

Dell Compellent Storage Center™ Flash Optimization

Upgrade Guide

**Creating a Flash Optimized Disk Folder
on an Existing Storage Center**



Compellent

Storage Center Flash Optimization Upgrade Guide

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Revision	Date	Description
A	December 2013	Initial release

Notes, Cautions, and Warnings



Note: Indicates important information that helps you complete a procedure.



Caution: Indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.



Warning: Indicates that failure to follow directions could result in property damage, personal injury, or death.

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Preface

This preface introduces the Storage Center documentation. It provides the purpose and audience of this document as well as a list of related publications.

Purpose

The *Storage Center Flash Optimization Upgrade Guide* provides instructions for installing and configuring read-and write-intensive solid state drives (SSDs) to create a Flash-Optimized Storage Center.

Audience

This document is intended for system administrators, storage administrators, and architects who analyze, design, and maintain Dell Compellent Storage Center. Readers should be familiar with administration of Storage Center version 6.x.

Related Publications

The following documents contain information related to this upgrade.

- *Storage Center Release Notes*
Contains information about features and open and resolved issues for a particular product version.
- *Storage Center SC8000 Deployment Guide*
Provides cabling instructions for Storage Center SC8000 controllers, switches, and enclosures and provides instructions for configuring a new Dell Compellent Storage Center using the System Manager Startup wizard.
- *Storage Center System Manager Administrator's Guide*
Describes the Storage Center System Manager software that manages an individual Storage Center.
- *Storage Center Software Update Guide*
Describes how to upgrade Storage Center software from an earlier version to the current version.
- *Storage Center Maintenance CD Instructions*
Describes how to install Storage Center software on Storage Center controllers. Installing Storage Center software using the Storage Center Maintenance CD is intended for use only by sites that cannot update Storage Center using the standard update options available through the Storage Center System Manager.

About Flash Optimized Upgrades

This upgrade procedure describes how to upgrade a Storage Center by adding a new disk folder to hold Flash Optimized storage. The upgrade can add both read-and write-intensive SSDs to Storage Center.



Note: In previous Storage Center OS versions, write-intensive SSDs are referred to as SLCSSD.

Preparing for the Upgrade

Before upgrading Storage Center to use Flash Optimized storage, Phone Home to record the existing configuration information to Dell Technical Support Services, update the Storage Center OS, and perform a system back up.

Phone Home

Perform a Phone Home before installing an update.

- 1 From the **Storage Management** menu, select **System**→ **Phone Home**→ **Phone Home**. The Phone Home wizard starts.
- 2 Click **Phone Home Now**. The **Phone Home In Progress** dialog box appears.
- 3 When the dialog box displays the message Phone Home Started, click **OK**.
- 4 When System Manager reports success for all Phone Home transfers, click **Close** to exit the Phone Home wizard.

Update Storage Center OS

Follow the instructions in the *Storage Center Version 6.4 Software Update Guide* to update the Storage Center to version 6.4.2 or later.

Back Up the System


Make sure that backups are up to date and Replications are synchronized.

Upgrade Procedure

This upgrade adds new, unmanaged read- and write- intensive SSDs to a new disk folder where they will be managed separately as Flash-Optimized storage.

Prerequisites

A minimum of six SSDs are required for a Flash Optimized array. When two types of SSDs are present, the array must contain at least six of each type.


 **Caution:** This procedure adds new, unmanaged SSDs to a new disk folder. Do not add read-intensive drives (MLC SSDs) to an existing disk folder. Adding read-intensive drives to an existing disk folder is not supported, and may compromise performance or data availability.

Install New Disks

- 1 Follow the instructions in the *Storage Center SC8000 Deployment Guide* to install a new enclosure or to install new disks into an existing enclosure.
- 2 Storage Center will recognize new disks and place them in a disk folder named **Unassigned**. If new disks do not appear, select **Disk**→ **Scan for Disks** from the **Storage Management** menu. Storage Center scans for new disks and places them in the **Unassigned** disk folder.

