



EMC[®] ViPR[®] Controller Storage Provider for VMware vCenter Server

Version 2.3

Configuration Guide

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CHAPTER 1

ViPR Controller Storage Provider Overview

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ViPR Controller Storage Provider for VMware vCenter Server overview

The ViPR Controller Storage Provider integrates ViPR Controller with VMware vCenter Server. It allows ViPR Controller users with vCenter administrator credentials to view virtual pools and manage association of these virtual pools with ViPR Controller storage objects. The Storage Provider also reports events and alarms originating from ViPR Controller.

The ViPR Controller Storage Provider conforms to the VMware VASA Provider 1.0 specification. The Storage Provider works in a multi-node ViPR Controller configuration.

The Storage Provider is started as a service when ViPR Controller is deployed in the datacenter. The vCenter Server communicates with the Storage Provider, which communicates with underlying storage arrays (in this case, ViPR Controller). The Storage Provider supports the following use cases from a vCenter Server, for a ViPR Controller user with vCenter administrator credentials:

- Registering the Storage Provider

Note

You must have registered the Storage Provider from the vCenter Server using a vSphere client to access the storage capabilities created in ViPR Controller. Contact ViPR Controller System Monitor for details about registration.

- Associating ViPR Controller virtual pools to virtual machine (VM) storage profiles created for file and block storage data
- Associating file or block datastores with VM storage profiles while creating virtual machines (VMs)
- Monitoring storage health through events and alarms from ViPR Controller reported in the vCenter Server

Note

Throughout this document *virtual storage pools* are referred as virtual pools and *virtual storage arrays* are referred as virtual arrays.

CHAPTER 2

Registering the Storage Provider

This chapter contains the following topics:

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Preparing to register the Storage Provider

You must verify that the Storage Provider service is running and copy the Service End Point Reference (EPR) before registering the Storage Provider.

Before you begin

- You must have a ViPR Controller System Monitor role.
- You must have a ViPR Controller appliance deployed and running in your datacenter.
- You must have the ViPR Controller controller virtual IP address configured during a multi-node ViPR Controller installation.

Procedure

1. [Verify the Storage Provider service is running on page 10.](#)
2. [Copy the Storage Provider Service EPR URL on page 10.](#)

Verifying that the Storage Provider service is running

You must confirm that the Storage Provider service is running in the ViPR Controller deployment before registering it with the vCenter Server.

Before you begin

- You must have a ViPR Controller System Monitor role.
- You must know the ViPR Controller controller virtual IP address of a multi-node ViPR Controller configuration.

Procedure

1. Log in to ViPR Controller Admin and Self-Service UI by typing the URL `https://<vipr_controller_ip_address>` in the browser address bar.

Note

You can use either the ViPR Controller controller virtual IP address or a Fully Qualified Domain Name of the appliance to log in.

2. From **Home**, click **Admin** on the top right.
3. Select **System Health** to confirm that `vasasvc` is displayed among the list of services in the dashboard.

Copying the Storage Provider Service EPR

You must copy the Service EPR for registering the Storage Provider.

Before you begin

- You must have a ViPR Controller System Monitor role.
- You must know the ViPR Controller controller virtual IP address of a multi-node ViPR Controller configuration.

The Service EPR informs vCenter Server about the Storage Provider service address.

Procedure

1. Type the appliance URL as specified `https://<vipr_controller_virtual_ip_address>:9083/storageos-vasasvc/services/listServices` in the browser address bar.
2. Note down or copy the **Service EPR URL** displayed under **vasaService**.
For example: `https://192.168.92.132:9083/storageos-vasasvc/services/vasaService`

After you finish

Provide the copied URL to the ViPR Controller user responsible for registering the Storage Provider.

Registering the Storage Provider

You must register the Storage Provider with the vCenter Server to view and associate the storage capabilities, file systems, and volumes created in ViPR Controller. You can also monitor events and alarms originating from ViPR Controller being reported in vCenter using a vSphere client.

You can register the Storage Provider with vCenter Server using these clients:

- vSphere Web Client
- vSphere Client

The client version must be 5.0 or higher.

Registering the Storage Provider using VMware vSphere Web Client

You must register the Storage Provider service for the vCenter Server to be able to communicate and report the storage capabilities of ViPR Controller.

Before you begin

- You must have the vCenter Server administrator credentials.
- You must have the Storage Provider Service EPR URL.
- You must have a ViPR Controller System Monitor role.

