



# EMC ViPR Controller

Version 2.4

## Installation, Upgrade, and Maintenance Guide

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# CHAPTER 1

## ViPR Controller installation and configuration roadmap

Use this roadmap as a starting point for ViPR Controller installation and configuration.

You must perform the following high-level sequence of steps to install and configure ViPR Controller. These steps must be completed for each instance of a ViPR Controller virtual data center. Once ViPR Controller is installed and configured, you can automate block and file storage provisioning tasks within the ViPR Controller virtual data center.

1. Review the [ViPR Controller readiness checklist on page 7](#).
2. [Obtain the EMC ViPR Controller license file on page 9](#).
3. Determine which method you will be using to deploy ViPR Controller, and follow the installation instructions:
  - [Install ViPR Controller on VMware as a vApp on page 12](#)
  - [Install ViPR Controller on VMware without a vApp on page 15](#)
  - [Install ViPR Controller on Hyper-V on page 21](#)
4. Optionally:
  - Install the ViPR Controller CLI.  
For steps to install the ViPR Controller CLI, refer to the *ViPR Controller CLI Reference Guide* which is available from the [ViPR Controller Product Documentation Index](#).
  - [Deploy a compute image server on page 26](#)
5. Once you have installed the ViPR Controller, refer to the *ViPR Controller User Interface Tenants, Projects, Security, Users and Multisite Configuration Guide* to:
  - Add users into ViPR Controller via authentication providers.
  - Assign roles to users.
  - Create multiple tenants (optional)
  - Create projects.
6. Prepare to configure the ViPR Controller virtual data center, as described in the *ViPR Controller Virtual Data Center Requirements and Information Guide*.
7. Configure the ViPR Controller virtual data center as described in the *ViPR Controller User Interface Virtual Data Center Configuration Guide*.



# CHAPTER 2

## EMC ViPR Controller deployment readiness checklist

Use this checklist as an overview of the information you will need when you install and configure the EMC ViPR Controller virtual appliance.

For the specific models, and versions supported by the ViPR Controller, ViPR Controller resource requirements see the [ViPR Controller Support Matrix](#).

- Identify an VMware or Hyper-V instance on which to deploy ViPR Controller.
- Make sure all ESXi servers (or all HyperV servers) on which ViPR controller will be installed are synchronized with accurate NTP servers.
- Collect credentials to access the VMware or Hyper-V instance.  
Deploying ViPR Controller requires credentials for an account that has privileges to deploy on the VMware or Hyper-V instance.
- Refer to the *ViPR Controller Support Matrix* to understand the ViPR Controller VMware or Hyper-V resource requirements, and verify that the VMware or Hyper-V instance has sufficient resources for ViPR Controller deployment.
- If deploying on VMware, it is recommended to deploy the ViPR Controller on a minimal of a 3 node ESXi DRS cluster, and to set an anti-affinity rule among the ViPR Controller nodes to, "Separate Virtual Machines," on available ESXi nodes. Refer to VMware vSphere documentation for instructions to setup ESX/ESXi DRS anti-affinity rules.
- Identify 4 IP addresses for 3 node deployment or 6 IP addresses for 5 node deployment. The addresses are needed for the ViPR Controller VMs and for the virtual IP by which REST clients and the UI access the system. The address can be IPv4 or IPv6.

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### Note

that in dual mode, all controllers and VIPs must have both IPv6 and IPv4 addresses.

---

- A supported browser.
- Download the ViPR Controller deployment files from [support.EMC.com](http://support.EMC.com).
- For each ViPR Controller VM, collect: IP address, IP network mask, IP network gateway, and optionally IPv6 prefix length and IPv6 default gateway.
- Two or three DNS servers
- Two or three NTP servers.
- ViPR Controller requires ICMP protocol is enabled for installation and normal usage.
- FTPS server for storing ViPR Controller backups remotely. You need the URL of the FTPS server and credentials for an account with read and write privileges on the FTPS server. Plan for 6 GB per backup initially, then monitor usage and adjust as needed.
- A valid SMTP server and email address.

- An Active Directory or LDAP server and related attributes.  
ViPR Controller validates added users against an authentication server. To use accounts other than the built-in user accounts, you need to specify.



# CHAPTER 3

## Obtain the EMC ViPR Controller license file

EMC ViPR Controller licensing is capacity-based. You need to obtain the license file (.lic) from the EMC license management web site for uploading to ViPR Controller.

### Before you begin

In order to obtain the license file you must have the License Authorization Code (LAC), which was emailed from EMC.

The license file is needed during initial setup of ViPR Controller, or when adding capacity to your existing ViPR Controller deployment. Initial setup steps are described the deployment sections of this guide. If you are adding a ViPR Controller license to an existing deployment, obtain the license file as described below, and then follow the steps described in [Add a ViPR Controller license on page 61](#).

### Procedure

1. Go to support.EMC.com
2. Select **Support > Service Center**.
3. Select **Get and Manage Licenses**.
4. Select **ViPR** from the list of products.
5. On the LAC Request page, enter the LAC code and **Activate**.
6. Select the entitlements to activate and **Start Activation Process**.
7. Select **Add a Machine** to specify any meaningful string for grouping licenses.

The "machine name" does not have to be a machine name at all; enter any string that will help you keep track of your licenses.

8. Enter the quantities for each entitlement to be activated, or select **Activate All**. Click **Next**.

If you are obtaining licenses for a multisite (geo) configuration, you should distribute the controllers as appropriate in order to obtain individual license files for each virtual data center.

9. Optionally specify an addressee to receive an email summary of the activation transaction.
10. Click **Finish**.
11. Click **Save to File** to save the license file (.lic) to a folder on your computer.

Obtain the EMC ViPR Controller license file

# CHAPTER 4

## Deploying ViPR Controller

The chapter includes the following topics:

- [Deploying ViPR Controller VMware with a vApp](#) ..... 12
- [Deploying ViPR Controller on VMware without a vApp](#) ..... 15
- [Deploying ViPR Controller on Hyper-V](#) ..... 21
- [Deploy a compute image server](#) ..... 26

## Deploying ViPR Controller VMware with a vApp

Follow these steps to install ViPR Controller on VMware as a vApp on vSphere Enterprise edition and perform the initial setup.

### Before you begin

- You need access to the ViPR Controller deployment files. You can get them from the [ViPR download page on support.emc.com](https://support.emc.com).

#### **vipr-*<version>*-controller-2+1.ova**

Deploys on 3 VMs. One VM can go down without affecting availability of the virtual appliance.

#### **vipr-*<version>*-controller-3+2.ova**

Deploys on 5 VMs. Two VMs can go down without affecting availability of the virtual appliance.

This option is recommended for deployment in production environments.

- You need credentials to log in to vSphere.
- Be prepared to provide new passwords for the ViPR Controller root and system accounts.
- You need IPv4 and/or IPv6 addresses for DNS and NTP servers.
- You need the name of an SMTP server. If TLS/SSL encryption is used, the SMTP server must have a valid CA certificate.
- You need access to the ViPR Controller license file.

### Procedure

- Download a ViPR Controller OVA file from the ViPR Controller product page to a temporary directory.
- Start the vSphere Client and log in to the vCenter Server on which you will be deploying the virtual appliance.
- From the **File** menu, select **Deploy OVF Template**.
- Browse to and select the ViPR Controller OVA file located in the temporary directory you created earlier.
- On the **OVF Template Details** page, review the details about the appliance.
- Accept the End User License Agreement.
- Specify a name for the appliance.
- Select the host or cluster on which to run the virtual appliance.
- If resource pools are configured (not required for ViPR Controller), select one.
- Select the datastore or datastore cluster for your appliance.
- Select a disk format:
  - Thick Provision Lazy Zeroed** (Default)
  - Thick Provision Eager Zeroed** (Recommended for production deployment)
  - Thin Provision**
- On the **Network Mapping** page, map the source network to a destination network as appropriate.

(If you are running vSphere Web Client, you can disregard the "IP protocol: IPv4" indicator; it is part of the standard screen text. In fact this deployment is used for both IPv4 and IPv6.)

### 13. Enter values for the properties.

Note that when entering IP addresses, you must enter values for the IPv4 properties, or IPv6 properties, or both (if dual stack), according to the mode you need to support.

#### Server *n* IPv4 address

Key name: `network_n_ipaddr`

One IPv4 address for public network. Each Controller VM requires either a unique, static IPv4 address in the subnet defined by the netmask, or a unique static IPv6 address, or both.

Note that an address conflict across different ViPR Controller installations can result in ViPR Controller database corruption that would need to be restored from a previous good backup.

#### Public virtual IPv4 address

Key name: `network_vip`

IPv4 address used for UI and REST client access. See also [Avoid conflicts in EMC ViPR network virtual IP addresses on page 46](#).

#### Network netmask

Key name: `network_netmask`

IPv4 netmask for the public network interface.

#### IPv4 default gateway

Key name: `network_gateway`

IPv4 address for the public network gateway.

#### Server *n* IPv6 address

Key name: `network_n_ipaddr6`

One IPv6 address for public network. Each Controller VM requires either a unique, static IPv6 address in the subnet defined by the netmask, or a unique static IPv4 address, or both.

Note that an address conflict across different ViPR Controller installations can result in ViPR Controller database corruption that would need to be restored from a previous good backup.

#### Public virtual IPv6 address

Key name: `network_vip6`

IPv6 address used for UI and REST client access. See also [Avoid conflicts in EMC ViPR network virtual IP addresses on page 46](#).

#### IPv6 prefix length

Key name: `network_prefix_length`

IPv6 prefix length. Default is 64.

#### IPv6 default gateway

Key name: `network_gateway6`

IPv6 address for the public network gateway.

### 14. Power on the VM.

If you made a mistake specifying IP addresses, netmask, or gateway, the VM may fail to boot up and you will see a message in the console. You can power off the vApp at this point, fix the IP values, and power on vApp again.

15. Wait 7 minutes after powering on the VM before you follow the next steps. This will give the ViPR Controller services time to start up.

16. Open `https://ViPR_virtual_ip` with a supported browser and log in as root.

Initial password is ChangeMe.

The *ViPR\_virtual\_IP* is the ViPR Controller public virtual IP address, also known as the `network.vip` (the IPv4 address) or the `network.vip6` (IPv6). Either value, or the corresponding FQDN, can be used for the URL.

17. Browse to and select the license file that was downloaded from the EMC license management web site, then **Upload License**.

18. Enter new passwords for the root and system accounts.

The passwords must meet these requirements:

- at least 8 characters
- at least 1 lowercase
- at least 1 uppercase
- at least 1 numeric
- at least 1 special character
- no more than 3 consecutive repeating
- at least change 2 characters (settable)
- not in last 3 change iterations (settable)

The ViPR Controller root account has all privileges that are needed for initial configuration; it is also the same as the root user on the Controller VMs. The system accounts (`sysmonitor`, `svcuser`, and `proxyuser`) are used internally by ViPR Controller.

19. For DNS servers, enter two or three IPv4 or IPv6 addresses (not FQDNs), separated by commas.

20. For NTP servers, enter two or three IPv4 or IPv6 addresses (not FQDNs), separated by commas.

21. Select a transport option for ConnectEMC (FTPS (default), SMTP, or none) and enter an email address (`user@domain`) for the ConnectEMC Service notifications.

If you select the SMTP transport option, you must specify an SMTP server under SMTP settings in the next step. "None" disables ConnectEMC on the ViPR Controller virtual appliance.

In an IPv6-only environment, use SMTP for the transport protocol. (The ConnectEMC FTPS server is IPv4-only.)

22. (Optional) Specify an SMTP server and port for notification emails (such as ConnectEMC alerts, ViPR Controller approval emails), the encryption type (TLS/SSL or not), a From address, and authentication type (login, plain, CRAM-MD5, or none).

Optionally test the settings and supply a valid addressee. The test email will be from the From Address you specified and will have a subject of "Mail Settings Test".

If TLS/SSL encryption used, the SMTP server must have a valid CA certificate.