Create a New Disk Folder

- 1 From the **Storage Management** menu, select **Disk**→ **Folder** → **Create Disk Folder**. The **Create Disk Folder** wizard starts and prompts you to confirm creating a second disk folder.
- 2 Click **Yes**. System Manager displays unassigned disks to be added to the new disk folder.
- 3 From the list of unmanaged disks, select the read- and write-intensive drives to be placed in the new disk folder.
- 4 Click **Continue**. System Manager displays the disks selected, and prompts you to select one or more disks to be a hot spare. You cannot create a disk folder without a hot spare.
- 5 Select the disk to use as a hot spare or accept the default.
- 6 Click **Continue**.
- 7 Enter a folder name and any optional notes about the disk folder.
- 8 The default page size for Flash Optimized storage is 512 K. Depending on storage capacity and use, you may increase the page size to 2 MB. Refer to *Storage Center 6.4 Sizing Guidelines* for details about when to change the page size.

 **Note:** 4 MB page sizes are not supported in Flash Optimized storage.

If required, follow these steps to change the page size.

- a Click **Advanced**.
 - b From the Datapage Size list, select **2 MB**.
 - c Click **Continue**.
- 9 Click **Create Now**. The disk folder is created.
 - 10 Refresh the System Manager window and verify that the new Flash Optimized disk folder appears in the System Tree.

Storage Configuration Utility

Flash

Storage Type: Flash Optimized, Redundant 512 KB

Tier 1 Storage
11 managed disks (4 TB) | 1 spare disk (372.61 GB) | Redundancy: Single Redundant

Position or Name	Capacity	Free Space	Classification	Enclosure	Status	Health	Endurance	Control Type	LUN	Vendor	Product
01-00	372.61 GB	372.61 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Spare	0000000000000000	DELL	LB4065
01-01	372.61 GB	372.12 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB4065
01-02	372.61 GB	372.25 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB4065
01-03	372.61 GB	372.25 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB4065
01-04	372.61 GB	372.25 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB4065
01-05	372.61 GB	372.25 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB4065
01-06	372.61 GB	372.25 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB4065
01-07	372.61 GB	372.25 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB4065
01-08	372.61 GB	372.25 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB4065
01-09	372.61 GB	372.25 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB4065
01-10	372.61 GB	372.25 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB4065
01-11	372.61 GB	372.25 GB	Write-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB4065

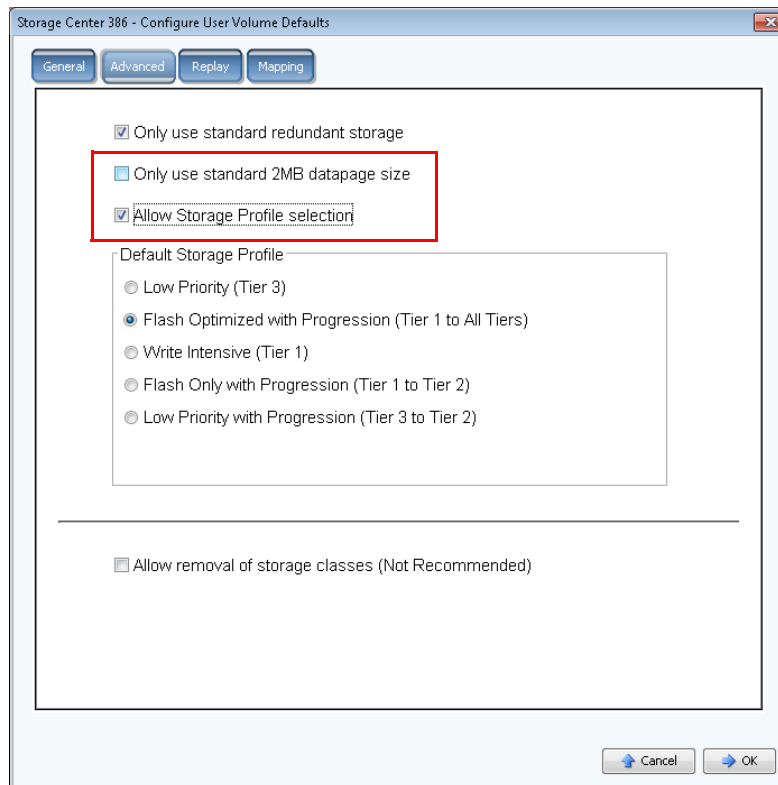
Tier 2 Storage
11 managed disks (16.01 TB) | 1 spare disk (1.46 TB) | Redundancy: Single Redundant

