



Manage NetApp HCI

HCI

NetApp
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Table of Contents

- Manage NetApp HCI..... 1
 - Monitor your NetApp HCI system 1
 - Work with the management node 8

Manage NetApp HCI

Monitor your NetApp HCI system

Monitor storage and compute resources with the HCC Dashboard

With the NetApp Hybrid Control (HCC) Dashboard, you can view all your storage and compute resources at a glance.

Only compute nodes that are managed and clusters with at least one managed node in H-series hardware appear on the Dashboard.

Steps

1. Open a web browser and browse to the IP address of the management node. For example:

```
https://[management node IP address]
```

2. Log in to NetApp Hybrid Cloud Control by providing the NetApp HCI storage cluster administrator credentials.
3. View the Dashboard:
 - **Storage:** Displays the number of storage clusters, storage nodes, and total volumes.
 - **Compute:** Displays the number of compute clusters and total compute nodes.
 - **Storage Capacity:** Displays the total physical storage space available in your cluster on the **RAW** tab, and information about the provisioned storage on the **EFFECTIVE** tab.



To view cluster health, look at the SolidFire Active IQ Dashboard. See [Monitor performance, capacity, and cluster health in SolidFire Active IQ](#).

Find more information

- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

View your inventory in the Nodes page

You can view both your storage and compute assets in your system and determine their IP addresses, names, and software versions.

You can view storage information for your two-, three-, and four-node systems and any NetApp HCI Witness Nodes associated with two-node or three-node clusters.

Witness Nodes manage quorum within the cluster; they are not used for storage. Witness Nodes are applicable only to NetApp HCI and not to all-flash storage environments.

For more information about Witness Nodes, see [Nodes definitions](#).

Steps

- 1. Open a web browser and browse to the IP address of the management node. For example:

https://[management node IP address]

- 2. Log in to NetApp Hybrid Cloud Control by providing the NetApp HCI storage cluster administrator credentials.
- 3. In the left navigation blue box, select the NetApp HCI installation.

The Hybrid Cloud Control Dashboard appears.

- 4. In the left navigation, click **Nodes**.

The Storage tab appears.

Nodes

Only NetApp HCI Nodes are displayed on this page.

STORAGE

COMPUTE

RagnarokNomadCluster

1 of 1

Two-node

Hostname

Node Model

Element Version

Management IP Address

stg01

H410S-0

12.0.0.318

- VLAN 1184

stg02

H410S-0

12.0.0.318

- VLAN 1184

1 - 2 of 2 results

1

30

Witness Nodes

Hostname

Management IP Address

Storage (iSCSI) IP Address

wit01

wit02

- 5. On the **Storage** tab of the Nodes page, review the following information:
 - a. Two-node clusters: A “two-node” label appears on the Storage tab and the associated Witness Nodes are listed.
 - b. Three-node clusters: The storage nodes and associated Witness Nodes are listed. Three-node clusters have a Witness Node deployed on standby to maintain high availability in the case of node failure.

- c. Clusters with four nodes or more: Information for clusters with four or more nodes appears. Witness Nodes do not apply; the Witness Nodes table does not appear.
6. To view compute inventory information, click **Compute**.
7. You can manipulate the information on this page in several ways:
 - a. To filter the list of items in the results, click the **Filter** icon and select the filters. You can also enter text for the filter.
 - b. To show or hide columns, click the **Show/Hide Columns** icon.
 - c. To download the table, click the **Download** icon.



To view the number of storage and compute resources, look at the Hybrid Cloud Control (HCC) Dashboard. See [Monitor storage and compute resources with the HCC Dashboard](#).

Find more information

- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Monitor performance, capacity, and cluster health with SolidFire Active IQ

By using SolidFire Active IQ, you can monitor the events, performance, and capacity of your clusters. You can access SolidFire Active IQ from the NetApp Hybrid Control Dashboard.

Before you begin

- You must have a NetApp Support account to take advantage of this service.
- You must have authorization to use management node REST APIs.
- You have deployed a management node running version 12.0 or later.
- Your cluster version is running NetApp Element software 12.0 or later.
- You have Internet access. The Active IQ collector service cannot be used from dark sites.

About this task

You can obtain continually updated historical views of cluster-wide statistics. You can set up notifications to alert you about specified events, thresholds, or metrics on a cluster so that they can be addressed quickly.

By default, NetApp HCI sends performance and alert statistics to the NetApp SolidFire Active IQ service. As part of your normal support contract, NetApp Support monitors this data and alerts you to potential system issues.

Steps

1. Open a web browser and browse to the IP address of the management node. For example:

```
https://[management node IP address]
```

2. Log in to NetApp Hybrid Cloud Control by providing the NetApp HCI storage cluster administrator credentials.
3. From the Dashboard, click the menu on the upper right.
4. Select **View Active IQ**.

The [SolidFire Active IQ Dashboard](#) appears.

