Hewlett Packard Enterprise

HPE 3PAR Plug-in for VMware vRealize Orchestrator 2.1 User Guide

Abstract

This guide describes how to install and use HPE 3PAR Plug-in for VMware® vRealize Orchestrator for running workflows for 3PAR operations in HPE 3PAR StoreServ Systems. The guide is intended for the system administrators who use HPE 3PAR StoreServ Systems, HPE Recovery Manager Central (RMC) and VMware® vRealize Orchestrator.

Contents

Introduction

Overview

HPE 3PAR Plug-in for VMware vRealize Orchestrator enables support for HPE 3PAR StoreServ arrays in VMware vRealize Orchestrator. With the predefined workflows that enables specific operations in HPE 3PAR StoreServ, the plug-in:

- Automates provisioning of storage arrays.

- Protects datastores using HPE RMC

For more information about HPE Recovery Manager Central, see **HPE RMC documents**.

The 3PAR Plug-in for VMware vRealize Orchestrator supports:

- Automation of basic storage provisioning tasks.

- Basic virtual volume or snapshot life cycle automation capabilities for virtual volumes.

- Application of QoS settings.

- Operations to manage datastores on HPE 3PAR arrays.

- Operations to use HPE RMC protection features (Snapshot and Express Protect) to protect VMware VMFS data stores created with 3PAR virtual volumes.

- Operations to create and manage 3PAR physical copies of virtual volumes and volume sets.

The 3PAR Plug-in for VMware vRealize Orchestrator provides the following workflows:

- Provisioning workflows

  - Common Provisioning Groups (CPG) management

  - Quality of Service (QoS) management

  - Virtual Volume management

  - Virtual Volume set management

  - Host management

  - Host set management

  - Physical copy management

  - Export management (Presentation of volumes to 3PAR managed hosts)

  - Snapshot management

- Protection workflows

  - Protect Datastores and VMs

  - Promote Datastore and VM snapshots or Backups

- Composite workflows

- VASA Management (VVol life cycle management workflows)

- Datastore management (Datastore life cycle and protection workflows)

Prerequisites

The HPE 3PAR plugin for VMware vRealize Orchestrator depends on the following:

- To add a 3PAR connection, **Import a certificate from URL with certificate alias** workflow available in **Library** > **HPE Storage** > **3PAR StoreServ** > **Connection Management**.

- **RescanAll** action available in `com.vmware.library.vc.storage`.

- To add a RMC instance, **Import a certificate from URL with certificate alias** workflow available in **Library** > **HPE Storage** > **3PAR StoreServ** > **Protection** > **Manage RMC Instances**.

- Register the RMC-V plug-in with vCenter for using the protection features.

If the workflows and actions are not available in vRO or if they are modified, the execution of the HPE 3PAR plugin fails or may not provide the expected results.

Installation

Downloading and installing HPE 3PAR plug-in for VMware vRealize Orchestrator

Procedure

1. **Download HPE 3PAR plug-in for VMware vRealize Orchestrator.**

2. **Install the plug-in.**

3. **Restart the Orchestrator Server.**

Downloading the HPE 3PAR plug-in for VMware vRealize Orchestrator

Procedure

1. Navigate to **Software Depot**.

2. Download the `Z7550-02246.zip` file.
   A dialog box with options to **Save** or **Open** the file appears.

3. Click **Save**.

   The system saves the file in the local directory.

More information

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Installing the HPE 3PAR plug-in for VMware vRealize Orchestrator

Prerequisites

Ensure that the `vmoapp` file is downloaded.

Procedure

1. Open VMware vRealize Orchestrator by using the VRO appliance IP address.

   The **VMware vRealize Orchestrator** home page appears.

2. Click **Orchestrator Control Center**.

3. Enter the following details to log in:

   • **Username**

   • **Password**

4. Click **OK**.

   VMware vRealize Orchestrator Control Center window appears.

5. Navigate to the **Plug-ins** section.

6. Click **Manage Plug-ins**.

   All plug-ins that are currently installed on VMware vRealize Orchestrator are listed.

7. On the **Install Plug-in** section, click **Browse**.

8. Navigate to the `vmoapp` file in the local directory, and click **Open**.

9. Click **Install**.

   The **EULA** window with the license details appears.

10. Select **Accept EULA**.

    You must select this option to continue installation.

11. Click **Install**.

    The storage integration plug-in appears in the plug-ins section after installation.

    You must restart the Orchestrator Server before launching the plug-in to run the workflows.

More information

Restarting the Orchestrator Server

NOTE: For specific restart requirements for the version of vRO that you are using, refer to the VMware vRealize Orchestrator documentation.

Procedure

1. In the Control Center home page, click **Manage** > **Startup Options**.

   The **Statrup Options** window appears.

2. Click **Restart**.
   The VMware vRealize Orchestrator is restarted.

3. Optional: Navigate to VMware vRealize Orchestrator home page, and click **Help** > **Installed plug-ins** to verify that the plug-in is installed.

   A list of all installed plug-ins appears.

More information

Launching 3PAR plug-in workflows

To configure workflows and perform administrative tasks on Orchestrator client use Java Web Start.

Prerequisites

• Ensure that the 3PAR plug-in is installed.

• Ensure that VMware vRealize Orchestrator launched using the vRO appliance IP address.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click **Start Orchestrator Client**.

A dialog box with options to save or open `client.jnlp` file appears.

2. Click **Open**.

3. Click **Allow** when prompted.

4. On the **Security Warning** dialog box, click **Continue** when prompted.

   The **VMware vRealize Orchestrator Login** window appears.

5. In the **Host name** field, enter the host name.

6. In the **User name** field, enter the administrator user name.

7. In the **Password** field, enter the password.

8. Click **Login**.

   a. If prompted, on the **Security** window, select **Install this certificate and do not display any security warning for it any more** field and click **Ignore**.

   The system launches VMware vRealize Orchestrator.

Workflow

You can use the workflows provided by the HPE 3PAR plug-in for VMware vRealize Orchestrator to perform storage provisioning tasks such as configuring virtual volumes and volume sets and configuring hosts and host sets. A workflow receives input parameters for an operation and provides an output for the operation. For example, the name of the HPE 3PAR StoreServ system and a name for the virtual volume are required as input parameters for the workflow when you intend to create a volume in a HPE 3PAR StoreServ system. This workflow configures a virtual volume in the specified HPE 3PAR StoreServ array as the output.

NOTE: Before you begin with the workflows, you may have to know about the CPU and memory utilization of the HPE 3PAR plug-in for performing the workflows. The following test result captured by HPE were observed on a VMware vRO 7.3.1 appliance with the default configuration. The results may vary on other configurations and environments.

Test environment requirements

- VMware vRO appliance version 7.3.1
- CPU - 2 vCPU
- Memory - 6 GB

Resource utilization

Resource	Average	Peak
CPU utilization (%)	14.5	24.12
Memory utilization (MB)	2844	2930

More information

3PAR StoreServ

Connection management

The workflow in connection management allows the user to manage HPE 3PAR StoreServ connections in the VMware vRealize Orchestrator.

It is necessary to import the certificate from the target HPE 3PAR StoreServ system, before you add a new HPE 3PAR StoreServ connection. You can run the **Import 3PAR certificate from url** workflow to import the certificate from the HPE 3PAR.

NOTE: The VMware vRealize Orchestrator administrators can manage the certificates by logging in to **Orchestrator Control Center**.

Importing 3PAR certificate from url

Field descriptions

Table 1: Import 3PAR certificate from url

Name	Description
URL	URL or just the host:port for non HTTPS SSL services.
ignoreWarnings	Option to select a certificate and add the certificate to a trusted store.

Prerequisites

Log in to VMware vRealize Orchestrator.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Connection Management** folder.

4. Select **Import 3PAR certificate from url** and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Import 3PAR certificate from url**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Import 3PAR certificate from url** window appears.

5. In the **URL** field, enter the URL or the host:port for the non HTTPS SSL services.

   The host:port is displayed in the following format: <hostname of 3PAR array> : 8080, where 8080 is the port number.

6. In the **ignoreWarnings** field, click **Yes** to select a certificate and add the certificate to a trusted store.

7. Click **Submit**.

   The system displays the HPE 3PAR StoreServ system added in the StoreServ inventory at **Inventory** > **HPE 3PAR StoreServ** folder.

Adding 3PAR connection

Field descriptions

Table 2: Add 3PAR Connection

Name	Description
Connection Name	Name of the HPE 3PAR StoreServ connection.
StoreServ Storage System IP or FQDN	IP or FQDN of the HPE 3PAR StoreServ connection.

Table Continued

Username	StoreServ administrator username.
Password	StoreServ administrator password.

Prerequisites

Log in to VMware vRealize Orchestrator.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Connection Management** folder.

4. Select **Add 3PAR Connection** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Add 3PAR Connection**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Add 3PAR Connection** window appears.

5. In the **Connection Name** field, enter a name for the connection.
   To add the system to the inventory, provide a name for a HPE 3PAR StoreServ connection.

6. In the **StoreServ Storage System IP or FQDN** field , enter the IP address or FQDN of the StoreServ connection.

7. In the **Username** field, enter the StoreServ administrator username.

8. In the **Password** field, enter the StoreServ administrator password.

9. Click **Submit**.

   The system displays the HPE 3PAR StoreServ system added in the StoreServ inventory at **Inventory** > **HPE 3PAR StoreServ** folder.

Removing 3PAR connection

You can remove an HPE 3PAR StoreServ connection from the HPE 3PAR StoreServ inventory in the VMware vRealize Orchestrator inventory if you no longer use the connection.

Field descriptions

Table 3: Remove 3PAR Connection

Name	Description
Connection	Name of the HPE 3PAR StoreServ connection.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Connection Management** folder.

4. Select **Remove 3PAR Connection** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Remove 3PAR Connection**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Remove 3PAR Connection** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. Click **Submit**.

   The system removes the HPE 3PAR StoreServ array from the inventory.

Common Provisioning Group (CPG) management

A Common Provisioning Group (CPG) is a virtual pool of logical disks (LD) that allocates space to virtual volumes on demand. A CPG enables virtual volumes to share the CPG resources. You can create fully provisioned virtual volumes (FPVVs), thinly provisioned virtual volumes (TPVVs), or thinly deduplicated virtual volumes that draw space from a CPG LD pool.

CPG enables shared access to pooled logical capacity and multiple volumes share the buffer pool of LDs. The maximum number of CPGs depend on the configuration of HPE 3PAR StoreServ system.

When you configure a CPG, set a growth increment and an optional growth warning and growth limit to restrict the CPG growth and maximum size.

Creating CPG

Use the Create CPG workflow to define the logical disk creation characteristics, which are known as CPG, such as disk type, RAID type, set size, total space warning, and growth limits.

Field descriptions

Table 4: Create CPG

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ connection to configure CPG. You can select an HPE 3PAR StoreServ array from the inventory.
CPG Common Parameters	
CPG Name	Name of the CPG. This setting is mandatory.

Table Continued

Domain	Domain for which CPG is configured. This setting is optional.
CPG Allocation Settings	
Disk Type	Type of disk. The options are: • **FC** • **NL** • **SSD**
RAID Type	Type of RAID. The options are: • **RAID-0** • **RAID-1** • **RAID-5** • **RAID-6**
Set Size	Set size for the selected RAID. For a RAID, you can select a set size from the drop-down menu of feasible set sizes.
High Availability	System availability in a hardware failure. The options are: • **Port** — Port failure does not affect the CPG. • **Cage** — Disk enclosure failure does not affect the CPG. • **Mag** — Magazine failure does not affect the CPG.
CPG Growth Settings	
Growth Increment	Growth increment for the CPG. When volumes that draw storage from a CPG require additional storage, the system automatically creates additional LDs according to the CPG growth increment.
growthIncrementUnit	Unit of growth increment. Different units are: • **MiB** • **GiB** • **TiB**
Growth Limit	Maximum storage that a volume can draw from the CPG. The autogrow operation is limited to this storage. When the volumes that draw storage from a CPG reaches the CPG growth limit, the system prevents the volumes from allocating additional space.

Table Continued

growthLimitUnit	Unit of growth limit. Different units are: • **MiB** • **GiB** • **TiB** --- **NOTE:** You can set growth warnings that exceed the total capacity of the system. However, when volumes associated with a CPG use all space available to that CPG, any new writes to TPVVs associated with the CPG fails and snapshots associated with the CPG might become invalid. ---
Used LD Warning Alert	Growth limit after which the system generates an alert. When the size of the volumes that draw storage from a CPG reach the CPG growth warning, the system generates an alert.
growthWarningUnit	Unit of growth warning limit. Different units are: • **MiB** • **GiB** • **TiB**

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Common Provisioing Group (CPG) management** folder.

4. Select **Create CPG** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Create CPG**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Create CPG** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **CPG Common Parameters** tab, enter the following details:

   • **CPG Name**

   • **Domain**

7. On the **CPG Allocation Settings** tab, enter the following details:

- **Disk Type**

- **RAID Type**

- **Set Size**

- **High Availability**

8. On the **CPG Growth Settings** tab, enter the following details:

- **Growth Increment**

- **growthIncrementUnit**

- **Growth Limit**

- **growthLimitUnit**

- **Used LD Warning Alert**

- **growthWarningUnit**

9. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Deleting CPG

You can delete a CPG only if no volumes are associated with the CPG.

Field descriptions

Table 5: Delete CPG

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ connection in which the CPG is configured. You can select an HPE 3PAR StoreServ array from the inventory.
CPG Parameters	
CPG	Name of the CPG to delete. This setting is mandatory. You can select a CPG from the list of CPGs available in the selected HPE 3PAR StoreServ array.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Common Provisioing Group (CPG) management** folder.

4. Select **Delete CPG** and perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Delete CPG**, and click **Start workflow**.

- Press **Ctrl+R**.

   The **Start Workflow : Delete CPG** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **CPG Parameters** tab, select the CPG from inventory.

7. Click **Submit**.

   The system removes the CPG from the inventory.

Querying CPGs

Querying All CPGs

To get a list of all CPGs available in an HPE 3PAR StoreServ system, use the Get All CPGs workflow .

Field descriptions

Table 6: Get All CPGs

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ connection in which the CPG is configured. You can select an HPE 3PAR StoreServ array from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⊞) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Common Provisioing Group (CPG) management** > **Query** folder.

4. To view all configured CPGs, select **Get All CPGs** .

   a. Perform one of the following:

   - Click the **Start workflow** (▶) icon.

   - Right-click **Get All CPGs** , and click **Start workflow**.

   - Press **Ctrl+R**.

      The **Start Workflow : Get All CPGs** window appears.

   b. In the **Common Parameters** tab, enter the HPE 3PAR StoreServ connection name.

You can select an HPE 3PAR StoreServ connection from the inventory.

   c. Click **Submit**.

The system returns an array with the list of all CPGs in the selected HPE 3PAR StoreServ system.

Querying CPG by Name

Use the Get CPG by Name workflow to ensure that a specific CPG is available in the system.

Field descriptions

Table 7: Get CPG by name

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ connection in which the CPG is configured. You can select an HPE 3PAR StoreServ array from the inventory.
CPG Parameters	
CPG	Name of the CPG.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⊞) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Common Provisioing Group (CPG) management** > **Query** folder.

4. To view a particular CPG by name, select **Get CPG by name**.

      a. Perform one of the following:

   - Click the **Start workflow** (▶) icon.
   - Right-click **Get CPG by Name** , and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Get CPG by Name** window appears.

      b. On the **Connection** tab, enter the HPE 3PAR StoreServ connection name.

      c. On the **CPG Parameters** tab, enter the CPG name.

      d. Click **Submit**.

   If the specified CPG is available in the HPE 3PAR StoreServ system, the system returns the details of the CPG.

Virtual Volume (VV) management

Virtual volumes draw resources from CPGs and volumes are exported as logical unit numbers (LUNs) to hosts. Virtual volumes are the only data layers visible to the hosts. Before creating virtual volumes, you must create CPGs to allocate space to the virtual volumes. The two types of volumes are base volumes and snapshot volumes.

A Thinly Provisioned Virtual Volume (TPVV) is a volume that uses LDs that belong to a CPG. TPVVs associated with the same CPG draw space from the LD pool as needed, allocating space on demand in 16 KB increments. When the volumes that draw space from the CPG require additional storage, the 3PAR OS automatically creates additional LDs and adds them to the pool until the CPG reaches the user-defined growth limit, which restricts the CPG maximum size. The TPVV volume size limit is 16 TB.

An Fully Provisioned Virtual Volume (FPVV) is a volume that uses LDs that belong to a CPG. Unlike TPVVs, FPVVs have a set amount of user space allocated in the system for user data. FPVVs require the system to reserve the entire amount of space required by the FPVV whether the space is used. The FPVV size is fixed, and the size limit is 16 TB. You can set snapshot space allocation limits and usage warnings to help manage the growth of snapshot space.

A thinly deduplicated virtual volume is a TPVV with space for the base volume allocated from the associated user CPG and snapshot space allocated from the associated snapshot CPG, if any.

Creating virtual volume

To configure a new 3PAR virtual volume in an HPE 3PAR StoreServ system, use the Create Virtual Volume workflow . You can configure any number of virtual volumes in an HPE 3PAR StoreServ system depending upon the storage capacity of the system.

Field descriptions

Table 8: Create Virtual Volume

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServe array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Parameters	
Name of the Virtual Volume	Name of the virtual volume. You can select a virtual volume from the inventory.
User CPG	Name of the CPG in which the virtual volume is configured. You can select a CPG from the inventory.
Size	Size of the virtual volume.
Size Increment Unit	Unit for the size increment. The options are: • **MiB** • **GiB** • **TiB**

Table Continued

Virtual Volume provisioning type	Type of virtual volume. The options are: • **Thin** — Thinly Provisioned virtual volume. • **ThinDedupe** —Thinly Provisioned virtual volume with dedupe feature. • **Full** — Fully Provisioned virtual volume.
Enable or disable compression	Specifies whether the virtual volume is compressed. Only TPVVs support this feature. This feature is available on 3PAR OS 3.3.1 or later only. The options are: • **Yes** • **No**

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume (VV) management** > **Tune** folder, and double-click the **Tune** folder.

4. Select **Create Virtual Volume** and perform one of the following:

   • Click the **Start workflow** ( ) icon.
   • Right-click **Create Virtual Volume**, and click **Start workflow**.
   • Press **Ctrl+R**.

   The **Start Workflow : Create Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Parameters** tab:

   a. In the **Name of the Virtual Volume** field, enter a name for the virtual volume.

   b. In the **User CPG** field, enter the name of the CPG in which you want to configure the virtual volume.

   c. In the **Size in MiB** field, enter the storage space required for the virtual volume.

   d. From the **Size Increment Unit** list, select a unit.

   e. In the **Virtual Volume provisioning type** field, select the type of virtual volume.

7. Specify whether you want to compress the virtual volume.

8. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Deleting virtual volume

If the virtual volume is not presented or exported to any hosts, you can delete a virtual volume from a 3PAR storage systems.

Field descriptions

Table 9: Delete Virtual Volume

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Parameters	
Virtual Volume	Name of the virtual volume to delete. You can select a virtual volume from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume (VV) management** > **Tune** folder, and double-click the **Tune** folder.

4. Select **Delete Virtual Volume**, and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Delete Virtual Volume**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Delete Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Parameters** tab, enter the virtual volume name.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through tabs.

   The system removes the selected virtual volume from the HPE 3PAR StoreServ inventory.

Adding additional storage to virtual volume

Even if the volume is presented to a host, you can add additional storage to a virtual volume.

Field descriptions

Table 10: Grow Virtual Volume

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Parameters	
Virtual Volume	Name of the virtual volume to allocate additional storage space. You can select a virtual volume from the inventory.
New size of Virtual Volume in MiB	New size of the virtual volume.
Size Increment Unit	Unit for the size increment. The options are: • **MiB** • **GiB** • **TiB**

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume (VV) management** > **Tune** folder, and double-click the **Tune** folder.

