Dell EqualLogic PS Series Storage Arrays Firmware Version 10.0.3 Release Notes

This document describes important product information and restrictions for Dell EqualLogic PS Series storage arrays running PS Series firmware version 10.0.

This version of the firmware includes all corrections and enhancements made in prior releases. Unless otherwise noted, all information in this document applies to version 10.0 of the PS Series storage arrays and all future maintenance releases for version 10.0.

Topics:

Revision History

Document number: 110-6294-EN-R5

Revision	Date	Description
R1	April 2018	EPA release of PS Series Storage Arrays firmware version 10.0.0
R2	May 2018	Initial release of PS Series Storage Arrays firmware version 10.0.1
R3	October 2018	Added supported browser information
R4	December 2018	End User License Agreement (EULA) update
		Bug fixes
R5	July 2019	Maintenance release v10.0.3
R6	August	Corrections for maintenance release v10.0.3

About PS Series Storage Arrays

Dell EqualLogic PS Series arrays optimize resources by automating capacity, performance, and network load balancing.

Additionally, PS Series arrays offer all-inclusive array management software and firmware updates. Dell EqualLogic PS Series arrays, when combined with FS Series appliances, offer a high-performance, high-availability, scalable NAS solution.

NOTE: PS Series storage arrays version 10.0 are compatible with FS Series appliances version 4.0 or later.

For product information about FS Series appliances, see the *Dell EqualLogic FS Series Appliances Release Notes*, available at eqlsupport.dell.com.

PS-M4110 Precaution

The PS-M4110 chassis contains a locking mechanism that was engineered for smooth operation and will engage without the need to apply a large amount of force. Using excessive force to close the drawer is not necessary and could result in physical damage to the chassis.

Firmware Update Kit

NOTE: If you use the Dell Storage Update Manager to update to firmware v10.0, this tool takes care of the update for you. The Dell Storage Update Manager (including the *Dell Storage Update Manager User's Guide*) can be downloaded from the Dell EqualLogic support website (eqlsupport.dell.com).

Two separate kits (32-bit and 64-bit) are available within the .zip file. The name of the kits starts with either `kit_V10.0` (32-bit) or `kit_64_V10.0` (64-bit). After you download the .zip file, and begin to install the update, the wizard will ask you to select the kit to install:

- If you have array models PS60x0, PS65x0, or PS-M4110, select the 32-bit kit.
- If you have array models PS41x0, PS4210, PS61x0, PS6210, or PS6610, select the 64-bit kit.

If you choose the wrong kit when updating from v7.0.x or later, the following error displays: `The type <n> controller is not supported by this firmware. See the latest Release Notes for more information.`

NOTE: The firmware update process remains the same as it was for previous versions.

To download the firmware update kit:

1. Use a web browser to access the Dell EqualLogic support website (eqlsupport.dell.com).
2. Log in to your support account. If you do not have an account, request one from the **Login** page.
3. Click the **Downloads** tab, then click **PS Series firmware**.
4. Select **PS Series firmware version 10.0.x**.
5. Download the firmware to a host that has network access to the array.

If you downloaded the firmware in a compressed format (.tar or .zip), decompress the file to a directory on the host.

Supported Update Paths

When updating array firmware, you must follow the supported update path, as shown in the following table:

NOTE: Dell Storage Update Manager can be used when updating firmware from the following versions:

- **PS Series Storage Arrays firmware version 8.0 and later**
- **FS Series Storage Appliances firmware version 3.0 and later**

The first column lists starting firmware versions, and the second column lists the versions to which they can be updated. The notation used in the table refers to all releases of a given firmware revision. For example, 10.0.x refers to versions 10.0.1, 10.0.2, and so on, as well as all version 10.0 patch releases.

Table 1. Supported PS Series Firmware Update Paths

Starting Versions	Supported Update Versions
10.0.x	• Later 10.0 releases
9.1.x	• Later 9.1.x releases • 10.0.x releases
9.0.x	• Later 9.0.x releases • 9.1.x releases
8.1.x	• Later 8.1.x releases • 9.0.7 or later; cross-platform replication requires v9.0.9 or later

Starting Versions	Supported Update Versions
8.0.x	• Later 8.0.x releases • 8.1.x releases • 9.0.x releases

NOTE: If you are updating from a version earlier than v8.0.x, contact Dell Technical Support for assistance.

What's New in Version 10.0.2

End-User License Agreement was revised

Starting with v10.0.2, the following portions of the End-User License Agreement (EULA) were revised:

- Commercial Terms of Sale (US) includes a table that shows where to get a local language version of the CTS. This provides all the commercial terms such as payment, taxes, warranty, limitation of liability.
- EULA is no longer country-specific, and contains the software license grant, restrictions, and other terms that apply just to software products.

