Expand your NetApp HCI system

HCI

NetApp
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Table of Contents

Expand your NetApp HCI system 1
Expansion overview 1
Expand NetApp HCI storage resources 2
Expand NetApp HCI compute resources 4
Expand NetApp HCI storage and compute resources at the same time 7
Remove Witness Nodes after expanding cluster 10

Expand your NetApp HCI system

Expansion overview

You can expand your NetApp HCI system by using NetApp Hybrid Cloud Control. You can expand storage or compute resources separately or expand them at the same time.

After installing the node in the NetApp HCI chassis, you use NetApp Hybrid Cloud Control to configure NetApp HCI to utilize the new resources. NetApp HCI detects the existing network configuration and offers you configuration options within the existing networks and VLANs, if any.

If you recently expanded your installation and the new assets were not added automatically to your configuration, you might need to add the assets manually. See the Management Node User Guide.

NetApp HCI uses VMware Enhanced vMotion Compatibility (EVC) to ensure vMotion functionality when there are compute nodes with different CPU generations in the vSphere cluster. When EVC is required for expansion, NetApp HCI enables it automatically whenever possible.

In the following situations, you might need to manually change EVC settings in the vSphere client to complete expansion:

- The existing compute nodes have a newer CPU generation than the compute nodes you are trying to add.
- The controlling vCenter instance does not support the required EVC level.
- The compute nodes you are trying to add have an older CPU generation than the EVC setting of the controlling vCenter instance.

When expanding NetApp HCI compute or storage resources in the NetApp Deployment Engine, you should connect to the vCenter instance that manages your existing NetApp HCI compute nodes.

Find more information

- Expand NetApp HCI compute resources
- Expand NetApp HCI storage resources
- Expand NetApp HCI storage and compute resources at the same time
- NetApp HCI Resources page
- NetApp HCI Documentation Center

Expand NetApp HCI storage resources

After you finish NetApp HCI deployment, you can expand and configure NetApp HCI storage resources by using NetApp Hybrid Cloud Control.

Before you begin

- Ensure that you have free and unused IPv4 addresses on the same network segment as existing nodes (each new node must be installed on the same network as existing nodes of its type).
- Ensure that you have one of the following types of SolidFire storage cluster accounts:
  - The native administrator account that was created during initial deployment
  - A custom user account with Cluster Admin, Drives, Volumes, and Nodes permissions
- Ensure that you have performed the following actions with each new node:
  - Installed the new node in the NetApp HCI chassis by following the installation instructions available in the NetApp HCI Documentation Center.
  - Cabled and powered on the new node
- Ensure that you have the management IPv4 address of an already installed storage node. You can find the IP address in the **NetApp Element Management** > **Cluster** > **Nodes** tab of the NetApp Element Plug-in for vCenter Server.
- Ensure that each new node uses the same network topology and cabling as the existing storage or compute clusters.

When you are expanding storage resources, storage capacity should be split evenly across all chassis for the best reliability.

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. Click **Expand** at the top right corner of the interface.

   The browser opens the NetApp Deployment Engine.

4. Log in to the NetApp Deployment Engine by providing the NetApp HCI storage cluster administrator credentials.
5. On the **Welcome** page, click **No** and click **Continue**.

6. On the **Available Inventory** page, select the storage nodes you want to add and click **Continue**.
7. On the **Network Settings** page, some of the network information has been detected from the initial deployment. Each new storage node is listed by serial number, and you need to assign the new network information to it. For each new storage node, complete the following steps:
   a. **Hostname**: If NetApp HCI detected a naming prefix, copy it from the Detected Naming Prefix field, and insert it as the prefix for the new unique hostname you add in the Hostname field.
   b. **Management Address**: Enter a management IP address for the new storage node that is within the management network subnet.
   c. **Storage (iSCSI) IP Address**: Enter an iSCSI IP address for the new storage node that is within the iSCSI network subnet.
   d. Click **Continue**.