4. Select **Grow Virtual Volume** and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Grow Virtual Volume**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Grow Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Parameters** tab:

   a. In the **Virtual Volume** field, enter the virtual volume name.

      You can select a virtual volume from the inventory.

   b. In the **New size of Virtual Volume in MiB** field, enter the new storage size for the virtual volume.

   c. From the **Size Increment Unit** list, select appropriate unit.

7. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Modifying virtual volume

Field descriptions

Table 11: Modify Virtual Volume

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Parameters	
General	
Virtual Volume	Virtual volume name. You can select a virtual volume from the inventory.
Set Copy CPG	CPG for the virtual volume snapshot.
Select Yes to remove virtual volume expiration time	Confirm whether the current expiration time is to be removed.
Set Virtual Volume retention time (hours)	Specifies how long the virtual volume is protected against deletion.
Set Virtual Volume expiration time (hours)	Validity of the virtual volume snapshot.
User space allocation	
Select Yes to remove User CPG space allocation warning percentage	Confirm whether the system provides a warning if the space usage of the virtual volume exceeds the set limit.
Set User CPG space allocation warning percentage	Virtual volume space allocation percentage after which the system generates an alert.
Select Yes to remove User CPG space allocation limit percentage	Maximum space allocation limit for the virtual volume is to be removed.
Set User cpg space allocation limit percentage	Maximum space allocation limit for the virtual volume in percentage.
Copy CPG space allocation	
Select Yes to remove Copy CPG space allocation warning percentage	Confirm whether the system provides a warning if the space usage of virtual volume snapshot exceeds the set limit.

Table Continued

Set Copy CPG space allocation warning percentage	Space allocation percentage for the virtual volume snapshot after which the system generates an alert.
Select Yes to remove Copy CPG space allocation limit percentage	Confirm whether the maximum space allocation limit for the virtual volume snapshot is to be removed.
Remove Copy CPG space allocation limit percentage	Maximum space allocation limit for the virtual volume snapshot in percentage.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume (VV) management** > **Tune** folder, and double-click the **Tune** folder.

4. Select **Modify Virtual Volume** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Modify Virtual Volume**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Modify Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Parameters** tab, enter the following settings:

   • **General**

   • **User space allocation**

   • **Copy cpg space allocation**

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Renaming virtual volume

Field descriptions

Table 12: Rename Virtual Volume

Name	Description
Connection	

Table Continued

StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Parameters	
Virtual Volume to rename	Name of the virtual volume to be changed. You can select a virtual volume from the inventory.
New Virtual Volume name	New name for the virtual volume.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume (VV) management** > **Tune** folder, and double-click the **Tune** folder.

4. Select **Rename Virtual Volume** and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Rename Virtual Volume**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Rename Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Parameters** tab:

   a. In the **Virtual Volume to rename** field, enter the virtual volume name.

   b. In the **New Virtual Volume name** field, enter the new name for the virtual volume.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Metadata management

Metadata management enables to manage the metadata for the virtual volumes.

Creating virtual volume metadata

To create metadata for a 3PAR virtual volume, use the Create Virtual Volume Metadata workflow.

Field descriptions

Table 13: Create Virtual Volume Metadata

Name	Description
Connection	
StoreServ Connection	HPE 3PAR StoreServe array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Metadata Parameters	
Volume	Name of the virtual volume. You can select a virtual volume from the inventory.
Key	Metadata for the virtual volume. For example: You can set the metadata **Key** = Project.
Value	Metadata for the virtual volume. For example: You can set the metadata **Value** = Project1.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume (VV) management** > **Metadata management** folder, and double-click the **Metadata management** folder.

4. Select **Create Virtual Volume Metadata** and perform one of the following:

   - Click the **Start workflow** () icon.
   - Right-click **Create Virtual Volume Metadata**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Create Virtual Volume Metadata** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Metadata Parameters** tab, enter the following details:

   a. **Volume**

   b. **Key**

   c. **Value**

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Deleting virtual volume metadata

To delete the metadata for a 3PAR virtual volume, use the Delete Virtual Volume Metadata workflow.

Field descriptions

Table 14: Delete Virtual Volume Metadata

Name	Description
Connection	
StoreServ Connection	Specifies the name of the HPE 3PAR StoreServ array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Parameters	
Volume	Name of the virtual volume. You can select a virtual volume from the inventory.
Key	Metadata for the virtual volume.
	For example: You can set the metadata **Key** = Project.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume (VV) management** > **Metadata management** folder, and double-click the **Metadata management** folder.

4. Select **Delete Virtual Volume Metadata**, and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Delete Virtual Volume Metadata**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow: Delete Virtual Volume Metadata** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Metadata Parameters** tab:

   a. In the **Volume** field, enter a name for the virtual volume.

   b. In the **Key** field, enter the key metadata value.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through tabs.

   The system removes the selected virtual volume metadata.

Modifying virtual volume metadata

To modify metadata for a 3PAR virtual volume, use the Modify Virtual Volume Metadata workflow.

Field descriptions

Table 15: Modify Virtual Volume Metadata

Name	Description
Connection	
StoreServ Connection	HPE 3PAR StoreServe array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Metadata Parameters	
Volume	Name of the virtual volume. You can select a virtual volume from the inventory.
Key	Metadata for the virtual volume. For example: You can set the metadata **Key** = Project.
Value	Metadata for the virtual volume. For example: You can set the metadata **Value** = Project1.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume (VV) management** > **Metadata management** folder, and double-click the **Metadata management** folder.

4. Select **Modify Virtual Volume Metadata** and perform one of the following:

   - Click the **Start workflow** ( ) icon.
   - Right-click **Modify Virtual Volume Metadata**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Modify Virtual Volume Metadata** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Metadata Parameters** tab, enter the following details :

   a. **Volume**

   b. **Key**

   c. **Value**

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Querying virtual volumes

Querying all virtual volumes

To get a list of all virtual volumes in an HPE 3PAR StoreServ array, use the Get all Virtual Volumes workflow.

Field descriptions

Table 16: Get all Virtual Volumes

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Virtual Volume (VV) management** > **Query** folder.

4. To view all configured virtual volumes, select **Get all Virtual Volumes**:

   a. Perform one of the following:

      - Click the **Start workflow** () icon.
      - Right-click **Get all Virtual Volumes** , and click **Start workflow**.
      - Press **Ctrl+R**.

      The **Start Workflow : Get all Virtual Volumes** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Querying virtual volume by name

To check whether a specific virtual volume is available in a selected HPE 3PAR StoreServ array, use the Get Virtual Volume by name workflow.

Field descriptions

Table 17: Get Virtual Volume by name

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Parameters	
Virtual Volume Name	Name of the virtual volume.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Virtual Volume (VV) management** > **Query** folder.

4. To view a particular volume by name, select **Get Virtual Volume by name** .

   a. Perform one of the following:

      • Click the **Start workflow** ( ) icon.

      • Right-click **Get Virtual Volume by name**, and click **Start workflow**.

      • Press **Ctrl+R**.

      The **Start Workflow : Get Virtual Volume by name** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Parameters** tab, enter the virtual volume name.

7. Click **Submit**.

   If the virtual volume is available in the HPE 3PAR StoreServ system, the system displays the details of the virtual volume.

Querying virtual volume by WWN

Use the Get Virtual Volume by WWN workflow if you know only the WWN of the virtual volume.

Field descriptions

Table 18: Get Virtual Volume by WWN

Name	Description
Connection	

Table Continued

StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Parameters	
Virtual Volume WWN	Virtual volume WWN.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Virtual Volume (VV) management** > **Query** folder.

4. To view a particular volume by name, select **Get Virtual Volume by WWN**, and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Get Virtual Volume by WWN**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Get Virtual Volume by WWN** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Parameters** tab, enter the virtual volume WWN.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Querying virtual volume metadata

Field descriptions

Table 19: Get Virtual Volume Metadata

Name	Description
Connection	
StoreServ Connection	Specifies the name of the HPE 3PAR StoreServ array in which the virtual volume metadata is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Metadata Parameters	
Volume	Name of the virtual volume. You can select virtual volume from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Virtual Volume (VV) management** > **Query** folder.

4. Select **Get Virtual Volume Metadata** and perform one of the following:

   - Click the **Start workflow** (▶) icon.

   - Right-click **Get Virtual Volume Metadata**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Get Virtual Volume Metadata** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Metadata Parameters** tab, enter the virtual volume name in the **Volume** field.

   You can select virtual volume from the inventory.

7. Click **Submit**.

Querying all virtual volume metadata

Field descriptions

Table 20: Get all Virtual Volume Metadata

Name	Description
Connection	
StoreServ Connection	Specifies the name of the HPE 3PAR StoreServ array in which the virtual volume metadata is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Metadata Parameters	
Key	Metadata for the virtual volume. For example: You can set the metadata **Key** = Project.
Value	Metadata for the virtual volume. For example: You can set the metadata **Value** = Project1.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⬚) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Virtual Volume (VV) management** > **Query** folder.

4. Select **Get all Virtual Volume Metadata** and perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Get all Virtual Volume Metadata**, and click **Start workflow**.

- Press **Ctrl+R**.

The **Start Workflow : Get all Virtual Volume Metadata** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Metadata Parameters** tab, enter the following details:

   a. **Key**

   b. **Value**

7. Click **Submit**.

Virtual Volume Set management

Adding virtual volumes to virtual volume set

Field descriptions

Table 21: Add Virtual Volume(s) to Virtual Volume Set

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume set is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Set Parameters	
Virtual Volume Set	Name of the virtual volume set to which virtual volumes are added. You can select a virtual volume from the inventory.
Virtual Volumes to be added to the Virtual Volume Set	Name of the virtual volume to be added to the virtual volume set.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⧉) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume Set (VVSET) management** folder.

4. Select **Add Virtual Volume(s) to Virtual Volume Set** and perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Add Virtual Volume(s) to Virtual Volume Set**, and click **Start workflow**.

- Press **Ctrl+R**.

   The **Start Workflow : Add Virtual Volume(s) to Virtual Volume Set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Set Parameters** tab:

   a. In the **Virtual Volume Set** field, enter the name of the virtual volume set.

      You can select a virtual volume set from the inventory.

   b. In the **Virtual Volume(s) to be added to the Virtual Volume Set** field, select the virtual volumes to add to the virtual volume set.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Creating virtual volume sets

To group virtual volumes to a virtual volume set, use the Create Virtual Volume Set workflow.

Field descriptions

Table 22: Create Virtual Volume Set

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume set is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Set Parameters	
Virtual Volume Set	Name of the virtual volume set to create. You can select a virtual volume from the inventory.
3PAR domain in which the Virtual Volume Set will be created	Domain to which the virtual volume set is added.
Virtual Volume(s) to be added to the Virtual Volume Set	Name of virtual volumes to add to the virtual volume set.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⊞) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume Set (VVSET) management** folder.

4. Select **Create Virtual Volume Set** and perform one of the following:

   - Click the **Start workflow** () icon.

   - Right-click **Create Virtual Volume Set**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Create Virtual Volume Set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Set Parameters** tab:

   a. In the **Virtual Volume Set name** field, enter the name for the virtual volume set.

   b. In the **3PAR domain in which the Virtual Volume set will be created** field, enter the name of the domain.

   c. In the **Virtual Volume(s) to be added to the Virtual Volume set** field, select the virtual volumes to add to the virtual volume set.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Deleting virtual volume sets

You can delete a virtual volume set only if the virtual volume set is not presented or exported to a host.

Field descriptions

Table 23: Delete Virtual Volume Set

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume set is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Set Parameters	
Virtual Volume set	Name of the virtual volume set to be deleted. You can select a virtual volume set from the inventory. You can select more than one volume set at a time.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume Set (VVSET) management** folder.

4. Select **Delete Virtual Volume Set** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Delete Virtual Volume Set**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Delete Virtual Volume Set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Set Parameters** tab, enter the virtual volume set name.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through tabs.

   The system removes the virtual volume set from the HPE 3PAR StoreServ system.

Removing virtual volumes from virtual volume sets

Field descriptions

Table 24: Remove Virtual Volume(s) from the Virtual Volume Set

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume set is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Set Parameters	
Virtual Volume set	Name of the virtual volume set. You can select a virtual volume from the inventory.
Virtual Volume(s) to be removed from the Virtual Volume Set	Names of the virtual volumes to be removed from the virtual volume set. You can select the virtual volumes from the list of available virtual volumes in the StoreServ system.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume Set (VVSET) management** folder.

4. Select **Remove Virtual Volume(s) from the Virtual Volume Set** and perform one of the following:

- Click the **Start workflow** () icon.

- Right-click **Remove Virtual Volume(s) from the Virtual Volume Set**, and click **Start workflow**.

- Press **Ctrl+R**.

   The **Start Workflow : Remove Virtual Volume(s) from the Virtual Volume Set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Set Parameters** tab:

   a. In the **Virtual Volume Set** field, enter the name of the virtual volume set.

   b. In the **Virtual Volume(s) to be removed from the Virtual Volume Set** field, select the virtual volumes.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Querying virtual volume set(s)

Querying all virtual volume sets

Field descriptions

Table 25: Get all Virtual Volume Sets

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume set is configured. You can select the HPE 3PAR StoreServ system from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume Set (VVSET) management** > **Query** folder.

4. To view all virtual volume sets in an HPE 3PAR StoreServ array, select **Get all Virtual Volume Sets**.

   a. Perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Get all Virtual Volume Sets**, and click **Start workflow**.

- Press **Ctrl+R**.

  The **Start Workflow : Get all Virtual Volume Sets** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. Click **Submit**.

   The system lists all virtual volume sets in the selected HPE 3PAR StoreServ array.

Querying virtual volume set by name

To view details of a virtual volume set in an HPE 3PAR StoreServ array, use Get Virtual Volume Set by Name workflow .

Field descriptions

Table 26: Get Virtual Volume Set by Name

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the virtual volume set is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Virtual Volume Set Parameters	
Virtual Volume Set	Name of the virtual volume set. You can select a virtual volume set from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⬆) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Virtual Volume Set (VVSET) management** > **Query** folder.

4. To view details of a specific virtual volume set, select **Get Virtual Volume Set by Name**.

   a. Perform one of the following:

   - Click the **Start workflow** (▶) icon.

   - Right-click **Get Virtual Volume Set by Name**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Get Virtual Volume Set by Name** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Virtual Volume Set Parameters** tab, enter the name of the virtual volume set.

7. Click **Submit**.

   The system displays the details of the specified virtual volume set in the selected HPE 3PAR StoreServ array.

Host management

Host management workflows allows user to manage host connectivity to 3PAR.

Creating 3PAR host

To present a volume to an external system, you must define a host entry in 3PAR system.

Field descriptions

Table 27: Create 3PAR Host

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Parameters	
Name of the host	Name of the host.
ID of the persona to assign to the host	Persona of the host. You can select a persona from the drop-down list.
The 3PAR Domain in which the host will be created	Domain in which the host is created.
Select type of path	Type of path. The options are: • **FC** • **iSCSI**
One or more FC WWN to set for the host	FC WWN for the host. This option is available only if you set the path type as FC.
One or more iSCSI to set for the host	iSCSI name to set for the host. This option is available only if you set the path type as iSCSI.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host management** folder.

4. Select **Create 3PAR Host** and perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Create 3PAR Host**, and click **Start workflow**.

- Press **Ctrl+R**.

  The **Start Workflow : Create 3PAR Host** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Parameters** tab:

   a. In the **Name of the host** field, enter the host name.

   b. In the **ID of the persona to assign to the host** field, enter the required persona.

   c. In the **3PAR Domain in which the host will be created** field, enter the name of the domain.

   d. From the **Select type of path** list, select a type.

   e. For FC path, in the **One or more FC WWN to set for the host** field, enter FC WWN for host.

   f. For iSCSI name, in the **One or more iSCSI to set for the host** field, enter the iSCSI name to set for the host.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Adding paths to 3PAR hosts

To add a path to associate a host with the HPE 3PAR StoreServ system, use the Add FC WWN/iSCSI name to 3PAR host workflow.

Field descriptions

Table 28: Add FC WWN / iSCSI name to 3PAR host

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Parameters	
Host	Name of the host. You can select a host from the inventory.
Select type of path	Type of path. The options are: • **FC** • **iSCSI**
One or more FC WWN to set for the host	FC WWN for the host. This option is available only if you set the path type as FC.
One or more iSCSI to set for the host	iSCSI name to set for the host. This option is available only if you set the path type as iSCSI.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host management** folder.

4. Select **Add FC WWN / iSCSI name to 3PAR host** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Add FC WWN / iSCSI name to 3PAR host**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Add FC WWN/iSCSI name to 3PAR host** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Parameters** tab:

   a. In the **Host** field, enter the host name.

   b. From the **Select type of path** list, select a path type.

   c. For FC path, in the **One or more FC WWN set for the host** field, enter the iSCSI name or WWN of the host.

   d. For iSCSI path, in the **One or more iSCSI names to set for the host** field, enter the iSCSI name or WWN of the host.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Deleting 3PAR host

If at least one volume is exported to a host, you cannot delete that host.

Field descriptions

Table 29: Delete 3PAR Host

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Parameters	
Host to be deleted from HPE 3PAR StoreServ array	Name of the host to be removed from the selected HPE 3PAR StoreServ array. You can select a host from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host management** folder.

4. Select **Delete 3PAR Host** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Delete 3PAR Host**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Delete 3PAR Host** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Parameters** tab, enter the name of the host to be deleted.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Removing paths from the 3PAR host

With the Remove FC WWN /iSCSI name from 3PAR host workflow, you can remove the FC WWN or iSCSI name from the host in a 3PAR array.

Field descriptions

Table 30: Remove FC WWN /iSCSI name from 3PAR host

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Parameters	
Host	Name of the host from which the WWN or iSCSI name need be removed. You can select a host from the inventory.
Select type of path	Type of path. The options are: • **FC** • **iSCSI**

Table Continued

One or more FC WWN to set for the host	FC WWN of the host to remove. This option is available only if you set the path type as FC.
One or more iSCSI to set for the host	iSCSI name of the host to remove. This option is available only if you set the path type as iSCSI.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host management** folder.

4. Select **Remove FC WWN /iSCSI name from 3PAR host** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Remove FC WWN /iSCSI name from 3PAR host**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Remove FC WWN /iSCSI name from 3PAR host** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Parameters** tab:

   a. In the **Host** field, enter the name of the host from which the WWN or iSCSI name need be removed.

   b. In the **Select type of path** field, enter the path type.

   c. In the **One or more iSCSI names or WWN to remove from the host** field, enter the WWN or ISCSI name of the host to remove.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Renaming 3PAR host

Field descriptions

Table 31: Rename 3PAR Host

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.

Table Continued

Parameters

Host to be renamed	Name of the host to be renamed. You can select a host from the inventory.
New name of the host	New name for the host.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host management** folder.

4. Select **Rename 3PAR Host** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Rename 3PAR Host**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Rename 3PAR Host** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Parameters** tab:

   a. In the **Host to be renamed** field, enter the host name to be changed.

   b. In the **New name of the host** field, enter the new name for the host.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Querying hosts

Querying 3PAR hosts by FC WWN

Field descriptions

Table 32: Get 3PAR host by FC WWN

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Parameters	
fcWWN	FC WWN of the host to query.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

    The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
    All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host management** > **Query** folder.

4. To view details of a particular host by WWN, select **Get 3PAR host by FC WWN**.

    a. Perform one of the following:

        *   Click the **Start workflow** ( ) icon.
        *   Right-click **Get 3PAR host by FC WWN**, and click **Start workflow**.
        *   Press **Ctrl+R**.

        The **Start Workflow : Get 3PAR host by FC WWN** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Parameters** tab, enter the FC WWN of the host.

