

HP 3PAR OS 3.1.2

Release Notes

Abstract

This document describes the features and issues included in HP 3PAR OS 3.1.2 and is intended for use by HP customers, partners, and HP field representatives. This document is applicable to HP 3PAR OS 3.1.2.278 (GA), HP 3PAR OS 3.1.2.322 (MU1), HP 3PAR OS 3.1.2.422 (MU2), HP 3PAR OS 3.1.2.422 (EMU2), and HP 3PAR OS 3.1.2.484 (MU3).



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1 HP 3PAR OS 3.1.2 GA Release Notes

Online Upgrade Considerations

This feature allows the upgrade of the OS concurrently with I/O activity on the attached hosts, provided certain conditions are met. For further information and pre-planning of online upgrades, refer to the latest version of the *HP 3PAR OS Upgrade Pre-Planning Guide*. To obtain a copy of this documentation, go to <http://www.hp.com/3par/support/manuals>, select your product, and then click **Manuals**.

⚠ WARNING! Beginning with HP 3PAR OS 3.1.2, Adaptive Optimization (AO) is implemented on the nodes together with an on-node version of System Reporter (SR). After upgrading to HP 3PAR OS to 3.1.2.278 (GA), AO will need to be configured on the nodes; AO implemented by external SR will no longer work for systems running HP 3PAR OS 3.1.2. There is no direct conversion from external System Reporter-based AO configurations and HP 3PAR OS 3.1.2 AO, see the *HP 3PAR CLI Administrator's Guide* for additional information on how to configure AO on-node. SR 3.1 should be used for performance analysis and reports.

⚠ CAUTION: If you are running any Recovery Manager or System Reporter applications you must upgrade to the latest versions (RM-E 4.4, RM-S 4.4, RM-O 4.3, RM-V 2.4, or SR 3.1) **before** upgrading to HP 3PAR OS 3.1.2. These later Recovery Manager and System Reporter versions are the only versions compatible with HP 3PAR OS 3.1.2, and as they are backwards compatible with HP 3PAR OS 2.3.1 and 3.1.1 there is no issue with upgrading them **before** upgrading the HP 3PAR OS.

NOTE: Direct upgrades from 3.1.1.226 to 3.1.2.278 are not supported with the initial release of HP 3PAR OS 3.1.2, but are expected to be supported at a future date.

Customers running 3.1.1 and wishing to upgrade to 3.1.2 will need to upgrade to the latest 3.1.1 Maintenance Update (MU) prior to upgrading to 3.1.2.

Supported Platforms

See the Single Point of Connectivity Knowledge for HP Storage Products (SPOCK) website at <http://www.hp.com/storage/spock>.

End of Support Features

The following features are no longer supported by HP 3PAR:

- Direct Connect for Remote Copy over Fibre Channel (RCFC).
- Port Personas, as Host Personas are now used.

Components

Component	Version
OS	3.1.2.278
CLI	3.1.2.278
SNMP Agent	1.6.0

What's New in the OS

HP 3PAR OS 3.1.2 enables customers to increase multi-tenant consolidation on shared infrastructure and increase agility and efficiency with several new features and enhancements. HP 3PAR OS 3.1.2 supports the new HP 3PAR StoreServ 7000 Storage.

HP 3PAR OS 3.1.2 features include the following benefits:

- Enhanced multi-tenancy and several scalability and resiliency features
- Autonomic management for agility and ease of use with enhancements to Autonomic System Rebalance, Adaptive Optimization and other enhanced capabilities
- Thin Technologies for efficiency and capacity reduction with tighter integration with Windows Server 2012
- Federated Technologies for providing online data migration with Online Import between EVA Storage and 3PAR storage

NOTE: The HP 3PAR OS 3.1.2 introduces a new host persona for ESX, host persona 11. Host persona 11 should be used when configuring any new ESX host. Persona 6 remains fully supported.

Multi-tenancy for Consolidation on Scalable, Resilient Infrastructure

HP 3PAR StoreServ Storage

HP 3PAR Operating System (OS) 3.1.2 enables support for HP 3PAR StoreServ 7000 Storage system, a new, midrange offering from the world's most advanced storage platform, bringing massive scalability and advanced features to the midrange storage.

Multi-tenancy Enhancements

- Persistent Ports: Reduces the dependency on multipath software during the process of Online SW Upgrade. Persistent Ports enables the host paths to remain online during the online upgrade process.
- Significantly improved the performance of group snapshot creation and deletion by grouping the necessary metadata updates and also running the deletion as a background task.
- Enhanced the Logical Disk check mechanism to reduce the time duration it takes to complete and to also serve data while the check is in progress.

Remote Copy Enhancements

- HP 3PAR Remote Copy Software has been enhanced to support Synchronous mode and Asynchronous Periodic mode between a pair of HP 3PAR StoreServ Storage.
- Ability to support bi-directional replication between the Source and the Synchronous target in a Synchronous Long Distance Remote Copy configuration.
- The ability to mix Remote Copy ports with host ports on the same HBA for HP 3PAR StoreServ 7000 Storage.
- Ability to support bi-directional replication on both the links in a 1:2 Remote Copy configuration.
- Ability to move Remote Copy Volumes from one Remote Copy Volume Group to another without having to perform a full synchronization
- Remote Copy is enhanced to support auto creation of a volume and the ability to automatically add the volume to the Remote Copy group on the secondary array. The auto created volume on the secondary site by default will have the same size, type, and WWN as the primary site. For the auto created volumes a volume grow operation on the primary site will trigger a volume grow operation automatically on the secondary site.

Autonomic Management for Agility and Ease of Use

- HP 3PAR Adaptive Optimization software has been enhanced to support all manageability and configuration using HP 3PAR management console and CLI. The data for AO is now maintained on the StoreServ Storage in an internal database.
- Autonomic Rebalance capability is now available as part of the HP 3PAR OS. Autonomic Rebalance provides the ability to analyze how volumes on the HP 3PAR Storage System are using physical disk space and makes intelligent, autonomic adjustments to ensure optimal volume distribution when new hardware is added to the system.
- Added the ability to retrieve and display Fibre Channel fabric information to provide the users with a single location to obtain switch models, logs and other connectivity information.
- Ability to instantly export a full copy to the host while the data is being copied as a background task.
- Common Provisioning Groups are created by default based on the drive configuration once the new hardware is admitted to the system.
- Introducing HP 3PAR Web Services API which is a well-defined application programming interface that customers can use for end-to-end automation of their service delivery and management of HP 3PAR StoreServ Storage.
- Re-imaging the local drive on the node has been simplified and automated in most scenarios. The drive is re-imaged by leveraging the image from the master nodes in the system through the backplane.
- Introducing HP 3PAR SmartStart for HP 3PAR StoreServ 7000 Storage which simplifies the startup functionality and guides the administrator through the configuration of HP 3PAR StoreServ Storage, HP 3PAR Service Processor, and Production Application hosts.

Thin Technologies for Efficiency and Capacity Reduction

- Array integration with Windows Server 2012 storage features such as Thin Provisioning, Space reclamation with UNMAP, and Offloaded Data Transfer (ODX) capabilities. These capabilities in addition to providing capacity efficiencies also minimize administrative tasks.
- Conversion of fully provisioned volumes to thin provisioned volumes and vice versa has been enhanced to provide the ability to convert the volumes online so that the applications need not go through an offline transition from the old volumes to the new volumes.

Federated Technologies

- Introducing EVA to 3PAR Online Import: The EVA Command View will enable the orchestration of data migration from a source EVA storage system to a destination 3PAR storage system. Customers can migrate EVA virtual disks and host configuration information to a HP 3PAR StoreServ Storage system without having to change host configuration or interrupting data access. Peer Motion is the fundamental technology that enables this capability.
- Peer Motion configuration and management between HP 3PAR StoreServ Storage can now be orchestrated through the HP 3PAR Management Console.
- Introducing HP 3PAR Peer Persistence which enables HP 3PAR StoreServ Storage systems located at metropolitan distances to act as peers to each other, presenting a nearly continuous storage system to hosts and servers connected to them. This capability allows you to configure a high-availability solution between two sites or data centers where failover and failback remains completely transparent to the hosts and applications running on those hosts.

Other Enhancements

- Provides the ability to force the shutdown of the HP 3PAR StoreServ Storage node for maintenance if there are active tasks running without having to manually stop all the tasks before shutting down the node for maintenance.

HP 3PAR Remote Copy software now leverages the HP 3PAR Thin Built-In ASIC to detect and eliminate the remote replication of zero pages during initial synchronization and ongoing synchronous replication. As a result, precious remote copy link bandwidth is utilized efficiently by replicating non-zero written data only. This capability also enables near-instant initial synchronization of new volumes that are added to a remote copy group.

Special capacity savings stem when remote copy bandwidth optimization is coupled with HP 3PAR Thin Conversion and Thin Persistence Software. Fully provisioned, “fat” source volumes can be converted simply and rapidly to higher efficiency, “thin” target volumes during remote replication while making efficient use of remote copy bandwidth. Capacity associated with zero pages on the source volume is eliminated on the replication target volume. Thin Persistence keeps the thin target volume as lean and efficient as possible.

Modifications to the OS

The following items are addressed in this release:

Issue ID	Item	Description
39805	Rate Limit LUNs Changed Unit Attentions	Limit the rate at which REPORTED LUNS DATA HAS CHANGED Unit Attentions are raised to an SCSI initiator to a maximum of one in any thirty second interval to avoid overwhelming the host.
46335	IMC shows CPG as failed although the CPG can grow	A software defect in the CPG growth area causing the IMC to incorrectly display CPG as failed has been fixed.
46983	Configure fabric ports in target mode after node replacement	Addresses an issue in earlier software releases where Emulex HBA ports configured in host/fabric mode could be switched to initiator mode after node replacement. Fibre Channel HBA ports configured with 'point' connection type for fabric topology will be switched to target mode, as 'point' connection type is supported only in target mode.
50874	Speeding up the chunklet state transition into logging state	The time it takes to transition a chunklet into logging state is now 20 seconds, and the scsi timeout is now 5 seconds (from 40 and 10 respectively). In addition, Once a disk has one chunklet in logging mode, additional chunklets will transition into logging state after a single write failure.
53517 (also 53613)	Dynamic Logic: IMC keeps showing CPGs degraded	When a CPG fails to grow an alert is raised, e.g: <pre> Id : 44 State : New Message Code: 0x270009 Time : 2010-07-29 03:12:54 PDT Severity : Critical Type : CPG growth failure Message : CPG al SD grow command: createald -wait 0 -cpsd al -ha disk -p -dk 70-79 -devtype NL -n tp-10-sd-2 -sz 1638 : Failed with: There are no disks with free space in the system </pre> There was an issue where if later the CPG could grow then the alert was not cleared correctly. This fix clears the alert appropriately.
53930	Clear IMC CPG growth failure flag	After a CPG has failed to grow and then subsequently succeeded, then the CPG growth failure flag is erroneously left set. This results in the CPG being displayed as growth failed in the IMC. The flag is now reset appropriately after the CPG grow succeeds.
54424	Issue to track DIF performance findings for NL drives. Primary area of performance loss is expected (RAID1 volumes).	Raid1 NL write performance will be less due to DIF on HP 3PAR StoreServ Storage 7000 systems.

Issue ID	Item	Description
54956	2.3.1 MU1: sysmgr panicked, system pending pfail recovery	When resynchronizing a volume over 2TB in size to a rcopy secondary system, a 32bit counter used to represent the number of contiguous blocks which has ""delta"" data since the last resync may overflow. HP 3PAR OS has since been enhanced to use 64bit counters.
55196	Configure fabric ports in target mode after node replacement	Addresses an issue in earlier software releases where Emulex HBA ports configured in host/fabric mode could be switched to initiator mode after node replacement.
56781	Allows IMC support for scheduler	In 3.1.1.MU1, there will be IMC support for the scheduler because this bugfix enables the required functionality in the HP 3PAR OS.
57495	sysmgr panic and degraded single esi port for all cages when removing vv from cpg	The command <code>setvv -snp_cpg</code> (remove the snapspace CPG) was causing the System Manager to crash for Virtual Volumes created via <code>createaldrv</code> , which had space reclaimed. This command should now work without error, provided that there is no snapshot on the Virtual Volume.
58251	Remote copy traffic may stall if destination link IP address corresponds to a local link address	To avoid potential problems with stalled remote copy traffic, in 2.3.1.MU5 the <code>createrecopytarget</code> and <code>admitrcopylink</code> commands will not permit destination link IP addresses that correspond to local RCIP link addresses or the address of the management interface.
60029	Fixed chunklet relocation after media failures.	Media failures on certain chunklets would sometimes prevent relocation of other chunklets from the raid set as well as returning a preserved LD back to normal. This has now been fixed.
60141	HP 3PAR system Panic - tpd: Assertion point: file: cmp.c, line: 16883	When a controller node rejoins cluster, HP 3PAR OS attempts to rebalance the load across system. During the rebalancing process, the current HP 3PAR OS does not handle the out of resource condition which can cause entire system to be offline. The fix is to make sure there is enough resource before starting the load rebalancing process.
60272	Failed snapshots for atlantis cluster -	There is a new database created in the "Atlantis" instance, called "OAuth". Notice that there is a "space" in the name of the database. For some reason, definitely a bug with the SQL writer, the writer fails to come up; which explains why we don't see it in the list of vssadmin writers. This topic has been discussed, and the user apparently found the solution with no acknowledgement from Microsoft. http://social.technet.microsoft.com/Forums/en-US/dpmsqlbackup/thread/432b4e38-6c7c-4fe0-abe5-769275784fcf/
60494	When deleting a very large and filled snapshot can lock up a CPU for long time	If we have a heavily loaded system and have snapshots with lots of data, the meta data tables which are heavily populated, then on deleting some of these snapshots the meta data tables are traversed causing the cpu on occasions to be held for an excessive amount of time. This can cause the locking out other processes/tasks from running and can cause the background internode comms processing to be delayed resulting in the erroneous belief that one of the other nodes has died. This fix prevents the cpu from being held for an excessive amount of time while traversing the the meta data tables during snapshot removal. This fix includes an enhancement (65646) to cover the case where the meta data tables are being merged during snapshot removal. This fix with enhancement is applied to 2.3.1.MU5, 3.1.1.MU1, 3.1.2. The fix without the enhancement is in 3.1.1.(This is also logged as # 52911).
61058	Raw space alerts	Excessive raw space alerts have been seen when AO is configured on a system. In 3.1.2 we have provided the ability to set raw space alert threshold to 10g to suppress these alerts.
61363	Removal of volume from exported VV set could cause sysmgr crash	It was possible to try to remove a VV that had been just removed from an exported VV set before the VV export was fully cleaned up. In some instances this would cause sysmgr to crash and restart.