5. To learn about SolidFire Active IQ, from the Dashboard, click the menu icon on the upper right and click **Documentation**.
6. From the SolidFire Active IQ interface, verify that the NetApp HCI compute and storage nodes are reporting telemetry correctly to Active IQ:
 - a. If you have more than one NetApp HCI installation, click **Select a Cluster** and choose the cluster from the list.
 - b. In the left navigation pane, click **Nodes**.
7. If a node or nodes are missing from the list, contact NetApp Support.



To view the number of storage and compute resources, look at the Hybrid Cloud Control (HCC) Dashboard. See [Monitor storage and compute resources with the HCC Dashboard](#).

Find more information

- [NetApp SolidFire Active IQ Documentation](#)
- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Collect NetApp HCI logs

If you have trouble with your NetApp HCI installation, you can collect logs to send to NetApp Support to help with diagnosis. You can either use NetApp Hybrid Cloud Control or the REST API to collect logs.

Log collection options

Choose one of the following options:

- [Use NetApp Hybrid Cloud Control to collect NetApp HCI logs](#)
- [Use the REST API to collect NetApp HCI logs](#)

Use NetApp Hybrid Cloud Control to collect NetApp HCI logs

You can access the log collection area from the NetApp Hybrid Cloud Control Dashboard.

Steps

1. Open a web browser and browse to the IP address of the management node. For example:

```
https://[management node IP address]
```

2. Log in to NetApp Hybrid Cloud Control by providing the NetApp HCI storage cluster administrator credentials.
3. From the Dashboard, click the menu on the upper right.
4. Select **Collect Logs**.

The **Collect Logs** page appears. If you have collected logs before, you can download the existing log package, or begin a new log collection.

5. Select a date range in the **Date Range** drop-down menu to specify what dates the logs should include.

If you specify a custom start date, you can select the date to begin the date range. Logs will be collected from that date up to the present time.

6. In the **Log Collection** section, select the types of log files the log package should include.

For storage and compute logs, you can expand the list of storage or compute nodes and select individual nodes to collect logs from (or all nodes in the list).

7. Click **Collect Logs** to start log collection.

Log collection runs in the background, and the page shows the progress.



Depending on the logs you collect, the progress bar might remain at a certain percentage for several minutes, or progress very slowly at some points.

8. Click **Download Logs** to download the log package.

The log package is in a compressed UNIX .tgz file format.

Use the REST API to collect NetApp HCI logs

You can use REST API to collect NetApp HCI logs.

Steps

1. Locate the storage cluster ID:

a. Open the management node REST API UI on the management node:

```
https://[management node IP]/logs/1
```

b. Click **Authorize** and complete the following:

i. Enter the cluster user name and password.

ii. Enter the client ID as `mnode-client` if the value is not already populated.

iii. Click **Authorize** to begin a session.

2. Collect logs from NetApp HCI:

a. Click **POST /bundle**.

b. Click **Try it out**.

c. Change the values of the following parameters in the **Request body** field depending on which type of logs you need to collect and for what time range:

Parameter	Type	Description
<code>modifiedSince</code>	Date string	Only include logs modified after this date and time. For example, the value "2020-07-14T20:19:00.000Z" defines a start date of July 14, 2020 at 20:19 UTC.
<code>computeLogs</code>	Boolean	Set this parameter to <code>true</code> to include compute node logs.
<code>computeIds</code>	UUID array	If <code>computeLogs</code> is set to <code>true</code> , populate this parameter with the management node asset IDs of compute nodes to limit log collection to those specific compute nodes. Use the <code>GET https://[management node IP]/logs/1/bundle/options</code> endpoint to see all possible node IDs you can use.

Parameter	Type	Description
<code>mnodeLogs</code>	Boolean	Set this parameter to <code>true</code> to include management node logs.
<code>storageCrashDumps</code>	Boolean	Set this parameter to <code>true</code> to include storage node crash debug logs.
<code>storageLogs</code>	Boolean	Set this parameter to <code>true</code> to include storage node logs.
<code>storageNodeIds</code>	UUID array	If <code>storageLogs</code> is set to <code>true</code> , populate this parameter with the storage cluster node IDs to limit log collection to those specific storage nodes. Use the <code>GET https://[management node IP]/logs/1/bundle/options</code> endpoint to see all possible node IDs you can use.

d. Click **Execute** to begin log collection.

The response should return a response similar to the following:

```
{
  "_links": {
    "self": "https://10.1.1.5/logs/1/bundle"
  },
  "taskId": "4157881b-z889-45ce-adb4-92b1843c53ee",
  "taskLink": "https://10.1.1.5/logs/1/bundle"
}
```

3. Check on the status of the log collection task:

- Click **GET /bundle**.
- Click **Try it out**.
- Click **Execute** to return a status of the collection task.
- Scroll to the bottom of the response body.

You should see a `percentComplete` attribute detailing the progress of the collection. If the collection is complete, the `downloadLink` attribute contains the full download link including the file name of the log package.

- Copy the file name at the end of the `downloadLink` attribute.

