



# **Install and configure the NetApp Element Plug-in for vCenter Server VCP**

NetApp  
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# Table of Contents

- Install and configure the NetApp Element Plug-in for vCenter Server . . . . . 1
  - Install and configure Element Plug-in 5.0 and later for vCenter Server 7.0 and later . . . . . 1
  - Install and configure Element Plug-in 4.10 and earlier. . . . . 7

# Install and configure the NetApp Element Plug-in for vCenter Server

## Install and configure Element Plug-in 5.0 and later for vCenter Server 7.0 and later

Beginning with NetApp Element Plug-in for vCenter Server 5.0, you can install the most recent version of the Element Plug-in directly to your vCenter and access the plug-in with the vSphere Web Client.

After installation is complete, you can use the quality of service based on storage I/O control (QoSSIOC) service as well as other services of the vCenter Plug-in.

Read and complete each step to install and begin using the plug-in:

- [Prepare for installation](#)
- [Install the management node](#)
- [Register the plug-in with vCenter](#)
- [Access the plug-in and verify successful installation](#)
- [Add storage clusters for use with the plug-in](#)
- [Configure QoSSIOC settings using the plug-in](#)
- [Configure user accounts](#)
- [Create datastores and volumes](#)

### Prepare for installation

Before you begin the installation, review [pre-deployment requirements](#).

### Install the management node

You can manually [install the management node](#) for your cluster running NetApp Element software using the appropriate image for your configuration.

This manual process is intended for SolidFire all-flash storage administrators and NetApp HCI administrators who are not using the NetApp Deployment Engine for management node installation.

### Register the plug-in with vCenter

Deploying the vCenter Plug-in package in the vSphere Web Client involves registering the package as an extension on vCenter Server. After registration is complete, the plug-in is available to any vSphere Web Client that connects to your vSphere environment.

#### What you'll need

- You have vCenter Administrator role privileges to register a plug-in.
- You have deployed a management node OVA running Element software 12.3.x or later.
- Your management node is powered on with its IP address or DHCP address configured.

- You are using an SSH client or web browser (Chrome 56 or later or Firefox 52 or later).
- Your firewall rules allow open [network communication](#) between the vCenter and the storage cluster MVIIP on TCP ports 443, 8443, 8333, and 9443. Port 9443 is used for registration and can be closed after registration is complete. If you have enabled virtual volumes functionality on the cluster, ensure TCP port 8444 is also open for VASA provider access.

### About this task

You must register the vCenter Plug-in on every vCenter Server where you need to use the plug-in.

For Linked Mode environments, you must register separate plug-ins with each vCenter Server in the environment to keep MOB data in sync and to be able to upgrade the plug-in. When a vSphere Web Client connects to a vCenter Server where your plug-in is not registered, the plug-in is not visible to the client.



To use [vCenter Linked Mode](#), you register the Element Plug-in from a separate management node for each vCenter Server that manages NetApp SolidFire storage clusters.

### Steps

1. Enter the IP address for your management node in a browser, including the TCP port for registration:

`https://<managementNodeIP>:9443`

The registration UI displays the Manage QoSSIOC Service Credentials page for the plug-in.

2. **Optional:** Change the password for the QoSSIOC service before registering the vCenter Plug-in:
  - a. For the Old Password, enter the current password of the QoSSIOC service. If you have not yet assigned a password, type the default password:

solidfire

b. Select **Submit Changes**.



After you submit changes, the QoSSIOC service automatically restarts.

3. Select **vCenter Plug-in Registration**.

The screenshot shows the NetApp Element Plug-in for vCenter Server Management Node interface. The page title is "vCenter Plug-in - Registration". On the left, there is a sidebar with the following options: "Manage vCenter Plug-in", "Register Plug-in" (highlighted), "Update Plug-in", "Unregister Plug-in", and "Registration Status". The main content area contains the following fields and instructions:

- vCenter Address:** vCenter Server Address. Enter the IPv4, IPv6 or DNS name of the vCenter server to register plug-in on.
- vCenter User Name:** vCenter Admin User Name. Ensure this user is a vCenter user that has administrative privileges for registration.
- vCenter Password:** vCenter Admin Password. The password for the vCenter user name entered.
- ☐ **Customize URL:** Select to customize the Zip file URL.
- Plug-in Zip URL:** <https://10.117.227.44:8333/ecp-UI/plugin.json>. URL of XML initialization file.