Issue ID	Item	Description
62000	<code>setvv -snp_cpg</code> behavior with shared logical disks corrected	Using <code>setvv -snp_cpg</code> on virtual volumes relying on shared logical disks was causing a panic of the system manager. The behavior of <code>setvv</code> has been corrected: now all the virtual volumes sharing logical disks must be specified as arguments, otherwise the command will fail.
62135	Disk replacement now better handles premature closing	In prior releases SP, if one prematurely exited the GM script replacement, the scripts may misinterpret 'abandoned' files with state information. This is corrected in SP 2.5.1.
62212	Host ID shown in the CLI command <code>showhost -agent</code> is incorrect.	Host ID shown in the CLI command <code>showhost -agent</code> is incorrectly showing the internally generated host ID from the HP 3PAR system and not the one reported by the Host Explorer running on the host. Workaround is to consult the Host Explorer for the ID.
62564	Do not use the SCSI-2 reservation lock when servicing the <code>MCLP_SCSI2_SHOW mcall</code>	<code>showsv</code> and the IMC retrieving reservation info will no longer cause a long block of being able to run other commands.
63214	Multiple <code>tpds_scsi_thread</code> eventlog entries	Incorrect reference counting in earlier versions of HP 3PAR OS may lead to a large number of debug eventlog entries of the form " <code>tpds_scsi_thread 4816921 secs lapsed on entry: "</code> on host deletion. This issue has had no other observed impact and the reference counting has been corrected in HP 3PAR OS 3.1.2.
63307 (also 43798)	Improve detection of HBA mailbox timeouts	Under heavy CPU load, sometimes HBA mailbox commands are incorrectly deemed timed out, resulting in the driver taking a firmware core dump and resetting the HBA. The driver has been modified to avoid incorrectly treating mailbox commands as timed out.
64109	On rare occasions a link down event on a Remote Copy IP link can lead to system unavailability	The underlying behavior that led to this potential instability has been identified and corrected.
64138	Record Timing Information for Reservations	System Manager has been updated to track the time taken to process SCSI-II and SCSI-3 reservation requests and to log any abnormally high processing times. Slow processing of reservation requests has been seen on heavily-loaded customer systems and the additional diagnostic information will help to identify this condition.
64497	Issue Capacity Change Notification to HP-UX hosts	Issue 'CAPACITY DATA HAS CHANGED' SCSI Unit Attention to hosts which use the HP-UX host persona on VV grow. This will allow recent versions of HP-UX to detect volume resize automatically.
64814	Issuing <code>startrcopy -nosync <grp></code> when a group is already started may lead to the system going offline	To avoid the system potentially going offline during a Remote Copy resync operation, the <code>startrcopygroup -nosync <grp></code> will now return a failure in 2.3.1.MU5 if RC group is already started.
64924	System Reporter and Adaptive Optimization Functionality	System Reporter and Adaptive Optimization functionality has been added into HP 3PAR OS.
65389	Rate Limit LUNs Changed Notifications	Limit the rate at which REPORTED LUNS DATA HAS CHANGED Unit Attentions are raised to a SCSI initiator.
65460	Memory leak if vv block failure occurs	When setting up a virtual volume block, we allocate some memory upfront. If the virtual volume block fails, we may not free this memory which can cause a memory leak. To resolve this issue the allocated memory is now released upon virtual volume block failure.
65463	On rare occasions bad RTC battery sets PR failure timestamp way in future ultimately degrading BBU (Battery Backup Unit) charge level to 0% and preventing same from improving	Bad RTC battery on master node can cause system's time to set in distant past or future. That, in turn, causes battery's charge level to drop to 0% due to bug in battery manager (a thread of <code>sysmgr</code>). It also prevents battery's charge level to improve. Hence, with 0% cache system goes in to write-through mode with 0% cache. We have fixed the bug in 2.3.1.MU5 which was also propagated to all the later releases. The fix makes sure that system-time is always

Issue ID	Item	Description
		coherent and let the battery charge level to set to normal. On releases before 2.3.1.MU5, there's no workaround that would fix the problem without interrupting system. On such system, the only way to get the system to work normally is to restart sysmgr.
65646	Deleting a very large and filled snapshot can lock up a CPU for a long time	If we have a heavily loaded system and have snapshots with lots of data, the meta data tables of which are heavily populated, then on deleting some of these snapshots the meta data tables are traversed causing the cpu on occasions to be held for an excessive amount of time. This can cause the locking out other processes/tasks from running and can cause the background internode comms processing to be delayed resulting in the erroneous belief that one of the other nodes has died. This fix prevents the cpu from being held for an excessive amount of time while traversing the meta data tables during snapshot removal. This fix includes an enhancement to cover off the case where the meta data tables are being merged during snapshot removal. This enhancement fix is applied to 2.3.1.MU5, 3.1.1.MU1, and 3.1.2.
65663	Core dumps	The firmware has a bug where it trashes its internal copy of scatter gather list which results in the fw trying to access invalid/incorrect addresses. This bug can be triggered only when fw is requiring to use DDR memory for BLP storage. If DDR memory was used at any time in the past, there is a potential of the fw polluting its internal memory (and thus using invalid/incorrect host memory addresses) till the port has been reset.
65722	Cluster goes offline following Synch Remote Copy Group Stop	When stopping a Synchronous Remote Copy Group in the middle of re-sync phase following the admission of additional volumes into that group can cause the cluster to go offline.
65775	Cluster goes offline following Synch Remote Copy Group Stop	When stopping a Synchronous Remote Copy Group in the middle of re-sync phase following the admission of additional volumes into that group can cause the cluster to go offline.
65800	Move AO configuration into the TOC	Four new commands have been added to allow the creation, update, removal and display of Adaptive Optimization configurations via the CLI. These new commands are: <ul style="list-style-type: none"> • <code>createaocfg</code> - create a new AO configuration • <code>setaocgg</code> - modify an AO configuration • <code>removeaocfg</code> - remove an AO configuration • <code>showaocfg</code> - show AO configurations See the individual commands for usage & licensing information.
65906	node/port symbolic information	Fibre Channel (FC) target ports will register new node and port symbolic information starting in 3.1.2. Node symbolic information is of the form: Legacy systems: HP_3PAR 7000 <model>-<serial>-fw:<release> 7200 systems: HP_3PAR 7200 - <serial>-fw:<release> 7400 systems: HP_3PAR 7400 - <serial>-fw:<release> where <model> is the legacy system model, such as V800; <serial> is the system serial number, e.g., 1499607; and <release> is a four digit number representing the HP 3PAR OS release and MU, e.g., 3120 for 3.1.2 GA, 3121 for 3.1.2 MU1. Port symbolic information is of the form: <serial> - <n:s:p> — <type> where <serial> is the system serial number, e.g., 1499607; <n:s:p> is the location of the port, e.g., 1:3:2; and <type> is the type of the HBA, eg., LPe12004. Node and port symbolic information are registered with the FC fabric. On Brocade switches, <code>nsshow</code> will display this information. On Cisco

Issue ID	Item	Description
		switches, show fcns database detail will display this information. HP's SAN Visibility software will key off this information.
65930	Improve peer motion performance for full VVs	Earlier full VVs used to be in writethru during import, and this impacted the VV performance as more regions are moved to local LDs over time. Now full VV and TPVV volumes are imported in the same way and the local LDs are no longer in writethru.
66414	Renamed SNMP MIB definitions file	The SNMP MIB definitions file used by HP 3PAR is provided on the release CD as a courtesy for customers that wish to compile the SNMP MIB. The file has been renamed so that the new name matches the 3PAR MIB name defined in the file. The name has been changed from <code>cd1/contents/snmp/3PAR-MIB.mib</code> to <code>ThreeParMIB.mib</code> in the same directory.
66436	TOCs more than a day old no longer invalid choice for automatic selection.	In HP 3PAR OS version 3.1.1, a check was added when selecting a TOC after system reboot to prevent automatically selecting a TOC more than a day old. this change is reverted.
66491	Fixed partial page data inconsistency issue for rw snapshots with zero tte	Under certain conditions, if a node goes down, and an rw snapshot with zero detect enabled has a partial page write in progress, the rest of the page could get corrupted with data from the parent of the rw snapshot instead of being set to zero. Fixed node down recovery to handle this situation properly.
66706	Support for RW snapshots from RW bases	Read write snapshots can now directly be created from Read write bases or other read-write snapshots. This process will not require an explicit read-only snapshot creation in the middle.
66707	createsvgroup/createvvset: support for RW snapshots from RW bases	creategroupsv now supports creation of RW snapshots from RW bases (or snapshots), instead of only from RO snapshots.
66727	Fixed BBU events at insert; a regression caused by 64033	Fix for bug 64033 broke basic assumption that BBU perm. failure is always cleared before I2C faults (if any). That caused NEMOE to send same event twice when BBU monitor cleared any I2C event leaving TPD in inconsistent state with one unresolved event. Added fix to ignore I2C events for first 10 seconds and made sure that NEMOE always sends two distinct events when an I2C error to BBU is cleared.
66757	HP 3PAR system can become unavailable during intial sync of large volumes	An issue which may cause an HP 3PAR system to become unavailable during the initial sync of volumes greater than 400GB has been fixed.
66787	Enhance Node Rescue to handle new 3.1.1 Patches	TPD packages have been enhanced in 3.1.1 and differ in structure to previous patches. In instances where Node Rescue is being performed with a patch installed on the HP 3PAR system the correct image could not be formed The patch merging process has been enhanced to correctly merge the patches with the base image to create the correct image to be installed on the HP 3PAR system via Node Rescue.
67016	IMC still showing RAID0 volumes	IMC will display correct raid type for the volumes. If a r6 type volume is created, IMC with the fix in 3.1.2, it will display Raid 6 instead of Raid 0.
67226	NODE0 C-S failed. PANIC: tpd: Assertion point: file: drvmain.c, line: 1101	Code was doing an incorrect check on reductive operators for the address range when the address being used was at the end of the xcb bound area. In this case we should only be checking that the 64B destination does not exceed the bounded range instead of using the xcb length.
67338	Firmware could become unresponsive and cause port resets	Upgraded 1G iSCSI firmware to version 3.0.1.67 in order to address an incorrect bitmask check that could result in port reset due to loss of response from the firmware.
67384	Additional functionality within the createsv command.	During the migration of remote copy volumes using peer motion, the need arose to create identical snapshots on the primary and secondary

Issue ID	Item	Description
		to facilitate expedited synchronization post migration. This functionality was integrated into the <code>createsv</code> command, using the <code>-copy</code> switch.
67556	Help for <code>createsv</code> CLI command does not reflect changes to functionality	<code>createsv</code> now allows read-write snapshot creation from read-write base/read-write snapshots
67913	Firmware issue could cause port resets due to mailbox command timeouts	Upgraded 1G iSCSI firmware to version 3.0.1.67 in order to address a firmware issue which could cause port resets due to mailbox command timeouts under heavy I/O load.
67983	Secondary iSNS address removed from CLI	Secondary iSNS address has been removed from CLI since it was never supported.
68750	<code>tunesys</code> - added support for AO volumes	The system tuning command <code>tunesys</code> now supports Adaptive Optimisation (AO) configured volumes split between CPGs.
68952	New alert if a 1G iSCSI port comes up at a lower speed	If a 1G iSCSI port on the array comes up at a negotiated port rate that is lower than the expected 1G rate, an alert is generated. The <code>showport -iscsi</code> command now displays the actual rate; previous releases used to display 1Gbps regardless of the actual rate the link came up at.
69011	Fixed manual 8Gps rate setting for RCFC & PEER ports	This release fixes the <code>controlport rate</code> command to allow for a manual rate setting of 8Gps on <code>rcfc</code> and <code>peer</code> ports that are capable of that data rate. Previously only the rate setting of 'auto', which is the default, would achieve a 8Gps rate for those ports.
69130	Cage Inaccessible errors after master node/sysmgr panic	Misleading alerts indicating that a cage is inaccessible, are no longer emitted at the time of System Manager startup.
69193	Fibre Channel driver issue	Fixed a driver bug that could cause a link list break in a very rare condition.
69439	Deprecate <code>updateev</code> 's <code>-anyid</code> option	The <code>updateev -anyid</code> option is deprecated. In 3.1.2 we changed the volume and snapshot removal handling in System Manager. When a volume or snapshot is removed, it is not cleaned up immediately. It remains hidden until a background thread recycles the resource. That means upon removal, the id of the volume is still being occupied, so <code>updateev</code> may fail. In 3.1.2, we are using a different volume id but keep the same WWN when the snapshot is updated. Now <code>updateev</code> calls a modified <code>creategroupsv</code> command which will always use the same WWN to create the new snapshot.
69556	Promote XR3B drive FW for Moose drives	The XR3B firmware will lower a temperature threshold. The patch will modify the firmware database to cause the required firmware on Moose drives to be XR3B. SN: P90 will modify the <code>scsidb</code> to point the current firmware for Moose to be XR3B. As this is a scripted modification the <code>scsidb</code> it will need to be applied after every upgrade, before <code>admithw</code> is run.
69606	Pinned data after growing a VV part of a RC group	In cases where NL drives are overloaded in the extreme, upper layers can see this as loss of access. If multiple NL drives are in this state, this loss of access can result in volumes going into preserved state. Along with other fixes to prevent this type of overloading (as in 77976) we also now allow longer NL access times and ensure multiple retries to ensure what looks like loss of access is actually so.
70121	Network issue when node is added/removed	If a network message is sent to a node that then is removed from the system, the networking infrastructure hangs. Any future network issue cannot be handled, ultimately resulting in connectivity loss to the cluster until the network interface is restarted. A fix was made so that the network interface does not hang in this situation but eventually times out instead, allowing handling of other networking changes.
70425	Improved UNMAP performance	Unmap SCSI commands issued to already-unmapped logical block address ranges of thinly-provisioned volumes are handled more efficiently in HP 3PAR OS 3.1.2. This can lead to improved performance during formatting operations for some host types.

Issue ID	Item	Description
70797	VV state returns to "normal" if a tune is cancelled	In previous HP 3PAR releases, when a VV tune is cancelled the displayed VV state remained at ""tuning"" indicating that the tune must be completed (re-run) or rolled back in order to return the VV state to normal. This behavior changes in 3.1.2 as the VV state returns to ""normal immediately on task cancellation.
71127	sysmgr panic - too many chunklet regions specified	Avoid potential sysmgr failures by disabling reclaim for a volume if the total number of vmaps exceed a certain threshold.
71684	Node state properly indicated after early node reboot	When a node is rebooted before the system is fully started, we will now properly report its status in shownode.
72505	Potential for interaction between LD node balancing and importvv operations	In rare cases a system that was trying and failing to rebalance LD node ownership while using Peer Motion to import volumes from another array could get stuck while doing the final VV block to finish the import. This was a volume block locking issue and has been resolved to prevent this negative interaction.
72983	Meta Data Inconsistency in bitmaps can cause node to panic	A type of meta data inconsistency when discovered caused the node to panic rather than alert the user via the raising of the Internal Consistency Event.
73067	servicehost list performance improved	The servicehost list command will now have greatly reduced memory consumption and now focuses on the important information.
73796	Prevent spurious "More than one WWN" alerts	In previous versions of HP 3PAR OS, 3PAR WWNs which were previously visible on an RCFC port could incorrectly trigger an alert of the form "More than one WWN seen on an RCFC port". The 3.1.2 release of HP 3PAR OS includes modifications to ensure that this alert is raised only as a result of WWNs which are currently visible on the RCFC port.
73837	tunesys no longer requires a Dynamic Optimization license for system rebalancing	In previous releases of the HP 3PAR OS, tunesys required a Dynamic Optimization (DO) license to run. This requirement has been removed & systems without a DO license can now be re-balanced.
74520	checkhealth warns about having more vluns than are supported	Having more vluns than are supported can result in out of memory issues. The <code>checkhealth</code> command will now flag a warning when the number of luns is beyond the supported limit.
74917	Address deletion of SCSI-3 PGR registrations	When more than 16 initiators were registered for SCSI-3 persistent reservations on a single VV, deletion of registered initiators on VV deletion or manual clearing of reservations could introduce inconsistency into the system's Table of Contents. This software defect has been addressed to handle deletion of registered initiators correctly.
75245	Default NL CPGs will use FC drives for SA space	The default R1 and R6 NL CPGS created by the system will now use FC drives (if they are available) for SA space.
75839 (also 70918)	3.1.1 MU1 : tunesys fails to distribute chunklets evenly	An issue has been reported where the LD tuning phase of tunesys can, in some circumstances, cause an out of space situation. This has been resolved by compacting any residual free space in the related CPG after an LD has been tuned.
76022	System management application restart when starting a region move	An issue has been reported where the system management application could restart if thin persistence space reclaim started at the same time as a region move (tune) operation. This issue has been fixed in release 3.1.2.
77304	Changes to hw_cage_sled and sw_cage_sled	New sw_cage_sled component supports C:M:D format in PD alerts. Existing hw_cage_sled component reverted to support Magazine: x format in HW cage alerts.
77440	Fibre Channel driver issue	The Emulex driver didn't clean up its device database entry completely when a host hba port was re-assigned to a different FCID by the fabric switch, this led to a stale device entry remaining in the device database. A further look-up in the device database returned a stale

Issue ID	Item	Description
		device entry, thus the follow-up operations (e.g. LOGO) caused a host being wrongly disconnected.
78498	Sysmgr Unresponsive	Fixed a defect in the sysmgr subsystem that could cause the sysmgr to be unresponsive and for host io to be blocked. Operations involving a region move (such as tunes) or a node integration could get the sysmgr into this state. Fixed the race condition between the sysmgr and kernel that caused this behavior.
78568	Correct handling of P10000 ASIC hardware errors	In earlier versions of HP 3PAR OS for P10000 systems, a node was allowed to continue operating despite experiencing certain hardware errors internal to its ASIC device. This deficiency has now been addressed. When a node encounters any hardware error in an ASIC device, it is rebooted.
78639	Host lost access during HP 3PAR OS upgrade from 3.1.1 MU1 to 3.1.1 MU2	The ioctl to non-existent nodes has been removed in 3.1.2, this ioctl will only be sent to nodes which are online.
78761	int coal is still enabled in 3.1.2.220	The default interrupt coalescing stance for FC ports has been changed as follows: 1. Target ports will come up with interrupt coalescing disabled across a 3.1.1->3.1.2 update. 2. All new target ports created will have interrupt coalescing disabled.
79944	Handle abort of pending NACA commands	Due to a software error in earlier versions of HP 3PAR OS, abort of commands which trigger the ACA ACTIVE condition was not handled correctly. Under rare circumstances, this could cause node panics on busy systems to which AIX hosts were attached. The software error has been fixed in this release.

