Abstract
This document contains detailed instructions for configuring and using HPE OneView for VMware vCenter. It is intended for system administrators who are experienced in virtual and physical IT infrastructure administration and understand server virtualization, storage, and networking concepts.
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**Troubleshooting the HPE OneView for VMware vCenter for Storage**

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- **HPE MSA Storage System Information not Displayed in HPE OneView for VMware vCenter for Storage GUI**
- **Duplicate LUNs Displayed in HPE OneView for VMware vCenter for Storage Interface**
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- **Internet Explorer script error occurs in environment with 100 or more LUNs**
- **HPE Storage pages show stale information**
- **Provisioning operation fails**
- **Change in HPE Storage Systems credentials must be re-registered**

### Websites

- **Accessing Hewlett Packard Enterprise Support**
- **Accessing updates**
- **Registering for software technical support and update service**
- **How to use your software technical support and update service**
- **Related information**
- **Customer self repair**
- **Remote support**
- **Warranty information**
- **Regulatory information**
- **Documentation feedback**
HPE OneView for VMware vCenter is a single, integrated plugin application for VMware vCenter management which enables the vSphere administrator to quickly obtain context-aware information about HPE servers and HPE storage in their VMware vSphere data center directly from within vCenter. This application enables the vSphere administrator to easily manage physical servers and storage, datastores and virtual machines. By providing the ability to clearly view and directly manage the HPE Infrastructure from within the vCenter console, the productivity of VMware administrator increases, as does the ability to ensure quality of service.

HPE OneView for VMware vCenter offers the following benefits:

- Simplified administration through integration of the physical and virtual infrastructure.
- Accurate problem indicators through the hardware events generated in the VMware vSphere Management Console.
- Single-click launch of trusted HPE management tools from the vSphere dashboard.
- Ability to proactively manage or view changes with detailed relationship dashboards of server, networking, and storage.
- Simplified on-demand server and storage provisioning.
- Visualization of complex configuration relationships:
  - Virtual machine mashup with storage
  - Peer persistence volumes mashup
  - Virtual connect end-to-end networking view

The HPE OneView for VMware vCenter consists of server and storage components which provide the following features:

- **HPE OneView for VMware vCenter for server**—HPE OneView for VMware vCenter for server offers the following server hardware management capabilities for HPE ProLiant (BL and DL) servers:
  - Comprehensive monitoring using HPE OneView within VMware vCenter environment
  - Firmware update
  - vSphere/ESXi image deployment
  - Remote support information
  - End-to-end monitoring for Virtual connect for HPE ProLiant BL servers
  - End-to-end monitoring for HPE Composable Fabric Switch for ProLiant DL servers
  - Extended Grow Cluster support for HPE Composable Cloud for ProLiant DL
  - Provides detailed infrastructure inventory for HPE ProLiant Gen 10 servers that includes information on memory, NIC, HBA, and Smart Array storage components.

- **HPE OneView for VMware vCenter for storage**—HPE OneView for VMware vCenter for storage offers the following storage hardware management capabilities:
• Provides storage configuration and status information for mapping VMs, datastores, and hosts to LUNs on Hewlett Packard Enterprise storage systems.

• Supports provisioning on HPE 3PAR StoreServ, HPE StoreVirtual, and HPE MSA1050/2050/2052 storage systems. Supported provisioning tasks include creating, expanding, or deleting a datastore, and creating a VM.

• Displays view-only information for the HPE StoreOnce Backup systems.

For installation instructions, see the *HPE OneView for VMware vCenter Installation Guide*.

**Licensing**

HPE OneView for VMware vCenter use is covered under the HPE OneView Advanced License. Basic monitoring and inventory are supported with HPE OneView for VMware vCenter using HPE OneView Standard Licenses. Other functionality requires HPE OneView Advanced Licenses. For more information, visit [Software License Documents](#).
HPE OneView for VMware vCenter configuration

HPE OneView for VMware vCenter is managed as a plug-in in the vCenter Server environment. Several settings can impact the interaction between HPE OneView for VMware vCenter and vCenter server. You can manage these settings from the HPE OneView for VMware vCenter page in the vSphere Client to perform the following tasks:

- **Manage credentials** (HPE OneView and HPE Servers)
- **Certificate Management**

To navigate to HPE OneView for VMware vCenter settings:

1. Log in to vSphere Client.
2. From **Menu** drop-down, select **Administration** option.
   
   The **Administration** panel is displayed in the left side.
3. Under **Administration > HPE OneView for VMware vCenter** select one of the following options to manage the required settings:
   - **HPE Storage Systems**
   - **HPE Storage Schedules**
   - **Administrator Console**
   - **Certificate Management**
   - **Server Integrations**
   - **HPE OneView for VMware vCenter Deployment Server**

For more information on these options, see **vSphere Client Administration**.

**Prerequisites**

After successful installation of the HPE OneView for VMware vCenter appliance and before you configure the HPE OneView for VMware vCenter, ensure you have:

- Launched the Administrator console. For information on how to launch Administrator Console, see **HPE OneView for VMware vCenter Installation Guide**.
- Added vCenters. For information on how to add vCenters, see **Configuring vCenters**.
- Based on the requirement, you can add servers and/or storage systems through HPE OneView for VMware vCenter. For information on how to add server credentials and/or storage systems, see **HPE OneView for VMware vCenter for Server credentials** and **Configuring Storage System**.

**Enhanced Linked Mode**

HPE OneView for VMware vCenter supports the Enhanced Linked Mode (ELM) feature of VMware vCenter and allows you to link multiple vCenter servers and manage the environment through a single web console. With ELM you can perform provisioning operations such as create datastores on entities related to vCenter in ELM mode. You can also search, view, configure, and access the inventory of all the...
linked vCenters through any vCenter web console. Installing the VMware Platform Services Controller (PSC) is a prerequisite for ELM. You can install PSC either in an embedded form or externally as a separate standalone VM. You need an external PSC for linking multiple vCenters.

For more information about setting up ELM and installing PSC, see the VMware documentation.

**NOTE:** HPE does not support using multiple instances of HPE OneView for VMware vCenter in an ELM environment. You can have only one instance of HPE OneView for VMware vCenter configured in an ELM across all connected domains, PSCs, and vCenters.

**NOTE:** Configure all the vCenters in linked mode using the Administrator Console for the configured storage systems to appear on the HPE Infrastructure page on the vSphere Client.

### Configuring vCenters

This section is about configuring and managing vCenters in the HPE OneView for VMware vCenter environment using the Administrator Console. You can add, edit, refresh, and delete the configured vCenters in the environment.

#### Adding vCenter

**Procedure**

1. Log in to the Administrator Console.
2. Click the down arrow next to **HPE OneView for VMware vCenter**.
   
   The main menu is displayed.
3. Under **MANAGERS**, click **vCenters**.
   
   The **vCenters** page is displayed.
4. Click **+ Add vCenter** in the left pane. Alternatively, from the **Actions** drop-down list, select **Add**.
   
   **IMPORTANT:** Until the first vCenter appliance is added, the **Actions** button in the top right corner is grayed out.
5. Provide the following details in the **Add vCenter** dialog box:
   
   - **Name**—Enter the vCenter Fully Qualified Domain Name or an IPv4 address.
   - **Username**—Enter the vCenter username.
   - **Password**—Enter the vCenter password.
6. Click **Add**.

   **NOTE:** **Add +** enables you to add another vCenter in the same dialog box.

   The screen displaying the SSL certificate details appears.
7. Review the details and click **Accept**.
   
   Upon successful addition, the newly added vCenter is listed on the vCenter page. If the vCenter fails to add successfully, an error message informing the user about the cause of the error is displayed.
Editing vCenter details

Procedure

1. Log in to the Administrator Console.
2. Click the down arrow next to **HPE OneView for VMware vCenter**.
   The main menu is displayed.
3. Under **MANAGERS**, click **vCenters**.
   The **vCenters** page is displayed.
4. Select the existing vCenter for which you want to modify the details.
5. From the **Actions** drop-down list, select **Edit**.
6. Modify the **Username** and **Password** and click **OK**.

Initiate vCenter refresh

To refresh an existing vCenter, after modifying its details:

1. Select the vCenter that you want to refresh.
2. From the **Actions** drop-down list, select **Refresh**.

Deleting vCenter

Procedure

1. Log in to the Administrator Console.
2. Click the down arrow next to **HPE OneView for VMware vCenter**.
   The main menu is displayed.
3. Under **MANAGERS**, click **vCenters**.
   The **vCenters** page is displayed.
4. Select the vCenter that you want to delete.
5. From the **Actions** drop-down list, select **Delete**.
6. To confirm the delete action, click **Yes, delete**.

vSphere Client Administration

The vSphere Client home page provides access to the following administration pages. The page links are provided in the left navigation pane.
### Figure 1: Administration

**Under HPE OneView for VMware vCenter option:**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HPE Storage Systems</strong></td>
<td>This page provides information about the health status of storage systems. From HPE Storage Systems page, you can:</td>
</tr>
<tr>
<td></td>
<td>• Enable or disable VASA service on HPE 3PAR Storage System.</td>
</tr>
<tr>
<td></td>
<td>• Register VASA provider to vCenter.</td>
</tr>
<tr>
<td></td>
<td>• Create, renew, and export the storage certificates for VASA provider.</td>
</tr>
<tr>
<td><strong>HPE Storage Schedules</strong></td>
<td>This page provides a list of all the schedules defined for datastores. The page provides details like the datastore name, the frequency of the schedule, the previous and the next execution time, the start time. You can also delete a schedule from this page by selecting the schedule and clicking icon.</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Getting Started</strong></td>
<td>This page provides information on accessing the information on the installed HPE OneView for VMware vCenter version. It also provides links to:</td>
</tr>
<tr>
<td></td>
<td>• About HPE OneView for VMware vCenter</td>
</tr>
<tr>
<td></td>
<td>• About HPE and VMware</td>
</tr>
<tr>
<td></td>
<td>• Configuring the product</td>
</tr>
<tr>
<td></td>
<td>• Using the product</td>
</tr>
<tr>
<td><strong>Administrator Console</strong></td>
<td>This page provides a hyperlink to access the HPE OneView for VMware vCenter Administrator Console that enables configuration of vCenter server instances and storage systems. You can assign access permissions for storage pools belonging to the storage systems that support provisioning. You can launch the Administrator Console from this page.</td>
</tr>
<tr>
<td><strong>Certificate Management</strong></td>
<td>From this page, you can view an installed signed certificate, generate a new self-signed certificate, or generate a certificate signing request to be signed by a Certificate Authority.</td>
</tr>
<tr>
<td><strong>Server Integrations</strong></td>
<td>Access this page to set credentials for HPE OneView, global credentials or specific device credentials for HPE Onboard Administrator, ESXi servers, HPE iLO, and HPE Virtual Connect.</td>
</tr>
<tr>
<td><strong>HPE OneView for VMware vCenter Deployment Server</strong></td>
<td>This page provides options to view a list of OS build plans, create, edit, and delete OS build plans. From this page, you can also upload an ESXi ISO image to any of the existing build plans or remove them.</td>
</tr>
</tbody>
</table>

**Administrator Console**

This page provides a hyperlink to access the HPE OneView for VMware vCenter Administrator Console that enables configuration of vCenter server instances and storage systems.

To launch Administrator Console from vSphere Client:

1. Navigate to **Menu > Administration**.
2. Under **HPE OneView for VMware vCenter**, click **Administrator Console**.
   
   The **Administrator Console** page is displayed.
3. Click **Launch Administrator Console** link.
   
   The **HPE OneView for VMware vCenter** login page is displayed.
4. Log in using username and password.
   
   The **HPE OneView for VMware vCenter** page is displayed.
# HPE OneView for VMware vCenter

The HPE OneView for VMware vCenter provides the following options:

<table>
<thead>
<tr>
<th>Menu</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
</table>
| **GENERAL** | **Activity** | This page provides the information on all the activities performed on the appliance. You can filter the information based on:  
  • Activities that need attention.  
  • Type of an activity — All, Alerts, and Tasks.  
  • Status of an activity — All, Critical, Warning, OK, Unknown, or Disabled.  
  • State of an activity — All, Active, Locked, Cleared, Pending, Running, Completed, Interrupted, Error, Warning, Terminated, or Killed.  
  • Time duration — Today, Last 7 days, Last 30 days, Older than 3 months, Older than 1 year, or you can also specify a date range. |
| **MANAGERS** | **vCenters** |  
  • **Add vCenter** — Adds single or multiple vCenters.  
  • **Edit vCenters** — Modifies the details of the selected vCenter.  
  • **Refresh vCenters** — Refreshes the selected vCenter.  
  • **Delete vCenters** — Deletes the selected vCenter. |
### INFRASTRUCTURE

**Storage Systems**

- **Get an Overview** — Provides the details about the selected storage system.
- **Add storage system** — Adds single or multiple storage systems.
- **Edit storage system** — Modifies the details of the selected storage system.
- **Refresh storage system** — Refreshes the selected storage system.
- **Delete storage system** — Deletes the selected storage system.

You can also filter the information for the storage systems based on the health status of a storage system — Critical, Warning, OK, Unknown, or Disabled.

### ADMINISTRATION

**Settings**

- **Management VM** — configure network and DNS settings.
- **Log Collection** — generate logs required for logging a support call.
- **Sessions** — display information about all the active sessions in the appliance.
- **Time** — display the log in time and date.
- **Upgrade** — display the last upgrade activity status and update the appliance to the latest version.
- **Backup and Restore** — display the date and time of the last backup taken. Initiate the backup or restore from the backup of the configuration date about the servers, enclosures, and storage systems in the HPE OneView for VMware vCenter plug-in.
- **Custom Properties** — define custom properties for debugging with help from the support personnel.
- **Logging** — enable or disable trace-level logging for troubleshooting.
<table>
<thead>
<tr>
<th>Menu</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users</td>
<td>• Add local user</td>
<td>add single or multiple local users as Administrator or Observer.</td>
</tr>
<tr>
<td></td>
<td>• Edit</td>
<td>modify the details of the selected user.</td>
</tr>
<tr>
<td></td>
<td>• Remove</td>
<td>remove a selected user.</td>
</tr>
<tr>
<td>DATA</td>
<td>RMC Instances</td>
<td></td>
</tr>
<tr>
<td>PROTECTION</td>
<td>• Adding RMC instances</td>
<td>add single or multiple RMC instances.</td>
</tr>
<tr>
<td></td>
<td>• Editing RMC instances</td>
<td>modify the details of the selected RMC instance.</td>
</tr>
<tr>
<td></td>
<td>• Refreshing RMC instances</td>
<td>refreshes the selected RMC instance.</td>
</tr>
<tr>
<td></td>
<td>• Deleting RMC instances</td>
<td>delete the selected RMC instance.</td>
</tr>
</tbody>
</table>

**Certificate Management**

The Certificate Management page enables you to generate a new self-signed certificate for HPE OneView for VMware vCenter or generate a certificate signing request to be signed by a Certificate Authority. You can install a certificate once it is signed.

You can perform the following tasks:

- View installed certificate
- Installing a CA-signed certificate

**Navigating to Certificate Management page**

To navigate to Certificate Management page:

1. Login to vSphere Client.
2. From Menu drop-down list, select Administration.
3. Select **HPE OneView for VMware vCenter > Certificate Management**.

The Certificate Management page appears.
Figure 2: Certificate Management page

Viewing installed certificate

Procedure

1. Navigate to **Menu > Administration > Certificate Management**.
   The **Certificate Management** page is displayed.

2. Click **View Installed Certificate**.
   The **View Installed Certificate** window with the details of the certificates is displayed.

3. To save and go back to the **Certificate Management** page, click the **Close** icon.

Installing a CA-signed certificate

HPE recommends using a CA-signed certificate when using the HPE OneView for VMware vCenter with the VMware VASA provider.

Procedure

1. Navigate to **Home > Administration > HPE OneView for VMware vCenter**.

2. Click **Certificate Management**.
   The **Certificate Management** page is displayed.

3. Click **Generate certificate signing request**.
   The **Generate Certificate Signing Request window** is displayed.

4. Enter the following information in the mandatory fields:
   - Country
   - State
   - Locality
• Organization
• Common name (The fully qualified vCenter Server name)

Additionally, you can also enter the information in the optional fields:
• Organization unit
• Email
• Surname
• Given name

The certificate signing request is generated. A certificate request with 1024-bit encryption is generated.

5. Click Close to save and go back to the Certificate Management window.
6. Provide the certificate signing request to your trusted authority. The trusted authority must generate a signed certificate that matches your signing request.
7. Export the certificate using Base-64 encoding.
8. Click Install Signed Certificate.
   The Install Signed Certificate window opens.
9. Press ctrl+v to paste the certificate in the empty text area.
10. Click Close to save and go back to the Certificate Management page.
11. Restart the HPE OneView for VMware vCenter appliance.

**Configuring Server Integrations for HPE OneView for VMware vCenter**

Post configuring the HPE OneView for VMware vCenter plugin:
• Add credentials of HPE OneView for HPE OneView-managed hosts.
• Add credentials for HPE iLO, HPE Virtual Connect, ESXi, and HPE Onboard Administrator for managing non-HPE OneView hosts.

**Procedure**

1. Log in to the vSphere Client home page.
2. Navigate to Menu > Administration > HPE OneView for VMware vCenter > Server Integrations.

**HPE OneView for VMware vCenter for Server credentials**

HPE OneView for VMware vCenter for Server credentials page enables you to manage the credentials for infrastructure integration and Hewlett Packard Enterprise management software integration. From the credentials page, you can set:
• HPE OneView Credentials
• Server Credentials
HPE OneView Credentials

From the OneView tab, you can view and set the credentials for the HPE OneView appliance. You can perform the following tasks:

- **Add a new HPE OneView credentials**—Click the Add icon. If the host or the credentials are invalid, the HPE OneView appliance is not added.

  NOTE: From HPE OneView 4.0, the connection between HPE OneView and the vCenter requires a trusted certificate. This might require adding the vCenter’s certificate or a CA certificate to HPE OneView using the Manage Certificates screen in HPE OneView.

  NOTE: If your HPE OneView appliance is configured to authenticate using one or more Directory servers, the plugin can only authenticate against the Default Directory configured in HPE OneView. When entering the username, only enter the UserName portion of the full account username. For example, if the full account username is MyUser@example.com or example\MyUser configure the plugin with the username MyUser.

- **Delete an HPE OneView credential**—Select the appliance for which you want to delete the credentials, and then click the Delete icon.

- **Edit an HPE OneView credential**—Select the appliance for which you want to edit the credentials and then click the Edit icon. Only the password can be edited.

- **HPE OneView Configuration**—The HPE OneView Configuration window displays the status of the registered vCenter with the selected HPE OneView appliance. To access the HPE OneView Configuration window, select the HPE OneView appliance and then click the icon. From the OneView Configuration window, you can perform the following tasks:
  - View status (Connected, Registering, Not Registered, Configuring, and Disconnected) of the vCenter registered to the HPE OneView appliance.
  - Reregister the vCenter if the status shows "Not Registered".
  - Deleting the vCenter will unregister the vCenter in the selected HPE OneView appliance.

To verify the status of the vCenter registration to HPE OneView appliance:
1. Navigate to Administration > HPE OneView for VMware vCenter > Server Integrations. The HPE Server Integrations page is displayed.
2. Under the OneView Credentials, select the HPE OneView credentials from the table, and click icon.

The OneView Configurations window is displayed.
NOTE: If the vCenter certificate is not added in the HPE OneView, the following error message is displayed for the missing certificate:

VMware vCenter is not registered with OneView. Ensure OneView has a network path to the vCenter and can validate the vCenter certificate.

3. Under Cluster Management, if the status for the vCenter is displayed as Not Registered, click the icon to reregister the vCenter.

The status changes to Registering. This process might take some time.

4. To unregister a vCenter, select the vCenter and click the icon.

5. To close the window, click OK or Cancel

Server Credentials

NOTE: Device credentials are no longer needed for HPE OneView managed hardware. All data will be collected from HPE OneView.

The Servers tab allows you to set the Device credentials for individual or global devices as follows:

- The credentials must be defined for ESXi, HPE-Integrated Lights Out (iLO), HPE Onboard Administrator (OA), and HPE Virtual Connect (VC).
- Use global credentials if your environment uses the same credentials for all or many of the entities in the infrastructure.
- Use specific device credentials if your environment uses different credentials for each device.
- If global HPE Onboard Administrator and HPE Virtual Connect credentials are not defined, each HPE Onboard Administrator and HPE Virtual Connect must have a specific credential entry. This includes secondary HPE Onboard Administrator modules and subordinate HPE Virtual Connect modules.
- If credentials have not been defined for an entity's IP/Hostname, the global credential, if defined, will be used.
1. Login to the vCenter client.


3. Click the add icon.

   The Add Device Credentials window is displayed.

4. Select the type of host for which you want to add the device credentials from the Type drop-down list.

5. Select one of the following scopes: IP or Global.

   a. If you choose IP, enter the IP/HostName.

   b. If you choose Global, the IP/HostName field displays Global.