   NetApp HCI might take some time to validate the IP addresses you enter. The Continue button becomes available when IP address validation completes.
8. On the **Review** page in the Network Settings section, new nodes are shown in the bold text. To make changes in any section, do the following:
   a. Click **Edit** for that section.
   b. After you finish, click **Continue** on any subsequent pages to return to the Review page.
9. **Optional**: If you do not want to send cluster statistics and support information to NetApp hosted Active IQ servers, clear the final checkbox.

   This disables real-time health and diagnostic monitoring for NetApp HCI. Disabling this feature removes the ability for NetApp to proactively support and monitor NetApp HCI to detect and resolve issues before production is impacted.
10. Click **Add Nodes**.

    You can monitor the progress while NetApp HCI adds and configures the resources.
11. **Optional**: Verify that any new storage nodes are visible in the Element Plug-in for vCenter Server.

    If you expanded a two-node storage cluster to four nodes or more, the pair of Witness Nodes previously used by the storage cluster are still visible as standby virtual machines in vSphere. The newly expanded storage cluster does not use them; if you want to reclaim VM resources, you can manually remove the Witness Node virtual machines.

Find more information

- NetApp HCI Documentation Center

- NetApp HCI Resources Page

Expand NetApp HCI compute resources

After you finish NetApp HCI deployment, you can expand and configure NetApp HCI compute resources by using NetApp Hybrid Cloud Control.

Before you begin

- Ensure that the vSphere instance of NetApp HCI is using vSphere Enterprise Plus licensing if you are expanding a deployment with Virtual Distributed Switches.
- Ensure that none of the vCenter or vSphere instances in use with NetApp HCI have expired licenses.
- Ensure that you have free and unused IPv4 addresses on the same network segment as existing nodes (each new node must be installed on the same network as existing nodes of its type).
- Ensure that you have the vCenter administrator account credentials ready.
- Ensure that you have performed the following actions with each new node:
  - Installed the new node in the NetApp HCI chassis by following the installation instructions available in the NetApp HCI Documentation Center.
  - Cabled and powered on the new node
- Ensure that each new node uses the same network topology and cabling as the existing storage or compute clusters.

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. Click **Expand** at the top right corner of the interface.

   The browser opens the NetApp Deployment Engine.

4. Log in to the NetApp Deployment Engine by providing the NetApp HCI storage cluster administrator credentials.
5. On the **Welcome** page, click **Yes** and click **Continue**.
6. On the **End User License** page, read the VMware End User License Agreement and click **I accept** to accept the terms and click **Continue**.

7. On the **vCenter** page, complete the following steps:
   a. Enter a FQDN or IP address and administrator credentials for the vCenter instance associated with your NetApp HCI installation.
   b. Click **Continue**.
   c. Select a vSphere datacenter where you want to add the compute nodes, or click **Create New Datacenter** to add the compute nodes to a new datacenter.

      If you click Create New Datacenter, the Cluster field is automatically populated.

   d. If you selected an existing datacenter, select a vSphere cluster with which the new compute nodes should be associated.

      If NetApp HCI cannot recognize the network settings of the cluster you have selected for expansion, ensure that the vmkernel and vmnic mapping for the management, storage and vMotion networks are set to the deployment defaults. See Supported networking changes in the NetApp HCI Documentation Center for more information.

   e. Click **Continue**.
8. On the **ESXi Credentials** page, enter an ESXi root password for the compute node or nodes you are adding.

   You should use the same password that was created during the initial NetApp HCI deployment.
9. Click **Continue**.
10. If you created a new vSphere datacenter cluster, on the **Network Topology** page, select a network topology to match the new compute nodes you are adding.

    You an select the two-cable option only if your compute nodes are using the two-cable topology and the existing NetApp HCI deployment is configured with VLAN IDs.
11. On the **Available Inventory** page, select the nodes you want to add to the existing NetApp HCI installation.

    For some compute nodes, you might need to enable EV at the highest level that your vCenter version supports before you can add them to your installation. You need to use the vSphere client to enable EVC for these compute nodes. After you enable it, refresh the Inventory page and try adding the compute nodes again.
12. Click **Continue**.

13. **Optional**: If you created a new vSphere datacenter cluster, on the **Network Settings** page, import network information from an existing NetApp HCI deployment by selecting the **Copy Setting from an Existing Cluster** checkbox.

