

vRO Plug-in for Dell EMC PowerMax 1.2.4

Product Guide

1.2.4

Notes, cautions, and warnings

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

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

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

Introduction

This chapter includes the following topics:

Topics:

- [About this Document](#)
- [Product Overview](#)

About this Document

This document provides information about the vRO Plugin for Dell EMC PowerMax. It provides instructions to deploy the plugin and also provides the workflow list.

Audience

This solution is designed for VMware, storage, automation, and other types of administrators who use vRealize Orchestrator to manage and automate Dell EMC storage.

Product Overview

The vRO Plug-in for Dell EMC PowerMax is a plug-in for VMware vRealize Orchestrator. It enables administrators to provide automation capabilities for Dell EMC VMAX All Flash and PowerMax storage arrays within vRO. It helps automate the operations that are required for provisioning and protection. You can also schedule and customize workflows.

The vRO Plug-in for Dell EMC PowerMax delivers low-level and VMware-integrated workflows that enable automation of storage provisioning operations on Dell EMC PowerMax and VMAX All Flash arrays. Use the workflows as is or copy and customize them to meet your automation needs:

- Low-Level Workflows:
 - PowerMax Host Operations
 - PowerMax Volume Operations
 - PowerMax Snapshot Operations
 - PowerMax Storage Group Operations
 - PowerMax SRDF Operations
- VMware-Integrated Workflows:
 - ESXi Host and Cluster Operations
 - VMFS Datastore Operations
 - RDM Operations
- Actions
- Inventory

Dell EMC Storage System Requirements

Learn about Dell EMC storage systems that are supported and related system requirements.

The Dell EMC [Simple Support Matrix](#) provides the supported storage system version numbers for this release. To obtain the required software, contact Dell EMC Customer Support.

Deploy the vRO Plug-in for Dell EMC PowerMax

This chapter includes the following topics:

Topics:

- [Deploy the vRO Plug-in for Dell EMC PowerMax](#)
- [Configure Dell EMC PowerMax Plug-in](#)
- [Configure vCenter](#)

Deploy the vRO Plug-in for Dell EMC PowerMax

This section provides instructions on how to deploy the vRO Plug-in for Dell EMC PowerMax.

Prerequisites

Before you deploy the plug-in, install the vRO server. To install the vRO server, see VMware documentation at www.vmware.com.

The required environment and system requirements are listed on the Dell EMC [Simple Support Matrix](#).

You must have administrator privileges to deploy the plug-in.

NOTE: Before you begin this procedure, you must delete any existing version of the vRO plug-in that you have installed. To delete an existing plug-in, perform the steps that are described in the [Delete or Update vRO Plug-in for Dell EMC PowerMax](#) section of this document.

About this task

The memory and CPU utilization of the plug-in have been characterized and it has been determined that none of the workflows or actions result in significant usage of these resources.

Steps

1. Download the latest VMOAPP from the Dell EMC [Support Site](#).
2. Log in to the VMware vRO server: `https://<vRO_FQDN>/vco`
The **VCO** page is displayed.
3. Click **START THE CONTROL CENTER** under Control Center.
Log in to the control center configuration with username and password. The control center page is displayed.
4. Click **Plug-Ins > Manage Plug-Ins**.
The **Manage Plug-Ins** page is displayed.
5. Click **BROWSE**. Select the latest vRO plug-in that you downloaded to upload the file to the vRO server.
6. Click **UPLOAD** to install the plug-in to the vRO server. Accept the EULA.
7. Click **INSTALL** to install the plug-in.
The Dell EMC PowerMax plug-in is now installed and displayed in the **Plug-In** tab.
8. On the **VCO** page, click **START THE ORCHESTRATOR CLIENT** to open the vRO client.
9. Log in to the vRO client `https://<vRO_FQDN>/orchestration-ui`.
The vRO client opens. The **Dell EMC PowerMax** folder is listed in the **Library** folder. The **Dell EMC PowerMax** folder provides a list of workflows that you can run.

Configure Dell EMC PowerMax Plug-in

This topic describes the procedure to configure the Dell EMC PowerMax plug-in.

To configure the plug-in, you need to run the following workflows:

- Add Storage Management Server
- Register Storage Systems

To view the management servers and/or registered arrays, run the following workflows:

- List all Storage Management Servers
- Get Registered PowerMax Arrays

Log in to the **vRO client** with **username** and **password**. Click the **Workflows** icon on the left panel and perform the following workflows:

Add Storage Management Server

This topic describes how to add the storage management server instance to the vRO server.