6. Enter UserName, Password and Confirm Password.

   NOTE: Confirm Password option is added to mitigate the possibility of adding wrong password.

7. Click Save. The Device credentials for individual device or global device is added.

   NOTE: If both global and individual device credentials are added, the global device credentials are by default listed at the top of the table.

Edit Device Credentials

1. Login to the vCenter client.


3. Select the device credential that you want to edit, and click edit icon.

4. Enter the new Password and then Confirm Password.

5. Click Save.

   NOTE: You can only edit the Password and Confirm Password fields.

Delete Device Credentials

1. Login to the vCenter client.


3. Select the device credential that you want to delete, and click delete icon.

4. To confirm the deletion, click Yes.

Configuring vCenters and Storage Systems

After the HPE OneView for VMware vCenter appliance is deployed and powered on, use HPE OneView for VMware vCenter Administrator Console to configure storage systems and vCenters.
Configuring HPE OneView for VMware vCenter

This section provides information about how to maintain the configuration data for vCenters and HPE storage systems in the HPE OneView for VMware vCenter appliance.

- Configuring vCenters
- Configuring Storage System
- Configuring HPE Recovery Manager Central (RMC)

**NOTE:** You must have a super user role or administrator privileges to use all the functionality provided by HPE OneView for VMware vCenter.

Before proceeding, verify that the storage systems and the management servers meet the network connectivity requirements described in the *Single Point of Connectivity Knowledge*.

Configuring storage systems

This section is about configuring and managing storage systems in HPE OneView for VMware vCenter environment. You can use the Actions drop-down menu to manage (Add, Edit, Refresh, and Delete) the storage systems currently configured in the environment.

**NOTE:** Before proceeding, verify that the storage systems and the management servers meet the network connectivity requirements described in the *HPE OneView for VMware vCenter Installation Guide*.

Adding storage systems

**Procedure**

1. Log in to Administrator Console.
   
   The *HPE OneView for VMware vCenter* page opens.

2. Navigate to *Infrastructure > Storage Systems*.

3. Click *+ Add storage system* from the master pane.

4. Provide the following details in the *General* pane of the *Add storage system* screen.
   
   - **Type**—Specify the type of storage system you want to add, such as HPE MSA, HPE 3PAR StoreServ, HPE StoreVirtual, or HPE StoreOnce.
   
   - **Name**—Specify a valid host name or an IPv4 address.
   
   - **Username**—Specify a valid user name.
   
   - **Password**—Specify a valid password.

5. Click *Connect*.
   
   The screen displaying the SSL certificate details appears.

6. Review the details and click *Accept*.

**NOTE:** An error or a warning box appears if there are any issues related to the certificate. Address the issues, if any.
7. As part of adding storage system, you can change the access permission for individual storage pools on the storage systems or change the access for all the storage pools by performing either of the following:

   a. To change access permission for individual storage pools on the storage systems, click **Read only** on the Maintenance tool to toggle the value to **Allow provisioning**.

   OR

   b. To change access permission for all storage pools on the storage systems, click **Set All** to toggle the value.

8. Click **Add**

   **NOTE:** Add + enables you to add another Storage System in the same dialog box.

   The Refresh Storage Data dialog appears.

9. Click **Yes, refresh data**.

   The Add Storage Systems screen displays the current health state and the refresh data status of the storage system.

10. You can postpone and initiate refresh at a later time, by clicking **Cancel**.

## Initiating a refresh

To initiate refresh at a later time:

1. Log in to the Administrator Console.

   The HPE OneView for VMware vCenter page is displayed.

2. Navigate to **Infrastructure > Storage Systems**.

3. From the Actions drop-down menu, select **Refresh** or click on the header of the sub menu items of HPE Storage menu in vCenter.

## Modifying storage systems

### Procedure

1. Select one of the storage systems configured in HPE OneView for VMware vCenter.

2. From the **Actions** menu, click **Edit**.

3. Provide the credentials and click **Connect**.

4. Change the permissions to the storage pools, if you need to by following step 7 in **Adding Storage System**.

5. From the **Actions** menu, click **Refresh**.
Deleting storage systems

Procedure
1. Select one of the storage systems configured in HPE OneView for VMware vCenter.
2. From the Actions menu, select Delete.
3. To confirm that you want to continue with deleting the information about the selected Storage System, click Yes, delete.

Configuring HPE Recovery Manager Central (RMC)

This section is about configuring and managing HPE Recovery Manager Central (RMC) in HPE OneView for VMware vCenter environment. You can use the Actions drop-down menu to manage (Add, Edit, Refresh, and Delete) the RMC currently configured in the environment.

Adding RMC instances

Procedure
1. Log in to Administrator Console.
   The HPE OneView for VMware vCenter page opens.
2. Navigate to Data Protection > RMC Instances.
3. Click + Add RMC Instance from the master pane.
4. Provide the following details in the General pane of the Add RMC screen.
   • FQDN/IP address—Specify a valid FQDN/IP address.
   • Username—Specify a valid user name.
   • Password—Specify a valid password.
5. Click Add.
   NOTE: Add + enables you to add another RMC Instance in the same dialog box.
6. The screen displaying the Accept certificate details appears. Review the details and click Accept.
   NOTE: If there are any issues related to the certificate, an error or a warning box appears. Address the issues, if any.
7. Refresh recovery managers screen appears, click Yes, refresh data.
   The RMC Instances screen displays the current health state and the refresh data status.
   NOTE: You can postpone and initiate refresh at a later time, by clicking Cancel.
Editing RMC instances

Procedure
1. Select one of the RMC instances configured in HPE OneView for VMware vCenter.
2. From the Actions menu, click Edit.
3. Provide the new credentials and click OK.
4. From the Actions menu, click Refresh.

Refreshing RMC instances
To initiate refresh at a later time:
1. Log in to the Administrator Console.
   The HPE OneView for VMware vCenter page is displayed.
2. Navigate to Data Protection > RMC Instances.
3. From the Actions drop-down menu, select Refresh.

Deleting RMC instances

Procedure
1. Select one of the RMC instances configured in HPE OneView for VMware vCenter.
2. From the Actions menu, select Delete.
3. Click Yes, delete and confirm that you want to continue with deleting the information about the selected RMC Instance.

NOTE: RMC Instance deletion only removes it from HPE OneView for VMware vCenter context. All the schedules and recovery sets that are managed by RMC continues to exist.

HPE OneView for VMware vCenter appliance settings

From the Settings page, you can perform any of the following tasks:

<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management VM</td>
<td>To configure the network and DNS settings.</td>
</tr>
<tr>
<td>Log Collection</td>
<td>To generate logs required for logging a support call for the product.</td>
</tr>
<tr>
<td>Sessions</td>
<td>Displays information about all the active sessions (deployment, provisioning, and so on) in the appliance.</td>
</tr>
<tr>
<td>Time</td>
<td>Displays the log in time and date.</td>
</tr>
<tr>
<td>Upgrade</td>
<td>Displays the last upgrade activity status and can be used to update the appliance to the latest version.</td>
</tr>
</tbody>
</table>

Table Continued
<table>
<thead>
<tr>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backup and Restore &gt;</td>
<td>Displays the date and time of the last backup taken. Used to initiate the backup or restore from the backup of the configuration date about the servers, enclosures, and storage systems in the HPE OneView for VMware vCenter plug-in. For more information, see Backup and Restore.</td>
</tr>
<tr>
<td>Custom Properties &gt;</td>
<td>Used to define the customer properties that can be used for debugging with help from the support personnel. For more information, see Custom Properties.</td>
</tr>
<tr>
<td>Logging &gt;</td>
<td>Used to enable or disable Trace-level logging, if required by the support personnel for troubleshooting. For more information, see Logging.</td>
</tr>
</tbody>
</table>

Navigating to the Settings page

1. From Menu drop-down list, select Administration.
2. Under HPE OneView for VMware vCenter, click Administrator Console.
   The Administrator Console login page is launched.
3. Log in to the Administrator Console.
   The Settings page is displayed.

### Backup and restore

**Backup**

You can create a backup that will replace any existing backup on the system locally. You can also download and manage the backup outside the system.

**Restore**

The following are ways you can perform a restore:
• Restore from a previously downloaded backup file by browsing or dragging and dropping it into the
dialog.
• Restore from a local backup, if it exists.

For more information about backup and restore, see the HPE OneView for VMware vCenter Installation
Guide.

Custom properties
You can create the custom properties, as suggested by the support personnel.

Logging
Enable trace level logging, if required by the support personnel.

Role-based security
HPE OneView for VMware vCenter uses role-based security access. Windows or domain users/groups
can be assigned to any of the vCenter roles. HPE OneView for VMware vCenter classifies these roles into
three categories:

• Administrator—The vCenter administrator role maps to this category.
• Read-only—The vCenter read-only and view-only roles map to this category.
• User—All other vCenter roles map to this category.

An administrator can:
• Run the setup wizard.
• Edit the password database.
• Use the properties link to edit properties.
• Launch Hewlett Packard Enterprise management tools.
• Access the HPE OneView for VMware vCenter Server vSphere Client home page.

A read-only user can:

View HPE OneView for VMware vCenter.

A user can:

• Launch Hewlett Packard Enterprise management tools.
• View HPE OneView for VMware vCenter.

For information about assigning a user access role, see the HPE OneView for VMware vCenter
Installation Guide.
Using HPE OneView for VMware vCenter for Servers

HPE OneView for VMware vCenter for Server enables you to complete the following tasks when using HPE ProLiant servers and BladeSystem enclosures on the network:

After HPE OneView for VMware vCenter is installed, an **HPE Server Hardware** menu is added to the vSphere Client under the **Monitor** and **Manage/Configure** tabs. HPE OneView for VMware vCenter for Server enables you to complete the following tasks when using HPE ProLiant servers and BladeSystem enclosures on the network:

- Monitor health status.
- Manage server information.
- Manage and update firmware inventory.
- Identify the physical server.
- Trace network path from virtual machine to external switch.
- Display deployment and network configuration features.
- Display enclosure view.
- Alert and event forwarding from Onboard Administrator, and CIM providers to vCenter Server.

Use HPE OneView for VMware vCenter for Server to manage clusters and hosts remotely, manage system health and configuration, optimize power usage, and for Virtual Connect networking. The administrator can manage the system and monitor the Virtual Connect network, gather information about individual HPE ProLiant servers and BladeSystem enclosures or the infrastructure, and launch certain HPE tools.

**Related topics**

- **Navigating HPE Server Hardware**
- **Managing HPE Enclosures**
- **FCoE support using HPE 5900 switch**

**Navigating HPE server hardware**

HPE OneView for VMware vCenter displays information about the servers under **HPE Server Hardware** menu. Information from HPE iLO, HPE Onboard Administrator, CIM providers, and HPE Virtual Connect Manager is compiled and displayed at both the cluster level and the host level.

- **Accessing the HPE Server Hardware**
  - **Monitor**
  - **Configure**

**Accessing HPE Server Hardware**

After completing the installation and configuration procedures, you can use the vSphere Client to access HPE OneView VMware for vCenter.
Procedure

1. Log into the vSphere Client.
   The vSphere Client home page is displayed.

2. Select a cluster, host, VM, or datastore from the left navigation pane.

3. Click the Monitor or Manage or Configure tab.

4. Click HPE Server Hardware menu option.
   Based on the selected component and tab, submenu options are displayed.
   For more information submenus, see Monitor and Manage/Configure.

Monitor

The HPE Server Hardware menu for the Monitor tab provides information on the configured vCenters under following categories:

- **Overview** — Provides the details of the selected host and ports that it connects to.
- **Hardware** — Provides detailed information about the selected host server such as the health state of that server, server profile, model type, location of the server, iLO IP address, memory, serial number, product ID.
- **Firmware** — Provides the details of the firmware component installed for the selected host.
- **Network Ports** — Provides the details of the network ports IP address and Virtual switch.
- **Activity** — Provides information about any active alerts in HPE OneView or in iLO for non-HPE OneView managed servers.
- **Network Diagram** — Displays a graphical representation of the network topology of the server. This feature requires HPE Blade Enclosures or Frames with HPE Interconnects.
- **Communication Status** — Provides information about the communications status of the non-HPE OneView managed servers.
- **Remote Support** - Provides support or contract information for specific vCenter host.

Overview

The Overview page displays the hardware and ports information for the selected host server.
Launching into HPE Tools

The Overview page for the HPE Server Hardware provides links to launch the following HPE tools:

- Integrated Lights Out
- Onboard Administrator
- Virtual Connect Manager
- HPE OneView — This link is displayed if the selected host is managed by HPE OneView. If a selected cluster contains hosts managed by HPE OneView, this link will be displayed at the cluster level also. If the cluster includes hosts managed by separate instances of HPE OneView, mouse-over the HPE OneView icon to display a popup menu with links to each HPE OneView instance.

When configured for vCenter administrators, auto-login is enabled for direct launch into the HPE tools listed in this section with the exception of HPE OneView, which does not support auto-login. Users with read-only access cannot access the HPE tools. Other non-administrative vCenter Server users are prompted to enter a user name and password to access the HPE tools.

**NOTE:** For DL servers, the Onboard Administrator launch link is unavailable.

Links that appear to be transparent indicate that the tool is inaccessible or that no data is available.

Hardware

to view the current hardware details about the selected host, select the Hardware page from the drop-down menu. The Hardware page displays the following information:
### Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Defines whether HPE OneView profile has been applied to the host or not.</td>
</tr>
<tr>
<td>Server Profile</td>
<td>Name of the HPE OneView profile applied.</td>
</tr>
<tr>
<td>Server Profile</td>
<td>Consistency between the server profile and server profile template.</td>
</tr>
<tr>
<td>Server power</td>
<td>Displays the state of the server power.</td>
</tr>
<tr>
<td>Model</td>
<td>Displays the model number of the selected host.</td>
</tr>
<tr>
<td>Product ID</td>
<td>Displays the product ID of the selected host.</td>
</tr>
<tr>
<td>Serial number</td>
<td>Displays the serial number of the selected host.</td>
</tr>
<tr>
<td>License</td>
<td>Displays the type of the license.</td>
</tr>
<tr>
<td>UUID</td>
<td>Universally unique identifier set when a server hardware type is inserted in the bay.</td>
</tr>
<tr>
<td>Virtual UUID</td>
<td>Universally unique identifiers assigned to the virtual machine.</td>
</tr>
<tr>
<td>iLO</td>
<td>Integrated Lights Out.</td>
</tr>
<tr>
<td>Location</td>
<td>Displays the details of the rack and the bay where the host is installed.</td>
</tr>
<tr>
<td>Asset tag</td>
<td>Identifies the hardware for tracking and inventory purposes.</td>
</tr>
<tr>
<td>Maximum power</td>
<td>Displays the maximum power limit.</td>
</tr>
<tr>
<td>CPU</td>
<td>Displays the CPU details of the selected host server.</td>
</tr>
<tr>
<td>Memory</td>
<td>Displays the RAM capacity details for the server.</td>
</tr>
<tr>
<td>Powered by</td>
<td>Displays the power delivery device or devices that are connected to the server hardware.</td>
</tr>
</tbody>
</table>

### Ports

To see the details of the ports in use for the selected host, select the **Ports** page. Based on the underlying hardware - HPE ProLiant BL servers or HPE ProLiant DL servers, the port details are represented in tabular or graphical formats. The tabular format covers all the data about the ports and the
The graphical (doughnut) representation displays the connection speed for the ports. For the HPE ProLiant BL servers, the Ports page displays data in both the tabular as well as the graphical format. For the HPE ProLiant DL servers, the Ports page displays data in tabular format only.

The following image is a sample for the tabular and graphical representation of the port details for HPE ProLiant BL servers.

The following image is a sample for the tabular representation of the port details for HPE ProLiant DL servers.

Firmware

To view the firmware version details for the selected host, select the Firmware page from the drop-down menu.
Activity

To view the HPE OneView Active and Locked alerts, select the Activity page from the drop-down menu.

The following table lists active and locked alerts under the following columns:
### Field | Description
--- | ---
**Status** | The icon indicates the status of the task or alert. You can filter the alerts based on the following status types:
- All
- Critical
- Warning

**Name** | The name or a short description of the task or alert.

**Date** | The date and time of the alert.

**State** | The state of the task or the alert:
- All
- Active
- Locked

**Owner** | The name of the user that either started the task or is assigned to investigate the alert.

---

**Device Inventory**

To view device inventory details of the selected host, select the **Device Inventory** page from the drop-down menu.

---

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Displays the location of the device.</td>
</tr>
<tr>
<td>Product Name</td>
<td>Displays the name of the product.</td>
</tr>
<tr>
<td>Part Number</td>
<td>Displays the part number of the product.</td>
</tr>
</tbody>
</table>

*Table Continued*
### Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly number</td>
<td>Displays the board part number of the product.</td>
</tr>
<tr>
<td>Serial number</td>
<td>Displays the serial number of the product.</td>
</tr>
<tr>
<td>Product Version</td>
<td>Displays the current version of the product.</td>
</tr>
<tr>
<td>Firmware</td>
<td>Displays the current firmware version of the product.</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Displays the name of device manufacturer.</td>
</tr>
</tbody>
</table>

### Memory

To view memory details of the selected host, select the **Memory** page from the drop-down menu.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total memory</td>
<td>Displays the total size of the memory populated on the board.</td>
</tr>
<tr>
<td>Operating frequency</td>
<td>Displays the frequency at which memory on the board is operating.</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>Displays the voltage at which memory on the board is operating.</td>
</tr>
<tr>
<td>Parameters</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Configured AMP mode</td>
<td>Displays one of the following AMP modes:</td>
</tr>
<tr>
<td></td>
<td>• The system is configured for AMP with A3DC.</td>
</tr>
<tr>
<td></td>
<td>• The system is configured for AMP with the Advanced Error Correcting Code (ECC) engine.</td>
</tr>
<tr>
<td></td>
<td>• The system is configured for AMP with the LockStep engine.</td>
</tr>
<tr>
<td></td>
<td>• The system is configured for mirrored memory protection. All memory banks are duplicated in mirrored memory, as opposed to only one for online spare memory. If enough ECC errors occur, the spare memory is activated and the memory that is experiencing the errors is disabled.</td>
</tr>
<tr>
<td></td>
<td>• The management software cannot determine the AMP, or the system is not configured for AMP.</td>
</tr>
<tr>
<td></td>
<td>• A single spare bank of memory is set aside at boot time. If enough ECC errors occur, the spare memory is activated and the memory that is experiencing the errors is disabled.</td>
</tr>
<tr>
<td></td>
<td>• The system is configured for AMP with the XOR engine.</td>
</tr>
<tr>
<td></td>
<td>• The management software cannot determine the AMP, host OS may not have provided it yet.</td>
</tr>
</tbody>
</table>

*Table Continued*
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMP mode status</td>
<td>Displays one of the following AMP modes statuses:</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by AMP in the A3DC mode.</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by AMP in the Advanced ECC mode.</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by DIMM Error Correcting Code (ECC) only.</td>
</tr>
<tr>
<td></td>
<td>• The system was protected, but AMP is engaged. Therefore, AMP is no longer available.</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by AMP in the A3DC mode. One or more DIMM faults have been detected.</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by AMP in the Advanced ECC mode. One or more DIMM faults have been detected.</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by AMP in the LockStep mode. One or more DIMM faults have been detected.</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by AMP in the mirrored mode. One or more DIMM faults have been detected.</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by AMP in the hot spare mode. One or more DIMM faults have been detected.</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by AMP in the XOR memory mode. One or more DIMM faults have been detected.</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by AMP in the LockStep mode.</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by AMP in the mirrored mode. No DIMM faults have been detected.</td>
</tr>
<tr>
<td></td>
<td>• The system supports AMP, but the feature is disabled.</td>
</tr>
<tr>
<td></td>
<td>• The system is protected by AMP in the hot spare mode. No DIMM faults have been detected.</td>
</tr>
<tr>
<td></td>
<td>• The system does not support AMP, or the management software cannot determine the status.</td>
</tr>
<tr>
<td></td>
<td>• The system supports AMP. The feature is enabled but not engaged.</td>
</tr>
</tbody>
</table>