    This populates the default gateway and subnet information for each network.

14. On the **Network Settings** page, some of the network information has been detected from the initial deployment. Each new compute node is listed by serial number, and you need to assign new network information to it. For each new compute node, complete the following steps:

    a. **Hostname**: If NetApp HCI detected a naming prefix, copy it from the **Detected Naming Prefix** field, and insert it as the prefix for the new hostname.

    b. **Management IP Address**: Enter a management IP address for the new compute node that is within the management network subnet.

    c. **vMotion IP Address**: Enter a vMotion IP address for the new compute node that is within the vMotion network subnet.

    d. **iSCSI A - IP Address**: Enter an IP address for the first iSCSI port of the compute node that is in the iSCSI network subnet.

    e. **iSCSI B - IP Address**: Enter an IP address for the second iSCSI port of the compute node that is in the iSCSI network subnet

    f. Click **Continue**.

15. On the **Review** page in the Network Settings section, new nodes are shown in the bold text. To make changes in any section, do the following:

    a. Click **Edit** for that section.

    b. After you finish, click **Continue** on any subsequent pages to return to the **Review** page.

16. **Optional**: If you do not want to send cluster statistics and support information to NetApp hosted SolidFire Active IQ servers, clear the final checkbox.

    This disables real-time health and diagnostic monitoring for NetApp HCI. Disabling this feature removes the ability for NetApp to proactively support and monitor NetApp HCI to detect and resolve issues before production is impacted.

17. Click **Add Nodes**.

    You can monitor the progress while NetApp HCI adds and configures the resources.

18. **Optional**: Verify that any new compute nodes are visible in the VMware vSphere Web Client.

Find more information

- NetApp HCI Documentation Center
- NetApp HCI Resources Page

Expand NetApp HCI storage and compute resources at the same time

After you finish NetApp HCI deployment, you can expand and configure NetApp HCI storage and compute resources at the same time by using NetApp Hybrid Cloud Control.

Before you begin

- Ensure that the vSphere instance of NetApp HCI is using vSphere Enterprise Plus licensing if you are expanding a deployment with Virtual Distributed Switches.
- Ensure that none of the vCenter or vSphere instances in use with NetApp HCI have expired licenses.
- Ensure that you have the vCenter administrator account credentials ready.
- Ensure that you have free and unused IPv4 addresses on the same network segment as existing nodes (each new node must be installed on the same network as existing nodes of its type).
- Ensure that you have one of the following types of SolidFire storage cluster accounts:
  - The native administrator account that was created during initial deployment
  - A custom user account with Cluster Admin, Drives, Volumes, and Nodes permissions
- Ensure that you have performed the following actions with each new node:
  - Installed the new node in the NetApp HCI chassis by following the installation instructions available in the NetApp HCI Documentation Center.
  - Cabled and powered on the new node
- Ensure that you have the management IPv4 address of an already installed storage node. You can find the IP address in the **NetApp Element Management** > **Cluster** > **Nodes** tab of the NetApp Element Plug-in for vCenter Server.
- Ensure that each new node uses the same network topology and cabling as the existing storage or compute clusters.

About this task

- You can intermix the H410C compute node with existing NetApp HCI compute and storage nodes in the same chassis and cluster.
- You cannot intermix compute nodes and BPU-enabled compute nodes in the same cluster. If you select a GPU-enabled compute node, CPU-only compute nodes become unselectable, and vice versa.
- If you are adding compute nodes with CPU generations that are different than the CPU generation of the existing compute nodes and Enhanced vMotion Compatibility (EVC) is disabled on the controlling vCenter instance, you must enable EVC before proceeding. This ensures vMotion functionality after expansion is complete.

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. Click **Expand** at the top right corner of the interface.

   The browser opens the NetApp Deployment Engine.

4. Log in to the NetApp Deployment Engine by providing the NetApp HCI storage cluster administrator credentials.
5. On the **Welcome** page, click **Yes** and click **Continue**.
6. On the **End User License** page, read the VMware End User License Agreement and click **I accept** to accept the terms and click **Continue**.
7. On the **vCenter** page, complete the following steps:
   a. Enter a FQDN or IP address and administrator credentials for the vCenter instance associated with your NetApp HCI installation.
   b. Click **Continue**.
   c. Select a vSphere datacenter where you want to add the compute nodes, or click **Create New Datacenter** to add the compute nodes to a new datacenter.