If you perform a firmware update within the same compat level, close the GUI browser window and log in again in order to accept the new EULA changes.

What's New in Version 10.0

PS Series Array v10.0 provides the following new features and enhancements:

New Features

Secure Erase

This feature enables the EqualLogic array to clear the data on the disk when a volume is deleted or moved from the array. Secure delete also supports member delete, member vacate, and page move. You can enable or disable this feature by selecting the `Enable secure erase data` checkbox from the Group Configuration Advanced tab.

NOTE: The deleted pages are not immediately available for new allocation in existing or new volumes. Under certain conditions, such as FST (free space trouble), when old snapshots are deleted automatically, or if some pages are moved out of the system, clearing the data might delay recovery from the FST process.

- **The process of clearing the data in the background consumes system resources.**
- **I/O timings are also slightly impacted while the data is being cleared.**

Unmap Support for VVol Datastores Unmap SCSI commands enable the EqualLogic array to reclaim the space in a thin volume. Starting with PS Series firmware v10.0, Unmap supports multiple LUNs under a single Protocol Endpoint (PE) target. In a VMware environment, whenever files are deleted or space optimization utilities are run, the guest OS on VVol datastores issues the unmap SCSI commands. Blocks that are not being utilized by the OS are reclaimed.

NOTE:

- **Unmap for VVol datastores requires ESX v6.5 or later.**
- **Unmap is not reported as an available function for VVols until all members in the group are updated to PS Series v10.0.**

Limitations

Unmap support requires the use of the command line utility `esxcli` in order to perform unmap operations on VMFS Datastores. This includes ESXi v6.5 Datastores. ESXi does not support unmap with PS series arrays in the following three cases:

- The EQL volume is replicated. (SYNC or ASYNC). This restriction is true for all operating systems supporting unmap.
- The VMFS Datastore was updated from VMFS v3.x to VMFS v5.0. It must be formatted at VMFS v5+ in order to support unmap
- ESXi v6.5 offers VMFS automatic unmap on VMFS v6.x Datastores. However, VMware requires that the unmap granularity be 1MB or less. PS Series arrays use an unmap granularity of 15 MB.
- ESXi v6.7 update 2 adds support for VMFS6 automatic unmap processing on storage arrays and devices that report to ESXi hosts an unmap granularity value greater than 1 MB. On arrays that report granularity of 1 MB and less, the unmap operation is supported if the granularity is a factor of 1 MB.

XCopy Support for VVol Datastores

SCSI Extended Copy (XCopy) now supports VVol-based datastores. This feature is typically used in live migration of VMs by the ESX server. XCopy enables the storage arrays to make full copies of data within the array without having the host read and write the data. This operation reduces the time and network load when cloning virtual machines, provisioning from a template, or migrating with vMotion.

NOTE: The following requirements apply to XCopy for VVol datastores:

- **ESXi issues the XCopy only when the VM is powered on.**
- **To use XCopy, the members must be part of the same group.**
- **The datamover supports VAAI offload using XCopy for migrations from VMFS to VVols but does not support migrations from VVols to VMFS.**

The XCopy feature is enabled by default. To disable XCopy, use the following ESX CLI command: `esxcli system settings advanced set --int-value 0` --option /DataMover/HardwareAcceleratedMove.

Active Directory Search Path Optimization

PS Series v10.0 provides the option to disconnect the Base DN from search paths and adds two search paths, `group-search-dn` and `user-search-dn`. These two options enable Active Directory to perform recursive object search within a specified path. If you do not specify either of these two new parameters, the behavior of this command will be the same as earlier releases.

Deprecated Features

SHA-1 – The SHA-1 hash algorithm is no longer secure for certificates and certain other digital signatures. SHA-1 has been disabled in PS Series v10.0 and later.

SSLv2 – The SSLv2 protocol is no longer supported, starting with PS Series v10.0.

Java on Mac OS – Group Manager applet is no longer supported in the MacOS environment due to the operating systems' updated security preferences.

Workaround: To make the Group Manager applet work in a Mac OS environment, open the **Java Control** panel, **Java Security Settings**, and add the Group IP address from which the Group Manager is being accessed (downloaded) to the list of trusted sites. Adding wildcard entries (like 100.84.*.*) does not work in this case, specific IP address must be added separately. To open the Group Manager applet itself, the MAC OS Gatekeeper has to be bypassed. This can be done by clicking on the downloaded Group Manager applet while holding the CTRL key (or right clicking the icon) and choosing **open** > **open anyway**.

CLI Commands – The following commands displayed the password in plain text. These commands have been removed and replaced with new commands that do not display the passwords.

