

Dell PowerStore Manager for Windows Admin Center

User Guide

1.0

Notes, cautions, and warnings

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

 **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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As part of an improvement effort, revisions of the software are periodically released. The product release notes provide the most up-to-date information about the product. Contact your service provider if a product does not function properly or does not function as described in the *Dell PowerStore Manager for Windows Admin Center User Guide*.

Where to get help

Support, product, and licensing information can be obtained as follows:

- **Product information**

The *Dell PowerStore Manager for Windows Admin Center User Guide* contains product and feature documentation. For the latest version of the *Dell PowerStore Manager for Windows Admin Center User Guide* and release notes, go to <https://www.dell.com/support> and locate the appropriate product model support page. For environment and system requirements, see the *Dell PowerStore Manager for Windows Admin Center Simple Support Matrix* document at <https://elabnavigator.dell.com/eln/modernHomeSoftwareSolutions>.

- **Troubleshooting**

For information about products, software updates, licensing, and service, go to <https://www.dell.com/support> and locate the appropriate product model support page.

- **Technical support**

For technical support and service requests, go to <https://www.dell.com/support> and locate the **Service Requests** page. To open a service request, you must have a valid support agreement. Contact your Sales Representative for details about obtaining a valid support agreement or to answer any questions about your account.

Introduction

This document describes the Dell PowerStore Manager solution extension for Windows Admin Center, how to install and uninstall the extension, and its usage.

This chapter contains the following information:

Topics:

- [Dell PowerStore Manager extension overview](#)
- [Installing the Dell PowerStore Manager extension](#)

Dell PowerStore Manager extension overview

The Dell PowerStore Manager for Windows Admin Center is a solution extension that provides tools to manage PowerStore hosts, host groups, volumes, and volume groups for Windows servers and clusters that are connected to Windows Admin Center. The solution extension filters out storage objects that are not related to Windows servers and clusters connected to Windows Admin Center.

The Dell PowerStore Manager solution extension leverages platform security, identity, and management capabilities.

The intended users of this solution extension are Windows administrators who prefer to perform storage management from the same tool used for managing Windows servers and clusters.

Once the relevant connections (Windows servers and clusters, and PowerStore appliances) are added to Windows Admin Center, the PowerStore Manager extension discovers the PowerStore appliance and reports all the relevant information in the **Overview** page for the PowerStore appliance.

When the **Hosts and Hosts Groups** tool is selected and the associated landing page appears, only the hosts and host groups that are associated with Windows servers and clusters managed by Windows Admin Center will be reported on the associated page.

- For a Windows server to be reported as a PowerStore host:
 - The initiators on the PowerStore host must be a subset of the initiators associated with the Windows server. In other words, the PowerStore host cannot contain initiators that are not associated with the Windows server.
- For a Windows cluster to be reported as a PowerStore host group:
 - The hosts part of the PowerStore host group must only be associated with a single server part of the Windows cluster. In other words, the non-empty initiators should be a subset of initiators that belong to a server of the Windows cluster.

When the **Volumes** tool is selected and the associated landing page appears, only volumes that are mapped to hosts and host groups that are associated with Windows servers and clusters managed by Windows Admin Center will be reported.

When the **Volume groups** tool is selected and the associated landing page appears, only volume groups containing volumes that are associated with Windows servers or clusters managed by Windows Admin Center will be reported. If there is a single volume in the volume group that is not managed by Windows Admin Center, that volume group will not be reported.

Installing the Dell PowerStore Manager extension

The Dell PowerStore Manager extension is distributed as a NuGet package for Windows Admin Center. By default, Windows Admin Center points to the Microsoft official NuGet feed which hosts extensions published by Microsoft and other developers.

The Dell PowerStore Manager extension package can be installed through one of the following means:

- From the list of **Available extensions** within the public Windows Admin Center feed
- By using a local feed for sites that are without Internet access

Install the Dell PowerStore Manager extension using the public Windows Admin Center feed

Prerequisites

To install the Dell PowerStore Manager extension, users should have knowledge of Windows Admin Center, its use, and functions.

Ensure that Windows Admin Center is up and running.

NOTE: For environment and system requirements, see the *Dell PowerStore Manager for Windows Admin Center Simple Support Matrix* document. For the latest version of the document, go to <https://elabnavigator.dell.com/eln/modernHomeSoftwareSolutions>.

About this task

To install the Dell PowerStore Manager extension from within Windows Admin Center, do the following:

Steps

1. In Windows Admin Center, select **Settings** (gear shaped icon) in the top right. The **Settings** page appears.
2. Under **Gateway** in the list of **Settings** in the left pane, select **Extensions**. **Extensions** opens in the right pane and lists the available extensions.
3. Select **Dell PowerStore Manager** and then select **Install**.

NOTE: To view the extension description, version, publisher and other information in the **Details** pane, click on the extension.

Results

After installation is complete, your browser automatically refreshes and Windows Admin Center reloads with the new extension installed.

Install the Dell PowerStore Manager extension using a local feed

Prerequisites

To install the Dell PowerStore Manager extension, users should have knowledge of Windows Admin Center, its use, and functions.