      If you click Create New Datacenter, the Cluster field is automatically populated.

   d. If you selected an existing datacenter, select a vSphere cluster with which the new compute nodes should be associated.

      If NetApp HCI cannot recognize the network settings of the cluster you have selected for expansion, ensure that the vmkernel and vmnic mapping for the management, storage and vMotion networks are set to the deployment defaults. See Supported networking changes in the NetApp HCI Documentation Center for more information.

   e. Click **Continue**.
8. On the **ESXi Credentials** page, enter an ESXi root password for the compute node or nodes you are adding.

   You should use the same password that was created during the initial NetApp HCI deployment.

9. Click **Continue**.
10. If you created a new vSphere datacenter cluster, on the **Network Topology** page, select a network topology to match the new compute nodes you are adding.

    You an select the two-cable option only if your compute nodes are using the two-cable topology and the existing NetApp HCI deployment is configured with VLAN IDs.

11. On the **Available Inventory** page, select the storage and compute nodes you want to add and click **Continue**.

    For some compute nodes, you might need to enable EV at the highest level that your vCenter version supports before you can add them to your installation. You need to use the vSphere client to enable EVC for these compute nodes. After you enable it, refresh the Inventory page and try adding the compute nodes again.

12. Click **Continue**.
13. **Optional**: If you created a new vSphere datacenter cluster, on the **Network Settings** page, import network information from an existing NetApp HCI deployment by selecting the **Copy Setting from an Existing Cluster** checkbox.

    This populates the default gateway and subnet information for each network.

14. On the **Network Settings** page, some of the network information has been detected from the initial deployment. Each new storage node is listed by serial number, and you need to assign the new network information to it. For each new storage node, complete the following steps:
    a. **Hostname**: If NetApp HCI detected a naming prefix, copy it from the Detected Naming Prefix field, and insert it as the prefix for the new unique hostname you add in the Hostname field.
    b. **Management Address**: Enter a management IP address for the new storage node that is within the management network subnet.
    c. **Storage (iSCSI) IP Address**: Enter an iSCSI IP address for the new storage node that is within the iSCSI network subnet.
    d. Click **Continue**.

    NetApp HCI might take some time to validate the IP addresses you enter. The Continue button becomes available when IP address validation completes.

15. On the **Review** page in the Network Settings section, new nodes are shown in the bold text. To make changes in any section, do the following:
    a. Click **Edit** for that section.
    b. After you finish, click **Continue** on any subsequent pages to return to the Review page.

16. **Optional**: If you do not want to send cluster statistics and support information to NetApp hosted Active IQ servers, clear the final checkbox.

    This disables real-time health and diagnostic monitoring for NetApp HCI. Disabling this feature removes the ability for NetApp to proactively support and monitor NetApp HCI to detect and resolve issues before production is impacted.

17. Click **Add Nodes**.

    You can monitor the progress while NetApp HCI adds and configures the resources.

18. **Optional**: Verify that any new nodes are visible in the VMware vSphere Web Client (for compute nodes) or the Element Plug-in for vCenter Server (for storage nodes).

If you expanded a two-node storage cluster to four nodes or more, the pair of Witness Nodes previously used by the storage cluster are still visible as standby virtual machines in vSphere. The newly expanded storage cluster does not use them; if you want to reclaim VM resources, you can manually remove the Witness Node virtual machines.

Find more information

- NetApp HCI Documentation Center
- NetApp HCI Resources Page

Remove Witness Nodes after expanding cluster

After you expand a two-node storage cluster to four or more nodes, you can delete the pair of Witness Nodes to free up compute resources in your NetApp HCI installation. The Witness Nodes previously used by the storage cluster are still visible as standby virtual machines (VM) in vSphere Web Client.

About this task

Witness Nodes are not required in clusters with more than four storage nodes. This is an optional procedure if you want to free up CPU and memory after you expand your two-node cluster to four or more nodes.