At the bottom of the main content area is a "REGISTER" button. At the bottom of the page is a footer that says "Contact NetApp Support at <http://mysupport.netapp.com>".

4. Enter the following information:

- The IPv4 address or the FQDN of the vCenter service on which you will register your plug-in.
- The vCenter Administrator user name.



The user name and password credentials you enter must be for a user with vCenter Administrator role privileges.

- The vCenter Administrator password.

5. Select **Register**.

6. (Optional) Verify registration status:

a. Select **Registration Status**.

b. Enter the following information:

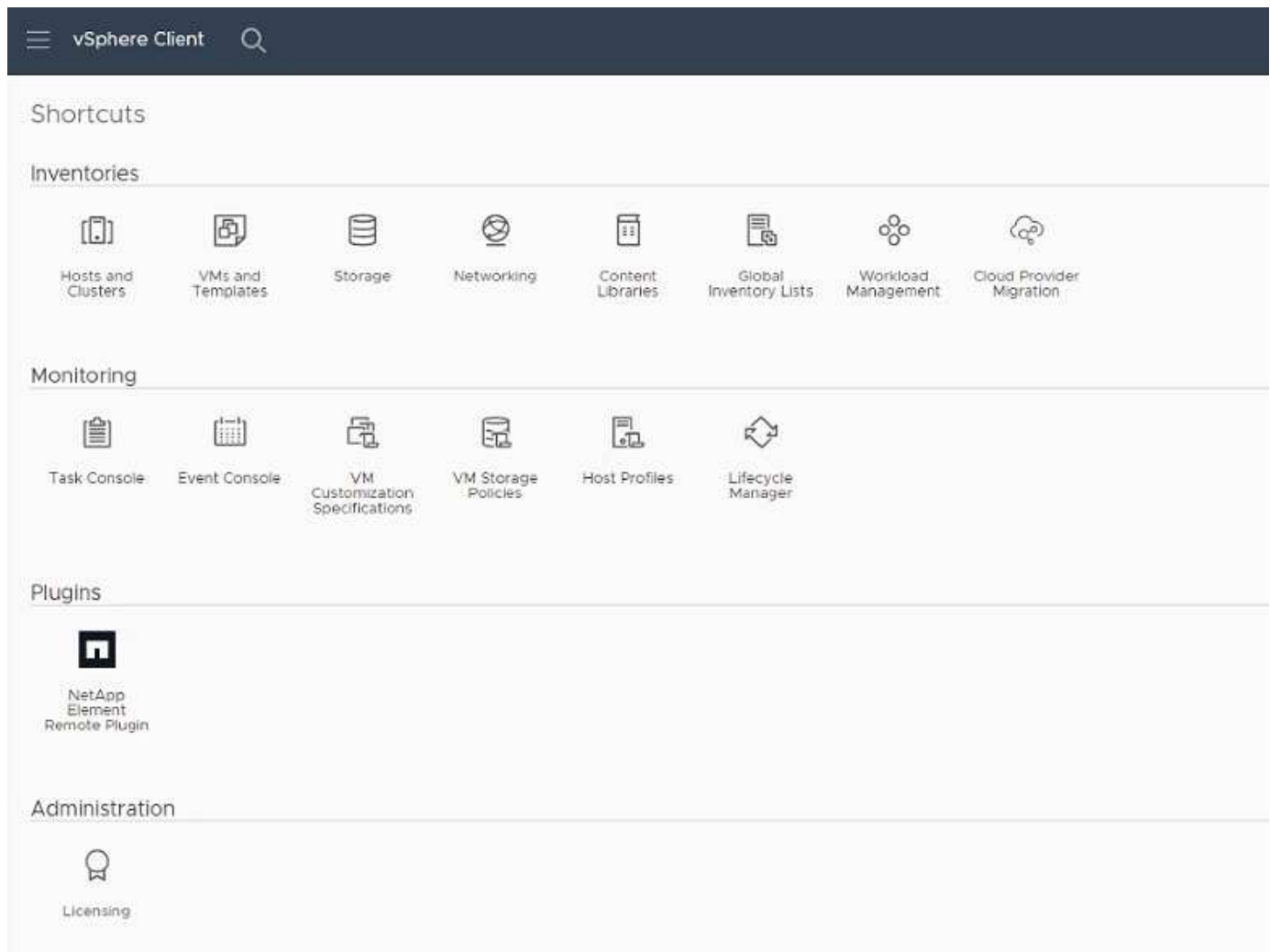
- The IPv4 address or the FQDN of the vCenter service on which you are registering your plug-in
- The vCenter Administrator user name
- The vCenter Administrator password

c. Select **Check Status** to verify that the new version of the plug-in is registered on the vCenter Server.

