameter value to 0 in the HP-SMB registry and then restart SMB Services.
48696	Overlapping writes to the same file from NFS and SMB might cause corruption.
51093	On failover of multiple FPGs with a combination of SMB and NFS shares with active I/O, you might experience that some FPGs do not failover. **Workaround**: Execute the `setfpg -f -failover <fpg01smb>` command on the FPG that does not failover on the first attempt.
52678	Unexpected failover of FPGs might occur while running a SPECfs workload and an alert is generated. **Workaround**: The FPGs must be failed back to their original node with the `setfpg -failover` command.
54778, 54687	NFS/HTTP users do not have access to the folder if permission is given with built in domain users group. This is a limitation with respect to cross protocol support. For more details, see *Setup Guide for HPE 3PAR File Persona in a Cross Protocol Environment*.
55128	If an NFS export is configured with more than 31 client IP addresses, NFS exports can not be modified. **Workaround**: Limit the number of client IPs used with NFS exports to less than 31. Use a subnet range when possible rather than explicitly specifying each IP address.
57072	LDAP groups are not supported within POSIX ACLs. LDAP Users, Active Directory Users and Groups, and Local Users and Groups are supported within POSIX ACLs. LDAP groups are supported for "chgrp".

Issue ID	Description
58601	If the VSD is not up (or VENDOR_TYPE not set), the files are served irrespective of AV unavailable policy. Files must be served as per AV unavailable policy if AV is ON irrespective of whether VSD is responding or not.
59906	On rare occasion, a request to stop file services on a node might result in restarting of file services instead of going to a stopped state. **Workaround**: Try again to stop file services on that node and it generally succeeds on the second attempt.
58905 (60564)	Windows and Linux NFSv3 use significantly different methods to process permissions. Windows combine access from *all* of the ACEs on the file to determine if the user has the requested access. In NFSv3, Linux proceeds through a hierarchy and determines the user's permissions from *one* of the mode bit fields – user, group, or other. In the NFSv3 Linux behavior, it is possible to get inverted priorities – where others have more permissions than the owner. In Windows' ACL implementation, it is not possible to get such an inversion.
60985	Restarting HPE SMB server multiple times in quick succession causes daemon to become unresponsive, if Active Directory cache contains large number of entries. This occurs when the HPE SMB server is stopped while the Active Directory cache is still being loaded.
52552 (61082)	If both NFS and SMB share refer to the same file system path, then `mkdir` command issued on the NFSv3 mount from client displays error: `mkdir: cannot create directory <dir_name> : invalid argument`. But, directory is created. **NOTE:** Hewlett Packard Enterprise does not recommend cross protocol access to the same share for Unity version1.
43596 (61247)	When user quota is enabled for hard Inode limit on a Roaming profile user, one less file is allowed to be created on the HPE-SMB share, after logging off. Any attempt to write a file further causes `No space on the disk` error during logoff.
56895 (61253)	If a share of the .admin file store is set up to copy the configuration backup file to the VFS, the restore might fail if that share is still in place and the share conflicts with a share being restored. **Workaround**: Before attempting a restore, delete all shares. If the issue has already occurred, delete the FPG and try the restore again.
61184	Many NFSv3 clients do not respond to the EJUKEBOX error no 528 correctly.
61706	Only users added to the `B-LOCAL_CLUSTER\Administrators` group of server can access C$ share. `LOCAL_CLUSTER\Administrator` is added to this group, by default. If a server is joined to an AD domain, then `Domain Admins` group of the AD server gets added to `B-LOCAL_CLUSTER\Administrators`. Other users must be added to this group to access C$ share.
61897 (61913)	Setting an access control entry via UID or GID succeeds only if the ID can be properly resolved to a user or group name.
61920	The configuration backup has an added validation checksum to ensure integrity of the configuration during the configuration restore process. Therefore, a configuration backup taken in the 3PAR OS version 3.2.2 is incompatible for restore in the 3PAR OS 3.2.1 MU3. If 3PAR OS is reverted to 3.2.1 MU3, you must create a new configuration backup compatible with that release.
62719 (62722)	While configuring LDAP provider, if passive node has network issue and cannot contact LDAP server, only the active node gets configured. This causes error in the 3PAR CLI report. **Workaround**: Resolve the passive node networking issue and then reconfigure the LDAP provider.
62799	When a forced failover of an FPG is required, the VVs associated with the FPG are isolated from being used by the node on the source side of the failover. The time required to isolate the volumes is proportional to the number of volumes, with each volume taking around 2 seconds to isolate. For an FPG of maximum size of 32 TB, grown 1 TB at a time, the forced failover time could be extended by more than a minute. **Workaround**: Grow FPGs in larger increments to minimize the number of volumes in use. Avoid conditions that require a forced failover of the FPG.

Issue ID	Description
62843 (62848)	As nodes in the cluster are in transition, the health monitor indicates an issue with these nodes. After the nodes are back on-line, they are reported as healthy. Acknowledge the alerts after the update or install of the cluster is complete.
62959 (62976)	Invalid Everyone@somedomain ace is not blocked at the input.
63140	File store snapshots are read only. Moving files from a snapshot to the original folder is not supported. **Workaround**: Use copy operation when recovering files from a snapshot.
63227	Cross protocol directory changes from NFS are not notified in Win2K12 client. **Workaround**: Refresh the windows explorer and the changes are visible.
63278	Unresolvable SIDs in Windows ACLs might generate errors while copying files using the `robocopy` command. **Workaround**: Use Windows advanced properties to remove the SID from the file. The copy will complete successfully after removing SID.
64247	Duplicate users in multiple configured authentication providers is not supported.
63352	If file store quota is deleted, then every time quota configuration changes, user receives the alert message `Quota Event:Unable to persist quota limits on Virtual Server <vfs_name> logged to STaTS`. But, quota functionality is not affected due to this alert message logged.
63852	When using bond mode 6, if node fs ports are shut down using the `controlport fs state down` command or the associated Ethernet switch ports are disabled, I/O might become unresponsive for several minutes depending on the ARP cache timeout when the ports are once again enabled. **Workaround**: If a client is unable to connect to a share after manipulating the network interfaces, use a client OS specific mechanism to purge the relevant entry from the ARP cache. On some OS, this can be done using the `arp -d` command.
63901	Because of the POSIX nature of the backing file system, groups cannot be the owners of directories or files. This is an expected behavior.
64221 (64223)	During failover with SMB shares and control port changes, SMB shares loose contact and error on server RDRSocketRead. **Workaround**: All clients must unmount the SMB share and the cluster must leave the AD domain. Reset the node and then cluster can rejoin the AD domain. If Hewlett Packard Enterprise support is performing the repair, a single node can leave and join the AD domain.
64359	When running an on demand or scheduled virus scan of a large set of files, the expected maximum processing rate is 2 million files per day, depending on load.
64610 (64952)	If the new VFS is created and assigned the IP address of the VFS which is temporarily offline, the two VFS conflict over the IP address when the offline VFS is activated. When the IP address of the newly created VFS is changed with the `setfsip` command, the `showfsip` command does not indicate any conflict but conflict exists. This usually manifests as a complaint that the address of one of the pair cannot be activated for the one that shows a different one, because it's already in use on a different policy ID (the ID field displayed by the showfsip command) - the one for the other VFS in the affected pair. **Workaround**: Remove the IP address of the conflicting VFSs using the `removefsip` command. Create the addresses on the VFSs again with the `createfsip` command.
65139	If an attempt to modify a VFS IP fails due to a condition such as a duplicate IP address, the modification are rolled back. However, the reconfiguration of shares for the original IP configuration might not complete and shares remain unavailable. **Workaround**: Failover the FPG to its backup node and then failback the FPG to the original node using the `setfpg -failover <fpgname>`command.
65346	The directory structure of File Persona share is not visible in windows explorer after system upgrade from Windows 7_64 to SP1.