About this task

If Windows Admin Center is installed on a computer that is not connected to the Internet or is behind a proxy server, it may not be able to access and install the Dell PowerStore Manager extension from the Windows Admin Center feed. You can download the extension package manually, and configure Windows Admin Center to retrieve the package from a file share or local drive.

Steps

1. On another computer that has Internet connectivity, open a Web browser and download the extension package, `dell.powerstore-manager.1.0.0.nupkg`.

NOTE: Go to <https://www.dell.com/support> and locate the appropriate product support page from which to download the extension package. The extension package can also be downloaded from the following URL: https://dev.azure.com/WindowsAdminCenter/Windows%20Admin%20Center%20Feed/_packaging?_a=feed&feed=WAC

2. Click on the name of the package to install to view the package details page.
3. Click on the **Download** link in the top navigation bar of the package and download the `dell.powerstore-manager.1.0.0.nupkg` file for the extension.
4. Copy the package file to a file share that can be accessed from the computer that Windows Admin Center is installed on, or to the local disk of the computer on which Windows Admin Center is installed.

5. In Windows Admin Center, select **Settings** (gear shaped icon) in the top right. The **Settings** page appears.
6. Under **Gateway** in the list of **Settings** in the left pane, select **Extensions**. **Extensions** opens in the right pane.
7. On the **Extensions** pane, select **Feeds**.
8. To install the extension package from the local feed, select **Add** and type the full path of the file share in which the extension package file (dell.powerstore-manager.1.0.0.nupkg) is stored.
9. Click **Add**.
 **NOTE:** The **Available extensions** list will show extensions from all registered feeds. You can check which feed each extension is from using the **Package feeds** column.
10. Click the **Available extensions** tab.
11. Select **Dell PowerStore Manager** extension and then select **Install**.

Uninstall the Dell PowerStore Manager extension

About this task

To uninstall the Dell PowerStore Manager extension, do the following:

Steps

1. In Windows Admin Center, select **Settings** (gear shaped icon) in the top right. The **Settings** page appears.
2. Under **Gateway** in the list of **Settings** in the left pane, select **Extensions**. **Extensions** opens in the right pane.
3. Select **Installed extensions** to view all installed extensions.
4. Select the **Dell PowerStore Manager** extension to uninstall, and then click **Uninstall**.

Results

After uninstall is complete, your browser automatically refreshes and Windows Admin Center reloads with the extension removed.

Connections

Before you can view pertinent PowerStore cluster information and manage hosts, host groups, volumes, and volume groups using the Dell PowerStore Manager extension, a connection must be made to the relevant PowerStore cluster.

This chapter contains the following information:

Topics:

- [Certificate management](#)
- [Add PowerStore cluster as a connection](#)
- [Connect to a PowerStore cluster](#)

Certificate management

When adding a PowerStore cluster connection for the first time, you may encounter Transport Layer Security (TLS) certificate errors such as `Could not establish trust relationship for SSL/TLS secure channel`. In this case, the PowerStore certificate must be imported to the Windows host that is running the Windows Admin Center service. The certificate can be imported in one of the following ways:

- Locally, when the Windows Admin Center service is running on a standalone Windows platform in single user mode
- To the Windows server that is running the Windows Admin Center service for service mode

Import the certificate using either PowerShell or the Certificate Import Wizard.

Import a PowerStore cluster TLS certificate using PowerShell

Prerequisites

Requires Windows admin privileges to import to `Cert:\LocalMachine\Root`.

About this task

To import the TLS certificate for the PowerStore cluster, do the following:

Steps

1. Open the browser and attempt to connect to the PowerStore cluster.
2. Select **Not secure** and then select **Certificate (Valid)** to view the certificate information.
3. Select the **Certification Path** tab to view the Certification path for the certificate.
4. Select the **Details** tab.
5. Select **Copy to File** to download and save all certificate files from the PowerStore cluster, `https://<PowerStore host>`, to your Windows system.

 **NOTE:** All the certificates in the path must be saved.

6. Start PowerShell as Administrator.
7. Run `Import-Certificate -FilePath <certificate file> -CertStoreLocation 'Cert:\LocalMachine\Root' -Verbose`
8. Repeat step 7 to import all the certificates.

Import a PowerStore cluster TLS certificate using Windows Certificate Import Wizard

About this task

To import the TLS certificate for the PowerStore cluster, do the following:

Steps

1. Open the browser and attempt to connect to the PowerStore cluster.
2. Select **Not secure** and then select **Certificate (Valid)** to view the certificate information.
3. Select the **Certification Path** tab to view the Certification path for the certificate.
4. Select the **Details** tab.
5. Select **Copy to File** to download and save all certificate files from the PowerStore cluster, `https://<PowerStore host>`, to your Windows system.

 **NOTE:** All the certificates in the path must be saved.

6. Download and save all certificate files from the PowerStore cluster, `https://<PowerStore host>`.

 **NOTE:** All the certificates in the path must be saved.

7. Navigate to the directory where the certificates were saved.
8. Double click the certificate file.
The Certificate Import Wizard opens.
9. Follow the steps to import the certificate to Root Certification Authorities store.
10. Repeat steps 8 and 9 to import all the certificates.