7. In the vSphere Web Client, look for the following completed tasks in the task monitor to ensure installation has completed: Download plug-in and Deploy plug-in.

## Access the plug-in and verify successful installation

After successful installation or upgrade the NetApp Element Remote Plugin extension point appears in the Shortcuts tab of the vSphere Web Client in the side panel.



If the vCenter Plug-in icons are not visible, see the [troubleshooting documentation](#).

## Add storage clusters for use with the plug-in

You can add and manage a cluster running Element software using the NetApp Element Remote Plugin extension point.

## What you'll need

- At least one cluster must be available and its IP or FQDN address known.
- Current full Cluster Admin user credentials for the cluster.
- Firewall rules allow open [network communication](#) between the vCenter and the cluster MVIP on TCP ports 443, 8333, and 8443.



You must add at least one cluster to use Management functions.

## About this task

This procedure describes how to add a cluster profile so that the cluster can be managed by the plug-in. You cannot modify cluster administrator credentials using the plug-in.

See [managing cluster administrator user accounts](#) for instructions on changing credentials for a cluster administrator account.

## Steps

1. Select **NetApp Element Remote Plugin > Configuration > Clusters**.
2. Select **Add Cluster**.
3. Enter the following information:
  - **IP address/FQDN**: Enter the cluster MVIP address.
  - **User ID**: Enter a cluster administrator user name.
  - **Password**: Enter a cluster administrator password.
  - **vCenter Server**: If you set up a Linked Mode group, select the vCenter Server you want to access the cluster. If you're not using Linked Mode, the current vCenter Server is the default.



- The hosts for a cluster are exclusive to each vCenter Server. Be sure that the vCenter Server you select has access to the intended hosts. You can remove a cluster, reassign it to another vCenter Server, and add it again if you decide later to use different hosts.
- To use [vCenter Linked Mode](#), you register the Element Plug-in from a separate management node for each vCenter Server that manages NetApp SolidFire storage clusters.

4. Select **OK**.

When the process completes, the cluster appears in the list of available clusters and can be used in the NetApp Element Management extension point.

## Configure QoSSIOC settings using the plug-in

You can set up automatic quality of service based on Storage I/O Control ([QoSSIOC](#)) for individual volumes and datastores controlled by the plug-in. To do so, you configure QoSSIOC and vCenter credentials that will enable the QoSSIOC service to communicate with vCenter.

## About this task

After you have configured valid QoSSIOC settings for the management node, these settings become the default. The QoSSIOC settings revert to the last known valid QoSSIOC settings until you provide valid QoSSIOC settings for a new management node. You must clear the QoSSIOC settings for the configured

management node before setting the QoSSIOC credentials for a new management node.

### Steps

1. Select **NetApp Element Remote Plugin > Configuration > QoSSIOC Settings**.
2. Select **Actions**.
3. In the resulting menu, select **Configure**.
4. In the **Configure QoSSIOC Settings** dialog box, enter the following information:
  - **mNode IP Address/FQDN**: The IP address of the management node for the cluster that contains the QoSSIOC service.
  - **mNode Port**: The port address for the management node that contains the QoSSIOC service. The default port is 8443.
  - **QoSSIOC User ID**: The user ID for the QoSSIOC service. The QoSSIOC service default user ID is admin. For NetApp HCI, the user ID is the same one entered during installation using the NetApp Deployment Engine.
  - **QoSSIOC Password**: The password for the Element QoSSIOC service. The QoSSIOC service default password is solidfire. If you have not created a custom password, you can create one from the registration utility UI ([https://\[management node IP\]:9443](https://[management node IP]:9443)).
  - **vCenter User ID**: The user name for the vCenter admin with full Administrator role privileges.
  - **vCenter Password**: The password for the vCenter admin with full Administrator role privileges.
5. Select **OK**.

The **QoSSIOC Status** field displays UP when the plug-in can successfully communicate with the service.