Old commands	New commands
`grpparams target-auth-password`	`grpparams target-auth-password-new`
`chapuser create`	`chapuser create-new`
`chapuser select <name> passwd`	`chapuser select <name> passwd-new`
`partner create`	`partner create-new`
`partner select <name> inbound-password`	`partner select <name> inbound-password-new`
`partner select <name> outbound-password`	`partner select <name> outbound-password-new`

Enhancements

Maintenance Pool

When you update the group to PS Series firmware to v10.0, a pool named `maintenance` is created by default. You no longer have to remove the member from the group to perform updates or maintenance of EqualLogic members. You can move the member to the maintenance pool to perform any maintenance activity. The maintenance pool behaves like the default pool, but it does not support any data operation. The default name of the pool created by the system is `maintenance`. You can rename the pool, but you cannot delete it.

You can see information about this pool by invoking any of the following commands:

- `member vacate`
- `pool show`
- `pool rename`
- `pool select` <*pool_name*> `show`

NOTE: Maintenance pool space cannot be used by user because no data operation is allowed in the maintenance pool. Maintenance pool capacity, however, is added to total group capacity.

Time-to-Live

This feature is applicable for SC to PS cross-platform replication only. Prior to this release, PS did not honor the Time-to-Live (TTL) field and replica snapshots were never deleted from PS no matter what the TTL value was. TTL now deletes the replica snapshots on the PS array based on the TTL value sent by the Storage Center during the creation of a replica snapshot. Only the expired snapshots are deleted.

NOTE:

- **Modifying the TTL value on the Storage Center is supported with Dell Storage Manager 2018 R1 or later.**
- **The latest replica snapshot for a volume is never deleted even when it has expired.**

grpparams test-email-home CLI Command

A new command, `grpparams test-email-home` was created to test whether EmailHome is enabled. For command usage and output information, see the *Group Manager CLI Reference Guide*.

Active Directory Search Path Optimization

PS Series v10.0 provides the option to disconnect the Base DN from search paths and adds two search paths, `group-search-dn` and `user-search-dn`. These two options enable Active Directory to perform recursive object search within a specified path. If you do not specify either of these two new options, the behavior of the `ldap server-list create` command will be the same as earlier releases.

System Limits and Compatibility

This section includes information about supported control modules, configuration limits, replication partnerships, and Manual Transfer Utility versions.

Control Module Support

The following table describes the supported control modules and the array models that use them:

Table 2. Control Module Support

Control Module Description	Drive Type and Maximum Quantity	Array Models[1]
Type 19—Two 10Gb dual-media Ethernet Interfaces (two 10GBASE-T, two SFP+), labeled Ethernet 0 and Ethernet 1. Individually selectable as 10GBASE-T or SFP+. One additional port labeled MANAGEMENT, restricted to management network use. Model 70–0485 (Red Label)	12 x 3.5" or 24 x 2.5" Type: SAS, Nearline SAS, or SSD	PS4210
Type 18—Two 10Gb dual-media Ethernet Interfaces (two 10GBASE-T, two SFP+), labeled Ethernet 0 and Ethernet 1. Individually selectable as 10GBASE-T or SFP+. One additional port labeled MANAGEMENT, restricted to management network use. Model 70-0480 (Turquoise Label)	84 x 3.5" or 84 x 2.5" Type: SAS, Nearline SAS, or SSD	PS6610
Type 17—Two 10Gb Ethernet ports (one copper, one SFP+), both labeled Ethernet 0. One port can be active at a time. One additional port labeled MANAGEMENT, restricted to management network use. Model 70–0478 (Yellow/Gold Label)	12 x 3.5" or 24 x 2.5" Type: SAS, Nearline SAS, or SSD	PS4110
Type 15—Two 10Gb dual-media Ethernet Interfaces (two 10GBASE-T, two SFP+), labeled Ethernet 0 and Ethernet 1. Individually selectable as 10GBASE-T or SFP+, One additional port labeled MANAGEMENT, restricted to management network use. Model 70-0425 (Gray Label)	24 x 3.5" or 24 x 2.5" Type: SAS, Nearline SAS, or SSD	PS6210
Type 14—Two 10Gb Ethernet ports (one copper, one SFP+), both labeled Ethernet 0. One port can be active at a time. One additional port labeled MANAGEMENT, restricted to management network use. Model 70–0477 (Orange Label)	24 x 2.5" or 24 x 3.5" Type: SAS, Nearline SAS, or SSD	PS6110