4. Download the collected log package:
 - a. Click **GET /bundle/{filename}**.
 - b. Click **Try it out**.
 - c. Paste the file name you copied earlier into the **filename** parameter text field.
 - d. Click **Execute**.

After execution, a download link appears in the response body area.

- e. Click **Download file** and save the resulting file to your computer.

The log package is in a compressed UNIX .tgz file format.

Find more information

- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Work with the management node

Management node overview

You can use the management node (mNode) to upgrade system services, manage cluster assets and settings, run system tests and utilities, configure Active IQ for system monitoring, and enable NetApp Support access for troubleshooting.

For clusters running Element software version 11.3 or later, you can work with the management node by using one of two interfaces:

- With the management node UI ([https:// \[mNode IP\]:442](https:// [mNode IP]:442)), you can make changes to network and cluster settings, run system tests, or use system utilities.
- With the built-in REST API UI ([https://\[mNode IP\]/mnode](https://[mNode IP]/mnode)), you can run or understand APIs relating to the management node services, including proxy server configuration, service level updates, or asset management.

Install or recover a management node:

- [Install a management node](#)
- [Configure a storage Network Interface Controller \(NIC\)](#)
- [Recover a management node](#)

Access the management node:

- [Access the management node \(UI or REST API\)](#)

Tasks you can perform with the management node UI:

- [Configure alert monitoring on NetApp HCI](#)
- [Modify and test the management node network, cluster, and system settings](#)
- [Run system utilities from the management node](#)

Tasks you can perform with the management node REST APIs:

- [Get authorization to use REST APIs](#)
- [Enable Active IQ and NetApp HCI monitoring](#)
- [Add compute and controller assets to the management node](#)
- [Change the storage cluster administrator password](#)
- [Configure a proxy server for the management node](#)
- [Use the REST API to collect NetApp HCI logs](#)

Enable remote NetApp Support connections to help you troubleshoot:

- [Enable remote NetApp Support connections](#)

Find more information

- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Install or recover a management node

Install a 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.

Before you begin

- Your cluster version is running NetApp Element software 11.3 or later.
- Your installation uses IPv4. The management node 11.3 does not support IPv6.



If you need to IPv6 support, you can use the management node 11.1.

- You have permission to download software from the NetApp Support Site.

- You have identified the management node image type that is correct for your platform:

Platform	Installation image type
Microsoft Hyper-V	.iso
KVM	.iso
VMware vSphere	.iso, .ova
Citrix XenServer	.iso
OpenStack	.iso

About this task

Prior to following this procedure, you should have an understanding of [persistent volumes](#) and whether or not you want to use them.

Steps

1. [Download ISO or OVA and deploy the VM](#)
2. [Create the management node admin and configure the network](#)
3. [Configure the management node](#)
4. [Configure controller assets](#)
5. (NetApp HCI only) [Configure compute node assets](#)

Download ISO or OVA and deploy the VM

1. Download the OVA or ISO for your installation from the NetApp Support Site:

Element software: <https://mysupport.netapp.com/site/products/all/details/element-software/downloads-tab>

NetApp HCI: <https://mysupport.netapp.com/site/products/all/details/netapp-hci/downloads-tab>

- a. Click **Download Latest Release** and accept the EULA.
 - b. Select the management node image you want to download.
2. If you downloaded the OVA, follow these steps:
 - a. Deploy the OVA.
 - b. If your storage cluster is on a separate subnet from your management node (eth0) and you want to use persistent volumes, add a second network interface controller (NIC) to the VM on the storage subnet (for example, eth1) or ensure that the management network can route to the storage network.
 3. If you downloaded the ISO, follow these steps:
 - a. Create a new 64-bit virtual machine from your hypervisor with the following configuration:
 - Six virtual CPUs

- 12GB RAM
- 400GB virtual disk, thin provisioned
- One virtual network interface with internet access and access to the storage MVIP.
- (Optional for SolidFire all-flash storage) One virtual network interface with management network access to the storage cluster. If your storage cluster is on a separate subnet from your management node (eth0) and you want to use persistent volumes, add a second network interface controller (NIC) to the VM on the storage subnet (eth1) or ensure that the management network can route to the storage network.



Do not power on the virtual machine prior to the step indicating to do so later in this procedure.

b. Attach the ISO to the virtual machine and boot to the .iso install image.



Installing a management node using the image might result in 30-second delay before the splash screen appears.

4. Power on the virtual machine for the management node after the installation completes.

Create the management node admin and configure the network

1. Using the terminal user interface (TUI), create a management node admin user.



To move through the menu options, press the Up or Down arrow keys. To move through the buttons, press Tab. To move from the buttons to the fields, press Tab. To navigate between fields, press the Up or Down arrow keys.

2. Configure the management node network (eth0).



If you need an additional NIC to isolate storage traffic, see instructions on configuring another NIC: [Configure a storage Network Interface Controller \(NIC\)](#).