Issue ID	Description
65289 (65360)	SuSE SLES11 and SLES11 SP1 client do not support NFS4 ACL.
65204 (65441)	If a group name is reused with a different GID, and that group has a quota, the output of the `showfsquota` command shows the group name only after about an hour.
65779	If TrendMicro is set as AV vendor, it can not be changed or the policy cannot be removed after remote copy from 3PAR OS 3.2.2 to 3PAR OS 3.2.1 MU3.

66152	After upgrade, VTL is not listed.
	Workaround: Add and discover VTL again after completing the upgrade.
	To add and discover VTLs/Tapes:
	`setfsndmp vtl`
	To list VTL tapes/drives:
	`showfsndmp -vtl vtldevices`
	`showfsndmp -vtl vtltapes`

66344	After upgrade, httpd is not running and FPG full event is seen. **Workaround**: Remove some content from FPG to free some space in FPG. Umount the FPG and mount it again. This recreates apache configurations, start httpd and make object shares accessible.
66713	You might experience very slow login performance with roaming profiles. **Workaround**: Turn off either Oplocks or SMB Leases.
67131	LDAP is not configured for node added in cluster expansion, or if node is offline when LDAP changed. **Workaround**: If a node is out of sync with other nodes in the cluster with regard to LDAP configuration, issue the following commands: **1.** `setfs ldap -passwd ssmssm99 -schema samba -usessl -certcn set-ldap-host.setldap.com -certfile cert.pem 10.10.10.11 cn=Manager,dc=setldap,dc=com dc=setldap,dc=com set-ldap-host` **2.** `setfs auth Local ActiveDirectory Ldap`
67576	During a request to failover an FPG, if that request fails during deactivation of the FPG on the original node, the IPs and shares related to that FPG might be left in an unavailable state. **Workaround**: Retry the failover request with the `setfpg` command using `-forced` option. `setfpg -forced -failover <fpg>`
67960	NFS shares created on the default .admin File Store are not restored after completion of the `restorefsconf` command. **Workaround**: Remove any existing .admin share configured on target node before issuing the `restorefsconf` command.
68447	In some cases, removing a Virtual Tape Library (VTL) device from the cluster using the `setfsndmp vtl -<IP address of the VTL>` command appears to fail. The tape drive and robot information pertaining to the VTL are removed, but the VTL IP address information is still listed. This can be ignored.
68497, 68597	Unavailability of NFS shares after remote copy with source and target FPGs having same names. **Workaround**: Do not setup Remote Copy between source and target File Persona Clusters that share duplicate FPG names.
68694	If an incorrect File Persona snap_name is passed to the `removefsnap` CLI command, it returns error code - 643. This indicates that a non-existent snap name is specified in the command
118467	Under rare circumstances, the `startfs` command might fail after printing 'Executing "createfsvm fs_cpg"'. An alert is generated which indicates that the `createfsvm` task has failed. **Workaround**: Run the `startfs` command again.

Issue ID	Description
124078	Creating and editing an FPG, VFS, file store or file share with special characters in the comment field can fail or the comment may not be displayed correctly. Error messages include but are not limited to the following: • Failed: status=500, exception • Failed: unmatched open brace in list • Failed: list element in braces followed by "\" instead of space • FAILED : Command contains unprintable characters: **Workaround**: Avoid using special characters in comment fields.
128699	File Persona does not support names with only the "-" character. This is prevented in the 3PAR OS CLI for 3.2.2, but is allowed in the GUI. **Workaround**: Avoid creating File Persona objects with the name "-".
128847	The `createsched` command has a limit of 127 characters for the command being scheduled. If the combination of the FPG/VFS/FStore names and the tag selected is too long, scheduling of snapshots for File Stores with long paths and tags might not be possible. **Workaround**: Use shorter names for the FPG/VFS/FStore/Tag, or schedule snapshots using an external client invoking the `createfsnap` CLI command. (for example, using cron).
133389	File Persona does not support multi-byte characters in the name or description of objects, including FPG, VFS, file store and file share. File share paths created in other tools containing multi-byte characters are shown in the CLI with the string "[international data]".
133596	File Store names containing curly braces { or } can cause SSMC (3PAR StoreServ Mangement Console) to display incorrect information associated with that File Store. **Workaround**: Avoid creating File Stores with names that contain { or }.
136787	Under scenarios where a significant block workload exists, FPGs (File Provisioning Group) on a controller node might be automatically migrated to the partner node. This can lead to a temporary disruption in client access, depending on the protocols in use. The load on the system must be reduced either through the addition of more hardware (disks/nodes) or by the reduction of client workload. The FPGs must return to their primary node with the use of the `setfpg -failover` command. For the purposes of this issue, significant block workload is defined as either of the following: • VLUN service times of greater than 150 ms, as reported by the `statvlun` or `srstatvlun` command • Occurrences of DelAck (delayed acks), as reported by the `statcmp` or `srstatcmp` command.
138407	When performing an online upgrade from 3.2.2 to 3.2.2 MU1, some FPGs may failover to the Alternate Node after the upgrade. In that case, you will need to manually fail those FPGs back to the Primary Node for load balancing. Before the upgrade, record the Primary, Alternate and Current Node for each FPG using the "showfpg -d" CLI command or SSMC. Once the upgrade is complete, restore the FPGs to the Primary or previous Current Nodes as needed using the "setfpg -failover" CLI command or SSMC.

2 3PAR OS 3.2.2 CLI Release Notes

Installation Notes for the CLI

Virus Checking

Virus checking is known to slow down and potentially cause issues with installation of the CLI. Before attempting an install or uninstall of the Remote CLI client, shut down all running applications and disable virus-checking software.

Deprecated Commands and Options

The deprecated options for the `cli`, `createuser`, and `setpassword` commands have been removed from the documentation.

Compatibility Changes in this Release

Remote CLI client versions earlier than Remote CLI client 3.2.2 cannot connect to the 3PAR OS, without using `-nosockssl` option.

Compatibility Changes in Next Release

The following options will be removed:

`cli`: `-pwf`, `-user`, `-password`, and variable `TPDPWFILE`

`createuser`: `-e`

`setpassword`: `-save`, `-saveonly`, `-file`

Installation Directory

Windows 32-bit: `C:\Program Files\Hewlett-Packard\HP 3PAR CLI`

Windows 64-bit: `C:\Program Files (x86)\Hewlett-Packard\HP 3PAR CLI`

UNIX and Linux: `/opt/hp_3par_cli`

Supported Operating Systems

For the list of supported operating systems, see the *HPE 3PAR CLI Remote Client* document on the SPOCK website at www.hpe.com/storage/spock.