*Table Continued*
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• The system is protected by AMP in the XOR memory mode. No DIMM faults have been detected.</td>
</tr>
<tr>
<td></td>
<td>• The management software cannot determine the status, host OS may not have provided it yet.</td>
</tr>
<tr>
<td>Location</td>
<td>Displays the location of the memory in the platform.</td>
</tr>
<tr>
<td>Size</td>
<td>Displays the capacity of the memory.</td>
</tr>
<tr>
<td>Part Number</td>
<td>Displays the part number of the product.</td>
</tr>
<tr>
<td>Type</td>
<td>Displays the type of the memory.</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Displays the manufacturer of the memory.</td>
</tr>
<tr>
<td>HPE Memory</td>
<td>If HPE, Yes else No.</td>
</tr>
<tr>
<td>Minimum voltage</td>
<td>Displays the HPE extended property of Memory module.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Displays the operating speed of the memory.</td>
</tr>
<tr>
<td>Racks</td>
<td>Displays the number of ranks available in the memory.</td>
</tr>
<tr>
<td>Technology</td>
<td>Following are the technologies listed for memory. Displays one of the following names of the technology:</td>
</tr>
<tr>
<td></td>
<td>• Registered DIMM</td>
</tr>
<tr>
<td></td>
<td>• UDIMM</td>
</tr>
<tr>
<td></td>
<td>• SO_DIMM</td>
</tr>
<tr>
<td></td>
<td>• Load Reduced</td>
</tr>
<tr>
<td></td>
<td>• Mini_RDIMM</td>
</tr>
<tr>
<td></td>
<td>• Mini_UDIMM</td>
</tr>
<tr>
<td></td>
<td>• SO_RDIMM_72b</td>
</tr>
<tr>
<td></td>
<td>• SO_UDIMM_72b</td>
</tr>
<tr>
<td></td>
<td>• SO_DIMM_16b</td>
</tr>
<tr>
<td></td>
<td>• SO_DIMM_32b</td>
</tr>
</tbody>
</table>

*Table Continued*
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Type</td>
<td>Following device types are listed for memory. Displays one of the following device types:</td>
</tr>
<tr>
<td></td>
<td>• DDR</td>
</tr>
<tr>
<td></td>
<td>• DDR2</td>
</tr>
<tr>
<td></td>
<td>• DDR3</td>
</tr>
<tr>
<td></td>
<td>• DDR4</td>
</tr>
<tr>
<td></td>
<td>• DDR4 SDRAM</td>
</tr>
<tr>
<td></td>
<td>• DDR4E SDRAM</td>
</tr>
<tr>
<td></td>
<td>• LPDDR4 SDRAM</td>
</tr>
<tr>
<td></td>
<td>• DDR3 SDRAM</td>
</tr>
<tr>
<td></td>
<td>• LPDDR3 SDRAM</td>
</tr>
<tr>
<td></td>
<td>• DDR2 SDRAM</td>
</tr>
<tr>
<td></td>
<td>• DDR2 SDRAM FB_DIMM</td>
</tr>
<tr>
<td></td>
<td>• DDR2 SDRAM FB_DIMM PROBE</td>
</tr>
<tr>
<td></td>
<td>• DDR SGRAM</td>
</tr>
<tr>
<td></td>
<td>• DDR SDRAM</td>
</tr>
<tr>
<td></td>
<td>• ROM</td>
</tr>
<tr>
<td></td>
<td>• SDRAM</td>
</tr>
<tr>
<td></td>
<td>• EDO</td>
</tr>
<tr>
<td></td>
<td>• Fast Page Mode</td>
</tr>
<tr>
<td></td>
<td>• Pipelined Nibble</td>
</tr>
<tr>
<td>Error correction</td>
<td>Displays the error correction scheme supported for this memory.</td>
</tr>
<tr>
<td>Data width bits</td>
<td>Displays the data width in bits.</td>
</tr>
<tr>
<td>Bus width bits</td>
<td>Displays the bus width in bits.</td>
</tr>
<tr>
<td>Channel</td>
<td>Displays the channel number in which memory is connected.</td>
</tr>
<tr>
<td>Memory Controller</td>
<td>Displays the memory controller number in which memory is connected.</td>
</tr>
</tbody>
</table>

*Table Continued*
### Parameters

<table>
<thead>
<tr>
<th>Slot</th>
<th>Displays the slot number in which memory is connected.</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Following states are listed for controller. Displays one of the following states:</td>
</tr>
<tr>
<td></td>
<td>• This function or resource is not present or not detected.</td>
</tr>
<tr>
<td></td>
<td>• The element will not process any commands but will queue new requests.</td>
</tr>
<tr>
<td></td>
<td>• This function or resource has been disabled.</td>
</tr>
<tr>
<td></td>
<td>• This function or resource has been enabled.</td>
</tr>
<tr>
<td></td>
<td>• This function or resource is undergoing testing.</td>
</tr>
<tr>
<td></td>
<td>• The element is enabled but only processes a restricted set of commands.</td>
</tr>
<tr>
<td></td>
<td>• This function or resource is enabled, but awaiting an external action to activate it.</td>
</tr>
<tr>
<td></td>
<td>• This function or resource is part of a redundancy set and is awaiting a failover or other external action to activate it.</td>
</tr>
<tr>
<td></td>
<td>• This function or resource is starting.</td>
</tr>
<tr>
<td></td>
<td>• This function or resource is present but cannot be used.</td>
</tr>
<tr>
<td></td>
<td>• The element is updating and may be unavailable or degraded.</td>
</tr>
</tbody>
</table>

### Local storage

To view storage details of the selected host, select the **Local Storage** page from the drop-down menu.
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Identifies the location of the controller.</td>
</tr>
<tr>
<td>Model</td>
<td>The model number for the controller.</td>
</tr>
</tbody>
</table>
| Type                    | Following are the types of the controllers listed. Displays one of the following types:  
                          | • A controller that allows software RAID configuration.                                                                                  |
|                         | • A controller that supports all SmartArray features and configuration.                                                                      |
|                         | • A controller that functions natively as an HBA, but has a ValueRAID mode for basic RAID configuration.                                  |
| Serial number           | Displays the serial number of the controller.                                                                                              |
| Firmware                | Displays the current firmware version of the controller.                                                                                   |
| Cache module status     | Represents the health state of the cache module.                                                                                           |
| Cache module serial number | Displays the serial number of the cache module.                                                                                          |
| Cache module memory     | Displays the total cache memory size of the controller.                                                                                   |
| Encryption status       | Defines whether encryption is enabled for the controller or not.                                                                           |
| Encryption ASIC status  | Defines whether the encryption self-test passed or failed.                                                                                   |
| Encryption critical security parameter NVRAM status | Defines whether the encryption CSP test passed or failed.                                                                                       |
| Physical Drive          | Displays the location of the drive.                                                                                                         |
| Drive Enclosure         | Internal/External                                                                                                                         |
| Type                    | Following are the types of the drives listed. Displays one of the following types:  
                          | • Nonvolatile memory  
                          | • PCIe interface  
                          | • SAS  
                          | • SATA  
                          | • Information is unavailable |
| Capacity                | Displays the capacity of the drive.                                                                                                        |
| Serial number           | Displays the serial number of the drive.                                                                                                   |
| Model                   | Displays the model number of the drive.                                                                                                     |
### Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firmware</td>
<td>Displays the current firmware version of the disk drive.</td>
</tr>
<tr>
<td>Drive configuration</td>
<td>Displays the location of the drive.</td>
</tr>
<tr>
<td>Encryption</td>
<td>Defines whether the encryption is enabled on this disk drive or not.</td>
</tr>
</tbody>
</table>

### Network Diagram

The **Network Diagram** page under Monitor tab for HPE Server Hardware displays a graphical representation of the network topology of the server.

**Port Telemetry:**

The **Network Diagram** gives the Telemetry information of the HPE OneView Interconnect Ports. To view telemetry of the interconnect port, mouse-hover over the interconnect-port to display a graph which contains the following information:

- The data transfer rate is in Kilobits/sec, Megabits/sec, or Gigabits/sec.
- Blue line displays transmitted(out) data through the port over time.
- Green line displays the received(in) data through the port over time.
NOTE: If the transmitted or received information is not available from HPE OneView, Graph is not be displayed.

Link Aggregation Groups support
If you have configured LAG (Link Aggregation Groups) on the client system, the Network Diagram supports display of LAG.

Export
To save (.png format) and view the network diagram as and when required, click Export.

The following network diagram is applicable for HPE Composable Cloud for ProLiant DL only.

Communications Status
You can select Communication Status from the Overview drop-down list to view the information about the non-HPE OneView servers availability and display the following information:
Table 1: Non-HPE OneView Servers Communication Status

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Component</td>
<td>The management components listed for non-HPE OneView servers are:</td>
</tr>
<tr>
<td></td>
<td>• server</td>
</tr>
<tr>
<td></td>
<td>• iLO</td>
</tr>
<tr>
<td></td>
<td>• OA</td>
</tr>
<tr>
<td></td>
<td>• VC</td>
</tr>
</tbody>
</table>

Remote Support

To view information about the HPE OneView remote support for the selected host, select the Remote Support page from the drop-down menu.

For more information, see HPE OneView Remote Support information.
HPE OneView for VMware vCenter—Dashboard

HPE OneView for VMware vCenter—Dashboard provides aggregate health status of server profiles, server hardware, and server consistency status for all the hosts available in a cluster. The dashboard is a single window that enables you to visualize the overall host status and help determine how many hosts are in critical or warning state.

**NOTE:** The server consistency health status is displayed only for HPE OneView-managed hosts.

To view the dashboard, select the cluster and click **Summary**. The page displays the status of server profiles, server hardware, and consistency in the summary section of the cluster using three doughnut graphs. You can view the count of a particular status by hovering the mouse on that section. The text in the center of the graph displays the highest count of the status or the aggregate status for the entity that the graph represents.

**NOTE:** The dashboard functionality is available only for the hardware managed by HPE OneView. For any non-HPE OneView host present in the cluster, the status is not displayed in the dashboard.
HPE Server Hardware – Manage/Configure

The Configuration tab provides the Consistency information for:

- Cluster configuration
- Host configuration

**NOTE:** HPE OneView supports granular/partial remediation. SPTs allow user to customize consistency checks for the sections of SPT. Connections, Firmware, and Storage have a **Consistency Checking** setting with the values of Exact Match, Minimum Match, and Not Checked. For Connections and Storage, HPE OneView for VMware vCenter provides Exact match value.

For Connections and Storage, HPE OneView for VMware vCenter supports only **Exact Match** as value. For more information, see *HPE OneView 4.2 Online Help*.

Cluster Consistency

The Configuration Consistency page displays the consistency information for all the hosts under it – whether the Host network configuration matches the Server Profile Template and if the Server Profile matches the Server Profile Template.

Procedure

1. Select the cluster.
2. Click **Configure** tab.
3. Click **HPE Server Hardware** menu.

   The **Configuration Consistency** page for the selected cluster is displayed. The information for all the hosts under the selected cluster is displayed.

   If you select the host in the table, the consistency for the selected host is displayed.
Host Consistency

The Configuration Consistency page displays whether the VM host configuration matches the HPE OneView Server Profile and if the Server Profile matches the cluster configuration. If there are any mismatches, the page displays the list of the recommended actions.

Procedure

1. Select the host.

   NOTE: The host can either be HPE OneView-managed or non-HPE OneView managed.

2. Click Configure tab.

3. Click HPE Server Hardware menu.

   • The Configuration Consistency page for a HPE OneView-managed cluster is displayed as follows:
     - While Host is in Consistency
       
       ![Server Profile matched with Server Profile Template]
       ![Host Network Configuration matched with Server Profile]

       The following message is displayed:
       
       Host Configuration matches the Server Profile

     - While server profile is not matched with Server Profile Template
       
       ![Server Profile does not match with Server Profile Template]
       ![Host Network Configuration matched with Server Profile]

       The following message is displayed:
       
       Host Configuration does not match the Server Profile

   • The Configuration Consistency page for a non-HPE OneView-managed cluster is displayed as follows:
     - While Host is in Consistency
While server profile is not matched with Server Profile Template

The **Configuration Consistency** page for the selected host is displayed.

You can use the **Apply Recommended Actions** button to trigger the recommended action and resolve the mismatch.

**NOTE:** The **Apply Recommended Actions** button is available only for HPE OneView-managed cluster configurations.

## Managing HPE Enclosures

HPE Enclosures provide information about the Health, Hardware, Firmware, and Activity information, and also other related information of Enclosure.

To access HPE Enclosures:

- From the **Menu** drop-down list, click **Shortcuts**.
  
  The **Shortcuts** page is displayed.

- Under **Inventories**, click **HPE Enclosures**.
  
  The **HPE Enclosures** page is displayed.

  ![HPE Enclosures](image)

- **Summary**
- **Monitor**
- **More Objects**
Summary

HPE Enclosures Summary page displays information for all enclosures configured in the environment. The number adjacent to the HPE Enclosures link in the left navigation panel indicates the number of enclosures in the environment.

The enclosure infrastructure information is organized into the following sections:

- **Summary**—The Summary page displays:
  - General enclosure information including name, rack, model, UUID, serial number, VMware hosts, and number of empty bays.
  - Pictorial representation of the current enclosure power and temperature values.
  - The health of the enclosure is indicated using color-coded icons:
    - A green icon ( ![green][1] ) indicates that there are no warnings or errors for this enclosure.
    - A yellow icon ( ![yellow][1] ) indicates warning.
    - A red icon ( ![red][1] ) indicates errors.

Details on the health may be obtained by logging in to the management console for the enclosure.

- **Devices portlet**—Lists the enclosure host servers and storage blades (for HPE Synergy).
- **Fans portlet**—Lists the enclosure fan information including model, status, and bay number.
- **Interconnects portlet**—Lists the interconnect information including status, product name, and bay number.
- **Power Supplies portlet**—Lists the enclosure power supply information including model, status, and bay number.

Monitor

The HPE Enclosure menu for the Monitor tab provides information on the following categories:

- **Activity**
- **CI Appliances**
- **Devices**
- **Fans**
- **Firmware**
- **General**
- **Hardware**
- **Interconnects**
- **Power Supplies**
- **Remote support**

The following table lists the status icons:
View the health of the environment and resources by selecting the **Activity** page from the drop-down menu. It combines all system and user-initiated tasks, alerts, and administrator notes into a single view.

The following table lists the health of the environment and resource information:

### Field | Description
--- | ---
**Status** | The icon indicates the status of the task or alert. You can filter the alerts based on the following status types:
  - All
  - Critical
  - Warning

**Name** | The name or a short description of the task or alert.
**Date** | The date and time of the alert.
Field | Description
--- | ---
State | The state of the task or the alert:
• All
• Active
• Locked
Owner | The name of the user that either started the task or is assigned to investigate the alert.

**NOTE:** The **Activity** is available only for the HPE OneView hosts and not for the standalone hosts or non-HPE OneView hosts.

**Composable Infrastructure Appliances**

To view the configured Composable Infrastructure Appliances in HPE Synergy enclosure, select the **Composable Infrastructure Appliances** page from the drop-down menu.

**NOTE:** This information is displayed only for HPE Synergy enclosures.

The following table lists the configured Composable Infrastructure (CI) Appliances in the HPE Synergy enclosure:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay</td>
<td>The bay number where the CI Appliances are located.</td>
</tr>
<tr>
<td>Status</td>
<td>The status of the CI Appliances.</td>
</tr>
<tr>
<td>Model</td>
<td>The model information of the CI Appliance. It is either HPE Synergy Composer or Images Streamer.</td>
</tr>
<tr>
<td>Power</td>
<td>Displays the state of power for the CI Appliance.</td>
</tr>
</tbody>
</table>
### Field | Description
---|---
Serial Number | Displays the serial number of the part.
Part Number | Displays the part number of the part.
Spare Part Number | Displays the spare part number of the part.

**Devices**

To view information about the different devices plugged into the enclosure bay, such as blade servers and drive-enclosures, select the **Devices** page from the drop-down menu.

![Image of HPE OneView interface showing devices]

The following table lists the information about devices:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
| Bay        | The device bay number for the device, such as server hardware or drive enclosure.  
For full-height or doublewide devices, the device is displayed in the primary bay. All other bays where the device is located are displayed as subsumed. |
| Status     | Indicates the status of the device.                                          |
| Hardware   | The enclosure and bay number for the device.                                |
| Host       | The host in the vCenter. It provides a link to navigate the host in vCenter's Host and Clusters inventory tree. If the host is not managed by the current vCenter, Unmanaged is displayed. |
| Server Name| The name of the server as reported by the iLO. If server name is not found, Not Configured is displayed. |
| Model      | Displays the model number, which is the same as product name.               |

*Table Continued*
### Field Description

**Server Profile**
Name of the HPE OneView profile applied.

**NOTE:** This field is available only for HPE OneView managed server.

**Power Allocation (Watts)**
Total amount of power that is allocated to the device in the enclosure.

**NOTE:** This field is available only for HPE Synergy enclosures.

### Fans

to view information about the fans for the selected enclosure, select the Fans page from the drop-down menu.

The following table lists the information about fans:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay</td>
<td>The bay number for the fan.</td>
</tr>
<tr>
<td>Status</td>
<td>Indicates the status of the fan.</td>
</tr>
<tr>
<td>Model</td>
<td>Displays the model number.</td>
</tr>
<tr>
<td>Serial Number</td>
<td>Indicates the factory serial number of the fan.</td>
</tr>
<tr>
<td>Part Number</td>
<td>Indicates the factory part number of the fan.</td>
</tr>
<tr>
<td>Spare Part Number</td>
<td>Indicates the fan spare part number you can order as a replacement.</td>
</tr>
</tbody>
</table>

**NOTE:** This field is available only for HPE Synergy enclosures.
### Field Description

**State**
Displays the state of the fan.

**NOTE:** This field is available only for C7000 enclosure type.

**Required**
Indicates if the fan is required to support cooling of devices.

**NOTE:** This field is available only for C7000 enclosure type.

---

### Firmware

To view details of the installed firmware for the various components of the selected enclosure, select the **Firmware** page from the drop-down menu.

The following table lists the installed firmware information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>The location of the component, such as the enclosure, bay number, or interconnect.</td>
</tr>
<tr>
<td>Component</td>
<td>The enclosure component for which the firmware status is being displayed, such as server iLOs, server system ROM, and interconnect module.</td>
</tr>
<tr>
<td>Installed</td>
<td>The version of firmware installed on the component.</td>
</tr>
</tbody>
</table>

---

### General

To view general details of the various components for the selected enclosure, select the **General** page from the drop-down menu.
The following table lists the general details of the various components:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Displays the name of the selected Enclosure.</td>
</tr>
<tr>
<td>State</td>
<td>Displays the state of the Enclosure, such as Configured, Monitored and etc.</td>
</tr>
<tr>
<td>Model</td>
<td>Displays the model name of the selected Enclosure.</td>
</tr>
<tr>
<td>Server Licensing Policy</td>
<td>Displays the Server Licensing Policy as HPE OneView Advanced for HPE OneView Managed and Insight Control for Non-HPE OneView.</td>
</tr>
<tr>
<td>Rack</td>
<td>Displays the configured rack name for the selected Enclosure. If the rack is not configured, Not Configured is displayed.</td>
</tr>
<tr>
<td>Logical Enclosure</td>
<td>Displays Logical Enclosure name for the selected Enclosure.</td>
</tr>
<tr>
<td>UUID</td>
<td>Displays the factory UUID for the selected Enclosure.</td>
</tr>
<tr>
<td>Serial Number</td>
<td>Displays the factory serial number for the Enclosure.</td>
</tr>
<tr>
<td>VMware Hosts</td>
<td>Displays the number of available hosts of the selected Enclosure.</td>
</tr>
<tr>
<td>Empty Bays</td>
<td>Displays the number of empty bays of the selected Enclosure.</td>
</tr>
</tbody>
</table>

**Hardware**

To view hardware details of the selected enclosure, select the Hardware page from the drop-down menu. OA details are displayed in a separate table.
The following table lists the installed hardware information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>The location of the component, such as the enclosure rack name.</td>
</tr>
<tr>
<td>Serial Number</td>
<td>Displays the serial number of the selected enclosure hardware.</td>
</tr>
<tr>
<td>Part Number</td>
<td>Displays the part number of the selected enclosure hardware.</td>
</tr>
<tr>
<td>Maximum Power</td>
<td>Displays the maximum power of the hardware in watts.</td>
</tr>
<tr>
<td>Powered by</td>
<td>Displays the number of power connections for the selected enclosure hardware.</td>
</tr>
</tbody>
</table>

The following table lists the installed OA information under the following columns:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OA</td>
<td>Displays the type of OA, such as Primary OA or Secondary OA.</td>
</tr>
<tr>
<td>Host Name</td>
<td>Displays a valid Host name or corresponding IP as host name.</td>
</tr>
<tr>
<td>IPv4</td>
<td>Displays the IPv4 IP address.</td>
</tr>
<tr>
<td>IPv6</td>
<td>Displays the IPv6 IP address, based on the availability.</td>
</tr>
</tbody>
</table>

**NOTE:** For HPE Synergy enclosures, OA information is not displayed.

**Interconnects**

To view the interconnects information for the selected enclosure, select the [Interconnects](#) page from the drop-down menu.
The following table lists the interconnects information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay</td>
<td>The bay number of the interconnect.</td>
</tr>
<tr>
<td>Status</td>
<td>Indicates the status of the interconnect.</td>
</tr>
<tr>
<td>Interconnect</td>
<td>Displays the enclosure and interconnect bay number.</td>
</tr>
<tr>
<td>Installed Module</td>
<td>Displays the installed interconnect.</td>
</tr>
<tr>
<td>Power Allocation (Watts)</td>
<td>Displays the total amount of power that is allocated to the interconnect in the enclosure.</td>
</tr>
</tbody>
</table>

**NOTE:** This field is available only for HPE Synergy enclosures.

**Power Supplies**

To view the Power Supplies information for the selected enclosure, select the **Power Supplies** page from the drop-down menu.
The following table lists the power supply information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bay</td>
<td>The bay number for the power supply.</td>
</tr>
<tr>
<td>Status</td>
<td>Indicates the status of the power supply.</td>
</tr>
<tr>
<td>Model</td>
<td>Displays the model name of the power supply.</td>
</tr>
<tr>
<td>Serial Number</td>
<td>Displays the factory serial number of the power supply.</td>
</tr>
<tr>
<td>Part Number</td>
<td>Displays the factory part number of the power supply.</td>
</tr>
<tr>
<td>Spare Part Number</td>
<td>Displays the power supply spare part number you can order as a replacement.</td>
</tr>
</tbody>
</table>

If a power supply is not present for any bay, the model is displayed as empty and all other columns are blank for that bay.

