



EMC[®] ViPR Controller Plug-in for VMware[®] vRealize Orchestrator

Version 2.3

Installation and Configuration Guide

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CHAPTER 1

EMC ViPR Controller Plug-in for vRealize Orchestrator Overview

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- [Multi-client integration](#)..... 11

ViPR Controller for vRealize Orchestrator

The EMC ViPR Controller plug-in for vRealize™ Orchestrator™ (ViPR Controller for vRO) provides an orchestration interface to the ViPR Controller software platform. The ViPR Controller plug-in has pre-packaged workflows used through the vRO Client as well as other clients that support ViPR Controller integration.

Note

VMware vRealize Orchestrator was formerly named VMware vCenter Orchestrator.

ViPR Controller plug-in for vRO workflows

There are three types of workflows pre-packaged with ViPR Controller used to perform: . One set of workflows is used for common ViPR Controller operations, another is a the other set are the "building block" workflows used for more granular ViPR Controller operations.

- [Common ViPR Controller operations on page 8](#)
- [Single \("Building block\) ViPR Controller operations on page 9](#)
- [Multiple ViPR Controller operations. on page 10](#)

Note

You can access the ViPR Controller workflows from the vRO client or web client, **Workflows > Library tree.**

Workflows for common ViPR Controller operations

The workflows used to automate common ViPR Controller operations such as provisioning storage for an entire cluster.

Table 1 Common workflows

Workflow	Used to
In Workflow, Library > EMC ViPR > vCenter > Datastore	
Create EMC ViPR Volume Snapshot for VMFS Datastore	Creates a snapshot of a ViPR Controller block volume.
Delete Datastore and EMC ViPR Storage	Deletes the ViPR Controller storage, if there are no hosts associated, or snapshots associated with the storage. <ul style="list-style-type: none"> • If the storage is associated with hosts, there is an option to delete the storage and the host associations. • If the storage has snapshots there is an option to delete the storage and the associated snapshots.
Expand a Datastore with EMC ViPR Storage	Expands the ViPR Controller storage and then the datastore.
Share VMFS Datastore with Cluster	Shares the VMFS datastore and the ViPR Controller storage with the hosts in a cluster.

Table 1 Common workflows (continued)

Workflow	Used to
Share VMFS Datastore with Multiple Clusters	Shares a VMFS datastore with more than one cluster.
In Workflow, Library > EMC ViPR > vCenter > Hosts/cluster	
Delete Raw Disk (RDM) and EMC ViPR Storage	Deletes the Raw Disk, removes the storage from the hosts, then deletes the storage.
Provision NFS Datastore for Cluster with EMC ViPR Storage	Creates a ViPR Controller file system, and datastore, and associate them with the cluster.
Provision Raw Disk (RDM) with EMC ViPR Storage	Creates a ViPR Controller block storage volume, associates the volume with the hosts in a cluster, and creates a corresponding Raw Disk (RDM) for a virtual machine (VM).
Provision VMFS Datastore for Cluster with EMC ViPR Storage	Creates a ViPR Controller volume, and datastore, and associate them with the cluster.

Building block workflows

Building block workflows are individual operations used to construct the common, and multiple workflows. The building block workflows can also be used individually, to perform granular ViPR Controller operations such as creating a ViPR Controller volume.

Table 2 Building block workflows

Workflow	Used to
In Workflow, Library > EMC ViPR > General	
Create EMC ViPR File System	Creates a file system with ViPR Controller storage.
Create EMC ViPR Volume	Creates a block volume with ViPR Controller storage.
Create EMC ViPR Volume Snapshot	Creates a snapshot of the VMFS datastore.
Create Raw Disk (RDM)	Creates a SCSI controller and Raw Device Mapping (RDM) on the virtual machine (VM).
Delete EMC ViPR File System	Deletes the ViPR Controller file system, if there are no hosts associated with the file system, and if no snapshots are associated with the file system. <ul style="list-style-type: none"> • If the files system is associated with hosts, there is an option to delete the storage and the host associations. • If the file system has snapshots there is an option to delete the storage and the associated snapshots.
Delete EMC ViPR Volume	Deletes the ViPR Controller block volume, if there are no hosts associated with the volume, and if no snapshots are associated with the volume.