Add PowerStore cluster as a connection

Prerequisites

Obtain the following information for the PowerStore cluster:

- The PowerStore certificate must be imported to the Windows host that is running the Windows Admin Center service.
- Hostname or management IP address
- Username and password of the PowerStore admin user account to use

 **NOTE:** The user account credentials are never saved. Whenever a browser session ends, you must re-enter the credentials to begin another session. A session expires after four hours and, therefore, requires re-entry of credentials to continue.

Windows Admin Center should be up and running with the Dell PowerStore Manager extension open.

About this task

To add a PowerStore cluster as a connection, do the following:

Steps

1. In Windows Admin Center, under **All connections** select **Dell PowerStore Manager**.
The **Dell PowerStore Cluster Connections** page appears.
2. Click **Add**.
The **Connections tags** slide out panel appears.
3. Type in either the hostname or management IP address for the PowerStore cluster and the username and password of the PowerStore user account to use.

 **NOTE:** Port 443 is the default port used to connect to a PowerStore cluster.

4. Click **Add**.
The connection information will appear in the list of **Dell PowerStore Cluster Connections**.

- Repeat steps 2, 3, and 4 for each additional PowerStore cluster that will be accessed through the extension.

Connect to a PowerStore cluster

Prerequisites

Windows Admin Center should be up and running with the Dell PowerStore Manager extension open.

The hostname or management IP address of the specific PowerStore cluster has been added to the list of **Dell PowerStore Cluster Connections**.

Obtain the following information for the PowerStore cluster:

- Hostname or management IP address.
- Username and password of the PowerStore user account to use.

i **NOTE:** The user account roles that Dell PowerStore Manager for Windows Admin Center supports for a PowerStore appliance are:

- Administrator (admin)
- Storage Administrator
- Storage Operator
- Operator (read only access)

The user account credentials are never saved. Whenever a browser session ends, you must re-enter the credentials to begin another session. A session expires after four hours and, therefore, requires re-entry of credentials to continue.

About this task

To connect to a PowerStore cluster, do the following:

Steps

- In Windows Admin Center, under **All connections** select **Dell PowerStore Manager**. The **Dell PowerStore Cluster Connections** page appears.
- Click on the hostname or IP address of the specific PowerStore cluster. A Dell PowerStore Manager page opens that requests PowerStore cluster login credentials.
- Type in the username and password of the PowerStore user account to use.
i **NOTE:** Port 443 is the default port used to connect to a PowerStore cluster.
- Click **Connect**.
Once the relevant connections (Windows servers and clusters, and PowerStore appliances) are added to Windows Admin Center, the PowerStore Manager extension discovers the PowerStore appliance and reports the following information in the **Overview** page for the PowerStore appliance:
 - Cluster properties
 - Inventory based on Windows Admin Center managed Windows servers and clusters
 - Cluster capacity
 - Cluster performance (updated every 20 seconds)
- When connecting to a Windows server or cluster, you need to specify the administrator account to use in the **Specify your credentials** dialog.
i **NOTE:** Use either your Windows account or another account for this connection. For single sign-in using your Windows account, you may need to set up Kerberos constrained delegation. When using another account, you must enter the user credentials (username and password) for the account. Click **Continue** to return to the **Overview** page.

Hosts and host groups

Host configurations are logical connections through which hosts or applications can access storage resources. Before a host can access storage, you must define a configuration for the host and associate it with a storage resource.

You can pool individual hosts together into a host group. A host group is a collection of hosts that enables you to perform volume-related operations across all the hosts in the group. For example, when you provision volumes for a host group, the volumes become available to all member hosts. A host group uses an iSCSI or Fibre Channel connection. It cannot use both.

Only hosts and host groups that are exclusively associated with Windows Admin Center managed servers and clusters are reported.

Under **Compute**, click **Hosts & Host Groups** to perform the following actions:

- Manage (**Add**, **Modify**, and **Remove**) hosts and host groups.
- Review the storage resources that are mapped to individual hosts or host groups.
- Review the initiators that are associated with the existing host configurations.
- For host groups, you can also add more hosts.

Selecting the checkbox of an individual host or host group row in the list of **Hosts and Host Groups** provides additional details about the selected item. For hosts, clicking on an individual host name allows you to manage initiators, mapped volumes, and disks. For hosts groups, clicking on an individual host group name allows you to manage hosts and mapped volumes.

Host group considerations

The following rules apply to host groups:

- A host can belong to one host group only.
- If the host has mapped volumes, you cannot add a host to a host group.
- You cannot add a host to a host group that uses a different initiator type (FC, iSCSI).
- A volume can be mapped to multiple host groups.
- An initiator can only be associated with one host or host group.
- When you delete a host from a host group, the associated volumes get detached from the host, and the host becomes a stand-alone host.
- It is typical to have a host group for a cluster but it is not required.