Steps

1. Log in to the vRealize Orchestrator client.
2. From the left navigation pane, select the **Workflows** object page.
3. From the top-right, select the tree view icon and navigate to **Workflows > Library > Dell EMC PowerMax**.
4. Select **Plugin Settings > Add Storage Management Server** and click **Run** to display the **Add Storage Management Server** workflow. The **Add Storage Management Server** page is displayed.
5. Enter the values for the following fields:
 - **Unique user friendly name**
 - **Type of the storage management server**
 - **Host name (FQDN or IP address) of the storage management server (Unisphere)**
 - **Port number**
 - **User name**
 - **Password**
 - **Time to wait in seconds until cluster REST server responds**

Select **Yes** to add the storage management server instance certificate to the trusted store.

Select **No** if the certificate is already added to the trusted store.

6. Click **Run**.
If the details entered are correct and the Unisphere is running ok, the workflow runs successfully.

Register Storage Systems

This topic describes how to run the workflow to register storage systems from the vRealize Orchestrator Client.

Steps

1. Log in to the vRealize Orchestrator client.
2. From the left navigation pane, select the **Workflows** object page.
3. From the top-right, select the tree view icon and navigate to **Workflows > Library > Dell EMC PowerMax**.
4. Select **Plugin Settings > Register Storage Systems** and click **Run** to display the **Register Storage Systems** workflow. The **Register Storage Systems** page is displayed.
5. In the wizard, click **Storage Management Server**, select one of the entries that are returned in the list to set as the storage management server.
6. Click **+** to open search box for **Storage systems to be registered**. Enter the string partially for the control to list the values. Select the required value and click **Apply**.
Select the storage systems to be registered by checking the checkboxes.

7. Click **Run**.

List all Storage Management Servers

This topic describes how to list all the registered storage management servers in the vRO Client.

Prerequisites

Storage systems must be registered in the vRO server.

Steps

1. Log in to the vRealize Orchestrator client.
2. From the left navigation pane, select the **Workflows** object page.
3. From the top-right, select the tree view icon and navigate to **Workflows > Library > Dell EMC PowerMax**.
4. Select **Plugin Settings > List all Storage Management Servers** and click **Run** to display the **List all Storage Management Servers** workflow. The **List all Storage Management Servers** page is displayed.
5. Click **Run**.

Get Registered PowerMax Arrays

This topic describes how to get registered PowerMax arrays from the vRealize Orchestrator Client.

Steps

1. Log in to the vRealize Orchestrator client.
2. From the left navigation pane, select the **Workflows** object page.
3. From the top-right, select the tree view icon and navigate to **Workflows > Library > Dell EMC PowerMax**.
4. Select **PowerMax Discovery > Get Registered PowerMax Arrays**.
The **Get Registered PowerMax Arrays** page is displayed.
5. In the wizard, select the value for management server instance and click **Run**.

Configure vCenter

This topic describes how to configure the vCenter in the vRO Client.

Prerequisites

Some of the workflows that are offered by the vRO Plug-in for Dell EMC PowerMax function only if one or more vCenter instances are registered with the vRO server.

Steps

1. Log in to the vRealize Orchestrator client.
2. From the left navigation pane, select the **Workflows** object page.
3. From the top-right, select the tree view icon and navigate to **Workflows > Library > vCenter**.
4. Select **Configuration > Add a vCenter Server instance** and click **Run** to display the workflow.
5. On the **Set the vCenter Server instance properties** screen, enter the values for the fields.
6. On the **Set the connection properties** screen, enter the values for the fields.
7. On the **Additional Endpoints** screen, enter the values for the fields and click **Run**.
The workflow runs successfully and the vCenter Server instance is displayed in the **Inventory** tab.

Workflows

This chapter includes the following topics:

Topics:

- [List of Workflows](#)

List of Workflows

This topic provides the list of workflows in Dell EMC PowerMax that you can run in the vRO client.

Plugin Settings

The following are the workflows for **Plugin Settings**:

- **Add Storage Management Server**
- **List all Storage Management Servers**
- **List Registered Storage Systems**
- **List Unregistered Storage Systems**
- **Register Storage Systems**
- **Remove Storage Management Server**
- **Unregister Storage Systems**
- **Update Storage Management Server**

PowerMax Discovery

The following are the workflows for **PowerMax Discovery**:

- **Get Host**
- **Get Host Group**
- **Get Host Groups (Bulk)**
- **Get Hosts (Bulk)**
- **Get Initiator Alias**
- **Get Masking View**
- **Get Masking Views (Bulk)**
- **Get Port Group**
- **Get Port Groups (Bulk)**
- **Get RDF Group**
- **Get RDF Groups (Bulk)**
- **Get RDF Pairs (Bulk)**
- **Get Registered PowerMax Arrays**
- **Get Storage Group**
- **Get Storage Group RDF Groups (Bulk)**
- **Get Storage Group RDF Pairs (Bulk)**
- **Get Storage Groups (Bulk)**
- **Get Storage Group Snapshot**
- **Get Storage Group Snapshot Generation**
- **Get Storage Group Snapshot Generations (Bulk)**
- **Get Storage Group Snapshots (Bulk)**
- **Get Volume**

- **Get Volumes In Storage Group (Bulk)**
- **List Host Groups**
- **List Hosts**
- **List Initiators for Array**
- **List Masking Views**
- **List Port Groups**
- **List Ports for Array**
- **List RDF Groups**
- **List Storage Groups**
- **List Storage Group Snapshot Generations**
- **List Storage Group Snapshots**
- **List Volumes**

PowerMax Host Operations

The following are the workflows for **PowerMax Host Operations**:

- **Create Host**
- **Create Host Group**
- **Create Masking View**
- **Create Port Group**
- **Delete Host**
- **Delete Host Group**
- **Delete Masking View**
- **Delete Port Group**
- **Modify Host**
- **Modify Host Group**
- **Modify Initiator Alias**
- **Modify Masking View**
- **Modify Port Group**

PowerMax Provisioning

The following are the workflows for **PowerMax Provisioning**:

- **Host Provisioning**
 - **Provision Volumes to Host**
 - **Provision Volumes to Host Group**
 - **Remove Host Access to Volumes**
 - **Remove Host Group Access to Volumes**
- **VMware Provisioning**
 - **Add datastore on iSCSI/FC/local SCSI**
 - **Add New ESXi Host to ESXi Cluster**
 - **Add RDM Volume to VM**
 - **Create Host for ESXi Host**
 - **Create Host Group For ESXi Cluster**
 - **Create Snapshot for VMFS Datastore**
 - **Create VMFS Datastore for ESXi Cluster [Deprecated]**
 - **Create VMFS Datastore for ESXi Host [Deprecated]**
 - **Create Volume and Add RDM Volume to VM**
 - **Delete RDM Device and PowerMax Volume**
 - **Delete VMFS Datastore and PowerMax Volume**
 - **Delete VMFS Datastore Snapshot**
 - **Expand VMFS Datastore with PowerMax Volume**
 - **Link VMFS Datastore Snapshot to a New Volume**
 - **Mount Volume as Datastore on an ESXi host**

- **Provision VMFS Datastores to ESXi Cluster**
- **Provision VMFS Datastores to ESXi Host**
- **Relink VMFS Datastore Snapshot**
- **Remove ESXi Host from ESXi Cluster**

PowerMax Snapshot Operations

The following are the workflows for **PowerMax Snapshot Operations**:

- **Create Storage Group Snapshot**
- **Delete Storage Group Snapshot**
- **Link Storage Group Snapshot**
- **Relink Storage Group Snapshot**
- **Rename Storage Group Snapshot**
- **Restore Storage Group Snapshot**
- **Unlink Storage Group Snapshot**

PowerMax SRDF Operations

The following are the workflows for **PowerMax SRDF Operations**:

- **Create SRDF Pairs**
- **Create Storage Group SRDF Protection**
- **Delete SRDF Pair**
- **Establish SRDF Protection**
- **Failback SRDF Protection**
- **Failover SRDF Protection**
- **Move SRDF Pairs**
- **Remove SRDF Protection**
- **Restore SRDF Protection**
- **Resume SRDF Protection**
- **Set Bias SRDF Protection**
- **Set Mode SRDF Protection**
- **Split SRDF Protection**
- **Suspend SRDF Protection**
- **Swap SRDF Protection**

PowerMax Storage Group Operations

The following are the workflows for **PowerMax Storage Group Operations**:

- **Add Child Storage Groups**
- **Create Storage Group**
- **Delete Storage Group**
- **Modify Storage Group**
- **Modify Storage Group SL Settings**
- **Remove Child Storage Groups**

PowerMax Volume Operations

The following are the workflows for **PowerMax Volume Operations**:

- **Create Volumes**
- **Delete Volume**
- **Expand Volume**
- **Modify Volume**

Sample Workflows

This topic includes procedure to run the workflows on vRealize Orchestrator Client with sample workflows.

vCenter and storage management instances must be configured on the vRO server before you invoke any of the PowerMax Plugin workflows.

Topics:

- [Create Host](#)
- [Provision VMFS Datastores to ESXi Host](#)

Create Host

This topic describes how to run the workflow to create host on vRealize Orchestrator Client.