Control Module Description	Drive Type and Maximum Quantity	Array Models[1]
Type 13—One 10Gb Ethernet port, connected through the backplane. One additional port labeled MANAGEMENT, restricted to management network use. Model 70-0450 (No Label)	14 x 2.5" Type: SAS, Nearline SAS, or SSD	PS-M4110
Type 12—Two Ethernet ports. One additional port labeled MANAGEMENT, restricted to management network use. Model 70–0476 (Purple/Magenta Label)	12 x 3.5" or 24 x 2.5" Type: SAS, Nearline SAS, or SSD	PS4100
Type 11—Four Ethernet ports. One additional port labeled MANAGEMENT, restricted to management network use. Model 70–0400 (Green Label)	24 x 2.5" or 24 x 3.5" Type: SAS, Nearline SAS, or SSD	PS6100
Type 10—Two 10Gb Ethernet ports that use optical or copper SFP+ modules. One port labeled MANAGEMENT, restricted to management network use. Model 70–0300 (Orange Label)	48–SAS or SATA 16–SAS (Black latch) or SATA (Gray latch)	PS6510, PS6010
Type 7—Four Ethernet ports Model 70–0202 (Green Label)	48–SAS or SATA 16–SAS (Black latch) or SATA (Gray latch)	PS6500, PS6000

[1] Regulatory compliance numbers E01J, E02J, E03J, E04J, E05J, and E11J apply to Dell EqualLogic PS Series arrays. See the Safety, Environmental, and Regulatory Information document for more information about specific array models.

Configuration Limits

The following table describes the supported configuration limits for a PS Series group running version 10.0 of the PS Series firmware:

NOTE: For the purposes of this table, a PS4XXX array is defined as any array in the PS4000-series family, which includes PS4100, PS-M4110, PS4110, and PS4210 systems. Only two PS4XXX-series arrays can be in a mixed group of multiple array types. A group consisting entirely of PS4XXX-series arrays has only two members. When a group contains a mix of PS4XXX arrays and other array models, the higher limits prevail.

Table 3. Configuration Limits

Configuration	Groups of PS4XXX Arrays Only	All Other Groups
Volumes and replica sets per group	512	1024
Volume size[1]	15TB	15TB
Volumes that have replication enabled (outbound)[2]	32	256
Volumes that have synchronous replication enabled	4	32[3]
Volumes per collection	8	8
Total combined folders and volume tags per group	1024	1024
VVols + volumes per group	512	1024
Bound VVols + online volumes + online snapshots (max 100) per group	512	1024
VVol metadata	64K	64K
Snapshots + replicas + VVols per group[4]	2048	10,000
Snapshots per volume	128	512
Replicas per volume	128	512
Schedules (snapshot or replication) per volume or volume collection	64	64
Number of online snapshots	100	100

Configuration	Groups of PS4XXX Arrays Only	All Other Groups
Persistent Reservation registrants per volume	512 per pool	1024 per pool
	1024 per group with 2 pools	4096 per group with 4 pools
Replication partners per group	16	16
Replication partners per volume	1	1
Members per group	2	16
		8 if using VVols
Members per pool	2	8
Pools per group	2	4
Recommended minimum free space per pool	5% of total pool capacity or 100GB per pool member, whichever is less	5% of total pool capacity or 100GB per pool member, whichever is less
Collections per group (snapshot and replication)	100	100
Volume connections (each time an iSCSI initiator connects to a volume counts as a connection) [2, 5]	512 per pool	1024 per pool
	1024 per group with 2 pools	4096 per group with 4 pools
Basic access points per volume and its snapshots	16	16
Access policy groups	128	128
Access policies	512	512
Access points	1024	1024
Access point IP address	2048	2048
Associations	4096	4096
Simultaneous management sessions (any combination of GUI, telnet, or scripting sessions)	7	7
Thin-provisioning limits (minimum allocation)	10% of volume size	10% of volume size
Administrator accounts per group[6]	100	100
SCSI Power Fencing[7, 8]	Up to 16 nodes	Up to 16 nodes
IPsec policies	256	256
IPec security parameters	256	256
IPsec certificates[8]	10	10

1 Practical maximum volume size is specific to your operating system. A PS Series group can create and present volumes up to 15TB.

2 To avoid service outages or possible loss of connectivity during failovers, Dell recommends that you set initiator timeouts according to the recommendations in the *Dell EqualLogic PS Series Storage Arrays iSCSI Initiator and Operating System Considerations* document.

3 When mixing PS6XXX and PS4XXX arrays, SyncRep remains at 4 volumes if any PS4XXX members are in the group.

4 This value includes VVol snapshots and VVol-linked clones.

5 Inbound replication connections count toward the total number of connections.

6 This number includes local accounts, the built-in grpadmin account, and any remotely authenticated accounts added to the group.

7 SCSI fencing is not supported for Red Hat Enterprise Linux. See the *Dell EqualLogic PS Series Storage Arrays iSCSI Initiator and Operating System Considerations* document for more information.

8 This value includes one local and one root CA certificate; the rest are intermediate CA certificates.

Replication Partnerships

Replication is supported only between certain firmware versions.

The following table shows whether replication is supported between any two partners running different firmware versions:

NOTE: If you are running firmware earlier than version v8.0, contact your support provider.