Known Issues with the OS

Issue ID	Item	Description
54303	Emulex-based 8Gb HBAs fill word compatibility	The Emulex-based 8Gb HBAs use a different fill word (ARB(FF)) for Fibre Channel connections. The Fibre Channel switch port connecting the Emulex-based 8Gb HBAs fill word compatibility 54303 8Gb HBA port must have the same fill word configured for compatibility. Contact the switch vendor for help to configure the fill word. On Brocade switches, the command to configure the fill word is <code>portcfgfillword</code> .
55097	Need to disable UAC if <code>libtls</code> cannot load	On Windows 7 or Vista systems, if this error is encountered: <pre>C:\Users\cli>cli -sockssl system: s238 user: a username password: Could not open connection to CLI server process on "s238": -sockssl option not supported, libtls not loaded. System name may be invalid, or the process may not have started yet or may have failed.</pre> Disable the UAC feature and run the <code>libtls</code> command again. Afterwards, turn on the UAC if needed.
60162	Remote Copy Link Speeds	When setting link speeds for Remote Copy operations using the <code>controlport</code> command speed setting, only the 1000Mbps link speed option should be used. Using the 10Mbps and 100Mbps link speed options may result in negotiation issues. Support for setting the interface speed to 10Mbps and 100Mbps will be removed in a future release.
60936	RCFC link issues when ISLs are removed.	Under heavy remote copy traffic, adding or removing an ISL to the fabric may cause traffic delays and congestion, due to the dropping of FC frames. FC fabrics with multiple ISL connections should be configured with these links trunked together.

Issue ID	Item	Description
68387	CLI command <code>controlport rst -1</code> can lead to fatal PCI errors	Using CLI command <code>controlport rst -1</code> on a 10G iSCSI port under heavy host I/O can lead to fatal PCI errors and a subsequent node reboot.
68839	User guide edits	Need to remove references to the MENU Driven Application from the UG if it is deprecated.
68840	Menu Driven Application deprecated	Need to update RMO 4.1 RN's to indicate the Menu Driven Application has been deprecated
70792	<code>tunesys</code> should not be run with a <code>maxchunk</code> value of more than 2 (default)	There is a problem with the chunklet moving algorithm used in the intra-node (<code>tunenodech</code>) phase of <code>tunesys</code> . This causes a high chunklet move failure rate if the value of <code>maxchunk</code> (number of chunklets that can be moved in parallel) is set to greater than 2 (default). It is recommended that the value of <code>maxchunk</code> is left at its default for all <code>tunesys</code> runs.
71952	Remote Copy User Guide	In this guide the maximum supported RCIP latency (delay times) is incorrect.
75801	Persistent Port <code>fc</code> failover/failback SLES host device-mapper detected fail paths	On FC ports with a large number of attached hosts, failover/failback may not be sufficiently fast with the consequence that multipathing messages may be seen in host logs. Host multipathing may temporarily mark paths as failed but they are quickly re-instated. This behavior has been observed on Linux hosts (Redhat and SLES11) which have more stringent path validation algorithms. However, it is conceivable that it could also be observed on other host types depending on how heavily the interface is loaded.
79411	I/O fails when a persistent port event occurs with windows 2008 r2 sp1 on ucs with m81kr	Cisco VIC HBA M81KR is not supported with 3.1.2 at this time.
80283	Solaris host loses paths in some failover/failback scenarios, in configurations involving a Brocade switch	This problem is a defect on the Solaris host. The Brocade switch has a feature where it will consolidate events that happen in close succession into a single RSCN. The FC subsystem on Solaris does not handle this appropriately and therefore does not re-establish all the paths as it should. Impact: Assuming host multi-pathing is configured properly, if this problem occurs the customer may lose some IO paths, resulting in possible reduced performance until the failed paths are restored. Failed paths can be restored via <code>controlport rst</code> . Note that this problem only shows up with the combination of Brocade switch and a Solaris 11 host.
80428	A VV in an AO configuration may occasionally display incorrect RAID type and device type information	A VV which is split between tiers by Adaptive Optimization may incorrectly display RAID type and device type (SSD, FC, NL) information for a secondary tier CPG. This is a display issue and does not affect the primary tier CPG from which new VV growth is taken.
80779	Error message that volume is locked	Active volume removals will prevent periodic syncs starting for volumes within the same volume family. An error message will be returned indicating that the volume is locked. Once the removals have finished the next periodic sync will succeed.
81188	Periodic RC stalled during online upgrade from 3.1.1.MU1 to 3.1.2	During an online upgrade periodic remote copy groups may stop syncing. If this occurs, normal operation will resume as soon as the upgrade is completed (i.e. after the <code>cli upgradesys -finish</code> command has been entered). There is no need to stop periodic groups before the upgrade is carried out. Synchronous Remote Copy groups are unaffected. I/O to volumes in remote copy groups is unaffected. No manual intervention is required to Remote Copy groups or volumes before, during or after the upgrade.

Issue ID	Item	Description
		The only impact this has is the suspension of periodic resyncs for the duration of the online upgrade.
81222	eventlog: Critical Cluster thermal shutdown seen during soft reset of DCN1 cages	After a soft reset of the DCN1 cage's controllers, we noticed the following events being generated. 2012-10-26 09:27:41 PDT 0 Critical Cluster thermal shutdown hw_node:0 Node 0 We have not noticed any issues caused by the generation of this event.
81383	A Newly Converted/Imported TPVV should have Zero Detect on by Default	A volume that has been thinly imported via Peer Motion or converted to a thin volume using online conversion will not have the zero detect policy set by default. This does not affect the conversion process, which will perform zero detection correctly. The work around for this is to manually set the zero detect policy after the import or conversion has completed.
81507	System jammed with max limit of VV objects when running RC...	In an RC setup with periodic sync, it is possible for the HP 3PAR OS to hit the limit of VV objects that can be created. When that happens, the periodic sync may not complete and the sync cycle may be missed.
81667	SP-4.1.0.-60: The simple upgrade from 3.1.1 + Patches to 3.1.2 wasn't successful	
81772 (also 75517)	Check Health sometimes incorrectly reports matching empty slots	Due to an inconsistency in how PCI slot information is returned, <code>checkhealth</code> may display incorrect information about PCI cards being incorrectly matched between nodes. Example of erroneous output: Checking node Component -----Description----- Qty Node PCI card model differs for slot in node pair 2 Component -Identifier- -----Description----- Node node:0 PCI card in Slot:4 is empty, but is not empty in Node:1 Node node:1 PCI card in Slot:4 is empty, but is not empty in Node:0
83492	IO timeout with HP-UX 11i v2	Certain IO requests issued by HP-UX 11i v2 hosts have strict timeouts associated with them. If the HP 3PAR array to which the host is issuing IOs experiences a node reboot, the outstanding IOs may experience stalls while the node recovers. If the stall exceeds the timeouts, IOs can be marked as failed. This is a temporary condition. If the IO requests are tried again after the node recovery, they will succeed. HP recommends that a supported multipathing solution be installed and configured on the HP-UX 11i v2 host. This will automatically retry the IOs that timeout.

Persistent Ports Limitations

The goal of the persistent ports feature is to quickly transfer the WWN of one Inserv HBA port to another. Done quickly enough, the host multipathing software should not mark any paths as offline/unusable. However, with the current 3.1.2 release, the transition is sometimes not quick enough. The result is that, in some scenarios, the host multipathing software does notice the transition. In addition, in one scenario, the transition is actually too fast for the host to handle it correctly.

The following scenarios have been observed during testing:

- SLES11.1 Host with Device Mapper Multipathing

Periodically, there will be multipath errors during failover or failback. These errors describe devices going offline and within seconds the devices are back on line. This is an intermittent issue seen about 10% of the time.

Improving the transition time in a future release is planned.

- Solaris 11 with Brocade Fabric

Occasionally, Solaris hosts that are attached through a Brocade fabric lose paths after a failover or failback. In this case the host seems to have a problem with multiple FC_IDs referenced in the RSCN payload from the switch. This is an intermittent issue seen about 10% of the time.

Ultimately the fix for this needs to be done on the host and is currently being investigated.

- RHEL 6.2 with VXDMP

Periodically, there will be multipath errors during failover. These errors describe devices going offline and within seconds the devices are back on line.

Improving the transition time in a future release is planned.

- AIX 7.1 with VXDMP

When an Inserv node is rebooting and failover triggered, the host DMP software marks paths as 'disabled'. The paths are not automatically re-enabled by the DMP restore process. The paths are only restored by issuing the `vxdtl enable` command or when the InServ node completes rebooting.

- HP-UX 11.31 with Symantec Storage Foundation DMP

To take advantage of the Persistent ports feature, the following DMP tunables must be disabled:

```
# vxdmpadm settune dmp_fast_recovery=off
# vxdmpadm settune dmp_monitor_fabric=off
```

2 HP 3PAR OS CLI Release Notes

Installation Notes for the OS CLI

Virus Checking

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

What's New in the OS CLI

The following features are added/removed for OS 3.1.2 CLI:

- OS CLI support for Red Hat Enterprise Linux 6.1 (RHEL) is added.
- The OS CLI remote client now has the capability to connect to the storage system with IPv6.
- OS CLI support for Solaris 8 is removed.
- The default for `createcpg` for NL devtype is now R6.
- The number of CLI connections now scales on nodes with larger CPU memory, in the following way:

Memory size	Total	SSH connections
4 GB or lower (pre-3.1.2 values)	64	16
8 GB	96	24
16 GB	128	32
32 GB	192	48
>32 GB	256	64

- A new column, Protocol, was added to the `showpd` command. The column identifies the protocol used by each drive. The possibilities are SATA FC, SAS.
- The following are new commands in this release for on-node SR and AO:
`createaocfg`, `removeaocfg`, `setaocfg`, `showaocfg`, `srcpgspace`, `srlldspace`, `srpdspace`, `srvvspace`, `srstatld`, `srhistld`, `srstatpd`, `srhistpd`, `srstatport`, `srhistport`, `srstatvlun`, `srhistvlun`, `srstatcmp`, `srstatcpu`, `srrgiodensity`, `sraomoves`, `startao`
- A new command: `startnoderescue`
- New Web Services API (WSAPI) commands: `setwsapi`, `showwsapi`, `startwsapi`, `stopwsapi`

Changed commands

Command	Options added (unless stated otherwise)
<code>admitrcopyvv</code>	<code>-createvv</code> , <code>-nosync</code>
<code>checkld</code>	<code>-poll</code> , <code>-recover</code>
<code>controlport</code>	<code>failover</code> , <code>failback</code> , <code>login</code> , <code>logout</code> , <code>label</code>
<code>creategroupsv</code>	<code>-noblock</code>

Command	Options added (unless stated otherwise)
creatercopygroup	-usr_cpg -snp_cpg
createsv	-noblock
createvvcopy	-online
dismissrcopytarget	-f
dismissrcopyvv	-keepsnap
movepdtospare	-vacate
removeld	-unused
removercopygroup	-removevv, -keepsnap
setauthparam	New specifier values: create-map, basic_edit-map, 3PAR_AO-map, 3PAR_RM-map
sethost	rst
setnet	addaddr, removeaddr, dns
setrcopygroup	cpg, -usr_cpg, -snp_cpg, -usr_cpg_unset, -snp_cpg_unset
setsys	New specifier values: RawSpaceAlertSAS, UpgradeNote, PortFailoverEnabled, AutoExportAfterReboot, AllowR5onNLDrives, AllowR0
showcage	-svc
showinventory	-svc
shownode	-svc
showport	-ids
showportdev	-pel, sas, fcswitch, fcfabric, findport
shutdownnode	wipeid
tunesys	-maxchunk, -tunenodech NOTE: tunesys no longer requires a Dynamic Optimization license.
tunevv	-tpvv, -full, -keepvv

Removed and Deprecated Commands and Options

The following commands are removed or deprecated in the OS 3.1.2 release.

Removed Commands and Options	
setbattery	The -r and -s options are not supported on HP P10000 3PAR Storage Systems.
showbattery	The -s option is deprecated and replaced by -state.
shownode	The -s option is deprecated and replaced by -state.
createvv	Removed options: -pol tp_bzero, -pol no_tp_bzero
setvv	Removed options: -pol tp_bzero, -pol no_tp_bzero

Modifications to the OS CLI

Issue ID	Item	Description
37356	IPv6 support has been added to the CLI client	The CLI remote client now has the capability to connect to the HP 3PAR system with IPv6.
43691	The CLI Client can provide name, version and host name to the server	<p>1. The CLI client can provide the client application name, version and the host it runs from to the server. It can either use the new options -clientname, -clientver and -clienthost or use the environment variable TPDCLIENTNAME, TPDCLIENTVER or TPDCLIENTHOST.</p> <p>-clientname Name of the client application. (Not available before version 3.1.1)</p> <p>-clientver Version of the client application. (Not available before version 3.1.1)</p> <p>-clienthost Name of the host the client application runs on. (Not available before version 3.1.1)</p> <p>New environment variables have been added to support that information too:</p> <p>TPDCLIENTNAME Client application name. Overridden by -clientname option. (Not available before version 3.1.1)</p> <p>TPDCLIENTVER Client application version. Overridden by -clientver option. (Not available before version 3.1.1)</p> <p>TPDCLIENTHOST The host the client application runs on. Overridden by -clienthost option. (Not available before version 3.1.1)</p> <p>Example to use the cli with the client application info: cli -clientname "cli" -clientver "3.1.1" -clienthost "simpsons"</p> <p>2. New option -d for command showuserconn to show the client name, version and the host name it runs from</p> <pre>cli% showuserconn -d -----Connection 0----- Id : 2844 Name : root IP Addr : 192.168.4.77 Role : super Connected since : 2010-08-10 10:40:37 PDT Current : - Client : remote Encrypted : N Client Name : -- Client Host : -- Client Version : -- -----Connection 1----- Id : 2956 Name : 3parsvc IP Addr : 127.0.0.1 Role : super Connected since : 2010-08-10 10:54:26 PDT Current : - - Client : local Encrypted : Y Client Name : SSH Client Host : -- Client Version : -- -----Connection 2----- Id : 3243 Name : root IP Addr : 192.168.6.11</pre>

Issue ID	Item	Description
		<pre> Role : super Connected since : 2010-08-10 11:31:13 PDT Current : current Client : remote Encrypted : N Client Name : myclient Client Host : envhost Client Version : 3.1 3. showuserconn default output has been modified to show the client name: cli% showuserconn Id Name ---IP_Addr--- -Role- ----Connected_since---- Current Client ClientName 21283 root 192.168.80.57 super 2010-08-06 09:55:20 PDT - remote -- 21564 root 192.168.17.70 super 2010-08-06 10:35:40 PDT - remote -- 21598 root 192.168.17.70 super 2010-08-06 10:35:57 PDT - remote -- 21765 3parsvc 127.0.0.1 super 2010-08-06 10:55:35 PDT current local SSH ----- 4 total </pre>
51516	tpdtcl/user event should need browse privileges	The permission to run <code>userevent</code> command is now granted to all roles (SUPER, EDIT, BROWSE, and SERVICE). Previously only SUPER and SERVICE roles could issue this command.
53023	stat/hist command could exit SSH session on large config systems	<p>A new CLI environment variable <code>histstatnum</code> has been added for the <code>stat/hist</code> commands. The value of <code>histstatnum</code> is used to determine how many records to show at a time for <code>hist/stat</code> commands. If it is set to 0, then the <code>hist/stat</code> commands will show 5000 records at a time. The sorting of the records will be limited to the <code>histstatnum</code> records. For example, if <code>histstatnum</code> is set to 1000, then the sorting will be for every 1000 records of the output.</p> <p>To set the value of <code>histstatnum</code>, use <code>showclienv</code> and <code>setclienv</code> commands:</p> <pre> cli% showclienv Parameter Value csvtable 0 nohdtot 0 hafter -1 histstatnum 0 listdom 0 editor emacs cli% setclienv histstatnum 1000 cli% showclienv Parameter Value csvtable 0 nohdtot 0 hafter -1 histstatnum 1000 listdom 0 editor emacs </pre> <p>If the system config is large and <code>histstatnum</code> is set to be more than 5000, then it is possible that a SSH session can not run the command because of memory limit. In that case, the <code>stat/hist</code> command (<code>statvv</code>, <code>histvv</code>, <code>statvln</code>, <code>histvln</code>, <code>statch</code>, <code>histch</code>, <code>statld</code>, <code>histld</code>) will exit with the following error message: "There is not enough memory to run this command on the system. Please use the CLI remote client to</p>

Issue ID	Item	Description
		run it. Exiting the command." In that case, the customer should run the command from a remote CLI session.
53041	tunepd may not be able to run in a SSH session	If the system config is large, tunepd may not be able to run in the SSH session because of the memory limit. It will exit with the error message that there is not enough memory to run the command on the system. In that case, please run the command from the remote CLI client.
58800	new option -conntimeout for cli client	A new option (-conntimeout) and TPD environment variable (TPDCONN TIMEOUT) has been added to the CLI client. It is the maximum wait time for the client to establish the connection to the HP 3PAR system. If not specified, it defaults to 36 seconds.
59562	statvlun won't run, complains of not enough memory	If the HP 3PAR system has too many vluns, statvlun could run out of memory in SSH session. In that case, it will return an error message and exit: "There is not enough memory to run this command on the system. Please use the CLI remote client to run it." In that case, the customer should run the command from the remote CLI client.
60809	Solaris 8 support has been removed from the CLI client	The CLI client is no longer supported on Solaris 8 platform starting 3.1.1 release.
63064	Added Redhat Enterprise Linux 6.1 support	Added support for Redhat Enterprise Linux 6.1.
63992	CLI Client now uses secure SSL connection	The 3.1.1 MU1 CLI client will connect via SSL by default and this client is backward compatible with older releases. To revert back to unsecure mode, a -nosockssl option must be specified or the TPDNOSOCKSSL environment variable must be set to a non-zero value.
69178	CLI client now supports HP-UX 11iv3 for Integrity servers	New CLI client support on HP-UX 11iv3 for Integrity servers has been added to 3.1.2.
69590	The CLI client is digital signed	The CLI client set up file is now signed. The Linux, Solaris and HP-UX client now delivers setup.bin.sig together with the setup.bin. The Windows client is still only one file (setup.exe), and that file carries the signature with it.
71701	Windows 2012 and SuSE 11 support added for CLI client	CLI client can now run on Windows Server 2012 and SuSE 11.
73198	setsysmgr wipe documentation doesn't match code	The setsysmgr command was not changed, only the documentation. Note that there is an optional <system_ID> parameter BEFORE <system_name>.
73204	Removal of MgmtOldPorts from setsys and showsys	HP 3PAR storage array only accepts client connection requests at TCP ports 5782 and 5783 starting from 3.1.2 release. TCP ports 2540 and 2550 are no longer supported.

