

vRO Plugin for Dell EMC PowerMax

Version 1.0

Product Guide

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CHAPTER 1

Introduction

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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 the 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
- 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.

Dell EMC storage system	Requirements
Dell EMC VMAX All Flash and PowerMax	<ul style="list-style-type: none"> • Unisphere for Dell EMC VMAX All Flash and PowerMax is installed.

Dell EMC storage system	Requirements
	<ul style="list-style-type: none">• A supported PowerMaxOS release and Unisphere for PowerMax 9.x are installed.

CHAPTER 2

Deploying the vRO Plug-in for Dell EMC PowerMax

This chapter includes the following topics:

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Software prerequisites

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

Pre-requisites

The following is a list of software prerequisites for the vRO plug-in for Dell EMC PowerMax:

- VMware vRealize Orchestrator 7.3, 7.4, 7.5
- Unisphere for PowerMax 9.x must be installed

Deploying the vRO Plug-in for Dell EMC PowerMax

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

Before you begin

Before you deploy the plug-in, install the vRO server version 7.5, using the VMware documentation at www.vmware.com. The vRO server versions 7.3 and 7.4 are also supported.

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.

Procedure

1. Download the latest VMOAPP from the Dell EMC [Support Site](#).
2. Log in to the VMware vRO server: `https://<vRO_IP>:8283/vco/`
The **VCO** page is displayed.
3. Click **Configure the Orchestrator Server > OPEN 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 **Create and Manage > START THE ORCHESTRATOR CLIENT**.
The vRO client is downloaded and you must install it to open the vRO client.

Note

You can also download the vRO client for different platforms that are supported, click **DOWNLOAD THE ORCHESTRATOR CLIENT**.

9. Log in to the vRO client with **username** and **password**.

The vRO client window is displayed. 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
- 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.

Procedure

1. Click **Library > Dell EMC PowerMax > Plugin Settings > Add Storage Management Server**.
2. Right-click **Add Storage Management Server** and select **Start workflow** to run the workflow.

The **Add Storage Management Server** wizard is displayed.

Note

You can also click the play button on the right panel to run the workflow.

3. 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**
 - **Port number**
 - **User name**
 - **Password**

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.

4. Click **Submit**.

If the details entered are correct and the Unisphere is running ok, the workflow runs successfully. The workflow completion is indicated through the schema on the right panel.

Register Storage Systems

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

Procedure

1. Click **Library > Dell EMC PowerMax > Plugin Settings > Register Storage Systems**.
2. Right-click **Register Storage Systems** and select **Start workflow** to run the workflow.

The **Register Storage Systems** wizard is displayed.

Note

You can also click the play button on the right panel to run the workflow.

3. In the wizard, click **Storage Management Server**, select one of the entries that are returned in the list to view details of each storage management server. Double-click the one you want to set as the storage management server.
4. Click **Storage Systems to be registered**.
In the wizard, the value for the string is autofilled. Click **Insert value** and click **Accept**.
5. Click **Submit**.

The workflow completion is indicated through the schema on the right panel.

List all Storage Management Servers

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

Before you begin

Storage systems must be registered in the vRO server.

Procedure

1. Click **Library > Dell EMC PowerMax > Plugin Settings > List all Storage Management Servers**.
2. Right-click **List all Storage Management Servers** and select **Start workflow** to run the workflow.

Note

You can also click the play button on the right panel to run the workflow. The workflow completion is indicated through the schema on the right side.

Get Registered PowerMax Arrays

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

Procedure

1. Click **Library > Dell EMC PowerMax > PowerMax Discovery > Get Registered PowerMax Arrays**.
2. Right-click **Get Registered PowerMax Arrays** and select **Start workflow** to run the workflow.

The **Get Registered PowerMax Arrays** wizard is displayed.

Note

You can also click the play button on the right panel to run the workflow.

3. In the wizard, select the value for management server instance and click **Submit**.

The workflow completion is indicated through the schema on the right side.

Configure vCenter

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

Before you begin

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.

Procedure

1. Click **Library > vCenter > Configuration > Add a vCenter Server instance**.
2. Right-click **Add a vCenter Server instance** and select **Start workflow** to run the workflow.

The **Add a vCenter Server instance** wizard is displayed.

Note

You can also click the play button on the right panel to run the workflow.

3. On the **Set the vCenter Server instance properties** screen, enter the values for the fields and click **Next**.
4. On the **Set the connection properties** screen, enter the values for the fields and click **Next**.
5. On the **Additional Endpoints** screen, enter the values for the fields and click **Submit**.

The workflow runs successfully and the workflow completion is indicated through the schema on the right side.

The vCenter Server instance is displayed in the **Inventory** tab.