**Remote Support**

To view information about the HPE OneView remote support for the selected enclosure, select the Remote Support page from the drop-down menu.

For more information, see [HPE OneView Remote Support information](#).

**More Objects**

- **Hosts**—Click the More Objects tab and select Hosts to display information for all the hosts configured in the environment. Host information includes Name, State, Status, Cluster, and percentage of CPU.

- **Cluster**—Click the More Objects tab and select Cluster to display information for all the clusters configured in the environment. This feature helps you to determine where your clusters reside inside of the enclosures. The information displayed on this page includes cluster name, Available CPU, Available Memory, Available Storage, and vsphere HA. Click the cluster you want to investigate and select HPE Enclosure from the list of more objects.

- **HPE Enclosure**—Click More Objects > Host Enclosure to display the Enclosure Name, Status, Temperature, and Power parameters.
FCoE support using HPE 5900 switch

Starting with release 8.1, HPE OneView for VMware vCenter supports Grow Cluster with FCoE connections.

The Grow Cluster supports two types of configurations:

- Boot from SAN (OS booting from the LUN which is presented through FCoE).
- Shared disk to the server, which is presented through FCoE.

The Grow Cluster workflow with FCoE maintains the same ability to create and grow VMware cluster from HPE OneView profiles as is done using FC.

Grow cluster deployment having FCoE connection, you must bind the MAC address of the physical server to the Virtual Fiber Channel by performing manual configuration steps. The binding is required for the FCoE LUN to be available to the target server during build plan execution and server provisioning. The manual steps are required only if HPE 5900 switch series is used with FCoE. For information about performing these steps, see the HPE OneView User Guide available at [http://www.hpe.com/info/oneview/docs](http://www.hpe.com/info/oneview/docs).

VMware Proactive HA support

HPE OneView for VMware vCenter now supports a new feature in vCenter6.5 called Proactive HA. You can configure Proactive HA to perform actions based on the health status, including sending notifications, placing a host in quarantine mode, or even placing a host in maintenance mode.

HPE OneView for VMware vCenter monitors Server Hardware alerts and forwards alerts under the following five health categories to vCenter. Alerts under other health categories are ignored.

- Memory
- Power
- Fan
- Network
- Storage

Only servers that are hosts in vCenter are monitored. HPE OneView for VMware vCenter gathers the host UUID and attempts to find a server in HPE OneView with that same UUID. If a match is found, alerts from that server are monitored.

Remediation

Automation Level

- **Manual**: vCenter Server suggests migration recommendations for virtual machines, and at your discretion, manually migrates VMs off of the host.
- **Automatic**: Remediation is performed automatically without your interaction.

Types of Remediation

- **Quarantine Mode**: When a host is placed in Quarantine Mode, vCenter attempts to migrate that host's VMs only, if there is no performance impact on the clusters VMs and if no DRS Affinity or Anti-Affinity rules are violated.
- **Maintenance Mode**: All VMs on the host will be migrated.
Remediation Options

- Quarantine Mode for all failures.
- Quarantine Mode for moderate failures and Maintenance mode for severe failures.
  - HPE OneView Warning alerts are reported as Moderate failures.
  - HPE OneView Critical alerts are reported as Severe failures.
- Maintenance mode for all failures.

Enabling HPE OneView for vCenter Proactive HA provider

HPE OneView for vCenter automatically registers as a Proactive HA provider when it is initially configured.

If you want to use the HPE OneView for vCenter Proactive HA provider, enable it in Partial Failures and Responses in the Edit Cluster Settings section.

You can block failure conditions for the cluster or for certain hosts; clicking the Edit link allows you to block.

NOTE: If all hosts in the cluster are managed or monitored by HPE OneView, the HPE OneView provider is only available in the cluster settings.

Blocked failure conditions

You can block failure conditions in each health category globally or only for certain hosts.

Checking a box in the Component column disables the reporting of that failure condition. If you want all failure conditions to be reported, leave all the boxes clear.
Proactive HA user interface support

The Proactive HA user interface support displays the cluster level configuration of HPE Proactive HA provider.

Figure 4: Proactive HA user interface support page

The page displays the following information:

- Current configuration of Proactive HA [configured in vCenter] for any cluster.
- Current state of HPE Proactive HA provider (enabled or disabled).
• List of hosts under the cluster which are monitored or not monitored by HPE Proactive HA provider.

• Current state of the following five subcomponents of a host under the cluster:
  ◦ Fan
  ◦ Memory
  ◦ Network
  ◦ Power
  ◦ Storage

Viewing Proactive HA page

1. Select the cluster for which you want to see the status.
2. Click Monitor tab.
3. Click HPE Server Hardware menu.

The Proactive HA page displays the cluster-level configuration of HPE Oneview for vCenter provider and host-level status of the subcomponents.

HPE OneView Remote Support information

The HPE OneView Remote Support functionality allows you to get support or contract information for a specific vCenter host or enclosure. The functionality also provides information on the vCenter events for vCenter hosts for which HPE OneView Support has either expired or is about to expire. For this functionality to be enabled in the plugin, it must be enabled in the HPE OneView. Remote Support information or events are displayed for HPE OneView-managed entities only. If specific host or enclosure is not managed by HPE OneView, and you attempt to view the Remote Support information or events, the following error message is displayed:

Remote Support is not enabled for this device.

The HPE OneView for VMware vCenter plugin supports the display of events for the vCenter hosts only. No events are displayed for the enclosures.

You can view HPE OneView Remote Support information for selected host or enclosure.

1. Click vSphere Client and click Hosts and Clusters or HPE Enclosures.
2. Select the host or the enclosure, and click Monitor tab.
   If you selected host, then click HPE Server Hardware.
3. From the Overview drop-down menu, select Remote Support.
   The HPE OneView Remote Support information for the selected host or enclosure is displayed.
Figure 5: HPE OneView Remote Support Information
Provisioning HPE Servers

This section provides the following information:

- Growing a cluster
- Grow Cluster using Image Streamer
- Edit cluster
- Import Cluster
- Import Host
- Shrink Cluster
- Creating a custom build plan

Growing a cluster

Using the Grow Cluster feature, you can create or expand the capacity of an existing cluster. Grow Cluster option uses HPE OneView for VMware vCenter OS build plans or Image Streamer OS build plans for deployment of ESXi on the HPE server.

**NOTE:**

- Deployment option with HPE OneView for VMware works only when NIC0 of the server profile is configured with a network that has connectivity to HPE OneView Server Provisioning server.
- The preceding network can act as a vCenter management network or you can configure a unique vCenter management network on any of the NICs.
- Enter a valid static IP from the vCenter management network for the host to be discovered in vCenter.
- Grow Cluster option is supported only with HPE OneView-managed servers.
- Grow cluster is supported on HPE Composable Cloud for ProLiant DL environment. For more information on HPE Composable Cloud for ProLiant DL, see *HPE OneView 4.2 Online Help*.

**Procedure**

1. Launch the vSphere Client.
2. Use one of the following methods to start the Grow Cluster wizard:
   a. In the left navigation pane, right-click a cluster and select **HPE Server Management Actions > Grow Cluster**.
   b. In the left navigation pane, select a cluster and from the VMware Actions pull-down menu, select **HPE Server Management Actions > Grow Cluster**.

   The Grow Cluster wizard opens.
3. Follow the steps in the wizard.
   If you need assistance, Help is available for each screen.

   You can grow a cluster using Server Profile Templates (SPT). It ensures that appropriate network interfaces, active IP pools, and other configuration parameters remain in sync at the time of cluster
expansion. HPE OneView supports common host network configuration. It supports HPE OneView SPT to obtain the OS build plans to execute deployment to the target hardware. This ensures a successful addition of the host to the vCenter cluster with ESX deployment.

**NOTE:** If HPE OneView credentials are not configured, this work flow is disabled and a warning message is displayed.

### Grow Cluster – choosing Server Profile Template, Deployment plan and Target Servers

This page enables you to select the server profile template, deployment plan, and target servers used to grow the cluster.

**Procedure**

1. **Select a Server Profile Template.**

   **NOTE:** HPE OneView for VMware vCenter plugin supports the listing of SPTs in groups of HPE OneView thus enabling easier search and legibility.

   If the selected cluster has expanded using SPT, the selected SPT is used as a reference for growing the cluster and is marked as Read-only.

2. **Select an OS Build Plan.** When you select SPT, you automatically get the build plans from HPE OneView, depending on whether the server provisioning credentials are saved in HPE OneView.

   **NOTE:** The **OS Build Plan** drop-down also lists the OS build plans created in HPE OneView for VMware vCenter. For more information, see [HPE OneView for VMware vCenter OS Build Plans](#).

3. **Select the target server.**

   **NOTE:** The target servers listed for selection are filtered based on hardware type and enclosure group of the reference profile (or reference host).

   Multiple servers can be selected. Use the check box at the top of the table to select all the targets displayed.

   **NOTE:** Key points to remember when using private volumes:

   - If the SPT has a private volume attached to it, the grow cluster workflow will create a private volume for deploying ESXi. If there is a private volume present, local storage will not be used for deployment.
   - Multiple private volumes are not supported.
   - Multiple shared volumes as part of a profile are supported.

4. **Select Exit Maintenance Mode after OS deployment** if you want to quit the maintenance mode after build plan execution.

5. **Select either Assign Static IP or Assign IP from HPE OneView IP pools.**

   The two fields are displayed, depending on whether the SPT has subnet pools associated with a network.
If a management network is associated with the IP pool, you can choose to assign IP from IP pool or static IP.

6. Click Next.

**Grow Cluster – Configuring VMware hosts**

This page enables you to enter configuration information.

**Procedure**

1. Enter the **Netmask** and **Gateway** information.
   The **DNS Domain** and **DNS Server** information is optional.

2. Enter the **NIC0 Static IP Address** and **ESXi Root Password** for each selected target server enclosure.
   The **Hostname** information is optional.

   **NOTE:**
   - DHCP is not supported.
   - The ESXi Root Password and Hostname are common per cluster and cannot be defined for an individual host. HPE OneView supports common host network configuration.

   If you select **Assign IP from HPE OneView IP Pools**, the following network-related information is displayed:

   - **vMotion Network**
   - **Management Network**
   - **Fault Tolerance Network**
   - **Network Name**: Can be either DHCP or Subnet.

   **NOTE:** If all the special purpose networks, like Vmotion and Fault Tolerance networks, are associated with Subnet Pool, IP is assigned from IP pool. Else, IP is obtained from DHCP for these networks.

3. Click Next.
   The confirmation screen is displayed.

**Grow Cluster – Confirming the configuration**

This page enables you to confirm the configuration before initiating the grow cluster operation.

**Procedure**

1. Review the information for accuracy.

2. To grow the cluster, click **Finish**.
   A message is displayed indicating where you can monitor the progress of the operation.
NOTE: The hosts added using the grow cluster feature remain in Maintenance Mode.

Grow Cluster with Image Streamer

You can use the following steps an Image Streamer environment to grow a cluster in HPE OneView for VMware vCenter.

Procedure

1. Register HPE OneView with HPE OneView for VMware vCenter.
2. Create a Server Profile Template in HPE OneView describing how you want the hosts in your cluster configured.
   HPE Synergy Image Streamer uses the first NIC in the iSCSI network to place the appliance during deployment. Hence, it is mandatory to leave the NIC [:1-a] empty.
3. In the vSphere Client, right-click a cluster and select HPE Server Management Actions > Grow Cluster.
4. Select server profile template and the customized Image Streamer Build Plan.
   Image Streamer deployment works only with a custom build plan which re-configures first NIC based on custom attribute.
5. Select the target server(s).
6. Select the Exit Maintenance Mode option depending on the requirement.
7. Select the IP option. User can also use HPE OneView-based IP/Subnet pools.
   a. In case of IP/subnet pools option, you do not need to enter any IP configuration values.
   b. In case of static IP option, manually enter IP details.
8. Click Next.
9. Enter the network information, in case of Static IP option.
10. Enter the ESXi Root Password. This same password will be set for all the new hosts. This is a one-time option for SPT-based deployment.
11. Click Next and review the information.
12. Click Finish to grow the cluster.
   A task progress message is displayed to monitor the deployment.
   After a successful deployment, you can see the host(s) added to the cluster.

Editing cluster

The Edit Cluster Deployment Plan is used to upgrade all the hosts in a cluster to a new version of ESXi.
Prerequisites

- Ensure that the cluster is consistent before performing an Edit Deployment plan operation. Refer to the Consistency tab on Clusters.
- Spare capacity on this cluster to perform vMotion.

Procedure

1. Log in to vCenter Client.
2. Navigate to the cluster for which you want to change the Deployment Plan.
3. Right-click a cluster in the vSphere Client and select **HPE Server Management Actions > HPE Edit OS Deployment Plan**.

   **Edit OS Deployment Plan** window appears with the **OS Deployment Plan** field populated.

   **NOTE:** Edit Cluster Deployment Plan is supported only for HPE OneView-managed host and Image Streamer.

   For information on how to perform Edit Cluster operations for SPT with OS deployment settings from HPE OneView, see **Editing cluster deployment plans with OS Deployment from HPE OneView**.

   The user is not allowed to define new custom attributes in the HPE OneView for VMware vCenter.

4. From the **New OS Deployment Plan** drop-down menu, select the Deployment Plan.
5. Add or modify the custom attributes.

   **NOTE:** Addition or modification of the custom attributes is optional.

6. Click **redeploy**.

   The **Confirmation** dialog box appears.

7. Click **OK**.

   A task progress message is displayed to monitor the deployment.

   This will redeploy the selected deployment plan to all the hosts in the cluster on non-disruptive rolling method.

---

**Editing cluster deployment plans with OS Deployment from HPE OneView**

Procedure

1. In HPE OneView, navigate to **Server Profile Template** of the cluster.
2. Click **Edit** and under OS Deployment, select new OS deployment plan.
3. Click **OK**.

   The consistency state for the cluster is changed to inconsistent.

4. Click **Apply Recommended Actions**.

   The OS upgrade is initiated for all the hosts in the cluster to the new deployment plan selected in the SPT through rolling update.
Import Cluster

Prerequisites

A cluster level action can be performed to import any unmanaged vCenter cluster (for example, existing clusters) into HPE OneView. After the cluster is imported and managed by HPE OneView, you can perform Grow Cluster, Edit OS Deployment plan, and Shrink Cluster operations on the cluster using HPE OneView.

Importing a cluster is a nondisruptive action. Any inputs selected are not applicable to existing hosts, and are only used for the future deployments. After successfully importing of a cluster, the cluster consistency is calculated against the selected Server Profile Template (SPT) and current host configuration settings. If there are any inconsistencies, click Apply recommended action to make it consistent.

- The cluster must have one or more hosts. Empty clusters are not supported.
- The cluster is not managed by HPE OneView for VMware vCenter.
- The vCenter is registered as the hypervisor-manager to the HPE OneView.
- DHCP settings are not supported. Set all the host management network kernel port to static IP settings. If the management port is set to DHCP, import a cluster fails and clusters are in an inconsistent state.

![Import Cluster - OneView Cluster Management](image)

Importing a cluster will allow the cluster's server hardware configuration to be managed using a Server Profile Template.

The following settings will be used while deploying new hosts to the cluster. Importing a cluster will not redeploy existing hosts.

- **Server Profile Templates:** Select a Server Profile Template
- **OS Deployment Plan:** Select a Deployment Plan
- **ESXi Root Password:**

**Cluster Preferences**

- **IP Preference:**
  - Assign static IP
  - Assign IP from HPE OneView IP Pools
- **Host Prefix As Hostname:**
  - Enable
  - Disable
- **Leave Host In Maintenance:**
  - Enable
  - Disable
- **Hostname To Register:**
  - Enable
  - Disable
Procedure

1. Select the cluster you want to import.

2. Select the **Server-Profile Template** from the drop-down menu to apply the template to any future additions.

3. Select the **OS-deployment Plan** from the drop-down menu to apply for future deployments.

4. Create a ESXi root password; it is used as the root password for all the hosts which going to be created.

5. Select the **Cluster Preferences**.
   a. IP preferences – Select a static IP or select an IP from the IP-Pool.
   b. Host Prefix – Use the host prefix as host name.
   c. Leave Host in Maintenance – Keep the newly deployed host in maintenance mode.
   d. Host name to Register – Add the host in vCenter using the host name.

**NOTE:**
- If all the hosts of the cluster have the same SPT, that SPT is auto-selected; else the best possible match is determined. If HPE OneView for VMware vCenter is not able to determine the best match, a drop of SPTs is listed for your selection.
- If the SPT has OS deployment settings, OS deployment plan is auto-selected.
- Based on the SPT properties, some of the Cluster Preferences are fixed and auto-selected.
- If the SPT has OS deployment options mentioned in it, the ESXi password is not requested by HPE OneView for VMware vCenter and text box is not displayed.

6. To initiate Import Cluster, click **Import**.

7. Import Cluster initiates a new vCenter task by the name Import Cluster, view the task at **Cluster > Monitor > Tasks** to know the success or failure or current status of the "Import Cluster" operation.

**Import Host**

Import Host is used to import a host into an already managed cluster configuration in HPE OneView. If a new host is added to an existing HPE OneView-managed cluster, the host configuration is not managed by the HPE OneView. Importing the host to HPE OneView helps create a host profile and enables its management from HPE OneView.

**Prerequisites**
- Ensure that the cluster is imported to manage the cluster configuration from HPE OneView.
- Ensure that the host to be imported is of the same hardware type as managed cluster.

**Procedure**

1. Navigate to **Home > Hosts and Clusters**.

2. Select a host and right click.

3. Click **HPE Server Management Actions > Import Host**.
4. You are prompted to import the host configuration into HPE OneView to manage. Click Import.

5. Click OK.

The process of importing the host takes some time. You can monitor the process in the vCenter task window.

**shrinking clusters**

This feature is available only for clusters managed through HPE OneView. You can use the Shrink Cluster option to reduce the capacity of the cluster by removing the hosts.

**note:** To complete this operation, hosts must be added through the Grow Cluster or Import Cluster operation. Manually added hosts and hosts moved from another clusters are not eligible.

All the hosts selected for the Shrink Cluster operation become bare metal server hardware after the operation is completed, which makes the server hardware eligible to use the Grow Cluster operation when you need extra capacity. The VMs from the selected host will be migrated to other active hosts on the same cluster.

The Shrink Cluster option is available in cluster context menu under the HPE Management.
The following table lists the Shrink Cluster information:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td>Displays the IP/Hostname. Orphaned (If HPE OneView host reference is available, but host removed manually from the cluster).</td>
</tr>
<tr>
<td>HPE OneView Server Profile</td>
<td>Displays the server profile name. Orphaned (If server profile is deleted).</td>
</tr>
<tr>
<td>VM Count</td>
<td>Displays the number of virtual machines present in host.</td>
</tr>
</tbody>
</table>

**NOTE:**

1. Hosts whose associated server profile has been deleted, will be displayed in error state (red color) and selected by-default.

2. If you are not adding hosts using Grown Cluster, displayed in disabled state (red color), you cannot perform Shrink Cluster on these hosts.
Updating the firmware baseline

This functionality enables you to view the cluster-level firmware baseline from the HPE OneView for VMware vCenter plugin. You can edit the firmware setting and initiate the firmware updates for all the hosts in a cluster without going to HPE OneView.

**IMPORTANT:** This functionality is applicable only to the clusters managed by HPE OneView.

**Procedure**

1. Log into the vCenter Client.
2. Navigate to the cluster for which you want to edit or initiate firmware baseline update.
3. Click **Configure > HPE Server Hardware** and select the firmware from the drop-down list. The current firmware settings are displayed.
4. Click **Edit Firmware Settings**.
   The options similar to the ones available in HPE OneView are displayed to edit the firmware settings.
   **NOTE:** If the cluster is not consistent with the SPT, then you will be informed that other configuration changes (for which the cluster is inconsistent) will also be applied along with the firmware update changes.
5. Click **Save & Apply**.
   Click **Yes** to proceed.
   **NOTE:** Once the operation is triggered, the plugin updates the firmware baseline to all the hosts in a rolling manner. You can track the task status in **Cluster > Monitor > Tasks**.