Topics:

- [About initiators](#)
- [Add a host](#)
- [Add a host group](#)
- [Modify a host or host group](#)
- [Remove hosts or host groups](#)
- [Add initiators](#)
- [Delete initiators](#)
- [Map volumes to a host or a host group](#)
- [Unmap volumes from a host or a host group](#)
- [View host disks](#)
- [Add hosts to a host group](#)
- [Remove hosts from a host group](#)

About initiators

When you map a host to a storage resource, the initiators that are registered with the hosts are used to establish a connection. Initiators are endpoints from which FC and iSCSI sessions originate. A host can have one or more initiators that are registered

on it. Each initiator is uniquely identified by its World Wide Name (WWN) or iSCSI qualified name (IQN). It is recommended that you register one or more initiators on the host side before connecting the host to the PowerStore cluster. Once the initiators are registered with a host, all paths from each registered initiator are automatically granted access to a storage mapped to the host. This ensures a high availability connection between the host and the PowerStore cluster.

Windows Admin Center discovers initiators on a Windows server and lists them in a dialog from which a user can choose while adding a host.

Add a host

Prerequisites

The following rules apply to hosts:

- Hosts are listed based on added Windows server connections.
- Adding multiple hosts is supported.
- Fibre Channel (FC) and iSCSI initiator types are supported.
- A volume can belong to multiple hosts.
- A host can belong to one host group only.

One or more initiators are registered on the host side before connecting the host to the PowerStore cluster.

For FC initiators, ensure that the FC ports and host are on the same FC network zone.

About this task

Before you can map a host to access storage on your PowerStore cluster, you must define a configuration for it in Dell PowerStore Manager. Adding multiple hosts is supported.

Steps

1. Under **Compute** in the left **Tools** pane, select **Hosts & Host Groups**.

 **NOTE:** The discovery and population of known Windows servers and clusters on the **Hosts & Host Groups** page may take time to complete.

2. On the **Hosts & Host Groups** page, click **Add Hosts**.
The **Add Hosts** dialog appears in the right pane.
3. On the **Add Hosts** dialog, select either **Fibre Channel** or **iSCSI** as the initiator type for host (Windows server) connections.
4. Select the Windows servers to be added to PowerStore as hosts.
5. (Optional) Edit the host name or select specific initiators, or both.
6. Click **Add**.
Added hosts appear on the **Hosts & Host Groups** page.

Add a host group

Prerequisites

The following rules apply to host groups:

- Host groups are listed based on added Windows cluster connections.
- Adding multiple host groups is supported.
- Fibre Channel (FC) and iSCSI initiator types are supported.
- All Windows servers in the cluster must first be added as PowerStore hosts.
- A host can belong to one host group only.
- If the host has mapped volumes, it cannot be added to a host group.
- You cannot add a host to a host group that uses a different protocol.
- A volume can belong to multiple host groups.
- When you remove a host from a host group, the associated volumes get detached from the host, and the host becomes a stand-alone host.

Steps

1. Under **Compute** in the left **Tools** pane, select **Hosts & Host Groups**.
2. Click **Add Host Groups**.
The **Add Host Groups** dialog appears in the right pane.
3. On the **Add Host Groups** page, select either **Fibre Channel** or **iSCSI** as the initiator type for the PowerStore host group.
4. Select the Windows clusters to be added to PowerStore as hosts groups.
5. (Optional) Edit the host group name or select specific PowerStore hosts, or both.
6. Click **Add**.
Added host groups appear on the **Hosts and Host Groups** page.

Modify a host or host group

About this task

You can modify the basic properties **Name** and **Description** for a host or host group by doing the following:

Steps

1. Under **Compute** in the left **Tools** pane, select **Hosts & Host Groups**.
2. On the **Hosts & Host Groups** page, select the host or host group to modify.
3. Click **Modify**.
The relevant dialog appears in the right pane.
4. Make the relevant changes.
5. Click **OK**.

Remove hosts or host groups

About this task

Multiple hosts, host groups, or both, can be removed at once from the PowerStore appliance. Removing host groups also removes the hosts within those host groups from the PowerStore appliance.

To remove hosts, host groups, or both, do the following:

Steps

1. Under **Compute** in the left **Tools** pane, select **Hosts & Host Groups**.
2. On the **Hosts & Host Groups** page, select the hosts, host groups, or both to remove.
 **NOTE:** Any hosts or hosts groups that have volume mappings cannot be removed. If any hosts or hosts groups are selected that have volume mappings, the **Remove** control under **More Actions** will be disabled.
3. Under **More Actions**, select **Remove**.
The **Remove** dialog opens in the right pane.
4. Select the checkbox to confirm that you understand the results of the action and to continue.
 **NOTE:** Removal of hosts and host groups must be confirmed.

The **Remove** control becomes active.
5. Click **Remove**.
The specified hosts or host groups no longer appear on the **Hosts & Host Groups** page.

Add initiators

About this task

Initiators are listed based on the associated Windows server's HBA initiator port. Multiple initiators can be added at once.

Steps

1. Under **Compute** in the left **Tools** pane, select **Hosts & Host Groups**.
2. Click on the name of the specific host.
The page for that host appears and the **Initiators** tab is selected by default.
3. Click **Add** within the tab.
A separate dialog appears that allows initiator selection.
4. Select the initiators to add to the host.
5. Click **Add**.
Added initiators appear on the page for that host.