Known Issues with the OS CLI

Issue ID	Item	Description
51356	Extended groups supersede static groups	The matching of a user's extended group (basic_edit-map, create-map, 3PAR_AO-map, 3PAR_RM-map) supersedes static groups (super-map, service-map, edit-map, browse-map). Workaround: If there are multiple group matches, the first match determines the user's role.
57362	createsched does not support [and] globbing characters.	createsched does not support [and] globbing characters. Workaround: These characters cannot be used when specifying a pattern with the createsched command.

Issue ID	Item	Description
59715	sasl-mechanism set to GSSAPI and binding set to simple not functional.	The combination of sasl-mechanism set to GSSAPI and binding set to simple does not function properly. Workaround: Set sasl-mechanism to GSSAPI and binding to sasl instead.
60105	servicecage syntax is incorrect.	The servicecage command's specifier 0 1 is required for many subcommands including staretfc and endfc in order for the command to function properly.
63624	showport command displays incorrect error message.	When an invalid option is entered, the showport command displays the message: Expecting <NSP or pattern> got: -a instead of Invalid option: -a and the command usage.
69962	Tasks on the array can only be run by local users	Tasks like tunesys can only be run by local users, since the system tries to authenticate users before running tasks on their behalf. Since LDAP user credentials (username and password) are not maintained locally on the array's persistent repository (AKA database), LDAP users fail authentication, hence attempts to run the task fails. The workaround is to use a local (as opposed to LDAP) user for commands like tunesys.
78747	PCR EOS-034: CIM enhancements concerning RAID5 CPG with NL drives	The new smi-s cimserver property corresponds to the AllowR5OnNLDrives parameter which may be read or set with the showsys command. The AllowR5ONNLDrives property for TPD_StorageSystem instances may be read with the TPD_StorageSystem::getInstance() method or set with the modifyInstance() method.
78762	HP 3PAR s747. GEM disarmed both BBUs in cage7, but showbattery status shows it as OK.	After repeated power failures in a relatively short period of time the situation can arise where both batteries require a maintenance discharge, this is only allowed when cache is already disabled, and can result in the batteries requiring a 24 hour discharge cycle before they will be used for battery protection.
81558	CLI is failing on a few RHEL 5.5 32 bit machines	The following error may occur on RHEL if not using permissive in setenforce: Could not open connection to CLI server process on "xxx.xxx.xxx.xxx": -sockssl option not supported, libtls not loaded ... Workaround: Execute the following linux command: setenforce 0

3 HP 3PAR CIM API Release Notes

What's new with HP 3PAR CIM API

- 56532 - SMI-S support for StorageVolume with 16-byteWWN has been added.
- 63950 - Support for SAS Initiator Ports Profile has been added.
- 68741 - All customer alerts will be converted to generic AlertIndications, and a client can subscribe to TPD_AlertIndication to receive them.

Interface changes

- 67559 - As part of the name rebranding effort, prefix for the value of the InstanceID property of all classes has been changed to HP_3PAR: from 3PAR:.. Clients might need to re-discover affected objects after an upgrade.
- 67836 - Cardinality of AuthorizedSubject has been changed so that each AuthorizedPrivilege is associated to only one instance of StorageHardwareID, though each StorageHardwareID can be associated to multiple AuthorizedPrivilege's. As a result, value of the AuthorizedPrivilege.InstanceID property has been changed to HP_3PAR:<SPC.DeviceID>::<StorageHardwareID.StorageID> from 3PAR:<SPC.DeviceID>.
- 64976 - Cardinality of ElementCapabilities between StoragePool and StorageCapabilities has been changed so that each StoragePool is associated to only one instance of StorageCapabilities and vice versa.
- 69303:
 - In Replication Services, the new replication type "asynchronous clone" has been added.
 - In Copy Services, the CopyType of "UnsyncAssoc" no longer maps to clone, it only maps to snapshots.
- Host persona to StorageClientSettingData.ClientTypes mapping has changed.

This table contains the mapping for 3.1.2:

Persona	ClientTypes	OtherClientTypeDescriptions
1	Other (1)	Citrix Xen Server 5.x/6.x
	Standard (2)	Standard
	Solaris (3)	Solaris 9/10
	Linux (14)	Red Hat Enterprise Linux
	Linux (14)	SuSE
2	Microsoft Windows 2003 (21)	Microsoft 2003
	Solaris (3)	Solaris 11
	Microsoft Windows (15)	Generic Microsoft Windows
6	Microsoft Windows 2008 (20)	Windows 2008/2008 R2/2012
	Other (1)	Exanet
	HP-UX (4)	HP-UX
8	Other (1)	IBM VIO Server
	AIX (9)	AIX

Persona	ClientTypes	OtherClientTypeDescriptions
9	Other (1)	Egenera
10	Other (1)	NetApp/ONTAP
11	VMWare ESXi (19)	ESX 4.x/5.x

Removed and Deprecated Commands and Options

- In Copy Services, SynchronizationType of UnSyncAssoc-Full has been removed.

Modifications to the HP 3PAR CIM API

Issue ID	Item	Description
50618	Fixed memory leak defect in SMI-S provider when responding to requests	Fixed a defect where there is a memory leak in SMI-S provider whenever it is responding to certain requests.
56400	Volume undergoing AO will have associations to both source and target DynamicStoragePools	Volume undergoing Adaptive Optimization will have TPD_VolumeAllocatedFromDynamicStoragePool associations to both source and target TPD_DynamicStoragePools. Similarly for snapshot data space undergoing Adaptive Optimization, the corresponding TPD_DeltaReplicaStoragePool will have TPD_DeltaReplicaPoolAllocatedFromDynamicStoragePool associations to both source and target TPD_DynamicStoragePools.
56532	Added SMI-S support for StorageVolume with 16-byte WWN	SMI-S support for StorageVolume with 16-byte WWN has been added.
58186	Cimserver provides detailed battery status	The cimserver has been enhanced to provide detailed status in the property StatusDescription for a TPD_Battery instance.
63950	Added support for SAS Initiator Ports Profile	Support for SAS Initiator Ports Profile has been added.
64222	Added SMI-S ParitySetSize property to TPD_StorageCapabilities class	This new SMI-S cimserver property represents the number of data chunklets in a RAID 50 or RAID 60 parity set.
64223	Added patch release numbers in CIM	A new property Patches was added in TPD_SoftwareIdentity that contains patch release number if present.
64830	Support audible alarm for Drive Enclosure in CIM	Drive Enclosures have audible alarm button on the left corner of front panel. The state of audible alarm was added as AudibleAlarmState in TPD_DriveCage accordingly.
64976	Fixed cardinality problem between StoragePool and StorageCapabilities	1. Each StoragePool is now associated to a unique instance of StorageCapabilities and vice versa. 2. Only one StorageSettingAssociatedToCapabilities association per StorageCapabilities has a DefaultSetting value of true, the rest are false.
66811	CIM support for reset of Parent StoragePool from Virtual Volume	Enhance the CreateOrModifyElementFromStoragePool method to accept an empty string for the InPool parameter during a StorageVolume modification operation, which will remove the parent StoragePool from the volume, similar to <code>setvv -usr_cpg ""</code> in CLI.
67018	New statistics added to DiskStatisticalData, VolumeStatisticalData and NodeStatisticalData	New statistics are added to DiskStatisticalData, VolumeStatisticalData and NodeStatisticalData, including ReadServiceTimeCounter, WriteServiceTimeCounter, TotalServiceTimeCounter, PercentBusy and QueueLength for both DiskStatisticalData and VolumeStatisticalData; ReadHitIOs, ReaMissIOs, WriteHitIOs and WriteMissIOs for VolumeStatisticalData; and FreeCachePages,

Issue ID	Item	Description
		CleanCachePages, Write1CachePages, WriteNCachePages, WriteScheduledCachePages, WritingCachePages, PendingDelayedCooyOnWriteCachePages, ProcessingDelayedCopyOnWriteCachePages, FC10kRPMCfcDirty, FC15kRPMCfcDirty, NLCfcDirty, SSDCfcDirty, FC10kRPMCfcMax, FC15kRPMCfcMax, NLCfcMax, SSDCfcMax, FC10kRPMDelayedAck, FC15kRPMDelayedAck, NLDelayedAck, SSDDelayedAck, TotalCPUUserTimeCounter, TotalCPUSystemTimeCounter, TotalCPUIdleTimeCounter, Interrupts and ContextSwitches for TPD_NodeStatisticalData.
67559	Rebranding with HP standard for CIM and SNMP	With HP standards, the new format of brand name is introduced — rebranding changes from 3PAR to HP 3PAR (or "HP_3PAR") in CIM server & SNMP agent. In CIM, the prefix of the value of an InstanceID property is changed to HP_3PAR: from 3PAR:.
67767	Corrected a problem where CreateStorageHardwareIDCollection/ CreateStorageHardwareID methods accepts ElementName longer than 31 characters	Corrected a problem where CreateStorageHardwareIDCollection or CreateStorageHardwareID methods accept ElementName that is longer than 31 characters; provider will now reject the request.
67836	PrivilegeForStorageHardwareID association will exist for a host-see SPC to a host that is not logged in; cardinality of PrivilegeForStorageHardwareID is corrected	Enhanced PrivilegeForStorageHardwareID association so that it exists for a host-see SPC to a host that is not logged in. This fix also ensures that there is only one associated StorageHardwareID per AuthorizedPrivilege (though there can be multiple AuthorizedPrivilege per StorageHardwareID), in accordance with SMI-S. InstanceId of AuthorizedPrivilege is changed as a result from ""3PAR:<SPC.DeviceID>" to ""HP_3PAR:<SPC.DeviceID>::<StorageHardwareID.StorageID>".
68321	CIM & SNMP security enhancement for common criteria	As a part of common criteria, the enhancement in CIM & SNMP provides capability to log user authorization, authentication , remote address, setting actions, operation types and critical failures for security.
68741	Added generic AlertIndications	All customer alerts will be converted to generic AlertIndications and a client can subscribe to TPD_AlertIndication to receive them.
69155	HP FRU electronic IDs support for HP 3PAR in CIM	The HP saleable serial and product numbers will replace the 3PAR system product & serial numbers for HP 3PAR FRU. The enhancement provides the capability to support them for node, cage, ps, memory, ide & interface card in CLI & CIM.
69303	Added asynchronous clone replication type	A new replication type ""asynchronous clone"" has been added. This is a clone that retains relationship with the source volume and does not detach after the copy is done. Resynchronization can only be done manually. CopyType of ""UnsyncAssoc"" no longer maps to clones, it maps only to snapshot volumes. CopyType of ""UnsyncUnassoc"" maps to both sync and async clones. Support for SynchronizationType of UnSyncAssoc-Full has been removed. The only two supported SynchronizationType's are UnSyncAssoc-Delta for snapshots and UnSyncUnAssoc for clones.
70000	Added used snapshot admin space and snapshot admin growth limit properties to TPD_DynamicStoragePool	The following properties are added to TPD_DynamicStoragePool: GrowthLimitSnapAdminSpace - corresponds to the ""Limit"" value displayed for a cpg with ""showcpg -sag"" UsedSnapAdminSpace - corresponds to the ""Admin Used"" value displayed for a cpg with ""showcpg -d""
70091	CIM provider Enhancement for Drive Enclosure and HP 3PAR node	The enhancement provides the CIM support for SAS cages of Xyratex Drive Enclosures as DCS1, DCS2 & DCN1, also including SAS I/O interface modules. New DCS family of DriveCage and

Issue ID	Item	Description
		CageInterfaceCard are added to CIM. NodePackage, PowerSupply & Battery providers change to support HP 3PAR components.
70904	Additional properties added to TPD_SFP Class.	The new properties added represent the threshold values for items like temperature, voltage, transmit power, and receive power. These values are the same as the values displayed with the CLI command "showport -sfp -ddm". The associations for TPD_SFP have been updated to correctly show the relationship with TPD_EthernetPort and TPD_FCPort instances.
72836	DynamicStoragePool now has UUID property	A new property called "UUID" has been added to TPD_DynamicStoragePool which contains the uuid of the pool.
74969	Corrected HTTPS connection problem to HP 3PAR SMI-S server from client that has fixed the BEAST vulnerability issue of SSLv3/TLSv1	Fixed an HTTPS connectivity issue to HP 3PAR SMI-S server from client that has addressed the BEAST vulnerability issue of SSLv3/TLSv1 as described in CVE-2011-3389.
75242	Fixed a defect where the SPC of volume exported to a hostset containing iSCSI hosts is not getting discovered	Fixed a defect where the SPC of volume exported to a hostset containing iSCSI hosts is not getting discovered.
76692	LocateOnRemainingTime property added to TPD_DriveCageDCSFamily and TPD_NodeSystem.	The LocateOnRemainingTime property for TPD_DriveCageDCSFamily instances indicates the time (in seconds) remaining for the LED set by the ""locatecage"" CLI command to remain on. The LocateOnRemainingTime property for TPD_NodeSystem instances indicates the time (in seconds) for the LED set by the ""locatenode"" CLI command to remain on.
77944	Missing StoragePoolComponent association from DiskStorageExtent to concrete pool	Fixed a defect where the response from Associators of TPD_StoragePoolComponent on a TPD_DiskStorageExtent or EnumerateInstances on TPD_StoragePoolComponent is missing the concrete TPD_StoragePool's.
78005	Fixed defect where masking and mapping operation to iSCSI host with EUI name format fails	Fixed a defect in the SMI-S provider where masking and mapping operation such as ExposePaths to an iSCSI host with EUI name format fails.
79127	Fixed a defect where Size parameter does not take effect in CreateOrModifyStoragePool.	Fixed a defect where Size parameter does not take effect when calling CreateOrModifyStoragePool to create a TPD_DynamicStoragePool.
79187	Added support for InExtents parameter in CreateOrModifyStoragePool method	Enabled support for InExtents parameter when calling CreateOrModifyStoragePool method to create a DynamicStoragePool, and support for primordial StoragePool in InPools parameter when calling CreateOrModifyStoragePool method to create a DynamicStoragePool consisting only of FC disks.
79188	Corrected defect in CIM_DeviceSAPImplementation	Corrected a defect where an associator operation on a ProtocolEndpoint with AssocClass of CIM_DeviceSAPImplementation and ResultClass of NetworkPort yields no instances.
79202	Fixed defect during EnumerateInstances of TPD_MemberOfReplicationGroup	Fixed a defect where EnumerateInstances of TPD_MemberOfReplicationGroup results in cimserver process failure.
79406	OperationalStatus and HealthState values for TPD_EthernetPort did not match IMC display	Fixed a problem where the OperationalStatus and HealthState values of TPD_EthernetPort contain the wrong values and do not match the state of the port as displayed on IMC.

Known Issues of the HP 3PAR OS CIM API

Issue ID	Item	Description
81197	Detaching an RW snapshot of an RW volume will also cause the parent volume to be removed	When using StorageConfigurationService.ModifySynchronization operation=Detach, or ReplicationService.ModifyReplicaSynchronization operation=Detach or operation="Return To Resource Pool" to remove an RW snapshot of an RW parent volume, the parent volume is also incorrectly being deleted. This issue only happens if the parent volume has only one snapshot. Workaround is to use StorageConfigurationService.ReturnToStoragePool to delete the snapshot.