See this [KB](#) to troubleshoot if the status is any of the following:

- Down: QoSSIOC is not enabled.
- Not Configured: QoSSIOC settings have not been configured.
- Network Down: vCenter cannot communicate with the QoSSIOC service on the network. The mNode and SIOC service might still be running.

After the QoSSIOC service is enabled, you can configure QoSSIOC performance on individual datastores.

## Configure user accounts

To enable access to volumes, you'll need to create at least one [user account](#).

## Create datastores and volumes

You can create [datastores](#) and [Element volumes](#) to start allocating storage.

## Find more information

- [NetApp HCI Documentation](#)
- [NetApp HCI Resources page](#)
- [SolidFire and Element Resources page](#)



# Install and configure Element Plug-in 4.10 and earlier

You can install NetApp Element Plug-in for VMware vCenter Server 4.10 or earlier directly to your vCenter and access the plug-in with the vSphere Web Client.

After installation is complete, you can use the quality of service based on storage I/O control (QoSSIOC) service as well as other services of the vCenter Plug-in.

Read and complete each step to install and begin using the plug-in:

- [Prepare for installation](#)
- [Install the management node](#)
- [Register the plug-in with vCenter](#)
- [Modify vCenter properties for a dark site HTTP server](#)
- [Access the plug-in and verify successful installation](#)
- [Add storage clusters for use with the plug-in](#)
- [Configure QoSSIOC settings using the plug-in](#)
- [Configure user accounts](#)
- [Create datastores and volumes](#)

## Prepare for installation

Before you begin the installation, review [pre-deployment requirements](#).

## Install the management node

You can manually [install the management node](#) for your cluster running NetApp Element software using the appropriate image for your configuration.

This manual process is intended for SolidFire all-flash storage administrators and NetApp HCI administrators who are not using the NetApp Deployment Engine for management node installation.

## Register the plug-in with vCenter

Deploying the vCenter Plug-in package in the vSphere Web Client involves registering the package as an extension on vCenter Server. After registration is complete, the plug-in is available to any vSphere Web Client that connects to your vSphere environment.

### What you'll need

- For vSphere 6.5 and 6.7, ensure you have logged out of the vSphere Web Client. The web client for these versions will not recognize updates made during this process to your plug-in if you do not log out. For vSphere 7.0, you do not need to log out of the web client.
- You have vCenter Administrator role privileges to register a plug-in.
- You have deployed a management node OVA running Element software 11.3 or later.
- Your management node is powered on with its IP address or DHCP address configured.
- You are using an SSH client or web browser (Chrome 56 or later or Firefox 52 or later).
- Your firewall rules allow open [network communication](#) between the vCenter and the storage cluster MVIP

on TCP ports 443, 8443, and 9443. Port 9443 is used for registration and can be closed after registration is complete. If you have enabled virtual volumes functionality on the cluster, ensure TCP port 8444 is also open for VASA provider access.

### About this task

You must register the vCenter Plug-in on every vCenter Server where you need to use the plug-in.

For Linked Mode environments, the plug-in must be registered with each vCenter Server in the environment to keep MOB data in sync and to be able to upgrade the plug-in. When a vSphere Web Client connects to a vCenter Server where your plug-in is not registered, the plug-in is not visible to the client.



Using NetApp Element Plug-in for vCenter Server to manage cluster resources from other vCenter Servers using [vCenter Linked Mode](#) is limited to local storage clusters only.

### Steps

1. Enter the IP address for your management node in a browser, including the TCP port for registration:

`https://<managementNodeIP>:9443`

The registration UI displays the Manage QoSSIOC Service Credentials page for the plug-in.

NetApp Element Plug-in for vCenter Server Management Node

QoSSIOC Service Management vCenter Plug-in Registration

QoSSIOC Management

Manage Credentials

Restart QoSSIOC Service

Manage QoSSIOC Service Credentials

Old Password Current password  
Current password is required

New Password New password  
Must contain at least 8 characters with at least one lower-case and upper-case alphabet, a number and a special character like @\$%&'()\*~+-\_!@

Confirm Password Confirm New Password  
New and confirm passwords must match

SUBMIT CHANGES

Contact NetApp Support at <http://mysupport.netapp.com>

2. **Optional:** Change the password for the QoSSIOC service before registering the vCenter Plug-in:
  - a. For the Old Password, enter the current password of the QoSSIOC service. If you have not yet assigned a password, type the default password:

`solidfire`

b. Select **Submit Changes**.