**23.Finish.**

At this point ViPR Controller services restart (this can take several minutes).

**After you finish**

You can now set up Authentication Providers as described in *ViPR Controller User Interface Tenants, Projects, Security, Users and Multisite Configuration Guide*, and setup your virtual data center as described in *ViPR Controller User Interface Virtual Data Center Configuration Guide*. Both guides are available from the [ViPR Controller Product Documentation Index](#).

## Deploying ViPR Controller on VMware without a vApp

This section describes the prerequisites and the step-by-step procedure to use the installer script to perform initial installation of ViPR Controller nodes on VMware without a vApp, or to redeploy a ViPR Controller after failure.

**Before you begin**

- You need access to the ViPR Controller deployment file, `vipr-<version>-controller-vsphere.zip`. You can get the file from the [ViPR download page on support.emc.com](#).
- You need credentials for an account with privileges for vSphere deployment.
- You can run the installer on a supported Linux or Windows computer that has IP access to the vCenter Server or to a specific ESXi server. See the *EMC ViPR Controller Support Matrix* for exact OS versions supported.
- The VMware OVF Tool command-line utility (`ovftool`), version 3.5.0 or 4.0.0, is required on the computer where you are running the installer script. Download OVF Tool from the VMware site. Add OVF Tool to the path environment variable so the installer can find it.
- To run the installer on Windows, PowerShell 4.0 is required.
- Be prepared to provide new passwords for the ViPR Controller root and system accounts.
- You need IPv4 and/or IPv6 addresses for DNS and NTP servers.
- Optionally, you need the name of an SMTP server. If TLS/SSL encryption is used, the SMTP server must have a valid CA certificate.
- You need access to the ViPR Controller license file.
- For details about redeploying ViPR Controller minority nodes see the *EMC ViPR Controller Backup and Disaster Recovery Guide*, which is available from the [ViPR Controller Product Documentation Index](#).

**Procedure**

1. Log in to a Linux or Windows computer that has IP access to the vCenter Server or to a specific ESXi server.
2. Download `vipr-<version>-controller-vsphere.zip` from the [ViPR download page on support.emc.com](#).
3. Unzip the ZIP file.
4. Open a bash command window on Linux, or a PowerShell window on Windows, and change to the directory where you unzipped the installer.
5. To deploy the ViPR Controller, run the `vipr-version-deployment` installer script to deploy ViPR Controller.

You can run the script in interactive mode, or through the command line. Interactive mode will easily guide you through the installation, and the interactive script encodes

the vCenter username and password for you in the event the username or password contains special characters, you will not be required to manually encode them.

For interactive mode enter:

- bash shell:

```
.\vipr-2.3.0.0.682-deployment.sh -mode install -interactive
```

- PowerShell

```
.\vipr-2.3.0.0.637-deployment.ps1 -mode install -interactive
```

If you choose to deploy the ViPR Controller from the command line, you will need to manually enter the deployment parameters, and escape special characters if any are used in the vCenter username and password.

The following are examples of deploying ViPR Controller from the command line. See the following table for complete syntax.

- bash shell:

```
./vipr-2.3.0.0.682-deployment.sh -mode install -vip 1.2.3.0 -
ipaddr_1 1.2.3.1 -ipaddr_2 1.2.3.2
-ipaddr_3 1.2.3.3 -gateway 1.1.1.1 -netmask 255.255.255.0 -
nodeid 1 -nodecount 3
-targeturi vi://username:password@vsphere_host_url -ds
datastore_name -net network_name -vmprefix vmprefix-
-vmfolder vm_folder -dm zeroedthick -cpucount 2 -memory 8192 -
poweron
```

- PowerShell:

```
.\vipr-2.3.0.0.637-deployment.ps1 -mode install -vip 1.2.3.0 -
ipaddr_1 1.2.3.1 -ipaddr_2 1.2.3.2 -ipaddr_3
1.2.3.3 -gateway 1.1.1.1 -netmask 255.255.255.0 -nodeid 1 -
nodecount 3
-targeturi vi://username:password@vsphere_host_url -ds
datastore_name -net network_name -vmprefix vmprefix-
-vmfolder vm_folder -dm zeroedthick -cpucount 2 -memory 8192 -
poweron
```

While entering the options:

- If you omit a required option, the installer will enter interactive mode. When you enter a value or values in interactive mode, do not use quotes.
- The argument delimiter for PowerShell is the double quotation (") but for bash it is single quotation (').

Option	Description
<b>-help</b>	Optional, to see the list of parameters, and descriptions.
<b>-mode install</b>	Required for initial install.
<b>-mode redeploy</b>	Required to redeploy a node for restore. For details see the <i>EMC ViPR Controller Backup and Disaster Recovery Guide</i> , which is available from the <a href="#">ViPR Controller Product Documentation Index</a> .
<b>-interactive</b>	Optional for install, and redeploy.



Option	Description
	Prompts for user input, one parameter at a time. Do not use delimiters when in interactive mode, that is, no single quotes, no double quotes.
<b>-nodecount</b>	Required for install. Number of nodes: 3 or 5 or 1 for evaluation installation only.
<b>-vip</b>	Required for install. Public virtual IPv4 address.
<b>-ipaddrs_n</b>	Required for install. Where "n" equals the IPv4 address list of each node for example, -ipaddrs_1, -ipaddrs_2... i-ipaddrs_5.
<b>-netmask</b>	Required for install. Network netmask.
<b>-gateway</b>	Required for install. IPv4 default gateway.
<b>-vip6</b>	Required for install if using IPv6. Public virtual IPv6 address.
<b>-ipaddrs6_n</b>	Required for install. Where "n" equals the IPv6 address list of each node for example, -ipaddrs6_1, -ipaddrs6_2... i-ipaddrs6_5.
<b>-gateway6</b>	Required for install if using IPv6. IPv6 default gateway.
<b>-ipv6prefixlength</b>	Optional for install if using IPv6. IPv6 address prefix length. Default is 64.
<b>-nodeid</b>	<p>Required for install and redeploy.</p> <p>The -nodeid defines which node in cluster will be deployed (1, 2, 3 in 3 node install, or 1,2,3,4, or 5 in 5 nodes installation. The IP address of the node will be defined by this value (for example if specifying nodeid as 3, the IP address assigned to this node will be the address specified in ipaddrs_3 .</p> <p>For example, when deploying a ViPR Controller 2+1 cluster on multiple ESXi and datastores, you run the installer script 3 times, using different values each time for the options -nodeid, -ds, and -targeturi.</p> <p>The values of IP addresses for the -ipaddrs-n option must be the same each time.</p> <p>node 1:</p> <pre> .\vibr-2.2.1.0.100-deployment.ps1 -mode install -vip 10.20.30.40 -ipaddr_1 10.20.30.41 -ipaddr_2 10.20.30.42 -ipaddr_3 10.20.30.43 -gateway 10.20.35.45 -netmask 10.20.36.46 -vmprefix "Test123-" -dm thin -net mynetworkname -vmfolder "TestConfig/Test1" -poweron -ds "DATA STORE 1" -targeturi "vi:// username:password@ESXi_HOST1_url" -nodeid 1 </pre>

Option	Description
	<p>node 2:</p> <pre>.\vibr-2.2.1.0.100-deployment.ps1 -mode install -vip 10.20.30.40 -ipaddr_1 10.20.30.41 -ipaddr_2 10.20.30.42 -ipaddr_3 10.20.30.43 -gateway 10.20.35.45 -netmask 10.20.36.46 -vmprefix "Test123-" -dm thin -net mynetworkname -vmfolder "TestConfig/Test1" -poweron -ds "DATA STORE 1" -targeturi "vi:// username:password@ESXi_HOST1_url" -nodeid 2</pre> <p>node 3:</p> <pre>.\vibr-2.2.1.0.100-deployment.ps1 -mode install -vip 10.20.30.40 -ipaddr_1 10.20.30.41 -ipaddr_2 10.20.30.42 -ipaddr_3 10.20.30.43 -gateway 10.20.35.45 -netmask 10.20.36.46 -vmprefix "Test123-" -dm thin -net mynetworkname -vmfolder "TestConfig/Test1" -poweron -ds "DATA STORE 1" -targeturi "vi:// username:password@ESXi_HOST1_url" -nodeid 3</pre>
<b>-net <i>networkname</i></b>	Required for install and redeploy. Set a network assignment.
<b>-file</b>	Optional for install, required for redeploy. Valid path and name to the configuration settings file.
<b>-vmprefix</b>	Optional for install, and redeploy. Prefix of virtual machine name.  You can use either -vmprefix, or -vmname, but not both.
<b>-vmname</b>	Optional for install, and redeploy. Name of the virtual machine.  You can use either -vmprefix, or -vmname, but not both.
<b>-poweron</b>	Optional for install, and redeploy. Use -poweron if using the command line to power on the virtual machine after installation, or don't enter any value to not have the virtual machine power on after installation.  For interactive mode, at the command prompt, you will need to enter yes to power on the virtual machine after deployed, or no, do not power on.  If redeploying as part of minority node restore, do not power on until after you have started the node recovery as described in the <i>EMC ViPR Controller Backup and Disaster Recovery Guide</i> , which is available from the <a href="#">ViPR Controller Product Documentation Index</a> .
<b>-cpucount</b>	Optional for install, and redeploy. Number of CPUs for each virtual machine. Valid values are 2 - 16.  By default , 2 CPUs are used for 3 node installation and 4 CPUs are used for 5 node installation. For details see the <a href="#">ViPR Controller Support Matrix</a> .
<b>-memory</b>	Optional for install, and redeploy.

Option	Description
	<p>Memory size for each virtual machine. Valid values are 4096 - 16384MB.</p> <p>By default , 8192MB is used for a 3 node installation, and 16384 is used for a 5 node installation. To determine right values for specific customer inventory considerations refer to <a href="#">ViPR Controller Support Matrix</a>.</p>
<b>-ds</b>	Required for install, and redeploy. Datastore name.
<b>-vmfolder</b> <i>folder</i>	Optional for install, and redeploy. Target VM folder in VI inventory.
<b>-dm</b> {thin   lazyzeroedthick   zeroedthick}	Optional for install, and redeploy. Disk format. Use thick for deployment in production environment. Default is zeroedthick.
<b>-targeturi</b> <i>target-uri</i>	<p>Required for install, and redeploy. This is the Target locator of vSphere. The format is: <i>vi://vSphere client username:password@esxi_host_uri</i> where the typical format for <i>esxi_host_uris</i>: <i>esxi_host_uri is My-vcener-or-ESXi.example.com/datacenter-name/host/host-name/Resources/resource-pool</i></p> <p>Entering the username and password in the target URI is optional. If you do not enter the user name and password in the Target URI you will go into interactive mode, and be prompted to enter them during installation. An example for entering the URI without a user name and password is: <i>My-vcener-or-ESXi.example.com/ViPR-DataCenter/host/ViPR-Cluster/Resources/ViPR-Pool</i></p> <p>If you chose to enter the username and password in the URI, when you use URIs as locators, you must escape special characters using % followed by their ASCII hex value. For example, if <i>username</i> requires a backslash (for example, <i>domain\username</i>) use %5c instead of \ (that is, use <i>domain %5cusername</i>) for example: <i>vi://user1:password1@vcenter1.emc.com:443/My-vcener-or-ESXi.example.com/host/ViPR-Cluster-/Resources/ViPR-Pool</i></p> <p>For details refer to the <i>VMware OVF Tool User Guide</i>.</p>
<b>-username</b>	Optional for install, and redeploy. vSphere client user name.  You do not need to escape special characters when entering the username at the interactive mode prompt.
<b>-password</b>	Optional for install, and redeploy. vSphere client password.  You do not need to escape special characters when entering the username at the interactive mode prompt.

6. If redeploying a failed node, for the remaining steps refer to the *EMC ViPR Controller Backup and Disaster Recovery Guide*, which is available from the [ViPR Controller Product Documentation Index](#).