7. Click **Submit**.

    The system displays the details of the host with the provided FC WWN.

Querying 3PAR host by iSCSI name

Field descriptions

Table 33: Get 3PAR host by iSCSI name

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Parameters	
iSCSIName	iSCSI name of the host to query.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

    The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
    All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host management** > **Query** folder.

4. To view a particular host by the iSCSI name, select **Get 3PAR host by iSCSI name**.

   a. Perform one of the following:

      - Click the **Start workflow** ( ) icon.
      - Right-click **Get 3PAR host by iSCSI name**, and click **Start workflow**.
      - Press **Ctrl+R**.

      The **Start Workflow : Get 3PAR host by iSCSI name** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Parameters** tab, enter the iSCSI name of the host.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Querying 3PAR host by name

Field descriptions

Table 34: Get 3PAR host by name

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Parameters	
Name of the 3PAR host	Name of the 3PAR host. You can select a host from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host management** > **Query** folder.

4. To view a particular host by the name, select **Get 3PAR host by name**.

   a. Perform one of the following:

- Click the **Start workflow** ( ) icon.

- Right-click **Get 3PAR host by name**, and click **Start workflow**.

- Press **Ctrl+R**.

  The **Start Workflow : Get 3PAR host by name** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Parameters** tab, enter the host name.

7. Click **Submit**.

   The system displays the details of the selected host.

Querying all 3PAR hosts

Field descriptions

Table 35: Get all 3PAR hosts

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host management** > **Query** folder.

4. To view all hosts in a 3PAR system, select **Get all 3PAR hosts**.

   a. Perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Get all 3PAR hosts**, and click **Start workflow**.

   - Press **Ctrl+R**.

     The **Start Workflow : Get all 3PAR hosts** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. Click **Submit**.

The system lists all hosts in the selected HPE 3PAR StoreServ system.

Host set management

Host set management enables to manage a group of hosts as a host set. This allows the virtual volume/ virtual volume set to be exported to the same set of hosts.

Creating 3PAR host set

Field Descriptions

Table 36: Create 3PAR host set

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host set is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Set Parameters	
Name of the host set	Mame of the host set to be created. You can select a host set from the inventory.
3PAR Domain in which the host set will be created	3PAR domain in which the host set will be created.
Host(s) to be added to the host set	Name of the hosts to be added to the 3PAR host set. You can select a host from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**. All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host set management** folder.

4. Select **Create 3PAR host set** and perform one of the following:

   - Click the **Start workflow** () icon.

   - Right-click **Create 3PAR host set**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Create 3PAR host set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Set Parameters** tab:

a. In the **Name of the host set** field, enter a name of the host set.

b. In the **3PAR Domain in which the host set will be created** field, enter the domain name.

c. In the **Host(s) to be added to the host set** field, select the hosts to add to the host set.

7. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Adding 3PAR hosts to host set

Field Descriptions

Table 37: Add 3PAR host(s) to host set

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host set is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Set Parameters	
Host set	Name of the host set to which hosts are added. You can select a host set from the inventory.
Host(s) to be added to the set	Name of the hosts to be added to the host set. You can select a host from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host set management** folder.

4. Select **Add 3PAR host(s) to host set** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Add 3PAR host(s) to host set**, and click **Start workflow**.

   • Press **Ctrl+R**.

The **Start Workflow : Add 3PAR host(s) to host set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Set Parameters** tab:

   a. In the **Host Set** field, enter the name of the host set.

   b. In the **Host(s) to be added to the host set** field, select the hosts to add to the host set.

   You can select a host set from the inventory.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Deleting 3PAR host set

To delete a 3PAR host set from an HPE 3PAR StoreServ array, use the Delete 3PAR host set workflow.

Field Descriptions

Table 38: Delete 3PAR host set

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host set is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Set Parameters	
Host set	Name of the host set to be deleted from the array. You can select a host set from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host set management** folder.

4. Select **Delete 3PAR host set** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Delete 3PAR host set**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Delete 3PAR host set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Set Parameters** tab, enter the name of host set to be deleted.

   You can select a host set from the inventory.

7. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Removing 3PAR hosts from host set

To remove 3PAR hosts from a host set, use Remove 3PAR host(s) from host set workflow.

Field Descriptions

Table 39: Remove 3PAR host(s) from host set

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host set is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Set Parameters	
Host set from which host(s) need to be deleted	Name of the host set from which the host is removed. You can select a host set from the inventory.
Host(s) to be removed from the set	Name of hosts to be removed from the host set. You can select a host from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **HostSet** folder.

4. Select **Remove 3PAR host(s) from host set** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Remove 3PAR host(s) from host set**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Remove 3PAR host(s) from host set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Set Parameters** tab:

   a. In the **Host set from which hosts need to be deleted** field, enter the name of host set from which host is removed.

      You can select a host set from the inventory.

   b. In the **Host(s) to be removed from the set** field, enter the name of hosts to be removed.

7. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Querying host sets

Querying all 3PAR host sets

To view all 3PAR host sets in an HPE 3PAR StoreServ array, use the Get all 3PAR host sets workflow.

Field Descriptions

Table 40: Get all 3PAR host sets

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host set is configured. You can select the HPE 3PAR StoreServ system from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host set management** > **Query** folder.

4. To view all host sets in an HPE 3PAR StoreServ array, select **Get all 3PAR host sets**.

   a. Perform one of the following:

   - Click the **Start workflow** ( ) icon.
   - Right-click **Get all 3PAR host sets**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Get all 3PAR host sets** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. Click **Submit**.

   The system displays all host sets in the selected HPE 3PAR StoreServ array.

Querying 3PAR host set by name

Field Descriptions

Table 41: Get 3PAR host set by name

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host set is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Set Parameters	
Name of the host set	Displays the details of the specified 3PAR host set in the selected HPE 3PAR StoreServ array.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host set management** > **Query** folder.

4. To get details of a host set in a 3PAR system by the name of the host set, select **Get 3PAR host set by name**.

   a. Perform one of the following:

   - Click the **Start workflow** () icon.
   - Right-click **Get 3PAR host set by name**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Get 3PAR host set by name** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Set Parameters** tab, enter the name of the host set.

7. Click **Submit**.

   The system displays the details of the specified 3PAR host set in the selected HPE 3PAR StoreServ array.

Querying 3PAR host sets by host name

To retrieve a list of host sets to which the specified host belongs, use the Get 3PAR host set by host name workflow.

Field Descriptions

Table 42: Get 3PAR host set by host name

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host set is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Host Set Parameters	
Host name	Displays the details of the specified 3PAR host set in the selected HPE 3PAR StoreServ array. You can select a host from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Host set management** > **Query** folder.

4. To get the details of host set in a 3PAR system by the name of a host in the set, select **Get 3PAR host set by host name**.

   a. Perform one of the following:

      • Click the **Start workflow** ( ) icon.

      • Right-click **Get 3PAR host set by host name**, and click **Start workflow**.

      • Press **Ctrl+R**.

      The **Start Workflow : Get 3PAR host set by host name** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Host Set Parameters** tab, enter the name of the host.

7. Click **Submit**.

   The system displays the details of the specified 3PAR host set in the selected HPE 3PAR StoreServ array.

Physical copy management

Creating offline physical copy of Virtual Volume

To create offline physical copy of Virtual Volume use the **Create offline physical copy of Virtual Volume** workflow.

Field descriptions

Table 43: Create offline physical copy of Virtual Volume

Name	Description
Connection	
Storeserv	Name of the HPE 3PAR StoreServe array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Copy Parameters	
Virtual Volume	Parameters of the Virtual Volume for creating offline physical copy.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

3. Navigate to the **Physical copy management** folder.

4. Select **Create offline physical copy of Virtual Volume** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Create offline physical copy of Virtual Volume**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Create offline physical copy of Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Copy Parameters** tab, enter the name of the virtual volume physical copy in the **Copy Volume** field.

   You can select a virtual volume physical copy from the inventory.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Creating online physical copy of Virtual Volume

To create online physical copy of Virtual Volume use the **Create online physical copy of Virtual Volume** workflow.

Field descriptions

Table 44: Create online physical copy of Virtual Volume

Name	Description
Connection	

Table Continued

Storeserv	Name of the HPE 3PAR StoreServe array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Copy Parameters	
Virtual Volume	Parameters of the Virtual Volume for creating online physical copy.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

3. Navigate to the **Physical copy management** folder.

4. Select **Create online physical copy of Virtual Volume** and perform one of the following:

   - Click the **Start workflow** ( ) icon.
   - Right-click **Create online physical copy of Virtual Volume**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Create online physical copy of Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Copy Parameters** tab, enter the name of the virtual volume physical copy in the **Copy Volume** field.

   You can select a virtual volume physical copy from the inventory.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Creating physical copy of VVSet

Field descriptions

Table 45: Create physical copy of VVSet

Name	Description
Connection	
StoreServ	Name of the HPE 3PAR StoreServe array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Copy Parameters	
Source VV Set	Physical copy of the source VV Set.
Destination VV Set	Destination for the VV Set physical copy.

Table Continued

Save snapshot of source Virtual Volumes	Prompts to save the source virtual volume snapshot after completing VV Set copy.
	The options available are:
	• **Yes**
	• **No**
	The default setting is **No**.
Priority	Priority of the operation.
	The options are:
	• **LOW**
	• **MEDIUM**
	• **HIGH**

Prerequisites

Log in to VMware vRealize Orchestrator.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Physical copy management** folder.

4. Select **Create physical copy of VVSet** and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Create physical copy of VVSet**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Create physical copy of VVSet** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Copy Parameters** tab:

   a. In the **Source VV Set** field, enter the name for the source of the VV Set physical copy.

      You can select a source VV Set physical copy from the inventory.

   b. In the **Destination VV Set** field, enter the name for the destination of the VV Set physical copy.

      You can select a destination VV Set physical copy from the inventory.

   c. You can enable or disable the **Save snapshot of source Virtual Volumes** option by selecting **Yes** or **No**.

The default setting is **No**.

    d. In the **Priority** field, select an appropriate option.

7. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Resyncing virtual volume physical copy

Field descriptions

Table 46: Resync Virtual Volume physical copy

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServe array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Resync Parameters	
Copy Volume	Virtual volume physical copy for resync operation.

Prerequisites

Log in to VMware vRealize Orchestrator.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Physical copy management** folder.

4. Select **Resync Virtual Volume physical copy** and perform one of the following:

- Click the **Start workflow** ( ) icon.

- Right-click **Resync Virtual Volume physical copy**, and click **Start workflow**.

- Press **Ctrl+R**.

The **Start Workflow : Resync Virtual Volume physical copy** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Resync Parameters** tab, enter the name of the virtual volume physical copy in the **Copy Volume** field.

You can select a virtual volume physical copy from the inventory.

7. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Resyncing VV Set physical copy

Field descriptions

Table 47: Resync VV Set physical copy

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServe array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Resync Parameters	
VV Set copy	Destination for VV Set physical copy
Priority	Priority of the resync operation. The options are: • **LOW** • **MEDIUM** • **HIGH**

Prerequisites

Log in to VMware vRealize Orchestrator.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⬚) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Physical copy management** folder.

4. Select **Resync VV Set physical copy** and perform one of the following:

   • Click the **Start workflow** (▶) icon.

   • Right-click **Resync VV Set physical copy**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Resync VV Set physical copy** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Resync Parameters** tab:

a. In the **VV Set copy** field, enter the name of the destination VV Set physical copy.

   You can select a destination VV Set physical copy from the inventory.

b. In the **Priority** field, select an appropriate option.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Stopping virtual volume physical copy

Field descriptions

Table 48: Stop Virtual Volume physical copy

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServe array in which the virtual volume is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Stop Parameters	
Copy Volume	Virtual volume physical copy to stop the copy/resync operation.

Prerequisites

Log in to VMware vRealize Orchestrator.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Physical copy management** folder.

4. Select **Stop Virtual Volume physical copy** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Stop Virtual Volume physical copy**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Stop Virtual Volume physical copy** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Stop Parameters** tab, enter the name of the virtual volume physical copy in the **Copy Volume** field.

You can select a virtual volume physical copy from the inventory.

7. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Stopping VV Set physical copy

Field descriptions

Table 49: Stop VV Set physical copy

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServe array in which the VVSet is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Stop Parameters	
VV Set	VV Set physical copy to stop the copy/resync operation. You can select the target VV Set physical copy from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Physical copy management** folder.

4. Select **Stop VV Set physical copy** and perform one of the following:

   - Click the **Start workflow** ( ) icon.
   - Right-click **Stop VV Set physical copy**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Stop VV Set physical copy** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Stop Parameters** tab, enter the name of the VV Set physical copy in the **VV Set** field.

   You can select the target VV Set physical copy from the inventory.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Export management

Exporting virtual volume set to host

Use the Export Virtual Volume Set to host workflow to export a volume set to a host. The system establishes a connection between the volume set and host and assigns a VLUN ID for the connection.

Field Descriptions

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array to which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Export Parameters	
Virtual Volume Set to export	Name of the virtual volume set to be exported. This setting is mandatory. You can select a virtual volume set from the inventory.
Auto assign LUN	LUN ID is auto assigned. • **Yes** — The system assigns a LUN ID for the export operation. • **No** — You must provide a value for the LUN ID. The default setting is **Yes**.
Lun ID	LUN ID. If you set auto-assign for LUN ID and provide a value for the LUN ID, the system assigns a value greater than or equal to the specified LUN ID for the export operation.
Max for AutoLun	Maximum limit for the LUN ID. The system assigns a value between the provided LUN ID and the maximum LUN value.
Host to which Virtual Volume Set to be exported	Name of the host to which the virtual volume is to be exported. You can select a host from the inventory.
System port	System port to which the virtual volume set is to be exported. The system port comprises of node number, slot number, and card port in the 3PAR system, which is provided in the node number: slot number: card Port number format.

NOTE: You can provide either the host name or the system port or both.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** folder.

4. Select **Export Virtual Volume Set to host** and perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Export Virtual Volume Set to host**, and click **Start workflow**.

- Press **Ctrl+R**.

   The **Start Workflow : Export Virtual Volume Set to host** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Export Parameters** tab, enter the following details:

   - **Virtual Volume Set to export**

   - **Auto assign LUN**

   - **Lun ID**

   - **Max for AutoLun**

   - **Host to which the Virtual Volume Set to be exported**

   - **System port through which Virtual Volume Set is to be exported**

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Exporting virtual volume set to host set

Use the Export Virtual Volume Set to host set workflow to export a volume set to a host set. The system establishes a connection between the volume set and host set and assigns a VLUN ID for the connection.

Field Description

Table 50: Export Virtual Volume Set to host set

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array to which the host is connected. You can select a HPE 3PAR StoreServ system from the inventory.
Export Parameters	
Virtual Volume Set to export	Name of the virtual volume set to be exported. This setting is mandatory. You can select a virtual volume set from the inventory.
Auto assign LUN	LUN ID is auto assigned. • **Yes** — The system assigns a LUN ID for the export operation. • **No** — You must provide a value for the LUN ID. The default setting is **Yes**.
Lun ID	LUN ID. If you set auto-assign for LUN ID and provide a value for the LUN ID, the system assigns a value greater the specified LUN ID for the export operation.

Table Continued

Max for AutoLun	Maximum limit for the LUN ID. The system assigns a value between the provided LUN ID and the maximum LUN value.
Host Set to which Virtual Volume Set to be exported	Name of the host set to which the virtual volume set is to be exported. You can select a host set from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** folder.

4. Select **Export Virtual Volume Set to host set** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Export Virtual Volume Set to host set**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Export Virtual Volume Set to host set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Export Parameters** tab, enter the following details:

   - **Virtual Volume Set to export**

   - **Auto assign LUN**

   - **Lun ID**

   - **Max for AutoLun**

   - **Host Set to which Virtual Volume Set to be exported**

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Exporting virtual volume to host

Use the Export Virtual Volume to host workflow to associate a virtual volume to a host. The system establishes a connection between the virtual volume and host and assigns a VLUN ID for the connection.

Field Description

Table 51: Export Virtual Volume to host

Name	Description
Connection	

Table Continued

StoreServ connection	Name of the 3PAR array to which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Export Parameters	
Virtual Volume to export	Name of the virtual volume to be exported. This setting is mandatory. You can select a virtual volume from the inventory.
Auto assign LUN	LUN ID is auto assigned. • **Yes** — The system assigns a LUN ID for the export operation. • **No** — You must provide a value for the LUN ID. The default setting is **Yes**.
Lun ID	LUN ID. If you set auto-assign for LUN ID and provide a value for the LUN ID, the system assigns a value greater the specified LUN ID for the export operation.
Max for AutoLun	Maximum limit for the LUN ID. The system assigns a value between the provided LUN ID and the maximum LUN value.
Host to which Virtual Volume to be exported	Name of the host to which the virtual volume is to be exported. You can select a host from the inventory.
System port	System port to which the virtual volume is to be exported. The system port comprises of node number, slot number, and card port in the 3PAR system, which is provided in the Node number: Slot number: card Port number format.

NOTE: You can provide either the host name or the system port or both.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** folder.

4. Select **Export Virtual Volume to host** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Export Virtual Volume to host**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Export Virtual Volume to host** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Export Parameters** tab, enter the following details:

- **Virtual Volume to export**

- **Auto assign LUN**

- **Lun ID**

- **Max for AutoLun**

- **Host to which the Virtual Volume to be exported**

- **System port through which Virtual Volume Set is to be exported**

7. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Exporting virtual volume to host set

To associate a virtual volume to a host set, use the Export Virtual Volume to host set workflow . The system establishes a connection between the virtual volume and host set and assigns a VLUN ID for the connection.

Field Description

Table 52: Export Virtual Volume to host set

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array to which the host is connected. You can select the HPE 3PAR StoreServ system from the inventory.
Export Parameters	
Virtual Volume to export	Name of the virtual volume to be exported. This setting is mandatory. You can select a virtual volume from the inventory.
Auto assign LUN	LUN ID is auto assigned. • **Yes** — The system assigns a LUN ID for the export operation. • **No** — You must provide a value for the LUN ID. The default setting is **Yes**.
Lun ID	LUN ID. If you set auto-assign for LUN ID and provide a value for the LUN ID, the system assigns a value greater the specified LUN ID for the export operation.
Max for AutoLun	Maximum limit for the LUN ID. The system assigns a value between the provided LUN ID and the maximum LUN value.
Host Set to which Virtual Volume to be exported	Name of the host set to which the virtual volume is to be exported. You can select a host set from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** folder.

4. Select **Export Virtual Volume to host set** and perform one of the following:

   - Click the **Start workflow** (▶) icon.

   - Right-click **Export Virtual Volume to host set**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Export Virtual Volume to host set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Export Parameters** tab, enter the following details:

   - **Virtual Volume to export**

   - **Auto assign LUN**

   - **Lun ID**

   - **Max for AutoLun**

   - **Host Set to which the volume to be exported**

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Unexporting virtual volume from host

To remove and unexport a VLUN ID associated with a connection between the virtual volume and host in the selected HPE 3PAR StoreServ system, use the Unexport Virtual Volume from host workflow.

Field Description

Table 53: Unexport Virtual Volume from host

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array to which the host is connected. You can select the HPE 3PAR StoreServ system from the inventory.
Unexport Parameters	
Virtual Volume to unexport	Name of the virtual volume that is to be unexported from the host. This setting is mandatory. You can select a virtual volume from the inventory.
Exported LUN value	LUN ID of the virtual volume that is to be unexported.

Table Continued

Host from which Virtual Volume is to be unexported	Name of the host from which the virtual volume is to be unexported. You can select a host from the inventory.
System port	System port of the unexported virtual volume. The system port comprises of node number, slot number, and card port in the 3PAR system, which is provided in the Node number: Slot number: card Port number format.

NOTE: You can provide either the host name or the system port or both.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** folder.