Position or Name	Capacity	Free Space	Classification	Enclosure	Status	Health	Endurance	Control Type	LUN	Vendor	Product
01-12	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Spare	0000000000000000	DELL	LB1606R
01-13	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB1606R
01-14	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB1606R
01-15	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB1606R
01-16	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB1606R
01-17	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB1606R
01-18	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB1606R
01-19	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB1606R
01-20	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB1606R
01-21	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB1606R
01-22	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB1606R
01-23	1.46 TB	1.46 TB	Read-Intensive...	Enclosure - 1	Up	Healthy	Full	Managed	0000000000000000	DELL	LB1606R

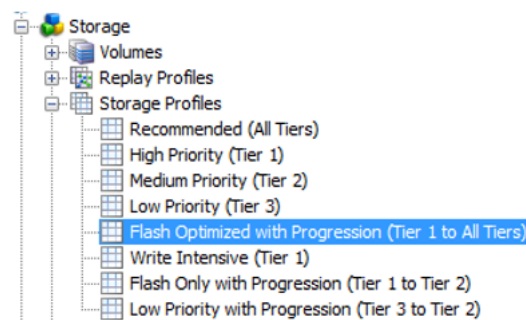
Set Storage Volume Defaults

Use the **Advanced** tab of the **Configure User Volume Defaults** dialog box to set default data storage options.

- 1 From the **Storage Management** menu, select **Volume**→ **Configure My Volume Defaults**.
- 2 Click the **Advanced** tab.



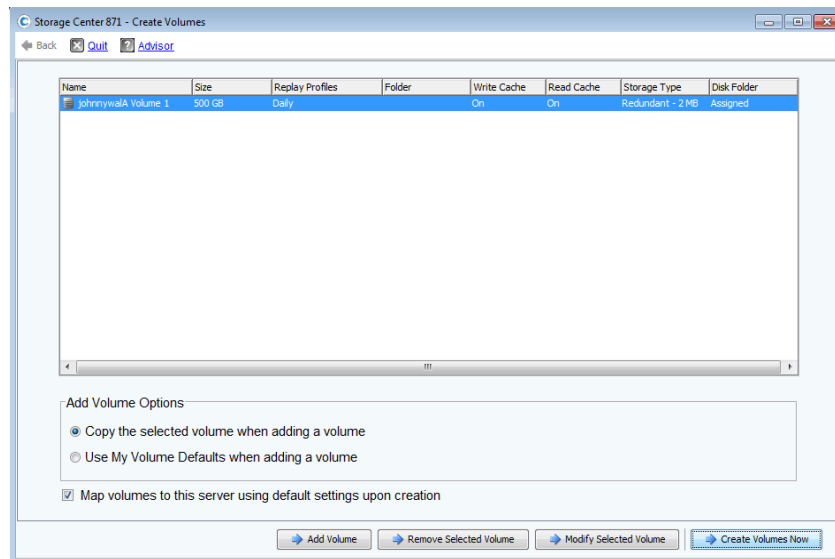
- 3 Select the **Allow Storage Profile Selection** check box.
- 4 If you are using the default 512K page size, clear the **Only use Standard 2MB datapage size** check box.
- 5 Click **OK**.
- 6 Refresh the System Manager window and verify that the Flash Optimized Profiles appear in the System Tree.