If installing ViPR Controller for the first time, repeat steps 1 - 5 for each node you are installing.

You will need to enter the information required to install the first node, however, you will not need to enter all of the information for the additional nodes. A `.settings` file is created during installation of the first node. The settings file is used to enter the configuration information for the remaining nodes.

You will only need to change specific parameters for each subsequent node that you want to change, such as "node id", VM name, or target datastore.

Once all nodes are installed continue to step 7.

7. Wait a few minutes after powering on the nodes before you follow the next steps. This will give the ViPR Controller services time to start up.
8. When the installer script indicates successful deployment and the VMs are powered on, open the ViPR Controller UI with a supported browser and log in as root.
  - The initial password is ChangeMe.
  - The *ViPR\_virtual\_IP* is the ViPR Controller public virtual IP address, which is the vip or vip6 value. You can also use the corresponding FQDN for the URL.
9. Browse to and select the license file that was downloaded from the EMC license management web site, then **Upload License**.

10. Enter new passwords for the root and system accounts.

The passwords must meet these requirements:

- at least 8 characters
- at least 1 lowercase
- at least 1 uppercase
- at least 1 numeric
- at least 1 special character
- no more than 3 consecutive repeating
- at least change 2 characters (settable)
- not in last 3 change iterations (settable)

The ViPR Controller root account has all privileges that are needed for initial configuration; it is also the same as the root user on the Controller VMs. The system accounts (sysmonitor, svcuser, and proxyuser) are used internally by ViPR Controller.

11. For DNS servers, enter two or three IPv4 or IPv6 addresses (not FQDNs), separated by commas.
12. For NTP servers, enter two or three IPv4 or IPv6 addresses (not FQDNs), separated by commas.
13. Select a transport option for ConnectEMC (FTPS (default), SMTP, or none) and enter an email address (user@domain) for the ConnectEMC Service notifications.

If you select the SMTP transport option, you must specify an SMTP server under SMTP settings in the next step. "None" disables ConnectEMC on the ViPR Controller virtual appliance.

In an IPv6-only environment, use SMTP for the transport protocol. (The ConnectEMC FTPS server is IPv4-only.)

14. (Optional) Specify an SMTP server and port for notification emails (such as ConnectEMC alerts, ViPR Controller approval emails), the encryption type (TLS/SSL or not), a From address, and authentication type (login, plain, CRAM-MD5, or none).

Optionally test the settings and supply a valid addressee. The test email will be from the From Address you specified and will have a subject of "Mail Settings Test".

If TLS/SSL encryption used, the SMTP server must have a valid CA certificate.

### After you finish

You can now set up Authentication Providers as described in *ViPR Controller User Interface Tenants, Projects, Security, Users and Multisite Configuration Guide*, and setup your virtual data center as described in *ViPR Controller User Interface Virtual Data Center Configuration Guide*. Both guides are available from the [ViPR Controller Product Documentation Index](#).

## Deploying ViPR Controller on Hyper-V

This section describes the prerequisites and the step-by-step procedure for installing the ViPR Controller virtual machine in a Hyper-V environment.

### Before you begin

- You need access to the ViPR Controller deployment file. You can get the file from the [ViPR download page on support.emc.com](#).

#### **vipr-*<version>*-controller-hyperv.zip**

Deploys 3 or 5 VMs, depending on selection you make during deployment.

- You need credentials to log in to the Service Center Virtual Machine Manager (SCVMM).
- Be prepared to provide new passwords for the ViPR Controller root and system accounts.
- You need IPv4 and/or IPv6 addresses for DNS and NTP servers.
- You need the name of an SMTP server. If TLS/SSL encryption is used, the SMTP server must have a valid CA certificate.
- You need access to the ViPR Controller license file.
- Note the following restrictions on ViPR Controller VMs in a Hyper-V deployment:
  - Hyper-V Integration Services are not supported. Do not install Integration Services on ViPR Controller VMs.
  - Restoring from a Hyper-V virtual machine checkpoint or clone is not supported.
  - Modifications to VM memory, CPU, or data disk size requires powering off whole cluster, prior to changing with SCVMM.

### Procedure

- Log in to the SCVMM server using the Administrator account, and copy the zip file to the SCVMM server node.
- Unzip the ZIP file.
- Open a PowerShell window and change to the unzip directory.
- To deploy the ViPR Controller, run the *vipr-*version*-deployment* installer script.

You can run the script in interactive mode, or through the command line. Interactive mode will easily guide you through the installation, or you can use the command line to enter the parameters on your own.

For interactive mode enter:

```
.\vibr-release_version_deployment.ps1 -mode install -interactive
```

From the command line, you will need to enter the parameters when deploying. The following is only an example, see the table for complete syntax.

```
.\vibr-release_version_deployment.ps1 -mode install -vip
10.200.101.100 -ipaddr_1 10.200.101.101
-ipaddr_2 10.247.101.102 -ipaddr_3 10.247.101.103 -gateway
10.247.100.1 -netmask 255.255.255.0 -nodeid 1 -nodecount 3
-net lglw -vswitch vSwitch1 -librarypath \\lglax200\MSSCVMLibrary
-vmhostname lglax140.vibr.instance
-vmopath C:\\ClusterStorage\\Volume4 -vmoprefix viprtest -disktype
dynamic -vlanid 96 -cpucount 2 -memory 8192 -poweron
```

Option	Description
<b>-help</b>	Optional, to see the list of parameters, and descriptions.
<b>-mode install</b>	Required for initial install.
<b>-mode redeploy</b>	Required to redeploy a node for restore. For details see the: <i>EMC ViPR Controller Backup and Disaster Recovery Guide</i> , which is available from the <a href="#">ViPR Controller Product Documentation Index</a> .
<b>-interactive</b>	Optional for install, and redeploy. Prompts for user input, one parameter at a time. Do not use delimiters when in interactive mode, that is, no single quotes, no double quotes.
<b>-nodecount</b>	Required for install. Number of nodes: 3 or 5
<b>-vip</b>	Required for install. Public virtual IPv4 address.
<b>-ipaddrs_n</b>	Required for install. Where "n" equals the IPv4 address list of each node for example, -ipaddrs_1, -ipaddrs_2... i-ipaddrs_5.
<b>-netmask</b>	Required for install. Network netmask.
<b>-gateway</b>	Required for install. IPv4 default gateway.
<b>-vip6</b>	Required for install if using IPv6. Public virtual IPv6 address.
<b>-ipaddrs6_n</b>	Required for install. Where "n" equals the IPv6 address list of each node for example, -ipaddrs6_1, -ipaddrs6_2... i-ipaddrs6_5.
<b>-gateway6</b>	Required for install if using IPv6. IPv6 default gateway.

Option	Description
<b>-ipv6prefixlength</b>	Optional for install if using IPv6. IPv6 address prefix length.  Default is 64.
<b>-nodeid</b>	<p>Required for install and redeploy.</p> <p>The <code>-nodeid</code> defines which node in cluster will be deployed (1, 2, 3 in 3 node install, or 1,2,3,4, or 5 in 5 nodes installation. The IP address of the node will be defined by this value (for example if specifying nodeid as 3, the IP address assigned to this node will be the address specified in <code>ipaddrs_3</code> .</p> <p>For example, when deploying a ViPR Controller 2+1 on different hosts of a Hyper-V cluster, you run the installer script 3 times, using different values each time for the options <code>-nodeid</code>, and <code>-vmpath</code>.</p> <p>The order of IP addresses for the <code>-ipaddrs_n</code> option must be the same each time.</p> <p>node 1:</p> <pre>.\vibr-2.3.0.0.669-deployment.ps1 -mode install -vip 1.2.3.0 -ipaddr_1 1.2.3.1 -ipaddr_2 1.2.3.2 -ipaddr_3 1.2.3.3 -gateway 1.1.1.1 -netmask 255.255.255.0 -nodeid 1 -nodecount 3 -net network_name -vswitch virtual_switch_name -librarypath library_path -vmhostname vm_host_name -vmpath vm_path -disktype fixed -vlanid vlan_id -vmnameprefix vmprefix -cpucount 2 -memory 8192 -poweron</pre> <p>node 2:</p> <pre>.\vibr-2.3.0.0.669-deployment.ps1 -mode install -vip 1.2.3.0 -ipaddr_1 1.2.3.1 -ipaddr_2 1.2.3.2 -ipaddr_3 1.2.3.3 -gateway 1.1.1.1 -netmask 255.255.255.0 -nodeid 2 -nodecount 3 -net network_name -vswitch virtual_switch_name -librarypath library_path -vmhostname vm_host_name -vmpath vm_path -disktype fixed -vlanid vlan_id -vmnameprefix vmprefix -cpucount 2 -memory 8192 -poweron</pre> <p>node 3:</p> <pre>.\vibr-2.3.0.0.669-deployment.ps1 -mode install -vip 1.2.3.0 -ipaddr_1 1.2.3.1 -ipaddr_2 1.2.3.2 -ipaddr_3 1.2.3.3 -gateway 1.1.1.1 -netmask 255.255.255.0 -nodeid 3 -nodecount 3 -net network_name -vswitch virtual_switch_name -librarypath library_path -vmhostname vm_host_name -vmpath vm_path -disktype fixed -vlanid vlan_id -vmnameprefix vmprefix -cpucount 2 -memory 8192 -poweron</pre>
<b>-net <i>networkname</i></b>	Required for install and redeploy. Set a network assignment.
<b>-file</b>	Optional for install, required for redeploy. Valid path and name to the configuration settings file.
<b>-vmprefix</b>	Optional for install, and redeploy. Prefix of virtual machine name.  You can use either <code>-vmprefix</code> , or <code>-vmname</code> , but not both.

Option	Description
<b>-vmname</b>	Optional for install, and redeploy. Name of the virtual machine. Enter a different value for each node i.e, vipr1, vipr2, vipr3, You can use either -vmprefix, or -vmname, but not both.
<b>-poweron</b>	Optional for install, and redeploy. Use -poweron if using the command line to power on the virtual machine after installation, or don't enter any value to not have the virtual machine power on after installation.  For interactive mode, at the command prompt, you will need to enter yes to power on the virtual machine after deployed, or no, do not power on.  If redeploying as part of minority node restore, do not power on until after you have started the node recovery as described in the <i>EMC ViPR Controller Backup and Disaster Recovery Guide</i> , which is available from the <a href="#">ViPR Controller Product Documentation Index</a> .
<b>-cpucount</b>	Optional for install, and redeploy. Number of CPUs for each virtual machine. Valid values are 2 - 16. By default , 2 CPUs are used for 3 node installation and 4 CPUs are used for 5 node installation. For details see the <a href="#">ViPR Controller Support Matrix</a> .
<b>-memory</b>	Optional for install, and redeploy. Memory size for each virtual machine. Valid values are 4096 - 16384MB.  By default , 8192MB is used for a 3 node installation, and 16384 is used for a 5 node installation. To determine right values for specific customer inventory considerations refer to <a href="#">ViPR Controller Support Matrix</a> .
<b>-librarypath</b>	Required for install, and redeploy. Library path shared in SCVMM.
<b>-vmhostname</b>	Required for install, and redeploy. Host machine for the VM.
<b>-vmopath</b>	Required for install, and redeploy. VM Path in host machine Note: user needs to make sure it exists.
<b>-vswitch</b>	Required for install, and redeploy. Name of the virtual switch.
<b>-disktype</b>	Optional for install, and redeploy. Type of virtual hard disk: <i>dynamic</i> or <i>fixed</i> . Use <i>fixed</i> for deployment in a production environment.
<b>-vlanid</b>	Required if VM network is configured with one or more VLANs; otherwise optional. VLAN id. Default is -1.

5. If redeploying a failed node, for the remaining steps, refer to the *EMC ViPR Controller Backup and Disaster Recovery Guide*, which is available from the [ViPR Controller Product Documentation Index](#) .



If installing ViPR Controller for the first time, repeat steps 1 - 4 for each node you are installing.