HPE OneView for VMware vCenter OS Build Plans

HPE OneView for VMware vCenter plugin enables you to grow a cluster with iLO Virtual Media Deployment using the HPE OneView for VMware vCenter OS build plans. The iLO Virtual Media Deployment deploys the ESXi on Gen10 and Gen9 servers. The clusters grown using the HPE OneView for VMware vCenter deployment plans support most of the HPE OneView for VMware vCenter cluster operations, such as, they can be regrown multiple times, consistency or remediation applied. The deployment server provides the following functionalities:

- **Display OS build plans** managed by HPE OneView for VMware vCenter.
- **Create and edit OS build plans** managed by HPE OneView for VMware vCenter.
- **Remove OS build plans** managed by HPE OneView for VMware vCenter.
- **Upload ESXi ISO image** to any of the existing build plans.
- **Remove ESXi ISO image** from a OS build plan.

**Displaying the OS build plans**

The list of existing OS build plans is displayed in the HPE OneView for VMware Deployment Server. HPE Oneview For VMware vCenter provides six predefined OS build plans by default. You can upload the ISO image files to start using them.
1. Navigate to **Menu > Administration > HPE OneView for VMware vCenter Deployment Server**.

2. Select the OS build plan.

3. Click **Browse** to select the ISO image and click **START UPLOAD** to upload the ISO image file. You can also drag and drop the VMware ESXi ISO image file in the **Browse** area and click **START UPLOAD**.

![Figure 6: Upload VMware ESXi ISO image file](image)

### Create HPE OneView for VMware vCenter OS Build Plan

To create new OS build plans:

**Procedure**

1. Navigate to **Menu > Administration > HPE OneView for VMware vCenter Deployment Server**.

2. Click **CREATE OS BUILD PLAN**.

The **Create OS Build Plan** window is displayed.
Figure 7: Create OS Build Plan

3. Enter the following details for the ESXi:
   - Name
   - Description
   - Type
   - Architecture

4. Click Create.

5. Click OK.

The new OS build is created and listed.

Figure 8: Create OS Build Plan - Added and Listed

Remove HPE OneView for VMware vCenter OS build plans

You can only delete custom build plans that you have created and cannot delete the HPE preshipped OS build plans.
Procedure

1. Select the custom OS build plan to delete.

2. Click Action > Remove Build Plan.

3. Click OK.

The build plan is removed successfully.

Upload ISO image to HPE OneView VMware vCenter OS Build Plans

HPE OneView VMware vCenter plugin, by default, ships six predefined OS build plans. You can use the existing OS build plans only after uploading ESXi ISO images to them. You can also upload an ESXi image to a custom OS build plan.

Procedure

1. Select the build plan.

2. Click Browse to browse and select the ISO image from the file system. You can also drag and drop the ISO image to upload.
3. Click **START UPLOAD**.
   
The ESXi ISO image is successfully uploaded.

4. If the HPE OneView VMware vCenter plugin is not accepted by the current browser, the certificate error is displayed, and the **ACCEPT CERTIFICATE** button is enabled.
5. Click **ACCEPT CERTIFICATE**.

   A new browser window is opened where you can accept the HPE OneView VMware vCenter plugin certificate.

6. Repeat steps 2 and 3.

7. After successful ESXi ISO image upload, the value for **Image available** field changes to **Yes**.

   **NOTE:** The ESXi ISO images are uploaded to HPE OneView VMware vCenter server and are counted on the VM space. With more number of ISO images being uploaded, the VM size on the disk increases.

8. Click **Abort** to stop the upload operation.

---

**Removing an ESXi ISO image from the OS build plan**

To remove an uploaded ESXi ISO image from the OS build plan:

**Procedure**

1. Select the OS build plan from which you want to remove the ISO image.

2. Click **ACTION > Remove Image**.

   The ISO image is removed leaving the OS build plan intact.
Using HPE OneView for VMware vCenter for Storage

The HPE Storage menu is available for clusters, hosts, datastores, and virtual machines. HPE Storage menu under Monitor or Configure tabs provides the following information:

- Health status of the relevant storage systems. Storage systems from which disks are presented to the selected vSphere component will appear.
- Details on the storage system summary, storage volumes, virtual disks, HBAs, path for a storage volume, graphical and tabular mapping information about replica of storage volumes and virtual machines related to HPE Storage system.
- Performance details for underlying HPE 3PAR storage volumes of VMFS Datastore, VVol Datastore, and VVol VMs.
- Alerts generated in the HPE 3PAR Storage systems.

Depending on the component selected in the inventory tree and your configuration, the information displayed varies. However, the information displayed on the top of all Management pages is consistent and displays:

- The Host, Cluster, Datastore, or VM name, depending on what is selected.
- The type of provisioning operations displayed depends on the type of component selected in the inventory tree.

<table>
<thead>
<tr>
<th>Component</th>
<th>Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home &gt; Host and Cluster &gt; Monitor or Configure &gt; HPE Storage</td>
<td>Create VMFS Datastore (VMFS Datastore)</td>
</tr>
<tr>
<td></td>
<td>Create VVol Datastore (VVol Datastore)</td>
</tr>
<tr>
<td></td>
<td>Create VM from template (VM from Template)</td>
</tr>
<tr>
<td></td>
<td>Schedule VMFS Datastore snapshot</td>
</tr>
<tr>
<td></td>
<td>Expand Datastore (Expand Datastore)</td>
</tr>
</tbody>
</table>

Table Continued
Component | Operations
---|---
Delete Datastore (Delete Datastore)
Schedule Snapshot (Schedule Datastore Snapshot)

• A Settings icon to modify configuration settings through Administrator console.
• A cache refresh icon to refresh the cache of the Storage component.
• A help icon to display help files.

Navigating the HPE Storage

HPE OneView for VMware vCenter displays information about storage systems under HPE Storage menu. This section provides information on:

• Accessing HPE Storage
• HPE Storage – Monitor
• HPE Storage – Configure

Accessing HPE Storage

Procedure

1. Log into the vSphere Client.
   The vSphere Client home page is displayed.
2. Select a cluster, host, VM, or datastore from the left navigation pane.
3. Click the Monitor or Configure tab.
4. Click HPE Storage.
   The sub-menu options based on the tab selected are displayed.

HPE Storage – Monitor

The HPE Storage menu for the Monitor tab provides information on the health status. The following are the sub-menu options available:
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>Displays the related Array name and its status. For more information, see Viewing health/status information.</td>
</tr>
<tr>
<td>Performance</td>
<td>Displays the aggregate view of all the related storage volumes of VVol Datastores, VMFS Datastores, and VVol VMs. For more information, see Viewing Performance information</td>
</tr>
<tr>
<td>Alerts</td>
<td>Displays the storage system alert information. For more information, see Viewing Alerts information.</td>
</tr>
</tbody>
</table>

**Viewing health/status information**

HPE Storage Health displays the Array name and its status that corresponds to the selected component.

**Procedure**

1. Select a component in the inventory tree.

Health information for the array from which at least one volume relates to the corresponding component is displayed. The details include Array Status and Array Name.

**TIP:**

- To sort the information in a column, select the column and use the up or down arrow to the right of the column header.
- Use the Filter tool in the upper-right corner of the page to limit the information displayed to the specified criteria. Enter the data you want to filter.
Viewing Performance information

Performance data will be available for 3PAR Storage system under following cases:

- VMFS Datastores
- VVol Datastores (Data is available only if there are VMs with powered ON state on the VVol Datastore.)
- VVol VMs

This page displays the aggregate information for all the datastores and all the underlying storage volumes. You can also select to view the performance details of a single storage volume.

To view the storage volume performance information:

1. Select the Datastore (VMFS/VVol) or VVol VMs for which you want to view the performance details.

As the performance is not implemented for Host/Cluster, the following screen would be displayed during this navigation.

---

HPE Storage Performance for VVol VMs and underlying volumes

Procedure

1. Log into the vSphere Client.
2. Select the VM from the left side pane for which you want to view the performance details.
   The following screens would be displayed during this navigation.
HPE Storage Performance for VVol/VMFS Datastore and underlying volumes

Procedure

1. Log into the vSphere Client.
2. Select the Datastore from the left side pane for which you want to view the performance details.

The following screens would be displayed during this navigation. By default, it displays an aggregated view of all datastores and underlying volumes.
Viewing Alerts information

This page displays alerts related to selected storage system.

Alerts are the events that require attention from the system administrator and typically indicate a system problem. For example, you might receive an alert telling you that a drive has faulted, or that the system is low on storage capacity.

Each event record and alert is identified by an ID. Following information is displayed for storage system alerts:

- Severity
- Status
- Time
- Type of alerts
- Message code
- Message

HPE Storage – Configure

The HPE Storage menu under Configure tab provides management, detailed topology, and detailed properties of the selected component. The following are the submenu options available:
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
<td>This page provides the details of the following:</td>
</tr>
<tr>
<td></td>
<td>• HPE Storage Provisioned to Host</td>
</tr>
<tr>
<td></td>
<td>• Provisioned from Host to Virtual Machines</td>
</tr>
<tr>
<td></td>
<td>• HPE Storage Systems</td>
</tr>
<tr>
<td></td>
<td>• Datastores</td>
</tr>
<tr>
<td></td>
<td>For more information, see <a href="#">HPE Storage systems - Summary</a>.</td>
</tr>
<tr>
<td>VMs to Volumes</td>
<td>This page provides information on the VMs to Volumes paths. You can view the data either in tabular format or in graphical format. For more information, see <a href="#">Viewing VMs to volumes</a>.</td>
</tr>
<tr>
<td>Remote Replications</td>
<td>This page provides the information on the details about the storage system local replications. For more information, see <a href="#">Viewing Remote Replications</a>.</td>
</tr>
<tr>
<td>Volumes</td>
<td>This page provides details on the storage volumes. For more information, see <a href="#">Viewing volumes</a>.</td>
</tr>
<tr>
<td>Virtual Disks</td>
<td>This page provides details on the virtual disks. For more information, see <a href="#">Viewing Virtual Disks</a>.</td>
</tr>
<tr>
<td>Paths</td>
<td>This page provides information on the Path ID for the disks. For more information, see <a href="#">Viewing paths</a>.</td>
</tr>
<tr>
<td>Snapshots</td>
<td>This page provides the information on snapshots. For more information, see <a href="#">Viewing Snapshots</a>.</td>
</tr>
</tbody>
</table>

### Refreshing HPE Storage for vCenter data

After installation, the HPE OneView for VMware vCenter collects information about the VMware environment and the HPE storage systems configured in the HPE OneView for VMware vCenter.
When a cache refresh is in progress:

The refresh status is listed at the top of each storage page. To view details about the cache refresh, move the cursor over the refresh icon.

The time it takes for a refresh to complete depends on the size of the environment and the number of storage systems configured in the HPE Storage systems.

**NOTE:** Previously gathered data is displayed in the GUI during a cache refresh. For more information, see [Manually refreshing the cache](#).

### Manually refreshing the cache

When you make changes to the VMware environment using VMware operations (for example, Add Datastore, New Virtual Machine, and Remove VM From Inventory), the changes are not reflected in the HPE OneView for VMware vCenter until the cache is refreshed. Hewlett Packard Enterprise recommends that you manually refresh the cache whenever you do any of the following:

- Add, remove, or modify storage systems.
- Add or remove VMware hosts, VMs, or datastores using VMware operations.
- Change the storage provisioning using the storage system management console.
- Delete a VM from a disk using a VMware command.

**NOTE:** Provisioning changes performed by the HPE OneView for VMware vCenter do not require a manual refresh. This information is automatically updated when provisioning is complete. For more information, see [Provisioning storage](#).

You can manually refresh the cache through:

- Refresh icon
- Administrator Console

#### Using Refresh icon

**Procedure**

1. On the top pane of the content of any HPE Storage related submenu, click the ![Refresh icon](#) icon.
   - The Refresh HPE Storage Data screen is displayed with the estimated time required for the refresh to complete.
2. To start cache refresh, click Yes.
3. Optional: To view the elapsed time and estimated time remaining while the refresh is in progress, move the cursor over the refresh icon.

#### Using the Administrator Console

**Procedure**

1. From the ![icon](#) icon drop-down list, click Administrator Console.
The login page for the Administrator Console is displayed.

2. Enter **Username** and **Password** and click **Login**.

3. Click the down arrow in the top pane.
   The menu options are displayed.

4. Under **INFRASTRUCTURE**, click **Storage Systems**.
   The **Storage Systems** page is displayed.

5. Select the storage system that you want to refresh, and click **Actions > Refresh**.

   To view the status of the action, click the icon. The green circle indicates successful completion of the action.

### Customizing HPE Storage for vCenter tables

HPE Storage for vCenter pages include tabs that allow you to view additional information about cluster, hosts, VMs, and datastores. To view a table that shows information about the selected cluster, host, VM, or datastore, click a submenu.

To export the information in the storage tables:

1. Click **Export** and select one of the following options:
   - **Copy All**—copies all the entries across all the pages.
   - **Copy to Clipboard Selected Items Only**—copies only the selected rows.
   - **Export All**—exports all the information to an excel format (.csv).
   - **Export Selected Items Only**—exports only the selected rows to the excel format (.csv).

2. You can filter the data by entering the text in the **Filter** text box to view only particular range of data.

3. Click the triangles after each column heading to sort the table in ascending or descending orders.

### Viewing Storage systems information

To view complete information for storage systems:

1. Select a component (cluster, host, VM, or datastore) for which you want to view the related storage systems information.

2. Click **Configure** tab.

3. Click **HPE Storage** in master pane and click one of the following options:
   - **Summary**
   - **VMs to Volumes**
   - **Snapshots**
   - **Remote Replications**
   - Click **More** and select one of the following options from the drop-down:
- Volumes
- Virtual Disks
- Paths

For information on what each of these options provides information about, see HPE Storage - Configure.

**TIP:** Use the following features when viewing detailed storage information:

- For a brief description of the content and to know the applicability of the information on products, mouse-over a column heading.
- To sort the information in a column, select the column and use the up/down arrow to the right of the column header.
- Use the Filter text box (🔍) in the upper-right corner of the page to limit the information displayed to the specified criteria. Enter the data you want to filter.

**HPE Storage systems – Summary**

The HPE Storage Summary option under the HPE Storage menu provides summarized information for selected clusters, hosts, VMs, and datastores. Using Summary submenu option, you can view:

- Storage information for a selected host
- Storage information for a selected cluster
- Storage information for a selected VM
- Storage information for a selected datastores

**Accessing HPE Storage Summary information**

1. Log in to the HPE OneView for VMware vCenter.
2. Select host, cluster, VM, or datastore.
3. Click Configure and navigate to HPE Storage > Summary.
The details pane displays the storage information associated with the selected component.

**Cluster Storage Summary Information**

The storage summary displays the following information about the selected cluster:

**HPE Storage Provisioned to Cluster**

- **Volumes**—Number of volumes available to the cluster from configured HPE storage systems and number of thin provisioned volumes amongst these volumes.

- **Storage Provisioned**—Amount of storage available to the cluster from configured HPE storage systems.

- **Storage Used**—Amount of storage from configured HPE storage systems that is allocated/used by the cluster. It corresponds to the dark blue pie.

**NOTE:** The Storage Used value can differ from the Storage Provisioned value if thin provisioning or demand-allocated snapshots are used.

- **Storage ThP Savings**—Amount of storage saved through the use of storage systems-based thin provisioning.

If configured HPE Storage Systems has volumes provisioned to the cluster, corresponding storage pool information appears. Following information is displayed:

1. HPE storage system type, name, and firmware.
2. Storage pool name.
3. If you hover over the bar corresponding to storage pool, it informs about number of volumes from the pool, used/allocated capacity to the corresponding volumes (maps to dark blue portion of the bar), total capacity provisioned for the corresponding volumes and resultant capacity savings due to thin provisioning.

**Provisioned from Cluster to Virtual Machines**

All data available here includes configured storage, local storage, and any other unmanaged storage.

- **Datastores overprovisioned**—Number of datastores on the cluster, number of RDM volumes made available to VMs, number of unused volumes that are neither RDM nor used to create datastore.

- **Cluster Provisioned Capacity**—Total amount of storage available to the cluster. This includes capacity from datastores and RDMs.

- **Cluster Used Capacity**—Amount of storage used by the cluster. This includes capacity from datastores and not RDMs. It corresponds to the dark blue pie.

- **Cluster Available Capacity**—Amount of unused storage available to the cluster. This includes "datastores" available capacity only.

**Datastores**

This section lists the datastores corresponding to the selected host. For each datastore, move the cursor over the status bar to view storage information. The bar corresponding to the datastore is marked yellow when it is overprovisioned. This is when datastore is provisioned for more capacity but total capacity currently allocated from storage disks to datastore is less.

The following information is displayed for each datastore:
• **Virtual disks**—Number of virtual disks on datastores provisioned to VM.

• **Total**—Total capacity allocated from disks to datastore.

• **Used**—Amount of storage used on the host as virtual disks (VMDKs or RDMs). It corresponds to the dark blue bar.

• **% Savings**—Amount of storage saved through the use of VMware thin provisioning. It is the percentage of the available over total capacity.

### Host Storage Summary Information

The storage summary displays the following information about the selected host:

**HPE Storage Provisioned to Host**

- **Volumes** — Number of volumes available to the host from configured HPE storage systems and number of thin provisioned volumes amongst these volumes.

- **Storage Provisioned** — Amount of storage available to the host from configured HPE storage systems.

- **Storage Used** — Amount of storage from configured HPE storage systems that is allocated/used by the host. It corresponds to dark blue pie.

**NOTE:** The Storage Used value can differ from the Storage Provisioned value if thin provisioning or demand-allocated snapshots are used.

- **Storage ThP Savings** — Amount of storage saved through the use of thin provisioning.

If configured HPE Storage Systems has volumes provisioned to the host, corresponding storage pool information appears. Following information is displayed:

1. HPE storage system type, name, and firmware.

2. Storage pool name.

3. If you hover over the bar corresponding to storage pool, it informs about number of volumes from the pool, used/allocated capacity to the corresponding volumes (maps to dark blue portion of the bar), total capacity provisioned for the corresponding volumes and resultant capacity savings due to thin provisioning.

**Provisioned from Host to Virtual Machines**

All Data available here includes configured storage, local storage, and any other unmanaged storage.

- **Datastores overprovisioned** — The number of overprovisioned datastores.

- **Host Provisioned Capacity** — Total amount of storage available to the host. This includes capacity from datastores and RDMs.

- **Host Used Capacity** — Amount of storage used by the host. This includes capacity from datastores and not from RDMs. It corresponds to the dark blue pie.

- **Host Available Capacity** — Amount of unused storage on the host. This includes datastores’ available capacity only.

- **Current storage inventory** — Number of datastores on the host, number of RDM volumes made available to VMs, number of unused volumes that are neither RDM nor used to create datastore.
Datastores
This section lists the datastores corresponding to the selected host. For each datastore, move the cursor over the status bar to view storage information. The bar corresponding to the datastore is marked yellow when it is overprovisioned. This is when datastore is provisioned for more capacity but total capacity currently allocated from storage disks to datastore is less.

The following information is displayed for each datastore:

- **Virtual disks** — Number of virtual disks on datastore provisioned to VM.
- **Total** — Total capacity allocated from disks to datastore.
- **Used** — Amount of storage used on the host as virtual disks (VMDKs or RDMs). It corresponds to dark blue bar.
- **% Savings** — Amount of storage saved through the use of VMware-based thin provisioning. It is the % of available over total capacity.

Datastore Storage Summary Information
This tab displays the following information about the selected datastore:

**HPE Storage Provisioned to Datastores**

- **Volumes**—Number of volumes available to the datastore from configured HPE storage systems and the number of thin provisioned volumes amongst these volumes.
- **Storage Provisioned**—Amount of storage available to the datastore from HPE storage systems.
- **Storage Used**—Amount of storage from HPE storage systems that is allocated/used by the datastore. It corresponds to the dark blue pie.
- **Storage ThP Savings**—Amount of storage saved through the use of storage system-based thin provisioning.

If configured HPE Storage Systems has volumes provisioned to the datastores, corresponding storage pool information appears. Following information is displayed:

1. HPE storage system type, name, and firmware.
2. Storage pool name.
3. If you hover over the bar corresponding to storage pool, it informs about number of volumes from the pool, used/allocated capacity to the corresponding volumes (maps to dark blue portion of the bar), total capacity provisioned for the corresponding volumes and resultant capacity savings due to thin provisioning.

**Provisioned from Datastore to Virtual Machines**
All data available here includes configured storage, local storage, and any other unmanaged storage.

