Dell Storage vSphere Web Client Plugin

Version 4.1

Administrator's Guide

Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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Contents

Preface

The *Dell Storage vSphere Web Client Plugin Administrator's Guide* provides instructions for installing, configuring, and using the Dell Storage vSphere Web Client Plugin. The plugin provides management of Dell storage with the VMware vSphere Web Client.

Revision History

Document Number: 680-054-007

Revision	Date	Description
A	February 2017	Dell Storage vSphere Web Client Plugin version 4.1 general release

Audience

The intended audience of this guide is information technology professionals who have intermediate to expert knowledge of both Dell Storage Centers and Storage Manager. This guide also assumes administrative working knowledge of VMware vSphere Web Client, VMware vCenter, VMware ESXi, and FluidFS.

Related Publications

In addition to this guide, the following documentation is available for client applications used with Dell Storage products:

- *Dell Storage vSphere Web Client Plugin Release Notes*
  Describes new enhancements and known issues for the Dell Storage vSphere Web Client Plugin.
- *Dell Storage Integration Tools for VMware Administrator's Guide*
  Provides instructions for deploying and configuring the Dell Storage vSphere Web Client Plugin.
- *Dell Storage Integration Tools for VMware Release Notes*
  Describes the new features and enhancements in the latest version of DSITV.
- *Dell Storage SC Series Best Practices with VMware vSphere 5.x–6.x*
  Provides configuration examples, tips, recommended settings, and other storage guidelines a user can follow while integrating VMware vSphere with a Storage Center. This document answers many frequently asked questions about how VMware interacts with Storage Center features, such as Dynamic Capacity, Data Progression, and Data Reduction.
- *Dell Storage Manager Administrator's Guide*
  Provides configuration and management instructions for Dell Storage Manager.

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.

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Getting Started

The Dell Storage Dell Storage vSphere Web Client Plugin enables storage administrators the ability to manage Storage Centers and Dell Fluid File System (FluidFS) clusters with the VMware vSphere Web Client.

Introduction to vSphere Web Client Plugin

The Dell Storage vSphere Web Client Plugin provides management of Dell Storage.

NOTE: Use the VMware vSphere Web Client to perform all procedures in this guide, unless instructed otherwise.

Key Features

The Dell Storage vSphere Web Client Plugin provides these functions:

- Adding and removing VMFS storage, such as datastores and Raw Device Mappings, on Storage Centers
- Adding and removing NFS datastores on FluidFS clusters
- Provisioning virtual machines on Dell Storage
- Configuring VMware ESXi hosts on Dell Storage
- Creating and managing Storage Center snapshots for VMFS datastores
- Creating and managing FluidFS cluster snapshots for NFS datastores
- Replicating VMFS datastores between Storage Centers
- Adding and managing Live Volumes
- Recovering VMFS datastores and VMs from VMFS datastore snapshots
- Managing Disaster Recovery for VMFS datastores

In addition, the vSphere Web Client Plugin displays information tabs within the VMware vSphere Web Client inventory views.

Status of vSphere Web Client Plugin Tasks

The Recent Tasks pane displays the status of tasks performed using the Dell Storage vSphere Web Client Plugin. If a task's status is not displayed in the **Recent Tasks** pane, click **Refresh** to update the pane, or click **More Tasks** to display the **Task Console** page.

Requirements for the vSphere Web Client Plugin

Hardware and software requirements must be met before installing the Dell Storage vSphere Web Client Plugin. Also, Storage Center requirements must be met to replicate data

Hardware and Software Requirements

The *Dell Storage vSphere Web Client Plugin Release Notes* list the minimum hardware and software requirements for installation of the Dell Storage vSphere Web Client Plugin.

Replication Requirements for VMFS Datastores

To replicate data from one Storage Center to another, make sure that the following requirements are met:

- Storage Center: Both the source and destination Storage Centers must be configured in Storage Manager. They must be configured for the Storage Manager user credentials supplied to the vSphere Web Client Plugin in Configuring the Dell Storage vSphere Web Client Plugin.

- QoS Definition: A Quality of Service (QoS) definition must be set up on the source Storage Center for replication. See the *Dell Storage Manager Administrator's Guide* for instructions on creating QoS definitions.

If you are using iSCSI connections for replications:

- The destination Storage Center must be defined as an iSCSI Remote System on the source Storage Center.
- The source Storage Center must be defined as an iSCSI Remote Connection on the destination Storage Center.

See the *Dell Storage Manager Administrator's Guide* for instructions on configuring iSCSI connections between Storage Centers.

Configuring the Dell Storage vSphere Web Client Plugin

Configure the Dell Storage vSphere Web Client Plugin to communicate with a Storage Manager server.

Prerequisites

Install the Dell Storage Integration Tools for VMware (DSITV) and register the Dell Storage vSphere Web Client Plugin with a vCenter server as described in the *Dell Storage Integration Tools for VMware Administrator's Guide*.

Steps

1. Log in to the vSphere Web Client.
2. Click **Go Home**. The **Home** page opens.
3. Click the **Home** tab. A **Dell Storage** icon appears below the **Administration** heading on the **Home** tab.
4. Click **Dell Storage**. The **Dell Storage** page opens, and the **Getting Started** tab is displayed by default.
5. Under the **Basic Tasks** heading, click **Manage Credentials**.
   The Connection Manager Credentials dialog box opens.

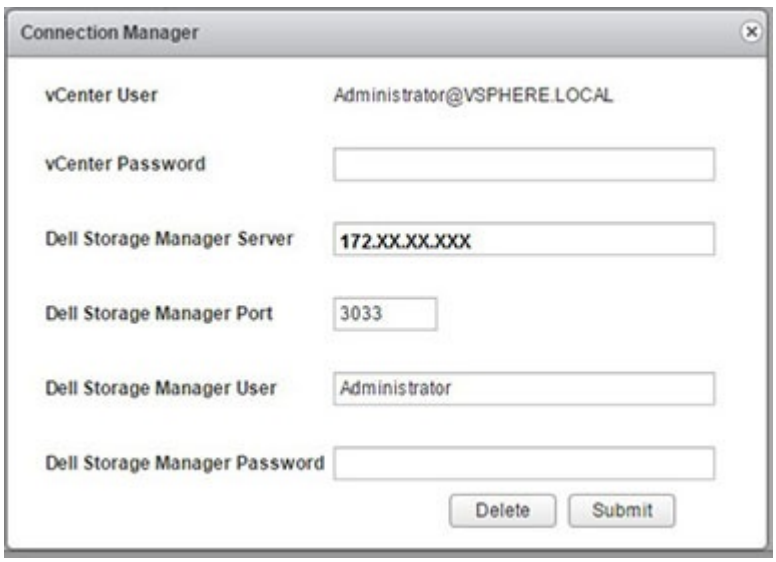

Figure 1. Connection Manager Credentials Dialog Box

6. Type the password of the vCenter user in the **vCenter Password** field.
   The **vCenter User** field displays the user that was used to log in to the vSphere Web Client. To configure the vSphere Web Client Plugin for a different vCenter user, log out of the vSphere Web Client and log back in with that user.

   NOTE: The vSphere Web Client Plugin uses the vCenter continues running tasks using the vCenter user credentials after the vSphere Web Client Plugin is closed.
7. Type the host name or IP address of the Storage Manager server in the **Dell Storage Manager Server** field.
8. Type the port number for the Storage Manager in the **Dell Storage Manager Port** field.
9. Type the user name and password of a Storage Manager user with administrator privileges in the **Dell Storage Manager User** and **Dell Storage Manager Password** fields.

The Storage Manager user credentials control which Storage Centers and FluidFS clusters can be managed in the vSphere Web Client Plugin.

To add a Storage Center or FluidFS cluster to the vSphere Web Client Plugin, log in to the Storage Manager client using the same user credentials. Add the Storage Center or FluidFS cluster to manage. See the *Dell Storage Manager Administrator's Guide* for instructions on adding a Storage Center to Storage Manager and for instructions on adding a FluidFS cluster to Storage Manager.

10. Click **Submit**.
    - The plugin validates the vCenter and Storage Manager credentials.
    - If the credentials are correct, the vSphere Web Client Plugin retrieves Storage Center information from the Storage Manager server.

    NOTE:
    The more Storage Centers and volumes managed by the Storage Manager user, the longer it takes to display the **Dell Storage** page.

    If the credentials are incorrect, a **Connection Manager** error dialog box opens.

Register the vSphere Web Client Plugin After a DSITV Upgrade Installation

After a successful upgrade of the DSITV appliance, a reboot is required. You then must unregister and reregister the Dell Storage vSphere Web Client Plugin from the DSITV appliance's CLI menu. This action removes the old plugin and registers the new plugin to vCenter.

After performing these steps, if the Dell Storage icon does not appear in the vSphere Web Client, restart the vSphere Web Client service. See the *Dell Storage Integration Tools for VMware* for vSphere Web Client Plugin installation and troubleshooting information.

Managing the vSphere Web Client Plugin

The following sections describe how to manage vCenter and Storage Manager credentials, display Storage Center and FluidFS cluster information, and disable or enable the vSphere Web Client Plugin.

Changing vCenter and Storage Manager Credentials

If the credentials change for the Storage Manager user defined in the vSphere Web Client Plugin, update the credentials on the **Manage** tab of the **Dell Storage** page.

Prerequisites

Data Collector must be installed and running before you can configure the vSphere Web Client Plugin. See the *Dell Storage Manager Installation Guide* for information about installing Data Collector.

Steps

1. Log in to the vSphere Web Client.
2. Click **Go Home**. The **Home** page opens.
3. Click the **Home** tab. A **Dell Storage** icon appears below the **Administration** heading on the **Home** tab.
4. Click **Dell Storage**. The **Dell Storage** page opens and the **Getting Started** tab is displayed by default.

   NOTE: The more Storage Centers and volumes managed by the Storage Manager user, the longer it takes to display the Dell Storage page.
5. Under the **Basic Tasks** heading, click **Manage Credentials**. The **Manage** tab is displayed.

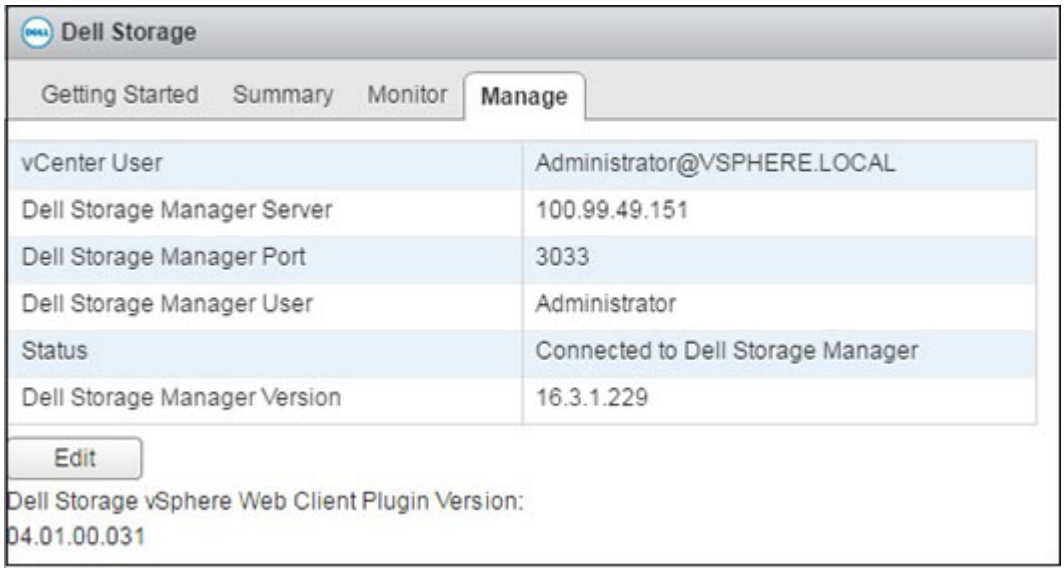

Figure 2. Connection Manager Credentials Dialog Box

6. Click **Edit**. The **Connection Manager** dialog box opens. (See Figure 1. Connection Manager Credentials Dialog Box).
7. Modify the vCenter and Storage Manager credentials as needed and click **Submit**.
   To delete the vCenter and Storage Manager credentials, click **Delete**.

Displaying Storage Center and FluidFS Information

The **Summary** tab on the Dell Storage page displays summary information for Storage Center and FluidFS clusters. The **Monitor** tab displays performance and usage charts for Storage Center and FluidFS clusters.

Display Dell Storage Summary Information

The **Summary** tab displays Display Storage Center controller and FluidFS information and storage type information.

1. Log in to the vSphere Web Client.
2. Click **Go Home**. The **Home** page opens.
3. In the Administration pane, click **Dell Storage**. The **Dell Storage** page opens.
4. Click the **Summary** tab.
5. Select the Storage Center or FluidFS cluster to display.

Storage Center Summary Information

The following figure shows summary information for a Storage Center.

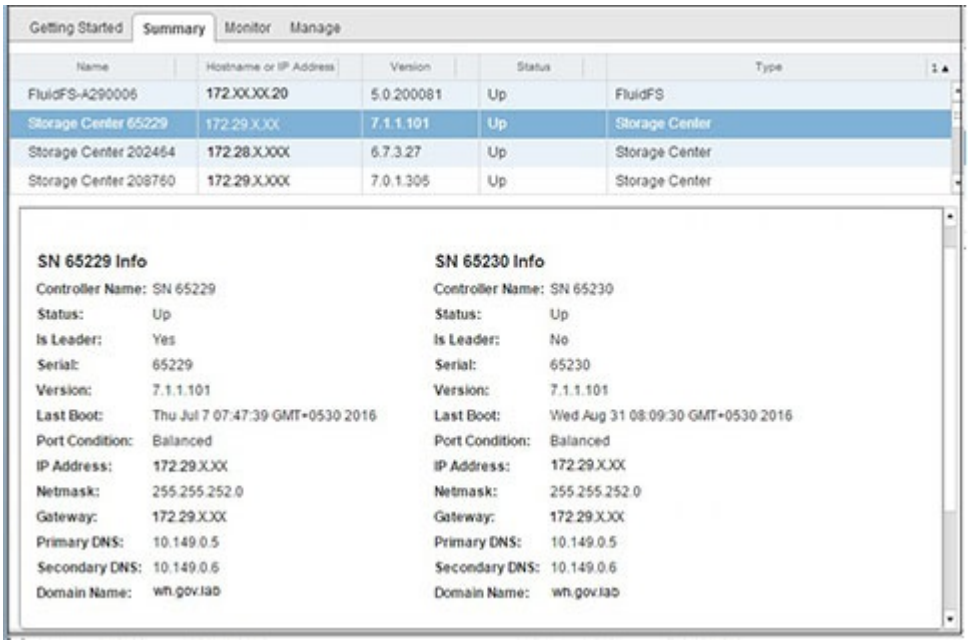

Figure 3. Storage Center Summary Information

Label	Description
Controller Information	Displays network and status information about the Storage Center controllers
Storage Type Information	Displays the Storage Types defined on the Storage Center

FluidFS Summary Information

The following figure shows summary information for a FluidFS cluster.

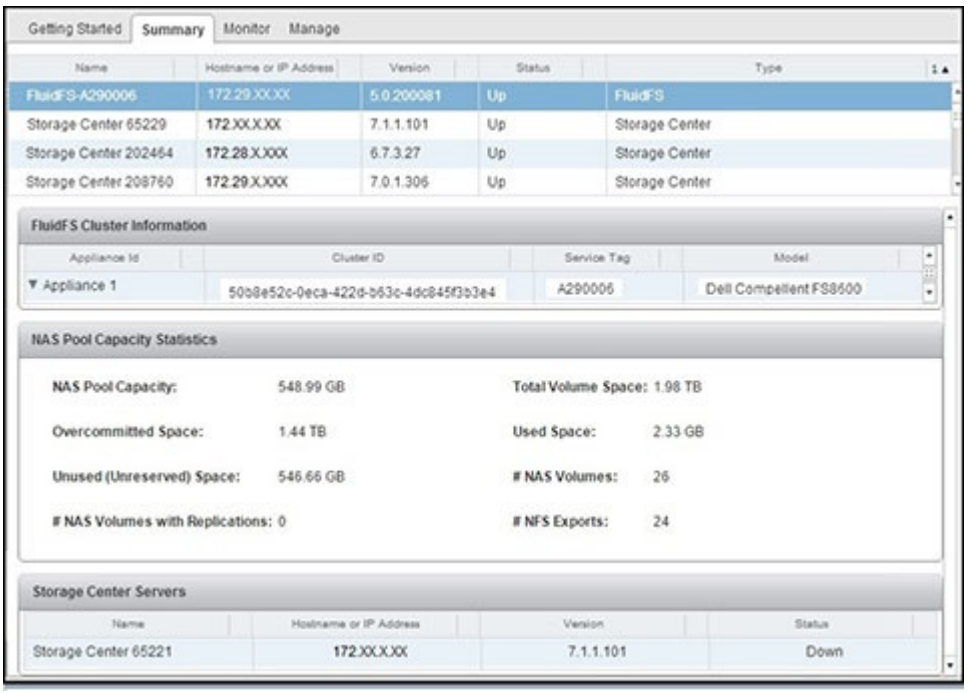

Figure 4. FluidFS Summary Information Page

Label	Description
FluidFS Cluster Information	Shows the details of FluidFS appliances and associated controller details
NAS Pool Capacity Statistics	Displays pool capacity and space information about the NAS pool

Display Dell Storage Monitoring Information

Display performance and usage information for Storage Center and FluidFS clusters on the **Monitor** tab.

1. Log in to the vSphere Web Client.
2. Click **Go Home**. The **Home** page opens.
3. In the **Administration** pane, click **Dell Storage**. The **Dell Storage** page opens.
4. Click the **Monitor** tab.
5. Select the Storage Center or FluidFS cluster to display.

Charts

The **Charts** tab displays performance information for Storage Centers and FluidFS clusters.

Storage Center Charts Information

The following figure shows a chart for a Storage Center.

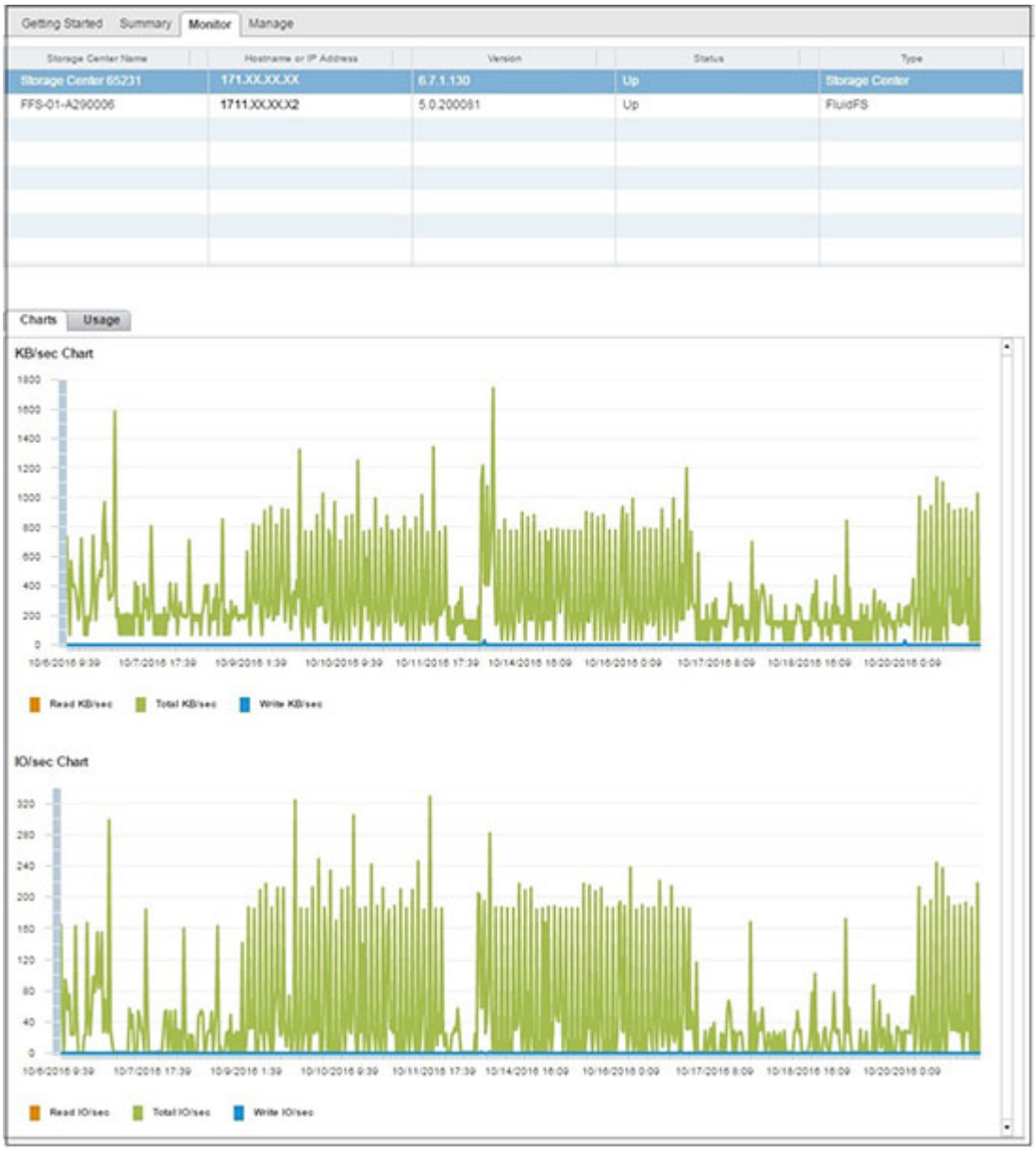

Figure 5. Storage Center Charts Information

Label	Description
KB/sec Chart	**Read KB/sec** —Transfer rate of read operations in kilobytes per second **Total KB/sec** — Combined transfer rate of read and write operations in kilobytes per second **Write KB/sec** —Transfer rate of write operations in kilobytes per second
IO/sec Chart	**Read IO/sec** — Transfer rate of read operations in I/O operations per second **Total IO/sec** — Combined transfer rate of read and write operations in I/O operations per second **Write IO/sec** —Transfer rate of write operations in I/O operations per second

FluidFS Chart Information

The following figure shows a chart for a FluidFS cluster.

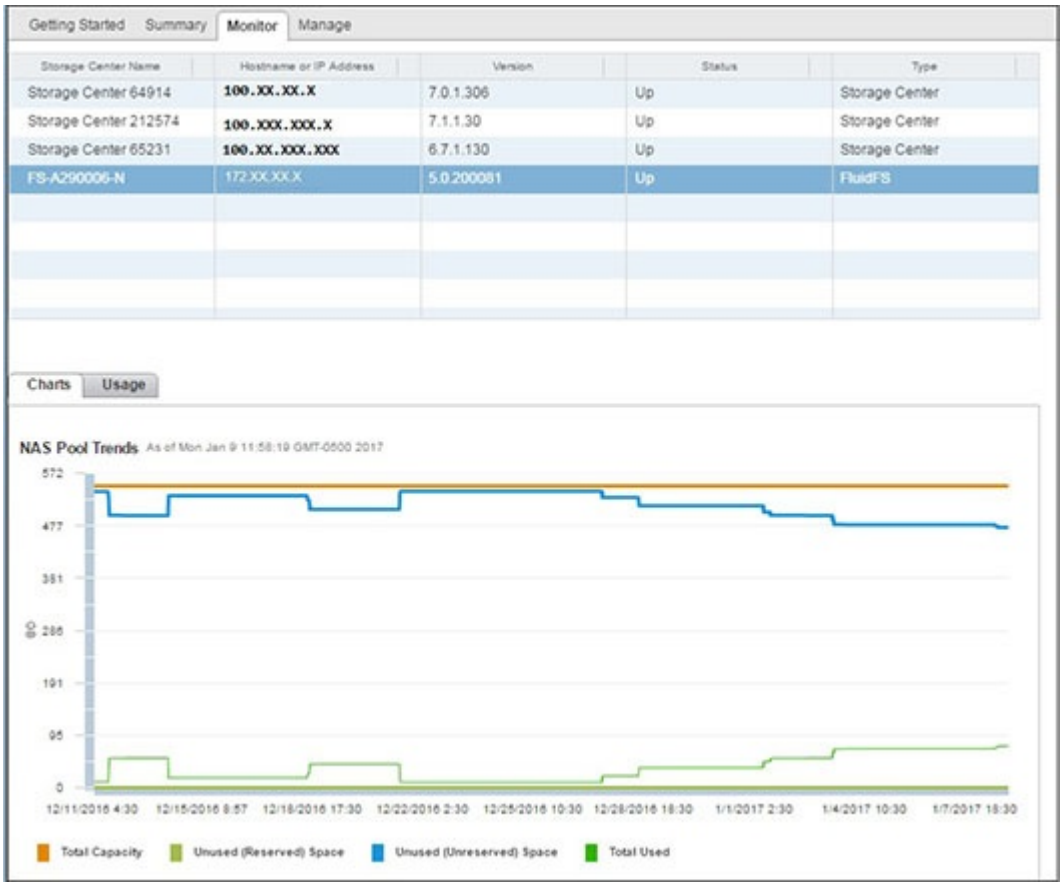

Figure 6. FluidFS Cluster Chart Information

Label	Description
Total Capacity	Total capacity of the NAS pool
Unused (Reserved) Space	Size of the storage that is statically allocated to the NAS volume
Unused (Unreserved) Space	Space allocated for the NAS pool that has not been used
Total Used	Amount of all space that has been used

Usage

The **Usage** tab displays disk space information for Storage Centers and FluidFS clusters.

Storage Center Usage Information

The following figure shows an example of the usage information for a Storage Center.

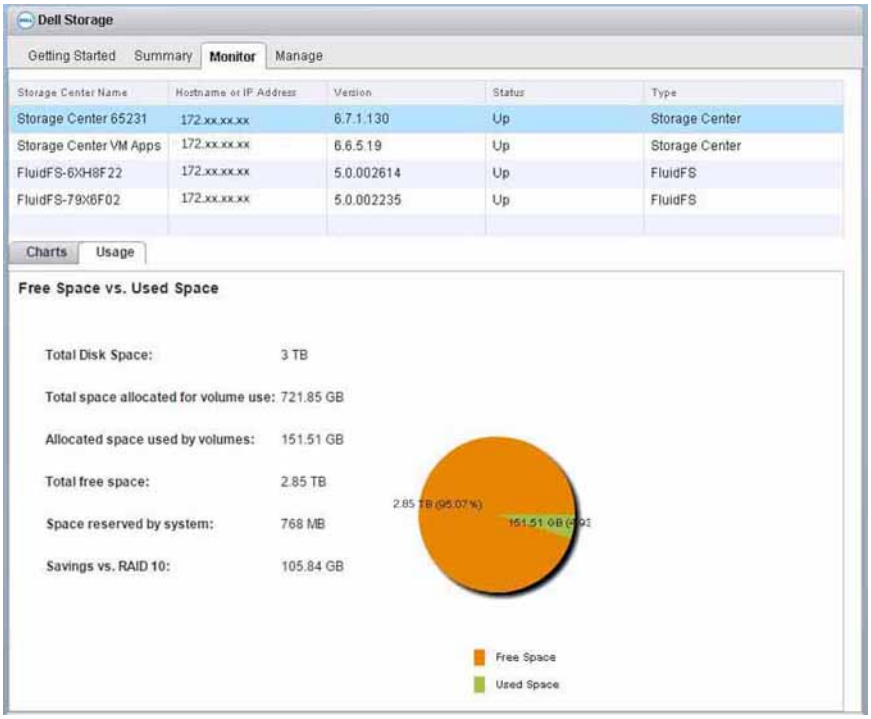

Figure 7. Storage Center Usage Information

Label	Description
Total Disk Space	Total amount of disk space available on the disks of the Storage Center
Total space allocated for volume use	Amount of disk space allocated on the disks of the Storage Center
Allocated space used by volumes	Amount of disk space used by volumes on the Storage Center
Total free space	Amount of disk space available for use by the Storage Center
Space reserved by system	Space consumed by snapshots and RAID overhead
Savings vs. RAID 10	Amount of disk space saved by using Dell Dynamic Block Architecture instead of RAID 10 storage

FluidFS Usage Information

Figure 8. FluidFS Cluster Usage Information shows usage information for a FluidFS cluster.

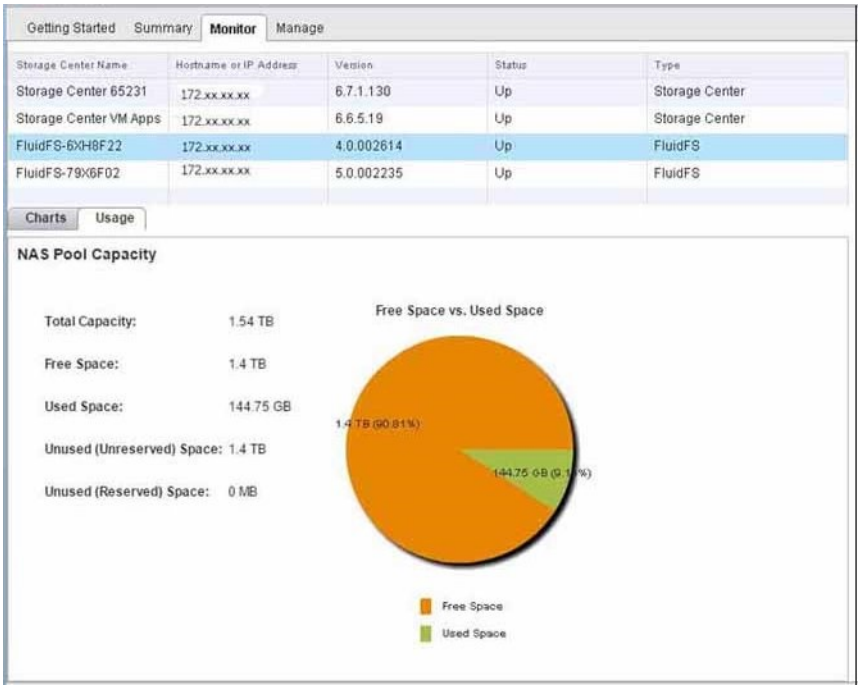

Figure 8. FluidFS Cluster Usage Information

Label	Description
Total Capacity	Total capacity of the NAS pool
Free Space	Amount of free space for the NAS pool
Used Space	Storage space occupied by writes to the NAS volume (user data and snapshots)
Unused (Unreserved) Space	Space allocated for the NAS pool that has not been used
Unused (Reserved) Space	A portion of a thin-provisioned NAS volume that is dedicated to the NAS volume (no other volumes can take the space). The amount of reserved space is specified by the storage administrator. Reserved space is used before unreserved space.

Disabling and Enabling the vSphere Web Client Plugin

After installing the vSphere Web Client Plugin, enable it by registering the plugin with VMware vCenter.

All plugins can also be enabled or disabled using vSphere. The procedures for enabling and disabling plugins vary depending on the version of the vSphere Web Client. For instructions on managing plugins, see the vSphere documentation.

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Working With Dell Storage

The Dell Storage vSphere Web Client Plugin communicates with Storage Manager and enables the management of Dell Storage.

Introduction to Dell Storage

An administrator can use the Dell Storage vSphere Web Client Plugin to manage Dell storage on a Storage Center or FluidFS cluster.

A Storage Center configures and uses storage based on the following settings.

Storage Term	Description
Storage Tier *physical media classes*	Storage tiers represent the classification of all physical storage media in the Storage Center. Storage Center automatically populates storage tiers with the available media in the Assigned disk folder. • Tier 1: Contains the fastest media appropriate for frequently used, mission-critical data. Tier 1 media is typically the most expensive media. • Tier 2: Contains medium-quality media appropriate for medium-priority data. • Tier 3: Contains slower, inexpensive media appropriate for backup copies, snapshots, and low-priority, rarely used data.
Storage Type *RAID level and page size*	Within each tier, the following storage types are available. • Non-redundant: RAID 0 with 2-MB page size • Redundant: RAID 10, RAID 5–5, RAID 5–9 with 512 KB, 2 MB, or 4 MB page size • Dual redundant: RAID 10 with 2 MB page size • The default and recommended setting for storage type is redundant using both RAID 10 and RAID 5–9 with a 2 MB page size.
Volume *a logical unit of storage*	A volume is a logical unit of storage on the Storage Center. When you add a datastore within the vSphere Client, you create and map a new Dell volume as a datastore, or map an existing Dell volume as a datastore. When mapping an existing Dell volume as a datastore, the volume must have been a previously formatted VMFS volume that was used as a datastore and unmapped.
Live Volume *keeps applications online and data accessible during planned or unplanned downtime*	A Live Volume is a replicating volume that can be mapped and active on a source and destination Storage Center at the same time.
Data Type *writeable or snapshot*	Volume data can be either of the following types: • Writeable: Data written to storage dynamically • Snapshot: Point-in-time copy data
Storage Profiles *applied to a volume to determine how data is migrated on the Storage Center*	Storage Profiles determine how volume data is stored and migrated on the Storage Center. The following Storage Profiles are defined by the system: • Recommended: Available only on Storage Center with Licensed Data Progression. Use the Recommended profile to optimize Data Progression and performance on the Storage Center. The Recommended profile allows the system to automatically progress data between storage types and across all storage tiers based on data type and usage. • High Priority: Use the High Priority profile only for volumes that contain data you want to keep in tier 1 storage. That is, applying the High Priority profile to a volume prevents the volume data from migrating to another tier.