You will need to retype all the information required to install the first node, however, you will not need to enter the information for the additional nodes. A `.settings` file is created during installation of the first node. The settings file is used to enter the configuration information for the remaining nodes.

Once all nodes are installed continue to step 7.

6. Wait a few minutes after powering on the nodes before you follow the next steps. This will give the ViPR Controller services time to start up.
7. Open `https://ViPR_virtual_ip` with a supported browser and log in as root.

Initial password is ChangeMe.

The *ViPR\_virtual\_IP* is the ViPR Controller public virtual IP address, also known as the `network.vip` (the IPv4 address) or the `network.vip6` (IPv6). Either value, or the corresponding FQDN, can be used for the URL.

8. Browse to and select the license file that was downloaded from the EMC license management web site, then **Upload License**.
9. Enter new passwords for the root and system accounts.

The passwords must meet these requirements:

- at least 8 characters
- at least 1 lowercase
- at least 1 uppercase
- at least 1 numeric
- at least 1 special character
- no more than 3 consecutive repeating
- at least change 2 characters (settable)
- not in last 3 change iterations (settable)

The ViPR Controller root account has all privileges that are needed for initial configuration; it is also the same as the root user on the Controller VMs. The system accounts (`sysmonitor`, `svcuser`, and `proxyuser`) are used internally by ViPR Controller.

10. For DNS servers, enter two or three IPv4 or IPv6 addresses (not FQDNs), separated by commas.
11. For NTP servers, enter two or three IPv4 or IPv6 addresses (not FQDNs), separated by commas.
12. Select a transport option for ConnectEMC (FTPS (default), SMTP, or none) and enter an email address (`user@domain`) for the ConnectEMC Service notifications.

If you select the SMTP transport option, you must specify an SMTP server under SMTP settings in the next step. "None" disables ConnectEMC on the ViPR Controller virtual appliance.

In an IPv6-only environment, use SMTP for the transport protocol. (The ConnectEMC FTPS server is IPv4-only.)

13. (Optional) Specify an SMTP server and port for notification emails (such as ConnectEMC alerts, ViPR Controller approval emails), the encryption type (TLS/SSL or not), a From address, and authentication type (login, plain, CRAM-MD5, or none).

Optionally test the settings and supply a valid addressee. The test email will be from the From Address you specified and will have a subject of "Mail Settings Test".

If TLS/SSL encryption used, the SMTP server must have a valid CA certificate.

#### 14.Finish.

At this point ViPR Controller services restart. This can take several minutes.

#### After you finish

You can now set up Authentication Providers as described in *ViPR Controller User Interface Tenants, Projects, Security, Users and Multisite Configuration Guide*, and setup your virtual data center as described in *ViPR Controller User Interface Virtual Data Center Configuration Guide*. Both guides are available from the [ViPR Controller Product Documentation Index](#).

## Deploy a compute image server

You can deploy a single or multiple compute image servers for each Vblock system you are adding to ViPR Controller.

For information about ViPR Controller support for a Vblock system, see the: *ViPR Controller Virtual Data Center Requirements and Information Guide*, which is available from the [ViPR Controller Product Documentation Index](#).

## ViPR Controller network requirements for the compute image server

A network administrator must configure two networks for each compute image server you are deploying before deploying the compute image server for ViPR Controller.

#### Management Network

The management network is required for communication between ViPR Controller, and the compute image server.

#### Private OS Install Network

The OS Install Network is a private network for operating system (OS) installation. The OS installation Network is used by ViPR Controller during provisioning, for communication between the hosts, and the ViPR Controller compute image server. Once the hosts, and ViPR Controller compute image server are connected over the OS Install Network, the operating system installation is then performed over the OS Install Network. Once installation is complete, the OS Install Network is removed from the hosts.

The Private OS Install Network must be:

- Configured with its own private DHCP server. No other DHCP server can be configured on the OS Install Network.

---

#### Note

The OS Image Server, which is provided with ViPR Controller, contains a dedicated DHCP server.

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- Isolated from other networks to avoid conflicts with other VLANs.

## Deploying the compute image server

ViPR Controller provides a compute image server OVF template that you can deploy, or you can create a custom compute image server, which adheres to the ViPR Controller

compute image server requirements. Use one of the following methods for each compute image server you are deploying in your environment.

- [Deploying the ViPR Controller Compute Image Server OVF file on page 27](#)
- [Requirements to create a custom Compute Image Server for ViPR Controller on page 28](#)

Once you have completed deployment of the compute image servers you will need to configure each compute image server with the steps described in

## Deploying the ViPR Controller Compute Image Server OVF file

ViPR Controller is provided with a compute image server OVF template that you can deploy as a VM.

### Before you begin

- You need access to the compute image server deployment file, `OSImageServer.x86_64-2.2.0.0.xx.ovf`, where `xx` is the compute image server build version number, from the ViPR Controller download page on [support.emc.com](http://support.emc.com).

---

#### Note

The `OSImageServer.x86_64-2.2.0.0.xx` is supported with ViPR Controller 2.2 and higher.

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- You need credentials to log in to vSphere for the vCenter Server where you are deploying the compute image server.
- During deployment you will need to provide:
  - Management Network
  - OS Install Network
  - A fully-qualified hostname for the compute image server
  - IPv4 address for the management network interface
  - IPv4 address for the private OS install network interfaces
  - Netmasks and gateway addresses for both the Management Network
  - One or more DNS server IPv4 addresses
  - Search domain
  - Time zone of the compute image server

### Procedure

1. Download the compute image server image from the ViPR Controller product page to a temporary directory.
2. Start the vSphere Client and log in to the vCenter Server on which you will be deploying the virtual appliance.
3. From the File menu, select Deploy OVF Template.
4. Browse to and select the ViPR Controller compute image server file located in the temporary directory you created earlier.
5. On the **OVF Template Details** page, review the details about the appliance.
6. Accept the **End User License Agreement**.
7. Specify a name and location for the appliance.

8. Select the host or cluster on which to run the virtual appliance.
9. If resource pools are configured, select one.
10. If more than one datastore is attached to the ESX Server, select the datastore for your appliance.
11. Select a disk format: **Thick Provision Lazy Zeroed, Thick Provision Eager Zeroed, or Thin Provision.**
12. On the **Network Mapping** page, specify a destination network for the Management Network and for the private OS Install Network.
13. Enter the values for the properties:

Property	Description
<b>Appliance fully qualified name</b>	FQDN of the image server host name.
<b>Management Network IP Address</b>	IPv4 address for the Management Network interface
<b>Management Network Netmask</b>	IPv4 netmask for the Management Network interface
<b>Management Network Gateway</b>	IPv4 address for the Management Network gateway
<b>Private OS Install Network IP address</b>	IPv4 address for the OS Install Network interface
<b>DNS Server(s)</b>	IPv4 addresses for one or more DNS servers
<b>Search Domain(s)</b>	One or more domains for directing searches.
<b>Time Zone</b>	Select the time zone where the image server resides.

14. Power on the VM.

### Requirements to create a custom compute image server

If you choose to create a custom compute image server for the ViPR Controller compute images, the image server must be configured as follows:

- Compute Image Server must run on Linux OS
  - Compute Image Server must have 2 vNICs
    - Management Network vNIC
    - OS Install Network vNIC  
OS Install vNIC netmask must be 255.255.255.0 for example:
- ```
/etc/sysconfig/network/ifcfg-eth1
DEVICE='eth1'
STARTMODE='auto'
BOOTPROTO='static'
IPADDR='12.0.55.10'
NETMASK='255.255.255.0'
```
- Compute Image Server must have DHCP server
    - DHCP server must be listening on the OS Install Network
    - DHCP response must contain "next-server" option with its own OS Install Network IP and "filename" option set to "/pxelinux.0"

- Suggested DHCP version: Internet Systems Consortium DHCP Server 4.2 <http://www.isc.org/downloads/dhcp/> as demonstrated in the following example. Note the next-server, and filename.

```
/etc/dhcpd.conf
ddns-update-style none;
ignore client-updates;

subnet 12.0.55.0 netmask 255.255.255.0 {
    option subnet-mask      255.255.255.0;
    option time-offset      -18000; # Eastern Standard Time

# --- DHCP pool configuration
    range 12.0.55.1 12.0.55.9;
    range 12.0.55.11 12.0.55.254;
    default-lease-time 3600;
    max-lease-time 7200;

# --- TFTP/PXE configuration
    next-server 12.0.55.10;
    filename "/pxelinux.0";
}
```

```
/etc/sysconfig/dhcpd
# listen on eth1 only
DHCPD_INTERFACE="eth1"
```

- Compute Image Server must have TFTP server
  - TFTP server must listen on the OS Install Network
  - TFTPBOOT directory must contain pxelinux.0 binary (version 3.86) <https://www.kernel.org/pub/linux/utils/boot/syslinux/3.xx/>
  - Suggested TFTP server version: tftp-hpa <https://www.kernel.org/pub/software/network/tftp/tftp-hpa/>
  - TFTP can be configured to run as its own service or as part of xinetd. In the following example, TFTP was configured with xinetd

```
/etc/xinetd.d/tftp
service tftp
{
    socket_type      = dgram
    protocol        = udp
    wait            = yes
    user            = root
    server          = /usr/sbin/in.tftpd
    server_args     = -s /opt/tftpboot/ -vvvvvvv
    disable         = no
    per_source      = 11
    cps             = 100 2
    flags           = IPv4
}
```

- SSH acces
  - User account must have permissions to write to TFTPBOOT directory.
  - User account must have permissions to execute mount/umount commands
- Python
- Enough disk space to store multiple OS images - at least 50 GB is recommended
- No firewall blocking standard SSH, DHCP, TFTP ports and HTTP on 44491 (or a custom port chosen for HTTP).
- wget binary must be installed.

## Add the compute image server in ViPR Controller

Once the compute image server is deployed, you must add and configure the connectivity for the compute image server in the ViPR Controller.

The compute image server can only be added and configured in ViPR Controller using the ViPR Controller REST API, or CLI. To use the ViPR Controller REST API see the *ViPR Controller REST API Virtual Data Center Configuration Guide* To use the ViPR Controller CLI see the *ViPR Controller CLI Reference Guide*. Both documents are available from the [ViPR Controller Product Documentation Index](#).

# CHAPTER 5

## ViPR Controller Log in, and User Role Requirements

This chapter includes the following topics:

- [Log in to EMC ViPR Controller](#).....32
- [ViPR Controller user role requirements](#)..... 32

## Log in to EMC ViPR Controller

You can log in to the ViPR Controller UI from your browser by specifying the virtual IP address of the ViPR Controller appliance.

### Procedure

1. To access the UI, you need to enter the address of the ViPR Controller appliance in your browser's address bar:  
`https://ViPR_virtual_ip`
2. Enter your username and password. The username should be in the format **user@domain**.
3. Optionally check **Remember me**, which maintains your session for a maximum of 8 hours or 2 hours of idle time (whichever comes first), even if you close the browser. If you don't check this option, your session ends when you close the browser, or log out. Logging out always closes the session.

Note that this option does not remember user credentials between sessions.

If you are unable to log in, contact your administrator.

4. You can log out at *username* > **Logout** on the upper-right corner of the UI.

## ViPR Controller user role requirements

ViPR Controller roles fall into two groups: roles that exist at the ViPR Controller virtual data center level, and roles that exist at the tenant level.

### Note

Access to different areas of the ViPR Controller UI is governed by the actions permitted to the role assigned to the user. The actions authorized when you access ViPR Controller from the UI can differ (be more constrained) from those available when you use the REST API or CLI.

### Virtual data center-level roles

VDC roles are used to set up the ViPR Controller environment which is shared by all tenants. The following table lists the authorized actions for each user role at the virtual data center level.