Configure the management node

1. SSH into the management node.
2. Using SSH, run the following command to gain root privileges. Enter your password when prompted:

```
sudo su
```

3. Ensure time is synced (NTP) between the management node and the storage cluster.



In vSphere, the **Synchronize guest time with host** box should be checked in the VM options. Do not disable this option if you make future changes to the VM.

4. Configure and run the management node setup command:



You will be prompted to enter passwords in a secure prompt. If your cluster is behind a proxy server, you must configure the proxy settings so you can reach a public network.

```
/sf/packages/mnode/setup-mnode --mnode_admin_user [username] --storage_mvip [mvip]
--storage_username [username] --telemetry_active [true]
```

a. Replace the value in [] brackets (including the brackets) for each of the following required parameters:



The abbreviated form of the command name is in parentheses () and can be substituted for the full name.

- **--mnode_admin_user (-mu) [username]**: The username for the management node administrator account. This is likely to be the username for the user account you used to log into the management node.
- **--storage_mvip (-sm) [MVIP address]**: The management virtual IP address (MVIP) of the storage cluster running Element software.
- **--storage_username (-su) [username]**: The storage cluster administrator username for the cluster specified by the **--storage_mvip** parameter.
- **--telemetry_active (-t) [true]**: Retain the value true that enables data collection for analytics by Active IQ.

b. (Optional): Add Active IQ endpoint parameters to the command:

- **--remote_host (-rh) [AIQ_endpoint]**: The endpoint where Active IQ telemetry data is sent to be processed. If the parameter is not included, the default endpoint is used.

c. (Optional): Add the following persistent volume parameters. Do not modify or delete the account and volumes created for persistent volumes functionality or a loss in management capability will result.

- **--use_persistent_volumes (-pv) [true/false, default: false]**: Enable or disable persistent volumes. Enter the value true to enable persistent volumes functionality.
- **--persistent_volumes_account (-pva) [account_name]**: If **--use_persistent_volumes** is set to true, use this parameter and enter the storage account name that will be used for persistent volumes.



Use a unique account name for persistent volumes that is different from any existing account name on the cluster. It is critically important to keep the account for persistent volumes separate from the rest of your environment.

- **--persistent_volumes_mvip (-pvm) [mvip]:** Enter the management virtual IP address (MVIP) of the storage cluster running Element software that will be used with persistent volumes. This is only required if multiple storage clusters are managed by the management node. If multiple clusters are not managed, the default cluster MVIP will be used.

d. Configure a proxy server:

- **--use_proxy (-up) [true/false, default: false]:** Enable or disable the use of the proxy. This parameter is required to configure a proxy server.
- **--proxy_hostname_or_ip (-pi) [host]:** The proxy hostname or IP. This is required if you want to use a proxy. If you specify this, you will be prompted to input **--proxy_port**.
- **--proxy_username (-pu) [username]:** The proxy username. This parameter is optional.
- **--proxy_password (-pp) [password]:** The proxy password. This parameter is optional.
- **--proxy_port (-pq) [port, default: 0]:** The proxy port. If you specify this, you will be prompted to input the proxy host name or IP (**--proxy_hostname_or_ip**).
- **--proxy_ssh_port (-ps) [port, default: 443]:** The SSH proxy port. This defaults to port 443.

e. (Optional) Use parameter help if you need additional information about each parameter:

- **--help (-h):** Returns information about each parameter. Parameters are defined as required or optional based on initial deployment. Upgrade and redeployment parameter requirements might vary.

f. Run the **setup-mnode** command.

Configure controller assets

1. From a browser, log into the management node REST API UI:

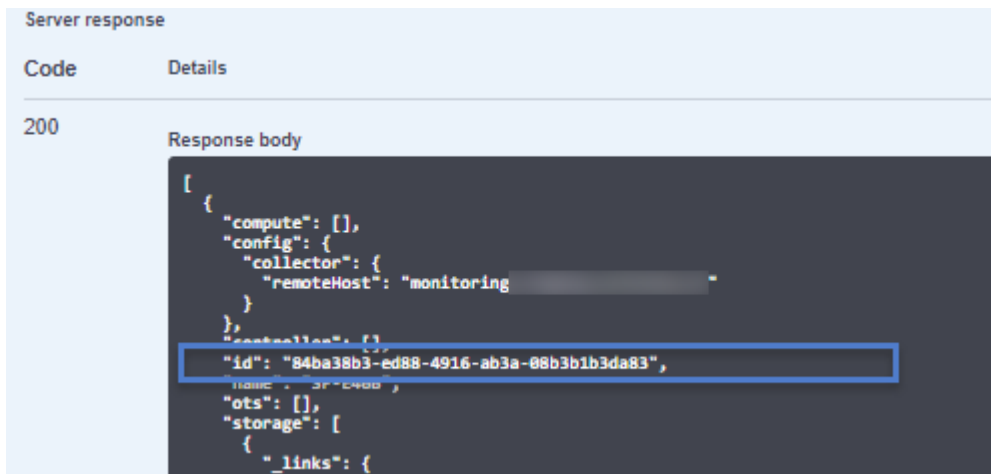
- a. Go to the storage MVIP and log in. This action causes the certificate to be accepted for the next step.
- b. Open the REST API UI on the management node:

```
https://[management node IP]/ mnode
```

2. From the management node REST API UI, click **Authorize** or any lock icon and complete the following:

- a. Enter the cluster user name and password.
- b. Enter the client ID as **mnode-client**.