Storage Term	Description
	• Medium Priority: Use the Medium Priority profile only for volumes that contain data you want to keep in tier 2 storage. That is, applying the Medium Priority profile to a volume prevents the volume data from migrating to another tier. • Low Priority: Use the Low Priority profile only for volumes that contain data you want to keep in tier 3 storage. That is, applying the Low Priority profile to a volume prevents the volume data from migrating to another tier. You can create and modify Storage Profiles within a Storage Center, if you have licensed Data Progression software.
Snapshots and Snapshot Profiles *applied to a volume to determine how often snapshots are taken*	A Storage Center snapshot is a point-in-time copy of data. As such, a snapshot can be exposed and mapped to allow recovery of a datastore or virtual machine. Snapshot Profiles determine a schedule for volume snapshots. System-defined Snapshot Profiles include commonly used schedules for daily and weekly snapshot. Custom snapshot profiles can be created to schedule snapshots appropriate to the data that you want to back up.
View Volume *an Exposed (mapped) snapshot*	An exposed (mapped) snapshot used to recover data from a point-in-time copy of data (snapshot)
Data Progression *automatically migrating volume data based on the Storage Profile settings*	Based on the Storage Profile applied to the volume and the Data Progression licensing, volume data automatically progresses on the Storage Center. On Storage Centers with licensed Data Progression, data can automatically migrate to different Storage Types within a storage tier, and also across storage tiers.

The following concepts apply to FluidFS:

Storage Term	Description
Fluid File System (FluidFS)	Dell's high-performance, scalable file system software installed on NAS controllers
FluidFS cluster	One to four FS8600 scale-out NAS appliances configured as a FluidFS cluster
NAS pool	The sum of all storage provided by up to two Storage Centers minus space reserved for internal system use
NAS volume	Virtualized volume that consumes storage space in the NAS pool. Administrators can create SMB shares and NFS exports on a NAS volume and share them with authorized users.
NAS volume snapshot	A point-in-time copy of a NAS volume, mounted as an NFS datastore
Client VIP	Virtual IP address that clients use to access SMB shares and NFS exports hosted by the FluidFS cluster
NFS export	A directory in a NAS volume that is shared on the network using the Network File System (NFS) protocol

See the *Dell Storage Manager Administrator's Guide* for more FluidFS and NAS concepts.

Creating and Managing VMFS Datastores and Raw Device Mappings on Storage Centers

The vSphere Web Client Plugin allows you to create and manage Dell volumes that are mapped as VMFS datastores to ESXi hosts or clusters on a Storage Center and volumes that are mapped as Raw Device Mappings (RDMs) to virtual machines.

NOTE: The options that appear when creating and managing datastores and RDMs change depending on the Storage Center user preferences of the Storage Manager user defined in the vSphere Web Client Plugin.

The following sections describe how to create and manage datastores:

- Adding a Datastore
- Adding Multiple Datastores
- Adding an RDM to a Virtual Machine
- Resizing a Datastore or RDM
- Removing a Datastore or RDM

Adding a VMFS Datastore

Use the **Add Datastore** wizard to add Dell storage as a VMFS datastore.

When you add a VMFS datastore, you create and/or map a Dell volume on the Storage Center. See Introduction to Dell Storage for details about Dell volumes.

To add a VMFS datastore, use these options:

- **Create New Dell Volume** – Create and map a new Dell volume as a VMFS datastore.
- **Map Existing Dell Volume** – Select an existing Dell volume to map as a datastore.

NOTE: The existing volume must be a formatted VMFS datastore.

Adding a Datastore Using a New Dell Volume

A datastore can be created from a new Dell volume using the vSphere Web Client Plugin.

Prerequisites

- The active controller option is not available if the Storage Center user in Storage Manager has only volume manager privileges.
- The SAS mapping protocol selection is available on supported Storage Centers only. The SCv2000 Series and SC4020 Storage Centers support FE-SAS.
- The options for selecting the VMFS versions depend on the version of ESXi that is running on the host. If the host is running ESXi 5.5 or ESXi 6.5, the VMFS version selection is available. The VMFS version selection does not appear when only ESXi 6.0 hosts are available in the inventory. ESXi 6.0 supports only VMFS 5. ESXi 5.5 supports VMFS 3 and VMFS 5. ESXi 6.5 supports VMFS 5 and VMFS 6.
- On the **Volumes** page, the values for Storage Profile and Disk Folder can be modified only if the preferences for the Storage Center have been set to Allow. For information about managing the preferences, see the *Dell Storage Manager Administrator's Guide*

Steps

1. Select an object in inventory that can be a parent of a datastore:
   - Datacenter
   - Host
   - Cluster
2. Select **Actions → All Dell Storage Actions → Add Datastore**.
   The **Add Datastore** wizard opens.
3. Select the **VMFS** datastore type and click **Next**.
   The vSphere Web Client Plugin loads the Storage Center information.
4. If necessary, select one or more hosts to which to map the new volume.
5. Select the Storage Center and/or active controller for volume creation. Click **Next**.
6. Select **Create New Dell Volume**, and click **Next**.
7. Select from the following steps that pertain to your environment. The steps that apply depend on the user-preferences settings of the Storage Center user in Storage Manager.
   a. Type the name and size for the new volume, select the volume folder, and click **Next**.
   b. Select the pagepool to use for creating the volume.
   c. If applicable, select the storage options for this volume.
      - If the preferences for the Storage Center have been set, you can select a Storage Profile for the volume.

- If the preferences for the Storage Center have been set, select a Disk Folder from the drop-down menu.
- Click **Next**.

NOTE: If the Reduction Profile option has been set to enable Compression in the user preferences of Storage Manager, Compression will be applied to the datastore. For information about managing the preferences, see the *Dell Storage Manager Administrator's Guide*.

d. Select a Snapshot Profile for the volume, and click **Next**.
e. Specify the LUN for mapping the volume, and click **Next**.
f. If permitted, select the VMFS version, and click **Next**.

8. If necessary, select the protocol for mapping, and click **Next**.

NOTE: The option to select protocol mappings is visible only when more than one protocol is available. If FE-SAS is supported on the Storage Center, the SAS option is listed as available.

9. Type a name for the datastore, and select an inventory location in the datastore properties.

   Depending on the VMFS file system version, you are also prompted to select the maximum file size and block size for the datastore.

10. (Optional) Select **Create Replication/Live Volume** if you want to replicate the volume data to a second Storage Center and allow both Storage Centers to process I/O requests for the volume. For information, see Create and Manage Replications and Live Volumes.
11. (Optional) Select **Replication Options** if you want to replicate a datastore. For information, see Replication Options
12. Click **Next**.

    The **Ready to Complete** page opens.

13. Click **Finish**.

Related links

Add Storage
Datastore Properties
File System Version
Hosts and Clusters
Mapping LUN
Replication Options
Snapshot Profile
Protocol Selection
Storage Center
Volume
Volume Settings

Map an Existing Dell Volume as a Datastore

An existing Dell volume can be mapped as a datastore using the vSphere Web Client Plugin.

Prerequisites

- The active controller option is not available if the Storage Center user in Storage Manager has only volume manager privileges.
- The SAS mapping protocol selection is available on supported Storage Centers only. The SCv2000 and SC4020FStorage Centers support FE-SAS.

Steps

1. Select an object in inventory that can be a parent of a datastore:
   - Datacenter
   - Host
   - Cluster
2. Select **Actions → All Dell Storage Actions → Add Datastore**.

   The **Add Datastore** wizard starts.

3. If necessary, select one or more hosts to which to map the new volume, and click **Next**.

4. Select the Storage Center and/or active controller that contains the volume to be mapped.
5. Select **Map Existing Dell Volume**, and click **Next**.
   a. Find and select an existing Dell volume to map as a datastore, and click **Next**.

      NOTE: The Dell volume must be a VMFS volume.

   b. Specify the LUN for mapping the volume, and click **Next**.
6. If necessary, select the protocol for mapping, and click **Next**.

   NOTE: If FE-SAS is supported on the Storage Center, the SAS option is listed as available.
7. Specify the name for the datastore. The Dell volume name is used by default.
   - To change the name of the datastore, clear the **Keep existing datastore name** check box and type a new name in the **Datastore name** field.
   - To rename the Dell volume to match the new datastore name, select the **Rename volume to match datastore name** checkbox.
8. (Optional) Select **Create Replication/Live Volume** if you want to replicate the volume data to a second Storage Center and allow both Storage Centers to process I/O requests for the volume. For information, see Live Volume Operations.
9. Click **Next**.

   The **Ready to Complete** page opens.
10. Click **Finish**.

Related links

Add Storage
Datastore Properties
Hosts and Clusters
Mapping LUN
Protocol Selection
Replication Options
Select Volume
Storage Center

Adding Multiple Datastores

Use the **Add Multiple Datastore** wizard to add Dell storage as datastores.

Prerequisites

- The active controller option is not available if the Storage Center user in Storage Manager only has volume manager privileges.
- The SAS mapping protocol selection is available on supported Storage Centers only. The SCv2000 Series and SC4020 Storage Centers support FE-SAS.
- The options for selecting the VMFS versions depend on the version of ESXi that is running on the host.

About this task

When you add multiple datastores, you create multiple Dell volumes on the Storage Center. See Introduction to Dell Storage for details about Dell volumes.

Steps

1. Select an object in inventory that can be a parent of datastores:
   - Datacenter
   - Host
   - Cluster
2. Select **Actions → All Dell Storage Actions → Add Multiple Datastores**.
3. Select the Storage Center and/or active controller for volume creation, and click **Next**.

   The **Select Action Type** page opens.
4. Select **Create New Dell Volume**, and click **Next**.
5. Select from the following steps that pertain to your environment: The steps that apply depend on the user-preferences settings of the Storage Center user in Storage Manager.

a. Type the name and size for the new volume, select the volume folder, and click **Next**.
b. Select the pagepool to use for creating the volume.
c. Select the storage options for this volume.
   - Select a Storage Profile for the volume. Dell recommends using the Recommended (All Tiers) profile for most volumes.
   - If your storage system contains multiple disk folders, select a Disk Folder from the drop-down menu.

   Click **Next**.
d. Select a Snapshot Profile for the volume, and click **Next**.
e. Specify the LUN for mapping the volume, and click **Next**.
f. Select the VMFS version, and click **Next**.

NOTE: The option to select the VMFS version is shown only if the host is running ESXi 6.0 or 6.5.

6. If necessary, select the protocol for mapping, and click **Next**.

NOTE: If FE-SAS is supported on the Storage Center, the SAS option is listed as available.

7. Type a name for the datastore, and select an inventory location in the datastore properties.
   If the file system version is VMFS-3, select the maximum file size and block size for the datastore.
8. Click **Next**.
   The **Create Multiple Datastores** page opens.
9. Type the number of datastores to create, and type the number from which to start the numbering of volume names and datastore names.
10. (Optional) Select a datastore and click **Edit** to open the **Datastore Properties** dialog box, from which you change the volume name, datastore name, and datastore size.
11. Click **Next**.
    The **Ready to Complete** page opens.
12. Click **Finish**.

Related links

Datastore Properties
File System Version
Hosts and Clusters
Mapping LUN
Create Multiple Datastores
Protocol Selection
Storage Manager Profile
Storage Center
Volume
Volume Settings

Editing Volume Settings

You can modify the settings for a datastore.

Prerequisites

The Compression option is enabled only if the Allow Compression option has been set on the Storage Center. Otherwise, the Compression option is not enabled. For information about managing the Allow Compression option, see the *Dell Storage Manager Administrator's Guide*.

Steps

1. Select a datastore.
2. Select **Actions → All Dell Storage Actions → Edit Volume Settings**.
   The **Edit Volume Settings** wizard opens.
3. Modify the Compression setting. Click **Next**.
   The **Ready to Complete** page opens.

4. Click **Finish**.

Related links

Edit Volume

Adding an RDM to a Virtual Machine

Use the **Add Dell Storage** wizard to add a Raw Device Mapping (RDM) to a virtual machine.

Add an RDM Using a New Dell Volume

An RDM can be created and mapped to a virtual machine using the vSphere Web Client Plugin.

Prerequisites

The active controller option is not available if the Storage Center user in Storage Manager only has volume manager privileges.

Steps

1. Select the virtual machine in inventory to which to add an RDM.
2. Select **Actions → All Dell Storage Actions → Add Raw Device**.

   The **Add Storage** wizard starts with the **Device Configuration** page open.
3. Select **Add New Raw Device Mapping to Virtual Machine** and select a virtual device node.
4. Click **Next**.

   The **Storage Center** page opens.
5. Select the Storage Center and/or active controller for volume creation, and click **Next**.
6. If necessary, select one or more hosts to which to map the new Dell volume, and click **Next**.
7. Select **Create New Dell Volume**, and click **Next**.
8. Select among the following steps that pertain to your environment. The steps that apply depend on the user-preferences settings of the Storage Center user in Storage Manager.
   a. Type the name and size for the new volume, select the volume folder, and click **Next**.
   b. Select the pagepool to use for creating the volume.
   c. Select the storage options for this volume.
      - Select a Storage Profile for the volume. Dell recommends using the Recommended (All Tiers) profile for most volumes.
      - If your storage system contains multiple disk folders, select a Disk Folder from the drop-down menu.

      Click **Next**.

      NOTE: If the Reduction Profile option has been set to enable Compression in the user preferences of Storage Manager, Compression will be applied to the datastore. For information about managing the preferences, see the *Dell Storage Manager Administrator's Guide*.
   d. Select a Snapshot Profile for the volume, and click **Next**.
   e. Select the LUN for mapping the volume, and click **Next**.
9. If necessary, select the protocol for mapping, and click **Next**.
10. Select the compatibility mode for the raw device, and click **Next**.

    The **Ready to Complete** page opens.
11. Click **Finish**.

Related links

Add Storage
Compatibility Mode
Device Configuration
Datastore Properties
Host Selection
Mapping LUN
Protocol Selection
Snapshot Profile
Storage Center
Volume
Volume Settings

Add an RDM Using an Existing Dell Volume

An RDM can be created from an existing Dell volume and mapped to a virtual machine using the vSphere Web Client Plugin.

Prerequisites

The active controller option is not available if the Storage Center user in Storage Manager only has volume manager privileges.

Steps

1. Select the virtual machine in inventory to which to add an RDM.
2. Select **Actions** → **All Dell Storage Actions** → **Add Raw Device**.
   The **Add Storage** wizard starts with the **Device Configuration** page open.
3. Select **Map Existing Raw Device Mapping to Hosts and Clusters** and select a virtual device node.
4. Click **Next**.
   The **Storage Center** page opens.
5. Select the Storage Center and/or active controller for volume creation, and click **Next**.
6. If necessary, select one or more hosts to which to map the new Dell volume, and click **Next**.
7. Select **Map Existing Dell Volume**, and click **Next**.
8. Find and select an existing Dell volume to map as a raw device, and click **Next**.
9. Select the LUN for mapping the volume, and click **Next**.
10. If necessary, select the protocol for mapping, and click **Next**.
11. Select the compatibility mode for the raw device, and click **Next**.
    The **Ready to Complete** page opens.
12. Click **Finish**.

Related links

Add Storage
Compatibility Mode
Device Configuration
Host Selection
Mapping LUN
Protocol Selection
Storage Center
Select Volume
Volume

Map an Existing RDM to Additional Hosts or Clusters

An RDM can be mapped to additional hosts or clusters using the vSphere Web Client Plugin.

1. Select the virtual machine in inventory that has a raw device that you want to map to additional hosts and/or clusters.
2. Select **Actions** → **All Dell Storage Actions** → **Add Raw Device**.
   The **Add Dell Storage** wizard starts.

3. Select **Map Existing Raw Device Mapping to Hosts and Clusters**, and click **Next**.
   The **RDM Selection** page opens.
4. Select the raw device to be mapped to other hosts and/or clusters, and click **Next**.
   The **Host Selection** page opens.
5. Select one or more hosts or clusters to which to map the existing Dell volume, and click **Next**.
   The **Protocol Selection** page opens.
6. Select the protocol for mapping, and click **Next**.
   The **Ready to Complete** page opens.
7. Click **Finish**.

Related links

Device Configuration
Host Selection
Protocol Selection
Select Raw Device

Resizing a Datastore or RDM

Use the **Resize Datastore** or **Extend Raw Device Mapping** wizard to increase the capacity of a datastore or RDM.

Resize a Datastore

The size of a datastore can be changed using the vSphere Web Client Plugin.

1. Select a datastore in inventory.
2. Select **Actions** → **All Dell Storage Actions** → **Resize Datastore**.
   The **Resize Datastore Storage** wizard starts.
3. Type the new size for the datastore in the **Resize to** field and select the unit of measure from the **Storage Size Type** drop-down menu.
4. Click **Next**.
   The **Ready to Complete** page opens.
5. Click **Finish**.

Related links

Resize Datastore

Extend an RDM

An RDM can be resized (extended) using the vSphere Web Client Plugin.

1. Select a virtual machine in inventory with an RDM to extend.
2. Select **Actions** → **All Dell Storage Actions** → **Extend Raw Device**.
   The **Extend Datastore RDM** wizard starts.
3. Select the RDM to extend.
4. Click **Next**.
   The **Expansion Size** page opens.
5. Type the new size for the RDM in the **Extend to** field and select the unit of measure from the **Storage Size Type** drop-down menu.
6. Click **Next**.
   The **Ready to Complete** page opens.
7. Click **Finish**.

Related links

Select RDM

Extend RDM Size

Removing a Datastore or RDM

Use the **Remove Storage** wizard to remove a datastore or RDM.

Remove a VMFS Datastore

A VMFS datastore can be removed using the vSphere Web Client Plugin.

1. Select an object in inventory that can be a parent of a datastore:
   - Datacenter
   - Host
   - Cluster
2. Select a datastore in inventory.
3. Select **Actions → All Dell Storage Actions → Remove Datastore**.
   The **Remove Datastores** page opens. By default, the VMFS tab is selected.
4. Click to select the datastores to remove. To select all datastores, click **Choose All**.
5. Select a retention option for the datastore.
6. Click **Next**.
   The **Ready to Complete** page opens.
7. Click **Finish**.

Related links

Volume Retention

Remove an RDM

An RDM can be removed using the vSphere Web Client Plugin.

1. Select a virtual machine in inventory with an RDM to remove.
2. Select **Actions → All Dell Storage Actions → Remove Raw Device**.
   The **Remove Storage** wizard starts.
3. Select one or more RDMs to remove.
4. Click **Next**.
   The **Volume Retention** page appears.
5. Select a retention option for the raw devices.
6. Click **Next**.
   The **Ready to Complete** page appears.
7. Click **Finish**.

Related links

Select Raw Device

Volume Retention

Creating and Managing NFS Datastores

The vSphere Web Client Plugin allows you to create and manage NFS exports on NAS volumes that are mapped as NFS datastores to ESXi hosts or clusters.

You can create NFS datastores as follows:

- Use a new or existing NAS volume and create a new NFS export in the FluidFS cluster.

- Use an existing NFS export in the FluidFS cluster.

The following sections describe how to create and manage NFS datastores:

- Create a New NFS Datastore
- Add an NFS Datasore Using an Existing NFS Export
- Remove NFS Datastores

Create a New NFS Datastore

An NFS datastore can be created using the vSphere Web Client Plugin.

Prerequisites

- The option to select the NFS version is available only if NFS 4.1 is installed on the host.
- NFS 4.1 is enabled only if the `Maximum NFS Protocol Supported` value has been set inStorage Manager using the **Modify NFS Settings** action. For information about this setting, see the *Dell Storage Manager Administrator's Guide*.
- The NFS 4.1 selection option is enabled if host is running ESXi 6.0 or greater.

Steps

1. Select an object in inventory that can be a parent of a datastore:
   - Datacenter
   - Host
   - Cluster
2. Select **Actions** → **All Dell Storage Actions** → **Add Datastore**.
   The **Add Datastore** wizard starts and the **Select Type** page opens.
3. Select **NFS**, and click **Next**.
4. Select the FluidFS cluster for volume creation, and click **Next**.
5. Select **Create a New NFS Datastore**, and click **Next**.
   The **Datastore Properties** page opens.
6. Type the name for the new volume, select the volume folder under Inventory Location, and click **Next**.
   The **NFS Export** page opens.
7. Type a value for the size. Select from the drop-down menu to specify the unit type.
8. Choose a folder option:
   - **Create a New NAS Volume Folder** – By default, the folder name is derived from the name of the datastore that you entered.
   - **Use Existing NAS Volume Folder** – Browse for a folder to use.
9. Type the FluidFS cluster VIP in the **FluidFS Cluster VIP or DNS Name** field.
10. Click **Next**.
    The **Select NFS Version** page opens.
11. Select an NFS version to be used:
    - NFS 3
    - NFS 4.1

    If you choose NFS 4.1, you are prompted to Configure Kerberos Authentication. If you select the checkbox to enable this authentication, choose one of the following options:
    - Use Kerberos for authentication only
    - Use Kerberos for authentication and data integrity
12. Click **Next**
    The **Ready to Complete** page opens.
13. Click **Finish**.

Related links

Add Storage - NFS
Hosts and Clusters
NFS Exports
Select NFS Version

Add an NFS Datasore Using an Existing NFS Export

You can create a NFS datastore by using an existing NFS export in the FluidFS cluster.

Prerequisites

The option to select the NFS version is available only if NFS 4.1 is installed on the host.

Steps

1. Select an object in inventory that can be a parent of a datastore:
   - Datacenter
   - Host
   - Cluster
2. Select **Actions → All Dell Storage Actions → Add Datastore**.
   The **Add Datastore** wizard starts and the **Select Type** page opens.
3. Select **NFS**, and click **Next**.
4. Select the FluidFS cluster for volume creation, and click **Next**.
5. Select **Map an Existing NFS Export**, and click **Next**.
6. Select an NFS export from the list of available NFS exports.
7. Type a value in the **FluidFS Cluster VIP or DNS Name** field.
8. Click **Next**.
   The **Select NFS Version** page opens.
9. Select an NFS version to be used:
   - NFS 3
   - NFS 4.1

   If you choose NFS 4.1, you are prompted to Configure Kerberos Authentication. If you select the checkbox to enable this authentication, choose one of these options:

   a. Use Kerberos for authentication only
   b. Use Kerberos for authentication and data integrity
10. Click **Next**
    The **Ready to Complete** page opens.
11. Click **Finish**.

Related links

Add Storage - NFS
Hosts and Clusters
NFS Exports
Select NFS Version

Remove NFS Datastores

An NFS datastore can be removed using the vSphere Web Client Plugin.

1. Select an object in inventory that can be a parent of a datastore:
   - Datacenter
   - Host

- Cluster

2. Select an NFS datastore in inventory and right-click on its name.
3. Select **Actions → All Dell Storage Actions → Remove Datastore**.
   The **Remove Datastores** page opens. By default, the VMFS tab is selected.
4. If necessary, select **NFS** to view the NFS datastores.
5. Click to select the datastores to remove. To select all datastores, click **Choose All**.
6. (Optional) Select **Delete NFS Exports for selected datastores**.
7. (Optional) Select **Delete volumes for selected datastores if possible**.
8. Click **OK**.

Configuring, Creating, and Recovering Snapshots

The Dell Storage vSphere Web Client Plugin allows you to configure Data Instant Snapshots, create snapshots, expire snapshots, and recover data from snapshots.

NOTE: The options that appear when configuring, creating, and recovering snapshots change depending on the volume preferences of the Dell Storage Manager user defined in the vSphere Web Client Plugin.

The following sections describe how to configure and manage snapshots.

- Configuring Data Instant Snapshot
- Creating a Snapshot
- Deleting a Snapshot
- Recovering Data From a Snapshot

Configuring Data Instant Snapshot

Configure Data Instant Snapshot to assign a Snapshot Profile to a datastore (Dell volume) or all volumes associated with a virtual machine to establish a schedule for automatically taking snapshots.

Only Snapshot Profiles already defined on the Storage Center are available for selection. For instructions on creating or modifying Snapshot Profiles, see either the *Storage Center System Manager Administrator's Guide* or the *Dell Storage Manager Administrator's Guide*.

Configure Data Instant Snapshot for a Datastore

Data Instant Snapshot can be configured for a datastore using the vSphere Web Client Plugin.

1. Select a datastore in inventory.
2. Select **Actions → All Dell Storage Actions → Snapshot → Set Snapshot Profile**.
   The **Configure Data Instant Snapshot** wizard starts.
3. Select one or more Snapshot Profiles to apply to the datastore.
4. Click **Next**.
   The **Ready to Complete** page opens.
5. Click **Finish**.

Related links

Snapshot Profile

Configure Data Instant Snapshot for RDMs on a Virtual Machine

Data Instant Snapshot can be configured for an RDM using the vSphere Web Client Plugin.

1. Select a virtual machine in inventory.
2. Select **Actions → All Dell Storage Actions → Snapshot → Set Snapshot Profile**.
   The **Configure Data Instant Snapshot** wizard starts. If the VM has multiple RDMs, the wizard displays a page for each RDM.
3. Select one or more Snapshot Profiles to apply to the RDM and click **Next**.

4. If the VM has multiple RDMs, repeat step 2.

   When all the RDMs have been configured, the **Ready to Complete** page opens.
5. Click **Finish**.

Related links

Snapshot Profile

Creating a Snapshot

In addition to snapshots scheduled taken automatically based on a Snapshot Profile, you can also take an immediate (unscheduled) snapshot. During snapshot creation, you can specify an expiration time for the snapshots. If you create a snapshot with the **Never Expire** option, the snapshot remains on the Storage Center until it is manually expired.

Take a Snapshot of a Datastore

A snapshot of a datastore can be taken using the vSphere Web Client Plugin.

1. Select the datastore for which you want to take a snapshot.
2. Select **Actions** → **All Dell Storage Actions** → **Snapshot** → **Create Snapshot**.

   The **Create Snapshot** wizard starts.
3. Specify a time after which you want the snapshot to expire. To set the snapshot to never expire, select the **Never Expire** checkbox.
4. Click **Next**.

   The **Ready to Complete** page opens.
5. Click **Finish**.

Related links

Snapshot Profile

Take a Snapshot of RDM Volumes Associated With a Virtual Machine

A snapshot of an RDM associated with a virtual machine can be taken using the vSphere Web Client Plugin.

1. Select the virtual machine for which you want to take a snapshot.
2. Select **Actions** → **All Dell Storage Actions** → **Snapshot** → **Create Snapshot**.

   The **Create Snapshot** wizard starts.
3. Specify a time after which you want the snapshot to expire. To set the snapshot to never expire, select the **Never Expire** checkbox.
4. Click **Next**.

   The **Snapshot Options** page opens.
5. To create a temporary VMware snapshot of the virtual machine prior to snapshot creation, select the **Create Temporary VMware Snapshot** checkbox.
6. If the **Temporary VMware Snapshot** checkbox is selected, specify whether to include the machine memory and/or quiesce the file systems.
7. Click **Next**.

   The **Ready to Complete** page opens.
8. Click **Finish**.

Related links

Snapshot Options

Snapshot Properties

Deleting a Snapshot

When a snapshot is created, an expiration time is assigned to the snapshot. However, you can override the expiration time by explicitly deleting a snapshot. Deleting a snapshot removes the snapshot from the Storage Center.

Delete Snapshots for a Datastore

A snapshot of a datastore can be deleted using the vSphere Web Client Plugin.

1. Select the datastore for which you want to deletesnapshots .
2. Select **Actions → All Dell Storage Actions → Snapshot → Delete Snapshot/Snapshot Schedule**.
   The **Delete Storage Center Snapshot** wizard starts.
3. Select the snapshots that you want to delete.
4. Click **Next**.
   The **Ready to Complete** page opens.
5. Click **Finish**.

Related links

Snapshot Selection

Delete Snapshots of RDM Volumes Associated With a Virtual Machine

A snapshot of an RDM can be deleted using the vSphere Web Client Plugin.

1. Select the virtual machine for which you want to delete datastore snapshots.
2. Select **Actions → All Dell Storage vSphere Web Client Plugin Actions → Snapshot → Delete Snapshots/Snapshot Schedules**.
   The **Delete Storage Center Snapshot** wizard starts.
3. Select the snapshots that you want to delete.
4. Click **Next**.
   The **Ready to Complete** page opens.
5. Click **Finish**.

Related links

Snapshot Selection

Recovering Data From a Snapshot

Use the Storage Center Snapshot Recovery wizard to recover data from a Storage Center snapshot. The wizard allows you to select the snapshot from which you want to recover data and then exposes and maps the snapshot to allow you to copy data for recovery.

Recover a Datastore From a Storage Center snapshot

A datastore can be recovered using the vSphere Web Client Plugin.

Prerequisites

A snapshot of the datastore must exist.

Steps

1. Select the datastore for which you want to recover data.
2. Select **Actions → All Dell Storage Actions → Replays → Recover VM Data from Replay**.
   The **Storage Center Replay Recovery** wizard starts.
3. Select one or more snapshots from which to recover data.

   NOTE: Only one snapshot per volume can be selected.
4. Click **Next**.
   The **Host Selection** page opens.

5. Select the host for accessing the recovered datastore.
6. Click **Next**.
   The **Datastore Name** page opens.
7. Specify a name and location for the recovered datastore.
8. Click **Next**.
   The **Mapping LUN** page opens.
9. Select the LUN for mapping the recovered datastore.
10. Click **Next**.
    The **Ready to Complete** page opens.
11. Click **Finish**.

Related links

Datastore Name
Host Selection
Mapping LUN
Replay Selection

Recover an RDM From a Storage Center snapshot

An RDM can be recovered using the vSphere Web Client Plugin.

Prerequisites

A snapshot of the RDM must exist.

Steps

1. Select the virtual machine for which you want to recover the RDM.
2. Select **Actions → All Dell Storage Actions → Replays → Recover VM Data from Replay**.
   The **Storage Center Replay Recovery** wizard starts.
3. Select one or more snapshots from which you want to recover data.
4. Click **Next**.
   The **VM Selection** page opens.
5. Select the virtual machine to use to access the recovered data.
6. Click **Next**.
   The **Ready to Complete** page opens.
7. Click **Finish**.

Related links

Replay Selection
VM Selection

Creating and Managing FluidFS NAS Volume Snapshots and Snapshot Schedules

Storage Centers present a certain amount of capacity (a NAS pool, composed of NAS volumes) to the Dell Fluid File System (FluidFS) cluster. When you create an NFS datastore (see Creating and Managing NFS Datastores), an associated NAS volume is created in the FluidFS cluster. The path of the NFS Export folder corresponds with the NAS volume and is mounted on the ESXi host.

Use the vSphere Web Client Plugin to create and manage snapshots of NAS volumes associated with an NFS datastore, and set a schedule for taking, retaining, and deleting the snapshots.

About FluidFS NAS Volume Snapshots

NAS volume snapshots are point-in-time copies of a NAS volume and are available for data recovery. NAS volume snapshots are similar to VMFS snapshots, except that VMFS snapshots are mounted as VMFS datastores and NAS volume snapshots are mounted

as NFS datastores. The first snapshot taken contains contents of the entire NAS volume. All snapshots created after that baseline represent only the changes made since the previous snapshot.

Using the Dell Storage vSphere Web Client Plugin, you can:

- Create a snapshot for an associated NAS volume for the corresponding NFS datastore
- Display all available snapshots of the associated NAS volume
- Modify the snapshot name and expiration date
- Select and delete one or more snapshots

About FluidFS NAS Volume Snapshot Schedules

NAS volume snapshot schedules let you take snapshots at regular intervals (for example, hourly or daily) to provide a complete view of your file system over time.

Using the Dell Storage vSphere Web Client Plugin, you can:

- Create a schedule that specifies the snapshot schedule name, frequency of snapshots taken, and retention time. Frequency and retention can be in minutes, hours, days, or weeks.
- Select and change the snapshot schedule name, frequency, and retention time.
- Select and delete a snapshot schedule.

NAS Volume Snapshots and Snapshot Schedules

This section provides steps for creating on-demand NAS volume snapshots and for setting up schedules to take snapshots at regular intervals.

Creating NAS Volume Snapshots

You can create an on-demand snapshot of a NAS volume for an associated datastore and set the expiration date for the snapshot.