**Table 1** VDC roles

| VDC Role               | Authorized Actions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Security Administrator | <ul style="list-style-type: none"> <li>• Manages the authentication provider configuration for the ViPR Controller virtual data center to identify and authenticate users. Authentication providers are configured to use Active Directory/Lightweight Directory Access Protocol (AD/LDAP) user accounts/domains to add specified users into ViPR Controller.</li> <li>• Creates ViPR Controller User Groups.</li> <li>• Assigns VDC and Tenant roles.</li> <li>• Sets ACL assignments for Projects, and Service Catalog.</li> </ul> |



**Table 1** VDC roles (continued)

| VDC Role             | Authorized Actions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | <ul style="list-style-type: none"> <li>• Sets ACL assignments for virtual arrays, and virtual pools, from the ViPR Controller API and CLI.</li> <li>• Update vCenter Tenants (ACLs) and Datacenter Tenant from ViPR Controller REST API and CLI (Only System Administrators can perform any of these functions from the ViPR Controller UI).</li> <li>• Creates, modifies, and deletes sub-tenants.</li> <li>• Assigns the tenant quotas, and user mappings.</li> <li>• Manages ViPR Controller virtual data center software and license updates.</li> <li>• Configures the repository from which ViPR Controller upgrade files will be downloaded and installed.</li> <li>• Manages SSL, and trusted certificates.</li> <li>• Can change IPs for ViPR Controller nodes deployed on VMware without a vApp, and Hyper-V.</li> <li>• Schedule backups of ViPR Controller instances.</li> <li>• Reset local user passwords.</li> <li>• Configures ACLs.</li> <li>• Restores access to tenants and projects, if needed. (For example, if the Tenant Administrator locks himself/herself out, the Security Administrator can reset user roles to restore access.)</li> <li>• Can add or change ViPR Controller node names.</li> <li>• Initiate a minority node recovery from the ViPR Controller REST API, and CLI.</li> <li>• View the minority node recovery status from the ViPR Controller CLI.</li> <li>• Make changes to the ViPR Controller, General Configuration, Security settings.</li> <li>• Shuts down, reboots, and restarts ViPR Controller services from the ViPR Controller REST API/CLI.</li> </ul> <p>The Security Administrator must also be assigned a System Administrator role to perform the following operations from the ViPR Controller UI:</p> <ul style="list-style-type: none"> <li>• Shut down, reboot, and restart ViPR Controller nodes or services.</li> <li>• Set ACL assignments for virtual arrays, and virtual pools.</li> <li>• Initiate a minority node recovery.</li> </ul> <p>In Geo-federated Environment:</p> <ul style="list-style-type: none"> <li>• Adds a VDC to create Geo-federated environment</li> <li>• Has Security Administrator privileges on authentication providers, which are global resources.</li> </ul> |
| System Administrator | <ul style="list-style-type: none"> <li>• Performs system upgrades.</li> <li>• Add ViPR Controller licenses.</li> <li>• Send support requests.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

**Table 1** VDC roles (continued)

| VDC Role       | Authorized Actions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | <ul style="list-style-type: none"> <li>• Sets up the physical storage infrastructure of the ViPR Controller virtual data center and configures the physical storage into two types of virtual resources: virtual arrays and virtual pools. Authorized actions include:                             <ul style="list-style-type: none"> <li>▪ Adding, modifying, and deleting the following physical storage resources into ViPR Controller such as storage systems, storage ports, and storage pools, data protections systems, fabric managers, networks, compute images, Vblock compute systems, and vCenters.</li> </ul> <hr/> <p><b>Note</b></p> <p>System Administrators cannot add, delete, or modify hosts or clusters.</p> <ul style="list-style-type: none"> <li>▪ Updating vCenter cascade tenancy and vCenter tenants (ACLs) and Datacenter Tenant from the ViPR Controller REST API, UI and CLI.</li> <li>▪ Creating virtual pools.</li> <li>▪ Creating virtual arrays.</li> </ul> </li> <li>• Manages the ViPR Controller virtual data center resources that tenants do not manage.</li> <li>• Retrieves ViPR Controller virtual data center status and health information.</li> <li>• Retrieves bulk event and statistical records for the ViPR Controller virtual data center.</li> <li>• View the Database Housekeeping Status.</li> <li>• View the minority node recovery status from the ViPR Controller CLI.</li> </ul> <p>In Geo-federated Environment:</p> <ul style="list-style-type: none"> <li>• Has System Administrator privileges on global virtual pools, which are global resources.</li> <li>• Sets ACL assignments for virtual arrays, and virtual pools, from the ViPR Controller API</li> </ul> |
| System Monitor | <ul style="list-style-type: none"> <li>• Has read-only access to all resources in the ViPR Controller virtual data center. Has no visibility into security-related resources, such as authentication providers, ACLs, and role assignments.</li> <li>• Retrieves bulk event and statistical records for the ViPR Controller virtual data center.</li> <li>• Retrieves ViPR Controller virtual data center status and health information.</li> <li>• (API only) Can create an alert event, with error logs attached, as an aid to troubleshooting. The alert event is sent to ConnectEMC.</li> <li>• View the Database Housekeeping Status.</li> <li>• View the minority node recovery status from the ViPR Controller UI, and CLI.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| System Auditor | Has read-only access to the ViPR Controller virtual data center audit logs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### Tenant-level roles

Tenant roles are used to administrate the tenant-specific settings, such as the service catalog and projects, and to assign additional users to tenant roles. The following table lists the authorized actions for each user role at the tenant level.

**Table 2** Tenant roles

| Tenant-Level Role     | Authorized Actions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tenant Administrator  | <ul style="list-style-type: none"> <li>• Becomes Tenant Administrator of created tenant.</li> <li>• A single-tenant enterprise private cloud environment has only one tenant, the Provider Tenant, and Tenant Administrators have access to all projects.</li> <li>• Modifies the name and description of the tenants.</li> <li>• Add vCenters to ViPR Controller physical assets in their own tenant.</li> <li>• Manages tenant resources, such as Hosts, Clusters vCenters, and Projects.</li> <li>• Configures ACLs for projects and the Service Catalog in their tenant.</li> <li>• Assigns roles to tenant users. (Can assign Tenant Administrator or Project Administrator roles to other users.)</li> </ul> <hr/> <p>In Geo-federated Environment:</p> <ul style="list-style-type: none"> <li>• Has Tenant Administrator privileges on tenants, which are global resources.</li> </ul> |
| Tenant Approver       | <ul style="list-style-type: none"> <li>• Approves or rejects Service Catalog orders in their tenant.</li> <li>• Views all approval requests in their tenant.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Project Administrator | <ul style="list-style-type: none"> <li>• Creates projects in their tenant and obtains an OWN ACL on the created project.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |



# CHAPTER 6

## Upgrading ViPR Controller

This chapter includes the following topics:

- [Pre-upgrade planning](#)..... 38
- [Upgrade ViPR Controller](#)..... 42
- [Add the Node ID property in VMware after upgrading the ViPR Controller vApp](#)..... 43
- [Changing ScaleIO storage provider type and parameters after upgrading ViPR Controller](#)..... 44
- [Upgrade the ViPR Controller CLI](#)..... 44

## Pre-upgrade planning

Some pre-upgrade steps are required and you should prepare for ViPR Controller to be unavailable for a period of time.

- If you are upgrading from ViPR Controller 2.1.x, or earlier:
  - You must contact EMC Customer Support to upgrade ViPR Controller running Data Services. If you have a previous version of ViPR Controller that is running Data Services, you cannot upgrade to ViPR Controller 2.2 or higher. ViPR Controller 2.2 and higher are compatible with Controller-only environments.
  - Before upgrading the Controller-only environment, even if Data Services is not deployed, you must verify that there are no extra node ID addresses configured. In the ViPR Controller UI, check **Settings > Network**. Remove any values from the **Extra Nodes ID addresses** field.
- ViPR Controller 2.2 Service Pack 1 (2.2.1) with IPv6 you must contact EMC Customer Support before upgrading to ViPR Controller 2.4. This issue only applies to ViPR Controller version 2.21 deployed with IPv6, and does not apply for dual stack environments (IPv4+IPv6).
- For supported upgrade paths, and most recent environment and system requirements see [Supported upgrade paths on page 41](#).
- To ensure your environment is compliant with the latest support matrix, review the [ViPR Controller Support Matrix](#).
- Determine if you will be upgrading from an EMC-based repository, or from an internal location by first downloading the ViPR Controller installation files.
  - If upgrading from an EMC-based repository, configure the ViPR Controller to point to the EMC-based repository as described in: [Configuring ViPR Controller for upgrade from an EMC-based repository on page 40](#).
  - If your site cannot access the EMC repository, and you will be installing from an internal location refer to [Configuring ViPR Controller for an upgrade from an internal location on page 41](#).
- Verify that the ViPR Controller status is **Stable** from the ViPR Controller UI **System > Dashboard**.
- In a multisite (geo) configuration, don't start an upgrade under these conditions:
  - if there are add, remove, or update VDC operations in progress on another VDC.
  - if an upgrade is already in progress on another VDC.
  - if any other VDCs in the federation are unreachable, or have been manually disconnected, or if the current VDC has been disconnected.  
In these cases, you should manually disconnect the unreachable VDC, and reconnect any disconnected VDC.
- Before upgrading, make a backup of the ViPR Controller internal databases using a supported backup method so that in the unlikely event, you will be able to restore to the previous instance. Supported methods for backing up ViPR Controller are described in the *EMC ViPR Controller Backup and Disaster Recovery Guide*, which is available from the [ViPR Controller Product Documentation Index](#).
- Prepare for the ViPR Controller virtual appliance to be unavailable for provisioning operations for 6 minutes plus approximately 1 minute for every 10,000 file shares, volumes, block mirrors, and block snapshots in the ViPR Controller database. System Management operations will be unavailable for a period of 8 minutes (for a 2+1 Controller node deployment) or 12 minutes (for a 3+2 Controller node deployment)

plus approximately 1 minute for every 10,000 file shares, volumes, block mirrors, and block snapshots in the ViPR Controller database.

- Verify that all ViPR Controller orders have completed before you start the upgrade.
- If RecoverPoint is used, upgrade RecoverPoint to a version supported by ViPR Controller 2.4, before upgrading ViPR Controller itself. Refer to the [EMC ViPR Support Matrix](#) for supported RecoverPoint versions.
- If your ViPR Controller is managing EMC ScaleIO storage, upgrade EMC ScaleIO to a version supported by ViPR Controller 2.4, before upgrading ViPR Controller itself. As part of the EMC ScaleIO upgrade, you must install the ScaleIO Gateway. Refer to the [EMC ViPR Support Matrix](#) for supported EMC ScaleIO versions.
- Verify that XtremIO folder names exactly match the ViPR Controller project names. If there are differences, update the XtremIO folder name to exactly match the ViPR Controller project name.

---

**Note**

ViPR Controller does not support spaces in project names, therefore, spaces are not supported on XtremIO folder names.

---

## ViPR Controller SMI-S provider upgrade requirements for VMAX systems

Review the following to understand the ViPR Controller upgrade requirements for VMAX storage systems.

---

**Note**

The [ViPR Controller Support Matrix](#) has the most recent version requirements for all systems supported, or required by ViPR Controller. For specific version requirements of the SMI-S provider review the [ViPR Controller Support Matrix](#) before taking any action to upgrade or install the SMI-S provider for use with ViPR Controller.

---

- For VMAX storage systems, EMC recommends using SMI-S provider 8.1.
- For VMAX storage systems, use either SMI-S provider 4.6.2 or SMI-S provider 8.1 but not both versions, however you must use 8.1 to use the new features provided with ViPR Controller 2.4.
- For VMAX3 storage systems, use SMI-S provider 8.1.
- ViPR Controller 2.4 requires SMI-S Provider 4.6.2 for all VNX storage systems. Plan accordingly if you are using both VMAX and VNX storage systems in your environment.
- When upgrading, you must upgrade the ViPR Controller to version 2.4 before you upgrade the SMI-S provider to 8.1.
- To upgrade to SMI-S Provider from 4.6.2 to 8.1, you must contact EMC Customer Support.