Delete initiators

About this task

Multiple initiators can be deleted at once. Deletion of initiators must be confirmed.

To delete initiators, do the following:

Steps

1. Under **Compute** in the left **Tools** pane, select **Hosts & Host Groups**.
2. Click on the name of the specific host.
The page for that host appears and the **Initiators** tab is selected by default.
3. Select the initiators to delete from the host.
 **NOTE:** If all initiators are selected, the **Delete** control will be disabled. At least one initiator must remain in the host, empty hosts are not allowed.
4. Click **Delete**.
The **Delete Host Initiators** dialog appears.
5. After reviewing the list of initiators to be deleted, click **Delete**.
The initiators are removed from the page for that host.

Map volumes to a host or a host group

You can map volumes to a single host or to a host group.

About this task

The following restrictions apply:

- After a volume is mapped to a host, it shares the same storage protocol (SCSI or FC) as the host to which it is mapped.
- Mixed protocols are not supported.

All the volumes from the PowerStore cluster are available for selection. The volume list is filtered by host initiator type and multiple volumes can be mapped at once.

Steps

1. Under **Compute** in the left **Tools** pane, select **Hosts & Host Groups**.
2. Click on the name of the specific host or host group.
The page for that host or host group appears and the **Initiators** tab is selected by default.
3. Select the **Mapped Volumes** tab.
4. Click **Map**.
The **Map Volumes** dialog opens in the right pane.
5. Select one or more volumes that you want to be mapped to the host or host group.
6. Select whether to provide a Logical Unit Number and type the number or have one generated automatically.
7. Click **Map**.
The mapped volumes appear on the page for that host or host group.

Unmap volumes from a host or a host group

You can unmap volumes from a single host or from a host group.

About this task

The unmap action must be confirmed. Volumes are no longer accessible from the host or host group once they are unmapped. Multiple volumes can be unmapped at once.

Steps

1. Under **Compute** in the left **Tools** pane, select **Hosts & Host Groups**.
2. Click on the name of the specific host or host group.
The page for that host or host group appears and the **Initiators** tab is selected by default.
3. Select the **Mapped Volumes** tab.
4. Select one or more volumes that you want to be unmapped from the host or host group.
5. Click **Unmap**.
A confirmation dialog box opens.
6. Review the list of volumes that appear in the dialog box and, if all the selected volumes in the list are correct, click **Unmap**.
The unmapped volumes no longer appear on the page for that host or host group.

View host disks

About this task

To view information related to the disks for a host, do the following:

Steps

1. Under **Compute** in the left **Tools** pane, select **Hosts & Host Groups**.
2. Click on the name of the specific host.
The page for that host appears and the **Initiators** tab is selected by default.
3. Select **Disks** tab.
The information about all the disks for that host appears.

Add hosts to a host group

About this task

The following restrictions apply:

- If a host has mapped volumes, it cannot be added to a host group.
- Hosts cannot be added to a host group that uses a different initiator type (iSCSI, FC).

Hosts are listed based on the servers part of the associated Windows cluster. Multiple hosts can be added at once. To add hosts to a host group do the following:

Steps

1. Under **Compute** in the left **Tools** pane, select **Hosts & Host Groups**.
2. Click on the name of the specific host group.
The page for that host group appears and the **Hosts** tab is selected by default.
3. Click **Add**.
The **Add Hosts to Host Group** dialog box appears in the right pane.
4. Select the hosts to add from the list of available hosts.
5. Click **Add**.
Added hosts appear on the page for that host group.

Remove hosts from a host group

About this task

Removal of hosts from a host group must be confirmed to complete the operation. The associated volumes get detached from the selected hosts, and the hosts become stand-alone hosts. Multiple hosts can be removed at once. To remove hosts from a host group, do the following:

Steps

1. Under **Compute** in the left **Tools** pane, select **Hosts & Host Groups**.
2. Click on the name of the specific host group.
The page for that host group appears and the **Hosts** tab is selected by default.
3. Select one or more hosts that you want to remove from the list.
4. Under **More Actions**, select **Remove Hosts from Host Group**.
A **Remove Hosts from Host Group** confirmation dialog box opens.
5. Review the list of hosts that appear in the dialog box and, if all the selected hosts in the list are correct, select the check boxes to confirm the impact of the host removal.

 **NOTE:** If all hosts are selected, the **Remove** control will be disabled. At least one host must remain in the host group.
Empty host groups are not allowed.

The **Remove** control becomes active.

6. Click **Remove**.
The hosts no longer appear on the page for that host group.

Volumes

A volume is a single unit that represents a specific amount of storage. Volume storage resources provide hosts with access to general-purpose, block-level storage through network-based iSCSI and Fibre Channel connections. With volume storage, you can manage partitions of block storage resources so that host systems can mount and use these resources. Each volume is associated with a name, a NAA (Network Addressing Authority) identifier and a NGUID (Namespace Globally Unique Identifier).