Procedure

1. Log in to the vSphere Web Client.
2. Navigate to **Home > Manage > vCenter Server > Storage Providers**.
3. Click the **+** (Register a new storage provider) icon.
4. Type the vendor provider details in the dialog box.

Field	Description
Name	Unique user-defined name for the Storage Provider.
URL	Storage Provider Service EPR URL obtained from the ViPR Controller System Administrator. For example, <code>https://<vipr_controller_virtual_ip_address>:9083/storageos-vasasvc/services/vasaService</code>
Login	User name with a ViPR Controller System Monitor role. The format for an Active Directory (AD) user is <code><domain-name>\<AD-username></code> .

Field	Description
Password	ViPR Controller password.

5. Click **OK**.
6. Click **Yes** to accept the security alert confirmation dialog.
7. From the **Storage Providers** page, click **Refresh**.
8. Under the **Vendor Provider Details** section, confirm the **Provider Status** column displays the status as **online**.

Registering the Storage Provider using VMware vSphere Client

You must register the Storage Provider service for the vCenter Server to be able to communicate and report the storage capabilities of ViPR Controller.

Before you begin

- You must have the vCenter Server administrator credentials.
- You must have the Storage Provider Service EPR URL.
- You must have a ViPR Controller System Monitor role.

Procedure

1. Log in to vSphere Client.
2. Navigate to **Home > Administration > Storage Providers**.
3. Click **Add**.
4. Type the vendor provider details in the dialog box.

Field	Description
Name	Unique user-defined name for the Storage Provider.
URL	Storage Provider Service EPR URL obtained from the ViPR Controller System Administrator. For example, <code>https://<vipr_controller_virtual_ip_address>:9083/storageos-vasasvc/services/vasaService</code>
Login	User name with a ViPR Controller System Monitor role. The format for an Active Directory (AD) user is <code><domain-name>\<AD-username></code> .
Password	ViPR Controller password.

5. Click **OK**.
6. Click **Yes** to accept the security alert confirmation dialog.
7. From the **Storage Providers** page, click **Refresh All**.
8. Under the **Vendor Provider Details** section, confirm that the **Provider Status** column displays the status as **online**.

CHAPTER 3

Using the Storage Provider from a vCenter Server

This chapter contains the following topics:

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- [Virtual pools associated to a datastore in vCenter](#)..... 16
- [Creating storage profiles and virtual machines](#)..... 17
- [Events and alarms from ViPR Controller in vCenter Server](#)..... 18

Mounting file systems and volumes

To see the association of storage capabilities with storage file systems and storage LUNs under a vCenter vSphere client, you must mount the file systems and volumes created in ViPR Controller to the preferred ESX server host.

Before you begin

- You must have either the Project Administrator or Tenant Administrator role to create and export file systems and volumes in ViPR Controller.
- You must be familiar with ViPR Controller CLI commands.

Note

For commands to create and export file systems, volumes, and groups, refer to the *ViPR Controller CLI Reference Guide*, which is available from the [ViPR Controller Product Documentation Index](#).

-
- You must have vCenter Server administrator credentials to mount file systems and volumes using vSphere.
 - You must know the name of the ESX server to export and mount the file systems and volumes.

You can also perform this procedure using ViPR ControllerUI. Refer to the ViPR Controller UI online help.

Procedure

1. Use the `viprcli filesystem create` and `viprcli volume create` commands to create one or more file systems and volumes.
2. Use the `viprcli filesystem export` and `viprcli exportgroup add_vol` commands to export the file systems and volumes to the ESX server host.
3. Use the `viprcli filesystem show-exports` command to extract the file system mount point IP address and folder path.

The command displays an output like "mount_point":

```
"192.247.96.132:/ifs/ViPR/urn:storageos:FileShare:eac67638-963d-4163-bad3-6dccb4625b7d:", where the mount point IP address is 192.247.96.132 and the folder path is /ifs/ViPR/urn:storageos:FileShare:eac67638-963d-4163-bad3-6dccb4625b7d.
```

4. Use a vSphere Web Client or vSphere Client to mount the file systems and volumes to the ESX server host.

Note

Refer to VMware documentation for vSphere Web Client and vSphere Client for instructions to mount file systems and volumes.

Virtual pools from ViPR Controller in vCenter Server

The virtual pools created in ViPR Controller are added automatically to be viewed from the vCenter Server. You must know the available virtual pools from ViPR Controller to associate them to a datastore.