Steps

1. Select an NFS datastore in inventory.
2. Select **Actions → All Dell Storage Actions → Snapshot → Create Snapshot**.
   The **Create Snapshot** wizard starts.
3. Type a name for the snapshot. Names can be a maximum of 230 characters including special characters (right or left angle bracket, backslash, hyphen, underscore, ampersand, tilde, plus sign). As best practice, use a snapshot name that is concise and descriptive.

   NOTE: If a snapshot name that you specified is already present, the snapshot is not created and the message `Snapshot name already exists` will be displayed.
4. (Optional) If you want to set an expiration date for the snapshot, select **Enable Expiration** and a date from the calendar. You can also indicate hours and minutes.

Next steps

(Optional) Set up a snapshot schedule to take snapshots of a NAS volume at regular intervals. See Creating NAS Volume Snapshot Schedules.

Creating NAS Volume Snapshot Schedules

Set up a snapshot schedule to take snapshots of a NAS volume at regular intervals during a designated timeframe.

1. Select an NFS datastore in inventory.
2. Select the NAS volume for which you want to take a snapshot.
3. Select **Actions → All Dell Storage Actions → Snapshot → Create Snapshot Schedule**.
   The **Create Snapshot Schedule** wizard starts.
4. Type a name for the snapshot schedule. Names can be a maximum of 230 characters including special characters (right or left angle bracket, back slash, hyphen, underscore, ampersand, tilde, plus sign).

5. Select **Take Snapshot Every**, type a numerical value for minutes, hours, days, or weeks, and select the snapshot frequency from the dropdown menu.
6. Alternatively, select **Take Snapshot On** to set a date and time for taking a snapshot.
   a. Select the day of the week.
   b. Select the time and AM or PM.
   c. Specify the number of minutes to offset each snapshot of a NAS volume. Optionally, type an offset value to begin taking the snapshot some minutes after the hour. The default is zero (0) minutes.
7. Select **Retain Snapshot for** to indicate how long snapshots are saved before automatic deletion. Type a numerical value for minutes, hours, days, or weeks, and select the retention interval from the dropdown menu.
8. Click **Next**.

   Summary information about the snapshot schedule is displayed.
9. Click **Finish** to set the schedule.

Snapshots of the NAS volume are taken and according to the values set by the schedule. You can revise the schedule values as needed. For information, see Editing NAS Volume Snapshot Schedules. If you want to take an immediate (on-demand) snapshot, see Creating NAS Volume Snapshots.

Viewing NAS Volume Snapshots and Schedules

After creating snapshots or snapshot schedules, you can view summary information about all snapshots or schedules on the Monitor tab under Dell Storage.

Viewing Snapshots On the Monitor Tab

Follow these steps to view summary information about all snapshots taken for the selected NAS volume.

1. Select an NFS datastore in inventory.

   The vSphere Web Client Plugin loads information for the selected datastore.

   NOTE: If summary information does not display for the selected NFS datastore, verify that you provided correct credentials for the vCenter server and Storage Manager configuration.
2. Click the **Monitor** tab.
3. Select **Dell Storage** from the menu bar.

   The NFS datastore and associated volume are shown in the table, and the **General** tab is selected by default.
4. Click the **Snapshot** tab.

   The vSphere Web Client Plugin lists all snapshots for the NAS volume, and displays the creation time, expiration date, number of clones, if any, and size of the snapshot.

The following figure shows an example of a NAS volume with three snapshots.

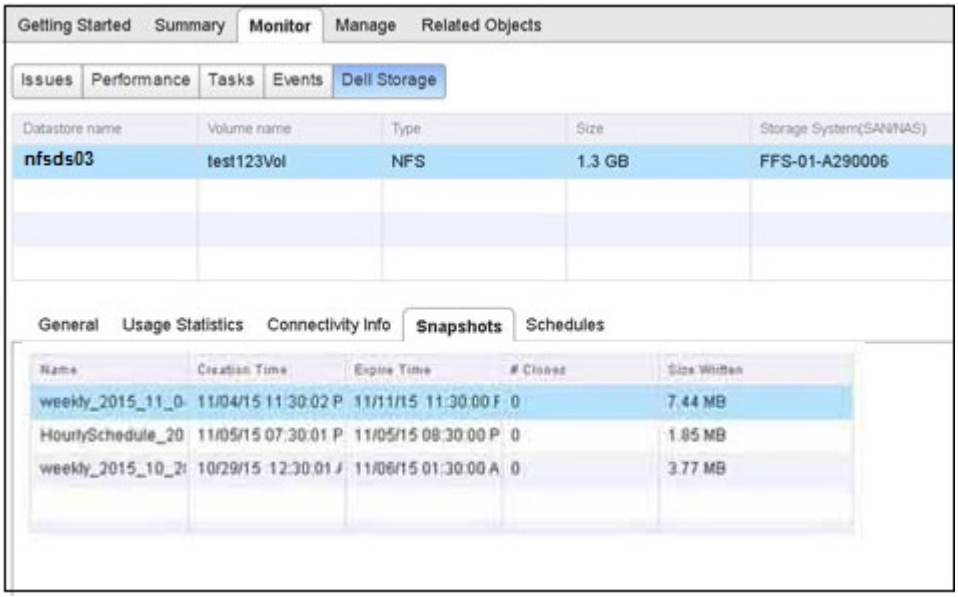


Figure 9. Monitor Tab Showing All Snapshots for the Selected NAS Volume

You can also view all snapshot schedules from the Monitor tab. See Viewing Schedules From the Monitor Tab.

Viewing Schedules From the Monitor Tab

View summary information about all snapshot schedules for the selected NAS volume.

1. Select an NFS datastore in inventory.
   The vSphere Web Client Plugin loads information for the selected datastore.

   NOTE: If summary information does not display for the selected NFS datastore, verify that the correct credentials for the vCenter server and Dell Storage Manager configuration are correct.
2. Click the **Monitor** tab.
3. Select **Dell Storage** from the menu bar.
   The NFS datastore and associated volume are displayed in the table.
4. Click the **Schedules** tab.
   The vSphere Web Client Plugin lists all schedules for the NAS volume and shows the frequency in which snapshots are taken and the expiration interval.

The following figure shows an example of a NAS volume with one snapshot schedule.

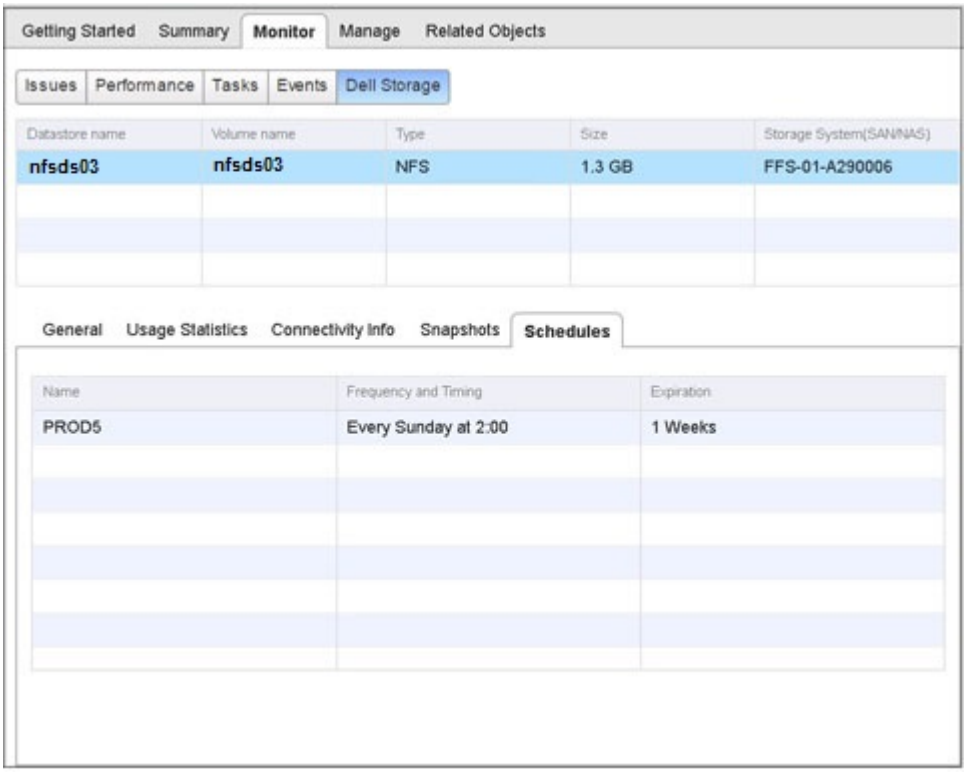


Figure 10. Monitor Tab Showing Schedules for the Selected NAS Volume

You can also view all snapshots on the Monitor tab. See Viewing Snapshots On the Monitor Tab.

Managing NAS Volume Snapshots and Snapshot Schedules

This section describes how to revise and delete snapshots and snapshot schedules.

Editing NAS Volume Snapshots

Edit a snapshot to modify the snapshot name and expiration date.

Steps

1. Select an NFS datastore in inventory.
2. Select **Actions** → **All Dell Storage Actions** → **Snapshot** → **Edit Snapshot/Snapshot Schedule**.
   The **Edit Snapshot/Snapshot Schedule** wizard starts.
3. On the **Edit Snapshot/Snapshot Schedule** page, select **Snapshot** and click **Next**.
4. Select the snapshot from the list of schedules in the table.
5. Edit the information as necessary:
   a. In the **Name** field, select the name for edit and type a revised name.
   b. To prevent automatic deletion of the snapshot, clear the **Enable Expiration** checkbox.
   c. To change expiration information, select a new date in the calendar and revise the numerical value for hours and minutes. The default expiration time is 30 minutes.
6. Click **Next**.
   A summary screen opens, displaying the details of the changes that you made.
7. If you are satisfied with the changes, click **Finish**. Otherwise, click **Back** to perform further edits.

Next steps

(Optional) Make changes to a snapshot that you created. See Editing NAS Volume Snapshot Schedules.

Editing NAS Volume Snapshot Schedules

You can display all available schedules for taking NAS volume snapshots, then select a snapshot schedule for editing. Editing allows you to modify the snapshot schedule name, change when to take the snapshot, or change the snapshot expiration date.

Steps

1. Select an NFS datastore in inventory.
2. Select **Actions → All Dell Storage Actions → Snapshot → Edit Snapshot/Snapshot Schedule**

   The **Edit Snapshot/Snapshot Schedule** wizard starts.
3. On the **Edit Snapshot/Snapshot Schedule** page, select **Snapshot Schedule** and click **Next**.
4. Select the snapshot schedule from the list of schedules in the table.
5. Edit any of the current information:
   a. Select **Take Snapshot Every** and revise the numerical value and interval (minutes, hours, days, or weeks). Alternatively, select **Take Snapshot On** and modify the day of the week, time of day, and minutes to offset each snapshot.
   b. To prevent automatic deletion of the snapshot, clear the **Enable Expiration** checkbox.
   c. To change expiration information, revise the numerical value and interval—minutes, hours, days, or weeks.
6. Click **Next**.

   A summary screen shows the details of the changes that you made.
7. If you are satisfied with the changes, click **Finish**. Otherwise, click **Back** to perform further edits.

Next steps

(Optional) Make changes to a snapshot that you created. See Editing NAS Volume Snapshots.

Deleting NAS Volume Snapshots

View all available snapshots of a NAS volume, then select and delete one or more snapshots.

Steps

1. Select an NFS datastore in inventory.
2. Select **Actions → All Dell Storage Actions → Snapshot → Delete Snapshot/Snapshot Schedule**.

   The **Delete Snapshot/Snapshot Schedule** wizard starts.
3. On the **Delete Snapshot/Snapshot Schedule** page, select **Snapshot** and click **Next**.
4. Select a snapshot or multiple snapshots from the list of schedules in the table. To select all snapshots in the list, check the box next to the **Snapshot Name** column heading.
5. Click **Next**.

   A summary screen specifies the snapshot or snapshots that you selected to delete.
6. Click **Finish** to delete the snapshots.

Next steps

(Optional) Select and delete snapshot schedules. See Deleting NAS Volume Snapshot Schedules.

Deleting NAS Volume Snapshot Schedules

View all available snapshot schedules, then select and delete one or more schedules.

Steps

1. Select an NFS datastore in inventory.
2. Select **Actions → All Dell Storage Actions → Snapshot → Delete Snapshot/Snapshot Schedule**.

   The **Delete Snapshot/Snapshot Schedule** wizard starts.
3. On the **Delete Snapshot/Snapshot Schedule** page, select **Snapshot Schedule** and click **Next**.
4. Select a snapshot schedule or multiple schedules from the list of schedules in the table. To select all snapshot schedules in the list, check the box next to the **Snapshot Schedule Name** column heading.
5. Click **Next**.

   A summary screen specifies the schedule or schedules that you selected to delete.
6. Click **Finish** to delete the schedules.

Next steps
(Optional) Select and delete one or more snapshots. See Deleting NAS Volume Snapshots.

Create and Manage Replications and Live Volumes

The Dell Storage vSphere Web Client Plugin supports two basic models for migrating data between Storage Centers:

- Replications
- Live Volumes

A replication copies volume data from one Storage Center to another Storage Center to safeguard data. A Live Volume is a replicating volume that can be mapped and active on a source and destination Storage Center at the same time.

For information about replications and Live Volumes, see the *Dell Storage Manager Administrator's Guide*.

Use the plugin to add and manage replications and Live Volumes to VMFS datastores and RDMs on Dell storage. You can use the plugin convert a replication to a Live Volume and vice versa.

The following sections describe the replication and Live Volume operations:

- Replication Operations
- Live Volume Operations

Replication Operations

Use the vSphere Web Client Plugin to add, modify, and remove replications for datastores and RDMs.

The following sections describe how to create and manage replications:

- Creating a Datastore or RDM Replication
- Modifying a Datastore or RDM Replication
- Removing a Datastore or RDM Replication

Create a Datastore or RDM Replication

Use the Dell Storage vSphere Web Client Plugin to create datastores and RDM replications.

Replicating a Datastore

Use the vSphere Web Client Plugin to replicate a datastore.

Prerequisites

If you are using iSCSI connections for replications, the following conditions must be met:

- The destination Storage Center must be defined as an iSCSI Remote System on the source Storage Center.
- The source Storage Center must be defined as an iSCSI Remote Connection on the destination Storage Center.
  See the *Dell Storage Manager Administrator's Guide* for instructions on configuring iSCSI connections between Storage Centers .
- At least one Quality of Service (QoS) definition must be set up on the source Storage Center for replication.
  See the *Dell Storage Manager Administrator's Guide* for instructions on creating QoS definitions

Steps

1. Select a datastore to replicate.
2. Select **Actions** → **Dell Storage Actions** → **Replications/Live Volume** → **Add**.
   The **Add Replication/Live Volume** wizard starts.
3. Select the target (destination) Storage Center.
4. Click **Next**.
   The **Replication Options** page opens.

5. Specify one of the following replication types:
   - Replication, Asynchronous
   - Replication, Synchronous—High Availability
   - Replication, Synchronous—High Consistency
6. Specify other replication settings and a target location as in Replication Options
7. Click **Next**.
   The **Ready to Complete** page opens.
8. Click **Finish**.

Related links

Replication Options
Storage Center for Replication

Replicating an RDM

Use the vSphere Web Client Plugin to create an RDM replication.

Prerequisites

If you are using iSCSI connections for replications, the following conditions must be met:

- The destination Storage Center must be defined as an iSCSI Remote System on the source Storage Center.
- The source Storage Center must be defined as an iSCSI Remote Connection on the destination Storage Center.
  See the *Dell Storage Manager Administrator's Guide* for instructions on configuring iSCSI connections between Storage Centers.
- At least one Quality of Service (QoS) definition must be set up on the source Storage Center for replication.
  See the *Dell Storage Manager Administrator's Guide* for instructions on creating QoS definitions.

Steps

1. Select the virtual machine with the RDM to replicate.
2. Select **Actions** → **All Dell Storage Actions** → **Replication/Live Volume** → **Add**.
   The **Add Replication/Live Volume** wizard starts.
3. Select the RDM to replicate.
4. Click **Next**.
   The **Storage Center** page opens.
5. Select the target (destination) Storage Center.
6. Click **Next**.
   The **Replication Options** page opens.
7. Specify one of the following replication types:
   - Replication, Asynchronous
   - Replication, Synchronous—High Availability
   - Replication, Synchronous—High Consistency
8. Specify other replication settings and a target location as in Replication Options.
9. Click **Next**.
   The **Ready to Complete** page opens.
10. Click **Finish**.

Related links

Select Raw Device
Replication Options
Storage Center for Replication

Modifying a Datastore or RDM Replication

The Dell Storage vSphere Web Client Plugin can modify datastore and RDM replications, including the ability to convert the replication type between a Live Volume and a replication.

Modify a Datastore Replication

Modify the settings of an existing datastore replication.

1. Select the datastore that is being replicated.
2. Select **Actions** → **Dell Storage Actions** → **Replications/Live Volume** → **Edit Settings/Convert**.

   The **Modify Replications/Live Volume** wizard starts.
3. From the list of replications, select one to modify.
4. Click **Next**.

   The **Replication Options** page opens.
5. To change the replication type, select a type from the drop-down menu.

   NOTE: If you choose to change the replication type from a replication to a Live Volume, a warning dialog box opens. You must select the checkbox to confirm that you want to make the conversion, and then click OK.
6. Modify the other replication settings as needed.
7. If you confirmed that you want to convert the replica to a Live Volume, the **Live Volume Options** page opens. Set the values for the Live Volume.
8. Click **Next**.

   The **Ready to Complete** page opens.
9. Click **Finish**.

Related links

Storage Center for Replication
Replication Options

Modify an RDM Replication

Modify the settings of an existing datastore replication.

1. Select the virtual machine with the RDM that is being replicated.
2. Select **Actions** → **Dell Storage Actions** → **Replications/Live Volume** → **Edit Settings/Convert**.

   The **Modify Replication/Live Volume** wizard starts.
3. Select the replication to modify.
4. Click **Next**.

   The **Replication Options** page opens.
5. To change the replication type, select a type from the drop-down menu.

   NOTE: If you choose to change the replication type from a replication to a Live Volume, a warning dialog box opens. You must select the checkbox to confirm that you want to make the conversion, and then click OK.
6. Modify the other replication settings as needed.
7. If you confirmed that you want to convert the replica to a Live Volume, the **Live Volume Options** page opens. Set the values for the Live Volume.
8. Click **Next**.

   The **Ready to Complete** page opens.
9. Click **Finish**.

Related links

Replication Options
Select Replications

Removing a Datastore or RDM Replication

The Dell Storage vSphere Web Client Plugin can remove datastore and RDM replications.

Remove a Datastore Replication

Remove a datastore replication after the replication is no longer needed.

1. Select the datastore for which you want to remove a replication.
2. Select **Actions → All Dell Storage Actions → Replications/Live Volume → Remove**.
   The **Remove Replication/Live Volume** wizard starts.
3. Select the replications to remove.
4. Click **Next**.
   The **Remove Options** page opens.
5. Specify removal options for the replications.
6. Click **Next**.
   The **Ready to Complete** page opens.
7. Click **Finish**.

Related links

Replication Delete Options

Remove an RDM Replication

Remove an RDM replication after the replication is no longer needed.

1. Select the virtual machine with the RDM from which you want to remove a replication.
2. Select **Actions → All Dell Storage Actions → Replications/Live Volume → Remove**.
   The **Remove Replication/Live Volume** wizard starts.
3. Select the replications to remove.
4. Click **Next**.
   The **Remove Options** page opens.
5. Specify removal options for the replications.
6. Click **Next**.
   The **Ready to Complete** page opens.
7. Click **Finish**.

Related links

Replication Delete Options
Select Replications

Live Volume Operations

The Dell Storage vSphere Web Client Plugin enables you to add, modify, and remove Live Volumes for datastores and RDMs. You can also configure automatic failover and restore features.

The following sections describe how to create and manage Live Volumes:

- Add a Live Volume to a Datastore or RDM
- Modify a Live Volume Datastore or RDM Replication
- Remove a Live Volume Datastore or RDM Replication
- Configure Live Volume Automatic Failover and Restore

Add a Live Volume to a Datastore or RDM

Use the Dell Storage vSphere Web Client Plugin to add Live Volumes to datastores and RDMs.

Adding a Live Volume to a Datastore

Use the Dell Storage vSphere Web Client Plugin to add Live Volumes to datastore.

1. Select a datastore to replicate.
2. Select **Actions** → **Dell Storage Actions** → **Replications/Live Volume** → **Add**.
   The **Add Replication/Live Volume** wizard starts.
3. Select the target (destination) Storage Center.
4. Click **Next**.
   The **Replication Options** page opens.
5. Specify one of the following replication types:
   - Live Volume, Asynchronous
   - Live Volume, Synchronous — High Availability
   - Live Volume, Synchronous — High Consistency
6. Specify the replication settings and a target location.
7. Click **Next**.
   The **Live Volume Settings** page opens.
8. (Optional) Select from the drop-down list of Secondary QoS Definitions.
9. (Optional) Clear the option labeled **Automatically Swap Primary Storage Center**.
10. If you keep the checkbox enabled for **Automatically Swap Primary Storage Center**, click **Advanced**.
    The Advanced options are shown. Modify the values for the following options:
    - Min. data written to secondary before swap
    - Min. % of I/O on secondary before swap
    - Min. time as primary before swap
11. (Optional) If you selected **Live Volume, Synchronous – High Availability** as the replication type in step 5, select **Failover Automatically** to configure Live Volumes to automatically fail over when service is disrupted. By default, **Restore Automatically** is also selected. For more information, see Configure Live Volume Automatic Failover and Restore.
12. Specify a Live Volume Secondary Mapping target location.
13. Click **Next**.
    The **Ready to Complete** page opens with a summary of the selections that you made.
14. Click **Finish**.

Related links

Replication Options
Live Volume Options
Storage Center for Replication

Adding a Live Volume to an RDM

Use the Dell Storage vSphere Web Client Plugin to add Live Volumes to RDMs.

1. Select the virtual machine with the RDM to replicate.
2. Select **Actions** → **All Dell Storage Actions** → **Replications/Live Volume** → **Add**.
   The **Add Replications/Live Volume** wizard starts.
3. Select the RDM to replicate.
4. Click **Next**.
   The **Storage Center** page opens.
5. Select the target (destination) Storage Center.
6. Click **Next**.

The **Replication Options** page opens.

7. Specify one of the following replication types:
   - Live Volume, Asynchronous
   - Live Volume, Synchronous—High Availability
   - Live Volume, Synchronous—High Consistency
8. Specify the replication settings and a target location.
9. Click **Next**.

   The **Live Volume Settings** page opens.
10. (Optional) Select from the drop-down list of Secondary QoS Definitions.
11. (Optional) Uncheck the option labeled **Automatically Swap Primary Storage Center**.
12. If you keep the checkbox enabled for **Automatically Swap Primary Storage Center**, click **Advanced**.

    The Advanced options are shown. Modify the values for the following options:
    - Min. data written to secondary before swap
    - Min. % of I/O on secondary before swap
    - Min. time as primary before swap
13. Specify a target location.
14. Click **Next**.

    The **Ready to Complete** page opens.
15. Click **Finish**.

Related links

Select Raw Device
Replication Options
Live Volume Options
Storage Center for Replication

Modify a Live Volume Datastore or RDM Replication

The vSphere Web Client Plugin can modify Live Volume datastore and RDM replications, and convert the replication type between a Live Volume and a replication.

Modifying a Live Volume Datastore

Modify the settings of an existing Live Volume datastore.

1. Select the datastore that is being replicated.
2. Select **Actions → Dell Storage Actions → Replications/Live Volume → Edit Settings/Convert**.

   The **Modify Replications/Live Volume** wizard starts.
3. From the list of replications, select one to modify.
4. Click **Next**.

   The **Replication Options** page opens.
5. To change the replication type, select a type from the drop-down menu.

   NOTE: If you choose to change the replication type from a Live Volume to a replica, a warning dialog box opens. You must select the checkbox to confirm that you want to make the conversion, and then click OK.
6. Modify the other replication settings as needed.
7. If you did not choose to convert from a Live Volume to a replica, the **Live Volumes Settings** page opens.
8. Click **Next**.

   The **Live Volumes Options** page opens.
9. (Optional) Select from the drop-down list of Secondary QoS Definitions.
10. (Optional) Uncheck the option labeled **Automatically Swap Primary Storage Center**.
11. If you keep the checkbox enabled for **Automatically Swap Primary Storage Center**, click **Advanced**.

    The Advanced options are shown. Modify the values for the following options:

- Min. data written to secondary before swap
- Min. % of I/O on secondary before swap
- Min. time as primary before swap

12. (Optional) If you enabled Automatic Failover and Automatic Restore, you can disable both or Automatic Restore, as follows:
    - Clear **Failover Automatically**, which also clears **Restore Automatically**.
    - Clear **Restore Automatically**, which disables Automatic Restore but retains Automatic Failover.
13. Click **Next**.
    The **Ready to Complete** page opens.
14. Click **Finish**.

Related links

Storage Center for Replication
Live Volume Options
Replication Options

Modify a Live Volume RDM Replication

Modify the settings of an existing Live Volume RDM replication.

1. Select the virtual machine with the RDM that is being replicated.
2. Select **Actions → Dell Storage Actions → Replications/Live Volume → Edit Settings/Convert**.
   The **Modify Replication/Live Volume** wizard starts.
3. Select the Live Volume to modify.
4. Click **Next**.
   The **Replication Options** page opens.
5. To change the replication type, select a type from the drop-down menu.

   NOTE: If you choose to change the replication type from a replication to a Live Volume, a warning dialog box opens. You must select the checkbox to confirm that you want to make the conversion, and then click OK.
6. Modify the other replication settings as needed.
7. Click **Next**. If you did not choose to convert from a Live Volume to a replication, the **Live Volumes Settings** page opens. Set the values for the Live Volume.
8. (Optional) If you enabled Automatic Failover and Automatic Restore, you can disable both or Automatic Restore, as follows:
    - Clear **Failover Automatically**, which also clears **Restore Automatically**.
    - Clear **Restore Automatically**, which disables Automatic Restore but retains Automatic Failover.
9. Click **Next**.
   The **Ready to Complete** page opens.
10. Set the values for the Live Volume.
11. Click **Finish**.

Related links

Select Replications
Replication Options
Live Volume Options

Remove a Live Volume Datastore or RDM Replication

Use the vSphere Web Client Plugin to remove a Live Volume datastore and RDM replication.

Removing a Live Volume Datastore

Remove a Live Volume datastore after the replication is no longer needed.

1. Select the datastore for which you want to remove a replication.
2. Select **Actions → All Dell Storage Actions → Replications/Live Volume → Remove**.

The **Remove Replication/Live Volume** wizard starts.

3. Select the replications to remove.
4. Click **Next**.

   The **Remove Options** page opens.
5. Specify removal options for the replications.
6. Click **Next**.

   The **Ready to Complete** page opens.
7. Click **Finish**.

Related links

Replication Delete Options

Remove a Live Volume RDM Replication

Remove a Live Volume RDM replication after the replication is no longer needed.

1. Select the virtual machine with the RDM from which you want to remove a replication.
2. Select **Actions → All Dell Storage Actions → Replications/Live Volume → Remove**.

   The **Remove Replication/Live Volume** wizard starts.
3. Select the replications to remove.
4. Click **Next**.

   The **Remove Options** page opens.
5. Specify removal options for the replications.
6. Click **Next**.

   The **Ready to Complete** page opens.
7. Click **Finish**.

Related links

Replication Delete Options
Select Replications

Configure Live Volume Automatic Failover and Restore

You can enable Storage Center Automatic Failover and Automatic Restore from the vSphere Web Client Plugin on Live Volumes that meet certain criteria. When Automatic Failover is enabled, the secondary Live Volume will automatically be promoted to primary in the event of a failure. After the primary Live Volume comes back online, Automatic Restore, configured by default, restores the Live Volume relationship. For more information about Live Volume Automatic Repair and Automatic Restore, see the *Dell Storage Manager Administrator's Guide*.

Enabling Live Volume Automatic Failover and Restore

Prerequisites

- Configure a datastore or RDM Live Volume with the following attributes:
  - Synchronous
  - High Availability
  - Protected

  NOTE: If you have not configured a Live Volume to the datastore, see Add a Live Volume to a Datastore or RDM .
- Storage Center version 6.7 or later
- VMware server operating system
- Port 3033 enabled for inbound traffic

Steps

1. Select a datastore or RDM in the inventory for which you have configured Live Volume synchronous replication with high availability.

   The vSphere Web Client Plugin wizard loads information for the selected datastore.
2. Click the **Monitor** tab.
3. Select **Dell Storage** from the menu bar.

   The datastore and associated volume are shown in the table. The most recently selected tab for this datastore is displayed; otherwise the **General** tab is selected by default.
4. Click the **Replications/Live Volume** tab.

   The vSphere Web Client Plugin shows the details of the configured replication. Under **Details**, the field for **Failover Automatically** indicates **No**.
5. Select **Actions → All Dell Storage Actions → Replication/Live Volume → Edit Settings/Convert**.

   The **Modify Replication/Live Volume** wizard starts.
6. Click **Next**.

   The replication options are loaded, and the wizard displays a screen from which you can set replication options. Verify that the **Replication Type** field shows **Live Volume, Synchronous - High Availability**. If not, change the replication type by selecting from the drop-down menu or selecting **Cancel** and choosing a different datastore with the correct replication type.
7. Click **Next**.

   The wizard displays a screen from which you can set Live Volume options.
8. Under **Live Volume Settings**, select **Failover Automatically**. By default, **Restore Automatically** is also selected. You can deselect this option when you modify a Live Volume datastore or RDM replication. For more information, see Modify a Live Volume Datastore or RDM Replication .
9. Click **Next**.

   Failover Automatically and, optionally, **Restore Automatically** should indicate **Yes**.
10. Click **Finish** to accept the configuration, and exit the wizard.

    The summary page is displayed again, and the **Details** table on the **Replications/Live Volumes** tab now indicates **Failover Automatically** and **Repair Automatically** as **Yes**.

The following figure shows a Live Volume with automatic failover and automatic repair enabled.

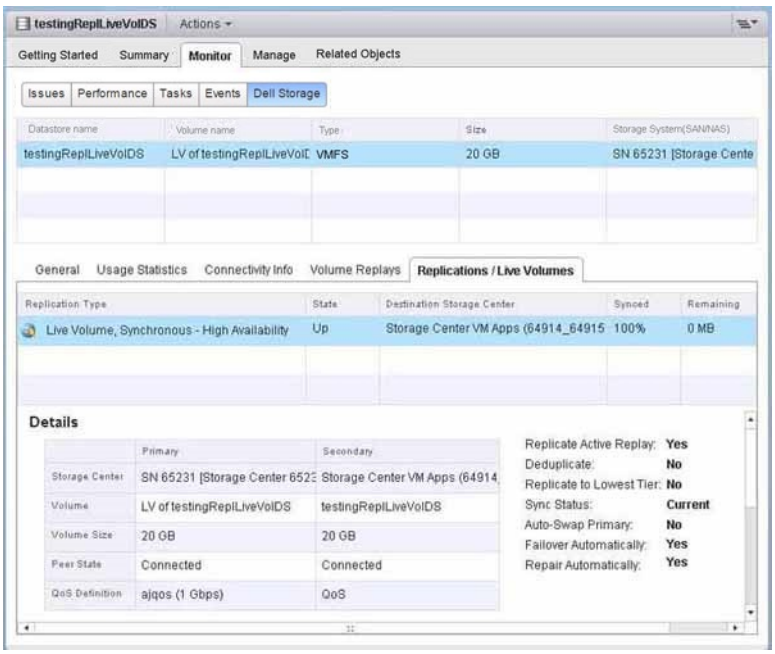


Figure 11. Live Volume With Automatic Failover Enabled

3

Working With Virtual Machines

The Dell Storage vSphere Web Client Plugin provides the ability to provision virtual machines and recover virtual machine data from a snapshot.

The following options are available for provisioning virtual machines:

- Create a virtual machine
- Clone a virtual machine by creating a thin copy of a virtual machine

Creating Virtual Machines

The vSphere Web Client Plugin allows you to provision (create) virtual machines using Dell storage.

NOTE: When the Provision Virtual Machine wizard is launched from a VM template and the template is backed by a VMFS datastore, the Clone VM option is disabled and only the Create VM option remains enabled. The Clone function is supported only for VMs or templates backed by NFS datastores.

Deploy Virtual Machines to an Existing VMFS or NFS Datastore

Use the Provision Virtual Machines wizard to create one or more virtual machines to an existing VMFS or NFS datastore.

Prerequisites

A virtual machine template must be created from which new virtual machines can be deployed. For information about creating or updating a virtual machine template, refer to the vSphere help topics on virtual machine templates.