What's New in the CLI

The following new commands are added in 3PAR CLI 3.2.2:

Command	Description
`controlsr`	Make changes to the System Reporter
`controlrecoveryauth`	Control the method used to authenticate recovery accounts
`setvvolsc`	Create and remove Storage Containers for VVols
`showvvolsc`	Show information about VVol storage containers in the system

Changed commands

Command	Options added (unless stated otherwise)
admithw	-notune
admitpd	-nopatch
admitrcopyvv	-noown
controliscsiport	-vlan <vlan_tag>, checkhealth -svc; **subcommand:**stgt
checkhealth	-svc
createaocfg	-t#min, -t#max
createflashcache	-t
createfpg	-tdvv
createfsshare	-f
creategroupvvcopy	-online, -tdvv, -tpvv, and -snp_cpg
createhost	-port
createsralertcrit	-rpm
createvfs	-tdvv, -full
createvv	-minalloc
createvvcopy	-wwn
histvlun	-p, -vmname, -vmid, -vmhost, -vvolstate, -vvolsc (VVol filters)
histvv	-p, -vmname, -vmid, -vmhost, -vvolstate, -vvolsc (VVol filters)
importvv	-pri, -nocons
locatecage	-t limits changed
movech	-perm functionality change
movepdtospare	-ovrd
removehost	-port
removevlun	-set
setaocfg	-t#min, -t#max
setauthparam	LDAP changes
setclient	matchbulkobjs
setcim	-pol one_hwid_per_view
setfsav	-vendor (Trendmicro support)
setfshare	-acl, -mode, -owner, -group
setsralertcrit	-comment, -all, and pattern support
setsys	new parameter: *HostDIF DisableDedup*
setsysmgr	system_ID and disk_quorum options removed.
setvasa	-certmgmt

Command	Options added (unless stated otherwise)
`setvfs`	`-certgen`
`showfshare`	`-dirperm`
`showld`	`-degraded`
`shownode`	`-drive` displays different result
`showport`	`-iscsivlans`
`showportdev`	subcommand: `tzone`
`showsr`	`-ldrg`
`showsralertcrit`	`-critical`
`showsys`	`-wwnbase`, `-snformat`
`showvv`	`-p`, `-vmname`, `-vmid`, `-vmhost`, `-vvolstate`, `-vvolsc` (VVol filters)
`showvvolvm`	`-binding`, `-d`, `-domain`, `-listcols`, `-sc [required option]`, `-sp`, `-showcols`, `-summary`, `-p [-vmhost, -vmid, -vmstate]`, `-vv`
`srhistpd`	`-rpm`
`srpdspace`	`-rpm`
`srstatpd`	`-rpm`
`srstatrcopy`	`-port`
`srstatvlun`	`-port`
`startao`	`-t#min`, `-t#max`
`statvlun`	`-p`, `-vmname`, `-vmid`, `-vmhost`, `-vvolstate`, `-vvolsc` (VVol filters)
`statvv`	`-p`, `-vmname`, `-vmid`, `-vmhost`, `-vvolstate`, `-vvolsc` (VVol filters)
`tunesys`	`-fulldiskpct`, `-devtype`
`tunevv`	`-tdvv`, `-src_cpg`

Removed and Deprecated Commands and Options

The following commands are removed or deprecated in the OS 3.2.1 release.

Removed Commands and Options	
`cli -pwf`	Replace remote CLI access by ssh access
`cli -password`	Replace remote CLI access by ssh access
`cli -user`	Replace remote CLI access by ssh access
`controliscsiport dhcp`	DHCP is not supported on iSCSI ports.
`movepdtospare`	use `-ovrd` instead of `-vacate`.
`setauthparam`	use `importcert` instead of `ldap-ssl-cacert`.
`setpassword -save`	Replace remote CLI access by ssh access
`setpassword -saveonly`	Replace remote CLI access by ssh access

Removed Commands and Options	
`setpassword -file`	Replace remote CLI access by ssh access
`setsysmgr`	`-system_ID`, `-disk_quorum` are removed.
`srstatqos`	Options `-vvset` and `-all_others` are deprecated.
`tunesys -diskpct`	No equivalent command.
`setcim`	Options `-httpport` and `-httpsport` are removed.

Modifications to the CLI

Issue ID	Description
18662	All open connections for a given user are removed when that user is removed. When a user's connection is removed, any running commands are aborted. To examine open connections, use the `showuserconn` command.
25837	A `-degraded` option is provided in the `showld` command.
64697	The original location of the chunklet is cleared without actually moving the data in following cases: • If `-perm` option is used on a non-spare chunklet and it is moved to itself • If the destination is left blank and the system chooses a destination on the same disk.
79398	The `servicecage remove` CLI command is available for users with service privileges.
95593	The alignment of the columns for output of `showcage -d` command is changed.
97804	The `showsr` command provides an option to show LD region samples for user specified time intervals.
100967	A large nodepct value set in the `tunesys -nodepct` command suppresses inter-node checks and tune generation.
101623	New `-pauseduration` option is provided for the `setsched -suspend` and `setsched -suspend all` command.
102239	Multiple NTP servers can been configured using the `setnet ntp` command options `-add`, `-remove`, and `-set`.
102813	The tunesys task cancellation might take a long time under some circumstances.
113390	The tunesys PD analysis shows accurate information for the available disks and percentage used for each node.
105155	VVol storage containers (VVol datastores) must be created by the storage administrator. For more details, see the *HPE 3PAR VMware ESX/ESXi Implementation Guide*.
107758	Resolved an issue where if a tune is performed on a VV which is in an AO configuration, the tune removes all AO optimizations. A check is introduced to warn the user to use `-src_cpg` option which allows the AO optimizations to be maintained after tuning.
109435	The `showsys -space` command displays Bulk VVs usage separately.
110417	The `-rpm` option is provided for the `srpdspace`, `srhistpd`, `srstatpd`, and `createsralertcrit` commands. The rpm option allows the user to specify the information displayed based on the RPM, the rpm values are 7 (NL), 10 (FC), 15 (FC), 100 (SSD) and 150 (SSD).
114032	Resolved an issue where the CLI help text for the `tunesys` command shows incorrect default value for the `maxchunk` option.
114069	A new option is added to the `tunesys` command to enable rebalancing of a single devtype using intranode tuning.

Issue ID	Description
114528	Using the `showvlun -host set:hset` command on a system with more than 8K VLUNs might give internal error as follows: `Internal CLI error: tableSetWidth line has 8 columns but tableWidth has 6 columns` This can occur if the `showvlun` command is repeated several times in the same session. Add the `-t` option to the command, `showvlun -t -host set:hset`.
115747	Resolved an issues where `showcage -d` command output incorrectly swaps the node cage link speeds for the DP1 and DP2 connectors.
116368	The `checkhealth pd` command is revised so that it does not report an issue if the columns of a LFF disk cage did not contain all SSD or all HDD disks.
116727	On rare occasions, the remote CLI client on Windows becomes unresponsive when exiting.
116830	The `showcage` command displays form factor information.
117425	Resolved an issue where the `tunesys -f` command does not display failed and degraded PDs and spindle count imbalance warnings.
118928	CLI uses the TLS handshake to establish an encrypted socket with the StoreServ. SSL is disabled.
119145	Resolved an issue where the `tpdtcl` process aborts if the VV names passed to the `statvv` or `histvv` commands are separated by commas.
120159	Resolved an issue where the tunevv restart option does not apply to DeDup TDVV volumes.
122872	Resolved an issue where an error `failed to link privilege file` might occur if many SSH connections are open at the same time.
124315	Resolved an issue where the `tuneld` command might fail sometimes if the LD region map changes between retrieval and use.
125568	Resolved an issue where use of `statvv` or `histvv` commands with VV names longer than 26 characters cause tpdtcl to fail.
125636	Removed the service alert and report in `checkhealth` about `/altroot` file system.
126153	Resolved an issue where if large number of tunes are scheduled, `tunesys` terminates unexpectedly in the internode analysis phase.
126969	While creating new TPVVs, default allocation size can be modified using `-minalloc` option with the `createvv` command. Allocation size must be specified in MB.
127082	The `createvvcopy` command supports `-wwn` option.
128948	Resolved an issue where the `tuneld` command reports a failure condition for a tune if it needs to retry some region moves.
128984	Resolved an issue where the intra node tuning phase of tunesys might terminate if it encounters an LD with a malformed creation pattern (-p) string.
130625	The optional `sysid` argument to `setsysmgr wipe` is removed as it is not required with 10 digit serial number.
130888	Resolved an issue where if a volume is included in more than one volume sets, Flash Cache policy of the volume might not display enabled state if one of the volume sets is not Flash Cache enabled.
131533	To remove a bulkvv or to remove a bulkvv from a VVol storage container VVset, use the `-matchbulkobjs` option with the `removevv` command.