You can view the virtual pools using one of these clients:

- vSphere Web Client
- vSphere Client

The client version must be 5.0 or higher in either case.

Note

Refer to VMware documentation for vSphere Web Client and vSphere Client for detailed instructions to create new datastores and associate storage capabilities to them.

Viewing virtual pools using vCenter vSphere Web Client

You can view the list of ViPR Controller virtual pools using a vSphere Web Client 5.0 or higher.

Before you begin

- You must have vCenter Server administrator or user credentials.
- The Storage Provider must be registered with vCenter Server.
- One or more virtual pools must be available in ViPR Controller.

Note

For instructions on creating virtual pools, refer to the *ViPR Controller User Interface Virtual Data Center Configuration Guide*, which is available from the [ViPR Controller Product Documentation Index](#).

Procedure

1. Log in to the vSphere Web Client.
2. Navigate to **Home** > **Monitoring** > **VM Storage Profiles**.
3. Click the **Create, Edit or Remove Storage Capabilities** icon to view the available virtual pools displayed under **Manage Storage Capabilities**.

Note

Refer to VMware documentation for vSphere Web Client for instructions to create a new datastore and associate storage capabilities to it.

Viewing virtual pools using vCenter vSphere Client

You can view the list of ViPR Controller virtual pools using a vSphere Client 5.0 or higher.

Before you begin

- You must have the vCenter Server administrator or user credentials.
- The Storage Provider must be registered with vCenter Server.

- One or more virtual pools must be available in ViPR Controller.

Note

or instructions on creating virtual pools refer to the *ViPR Controller User Interface Virtual Data Center Configuration Guide*, which is available from the [ViPR Controller Product Documentation Index](#).

Procedure

1. Log in to the vSphere Client.
 2. Navigate to **Home** > **Monitoring** > **VM Storage Profiles**.
 3. Click **Manage Storage Capabilities** to view the list of available virtual pools displayed.
-

Note

Refer to VMware documentation for vSphere Web Client for instructions to create a new datastore and associate storage capabilities to it.

Virtual pools associated to a datastore in vCenter

The virtual pools created in ViPR Controller are associated to a datastore in vCenter Server.

You can view the association using one of these clients:

- vSphere Web Client
- vSphere Client

The client version must be 5.0 or higher in either case.

Note

Refer to VMware documentation for vSphere Web Client and vSphere Client for instructions to create new datastores and associate storage capabilities to them.

Viewing virtual pools associated with a datastore

You can view the virtual pools associated with a datastore using vSphere Web Client 5.0 or higher.

Before you begin

- You must have the vCenter Server administrator or user credentials.
- The Storage Provider must be registered with vCenter Server.
- The preferred datastore must be associated with one or more virtual pools from ViPR Controller.

Procedure

1. Log in to the vSphere Web Client.
2. Navigate to **Home** > **Inventory** > **vCenter** > **Datastores**.
3. Select the preferred datastore from the list.
4. Select **Manage** > **Profiles** option.
5. Expand **System Storage Capability** and **User Storage Capability** to view the associated virtual pools.

Note

Refer to VMware documentation for vSphere Web Client for detailed instructions to create a new datastore and associate storage capabilities to it.

Viewing the virtual pools associated with a datastore

You can view the virtual pools associated with a datastore using vSphere Client 5.0 or higher.

Before you begin

- You must have the vCenter Server administrator or user credentials.
- The Storage Provider must be registered with vCenter Server.
- The preferred datastore must be associated with one or more virtual pools from ViPR Controller.

Procedure

1. Log in to the vSphere Client.
2. Navigate to **Home** > **Inventory** > **Hosts and Clusters**.
3. Select the preferred ESX server host from the left-pane navigation tree.
4. Navigate to **Hardware** > **Storage** on the right-pane view.
5. Click **Configuration**.
6. Select the preferred datastore from the list.
7. From the **Datastore Details** area, click the callout icon to view the associated virtual pools in the **Storage Capability Details** dialog box.

Note

Refer to VMware documentation for vSphere Client for instructions to create a new datastore and associate storage capabilities to it.

Creating storage profiles and virtual machines

You must create new storage profiles, associate virtual pools created in ViPR Controller to these storage profiles, and create virtual machines (VM) with these storage profiles to view the storage capabilities available in ViPR Controller from the vCenter Server.