Only volumes that are exclusively associated with Windows Admin Center managed servers and clusters are reported.

After a host is mapped to a volume, it can use the volume like a local storage drive. When a volume is created, the PowerStore Resource Balancer automatically determines on which appliance the volume is provisioned unless that volume has been mapped to a specific host or host group. In such cases, the volume is created only on an appliance that sees this host or host group. Since there is no redirection between appliances within a cluster, I/O is sent to one of the two nodes that contains storage for the volume.

Under **Storage**, click **Volumes** to perform the following actions:

- Create a volume
- Modify volume properties
- Delete a volume

Clicking any of the rows provides additional details for that row, and doing so also selects the checkbox next to that row. To select multiple rows, however, you must click the checkbox for each of the specific rows. If a row is selected in any table and another row in the table is clicked on, the row that was previously selected is deselected and the new row is selected instead.

Modification is only allowed when a single row is selected. You cannot modify if more than one row is selected, and you cannot modify if no rows are selected.

If you have a row selected and click the checkbox next to another row, you can select multiple rows at once for deletion.

Topics:

- [Create a volume](#)
- [Modify a volume](#)
- [Delete a volume](#)
- [Map hosts or host groups to a volume](#)
- [Unmap hosts or host groups from a volume](#)

Create a volume

Prerequisites

Obtain the following information:

- The storage size that you want to allocate for the volume.
- Performance and Protection policies to apply to the volume.
- Information about the host or host groups that can access the volume (if a host configuration does not exist).

The following list describes some important considerations when creating volumes:

- Volumes are created as thin volumes.
- Volumes can be between 1 MB and 256 TB in size.

When you create volumes, they may get automatically placed in different appliances within the cluster. A volume group requires all member volumes to reside in the same appliance.

i **NOTE:** Once volumes are created, they cannot be migrated within the extension to the same appliance. If you plan to add volumes in a volume group, it is recommended that you manually select the desired appliance when creating the volumes and that you create the volumes first. You can then create the volume group to contain the volumes and add the volumes to it.

About this task

To create a volume, do the following:

Steps

1. Under **Storage** in the left **Tools** pane, select **Volumes**.
2. On the **Volumes** page, click **Create**.
3. On the **Create Volumes** dialog box, enter the following volume information:
 - **Name (or Prefix)**: When you create a single volume, this name is the name of the volume. When you create multiple volumes, this name is the base name to which a number is appended.
 - **Description**: Brief description of the volume.
 - **Quantity**: You can add up to 100 volumes that have the same properties. The system appends the volume name with a number when creating multiple volumes.
 - **Size**: The size is the quantity of storage that is subscribed for the volume. After you create the volume, you can increase its size but not decrease it. PowerStore supports the creation of thin volumes up to 256 TB in size.
 - **Volume Group** (optional): Select a volume group to which to add this volume.
 - **Volume Protection Policy** (optional): Select a protection policy that contains snapshot and replication rules applicable for the volume. You can add a protection policy after creating the volume.
 - **Volume Performance Policy**: Set the performance profile on volumes to service IOPS when there is contention for resources at the system level. Limit I/O throughput and bandwidth to provide more predictable performance. Select a Performance Policy consistent with the I/O priority (High, Medium, or Low).
 - **Placement**: You can place the volume in an appliance that is shown in the drop-down list, or allow the system to place the volume automatically.
 - Under **Host/Host Group Mapping**, click **Select**.
 - ① **NOTE**: At least one host or host group mapping must be selected for a volume. A volume can be attached to either a iSCSI or FC host.
 - On the **Map Hosts** dialog box that opens, select the hosts or host groups, or both to map to the volume.
 - ① **NOTE**: You can add hosts or host groups after creating the volume.
 - When you connect the volume to the hosts or host groups, you can specify a Logical Unit Number. Select whether to provide a Logical Unit Number and type the number or have one generated automatically.
 - Click **Map** when you have finished selecting to return to the **Create Volumes** dialog box.
 - 4. Click **Create**.
The **Volumes** page refreshes and lists the newly created volume.

Modify a volume

About this task

You can modify the basic properties of Name, Description, Protection Policy, and Performance Policy for a volume by doing the following:

① **NOTE**: Volume expansion is supported, however, you are not allowed to reduce the size of the volume.

Steps

1. Under **Storage** in the left **Tools** pane, select **Volumes**.
2. On the **Volumes** page, select the volume to modify.
3. Click **Modify**.
The **Modify Volumes** dialog appears in the right pane.
4. Make the relevant changes.
5. Click **OK**.

Delete a volume

Prerequisites

Delete a volume only under the following conditions:

- The volume was used for testing purposes, and the tests have finished.
- The volume has been replicated to a different destination, and the source volume is no longer needed.
- You are trying to save space by deleting the volume and the data on that volume is no longer needed.

 **CAUTION: Volume deletion is an irreversible operation.**

About this task

Multiple volumes can be deleted at once. Deletion unmaps the volume from all hosts and host groups. Volumes that are part of a volume group, or have a protection policy, cannot be deleted. Deletion of volumes must be confirmed.