Steps

1. Select an object that can be the parent of a virtual machine:
   - Datacenter
   - Host
   - Cluster
2. Select **Actions → All Dell Storage Actions → Provision Virtual Machines**.
   The **Provision Virtual Machines** wizard starts.
3. Select **Create Virtual Machine**.
   If you selected a datacenter in step 1, the **Host/Cluster** page opens. If you selected a host or cluster in step 1, the **Template Selection** page opens.
4. If necessary, select the host or cluster on which to run virtual machines, and click **Next**.
   The **Template Selection** page opens.
5. Select a virtual machine template, and click **Next**.
   The **Name and Location** page opens.
6. Specify a base name for the VMs, the number of VMs to create, and an inventory location for new virtual machines, and click **Next**.
7. If necessary, specify the resource pool within which to run virtual machines, and click **Next**.
8. Select **Lookup for Existing Datastore** and click **Next**.
   The **Datastore Lookup** page opens.
9. Select the datastore in which to store virtual machine files, and click **Next**.
10. Customize the settings for each virtual machine, click **Update**, and click **Next**.

The **Ready to Complete** page opens.

11. Click **Finish**.

Related links

Customization
Datastore Lookup
Datastore Options
Name and Location
Template Selection

Deploy Virtual Machines to a New VMFS Datastore

Use the Create Virtual Machines wizard to deploy one or more virtual machines to a new datastore.

Prerequisites

A virtual machine template must be created from which new virtual machines can be deployed. For information about creating or updating a virtual machine template, refer to the vSphere help topics on virtual machine templates.

NOTE: The options that appear when deploying a virtual machine change depending on the volume preferences of the Storage Manager user defined in the vSphere Web Client Plugin.

Steps

1. Select an object that can be the parent of a virtual machine:
   - Datacenter
   - Host
   - Cluster
2. Select **Actions** → **All Dell Storage Actions** → **Provision Virtual Machines**.
   The **Provision Virtual Machines** wizard starts and the **Select Operation** page opens.
3. Select **Create Virtual Machine**.
   If you selected a datacenter in step 1, the **Host/Cluster** page opens. If you selected a host or cluster in step 1, the **Template Selection** page opens.
4. If the **Host/Cluster** page opens, select the host or cluster on which to run the virtual machines, and click **Next**.
   The **Template Selection** page opens.
5. Select a virtual machine template from the list, and click **Next**.
   The **Name and Location** page opens.
6. Specify a base name for the VMs, the number of VMs to create, and an inventory location for the new virtual machines, and click **Next**.
7. If necessary, specify the resource pool within which to run the virtual machines, and click **Next**.
   The **Select Datastore Options** page opens.
8. Select **Create VMFS Datastore**, and click **Next**.
   The **Storage Center** page opens.
9. Select the Storage Center for volume creation, and click **Next**
   The **Create Storage Volume** page opens.
10. Type the name and size for the new volume, select the volume folder, and click **Next**
11. Select the following steps that pertain to your environment. The steps that apply depend on the user-preferences settings of the Storage Center user in Storage Manager.
    a. Select the pagepool to use for creating the volume.
    b. Select the storage options for this volume.
       - Select a Storage Profile for the volume. Dell recommends using the Recommended (All Tiers) profile for most volumes.
       - If your storage system contains multiple disk folders, select a Disk Folder from the drop-down menu.

       Click **Next**.

c. Select a snapshot Profile for the volume, and click **Next**.
d. Specify the LUN for mapping the volume, and click **Next**.
e. Select the file system version, and click **Next**.
   If the file system version is VMFS-3, select the maximum file size and block size for the file system.
f. Click **Next**.
   The **Datastore Properties** page opens.
g. Verify the name and inventory location for the datastore, and click **Next**.
   The **Customization** page opens.

12. (Optional) Select **Create Replication/Live Volume** if you want to replicate the volume data to a second Storage Center and allow both Storage Centers to process I/O requests for the volume. For information, see Live Volume Operations.
13. (Optional) Select **Replication Options** if you want to replicate a datastore. For information, see Replication Options.
14. Customize the settings for each virtual machine, click **Update**, and click **Next**.
    The **Ready to Complete** page opens.
15. Click **Finish**.

Related links

Customization
Datastore Options
Datastore Properties
File System Version
Mapping LUN
Name and Location
Snapshot Profile
Storage Center
Template Selection
Volume
Volume Settings

Create Virtual Machines to an NFS Datastore Using an Existing NFS Export

Use the Provision Virtual Machines wizard to create (deploy) one or more virtual machines to an NFS datastore using an existing NFS export.

Prerequisites

A virtual machine template must be created from which new virtual machines can be deployed. For information about creating or updating a virtual machine template, refer to the vSphere help topics on virtual machine templates.

NOTE: The options that appear when deploying a virtual machine change depending on the volume preferences of the Storage Manager user defined in the vSphere Web Client Plugin.

Steps

1. Select an object that can be the parent of a virtual machine:
   - Datacenter
   - Host
   - Cluster
2. Select **Actions → All Dell Storage Actions → Provision Virtual Machines**.
   The **Provision Virtual Machines** wizard starts.
3. Select **Create Virtual Machine**.
   If you selected a datacenter in step 1, the **Host/Cluster** page opens. If you selected a host or cluster in step 1, the **Template Selection** page opens.
4. If the **Host/Cluster** page opens, select the host or cluster on which to run the virtual machines, and click **Next**.
   The **Template Selection** page opens.
5. Select a virtual machine template from the list, and click **Next**.

The **Name and Location** page opens.

6. Specify a base name for the VMs, the number of VMs to create, and an inventory location for the new virtual machines, and click **Next**.
7. If necessary, specify the resource pool within which to run the virtual machines, and click **Next**.

   The **Select Datastore Options** page opens.
8. Select **Create NFS Datastore**, and click **Next**.

   The **Select FluidFS Cluster** page opens.
9. Select a FluidFS cluster from the list, and click **Next**.

   The **Select Action Type** page opens.
10. Select **Map an Existing NFS Datastore**, and click **Next**.
11. Select an NFS export from the list of available NFS exports.
12. Type a value in the **FluidFS VIP or DNS Name** field.
13. Click **Next**.

    The **Customization** page opens.
14. Customize the settings for each virtual machine, click **Update**, and click **Next**.

    The **Ready to Complete** page appears.
15. Click **Finish**.

Related links

Add an NFS Datasore Using an Existing NFS Export
Customization
Datastore Options
Datastore Properties
Name and Location
NFS Exports
Template Selection
Volume

Create Virtual Machines By Creating a New NFS Export

Use the Provision Virtual Machines wizard to deploy one or more virtual machines to an NFS datastore.

Prerequisites

A virtual machine template must be created from which new virtual machines can be deployed. For information about creating or updating a virtual machine template, refer to the vSphere help topics on virtual machine templates.

NOTE: The options that appear when deploying a virtual machine change depending on the volume preferences of the Storage Manager user defined in the vSphere Web Client Plugin.

Steps

1. Select an object that can be the parent of a virtual machine:
   - Datacenter
   - Host
   - Cluster
2. Select **Actions → All Dell Storage Actions → Provision Virtual Machines**.

   The **Provision Virtual Machines** wizard starts.
3. Select **Create Virtual Machine**.

   If you selected a datacenter in step 1, the **Host/Cluster** page opens. If you selected a host or cluster in step 1, the **Template Selection** page opens.
4. If the **Host/Cluster** page opens, select the host or cluster on which to run the virtual machines, and click **Next**.

   The **Template Selection** page opens.
5. Select a virtual machine template from the list, and click **Next**.

The **Name and Location** page opens.

6. Specify a base name for the VMs, the number of VMs to create, and an inventory location for the new virtual machines, and click **Next**.
7. If necessary, specify the resource pool within which to run the virtual machines, and click **Next**.

   The **Select Datastore Options** page opens.
8. Select **Create NFS Datastore**, and click **Next**.

   The **Datastore Properties** page opens.
9. Type the name for the new datastore, select the volume folder under Inventory Location, and click **Next**.

   The **NFS Export** page opens.
10. Select **Create a new volume**, and click **Next**.
11. Type a value for size and select the unit of measurement. Click **Create a New NAS Volume Folder** then type a name in the Voume Folder field.
12. Type a value in the **FluidFS Cluster VIP or DNS Name** field and click **Next**.

    The **Customization** page opens.
13. Customize the settings for each virtual machine, click **Update**, and click **Next**.

    The **Ready to Complete** page opens.
14. Click **Finish**.

Related links

Add an NFS Datasore Using an Existing NFS Export
Customization
Datastore Options
Datastore Properties
Name and Location
NFS Exports
Template Selection
Volume

Clone a Virtual Machine

Use the Provision Virtual Machine wizard to clone a virtual machine and create a thin copy of the existing virtual machine.

Prerequisites

NOTE: This option applies only to VMs or VM templates on an NFS datastore.

The Clone Virtual Machine action is supported from a virtual machine template or a virtual machine that is in the Power Off state.

Steps

1. Select an object that can be the parent of a virtual machine:
   - Datacenter
   - Host
   - Cluster
2. Select **Actions → All Dell Storage Actions → Provision Virtual Machines**.

   The **Provision Virtual Machines** wizard starts.
3. Select **Clone Virtual Machine**.

   If you selected a datacenter in step 1, the **Host/Cluster** page opens. If you selected a host or cluster in step 1, the **Template Selection** page opens.
4. If the **Host/Cluster** page opens, select the host or cluster on which to run the virtual machines, and click **Next**.

   The **Template Selection** page opens.
5. Choose one of the following options:
   - **Select a Virtual Machine template**: Select a predefined virtual machine template to clone.

- **Select Virtual Machine**: Select a specific machine to clone.

  NOTE: An error message is displayed if you select a VM that is in the Powered On state or a VM that resides on a VMFS datastore.

  Click **Next**. The **Name and Location** page opens.

6. Specify a base name for the VMs, the number of VMs to create, and an inventory location for the new virtual machines.
7. If you want the virtual machine to be powered on, select the checkbox **Power on virtual machine after cloning**.
8. If necessary, specify the resource pool within which to run the virtual machines, and click **Next**.

   The **Customization** page opens.
9. (Optional) Select **Use Customization Spec**.

   The page then displays a list of customization specs that have been defined previously. Select from the list, and click **Next**. The **Host/Cluster (Destination)** page opens.

   NOTE: Use the Customization Specification Manager in vSphere to create and manage customization specs.
10. Select the destination host or cluster on which to deploy the virtual machine clone, and click **Next**.

    The **Datastore** page opens.
11. Select the datastore to store the virtual machine files and click **Next**.

    The **Ready to Complete** page opens.
12. Click **Finish**.

Related links

Host/Cluster
Name and Location
Datastore Selection for Clone Virtual Machine
Template Selection - Clone VM
Customization for Clone VM

Recovering a Virtual Machine From a Snapshot

The vSphere Web Client Plugin allows you to recover virtual machine data from a snapshot of a VMFS datastore.

Recovering Virtual Machine Data From a Snapshot

Use the Storage Center Snapshot Recovery wizard to recover virtual machine data from a snapshot of a VMFS datastore.

Prerequisites

At least one snapshot of the virtual machine must exist.

Steps

1. Select a virtual machine.
2. Select **Actions → All Dell Storage Actions → Snapshot → Recover VM Data from Snapshot**.

   The **Storage Center Snapshot Recovery Wizard** starts.
3. Select one or more snapshotsfrom which you want to recover data, and click **Next**.

   The **VM Selection** page opens.
4. Select the virtual machine that is used to access the snapshot data, and click **Next**.

   The **Ready to Complete** page opens.
5. Click **Finish**.

Related links

Replication Delete Options
VM Selection

4

Managing Disaster Recovery

Use the Dell Storage vSphere Web Client Plugin to manage Disaster Recovery for VMFS datastores.

Activate Disaster Recovery

Activate Disaster Recovery for the corresponding datastore on the associated Storage Center.

Prerequisites

Valid restore points must be defined.

Steps

1. Select a datacenter.
2. Select **Actions** → **All Dell Storage Actions** → **Disaster Recovery** → **Activate**.

   The **Activate Disaster Recovery** wizard starts and the **Select SAN array source/destination** page opens.
3. From the list, select a source/destination pair. Click **Next**.

   The **Disaster Recovery Warning** page opens.
4. (Optional) Check **Allow Planned Activate Disaster Recoveries**. Click **Next**.

   If this option is selected, the following actions result:

   - The servers on the production site are shut down.
   - The Storage Centers on the production site do not have to be shut down.
   - The source volume is no longer mapped to the server.

   The **Available Restore Points** page opens showing the datastores that have been specified as restore points.
5. From the list, select a pair of restore points. Click **Next**.

   A page opens showing the selected restore points.
6. (Optional) To modify the settings, click **Edit Settings**.

   The **Edit Activate Disaster Recovery Setting** page opens.
7. Modify the settings:

   - Click **Change** next to **Server** to modify the server.
   - Check the **Use Original Volumes Folder** checkbox to select that option.
   - Check the **Use Active Snapshot** checkbox to select that option.
   - Click **Change** next to **Snapshot Profile List** to modify the snapshot profile to be applied.

   Click **OK** to save the modified settings.
8. Click **Next**.

   The **Ready to Complete** page opens.
9. Click **Finish**.

Related links

Edit Activate Recovery Settings
Select Restore Points
Select Source/Destination Pair

Restore/Start Disaster Recovery

Use the **Restore/Start Disaster Recovery** page to restore the Disaster Recovery activated volume for the corresponding datastore.

Prerequisites

Valid restore points must be defined.

Steps

1. Select a datacenter.
2. Select **Actions → All Dell Storage Actions → Disaster Recovery → Restore/Restart**.

   The **Restore/Restart Disaster Recovery** wizard starts, and the **Select SAN array source/destination** page opens.
3. From the list, select a source/destination pair. Click **Next**.

   The **Restore/Restart Disaster Recovery Warning** page opens.
4. (Optional) Select Disaster Recovery options:
   - Check **Mirror Back Only** to skip recreating the replication in the original direction and use the Disaster Recovery site as the source.
   - Check **Automatically Deactivate Destination** to automatically remove server mappings from the activated volume without requiring administrator intervention. This option is available only if Disaster Recovery has been activated for the restore point. If this option is selected, I/O to the activated volume should be halted before performing the restore.

   Click **Next**.

   The **Available Restore Points** page opens showing the datastores that have been specified as restore points.
5. From the list, select a pair of restore points. Click **Next**.

   A page opens that shows the selected restore points.
6. (Optional) To modify the settings, click **Edit Settings**.

   The **Edit Activate Disaster Recovery Setting** page opens.
7. Modify the settings:
   - Click **Change** next to **Server** to modify the server.
   - Check the **Use Original Volumes Folder** checkbox to select that option.
   - Check the **Use Active Snapshot** checkbox to select that option.
   - Click **Change** next to **Snapshot Profile List** to modify the snapshot profile to be applied.

   Click **OK** to save the modified settings.
8. Click **Next**.

   The **Ready to Complete** page opens.
9. Click **Finish**.

Related links

Edit Activate Recovery Settings
Recover/Restart Disaster Recovery Warning
Select Restore Points
Select Source/Destination Pair

Predefine Disaster Recovery

Predefine Disaster Recovery updates the Disaster Recovery settings for the corresponding datastore on the the associated Storage Center volume.

1. Select a datacenter.
2. Select **Actions → All Dell Storage Actions → Disaster Recovery → Predefine**.

   The **Select SAN array source/destination** page opens.
3. From the list, select a source/destination pair. Then click **Next**.

A page opens that shows the selected restore points.

4. (Optional) To modify the settings, click **Edit Settings**.
   The **Edit Activate Disaster Recovery Setting** page opens.
5. Modify the settings:
   - Click **Change** next to **Server** to modify the server.
   - Check the **Use Original Volumes Folder** checkbox to select that option.
   - Check the **Use Active Snapshot** checkbox to select that option.
   - Click **Change** next to **Snapshot Profile List** to modify the snapshot profile to be applied.

   Click **OK** to save the modified settings.
6. Click **Next**.
   he **Ready to Complete** page opens.
7. Click **Finish**.

Related links

Edit Activate Recovery Settings
Select Restore Points
Select Source/Destination Pair

5

Viewing Dell Storage Information

Use the Dell Storage vSphere Web Client Plugin to display information about Dell Storage including HBA to Storage Center connectivity, datastore information, and performance charts.

Viewing the Dell Settings for a Host

Use the **Dell Storage Settings** tab to display information about the Fibre Channel and iSCSI connections between the ESXi host and the Storage Center. The **Dell Storage Settings** page is accessible from the **Configure** tab of an ESXi host.

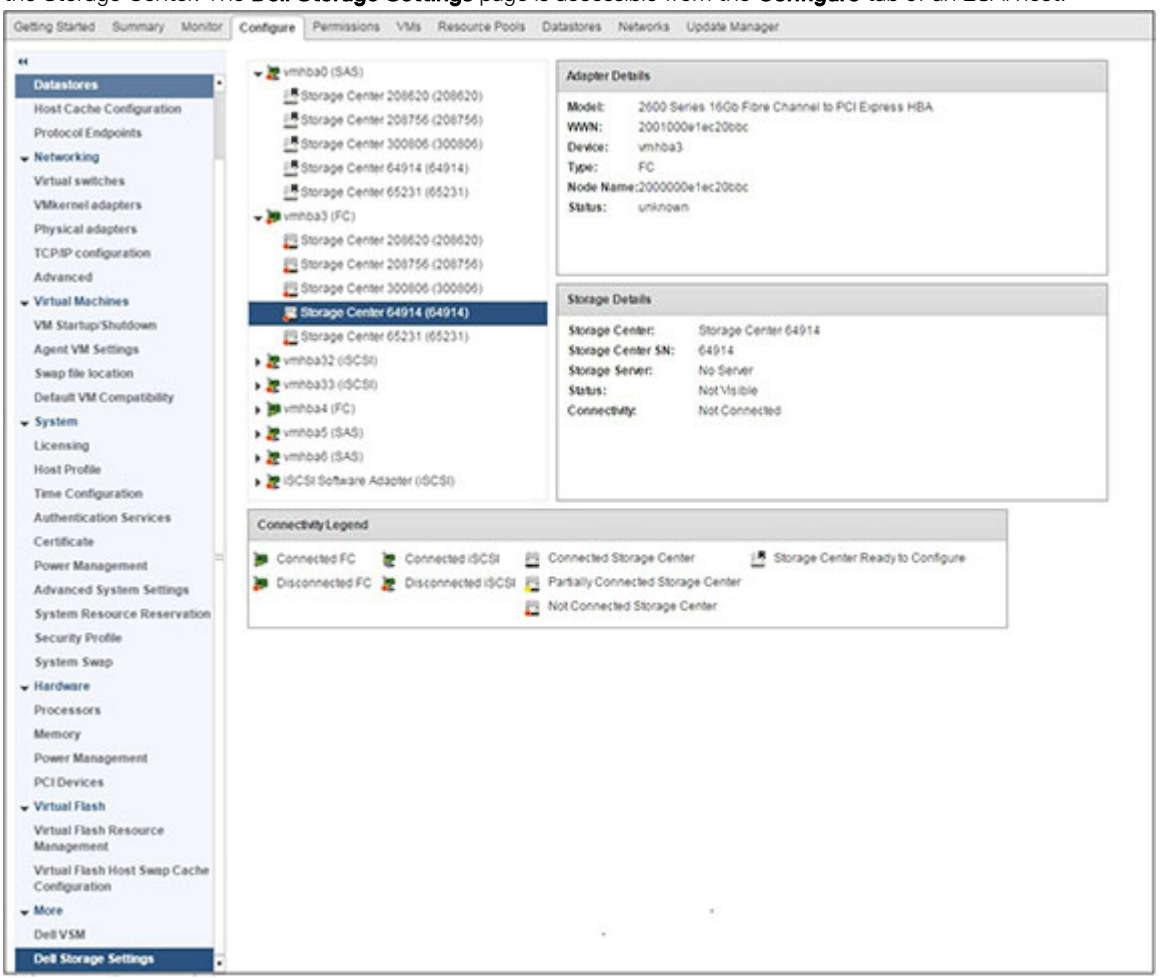


Figure 12. Dell Storage Settings for a Host

NOTE: The method for viewing Adapter Details varies depending on the version of ESXi that is running on the host. The previous figure shows the Adapter Details report on ESXi 6.5.

The left pane displays Fibre Channel and iSCSI host bus adapters (HBAs) on the ESXi host and Storage Center connections. The Storage Center icons indicate whether the Storage Center is connected, partially connected, not connected, or ready to be configured.

Connectivity Legends

Table 1. Description of Connectivity Legends

Icon	Label	Description
	Connected FC	A Fibre Channel connection between the HBA and Storage Center exists.
	Disconnected FC	A Fibre Channel connection between the HBA and Storage Center does not exist.
	Connected iSCSI	An iSCSI connection between the HBA and Storage Center exists.
	Disconnected iSCSI	An iSCSI connection between the HBA and Storage Center does not exist.
	Connected Storage Center	The Storage Center is connected to the ESXi host.
	Partially Connected Storage Center	The Storage Center is partially connected to the ESXi host.
	Not Connected Storage Center	The Storage Center is not connected to the ESXi host.
	Storage Center Ready to Configure	The Storage Center is ready to be configured to connect to the ESXi host.

Select a Storage Center connection to display configuration information for the HBA and Storage Center.

Configuring Storage Center Connections

Configure a connection between an HBA and a Storage Center.

1. Select a Storage Center connection that is unconfigured and shows the **Storage Center Ready to Configure** icon.
2. Click **Configure**.

   The configure operation performs the following tasks for a Fibre Channel connection:

   - Creates a server definition on the Storage Center if it does not exist
   - Creates corresponding HBA definitions associated with this server

     NOTE: If the host is in a cluster that does not exist on the Storage Center, the cluster definition is created on the Storage Center.

   The configure operation performs the following tasks for an iSCSI connection:

   - If necessary, enables the iSCSI software initiator on the ESXi host side
   - Sets the ESXi host firewall rules to enable iSCSI connections
   - Configures iSCSI software initiators with Storage Center IP (IQN) targets (the targets are added to a list of iSCSI static targets on the ESXi host)
   - Creates a server definition on the Storage Center if it does not exist and creates a corresponding HBA definition associated with this server

     NOTE: If the host is in a cluster that does not exist on the Storage Center, the cluster definition is created on the Storage Center.

Adapter Details

Table 2. Description of Reported Adapter Information

Label	Description
Model	Adapter model name
WWN	World Wide Name (WWN) for Fibre Channel and the iSCSI Qualified Name (IQN) for iSCSI
Device	Name of the adapter
Type	Storage adapter type (FC or iSCSI)
Node Name	Fibre Channel node name
Alias	iSCSI alias name
Status	Status of the adapter

Storage Details

Table 3. Description of Storage Details

Label	Description
Storage Center	Name of the Storage Center
Storage Center SN	Serial number of the Storage Center
Storage Server	Server to which the device is connected
Status	Configuration status of the Storage Center (Configured, Configurable, Not Visible)
Connectivity	Status of the Storage Center connection (Up, Down, or Not Connected)

Using Dell Views

Use Dell Storage Views to display information about a Dell datastore or RDM. The **Dell Views** page is accessible from the **Monitor** tab of a host, cluster, datastore, datastore cluster, virtual machine, or datacenter.

General Tab

The **General** tab displays general information about the selected Dell volume.

Storage Center General Tab Information

The following figure shows an example of information in the **General** tab for a Storage Center.

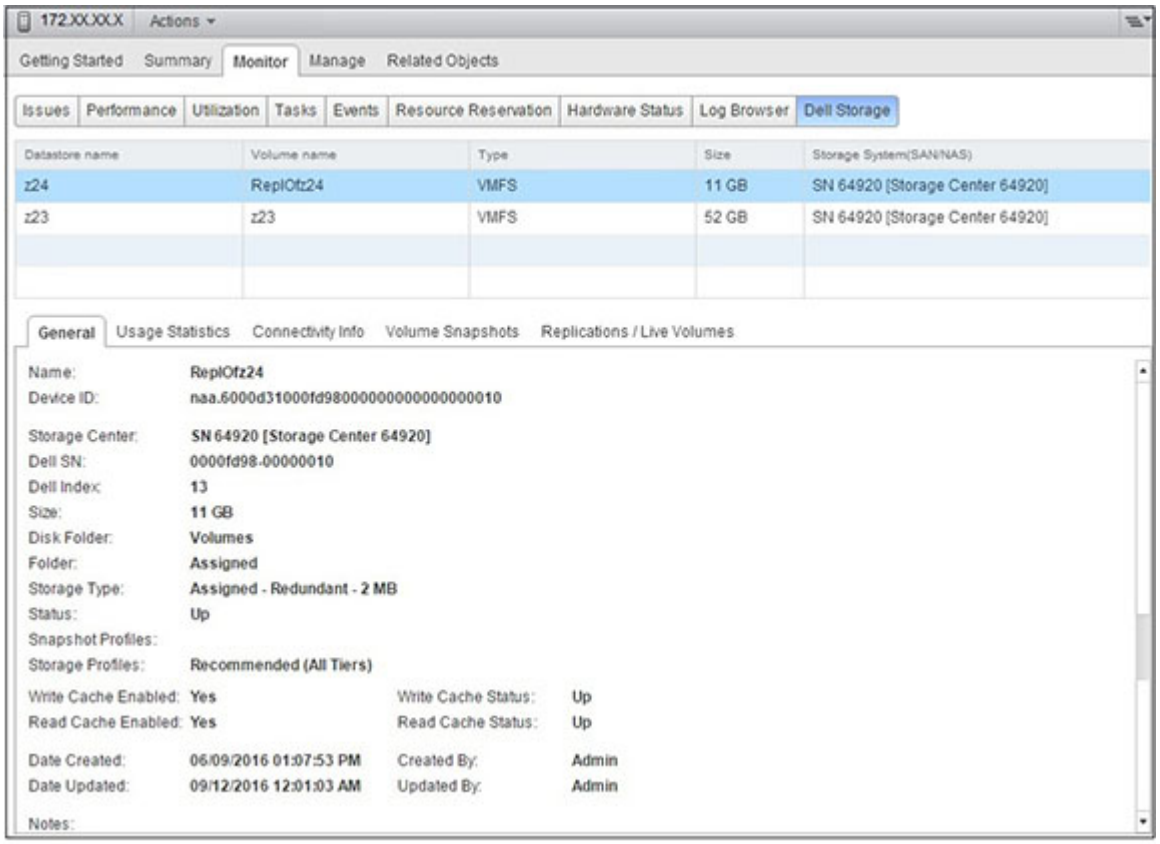


Figure 13. General Tab Information for a Storage Center

The following table describes the information in the **General** tab.

Table 4. Information From the General Tab

Label	Description
Name	Name of the volume
Serial Number	Volume serial number
Storage Center	Storage Center on which the volume resides
Dell SN	Dell serial number of the volume
Dell Index	Object index for the volume
Size	Size of the volume
Disk Folder	Storage Center disk folder location
Folder	Folder location of the volume
Storage Type	Storage type of the volume
Status	Current status for the volume, as well as the controller on which the volume is active
SnapshotProfiles	Snapshot Profiles applied to the volume
Storage Profiles	Storage Profiles for the volume
Write Cache Enabled	Indicates whether write cache is enabled for the volume
Read Cache Enabled	Indicates whether read cache is enabled for the volume

Label	Description
Read Cache	Indicates whether Read Cache is enabled or not (Yes or No)
Date Created	Date and time the volume was created
Created By	User that created the volume
Date Updated	Date the volume was last updated
Updated By	User that last updated the volume
Notes	Descriptive notes for the volume

FluidFS General Tab Information

The following figure shows an example of information in the **General** tab for a FluidFS cluster.

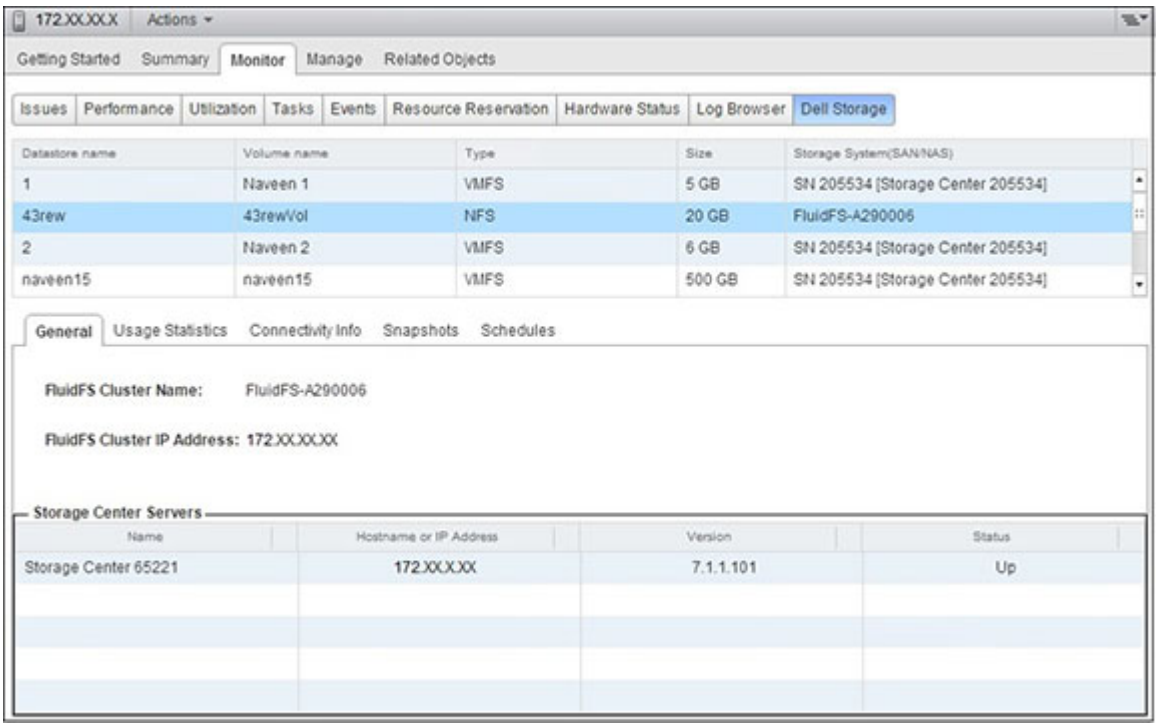


Figure 14. Information in the General Tab for a FluidFS Cluster

The following table describes the information in the **General** tab for a FluidFS cluster.

Table 5. Information From the General Tab for a FluidFS Cluster

Label	Description
FluidFS Cluster Name	Name of the cluster
FluidFS Cluters IP Address	IP address of the cluster
Storage Center Servers	Information about any connected Storage Centers

Usage Statistics Tab

The **Usage Statistics** tab displays usage information about the selected Dell volume.

Storage Center Statistics Information

The following figure shows an example of usage statistics for a Storage Center.

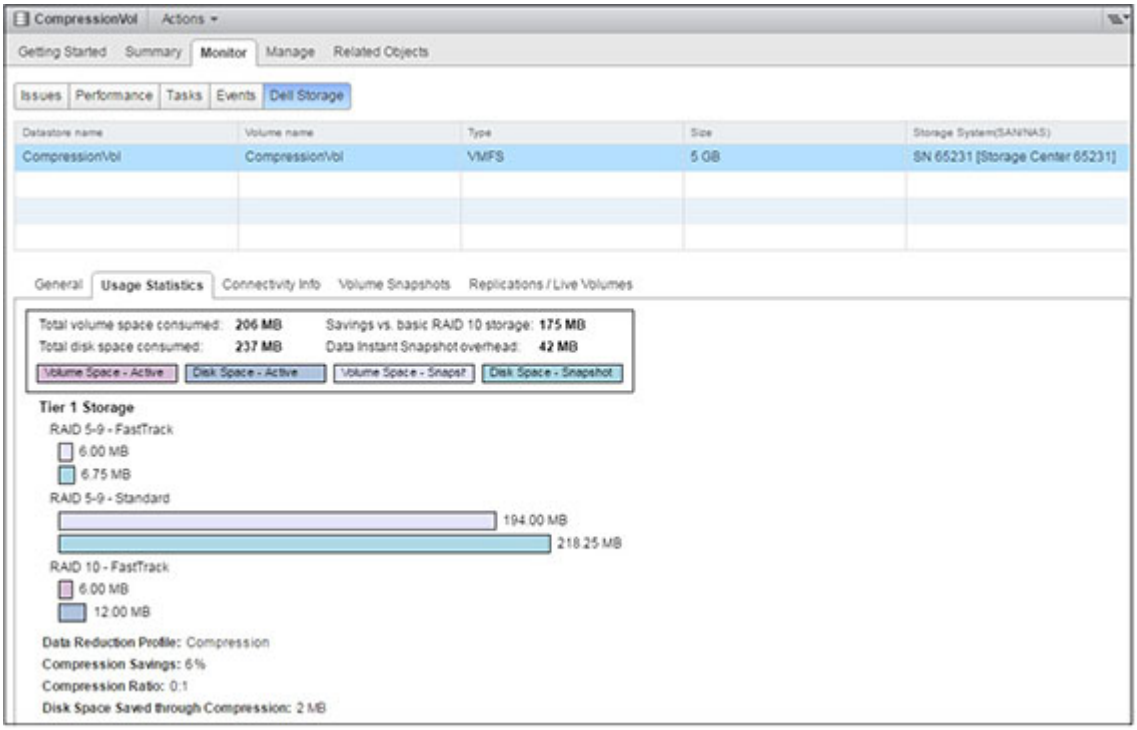


Figure 15. Storage Center Statistics Information

The following table describes the usage statistics for a Storage Center.