After you submit changes, the QoSSIOC service automatically restarts.

3. Select **vCenter Plug-in Registration**.

The screenshot shows the NetApp Element Plug-in for vCenter Server Management Node interface. The page title is "vCenter Plug-in - Registration". On the left, there is a sidebar with "Manage vCenter Plug-in" and a list of options: "Register Plug-in" (selected), "Update Plug-in", "Unregister Plug-in", and "Registration Status". The main content area contains the following fields and instructions:

- Register version** [dropdown] of the NetApp Element Plug-in for vCenter Server with your vCenter server. The Plug-in will not be deployed until a fresh vCenter login after registration.
- vCenter Address** [text input] vCenter Server Address  
Enter the IPV4, IPV6 or DNS name of the vCenter server to register plug-in on.
- vCenter User Name** [text input] vCenter Admin User Name  
Ensure this user is a vCenter user that has administrative privileges for registration.
- vCenter Password** [password input] vCenter Admin Password  
The password for the vCenter user name entered.
- ☐ **Customize URL**  
Select to customize the Zip file URL.
- Plug-in Zip URL** [text input] https://10.117.227.12:9443/solidfire-plugin-4.6.0-bin.zip  
URL of XML initialization file.

At the bottom of the main content area is a **REGISTER** button. At the very bottom of the page, it says "Contact NetApp Support at <http://mysupport.netapp.com>".

4. Enter the following information:

- The IPv4 address or the FQDN of the vCenter service on which you will register your plug-in.
- The vCenter Administrator user name.



The user name and password credentials you enter must be for a user with vCenter Administrator role privileges.

- The vCenter Administrator password.
- (For in-house servers/dark sites) A custom URL for the plug-in ZIP.



Most installations use the default path. To customize the URL if you are using an HTTP or HTTPS server (dark site) or have modified the ZIP file name or network settings, select **Custom URL**. For additional steps if you intend to customize a URL, see [Modify vCenter properties for a dark site HTTP server](#).

5. Select **Register**.

6. (Optional) Verify registration status:

a. Select **Registration Status**.

b. Enter the following information:

- The IPv4 address or the FQDN of the vCenter service on which you are registering your plug-in
- The vCenter Administrator user name
- The vCenter Administrator password

c. Select **Check Status** to verify that the new version of the plug-in is registered on the vCenter Server.

7. (For vSphere 6.5 and 6.7 users) Log in to the vSphere Web Client as a vCenter Administrator.



This action completes the installation in the vSphere Web Client. If the vCenter Plug-in icons are not visible from vSphere, see [troubleshooting documentation](#).

8. In the vSphere Web Client, look for the following completed tasks in the task monitor to ensure installation has completed: Download plug-in and Deploy plug-in.

## Modify vCenter properties for a dark site HTTP server

If you intend to customize a URL for an in-house (dark site) HTTP server during vCenter Plug-in registration, you must modify the vSphere Web Client properties file `webclient.properties`. You can use vCSA or Windows to make the changes.

### What you'll need

Permissions to download software from the NetApp Support Site.

### Steps using vCSA

1. SSH into the vCenter Server:

```
Connected to service
* List APIs: "help api list"
* List Plugins: "help pi list"
* Launch BASH: "shell"
Command>
```

2. Enter `shell` in the command prompt to access root:

```
Command> shell
Shell access is granted to root
```

3. Stop the VMware vSphere Web Client service:

```
service-control --stop vsphere-client
service-control --stop vsphere-ui
```

4. Change the directory:

```
cd /etc/vmware/vsphere-client
```

5. Edit the `webclient.properties` file and add `allowHttp=true`.

6. Change the directory:

```
cd /etc/vmware/vsphere-ui
```

7. Edit the `webclient.properties` file and add `allowHttp=true`.

8. Start the VMware vSphere Web Client service:

```
service-control --start vsphere-client  
service-control --start vsphere-ui
```



After you have completed the registration procedure, you can remove `allowHttp=true` from the files you modified.