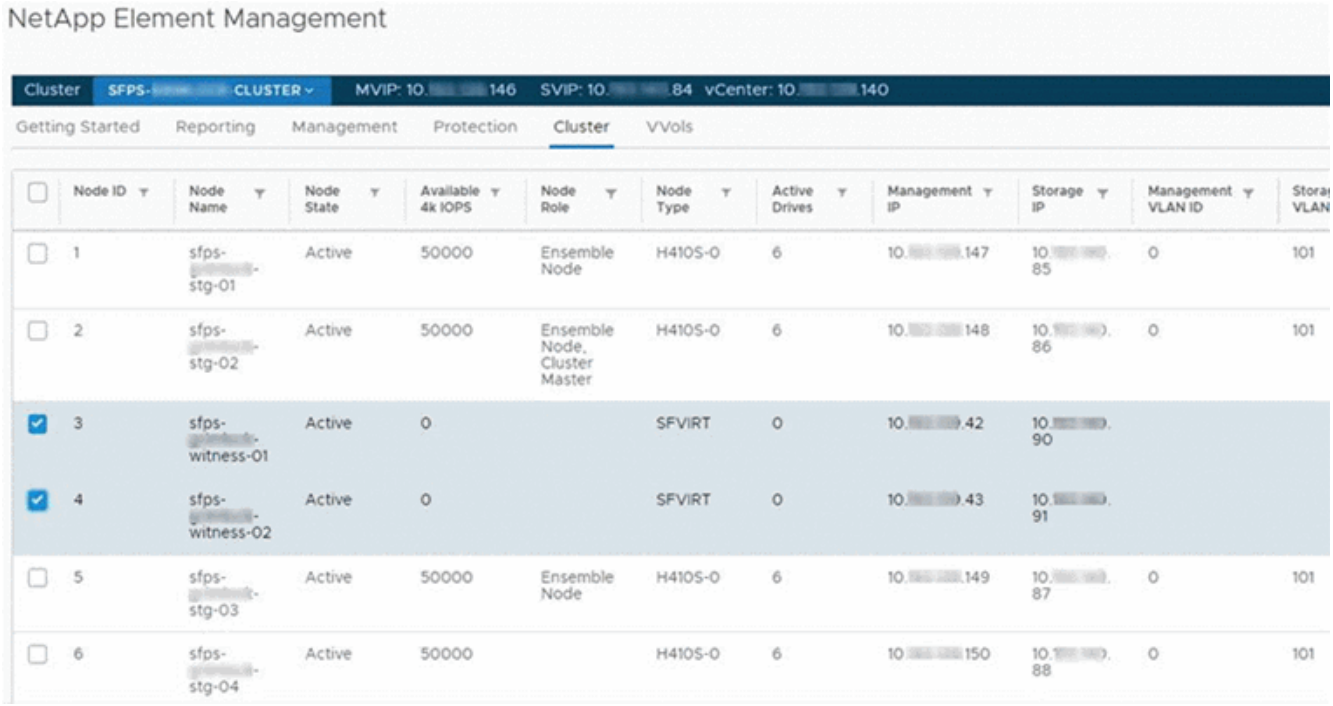
Verify that no cluster faults or errors are reported. You can find information about system alerts by clicking **Reporting** > **Alerts** in the NetApp Element Management extension point in vSphere.

Steps

1. From vSphere, access the NetApp Element Management extension point from the **Shortcuts** tab or

the side panel.

2. Select **NetApp Element Management** > **Cluster** > **Nodes**.



3. Select the checkbox for the Witness Node that you want to delete, and click **Actions** > **Remove**.
4. Confirm the action in the prompt.
5. Click **Hosts and Clusters**.
6. Navigate to the Witness Node VM that you removed earlier.
7. Right-click the VM and power it off.
8. Right-click the VM that you powered off, and click **Delete from Disk**.
9. Confirm the action in the prompt.

Find more information

- NetApp HCI Two-Node Storage Cluster | TR-4823
- NetApp HCI Documentation Center
- SolidFire and Element Software Documentation Center