Table 4. Replication Support – PS Series to Other PS Series

Firmware on Primary Group	Firmware on Replication Partner
v10.0	v9.0.x, v9.1.x, v10.0
v9.1	v8.0.x, v8.1.x, v9.0.x, v9.1.x, v10.x
v9.0	v8.0.x, v8.1.x, v9.0.x, v9.1.x, v10.x
v8.1	v8.0.x, v8.1.x, v9.0.x, v9.1.x, v10.x
v8.0	v8.0.x, v8.1.x, v9.0.x, v9.1.x, v10.x

Replication from PS Series groups to Storage Centers is supported between the firmware versions listed in the following table:

Table 5. Replication Support – PS Series Groups to Storage Centers

Firmware on Primary Group	Firmware on Replication Partner
PS Series v10.0	Storage Center 7.1 or later
	Dell Storage Manager 2016 R3 or later

Supported Browsers

NOTE:

- **Group Manager requires support for the Java browser plugin.**
- **Group Manager does not support the following browsers: Google Chrome, Mozilla Firefox, Safari, and Microsoft Edge.**
- **Group Manager can be downloaded and run as a Java application.**

The Group Manager GUI has the following browser requirements:

- Screen resolution requirements vary by language. For optimal resolution, make sure that your screen width has the minimum number of pixels for your language:

English – 1280	French – 1680	Chinese – 1280	Japanese – 1680
German – 1440	Spanish – 1680	Korean – 1280	

- If support for Java is not included with your operating system, you must download and install Java support from java.com to use the GUI.
- You must have JavaScript enabled to ensure that applets resize correctly.

Supported Host-Based Tools Versions

PS Series firmware version 10.0 supports the versions of the host-based tools listed in the following table:

Table 6. Host-Based Tools Supported

Product	Supported Versions
Host Integration Tools for Linux	v1.5 and v1.6
Host Integration Tools for Microsoft	v4.9, v5.0, and v5.1
Multipathing Extension Module for VMware vSphere (MEM)	v1.5
SAN Headquarters (SAN HQ)	v3.2, v3.3, and v3.4

Product	Supported Versions
Storage Replication Adapter (SRA) for VMware Site Recovery Manager	v2.4
Virtual Storage Manager (VSM) for VMware	v4.7 and v5.0
PS Series vRealize Operations (vROps) Management Pack	v1.3

NOTE: The following software versions are not supported in firmware version 10.0:

- **SAN HQ v3.0.x**
- **SRA v2.2.x**
- **vCenter Operations Management Pack v1.1 (replaced by vRealize Operations Management Pack)**

Some of the new features in version 10.0 of the PS Series firmware are not supported by previously released versions of the Host Integration Tools. For information about which versions of the Host Integration Tools are supported in this firmware version, refer to the compatibility matrix at eqlsupport.dell.com/support/download.aspx?id=6442454231.

Supported Manual Transfer Utility Versions

The Manual Transfer Utility (MTU) is available as a downloadable kit from the support website at eqlsupport.dell.com, and runs on Linux and Windows systems. MTU is documented in the *Dell EqualLogic Manual Transfer Utility Installation and User's Guide* and in the Group Manager online help.

The following table lists the supported PS Series firmware releases for use with MTU:

Table 7. Manual Transfer Utility Support

Manual Transfer Utility Version	PS Series Firmware Version
v2.0.x	v8.0, v8.1, v9.0, v9.1, and v10.0
v1.2.3	v8.0, and v8.1

PS Series Known Problems and Limitations

The following sections describe known problems and limitations in PS Series firmware version 10.0.

Configuration, Installation and Upgrades

Duplicate Entries in Active Directory Browse Function

When using port 3268 to browse Active Directory users and groups, you might see multiple entries with the same name. These names have different Base Domain Names, but have no reference to which domain they might be in.

Workaround– To differentiate the users and groups in Active Directory, type the Base Domain Name in the `Base DN` field or restrict the search path using the new `User/Group Search DN` field.

Users in the Groups Must Also Be in the Search Path

If a user in the group is not also in the user search path, remote authentication might fail.

I/Os Might Fail During a Firmware Update if Members Have Type 7 or Type 10 Controllers In the Group

Members with Type 7 or Type 10 controllers in the group show high latency during firmware updates, which can lead to I/O failures.

Relaunch Group Manager

After performing a firmware update, close the browser to relaunch Group Manager.

Array Does Not Leave Domain After Base Domain is Changed

The array does not leave the domain after the Base Domain is changed by a user with insufficient privileges, such as bind-dn user.

Cross-Platform Replication

Date and Time Changed to Epoch for Some Replicas

Following a PS Series firmware update to v10.0.x, the date and time for some of the existing replicas were correct while others were changed to epoch date and time.

Creating PS to SC Replication Might Generate Mapping Server Alerts

Replicating from a PS array to a Storage Center volume succeeds, but generates a mapping server alert on the Storage Center regarding connectivity. You can ignore these mapping server alerts.