9. Reboot vCenter.

### Steps using Windows

1. Change the directory from a command prompt:

```
cd c:\Program Files\VMware\vCenter Server\bin
```

2. Stop the VMware vSphere Web Client service:

```
service-control --stop vsphere-client  
service-control --stop vsphere-ui
```

3. Change the directory:

```
cd c:\ProgramData\VMware\vCenterServer\cfg\vsphere-client
```

4. Edit the `webclient.properties` file and add `allowHttp=true`.

5. Change the directory:

```
cd c:\ProgramData\VMware\vCenterServer\cfg\vsphere-ui
```

6. Edit the `webclient.properties` file and add `allowHttp=true`.

7. Change the directory from a command prompt:

```
cd c:\Program Files\VMware\vCenter Server\bin
```

8. Start the VMware vSphere Web Client service:

```
service-control --start vsphere-client  
service-control --start vsphere-ui
```

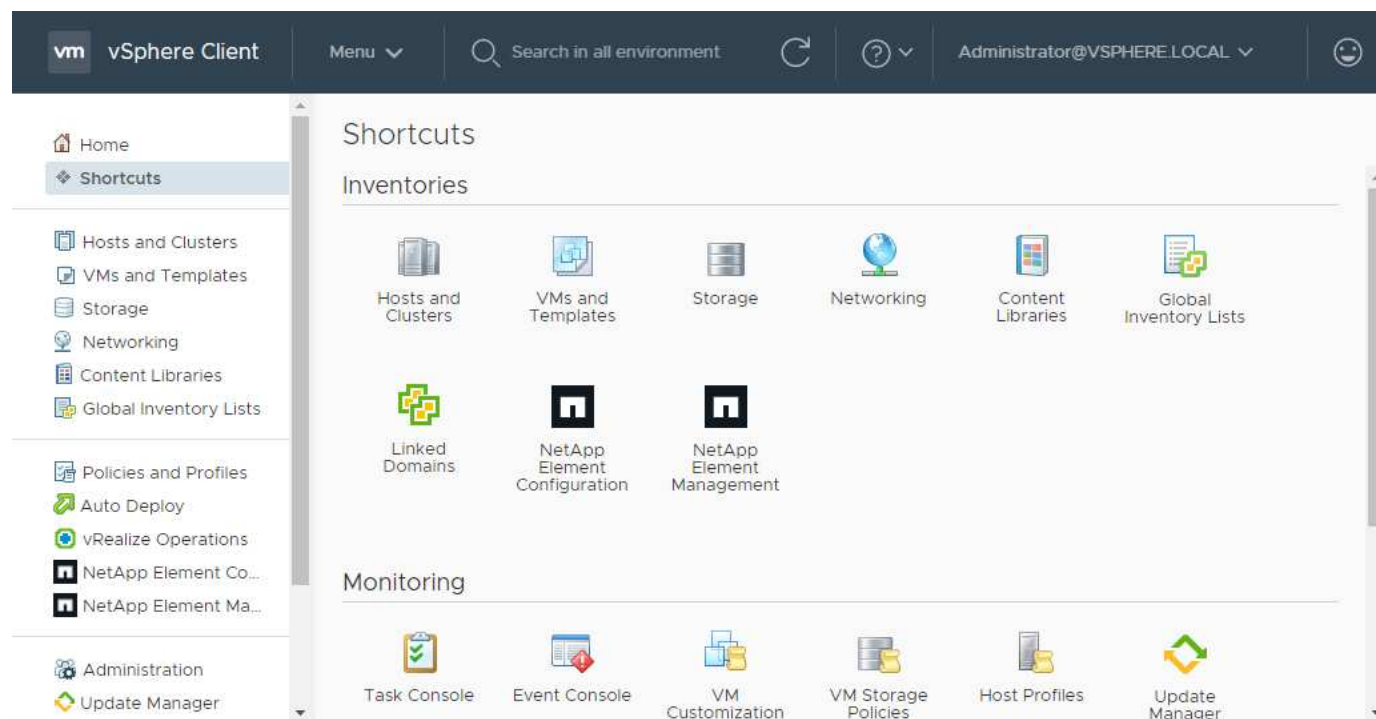


After you have completed the registration procedure, you can remove `allowHttp=true` from the files you modified.

9. Reboot vCenter.

## Access the plug-in and verify successful installation

After successful installation or upgrade, NetApp Element Configuration and Management extension points appear in the Shortcuts tab of the vSphere Web Client and in the side panel.



If the vCenter Plug-in icons are not visible, see the [troubleshooting documentation](#).

## Add storage clusters for use with the plug-in

You can add a cluster running Element software using the NetApp Element Configuration extension point so that it can be managed by the plug-in.