4. Select **Unexport Virtual Volume from host** and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Unexport Virtual Volume from host**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Unexport Virtual Volume from host** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Unexport Parameters** tab, enter the following details:

   • **Virtual Volume to unexport**

   • **Exported LUN value**

   • **Host from which Virtual Volume Set is to be unexported**

   • **System port from which Virtual Volume is to be unexported**

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Unexporting virtual volume from host set

To remove and unexport a VLUN ID associated with a connection between the virtual volume and host set in the selected HPE 3PAR StoreServ system, use the Unexport Virtual Volume from a host set.

Field Description

Table 54: Unexport Virtual Volume from host set

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array to which the host is connected. You can select a HPE 3PAR StoreServ system from the inventory.
Unexport Parameters	
Virtual Volume to unexport	Name of the virtual volume that is to be unexported from the host set. This setting is mandatory. You can select a virtual volume from the inventory.
Exported LUN value	LUN ID of the virtual volume that is to be unexported.
Host Set from which Virtual Volume is to be unexported	Name of the host set from which the virtual volume is to be unexported. You can select a host set from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** folder.

4. Select **Unexport Virtual Volume from host set** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Unexport Virtual Volume from host set** , and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Unexport Virtual Volume from host set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Unexport Parameters** tab, enter the following details:

   - **Virtual Volume to unexport**

   - **Exported LUN value**

   - **Host Set from which Virtual Volume Set is to be unexported**

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Unexporting virtual volume set from host

Use the Unexport Virtual Volume set from a host to unexport a VLUN ID associated with a connection between the virtual volume set and host in the selected HPE 3PAR StoreServ system.

Field Description

Table 55: Unexport Virtual Volume set from host

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array to which the host is connected. You can select a HPE 3PAR StoreServ system from the inventory.
Unexport Parameters	
Virtual Volume set to unexport	Name of the virtual volume set that is to be unexported from the host. This setting is mandatory. You can select a virtual volume set from the inventory.
Exported LUN value	LUN ID of the virtual volume set that is to be unexported.
Host from which Virtual Volume set is to be unexported	Name of the host from which the virtual volume set is to be unexported. You can select a host from the inventory.
System port	System port of the unexported virtual volume set. The system port comprises of node number, slot number, and card port in the 3PAR system, which is provided in the Node number: Slot number: card Port number format.

NOTE: You can provide either the host name or the system port or both.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** folder.

4. Select **Unexport Virtual Volume set from host** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Unexport Virtual Volume set from host**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Unexport Virtual Volume set from host** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Unexport Parameters** tab, enter the following details:

   - **Virtual Volume Set to unexport**

   - **Exported LUN value**

- **Host from which Virtual Volume Set to be exported**

- **System port from which Virtual Volume Set is to be unexported**

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Unexporting virtual volume set from host set

Use the Unexport Virtual Volume set from a host set workflow to unexport a VLUN ID associated with a connection between the virtual volume set and host set in the selected HPE 3PAR StoreServ system.

Field Description

Table 56: Unexport Virtual Volume set from host set

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array to which the host set is configured. You can select a HPE 3PAR StoreServ system from the inventory.
Unexport Parameters	
Virtual Volume Set to unexport	Name of the virtual volume set that is to be unexported from the host set. This setting is mandatory. You can select a virtual volume set from the inventory.
Exported LUN value	LUN ID of the virtual volume set that is to be unexported.
Host set from which Virtual Volume set is to be unexported	Name of the host set from which the virtual volume set is to be unexported. You can select a host set from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⊞) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** folder.

4. Select **Unexport Virtual Volume set from host set** and perform one of the following:

   - Click the **Start workflow** (▶) icon.

   - Right-click **Unexport Virtual Volume set from host set**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Unexport Virtual Volume set from host set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Unexport Parameters** tab, enter the following details:

- **Virtual Volume Set to unexport**

- **Exported LUN value**

- **Host set from to which Virtual Volume set to be unexported**

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Querying exported virtual volume

Querying all exported virtual volumes

To get the list of all VLUN IDs in an HPE 3PAR StoreServ array, use the Get all exported Virtual Volume workflow. The VLUN ID consists of the volume or volume set name, LUN ID, host or host set name, and the port number.

Field Description

Table 57: Get all exported Virtual Volume

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array to which the host set is connected. You can select a HPE 3PAR StoreServ system from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** > **Query** folder.

4. To view the VLUN IDs of all exported virtual volumes in an HPE 3PAR StoreServ array, select **Get all exported Virtual Volume**.

   a. Perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Get all exported Virtual Volume**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Get all exported Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. Click **Submit**.

Querying all exports of virtual volume

To query VLUN IDs of a specific Virtual Volume by the name, use the Get all exports of Virtual Volume workflow.

Field Description

Table 58: Get all exports of Virtual Volume

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array to which the host set is connected. You can select a HPE 3PAR StoreServ system from the inventory.
Export Parameters	
Virtual Volume	Queries VLUN IDs of a specific Virtual Volume by the name. You can select a virtual volume set from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** > **Query** folder.

4. To view all VLUN IDs associated with a specific virtual volume, select **Get all exports of Virtual Volume** .

   a. Perform one of the following:

   - Click the **Start workflow** ( ) icon.
   - Right-click **Get all exports of Virtual Volume**, and click **Start workflow**.
   - Press **Ctrl+R**.

      The **Start Workflow : Get all exports of Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Export Parameters** tab, enter the exported virtual volume name.

7. Click **Submit**.

   The system lists all VLUNs associated with the virtual volume name.

Querying exported virtual volume by FC WWN/iSCSI path

To query VLUN IDs by the FC WWN or iSCSI path of a host, use the Get exported Virtual Volume by FC WWN/iSCSI Path workflow.

Field Description

Table 59: Get exported Virtual Volume by FC WWN/iSCSI Path

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array to which the host set is connected. You can select a HPE 3PAR StoreServ system from the inventory.
Export Parameters	
FC WWN/iSCSI Path	Queries VLUN IDs by the FC WWN or iSCSI path of a host.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** > **Query** folder.

4. To view all exported virtual volume in an HPE 3PAR StoreServ array by the FC WWN or iSCSI path of the host, select **Get exported Virtual Volume by FC WWN/iSCSI Path**.

   a. Perform one of the following:

      - Click the **Start workflow** ( ) icon.
      - Right-click **Get exported Virtual Volume by FC WWN/iSCSI Path**, and click **Start workflow**.
      - Press **Ctrl+R**.

      The **Start Workflow : Get exported Virtual Volume by FC WWN/iSCSI Path** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Export Parameters** tab, enter the FC WWN/iSCSI path to which the virtual volume is exported.

7. Click **Submit**.

   The system displays a list of all VLUN IDs associated with the host or host set with the specified FC WWN or iSCSI path in the selected HPE 3PAR StoreServ array.

Querying exported virtual volume by host name

To query all VLUN IDs of all connections associated with a specific host, use the Get exported Virtual Volume by host workflow.

Field Description

Table 60: Get exported Virtual Volume by host

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array to which the host set is configured. You can select a HPE 3PAR StoreServ system from the inventory.
Export Parameters	
Host	Queries all VLUN IDs associated with a specific host. You can select a host from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⬚) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** > **Query** folder.

4. To view all virtual volumes connected to a specific host, select **Get exported Virtual Volume by host**.

   a. Perform one of the following:

   - Click the **Start workflow** (▶) icon.
   - Right-click **Get exported Virtual Volume by host**, and click **Start workflow**.
   - Press **Ctrl+R**.

     The **Start Workflow : Get exported Virtual Volume by host** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Export Parameters** tab, enter the host name to which the virtual volume is exported.

7. Click **Submit**.

   The system lists all VLUN IDs associated with the host name in the selected HPE 3PAR StoreServ array.

Querying exported virtual volume by WWN

To query VLUN IDs associated with a virtual volume by the WWN of the virtual volume, use the Get exported Virtual Volume by WWN workflow.

Field Description

Table 61: Get exported Virtual Volume by WWN

Name	Description
Connection	

Table Continued

StoreServ connection	Name of the 3PAR array to which the host set is configured. You can select a HPE 3PAR StoreServ system from the inventory.
Export Parameters	
Virtual Volume WWN	Queries VLUN IDs associated with a virtual volume by the WWN of the virtual volume. You can select a virtual volume from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** > **Query** folder.

4. To view all exported virtual volumes in an HPE 3PAR StoreServ array, select **Get exported Virtual Volume by WWN**.

   a. Perform one of the following:

   - Click the **Start workflow** ( ) icon.
   - Right-click **Get exported Virtual Volume by WWN**, and click **Start workflow**.
   - Press **Ctrl+R**.

      The **Start Workflow : Get exported Virtual Volume by WWN** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Export Parameters** tab, enter the WWN of the exported virtual volume.

7. Click **Submit**.

   The system lists all VLUN IDs associated with the specific virtual volume in the selected HPE 3PAR StoreServ array.

Querying specific exported virtual volume

To get all hosts in a host set associated with a virtual volume, use the Get exported Virtual Volume workflow. The system provides a list of active hosts and inactive hosts.

Field Description

Table 62: Get specific exported Virtual Volume

Name	Description
Connection	
	Name of the 3PAR array to which the host set is configured. You can select a HPE 3PAR StoreServ system from the inventory.
Export Parameters	

Table Continued

Volume	Queries active hosts and inactive hosts in a host set associated with a virtual volume. You can select a virtual volume from the inventory.
lunID	LUN ID. If you set auto-assign for LUN ID and provide a value for the LUN ID, the system assigns a value greater than or equal to the specified LUN ID for the export operation.
Host	Name of the host to which the virtual volume is to be exported. You can select a host from the inventory.
storeserv Port	System port to which the virtual volume set is to be exported. The system port comprises of node number, slot number, and card port in the 3PAR system, which is provided in the Node number: Slot number: card Port number format.

NOTE: You can provide either the host name or the system port or both.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Export management** > **Query** folder.

4. To get a specific virtual volume exported in an HPE 3PAR StoreServ array, select **Get specific exported Virtual Volume**.

   a. Perform one of the following:

      - Click the **Start workflow** () icon.
      - Right-click **Get specific exported Virtual Volume**, and click **Start workflow**.
      - Press **Ctrl+R**.

      The **Start Workflow : Get specific exported Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Export Parameters** tab, enter the following details:

   - **Volume** — Name of the exported virtual volume.
   - **lunID** — LUN value for the volume export.
   - **Host** — Name of host to which virtual volume is exported.
   - **storeserv Port** — System port number.

7. Click **Submit**.

Protection

The workflows in Protection allow the user to manage HPE RMC connections, snapshots, datastore backup activities, and related tasks in the VMware vRealize Orchestrator.

Manage RMC Instances

The workflow available in Manage RMC Instances allows the user to manage HPE RMC connections in the VMware vRealize Orchestrator.

It is necessary to import the certificate from the target HPE RMC, before you add a new HPE RMC connection. You can run the **Import RMC certificate from URL** workflow to import the certificate from the HPE RMC.

NOTE: The VMware vRealize Orchestrator administrators can manage the certificates by logging on to the **Orchestrator Control Center**.

Importing RMC certificate from URL

Field descriptions

Table 63: Import RMC certificate from URL

Name	Description
URL	URL or just the host for non HTTPS SSL services.
ignoreWarnings	An option to select a certificate and add the certificate to a trusted store.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Instances** folder.

4. Select **Import RMC certificate from URL** and perform one of the following:

   - Click the **Start workflow** () icon.
   - Right-click **Import RMC certificate from URL**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Import RMC certificate from URL** window appears.

5. In the **URL** field, enter the URL or the host for the non HTTPS SSL services.

6. In the **ignoreWarnings** field, click **Yes** to select a certificate and add the certificate to a trusted store.

7. Click **Submit**.

   The system displays the HPE RMC certificate added to a trusted store.

Adding RMC Instance

Field descriptions

Table 64: Add RMC Instance

Name	Description
Connection Name	Name of the HPE RMC connection.
IP Address or FQDN of the Protection System	The IP or FQDN of the HPE RMC instance.
Username	HPE RMC instance administrator username.
Password	HPE RMC instance administrator password.

NOTE: If the RMC configuration changes, you have to remove and add the HPE RMC connection again.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (![icon]) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Instances** folder.

4. Select **Add RMC Instance** and perform one of the following:

   - Click the **Start workflow** (![icon]) icon.
   - Right-click **Add RMC Instance**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Add RMC Instance** window appears.

5. In the **Connection Name** field, enter a name for the connection.
   To add the system to the inventory, provide a name for an HPE RMC connection.

6. In the **RMC IP or FQDN** field, enter the IP address or FQDN of the StoreServ connection.

7. In the **Username** field, enter the RMC administrator username.

8. In the **Password** field, enter the RMC administrator password.

9. Click **Submit**.

   The system displays the HPE RMC instance added in the StoreServ inventory at **Inventory** > **HPE 3PAR StoreServ** folder.

More information

Importing RMC certificate from URL on page 79

Removing RMC Instance

Field descriptions

Table 65: Remove RMC Instance

Name	Description
Common parameters	
Connection Name	Name of the HPE RMC connection. You can select an HPE RMC connection from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Instances** folder.

4. Select **Remove RMC Instance** and perform one of the following:

   - Click the **Start workflow** ( ) icon.
   - Right-click **Remove RMC Instance**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Remove RMC Instance** window appears.

5. On the **Connection** tab, select the HPE RMC instance from the inventory.

6. Click **Submit**.

   The system removes the HPE RMC instance from the inventory.

Manage RMC Data Protection

The workflows in Manage RMC data protection allows you to manage backups, schedules, and snapshots in the VMware vRealize Orchestrator.

Canceling Express protect backup task

Field descriptions

Table 66: Cancel Express Protect Backup Task

Name	Description
Backup	Protection backup. You can select a backup object from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Cancel Express Protect Backup Task** and perform one of the following:

   - Click the **Start workflow** () icon.

   - Right-click **Cancel Express Protect Backup Task** , and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Cancel Express Protect Backup Task** window appears.

5. In the **Backup** field, select a backup object from the inventory.

6. Click **Submit**.

Deleting Express protect backup

Field descriptions

Table 67: Delete Express Protect Backup

Name	Description
Backup	Protection backup. You can select a backup object from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Delete Express Protect Backup** and perform one of the following:

   - Click the **Start workflow** () icon.

   - Right-click **Delete Express Protect Backup**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Delete Express Protect Backup** window appears.

5. In the **Backup** field, select a backup object from the inventory.

6. Click **Submit**.

Deleting schedules

Field descriptions

Table 68: Delete Schedules

Name	Description
Schedules	RMC schedules. You can select an RMC schedule from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Delete Schedules** and perform one of the following:

   - Click the **Start workflow** ( ) icon.
   - Right-click **Delete Schedules**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Delete Schedules** window appears.

5. In the **Schedules** field, select an RMC schedule from the inventory.

6. Click **Submit**.

Deleting snapshot

Field descriptions

Table 69: Delete Snapshot

Name	Description
Snapshot	Protection snapshot. You can select a snapshot from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Delete Snapshot** and perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Delete Snapshot**, and click **Start workflow**.

- Press **Ctrl+R**.

   The **Start Workflow : Delete Snapshot** window appears.

5. In the **Snapshot** field, select a snapshot from the inventory.

6. Click **Submit**.

Promoting datastore snapshot

Field descriptions

Table 70: Promote Datastore Snapshot

Name	Description
Snapshot	Protection snapshot. You can select a snapshot from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⬒) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Promote Datastore Snapshot** and perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Promote Datastore Snapshot**, and click **Start workflow**.

- Press **Ctrl+R**.

   The **Start Workflow : Promote Datastore Snapshot** window appears.

5. In the **Snapshot** field, select a snapshot from the inventory.

6. Click **Submit**.

Promoting Express protect backup

Field descriptions

Table 71: Promote Express Protect Backup

Name	Description
Common Parameters	

Table Continued

Backup	Name of the backup. You can select a backup from the inventory.
Restore destination	Destination for restore. You can select from one of the following: • **Snapshot** • **Another Volume** • **Parent Volume**
Storage system	Name of the storage system.
Volume	Name of the virtual volume.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Promote Express Protect Backup** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Promote Express Protect Backup**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Promote Express Protect Backup** window appears.

5. In the **Common parameters** tab:

   a. In the **Backup** field, enter the name of the backup.

      You can select a backup from the inventory.

   b. In the **Restore destination** field, enter the destination to perform the restore operation.

6. Click **Submit**.

Promoting VM snapshot

Field descriptions

Table 72: Promote VM Snapshot

Name	Description
Snapshot	Name of the Protection snapshot. You can select a VM snapshot from the inventory.
Mount Parameters	

Table Continued

Host System	Name of the ESXi host. You can select a ESXi host from the vCenter inventory.
Copy Parameters	
Virtual Disk to copy	Name of the virtual disk that you have to copy.
Target Datastore	Name of the target datastore. You can select the target datastore from the vCenter inventory.
Virtual Disk target directory	Name of the virtual disk target directory.
Overwrite Target VMDK File	Enable or disable the overwrite target VMDK file option. The options available are: • **Yes** • **No** The default setting is **No**.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (🔲) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Promote VM Snapshot** and perform one of the following:

   • Click the **Start workflow** (▶) icon.
   • Right-click **Promote VM Snapshot**, and click **Start workflow**.
   • Press **Ctrl+R**.

   The **Start Workflow : Promote VM Snapshot** window appears.

5. On the **Mount Parameters** tab:

   a. In the **Host System** field, enter the name of the ESXi host.

      You can select a ESXi host from the vCenter inventory.

6. On the **Copy Parameters** tab:

   a. In the **Virtual Disk to copy** field, enter the name of the virtual disk that you have to copy.

   b. In the **Target Datastore** field, enter the name of the target datastore.

      You can select the target datastore from the vCenter inventory.

   c. In the **Virtual Disk target directory** field, enter the name of the virtual disk target directory.

   d. You can enable or disable the **Overwrite Target VMDK File** option by selecting **Yes** or **No**.

The default setting is **No**.

7. In the **Common Parameters** tab, enter the name of the snapshot in the **Snapshot** field.

   You can select a snapshot from the vCenter inventory.

8. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Promoting VVOL VM snapshot

Field descriptions

Table 73: Promote VVOL VM Snapshot

Name	Description
Snapshot	
Snapshot	Name of the Protection snapshot. You can select a VVOL VM snapshot from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Promote VVOL VM Snapshot** and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Promote VVOL VM Snapshot**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Promote VVOL VM Snapshot** window appears.

5. In the **Snapshot** tab, enter the name of the snapshot in the **Snapshot** field.

   You can select a snapshot from the vCenter inventory.

6. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Protecting datastore

Field descriptions

Table 74: Protect Datastore

Name	Description
Common Parameters	
vCenter Datastore	Name of the datastore. You can select a datastore from the vCenter inventory.
RMC Connection	Name of the RMC instance. You can select an RMC instance from the inventory.
Snapshot Name	Name of the snapshot.
Continue on VM Error	Continue with the creation of a protection schedule even if there are VM errors. The options available are: • **Yes** • **No** The default setting is **No**.
Policies	
Protection Policy	Name of the RMC protection policy. You can select a protection policy associated to an RMC instance from the inventory.
Backup Name	Name of the backup.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Protect Datastore** and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Protect Datastore**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Protect Datastore** window appears.

5. On the **Common Parameters** tab:

   a. In the **vCenter Datastore** field, enter the name of the datastore.

      You can select the datastore from the vCenter inventory.

   b. In the **RMC Connection** field, enter the name of the RMC instance.

You can select an RMC instance from the inventory.

   c. In the **Snapshot Name** field, enter the name of the snapshot.

   d. You can enable or disable the **Continue on VM error** option by selecting **Yes** or **No**. This option allows you to continue creating a protection schedule even with the VM errors.

The default setting is **No**.