- c. Click **Authorize** to begin a session.
 - d. Close the window.
3. Run **GET /assets** to find the base asset ID that you will need for the next steps:
 1. Click **GET /assets**.
 2. Click **Try it out**.
 3. Click **Execute**.
 4. Copy the value for **"id"** for the base asset to your clipboard:



Your installation has a base asset configuration that was created during installation or upgrade.

4. Add a vCenter controller asset for NetApp HCI monitoring (NetApp HCI installations only) and Hybrid Cloud Control (for all installations) to the management node known assets:
 - a. Click **POST /assets/{asset_id}/controllers** to add a controller sub-asset.
 - b. Click **Try it out**.
 - c. Enter the required payload values as defined in the **Model** tab with type vCenter and vCenter credentials.
 - d. Enter the parent base asset ID you copied to your clipboard in the **asset_id** field.
 - e. Click **Execute**.

(NetApp HCI only) Configure compute node assets

1. (For NetApp HCI only) Add a compute node asset to the management node known assets:
 - a. Click **POST/assets/{asset_id}/compute-nodes** to add a compute node sub-asset with credentials for the compute node asset.
 - b. Click **Try it out**.
 - c. In the payload, enter the required payload values as defined in the Model tab. Use type **ESXi Host** and remove the **"hardware_tag"** parameter.
 - d. Enter the parent base asset ID you copied to your clipboard in the **asset_id** field.

e. Click **Execute**.

Find more Information

- [Persistent volumes](#)
- [Add an asset to the management node](#)
- [Configure a storage NIC](#)
- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Configure a storage Network Interface Controller (NIC)

If you are using an additional NIC for storage, you can SSH in to the management node or use the vCenter console and run a curl command to set up that network interface.

Before you begin

- You know your eth0 IP address.
- Your cluster version is running NetApp Element software 11.3 or later.
- You have deployed a management node 11.3 or later.

Steps

1. Open an SSH or vCenter console.
2. Replace the values in the following command template and run the command:



Values are represented by **\$** for each of the required parameters for your new storage network interface. The **cluster** object in the following template is required and can be used for management node host name renaming. The **--insecure** or **-k** options should not be used in production environments.

```
curl -u $mnode_user_name:$mnode_password --insecure -X POST \
https://$mnode_IP:442/json-rpc/10.0 \
-H 'Content-Type: application/json' \
-H 'cache-control: no-cache' \
-d '{
    "params": {
        "network": {
            "$eth1": {
                "#default" : false,
                "address" : "$storage_IP",
                "auto" : true,
                "family" : "inet",
                "method" : "static",
                "mtu" : "9000",
                "netmask" : "$subnet_mask",
                "status" : "Up"
            }
        },
        "cluster": {
            "name": "$mnode_host_name"
        }
    },
    "method": "SetConfig"
}
```

Find more Information

- [Add an asset to the management node](#)
- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Recover a management node

You can manually recover and redeploy the management node for your cluster running NetApp Element software if your previous management node used persistent volumes.

You can deploy a new OVA and run a redeploy script to pull configuration data from a previously installed management node running version 11.3 and later.

Before you begin

- Your previous management node was running NetApp Element software version 11.3 or later with persistent volumes functionality engaged.

- You know the MVIP and SVIP of the cluster containing the persistent volumes.
- Your cluster version is running NetApp Element software 11.3 or later.
- Your installation uses IPv4. The management node 11.3 does not support IPv6.
- You have permission to download software from the NetApp Support Site.
- You have identified the management node image type that is correct for your platform:

Platform	Installation image type
Microsoft Hyper-V	.iso
KVM	.iso
VMware vSphere	.iso, .ova
Citrix XenServer	.iso
OpenStack	.iso

About this task

Prior to completing this procedure, you should have an understanding of [persistent volumes](#) and whether or not you want to use them.