**Table 3** Upgrade requirements for VMAX storage systems

| Upgrade from:   |                | To:             |                | When upgrading SMI-S Provider versions |
|-----------------|----------------|-----------------|----------------|----------------------------------------|
| ViPR Controller | SMI-S provider | ViPR Controller | SMI-S provider |                                        |

**Table 3** Upgrade requirements for VMAX storage systems (continued)

| Upgrade from: |             | To: |     | When upgrading SMI-S Provider versions                             |
|---------------|-------------|-----|-----|--------------------------------------------------------------------|
| 2.2           | 4.6.2       | 2.4 | 8.1 | Contact EMC customer support before upgrading from 4.6.2 to 8.x    |
| 2.2.1.0       | 4.6.2/8.0.1 |     |     |                                                                    |
| 2.3           | 4.6.2       |     |     |                                                                    |
| 2.3           | 8.0.3       | 2.4 | 8.1 | Use the SMI-S provider documentation to upgrade from 8.0.3 to 8.1. |

## Configuring ViPR Controller for upgrade from an EMC-based repository

If you want to download the latest version of ViPR Controller for an upgrade, you must first configure the ViPR Controller to point to the EMC ViPR Controller repository.

### Before you begin

- For the ViPR Controller user roles required to perform this operation see [ViPR Controller user role requirements on page 32](#).
- If your site cannot access the EMC repository, an alternative method of upgrade, for dark sites, is described in [Configuring ViPR Controller for an upgrade from an internal location on page 41](#).

The following are the steps to configure the ViPR Controller for upgrade from an EMC-based repository from the ViPR Controller UI.

Use the following command to configure the ViPR Controller for an upgrade from an EMC-based repository using the ViPR Controller CLI:

```
# viprcli system install-image vipr-2.4.0.x.x
```

For complete details refer to the *ViPR Controller CLI Reference Guide* which is available from the [ViPR Controller Product Documentation Index](#).

### Procedure

1. Select **Settings > General Configuration > Upgrade**.
2. Enter values for the properties.

| Option                 | Description                                                                                                                                     |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Repository URL</b>  | URL to the EMC upgrade repository. One value only. Default value is <a href="https://colu.emc.com/soap/rpc">https://colu.emc.com/soap/rpc</a> . |
| <b>Proxy</b>           | HTTP/HTTPS proxy required to access the EMC upgrade repository. Leave empty if no proxy is required.                                            |
| <b>Username</b>        | Username to access <a href="#">EMC Online Support</a> .                                                                                         |
| <b>Password</b>        | Password to access <a href="#">EMC Online Support</a> .                                                                                         |
| <b>Check Frequency</b> | Number of hours between checks for new upgrade versions.                                                                                        |



| Option | Description |
|--------|-------------|
|--------|-------------|

3. Click **Save**.

## Configuring ViPR Controller for an upgrade from an internal location

You can upgrade ViPR Controller from an internal location by first downloading the ViPR Controller Offline Upgrade img file from support.EMC.com and copying it to the ViPR Controller virtual appliance.

### Before you begin

- Only ViPR Controller System Administrators can perform this operation.
- You need credentials to access [EMC Online Support](#).

### Procedure

1. Download the ViPR Controller Offline Upgrade img file from [EMC Online Support](#) and save it locally on the system where you are running the viprccli.
2. Authenticate with ViPR Controller CLI:

```
viprccli authenticate -u username -d /tmp
```

- a. Enter the username password.

Upon successful authentication with above command , a cookie file is created in /tmp and subsequent viprccli commands can be executed without explicit authentication for each one.

- b. Enter the following to upload the image file to a location on the ViPR Controller virtual appliance where it will be found by ViPR Controller to upgrade:

```
viprccli system upload -imagefile locally_saved_img
```

For details about using the ViPR Controller CLI see: *ViPR Controller CLI Reference Guide*, which is available from the [ViPR Controller Product Documentation Index](#) .

## Supported upgrade paths

Upgrades that start at ViPR 1.x.x require an intermediate upgrade to ViPR Controller version 2.0.0.3. You should follow the pre-upgrade and upgrade steps in [Upgrade to EMC ViPR Controller 2.0](#) when you perform the intermediate upgrade, before continuing with the steps in this document.

**Table 4** Supported upgrade paths ViPR Controller 2.4.0

| From ViPR Controller version                                     | Upgrade path to ViPR Controller 2.4.0       |
|------------------------------------------------------------------|---------------------------------------------|
| 2.1.x.x, and prior                                               | Upgrade directly to 2.3.0 and then to 2.4.0 |
| 2.2.0 deployed with IPv4, or IPv6, or dual stack (IPv4 and IPv6) | Upgrade directly to 2.4.0                   |
| 2.2.1 deployed with IPv4, or dual stack (IPv4 and IPv6)          | Upgrade directly to 2.4.0                   |

**Table 4** Supported upgrade paths ViPR Controller 2.4.0 (continued)

| From ViPR Controller version                                                                                                                                                                                                                                                                                                                                                               | Upgrade path to ViPR Controller 2.4.0                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 2.2.1 deployed with IPv6                                                                                                                                                                                                                                                                                                                                                                   | Prior to upgrading, call EMC Customer Support and reference KB article: 000209423. |
| 2.3.0 (includes all patches and hotfixes)                                                                                                                                                                                                                                                                                                                                                  | Upgrade directly to 2.4.0                                                          |
| Note: If you are upgrading from ViPR Controller 2.1.x or earlier, and the ViPR Controller is running Data Services, you cannot upgrade to ViPR Controller 2.2.x.x or higher. ViPR Controller 2.2.x.x, and higher are only compatible with Controller-only environments. You must contact EMC Customer Support to upgrade from ViPR Controller 2.1.x or earlier when running Data Services. |                                                                                    |

## Upgrade ViPR Controller

ViPR Controller can be upgraded using the ViPR Controller UI or CLI.

### Before you begin

- For the ViPR Controller user roles required to perform this operation see [ViPR Controller user role requirements on page 32](#).
- Review to the [Pre-upgrade planning steps on page 38](#).
- The Security Administrator must have configured ViPR Controller with access to the upgrade files. Refer to one of the following for more information:
  - [Configuring ViPR Controller for upgrade from an EMC-based repository on page 40](#)
  - [Configuring ViPR Controller for an upgrade from an internal location on page 41](#)

The following are the steps to upgrade ViPR Controller using the ViPR Controller UI.

To upgrade ViPR Controller from the ViPR Controller CLI use the following command:

```
# viprcli system update-cluster -v vipr-2.4.0.x.x
```

For complete details refer to the *ViPR Controller CLI Reference Guide* which is available from the [ViPR Controller Product Documentation Index](#).

### Procedure

1. From the ViPR Controller UI, select **Settings > Upgrade**.
2. Select the release version and **Download**.

The downloaded software is stored on the ViPR Controller VM.

3. In the Software Versions list, click **Install** next to the release version.

A rolling upgrade is performed on the ViPR Controller VMs.

The **System Maintenance** page opens while installation is in progress, and shows you the current state of the upgrade process.

Wait for the system state to be Stable before making provisioning or data requests.

4. If you are upgrading on a ViPR Controller instance that was deployed as a VMware vApp, then continue to add the Node ID property as described in [Add the Node ID property in VMware after upgrading the ViPR Controller vApp on page 43](#).

**After you finish**

Note the following about ViPR Controller after an upgrade:

- Modified ViPR Controller catalog services are always retained on upgrade, but to obtain new services, and original versions of modified services, go to **Edit Catalog**, and click **Update Catalog**.
- After upgrading to version 2.4, any array with meta volumes need to be rediscovered, before you attempt to ingest those meta volumes.
- After upgrading to version 2.4, rediscover your RecoverPoint Data Protection Systems. This refreshes ViPR Controller's system information and avoids inconsistencies when applying RecoverPoint protection with ViPR Controller 2.4.

## Add the Node ID property in VMware after upgrading the ViPR Controller vApp

If you have deployed ViPR Controller on VMware with a vApp, and you are upgrading from ViPR Controller versions 2.3.x or lower, then you will need to add the `node_id` property in VMware after upgrading to ViPR Controller 2.4 or higher. You do not have to perform this action if this is a new installation, and not an upgrade.

---

### Note

Failure to perform this operation after upgrade from ViPR Controller versions 2.3.x or earlier will cause ViPR Controller operational failures if, at any time, you use vSphere to rename the original ViPR Controller vApp nodes names.

---

### Procedure

1. From the VMware vSphere, power off the ViPR Controller vApp.
2. Right click on the first virtual machine in the ViPR Controller vApp, and choose **Edit Settings**.
3. Go to the **Options > vApp Options > Advanced** menu.
4. Open the **Properties**, and create a new property with the following settings:
  - Enter a **Label**, optionally name it Node ID.
  - Leave the **Class ID** empty.
  - Enter "node\_id" for the **ID**. The name "node\_id" is required for the id name, and cannot be modified.
  - Leave the **Instance ID** empty.
  - Optionally enter a **Description** of the ViPR Controller node.
  - Type: string.
  - Enter the **Default value**, which must be the node id set by ViPR Controller during deployment for example, `vipr1`, for the first ViPR Controller node, `vipr2` for the second ViPR Controller node.  
ViPR Controller values for a 3 node deployment are `vipr1`, `vipr2`, `vipr3`, and for a 5 node deployment are `vipr1`, `vipr2`, `vipr3`, `vipr4`, and `vipr5`.
  - Uncheck **User Configurable**.
5. Repeat steps 2 through 4 for each virtual machine deployed with the ViPR Controller vApp.
6. Power on the ViPR Controller vApp.

## Changing ScaleIO storage provider type and parameters after upgrading ViPR Controller

If you discovered ScaleIO storage in a previous ViPR Controller release, you must update the storage provider associated with the ScaleIO storage and rediscover the associated storage systems. You do not have to perform this action if this is a new installation, and not an upgrade.

### Before you begin

- EMC ScaleIO has been upgraded to a release supported by ViPR Controller 2.4.
- The ScaleIO Gateway has been installed.

These steps use the ViPR Controller UI. But you can also use the ViPR Controller UI REST API or CLI to update the storage provider parameters and rediscover the associated storage systems.

### Procedure

1. Navigate to **Physical Assets > Storage Providers**.
2. Select the ScaleIO storage provider.  
The **Edit Storage Provider** screen appears.
3. Change **Type** to *ScaleIO Gateway*.
4. Change **Host** to the FQDN or IP Address of the ScaleIO Gateway host.
5. Change **Port** to the port used to communicate with the ScaleIO REST API service .
  - With SSL enabled, the default is 443.
  - With SSL disabled, the default is 80.
6. Select **Save**.
7. Navigate to **Physical Assets > Storage Systems**.
8. For each of the storage systems associated with the updated ScaleIO storage provider:
  - a. Select the ScaleIO storage system.
  - b. Click **Rediscover**.

## Upgrade the ViPR Controller CLI

To upgrade the ViPR Controller CLI, you must uninstall the version you are currently running, and install the most recent version.

For steps to uninstall, and install the ViPR Controller CLI see the *ViPR Controller CLI Reference Guide*, which is available from the [ViPR Controller Product Documentation Index](#) .

# CHAPTER 7

## Managing the ViPR Controller Nodes

This chapter includes the following topics:

- [Avoid conflicts in EMC ViPR network virtual IP addresses](#) .....46
- [Change the IP address of EMC ViPR Controller node](#).....46
- [Changing the ViPR Controller node names](#)..... 50

## Avoid conflicts in EMC ViPR network virtual IP addresses

Restrictions exist on the EMC ViPR virtual IP address when there are multiple ViPR instances in the same subnet.

When more than one ViPR instance exists in the same subnet, use care when allocating the ViPR virtual IP addresses, to prevent a conflict in the load balancer's virtual router ID. The virtual router ID is calculated using the virtual IP address configuration with the following algorithm:

- IPv4 only or dual stack: virtual router ID is the last octet of the IPv4 address.
- IPv6 only: virtual router ID is the decimal equivalent of the last two hex digits in the IPv6 address.