6. On the **Policies** tab:

   a. In the **Protection Policy** field, enter the name of the protection policy associated with the RMC instance.

You can select a protection policy from the inventory.

   b. In the **Backup Name** field, enter the name of the backup.

7. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Protecting datastore with schedule

Field descriptions

Table 75: Protect Datastore with Schedule

Name	Description
Common Parameters	
vCenter Datastore	Name of the VMWare vCenter datastore. You can select a vCenter datastore from the vCenter inventory.
vCenter Virtual Machine(s)	Name of the vCenter virtual machine. You can select a vCenter VM from the vCenter inventory.
RMC Connection	Name of the RMC instance. You can select an RMC instance from the inventory.
Snapshot Name	Name of the snapshot.
Continue on VM Error	Continue with the creation of a protection schedule even if there are VM errors. The options available are: • **Yes** • **No** The default setting is **No**.
Policies	
Protection Policy	Name of the RMC protection policy. You can select a protection policy associated to an RMC instance from the inventory.
Schedule Parameters	

Table Continued

Schedule Name	Name of the schedule.
Backup Name	Name of the backup.
Description	Schedule description.
Start Date and Time	Start date and time for the schedule.
End Date	End date for the schedule.
Frequency	Frequency for the schedule.
Recurrence in Minutes	Frequency for the schedule in minutes.
Recurrence in Hours	Frequency for the schedule in hours.
Recurrence in Days	Frequency for the schedule in days.
Weekly frequency recurrence	Weekly frequency for the schedule.
Monthly frequency recurrence	Monthly frequency for the schedule.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Protect Datastore with Schedule** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Protect Datastore with Schedule**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Protect Datastore with Schedule** window appears.

5. On the **Common Parameters** tab:

   a. In the **vCenter Datastore** field, enter the name of the VMWare vCenter datastore.

      You can select a vCenter datastore from the vCenter inventory.

   b. In the **vCenter Virtual Machine** field, enter the name of the vCenter virtual machine.

      You can select a vCenter VM from the vCenter inventory.

   c. In the **RMC Connection** field, enter the name of the RMC instance.

      You can select an RMC instance from the inventory.

   d. In the **Snapshot Name** field, enter the name of the snapshot.

   e. You can enable or disable the **Continue on VM error** option by selecting **Yes** or **No**. This option allows you to continue creating a protection schedule even with the VM errors.

      The default setting is **No**.

6. On the **Policies** tab:

    a. In the **Protection Policy** field, enter the name of the protection policy associated with the RMC instance.

    You can select a protection policy from the inventory.

7. On the **Schedule Parameters** tab:

    a. In the **Schedule Name** field, enter the name of the schedule.

    b. In the **Backup Name** field, enter the name of the backup.

    c. In the **Description** field, enter the description for the schedule.

    d. In the **Start Date and Time** field, enter the start date and time of the schedule using the calender.

    e. In the **End Date** field, enter the start date and time of the schedule using the calender.

    f. In the **Frequency** field, enter the frequency value for the schedule.

    g. In the **Recurrence in Minutes** field, enter the frequency of the schedule in number of minutes.

    h. In the **Recurrence in Hours** field, enter the frequency of the schedule in number of hours.

    i. In the **Recurrence in Days** field, enter the frequency of the schedule in number of days.

    j. In the **Weekly frequency recurrence** field, enter the frequency of the schedule in number of weeks.

    k. In the **Monthly frequency recurrence** field, enter the frequency of the schedule in number of months.

8. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Protecting VMs

Field descriptions

Table 76: Protect VMs

Name	Description
Common Parameters	
vCenter Virtual Machine	Name of the vCenter virtual machine. You can select a virtual machine from the vCenter inventory.
RMC Connection	Name of the RMC instance. You can select an RMC instance from the inventory.
Snapshot Name	Name of the Protection snapshot.
Policies	
Protection Policy	Name of the RMC protection policy. You can select a protection policy associated to an RMC instance from the inventory.
Backup Name	Name of the backup.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

    The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

    All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Protect VMs** and perform one of the following:

    - Click the **Start workflow** ( ) icon.
    - Right-click **Protect VMs**, and click **Start workflow**.
    - Press **Ctrl+R**.

    The **Start Workflow : Protect VMs** window appears.

5. On the **Common Parameters** tab:

    a. In the **vCenter Virtual Machine** field, enter the name of the vCenter virtual machine.

       You can select a virtual machine from the vCenter inventory.

    b. In the **RMC Connection** field, enter the name of the RMC instance.

       You can select an RMC instance from the inventory.

    c. In the **Snapshot Name** field, enter the name of the snapshot.

6. On the **Policies** tab:

    a. In the **Protection Policy** field, enter the name of the protection policy associated with the RMC instance.

       You can select a protection policy from the inventory.

    b. In the **Backup Name** field, enter the name of the backup.

7. Click **Submit**.

    You can use **Next** or **Previous** to navigate through the tabs.

Protecting VMs with schedule

Field descriptions

Table 77: Protect VMs with Schedule

Name	Description
Common Parameters	
vCenter Virtual Machine	Name of the vCenter virtual machine. You can select a virtual machine from the vCenter inventory.

Table Continued

RMC Connection	Name of the RMC instance. You can select an RMC instance from the inventory.
Snapshot Name	Name of the protection snapshot.
Policies	
Protection Policy	Name of the RMC protection policy. You can select a protection policy associated to an RMC instance from the inventory.
Schedule Parameters	
Name	Schedule name.
Backup Name	Name of the backup.
Description	Schedule description.
Start Date and Time	Start date and time for the schedule.
End Date	End date for the schedule.
Frequency	Frequency for the schedule.
Recurrence in Minutes	Frequency for the schedule in minutes.
Recurrence in Hours	Frequency for the schedule in hours.
Recurrence in Days	Frequency for the schedule in days.
Weekly frequency recurrence	Weekly frequency for the schedule.
Monthly frequency recurrence	Monthly frequency for the schedule.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Protect VMs with Schedule** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Protect VMs with Schedule**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Protect VMs with Schedule** window appears.

5. On the **Common Parameters** tab:

   a. In the **vCenter Virtual Machine** field, enter the name of the vCenter virtual machine.

      You can select a vCenter VM from the inventory.

   b. In the **RMC Connection** field, enter the name of the RMC instance.

You can select an RMC instance from the inventory.

   c. In the **Snapshot Name** field, enter the name of the snapshot.

6. On the **Policies** tab:

   a. In the **Protection Policy** field, enter the name of the protection policy associated with the RMC instance.

   You can select a protection policy from the inventory.

7. On the **Schedule Parameters** tab:

   a. In the **Name** field, enter the name of the schedule.

   b. In the **Backup Name** field, enter the name of the backup.

   c. In the **Description** field, enter the description for the schedule.

   d. In the **Start Date and Time** field, enter the start date and time of the schedule using the calender.

   e. In the **End Date** field, enter the start date and time of the schedule using the calender.

   f. In the **Frequency** field, enter the frequency value for the schedule.

   g. In the **Recurrence in Minutes** field, enter the frequency of the schedule in number of minutes.

   h. In the **Recurrence in Hours** field, enter the frequency of the schedule in number of hours.

   i. In the **Recurrence in Days** field, enter the frequency of the schedule in number of days.

   j. In the **Weekly frequency recurrence** field, enter the frequency of the schedule in number of weeks.

   k. In the **Monthly frequency recurrence** field, enter the frequency of the schedule in number of months.

8. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Refreshing VMWare objects

Field descriptions

Table 78: Refresh VMWare Objects

Name	Description
Common Parameters	
RMC Connection	Name of the HPE RMC instance. You can select an HPE RMC instance from the inventory.

NOTE: The **Refresh VMWare Objects** workflow refreshes the VMware objects in the HPE RMC instance.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Refresh VMWare Objects** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Refresh VMWare Objects**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Refresh VMWare Objects** window appears.

5. On the **Common Parameters** tab, enter the name of the RMC instance in the **RMC Connection** field.

6. Click **Submit**.

Snapshot copy VMDK operation

Field descriptions

Table 79: Snapshot Copy VMDK Operation

Name	Description
Common Parameters	
Snapshot	Name of the Protection snapshot. You can select a VM snapshot from the inventory.
Source	
Virtual Disk to copy	Name of the virtual disk that you have to copy.
Target	
Target Datastore	Name of the target datastore. You can select a target datastore from the vCenter inventory.
Virtual Disk target directory	Name of the virtual disk target directory.
Overwrite Target VMDK File	Enable or disable the overwrite target VMDK file option. The options available are: • **Yes** • **No** The default setting is **No**.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Snapshot Copy VMDK Operation** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Snapshot Copy VMDK Operation**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Snapshot Copy VMDK Operation** window appears.

5. In the **Common Parameters** tab, enter the name of the snapshot in the **Snapshot** field.

   You can select a VM snapshot from the inventory.

6. In the **Source** tab, enter the name of the virtual disk that you have to copy in the **Virtual Disk to copy** field.

7. On the **Target** tab:

   a. In the **Target Datastore** field, enter the name of the target datastore.

      You can select the target datastore from the vCenter inventory.

   b. In the **Virtual Disk target directory** field, enter the name of the virtual disk target directory.

   c. You can enable or disable the **Overwrite Target VMDK File** option by selecting **Yes** or **No**.

      The default setting is **No**.

8. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Snapshot mount operation

Field descriptions

Table 80: Snapshot Mount Operation

Name	Description
Common Parameters	
Snapshot	Name of the protection snapshot. You can select a snapshot from the inventory.
Host System	Name of the ESXi host. You can select a ESXi host from the vCenter inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Snapshot Mount Operation** and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Snapshot Mount Operation**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Snapshot Mount Operation** window appears.

5. On the **Common parameters** tab:

   a. In the **Snapshot** field, enter the name of a protection snapshot.

      You can select a snapshot from the inventory.

   b. In the **Host System** field, enter the name of the ESXi host.

      You can select a ESXi host from the vCenter inventory.

6. Click **Submit**.

Snapshot unmount operation

Field descriptions

Table 81: Snapshot Unmount Operation

Name	Description
Common Parameters	
Snapshot	Name of the protection snapshot. You can select a snapshot from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Snapshot Unmount Operation** and perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Snapshot Unmount Operation**, and click **Start workflow**.

- Press **Ctrl+R**.

    The **Start Workflow : Snapshot Unmount Operation** window appears.

5. In the **Common parameters** tab, enter the name of a protection snapshot.

    You can select a snapshot from the inventory.

6. Click **Submit**.

Verifying Express protect backup

Field descriptions

Table 82: Verify Express Protect Backup

Name	Description
Common Parameters	
Backup	Name of the backup. You can select a backup from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⊞) tab.

    The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

    All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Manage RMC Data Protection** folder.

4. Select **Verify Express Protect Backup** and perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Verify Express Protect Backup**, and click **Start workflow**.

- Press **Ctrl+R**.

    The **Start Workflow : Verify Express Protect Backup** window appears.

5. In the **Common parameters** tab, enter the name of the backup.

    You can select a backup from the inventory.

6. Click **Submit**.

Query

The **Query** workflow allows the user to get the protection data in the VMware vRealize Orchestrator.

Querying Configured Storage Systems

To validate a list of configured storage systems available in an HPE RMC, use the Get Configured Storage Systems workflow.

Field descriptions

Table 83: Querying Configured Storage Systems

Name	Description
Connection	
Protection Connection	You can select an HPE RMC connection from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

3. Navigate to **Protection** > **Query** folder.

4. Select **Get Configured Storage Systems** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Get Configured Storage Systems**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Get Configured Storage Systems** window appears.

5. In the **Start Workflow : Get Configured Storage Systems** wizard, select an HPE RMC from the inventory.

6. Click **Submit**.

Querying Configured StoreOnce

To validate a list of Configured StoreOnce available in the HPE RMC, use the Get Configured StoreOnce workflow.

Field descriptions

Table 84: Get Configured StoreOnce

Name	Description
Connection	
Protection Connection	You can select a configured HPE RMC from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

3. Navigate to **Protection** > **Query** folder.

4. Select **Get Configured StoreOnce** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Get Configured StoreOnce**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Get Configured StoreOnce** window appears.

5. In the **Get Configured StoreOnce** wizard, select an HPE RMC from the inventory.

6. Click **Submit**.

Querying Datastores Backups

To query for available datastore backups in an HPE RMC, use the Get Datastores Backups workflow.

Field descriptions

Table 85: Get Datastores Backups

Name	Description
Connection	
Protected Datastore	You can select a protected datastore from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

3. Navigate to **Protection** > **Query** folder.

4. Select **Get Datastores Backups** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Get Datastores Backups**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Get Datastores Backups** window appears.

5. In the **Get Datastores Backups** wizard, select a protected datastore from the inventory.

6. Click **Submit**.

Querying Datastore Snapshots

To get a list of all datastore snapshots available in an HPE RMC, use the Get Datastore Snapshots workflow.

Field descriptions

Table 86: Get Datastore Snapshots

Name	Description
Connection	
Protected datastore	You can select a protected datastore from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

3. Navigate to **Protection** > **Query** folder.

4. Select **Get Datastore Snapshots** and perform one of the following:

   - Click the **Start workflow** () icon.

   - Right-click **Get Datastore Snapshots**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Get Datastore Snapshots** window appears.

5. In the **Start Workflow : Get Datastore Snapshots** wizard, select protected datastore from the inventory.

6. Click **Submit**.

Querying Managed vCenter

To validate a list of managed vCenter available in an HPE RMC, use the Get Managed vCenter workflow.

Field Description

Table 87: Get Managed vCenter

Name	Description
Connection	
Protection Connection	You can select a managed HPE RMC from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

3. Navigate to **Protection** > **Query** folder.

4. Select **Get Managed VCenter** and perform one of the following:

   - Click the **Start workflow** (▶) icon.

   - Right-click **Get Managed vCenter**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Get Managed vCenter** window appears.

5. In the **Start Workflow : Get Managed vCenter** wizard, select an HPE RMC from the inventory.

6. Click **Submit**.

Querying Protected Datastores

To validate a list of Protected Datastores available in an HPE RMC, use the Get Protected Datastores workflow.

Field Description

Table 88: Get Protected Datastores

Name	Description
Connection	
Protection Connection	You can select a HPE RMC connection from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⊞) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Query** folder.

4. Select **Get Protected Datastores** and perform one of the following:

   - Click the **Start workflow** (▶) icon.

   - Right-click **Get Protected Datastores**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Get Protected Datastores** window appears.

5. In the **Start Workflow : Get Protected Datastores** wizard, select an object from the inventory.

> **NOTE:** If the datastore has any Snapshot or Schedule associated with it, then it is protected.

6. Click **Submit**.

Querying Protected Virtual Machines

To validate a list of Protected Virtual Machines available in an HPE 3PAR StoreServ system, use the **Get Protected Virtual Machines** workflow.

Field Description

Table 89: Get Protected Virtual Machines

Name	Description
Connection	
Protection Connection	You can select a HPE RMC connection from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Query** folder.

4. Select **Get Protected Virtual Machines** and perform one of the following:

- Click the **Start workflow** ( ) icon.

- Right-click **Get Protected Virtual Machines**, and click **Start workflow**.

- Press **Ctrl+R**.

The **Start Workflow : Get Protected Virtual Machines** window appears.

5. In the **Start Workflow : Get Protected Virtual Machines** wizard, select an object from the inventory.

> **NOTE:** If the Virtual Machine has any Snapshot or Schedule associated with it, then it is protected.

6. Click **Submit**.

Querying Virtual Machine Backups

To get a list of backups for the virtual machines available in HPE RMC, use the Get Virtual Machine Backups workflow.

Field Description

Table 90: Get Virtual Machine Backups

Name	Description
Connection	
Protected Virtual Machine	You can select a protected virtual machine from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Query** folder.

4. Select **Get Virtual Machine Backups** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Get Virtual Machine Backups**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Get Virtual Machine Backups** window appears.

5. In the **Start Workflow : Get Virtual Machine Backups** wizard, select an object from the inventory.

6. Click **Submit**.

Querying Virtual Machine Snapshots

To get a list of Snapshots for virtual machines available in an HPE RMC, use the Get Virtual Machine Snapshots workflow.

Field descriptions

Table 91: Get Virtual Machine Snapshots

Name	Description
Connection	
Protected virtual machine	You can select a protected virtual machine from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Query** folder.

4. Select **Get Virtual Machine Snapshots** and perform one of the following:

- Click the **Start workflow** ( ) icon.

- Right-click **Get Virtual Machine Snapshots**, and click **Start workflow**.

- Press **Ctrl+R**.

   The **Start Workflow : Get Virtual Machine Snapshots** window appears.

5. In the **Start Workflow : Get Virtual Machine Snapshots** wizard, select an object from the inventory.

6. Click **Submit**.

Querying task

The task details obtained by using the Querying task workflow.

Field Description

Table 92: Querying task

Name	Description
Connection	
Task ID	Enter the task ID.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to **Protection** > **Query** folder.

4. Select **Querying task** and perform one of the following:

- Click the **Start workflow** ( ) icon.

- Right-click **Querying task**, and click **Start workflow**.

- Press **Ctrl+R**.

   The **Start Workflow : Querying task** window appears.

5. In the **Start Workflow : Querying task** wizard, enter the task ID.

6. Click **Submit**.

Snapshot management

A snapshot is a point-in-time virtual copy of a base volume. The base volume is the original volume that is copied to the snapshot. Unlike a physical copy, which is a duplicate of a volume, a virtual copy only records changes to the base volume. You can use a snapshot to get an earlier state of the original virtual volume to be recreated by starting with the current state of the virtual copy and rolling back the changes that have been after creating the virtual copy.

When a snapshot is created, data is mapped indirectly with data in the parent volume. When a block is written to the parent, the original block is copied from the parent to the snapshot data space and the snapshot points to this data space.

Creating snapshot of virtual volume set

Field Descriptions

Table 93: Create snapshot of Virtual Volume Set

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which we are creating the snapshot for the virtual volume set. You can select the HPE 3PAR StoreServ system from the inventory.
Snapshot Parameters	
Virtual Volume Set	Name of the virtual volume set for which the snapshot is generated once the workflow is completed. You can select a virtual volume set from the inventory.
Snapshot name pattern	Naming pattern of the snapshot. The options are: • **VolumeName_And_Time_Stamp** • **VolumeName_And_Count** • **VolumeName_And_Time_in_Seconds_Since_Epoch** • **Custom**
Access Permissions	Access permission for the snapshot. The options are: • **Read and Write** — You can modify the snapshot or restore data on a different host. The default setting is read and write. • **Read only** — You cannot modify the snapshot.
Expiration time	Duration for which the snapshot is available. You can set maximum 43,800 hours or 1,825 days. You can access the snapshot for the specified time period, after which the snapshot expires and is no longer available in the system.

Table Continued

Expiration time unit	Time unit of the expiration time. The options are:
	• **Hours**
	• **Days**
Retention time	Time duration during which the snapshot is protected against deletion.
Retention time unit	Time unit of the retention time. The options are:
	• **Hours**
	• **Days**
Name of the virtual volume set to which the system adds your created snaps	Name of the virtual volume set to which the system adds the created snapshot. If the virtual volume set does not exist, the system creates the virtual volume set.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Snapshot management** > **Virtual Volume Set(VVSET)** folder, and double-click the **Virtual Volume Set(VVSET)** folder.

4. Select **Create snapshot of Virtual Volume Set** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Create snapshot of Virtual Volume Set**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Create snapshot of Virtual Volume Set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Volume Snapshot Parameters** tab:

   a. In the **Virtual Volume Set** field, enter the name of virtual volume set for which you have to create the snapshot.

   b. In the **Snapshot name pattern** field, enter the name pattern for the snapshot.

   c. In the **Access permissions** field, select appropriate setting.

   d. In the **Expiration time** field, enter the time by which the snapshot expires.

   e. In the **Expiration time unit** field, enter the expiration time unit.

   f. In the **Retention time** field, enter the time period during which deleting the snapshot is disabled.

   g. In the **Retention time unit** field, enter the retention time unit.

   h. In the **Name of the Virtual Volume set** field, enter a name for the virtual volume set.