Table 6. Usage Statistics for a Storage Center

Label	Description
Total volume space consumed	Total space used on the volume
Savings vs. basic RAID 10 storage	Estimate of storage space saved using Dell Dynamic Block Architecture compared to basic RAID storage
Total disk space consumed	Total disk space consumed by the volume
Data Instant Snapshotoverhead	Total space consumed by volume snapshots
Tier 1 Storage	Active volume space, active disk space, and Snapshot space for the volume on tier 1
Tier 2 Storage	Active volume space, active disk space, and Snapshot space for the volume on tier 2
Tier 3 Storage	Active volume space, active disk space, and Snapshot space for the volume on tier 3
Data Reduction Profile	Indicates either Compress or None, depending on the Data Reduction option selected
Data Reduction Savings	Percentage of volume space saved by using Compression
Compression Ratio	Indicates the volume efficiency of using Compression

Label	Description
Disk Space Saved Through Compression	Amount of volume space saved by using Compression

FluidFS Statistics Information

The following figure shows an example of usage statistics for a FluidFS cluster.

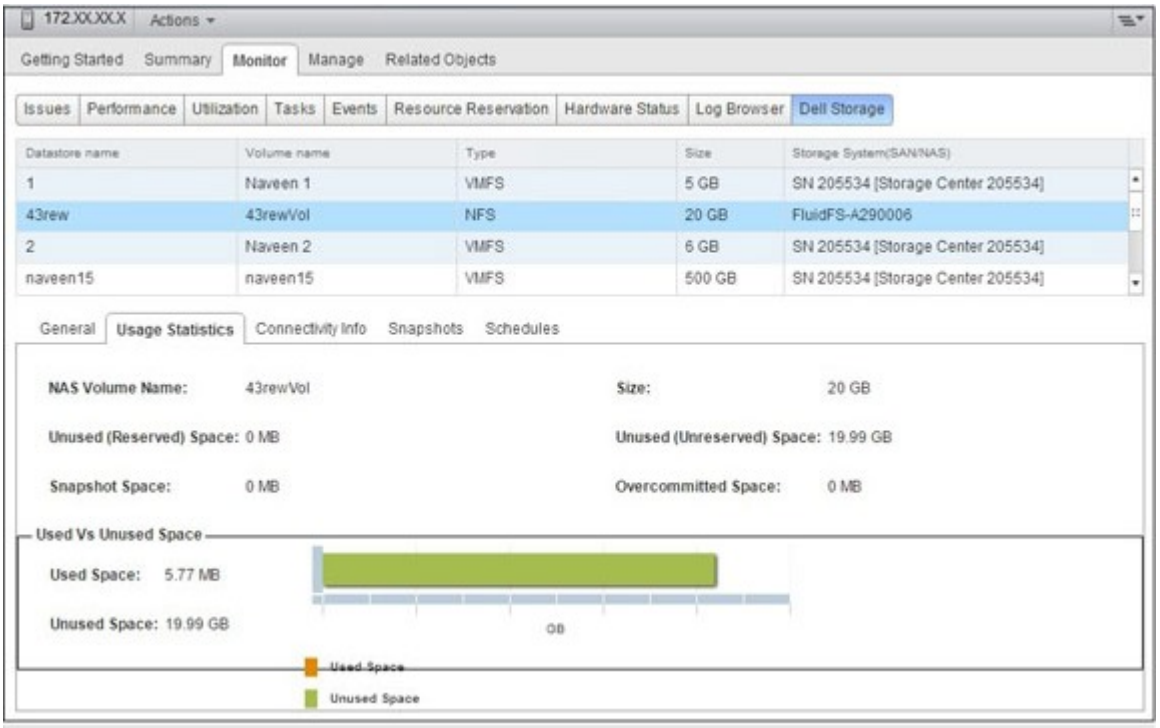


Figure 16. Usage Statistics for a FluidFS Cluster

The following table describes the FluidFS usage statistics information.

Table 7. Fluid FS Usage Statistics Information

Label	Description
NAS Volume Name	Name of the volume
Size	Size of the volume
Unused (Reserved) Space	A portion of a thin-provisioned NAS volume that is dedicated to the NAS volume (no other volumes can take the space). The amount of reserved space is specified by the storage administrator. Reserved space is used before unreserved space.
Unused (Unreserved) Space	Space allocated for the NAS pool that has not been used
Snapshot Space	Storage space occupied by snapshots of a NAS volume
Overcommited Space	A portion of a thin-provisioned NAS volume that is not available and not in use by the NAS volume. The amount of overcommitted space for a NAS volume is: (NAS volume size) – (NAS volume available space) – (NAS volume used space) With thin provisioning, storage space is consumed only when data is physically written to the NAS volume, not when the NAS volume is initially allocated. This

Label	Description
	provisioning means more storage space can be allocated to the NAS volumes than has been allocated in the NAS pool itself.
Volume Folder	Name of the NAS volume folder
Used Vs Unused Space	Bar charts showing comparison of used space and unused space

Connectivity Info Tab

The **Connectivity Info** tab displays connectivity information about the selected Dell volume.

The following figure shows the connectivity information for a Storage Center.

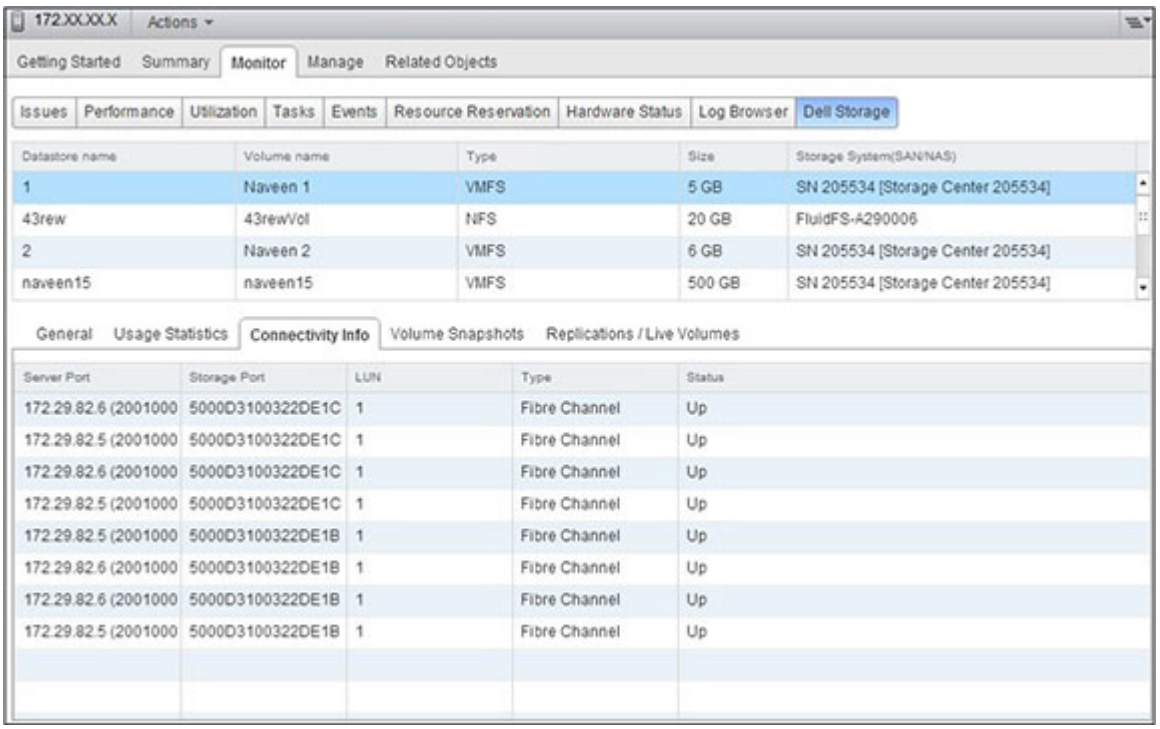


Figure 17. Connectivity Information for a Storage Center

The following table describes the information from the Connectivity tab.

Table 8. Information From the Connectivity Info Tab

Label	Description
Server Port	Server name and port
Storage Port	Storage port on the Storage Center
LUN	Mapping LUN
Type	Protocol (Fibre Channel or iSCSI)
Status	Status for the path

The following figure shows an example of connectivity information for a FluidFS cluster.

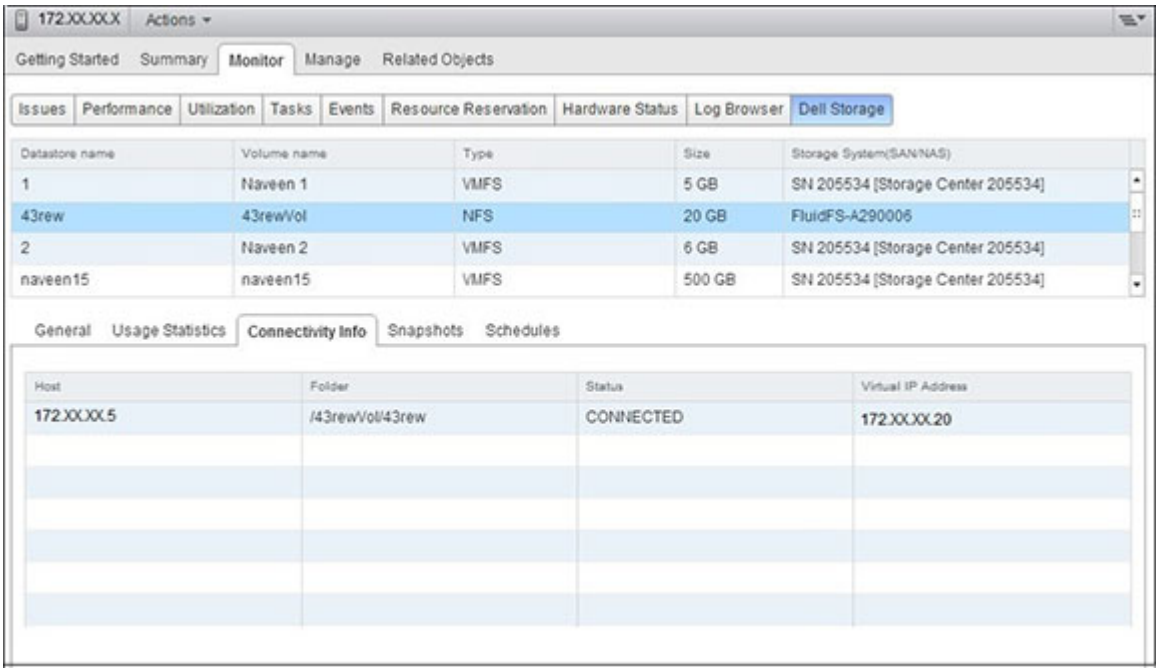


Figure 18. Connectivity Information for a FluidFS Cluster

The following table describes connectivity information for a FluidFS cluster.

Table 9. Connectivity Information for a FluidFS Cluster

Label	Description
Host	IP address of the host
Folder	Folder location of NFS datastores
Status	Status of host (connected, offline)
Virtual IP Address	IP address of virtual IP

Volume Snapshots Tab

The **Volume Snapshots** tab displays information about the snapshots for the selected Dell volume.

The following figure shows an example of information on the Volume Snapshots tab.

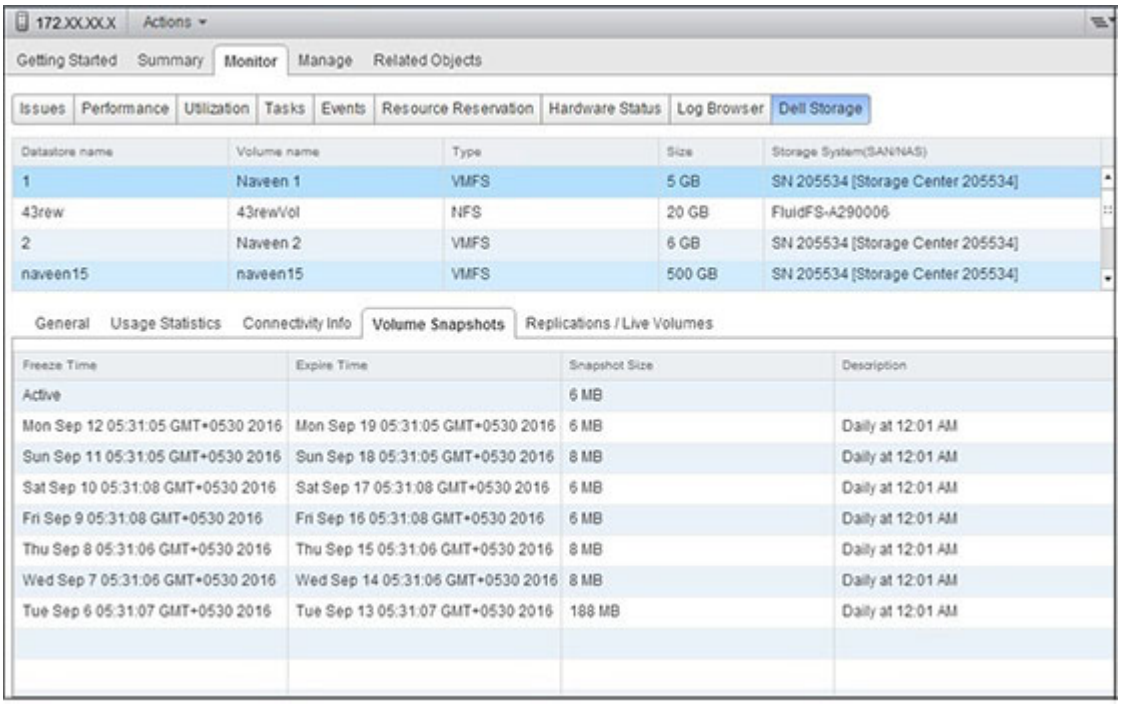


Figure 19. Volume Snapshots Tab

The following table describes the information in the Volume Snapshots tab.

Table 10. Information From the Volume Snapshots Tab

Label	Description
Freeze Time	Time at which the snapshot was taken
Expire Time	Time at which the snapshot automatically expires
Replay Size	Total space consumed by the snapshot
Description	Name of the Snapshot Profile that automatically created the snapshot for a description of the snapshot

Replications/Live Volume Tab

The **Replications/Live Volume** tab displays information about the replications for the selected Dell volume.

The following figure shows an example of information in the Replications/Live Volume tab.

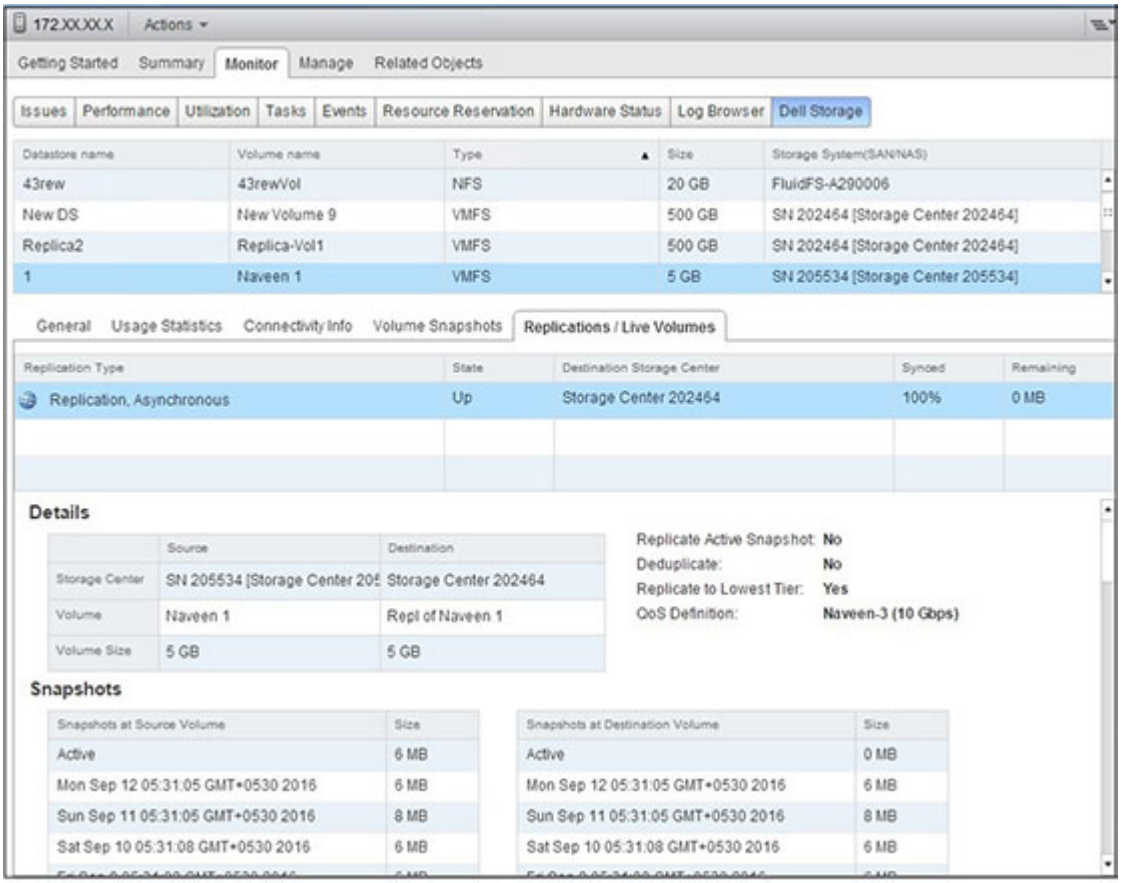


Figure 20. Replications/Live Volume Tab

The following table describes the information in the Replications/Live Volume tab.

Table 11. Information on the Replications/Live Volume Tab

Label	Description
Replication Type	Type of replication
State	Current state of the replication
Destination Storage Center	Destination (target) Storage Center for the replication
Synced	Percentage of data currently in sync
Remaining	Amount of data that is not yet synced
For each replication:	
Source Storage Center	Source Storage Center for the replication
Destination Storage Center	Destination (target) Storage Center for the replication
Source Volume	Name of the volume on the source Storage Center
Destination Volume	Name of the volume on the destination Storage Center
Source Volume Size	Capacity of the volume on the source Storage Center
Destination Volume Size	Capacity of the volume on the destination Storage Center
Replicate Active snapshot	Indicates whether the **Replicate Active Snapshot** option is enabled

Label	Description
Deduplicate	Indicates whether the **Deduplication** option is enabled
Replicate to Lowest Tier	Preference (Yes or No) for replicating to lowest tier
QoS Definition	Name of the QoS definition for the replication

Viewing Dell Charts

Use Dell Charts to display Storage Center performance information for an ESXi host. The Dell Charts view is accessible from the **Performance** page on the **Monitor** tab of a host, cluster, datastore, datastore cluster, virtual machine, or datacenter.

The following figure shows KB/sec and IO/sec charts for a Storage Center.

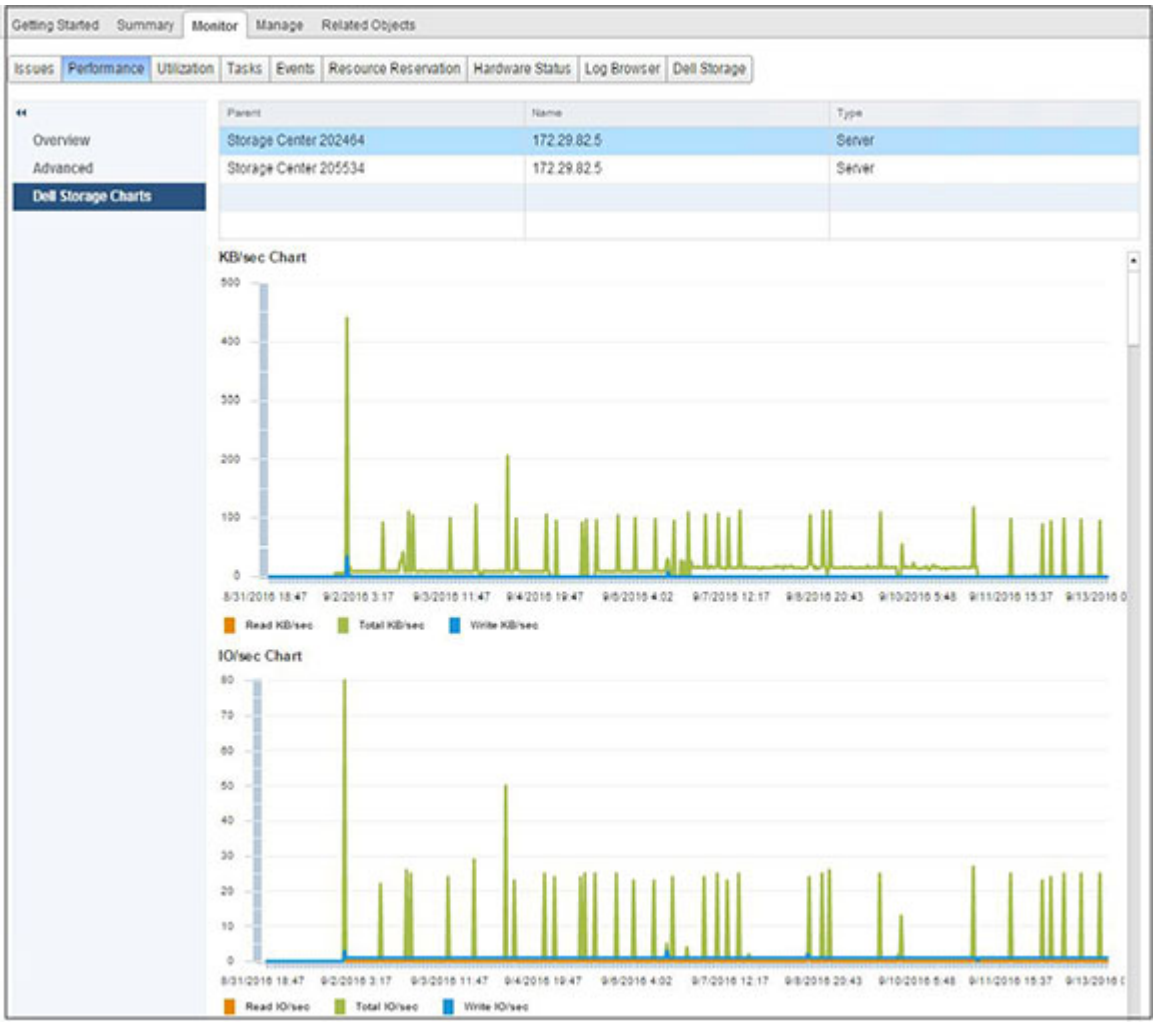


Figure 21. Example of KB/sec Chart and IO/sec Chart for a Storage Center

The following figure shows an example of a latency chart for a Storage Center.

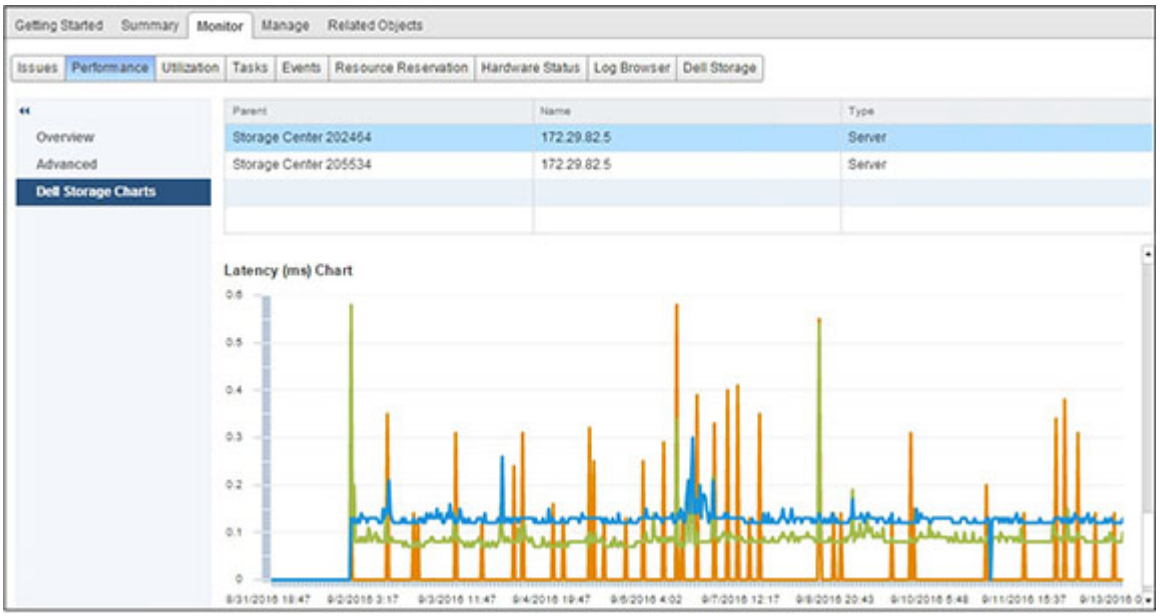


Figure 22. Example of Latency Chart for a Storage Center

For each Storage Center connected to the ESXi host, the header includes information described in the following table.

Table 12. Header Information for a Storage Center

Label	Description
Parent	Name of the Storage Center
Name	Name of the VMware object
Type	Type of object

Charts

The following table describes the type of Storage Center performance data displayed in charts.

Table 13. Charts Displaying Storage Center Performance Information

Label	Description
KB/sec Chart	**Read KB/sec** – Transfer rate of read operations in kilobytes per second **Total KB/sec** – Combined transfer rate of read and write operations in kilobytes per second **Write KB/sec** – Transfer rate of write operations in kilobytes per second
IO/sec Chart	**Read IO/sec** – Transfer rate of read operations in I/O operations per second **Total IO/sec** – Combined transfer rate of read and write operations in I/O operations per second **Write IO/sec** – Transfer rate of write operations in I/O operations per second
IO Size Chart	**Average IO Size** – Average size of I/O operations in kilobytes
Latency (ms) Chart	**Read Latency** – Latency of read operations in milliseconds **Write Latency** – Latency of write operations in milliseconds **Transfer Latency** – Latency of data transfer operations in milliseconds

6

Wizard Page Reference

The following sections describe the wizard pages of the Dell Storage vSphere Web Client Plugin.

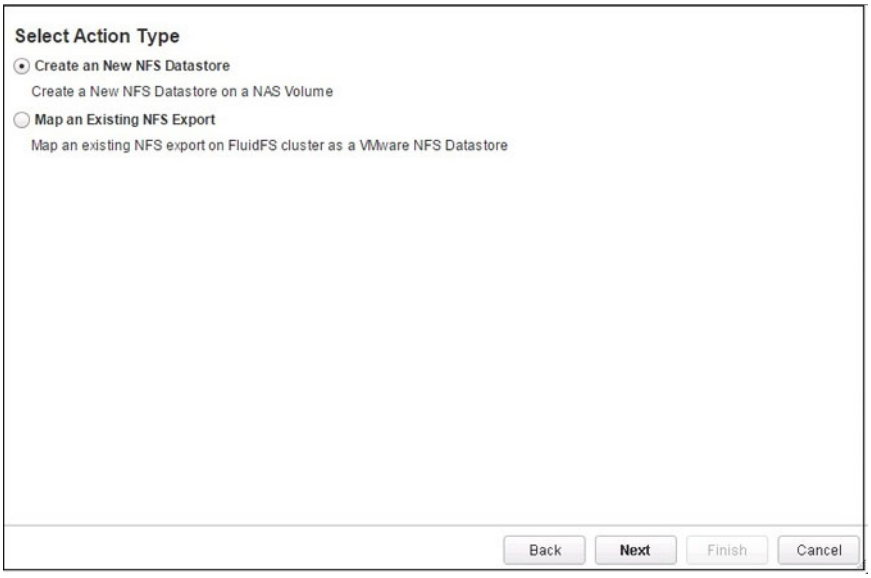
Add Storage (Storage Center)

Use the **Add Storage** page to select how you want to add storage.

- **Create New Dell Volume**—Select this option to create a new Dell volume to map.
- **Map Existing Dell Volume**—Select this option to select an existing Dell volume to map.

Add Storage (NFS)

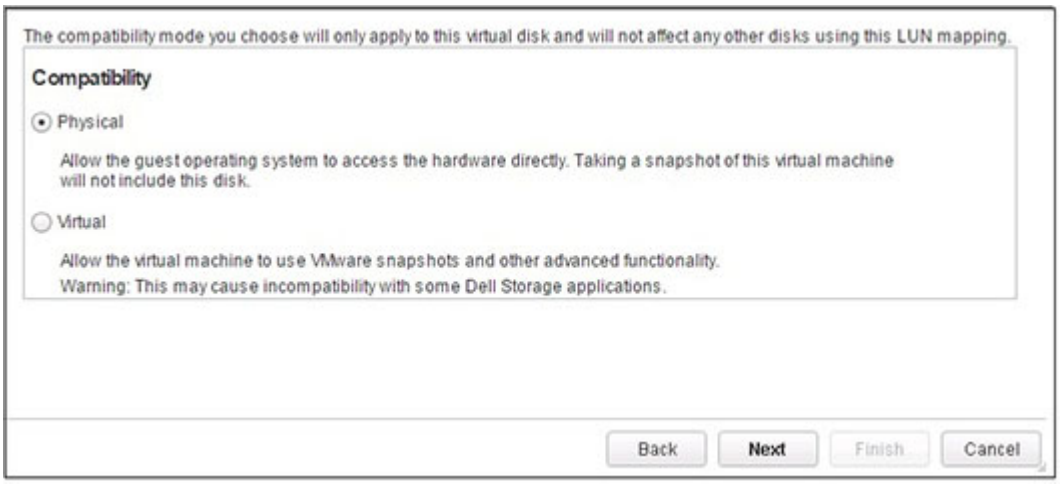
Use the **Add Storage** page to select how you want to add storage for an NFS datastore.



- **Create New NFS Datastore**—Select this option to create a new NFS datastore to map.
- **Map an Existing NFS Export**—Select this option to select an existing NFS datastore to map.

Compatibility Mode

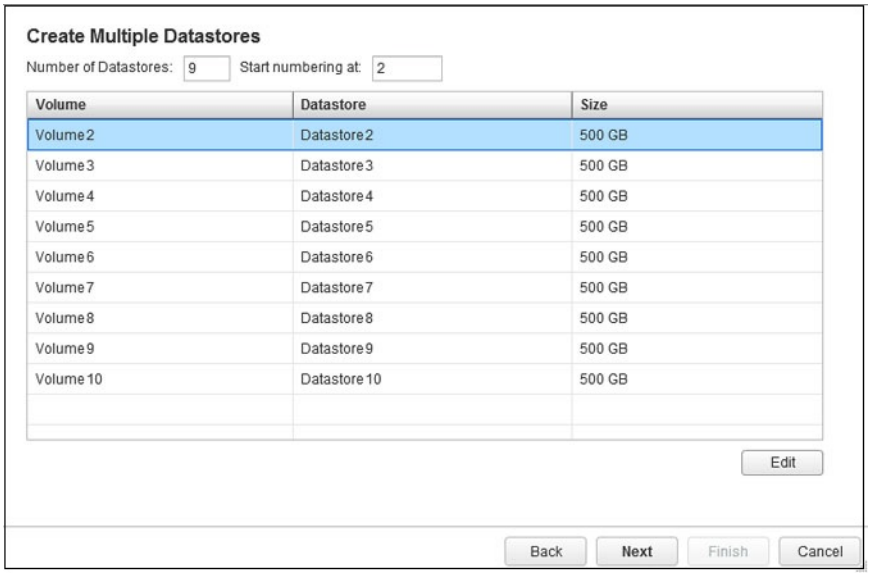
Use the **Compatibility Mode** page to select the access mode for the virtual disk.



- **Physical**—Select this option to allow the guest operating system direct access to the hardware. VMware snapshots of the virtual machine do not include this disk.
- **Virtual**—Select this option to provide the guest operating system virtual access to the disk. As such, the VMware snapshots and other advanced VMware features can be used. Note, however, that only providing virtual access might cause incompatibility issues with some Dell applications.