Steps

1. Log in to the vRealize Orchestrator client.
2. From the left navigation pane, select the **Workflows** object page.
3. From the top-right, select the tree view icon and navigate to **Workflows > Library > Dell EMC PowerMax**.
4. Select **PowerMax Host Operations > Create Host** and click **Run** to display the **Create Host** workflow.
5. On the **Host Information** screen, select the values.
6. On the **Host Flags** screen, select the values from the drop-down to set the PowerMax host flags.
7. Click **Run**.

Provision VMFS Datastores to ESXi Host

This topic describes how to run the workflow to provision VMFS datastores to ESXi host on vRealize Orchestrator Client.

Steps

1. Log in to the vRealize Orchestrator client.
2. From the left navigation pane, select the **Workflows** object page.
3. From the top-right, select the tree view icon and navigate to **Workflows > Library > Dell EMC PowerMax**.
4. Select **PowerMax Provisioning > VMware provisioning > Provision VMFS Datastores to ESXi Host** and click **Run** to display the **Provision VMFS Datastores to ESXi Host** workflow.
5. On the **Datastore** screen, select or enter the values for the following fields:
 - ESXi host
 - Datastore name
 - VMFS version
6. On the **PowerMax Host** screen, select the values for the following fields:
 - PowerMax array
 - Select Yes if the host is new, else select No.
 - Existing host on the array
7. On the **Masking View** screen, select Yes if the masking view is new, else select No.
8. On the **Storage Group** screen, select the existing storage group name.
9. On the **Volumes** screen:
 - Select Yes if the volume is new, else select No.
 - Enter the number of volumes to be created on the array.

- Enter the capacity unit.
 - Enter the size of each volume.
 - Enter the names for the volumes to be created on the array. The names must be user-friendly.
- Click **Run**.

Delete and Update Plug-in

This chapter includes the following topics:

Topics:

- [Delete the vRO Plug-in for Dell EMC PowerMax](#)
- [Update the Plug-in](#)

Delete the vRO Plug-in for Dell EMC PowerMax

This topic provides information about deleting the vRO Plug-in for Dell EMC PowerMax.

Prerequisites

You must unregister the storage management servers from vRO server.

- To unregister, log in to the VMware vRealize Orchestrator Client and run the workflow **Remove Storage Management Server**.

Steps

1. Log in to the VMware vRO server with administrator username and password.
The **VCO** page is displayed.
2. In the **VCO** page, click **START THE CONTROL CENTER**.
The control center configuration page is displayed.
3. In the **Plug-Ins** tab, click **Manage Plug-Ins**.
The Manage Plug-Ins page is displayed.
4. On the **Manage Plug-Ins** page, select the PowerMax plug-in.
5. To delete the current version of the PowerMax plug-in, click **Delete**.
The following note is displayed:

Are you sure you want to delete the PowerMax plug-in? The package that is included in the plug-in remains in the vRealize Orchestrator server. You must delete it manually from the Orchestrator client.

6. Click **Delete**.
The plug-in is deleted from the control center.
7. To delete the top-level workflows folder from the vRO client using the tree view, you must first delete all the subfolders under Dell EMC PowerMax and then the top-level folder.
8. To delete the action modules, navigate to the **Actions** tab, select the folder **com.dell.powermax.xxx**, and select **Delete** using the tree view.

 **NOTE:** Delete all the folders that begin with **com.dell.powermax.xxx** to remove all the remnants of the plug-in.

Update the Plug-in

This topic provides information about updating the vRO Plug-in for Dell EMC PowerMax to a newer version.

Prerequisites

You must unregister the storage management servers from vRO server.

- To unregister, log in to the VMware vRealize Orchestrator Client and run the workflow **Remove Storage Management Server**.

Steps

1. Log in to the VMware vRO server with administrator username and password.
The VCO page is displayed.
2. In the VCO page, click **START THE CONTROL CENTER**.
The control center configuration page is displayed.
3. In the **Plug-Ins** tab, click **Manage Plug-Ins**.
The **Manage Plug-Ins** page is displayed.
4. Download the latest version of the Dell EMC PowerMax plug-in from Dell EMC [support site](#).
5. To update to the latest plug-in, go to the control center. In the **Manage Plug-Ins** page, click **BROWSE** to go to the latest version of Dell EMC PowerMax plug-in.
6. Click **UPLOAD** to install the latest version of the plug-in to the vRO server.
The Dell EMC PowerMax plug-in is now updated with information showing that the newer plug-in has overwritten the existing plug-in. You can also see the instructions to [Update a Plug-In](#) provided in the VMware support site to update the plug-in.