If the virtual volume set does not exist, the system creates a virtual volume set to save the snapshot.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Restoring snapshot of virtual volume set

Field Descriptions

Table 94: Restore snapshot of Virtual Volume Set

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the snapshot for the virtual volume set is created. You can select the HPE 3PAR StoreServ system from the inventory.
Snapshot Parameters	
Virtual Volume Set	Name of the virtual volume set snapshot to be restored. You can select a virtual volume set snapshot from the virtual volumes sets available in the inventory.
Task priority	Priority of the restoration. The options are: • **Medium** • **High** • **Low**

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Snapshot management** > **Virtual Volume Set(VVS)** folder, and double-click the **Virtual Volume Set(VVS)** folder.

4. Select **Restore snapshot of Virtual Volume Set** and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Restore snapshot of Virtual Volume Set**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Restore snapshot of Virtual Volume Set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Snapshot Parameters** tab:

   a. In the **Virtual Volume Set** field, enter the name of snapshot for the virtual volume set.

   b. In the **Task priority** field, select an appropriate option.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Creating snapshot of virtual volume

Field Descriptions

Table 95: Create snapshot of Virtual Volume

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which we are creating the snapshot. You can select the HPE 3PAR StoreServ system from the inventory.
Snapshot Parameters	
Virtual Volume	Name of the virtual volume for which we are generating the snapshot. You can select a virtual volume from the inventory.
Snapshot name	Name of the snapshot. You can use maximum 31 alphanumeric characters and special characters, such as hyphens, periods, and underscore, to name the snapshot. The names must not start with a hyphen.
Access Permissions	Access permission for the snapshot. The options are: • **Read and Write** — You can modify the snapshot or restore data on a different host. The default setting is read and write. • **Read only** — You cannot modify the snapshot.
Expiration time	Duration for which the snapshot is available. You can set maximum 43,800 hours or 1,825 days. You can access the snapshot for the specified time period, after which the snapshot expires and is no longer available in the system.

Table Continued

Expiration time unit	Time unit of the expiration time.
	The options are:
	• **Hours**
	• **Days**
Retention time	Time duration during which the snapshots are protected against deletion.
Retention time unit	Time unit of the retention time. The options are:
	• **Hours**
	• **Days**

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Snapshot management** > **Virtual Volume(VV)** folder, and double-click the **Virtual Volume(VV)** folder.

4. Select **Create snapshot of Virtual Volume** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Create snapshot of Virtual Volume**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Create snapshot of Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Snapshot Parameters** tab:

   a. In the **Virtual Volume** field, enter the name of virtual volume for which you have to create the snapshot.

      You can select a virtual volume from the inventory.

   b. In the **Snapshot name** field, enter a name for the snapshot.

   c. In the **Access permissions** field, select an appropriate setting.

   d. In the **Expiration time** field, enter the time by which the volume expires.

   e. In the **Expiration time unit** field, enter a unit for the expiration time.

   f. In the **Retention time** field, enter the time period during which deletion of snapshot is disabled.

   g. In the **Retention time unit** field, enter a unit for the retention time.

7. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Creating snapshots of virtual volumes

To create a snapshot of volume group, use the Create snapshot(s) of Virtual Volume(s) workflow.

Field Description

Table 96: Create snapshot(s) of Virtual Volume(s)

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which we are creating the snapshots for the virtual volumes. You can select the HPE 3PAR StoreServ system from the inventory.
Snapshot Parameters	
Virtual Volumes and optional Snapshots name	Name of virtual volumes and corresponding snap names for which snapshots are generated. You can use maximum 31 alphanumeric characters and special characters, such as hyphens, periods, and underscore, to name the volumes and snaps. The names must not start with a hyphen. You can select the virtual volumes from the inventory.
Access Permissions	Access permission for the snapshot. The options are: • **Read and Write** — You can modify the snapshot or restore data on a different host. The default setting is read and write. • **Read only** — You cannot modify the snapshot.
Expiration time	Duration for which the snapshot is available. You can set maximum 43,800 hours or 1,825 days. You can access the snapshot for the specified time period, after which the snapshot expires and is no longer available in the system.
Expiration time unit	Time unit of the expiration time. The options are: • **Hours** • **Days**
Retention time	Time duration during which the snapshots are protected against deletion.

Table Continued

Retention time unit	Time unit of the retention time. The options are: • **Hours** • **Days**
Name of the volume set	Name of the virtual volume set to which the snapshots are added. If you specify the name, the system adds the snapshots to that virtual volume set. If the virtual volume set does not exist, it is created with the specified name.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Snapshot management** > **Virtual Volume(VV)** folder, and double-click the **Virtual Volume(VV)** folder.

4. Select **Create snapshot(s) of Virtual Volume(s)** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Create snapshot(s) of Virtual Volume(s)**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Create snapshot(s) of Virtual Volume(s)** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Snapshot Parameters** tab:

   a. In the **Volume names and optional Snap names** field, enter the names of virtual volumes and snapshots.

   b. In the **Expiration time** field, enter the time by which the snapshots expire.

   c. In the **Access permissions** field, select an appropriate setting.

   d. In the **Expiration time unit** field, enter a unit for the expiration time.

   e. In the **Retention time** field, enter the time period during which deletion of snapshots is disabled.

   f. In the **Retention time unit** field, enter a unit for the retention time.

   g. In the **Name of the volume set** field, enter the name of the virtual volume set in which snapshots for the virtual volumes are created.

   If the virtual volume set does not exist, the system creates a new virtual volume set with the time stamp.

7. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Deleting snapshot of virtual volume

To delete a snapshot of a volume, use the Delete Volume Snapshot workflow.

Field Descriptions

Table 97: Delete snapshot of Virtual Volume

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the snapshot for the virtual volume is created. You can select the HPE 3PAR StoreServ system from the inventory.
Snapshot Parameters	
Snapshot	Name of the snapshot to delete. You can select a snapshot from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Snapshot management** > **Virtual Volume(VV)** folder, and double-click the **Virtual Volume(VV)** folder.

4. Select **Delete snapshot of Virtual Volume** and Perform one of the following:

   - Click the **Start workflow** () icon.

   - Right-click **Delete snapshot of Virtual Volume**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Delete snapshot of Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Snapshot Parameters** tab, enter the snapshot name.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Restoring snapshot of virtual volume

Field Descriptions

Table 98: Restore snapshot of Virtual Volume

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the snapshot for the virtual volume is created. You can select the HPE 3PAR StoreServ system from the inventory.
Snapshot Parameters	
Snapshot	Name of the snapshot to be restored. You can select a snapshot from the inventory.
Task Priority	Priority of the restoration. The options are: • **Medium** • **High** • **Low**

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Snapshot management** > **Virtual Volume(VV)** folder, and double-click the **Virtual Volume(VV)** folder.

4. Select **Restore snapshot of Virtual Volume** and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Restore snapshot of Virtual Volume**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Restore snapshot of Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Snapshot Parameters** tab:

   a. In the **Snapshot** field, enter the name of snapshot for the volume.

   b. In the **Task Priority** field, select an appropriate option.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Querying snapshot

Querying all snapshots by virtual volume

Field Descriptions

Table 99: Get all snapshot(s) by Virtual Volume

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the snapshot for the virtual volume is created. You can select the HPE 3PAR StoreServ system from the inventory.
Snapshot Parameters	
Virtual Volume	Virtual volume name. You can select a virtual volume from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Snapshot** > **Volume** > **Query** folder, and double-click the **Volume** folder.

4. Select **Get all snapshot(s) by Virtual Volume** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Get all snapshot(s) by Virtual Volume**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Get all snapshot(s) by Virtual Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Parameters** tab, enter the virtual volume name.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

VASA management

Creating storage container

Field Descriptions

Table 100: Create Storage Container

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ connection. You can select an HPE 3PAR StoreServ system from the inventory.
Storage Container Parameters	
Storage Container name (VVSet with the same name will be created and then converted to Storage Container)	Name of the storage container to be created.
3PAR Domain in which the Storage Container will be created	3PAR domain in which the storage container will be created.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **VASA management** folder.

4. Select **Create Storage Container** and perform one of the following:

   - Click the **Start workflow** ( ) icon.
   - Right-click **Create Storage Container**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Create Storage Container** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Storage Container Parameters** tab:

   a. In the **Storage Container name** field, enter a name for the storage container.

   b. In the **3PAR Domain in which the Storage Container will be created** field, enter the domain name.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Deleting Storage Container

To delete a storage container from an HPE 3PAR StoreServ array, use the Delete Storage Container workflow.

Field Descriptions

Table 101: Delete Storage Container

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ connection. You can select an HPE 3PAR StoreServ system from the inventory.
Storage Container Parameters	
Storage Container	Name of the storage container (virtual volume set converted to storage container) to be deleted from the array. You can select a storage container from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **VASA management** folder.

4. Select **Delete Storage Container** and perform one of the following:

   - Click the **Start workflow** ( ) icon.
   - Right-click **Delete Storage Container**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Delete Storage Container** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Storage Container Parameters** tab, enter the name of storage container to be deleted.

   You can select a storage container from the inventory.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Migrating Datastore VMs with storage vMotion

To migrate all virtual machines from the selected datastore with storage vMotion, use the Migrate Datastore VMs with storage vMotion workflow.

Field descriptions

Table 102: Migrate Datastore VMs with storage vMotion

Name	Description
Common Parameter	
vCenter Datastore	Name of the vCenter datastore. You can select a datastore from the vCenter inventory.
Datastore to locate	Target datastore to which the VM is migrated.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **VASA management** folder.

4. Select **Migrate Datastore VMs with storage vMotion** and perform one of the following:

   - Click the **Start workflow** () icon.

   - Right-click **Migrate Datastore VMs with storage vMotion**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Migrate Datastore VMs with storage vMotion** window appears.

5. On the **Common Parameter** tab, enter the following details:

   a. **vCenter Datastore**: Name of the vCenter datastore

   b. **Datastore to locate**: Target datastore name

6. Click **Submit**.

Mounting VVOL Datastore

Field descriptions

Table 103: Mount VVOL Datastore

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ connection. You can select an HPE 3PAR StoreServ system from the inventory.
vCenter cluster	Name of the vCenter cluster. You can select a cluster from the inventory.

Table Continued

Mount Parameters	
Storage Container	Name of the storage container.
VVOL Datastore Name	Name of the VVOL datastore.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **VASA management** folder.

4. Select **Mount VVOL Datastore** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Mount VVOL Datastore**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Mount VVOL Datastore** window appears.

5. On the **Connection** tab, do the following:

   a. In the **StoreServ Connection** field, enter the 3PAR StoreServ connection in which the 3PAR virtual volume is configured.

   b. In the **vCenter cluster** field, enter the cluster in which the VVOL datastore is mounted.

6. On the **Mount Parameters** tab:

   a. In the **Storage Container** field, enter the name of the storage container.

   b. In the **VVOL Datastore Name** field, enter the name of the VVOL datastore to be mounted.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Registering VASA Provider

To register StoreServ VASA provider in vCenter, use the Register VASA Provider workflow.

Field descriptions

Table 104: Register VASA Provider

Name	Description
Connection	

Table Continued

StoreServ Connection	Name of the HPE 3PAR StoreServ array in which the host is configured. You can select the HPE 3PAR StoreServ system from the inventory.
Register Parameters	
vCenter	Name of the vCenter connection.
Name	Name of the VASA provider.
User	User name of the VASA provider.
Password	Password of the VASA provider
Certificate (If certificate is not provided the VASA provider certificate will be used)	You can use a self-signed certificate, or a certificate from the 3PAR array is selected.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **VASA management** folder.

4. Select **Register VASA Provider** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Register VASA Provider**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Register VASA Provider** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Register Parameters** tab:

   a. In the**vCenter** field, enter the name of the vCenter connection.

   b. In the **Name** field, enter VASA provider name.

   c. In the **User** field, enter the user name of the VASA provider.

   d. From the **Password** list, enter the password of the VASA provider.

   e. In the **Certificate** field, you can use a self-signed certificate, or a certificate from the 3PAR array is selected.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Starting VASA

To start VASA on the selected HPE 3PAR StoreServ array, use the Start VASA workflow.

Field descriptions

Table 105: Start VASA

Name	Description
Connection	
Storeserv	Name of the HPE 3PAR StoreServ connection. You can select an HPE 3PAR StoreServ system from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

3. Navigate to the **VASA management** folder.

4. Select **Start VASA** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Start VASA**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Start VASA** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. The **VASA Status** field displays the status of VASA as start.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Stopping VASA

To stop VASA on the selected HPE 3PAR StoreServ array, use the Stop VASA workflow.

Field descriptions

Table 106: Stop VASA

Name	Description
Connection	
Storeserv	Name of the HPE 3PAR StoreServ connection. You can select an HPE 3PAR StoreServ system from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.

3. Navigate to the **VASA management** folder.

4. Select **Stop VASA** and perform one of the following:

   - Click the **Start workflow** (▶) icon.

   - Right-click **Stop VASA**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Stop VASA** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. The **VASA Status** field displays the status of VASA as stop.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Unmounting VVOL Datastore

Field Descriptions

Table 107: Unmount VVOL Datastore

Name	Description
Common parameters	
vCenter Datastore	Name of the VVOL datastore. You can select a VVOL datastore from the vCenter inventory.
vCenter Cluster	Name of the cluster. You can select a cluster from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⬒) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **VASA management** folder.

4. Select **Unmount VVOL Datastore** and perform one of the following:

   - Click the **Start workflow** (▶) icon.

   - Right-click **Unmount VVOL Datastore**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Unmount VVOL Datastore** window appears.

5. On the **Common parameters** tab:

   a. In the **vCenter Datastore** field, select the VVol datastore from the inventory.

   b. In the **vCenter Cluster** field, enter the name of the cluster from which the datastore has to be unmounted.

6. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Unregistering VASA Provider

Field descriptions

Table 108: Unregister VASA Provider

Name	Description
Common parameters	
vCenter	Name of the vCenter connection.
Name	Name of the VASA provider.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**. All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **VASA management** folder.

4. Select **Unregister VASA Provider** and perform one of the following:

   • Click the **Start workflow** () icon.

   • Right-click **Unregister VASA Provider**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Unregister VASA Provider** window appears.

5. On the **Common parameters** tab:

   a. In the **vCenter** field, select the vCenter from the inventory

   b. In the **Name** field, enter name of the VASA provider.

6. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Querying VASA

Querying VASA status

Table 109: Get VASA status

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ connection. You can select an HPE 3PAR StoreServ system from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **VASA management** folder.

4. Select **Get VASA status** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Get VASA status**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Get VASA status** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. The **VASA Status** field displays the status of VASA.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Quality of Service (QoS) management

The HPE 3PAR Priority Optimization software provides quality of service rules to manage and control the input/output (I/O) capacity of an HPE 3PAR StoreServ Storage system across multiple workloads.

You can define QoS rules for file system input/output operations per second (IOPS), bandwidth, and latency. You can set a QoS rule for only one target object. The smallest target object to which a QoS rule can be applied is a virtual volume set (VVset).

IOPS is a common performance measurement used to benchmark computer storage. This value indicates the number of host I/O requests that the array receives per second. You must provide this value as a whole number, such as 50,000 IOPS.

Quality of Service (QoS) for system

Creating QoS rule for system

To create a QoS rule for a system, use the Create QoS Rule for system workflow. The system applies this rule to all objects in the system for which no QoS rule is defined.

Field Descriptions

Table 110: Create QoS rule for system

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array. You can select a HPE 3PAR StoreServ system from the inventory.
QoS Target Parameters	
Enable QoS rule for the target	Enable the QoS rule for the system. A QoS rule that is created becomes active immediately. You can use the following options to change the settings: • **Yes** — The system creates the QoS rule and applies to all objects in the system. • **No** — The system creates and saves the rule, but does not apply to the objects in the system.
Priority	Priority of the operations in the system. The options are: • **LOW** • **NORMAL** • **HIGH** Use high priority for critical applications and low priority less critical applications.
IOPS Limits	
IOPS minimum goal	Minimum number of I/O operations that the system must perform in a second. You must set IOPS maximum limit if you set the minimum goal. This setting specifies the minimum number of read and write operations in a second.
IOPS maximum limit	Maximum number of I/O operations that can be run per second. This setting specifies the maximum number of read and write operations that can be performed in a second. You can provide an integer value between 0 and 2^{31-1} depending on the configuration.
I/O minimum goal	Minimum number of I/O operations that the system must perform. If you set: • **1** — The I/O minium goal is zero and is disabled. • **2** — The I/O minimum goal has no limit.

Table Continued

I/O maximum limit	Maximum number of I/O operations that the system can perform. You must set the I/O maximum limit if you set the minimum limit. If you set: • 1 — The I/O maximum limit setting is disabled. • 2 — The I/O maximum limit is enabled, but not set.
Bandwidth Limits	
Bandwidth rate minimum goal in KB/s	Minimum bytes-per-second transfer rate for the system. If bandwidth falls below the minimum goal, the system does not reduce bandwidth for the virtual volumes associated with the policy.
Bandwidth rate maximum limit in KB/s	Maximum bytes-per-second transfer rate for the system. You can set this value as an integer between 0 and 2^{63-1} in KB/second depending on the system configuration.
Bandwidth minimum goal	Minimum bandwidth with which the system must perform. If you set: • 1 — The bandwidth minimum goal setting is disabled. • 2 — The bandwidth minimum goal has no limit.
Bandwidth maximum limit	Maximum bandwidth with which the system can perform. If you set: • 1 — The bandwidth maximum limit setting is disabled. • 2 — The bandwidth maximum limit is enabled, but not set.
Latency	
Default Latency	Selects the default latency. The options are: • **Yes** — Sets the default latency. • **No** — Enables options to provide latency goals in milliseconds and microseconds.
Latency goal in microseconds	Latency goal per microsecond.
Latency goal in milliseconds	Latency goal per millisecond.

NOTE: The 3PAR Priority Optimization software sets the values for IOPS and bandwidth in QoS rules in absolute numbers, not in percentages.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⊞) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Quality of Service management** > **System** folder, and double-click the **System** folder.

4. Select **Create QoS rule for system** and do one of the following:

   • Click the **Start workflow** (▶) icon.

   • Right-click **Create QoS rule for system**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Create QoS rule for system** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **QoS Target Parameters** tab, do the following:

   • In the **Enable QoS rule for the target** field, select an appropriate option.

   • From the **Priority** list, select a priority.

7. On the **IOPS Limits** tab, enter the following settings:

   • **IOPS minimum goal**

   • **IOPS maximum limit**

   • **I/O minimum goal**

   • **I/O maximum limit**

8. On the **Bandwidth Limits** tab, enter the following settings:

   • **Bandwidth rate minimum goal in KB/s**

   • **Bandwidth rate maximum limit in KB/s**

   • **Bandwidth minimum goal**

   • **Bandwidth maximum limit**

9. On the **Latency** tab, enter the following settings:

   • **Default Latency**

   • **Latency goal in microseconds**

   • **Latency goal in milliseconds**

10. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Deleting QoS rule for system

To delete existing rules for a system in the selected HPE 3PAR StoreServ system, use the delete QoS Rule for system workflow. You need not disable a QoS rule to remove an active QoS rule.

Field Descriptions

Table 111: Delete QoS rule for system

Name	Description
Connection	
StoreServ Connection	Name of the 3PAR array from which the QoS rule needs to be deleted. You can select a HPE 3PAR StoreServ system from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Quality of Service management** > **System** folder, and double-click the **System** folder.

4. Select **Delete QoS rule for system** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Delete QoS rule for system**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Delete QoS rule for system** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. Click **Submit**.