Cross-Replication From a Storage Center to a PS Group Replication Fails Due to Insufficient Space

Delegated space must be at least 1GB greater than the reserved space allocated for all volumes. The quota checker looks to see if enough space is available before starting the first replica. If the delegated space does not have enough free space, the replica fails with an error similar to `insufficient quota available`.

Replica Creation Limit

Cross-platform replication supports the following when created using an SC as the primary and a PS as the destination:

- 4,096 replicas created with SC4020 as the primary
- 10,000 replicas created with SC8000 as the primary

Do Not Create a Storage Center Replication Volume If a Storage Center Is Not a Replication Partner

If you create a Storage Center volume that only has a PS group as the replication partner, the following error is returned: `There are no Storage Arrays available to be the destination of a replication`.

Status of Replication Is Incorrect

When replicating from a PS Series array to a Storage Center, if the remote partner (Storage Center) is down, the status in Dell Storage Manager does not get updated until the next time replication is triggered from the PS Series array.

When Using Cross-Platform Replication, PS Group Manager Takes a Long Time to Reflect the Replica Status

During a cross-platform replication operation, if the Storage Center is powered down, the PS Group Manager can take up to 20 minutes to reflect the replica status as `Partner Down`.

Discrepancy In Replica Count After Performing Promote and Failback to Primary

While performing a PS to SC replication, during the DR activation (failover) and failback, Group Manager displays the replica count incorrectly. This replica count issue does not impact the replication process.

Replica Count Is Incorrect After the Partner (Storage Center) Is Powered On

Creating a replica for a volume while the partner (a Storage Center that already contains replicas) is down results in an incorrect replica count in Group Manager when the partner is brought back up. Dell Storage Manager shows the correct replica count.

Hardware

Replacing an 8-TB Drive With a 4-TB Drive Is Not Supported.

On a PS6610 member, you can upgrade a disk from 4 TB to 8 TB, but downgrading an 8 TB disk to 4 TB is not supported.

When PS4210 or PS6210 Arrays Are Halted, the ERR LEDs for Both Controllers Are On

When a PS4210 or PS6210 array is halted using the halt command, the controllers and battery backup units (BBU) go into ship mode, but the ERR LEDs on both control modules remain ON (red light).

On a Controller Failover, the Following Erroneous Message Might Appear On the Console or Group Manager

During a controller failover, fan failure messages similar to the following might be falsely reported on the console or Group Manager: Multiple fans are operating outside of acceptable speed ranges. This condition occurs rarely, and when it does, the fans go to a higher speed and then come back to the normal speed in approximately 10 to 15 seconds.

Networking

Member Cannot Detect IPV6 Group Address Automatically If the Group Name Is Numeric

If you create a group with a numeric name, you must also provide the IPv6 well-known address (WKA) to join the group.

Use TLS with OpenLDAP Port 389

Use TLS with OpenLDAP with the default port of 389 and not with port number 636 as mentioned on the *OpenLDAP faq* webpage.

Replication

Confusing Error On Replication Test Partnership Page

While using replication, on the test partnership page if you test an IPv4 partner on a group configured for IPv6, the following error is displayed: `Internal Error, could not complete tests`. The intended error should be: `Unable to communicate because both sides of the replication partnership must use the same IP version`.

Update the Pool Mapping Entry If You Move Delegated Space

When you move delegated space from one pool to another pool for a partner, the pool mapping entry (if any) does not automatically get updated. You must manually change the pool mapping.

User Interface

Launching Group Manager as an Application Generates Exception

If you launch Group Manager as an application, when you click Run, the following error might display: `Error. Click here for details`. When you click for details, the error `Illegal Argument Exception` is displayed. This error can be ignored, because Group Manager will still successfully launch as an application. Click Ignore to continue.

Group Manager GUI and CLI Provide Different Options When Creating Thin Clones

When you create a thin clone, the default for the Group Manager CLI is different from the default for the GUI. The CLI puts the clone of the template into the same folder as the template. The GUI defaults to not putting the clone into any folder, but allows you to check a box and select a folder.

Rear View Power Supply Status Reported Incorrectly

Group Manager does not show the latest information on rearview power supply status. If you switch to the front view, and then back to the rear view, the correct status will display.

GUI Logout Event Does Not Ooccur in MacOS Environments With Safari Browser Only

When using a macOS with the Safari browser only, the GUI logout event is not generated when the logout operation is performed.

Using the GUI With Tabbed Web Browsers

You can run multiple instances of the Group Manager GUI in separate tabs. When running multiple GUI instances, Dell recommends that you launch the GUI instances one at a time to avoid scenarios in which multiple login dialog boxes are displayed at the same time. Otherwise, the Javamachine might become unresponsive and the browser application must be restarted.