Issue ID	Description
	NOTE: To prevent vSphere configuration integrity issues, use the vSphere environment to remove the associated VMs. To remove a vSphere VVol storage container from the array, see the `setvvolsc` command. Do not remove individual VVols from the array.
137344	With the introduction of File Persona, use the adjusted memory sizes shown below to compute the number of available tpdtcl connections:

Adjusted Memory Size	Total	Connections
4 GiB or lower (prior to 3PAR OS 3.1.2)	64	16
8 GiB	96	24
16 GiB	128	32
24 GiB	160	40
32 GiB	192	48
48 GiB	240	60 (New)
>56 GiB	256	64

3 3PAR OS 3.2.2 CIM API Release Notes

What's new with 3PAR CIM API

- Support for 3PAR StoreServ 20000 Storage Systems
- Support for 3PAR StoreServ 8000 Storage Systems
- Replication Services
  - New remote Replication Services indications:
    - Lifecycle indications for rcopy group and volume:
      - `TPD_RemoteGroupSynchronizedInstCreation`
      - `TPD_RemoteGroupSynchronizedInstDeletion`
      - `TPD_StorageSynchronizedInstCreation`
      - `TPD_StorageSynchronizedInstDeletion`
      - `TPD_RemoteGroupSynchronizedInstModification` (CopyState and ProgressStatus changes only)
    - Alert indications for rcopy group and volume up/down:
      - `TPD_RemoteGroupSynchronizedCopyStateAlert`
      - `TPD_StorageSynchronizedCopyStateAlert`
      - `TPD_RemoteGroupSynchronizedCopyStateClear`
      - `TPD_StorageSynchronizedCopyStateClear`
  - Added capability to `CreateGroupReplicaFromElements` in ReplicationService class to create Async Streaming remote copy group. This is done by specifying the DesiredRPO value within the `ReplicationSettingData` parameter. Depending on

the value set for this parameter, either an async streaming or periodic mode rcopygroup is created. For details, see *3.2.2 CIM API Programming Guide*.

- Block Services

  ○ Added vendor extension extrinsic method `TPD_EnumerateVMWareVolumes` in `TPD_StorageConfigurationService` to enumerate VVols (VMWare Volume).

Interface changes

- None

Removed and Deprecated Commands and Options

- The `-httpport` and `-httpsport` options for the `setcim` CLI command are removed.

Modifications to the 3PAR CIM API

Issue ID	Description
110819	The `-httpport` and `-httpsport` options for the `setcim` CLI command are removed. The StoreServ blocks all connections to TCP/UDP ports with non-default values.
112588	The SMI-S cimserver ReplicationServices function `CreateGroupReplica` is corrected for the SyncType Clone as follows: 1. Check if the group specified via the *TargetGroup* parameter is in the same domain as the SourceGroup. 2. If no TargetGroup is specified, create a new group in the same domain as the SourceGroup. The name of the newgroup is taken from the *RelationshipName* parameter, or the ElementName in the *TargetSettingGoal* parameter, or is automatically generated.
114238	Async streaming and Recovery Point Objective support is added to CIMServer Replication Services.
120225	The SMI-S cimserver function `ReplicationServices::GetPeerSystems` is corrected to return the World Wide Name (WWN) of systems that are only reachable via RCIP connections.
121825	Resolved an issue where no StorageVolume instances are returned if a client specifies an empty value for PropertyList in the Associator request of a volume-related CIM_ConcreteJob.
127861	The `CreateGroupReplicaFromElements` function uses the `-nowwn` option of the `admitrcopyvv` command when it adds volumes a newly created Rcopy group.
128205	`TPD_DiskDrive.OtherOperationalStatus` now supports the value 12 indicating a "degraded" state.
133791	The SMI-S cimserver is updated with a StorageSetting that allows creation of TDVV volumes with `TPD_StorageConfigurationService:CreateOrModifyElementFromStoragePool()`. The StorageSetting is defined for SSD based DynamicStoragePools. The `TPD_ReplicationService::CreateGroupReplicaFromElements()` and `CreateElementReplica()` Clone operations are improved to create TDVV clones.
135327	Duplicate `TPD_LUNStatisticalData` instances are no longer reported for diffent VLUNs. The instance iproperty StatisticTime is also now supported.
135667	The extrinsic method `TPD_StorageConfigurationService::TPD_EnumerateVMWareVolumes` is added which returns an embedded list of VMware bulk VVs. The optional filter parameter is a comma separated list: name=name1|name2|... vvolstate=<bound | unbound> vmid=id1|id2|... vmhost=host1|host2|.. vvolsc=vvset1|vvset2|...

Issue ID	Description
	vmname=vmnam1|vmnam2|...
138472	Resolved an issue where cimserver process may get into a situation in which a thread servicing a request becomes unresponsive while holding on to a mutex lock, thus making other threads that are trying to service subsequent requests to line up in queue.
140441	CIMserver reports Async Streaming enablement and RPO value for Async Groups.

4 3PAR OS 3.2.2 Web Services API Release Notes

What's New with the 3PAR Web Services API Software

- Support for 3PAR StoreServ 20000 Storage Systems
- Support for 3PAR StoreServ 8000 Storage Systems
- Added support for the following on-node System Reporter metrics:
  - physicaldiskstatistics
  - physicaldiskcapacity
  - physicaldiskspacedata
  - volumespacedata
  - cpgspacedata
  - vlunstatistics
  - portstatistics
  - cachememorystatistics
  - cpgstatistics – actually logical disk statistics pertaining to a CPG.
- Added support for GET of AO configurations and volume space distribution (equivalent to showvvcpg)
- Added support for configuring async streaming mode
- Added support for creating snapshots off rcopy volumes
- Added license information to system object
- Added support for creategroupsv and updatevv
- Added support for system parameter GET and PUT:
  - remoteSyslog
  - remoteSyslogHost
  - portFailoverEnabled
  - failoverMatchedSet
  - allowWrtbackSingleNode (GET only)
  - allowWrtbackUpgrade (GET only)
  - disableDedup (GET only)

Interface Changes

- None

Modifications to the HPE Web Services API

Issue ID	Description
117675	Resolved an issue in WSAPI where it leaks file descriptor if it fails to connect to the WSAPI socket on another node due to node failure.
123431	Resolved an issue where certain characters like '|' are rejected when setting volume objectKeyValue via WSAPI.
124935	Host persona can be queried by the OS assigned ID and filtered by WSAPI assigned ID. The link to the host persona query by the WSAPI assigned ID is added to the result of the host query.
125889	Resolved an issue where communication with WSAPI server using IPv6 address of the array fails
126230	POST and DELETE of `/remotecopygroup/volumes` map to `admitrcopyvv` and `dismissrcopyvv` commands respectively: POST /remotecopygroup/<rcgroup name>/volumes DELETE /remotecopygroup/<rcgroup name>/volumes/<vv name>
126233	Added WSAPI support for system reporter for physical disk, port, VLUN, CPG, CMP statistic and physical disk, CPG, volume space information.
126234	New iSCSI port fields SendTarget and VLAN are added to ports object.
126490	AO configuration support is added to WSAPI.
126491	WSAPI supports the GET operation on following: • /v1/remotecopygroups/<groupname>/targets • /v1/remotecopygroups/<groupname>/targets/<targetname> • /v1/remotecopygroups/<groupname>/volumes • /v1/remotecopygroups/<groupname>/volumes/<volumename>
137036	A flag is added to cpg object to indicate whether it is dedup capable.
139321	Resolved an issue where updating comment for volumeset or hostset via PUT fails.
140426	A Boolean flag is added in /remotecopy to indicate if the system supports async streaming mode.