After a connection has been established to the cluster, the cluster can then be managed using the NetApp Element Management extension point.

## What you'll need

- At least one cluster must be available and its IP or FQDN address known.
- Current full Cluster Admin user credentials for the cluster.
- Firewall rules allow open [network communication](#) between the vCenter and the cluster MVIP on TCP ports 443 and 8443.



You must add at least one cluster to use the NetApp Element Management extension point functions.

## About this task

This procedure describes how to add a cluster profile so that the cluster can be managed by the plug-in. You cannot modify cluster administrator credentials using the plug-in.

See [managing cluster administrator user accounts](#) for instructions on changing credentials for a cluster administrator account.



The vSphere HTML5 web client and Flash web client have separate databases that cannot be combined. Clusters added in one client will not be visible in the other. If you intend to use both clients, add your clusters in both.

## Steps

1. Select **NetApp Element Configuration > Clusters**.
2. Select **Add Cluster**.
3. Enter the following information:
  - **IP address/FQDN**: Enter the cluster MVIP address.
  - **User ID**: Enter a cluster administrator user name.
  - **Password**: Enter a cluster administrator password.
  - **vCenter Server**: If you set up a Linked Mode group, select the vCenter Server you want to access the cluster. If you're not using Linked Mode, the current vCenter Server is the default.



- The hosts for a cluster are exclusive to each vCenter Server. Be sure that the vCenter Server you select has access to the intended hosts. You can remove a cluster, reassign it to another vCenter Server, and add it again if you decide later to use different hosts.
- Using NetApp Element Plug-in for vCenter Server to manage cluster resources from other vCenter Servers using [vCenter Linked Mode](#) is limited to local storage clusters only.

4. Select **OK**.

When the process completes, the cluster appears in the list of available clusters and can be used in the NetApp Element Management extension point.

## Configure QoSSIOC settings using the plug-in

You can set up automatic quality of service based on Storage I/O Control ([QoSSIOC](#)) for individual volumes and datastores controlled by the plug-in. To do so, you configure QoSSIOC and vCenter credentials that will enable the QoSSIOC service to communicate with vCenter.

## About this task

After you have configured valid QoSSIOC settings for the management node, these settings become the default. The QoSSIOC settings revert to the last known valid QoSSIOC settings until you provide valid QoSSIOC settings for a new management node. You must clear the QoSSIOC settings for the configured management node before setting the QoSSIOC credentials for a new management node.

## Steps

1. Select **NetApp Element Configuration > QoSSIOC Settings**.
2. Select **Actions**.
3. In the resulting menu, select **Configure**.
4. In the **Configure QoSSIOC Settings** dialog box, enter the following information:
  - **mNode IP Address/FQDN**: The IP address of the management node for the cluster that contains the QoSSIOC service.
  - **mNode Port**: The port address for the management node that contains the QoSSIOC service. The default port is 8443.
  - **QoSSIOC User ID**: The user ID for the QoSSIOC service. The QoSSIOC service default user ID is admin. For NetApp HCI, the user ID is the same one entered during installation using the NetApp Deployment Engine.
  - **QoSSIOC Password**: The password for the Element QoSSIOC service. The QoSSIOC service default password is `solidfire`. If you have not created a custom password, you can create one from the registration utility UI (`https://[management node IP]:9443`).
  - **vCenter User ID**: The user name for the vCenter admin with full Administrator role privileges.
  - **vCenter Password**: The password for the vCenter admin with full Administrator role privileges.
5. Select **OK**.

The **QoSSIOC Status** field displays UP when the plug-in can successfully communicate with the service.



See this [KB](#) to troubleshoot if the status is any of the following:

- **Down**: QoSSIOC is not enabled.
- **Not Configured**: QoSSIOC settings have not been configured.
- **Network Down**: vCenter cannot communicate with the QoSSIOC service on the network. The mNode and SIOC service might still be running.

After the QoSSIOC service is enabled, you can configure QoSSIOC performance on individual datastores.

## Configure user accounts

To enable access to volumes, you'll need to create at least one [user account](#).

## Create datastores and volumes

You can create [datastores and Element volumes](#) to start allocating storage.



## Find more information

- [NetApp HCI Documentation](#)
- [NetApp HCI Resources page](#)
- [SolidFire and Element Resources page](#)

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