Before you begin

- You must have access to vSphere Web Client or vSphere Client 5.0 or higher to view the storage capabilities.
- You must have the vCenter Server administrator credentials.
- The Storage Provider must be registered with vCenter Server.
- One or more virtual pools must be available in ViPR Controller.

Note

For instructions on creating virtual pools, refer to the *ViPR Controller User Interface Virtual Data Center Configuration Guide*, which is available from the [ViPR Controller Product Documentation Index](#).

Procedure

1. Create a new VM storage profile and associate the storage capabilities from ViPR Controller.
 2. Create a new VM and associate the VM storage profile.
-

Note

Refer to VMware documentation for vSphere Web Client and vSphere Client for instructions to create new VM storage profiles and VMs.

Events and alarms from ViPR Controller in vCenter Server

Events and alarms are generated by ViPR Controller when the system, virtual arrays, virtual pools, file systems, and volumes are affected or modified.

You must look into the specific area of vSphere based on the type of event or alarm that you are interested in using these procedures:

- Monitoring events and alarms from ViPR Controller system and virtual arrays
- Monitoring events and alarms from ViPR Controller file systems and volumes

You can monitor the events and alarms using one of these clients:

- vSphere Web Client
- vSphere Client

The client version must be 5.0 or higher in either case.

Note

Refer to VMware documentation for vSphere Web Client and vSphere Client for instructions related to the Events view.

Monitoring events and alarms from ViPR Controller system and virtual arrays

You can view and monitor ViPR Controller system and virtual array events and alarms in vCenter Server.

Before you begin

- You must have the vCenter Server administrator credentials.
- The Storage Provider must be registered with vCenter Server.

System events and alarms belong to both generic and error types. Virtual array events and alarms belong to generic type only.

Procedure

- From the vSphere Web Client or vSphere Client, navigate to **Home** > **Events**.

You can view the events, alarms, and their details originating from ViPR Controller system and virtual arrays.

Note

Refer to VMware documentation for vSphere Web Client and vSphere Client for instructions related to the Events view.

Monitoring events and alarms from ViPR Controller file systems and volumes

You can view and monitor events that affect file systems and volumes created in ViPR Controller from a vCenter Server.

Before you begin

- You must have the vCenter Server administrator credentials.
- The Storage Provider must be registered with vCenter Server.
- One or more file systems and volumes must be available in ViPR Controller.

Note

For instructions on creating virtual pools, refer to the *ViPR Controller User Interface Virtual Data Center Configuration Guide*, which is available from the [ViPR Controller Product Documentation Index](#).

File systems and volumes are always associated with a datastore and their events and alarms can only be viewed under the datastore section of the vSphere.

Procedure

- From the vSphere Web Client or vSphere Client, navigate to **Home** > **Inventory** > **vCenter** > **Datastores** > **Events**.

You can view the events, alarms, and their details originating from ViPR Controller file systems and volumes.

You can also see alarms for a datastore from the **Status** column under **Home** > **Inventory** > **Hosts and Clusters** > **Storage** > **Configuration** > **Datastores**. The possible statuses that can be observed are: Green for Normal, Yellow for Warning, and Red for Alert.

Note

Refer to VMware documentation for vSphere Web Client and vSphere Client for instructions related to the Events view.

Events and alarms from ViPR Controller available in VMware vSphere

You can view the following list of events and alarms generated from ViPR Controller.

Table 1 Events and Alarms

Event type	ViPR Controller event type	Storage Provider event type	Event triggers
System	GenericSystem	Event	Changes in the system.
	ArrayGeneric	Event	Changes that affect the arrays.
	SystemError	Alarm	Errors generated by the system.
	Volume	Event	Create, edit, delete, and expand volumes. Add and remove volumes through group operations.
	FileSystem	Event	Create, edit, delete, expand, export and unexport file system.

Table 1 Events and Alarms (continued)

APPENDIX A

Storage Provider FAQs

This appendix contains the following topics:

- [Can a single Storage Provider instance support multiple virtual data centers?..... 22](#)
- [Can multiple Storage Provider instances support a single virtual data center?..... 22](#)

Can a single Storage Provider instance support multiple virtual data centers?

Yes. A single instance of ViPR Controller Storage Provider can support multiple virtual data centers.

Can multiple Storage Provider instances support a single virtual data center?

Yes. If a virtual data center deployment consists of multiple ViPR Controller deployment instances, then a Storage Provider instance runs on each of these deployment instances. The Storage Provider instances are identical.