Create Multiple Datastores

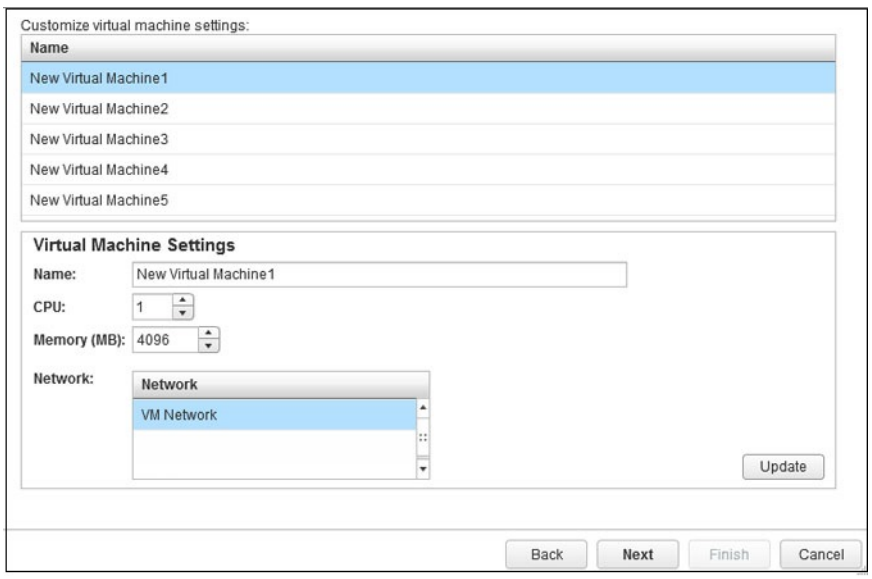
Use the **Create Multiple Datastores** page to specify the number and name of datastores to create.



- **Number of Datastores**—Type the number of datastores to create.
- **Start numbering at**—Type the number from which to start the numbering of volume names and datastore names.
- **Edit**—Select a datastore and click **Edit** to open the **Datastore Properties** dialog box, from which you can change the volume name, datastore name, and datastore size.

Customization

Use the **Customization** page to customize settings for the virtual machines.

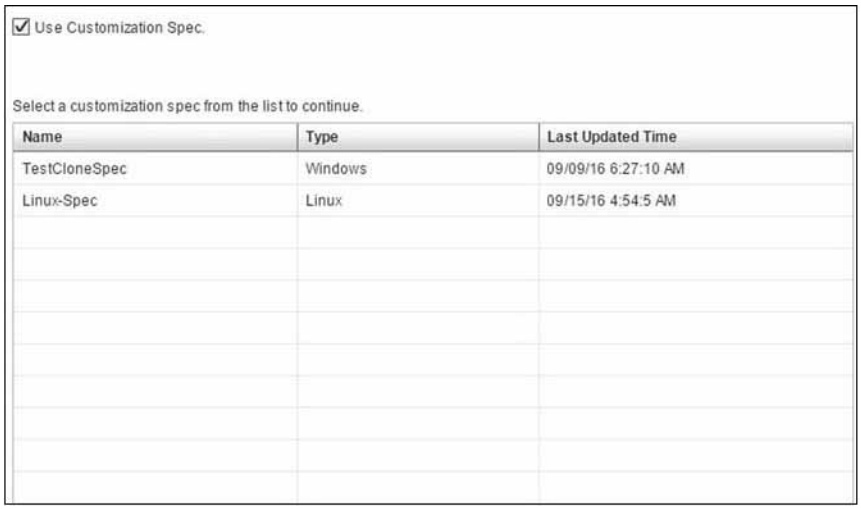


- **Customize virtual machine settings**—Select the virtual machine for which you want to specify custom settings.
- **Name**—Type a name for the virtual machine.
- **CPU**—Select the number of CPUs for the virtual machine.

- **Memory**—Select the memory capacity for the virtual machine.
- **Network**—Select the virtual networks to which to connect this virtual machine.

Customization For Clone Virtual Machine

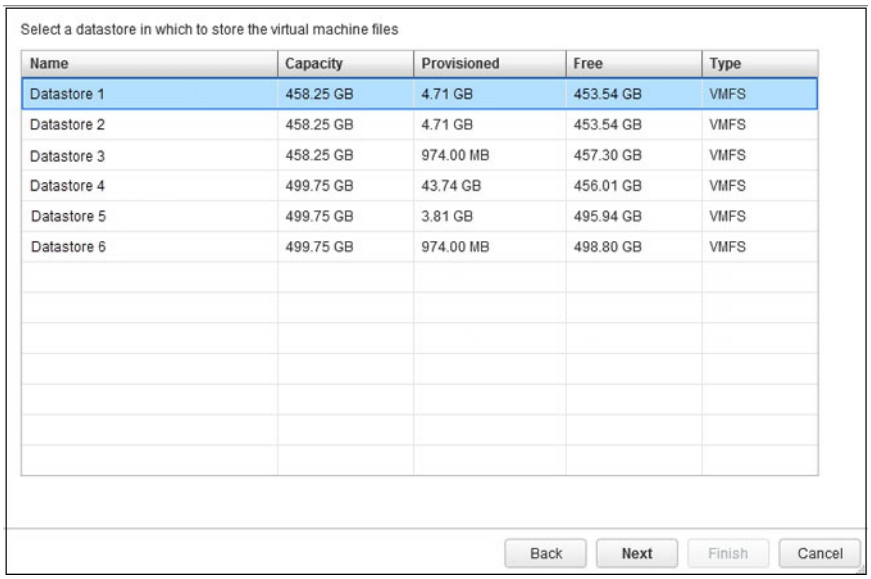
Use the **Customization** page to customize settings for cloning virtual machines.



- **Use Customization Spec**—Select this checkbox to choose from predefined customization specifications.

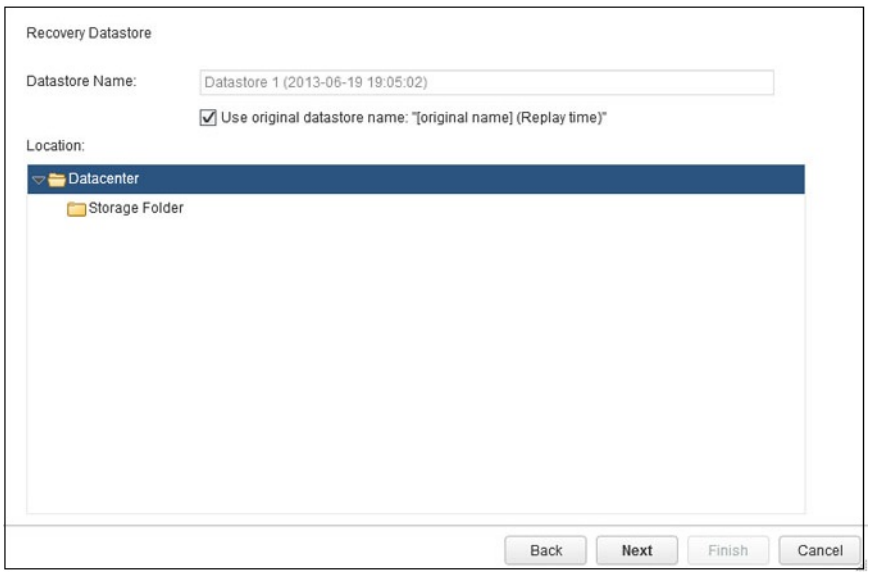
Datastore Lookup

Use the **Datastore Lookup** page to select the datastore in which to store the virtual machine files.



Datastore Name

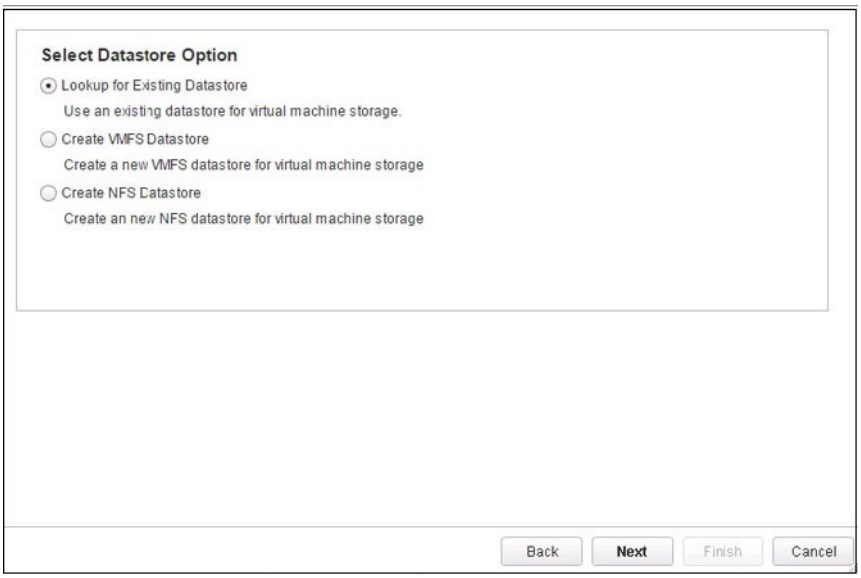
Use the **Datastore Name** page to specify the name and location for the recovered datastore.



- **Datastore Name**—Type a name for the recovered datastore.
- **Use original datastore name**—Select this checkbox to use the original datastore name and the snapshot time as the name of the recovered datastore.
- **Location**—Select the location for the recovered datastore.

Datastore Options

When provisioning a virtual machine, use the **Datastore Options** page to select a datastore to hold the virtual machine.

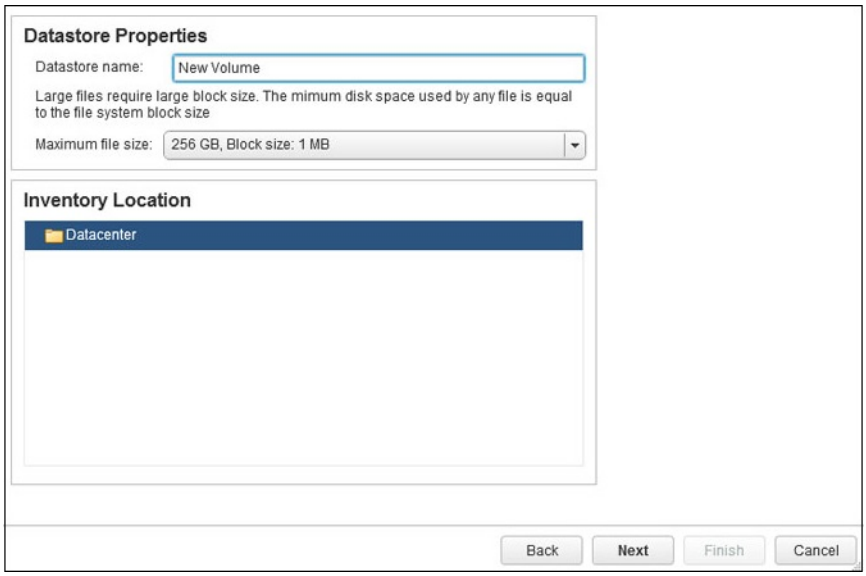


- **Lookup for Existing Datastore**—Select this option to use an existing datastore for the virtual machine.
- **Create VMFS Datastore**—Select this option to create a new datastore for the virtual machine. Creating a new datastore includes creating a new Dell volume and configuring a new datastore.

- **Create NFS Datastore**—Select this option to create a new NFS datastore for a virtual machine.

Datastore Properties

Use the **Datastore Properties** page to specify properties for the datastore.

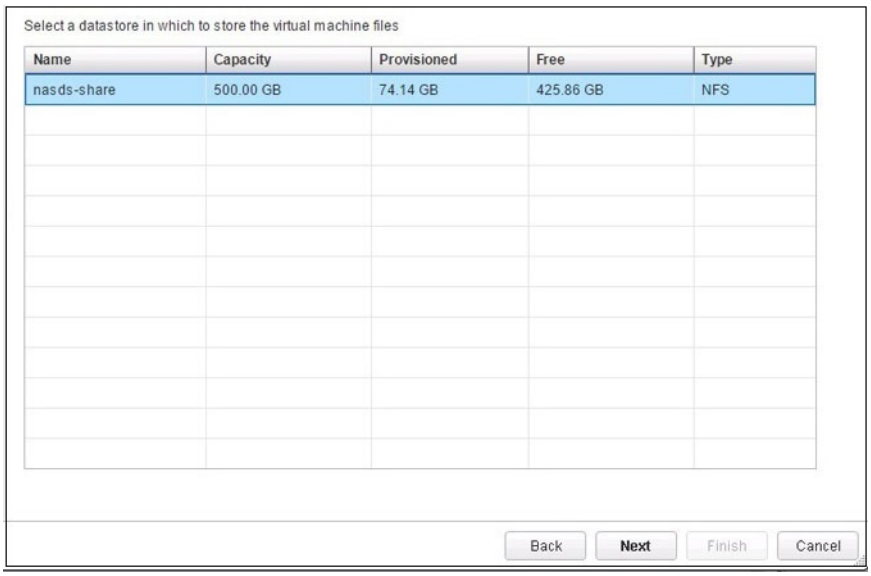


- **Datastore name**—Type a name for the datastore.
- **Maximum file size**—If the file system version is VMFS-3, select the file system block size option for the datastore. The block size affects the maximum file size the new datastore can support.

  NOTE: VMFS-5 uses a unified 1-MB file block size. Therefore, the Maximum file size option is not displayed if the file system version is VMFS-5.
- **Inventory Location**—Select the location for the datastore.

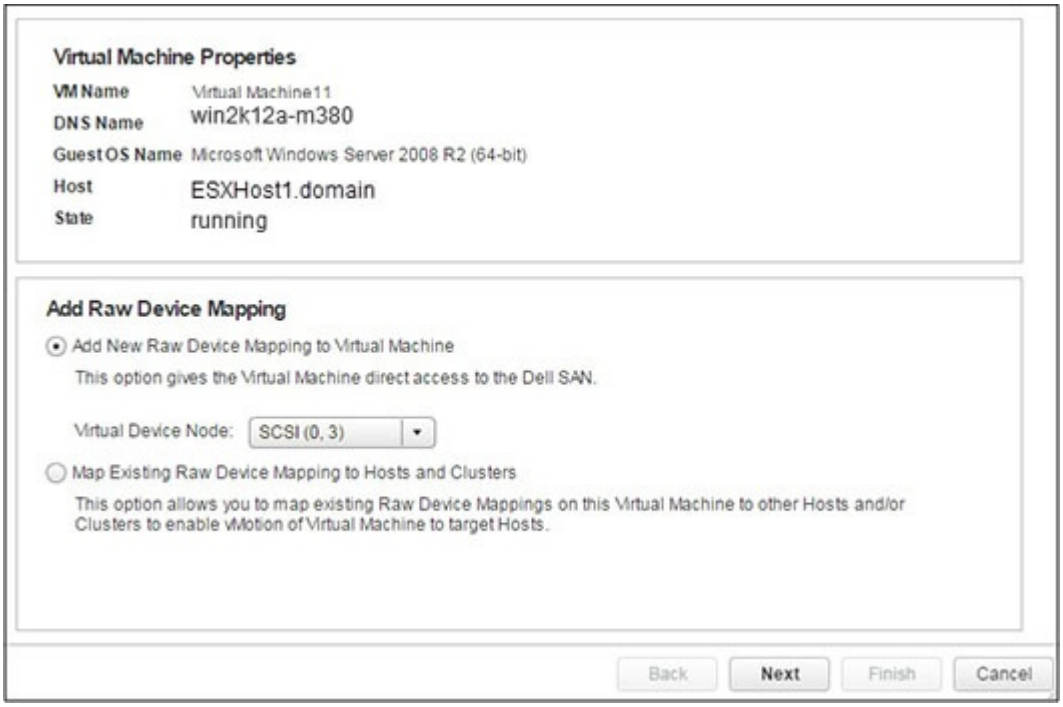
Datastore Selection for Clone Virtual Machine

When cloning a virtual machine, use the **Datastores** page to select a datastore to store the virtual machine files.



Device Configuration

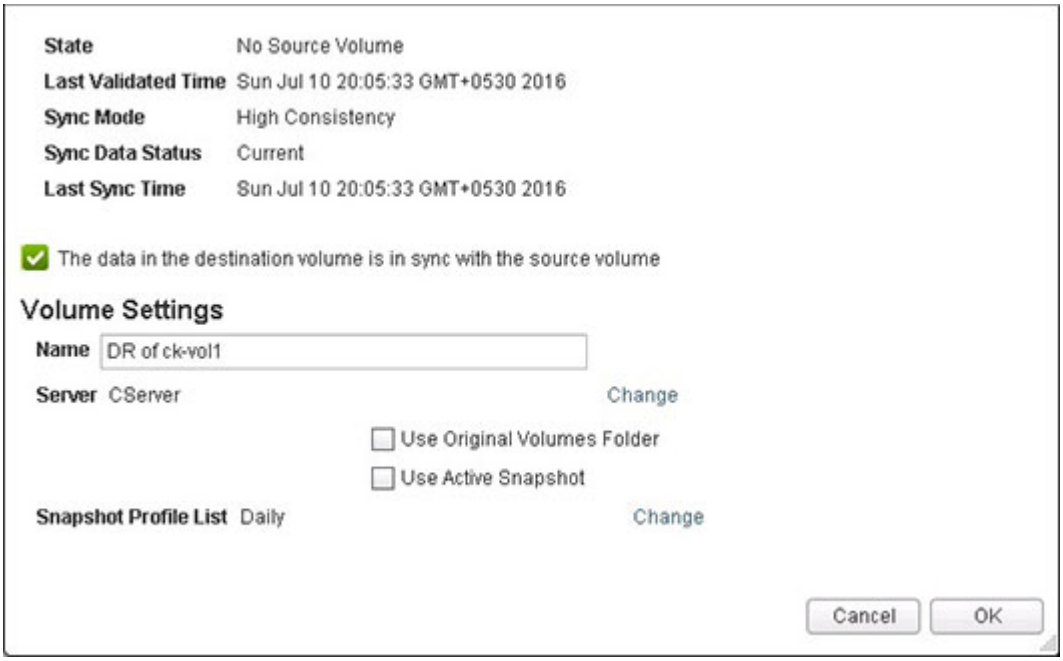
Use the **Device Configuration** page to select the option for adding a raw device.



- **Add New Raw Device Mapping to Virtual Machine**—Select this option to create a new volume to be mapped as an RDM to the virtual machine.
- **Virtual Device Node**—If the **Add New Raw Device Mapping to Virtual Machine** option is selected, select the node for the raw device mapping.
- **Map Existing Raw Device Mapping to Hosts and Clusters**—Select this option to map an existing raw device mapping on this virtual machine to other hosts and/or clusters.

Edit Activate Disaster Recovery Settings

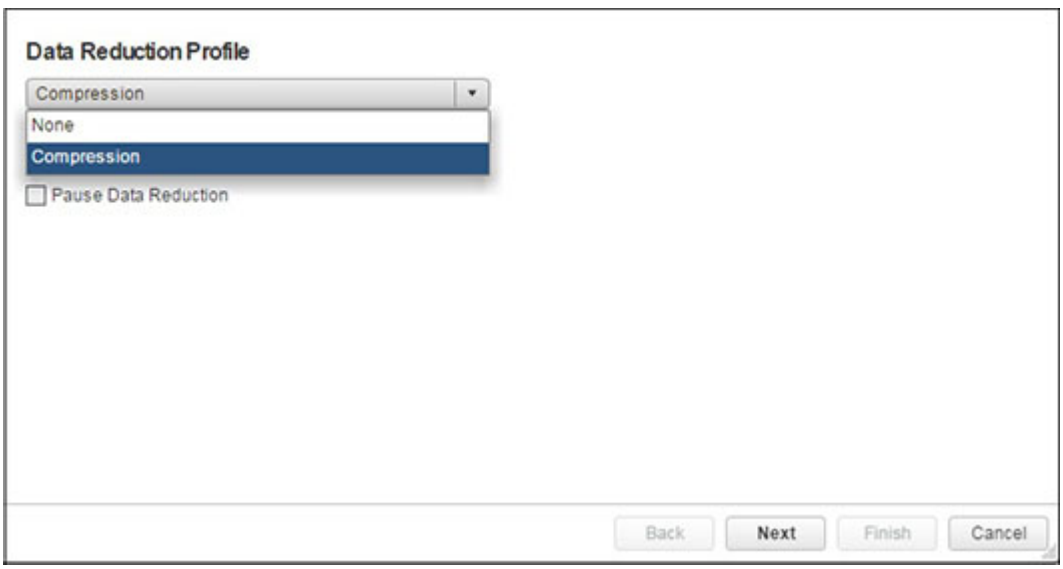
Use the **Edit Activate Disaster Recovery Settings** page to specify properties for the Disaster Recovery operations.



- **Server**—Allows you to change the server.
- **Use Original Volumes Folder**—Select this option to indicate that the original volume folder should be used for the Disaster Recovery operations.
- **Use Active Snapshot**—Select this option to indicate that active snapshots should be used in the Disaster Recovery operations.
- **Snapshot Profile List**—Opens a list of snapshot profile to be used.

Edit Volume

Use the **Edit Volume** page to modify settings for a datastore.

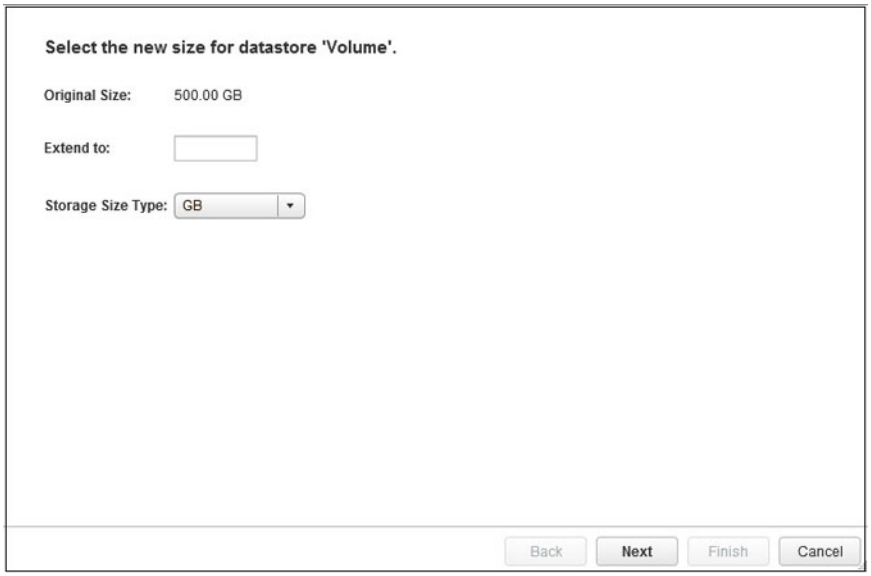


- **Compression**—Allows you to modify the data reduction Compression setting:
  - **None**—Do no use Compression
  - **Compression**—Use Compression
  - **Pause Data Reduction**—If selected, pauses compression

NOTE: The Compression option is enabled only if the Allow Compression option has been set on the Storage Center. Otherwise, the Compression option is not enabled, and cannot be selected. For information about managing the Allow Compression option, see the *Dell Storage Manager Administrator's Guide*.

Extend RDM Size

Use the **Expansion Size** page to specify a new, expanded size for an RDM of an existing volume.

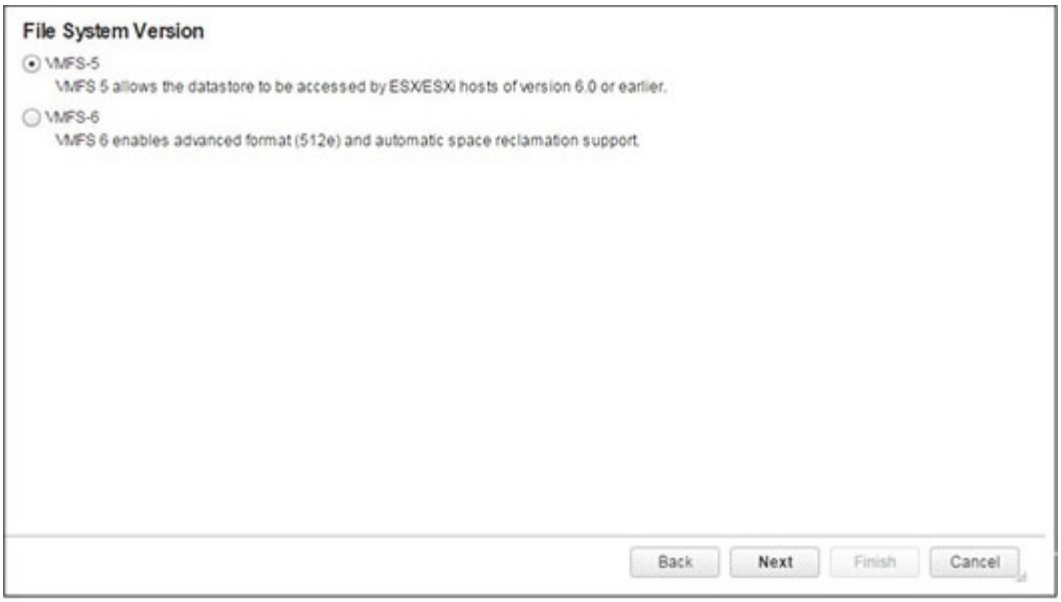


- **Original Size**—Displays the current size of the volume.
- **Extend to**—Type a new, resized value for the volume.
- **Storage Size Type**—Select a unit of measure—GB or TB.

File System Version

Use the **File System Version** page to specify the version of the VMFS for the datastore.

If the host is running ESXi 6.5, the following options are available:



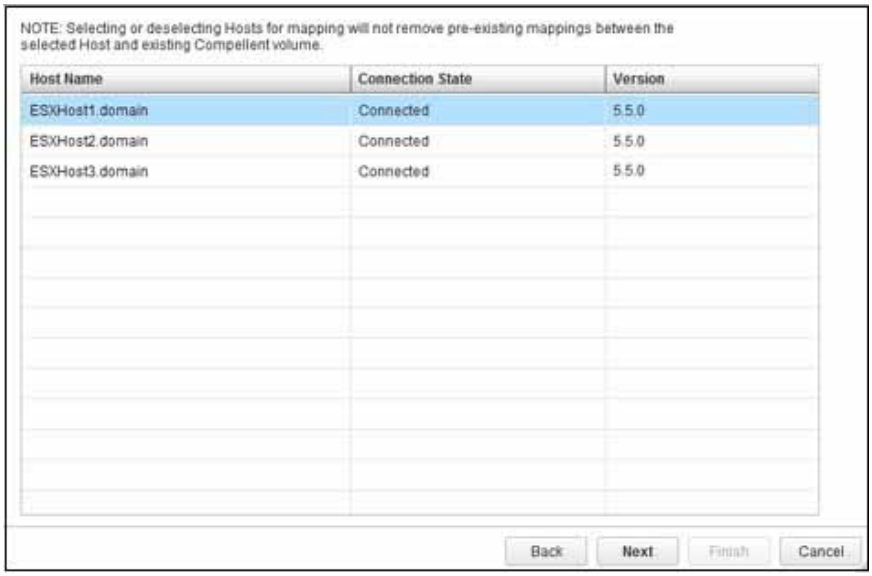
- **VMFS-5**—Select this option if the datastore will be accessed by hosts running ESXi version 6.0 or earlier.
- **VMFS-6**—Select this option to enable advanced format and automatic space reclamation.

If the host is running ESXi 5.5, the following options are available.

- **VMFS-5**—Select this option to enable additional capabilities, such as support for a datastore that is larger than 2 TB.
- **VMFS-3**—Select this option if the datastore is accessed by legacy (pre-5.0) ESX hosts.

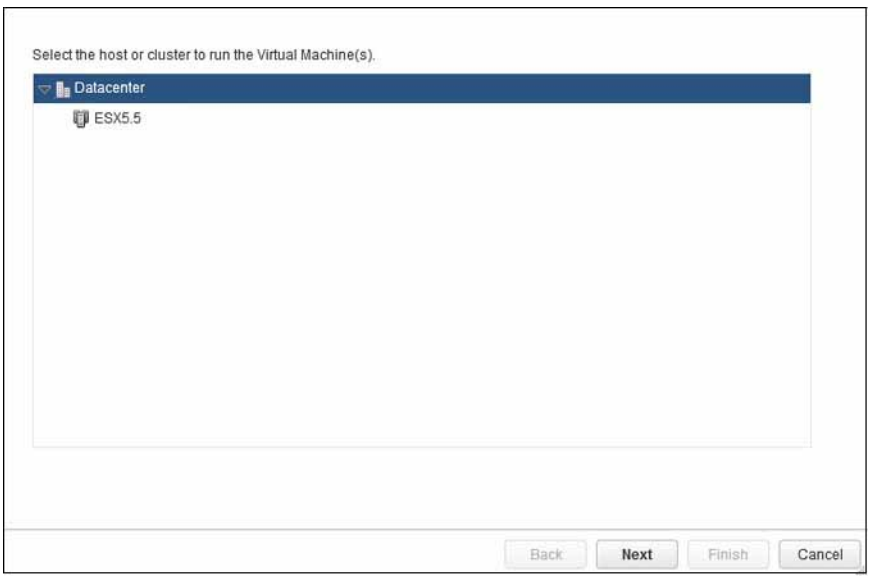
Host Selection

Use the **Host Selection** page to select one or more hosts to which to map the raw storage.



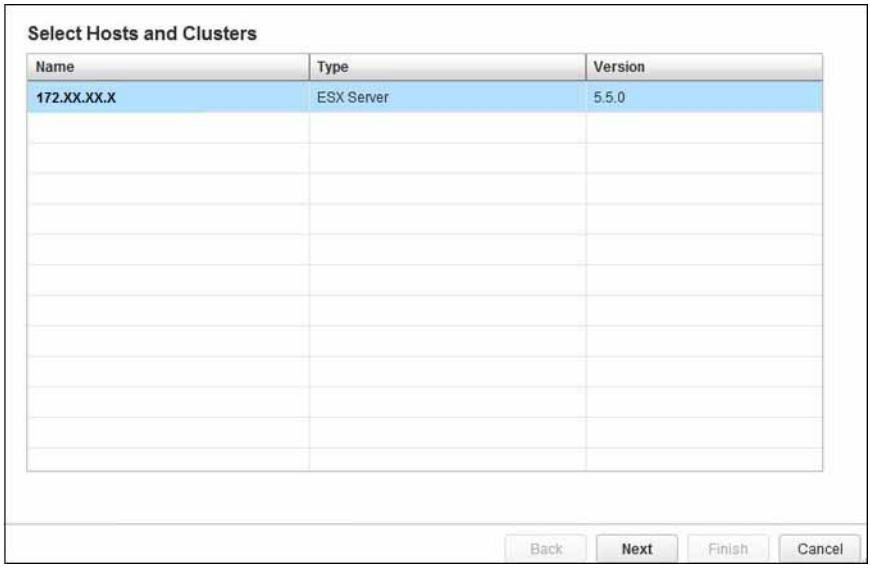
Host/Cluster

Use the **Host/Cluster** page to select a host or cluster on which to run the virtual machine.



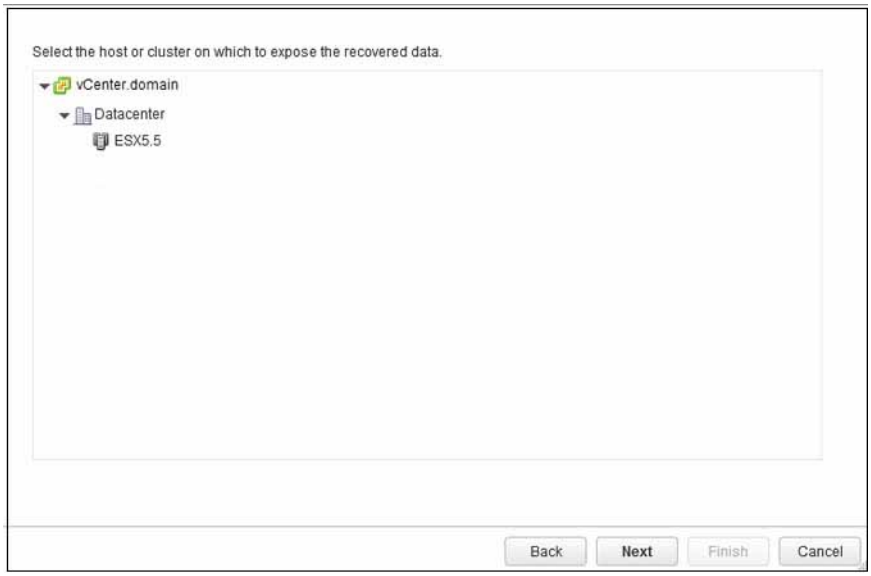
Hosts and Clusters

Use the **Hosts and Clusters** page to select one or more hosts or clusters to which to add the datastore.