4 HP 3PAR OS 3.1.2 MU1 Release Notes

Online Upgrade Considerations

This feature allows the upgrade of the OS concurrently with I/O activity on the attached hosts, provided certain conditions are met. For further information and pre-planning of online upgrades, refer to the latest version of the *HP 3PAR OS Upgrade Pre-Planning Guide*. To obtain a copy of this documentation, go to <http://www.hp.com/3par/support/manuals>, select your product, and then click **Manuals**.

NOTE: Direct upgrades from 3.1.1.226 to 3.1.2.322 are not supported with this release of HP 3PAR OS 3.1.2, but are expected to be supported at a future date.

Customers running 3.1.1 and wishing to upgrade to 3.1.2 will need to upgrade to the 3.1.1 MU prior to upgrading to 3.1.2.

Supported Platforms

The HP 3PAR OS 3.1.2 Configuration Matrix contains information about supported hardware and software platforms. To obtain a copy of this documentation, see the Single Point of Connectivity Knowledge for HP Storage Products (SPOCK) website at <http://www.hp.com/storage/spock>.

Components

Component	Version
OS	3.1.2.322
SNMP Agent	1.6.0

What's New in the HP 3PAR OS

HP 3PAR OS 3.1.2 MU1 provides support for Linux and VMWare ESX version 4 and 5 with EVA online Import.

NOTE: Starting from HP 3PAR OS 3.1.2, the HP 3PAR OS installation and admit hardware process does not automatically create a RAID 5 Fiber Channel CPG. RAID 5 for both HP 3PAR Fiber Channel and SAS (10K/15K) drives is fully supported on any class of HP 3PAR array. The creation and modification of RAID 5 on NL drives is disabled via a system parameter: *AllowR5OnNLDrives*. This system parameter can be modified via the `setsys` command to enable support for RAID 5 on NL drives. If this parameter is disabled, new RAID 5 CPGs cannot be created or modified on NL drives. If this parameter is enabled, RAID 5 CPGs can be created or modified on NL drives.

HP strongly recommends RAID 6 for high capacity NL drives. HP has no RAID level recommendation for non-NL drives, but the use of RAID 6 is a higher availability selection.

Modifications to the HP 3PAR OS

The following items are addressed in this release.

Issue ID	Item	Description
72577	A new Host Persona is added for OpenVMS OS hosts.	A new host persona is added for OpenVMS OS hosts. The capabilities are <code>Lun0SCC</code> and <code>UAREpLUN</code> . For the existing HPUX_Legacy host persona, the capabilities are clarified as <code>Lun0SCC</code> and <code>Volume Set Addressing</code>

Issue ID	Item	Description
		(VolSetAddr) . When the Lun0SCC capability applies, LUN0 should not be used as a name for a storage LUN.
79816	EVA to 3PAR Online Migration tasks could fail if the EVA is under load, and require restarting.	EVA to 3PAR Online Migration tasks could fail if the EVA is under load, and require restarting. Changes are made to improve the StoreServ's ability to deal with longer response times from the EVA during the importing phase.
80497	SCSI commands not terminating properly.	This addresses issues of not terminating SCSI commands properly when those commands could not be completed by the InServ. Some commands require the use of SYSMGR. When the SYSMGR is not available to help process the commands, the commands are not terminated and the commands are stuck in the queue of the host InServ ports.
80779	Active volume removals prevents periodic synchronizations starting for volumes within the same volume family.	When active volume removal is in progress, the periodic synchronization process for volumes within the same volume family does not start. An error message is displayed indicating that the volume is locked. After the volume removal is completed, the next periodic synchronization process will begin.
81188	Periodic synchronizations may suspend during an online upgrade.	During an online upgrade, periodic remote copy groups may stop synchronizing. If this occurs, normal operation will resume as soon as the upgrade is completed (after the <code>cli upgradesys -finish</code> command is executed). There is no need to stop periodic groups before the upgrade is carried out. Synchronous Remote Copy groups are unaffected. I/O to volumes in remote copy groups is unaffected. No manual intervention is required to Remote Copy groups or volumes before, during, or after the upgrade. The only impact of this issue is the suspension of periodic synchronization process for the duration of the online upgrade.
81544	Part number and model information displayed incorrectly for DCS1, DCS2, and DCN1 cage types.	Due to an issue in the routine which gathers manufacturing record from EEPROMs in the DCS1, DCS2, and DCN1 cage types, part number and model information is incorrectly displayed. This issue is resolved.
81722	Use of <code>setaocfg</code> command causes the SYSMGR application to become unusable.	Use of the <code>setaocfg</code> command to swap and change tier CPGs may cause the System Management application (SYSMGR) to become unusable. This issue is resolved.
81851	Improvement to RAID-1 large block sequential write performance.	The inconsistent data flusher tries to flush data in full-stripe more aggressively. This helps to decrease number of IO requests issued to physical disks, thus reducing the load on physical disks.
81891	A node down event during EVA Online Import from a heavily loaded source array could cause a transient SCSI level error to be returned to the host.	A node down event during EVA Online Import from a heavily loaded source array could cause a transient SCSI level error to be returned to the host. This is resolved. Now, the destination array locally retries the commands that fail in this way, rather than presenting the error to the host for retrying.
81905	A race condition that occurs during a node integration into the cluster and which causes SYSMGR to become unresponsive and data services to become unavailable.	A race condition that occurs during a node integration into the cluster and which causes SYSMGR to become unresponsive and data services to become unavailable. This issue is resolved now.
82092	During execution of very high workloads in an SSD-only configuration, backend IOs could stall for up to 5 seconds due to missing interrupt.	During execution of very high workloads in an SSD-only configuration, backend IOs could stall for up to 5 seconds due to missing interrupt. This stall is

Issue ID	Item	Description
		self-correcting, but results in host delays, extraneous logging, and a temporary performance imbalance of some PDs. This issue is resolved and the source of missing interrupt is eliminated.
82123	The parsing of the manufacturing record on various FRU parts of the DCN1, DCS1, and DCS2 cages is not allowed.	The parsing of the manufacturing record on various FRU parts of the DCN1, DCS1, and DCS2 cages is not allowed. This is resolved and now all of the manufacturing data is read and displayed.
82625	OpenVMS LUNs are not accessible after upgrade from 3.1.1 MU2 to 3.1.2.	This is resolved. The response to the SCSI inquiry command is modified for Hosts with the OpenVMS Persona. Normally the response message ANSI Version field is 0x06. For hosts with the OpenVMS Persona, this field is 0x05. This field for the OpenVMS Hosts may be set with the tcli interface.
82672	A potential problem can arise in an upgrade from 3.1.1 to 3.1.2 GA. It may lead to data inconsistency.	A potential problem can arise in an upgrade from 3.1.1 to 3.1.2 GA. If persistent reservation commands are received during the upgrade, it is possible that an apparent inconsistency can arise between the nodes with new 3.1.2 GA software, leading to the CLI command prompt being unresponsive. This issue is resolved.
83548	After an upgrade, several show commands fail.	In some scenarios, after an online upgrade several CLI commands, such as showvv, and their equivalent IMC displays fail. This is resolved.
83854	Disk based licensing was interfering with admitvv.	If systems licensed for a limited number of disks are at or near the licensed limit and if they are a target for Peer Motion, then attempting to use admitvv fails. The additional disks which are valid to admit are not admitted. This issue is resolved now.
84126	Undesirable increase in memory usage in Emulex FC driver.	There is an undesirable increase in memory usage in sending requests from the Emulex FC driver to the fabric. These requests are issued in regards to the 'showportdev fcfabric' user commands. This is resolved.
84209	Deleting a VV immediately after canceling a conversion causes the system management application to become unstable.	Deleting a VV immediately after canceling a conversion causes the system management application to become unstable. This issue is addressed now by preventing a user from performing the operation before the cleanup is complete.
84299	While doing online upgrade from HP 3PAR OS 3.1.1 to HP 3PAR OS 3.1.2, there is a mismatch in handling internal meta data between 3.1.1 and 3.1.2. HP 3PAR OS 3.1.2 node sends request to 3.1.1 node which it does not expect and causes system down.	While doing online upgrade from HP 3PAR OS 3.1.1 to HP 3PAR OS 3.1.2, there is a mismatch in handling internal meta data between 3.1.1 and 3.1.2. HP 3PAR OS 3.1.2 node sends request to 3.1.1 node which it does not expect and causes system down. This issue is resolved.

Known Issues with the OS

Issue ID	Item	Workaround
83492	IO timeout with HP-UX 11i v2	Certain IO requests issued by HP-UX 11i v2 hosts have strict timeouts associated with them. If the HP 3PAR array to which the host is issuing IOs experiences a node reboot, the outstanding IOs may experience stalls while node recovers. If the stall exceeds the timeouts, IOs can be marked as failed. This is a temporary condition. If the IO requests are tried again after the node recovery, they will succeed. HP recommends that a supported

Issue ID	Item	Workaround
		multipathing solution be installed and configured on the HP-UX 11i v2 host. This will automatically retry IOs that timeout.
84066	During the process of upgrading the Service Processor (SP) to HP 3PAR OS 3.1.2 MU1 using SP-4.1.0.GA-60, if HP 3PAR OS version 3.1.2.322 (MU1) is installed on the SP before HP 3PAR OS 3.1.2.278 (GA) is installed on the SP, a warning message is displayed during installation.	<p>It is required that HP 3PAR OS 3.1.2.278 be present on the Service Processor (SP) before installing HP 3PAR OS 3.1.2.322 onto the SP.</p> <p>If during the process of upgrading an SP running SP-4.1.0.GA-60 to HP 3PAR OS 3.1.2 MU1, the HP 3PAR OS version 3.1.2.322 (MU1) is installed on the SP before HP 3PAR OS 3.1.2.278 is installed on the SP, the following message is displayed during installation of 3.1.2 MU1. Warning: CLI client software is missing in this SP. Please download and install TPD InFormOS 3.1.2.GA on the SP.</p> <p>This message indicates that HP 3PAR OS version 3.1.2.278 must be installed on the SP to ensure that the CLI client software is present.</p>
84405	While doing online upgrade to HP 3PAR OS 3.1.2 from HP 3PAR OS 3.1.1, data replicated gives wrong values in case of a panic.	While doing online upgrade to HP 3PAR OS 3.1.2 from HP 3PAR OS 3.1.1, data replicated gives wrong values in case of a panic. To address this issue, while doing online upgrade to HP 3PAR OS 3.1.2 from HP 3PAR OS 3.1.1, use the old format of the pf_rep_info structure to save information about replicant data.

5 HP 3PAR OS 3.1.2 MU2 Release Notes

Online Upgrade Considerations

This feature allows the upgrade of the OS concurrently with I/O activity on the attached hosts, provided certain conditions are met. For further information and pre-planning of online upgrades, refer to the latest version of the *HP 3PAR OS Upgrade Pre-Planning Guide*. To obtain a copy of this documentation, go to <http://www.hp.com/3par/support/manuals>, select your product, and then click **Manuals**.

NOTE: Direct upgrades from 3.1.1.226 to 3.1.2.422 are not supported with the initial release of HP 3PAR OS 3.1.2.

Customers running 3.1.1 and wishing to upgrade to 3.1.2 will need to upgrade to the latest 3.1.1 MU before upgrading to 3.1.2.

NOTE: HP 3PAR OS 3.1.2.422 (EMU2) replaces HP 3PAR OS 3.1.2.422 (MU2).

Supported Platforms

The HP 3PAR OS 3.1.2 Configuration Matrix contains information about supported hardware and software platforms. To obtain a copy of this documentation, see the Single Point of Connectivity Knowledge for HP Storage Products (SPOCK) website at: <http://www.hp.com/storage/spock>.

Components

Component	Version
OS	3.1.2.422
CLI	3.1.2.422
SNMP Agent	1.6.0

What's New in the HP 3PAR OS

HP 3PAR OS 3.1.2 MU2 enables customers to increase multi-tenant consolidation on shared infrastructure and increase agility and efficiency with several new features and enhancements.

HP 3PAR OS 3.1.2 MU2 provides the following benefits:

- Support for HP 3PAR StoreServ 7450 Storage
- Enhanced Multi-tenancy for Consolidation on Scalable, Resilient Infrastructure
- Data-at-Rest (DAR) Encryption
- Remote Copy and Federated Technologies Enhancements
- Optimized Flash Architecture
- OpenVMS 32K VVIDs support
- HP 3PAR Peer Motion and HP 3PAR Online-Import (EVA-to-3PAR) support for AIX and HP-UX.

New Supported Drives

Drives	StoreServ
400GB	7000, 7450, 10000, F-Class, T-Class
600GB	7000
1TB	7000

- 400GB Drives

HP 3PAR StoreServ 7450 Storage System

HP 3PAR OS 3.1.2 MU2 enables support for HP 3PAR StoreServ 7450 Storage system, a new all flash-array offering from the world's most advanced storage platform. HP 3PAR StoreServ 7450 Storage delivers performance without compromises. It is the only all-flash array in the industry to deliver the performance advantages of a flash-optimized architecture and Tier 1 data services.

Multi-tenancy for Consolidation on Scalable, Resilient Infrastructure

- HP 3PAR Priority Optimization Software is a new optional software product that helps to ensure the quality of service on HP 3PAR StoreServ Storage systems and HP 3PAR StoreServ. HP 3PAR Priority Optimization enables maximum performance threshold for front-end IOPS, or Bandwidth, or both, to be configured for application workloads via HP 3PAR Autonomic Groups.
- It supports Fiber Channel over Ethernet (FCoE) protocol for host connectivity on HP 3PAR StoreServ 7000 and 10000 storage systems.
- It introduces a new OpenVMS persona, to support OpenVMS V8.31H1 and OpenVMS 8.4 hosts on HP 3PAR StoreServ 7000 and 10000 storage systems.
- It provides support for following new drives:
 - 400GB SFF and LFF MLC-SSD on HP 3PAR StoreServ 7450 Storage.
 - 400GB MLC SAS (4x magazine) for the HP 3PAR StoreServ 10000 Storage.
 - 600GB 10k SFF and 1TB SFF 7.2k Nearline SAS for the HP 3PAR StoreServ 7200/7400 Storage.
- Changes in licensing for the HP 3PAR StoreServ 10000 Storage. Introduction of Partial licensing support for HP 3PAR Remote Copy, HP 3PAR Peer Persistence, HP 3PAR Virtual Copy.

Data-at-Rest (DAR) Encryption

- HP 3PAR StoreServ Data at Rest Encryption is a new licensed software product for HP 3PAR StoreServ 7000, 7450 and 10000 Storage models configured with self-encrypting drives (SEDs). This software enables encryption of data as it is written to the drive.
- It provides support for following new self-encrypting drives:
 - 450 GB SFF 10k SAS and 900 GB SFF 10k SAS for the HP 3PAR StoreServ 7000 and 10000 Storage system.
 - 1TB SFF 7.2k Nearline SAS for the HP 3PAR 7200/7400 Storage system.
 - 400GB SFF and LFF MLC SAS for the HP 3PAR StoreServ 7450 Storage system.
 - 400GB MLC (4x magazine) for the HP 3PAR StoreServ 10000 Storage system.

Remote Copy and Federated Technologies Enhancements

- HP 3PAR Remote Copy Software in 1:N configuration is enhanced to provide synchronous mode replication support from source to both the target systems.
- HP 3PAR Remote Copy Software is enhanced to support Four Link Connectivity in synchronous and periodic mode. If both source system and target system have four or more nodes, four physical RCFC and four physical RCIP links can be configured between them for a total of eight physical connections between the two StoreServ Storage systems. If four physical links are configured, one link must be configured per node on a four-node system.
- HP 3PAR Remote Copy software allows configuring Remote Copy ports and Host ports on the same HBA for all HP 3PAR StoreServ Storage systems.
- HP 3PAR Peer Persistence to support Automatic and transparent failover (ATF) technology with VMware vSphere 5.0 and VMware vSphere 5.1. ATF uses the HP 3PAR Quorum Witness to monitor the HP 3PAR StoreServ Storage failure and to automatically determine whether a failover of host service is required.

Optimized Flash Architecture

HP 3PAR StoreServ Storage takes full advantage of flash media. HP 3PAR StoreServ architecture is adapted to deliver high performance at very low latencies.