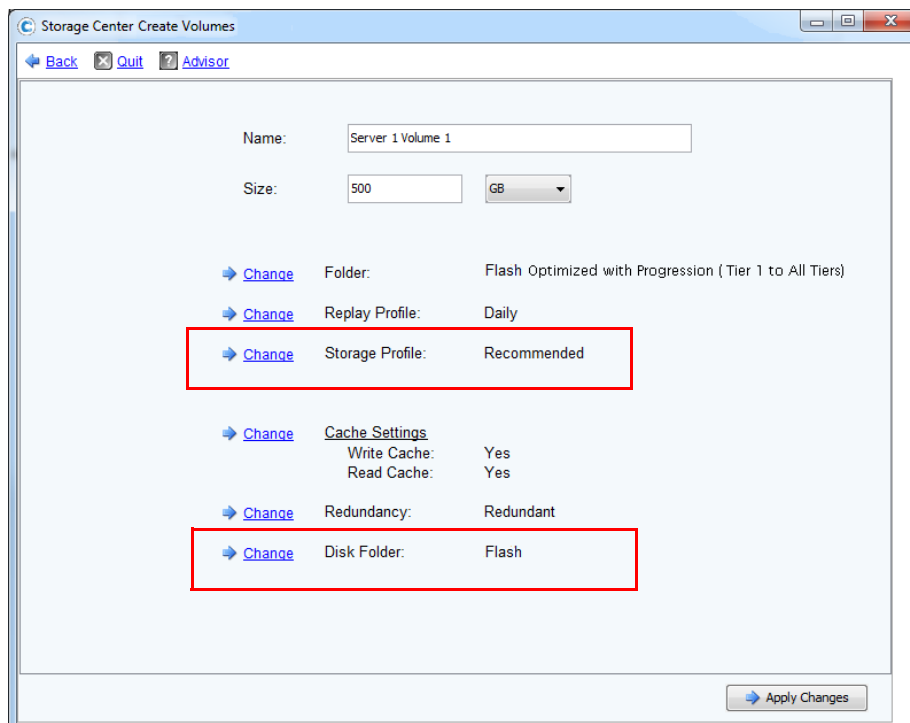
Create Volumes in the New Disk Folder

Use the **Create Volumes** wizard to create volumes in the Flash Optimized disk folder.

- 1 In the System Tree, select a server, server cluster, or virtual server.
- 2 From the context menu, select **Create Volumes**. The **Create Volumes** wizard starts. By default, the name of the volume is based on the name of the server.



- 3 Select **Copy the selected volume when adding a volume**.
- 4 Click **Modify Selected Volume**. A page appears that contains the volume attributes that can be changed.



- 5 Select a volume size large enough to hold the data to migrate.

- 6 Modify the following attributes.
 - **Disk Folder:** Select the disk folder created previously for Flash Optimized storage types.
 - **Storage Profile:** Choose from one of the following Storage Profiles for Flash Optimized storage types. See the *Storage Center System Manager Administrator's Guide* for a complete description of each profile.

Name	Initial Write Tier	Tier (T) and RAID Levels	Progression
Low Priority (Tier 3)	3	Writes: T3 RAID 10 Replays: T3 RAID 5/RAID 6	No
Flash Optimized with Progression (Tier 1 to All Tiers)^a	1	Writes: T1 RAID 10 Replays: T2/T3 RAID 5/RAID 6	Yes All Tiers
Write Intensive (Tier 1)	1	Writes: T1 RAID 10 Replays: T1 RAID 10	No
Flash Only with Progression (Tier 1 to Tier 2)	1	Writes: T1 RAID 10 Replays: T2 RAID 5	Yes to Tier 2 only
Low Priority with Progression (Tier 3 to Tier 2)	3	Writes: T3 RAID 10 Replays: T3 RAID 5/RAID 6, or T2 RAID 5	Yes to Tier 2 only

a. Default Storage Profile

- 7 Click **Apply Changes** to save changes and return to the volume list.
- 8 Click **Create Volumes Now**.

Migrate Volumes to Flash Optimized Disk Folder

Follow these steps to migrate volumes to the Flash-Optimized disk folder.

Prerequisites

- The SSD capacity must be large enough to contain the volume data from the existing disk folder.
- Capacity cannot exceed 1 PB. Refer to *Storage Center 6.4 Sizing Guidelines* for more information about system capacity.
- Volumes to be migrated cannot be part of an existing Replication or Live Volume. If so, use Enterprise Manager to delete the existing Replication or Live Volume. Do not recycle or delete the remote volume since you can use it after the data migration is completed.



Note: Storage Center performance may be affected during data migration, because additional back-end bandwidth will be used by the migration process.

- 1 In the System Tree, select a volume.
- 2 Select **Copy**→ **Copy/Migrate**. The **Copy/Migrate Volume** wizard starts.
- 3 In the Copy/Migrate Volume wizard, select a destination volume. Make sure that:
 - The volume is located in the Flash Optimized disk folder.
 - The volume is large enough to hold all of the data in the original volume.



Note: You may create a new volume rather than selecting an existing volume. When creating a new volume, make sure that the volume size and attributes are as specified on [page 5](#).

- 4 Click **Continue**.
- 5 Select the options to be used during the Copy/Migrate process.
- 6 Click **Continue**.
 - To migrate now, click **Start Now**.
 - To schedule the migration at a later time, click **Schedule**, enter a date and time, and click **Schedule Now**.
- 7 View the status of the Migrate action in either the **Copy/Mirror/Migrate** tab or from the **View** menu.
 - Select the volume in the System Tree and click the **Copy/Mirror/Migrate** tab in the right pane.
 - Select **View**→ **Copy/Mirror/Migrate**.

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