Modifying QoS rule for system

Field Descriptions

Table 112: Modify QoS rule for system

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array. You can select a HPE 3PAR StoreServ system from the inventory.
QoS Target Parameters	
Enable QoS rule for the target	Enable the QoS rule for the system. A QoS rule that is created becomes active immediately. You can use the following options to change the settings: • **Yes** — The system creates the QoS rule and applies to all objects in the system. • **No** — The system creates and saves the rule, but does not apply to the objects in the system .

Table Continued

Priority	Priority of the operations in the system. The options are: • **LOW** • **NORMAL** • **HIGH**
IOPS Limits	
IOPS minimum goal	Minimum number of I/O operations that the system must perform in a second. You must set IOPS maximum limit if you set the minimum goal. This setting specifies the minimum number of read and write operations in a second.
IOPS maximum limit	Maximum number of I/O operations that can be run per second. This setting specifies the maximum number of read and write operations that can be performed in a second. You can provide an integer value between 0 and 2^{31-1} depending on the configuration.
I/O minimum goal	Minimum number of I/O operations that the system must perform. If you set: • `1` — The I/O minium goal is zero and is disabled. • `2` — The I/O minimum goal has no limit.
I/O maximum limit	Maximum number of I/O operations that the system can perform. You must set the I/O maximum limit if you set the minimum limit. If you set: • `1` — The I/O maximum limit setting is disabled. • `2` — The I/O maximum limit is enabled, but not set.
Bandwidth Limits	
Bandwidth rate minimum goal in KB/s	Minimum bytes-per-second transfer rate for the system.
Bandwidth rate maximum limit in KB/s	Maximum bytes-per-second transfer rate for the system. You can set this value as an integer between 0 and 2^{63-1} in KB/second depending on the system configuration.
Bandwidth minimum goal	Minimum bandwidth with which the system must perform. If you set: • `1` — The bandwidth minimum goal setting is disabled. • `2` — The bandwidth minimum goal has no limit.
Bandwidth maximum limit	Maximum bandwidth with which the system can perform. If you set: • `1` — The bandwidth maximum limit setting is disabled. • `2` — The bandwidth maximum limit is enabled, but not set.
Latency	

Table Continued

Default Latency	Select default latency.
	The options are:
	• **Yes** — Sets the default latency.
	• **No** — Enables options to provide latency goals in milliseconds and microseconds.
Latency goal in microseconds	Latency goal per microsecond.
Latency goal in milliseconds	Latency goal per millisecond.

NOTE: The 3PAR Priority Optimization software sets the values for IOPS and bandwidth in QoS rules in absolute numbers, not in percentages.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Quality of Service management** > **System** folder, and double-click the **System** folder.

4. Select **Modify QoS rule for system** and perform one of the following:

   • Click the **Start workflow** ( ) icon.
   • Right-click **Modify QoS rule for system**, and click **Start workflow**.
   • Press **Ctrl+R**.

   The **Start Workflow : Modify QoS rule for system** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Qos Target Parameters** tab, change the following settings as required:

   • **Enable QoS rule for the target**
   • **Priority**

7. On the **IOPS Limits** tab, change the following settings as required:

   • **IOPS minimum goal**
   • **IOPS maximum limit**
   • **I/O minimum goal**
   • **I/O maximum limit**

8. On the **Bandwidth Limits** tab, change the following settings as required:

- **Bandwidth rate minimum goal in KB/s**

- **Bandwidth rate maximum limit in KB/s**

- **Bandwidth minimum goal**

- **Bandwidth maximum limit**

9. On the **Latency** tab, change the following settings as required:

   - **Default Latency**

   - **Latency goal in microseconds**

   - **Latency goal in milliseconds**

10. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Quality of Service (QoS) for virtual volume sets

Creating QoS rule for virtual volume set

To create QoS rules for a virtual volume set, use the Create QoS rule for Virtual Volume Set workflow.

Field Descriptions

Table 113: Create QoS rule for Virtual Volume Set

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array in which the virtual volume set is configured. You can select a HPE 3PAR StoreServ system from the inventory.
QoS Target Parameters	
Virtual Volume Set	Name of the virtual volume set.
Enable QoS rule for the target	Enable the QoS rule for the virtual volume set. A QoS rule that is created becomes active immediately. You can use the following options to change the settings: • **Yes** — The system creates the QoS rule and applies to the virtual volume set. • **No** — The system creates and saves the rule, but does not apply to the virtual volume set.

Table Continued

Priority	Priority of the operations in the virtual volume set. The options are: • **LOW** • **NORMAL** • **HIGH** Use high priority for critical applications and lower priority less critical applications.
IOPS Limits	
IOPS minimum goal	Minimum number of I/O operations that the virtual volume set must perform in a second. You must set IOPS maximum limit if you set the minimum goal. This setting specifies the minimum number of read and write operations in a second.
IOPS maximum limit	Maximum number of I/O operations that can be run per second. This setting specifies the maximum number of read and write operations that can be performed in a second.
I/O minimum goal	Minimum number of I/O operations that the virtual volume set must perform. If you set: • `1` — The I/O minium goal setting is disabled. • `2` — The I/O minimum goal has no limit.
I/O maximum limit	Maximum number of I/O operations that the virtual volume set can perform. You must set the I/O maximum limit if you set the minimum limit. If you set: • `1` — The I/O maximum limit setting is disabled. • `2` — The I/O maximum limit is enabled, but not set.
Bandwidth Limits	
Bandwidth rate minimum goal in KB/s	Minimum bytes-per-second transfer rate for the virtual volume set.
Bandwidth rate maximum limit in KB/s	Maximum bytes-per-second transfer rate for the virtual volume set. You can set this value as an integer between 0 and 2^{63-1} in KB/second depending on the system configuration.
Bandwidth minimum goal	Minimum bandwidth with which the virtual volume set must perform. If you set: • `1` — The bandwidth minimum goal setting is disabled. • `2` — The bandwidth minimum goal has no limit.
Bandwidth maximum limit	Maximum bandwidth with which the virtual volume set can perform. If you set: • `1` — The bandwidth maximum limit setting is disabled. • `2` — The bandwidth maximum limit is enabled, but not set.
Latency	

Table Continued

Default Latency	Selects the default latency. The options are: • **Yes** — Sets the default latency. • **No** — Enables options to provide latency goals in milliseconds and microseconds.
Latency goal in microseconds	Latency goal per microsecond.
Latency goal in milliseconds	Latency goal per millisecond.

NOTE: The 3PAR Priority Optimization software sets the values for IOPS and bandwidth in QoS rules in absolute numbers, not in percentages.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

    The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
    All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Quality of Service management** > **Virtual Volume Set (VVSET)** folder, and double-click the **Virtual Volume Set (VVSET)** folder.

4. Select **Create QoS rule for Virtual Volume Set** and perform one of the following:

    • Click the **Start workflow** ( ) icon.

    • Right-click **Create QoS rule for Virtual Volume Set**, and click **Start workflow**.

    • Press **Ctrl+R**.

    The **Start Workflow : Create QoS rule for Virtual Volume Set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Qos Target Parameters** tab, enter the following settings:

    • **Virtual Volume Set**

    • **Enable QoS rule for the target**

    • **Priority**

7. On the **IOPS Limits** tab, enter the following settings:

    • **IOPS minimum goal**

    • **IOPS maximum limit**

- **I/O minimum goal**

- **I/O maximum limit**

8. On the **Bandwidth Limits** tab, enter the following settings:

- **Bandwidth rate minimum goal in KB/s**

- **Bandwidth rate maximum limit in KB/s**

- **Bandwidth minimum goal**

- **Bandwidth maximum limit**

9. On the **Latency** tab, enter the following settings:

- **Default Latency**

- **Latency goal in microseconds**

- **Latency goal in milliseconds**

10. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Deleting QoS rule for virtual volume set

To delete an existing rule for a virtual volume set in a selected HPE 3PAR StoreServ system, use the Delete QoS Rule for Virtual Volume Set workflow. You need not disable a QoS rule to remove an active rule.

Field Descriptions

Table 114: Delete QoS rule for Virtual Volume Set

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array in which the virtual volume set is configured. You can select a HPE 3PAR StoreServ system from the inventory.
QoS Target Parameter	
Virtual Volume Set	Name of the virtual volume set. You can select a virtual volume set from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Quality of Service management** > **Virtual Volume Set (VVSET)** folder, and double-click the **Virtual Volume Set (VVSET)** folder.

4. Select **Delete QoS rule for Virtual Volume Set** and perform one of the following:

- Click the **Start workflow** ( ) icon.
- Right-click **Delete QoS rule for Virtual Volume Set**, and click **Start workflow**.
- Press **Ctrl+R**.

    The **Start Workflow : Create QoS rule for Virtual Volume Set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **QoS Target Parameters** tab, enter the virtual volume set name to delete.

7. Click **Submit**.

Modifying QoS rule for virtual volume set

Field Descriptions

Table 115: Modify QoS rule for Virtual Volume Set

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array in which the virtual volume set is configured. You can select a HPE 3PAR StoreServ system from the inventory.
QoS Target Parameters	
Enable QoS rule for the target	Enable the QoS rule for the virtual volume set. A QoS rule that is created becomes active immediately. You can use the following options to change the settings: • **Yes** — The system creates the QoS rule and applies to the virtual volume set. • **No** — The system creates and saves the rule, but does not apply to the virtual volume set.
Priority	Priority of the operations in the virtual volume set. The options are: • **LOW** • **NORMAL** • **HIGH**
IOPS Limits	
IOPS minimum goal	Minimum number of I/O operations that the virtual volume set must perform in a second. You must set IOPS maximum limit if you set the minimum goal. This setting specifies the minimum number of read and write operations in a second.
IOPS maximum limit	Maximum number of I/O operations that can be run per second. This setting specifies the maximum number of read and write operations that can be performed in a second.

Table Continued

I/O minimum goal	Minimum number of I/O operations that the virtual volume set must perform. If you set: • **1** — The I/O minium goal setting is disabled. • **2** — The I/O minimum goal has no limit.
I/O maximum limit	Maximum number of I/O operations that the virtual volume set can perform. You must set the I/O maximum limit if you set the minimum limit. If you set: • **1** — The I/O maximum limit setting is disabled. • **2** — The I/O maximum limit is enabled, but not set.
Bandwidth Limits	
Bandwidth rate minimum goal in KB/s	Minimum bytes-per-second transfer rate for the virtual volume set.
Bandwidth rate maximum limit in KB/s	Maximum bytes-per-second transfer rate for the virtual volume set. You can set this value as an integer between 0 and 2^{63-1} in KB/second depending on the system configuration.
Bandwidth minimum goal	Minimum bandwidth with which the virtual volume set must perform. If you set: • **1** — The bandwidth minimum goal setting is disabled. • **2** — The bandwidth minimum goal has no limit.
Bandwidth maximum limit	Maximum bandwidth with which the virtual volume set can perform. If you set: • **1** — The bandwidth maximum limit setting is disabled. • **2** — The bandwidth maximum limit is enabled, but not set.
Latency	
Default Latency	Selects the default latency. The options are: • **Yes** — Sets the default latency. • **No** — Enables options to provide latency goals in milliseconds and microseconds.
Latency goal in microseconds	Latency goal per microsecond.
Latency goal in milliseconds	Latency goal per millisecond.

NOTE: The 3PAR Priority Optimization software sets the values for IOPS and bandwidth in QoS rules in absolute numbers, not in percentages.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⊞) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
    All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Quality of Service management** > **Virtual Volume Set (VVSET)** folder, and double-click the **Virtual Volume Set (VVSET)** folder.

4. Select **Modify QoS rule for Virtual Volume Set** and perform one of the following:

    •   Click the **Start workflow** ( ) icon.

    •   Right-click **Modify QoS rule for Virtual Volume Set**, and click **Start workflow**.

    •   Press **Ctrl+R**.

    The **Start Workflow : Modify QoS rule for Virtual Volume Set Set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Qos Target Parameters** tab, change the following settings as required:

    •   **Virtual Volume Set**

    •   **Enable QoS rule for the target**

    •   **Priority**

7. On the **IOPS Limits** tab, change the following settings as required:

    •   **IOPS minimum goal**

    •   **IOPS maximum limit**

    •   **I/O minimum goal**

    •   **I/O maximum limit**

8. On the **Bandwidth Limits** tab, change the following settings as required:

    •   **Bandwidth rate minimum goal in KB/s**

    •   **Bandwidth rate maximum limit in KB/s**

    •   **Bandwidth minimum goal**

    •   **Bandwidth maximum limit**

9. On the **Latency** tab, change the following settings as required:

    •   **Default Latency**

    •   **Latency goal in microseconds**

    •   **Latency goal in milliseconds**

10. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Querying Quality of Service (QoS) rules

Querying all QoS rules

Field Descriptions

Table 116: Get all QoS rules

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array. You can select a HPE 3PAR StoreServ system from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Quality of Service management** > **Query** folder, and double-click the **Query** folder.

4. Select **Get all QoS rules** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Get all QoS rules**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Get all QoS rules** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Querying QoS rules by virtual volume set

Field Descriptions

Table 117: Get QoS rules by Virtual Volume Set

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array in which the virtual volume set is configured. You can select a HPE 3PAR StoreServ system from the inventory.
Qos Target Parameters	
Virtual Volume Set	Name of the specific virtual volume set. You can select a virtual volume set from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Quality of Service management** > **Query** folder, and double-click the **Query** folder.

4. Select **Get QoS rules by Virtual Volume Set** and do one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Get QoS rules by Virtual Volume Set**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Get QoS rules by Virtual Volume Set** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **QoS Target** tab, enter the volume set name.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Querying QoS rules for system

Field Descriptions

Table 118: Get QoS rules for system

Name	Description
Connection	
StoreServ connection	Name of the 3PAR array. You can select a HPE 3PAR StoreServ system from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Quality of Service management** > **Query** folder, and double-click the **Query** folder.

4. Select **Get QoS rules for system** and perform one of the following:

- Click the **Start workflow** ( ) icon.

- Right-click **Get QoS rules for system**, and click **Start workflow**.

- Press **Ctrl+R**.

  The **Start Workflow : Get QoS rules for system** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Datastore management

You can use the datastore management workflows to manage the VMware datastores created from 3PAR volumes.

Metadata management

Metadata management enables to manage the metadata for the datastore.

Creating datastore metadata

To create metadata for datastore, use the Create Datastore Metadata workflow.

Field descriptions

Table 119: Create Datastore Metadata

Name	Description
Create metadata for datastore	
VMFS Datastore	Name of the vCenter datastore. You can select a datastore from the vCenter inventory.
Key	Metadata for the datastore. For example: You can set the metadata **Key** = Project.
Value	Metadata for the datastore. For example: You can set the metadata **Value** = Project1.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Datastore management** > **Metadata management** folder, and double-click the **Metadata management** folder.

4. Select **Create Datastore Metadata** and perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Create Datastore Metadata**, and click **Start workflow**.

- Press **Ctrl+R**.

The **Start Workflow : Create Datastore Metadata** window appears.

5. On the **Create metadata for datastore** tab, enter the following details:

   a. **VMFS Datastore**

   b. **Key**

   c. **Value**

6. Click **Submit**.

Deleting datastore metadata

To delete metadata for a datastore, use the Delete Datastore Metadata workflow.

Field descriptions

Table 120: Delete Datastore Metadata

Name	Description
Delete metadata for datastore	
VMFS Datastore	Name of the vCenter datastore. You can select a datastore from the vCenter inventory.
Key	Metadata for the datastore. For example: Metadata **Key** = Project.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⊞) tab.
   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Datastore management** > **Metadata management** folder, and double-click the **Metadata management** folder.

4. Select **Delete Datastore Metadata**, and perform one of the following:

   - Click the **Start workflow** (▶) icon.

   - Right-click **Delete Datastore Metadata**, and click **Start workflow**.

   - Press **Ctrl+R**.

The **Start Workflow: Delete Datastore Metadata** window appears.

5. On the **Delete metadata for datastore** tab, enter the following details:

   a. **VMFS Datastore**

   b. **Key**

6. Click **Submit**.

   The system removes the selected datastore metadata.

Querying datastore metadata

Field descriptions

Table 121: Get Datastore Metadata

Name	Description
Get metadata for datastore	
VMFS Datastore	Name of the vCenter datastore. You can select a datastore from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Datastore management** > **Metadata management** folder, and double-click the **Metadata management** folder.

4. Select **Get Datastore Metadata** and perform one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Get Datastore Metadata**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Get Datastore Metadata** window appears.

5. On the **Get metadata for datastore** tab, enter the vCenter datastore name in the **VMFS Datastore** field.

   You can select a vCenter datastore from the inventory.

6. Click **Submit**.

Modifying datastore metadata

To modify metadata for a datastore, use the Modify Datastore Metadata workflow.

Field descriptions

Table 122: Modify Datastore Metadata

Name	Description
Modify metadata for datastore	
VMFS Datastore	Name of the vCenter datastore. You can select a datastore from the vCenter inventory.
Key	Metadata for the datastore. For example: Metadata **Key** = Project.
Value	Metadata for the datastore. For example: You can modify the metadata **Value** = Project1 to **Value** = Project2.

NOTE: In a key value pair you can modify only the value, not the key.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Navigate to the **Datastore management** > **Metadata management** folder, and double-click the **Metadata management** folder.

4. Select **Modify Datastore Metadata** and perform one of the following:

   - Click the **Start workflow** ( ) icon.
   - Right-click **Modify Datastore Metadata**, and click **Start workflow**.
   - Press **Ctrl+R**.

   The **Start Workflow : Modify Datastore Metadata** window appears.

5. On the **Modify metadata for datastore** tab, enter the following details:

   a. **VMFS Datastore**

   b. **Key**

   c. **Value**

6. Click **Submit**.

Creating 3PAR datastore

To create a VMFS datastore corresponding to a 3PAR virtual volume, run the Create 3PAR datastore workflow. When you run this workflow, the system queries and verifies the 3PAR hosts in vCenter cluster, creates a virtual volume, exports the virtual volume to the host set, and creates a VMFS datastore. This

composite workflow combines 3PAR StoreServ workflows with vCenter operations and creates a VMFS datastore.

Field descriptions

Table 123: Create 3PAR Datastore

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ connection. You can select an HPE 3PAR StoreServ system from the inventory.
vCenter cluster to provision VMFS Datastore	Name of the cluster. You can select a cluster from the inventory.
Create Datastore Parameters	
New Datastore Name	Name of the datastore. You can use maximum 31 alphanumeric characters including hyphen, and an en dash to name a datastore. The name must start and end with a letter or number.
Enter Datastore Size	The required storage space for the datastore.
Unit	Unit for the storage space. The options are: • **MiB** • **GiB** • **TiB**
Provision Type	The provisioning type.
CPG Name	Name of CPG for the virtual volume. You can select a CPG from the inventory.
Copy CPG	Name of the copy CPG. You can select a copy CPG from the inventory.
Host set	Name of the host group. The host set must contain all the hosts of the cluster. You can select a host set from the inventory.
Protection Parameters	
Enable Protection	Enables to backup or protect the created datastore. The options available are: • **Yes** • **No** The default setting is **No**.
RMC Connection	Name of the RMC instance.
Protection Policy	Name of the RMC protection policy.
Schedule Name	Name of the schedule.

Table Continued

Backup Name	Name of the backup.
Snapshot Name	Name of the snapshot.
Description	Schedule description.
Start Date and Time	Start date and time for the schedule.
End Date	End date for the schedule.
Frequency	Frequency for the schedule.
Recurrence in Minutes	Frequency for the schedule in minutes.
Recurrence in Hours	Frequency for the schedule in hours.
Recurrence in Days	Frequency for the schedule in days.
Weekly frequency recurrence	Weekly frequency for the schedule
Monthly frequency recurrence	Monthly frequency for the schedule
Continue on VM Error	Continue with the creation of a protection schedule even if there are VM errors. The options available are: • **Yes** • **No** The default setting is **No**.