Known Issues

Issue ID	Description
106458	Certain values are not included in response from GET /cpgs if they are default values.

5 3PAR OS 3.2.2 EGA Release Notes

Online Upgrade Considerations

This feature allows upgrade of the OS concurrently with I/O activity on the attached hosts, provided certain conditions are met. For more information regarding the required order for upgrade and installation of software components, see the *HPE 3PAR OS 3.2.2 EGA Upgrade Instructions*. For further information and pre-planning of online upgrades, refer to the latest version of the *HPE 3PAR OS Upgrade Pre-Planning Guide*. To obtain a copy of this documentation, go to www.hpe.com/info/enterprise/docs.

Supported Platforms

3PAR OS release supports 3PAR StoreServ Storage. For details, see the SPOCK website at www.hpe.com/storage/spock.

Components

Component	Version
OS	3.2.2.290 GA+P03
CLI Client	3.2.2.290
SNMP Agent	1.8.0
File Persona	1.1.1.1-20150828
Drive Cage Firmware:	
DC4 Firmware	2.64
MCU Firmware (OKI)	4.8.28
MCU Firmware (STM)	5.2.49
DCN1 / DCN2 / DCS1 / DCS2 /DCS7 / DCS8 Firmware	403d
DCS5 / DCS 6 Firmware	1.90
HBA Firmware:	
QLogic QLA4052C HBA Firmware	03.00.01.77
QLogic QLE8242 CNA Firmware	04.15.05
QLogic 8300 HBA FC Firmware	08.01.05
QLogic 8300 HBA FCoE Firmware	08.01.05
QLogic 8300 HBA iSCSI Firmware	05.07.06
Emulex LP11002 HBA Firmware	02.82.x10
Emulex LPe12002 HBA Firmware	02.03.x02
Emulex LPe12004 HBA Firmware	02.03.x02
Emulex LPe16002 HBA Firmware	10.4.395.0
Emulex LPe16004 HBA Firmware	10.4.395.0
3PAR FC044X HBA Firmware	200A8
LSI 9201-16e HBA Firmware	17.11.00

Component	Version
LSI 9205-8e HBA Firmware	17.11.00
LSI 9300-8e HBA Firmware	07.00.00

Modifications to the OS

3PAR OS 3.2.2 Extended General Availability (EGA) includes the following modifications:

- The recovery time is reduced in cases of unexpected node restarts on 3PAR StoreServ 8000/20000 Storage systems.
- Fixed 3PAR StoreServ 20000 port ordering.

What's New in the OS

3PAR OS 3.2.2 EGA provides all the benefits provided by 3PAR OS 3.2.2 GA and includes the following revision:

- The CLI command showversion –a –b now displays Drive Firmware and Firmware Database as version numbers.

Known Issues

3PAR OS 3.2.2 EGA includes the following known issue:

- LPe1600x FW may be displayed incorrectly by *showport -i* and *shownode -pci* CLI commands.

6 3PAR OS 3.2.2 MU1 Release Notes

Online Upgrade Considerations

This feature allows upgrade of the OS concurrently with I/O activity on the attached hosts, provided certain conditions are met. For more information regarding the required order for upgrade and installation of software components, see the *HPE 3PAR OS 3.2.2 EGA MU1 Upgrade Instructions*. For further information and pre-planning of online upgrades, refer to the latest version of the *HPE 3PAR OS Upgrade Pre-Planning Guide*. To obtain a copy of this documentation, go to www.hpe.com/info/enterprise/docs.

Supported Platforms

3PAR OS release supports 3PAR StoreServ Storage. For details, see the SPOCK website at www.hpe.com/storage/spock.

Components

Component	Version
OS	3.2.2.326
CLI Client	3.2.2.326
SNMP Agent	1.8.0
File Persona	1.1.1.1-20150828
Drive Cage Firmware:	
DC4 Firmware	2.64
MCU Firmware (OKI)	4.8.28
MCU Firmware (STM)	5.2.50
DCN1 / DCN2 / DCS1 / DCS2 /DCS7 / DCS8 Firmware	403d
DCS5 / DCS 6 Firmware	1.90
HBA Firmware:	
QLogic QLA4052C HBA Firmware	03.00.01.77
QLogic QLE8242 CNA Firmware	04.15.05
QLogic 8300 HBA FC Firmware	08.01.05
QLogic 8300 HBA FCoE Firmware	08.01.05
QLogic 8300 HBA iSCSI Firmware	05.07.06
Emulex LP11002 HBA Firmware	02.82.x10
Emulex LPe12002 HBA Firmware	02.03.x02
Emulex LPe12004 HBA Firmware	02.03.x02
Emulex LPe16002 HBA Firmware	10.4.395.0
Emulex LPe16004 HBA Firmware	10.4.395.0
3PAR FC044X HBA Firmware	200A8
LSI 9201-16e HBA Firmware	17.11.00

Component	Version
LSI 9205-8e HBA Firmware	17.11.00
LSI 9300-8e HBA Firmware	07.00.00

Modifications to the OS

3PAR OS 3.2.2 MU1 includes the following modifications:

Issue ID	Description
147602	Systems with encryption enabled failed to boot after an offline upgrades from 3.1.3 to 3.2.2 because encryption status could not be determined.
145786	Avoids an unexpected remote controller node restart for large I/Os (>16MB) when using RCFC.
144703	Avoids scenario where conversions will prevent the system from starting after trying to convert a TPVV not aligned on 256 MB.
144921	Avoids an unexpected cluster restart due to excessive consumption of resources.
145163	The Certificate Signing Requests (CSR) being generated by the array did not initialize the CSR version number. This prevent Windows CAs from signing the arrays CSRs. This issue has now been resolved.
116362	During 3PAR OS upgrades, on very rare occasions, the update of NEMOE may be unsuccessful and leave the system with mismatched NEMOE versions. This is now corrected.
149340	The existing 16G driver supports up to 4MB I/O size. The issue is resolved by rejecting any I/O requests above 4 MB, because above 4 MB causes a hung firmware.
148359	When a new virtual volume (VV) is added to the VVSET, if there are any host definitions in the system with an inactive Logical Unit Number (LUN) path, it results in a system manager core. Only check the inactive LUN path that is related to the VVSET to which the new VV is added. If there is an inactive LUN path related to this VVSET, an error is returned due to checking for 90099.
149461	3PAR OS 3.2.2 incorrectly allows the premium mode to be set to an AOCFG object, but it will not allow AO scheduled tasks with premium mode. The functionality was removed but the setting was not.