CHAPTER 3

Workflows

This chapter includes the following topics:

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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 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 Masking View**
- **Get Masking Views (Bulk)**
- **Get Port Group**
- **Get Port Groups (Bulk)**
- **Get Registered PowerMax Arrays**
- **Get Storage Group**
- **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 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 Masking View**
- **Modify Port Group**

PowerMax Provisioning

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

- **Add datastore on iSCSI/FC/local SCSI**
- **Add RDM Volume to VM**
- **Create Host for ESX Host**
- **Create Host Group For ESX Cluster**
- **Create Snapshot for VMFS Datastore**
- **Create VMFS Datastore for ESXi Cluster**
- **Create VMFS Datastore for ESXi Host**
- **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**
- **Relink VMFS Datastore Snapshot**

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 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**
- **Remove Child Storage Groups**

PowerMax Volume Operations

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

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

Generate Workflow Documentation

This topic provides information about generating workflow documentation from the vRO client.

Procedure

1. Log in to the **vRO client** with **Username** and **Password**.
The vRO client page is displayed.
2. In the **Workflows** tab, click **Library > Dell EMC PowerMax**.
3. Right-click **Dell EMC PowerMax** and select **Generate documentation**.
This step downloads the descriptions, inputs, and outputs for all the workflows of Dell EMC PowerMax.
4. To generate document for each workflow, right-click the workflow and select **Generate documentation**.

CHAPTER 4

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.

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- [Create VMFS Datastore for ESXi Host](#)..... 20

Create Host

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

Procedure

1. Log in to the **vRO client** with **Username** and **Password**.
The vRO client page is displayed.
2. In the **Workflows** tab, click **Dell EMC PowerMax > PowerMax Host Operations > Create Host**.
3. Right-click **Create Host** and select **Start workflow** to run the workflow.
The **Create Host** wizard is displayed.

Note

You can also click the play button on the right panel to run the workflow.

4. On the **Host Information** screen, select the values and click **Next**.
5. On the **Host Flags** screen, select the values from the drop-down to set the PowerMax host flags.
6. Click **Submit**.
The workflow completion is indicated through the schema on the right panel.

Create VMFS Datastore for ESXi Host

This topic describes how to run the workflow to create VMFS datastore for ESXi host on vRealize Orchestrator Client.

Procedure

1. Log in to the **vRO client** with **Username** and **Password**.
The vRO client page is displayed.
2. In the **Workflows** tab, click **Dell EMC PowerMax > PowerMax Provisioning > Create VMFS Datastore for ESXi Host**.
3. Right-click **Create VMFS Datastore for ESXi Host** and select **Start workflow** to run the workflow.

The **Create VMFS Datastore for ESXi Host** wizard is displayed.

Note

You can also click the play button on the right panel to run the workflow.

4. On the **Datastore Information** screen, enter the values for the datastore host and click **Next**.
5. On the **Storage Information** screen, select the values for storage array.
6. Click **Submit**.

The workflow completion is indicated through the schema on the right panel.

CHAPTER 5

Update Plug-in

This chapter includes the following topics:

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Delete or Update vRO Plug-in for Dell EMC PowerMax

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

Before you begin

To update the plug-in to a newer version, you must delete the existing version from control center and vRO client.

Procedure

1. Log in to the VMware vRO server with administrator username and password.
The **VCO** page is displayed.
2. In the **VCO** page, click **OPEN 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 the delete icon.
The following note is displayed:

Note

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

6. Click **DELETE**.
The plug-in is deleted from the control center.
-

Note

To remove all the remnants of the plug-in from vRO client, delete the workflows folder, package with contents and actions.

7. To delete the top-level workflows folder from the vRO client, right-click **Dell EMC PowerMax** folder and click **Delete**.
-

Note

The checkbox for **Delete non empty folder permitted** must be selected to enable **Delete** option for the Dell EMC PowerMax folder. In the vRO client, click **Tools > User preferences** and select the checkbox.

8. To delete the package, switch to **Design** view in the vRO client. Click **Packages** tab, right-click the plug-in package **com.dell.integration.vro**, and select **Delete element with content**.
9. To delete the action modules, click **Actions** tab, right-click the folder **com.dell.integration.vro.xxx**. and select **Delete**.

Note

Delete all the folders that begin with **com.dell.integration.vro.xxx** to remove all the remnants of the plug-in.

10. Download the latest version of the Dell EMC PowerMax plug-in from Dell EMC [support site](#).
11. 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.
12. Click **UPLOAD** to install the latest version of the plug-in to the vRO server.

The Dell EMC PowerMax plug-in is now installed and displayed in **Plug-In**. You can also see the instructions to [Uninstall a Plug-In](#) provided in the VMware support site to uninstall the plug-in.