- **Datastores overprovisioned**—Number of datastores on the cluster, number of RDM volumes made available to VMs, number of unused volumes that are neither RDM nor used to create datastore.
- **Datastore Provisioned Capacity**—Total amount of storage available to the datastore. This includes capacity from datastores and RDMs.
• **Datastore Used Capacity**—Amount of storage used by the datastore. This includes capacity from datastores and not RDMs. It corresponds to the dark blue pie.

• **Datastore Available Capacity**—Amount of available storage on the datastore. This includes “datastores” available capacity only.

**Datastores**

This section lists the datastores corresponding to the selected host. For each datastore, move the cursor over the status bar to view storage information. The bar corresponding to the datastore is marked yellow when it is overprovisioned. This is when datastore is provisioned for more capacity but total capacity currently allocated from storage disks to datastore is less.

The following information is displayed for the datastore:

• **Virtual disks**—Number of virtual disks on datastores provisioned to VM.

• **Total**—Total capacity allocated from disks to datastore.

• **Used**—Amount of storage used on the host as virtual disks (VMDKs or RDMs). It corresponds to the dark blue bar.

• **% Savings**—Amount of storage saved through the use of VMware thin provisioning. It is the percentage of the available over total capacity.

**VM storage summary information**

This tab displays the following information about the selected VM:

**HPE Storage Provisioned to Virtual Machine**

• **Volumes** — Number of volumes available to the VM from configured HPE storage systems and the number of thin-provisioned volumes amongst these volumes.

• **Storage Provisioned** — Amount of storage available to the VM from HPE storage systems.

• **Storage Used** — Amount of storage from HPE storage systems that is allocated/used by the VM. It corresponds to the dark blue pie.

• **Storage ThP Savings** — Amount of storage saved through the use of storage system-based thin provisioning.

If configured HPE Storage Systems has volumes provisioned to the VM, corresponding storage pool information appears. Following information is displayed:

1. HPE storage system type, name, and firmware.

2. Storage pool name.

3. If you hover over the bar corresponding to storage pool, it informs about number of volumes from the pool, used/allocated capacity to the corresponding volumes (maps to dark blue portion of the bar), total capacity provisioned for the corresponding volumes and resultant capacity savings due to thin provisioning.

** Provisioned by Virtual Machine**

All data available here includes configured storage, local storage, and any other unmanaged storage.
- **Virtual disks** — Number of virtual disks associated with datastore used by VM.
- **Shared storage volumes** — Number of VMs that share the same underlying storage volumes corresponding to the VM.
- **Datastores overprovisioned** — Number of datastores on the VM, number of RDM volumes made available to VMs, number of unused volumes that are neither RDM nor used to create datastore.
- **Virtual Machine Provisioned Capacity** — Amount of storage provisioned by VMDKs or RDMs. This includes capacity from datastores and RDMs.
- **Virtual Machine Used Capacity** — Total amount of storage used by the VM. This includes capacity from datastores and not RDMs. It corresponds to the dark blue pie.
- **Virtual Machine Available Capacity** — Amount of storage available to the VM. This includes “datastores” available capacity only.

### Datastores

This section lists the datastores corresponding to the selected host. For each datastore, move the cursor over the status bar to view storage information. The bar corresponding to the datastore is marked yellow when it is overprovisioned. This is when datastore is provisioned for more capacity but total capacity currently allocated from storage disks to datastore is less.

The following information is displayed for each datastore:

- **Virtual disks** — Number of virtual disks on datastores provisioned from the selected host to VMs.
- **Total** — Amount of storage provisioned on the host as virtual disks (VMDKs or RDMs).
- **Used** — Amount of storage used on the host as virtual disks (VMDKs or RDMs). It corresponds to the dark blue bar.
- **% Savings** — Amount of storage saved through the use of VMware thin provisioning. It is the percentage of the available over total capacity.

### Viewing VMs to Volumes

The **VMs to Volumes** page displays the following information:

On the **VMs to Volumes** page, click **Details** to display the information in table format or click **Graphics** to display a graphical representation of the VMs to volumes paths.

**Details format**

**NOTE:** The same VM can appear multiple times, based on the number of available paths to a storage disk.

- **Virtual Disk Name**—Virtual disk name assigned by VMware.
- **Virtual Disk Type**—Virtual disk type (Datastore or RDM).
- **Datastore**—The datastore that contains the VM.
- **Virtual Machine**—VM name.
- **Array Disk Name**
  - HPE StoreVirtual—Volume name
  - HPE 3PAR StoreServ—Volume name
- HPE MSA—Volume name
- HPE StoreOnce Backup—Not applicable

- **Storage Pool**—Storage system pool to which the underlying volume of the VM belongs.

- **Array Name**
  - HPE StoreVirtual—Management group name
  - HPE 3PAR StoreServ—Storage System display name
  - HPE MSA—System name
  - HPE StoreOnce Backup—Not applicable

- **Array Type**—Hewlett Packard Enterprise storage system type.

- **Array Disk Type**—Storage System disk type.

- **Array Total Disk Total Capacity**—Storage Volume's total capacity.

- **Array Disk Allocated Capacity**—Capacity allocated by the storage system. For a thin provisioned disk, this value might differ from the Array Disk Total Capacity value.

- **Host Name**—Host name.

**Graphics format**

The graphics format provides a representation of the paths between the following entities:

- Virtual Machine
- Virtual Disk Name
- Datastore
- Array Disk Name
- Storage pool
- Array Name

To limit the information displayed, use the **Filter** text box in the upper-right corner of the page. Enter the data you want to filter on. For example, if you want to see only unmanaged disks, filter on the word **unmanaged**.

**Viewing Snapshots**

The **Snapshots** page displays the following information:

- **Array**—Storage System name on which the source storage volume resides.
- **Source Disk Name**—Source storage volume.
- **Replica Name**—Target replica storage volume. It shows the replication set name.
- **Replication Type**—The type of replication used. For example, Peer Persistence, Snapshot.
- **Datastore/RDM Type**—Datastore/RDM type (Datastore or RDM).
• **Datastore Name**—Datastore name/the vmdk path on the datastore for RDM.
• **Replica Creation Time**—Replica volume creation time.
• **Replica Expiration Time**—Replica volume expiration time (applies to HPE 3PAR StoreServ).
• **Replica Retention Time**—Replica volume retention time (applies to HPE 3PAR StoreServ).

**Graphics format**
The graphics format provides a representation of the paths between the following entities:

- **Array**
- **Volume (Datastore Name/RDM's vmdk)**
- **Local Copy**

To limit the information displayed, use the **Filter** text box in the upper-right corner of the page. Enter the data you want to filter on.

**Viewing Remote Replications**
The **Remote Replications** page displays the following information:

- **Source Array**—Storage System name on which the source storage volume resides.
- **Source Disk Name**—Source storage volume.
- **Replica Name**—Target replica storage volume. It shows the replication set name.
- **Replica Array**—Storage System name where the replica storage volume resides.
- **Replication Type**—The type of replication used. For example, Peer Persistence, Snapshot.
- **Replica Status**—Status of the replica (for example, Synched, Suspended). See the Replication Status for MSA replication status mapping.
- **Source Replication Group**—Remote Copy group name of source storage system (applicable to HPE 3PAR StoreServ).
- **Target Replication Group**—Remote Copy group name of target storage system (applicable to HPE 3PAR StoreServ).
- **Datastore/RDM Type**—Datastore/RDM type (Datastore or RDM).
- **Datastore Name**—Datastore name/the vmdk path on the datastore for RDM.
- **Replica Creation Time**—Replica volume creation time.
- **Last Sync Time**—Replica volume last sync time (applies to HPE 3PAR StoreServ).

**Graphics Format**
The graphics format provides a representation of the paths between the following entities:

- **Source Array**
- **Source Replication Group**
- **Source Disk Name** (Datastore Name/RDM's vmdk)
- **Replica Name**
- Target Replication Group
- Replica Array

To limit the information displayed, use the **Filter** text box in the upper-right corner of the page. Enter the data you want to filter on.

**NOTE:** If only source array is configured, then the corresponding target array columns will have no information populated.

**Viewing Volumes**

The **Volumes** page displays the following information:

- **Array Disk Name**
  - Storage volume name as configured in the HPE Storage system. Locally attached disks appear as "Local Disk:", and other disks that are not configured appear as "Unmanaged disk".

- **Array Name**
  - HPE StoreVirtual — Management group name
  - HPE 3PAR StoreServ — Storage system display name
  - HPE MSA — System name
  - HPE StoreOnce Backup — Not applicable

- **Array Model** — Hewlett Packard Enterprise Storage System model.

- **Datastore/RDM** — Datastore name or the associated `.vmdk` name for the RDM.

- **Type** — Disk type (Datastore or RDM).

- **Paths** — Number of paths for the storage volume from storage system to corresponding host.

- **VMware Disk Identifier** — Disk name assigned by VMware.

- **Path ID** — Runtime name for the path assigned by VMware.

- **Array Disk RAID** — RAID level of the Storage volume.

- **Array Disk Total Capacity** — Storage volume's total capacity (in GB).

- **Array Disk Allocated Capacity** — Capacity allocated by the storage system. For a thin-provisioned disk, this value might differ from the Storage volume Total Capacity value.

- **Array Disk Provisioned** — Specifies whether the disk is thin provisioned or normal.

- **Array Disk Type** — Storage System disk type. For example, Virtual volume, Peer Persistence.

- **Compaction ratio** — Associated with HPE 3PAR StoreServ storage systems and depicts corresponding values as in storage system.

- **Deduplication ratio** — Associated with HPE 3PAR StoreServ storage systems and depicts corresponding values as in storage system.

- **Compression ratio** — Associated with HPE 3PAR StoreServ storage systems and depicts corresponding values as in storage system.

- **Storage Pool**
- HPE StoreVirtual — Name of the cluster.
- HPE 3PAR StoreServ — Common Provisioning Group where the storage volume is located.
- HPE MSA — Name of the pool where the volume is located. Storage volume name as configured in the HPE Storage system. Locally attached disks appear as "Local Disk:“, and other disks that are not configured appear as "Unmanaged disk".
- HPE StoreOnce Backup — Not applicable.

**Estimated Max Pool Capacity**
- HPE StoreVirtual — Unallocated space in the storage pool (cluster) that can be used to meet storage needs for a snapshot or thin-provisioned volume. The calculation of this value assumes that all unallocated space is formatted the same as this volume. For all other volume types, no value is displayed.
- HPE 3PAR StoreServ — Estimated maximum space that is assigned to the storage pool that can be used to meet storage needs for a snapshot or volume.
- HPE MSA — Unallocated space in the storage pool (cluster) that can be used to meet storage needs for a snapshot or thin-provisioned volume. The calculation of this value assumes that all unallocated space is formatted the same as this volume. For all other volume types, no value is displayed.
- HPE StoreOnce Backup — Not applicable

**Storage Pool Domain Name** — Domain name assigned to CPG (applies only to HPE 3PAR StoreServ).

**Copy Pool Name** — Assigned Copy CPG (applies only to HPE 3PAR StoreServ).

**Replicated** — Specifies whether the disk is replicated.

**Physical Device Type** — The type of device in the CPG (applies only to HPE 3PAR StoreServ). The types can be FC, NL, or SSD.

**Zero Detection** — If enabled, it implies that zeroes are detected and discarded during volume copy (applies only to HPE 3PAR StoreServ).

**Volume ID** — Internal volume ID (applies only to StoreServ and StoreVirtual 13.0 onwards).

**Volume Status** — Volume health status.

**Creation Time** — Storage creation time.

**Expiration Time** — Storage expiration time (applies only to HPE 3PAR StoreServ).

**Retention Time** — Storage volume retention time (applies only to HPE 3PAR StoreServ).

**User Space Warning** — Alert threshold for a volume’s User space (applies only to HPE 3PAR StoreServ).

**User Space Limit** — Write failure threshold for a volume’s User space (applies only to HPE 3PAR StoreServ).

**Copy Space Warning** — Alert threshold for a volume’s Copy space (applies only to HPE 3PAR StoreServ).

**Copy Space Limit** — Write failure threshold for a volume’s Copy space (applies only to HPE 3PAR StoreServ).

**NOTE:** All relevant HPE storage volumes status is reported, except the ones which are on standby.
Viewing Virtual Disks

The Virtual Disks page displays the following information:

- **Virtual Disk Name**—Virtual disk name assigned by VMware.
- **Type**—Virtual disk type (Datastore or RDM or VVol).
- **Virtual Machine**—Name of the VM associated with the virtual disk.
- **Datastore**—Datastore name if type is Datastore.
- **Provisioned Capacity**—Disk capacity that the datastore/RDM is provisioned for.
- **Allocated Capacity**—Disk capacity reserved by VMware for the datastore or RDM.
  
  For a Datastore, this value will match the provisioned capacity value. For a VMDK, this value might be less than the provisioned capacity value if VMware thin provisioning is used. This is separate from thin provisioning configured in the storage system.
- **VMware Provisioned**—Thick or thin.

Viewing Paths

The Paths page displays the following information:

- **Runtime Name** — Runtime name for the path assigned by VMware.
- **State** — The state of the path (Active/Standy/Dead/Disabled/Unknown).
- **VMware Disk Identifier** — Disk name assigned by VMware.
- **Array Disk Name** — Storage volume name as in configured HPE Storage system. Locally attached disks appear as "Local Disk:.", and other disks that are not configured appear as "Unmanaged disk".
- **Array Name**
  - HPE StoreVirtual — Management group name
  - HPE 3PAR StoreServ — Storage System display name
  - HPE MSA — System name
  - HPE StoreOnce Backup — Not applicable
- **Replica Disk Name** — Disk name of the replica storage system.
- **Replica Array Name** — Array name of the replica storage system.
- **Host** — Host that is running the selected VM.
- **Host HBA Port WWN/IQN** — Host to which the array disk is presented to.
- **Array Port WWN/IQN** — HBA WWN for FC/SAS & IQN for iSCSI. VMware assigned friendly names may appear for other port types.
- **Replica Array Port WWN/IQN** — HBA WWN for FC/SAS & IQN for iSCSI for the replica storage system.
- **RC Config - Source Array Port (Target Array Ports)** — Remote Copy configuration between source and target arrays.
- **LUN** — LUN used for presenting the array disk from the storage system port to the host HBA port.
- **Array Type** — Hewlett Packard Enterprise storage system type.
• **Array Controller** — Controller that is managing this path.

• **Array Port** — Storage System port identifier associated to this path.
  ◦ HPE StoreVirtual — Not applicable.
  ◦ HPE 3PAR StoreServ — Port WWN of the controller node.
  ◦ HPE MSA — Port on the storage system controller used for this path.
  ◦ HPE StoreOnce Backup — Not applicable.

• **Host Group** — Name associated with the host port as in the configured HPE storage system.

• **Host Access** — Access setting for volume mapping (for example, READ/WRITE or READ-ONLY).

• **Array Port Speed**
  ◦ HPE StoreVirtual — Not applicable.
  ◦ HPE 3PAR StoreServ — Speed of the storage port (Gb/s).
  ◦ HPE MSA — speed of the storage port (Gb/s).
  ◦ HPE StoreOnce Backup — Not applicable.

• If a path is active and then goes offline, a standby path takes over.

**Viewing VVols**

VVol information is available in the **Volumes**, **Paths**, **Remote Replications**, **VMs To Volumes**, and the **Virtual Disks** contents of the HPE Storage.

HPE OneView for VMware vCenter reports information about Data VVol, and Configuration VVol.

• **Volume**—Volumes can easily be identified by looking at the types shown in the **Storage System Disk Type** column and are displayed as Config VVol and Data VVol.

• **Virtual Disks**—Virtual disks related to Config VVol or Data VVol are represented as "VVol" under the "type" column.

• **VMs To Volume**—Enhanced to represent Data VVols and Configuration VVols with new icons. The updated legend on this page helps you to identify these volumes.
Remote Replications — Enhanced to display Remote Copy information of VVol VM created using replication.

HPE Storage Systems Page

To access the HPE Storage Systems page:
• Navigate to **Menu > Administration > HPE Storage Systems.**

• The **HPE Storage Systems** page displays information for all storage systems configured in the HPE OneView for VMware vCenter plugin environment. To expand the list of configured storage systems and backup systems, click **HPE Storage Systems.** The number adjacent to the **HPE Storage Systems** link in the left navigation panel indicates the number of storage systems that have been configured using the **Administrator Console.** From the **HPE Storage Systems**, you can enable VASA service on a storage system and register VASA provider to vCenter to be able to create VVol datastores on a vCenter.

• The inventory list indicates the type and name of storage system or backup system. To display more information in the content pane, select an item from the list. The information displayed is determined by the type of storage system selected.

  **TIP:** After configuring storage systems, refresh the storage data by clicking the **Refresh Cache** link in the **Administrator Console**, or clicking the **Refresh** icon (⟳) in any of the **Manage** or **Configure** pages. Wait for the refresh to complete. You can view the refresh status by mousing over the **Refresh** icon (⟳) in the vSphere client.

The **HPE Storage Systems** tab is organized into the following sections:

• **Header**—The first line of information includes details like health, storage system type, and the name of the item selected. The health of the storage system is indicated using color-coded icons. A green icon (.FALSE) indicates that there are no warnings or errors for this storage system. A yellow icon (⚠️) or a red icon (✖️) indicates warnings or errors respectively.

• **VASA**—Displays the status of the VASA service provider as well as vCenter storage VASA provider. For more information on enabling and registering VASA for storage systems, see [Enabling and registering VASA](#).

• **VASA Storage certificates**—Displays the information of VASA Storage Certificates such as Common Name, Type, End Date, and Fingerprint. For more information on Creating, Renewing, and Exporting the Storage Certificates of VASA provider, see [Creating the Storage Certificates for VASA Provider](#), [Renewing the Storage Certificates for VASA Provider](#), and [Exporting the Storage Certificates for VASA Provider](#).

• **Overview**—Displays system information such as the model, serial number, and firmware version. If a storage system is selected, the amount of storage provisioned to VMware is displayed.

• **System Summary section**—Displays the number of controllers, name of the individual controllers, and ports on the system for storage systems. For backup systems, the rolled up status at the cluster level is displayed along with the capacity and the deduplication ratio. In addition, the configured user and the IP address of the management system, if applicable, are displayed.

  **NOTE:** In storage summary page, only host connected ports are displayed for HPE MSA storage systems. For complete port details, login to HPE MSA storage system using SMU/CLI.

• **Storage Summary section**—Provides additional details about the storage on the system. For a storage system, all the storage pools are listed and also the online node and associated port wwn details for HPE 3PAR and MSA arrays. View capacity information for that storage pool and access level as specified in the Administrator Console. For HPE 3PAR StoreServ storage systems, the RAID value of the CPG and the drive type of the physical disks are also displayed. For a StoreOnce Backup system, this section displays the service sets in the cluster. View node name to see the primary and the secondary nodes on which the service set is running. View services label to see the status of the service and the number of backup targets for VTL, NAS, and catalyst services.
Enabling and registering VASA

To create VVol datastores, you must have registered VASA (vStorage APIs for Storage Awareness) service provider in the vCenter and enable the same in the plugin.

Procedure

1. Log in to vSphere vCenter.
3. To enable VASA provider on storage systems, click Enable.
4. To register VASA provider on the vCenter, click Register.

NOTE: The host which is being used for the creation of the VVol datastore must be registered in a storage system with the same domain as the user that has been used for registering the VASA provider in vCenter.

After the VASA for storage systems is enabled and registered, you can now create VVol datastores by using HPE OneView for VMware vCenter plugin in the VMware vCenter.

Creating the Storage Certificates for VASA Provider

To create a VASA self-signed or a Certificate Signing Request (CSR), there must not be an existing certificate of the same type. If both the self-signed and CSR type certificates are available, Create Certificate option will be disabled.

Procedure

1. Log in to vSphere vCenter.
2. Navigate to Menu > Administration > HPE Storage Systems
3. To create a certificate, click icon (Create Certificate) at the top of the Storage Certificates table.
4. Provide the necessary details in the Create Certificate pop-up window and click Create.

Renewing the Storage Certificates for VASA Provider

Prerequisites

If the VASA Provider is in server-managed mode, reregister the VASA Provider in the vCenter since it loses connectivity after the renewal of the certificate.

Procedure

1. Select a Storage Certificate that must be renewed.
2. Click the icon (Renew Certificate) on the top of the Storage Certificates table.
3. Select the End Date required and click Create. The certificate with the renewed date is created.
Exporting the Storage Certificates for VASA Provider

Procedure

1. Select a Storage Certificate that must be exported.

2. Click icon (Export Certificate) at the top of the Storage Certificates table.
   The selected Storage Certificate gets exported to a CSV file. The file contains the tabular info namely: Common Name, Type, End Date, and Fingerprint. The Privacy Enhanced Mail (PEM) of the certificate is populated in the file represented by PEM column in the CSV file.

3. To read the PEM of certificate, open the CSV file using Notepad or WordPad instead of Microsoft Excel since the PEM of the certificate cannot fit in to a column of Microsoft Excel cell.

Refreshing the Storage Certificates for VASA Provider

Procedure

To fetch the information of VASA Storage Certificates from the array, click icon (Refresh Storage Certificates table) at the top of the storage certificates table.