What's New in the OS

3PAR OS 3.2.2 MU1 provides all the benefits provided by 3PAR OS 3.2.2 EGA and includes the following revision:

- 3PAR Remote Copy provides solution for remote replication that enables flexible business continuity. 3PAR Remote Copy Asynchronous Streaming is a new remote replication mode, along with the existing Synchronous and Periodic Asynchronous modes. This mode eliminates the compromise between performance and the level of data protection. 3PAR Remote Copy Asynchronous Streaming helps the customer easily execute a data protection plan that includes a minimal RPO and protect data for replication distances up to 10ms round trip latency.

NOTE: Contact your Hewlett Packard Enterprise account representative to review the requirements for enabling the 3PAR Remote Copy Asynchronous Streaming feature.

Known Issues

3PAR OS 3.2.2 MU1 includes all known issues from 3PAR OS 3.2.2 EGA.

7 3PAR OS 3.2.2 MU2 Release Notes

Online Upgrade Considerations

This feature allows upgrade of the OS concurrently with I/O activity on the attached hosts, provided certain conditions are met. For more information regarding the required order for upgrade and installation of software components, see the *HPE 3PAR OS 3.2.2 MU2 Upgrade Instructions*. For further information and pre-planning of online upgrades, refer to the latest version of the *HPE 3PAR OS Upgrade Pre-Planning Guide*. To obtain a copy of this documentation, go to www.hpe.com/info/enterprise/docs.

Supported Platforms

3PAR OS release supports 3PAR StoreServ Storage. For details, see the SPOCK website at www.hpe.com/storage/spock.

Components

Component	Version
OS	3.2.2.390
CLI Client	3.2.2.390
SNMP Agent	1.8.0
File Persona	1.2.0.54-20160113
Drive Cage Firmware:	
DC4 Firmware	2.64
MCU Firmware (OKI)	4.8.28
MCU Firmware (STM)	5.2.52
DCN1 / DCN2 / DCS1 / DCS2 /DCS7 / DCS8 Firmware	4044
DCS5 / DCS 6 Firmware	1.90
HBA Firmware:	
QLogic QLA4052C HBA Firmware	03.00.01.77
QLogic QLE8242 CNA Firmware	04.15.06
QLogic 8300 HBA FC Firmware	08.01.05
QLogic 8300 HBA FCoE Firmware	08.01.05
QLogic 8300 HBA iSCSI Firmware	05.07.06
Emulex LP11002 HBA Firmware	02.82.x10
Emulex LPe12002 HBA Firmware	02.03.x02
Emulex LPe12004 HBA Firmware	02.03.x02
Emulex LPe16002 HBA Firmware	10.6.296.0
Emulex LPe16004 HBA Firmware	10.4.395.0
3PAR FC044X HBA Firmware	200A8
LSI 9201-16e HBA Firmware	17.11.00

Component	Version
LSI 9205-8e HBA Firmware	17.11.00
LSI 9300-8e HBA Firmware	07.00.00

Modifications to the OS

3PAR OS 3.2.2 MU2 includes the following modifications:

Issue ID	Description
102537	Adds a safeguard to ensure a consistent Physical Copy from a thinly provisioned source to an existing volume.
113857	Corrects an issue which prevented the BIOS form being properly flashed during a 3PAR OS upgrade.
121029	Alters the collection algorithm to be initiated differently to improve SAS I/O controller file collection success rate.
122710	Corrects an issue in which two nodes could simultaneously become the network master, preventing the array from being managed.
124360	Drive enclosure firmware improved.
124556	Improves network fail-over reliability for the administrative interface.
125677	Corrects an issue in some customer configurations in which certain I/O inefficacy patterns have resulted in conditions where physical disks became inaccessible through one disk port (DP1, DP2) on a given node.
132139	Prevents a situation where the loss of the controller node currently supplying the administrative network interface can result in that interface remaining inaccessible.
134267	Dedup GC generates write-same-zero requests for releasing garbage. These zero dirty pages are now returned to the clean queue after cleaning the associated resources and before sending to logical disk (LD) layer.
134711	Addresses an issue that required HP-UX hosts to rescan to find LUNs used for booting from the array.
137878	Corrects an issue in which, when using certain iSCSI adapters on the initiator side with TCP Timestamp option enabled, header alignment issues affect performance.
142643	Ensures that the volume retains its target port group ID (TPGID) in new groups; after Peer Persistence (PP) switchover.
142759	The array initialization process now correctly displays PD state information.
144921	Prevents excessive system calls when certain TCL processes start or exit.
145574	For 3PAR StoreServ 20000 platforms only, when using the HP560SFP+ HBA, port numbering will now be top-to-bottom, as is the standard convention. For StoreServ 7000 and 8000 platforms, which have horizontal HBAs, the port numbering will remain unchanged.
145693	Removes a slow increase in memory usage caused by processing Report Target Port Group (RTPG) commands on the Protocol Endpoint (PE) LUN, which is automatically exported for VMware persona.
146531	Prevents an unexpected node restart by allowing the Fibre Channel (FC) driver to correctly recover from an unsuccessful operation.
146577	`showportdev fcfabric` command now returns all the devices in the fabric and not limit it to the first 256 members.
146623	Dirty cache buffers are freed after an unsuccessful write to Peer Motion volumes.
147249	The metadata stored in the TOC now has additional logging to aid in analysis.
147603	Prevents host I/O disruption when deleting large Remote Copy snapshots.

Issue ID	Description
147804	Forces the use of the Adaptive Flash Cache (AFC) LDs table of contents (TOC) owner when defining the resources of the LD on the nodes.
148036	Prevents I/Os stalls on the backend of the array, which ultimately results in an unexpected restart of a controller node, by ensuring memory resources are properly freed.
148518	Resolves an issue in which, under certain conditions, node level tuning (tunenodech) may result in excessive disk space usage.
148706	Control pages are now sent to the cage only once to turn off cage and drive LEDs after the `locatecage` time expires.
149055	Added in -ha argument to grow arguments to allow for the grow to work on 2 cage systems.
149174	The `setrcopygroup restore` command now reverts to using the `-nosync -nostart` options.
149344	HPE Inform OS now rechecks the critical faults reported by the PS and fan units.
150221	Extended copy SCSI commands are now aborted if the source LUN is a Remote Copy secondary volume and if the Remote Copy replication direction changes during the extended copy processing.
150289	Detects an invalid originator exchange id (0xffff) used by a remote initiator port in an unsolicited `fc4` command and handle these as unsupported requests.
150719	Eliminates transient power supply error conditions when communicating with the controller node power supply.
150736	Corrects an issue in which the cache availability percentage calculation based on battery life results in an alert stating the cache is degraded.
151221	Corrects an issue that may cause host I/Os to be unsuccessful during a Peer Motion import operation's completion. The host I/Os are unsuccessful due to volumes entering a preserved state while migrating volumes for clustered operating systems using SCSI-3 reservations.
151237	Resolves an issue in which, if a snapshot tree is currently syncing a remote copy snapshot, `updatevv` returns an error.
151611	All timezone values are now recognized by the time conversion routines used in the checkupgrade prechecks, upgradechecks and postchecks that are run during OS upgrades.
152328	Corrects an issue in which the cimserver may exit abnormally when attempting to get an instance of a TPD_VolumeSetting for a legacy volume with no usable space.
152554	Automatic DDS defragmentation is seen for DDS of type TDVV2.
152555	Improvements to the power supply signal monitoring prevent an unexpected controller node restart while performing power supply maintenance on the 3PAR StoreServ 20000 array.
152900	Corrects QLIS driver mailbox synchronization issues.
152961	16 GB array driver for all 3PAR platforms now supports maximum I/O sizes of 16 MB instead of 4 MB.
153729	Bypasses false events indicating "Unable to do I/O to the node drive hw_node_ide".
153769	Issue resolved with memory allocation during inquiry processing.
153931	Limited the number of user initiated Dedup space update process based on system memory of each platform, added a service alert if Dedup garbage collection run exceeds reasonable time threshold, and added support to allow dvar (Ddcscan variables) to be set.
154099	During powerfail recovery, Dedup Store (DDS) is marked pending if any Dedup Client (DDC) aren't closed. Some DDC that aren't closed are appended to DDS's list, preventing DDS to close properly. This issue is corrected and all pending DDC now close.
154469	Corrects an unexpected controller node restart issue after unexpected system manager restart during conversions.