Ensure that the following conditions are met before attempting to delete a volume:

- The volume is not a member of a volume group. The deletion is blocked if the volume is a member of a volume group.
- The volume does not have an associated protection policy. The deletion is blocked if the volume has an associated protection policy.

Deleting the volume also deletes the associated snapshots.

 **NOTE:** Following an attempt to delete the volume, the system displays a warning, but does not block the deletion operation.

Steps

1. Under **Storage** in the left **Tools** pane, select **Volumes**.
2. Click the check box next to the volume you want to delete.
You can delete multiple volumes by checking all the volumes that you want to delete.
3. Under **More Actions**, select **Delete**.

 **NOTE:** If any volumes from the selected list cannot be presently deleted, such as having a protection policy, the **Delete** control will be disabled.

A **Delete Volumes** confirmation dialog box appears.

4. After reviewing the list of volumes to be deleted, click the checkbox and then click **Delete**.
The specified volumes are deleted from the **Volumes** page.

Map hosts or host groups to a volume

You can map multiple hosts or host groups to a specified volume.

About this task

The following restrictions apply:

- After a volume is mapped to a host, it shares the same storage protocol (SCSI or FC) as the host or host group to which it is mapped.
- Mixed protocols are not supported.

Only the hosts and host groups that have associated Windows Admin Center servers and clusters are available for selection. The host and host groups list is filtered by host initiator type and multiple host and host groups can be mapped at once.

Steps

1. Under **Storage** in the left **Tools** pane, select **Volumes**.
2. Click on the name of the specific volume to which to map hosts or host groups.
The page for that volume appears.
3. Click **Map**.
The **Map Hosts** dialog opens in the right pane.

4. Select one or more hosts or host groups that you want to be mapped to the volume.
5. Select whether to provide a Logical Unit Number and type the number or have one generated automatically.
6. Click **Map**.
The mapped hosts and host groups appear on the page for that volume.

Unmap hosts or host groups from a volume

You can unmap multiple hosts or host groups from a specified volume.

About this task

The unmap action must be confirmed. Volumes are no longer accessible from the specified hosts and host groups once they are unmapped. Attempting to unmap all hosts and host groups for a volume will make the volume inaccessible. However, the volume will be available to map to different hosts.

Steps

1. Under **Storage** in the left **Tools** pane, select **Volumes**.
2. Click on the name of the specific volume from which to unmap hosts or host groups.
The page for that volume appears.
3. Select one or more hosts or host groups that you want to be unmapped from the volume.
4. Click **Unmap**.
5. Review the list of hosts or host groups that appear in the dialog box and, if all the selected items in the list are correct, click **Unmap**.

 **NOTE:** If you attempt to unmap all hosts and host groups for a volume, a confirmation dialog box opens. Select the checkbox to confirm that you understand the results of the action and to continue. The **Unmap** control will become active. Click **Unmap**.

The unmapped hosts and host groups no longer appear on the page for that volume.

Volume groups

A volume group is a logical container for a group of volumes.

A volume group provides a single point of management for multiple storage resources that work together as a unit.

You can use volume groups to achieve the following:

1. A simpler and easier way to manage and monitor resources.
2. Maintaining consistency across multiple volumes.

For example, you can use volume groups to monitor metrics and manage data protection for development applications, user applications, and user storage resources. You can also use volume groups to separate the management of test environments from development environments.

Volume groups for a PowerStore appliance are dynamic and can be adjusted as your requirements change. You can add new members to a volume group or delete them from a volume group after it is created.

Topics:

- [Volume groups in PowerStore appliances](#)
- [Create a volume group](#)
- [Modify a volume group](#)
- [Delete a volume group](#)
- [Add existing volumes to a volume group](#)
- [Remove volumes from a volume group](#)

Volume groups in PowerStore appliances

A volume group in a PowerStore appliance consists of one or more volumes. A volume can only be a member of one volume group at a time.

To configure a volume group in a PowerStore appliance, use the **Volume Groups** tool in the Dell PowerStore Manager for Windows Admin Center extension. You can perform the following operations using this tool:

- Create a volume group.
- Modify properties for the volume group, including whether write order consistency is enabled for the volumes in the volume group.
- Delete a volume group.

 **NOTE:** Once you assign a protection policy to a volume group, it cannot be changed at the member level.

Create a volume group

Prerequisites

All members of a volume group must be hosted from a single appliance.

If a volume group does not have a protection policy and is not write-order-consistent, you can add a volume that has a protection policy to that volume group.

About this task

To create a volume group, do the following:

Steps

1. Under **Storage** in the left **Tools** pane, select **Volume Groups**.

2. On the **Volume Groups** page, click **Create**.
The **Create Volume Group** dialog opens.
3. On the **Create Volume Group** dialog, enter the name of the volume group. Optionally enter a description and choose a protection policy to apply to all volumes within the volume group.
 - NOTE:** If you apply a protection policy to the volume group, you cannot override the protection for individual volumes within the group. If you anticipate that member volumes may require different protection policies, consider removing these volumes from the group or creating a separate group for them.
4. To ensure consistent protection across all members of the volume group, select **Apply write order consistency to all volumes in this volume group**.
This setting means that local and remote protection holds all writes on members of the volume group to provide a uniform point-in-time copy across all members. Making a volume group write-order-consistent ensures that the write order is preserved among members when volume group snapshots are taken or when the volume group is replicated.
5. Under **Volumes**, click **Select**.
 - NOTE:** At least one volume must be selected.