For example, the following addresses in the same subnet would be invalid:

- 172.16.33.98 and 172.16.34.98 (because the last octets are the same, both 98)
- 172.16.33.98 and 2001:db8:170:2842::2462 (because 98 decimal equals 62 hex)

## Change the IP address of EMC ViPR Controller node

You can change the IP addresses of EMC ViPR Controller node and the network virtual IP address.

The method for changing the IP addresses is dependent on the type of installation, and the tool you choose to use:

- [Change the IP address of EMC ViPR Controller node deployed as a VMware vApp on page 46](#)
- [Change the IP address of ViPR Controller node on VMware without vApp, or Hyper-V using ViPR Controller UI on page 47](#)
- [Change the IP address of EMC ViPR Controller node on VMware with no vApp using vCenter on page 48](#)
- [Change the IP address of EMC ViPR Controller node on Hyper-V using SCVMM on page 49](#)

## Change the IP address of EMC ViPR Controller node deployed as a VMware vApp

This section describes how to change node IP address or VIP for a ViPR Controller virtual machine on VMware that was deployed as a vApp.

### Before you begin

If ViPR Controller was not deployed as a vApp, do not follow this procedure. Instead, refer to *Change the IP address of EMC ViPR Controller node on VMware deployed with no vApp*.

This operation requires the System Administrator role in ViPR Controller.

You need access to the vCenter Server that hosts the ViPR vApp.

If the ViPR Controller was deployed without a vApp, do not follow this procedure.

The ViPR Controller vApp must not be part of a multi-VDC configuration. Check **Virtual Assets > Virtual Data Centers**; there should only be one VDC listed.

### Procedure

1. From the ViPR Controller UI, shutdown all VMs (**System > Health > Shutdown All**).

2. Open a vSphere client on the vCenter Server that hosts the ViPR Controller vApp.
3. Right-click the ViPR vApp whose IP address you want to change and select **Edit Settings**.
4. Click **Properties** and expand **EMC ViPR**.
5. Edit the desired IP values and click **OK**.
6. If applicable, change the network adapter to match a change in the subnet:
  - a. Select a specific VM.
  - b. **Edit Settings**.
  - c. Select **Virtual Hardware** > **Network adapter**.
  - d. Click **OK**.
7. From the vSphere client, power on the ViPR vApp.

Note: the ViPR Controller vApp will fail to boot up after an IP address change if the vApp is part of a multi-VDC (geo) configuration. In this case you would need to revert the IP address change.

## Change the IP address of ViPR Controller node on VMware without vApp, or Hyper-V using ViPR Controller UI

Use the ViPR Controller UI to change the IP address of ViPR Controller nodes running on VMware without a vApp, or Hyper-V systems.

### Before you begin

If ViPR Controller was deployed as a vApp, do not follow this procedure. Instead, refer to [Change the IP address of EMC ViPR Controller node deployed as a VMware vApp on page 46](#).

This operation requires the Security Administrator role in ViPR Controller.

The ViPR Controller instance must not be part of a multi-VDC configuration. Check **Virtual Assets** > **Virtual Data Centers**; there should only be one VDC listed.

### Procedure

1. From the ViPR Controller UI, go to **Settings** > **Network Configuration**.
2. Leave the defaults, or enter the new IP addresses in the corresponding fields.  
Do not leave any of the IP address fields empty. You must leave the default, or enter the new IP address.
3. If you are changing the subnet, continue to step 4, otherwise, continue to step 5.
4. Enable the **Power off nodes** option.
5. Click **Reconfigure**.

A message appears telling you that the change was submitted, and your ViPR Controller instance will lose connectivity.

If you are not changing your subnet, you will be able to log back into ViPR Controller 5 to 15 minutes after the configuration change has been made. Only perform steps 6 and 7 if you are changing your network adapter settings in the VM management console.

6. Go to your VM management console (vSphere for VMware or SCVMM for Hyper-V), and change the network settings for each virtual machine.

7. Power on the VMs from the VM management console.

You should be able to log back into the ViPR Controller 5 to 15 minutes after powering on the VMs

If you changed ViPR Controller virtual IP address, remember to login with new virtual IP. ViPR Controller will not redirect you from the old virtual IP to the new virtual IP.

## Change the IP address of ViPR Controller node on VMware with no vApp using vCenter

This section describes how to change a node IP address or VIP from vCenter for a ViPR Controller virtual machine that was deployed on VMware as separate VMs, not as a vApp, in the event that the ViPR Controller UI was unavailable to change the IP addresses.

### Before you begin

If ViPR Controller was deployed as a vApp, do not follow this procedure. Instead, refer to [Change the IP address of the EMC ViPR Controller node on VMware deployed as vApp on page 49](#).

For the ViPR Controller user roles required to perform this operation see [ViPR Controller user role requirements on page 32](#).

You need access to the vCenter Server instance that hosts ViPR Controller.

The ViPR Controller instance must not be part of a multi-VDC configuration. Check **Virtual Assets > Virtual Data Centers**; there should only be one VDC listed.

### Procedure

1. From the ViPR UI, shutdown all VMs (**System > Health > Shutdown All**).
2. Open a vSphere client on the vCenter Server that hosts the ViPR Controller VMs.
3. Right-click the ViPR Controller node whose IP address you want to change and select **Power On**.
4. Right-click the ViPR VM whose IP address you want to change and select **Open Console**.
5. As the node powers on, select the 2nd option in the GRUB boot menu: **Configuration of a single ViPR(vipr-x.x.x.x) Controller node**.  
Be aware that you will only have a few seconds to select this option before the virtual machine proceeds with the default boot option.
6. On the Cluster Configuration screen, select the appropriate ViPR node id and click **Next**.
7. On the Network Configuration screen, enter the new IP addresses for all nodes that need to change in the appropriate fields and click **Next**.  
You will only need to type new IP addresses in one node, and then accept new configuration on subsequent nodes in steps 12-13.
8. On the Deployment Confirmation screen, click **Config**.
9. Wait for the "Multicasting" message at the bottom of the console next to the Config button, then power on the next ViPR Controller node.
10. As the node powers on, right-click the node and select **Open Console**.
11. On the next node, select the new VIP.

Note: if you changed the VIP in a previous step, you will see two similar options. One has the old VIP, the other has the new VIP. Be sure to select the new VIP.



12. Confirm the Network Configuration settings, which are prepopulated.
13. On the Deployment Confirmation screen, click **Config**.
14. Wait for the "Multicasting" message at the bottom of the console next to the Config button, then power on the next ViPR Controller node.
15. Repeat steps 10 through 14 for the remaining nodes.
16. When the "Multicasting" message has appeared for all nodes, select **Reboot** from the console, for each ViPR node.

#### After you finish

At this point the IP address change is complete. Note that the virtual machine will fail to boot up after an IP address change if the ViPR Controller is part of a multi-VDC (geo) configuration. In this case you would need to revert the IP address change.

## Change the IP address of ViPR Controller node on Hyper-V using SCVMM

This section describes how to change a node IP address or VIP for a ViPR Controller virtual machine on Hyper-V using SCVMM in the event that the ViPR Controller UI was unavailable to change the IP addresses..

#### Before you begin

This operation requires the System Administrator role in ViPR Controller.

You need access to the SCVMM Server instance that hosts ViPR Controller.

The ViPR Controller instance must not be part of a multi-VDC configuration. Check **Virtual Assets > Virtual Data Centers**; there should only be one VDC listed.

#### Procedure

1. From the ViPR UI, shutdown all VMs (**System > Health > Shutdown All**).
2. Open the SCVMM UI on the SCVMM Server that hosts the ViPR Controller.
3. On the SCVMM UI, right-click the ViPR Controller node whose IP address you want to change and select **Power On**.
4. On the SCVMM UI, as the node powers on, right-click the node and select **Connect or View > Connect via Console**.
5. On the console GRUB menu, select the 2nd option, **Configuration of a single node**.  
Be aware that you will only have a few seconds to select this option before the virtual machine proceeds with the default boot option.
6. On the Cluster Configuration screen, select the appropriate ViPR Controller node id and click **Next**.
7. On the Network Configuration screen, enter the new IP addresses for all nodes that need to change in the appropriate fields and click **Next**.  
You will only need to type new IP addresses in one node, and then accept new configuration on subsequent nodes in steps 12-13.
8. On the Deployment Confirmation screen, click **Config**.
9. Wait for the "Multicasting" message at the bottom of the console next to the Config button, then power on the next ViPR Controller node.
10. On the SCVMM UI, as the node powers on, right-click the node and select **Connect or View > Connect via Console**.
11. On the next node, select the new VIP for the cluster configuration. .

---

**Note**

if you changed the VIP in a previous step, you will see two similar options. One has the old VIP, the other has the new VIP. Be sure to select the new VIP.

---

12. Confirm the Network Configuration settings, which are prepopulated.
13. On the Deployment Confirmation screen, click Config.
14. Wait for the "Multicasting" message at the bottom of the console next to the Config button, then power on the next ViPR Controller node.
15. Repeat steps 10 through 14 for the remaining nodes.
16. When the "Multicasting" message has appeared for all nodes, select **Reboot** from the console, for each ViPR node.

**After you finish**

At this point the IP address change is complete. Note that the virtual machine will fail to boot up after an IP address change if the ViPR Controller is part of a multi-VDC (geo) configuration. In this case you would need to revert the IP address change.

## Changing the ViPR Controller node names

After installing ViPR Controller on VMware with a vApp, VMware without a vApp, or on Hyper-V, you can provide custom names to the ViPR Controller nodes using the ViPR Controller UI, REST API, or CLI. The custom node names allow you to easily identify the nodes in the ViPR Controller UI, REST API, and ViPR Controller logs. The custom node names can also be used to SSH between the ViPR Controller nodes.

By default ViPR Controller is installed with the following node IDs, which are also the default node names:

| Number of Nodes | Node ID and default Node Names    |
|-----------------|-----------------------------------|
| 3 nodes         | vipr1, vipr2, vipr3               |
| 5 nodes         | vipr1, vipr2, vipr3, vipr4, vipr5 |

During initial deployment, the default names are assigned to the nodes in ViPR Controller, vSphere for VMware installations, and SCVMM for Hyper-V installations.

---

**Note**

Node ids cannot be changed. Only the node names can be changed.

---

**Before you begin**

- For the ViPR Controller user roles required to perform this operation see [ViPR Controller user role requirements on page 32](#).
- Host names in the DNS entries do not need to match the ViPR Controller VM names, or "Custom Node Names" defined in ViPR Controller.
- When the ViPR Controller node names are changed from the ViPR Controller, the node names are not changed in vSphere, or SCVMM. If you want the ViPR Controller node names to be the same in ViPR Controller and vSphere, or Hyper-V, you will need to go into vSphere for VMware installations, or SCVMM for Hyper-V installations, and manually change the node name to match the name you provided in ViPR Controller.

**Note**

Alternatively, if you change the ViPR Controller node names in vSphere or SCVMM, they are not changed in the ViPR Controller. If you want the node names to match, you will need to manually change the node names in ViPR Controller to match the changes made in vSphere or SCVMM.

- Use the following naming conventions for the node name:
  - Use only characters 0-9, a-z, and '-'
  - Maximum number of characters is 253
  - If using FQDN for the node name:
    - No labels can be empty
    - Each label can have a maximum of 63 chars
  - Each custom node name must be unique
  - If you will be using custom short names, each custom short name must be unique. The short node name can be used for API query parameters and SSH between nodes. The short node name is the name that comes before the first period of the fully node name for example the short name for myhost.test.companyname.com is “myhost.”
  - Do not use the node id for another node in the custom node name for example, do not use vipr1.test.companyname.com for the vipr2 node name.
- Whether you change the node name or not, if you have deployed ViPR Controller on VMware with a vApp, and you are upgrading from ViPR Controller versions 2.3.x or lower, then you will need to add the node\_id property in VMware after upgrading to ViPR Controller 2.4 or higher, as described in [Add the Node ID property in VMware after upgrading the ViPR Controller vApp on page 43](#). You do not have to perform this action if this is a new installation and not an upgrade

## Changing the ViPR Controller node name from the UI

To change the ViPR Controller node name from the UI:

### Procedure

1. From the ViPR Controller UI, go to the **Settings > General Configuration > Custom Node Names** tab.
2. Enter a name for each of the nodes.
3. Choose **True** to enable ViPR Controller to use the short node name.
4. Click **Save**.