Refresh can be done upon the creation of new certificate / renewal of an existing certificate.

HPE Storage Schedules

The HPE Storage Schedules page lists all the schedules defined for datastores. The page covers the following information about a schedule:

- Job Name
- Schedule Type
- Host/Cluster
- Datastore
- Frequency
- Next Execution Time
- Prev Execution Time
- Start Time
Figure 12: HPE Storage Schedules

To access this page, navigate to Menu > Administration > HPE Storage Schedules.

You can delete any schedule from this page.

1. **Select** the schedule that you want to delete.

2. **Click** icon under **Action** column.

To limit the information displayed to the specified criteria, use the Filter tool in the upper-right corner of the page. Enter the data you want to filter.
Provisioning HPE Storage

HPE OneView for VMware vCenter supports storage provisioning for HPE 3PAR StoreServ, HPE StoreVirtual, and HPE MSA storage systems. Perform storage provisioning operations such as creating a new datastore, deleting or expanding an existing datastore, creating new VMs.

NOTE: Scheduling snapshot and Switch peer persistence provisioning operations are supported on HPE 3PAR StoreServ only.

To perform the tasks in this chapter, you must:

- Use a Hewlett Packard Enterprise storage system that support provisioning.
- Use the Administrator Console to set the Full Access permission for the storage pools to be used for the provisioning operations.
- Disable the browser pop-up blocker. If the pop-up blocker is enabled, provisioning cannot be initiated by right-clicking a VM, host, cluster, or datastore in the inventory tree.
- Use a cluster with configured hosts when performing provisioning operations on a cluster.
- vCenters tasks page lists all HPE storage provisioning operations handled through HPE OneView for VMware vCenter. These are postfixed with HPE in title and description is prefixed with Job Id.

TIP: By default, Internet Explorer shows the page URL in the title bar of a pop-up browser window. To show the window title, enable the following Internet Explorer security settings:

- Allow script-initiated windows without size or position constraints
- Allow websites to open windows without address or status bars

- Creating a datastore
- Creating VM from Template
- Scheduling Snapshot
- Expand a datastore
- Switching Peer Persistence
- Delete a datastore
- Delete Volume

Creating datastores

HPE OneView for VMware vCenter enables you to create the following types of datastores using HPE storage systems:

- VMFS (Virtual Machine File System) datastore
- VVol (Virtual Volumes) datastore
Creating VVol datastores

Prerequisites

- VVol datastores are supported only for HPE 3PAR storage systems. Ensure that you follow all the terms and conditions that exist in HPE 3PAR storage system for creating VVol datastores.
- **Enable VASA service on a storage system and register VASA provided to the vCenter.**
- The host which is being used for the creation of the VVol datastore must be registered in a storage system with the same domain as the user that has been used for registering the VASA provider in vCenter.

Procedure

1. Navigate using one of the following:
   a. Home > Hosts and Clusters and select the cluster and right-click and navigate to All HPE Storage Actions > Create VVOL Datstore.
   b. Home > Hosts and Clusters, and access any submenu of the HPE Storage menu, namely: Monitor, Configure, and select + VVOL Datstore.

   The Create VVol datastore wizard opens. Follow the steps in the wizard.

Create VVol datastore – Select the location

Select the location for the datastore being created.

Procedure

1. Under Select location section, select a cluster or host to create a datastore.
2. Click Next.

Create VVol Datastore – Select storage

Procedure

1. Under Select storage section, you can select one of the following:
   a. Existing Storage Container
   b. New Storage Container

2. To select an existing storage container from the list, select Existing Storage Container. If you selected, New Storage Container, you are prompted to: Enter Storage Container Name.
3. Click NEXT.
Creare VVol datastore-Specify names

Procedure

1. Under Specify names section, enter the Datastore Name.
2. Click NEXT.

Create VVol datastore - Summary

Procedure

1. Verify the details you entered in the Summary section.
2. Click FINISH.
3. Verify the status of the operation under vCenter Tasks.
   If any error is displayed, then verify if the VASA provider is enabled and registered. For more information, see Enabling and registering VASA.

   IMPORTANT: You cannot expand or delete a VVol store from HPE OneView for VMware vCenter plugin. You can only expand or delete a VVol datastore from a VMware vCenter.

Creating VMFS datastores

You can create a VMFS datastore on a host or cluster that meets the following prerequisites.

Hosts

1. The host must exist in the vSphere Client.
2. In an FC environment, the SAN must be zoned between the storage pools and the host.
3. The host must be configured as a hostgroup or host on the storage systems.
4. In an iSCSI environment:
   a. The iSCSI initiator on the host must be installed and configured.
   b. The iSCSI storage systems IP address or hostname must be configured in the iSCSI dynamic discovery list of initiators on the host.

Clusters

- The cluster and its hosts must exist in the vSphere Client.
- In an FC environment, the SAN must be zoned between the storage pools and the cluster hosts.
- The cluster hosts must be configured as hostgroups or hosts on the storage systems.
- The cluster hosts can belong to separate hostgroups.

   NOTE: The Storage Module for vCenter does not support configurations that have all cluster hosts in a single hostgroup.

- In an iSCSI environment:
- The iSCSI initiator on all cluster hosts must be installed and configured.
- The iSCSI storage systems IP address or hostname must be configured in the iSCSI dynamic discovery list of initiators on all the cluster hosts.

Procedure

1. Navigate using one of the following:
   a. Home > Hosts and Clusters and select the cluster and right-click and navigate to All HPE Storage Actions > Create VMFS Datastore.
   b. Home > Hosts and Clusters, and access any submenu of the HPE Storage menu, namely: Monitor, Configure, and select + VMFS Datastore.

   The Create VMFS datastore wizard opens. Follow the steps in the wizard.

Create VMFS datastore – Select the location

Select the location for the datastore being created.

Procedure

1. Select the host or the cluster which will own the new datastore.
2. Click Next.

Create VMFS Datastore – Select storage

To create and their storage properties, select the number of datastores.

Procedure

1. Enter the number of datastores to be created.
2. Enter the capacity for the new datastores in Datastore Capacity.
3. To use for the new datastore in Select Storage Pools table, select a storage pool
4. The configured storage pools with Full Access on storage systems that support provisioning are listed.
   TIP: The list can be sorted by any column.
5. If there is a drop-down of RAID level below the table, select required RAID level from the drop-down menu.
6. For an HPE 3PAR StoreServ, if Peer Persistence is to be enabled, select Enable Peer Persistence.
7. For an HPE 3PAR StoreServ, select a storage pool for Copy Space from the drop-down menu.
8. For an HPE 3PAR StoreServ, select Compression and/or Dedupe, if needed. These options will appear only if it is applicable to the storage pool.
9. Click Next.
Create VMFS datastores – Configure Peer Persistence

**Prerequisites**

To configure Peer Persistence, ensure:

- Peer Storage System is configured in the Administrator Console.
- The Peer Storage Pools to be used for the Peer Persistence on the storage systems are configured with Read-Write access.
- Peer Storage Pools are in the same domain as the selected host.

**Procedure**

1. Select the Storage Pool on the Peer.
2. Click Next.

Create datastores – Specifying names

Specify new names for the datastores being created.

**Procedure**

1. Enter the base name for the new datastore(s) in the **Datastore name**.
2. For single datastore, the # symbol is not required. For multiple datastores, the # symbol is required. It represents a numeric sequence. In the generated datastore names, the # symbol is replaced with a number.
3. Enter the start value for the numeric sequence in **Where # is numeric and starts at**.
4. The **Generated names** box displays the names of the datastores to be created.
5. Click Next.

The specified datastore names are validated. Any duplicate names entered are identified.

Create datastores – Scheduling DS Protection

The datastore protection list contains list of datastores that are added for data protection. You can also Modify and Remove the protection schedule for the datastores.

**Procedure**

1. In the Datastore Name, select one or more or all datastores at a time and enter the values.
2. Select the protection policy from the drop-down list available in the Select Protection Policy. Only those protection policies will appear that are associated with RMC that is related to the vCenter. Choose appropriate policy that corresponds to the storage system from which storage pool is selected.
3. Specify a new prefix of the job name in the **Job Name (Prefix)**. The same prefix is used in scheduled jobs for RMC.
4. Select the start date and time of the job in the **Schedule Start Time**. It is assumed that the system on which browser is running matches the time set in RMC. The time chosen must be a future time in RMC.
5. Select the end date and time of the job in the **Schedule End Time**.
6. Select the Schedule Frequency of the job from the drop-down list.

7. Specify the Recurrence value in the Recur tab. This recurrence parameter will depend on the frequency chosen.

8. Click **ADD DS PROTECTION**. It adds the selected datastores protection schedule to the datastore protection list. If required, you can modify entries to this by following the same steps once again or continue to next screen.

   **NOTE:** Being in the same screen, you can also Add DS Protection to many different datastores.

9. Click **NEXT**.

### Create datastores – Reviewing the summary

Review the information and create the datastore.

**Procedure**

1. To ensure it is correct, review the summary information

2. To create the specified datastores, click **Finish**.

   **TIP:**
   - View the progress of the operation in the vCenter **Tasks** pane of the vSphere Client.
   - Manual cache refresh is not necessary when the operation is finished. The cache will be refreshed automatically.

### Creating VM from Template

You can create one or more VMs from a template.

**Prerequisites**

- The VM template must exist in the datacenter of vCenter.
- Creating a VM has the same prerequisites as creating a datastore. For more information, see **Creating a datastore**. During the process of creating the new VM, one or more new datastores are created.
- All of the files associated with the new VMs are created on the new datastores.
- If the template contains an RDM, the operation will fail during the process of creating the new VM.

   **NOTE:** When VMware converts a VM to a template, all RDMs are converted to empty virtual disks (VMDKs). Therefore, VMs created from this template will not have associated RDMs. For more information, see **Virtual Disk Compatibility Modes** in the VMware vSphere Online Library.

- If a cluster is used to initiate the VM creation, all hosts in the cluster must be zoned to the storage, and hostgroups must be configured.

**Procedure**

1. Navigate using one of the following:
a. Navigate to Home > Hosts and Clusters and access any submenu of the HPE Storage menu, namely: Monitor, Configure and select + VM from Template.

b. Select Hosts and Clusters. Right-click a host or a cluster and navigate to All HPE Storage Actions > Create VM from Template.

The Create VM from Template wizard opens. Follow the steps in the wizard.

Create VM from Template – Selecting a location
Select the location for the virtual machines being created.

Procedure
1. Select the host or the cluster which will own the new virtual machine(s).
2. Click Next.

Create VM from Template – Selecting a VM template
Select the template and define the properties for the virtual machine being created.

Procedure
1. To create Number of virtual machines, enter the number of VMs.
2. Select the template to be used to create new VM(s).
3. When a template is selected, the wizard displays the required storage capacity per VM and for all VMs, if multiple VMs are being created.
4. Select a customization specification (if any are available) in Customization Specification.
5. For more information regarding customization specification, see the VMware documentation.
6. Select the Power option if desired.
7. Click Next.

Create VM from Template – Selecting storage
Select the number of datastores to create for the host VMs.

Procedure
1. Enter the number of datastores to create in Number of datastores.
2. The new VMs are distributed among these new datastores.
3. Enter the capacity for the new datastores in Datastore Capacity.
4. Select a storage pool to use for the new datastore in Select Storage Pool.
5. The configured storage pools with Full Access on storage systems that support provisioning are listed.

TIP: The list can be sorted by any column.

6. For a non-3PAR storage system, select a RAID level from the drop-down menu.
7. For an HPE 3PAR StoreServ storage system, if Peer Persistence is to be enabled, select **Enable Peer Persistence**.

8. For an HPE 3PAR StoreServ storage system, select a storage pool for **Copy Space** from the drop-down menu.

9. Click **Next**.

**Create VM from Template – Configuring Peer Persistence**

The Peer Storage System should be configured in the Administrator Console. The Peer Storage Pools to be used for the Peer Persistence on the storage system should be configured with Read-Write access. In addition, the Peer Storage Pools should be in the same domain as the selected host(s).

**Procedure**

1. Select the Storage Pool on the Peer.
2. Click **Next**.

**Create VM from Template – Specifying names**

Specify names for the virtual machines and datastores being created.

**Procedure**

1. Enter the base name for the new virtual machine(s) in the **Virtual Machine name**.
2. For single virtual machine, the # symbol is not required. For multiple virtual machines, the # symbol is required. It represents a numeric sequence. In the generated virtual machine names, the # symbol is replaced with a number.
3. Enter the start value for the numeric sequence in **Where # is numeric and starts at**.
4. The **Generated names** box displays the names of the virtual machines to be created.
5. Similarly, if multiple datastores are being created, enter the base name for the new datastore(s) in **Datastore name** and the start value of the # symbol for the datastore(s).
6. Click **Next**.

**Create VM from Template – Scheduling DS Protection**

**Procedure**

1. Datastore protection list contains list of datastores that are added for data protection. You can **Modify** and **Remove** the datastores schedule whenever required.
2. In the Datastore Name, select one or more or all datastores at a time and enter the values.
3. Select the protection policy from the drop-down list available in the Select Protection Policy. Only those protection policies will appear that are associated with RMC that is related to the vCenter. Choose appropriate policy that corresponds to the storage system from which storage pool is selected.
4. Specify a new prefix of the job name in the Job Name (Prefix). The same prefix is used in scheduled jobs for RMC. Resultant schedule job name in RMC will be <prefix>_<DS name>_<timestamp>.
After DS creation, it is recommended to verify if the schedule is appropriately created in RMC and at least first run happened successfully.

5. Select the start time and date of the job in the Schedule Start Time. It is assumed that the system on which browser is running matches the time set in RMC. The time chosen must be a future time in RMC.

6. Select the end time and date of the job in the Schedule End Time.

7. Select the Schedule Frequency of the job from the drop-down list.

8. Specify the Recurrence value in the Recur tab. This recurrence parameter will depend on the frequency chosen.

9. Click **ADD DS PROTECTION**. It adds the selected datastores protection schedule to the datastore protection list. If required, you can modify entries to this by following the same steps once again or continue to next screen.

   **NOTE:** Being in the same screen, you can also Add DS Protection to many different datastores.

10. Click **NEXT**.

### Create VM from Template – Scheduling VM Protection

**NOTE:** If you configure Schedule VM Protection, it enables additional protection on VMs. It is an optional DS protection.

**Procedure**

1. Virtual machine protection list contains list of VMs that are added for VM protection. You can also **Modify** and **Remove** the virtual machines schedule whenever required.

2. In the Virtual machine name, select one or more VMs at a time and enter the values.

3. Select the protection policy from the drop-down list available in the Select Protection Policy. Only those protection policies will appear that are associated with RMC that is related to the vCenter. Choose appropriate policy that corresponds to the storage system from which storage pool is selected.

4. Specify a new prefix of the job name in the Job Name (Prefix). The same prefix is used in scheduled jobs for RMC. Resultant schedule job name in RMC will be `<prefix>_<VM name>_<timestamp>`. After VM creation, it is recommended to verify that if the schedule is appropriately created in RMC and at least first run happened successfully.

5. Select the start time and date of the job in the Schedule Start Time. It is assumed that the system on which browser is running matches the time set in RMC. The time chosen must be a future time in RMC.

6. Select the end time and date of the job in the Schedule End Time.

7. Select the Schedule Frequency of the job from the drop-down list.

8. Specify the Recurrence value in the Recur tab. This recurrence parameter will depend on the frequency chosen.

9. Click **ADD VM PROTECTION**. It adds the selected datastores protection schedule to the datastore protection list. If required, you can modify entries to this by following the same steps once again or continue to next screen.
NOTE: Being in the same screen, you can also Add VM Protection to many different virtual machines.

10. Click NEXT.

Create VM from Template – Reviewing the summary

Review the information and create the VMs.

Procedure

1. Review the summary information to ensure it is correct.
2. To create the specified VMs and datastores, click Finish.

:TIP:

Manual cache refresh is not necessary when the operation is finished. The cache will be refreshed automatically.

Schedule VMFS Datastore Snapshot

Prerequisites

You can schedule underlying storage volumes snapshot for a datastore by selecting HPE Schedule datastore snapshot or Schedule snapshot being in host or cluster or datastore context.

NOTE: Schedule snapshot operation is supported only for HPE 3PAR StoreServ.

• Datastores
  ◦ Datastore must exist in the vSphere client.
  ◦ List of datastores which is being related to HPE 3PAR StoreServ only and managed by HPE OneView for VMware vCenter plugin will be available for selection.

Procedure

1. Navigate to Home > Hosts and Clusters, and select the host, cluster, or datastore for which you want to schedule a snapshot and right click.
2. Navigate to All HPE Storage Actions > Schedule VMFS Datastore Snapshot.
3. In Job Name (Prefix) field, specify a new prefix of the job name.
   The same prefix is used in scheduled jobs for snapshots. Resultant schedule job name will be <prefix>_<Datastore name>_<timestamp>.

   NOTE: It is recommended that you verify that a schedule has been appropriately created for the datastore and at least the first run has been successful.

4. Select the Frequency of the job from the drop-down list.
5. Specify the Recurrence value in the Execution on tab. This recurrence parameter will depend on the frequency chosen.
6. Specify the number of days for which information of the job must be maintained or retained in the Retention Days tab.

7. Select the end time and date of the job in the End Time.

8. Click ADD SCHEDULE. The snapshot schedule of the selected datastore is added to the snapshot schedule list.

---

**NOTE:** Do not configure more than 15 schedules to be executed at the same time.

To modify the snapshot schedule parameters, repeat all the steps again.

**NOTE:** You can schedule snapshots for multiple datastores following the same steps.

---

**Expanding datastores**

You can expand the size of a datastore if it is located on a single disk.

---

**NOTE:** If the underlying volume is setup for 3PAR StoreServ Peer Persistence, the datastore cannot be expanded.

---

**Procedure**

1. Browse to the vSphere Client.

2. Right-click a host or a cluster and select All HPE Storage Actions > Expand a datastore.

   Alternatively, select Actions > Expand a datastore on any page related to the submenu of HPE Storage under Configure/Manage tab for a host or a cluster.

   The Expand a datastore page is displayed.

3. Enter the new capacity in New Datastore Capacity.

4. The following rules apply when expanding datastores.

   a. A datastore can be expanded only if it is located on a single disk on a storage system that supports provisioning by the Storage Module for vCenter.

   b. The requested capacity cannot exceed the total capacity of the storage pool.

   c. The requested capacity cannot be less than or equal to the original datastore capacity.

5. The Expand Datastore window displays the Est Max Pool Capacity for the selected storage pool.

6. To expand the selected datastore, click Finish.

---

**TIP:**

- View the progress of the operation in the Tasks pane of the vSphere Client.

- Manual cache refresh is not necessary when the operation is finished. The cache will be refreshed automatically.
Switching Peer Persistence

The Switch Peer Persistence page is used to reverse the source and target roles of an HPE 3PAR StoreServ Peer Persistence relationship. Source and target storage systems must be configured in the Administrator Console for Peer Persistence related features to work.

**NOTE:** Switch Peer Persistence is only applicable to HPE 3PAR StoreServ source disks. The Switch Peer Persistence operation can be initiated from any of the HPE Storage content that display the source disk.

**Procedure**

1. Browse to the **HPE Storage Volumes** table.
2. Right-click a storage volume that has **Peer Persistence** as the array disk type, and then click **Switch Peer Persistence**.
3. To swap the source and target roles, click **Switch Peer Persistence**.
   
   An A window displays the current peer persistence setup details as known to HPE OneView for VMware vCenter to confirm switching to Peer Persistence. The confirmation window also indicates how you can monitor the progress of the operation.

4. Click **OK**.

Deleting datastores

You can delete a datastore if it is not used by a VM or VM template.

**Procedure**

1. Browse to the vSphere Client.
2. Right-click a host or a cluster and select **All HPE Storage Actions > Delete a datastore**.
   
   Alternatively, select **Actions > Delete a datastore** on any page related to the submenu of HPE Storage under **Configure/Manage** tab for a host or a cluster.

   The **Delete a datastore** wizard opens.

3. Follow the steps in the wizard.
4. If the disk used by the datastore is replicated using snapshot, the delete operation will fail.
5. If the datastore is used by a VM or VM template, the delete operation will fail.

To delete a datastore:

- If any errors are shown, address them and then retry the operation. Otherwise, click **Yes** to confirm the operation.
- The Storage Module for vCenter unpresents the storage volumes from all hosts, deletes the volumes, and re-scans the hosts. When these tasks are complete, the deleted datastore is no longer displayed in the vSphere Client.
• If the datastore is setup with Peer Persistence and the Peer storage systems is configured in the plug-in, the volumes on the Peer storage systems are also deleted.

• If the delete operation cannot be performed, an error message is displayed describing why the operation failed.

**TIP:**
Manual cache refresh is not necessary when the operation is finished. The cache will be refreshed automatically.