- [Download ISO or OVA and deploy the VM](#)
- [Configure the network](#)
- [Configure the management node](#)

Download ISO or OVA and deploy the VM

1. Download the OVA or ISO for your installation from the NetApp Support Site:

Element software: <https://mysupport.netapp.com/site/products/all/details/element-software/downloads-tab>

NetApp HCI: <https://mysupport.netapp.com/site/products/all/details/netapp-hci/downloads-tab>

- a. Click **Download Latest Release** and accept the EULA.
 - b. Select the management node image you want to download.
2. If you downloaded the OVA, follow these steps:
 - a. Deploy the OVA.
 - b. If your storage cluster is on a separate subnet from your management node (eth0) and you want to use persistent volumes, add a second network interface controller (NIC) to the VM on the storage subnet (for example, eth1) or ensure that the management network can route to the storage network.
 3. If you downloaded the ISO, follow these steps:
 - a. Create a new 64-bit virtual machine from your hypervisor with the following configuration:

- Six virtual CPUs
- 12GB RAM
- 400GB virtual disk, thin provisioned
- One virtual network interface with internet access and access to the storage MVIP.
- (Optional for SolidFire all-flash storage) One virtual network interface with management network access to the storage cluster. If your storage cluster is on a separate subnet from your management node (eth0) and you want to use persistent volumes, add a second network interface controller (NIC) to the VM on the storage subnet (eth1) or ensure that the management network can route to the storage network.



Do not power on the virtual machine prior to the step indicating to do so later in this procedure.

- b. Attach the ISO to the virtual machine and boot to the .iso install image.



Installing a management node using the image might result in 30-second delay before the splash screen appears.

4. Power on the virtual machine for the management node after the installation completes.

Configure the network

1. Using the terminal user interface (TUI), create a management node admin user.



To move through the menu options, press the Up or Down arrow keys. To move through the buttons, press Tab. To move from the buttons to the fields, press Tab. To navigate between fields, press the Up or Down arrow keys.

2. Configure the management node network (eth0).



If you need an additional NIC to isolate storage traffic, see instructions on configuring another NIC: [Configure a storage Network Interface Controller \(NIC\)](#).

Configure the management node

1. SSH into the management node or use the console provided by your hypervisor.
2. Using SSH, run the following command to gain root privileges. Enter your password when prompted:

```
sudo su
```

3. Ensure time is synced (NTP) between the management node and the storage cluster.



In vSphere, the **Synchronize guest time with host** box should be checked in the VM options. Do not disable this option if you make future changes to the VM.

4. Configure and run the management node redeploy command to connect to persistent volumes hosted on the cluster and start services with previous management node configuration data:



You will be prompted to enter passwords in a secure prompt. If your cluster is behind a proxy server, you must configure the proxy settings so you can reach a public network.

```
/sf/packages/mnode/redeploy-mnode --mnode_admin_user [username]
```

- a. Replace the value in [] brackets (including the brackets) for each of the following required parameters:



The abbreviated form of the command name is in parentheses () and can be substituted for the full name. You can add the following required parameters or allow the script to prompt you for the information.

- **--mnode_admin_user (-mu) [username]**: The username for the management node administrator account. This is likely to be the username for the user account you used to log into the management node.
- **--storage_mvip (-sm) [MVIP address]**: The management virtual IP address (MVIP) of the storage cluster running Element software with the persistent volumes that contain management node data for recovery.
- **--storage_username (-su) [username]**: The storage cluster administrator username for the cluster specified by the **--storage_mvip** parameter.
- **--persistent_volumes_account (-pva) [account_name]**: Enter the storage account name from the cluster containing the persistent volumes. This is the exact name of the storage user account that owns the volumes in the cluster.

- b. (Optional) Use parameter help if you need additional information about each parameter:

- **--help (-h)**: Returns information about each parameter. Parameters are defined as required or optional based on initial deployment. Upgrade and redeployment parameter requirements might vary.

- c. Run the **redeploy-mnode** command.

Find more Information

- [Persistent volumes](#)
- [NetApp HCI Documentation Center](#)

- [NetApp HCI Resources Page](#)

Access the management node

Beginning with NetApp Element software version 11.3, the management node contains two UIs: a UI for managing REST-based services and a per-node UI for managing network and cluster settings and operating system tests and utilities.

For clusters running Element software version 11.3 or later, you can make use one of two interfaces:

- By using the management node UI ([https:// \[mNode IP\]:442](https://[mNode IP]:442)), you can make changes to network and cluster settings, run system tests, or use system utilities.
- By using the built-in REST API UI ([https://\[mNode IP\]/mnode](https://[mNode IP]/mnode)), you can run or understand APIs relating to the management node services, including proxy server configuration, service level updates, or asset management.

Access the management node per-node UI

From the per-node UI, you can access network and cluster settings and utilize system tests and utilities.

Steps

1. Access the per-node UI for the management node by entering the management node IP address followed by :442

```
https://[IP address]:442
```

Network Settings - Management

Method : static

Link Speed : 1000

IPv4 Address : 10.117.148.201

IPv4 Subnet Mask : 255.255.255.0

IPv4 Gateway Address : 10.117.151.254

IPv6 Address :

IPv6 Gateway Address :

MTU : 1500

DNS Servers : 10.117.20.40, 10.116.133.40

Search Domains : den.solidfire.net, one.den.solidfire

Status : UpAndRunning

Routes

[+ Add](#)

[Reset Changes](#)

[Save Changes](#)

2. Enter the management node user name and password when prompted.

Access the management node REST API UI

From the REST API UI, you can access a menu of service-related APIs that control management services on the management node.