Table 2 Building block workflows (continued)

Workflow	Used to
	<ul style="list-style-type: none"> If the volume is associated with hosts, there is an option to delete the storage and the host associations. If the volume has snapshots there is an option to delete the storage and the associated snapshots.
Delete Raw Disk (RDM)	Deletes a Raw Disk Mapping (RDM) virtual disk on a virtual machine.
Expand EMC ViPR File System	Expands an ViPR Controller file system.
Expand EMC ViPR Volume	Expands the ViPR Controller block volume to the defined size.
Export EMC ViPR File System	Exports an ViPR Controller file system to a host or host cluster.
Export EMC ViPR Volume	Presents a ViPR Controller volume to a host or host cluster.
Get EMC ViPR File System Mount Path for Datastore	Gets the ViPR Controller file system mount path for a given datastore.
Get EMC ViPR Volume WWN for Datastore	Gets the ViPR Controller block volume World Wide Name (WWN) for a given datastore.
Provision for EMC ViPR Volume for Hosts	Creates a volume from ViPR Controller storage and presents it to the hosts.
Provision Raw Disk for VM name and UUID	This workflow is a non-interactive workflow designed specifically to work with the EMC ViPR Controller Enablement Kit for vRealize Automation Center (vRA) 6.2.1. ^a . For details see Create a VM and Provision an RDM with EMC ViPR Controller and vRA .

^a. This also works with the EMC ViPR Controller Enablement Kit for vCenter Automation Center (vCAC) version 6.0, 6.0.1, or 6.1

Multiple workflows

Multiple workflows allow you to perform ViPR Controller operations on multiple ViPR Controller resources, as well as perform multiple ViPR Controller operations in a single workflow.

Table 3 Multiple workflows

Workflow	Used to
In Workflow, Library > EMC ViPR > Multiple	
Create EMC ViPR Volume - Multiple	Creates a user-defined number of block volumes with ViPR Controller storage, and allows users to chose from the available consistency groups from the ViPR Controller user-assigned project.
Create Raw Disk (RDM) - Multiple	Creates a user-defined number of SCSI controller and Raw Device Mapping (RDM) on the virtual machine (VM).

Table 3 Multiple workflows (continued)

Workflow	Used to
Delete EMC ViPR Volume - Multiple	Deletes the user-defined number of ViPR Controller block volumes. If there are no hosts associated with the volume, and if no snapshots are associated with the volume. <ul style="list-style-type: none"> • If the volume is associated with hosts, there is an option to delete the storage and the host associations. • If the volume has snapshots there is an option to delete the storage and the associated snapshots.
Delete Raw Disk (RDM) - Multiple	Allows users to select one or more Raw Disk Mapping (RDM) from a drop-down menu, to delete from the virtual machine.
Delete Raw Disk (RDM) and EMC ViPR Storage - Multiple	Allows users to select one or more Raw Disk Mapping (RDM) from a drop-down menu, to delete from the virtual machine, then removes the storage from the hosts, then deletes the storage. Additionally, it allows users to chose from the available consistency groups from the ViPR Controller user-assigned project.
Export EMC ViPR Volume - Multiple	Presents one or more ViPR Controller volumes to a host or host cluster. User can enter the volume World Wide Name for each volume being exported to hosts or clusters.
Provision for EMC ViPR Volume for Hosts/Clusters - Multiple	Creates a user-defined number of block volumes from ViPR Controller storage and presents them to the hosts, and allows users to chose from the available consistency groups from the ViPR Controller user-assigned project.
Provision Raw Disk (RDM) with EMC ViPR Storage - Multiple	Creates a user-defined number of ViPR Controller block storage volumes, associates the volumes with the hosts in a cluster, and creates a corresponding Raw Disk (RDM) for a virtual machine (VM). Additionally, it allows users to chose from the available consistency groups from the ViPR Controller user-assigned project.
Provision VMFS Datastore for Cluster with EMC ViPR Storage - Multiple	Creates a user-defined number of ViPR Controller volumes, and datastores, and associate them with the cluster.

Multi-client integration

The EMC ViPR Controller plug-in for vRealize Orchestrator builds upon the vRealize Orchestrator integration functionality to provide EMC ViPR Controller workflow and resource management.

The multi-client support allows access either interactively or programmatically, with maximum flexibility to assemble any solution appropriate to your environment.

When used interactively, some workflow values are populated with values corresponding to the context from which they were launched. For example, if the workflow is executed from a vSphere Web Client within the context of a cluster, the host cluster values are entered into the workflow.

When used programmatically, the EMC ViPR Controller plug-in provides the capability to pass new workflow parameters, through an external application, as required.