Issue ID	Description
154489	Corrects an issue that may cause host I/Os to be unsuccessful during a Peer Motion import operation's completion. The host I/Os are unsuccessful due to volumes entering a preserved state while migrating volumes for clustered operating systems using SCSI-3 reservations.
154387	Pinned data no longer causes controller node issues on all-SSD arrays.
154837	Prevents memory compromise on a cluster configured with AFC simulation mode if the system manager is restarted or unexpectedly restarts and during OS upgrades.
155429	Minimizes impact of memory usage in the VASA provider.

What's New in the OS

3PAR OS 3.2.2 MU2 provides all the benefits provided by 3PAR OS 3.2.2 MU1 and includes the following revisions:

- 16 GB FC Direct Connect support for all 3PAR platforms; StoreServ 7000, 8000, 10000 and 20000

- Express layout (for SSD only)

- TDVV Scale increase

- Peer Persistence Scale increase

- Online Import for IBM XIV

- 16 GB array driver for all 3PAR platforms now supports maximum I/O sizes of 16 MB instead of 4 MB, starting with 3.2.2 MU2

NOTE: Contact your Hewlett Packard Enterprise account representative to review the requirements for enabling the 3PAR Remote Copy Asynchronous Streaming feature.

Known Issues with the OS

Issue ID	Description
123082	Once a VMware storage policy has been assigned to a newly created VVol-based VM, it can't be changed using the vSphere interface. VVol storage policies (such as the CPG) can be changed by migrating the VM to a different datastore, and then migrating back, with a new storage policy.

Modifications to File Persona

Issue ID	Description
51218	Only `chmod`, `chown`, `chgrp`, and `ls` are elevated to super user privileges with the local Administrator account. To perform other operations like `rmdir` on files where the administrator does not have sufficient access, a command should first be issued to `chown/chgrp/chmod` the object and then operate on it. This issue is corrected.
52463	There is an internal cache in one of the system processes that runs out of space after 16 FPGs have been created. The process will be automatically restarted and no manual corrective action is required.
52700	This scenario can occur if the nodes are attached to only a single switch and the switch goes down. It can occur in other scenarios in which all network links on a backup node are down at the time a failover is being processed. Once the network links are back up, the corrective action is to use the `setfpg -failover` command to bring the FPG command back to its proper owner.
52850	If some file persona nodes are stuck "Starting" after a system shutdown or after `stopfs` for all nodes, the FPGs associated with the down node will not be automatically migrated to the backup node. The FPGs should be migrated with the `setfpg -failover` command.
53438	Corrects folder recovery issue in which folders are stranded because due to invalid GIDs.

Issue ID	Description
53582	Corrects an issue in which creating an SMB share of an existing directory overwrites the existing permissions, causing potential DU on other protocols' clients.
53637	Before changing the MTU, all FPGs should be deactivated. After the MTU change, they can then be reactivated.
53640	HP-SMB space replacement character for user and group names.
53649	Unexpected failover of FPGs may occur while running a SPECfs workload. If this occurs, an alert will be generated, and the FPGs should be failed back to their original node with the `setfpg -failover` command. This issue is corrected.
53716	After creating a share directory, you need to create an export with no_root_squash, mount as root, and use chmod/chown/chgrp to modify permissions to something less restrictive. This no_root_squash export can be created with an allowed IP list of a single client to reduce any security impact.
55879	Corrects an issue in which NFS shares were unable to be restored.
56683	Corrects an issues in which, if one wants to rename a file where the characters in the file name only differ in case (e,g file.txt to FILE.txt), then one needs to rename the file in a two-step process 1. Rename file.txt temp 2. Rename temp FILE.txt. Note that SMB is case insensitive but case preserving so the file "file.txt" is the same as "File.TXT".
56685	This condition might likely occur either during boot time, if for example a switch is down, or during failover time. After the link comes up, if the VFS IP is not pingable, the FPGs should be manually deactivated and reactivated using `setfpg -deactivate`and `setfpg -activate` or failed over to the partner node with `setfpg -failover`. Either of these approaches will cause a retry of the network activation, which can now succeed if the link is up.
57056	File Persona settings outside of the Virtual File Server are properly restored in a bare metal scenario.
57057	User flow for modifying the provider stacking order is corrected.
63175	The `signingenableed` and `signingrequired` options in `setfs smb` and `showfs -smb` now relate to the connection between a client and the 3PAR File Persona. They formerly were controlling the connection between the 3PAR File Persona and the AD server.
68603	Corrects an issue in which File Persona FPG limit is 16 FPGs per StoreServ controller node pair. FPG counts beyond this are not supported.
68615	Addresses HP-SMB service stuck during continuous restarts while working with large AD infrastructure.
72784	Corrects an issue in which the error message "Internal Error" displays when trying to mount FPG with ODV 12.0 on 1.1 software after remote copy.
74770	Customers exceeding the number of tree connects get "Not enough resources" error message. This issue is corrected.
75818, 75820	In some cases, removing a Virtual Tape Library (VTL) device from the cluster using the `setfsndmp vtl -<IP address of the VTL>` command appears indicate that the tape drive and robot information pertaining to the VTL are removed, but the VTL IP address information is still listed. This can be ignored.

What's New with File Persona

File persona revisions:

- Higher scalability: 512 TB total file capacity for 8 node 20000 system

- Network expansion: Separate static routes for each VLAN

- FPG alignment with 16k deduplication allocation units

- Quota accounting to exclude snapshot space

- Support for Windows 10 (Refer to the SPOCK website at www.hpe.com/storage/spock for the complete interoperability matrix.)

Known Issues with File Persona

Issue ID	Description
65361	SuSE SLES11 (first release) and SLES11 SP1 client does not support NFS4 ACL
73108	Creating a share with the name "0.0" shows as "0".
74742	In case a VFS or File Store is created containing special characters in its name, i.e. mt`ree0, and the file system is mounted in a passive node, it will not be possible to delete this VFS/File Store. The workaround for this is to mount the file system in the active node and then delete the VFS/File Store.
74914	Major alerts are generated when the user removes the non-existent snapshot. This alert needs to be ignored as this condition is valid and no user action is required.
74941	When a SMB share creation operation is executed using a share name that is already in use for another SMB share, it won't be successfully created because this is a duplicated share. This action is improperly generating major alerts. When this alert is found, it's required to check the if this is a duplicate share, if so this alert can be ignored or the validity of the user operation can be checked.

8 3PAR OS 3.2.2 MU2 CLI Release Notes

Installation Notes for the CLI

Virus Checking

Virus checking is known to slow down and potentially cause issues with installation of the CLI. Before attempting an install or uninstall of the Remote CLI client, shut down all running applications and disable virus-checking software.

Deprecated Commands and Options

The deprecated options for the `cli`, `createuser`, and `setpassword` commands have been removed from the documentation.