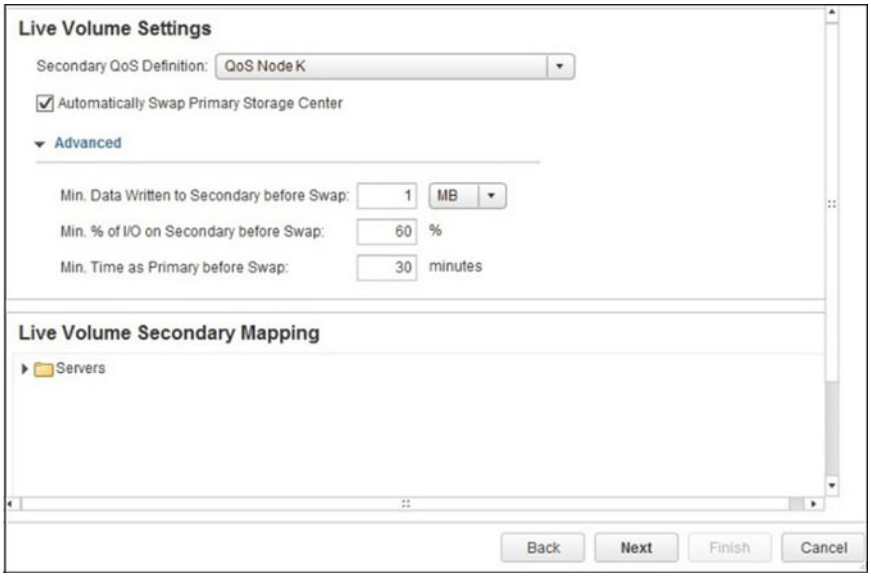
Host Selection for Snapshot Recovery

Use the **Host Selection** page to select the host or cluster on which to expose the recovered data.



Live Volumes

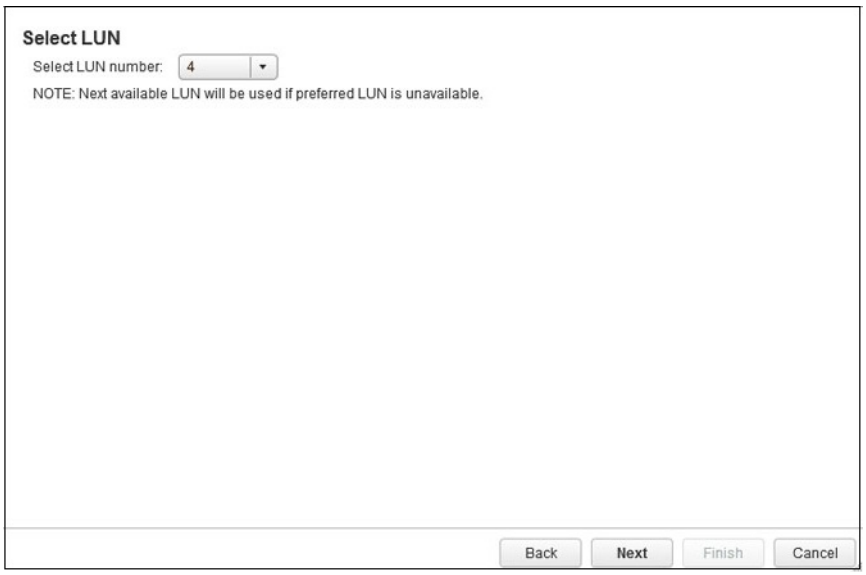
Use the **Live Volumes** page to specify the values for Live Volume replication.



- **Secondary QoS Definition**—Select a secondary Quality of Service (QoS) definition for the Live Volume. For information about creating or modifying QoS definitions, see the *Dell Storage Manager Administrator's Guide*.
- **Automatically Swap Primary Storage Center**—Select this checkbox to set the values for automatic swapping, then click **Advanced**.
- **Min. Data Written to Secondary before Swap**—Specifies the minimum amount of data that must be written to the secondary volume before the roles can be swapped.
- **Min. % of I/O on Secondary before Swap**—Specifies the minimum percentage of I/O that must occur before the roles can be swapped.
- **Min. Time as Primary before Swap**—Specifies the number of minutes that must pass before the roles can be swapped.
- **Live Volume Secondary Mapping**—Select the location on the destination Storage Center for the Live Volume.

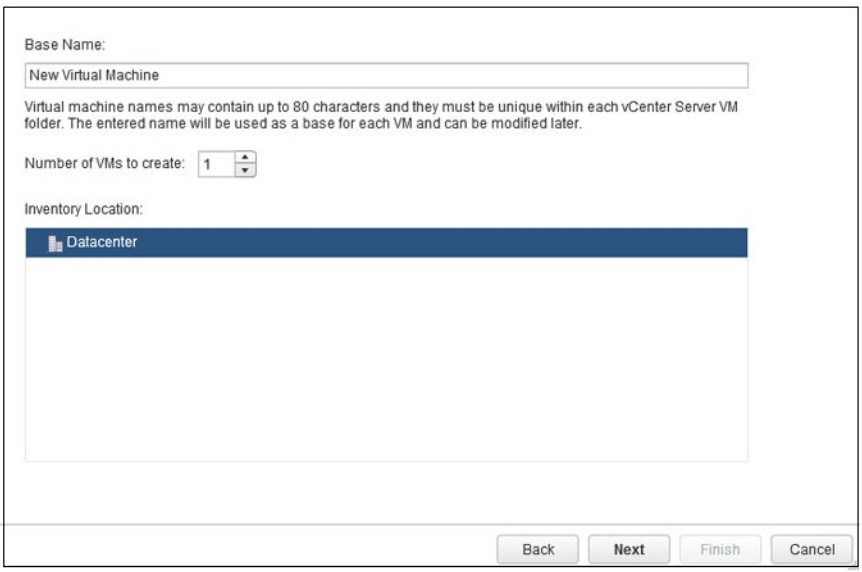
Mapping LUN

Use the **Mapping LUN** page to select the LUN to which to map the Dell volume. When creating multiple datastores, the assignment of LUNs starts at the specified LUN and increments using the available LUNs.



Name and Location

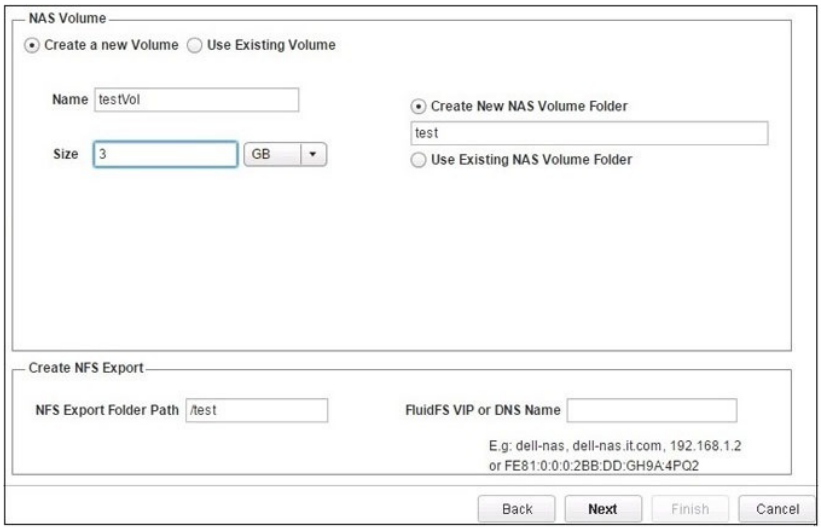
Use the **Name and Location** page to specify the name and location for the virtual machines.



- **Base Name**—Type a base name for the virtual machines to create.
- **Number of VMs to Create**—Specify the number of virtual machines to create.
- **Inventory Location**—Select the inventory location for the virtual machines.

NFS Export

Use the **NFS Export** page to specify properties for a NAS datastore.

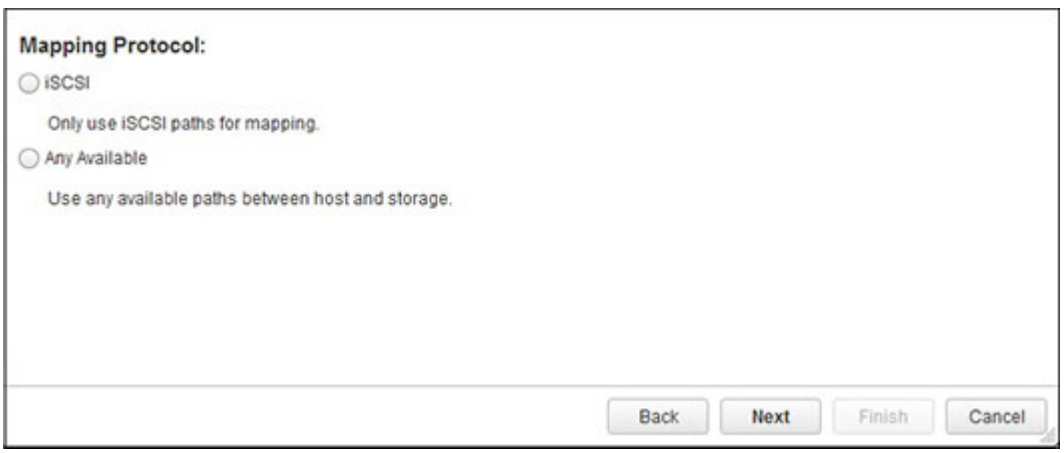


- **Create a New Volume**—Select this option to create a new NAS volume.
- **Use Existing Volume**—When you select this option, the existing NAS volumes are shown. Select a volume from the list.
- **Name**—NAS datastore name specified on the previous step of the datastore provisioning wizard.
- **Size**—Type a number and select the unit of measurement from the drop-down menu.
- **Create New NAS Volume Folder**—Type a name for the new volume folder. By default, this field is filled in with the datastore name specified in the previous step.
- **Use Existing NAS Volume Folder**—When you select this option, the existing NAS volume folders are shown. Select a folder from the list.
- **NFS Export Folder Path**—A default folder path is preselected based on the NFS datastore name. You can type a different folder path.
- **FluidFS VIP or DNS Name**—Type either the IP address or the DNS name of the host to be used for the FluidFS VIP.

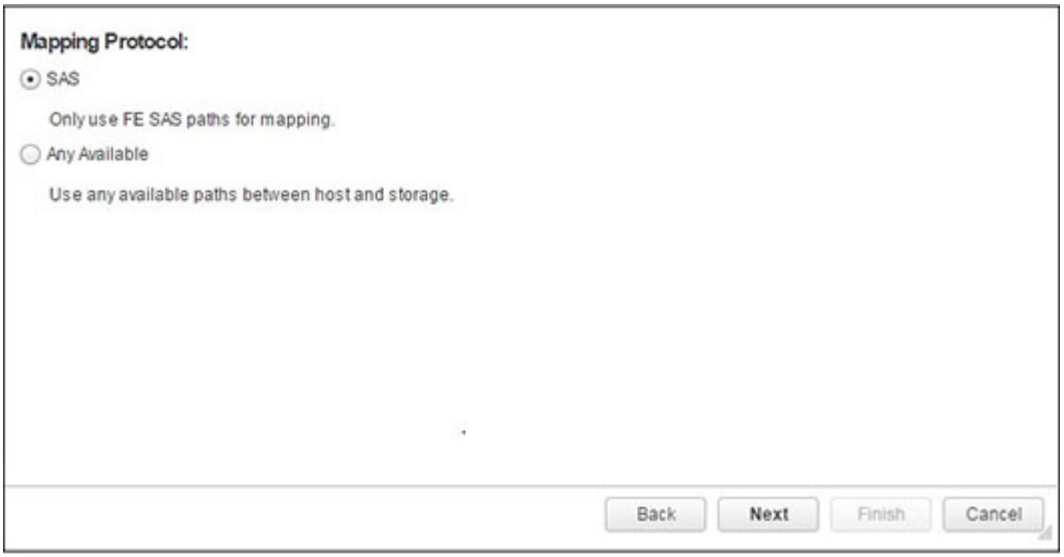
Protocol Selection

Use the **Protocol Selection** page to select the connection protocol for the Dell volume.

The following options are available if Front-End SAS is not supported on the Storage Center selected.



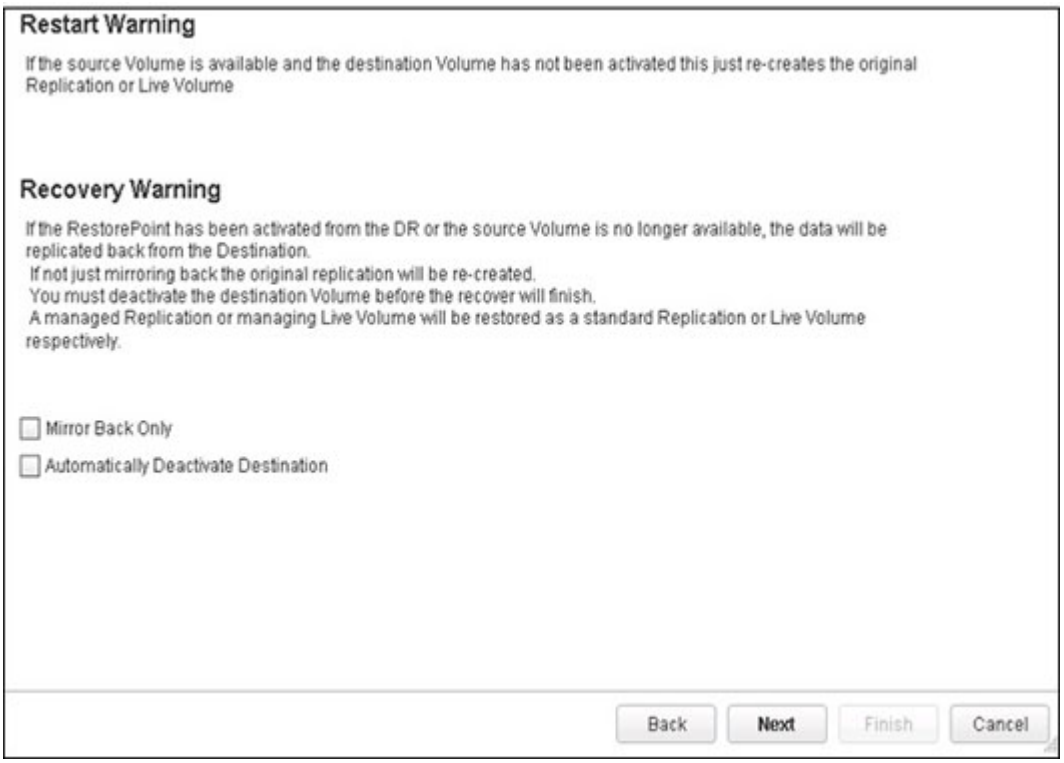
The following options are available if Front-End SAS is supported on the Storage Center selected.



- **SAS**—Select this option to use the Front-End SAS protocol.
- **iSCSI**—Select this option to restrict mapping to iSCSI paths only.
- **Any available**—Select this option to use any available path between the host and the storage.

Recover/Restart Disaster Recovery Warning

Use the **Recover/Restart Disaster Recovery Warning** page to select recovery options.

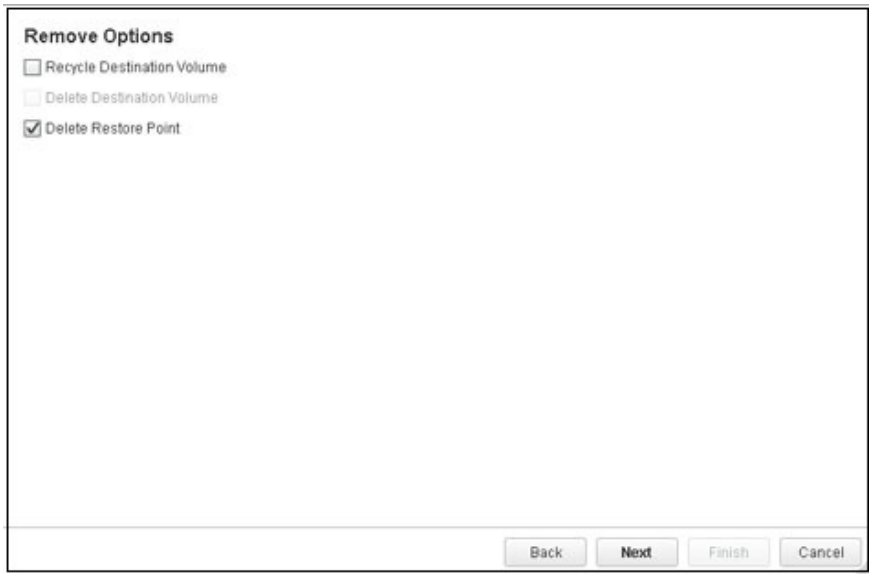


- **Mirror Back Only**—Skip the step of recreating the replication in the original direction and use the Disaster Recovery site as the source.

- **Automatically Deactivate Destination**—Automatically remove server mappings from the activated volume without requiring administrator intervention. If this option is selected, I/O to the activated volume should be halted before performing the restore.

Replication Delete Options

Use the **Delete Options** page to select options for removing a replication destination volume and restore point.

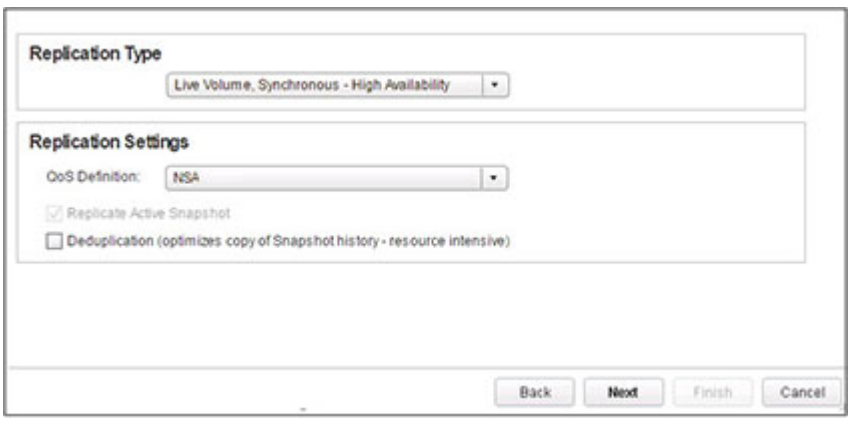


- **Recycle Destination Volume**—Select this checkbox if you want to move the destination volume to the Recycle Bin on the destination Storage Center.
- **Delete Destination Volume**—Select this checkbox if you do not want to retain the deleted destination volume in the Recycle Bin —not recommended.

  CAUTION: If you delete the destination volume, you cannot recover the volume on the destination (target) Storage Center. The volume is permanently deleted.
- **Delete Restore Point**—Select this checkbox if you want to delete the restore point for the replication.

Replication Modification Options

Use the **Modification Options** page to select options for replicating a datastore.



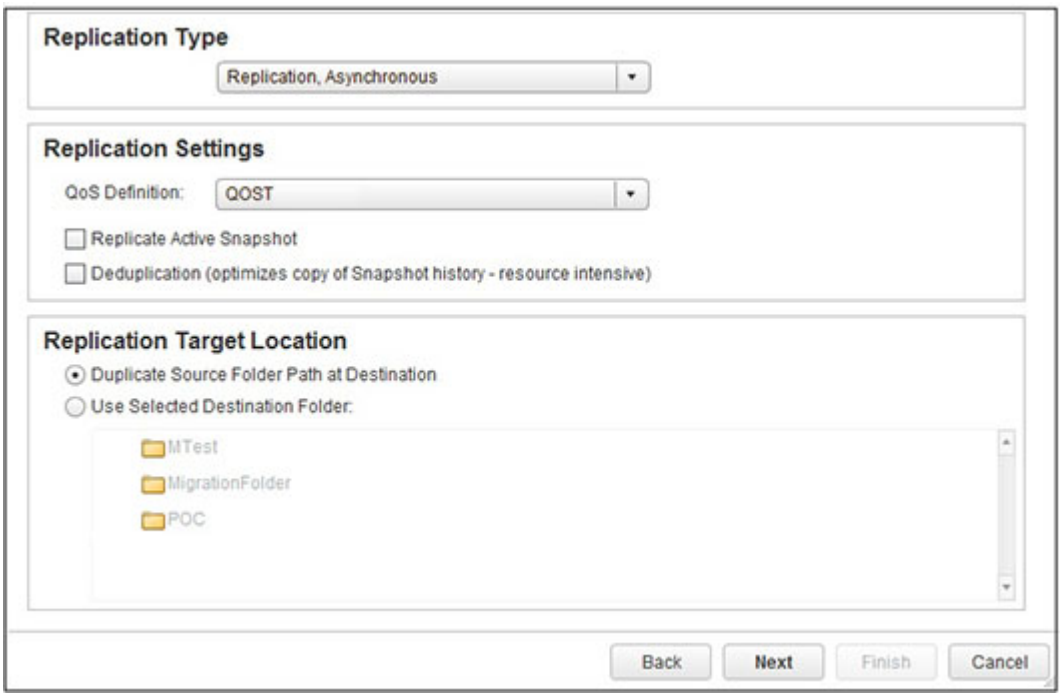
- **Replication Type**—Select the type of replication to be used:
  - Live Volume, Asynchronous
  - Live Volume, Synchronous — High Availability

- Live Volume, Synchronous — High Consistency

- **QoS Definition**—Select a Quality of Service (QoS) definition for the replication. For information about creating or modifying QoS definitions, see the *Dell Storage Manager Administrator's Guide*.
- **Deduplication**—Select this checkbox to copy only the changed portions of the Replay history on the source volume, rather than all data captured in each snapshot.

Replication Options

Use the **Replication Options** page to select options for replicating a datastore.



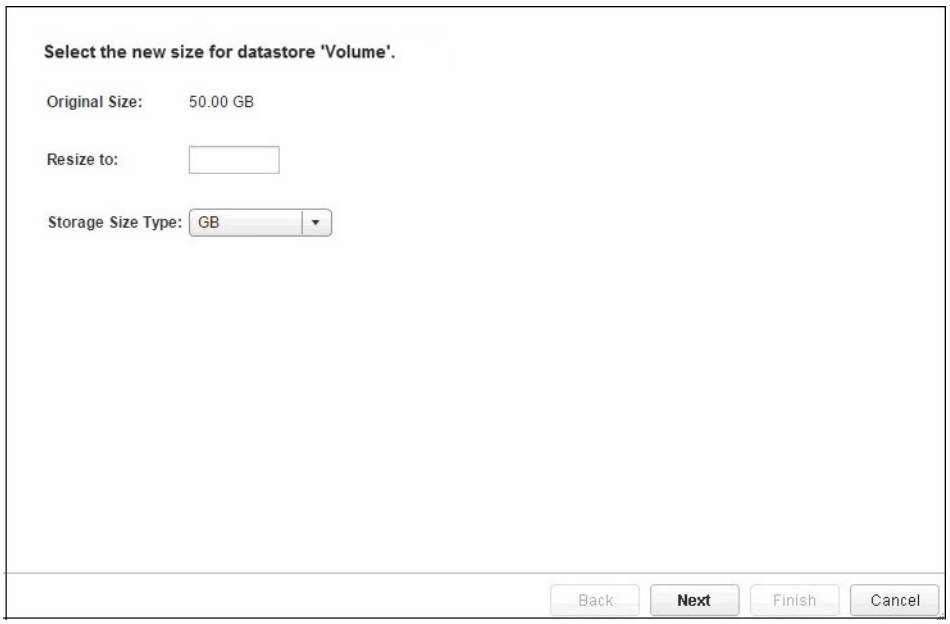
- **Replication Type** – Select one of the following types:
  - Replication, Asynchronous
  - Replication, Synchronous – High Availability
  - Replication, Synchronous – High Consistency
  - Live Volume, Asynchronous
  - Live Volume, Synchronous – High Availability
  - Live Volume, Synchronous – High Consistency

  For information about these replication types, see the *Dell Storage Manager Administrator's Guide*.
- **Replication Settings** – Select among the following fields:
  - **QoS Definition** – Select a Quality of Service (QoS) definition for the replication. For information about creating or modifying QoS definitions, see the *Dell Storage Manager Administrator's Guide*.
  - **Replicate Active Replay** – Select this checkbox to copy all writes from the active snapshot area of the volume. Note that replicating active snapshots can require significant bandwidth.
  - **Deduplication** – Select this checkbox to copy only the changed portions of the snapshot history on the source volume, rather than all data captured in each snapshot.
- **Replication Target Location** – Select the location on the destination Storage Center for the replicated volume:
  - **Disk Folder** – If your storage system contains multiple disk folders, select a Disk Folder from the drop-down menu, then select either:

- **Duplicate Source** – To duplicate the source folder
- **Use Selected** – To use the selected disk folder

Resize Datastore Storage

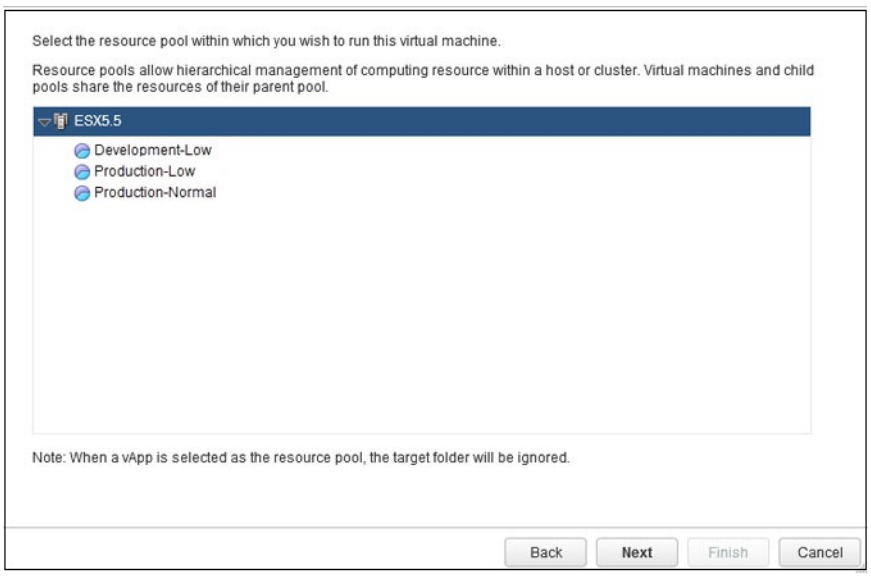
Use the **Resize Datastore Storage** page to specify a new, expanded size for an existing volume.



- **Original Size**—Displays the current size of the volume.
- **Resize to**—Type a new, resized value for the volume.
- **Storage Size Type**—Select a unit of measure—GB or TB.

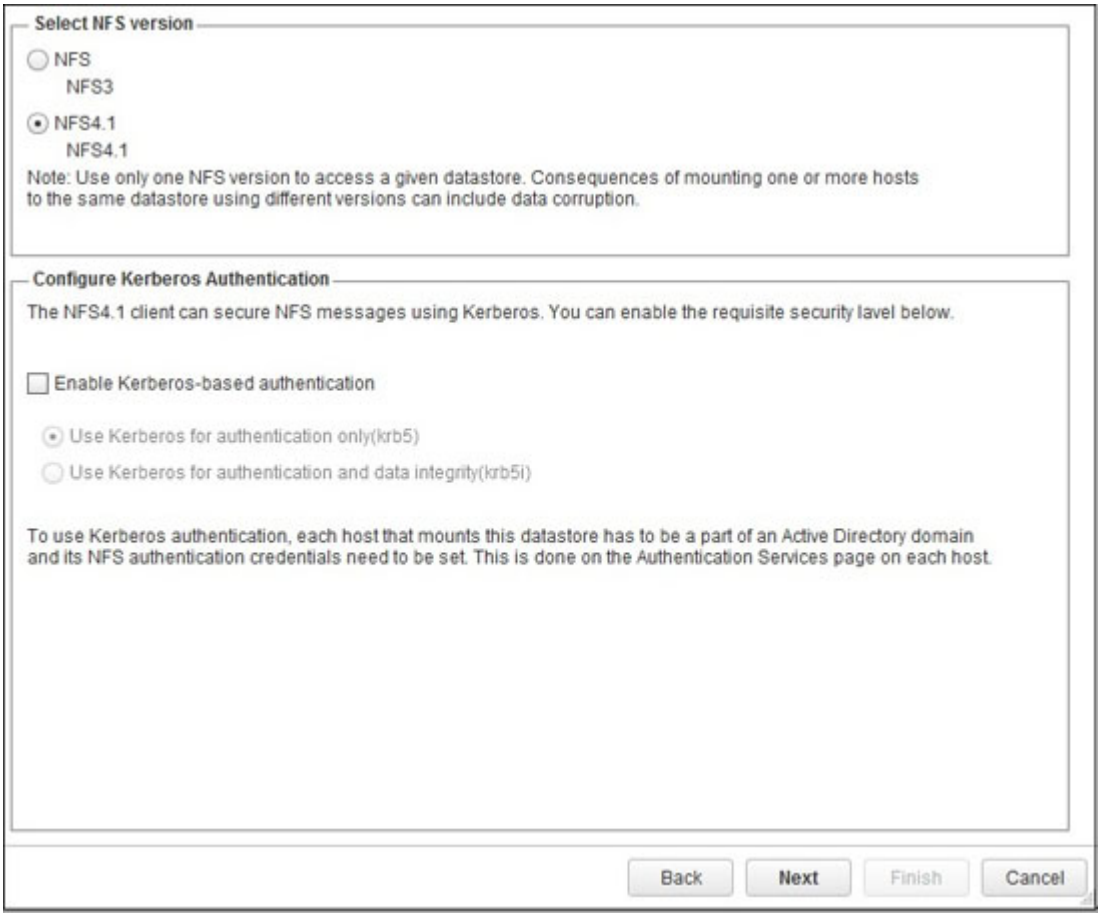
Resource Pool

Use the **Resource Pool** page to select a resource pool in which to run the virtual machine.



Select NFS Version

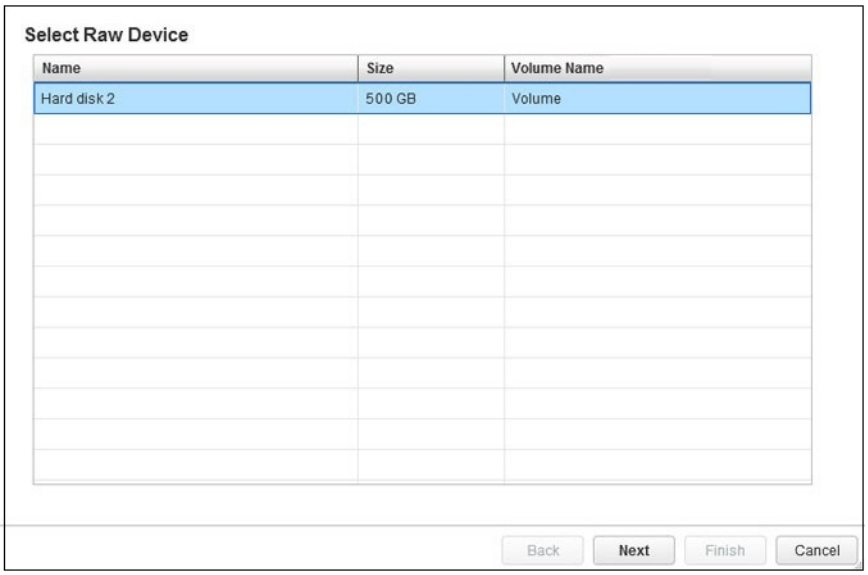
Use the **Select NFS Version** page to specify the NFS version to be applied when creating an NFS datastore.



- **NFS3**—Select this option if the datastore is accessed by older FluidFS appliances.
- **NFS4.1**—Select this option to enable additional capabilities provided in NFS 4.1.
- **Configure Kerberos Authentication**—If NFS 4.1 is selected, optionally enable Kerberos-based authentication when creating the NFS datastore.

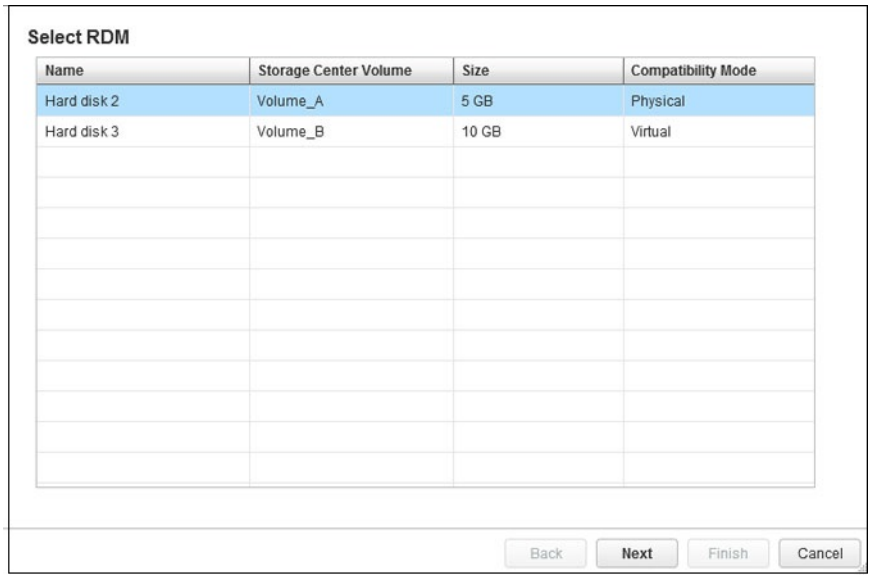
Select Raw Device

Use the **Select Raw Device** page to select the raw devices to replicate or remove.