Steps

1. To access the REST API UI for management services, enter the management node IP address followed by `/mnode`:

```
https://[IP address]/mnode
```

MANAGEMENT SERVICES API ^{4.0}

[Base URL: /mnode]
<https://10.117.1.100/mnode/swagger.json>

The configuration REST service for MANAGEMENT SERVICES

[NetApp - Website](#)

[NetApp Commercial Software License](#)

Authorize 

logs Log service

GET /logs Get logs from the MNODE service(s)

assets Asset service

POST /assets Add a new asset

GET /assets Get all assets

GET /assets/compute-nodes Get all compute nodes

GET /assets/compute-nodes/{compute_node_id} Get a specific compute node by ID

GET /assets/controllers Get all controllers

GET /assets/controllers/{controller_id} Get a specific controller by ID

GET /assets/storage-clusters Get all storage clusters

GET /assets/storage-clusters/{storage_cluster_id} Get a specific storage cluster by ID

PUT /assets/{asset_id} Modify an asset with a specific ID

DELETE /assets/{asset_id} Delete an asset with a specific ID

GET /assets/{asset_id} Get an asset by it's ID

POST /assets/{asset_id}/compute-nodes Add a compute asset

GET /assets/{asset_id}/compute-nodes Get compute assets

PUT /assets/{asset_id}/compute-nodes/{compute_id} Update a specific compute node asset

DELETE /assets/{asset_id}/compute-nodes/{compute_id} Delete a specific compute node asset

2. Click **Authorize** or any lock icon and enter cluster admin credentials for permissions to use APIs.

Find more Information

- [Enable the Active IQ collector service for SolidFire all-flash storage](#)
- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Work with the management node UI

Management node UI overview

With the management node UI ([https://\[management node IP\]:442](https://[management node IP]:442)), you can make changes to network and cluster settings, run system tests, or use system utilities.

Tasks you can perform with the management node UI:

- [Configure alert monitoring on NetApp HCI](#)
- [Modify and test the management node network, cluster, and system settings](#)
- [Run system utilities from the management node](#)

Find more information

- [Access the management node](#)
- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Configure alert monitoring on NetApp HCI

You can configure settings to monitor alerts on your NetApp HCI system.

NetApp HCI alert monitoring forwards NetApp HCI storage cluster system alerts to vCenter Server, enabling you to view all alerts for NetApp HCI from the vSphere Web Client interface.





These tools are not configured or used for storage-only clusters, such as SolidFire all-flash storage. Running the tools for these clusters results in the following 405 error, which is expected given the configuration: `webUIParseError : Invalid response from server. 405`

1. Open the per-node management node UI (`https://[IP address]:442`).
2. Click the **Alert Monitor** tab.
3. Configure the alert monitoring options.

Alert monitoring options

options	Description
Run Alert Monitor Tests	<p>Runs the monitor system tests to check for the following:</p> <ul style="list-style-type: none">• NetApp HCI and VMware vCenter connectivity• Pairing of NetApp HCI and VMware vCenter through datastore information supplied by the QoSSIOC service• Current NetApp HCI alarm and vCenter alarm lists

options	Description
Collect Alerts	Enables or disables the forwarding of NetApp HCI storage alarms to vCenter. You can select the target storage cluster from the drop-down list. The default setting for this option is Enabled .
Collect Best Practice Alerts	Enables or disables the forwarding of NetApp HCI storage Best Practice alerts to vCenter. Best Practice alerts are faults that are triggered by a sub-optimal system configuration. The default setting for this option is Disabled . When disabled, NetApp HCI storage Best Practice alerts do not appear in vCenter.
Send Support Data To AIQ	<p>Controls the flow of support and monitoring data from VMware vCenter to NetApp SolidFire Active IQ.</p> <p>Options are the following:</p> <ul style="list-style-type: none"> • Enabled: All vCenter alarms, NetApp HCI storage alarms, and support data are sent to NetApp SolidFire Active IQ. This enables NetApp to proactively support and monitor the NetApp HCI installation, so that possible problems can be detected and resolved before affecting the system. • Disabled: No vCenter alarms, NetApp HCI storage alarms, or support data are sent to NetApp SolidFire Active IQ. <div>  <p>If you turned off the Send data to AIQ option using NetApp Deployment Engine, you need to enable telemetry again using the management node REST API to configure the service from this page.</p> </div>

options	Description
Send Compute Node Data To AIQ	<p>Controls the flow of support and monitoring data from the compute nodes to NetApp SolidFire Active IQ.</p> <p>Options are the following:</p> <ul style="list-style-type: none"> • Enabled: Support and monitoring data about the compute nodes is transmitted to NetApp SolidFire Active IQ to enable proactive support for the compute node hardware. • Disabled: Support and monitoring data about the compute nodes is not transmitted to NetApp SolidFire Active IQ. <div>  <p>If you turned off the Send data to AIQ option using NetApp Deployment Engine, you need to enable telemetry again using the management node REST API to configure the service from this page.</p> </div>

Find more Information

- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Work with the management node REST API

Management node REST API UI overview

By using the built-in REST API UI ([https://\[mNode IP\]/mnode](https://[mNode IP]/mnode)), you can run or understand APIs relating to the management node services, including proxy server configuration, service level updates, or asset management.