In Firefox, you can run only one instance of Group Manager in a browser window.

JAWS Screen Reader Issues

- JAWS Screen Reader Software Reads Coding Tags—When SyncRep is configured, a SyncActive volume is created as well as the SyncAlternate volume. You can disconnect the SyncActive volume by selecting a volume configured for SyncRep, **Activities** > **SyncRep** .
- Attempting to disconnect the SyncActive volume opens a dialog box and the JAWS screen reader software reads the tags, such as `P left brace padding...`, before finishing with the contents of the dialog box.
- JAWS Screen Reader Does Not Read the Validation Column in the Replica Set Placement Tab—The Manage Delegated Space – Replica Set placement tab contains a Validate Primary Pool Names button. When this button is activated, it tries to validate the pool names specified in the table with those on the partner. The Validation column of the table is updated to reflect the status of each user-supplied pool. At this time, JAWS does not read this column.
- JAWS Reads HTML Tags for All Columns in Virtual Machines and Virtual Disk Tables—In VMware virtual machines, the HTML tags are read for all the columns in the `Virtual machines` and `Virtual disk` tables.

Error Displays When You Run Group Parameters

If you log in to the CLI as the pool administrator, and run the grpparams vss-vds access-policy show or grpparams vss-vds access- policy-group show command, the following error is displayed: Error: Too many parameters.

Virtual Volumes

Do Not Modify or Delete ACLs Associated to the PE

Using the CLI, users can inadvertently eliminate access to the protocol endpoint (PE), and impact their intended VVol access rules. Dell has placed many restrictions on CLI operations to prevent inadvertent misconfigurations, although they might still occur. For this reason, Dell requires the use of VSM (Virtual Storage Manager) for the creation or manipulation of ACL rules for protocol endpoints (associated with VVols).

If an access rule is inadvertently removed using the CLI, it will become immediately obvious by inspecting the specific PS group being managed by VSM and navigating to the **Manage** > **Protocol Endpoint** screen. Any ESX host without access to the PE will be labeled with a red exclamation point (!). You can press the allow button to allow access again for this host or any other chosen hosts.

Group Manager Does Not Display Virtual Machine Description Information

The Virtual Machine description column in Group Manager displays as empty. The value can be retrieved from the vCenter UI by accessing the Summary field under the Notes tab.

ESXi Support for Unmap with PS Arrays

Unmap support requires the use of the command line utility `esxcli` in order to perform unmap operations on VMFS Datastores. This includes ESXi v6.5 Datastores. ESXi does not support unmap with PS series arrays in the following three cases:

- The EQL volume is replicated. (SYNC or ASYNC). This restriction is true for all operating systems supporting unmap.
- The VMFS Datastore was updated from VMFS v3.x to VMFS v5.0. It must be formatted at VMFS v5+ in order to support unmap
- ESXi v6.5 offers VMFS automatic unmap on VMFS v6.x Datastores. However, VMware requires that the unmap granularity be 1MB or less. PS Series arrays use an unmap granularity of 15 MB.
- ESXi v6.7 update 2 adds support for VMFS6 automatic unmap processing on storage arrays and devices that report to ESXi hosts an unmap granularity value greater than 1 MB. On arrays that report granularity of 1 MB and less, the unmap operation is supported if the granularity is a factor of 1 MB.

Volumes

Error When Deleting Volume With Multiple Snapshots Online

If you attempt to delete a volume with multiple snapshots online, the following (incorrect) error is generated: `No Snapshot exists for volume_name`.

Issues Corrected in Version 10.0.3

This version of PS Series firmware includes all fixed issues that were incorporated into earlier releases.

Replication

- Cross-platform replications from a Storage Center system with Chelsio T3 iSCSI HBAs to a PS Series array stop approximately every six to eight weeks.
- Issues with Cluster Interprocess Communication (CIPC) might prevent the replication of a volume from a Storage Center system to a PS Series array.

User Interface

- If the Secure Communication option is enabled, users are unable to establish a connection to the Group Manager GUI after updating to Java 8 build 201.

Other

- The `ocps` daemon running on PS Series arrays only supported the anonymous Diffie-Hellman key exchange protocol.
- Updated the time zone data with the latest information from the IANA Time Zone Database.

Issues Corrected in Version 10.0.2

This version of PS Series firmware includes all bug fixes that were incorporated into earlier releases.

Replication

- User could not replicate a volume from a PS Series storage array to a Storage Center using cross-platform replication. After a controller failover, the replication completed successfully.
- During a cross-platform replication from PS to SC, if one of the controllers on the SC side rebooted, and a rebalance of ports was performed after the controller came back up, a stale session entry remained on the PS side.

SAN Headquarters (SAN HQ)

- While running SAN HQ on a PS6210 array, user reported a large number of the following event: `fsmRequest.cc:245:DIAG::7.6.5:context missing in read callback`.