NOTE: The virtual volume and datastore name remains the same.

Prerequisites

• Verify that for each cluster member host, a host entry is present in 3PAR.

• Verify that all cluster member hosts are added to a host set in 3PAR.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Double-click the **Datastore management** folder.

4. Select **Create 3PAR Datastore** and do one of the following:

   • Click the **Start workflow** ( ) icon.

   • Right-click **Create 3PAR Datastore**, and click **Start workflow**.

   • Press **Ctrl+R**.

   The **Start Workflow : Create 3PAR Datastore** window appears.

5. On the **Connection** tab, do the following:

   a. In the **StoreServ Connection** field, enter the 3PAR StoreServ connection in which the 3PAR virtual volume is configured.

   b. In the **vCenter cluster to provision VMFS Datastore** field, enter the cluster in which the VMFS datastore is created.

6. On the **Create Datastore Parameters** tab:

   a. In the **New Datastore Name** field, enter a name for the datastore.

   b. In the **Enter Datastore Size** field, enter the required storage space for the datastore.

   c. From the **Unit** list, select a unit for storage space.

   d. In the **Provision Type** field, enter the provision type for the datastore.

   e. In the **CPG Name** field, enter the CPG for the datastore.

      You can select a CPG from the inventory.

   f. In the **Copy CPG** field, enter the copy CPG for the datastore.

      You can select a copy CPG from the inventory.

   g. In the **Host set** field, enter the host group name.

7. On the **Protection Parameters** tab:

   a. In the **Enable Protection** field, enter the name of the schedule.

   b. You can enable or disable the **Enable Protection** option by selecting **Yes** or **No**. This option allows to backup or protect the created datastore.

      The default setting is **No**.

   c. In the **RMC Connection** field, enter the name of the RMC instance.

      You can select an RMC instance from the inventory.

   d. In the **Protection Policy** field, enter the name of the RMC protection policy.

      You can select an RMC protection policy from the inventory.

   e. In the **Schedule Name** field, enter the name of the schedule.

   f. In the **Backup Name** field, enter the name of the backup storage system.

   g. In the **Snapshot Name** field, enter the name of the snapshot.

   h. In the **Description** field, enter the description for the schedule.

   i. In the **Start Date and Time** field, enter the start date and time of the schedule using the calender.

   j. In the **End Date** field, enter the start date and time of the schedule using the calender.

   k. In the **Frequency** field, enter the frequency value for the schedule.

   l. In the **Recurrence in Minutes** field, enter the frequency of the schedule in number of minutes.

   m. In the **Recurrence in Hours** field, enter the frequency of the schedule in number of hours.

   n. In the **Recurrence in Days** field, enter the frequency of the schedule in number of days.

o. In the **Weekly frequency recurrence** field, enter the frequency of the schedule in number of weeks.

p. In the **Monthly frequency recurrence** field, enter the frequency of the schedule in number of months.

q. You can enable or disable the **Continue on VM error** option by selecting **Yes** or **No**. This option allows you to continue creating a protection schedule even with the VM errors.

The default setting is **No**.

8. Click **Submit**.

You can use **Next** or **Previous** to navigate through the tabs.

Creating 3PAR snapshot for datastore

To create a snapshot for the VMFS datastore, use the Create 3PAR snapshot for datastore workflow.

Field descriptions

Table 124: Create 3PAR snapshot for Datastore

Name	Description
Create Snapshot for datastore	
VMFS Datastore	Name of the datastore for which snapshot needs to be created. You can select a datastore from the inventory.
Snapshot name	Name of the snapshot. You can use maximum 31 alphanumeric characters including hyphen, period, and underscore. The name must not start with a hyphen.
snapCPG	Name of CPG for the snapshot. SnapCPG is set only if it is not set previously, otherwise this field is ignored. You can select a CPG from the inventory.

NOTE: The snapshot of the datastore creates a snapshot of the underlying 3PAR virtual volume.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⊞) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
All workflow options available in HPE 3PAR StoreServ appear.

3. Double-click the **Datastore management** folder.

4. Select **Create 3PAR snapshot for Datastore** and do one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Create 3PAR snapshot for Datastore**, and click **Start workflow**.

- Press **Ctrl+R**.

The **Start Workflow : Create 3PAR snapshot for Datastore** window appears.

5. On the **Create Snapshot for Datastore** tab, do the following:

   a. In the **VMFS Datastore** field, enter the datastore name for which snapshot needs to be created.

   b. In the **Snapshot name** field, enter a name for the snapshot.

   c. In the **snapCPG** field, enter the name of CPG for the snapshot.

6. Click **Submit**.

Deleting 3PAR datastore

To delete a datastore from vCenter cluster, use the Delete 3PAR datastore workflow. When you delete a datastore from the cluster, the system deletes the associated 3PAR virtual volume and the snapshot virtual volumes. However, the host set is not deleted.

Field description

Table 125: Delete 3PAR Datastore

Name	Description
vCenter Datastore	Name of the datastore to delete from the inventory. You can select a datastore from the inventory.

NOTE: You might have to delete the virtual machines on the specified datastore manually as they are displayed as inactive.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (▦) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Double-click the **Datastore management** folder.

4. Select **Delete 3PAR Datastore** and do one of the following:

   - Click the **Start workflow** (▶) icon.

   - Right-click **Delete 3PAR Datastore**, and click **Start workflow**.

   - Press **Ctrl+R**.

The **Start Workflow : Delete 3PAR Datastore** window appears.

5. In the **vCenter Datastore** field, enter the name of the datastore to delete from the inventory.

6. Click **Submit**.

Expanding VMFS datastore

To add additional storage space to the datastore, use the Expand VMFS datastore workflow.

Field descriptions

Table 126: Expand VMFS Datastore

Name	Description
Choose a host	
Datastore on which the VMFS will be expanded	Name of the datastore for the virtual volume. You can select a datastore from the inventory.
Expand datastore by	Additional storage required for the datastore.
Size Unit	Unit for the storage space. The options are: • **MiB** • **GiB** • **TiB**

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** () tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
All workflow options available in HPE 3PAR StoreServ appear.

3. Double-click the **Datastore management** folder.

4. Select **Expand VMFS Datastore** and perform one of the following:

• Click the **Start workflow** () icon.

• Right-click **Expand VMFS Datastore**, and click **Start workflow**.

• Press **Ctrl+R**.

The **Start Workflow : Expand VMFS Datastore** window appears.

5. On the **Choose a host** tab, do the following:

a. In the **Datastore on which the VMFS will be expanded** field, select the datastore for the virtual volume.

b. In the **Expand datastore by** field, enter the additional storage space required for the virtual volume.

c. In the **Size Unit** field, select the unit for the storage space.

6. Click **Submit**.

Mounting VMFS datastore from volume

To export and mount a 3PAR volume on a specified VMware cluster as a datastore, use the Mount VMFS datastore from volume workflow. The 3PAR volume can be mounted as a datastore only if the virtual volume has the supported VMware file system.

Field descriptions

Table 127: Mount VMFS Datastore from Volume

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ connection in which the 3PAR virtual volume is configured. You can select an HPE 3PAR StoreServ system from the inventory.
Mount Parameters	
vCenter cluster to mount the Volume	Cluster name to which the virtual volume is exported and mounted. You can select a cluster from the inventory.
Volume	Name of the virtual volume to mount. You can select a virtual volume from the inventory.
Host set	Name of the host group. You can select a host set from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** (⊞) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Double-click the **Datastore management** folder.

4. Select **Mount VMFS Datastore from Volume** and perform one of the following:

- Click the **Start workflow** (▶) icon.

- Right-click **Mount VMFS Datastore from Volume**, and click **Start workflow**.

- Press **Ctrl+R**.

The **Start Workflow : Mount VMFS Datastore from Volume** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Mount parameters** tab, perform the following:

   a. In the **vCenter cluster to mount the Volume** field, enter the cluster name to which the virtual volume is exported and mounted.

   b. In the **Volume** field, enter the name of the virtual volume to mount.

   c. In the **Host set** field, enter the host group name.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Mounting VMFS datastore from snapshot

To export and mount a snapshot of a datastore on a specified VMware cluster, use the Mount VMFS datastore from snapshot workflow.

Field descriptions

Table 128: Mount VMFS Datastore from snapshot

Name	Description
Connection	
StoreServ Connection	Name of the HPE 3PAR StoreServ connection in which the 3PAR virtual volume is configured. You can select an HPE 3PAR StoreServ system from the inventory.
Mount Parameters	
vCenter cluster to mount Snapshot	Cluster name to which the snapshot is exported and mounted. You can select a cluster from the inventory.
Snapshot	Name of the snapshot to mount. You can select a snapshot from the inventory.
Host set	Name of the host group. The host set must contain all the hosts of the cluster. You can select a host set from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
    All workflow options available in HPE 3PAR StoreServ appear.

3. Double-click the **Datastore management** folder.

4. Select **Mount VMFS Datastore from snapshot** and perform one of the following:

    *   Click the **Start workflow** () icon.

    *   Right-click **Mount VMFS Datastore from snapshot**, and click **Start workflow**.

    *   Press **Ctrl+R**.

    The **Start Workflow : Mount VMFS Datastore from snapshot** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Mount parameters** tab, perform the following:

    a. In the **vCenter cluster to mount Snapshot** field, enter the cluster name to which the snapshot has to be exported and mounted.

    b. In the **Snapshot** field, enter the name of the snapshot to mount.

    c. In the **Host set** field, enter the host group name.

7. Click **Submit**.

    You can use **Next** or **Previous** to navigate through the tabs.

Restoring VMFS datastore from snapshot

To restore a datastore from its snapshot, use the Restore VMFS Datastore from snapshot workflow.

Field descriptions

Table 129: Restore VMFS Datastore from snapshot

Name	Description
Common parameters	
VMFS datastore to restore	Name of the datastore to restore from the snapshot. You can select a datastore from the inventory.
Snapshot	Name the name of the snapshot. You can select a snapshot from the inventory.

Table Continued

Task Priority	Priority of the restoration. The options are:
	• **Medium**
	• **High**
	• **Low**
	You must select a priority when the restoration starts.
Take snapshot before restore, the snapshot will have a retention time of 24 hours.	Select **Yes** to take snapshot before restore, else select **No**.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

    The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
    All workflow options available in HPE 3PAR StoreServ appear.

3. Double-click the **Datastore management** folder.

4. Select **Restore VMFS Datastore from snapshot** and Perform one of the following:

    • Click the **Start workflow** ( ) icon.

    • Right-click **Restore VMFS Datastore from snapshot**, and click **Start workflow**.

    • Press **Ctrl+R**.

    The **Start Workflow : Restore VMFS Datastore from snapshot** window appears.

5. On the **Common parameters** tab, do the following:

    a. In the **VMFS datastore to restore** field, enter the name of the datastore to restore from the snapshot.

    b. In the **Snapshot** field, enter the name of the snapshot.

    c. From the **Task Priority** list, select a priority for the task.

    d. Click **Yes** for the **Take snapshot before restore, the snapshot will have a retention time of 24 hours.** field

6. Click **Submit**.

Unmounting 3PAR datastore

To unmount the datastore and unexport the underlying 3PAR volume from the hosts in the cluster, use the Unmount 3PAR datastore workflow.

Field descriptions

Table 130: Unmount 3PAR Datastore

Name	Description
Unmount Datastore	
Datastore	Name of the vCenter datastore. You can select a datastore from the inventory.

Procedure

1. On the **VMware vRealize Orchestrator** home page, click the **Workflows** ( ) tab.

   The folders available in the library appear.

2. Navigate to the **HPE Storage** > **3PAR StoreServ** folder and double-click **3PAR StoreServ**.
   All workflow options available in HPE 3PAR StoreServ appear.

3. Double-click the **Datastore management** folder.

4. Select **Unmount 3PAR Datastore** and perform one of the following:

   - Click the **Start workflow** ( ) icon.

   - Right-click **Unmount 3PAR Datastore**, and click **Start workflow**.

   - Press **Ctrl+R**.

   The **Start Workflow : Unmount 3PAR Datastore** window appears.

5. On the **Connection** tab, select the HPE 3PAR StoreServ array from the inventory.

6. On the **Unmount Datastore** tab, perform the following:

   a. In the **Datastore** field, enter the name of the vCenter datastore.

7. Click **Submit**.

   You can use **Next** or **Previous** to navigate through the tabs.

Troubleshooting

Unavailability of HPE 3PAR plugin for vRO in the UI

Symptom

The workflows in HPE 3PAR plugin for vRO are not available in the vRO client user interface even after successful installation of the 3PAR plugin.

Action

1. After you log in to VMware vRealize Orchestrator click **Orchestrator Control Center**.

2. Select the **Startup Options** in the **Manage** menu and click **RESTART**.

Unavailability of StoreServ connection in the vRO inventory

Symptom

Even after the successful execution of **Add 3PAR Connection** workflow the corresponding StoreServ connection is not available in the vRO inventory.

Action

1. Go to the **Inventory** tab of the vRO client user interface.

2. Right click on the HPE 3PAR StoreServ object and click **Reload**.

Unavailability of virtual volume, host, snapshot, and CPGs in the vRO inventory

Symptom

The inventory items such as virtual volumes, hosts, snapshots, and CPGs which are created on the array using applications such as SSMC, 3PAR CLI are not available in the vRO inventory.

Action

1. Refresh the cache.

   HPE 3PAR plugin for vRO maintains a cache of inventory objects from the 3PAR array. This cache is refreshed at a regular interval of 15 minutes. Thus items created using other applications are available after the next cache refresh and not immediately.

2. Restart of the orchestrator server service if refreshing the cache does not work.

Delay in expanding virtual volume tree in the vRO inventory

Symptom

The 3PAR plug in has a delay in displaying the volumes under the virtual volume tree in the vRO inventory.

Cause

The time required to list the volumes (or any other inventory objects) depends on the number of volumes in the array. For an array with 30,000 volumes this delay can be as high as 6 minutes.

Support and other resources

Support

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.

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:

http://www.hpe.com/support/selfrepair

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 for your product or to view the *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products* reference document, go to the Enterprise Safety and Compliance website:

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

Additional warranty information
HPE ProLiant and x86 Servers and Options
    www.hpe.com/support/ProLiantServers-Warranties
HPE Enterprise 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.

Other resources

HPE 3PAR documentation

For information about:	See:
Supported hardware and software platforms	The Single Point of Connectivity Knowledge for HPE Storage Products (SPOCK) website: **http://www.hpe.com/storage/spock**
Locating 3PAR documents	The HPE 3PAR StoreServ Storage site: **http://www.hpe.com/info/3par** To access 3PAR documents, click the **Support** link for your product.

Table Continued

For information about:	See:
HPE 3PAR storage system software	
Storage concepts and terminology	HPE 3PAR StoreServ Storage Concepts Guide
Using the HPE 3PAR Management Console (GUI) to configure and administer 3PAR storage systems	HPE 3PAR Management Console User's Guide
Using the HPE 3PAR CLI to configure and administer storage systems	HPE 3PAR Command Line Interface Administrator's Manual
CLI commands	HPE 3PAR Command Line Interface Reference
Analyzing system performance	HPE 3PAR System Reporter Software User's Guide
Installing and maintaining the Host Explorer agent in order to manage host configuration and connectivity information	HPE 3PAR Host Explorer User's Guide
Creating applications compliant with the Common Information Model (CIM) to manage 3PAR storage systems	HPE 3PAR CIM API Programming Reference
Migrating data from one 3PAR storage system to another	3PAR-to-3PAR Storage Peer Motion Guide
Configuring the Secure Service Custodian server in order to monitor and control 3PAR storage systems	HPE 3PAR Secure Service Custodian Configuration Utility Reference
Using the CLI to configure and manage HPE 3PAR Remote Copy	HPE 3PAR Remote Copy Software User's Guide
Updating 3PAR operating systems	HPE 3PAR Upgrade Pre-Planning Guide
Identifying storage system components, troubleshooting information, and detailed alert information	HPE 3PAR F-Class, T-Class, and StoreServ 10000 Storage Troubleshooting Guide
Installing, configuring, and maintaining the HPE 3PAR Policy Server	HPE 3PAR Policy Server Installation and Setup Guide
	HPE 3PAR Policy Server Administration Guide
Planning for HPE 3PAR storage system setup	
Hardware specifications, installation considerations, power requirements, networking options, and cabling information for 3PAR storage systems	

Table Continued

For information about:	See:
HPE 3PAR 7200, 7400, 7450, and 8000 storage systems	HPE 3PAR StoreServ 7000 Storage Site Planning Manual
	HPE 3PAR StoreServ 7450 Storage Site Planning Manual
	HPE 3PAR StoreServ 8000 Storage Site Planning Manual
HPE 3PAR 10000 and 20000 storage systems	HPE 3PAR StoreServ 10000 Storage Physical Planning Manual
	HPE 3PAR StoreServ 10000 Storage Third-Party Rack Physical Planning Manual
	HPE 3PAR Storeserv 20000 Storage Site Planning Manual
Installing and maintaining HPE 3PAR 7200, 7400, and 7450 storage systems	
Installing 7200, 7400, and 7450 storage systems and initializing the Service Processor	HPE 3PAR StoreServ 7000 Storage Installation Guide
	HPE 3PAR StoreServ 7450 Storage Installation Guide
	HPE 3PAR StoreServ 7000 Storage SmartStart Software User's Guide
Maintaining, servicing, and upgrading 7200, 7400, and 7450 storage systems	HPE 3PAR StoreServ 7000 Storage Service Guide
	HPE 3PAR StoreServ 7450 Storage Service Guide
Troubleshooting 7200, 7400, and 7450 storage systems	HPE 3PAR StoreServ 7000 Storage Troubleshooting Guide
	HPE 3PAR StoreServ 7450 Storage Troubleshooting Guide
Maintaining the Service Processor	HPE 3PAR Service Processor Software User Guide
	HPE 3PAR Service Processor Onsite Customer Care (SPOCC) User's Guide
HPE 3PAR host application solutions	
Backing up Oracle databases and using backups for disaster recovery	HPE 3PAR Recovery Manager Software for Oracle User's Guide
Backing up Exchange databases and using backups for disaster recovery	HPE 3PAR Recovery Manager Software for Microsoft Exchange 2007 and 2010 User's Guide

Table Continued

For information about:	See:
Backing up SQL databases and using backups for disaster recovery	HPE 3PAR Recovery Manager Software for Microsoft SQL Server User's Guide
Backing up VMware databases and using backups for disaster recovery	HPE 3PAR Management Plug-in and Recovery Manager Software for VMware vSphere User's Guide
Installing and using the HPE 3PAR VSS (Volume Shadow Copy Service) Provider software for Microsoft Windows	HPE 3PAR VSS Provider Software for Microsoft Windows User's Guide
Best practices for setting up the Storage Replication Adapter for VMware vCenter	HPE 3PAR Storage Replication Adapter for VMware vCenter Site Recovery Manager Implementation Guide
Troubleshooting the Storage Replication Adapter for VMware vCenter Site Recovery Manager	HPE 3PAR Storage Replication Adapter for VMware vCenter Site Recovery Manager Troubleshooting Guide
Installing and using vSphere Storage APIs for Array Integration (VAAI) plug-in software for VMware vSphere	HPE 3PAR VAAI Plug-in Software for VMware vSphere User's Guide

VMware vRealize Orchestrator documentation

For more information on VMware vRealize Orchestrator, see the following documents at **vRealize Orchestrator documentation**:

- Installing and Configuring VMware vRealize Orchestrator

- Using the VMware vRealize Orchestrator Client

- Using VMware vRealize Orchestrator Plug-Ins

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
VMware sites
    https://www.vmware.com/support/pubs/vrealize-operations-manager-pubs.html
    https://docs.vmware.com/en/vRealize-Orchestrator/index.html