Tasks you can perform with REST APIs:

- [Get authorization to use REST APIs](#)
- [Enable Active IQ and NetApp HCI monitoring](#)
- [Add compute and controller assets to the management node](#)
- [Change the storage cluster administrator password](#)

- [Configure a proxy server for the management node](#)
- [Use the REST API to collect NetApp HCI logs](#)

Find more information

- [Access the management node](#)
- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Get authorization to use REST APIs

You must authorize before you can use APIs for management services in the REST API UI. You do this by obtaining an access token.

To obtain a token, you provide cluster admin credentials and a client ID. Each token lasts approximately ten minutes. After a token expires, you can authorize again for a new access token.

Authorization functionality is set up for you during management node installation and deployment. The token service is based on the storage cluster you defined during setup.

Before you begin

- Your cluster version should be running NetApp Element software 11.3 or later.
- You should have deployed a management node running version 11.3 or later.

Steps

1. Open the REST API UI on the management node:

```
https://[management node IP address]/mnode
```

2. Click **Authorize**.



Alternately, you can click on a lock icon next to any service API.

3. Complete the following:
 - a. Enter the cluster user name and password.
 - b. Select **Request body** from the Type drop-down list.
 - c. Enter the client ID as `mnode-client`.
 - d. Do not enter a value for the client secret.
 - e. Click **Authorize** to begin a session.



If the error message **Auth Error TypeError: Failed to fetch** is returned after you attempt to authorize, you might need to accept the SSL certificate for the MVIP of your cluster. Copy the IP in the Token URL, paste the IP into another browser tab, and authorize again.

The Available authorizations screen indicates **Authorized**.

4. Close the Available authorizations dialog box.



If you try to run a command after the token expires, a **401 Error: UNAUTHORIZED** message appears. If you see this, authorize again.

Find more information

- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Configure a proxy server

If your cluster is behind a proxy server, you must configure the proxy settings so that you can reach a public network.

A proxy server is used for telemetry collectors and reverse tunnel connections. You can enable and configure a proxy server using the REST API UI if you did not already configure a proxy server during installation or upgrade. You can also modify existing proxy server settings or disable a proxy server.

The command to configure a proxy server updates and then returns the current proxy settings for the management node. The proxy settings are used by Active IQ, the NetApp HCI monitoring service that is deployed by the NetApp Deployment Engine, and other Element software utilities that are installed on the management node, including the reverse support tunnel for NetApp Support.

Before you begin

- You should know host and credential information for the proxy server you are configuring.
- Ensure that your cluster version is running NetApp Element software 11.3 or later.
- Ensure that you have deployed a management node running version 11.3 or later.

Steps

1. Access the REST API UI on the management node by entering the management node IP address followed by **/mnode**:

```
https://[management node IP]/mnode
```

2. Click **Authorize** or any lock icon and complete the following:

- a. Enter the cluster user name and password.
 - b. Enter the client ID as `mnode-client`.
 - c. Click **Authorize** to begin a session.
 - d. Close the window.
3. Click **PUT /settings**.
 4. Click **Try it out**.
 5. To enable a proxy server, you must set `use_proxy` to true. Enter the IP or host name and proxy port destinations.

The proxy user name, proxy password, and SSH port are optional and should be omitted if not used.

```
{
  "proxy_ip_or_hostname": "[IP or name]",
  "use_proxy": [true/false],
  "proxy_username": "[username]",
  "proxy_password": "[password]",
  "proxy_port": [port value],
  "proxy_ssh_port": [port value: default is 443]
}
```

6. Click **Execute**.

Find more information

- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

Enable remote NetApp Support connections

If you require technical support for your NetApp Element software-based storage system, NetApp Support can connect remotely with your system if you enable remote access. To gain remote access, NetApp Support can open a reverse Secure Shell (SSH) connection to your environment.

About this task

You can open a TCP port for an SSH reverse tunnel connection with NetApp Support. This connection enables NetApp Support to log in to your management node. If your management node is behind a proxy server, the following TCP ports are required in the `sshd.config` file:

TCP port	Description	Connection direction
443	API calls/HTTPS for reverse port forwarding via open support tunnel to the web UI	Management node to storage nodes
22	SSH login access	Management node to storage nodes or from storage nodes to management node

Steps

- Log in to your management node and open a terminal session.
- At a prompt, enter the following:

```
rst -r sfsupport.solidfire.com -u element -p <port_number>
```

- To close the remote support tunnel, enter the following:

```
rst --killall
```

Find more information

- [NetApp HCI Documentation Center](#)
- [NetApp HCI Resources Page](#)

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