The functionality provided with the EMC ViPR Controller plug-in for vRealize Orchestrator is supported by the following clients when vRealize Orchestrator is integrated with the application.

- vRealize Orchestrator REST API
- VMware vSphere, vCenter Server
- VMware vRealize Automation (earlier releases were referred to as VMware vCloud Automation Center)

Refer to [EMC ViPR Plug-in Integration with Additional VMware Applications on page 22](#) for client integration details.

CHAPTER 2

EMC ViPR Controller and vRealize Orchestrator Configuration Requirements

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- [vRealize Orchestrator configuration requirements](#)..... 14

EMC ViPR Controller configuration requirements

The EMC ViPR Controller environment must meet specific configuration requirements to support the ViPR plug-in for vRealize Orchestrator.

- Only a ViPR Controller Tenant Administrator or Project Administrator for the Project being configured, can run the workflows.

Note

ViPR Controller roles are configured by ViPR Controller Security Administrators from the ViPR Controller UI.

- A ViPR Controller System Administrator must configure the following, using the ViPR Controller UI, ViPR Controller API, or ViPR Controller CLI prior to running any of the workflows:
 - ViPR Controller virtual assets, such as virtual storage arrays (virtual arrays), and virtual storage pools (virtual pools) must have been created.

Note

Multi-volume consistency groups are not supported by the EMC ViPR Plug-in for vRealize Orchestrator. The ViPR Controller plug-in does not allow users to select virtual pools in which multi-volume consistency is enabled. However, if invoking the workflows programmatically, or through an external application, provisioning fails if a virtual pool with multi-volume consistency enabled is selected.

- Hosts must have been added to the virtual array, networks.
- The vCenter server must be added to ViPR Controller.
- Each instance of the ViPR Controller plug-in can be used to manage one instance of ViPR Controller . You cannot manage multiple instances of ViPR Controller with a single instance of the ViPR Controller plug-in for vRealize Orchestrator.

vRealize Orchestrator configuration requirements

vRealize Orchestrator must meet specific configuration requirements to support the EMC ViPR Controller plug-in for vRealize Orchestrator.

- vRealize Orchestrator version 6.0.1.
- VMware vCenter Orchestrator version 5.1, 5.5, or 5.5.2.

Note

Do not enable debug mode for version 5.5.2 while running workflows.

- The EMC ViPR Controller plug-in requires that the VMware vCenter Server plug-in for vCenter Orchestrator version 5.1, 5.5, or 5.5.2 is installed on the same vRealize Orchestrator running the EMC ViPR Controller plug-in.
- For EMC ViPR Controller Plug-in for vRealize Orchestrator version 6.0.1, import the vCenter Certificate into the configurator and then add the vCenter server, that will be used for provisioning to the vRealize Orchestrator client. To add the vCenter server to the vRO client:
 - From the vRealize Orchestrator client, go to the **vCenter > Configuration**.

- Run the **Add a vCenter** workflow.
- Enable the **Share a unique session** mode for the vCenter Server plug-in for vRealize Orchestrator before invoking the EMC ViPR Controller workflows. Enable the **Share a unique session mode** through the vRealizeOrchestrator Configuration interface, **vCenter Server, New vCenter Server Host** tab.

Note

vRealize Orchestrator users must be part of the Orchestrator administrator group to install and configure plug-ins.

Refer to VMware vRealize Orchestrator documentation for specific configuration steps.

CHAPTER 3

EMC ViPR Controller Plug-in Installation and Configuration

This chapter contains the following topics:

- [Installing the EMC ViPR Controller plug-in for vRealize Orchestrator](#) 18
- [Configuring EMC ViPR Controller and system settings](#) 18
- [Verifying the EMC ViPR Controller plug-in installation](#) 19
- [Generating EMC ViPR Controller workflow documentation](#)20

Installing the EMC ViPR Controller plug-in for vRealize Orchestrator

The EMC ViPR Controller plug-in, `EMC-ViPR-vRO-Plugin-2.3.x.x-xxxxxxxx.xxxxxx-x.dar`, is available from EMC Support Zone. Once downloaded, the plug-in is installed from the Orchestrator Configuration interface.

Procedure

1. Download the `EMC-ViPR-vRO-Plugin-2.3.x.x-xxxxxxxx.xxxxxx-x.dar` file from EMC Support Zone.
2. Enter the vRealize Orchestrator server host name in a supported browser to access the vRealize Orchestrator Web view.