The ViPR Controller instance will automatically restart to apply the changes.

## Changing the ViPR Controller node name from the CLI

ViPR Controller node names can be changed from the ViPR Controller CLI as follows.

1. Create a file with list of properties for the new ViPR Controller names, and optionally short name property to enable the use of the short node name. The following example is for a 5 node deployment.

```
# cat nodenames-file.txt
node_1_name=mynode1.domain.com
```

```
node_2_name=mynode2.domain.com
node_3_name=mynode3.domain.com
node_4_name=mynode4.domain.com
node_5_name=mynode5.domain.com
use_short_node_name=true
```

Where the node\_n\_name, sets the node name for the associated ViPR Controller Node ID for example:

- The value for node\_1\_name will replace the node name for vipr1
- The value for node\_2\_name will replace the node name for vipr2
- The value for node\_3\_name will replace the node name for vipr3
- The value for node\_4\_name will replace the node name for vipr4
- The value for node\_5\_name will replace the node name for vipr5

You can change the node names for as many number of nodes that are deployed either 3 node, or 5 node deployment.

2. Run the CLI command to update properties, and pass the file as an argument:

```
./viprcli system set-properties -pf /<path>/nodenames-file.txt
```

## Changing the ViPR Controller node name from the API

ViPR Controller node names can be changed from the ViPR Controller REST API using:

```
PUT https://ViPR_Controller_VIP:4443/config/properties/
<property_update>
<properties>
  <entry>
    <key>node_1_name</key>
    <value>mynode1.domain.com</value>
  </entry>
  <entry>
    <key>node_2_name</key>
    <value>mynode2.domain.com</value>
  </entry>
  <entry>
    <key>node_3_name</key>
    <value>mynode3.domain.com</value>
  </entry>
    <entry>
      <key>node_4_name</key>
      <value>mynode4.domain.com</value>
    </entry>
      <entry>
        <key>node_5_name</key>
        <value>mynode5.domain.com</value>
      </entry>
        <entry>
          <key> use_short_node_name </key>
          <value>true</value>
        </entry>
  </properties>
</property_update>
```

Where the node name key, sets the node name for the associated ViPR Controller Node ID for example:

- The value for node\_1\_name will replace the node name for vipr1
- The value for node\_2\_name will replace the node name for vipr2
- The value for node\_3\_name will replace the node name for vipr3

- The value for node\_4\_name will replace the node name for vipr4
- The value for node\_5\_name will replace the node name for vipr5

You can change the node names for as many number of nodes that are deployed either 3 node, or 5 node deployment.

For more details about using the ViPR Controller REST API, see the [ViPR Controller REST API Reference](#) .



# CHAPTER 8

## Modifying the ViPR Controller Footprint

This chapter includes the following topics:

- [Modify the ViPR Controller footprint on VMware](#).....56
- [Modify the ViPR Controller footprint on Hyper-V](#)..... 56

## Modify the ViPR Controller footprint on VMware

You can modify the CPU and memory resources used by the ViPR Controller VMs on VMware.

### Before you begin

- This operation requires the System Administrator role in ViPR Controller.
- You need access to the vCenter Server hosting ViPR Controller.

### Procedure

1. Shut down ViPR Controller from the UI at **System > Health > Shutdown All**.
2. Use the vSphere client to access the editable settings:
  - a. Go to **VMs and Templates**
  - b. Access the settings for each VM, depending on how ViPR Controller was deployed:  
If ViPR Controller was deployed as a vApp, browse to and select the ViPR Controller vApp, then select the **Virtual Machines** tab to see the individual VMs.  
  
If ViPR Controller was deployed as separate VMs (that is, no vApp), the individual VMs are visible in the VMs and Templates view.
  - c. Right click a VM and select **Edit settings**.
  - d. Adjust the **CPU** and **Memory** settings. Refer to the *EMC ViPR Support Matrix* for recommended CPU and memory sizes.  
  
Use identical settings for CPU and Memory on all ViPR Controller VMs.
3. Power up the ViPR Controller VMs or vApp.

## Modify the ViPR Controller footprint on Hyper-V

You can modify the CPU and memory resources used by ViPR Controller on Hyper-V.

### Before you begin

- This operation requires the System Administrator role in ViPR Controller.
- You need access to the Hyper-V server hosting the ViPR Controller virtual machine.

### Procedure

1. Shut down ViPR Controller from the UI at **System > Health > Shutdown All**.
2. Use the SCVMM UI to access the editable settings:
  - a. Go to **VMs and Services > All Hosts**.
  - b. Browse to and right-click the ViPR Controller VM for the first node.
  - c. Select **Properties**.
  - d. Select **Hardware Configuration**.
  - e. Adjust the **Processor** and **Memory** settings. Refer to the *EMC ViPR Support Matrix* for recommended processor and memory sizes.
  - f. Repeat for each ViPR Controller node.  
  
Use identical settings for processor and memory on all ViPR Controller nodes.



3. in the SCVMM UI, power up the ViPR Controller VM.



# APPENDIX A

## Other ViPR Controller configuration options

- [ViPR Controller email options](#)..... 60
- [Add a ViPR Controller license](#).....61
- [Submitting a support request](#)..... 61
- [View and download ViPR Controller System logs and alerts](#)..... 62

## ViPR Controller email options

ViPR Controller provides functionality to use email to communicate with various ViPR Controller users.

Email notifications can be sent from ViPR Controller to:

- The email configured to receive alert notifications from ViPR Controller. The alert notifications are copies of alerts sent to EMC Support from ConnectEMC. The email to the user from ViPR Controller, further indicates whether the alert sent from ConnectEMC to EMC Support was received by EMC Support successfully, or if it failed to be delivered to EMC Support.
- Tenant Approvers to request approvals from ViPR Controller provisioning users to run a service.
- Users
  - Root users can receive email notifications of failed backup uploads, or notifications of expired passwords.
  - Provisioning users can receive email notifications indicating if the Tenant Approver approved the order the user placed, or not.

### Enabling email notifications

All email notification require that you enter the following fields either during initial login, or from the **Settings > General Configuration > Email** tab.

| Option         | Description                                                                                                                                                     |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SMTP server    | SMTP server or relay for sending email.                                                                                                                         |
| Port           | Port on which the SMTP service on the SMTP server is listening for connections. "0" indicates the default SMTP port is used (25, or 465 if TLS/SSL is enabled). |
| Encryption     | Use TLS/SSL for the SMTP server connections.                                                                                                                    |
| Authentication | Authentication type for connecting the SMTP server.                                                                                                             |
| Username       | Username for authenticating with SMTP server.                                                                                                                   |
| Password       | Password for authenticating with SMTP server.                                                                                                                   |
| From address   | From email address to send email messages (user@domain).                                                                                                        |

Once these settings have been enabled, you can continue to configure ViPR Controller for ConnectEMC, Tenant Approver, and user email notifications.

### To receive email from ConnectEMC

Configure the ConnectEMC email from the **Settings > General Configuration > ConnectEMC** tab.

### To send email to Tenant Approvers

Configure the Tenant Approver email from the **Tenant Settings > Approval Settings** page.

### To send email to root users

You must be logged in as root. Open the root drop-down menu in the right corner of the ViPR Controller UI title bar, and select **Preferences**.

**To send email to provisioning users**

You must be logged in as the provisioning user. Open the user drop-down menu in the right corner of the ViPR Controller UI title bar, and select **Preferences**.

## Add a ViPR Controller license

Use the following steps to add a ViPR Controller license file.

**Before you begin**

For the ViPR Controller user roles required to perform this operation see [ViPR Controller user role requirements on page 32](#).

**Procedure**

1. Obtain the ViPR Controller license file, and download it to a directory on your local host, as described in [Obtain the EMC ViPR Controller license file on page 9](#).
2. Login to the ViPR Controller UI.
3. Select **Settings > License**.
4. In the **License File** field, click **Browse** and select the license file that was saved to your local host.
5. Click **Upload License File**.

## Submitting a support request

You can send a support request to ConnectEMC. A support request consists of the text comments that you enter in the ViPR Controller UI **System > Support Request** page, and the system logs for the range of time that you specify.

**Before you begin**

- For the ViPR Controller user roles required to perform this operation see [ViPR Controller user role requirements on page 32](#).
- The ConnectEMC and email must already be configured (**General Configuration > ConnectEMC**).
- A logs archive is automatically sent via ConnectEMC when a support request is submitted. However, the ConnectEMC logs are restricted to 16MB. If you want to analyze more than 16MB of log files you should use the download mechanism described in [View and download ViPR Controller System logs and alerts on page 62](#).

**Procedure**

1. From the ViPR Controller UI, go to the **Security > Support Request** page.
2. In the Contact Email field, enter the email address where you can be contacted with a response to your request.
3. Using the problem template, replace the bracketed ([ ]) text guidelines in order to enter a problem headline/title, a description of the problem and its impact, and the conditions that can be used to reproduce the problem.
4. Select the range of time for which the system logs will be collected to send with this support request.

The range must be small enough to generate less than 16MB of zipped logs. If greater than 16MB the logs will not be sent successfully.

Alternatively, you may need to download the logs using **System > Logs > Download**, and provide the .zip file to the customer service by another method.

## 5. Send.

## View and download ViPR Controller System logs and alerts

You can access log messages associated with each of the EMC ViPR Controller services and access to system events (alerts) through the **System > Logs** page.

Each ViPR Controller service on each virtual machine logs messages at an appropriate level (INFO, DEBUG, WARN and ERROR) and the service logs can be viewed when a problem is suspected. However, the log messages may not provide information that can be acted on by a System Administrator, and may need to be referred to EMC.

System alerts are a class of log message generated by the ViPR Controller system management service aimed at System Administrators and reflect issues, such as environment configuration and connectivity, that a System Administrator should be able to resolve.

### Download ViPR Controller System logs

The download button enables the you to download a zip file containing the logs that correspond to the current filter setting. In addition to the logs directory, the zip also contains an info directory, containing the configuration parameters currently applied, and orders directory showing all orders that have been submitted.

1. From the ViPR Controller UI go to the **System > Logs** page.
2. Click **Download** and specify the content that will be packaged in the zip file containing the logs.

A logs archive (.zip) file called `logs-<date>-<time>.zip` will be downloaded. The logs archive contains all log, system configuration, and order information. You can identify the service log file for a specific node in the zip file, by the log file name. The .log files are named as follows: `servicename_nodeid_nodename.log` for example:

- `apisvc.vipr1.mynodename.log` is a log file of the API service operations run on the first node of a ViPR Controller. `mynodename.log` is the custom node name provided by the user.

If a custom node name was not provided, then the node id will also be in the place of the node name for example:

- `apisvc.vipr1.vipr1.log`.

### System Logs Table

The system logs table displays the system events or ViPR Controller service logs in accordance with the current filter settings. The table displays the time of the message, the level, the message text, and the service with which the message is associated.

The table can be filtered to display either system alerts or log messages associated with specific ViPR Controller services (or for all ViPR Controller services) for a specified node, for a specific period of time. The events and log messages can also be filtered to show only those containing a specific text string.

In addition, the logs can be downloaded as a zip so that they can be reviewed offline, or shared with EMC Support.

### System Logs Summary

The status panel at the top of the system logs table provides a textual summary of the current filter applied to the system logs table.

### Filter Control

The **Filter** button provides access to the Filter dialog which enables you to specify: the node for which you want to retrieve the logs, whether you want to retrieve logs or system

events, the log level that you want to retrieve, the time span over which logs should be considered, a string that any filtered message must contain.