---

**Deleting volumes**

An unassigned volume is a volume that is not associated with a datastore or RDM. You can delete unassigned storage volumes that belong to storage systems that support provisioning.

**Procedure**

1. Browse to the **HPE Storage Volumes** table.

2. Right-click a storage volume, select **Delete volume**.

   The **Delete volume** wizard opens.

3. Follow the steps in the wizard.

4. If any errors are shown, address them and then retry the operation. Otherwise, click **Delete** to confirm the operation.

5. The Storage Module for vCenter removes the LUN presentation from all hosts, deletes the volume, and rescans the hosts. When these tasks are complete, the deleted volume is no longer displayed in the vSphere Client.

6. If the volume is set up with Peer Persistence and the Peer storage systems is configured in the plug-in, the volume on the Peer storage systems will also be deleted.

7. If the delete operation cannot be performed, an error message is displayed describing why the operation failed.

**TIP:** Manual cache refresh is not necessary when the operation is finished. The cache will be refreshed automatically.
HPE OneView for VMware vCenter delivers alerts from server hardware and enclosures to the vCenter Events Log. Users can then set up their own Alarm Definitions in vCenter to trigger actions based on received alerts.

**For HPE OneView managed hardware** — HPE OneView for VMware vCenter monitors the HPE OneView’s State Change Message Bus (SCMB) for Critical and Warning alerts from Server Hardware and Enclosures/Frames. Alerts that originate from an enclosure or frame are delivered to each host in the enclosure or frame.

**For Non-HPE OneView managed hardware** — HPE OneView for VMware vCenter monitors HPE iLO, HPE CIM providers, and HPE Onboard Administrator for alerts. Alerts from HPE Onboard Administrator are delivered to each host in the enclosure.

### Alerts delivered to vCenter

Alerts from HPE hardware are delivered to the vCenter Event Log with the following Event Types and fields:

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Event Name</th>
<th>Fields</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>com.hp.wbem.info</td>
<td>HPE Server WBEM Info Event</td>
<td>evDescription</td>
<td>Event Description</td>
</tr>
<tr>
<td>com.hp.wbem.warning</td>
<td>HPE Server WBEM Warning Event</td>
<td>evDescription</td>
<td>Event Description</td>
</tr>
<tr>
<td>com.hp.wbem.error</td>
<td>HPE Server WBEM Error Event</td>
<td>evDescription</td>
<td>Event Description</td>
</tr>
<tr>
<td>com.hp.cseries.status.info</td>
<td>HPE Infrastructure Status Info Event</td>
<td>entity</td>
<td>Subsystem type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>evDescription</td>
<td>Event Description</td>
</tr>
<tr>
<td>com.hp.cseries.status.warning</td>
<td>HPE Infrastructure Status Warning Event</td>
<td>entity</td>
<td>Subsystem type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>evDescription</td>
<td>Event Description</td>
</tr>
<tr>
<td>com.hp.cseries.status.error</td>
<td>HPE Infrastructure Status Error Event</td>
<td>entity</td>
<td>Subsystem type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>evDescription</td>
<td>Event Description</td>
</tr>
<tr>
<td>com.hp.cseries.hardware.info</td>
<td>HPE Infrastructure Hardware Info Event</td>
<td>evDescription</td>
<td>Event Description</td>
</tr>
<tr>
<td>com.hp.cseries.hardware.warning</td>
<td>HPE Infrastructure Hardware Warning Event</td>
<td>evDescription</td>
<td>Event Description</td>
</tr>
<tr>
<td>com.hp.cseries.hardware.error</td>
<td>HPE Infrastructure Hardware Error Event</td>
<td>evDescription</td>
<td>Event Description</td>
</tr>
<tr>
<td>com.hpe.oneview.status.info</td>
<td>HPE OneView Info Event</td>
<td>healthCategory</td>
<td>Check OneView /rest/alerts/ API reference for a detailed description of the fields.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>lifeCycle</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>alertState</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>evDescription</td>
<td></td>
</tr>
</tbody>
</table>

*Table Continued*
### Creating alarm descriptions

For monitoring your environment, you can create or modify alarm definitions in the vCenter Client to trigger actions based on received alerts. For information on the alert types, see [Alerts delivered to vCenter](#).

The alarm definitions can be accessed from the Monitor tab. For more information on how to create or modify alarm definitions, see [vSphere Monitoring and Performance](#) document from VMware.

**Procedure**

1. Log in to vSphere Client.

2. Navigate to Monitor > Issues and Alarms > Alarm Definitions. Follow the steps provided in the [vSphere Monitoring and Performance](#) document from VMware.

   The following are examples of how to create an Alarm Definition that will trigger an alarm when HPE OneView reports a memory alert on a server. A server hardware memory alarm can be defined in the following ways:

   a. You can define an alarm to trigger when any memory alert occurs on the server by looking for events where:

      - `healthcategory = Memory`
      - `lifeCycle = False`
      - `healthCategory = Memory`

      I. Navigate to New Alarm Definition window.
      II. Enter the details for the General window:
III. Click **Next**.

The **Triggers** window is displayed.

IV. Enter the details for the **Triggers** window:

b. You can define an alarm to trigger for a specific memory alert by checking the **evDescription** field for the text that matches the alert:

- **evDescription**—starts with "Correctable memory errors require a replacement of the memory module".

I. Navigate to **New Alarm Definition** window.

II. Enter the details for the **General** window:
III. Click **Next**.

The **Triggers** window is displayed.

IV. Enter the details for the **Triggers** window:

**NOTE:** For information on format of specific alerts, see documentation on HPE OneView, HPE iLO, and HPE Onboard Administrator.

For information on creating custom Alarm Definitions, see VMware documentation.

**NOTE:** Previous version of HPE OneView for VMware vCenter created example Alarm Definitions in vCenter. This version of HPE OneView for VMware vCenter does not create these examples but they might still be visible if HPE OneView for VMware vCenter was upgraded. These Alarm Definitions can be referenced as examples or deleted.
Before troubleshooting issues with HPE OneView for VMware vCenter, you must do the following:

- Verify that the correct user name and password are entered for vCenter Server.
- Verify that the software is installed and configured as described in the *HPE OneView for VMware vCenter Installation Guide*.

This section includes general troubleshooting information for HPE OneView for VMware vCenter. For troubleshooting information specific to the HPE OneView for VMware vCenter for Server, see **Troubleshooting the HPE OneView for VMware vCenter for Server**. For troubleshooting information specific to the HPE OneView for VMware vCenter for Storage, see **Troubleshooting the HPE OneView for VMware vCenter for Storage**.

This section covers the following troubleshooting solutions for HPE OneView for VMware vCenter:

- **HPE Storage menu not available in the vSphere Client**
- **Stale or corrupt cache or cookies result in GUI anomalies**
- **Internal server error on vSphere Client**

### HPE Storage menu not available in the vSphere Client

**Symptom**

Unable to access the HPE Storage menu in the vSphere Client.

**Cause**

The vSphere has not deployed the plug-in.

**Action**

1. Log out of the vSphere Client and then log back in.
2. If the icon still does not appear, ensure that the network firewall is not blocking ports that are used by HPE OneView for VMware vCenter.
3. If there is no port blocking, ensure that the vCenter server and HPE OneView for VMware vCenter can look up each other over network based on the IP address and FQDN.
4. A restart of the vSphere UI service in vCenter or restart of the vCenter may be needed.
Stale or corrupt cache or cookies result in GUI anomalies

**Symptom**
Stale, corrupt cache or cookies can result in GUI anomalies.

**Cause**
HPE OneView for VMware vCenter browser/proxy server may have cached data that is being displayed.

**Action**
Clear the cache in the browser.

Internal server error on vSphere Client

**Symptom**
Unable to work on the vSphere Client because of an internal server error message.

**Cause**
An error message displays because the screen was left for more than 60 minutes.

**Action**
Click home page and return to the current page.

Troubleshooting the HPE OneView for VMware vCenter for Server

This section includes troubleshooting information specific to the HPE OneView for VMware vCenter for Server.

For general HPE OneView for VMware vCenter troubleshooting, see *Troubleshooting HPE OneView for VMware vCenter*. For troubleshooting information specific to the HPE OneView for VMware vCenter for Storage, see *Troubleshooting the HPE OneView for VMware vCenter for Storage*.

This section covers the following troubleshooting solutions for HPE OneView for VMware vCenter for Server:

- **Health status or information is missing for specific hosts or clusters**
- **No Virtual Connect information is available for this host error**
- **Grow Cluster SPTs are not listed for the registered HPE OneView**
- **Grow Cluster using IP pool fails if "Hostname to Register" option set to true in Grow Cluster**
- **Non-HPE OneView server data is not displayed in the UI**

Health status or information is missing for specific hosts or clusters

**Cause**
Active and properly authenticated communication between vCenter Server, HPE OneView for VMware vCenter, ESXi Offline Bundle for VMware ESXi, or Virtual Connect Manager (blades only), and the managed nodes is not established with their management processors.
Action

1. Verify that properly authenticated communication is established.
2. Verify that the iLO information is associated correctly with the corresponding host system.
3. Verify that the ESXi Offline Bundle for VMware ESXi are installed and that the credentials are properly configured in HPE OneView for VMware vCenter.
4. Verify that either the global credentials or the credentials specific to each iLO, Onboard Administrator, and VMware host are configured properly.
5. Ensure that the initial polling cycle is complete. This may take a few moments, depending on the settings.

No Virtual Connect information is available for this host error

Cause
The following scenarios can cause this error:

Action

1. Servers are not blade servers.
2. The blade server is not configured with Virtual Connect.
3. The Virtual Connect credentials are not valid.
4. Other errors occurred while retrieving Virtual Connect data.

Grow Cluster SPTs are not listed for the registered HPE OneView

Cause
HPE OneView connection to VMware vCenter is disconnected.

Action
In HPE OneView credential page, go to configuration option and reregister hypervisor manager. After the hypervisor manager connection state is changed to Connected, you can see SPTs getting listed in Grow Cluster.

Grow Cluster using IP pool fails if "Hostname to Register" option set to true in Grow Cluster

Cause
Hostname generated from host prefix is not registered in DNS server automatically.
Non-HPE OneView server data is not displayed in the UI

Cause
This issue happens due to nonresponding host in the vCenter inventory.

Action
Connect the nonresponding host again to vCenter or you can remove the host from vCenter.

Troubleshooting the HPE OneView for VMware vCenter for Storage

This section includes troubleshooting information specific to the HPE OneView for VMware vCenter for Storage.

For general HPE OneView for VMware vCenter troubleshooting, see Troubleshooting HPE OneView for VMware vCenter.

For troubleshooting information specific to the HPE OneView for VMware vCenter for Server, see Troubleshooting the HPE OneView for VMware vCenter for Server.

This section covers the following troubleshooting solutions:

- Configuration Using the Administrator Console
- HPE OneView for VMware vCenter for Storage for vCenter GUI not responsive to mouse clicks
- HPE MSA Storage System Information not Displayed in HPE OneView for VMware vCenter for Storage GUI
- Duplicate LUNs Displayed in HPE OneView for VMware vCenter for Storage Interface
- LUN displayed multiple times for VM or datastore that is part of a cluster
- Internet Explorer script error occurs in environment with 100 or more LUNs
- HPE Storage pages show stale information
- Provisioning operation fails
- Change in HPE Storage Systems must be re-registered

Configuration Using the Administrator Console

To configure vCenters and storage systems, you must have administrator privileges with valid credentials to login to the Administrator console. However, this does not grant the VMware Administrator role that is required to perform HPE OneView for VMware vCenter for Storage for provisioning operations on Hewlett Packard Enterprise storage systems. To use the HPE OneView for VMware vCenter for Storage for provisioning features, you must configure the VMware Administrator role in a vSphere session. For instructions, see the HPE OneView for VMware vCenter Installation Guide.
HPE OneView for VMware vCenter for Storage for vCenter GUI not responsive to mouse clicks

Cause
The Temporary Internet Files directory is full.

Action
Delete the temporary files created by Internet Explorer.

HPE MSA Storage System Information not Displayed in HPE OneView for VMware vCenter for Storage GUI

Solution 1

Cause
The Secured SMI-S service on the storage system might be unresponsive.

Action
1. Log in to the SMU interface of the HPE MSA storage system as a user with Manage access. Use the available management IP address, applicable for MSA Storage Systems with firmware version VL100/VE100 or later (for example: http://Management_IP_address/).
3. Enable the check box under Storage Management Initiative Specification (SMI-S) along with Encrypted, and then click OK.
4. Re-apply the Storage Management Initiative Specification (SMI-S) by selecting the check box under Storage Management Initiative Specification (SMI-S) in System Settings dialog box, and then click OK.
5. The Secured SMI-S service is now running.
6. Refresh the HPE OneView for VMware vCenter for Storage cache.
7. For instructions, see Initiate refresh.

Solution 2

Action
1. Restart the HPE MSA storage system management controller.

   IMPORTANT: This procedure restarts the HPE MSA storage system controller. If you restart a management controller, communication with it is lost until it restarts successfully. This will not affect disk access. If the restart fails, the partner management controller remains active with full ownership of operations and configuration information. Other applications (such as Microsoft VSS and VDS) that rely on the management controller services might be affected.
2. Log in to the SMU interface of the HPE MSA storage system as a user with Manage access. Use the available management IP address applicable for MSA Storage Systems with firmware version VL100/VE100 or later (for example: http://Management_IP_address/).
3. Navigate to **System topics > Action > Restart System**.
4. Determine which controller has the IP address used in step 2.
5. Select the following:
   - **Operation**: Restart
   - **Controller type**: Management
   - **Controller Module**: A or B, as determined in step 4.
6. Click **OK**.
7. Wait till the storage system is operational to log in to the SMU.
8. Refresh the HPE OneView for VMware vCenter for Storage cache. For instructions, see Refreshing HPE Storage for vCenter data.

### Duplicate LUNs Displayed in HPE OneView for VMware vCenter for Storage Interface

#### Solution 1

**Cause**

When using multipathing, duplicate LUNs might be displayed if a LUN is presented to a host using different LUN numbers across multiple paths.

**Action**

Reconfigure the LUNs so they have a single LUN number across all paths. For more information, see article 1003973 in the **VMware Knowledge Base**.

#### Solution 2

**Action**

1. Disable the VMware advanced setting Scsi.CompareLUNNumber.
   a. Select a host in the vSphere Client.
   b. Click the **Configuration** tab.
   c. Click **Advanced Settings** in the Software pane.
   d. Click **Scsi** in the list of advanced settings.
   e. Edit the **Scsi.CompareLUNNumber** value, and then click **OK**.

### LUN displayed multiple times for VM or datastore that is part of a cluster

**Cause**

The Storage Module for vCenter uses an ESXi Host+LUN number as the unique identifier. When a single LUN is presented to multiple hosts that are part of a cluster, the LUN is listed on the Related VMs and Related Datastores pages for each host.
**Action**

LUNs with the same disk names are duplicates and represent a single disk on the storage system.

**Internet Explorer script error occurs in environment with 100 or more LUNs**

**Symptom**
The following message occurs during a refresh in an environment with 100 or more LUNs:

*Stop running this script? A script on this page is causing Internet Explorer to run slowly. If it continues to run, your computer might become unresponsive.*

**Cause**
An Internet script is taking too long to complete.

**Action**
1. Click *No*.
2. Add or modify the registry entry.
3. Open the registry key `HKEY_CURRENT_USER\Software\Microsoft\Internet Explorer \Styles`. If the key does not exist, add it.
4. Create a DWORD value called `MaxScriptStatements` under the key you opened or created in.
5. Assign the value `0x00FFFFFFFF` to prevent the script error. To prevent Internet Explorer from displaying this error message again, use the value `0xFFFFFFFF`.

**HPE Storage pages show stale information**

**Cause**
Cache in storage module is not up-to-date.

**Action**
Trigger a global refresh and wait till completion followed by browser refresh.

**Provisioning operation fails**

**Cause**
One of the causes could be that the credential etc. has changed on the storage system.
**Action**

If there is change in name/access to storage system or access to vCenter or any new storage pool is added then go to the admin console and edit or remove followed by add of the respective vCenter/storage system.

**Change in HPE Storage Systems credentials must be re-registered**

**Symptom**

Any change in Storage System credentials needs to be re-registered.

**Cause**

As per design when we add a Storage System to HPE OneView for VMware vCenter, it saves the credentials in the database and uses the same for all operations/queries. If a user updates the System password at any point in time, it becomes unmanageable.

**Action**

Re-register the Storage System continue managing the operations/queries.
Websites

General websites
Hewlett Packard Enterprise Information Library
  www.hpe.com/info/EIL
Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix
  www.hpe.com/storage/spock
Storage white papers and analyst reports
  www.hpe.com/storage/whitepapers
For additional websites, see Support and other resources.
Support and other resources

Accessing Hewlett Packard Enterprise Support

• For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:
  http://www.hpe.com/assistance

• To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:
  http://www.hpe.com/support/hpesc

Information to collect

• Technical support registration number (if applicable)
• Product name, model or version, and serial number
• Operating system name and version
• Firmware version
• Error messages
• Product-specific reports and logs
• Add-on products or components
• Third-party products or components

Accessing updates

• Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.

• To download product updates:
  Hewlett Packard Enterprise Support Center
  www.hpe.com/support/hpesc
  Hewlett Packard Enterprise Support Center: Software downloads
  www.hpe.com/support/downloads
  Software Depot
  www.hpe.com/support/softwaredepot

• To subscribe to eNewsletters and alerts:
  www.hpe.com/support/e-updates

• To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center More Information on Access to Support Materials page:
  www.hpe.com/support/AccessToSupportMaterials
IMPORTANT: Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HPE Passport set up with relevant entitlements.

Registering for software technical support and update service

Insight Management includes one year of 24 x 7 Hewlett Packard Enterprise Software Technical Support and Update Service. This service provides access to technical resources for assistance in resolving software implementation or operations problems.

The service also provides access to software updates and reference manuals in electronic form as they are made available from Hewlett Packard Enterprise. Customers who purchase an electronic license are eligible for electronic updates.

With this service, Insight Management customers benefit from expedited problem resolution as well as proactive notification and delivery of software updates. For more information about this service, see the HPE OneView Services website at HPE OneView Services.

Registration for this service takes place following online redemption of the license certificate.

How to use your software technical support and update service

As Hewlett Packard Enterprise releases updates to software, the latest versions of the software and documentation are made available to you. The Software Updates and Licensing portal gives you access to software, documentation and license updates for products on your Hewlett Packard Enterprise software support agreement.

You can access this portal from the Hewlett Packard Enterprise Support Center: Hewlett Packard Enterprise Support Center

After creating your profile and linking your support agreements to your profile, see the Software Updates and Licensing portal at http://www.hpe.com/info/hpesoftwareupdatesupport to obtain software, documentation, and license updates.

Related information

The following documents and websites provide related information:

Documents

• HPE Insight Control Getting Started Guide
• HPE Systems Insight Manager User Guide
• HPE iLO User Guide
• HPE BladeSystem Onboard Administrator User Guide
• HPE Insight Management Support Matrix

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:
Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

If your product includes additional remote support details, use search to locate that information.

Remote support and Proactive Care information
HPE Get Connected
www.hpe.com/services/getconnected
HPE Proactive Care services
www.hpe.com/services/proactivecare
HPE Proactive Care service: Supported products list
www.hpe.com/services/proactivecaresupportedproducts
HPE Proactive Care advanced service: Supported products list
www.hpe.com/services/proactivecareadvancedsupportedproducts

Proactive Care customer information
Proactive Care central
www.hpe.com/services/proactivecarecentral
Proactive Care service activation
www.hpe.com/services/proactivecarecentralgetstarted

Warranty information

To view the warranty information for your product, see the links provided below:

HPE ProLiant and IA-32 Servers and Options
www.hpe.com/support/ProLiantServers-Warranties
HPE Enterprise and Cloudline Servers
www.hpe.com/support/EnterpriseServers-Warranties
HPE Storage Products
www.hpe.com/support/Storage-Warranties
HPE Networking Products
www.hpe.com/support/Networking-Warranties

Regulatory information

To view the regulatory information for your product, view the Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products, available at the Hewlett Packard Enterprise Support Center:

www.hpe.com/support/Safety-Compliance-EnterpriseProducts

Additional regulatory information

Hewlett Packard Enterprise is committed to providing our customers with information about the chemical substances in our products as needed to comply with legal requirements such as REACH (Regulation EC No 1907/2006 of the European Parliament and the Council). A chemical information report for this product can be found at:
www.hpe.com/info/reach
For Hewlett Packard Enterprise product environmental and safety information and compliance data, including RoHS and REACH, see:

www.hpe.com/info/ecodata
For Hewlett Packard Enterprise environmental information, including company programs, product recycling, and energy efficiency, see:

www.hpe.com/info/environment

Documentation feedback

Hewlett Packard Enterprise is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (docsfeedback@hpe.com). When submitting your feedback, include the document title, part number, edition, and publication date located on the front cover of the document. For online help content, include the product name, product version, help edition, and publication date located on the legal notices page.