See VMware vRealize Orchestrator documentation for a list of supported Web browsers.

3. Click the vRealize Orchestrator **Orchestrator Configuration** link.
4. Click **Plug-ins**, and continue to follow the vRealize Orchestrator steps for installing plug-ins.
5. When prompted, point to the `EMC-ViPR-vRO-Plugin-2.3.x.x-xxxxxxxx.xxxxxx-x.dar` file on your local machine.

If the connection is valid the credential details will persist and project/virtual pool details will be automatically populated.

6. Once the plug-in is installed, restart the vRealize Orchestrator server host.
7. Restart both the vRealize Orchestrator and the Orchestrator Configuration server.

Note

The vRealize Orchestrator server host must be restarted before restarting the services.

Configuring EMC ViPR Controller and system settings

Set the ViPR Controller settings and workflow timeout period from the vRealize Orchestrator Configuration interface **EMC ViPR Configuration** page.

Before you begin

- vRealize Orchestrator requires users to be part of the vRealize Orchestrator administrator group to use the Orchestrator Configuration interface.
- The ViPR user entered in the vRealize Orchestrator Configuration settings must have been assigned a ViPR Controller Tenant Administrator role or a Project Administrator role for the Project being configured. ViPR Controller roles are configured by ViPR Controller Security Administrators from the ViPR Controller Administration and Self-service UI (ViPR Controller UI).
- While working with EMC ViPR Controller workflows interactively, through vRealize Orchestrator or vSphere, ViPR Controller configuration settings behave as follows:
 - The EMC ViPR Controller hostname/IP address, username, password, port, and project are not presented in the ViPR Controller workflows, and can only be changed through the vRealize Orchestrator Configuration interface.

- The ViPR Controller virtual array is a default setting, which may be automatically or manually set. While executing the workflow, the target virtual array is computed when possible. For example, if the workflow is executed within the context of a vSphere cluster, the correct virtual array for the cluster is computed by the plug-in, and set in the drop-down menu. If the virtual array cannot be computed, the virtual array, defined as the default in the vRealize Orchestrator Configuration interface is set as the first option in the drop-down menu, followed by a list of the other available ViPR Controller virtual arrays. You can change the computed or default virtual array setting when configuring the workflow.
- When ViPR Controller workflows are invoked programmatically from external applications, the configured settings act as defaults and can be overridden through the external program.

Procedure

1. Launch and login to vRealize Orchestrator Configuration .
2. Click **EMC ViPR Plug-in (version)**.
3. Enter the virtual IP address of the EMC ViPR Controller host, and port number 4443.

Note

The port number must be 4443.

4. Enter the user credentials and resources to manage with the EMC ViPR Controller plug-in for vRealize Orchestrator.
5. Click **Verify Connection** to ensure the connection is valid.
If the connection is valid, the credential details will persist to the ViPR Controller database, and the project and virtual pool details will automatically be populated.
6. Select an EMC ViPR Controller project in which to run the workflows.
7. Select the default virtual array to use when the virtual array cannot be automatically computed.
8. Select the amount of time in minutes that each ViPR Controller operation within a workflow can run before timing out.
9. Click **Apply Changes**.

Verifying the EMC ViPR Controller plug-in installation

To verify that the EMC ViPR Controller plug-in was correctly installed, locate the **EMC ViPR** folder **vRealize Orchestrator > Workflows > vCenter Administrator > Library** and review the list of workflows.

Procedure

1. Launch vRealize Orchestrator.
2. Log into the vRealize Orchestrator Client or Web Operator.
3. Go to **Workflows**, and expand the **vCenter Administrator > Library**.
4. Expand the **EMC ViPR** folder to ensure the EMC ViPR Controller workflow library is installed.

The expanded EMC ViPR Controller folder is demonstrated in the [EMC ViPR Workflow tree](#).

Generating EMC ViPR Controller workflow documentation

vRealize Orchestrator provides a feature for generating workflow documentation that describes the workflow inputs in detail.

Before you begin

- Adobe Reader is required to generate and view the workflow documentation.
- The generate documentation feature is only available from the vRealize Orchestrator installable client. Documentation cannot be generated from the vRealize Orchestrator Web Operator.