Compatibility Changes in this Release

Remote CLI client versions earlier than Remote CLI client 3.2.2 cannot connect to the 3PAR OS, without using `-nosockssl` option.

Compatibility Changes in Next Release

The following options will be removed:

`cli`: `-pwf`, `-user`, `-password`, and variable `TPDPWFILE`

`createuser`: `-e`

`setpassword`: `-save`, `-saveonly`, `-file`

Installation Directory

Windows 32-bit: `C:\Program Files\Hewlett-Packard\HP 3PAR CLI`

Windows 64-bit: `C:\Program Files (x86)\Hewlett-Packard\HP 3PAR CLI`

UNIX and Linux: `/opt/hp_3par_cli`

Supported Operating Systems

For the list of supported operating systems, see the *HPE 3PAR CLI Remote Client* document on the SPOCK website at www.hpe.com/storage/spock.

Modifications to the CLI

Issue ID	Description
146781	Due to limited memory, the variable used in earlier releases to gather statistics for VVs has now been obsoleted by current code. The allocated memory was not freed up upon every call to `statvv`. This variable has been removed to stop the memory leak when `statvv` is run.
148636	Issue corrected with `cgcmd` when executing the `ddump` command.
151580	If a system is capable of supporting Flash Cache and it is enabled, CLI command `createflashcache` creates Flash Cache LDs per node with the node being owner of these LDs. Due to the issue in checkhealth, it thinks that connection to each of these LDs from other nodes is not an owner of Flash Cache LD. This issue is corrected in this release by avoiding such check that is done for other LDs which has multiple node ownership.

What's New in the CLI

The following new commands are added in 3PAR CLI 3.2.2 MU2:

Command	Description
`createfsroute`	Creates a route for a target address with a gateway
`removefsroute`	Removes an existing route for a target address
`setfsroute`	Modifies an existing route for a target address
`showfsroute`	Displays routes for target addresses

Changed commands

Command	Options added (unless stated otherwise)
`createvfs`	`-snapquota`
`setfs`	`auth -clearcache`
`setfsquota -clear`	`-uid, -gid`
`showfs -smb`	Output changed
`showfsndmp`	Changed output format

9 3PAR OS 3.2.2 MU2 CIM API Release Notes

Modifications to the CIM API Software

Issue ID	Description
145564	TPD_HostedStoratePool association returns all CIM_StoragePools associated with the StorageSystem even when client requested only TPD_StoragePool in ResultClass. This has been corrected.
146214	New event is added when CIM configuration is changed via setcim CLI command.
151226	The TPD_StorageConfigurationService::ModifySynchronization(detach) operation would sometimes expire when the volume being detached was "busy" being referenced by an internal maintenance job on the 3PAR system. This issue has been corrected.
152210	A new cimserver policy has been added to set the SMI-S Interop namespace such that it conforms to the SMI-S 1.6 specification. Use the setcim CLI command to set the no_use_pegasus_interop_namespace policy for SMI-S Interop namespace compliance. The default policy is use_pegasus_interop_namespace, which is backward compatible with previous releases for cimserver.
153854	The method TPD_StorageConfigurationService::CreateReplica occasionally reports that it was unable to create a snapshot volume when in fact it did create the volume. The problem occurred because of an internal caching error, which has now been corrected.

What's New with the CIM API Software

A new cimserver policy has been added to set the SMI-S Interop namespace such that it conforms to the SMI-S 1.6 specification. Use the setcim CLI command to set the no_use_pegasus_interop_namespace policy for SMI-S Interop namespace compliance. The default policy is use_pegasus_interop_namespace, which is backward compatible with previous releases for cimserver.

NOTE: Support for TLS v1.0 and v1.1 will be deprecated and removed in a future release, making TLS v1.2 the only supported version. Please migrate your client to use TLS v1.2 and the ciphers DHE-RSA-AES256-GCM-SHA384 and/or DHE-RSA-AES128-GCM-SHA256 as soon as possible.

10 3PAR OS 3.2.2 MU2 Web Services API Release Notes

Modifications to the Web Services API Software

Issue ID	Description
144090	WSAPI URL is added to showwsapi output.
144650	Issues corrected when a hostset comment contains certain characters such as " or [.
146174	New event is added when WSAPI configuration is changed. In the following condition, this new event will occur: • WSAPI server is started (startwsapi) • WSAPI server is stopped (stopwsapi) • WSAPI configuration is changed (setwsapi)
150067	Issues corrected with PUT of /qos on vvset.
152206	There were limited memory resources in WSAPI server when establishing sessions. This has been corrected.

What's New with the Web Services API Software

- Added the following support for remotecopytargets object:

    ◦ GET

    ◦ PUT of target policy (mirrorConfig)

- New latencyGoaluSecs in qos object. Use this to set QoS latencyGoal in usec.

- New differentSecondaryWWN option when admitting a volume to a remotecopygroup. When used with volumeAutoCreation set to TRUE, this ensures a different WWN is used on the secondary volume. Without this option and with volumeAutoCreation set to TRUE, the same WWN will be used for both primary and secondary volumes.

- Web services API now supports TLS v1.1 and v1.2 as well as two new ciphers, DHE-RSA-AES256-GCM-SHA384 and DHE-RSA-AES128-GCM-SHA256.

NOTE: Support for TLS v1.0 and v1.1 will be deprecated and removed in a future release, making TLS v1.2 the only supported version. Please migrate your client to use TLS v1.2 and the above two new ciphers as soon as possible.

Known Issues

Issue ID	Description
106458	Certain values are not included in response from GET /cpgs if they are default values.

11 Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:

  www.hpe.com/assistance

- To access documentation and support services, go to the HP Support Center – Hewlett Packard Enterprise website:

  www.hpe.com/support/hpesc

Information to collect

- Technical support registration number (if applicable)

- Product name, model or version, and serial number

- Operating system name and version

- Firmware version

- Error messages

- Product-specific reports and logs

- Add-on products or components

- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.

- To download product updates, go to either of the following:

  - HP Support Center – Hewlett Packard Enterprise **Get connected with updates from HP** page:

    www.hpe.com/support/e-updates

  - Software Depot website:

    www.hpe.com/support/softwaredepot

- To view and update your entitlements, and to link your contracts, Care Packs, and warranties with your profile, go to the HP Support Center – Hewlett Packard Enterprise **More Information on Access to HP Support Materials** page:

  www.hpe.com/support/AccessToSupportMaterials

  (!) **IMPORTANT:** Access to some updates might require product entitlement when accessed through the HP Support Center – Hewlett Packard Enterprise. You must have a Hewlett Packard Enterprise Passport set up with relevant entitlements.

Websites

Website	Link
Hewlett Packard Enterprise Information Library	www.hpe.com/info/enterprise/docs
HP Support Center – Hewlett Packard Enterprise	www.hpe.com/support/hpesc
Contact Hewlett Packard Enterprise Worldwide	www.hpe.com/assistance
Subscription Service/Support Alerts	www.hpe.com/support/e-updates
Software Depot	www.hpe.com/support/softwaredepot
Customer Self Repair	www.hpe.com/support/selfrepair
Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix	www.hpe.com/storage/spock
Storage white papers and analyst reports	www.hpe.com/storage/whitepapers

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

www.hpe.com/support/selfrepair

Remote support

Remote support is available with supported devices as part of your warranty, Care Pack Service, or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

For more information and device support details, go to the following website:

www.hpe.com/info/insightremotesupport/docs

Documentation feedback

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