User Interface

- User could not open Group Manager nor use Dell Storage Update Manager with Java v10.x.
- The CLI command `pool select default show` returned an incorrect value of `unknown` .
- Users could delete members in the maintenance pool using the CLI, but could not delete members using Group Manager.

Volumes

- A volume administrator that was created using radius server was erroneously given maintenance pool access.

Issues Corrected in Version 10.0

This version of PS Series firmware includes all bug fixes that were incorporated into earlier releases.

Hardware

- The NMC batteries in PS4210, PS6210, and PS6610 arrays were programmed to learn capacity and a temperature threshold at 40C. This value was too low for normal ambient conditions and was changed to 55C.

Installation, Configuration, and Updates

- When users saved the group configuration to a file using the `save-config` CLI command, the volume schedules related to snapshot and replication were not saved.

Networking

- Initiators might erroneously fail to log in to a single volume with `Local reset initiated due to network` errors .

Replication

- Cross-platform replication snapshots were deleted even if the volume had an on-going replication scheduled or online activated DR snapshots.
- The time in all of the arrays involved in a cross-platform replication was not synchronized, which led to unexpected expiration of replicas.
- Cross-platform replication could not be configured because a volume was not created properly which prevented the system from making the proper connections from the SC to the PS array.
- [Critical] In very rare conditions where snapshot compression was enabled, PS6210 or PS6610 controllers could have rebooted continuously due to a misinterpretation in the internal metadata structures. Additional code enhancements have also been added in relation to this fixed item.

User Interface

- When an SSH client attempted to log in to an array, sshd presented keyboard-interactive and public-key as valid authentication methods, when they are not. This led to false-positive results on vulnerability scanners.

Product Documentation

This section contains the following information about product documentation:

Documentation Corrections

This section lists documentation corrections and updates that apply to PS Series storage arrays.

Front LCD Panel Disk Indicator Conditions

The Hardware Maintenance Guides and Disk Field Replaceable Unit (FRU) document for the PS6500 and PS6510 Series arrays fail to mention that the front LCD panel disk indicator also flashes in the following cases:

- If a RAID set is in a faulted state
- If multiple RAID sets are found
- If a drive is too small
- In lost block conditions
- If the write cache is lost or orphaned

NOTE: The color of the indicator was incorrectly stated as yellow instead of orange.

This correction affects the following documents:

- *PS6500 Storage Arrays Hardware Maintenance Manual*
- *PS6510 Storage Arrays Hardware Maintenance Manual*
- *PS Series Storage Arrays Disk Drive Replacement*, which supports both PS6500 and PS6510 storage array models

PS6000 Hardware Maintenance Guides

In previously published versions of the following document, the disk error LED color is incorrectly listed as red instead of orange. The document containing the error is:

- PS6000 Hardware Maintenance Guide, page 2-3, callout 4 in Table 2-1

Installation Guides Refer to Setup Utility

The *PS Series Storage Arrays Installation and Setup Manual* for the PS6000 and PS6500 storage arrays reference to a setup utility. This description of a utility is misleading; a more accurate description of this function would be the `setup` CLI command.

Technical Specifications

The following technical specifications are incorrect in the Installation and Setup Guides for PS6210, PS6110, PS6100, PS4210, PS4110, and PS4100 Series storage arrays:

- The documents mistakenly state that the maximum temperature is `50°C`. The correct maximum operating temperature is `40°C (104°F)`.
- The documents mistakenly state that the maximum operating temperature derating for altitudes above 2950 ft is `17.22222°C (1°F)/550 ft`. The correct derating of the maximum temperature for altitudes above 2950 ft is `0.5556°C (1°F)/550 ft`. Alternatively, you can use a derating ratio of `1°C /~300 m`.

Related Documentation

Information about PS Series storage arrays and FS Series storage appliances is included in the following documents:

- *Release Notes* – Provide the latest information about PS Series storage arrays and FS Series appliances.
- *Installation Guide* – Describes how to set up the hardware and start using PS Series storage arrays and FS Series appliances.
- *Group Manager Administrator's Guide* – Describes how to use the Group Manager GUI to manage PS Series storage arrays and FS Series appliances. This manual provides comprehensive information about concepts and procedures.
- *Group Manager CLI Reference Guide* – Describes how to use the Group Manager command-line interface to manage a storage array or a group and individual appliances.
- *Hardware Owner's Manual* – Provides information about maintaining the PS Series storage array and the FS Series appliance hardware.

Contacting Dell

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services might not be available in your area. To contact Dell for sales, technical support, or customer service issues, go to dell.com/support.

© 2018 – 2019 Dell Inc. or its subsidiaries. All rights reserved. Dell, EMC, and other trademarks are trademarks of Dell Inc. or its subsidiaries. Other trademarks may be trademarks of their respective owners.