Procedure

1. From the vRealize Orchestrator Client **Workflows** tab, expand the **vCenter Administrator > Library**.
2. Right-click the **EMC ViPR** folder, and select **Generate Documentation** to generate an Adobe PDF document of all the EMC ViPR Controller workflows and their parameter descriptions.
3. Optionally, expand the **EMC ViPR** folder, right-click on a specific EMC ViPR Controller workflow, and click **Generate Documentation** to generate an Adobe PDF document of the selected workflow.

CHAPTER 4

EMC ViPR Controller Plug-in Integration with Additional VMware Applications

This chapter contains the following topics:

- [EMC ViPR Controller workflow multi-client integration](#) 22
- [VMware vRealize Orchestrator REST API integration](#) 22
- [VMware vSphere, vCenter Server integration](#) 22
- [VMware vRealize Automation Center](#) 23

EMC ViPR Controller workflow multi-client integration

The EMC ViPR Controller plug-in for vRealize Orchestrator integration functionality provides EMC ViPR Controller workflows and resource management through additional VMware clients.

VMware integration requirements and recommendations

The VMware environment must meet the criteria described in the following sections to support the EMC ViPR Controller plug-in for vRealize Orchestrator. Refer to VMware documentation for integration procedures and additional details.

VMware vRealize Orchestrator REST API integration

Access and run the ViPR Controller plug-in for vRO workflows from the vRealize Orchestrator REST API.

vRealize Orchestrator REST API integration requirements

- vRealize Orchestrator REST API version 6.0.1.

Note

Do not enable debug mode for version 5.5.2 while running workflows.

- vCenter Orchestrator REST API version 5.1, 5.5, or 5.5.2
- The default ViPR Controller host, user, project, virtual array, and virtual pool were defined while configuring ViPR Controller from the vRealize Orchestrator Configuration interface.

VMware vSphere, vCenter Server integration

Integrate the workflows installed with EMC ViPR Controller plug-in for vRealize Orchestrator with the vCenter Server. Once integrated, invoke and use the workflows through the vSphere Web Client.

VMware vSphere integration recommendations and requirements

- VMware vSphere 5.1 (or higher) – VMware vCenter Server
- vSphere requires that a Single sign-on (SSO) is configured between vSphere and vRealize Orchestrator.
- Both the EMC ViPR Controller plug-in for vRealize Orchestrator and the vCenter Server plug-in for vRealize Orchestrator are installed on the same vRealize Orchestrator instance.
- Enable the **Share a unique session** mode for the vCenter Server plug-in for vRealize Orchestrator through the vRealize Orchestrator interface, before invoking the ViPR workflows through the vCenter Server.
- One instance of the vSphere vCenter Server can be used for one ViPR Controller instance. A single vCenter Server instance cannot be used to manage multiple instances of ViPR Controller.
- EMC ViPR Controller workflows can only be invoked from the vSphere Web Client. The workflows cannot be accessed from the locally installed vSphere Client.

EMC ViPR workflow settings

- The EMC ViPR Controller Hostname, Username, Password, and Project are brought in with the workflows and cannot be reconfigured when the workflows are invoked through the vSphere Web Client.
- The EMC ViPR Controller virtual array may be set automatically or manually. While executing the workflow, the target virtual array is computed based on the context of the workflow when it is invoked. If not computed, the virtual array is automatically set to the virtual array configured for the workflows in vRealize Orchestrator. The virtual array however, can always be manually overridden when executing the workflows.
- If manually entering the virtual array, and the virtual pool, the virtual array and virtual pool names are not rendered in vSphere. The virtual array and virtual pool names must be manually typed into the fields.

VMware vRealize Automation Center

Invoke and use the ViPR Controller plug-in workflows from vRealize Automation Center.

vRealize Automation Center integration requirements and recommendations

- VMware vRealize Automation Center version 6.2.1
- VMware vCloud Automation Center version 6.0, 6.0.1, or 6.1.
- A single instance of vRealize Automation Center (Formerly referred to as vCloud Automation Center) can be used to manage multiple instances of ViPR Controller for example, the ViPR Controller username and password can be passed in programmatically, allowing vRealize Automation Center to have multiple user mappings. This might be done in a multi-tenant environment or an enterprise, with self-service portals that may have different configurations for different departments.

EMC ViPR workflow settings

- All the EMC ViPR Controller workflow parameters can be passed programmatically through vRealize Automation Center.
- The ViPR Controller hostname, username, password, project, and virtual array that are configured for the workflows through the vRealizeOrchestrator Configuration interface are set as defaults, but can be overridden by the parameters passed when invoked through vRealize Automation Center.