- Flash-optimized cache algorithms to drive accelerated performance at low latency.
- Adaptive Reads. In hard disk drive configurations, data is read from hard disks into the cache in fixed block sizes of 16 KB for read operations. With flash media, HP 3PAR StoreServ Storage reads only the required amount of data into cache and this is called as variable caching.
- Adaptive Writes. This optimization helps HP 3PAR StoreServ Storage to reduce writes to flash media thus extending its life. At the same time, it optimizes back-end throughput as only the required amount of data is sent to the back-end.
- Autonomic cache offload allows HP 3PAR StoreServ Storage systems to deliver consistent performance at hundreds of thousands of IOPS, without running into cache bottlenecks.

Modifications to the HP 3PAR OS

The following items are addressed in this release.

Issue ID	Item	Description
51126	Inconsistent inter-node transaction logs cause service outage.	Inter-node transaction logs are protected by checksums and inconsistencies in such logs are detected during node down recovery. Inconsistent logs cause subsets of volumes to be marked as inconsistent instead of causing service outages.
68204	Resolved an issue in the cluster membership protocol that can cause a healthy node to lose its membership incorrectly.	Due to an issue in the cluster membership validation module of HP 3PAR OS, a healthy node might incorrectly lose its membership during a validation run. This issue exists in HP 3PAR OS version 3.1.2 MU1 or earlier. This is resolved and the node passes the membership validation correctly.
70043	HP 3PAR OS 3.1.2 MU2 supports VVIDs greater than 12287.	HP 3PAR OS 3.1.2 MU2 supports VVIDs greater than 12287. Earlier versions of HP 3PAR OS support VVIDs up to 12287 only. If a downgrade from HP 3PAR OS 3.1.2 MU2 to an earlier version is to be performed, then VVs with IDs greater than 12287 must be removed before starting the downgrade.

Issue ID	Item	Description
75161	CPG growth increments get set incorrectly when AO is running	An issue is reported where CPG growth increments for SA and SD space is changed to invalid values on systems where AO is running. This issue is resolved.
77263	Issue resolved for RTPG SYSMGR event replay.	This resolves a general protection fault in the SYSMGR event replay handling of a Remote Target Port Group (RTPG) command to LUN ID 0, which is not presented to the host initiator.
77357	Power Supply Warning is now a degraded alert.	Power Supply warning previously output a Failed alert, but now output a Degraded alert.
78747	SMI-S property added to enable RAID5 CPG with NL drives.	The new property corresponds to the AllowR5OnNLDrives parameter which may be read or set with the <code>showsys</code> CLI command. The AllowR5ONNLDrives property for TPD_StorageSystem instances may be read with the <code>TPD_StorageSystem::getInstance()</code> method or set with the <code>modifyInstance()</code> method.
78795	Resolved PS state of <code>shownode</code> for cable pull.	The command <code>shownode -ps</code> returns unknown for PS state if the cable is pulled. It can not differentiate between PS unavailable state and cable pulled state. This is resolved. SYSMGR and APILIB is changed to return a proper state for cable pulled case.
79061	Loop Down cage alerts cleared after <code>admithw</code> .	After <code>admithw</code> completes, Loop Down alerts are not generated.
80118	Under extreme conditions, heavy read loads could drive the system to a point that writes are literally stalled.	Under extreme conditions, heavy read loads could drive the system to a point that writes are literally stalled. Reserve the bandwidth for flushing unwanted data to the backend.
80218	Add <code>srstatlink</code> command.	Add SR sampling for link performance statistics and add the <code>srstatlink</code> command.
80863	Node may not have network connectivity.	Network may not be available on a given node because of an issue in creating a thread that sets environment variables for network configuration. This is resolved so that the environment variables are set in a thread-safe manner.
80968	False alerts for warnings or failures.	Alerts are cleared and duplicate alerts are prevented for warnings or failures of the second PCM (PCM1) on DCS1, DCS2 and DCN1 cages.
81197	Detaching an RW snapshot of an RW causes the parent volume to be removed.	When using <code>StorageConfigurationService.ModifySynchronization operation=Detach</code> , <code>ReplicationService.ModifyReplicaSynchronization operation=Detach</code> , or <code>operation="Return To Resource Pool"</code> to remove an RW snapshot of an RW parent volume, the parent volume is also being deleted incorrectly. This issue happens if the parent volume has only one snapshot. This is resolved.
81222	After a soft reset of the DCN1 cage controllers, the following events are generated. 2012-10-26 09:27:41 PDT 0 Critical Cluster thermal shutdown hw_node:0 Node 0	After a soft reset of the DCN1 cage controllers, the following events are generated. 2012-10-26 09:27:41 PDT 0 Critical Cluster thermal shutdown hw_node:0 Node 0 This event does not cause any issues.

Issue ID	Item	Description
81540	HP 3PAR OS generates false "Cluster thermal shutdown" events.	The electrical signal which indicates a severe thermal event is not handled properly, which sometimes results in false "Cluster thermal shutdown" event reports. This is resolved.
81685	SMI-S Provider initialization fails if an array has an all-numeric name.	SMI-S provider fails if an array has an all-numeric name (the name as shown in showsys). This is resolved.
81901	Cage requests handling improved.	To ensure that cage requests are handled successfully, timeout values and other functionalities are improved.
81925	Resolved an issue where calling HideLUsFromStorageHardwareIDCollection results in occasional "Invalid ProtocolControllers" failure.	Resolved an issue where calling HideLUsFromStorageHardwareIDCollection results in occasional "Invalid ProtocolControllers" failure.
82090	Added support for SNMPv3 trap.	Added support for SNMPv3 trap. A user can specify the trap version (v2 or v3) for a particular SNMP manager. SNMPv3 traps are encrypted with CFB128-AES-128 and authenticated with HMAC-SHA-96 hash.
82094	Resolved an issue that causes portion of the node EEPROM to be overwritten. The most common location overwritten is the Node ID, but the Midplane Type, NodeType or other fields may be affected. In rare cases, the Ethernet MAC Address may be erased.	An EEPROM read operation interrupted by a power failure alert can leave the EEPROM device in write mode. An issue in the Nemoe code prevents the read operation from being completed. A recovery behavior in the Intel PCH chip recognizes the stalled read operation and attempts a bus reset after a timeout causing a single byte write to be received by the EEPROM, overwriting data at the address where the read is interrupted. This only occurs when a node is powered off and timing of the power fail signal interrupts an EEPROM read. This is resolved. It correctly handles the power fail interrupt and allows the EEPROM read operation to complete so that the PCH timeout and bus recovery are not triggered.
82106	Both output Job and TargetElement parameters are NULL if calling CreateElementReplica without specifying the input TargetElement parameter to create a clone.	After calling CreateElementReplica, without specifying the input TargetElement parameter to create a clone, the output Job and TargetElement parameters are both NULL. The corresponding TPD_ConcreteJob instance is also missing. This is resolved.
82107	ModifySynchronization/ModifyReplicaSynchronization Resync operation on an asynchronous clone results in target volume getting detached.	ModifySynchronization/ModifyReplicaSynchronization Resync operation on an asynchronous clone results in target volume getting detached after the resynchronization. This is resolved.
82122	Retries are added to cage firmware download.	To ensure successful cage firmware downloads, retry operation is added.
82123	An issue prevents the parsing of the manufacturing record on various FRU parts of the DCN1, DCS1, DCS2 cages.	An issue prevents the parsing of the manufacturing record on various FRU parts of the DCN1, DCS1, DCS2 cages. This is resolved. All of the manufacturing data can be read and displayed.
82303	RAID level information is included in ElementName of fixed StorageSetting.	RAID level information is added to ElementName string of StorageSetting that has ChangeableType of "Fixed - Not Changeable" (0).
82464	System becomes unresponsive to commands under certain circumstances.	When enqueueing control and management requests to the fibre channel HBA, the driver

Issue ID	Item	Description
		includes a timeout. The HBA is supposed to return the request with an error code if it can not complete the request in the time specified by the driver. However, under certain circumstances, the HBA does not return the request within the time specified. This is resolved. A safety timer is added in the driver so that errors can be handled even if the HBA does not return the request within the time specified.
82492	Node cage battery firmware can be upgraded.	Node Cage battery firmware can be upgraded.
82826	Resolved a CIM API issue where TPD_CreateConsistentReplicaList, CreateGroupReplica, or TPD_CreateGroupReplica resulted in RO snapshots.	Resolved an issue where calling TPD_CreateConsistentReplicaList, CreateGroupReplica, or TPD_CreateGroupReplica resulted in read-only snapshots.
83219	Occasional failure in generating CIM indications.	Provider might fail to generate CIM indications. This is because IndicationProvider is not loaded properly during startup. Also, removing a IndicationSubscription may cause failure due to namespace case issue, a known OpenPegasus issue. This is resolved.
83347	Adaptive Optimization (AO) calculations more accurate.	The on-node Adaptive Optimization more accurately measures write accesses to calculate busy regions.
83357	The system management application may run out of memory after a large number of thin provisioned volume tunes.	The system management application may run out of memory due to an issue and require a restart after a large number of tunes involving thin provisioned volumes. This issue is resolved.
83383	Microsoft: Implement LifeCycle Indications for Windows Server 2012.	Microsoft is requesting that storage vendors support certain number of lifecycle indications to help VMM detect changes faster. Implemented VV related lifecycle indication providers in CIM.
83743	The commands admithw or ootb create a default FC_r5 cpg.	The commands admithw or ootb create a default FC_r5 cpg.
83881	Tunesys terminates unexpectedly when executed on a completely full system.	Tunesys terminates unexpectedly when executed on a system where no space is available to perform dry run checks during the inter-node tune analysis phase. This issue is resolved.
83884	Tunesys terminates unexpectedly if a VV had SD and USR space spread over different numbers of node pairs.	Tunesys unexpectedly terminates during the inter-node tune analysis phase if any VV had SD space spread over more node pairs than USR space. This issue is resolved.
84007	A driver issue where a critical section is not protected by mutex. This causes two threads to enter the critical section at the same time.	A driver issue where a critical section is not protected by mutex. This causes two threads to enter the critical section at the same time. This issue is resolved.
84264	Certain commands become unresponsive if issued when the network link is down.	If the fibre channel driver issues control or management requests to the HBA and the network link is down at that time, then under certain timing conditions, the system becomes unresponsive. This is because the driver does not properly issue errors for the outstanding commands when handling the link down event. This is resolved and it ensures that the error is displayed for all outstanding commands.

Issue ID	Item	Description
84307	Resolved licensing issue on post-ootb pre-license install wipe.	When HP 3PAR StoreServ 7000 Storage system is not built to order it means that it is shipped with a license for 8 disks. If such a system goes through the ootb process to create the admin volume but the process is restarted before the actual license key is installed, it does not admit disks on the second attempt until the license key is removed manually. This is resolved. The disks can be admitted in this situation.
84353	kernel error message is displayed when <code>dismissrcopytarget</code> command is issued.	The remote copy group must be stopped to ALL targets before issuing the <code>dismissrcopytarget</code> command or a kernel error message is displayed.
84384	Several issues with CIM API resolved.	The following issues, found while testing with client partners, are resolved: <ol style="list-style-type: none"> 1. <code>ReturnToStoragePool</code> does not remove the underlying logical disks of the <code>StorageVolume</code>. 2. <code>ExposePaths</code> with multiple <code>InitiatorPortIDs</code> results in multiple instances of SPC, one for each <code>InitiatorPortID</code>. This is resolved. All the <code>InitiatorPortIDs</code> belong to the same SPC. 3. There are no fixed <code>StorageSetting</code> that can be used for creating <code>DynamicStoragePool</code> from primordial <code>InExtents</code>. This is resolved. <code>StorageSettings</code> are added, one for each supported RAID type.
84500	CIM API - <code>ExposePaths</code> fails to map volumes to a host.	<code>TPD_ControllerConfigurationService.ExposePaths()</code> fails to map several volumes to a host. <code>ExposePaths()</code> incorrectly reports that some of the volumes belong to a different domain even if all the volumes are in the same domain, as reported by <code>showvv -listdom</code> command. This is resolved.
85608	The command <code>Upgradecage</code> sometimes fails with 3502 error.	The command <code>Upgradecage</code> of DCS1, DCS2, and DCN1 cages can fail sometimes due to a timing issue and a 3502 error is displayed. This is resolved and the operation is tried again in case of failure.
85797	Improve <code>upgradecage</code> failure error.	Improved error message for <code>upgradecage</code> errors on the HP 3PAR StoreServ 7000 Storage system.
85947	Kernel error occurs when issuing <code>dismissrcopytarget</code> on SLD system.	It is necessary to stop both targets on an SLD system before dismissing a secondary (periodic) target. Failure to do this can result in error on the primary storage system. In HP 3PAR OS 3.1.2 MU2, this criteria is enforced so that the user receives an error message if both targets are not stopped.
86094	When a <code>tunesys</code> task is cancelled, a new task may not start for an long period of time.	The cancellation of a <code>tunesys</code> task during the initial analysis phase on a system with a large number of base volumes can result in <code>tunesys</code> being unable to restart for a long period of time (over 2 hours in some cases). This issue is resolved.
86127	Microsoft Windows 2012 PowerShell cmdlet <code>New-MaskingSet -FriendlyName</code> fails to set friendly name.	Microsoft Windows 2012 PowerShell cmdlet <code>New-MaskingSet -FriendlyName</code> fails to set friendly name because <code>ModifyInstance</code> of SPC <code>ElementName</code> is not supported. This is resolved.
86441	Earlier cage PCM Alerts remain after system power cycle.	If a PCM issue on a DCS1, DCS2, or DCN1 cage generates an alert, and the issue is then resolved

Issue ID	Item	Description
		while the system is powered-down, the alert still exists upon reboot. The alert is not cleared.
86957	Resolved AIX SCSI command timeouts on VV busy errors	The SCSI subsystem is not handling busy errors from the Volume Layer correctly and it can result in SCSI commands being timed out for AIX (NACA supported) hosts. AIX issues an ABORT when the command timeout occurs and then retry the command. To resolve this, return the BUSY status back to AIX so that AIX does not issue an ABORT prior to retrying the command.
88271	CIM API - NumberOfBlocks of a snapshot StorageVolume could be inaccurate	The NumberOfBlocks of a snapshot StorageVolume is inaccurate when the parent volume grows in size. This is resolved.
88830	srdata volume can be mounted on multiple nodes.	Additional checks to make sure that the srdata volume is not mounted on another node before actually starting sampling rather than relying entirely on the srdatac process for management of the srdata volume.
89948	CLI Client 3.1.2.278 Support	The CLI client version on the SP is 3.1.2.278 instead of 3.1.2.422 as with other components. This is expected. These CLI client versions are essentially the same. CLI client version 3.1.2.278 supports all connections on the storage system to the CLI server from version 3.1.x to 3.1.2 MU2.

Known Issues with the OS

Cannot downgrade from 3.1.2.422 (MU2) to an earlier release on specific storage systems (Bug 86680)

Downgrading from HP 3PAR OS 3.1.2 MU2 to an earlier release is not possible on the 10000 and 7000 storage systems if the Virtual Volume IDs (VVIDs) exceed the earlier OS release's limit. The 3.1.2 MU2 version supports up to 32K OpenVMS VVIDs and the 3.1.2 MU1 and earlier releases support up to 12K VVIDs on the 10000 system and 8K VVIDs on the 7000 system. When downgrading from 3.1.2 MU2 to 3.1.2 MU1 or earlier releases, the VVID must be within the previously supported range for the system.

A message similar to this appears if VVIDs exceed the supported limit:

```
One or more vv's exist with an id greater than 12287. This not supported
by the target update version. Remove vv's with an id greater than 12287
and try again.
```

Workaround: If the number of VVIDs is greater than 12K on the 10000 system and 8K on the 7000 system, reduce the number of VVIDs to less than the number supported and retry the downgrade.

CAUTION: After the new features of HP 3PAR OS 3.1.2 MU2 are used, downgrading to an earlier version may not be possible.

Kernel Core when performing online upgrade from 3.1.2.322 MU1 to 3.1.2.412 (Bug 89407)

During an online upgrade from HP 3PAR OS 3.1.2.322 (MU1) to HP 3PAR OS 3.1.2.422 (MU2), a node running HP 3PAR OS 3.1.2.422 (MU2) causes data unavailability when rcopy transaction log is converted to the new format.