The **Add Existing Volumes** dialog opens.
6. On the **Add Existing Volumes** dialog, select the volumes to add to the volume group.
 - NOTE:** Be aware of some restrictions that apply when adding existing volumes to volume groups:
 - If the volume group has a protection policy, the volume that you are adding cannot have a protection policy already in place.
 - If the volume group has a protection policy or is write-order-consistent, you cannot add a volume that has a protection policy to that volume group.
 - NOTE:** If you manually remove the protection policy from the volume, the volume can be added to the volume group.
 - Host mappings do not occur at the volume group level. For hosts to access the volumes in the volume group, ensure that you configure host mappings to individual volumes.
7. Click **Add** when you have finished selecting to return to the **Create Volume Group** dialog.
8. Click **Create**.
The **Volume Groups** page refreshes and lists the newly created volume group.

Modify a volume group

About this task

You can modify the following properties of a volume group:

- Name
- Description
- Protection Policy
- Performance Policy
- Write-order Consistency

To modify the properties of a volume group, do the following:

Steps

1. Under **Storage** in the left **Tools** pane, select **Volume Groups**.
2. On the **Volume Groups** page, select the volume group to modify.
3. Click **Modify**.
The **Modify Volume Group** dialog appears in the right pane.
4. Make the relevant changes.
5. Click **OK**.

Delete a volume group

About this task

Multiple volume groups can be deleted at once. Deletion of a volume group does not delete the member volumes. Deletion of volume groups must be confirmed.

To delete a volume group, do the following:

Steps

1. Under **Storage** in the left **Tools** pane, select **Volume Groups**.

2. Click the check box next to the volume group you want to delete.

You can delete multiple volume groups by checking all the volume groups that you want to delete.

3. Under **More Actions**, select **Delete**.

 **NOTE:** If any volume groups from the selected list cannot be presently deleted, such as having a protection policy, the **Delete** control will be disabled

A **Delete Volume Groups** confirmation dialog box appears.

4. After reviewing the list of volume groups to be deleted, click **Delete**.

The specified volume groups are deleted from the **Volume Groups** page.

Add existing volumes to a volume group

About this task

The volume that you are adding to the volume group must be on the same appliance as other members.

If a volume group does not have a protection policy and is not write-order-consistent, you can add a volume that has a protection policy to that volume group.

However, be aware of some restrictions that apply when adding existing volumes to volume groups:

- If the volume group has a protection policy, the volume that you are adding cannot have a protection policy already in place.
- If the volume group has a protection policy or is write-order-consistent, you cannot add a volume that has a protection policy to that volume group .

 **NOTE:** If you manually remove the protection policy from the volume, the volume can be added to the volume group.

- Host mappings do not occur at the volume group level. For hosts to access the volumes in the volume group, ensure that you configure host mappings to individual volumes.

Steps

1. Under **Storage** in the left **Tools** pane, select **Volume Groups**.

2. In the **Volume Groups** page, click the name of the volume group to which you want to add volumes.

The page for that volume group appears.

3. Click **Add Existing Volumes**.

4. In the **Add Existing Volumes** dialog, select the volumes to add to the volume group.

5. Click **Add**.

The page for that volume group refreshes and lists the newly added volume members.

Remove volumes from a volume group

You can remove volumes from an existing volume group. Removing volumes from a volume group can affect future operations on those volumes and volume group.

About this task

These affected operations can include refresh, restore, and deletion operations as well as applying and deleting protection policies.

Be aware of some conditions that apply when removing volumes from volume groups:

- The volumes retain the protection policy of the volume group from which they are removed.
- You cannot delete the volumes that you removed from the volume group until all the volume group snapshots that were taken when the volumes were a part of the group are either expired or deleted.
- When you remove volumes from a volume group that has a protection policy with a replication rule, the volumes retain that policy but are not compliant until the volume group is synchronized with the destination.
 - When the volume group is synchronized to the destination, the membership change is applied to the destination volume group.
- If you remove volumes from a volume group that has existing snapshots, you cannot use those volume group snapshots for refresh or restore operations.
 - If you need to restore or refresh the volume group from a snapshot that was taken before the volumes were removed, you must add the volumes back to the volume group.
 - Restore and refresh operations require that the volume group membership match the membership that existed when the snapshot was taken.

Steps

1. Under **Storage** in the left **Tools** pane, select **Volume Groups**.
2. In the **Volume Groups** page, click the name of the volume group from which you want to remove volumes. The page for that volume group appears.
3. Select the volume or volumes that you want to remove.
4. Under **More Actions**, select **Remove**.

 **NOTE:** If all volumes are selected, the **Remove** control will be disabled. At least one volume must remain in the volume group. Empty volume groups are not allowed.

The page for that volume group refreshes and no longer lists the specified volume members.