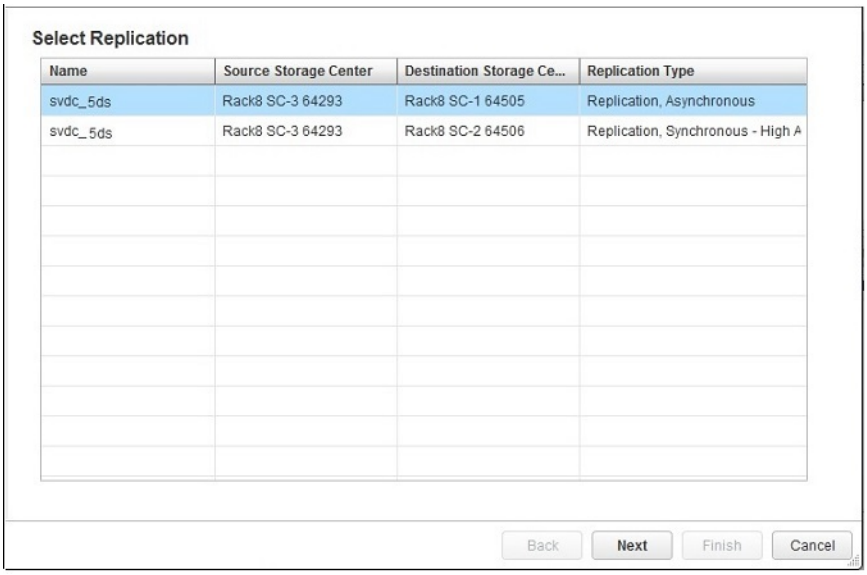
Select RDM

Use the **Select RDM** page to select the RDM to extend.



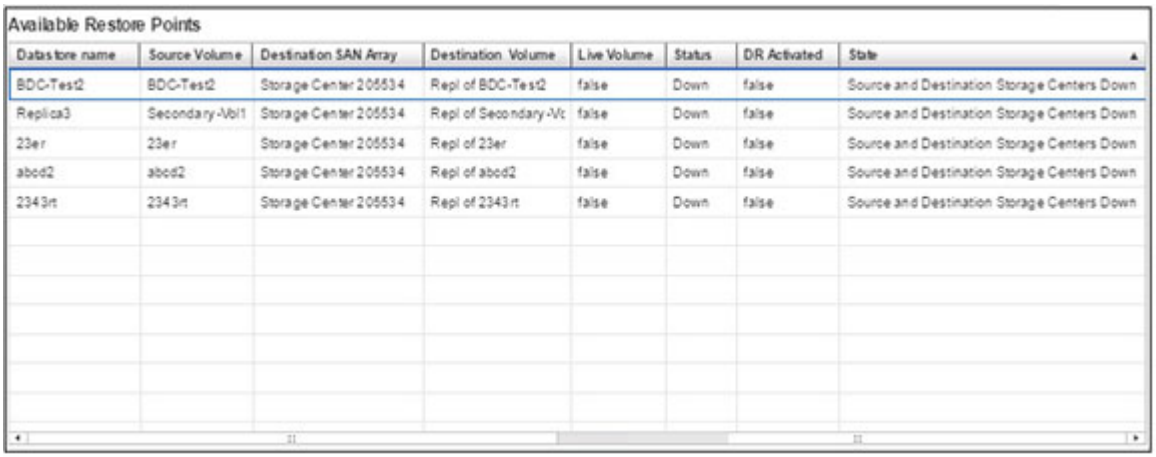
Select Replications

Use the **Select Replications** page to select one or more replications to modify or remove.



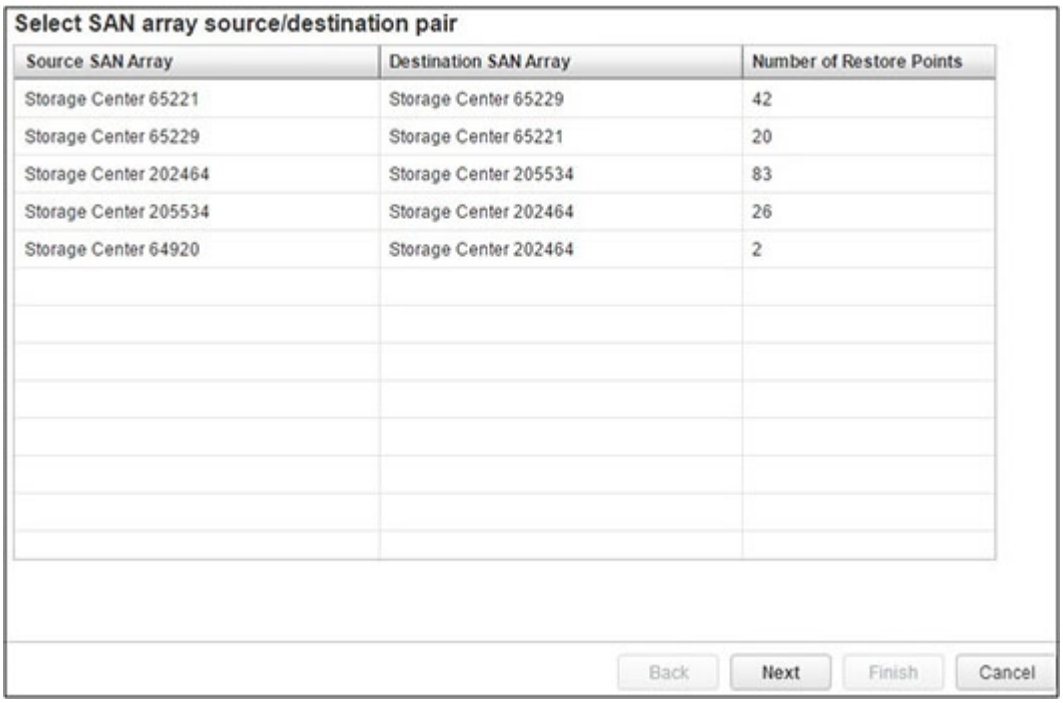
Select Restore Points

Use the **Select Restore Points** page to select the datastores identified as restore points for Disaster Recovery operations.



Select Source/Destination Pair

Use the **Select Source/Destination Pair** page to select the array pairs to be used in a Disaster Recovery operation.

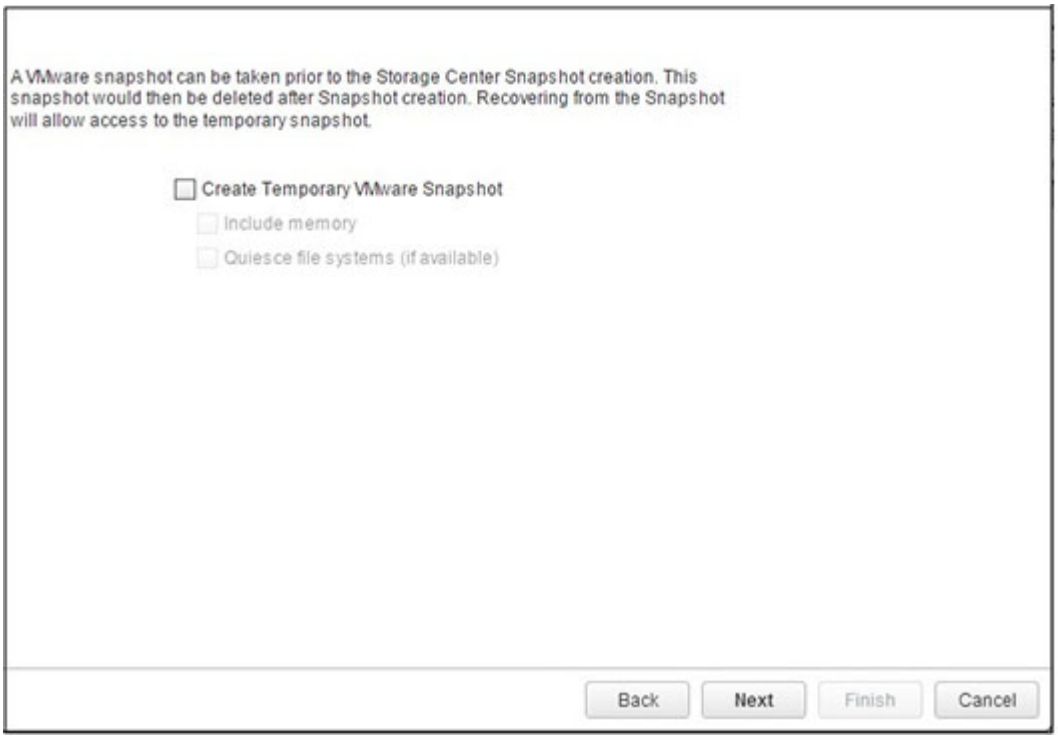


Select Volume

Use the **Select Volume** page to search for and select an existing Dell volume to map as storage. The selected volume must already be formatted as a VMFS datastore.

Snapshot Options

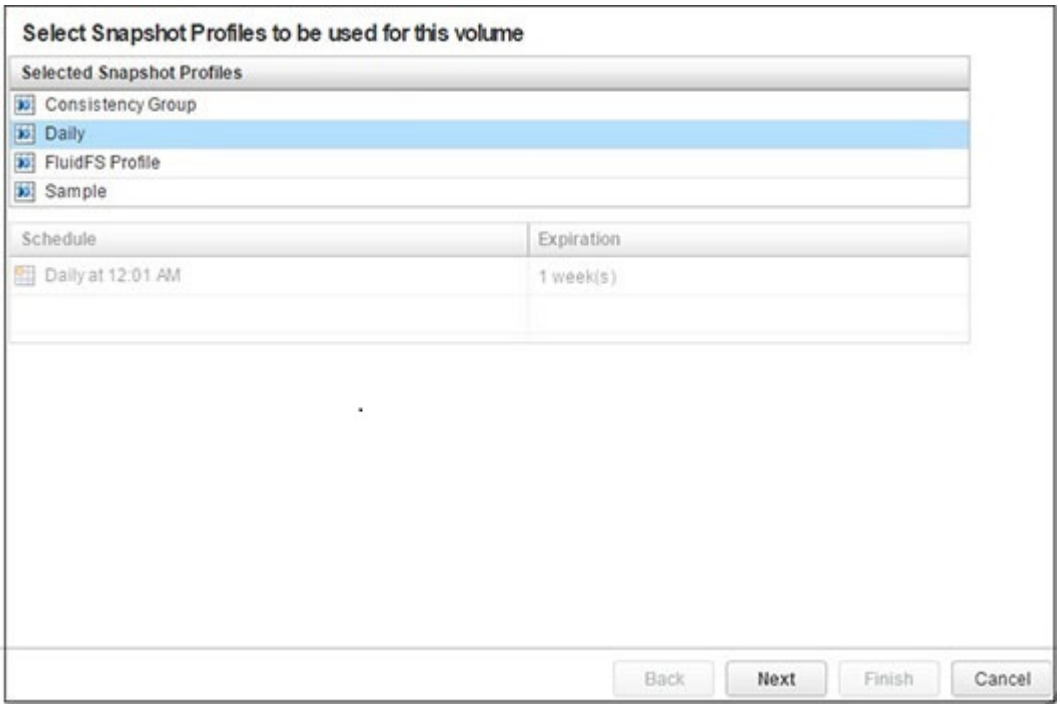
Use the **Snapshot Options** page to take a temporary VMware snapshot and specify options for the snapshot.



- **Create Temporary VMware Snapshot**—Select this checkbox to take a temporary VMware snapshot before taking a snapshot.
- **Include memory**—Select this checkbox to capture the virtual machine memory in the snapshot.
- **Quiesce file systems (if available)**—Select this checkbox to pause running processes in the guest operating system before taking the snapshot. Pausing the processes ensures that the file system is in a known, consistent state when the snapshot is taken. (This option requires that VMware tools are installed.) See VMware help for information about VMware snapshot options.

Snapshot Profile

Use the **Snapshot Profile** page to select one or more Snapshot Profiles to apply to the Dell volume. For information about Snapshot Profiles, see Introduction to Dell Storage.



- **Select Snapshot Profiles**—Select one or more Snapshot Profiles to associate with the volume.

  NOTE: To deselect a Snapshot Profile, press the Ctrl key and click the selected Snapshot Profile.

- **Schedule**—Displays the snapshotschedule for the selected Snapshot Profile.

Snapshot Properties

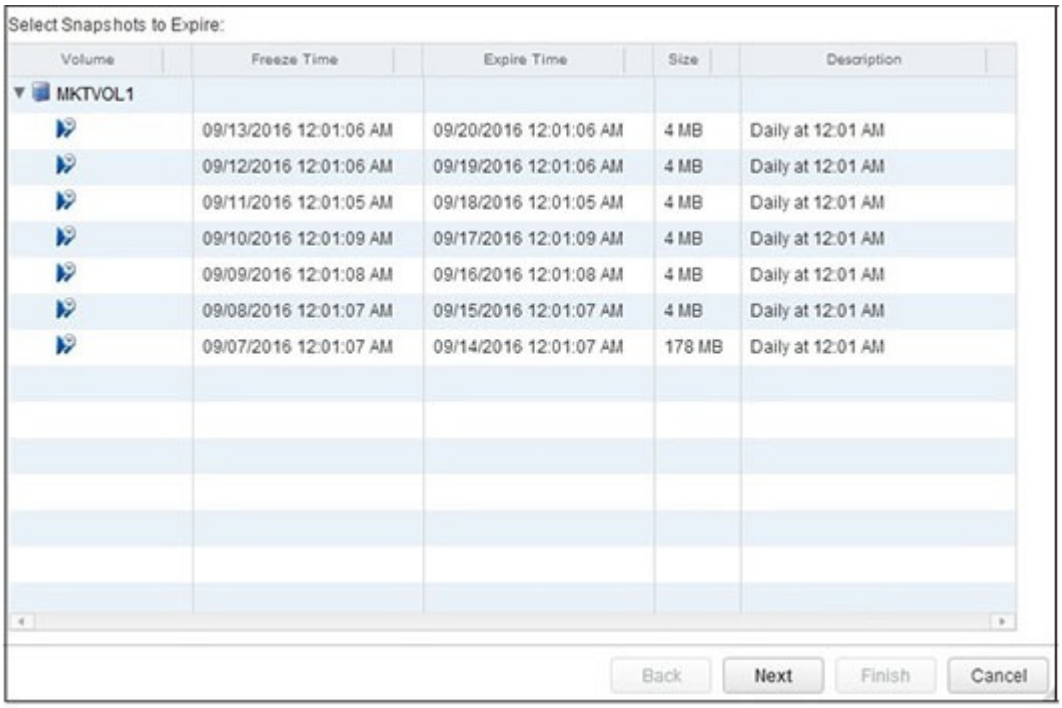
Use the **Snapshot Properties** page to specify properties for the snapshot.

- **Expiration**—Specify the time after which you want the snapshot to expire.

- **Never Expire**—Select this checkbox to prevent the snapshot from expiring automatically. The snapshot must be expired manually.
- **Description**—Type a description for the snapshot.

Snapshot Selection

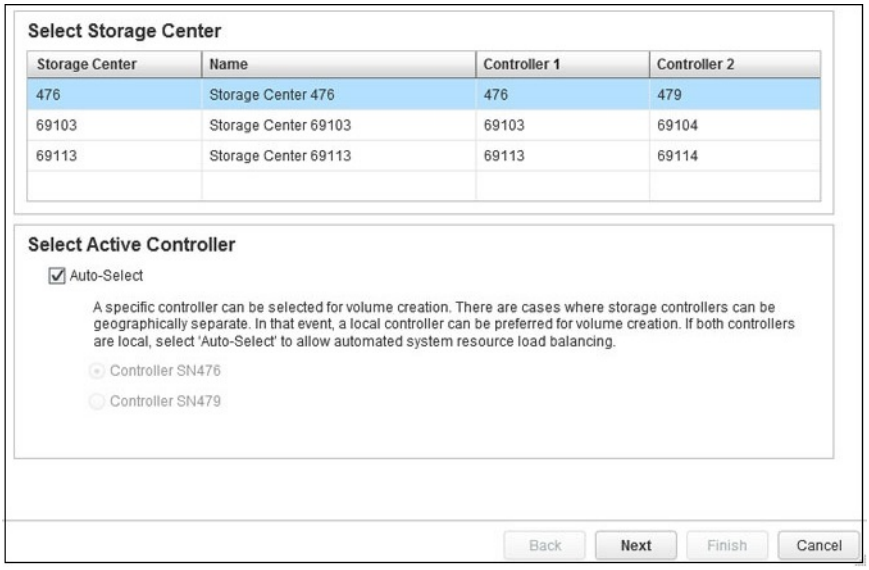
Use the **Select Snapshots** page to select the snapshots from which to recover data or to select the snapshots to delete.



- Select one or more snapshots to use to recover data. To recover data, select onesnapshots per volume that you want to recover. If more than one RDM is mapped to the virtual machine, you must select one snapshots for each volume to recover.
- Select one or more snapshots that you want to delete (expire).

Storage Center

Use the **Storage Center** page to select the Storage Center on which to add storage.

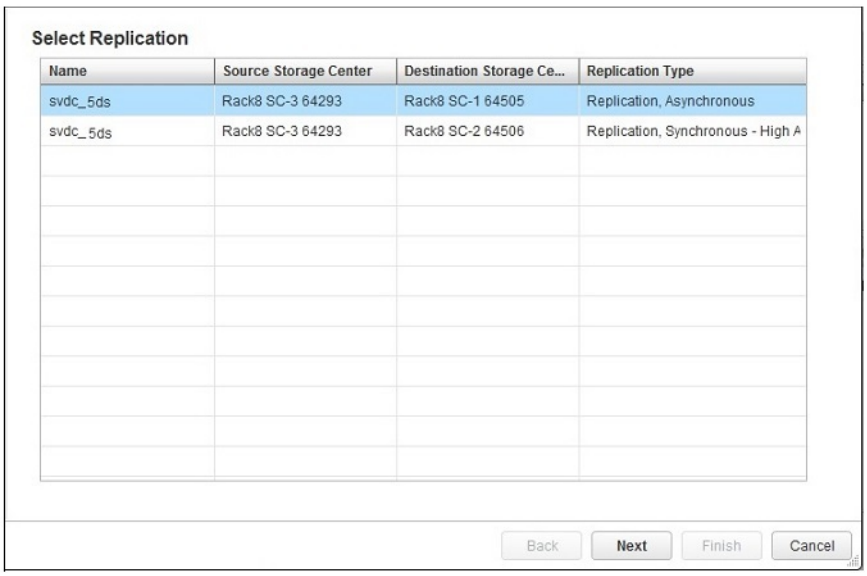


- **Select Storage Center**—Select the Storage Center on which to add storage.
- **Select Active Controller**—Select the **Auto-Select** checkbox to allow the Storage Center to load balance the system by automatically selecting the controller on which to add storage. Clear the **Auto-Select** checkbox to select a specific controller for accessing the storage.

NOTE: The Select Active Controller option is not available if the Storage Center user in Storage Manager only has volume manager privileges.

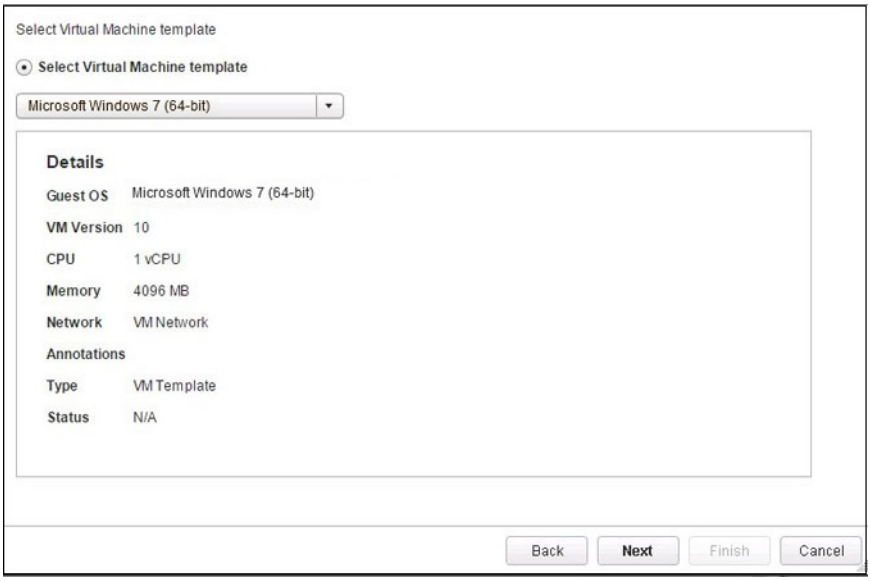
Storage Center for Replication

Use the **Storage Center** page to select the destination Storage Center for replication.



Template Selection

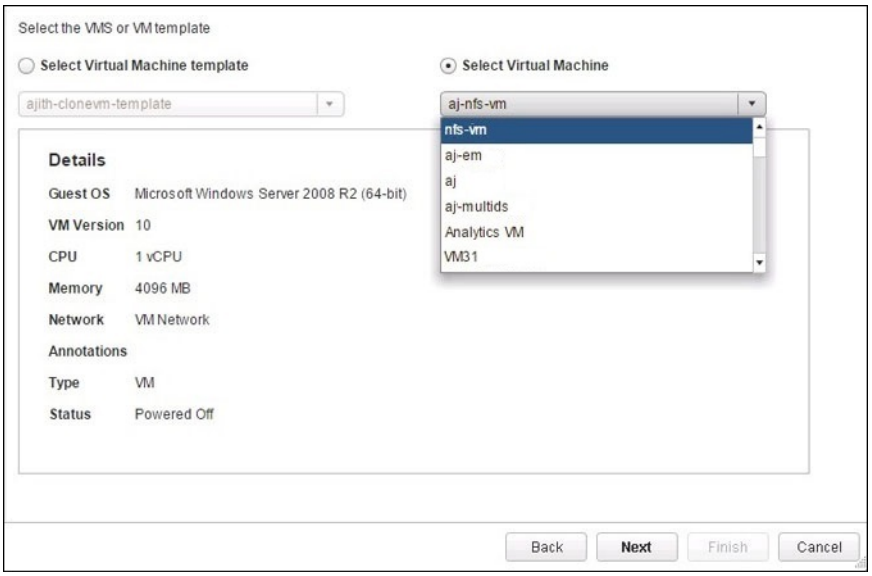
Use the **Template Selection** page to select a virtual machine template on which to base a new virtual machine.



- **Select Virtual Machine template**—Select a VM template from the drop-down list of available templates.
- **Details**—Displays details about the currently selected VM template.

Template Selection for Clone Virtual Machine

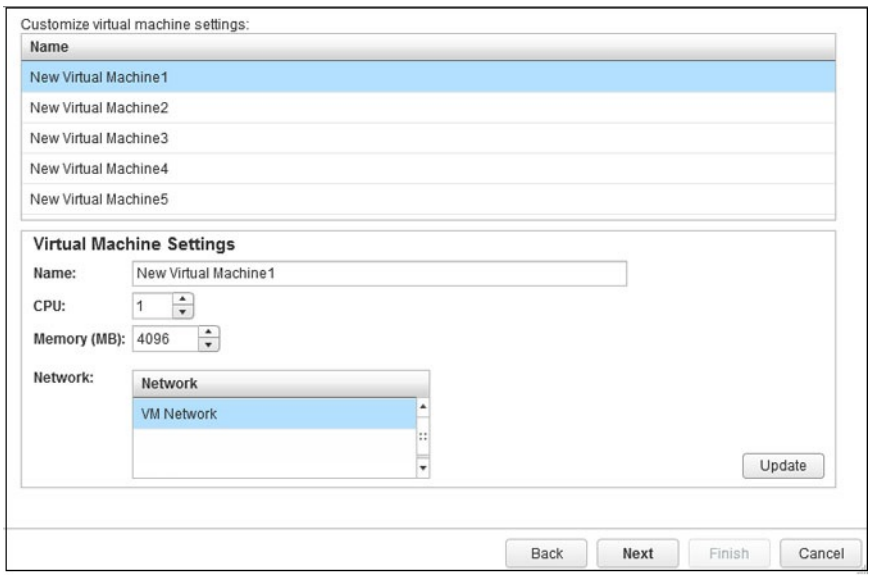
Use the **Template Selection** page to select a virtual machine template on which to clone a virtual machine.



- **Select Virtual Machine template**—Select a VM template from the drop-down list of available templates.
- **Select Virtual Machine**—Select a VM from the drop-down list of available virtual machines.
- **Details**—Displays details about the currently selected VM template.

VM Selection

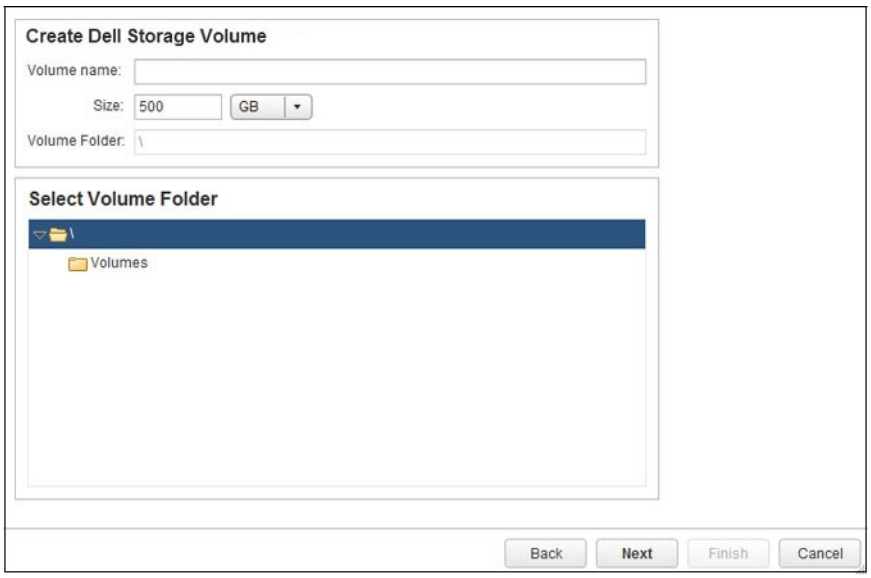
If an RDM volume is associated with the virtual machine, use the Recovery **VM Selection** page to select the virtual machine that you want to use to access the recovered data.



- **Name**—Name of the selected virtual machine
- **CPU**—The CPU to be associated with the virtual machine
- **Memory**—The amount of memory to be allocated
- **Network**—The network to use for the virtual machine

Volume

Use the **Volume** page to specify attributes for a new Dell volume.

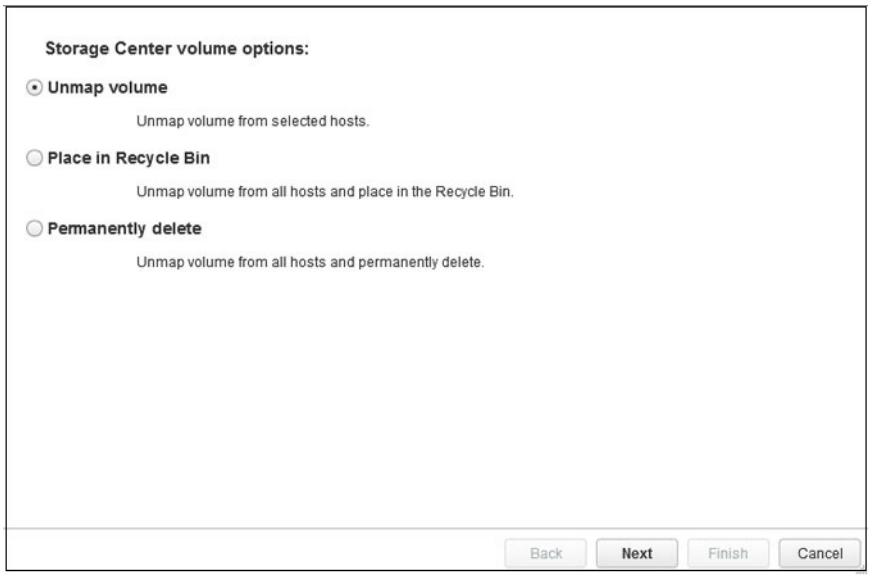


- **Volume Name**—Type a name for the volume.
- **Size**—Specify the volume size.

- **Volume Folder**—Select the folder location for the volume.

Volume Retention

Use the **Volume Retention** page to specify retention options for removing the volume or raw device.

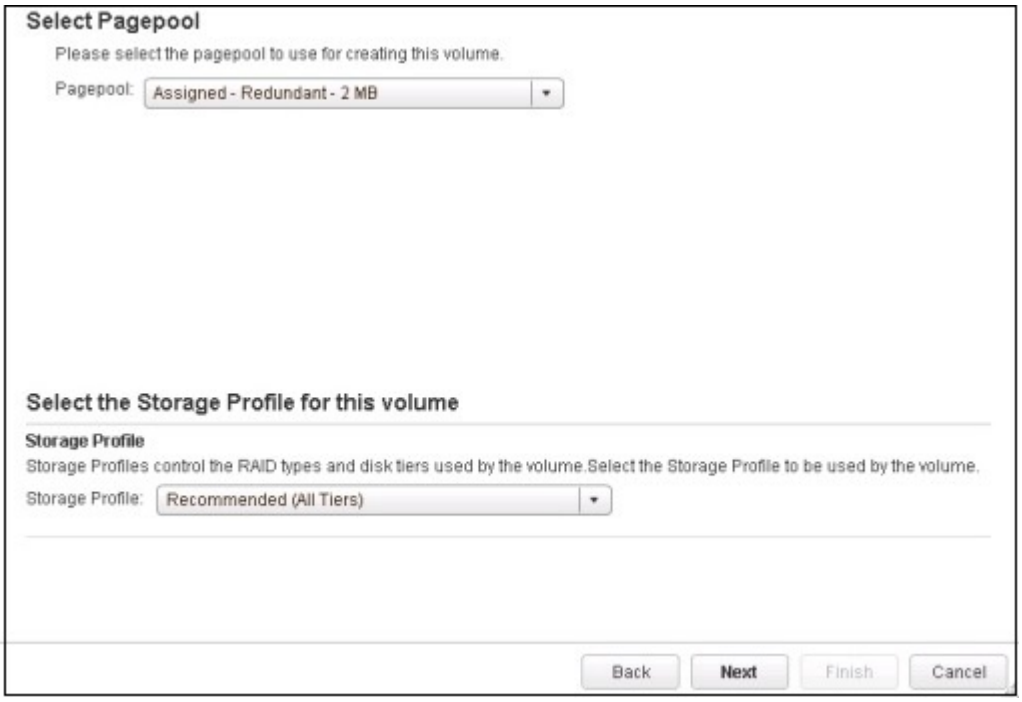


- **Unmap volume**—Select this option to unmap the volume from the host. The unmapped volume remains on the Storage Center.
- **Place in Recycle Bin**—Select this option to unmap the volume from the host and move the volume to the Recycle Bin. If necessary, the volume can be recovered from the Recycle Bin later—unless the Recycle Bin is emptied. To recover a volume from the Recycle Bin, use the Storage Center System Manager or Storage Manager.
- **Permanently delete**—Select this option to unmap the volume and permanently delete the volume. After the volume is permanently deleted, it cannot be recovered.

Volume Settings

Use the **Volume Settings** page to specify the options for a datastore.

NOTE: The Volume Settings page opens only if the Allow Storage Profile Selection user-preference setting is set for the Storage Center user in Storage Manager.



NOTE: The values for Storage Profile and Disk Folder can be modified only if the preferences for the Storage Center have been set to Allow. For information about managing the preferences, see the *Dell Storage Manager Administrator's Guide*

- **Pagepool**—Select a pagepool from the drop-down list.
- **Storage Profile**—Select a storage profile from the drop-down list:
  - **Recommended (All Tiers)**—Select this option for most volumes. The Recommended profile allows the system to automatically progress data between and across all storage tiers based on data type and usage.
  - **High Priority (Tier 1)**—Select this option to force volume data to remain in tier 1 storage.
  - **Medium Priority (Tier 2)**—Select this option to force volume data to remain in tier 2 storage.
  - **Low Priority (Tier 3)**—Select this option to force volume data to remain in tier 3 storage.
  - **Custom**—If available, select a custom storage profile that is appropriate to the volume data.
- **Disk Folder**—Select a disk folder from the drop-down list.