6 HP 3PAR OS 3.1.2 MU2 CLI Release Notes

What's New in the OS CLI

The following features are added for OS 3.1.2 MU2 CLI:

- CLI client supports HP-UX 11iv3 for Integrity servers.
- CLI client can run on Windows Server 2012 and SuSE 11.
- New commands: `controlencryption`, `setqos`, `setsnmpmgr`, `srstatqo`, `srstatlink`, `showqos`, `statqos`

Changed commands

Command	Options added (unless stated otherwise)
<code>addsnmpmgr</code>	<code>-snmpuser</code> , <code>-version</code>
<code>showalert</code>	<code>-svc</code>
<code>startao</code>	Acceptable time values expanded.
<code>sr*</code>	Acceptable time values expanded.
<code>srhistvlun</code>	<code>-host</code> , <code>-vv "set:"</code> notation
<code>srstatvlun</code>	<code>-host</code> , <code>-vv "set:"</code> notation

Modifications to the OS CLI

Issue ID	Item	Description
24932	Provide access to Service Alert information through the <code>showalert</code> command.	The <code>showalert</code> command includes a <code>-svc</code> option to display service alerts that are logged on the system. The command indirectly invokes the <code>showeventlog</code> command to display the "Service Alert" class of events.
79385	Service users are allowed to cancel tasks they create.	For HP 3PAR OS 3.1.2 MU2, Service users - a user whose role is "Service" - are allowed to issue <code>canceltask</code> command to cancel the tasks that they create. A Service user is not allowed to cancel any tasks created by another user.
80102	Resolved <code>shownode -state</code> that reported battery count as invalid when degraded.	The <code>shownode</code> command uses a procedure to get PS state description for versions before the HP 3PAR StoreServ 7000 Storage system. Since the PS should be retrieved from cage, it should use the mapping of cage PS table instead of bitmap of nodes. This is resolved by adding a function to <code>clicommon</code> .
80650	Additional time formatting for SR commands.	All on-node SR commands that require a time option can now be specified in a more accessible string format such as <code>yyyy-mm-dd h:mm:ss</code> . For example, <code>2013-07-31 05:30:00</code> .
81445	Changes to existing CLI commands to support SNMPv3 managers.	The <code>addsnmpmgr</code> and <code>showsnmpmgr</code> commands are changed. The <code>addsnmpmgr</code> command allows to configure an SNMPv3 manager by specifying a version and username for the manager. The

Issue ID	Item	Description
		showsnpmpmgr command displays the version and user (if configured). The commands removeuser and removesnmpuser do not remove a user assigned to an SNMP manager.
82166	Add setsnmpmgr CLI command.	The setsnmpmgr CLI command allows the user to change the properties associated with a previously configured SNMP manager.
82477	Reduce VM usage from long running tpdctl processes.	On systems with large numbers of VVs or VLUNs, long running tpdctl processes allocate and hold a large amount of virtual memory. The solution is to execute showvv, showvlun, showvvcpg, statvv, and statvlun commands in a child process. When that process exits, the space will be returned, at the cost of a very small increase in latency.
83290	CLI commands fail after servicemag from Microsoft Windows OS.	CLI commands may fail with unprintable character errors if they occur after a servicemag and within the same Windows session. Running cli.exe again or using -nosockssl is a workaround. There are other commands that may cause this problem: admithw, checkld, checkpd, checkport, checkrclink, createald, createvv, growaldvv, showcage, startao, tunealdvv, tunesys, tunevv, upgradecage, upgradepd
86239	New set options for srstatvlun.	The srstatvlun and srhistvlun commands can accept VV sets or host sets in the appropriate options by using "set:<setname> syntax.

7 HP 3PAR OS 3.1.2 MU2 CIM API Release Notes

What's new with HP 3PAR CIM API

- Added StorageVolume Lifecycle Indications for InstCreation, InstDeletion and InstModification of ElementName, NumberOfBlocks and OperationalStatus.
- Added DynamicStoragePool Lifecycle Indications for InstCreation, InstDeletion and InstModification of RemainingManagedSpace.
- Added support for FCoE port. A new class TPD_FCPortEthernetPortDependency is added which associates an FCoE TPD_FCPort with TPD_EthernetPort.
- Added a new ClientType to StorageClientSettingData.

Persona	ClientTypes	OtherClientTypeDescriptions
12	OpenVMS (5)	OpenVMS

Interface changes

- ReplicationService.CreateGroupReplica accepts TPD_RemoteReplicationGroup as the SourceGroup parameter for Snapshot creation. This creates a synchronous READ-ONLY snapshot of each of the StorageVolumes in the RemoteReplicationGroup, in both the primary and secondary arrays.

Removed and Deprecated Commands and Options

- Use of SourceNamespace property when creating IndicationFilter is deprecated. Use SourceNamespaces instead.

Modifications to the HP 3PAR CIM API

The following items are addressed in this release.

Issue ID	Item	Description
78747	SMI-S property added to enable RAID5 CPG with NL drives	The new property corresponds to the AllowR5OnNLDrives parameter which may be read or set with the <code>showsys</code> CLI command. The AllowR5ONNLDrives property for TPD_StorageSystem instances may be read with the <code>TPD_StorageSystem::getInstance()</code> method or set with the <code>modifyInstance()</code> method.
80703	Resolved an issue with SMI-S provider where read requests from CIM client to a provider on an array big configuration will cause the provider to fail	Resolved an issue with SMI-S provider where read requests from CIM client to a provider on an array with lots of volumes and disks causes the provider to fail. Provider rejects the requests if the response gets too big or if there are too many simultaneous requests.
81197	Detaching an RW snapshot of an RW causes the parent volume to be removed	When using <code>StorageConfigurationService.ModifySynchronization operation=Detach</code> , or <code>ReplicationService.ModifyReplicaSynchronization operation=Detach</code> or <code>operation="Return To Resource Pool"</code> to remove an RW snapshot of an RW parent volume, the parent volume is also deleted. This happens if the parent volume has only one snapshot. This is resolved.

Issue ID	Item	Description
81685	SMI-S Provider initialization fails if array has an all-numeric name.	SMI-S provider fails if array has an all-numeric name (the name as shown in showsys). This is resolved.
81925	Resolved an issue where calling HideLUsFromStorageHardwareIDCollection results in occasional "Invalid ProtocolControllers" failure.	Resolved an issue where calling HideLUsFromStorageHardwareIDCollection results in occasional "Invalid ProtocolControllers" failure.
82106	Both output Job and TargetElement parameters are NULL when calling CreateElementReplica, but without specifying the input TargetElement parameter, to create a clone.	After calling CreateElementReplica, without specifying the input TargetElement parameter to create a clone, the output Job and TargetElement parameters are both NULL. The corresponding TPD_ConcreteJob instance is also missing. This is resolved.
82107	ModifySynchronization/ ModifyReplicaSynchronization Resync operation on an asynchronous clone results in target volume getting detached	ModifySynchronization/ ModifyReplicaSynchronization Resync operation on an asynchronous clone results in target volume getting detached after the resynchronization. This is resolved.
82303	RAID level information is included in ElementName of fixed StorageSetting.	RAID level information is added to ElementName string of StorageSetting that has ChangeableType of "Fixed - Not Changeable" (0).
82826	Resolved an issue where TPD_CreateConsistentReplicaList, CreateGroupReplica, or TPD_CreateGroupReplica resulted in RO snapshots.	Resolved an issue where calling TPD_CreateConsistentReplicaList, CreateGroupReplica, or TPD_CreateGroupReplica resulted in read-only snapshots.
83219	Occasional failure in generating CIM indications	Provider might fail to generate CIM indications. This is due to IndicationProvider not properly loaded during startup. Also, removing a IndicationSubscription may cause failure due to namespace case issue, a known OpenPegasus issue. This is resolved.
84384	Several issues with CIM API resolved.	The following issues, found while testing with client partners, are resolved: <ol style="list-style-type: none"> 1. ReturnToStoragePool did not remove the underlying logical disks of the StorageVolume. 2. ExposePaths with multiple InitiatorPortIDs incorrectly resulted in multiple instances of SPC, one for each InitiatorPortID. All the InitiatorPortIDs belong to the same SPC. 3. There were no fixed StorageSetting's that can be used for creating DynamicStoragePool from primordial InExtents. They are added, one for each supported RAID type. 4. Allows ModifyInstance of ElementName of SCSIProtocolController (only for host-see and matched set vluns). The corresponding host name is modified as a result.
84500	ExposePaths fails to map volumes to a host	TPD_ControllerConfigurationService.ExposePaths() failed to map several volumes to a host. ExposePaths() incorrectly reports that some of the volumes belong to a different domain even if all the volumes are in the same domain, as reported by showvv -listdom.. This is resolved.
86127	Win2012 PowerShell cmdlet New-MaskingSet-FriendlyName fails to set friendly name	Win2012 PowerShell cmdlet New-MaskingSet-FriendlyName fails to set friendly name. This is

Issue ID	Item	Description
		due to the fact that ModifyInstance of SPC ElementName is not supported. This is resolved.

8 HP 3PAR OS 3.1.2 MU2 SNMP Release Notes

What's New with HP 3PAR SNMP

- Added support for SNMPv3 trap. A user can specify the trap version (v2 or v3) for a particular SNMP manager. SNMPv3 traps are encrypted with CFB128-AES-128 and authenticated with HMAC-SHA-96 hash.

What's New in the OS CLI for SNMP

The following is a new command in this release for SNMP:

- `setsnmpmgr` - Change or assign a username to an SNMPv3 manager, or to convert a manager from v2 to v3 or from v3 to v2.

Changed commands

Command	Options added
<code>addsnmpmgr</code>	<code>-snmpuser</code> , <code>-version</code>

Modifications to the HP 3PAR SNMP

Issue ID	Item	Description
81445	Changes to existing CLI commands to support SNMPv3 managers.	The <code>addsnmpmgr</code> and <code>showsnmpmgr</code> commands are modified. <code>addsnmpmgr</code> allows to configure an SNMPv3 manager by specifying a version and username for the manager. <code>showsnmpmgr</code> displays the version and the user (if configured). <code>removeuser</code> and <code>removesnmpuser</code> does not remove a user that is assigned to an SNMP manager.
82166	Added new <code>setsnmpmgr</code> CLI command	The new <code>setsnmpmgr</code> CLI command allows to change properties associated with a previously configured SNMP manager.
83408	Added serial number to SNMP alertNotify Trap.	The HP 3PAR MIB is updated with a new field for the alertNotify trap definition. A new read-only object descriptor named <code>serialNumber</code> is added as a varbind to the end of the alertNotify trap. The <code>serialNumber</code> is a character string that represents the serial number of the InServ system, such as displayed by the <code>showsys</code> command.

9 HP 3PAR OS 3.1.2 MU2 Web Services API Release Notes

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

- Support for Web Services API with HP 3PAR Operating System 3.1.2 MU2
- HP 3PAR OS 3.1.2 MU2 WS API adds the following operations:
- Modification of Virtual Volume, Virtual Copies, CPG parameters.
 - Creation, Removal and modification of Hosts.
 - Query single item (as opposed to querying an entire collection).
 - Query Available Space.
 - Query General System Information.

10 HP 3PAR OS 3.1.2 EMU2 Release Notes

Online Upgrade Considerations

This feature allows the upgrade of the OS concurrently with I/O activity on the attached hosts, provided certain conditions are met. For further information and pre-planning of online upgrades, see the latest version of the *HP 3PAR OS Upgrade Pre-Planning Guide*. To obtain a copy of this documentation, go to <http://www.hp.com/3par/support/manuals>, select your product, and then click **Manuals**.

NOTE: Direct upgrade from HP 3PAR OS 3.1.1.226 to HP 3PAR OS 3.1.2.422 (EMU2) is not supported with this release of HP 3PAR OS 3.1.2.

HP 3PAR OS 3.1.2.422 (EMU2) replaces HP 3PAR OS 3.1.2.422 (MU2).

Customers running HP 3PAR OS 3.1.1 and who wish to upgrade to HP 3PAR OS 3.1.2 must upgrade to the latest HP 3PAR OS 3.1.1 MU before upgrading to HP 3PAR OS 3.1.2.

Supported Platforms

The HP 3PAR OS 3.1.2 Configuration Matrix contains information about supported hardware and software platforms. To obtain a copy of this documentation, see the Single Point of Connectivity Knowledge for HP Storage Products (SPOCK) website at: <http://www.hp.com/storage/spock>.

Components

Component	Version
OS	3.1.2.422
CLI Server	3.1.2.422 (MU2)
CLI Client	3.1.2.278
System Manager	3.1.2.450 (P11)
TPD Kernel Patch	3.1.2.450 (P11)
SNMP Agent	1.7.0

What's New in the HP 3PAR OS

HP 3PAR OS 3.1.2 EMU2 provides all the benefits provided by HP 3PAR OS 3.1.2 MU2 and resolves following issues:

- Sets the correct ticket number during log conversion when upgrading from any earlier HP 3PAR OS release to HP 3PAR OS 3.1.2.422 (EMU2)
- Initializes a message variable involved in log page processing correctly
- Installs HP 3PAR OS Extended MU2 from SP 4.1.0.GA-97 correctly if HP 3PAR OS 3.1.2 MU2 is already installed on the node
- Filters false frames created by certain fabric switches which causes the StoreServ Storage port to shut down
- Supports failover commands without requiring a transparent failover license (Peer Persistence license) on the system issuing the command
- Avoids the timeout of host inquiry commands to the HP 3PAR vendor unique LUN page during rolling upgrades from HP 3PAR OS 3.1.1 to HP 3PAR OS 3.1.2 or later

Modifications to the HP 3PAR OS

This release addresses the following items:

Issue ID	Item	Description
89348	Inquiry requests to LUN Vendor Unique Page timeout when upgrading from HP 3PAR OS 3.1.1 to HP 3PAR OS 3.1.2.	This addresses an issue of inquiry commands to the 3PAR vendor unique LUN page (0xC0h) timing out from hosts when upgrading from HP 3PAR OS 3.1.1 to HP 3PAR OS 3.1.2 or later.
89407	Resolved the log conversion issue for remote copy logs.	During an online upgrade from earlier versions of HP 3PAR OS release to HP 3PAR OS 3.1.2.422 (MU2), a node running HP 3PAR OS 3.1.2.422 (MU2) causes data unavailability when rcopy transaction log is converted to the new format. This is resolved.
90034	False frame originated from some fabric switches causes the StoreServ port to shut down.	False frame originated from some fabric switches causes the InServ port to shut down. These false frames are filtered and issue is resolved.
90079	Resolved an uninitialized variable issue in log page message.	The status field in free-volume-space request messages is initialized correctly. Thus, the message is not sent to the server node twice.
90730	If HP 3PAR OS 3.1.2 MU2 is already installed on the node, there are issues while installing HP 3PAR OS 3.1.2 EMU2 from SP 4.1.0.GA-97.	This is resolved. HP 3PAR OS 3.1.2 EMU2 is installed correctly from SP 4.1.0.GA-97 even if HP 3PAR OS 3.1.2 MU2 is already installed on the node.
91152	If both the systems of a Remote Copy pair are running HP 3PAR OS 3.1.2 MU2 but do not have transparent failover license enabled, normal Remote Copy failover commands fail. This happens if the system issuing the command is not licensed for Peer Persistence.	Support failover commands without requiring a transparent failover license (Peer Persistence license) on the system issuing the command.

11 HP 3PAR OS 3.1.2 MU3 Release Notes

Online Upgrade Considerations

This feature allows the upgrade of the OS concurrently with I/O activity on the attached hosts, provided certain conditions are met. For further information and pre-planning of online upgrades, refer to the latest version of the *HP 3PAR OS Upgrade Pre-Planning Guide*. To obtain a copy of this documentation, go to <http://h20566.www2.hp.com/portal/site/hpsc/public/psi/manualsResults/?sp4ts.oid=5044394>, click **General Reference** and then search for *HP 3PAR OS Upgrade Pre-Planning Guide*.

NOTE: Direct upgrades from 3.1.1.226 to 3.1.2.484 are not supported.

Customers running 3.1.1.226 and wishing to upgrade to 3.1.2 will need to upgrade to the latest 3.1.1 MU before upgrading to 3.1.2.

Supported Platforms

The HP 3PAR OS 3.1.2 Configuration Matrix contains information about supported hardware and software platforms. To obtain a copy of this documentation, see the Single Point of Connectivity Knowledge for HP Storage Products (SPOCK) website at <http://www.hp.com/storage/spock>.

Components

Component	Version
OS	3.1.2.484
CLI	3.1.2.484

What's New in the HP 3PAR OS

HP 3PAR OS 3.1.2 MU3 resolves important issues in the HP 3PAR OS 3.1.2 release line. This includes following benefits:

- Manageability and Serviceability for the nodes and cages
- Remote Copy including Transparent Failover and Peer Persistence

Modifications to the HP 3PAR OS

Issue ID	Item	Description
58471	cage goes offline or degraded due to badly behaving pd.	When the link comes up, the driver issues PLOGIs to all devices in parallel. If the link goes down while some of PLOGIs are pending, then the driver issues PLOGIs to devices one by one. If the link goes down again while the PLOGI is pending, driver marks this device as ByPass and sends an event to SYSMGR.
73224	Resolved an issue in the inter-node transport layer that can cause a node to access unmapped memory and become unresponsive.	Due to an issue in the transport layer module of HP 3PAR OS, a node might incorrectly access unmapped memory area when sending large data mover requests and become unresponsive. This is resolved and node ensures that large data mover requests do not access invalid memory areas.
78536	On HP 3PAR 7000 Series storage system with no drives, the <code>showcage</code> and the <code>shownode</code> commands do not show the cage or the node information.	On HP 3PAR 7000 Series storage system with no drives, the <code>showcage</code> and the <code>shownode</code> commands do not show any of the cage or node information. This is resolved.

Issue ID	Item	Description
78834	HP 3PAR 7200 storage system or HP 3PAR 7400 storage system Node Cage Battery alerts will not display null as the failure state.	HP 3PAR 7200 storage system or HP 3PAR 7400 storage system Node Cage Battery alerts will not display null as the failure state. It will display the associated failure state such as not present, end of life, or not available.
79555	Cannot create VLUN on free port 1:2:1 in vlun_rand_create test.	This is resolved. It allows pre-provision of storage and attaching a host later to the SAN.
82576	An oversized NOP-Out PDU might cause a node to become unresponsive.	An incoming NOP-Out PDU with data payload greater than 8K might cause memory corruption leading to an unresponsive node. This is resolved.
83204	The issue is : Fix Assertion failed: sc->sc_vlun_stats_act == 0	When the array is attempting to invalidate a token but does not have the resources to do it, assertion fails with a message "Assertion failed: sc->sc_vlun_stats_act == 0". When sending a busy status to the host, the sc_vlun_stat_act flag is not cleared. This results in the assertion failure when freeing the SC structure. This is resolved and it clears the flag prior to returning busy status.
86369	EBOD and EOS cages report data ports corresponding to the documentation.	The data ports for DC1, DCS2, and DCN1 cages are now reported for the physical locations corresponding to the documentation. This corrects command output such as showcage -d and showalert.locs.
86448	3P03 Viper-C drive FW	Viper-C 3P03/VCX3 firmware is checked in HP 3PAR OS 3.1.2.MU3 and HP 3PAR OS 3.1.3. An upgradepd to the Viper-C drives upgrades the Viper-C drive firmware. Viper-C drives are the drives with model string: HVIPC0600GBFC15K or HVIPC0300GBFC15K.
86658	Removed misleading "Success" string from SCCMD_DOCDB error messages.	Removed misleading "Success" string from SCCMD_DOCDB error messages.
86779	Prevented installing truncated license keys.	Earlier, it was possible to install license keys truncated at certain points resulting in an unusable key being installed. The setlicense command now properly handles these cases.
87160	Resolved the issue that checkupgrade cannot read "connections(123456789ABCDEF1)"	The checkupgrade script is updated to prevent this error: can't read "connections(123456789ABCDEF1)": no such element in array.
87497	HP-UX/AIX host ports stalling on I/O.	When HP-UX or AIX host ports lose the connectivity to the fabric momentarily and their N-port IDs do not change, they assume that their sessions with target ports are intact. The host ports do not login again to the target ports. HP 3PAR target ports require that the host port will login again regardless of the duration of the loss of connectivity. This leads to the host ports stalling on I/O. This is resolved by forcing the host ports to login again by sending a LOGO to them when they reappear in the fabric. This is available in HP 3PAR OS 3.1.1 MU4, HP 3PAR OS 3.1.2 MU3, and HP 3PAR OS 3.1.3 GA.
88374	Added support for SCSI VPD Page B1h.	Added support for SCSI Block Device Characteristics (page code B1h) for host OS requirements.

Issue ID	Item	Description
88805	A subset of cage alerts continuously repeat.	The following set of cage alerts repeat continuously, if any of the associate issues is present: <ul style="list-style-type: none"> • Cage temperature fault • Audible alarm fault • Display fault • Cage not supported fault • Bad link speed This is resolved.
88812	Improved handling of 7000 Series PCM Fans.	Improved the handling of PCM Fans, as follows: <ol style="list-style-type: none"> 1. The processing of the fan tolerance warning is improved 2. The fan speed and ramp up are stabilized.
88873	Resolved an issue that causes the <code>shownode env</code> command to show partial node environmental information on F-class systems.	For HP 3PAR OS 3.1.1 GA, the <code>shownode env</code> command do not display all the node environmental information on F-class systems. Due to this, some hardware errors are not detected in early stage. The issue exists with subsequent HP 3PAR OS 3.1.1 MU and 3.1.2 releases. This issue is resolved and the <code>shownodeenv</code> command displays the full environmental table.
88929	The <code>ddump</code> command does not truncate its output.	When running the <code>ddump</code> command to dump the cage data, it previously use to truncate its output intermittently. More time is allowed for completion of the command, so that the output is not truncated.
89348	Inquiry requests to LUN Vendor Unique Page timeout during upgrades from HP 3PAR OS 3.1.1 to HP 3PAR OS 3.1.2 or later versions.	This resolves an issue of inquiry commands to the 3PAR vendor unique LUN page (0xC0h) timing out from Hosts during upgrades from HP 3PAR OS 3.1.1 to HP 3PAR OS 3.1.2 or later versions.
89407	Resolved an issue where a node running HP 3PAR OS 3.1.2 MU2 becomes unresponsive and results in data unavailability when a <code>rcopy</code> transaction log is converted to the new format on nodes running HP 3PAR OS 3.1.2 MU2 during online upgrade from previous HP 3PAR OS releases.	Resolved an issue where a node running HP 3PAR OS 3.1.2 MU2 becomes unresponsive and results in data unavailability when a <code>rcopy</code> transaction log is converted to the new format on nodes running HP 3PAR OS 3.1.2 MU2 during online upgrade from previous HP 3PAR OS releases.
89893	Zoning configuration issues.	HP 3PAR has specific recommendations documented in the installation guides on zoning configuration. If these recommendations are not followed, HP 3PAR target ports might see a large number of initiator (host) ports in a single zone. In such poorly zoned environments, under certain circumstances, the Fibre Channel driver might trigger a port reset if enqueued requests are not serviced in a timely manner. An issue in the driver causes a node to become unresponsive during or shortly after such a reset. This issue is resolved in the releases HP 3PAR OS version 3.1.1 MU4, HP 3PAR OS version 3.1.2 MU3, and HP 3PAR OS version 3.1.3 and it is carried forward.
90034	Wrong frame originated by some Fabric switches causes the Storeserv port to go down.	Wrong frame originated by some Fabric switches causes the Storeserv port to go down. The is resolved and such frames are filtered out.
90079	Resolved an uninitialized variable issue in log page message.	Correctly initialize the status field in free-volume-space request messages to prevent the message being sent to the server node twice.
90166	DCS1 PCM numbers reported by the CLI now match the documentation.	Previously, the PCMs in DCS1 (LFF) cages were reported as 0 for the lower-right PCM and 1 for the

Issue ID	Item	Description
		upper-left PCM. This was in reverse order from the documentation. This is corrected such that PCM 0 is now reported for the upper-left PCM and PCM 1 for the lower-right PCM.
90386	Old port handle can cause SYSMGR to become unresponsive.	Accessing the old port handles after a node reboot can cause the SYSMGR to become unresponsive. This is resolved by clearing the cached port handles.
90450	Check health speed is improved by not flagging PDs undergoing servicemag.	Check health speed is improved by eliminating some slow checks when many PDs are in the servicing state.
90750	Unreliable connections between Peer Motion arrays could lead to host issues.	An unreliable connections between a source and a destination array in a Peer Motion relationship could result in delays in responding to host requests for data. Due to this the host marks the file systems as unavailable. This is resolved.
90832	Alerts from peer motion trial licenses.	When the trial period for peer motion license that is included by default with new system licenses ends, alerts are generated about being in violation of the license agreement. These incorrect alerts are removed.
90953	Lack of updates in show commands.	A rare issue where show commands does not reflect changes to volumes and other objects is prevented.
91254	Missing hosts and LUNs in show commands with very large number of unused hosts.	If a large number of initiators, that are not part of any host definition, are visible to the system, show commands might miss some objects, typically hosts and LUNs. This is resolved.
91470	Admstat does not handle correctly the deleted VVs.	Resolved an issue where the <code>adminstat IOCTL</code> command does not account for a VV being deleted in the middle of the IOCTL execution.
91543	Resolved an Issue reading the TOC after a conversion using the <code>Keepvv</code> option.	The code that read the TOC assumed that base VVs always are entered before a snapshot. However, a conversion using the <code>keepvv</code> option transfers a snapshot to a different base VV. The code is updated so that the TOC can properly read the VVs in this scenario.
91760	Issuing a <code>setvvset -name</code> command might stop the event logging mechanism.	Issuing a <code>setvvset -name</code> command to modify the name of an existing virtual volume set can result in the termination of <code>em_filter</code> process. The <code>em_filter</code> process is responsible for event logging and alert processing. The <code>em_filter</code> process is stopped till the individual node on which the <code>setvvset -name</code> command was issued is rebooted.
91994	Get LBA Status processing with Virtual Copy.	On earlier versions of the HP 3PAR OS, processing of Get LBA Status SCSI commands to exported virtual copies may not complete, consuming excessive system resources. This is resolved and it ensures that these SCSI commands complete correctly.
92612	ExposePaths with multiple InitiatorPortIDs will now result in multiple SPC's.	One of the solution for issue 84384 in the HP 3PAR OS 3.1.2 MU2 Release Notes is reverted. Calling <code>ExposePaths</code> with multiple <code>InitiatorPortIDs</code> now results in multiple SPC's, same behavior before HP 3PAR OS 3.1.2 MU2 is retained.

Issue ID	Item	Description
92724	The drives not behaving correctly keep bringing the entire loop up and down.	<p>The drives not behaving correctly keep bringing the entire loop up and down. To resolve this, bypass the misbehaving drives.</p> <p>When the link comes up, the driver issues PLOGIs to all devices in parallel.</p> <p>If the link goes down while some of the PLOGIs are still pending, then the driver issues PLOGIs to devices one by one.</p> <p>If the link goes down again while the PLOGI is still pending, mark this device as ByPass and send an event to SYSMGR.</p>
93733	Optimized ODX zero token performance.	This provides performance optimizations for WRITE USING TOKEN SCSI commands issued with the 'zero' token to thinly-provisioned volumes.

12 Support and Other Resources

Contacting HP

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

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

Before contacting HP, collect the following information:

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

Specify the type of support you are requesting:

HP 3PAR storage system	Support request
HP 3PAR StoreServ 7200, 7400, and 7450 Storage systems	StoreServ 7000 Storage
HP 3PAR StoreServ 10000 Storage systems HP 3PAR T-Class storage systems HP 3PAR F-Class storage systems	3PAR or 3PAR Storage

HP 3PAR documentation

For information about:	See:
Supported hardware and software platforms	The Single Point of Connectivity Knowledge for HP Storage Products (SPOCK) website: http://www.hp.com/storage/spock
Locating HP 3PAR documents	The HP 3PAR StoreServ Storage site: http://www.hp.com/go/3par To access HP 3PAR documents, click the Support link for your product.
HP 3PAR storage system software	
Storage concepts and terminology	<i>HP 3PAR StoreServ Storage Concepts Guide</i>
Using the HP 3PAR Management Console (GUI) to configure and administer HP 3PAR storage systems	<i>HP 3PAR Management Console User's Guide</i>
Using the HP 3PAR CLI to configure and administer storage systems	<i>HP 3PAR Command Line Interface Administrator's Manual</i>
CLI commands	<i>HP 3PAR Command Line Interface Reference</i>
Analyzing system performance	<i>HP 3PAR System Reporter Software User's Guide</i>
Installing and maintaining the Host Explorer agent in order to manage host configuration and connectivity information	<i>HP 3PAR Host Explorer User's Guide</i>
Creating applications compliant with the Common Information Model (CIM) to manage HP 3PAR storage systems	<i>HP 3PAR CIM API Programming Reference</i>

For information about:	See:
Migrating data from one HP 3PAR storage system to another	<i>HP 3PAR-to-3PAR Storage Peer Motion Guide</i>
Configuring the Secure Service Custodian server in order to monitor and control HP 3PAR storage systems	<i>HP 3PAR Secure Service Custodian Configuration Utility Reference</i>
Using the CLI to configure and manage HP 3PAR Remote Copy	<i>HP 3PAR Remote Copy Software User's Guide</i>
Updating HP 3PAR operating systems	<i>HP 3PAR Upgrade Pre-Planning Guide</i>
Identifying storage system components, troubleshooting information, and detailed alert information	<i>HP 3PAR F-Class, T-Class, and StoreServ 10000 Storage Troubleshooting Guide</i>
Installing, configuring, and maintaining the HP 3PAR Policy Server	<i>HP 3PAR Policy Server Installation and Setup Guide</i> <i>HP 3PAR Policy Server Administration Guide</i>

For information about:	See:
Planning for HP 3PAR storage system setup	
Hardware specifications, installation considerations, power requirements, networking options, and cabling information for HP 3PAR storage systems	
HP 3PAR 7200, 7400, and 7450 storage systems	<i>HP 3PAR StoreServ 7000 Storage Site Planning Manual</i> <i>HP 3PAR StoreServ 7450 Storage Site Planning Manual</i>
HP 3PAR 10000 storage systems	<i>HP 3PAR StoreServ 10000 Storage Physical Planning Manual</i> <i>HP 3PAR StoreServ 10000 Storage Third-Party Rack Physical Planning Manual</i>
Installing and maintaining HP 3PAR 7200, 7400, and 7450 storage systems	
Installing 7200, 7400, and 7450 storage systems and initializing the Service Processor	<i>HP 3PAR StoreServ 7000 Storage Installation Guide</i> <i>HP 3PAR StoreServ 7450 Storage Installation Guide</i> <i>HP 3PAR StoreServ 7000 Storage SmartStart Software User's Guide</i>
Maintaining, servicing, and upgrading 7200, 7400, and 7450 storage systems	<i>HP 3PAR StoreServ 7000 Storage Service Guide</i> <i>HP 3PAR StoreServ 7450 Storage Service Guide</i>
Troubleshooting 7200, 7400, and 7450 storage systems	<i>HP 3PAR StoreServ 7000 Storage Troubleshooting Guide</i> <i>HP 3PAR StoreServ 7450 Storage Troubleshooting Guide</i>
Maintaining the Service Processor	<i>HP 3PAR Service Processor Software User Guide</i> <i>HP 3PAR Service Processor Onsite Customer Care (SPOCC) User's Guide</i>
HP 3PAR host application solutions	
Backing up Oracle databases and using backups for disaster recovery	<i>HP 3PAR Recovery Manager Software for Oracle User's Guide</i>
Backing up Exchange databases and using backups for disaster recovery	<i>HP 3PAR Recovery Manager Software for Microsoft Exchange 2007 and 2010 User's Guide</i>
Backing up SQL databases and using backups for disaster recovery	<i>HP 3PAR Recovery Manager Software for Microsoft SQL Server User's Guide</i>
Backing up VMware databases and using backups for disaster recovery	<i>HP 3PAR Management Plug-in and Recovery Manager Software for VMware vSphere User's Guide</i>
Installing and using the HP 3PAR VSS (Volume Shadow Copy Service) Provider software for Microsoft Windows	<i>HP 3PAR VSS Provider Software for Microsoft Windows User's Guide</i>
Best practices for setting up the Storage Replication Adapter for VMware vCenter	<i>HP 3PAR Storage Replication Adapter for VMware vCenter Site Recovery Manager Implementation Guide</i>
Troubleshooting the Storage Replication Adapter for VMware vCenter Site Recovery Manager	<i>HP 3PAR Storage Replication Adapter for VMware vCenter Site Recovery Manager Troubleshooting Guide</i>
Installing and using vSphere Storage APIs for Array Integration (VAAI) plug-in software for VMware vSphere	<i>HP 3PAR VAAI Plug-in Software for VMware vSphere User's Guide</i>

Typographic conventions

Table 1 Document conventions

Convention	Element
Bold text	<ul style="list-style-type: none">• Keys that you press• Text you typed into a GUI element, such as a text box• GUI elements that you click or select, such as menu items, buttons, and so on
Monospace text	<ul style="list-style-type: none">• File and directory names• System output• Code• Commands, their arguments, and argument values
<Monospace text in angle brackets>	<ul style="list-style-type: none">• Code variables• Command variables
Bold monospace text	<ul style="list-style-type: none">• Commands you enter into a command line interface• System output emphasized for scannability

⚠ WARNING! Indicates that failure to follow directions could result in bodily harm or death, or in irreversible damage to data or to the operating system.

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

NOTE: Provides additional information.

Required

Indicates that a procedure must be followed as directed in order to achieve a functional and supported implementation based on testing at HP.

HP 3PAR branding information

- The server previously referred to as the "InServ" is now referred to as the "HP 3PAR StoreServ Storage system."
- The operating system previously referred to as the "InForm OS" is now referred to as the "HP 3PAR OS."
- The user interface previously referred to as the "InForm Management Console (IMC)" is now referred to as the "HP 3PAR Management Console."
- All products previously referred to as "3PAR" products are now referred to as "HP 3PAR" products.