



Requirements and pre-deployment tasks

HCI

NetApp

August 10, 2020

This PDF was generated from https://docs.netapp.com/us-en/hci/docs/hci_prereqs_required_network_ports.html on August 10, 2020. Always check docs.netapp.com for the latest.

Table of Contents

- Requirements and pre-deployment tasks 1
 - Required network ports 1
 - Network and switch requirements 5
 - Network cable requirements..... 6
 - IP address requirements..... 7
 - Network configuration 8
 - DNS and timekeeping requirements 15
 - Environmental requirements 15
 - Protection Domains 16
 - Witness Node resource requirements for two-node storage clusters 16
 - Configuring LACP for optimal storage performance 17
 - Validating your environment with Active IQ Config Advisor 18
 - Final preparations 21

Requirements and pre-deployment tasks

Required network ports

You might need to allow the following ports through your datacenter’s edge firewall so that you can manage the system remotely, allow clients outside of your datacenter to connect to resources, and ensure that internal services can function properly. Some of these ports, URLs, or IP addresses might not be required, depending on how you use the system. All ports are TCP unless stated otherwise, and should be open bidirectionally.



The NetApp Hybrid Cloud Control web UI and API download software packages from the NetApp online software repository, which uses JFrog Bintray as a distribution hub and Akamai Technologies for file hosting. Because of this, some URLs or IP addresses might resolve to other URLs or IP addresses based on the content delivery network. If possible, you should work with a network engineer to add these URLs or IP addresses to the firewall rules, using the following general steps:

Steps

1. Use the Wget or cURL utilities to access a URL (repo.netapp.com, for example).
2. Receive a failure to access the URL (different from repo.netapp.com).
3. Edit the firewall rules to allow the new URL.
4. Repeat the above steps until the access attempt succeeds.

The following abbreviations are used in the table:

- MIP: Management IP address, a per-node address
- SIP: Storage IP address, a per-node address
- MVIP: Management virtual IP address
- SVIP: Storage virtual IP address

Source	Destination	Port	Description
iSCSI clients	Storage cluster MVIP	443	(Optional) UI and API access
iSCSI clients	Storage cluster SVIP	3260	Client iSCSI communications
iSCSI clients	Storage node SIP	3260	Client iSCSI communications

Source	Destination	Port	Description
Management node	sfsupport.solidfire.com	22	Reverse SSH tunnel for support access
Management node	Storage node MIP	22	SSH access for support
Management node	DNS servers	53 TCP/UDP	DNS lookup
Management node	Storage node MIP	442	UI and API access to storage node and Element software upgrades
Management node	Storage node MVIP	442	UI and API access to storage node and Element software upgrades
Management node	repo.netapp.com/api/repos/netapp-downloads , repo.netapp.com/bintray/dl/ , repo.netapp.com/bintray/api/package , netapp-downloads.bintray.com , bintray.com , repo.netapp.com , library.netapp.com	443	Management node service upgrades
Management node	monitoring.solidfire.com	443	Storage cluster reporting to Active IQ
Management node	Storage cluster MVIP	443	UI and API access to storage node and Element software upgrades
Management node	23.32.54.122 , 216.240.21.15	443	Element software upgrades
Management node	Witness Node	9442	Per-node configuration API service
SNMP server	Storage cluster MVIP	161 UDP	SNMP polling
SNMP server	Storage node MIP	161 UDP	SNMP polling
Storage node MIP	DNS servers	53 TCP/UDP	DNS lookup
Storage node MIP	Management node	80	Element software upgrades

Source	Destination	Port	Description
Storage node MIP	S3/Swift endpoint	80	(Optional) HTTP communication to S3/Swift endpoint for backup and recovery
Storage node MIP	NTP server	123 UDP	NTP
Storage node MIP	Management node	162 UDP	(Optional) SNMP traps
Storage node MIP	SNMP server	162 UDP	(Optional) SNMP traps
Storage node MIP	LDAP server	389 TCP/UDP	(Optional) LDAP lookup
Storage node MIP	Remote storage cluster MVIP	443	Remote replication cluster pairing communication
Storage node MIP	Remote storage node MIP	443	Remote replication cluster pairing communication
Storage node MIP	S3/Swift endpoint	443	(Optional) HTTPS communication to S3/Swift endpoint for backup and recovery
Storage node MIP	Management node	10514 TCP/UDP, 514 TCP/UDP	Syslog forwarding
Storage node MIP	Syslog server	10514 TCP/UDP, 514 TCP/UDP	Syslog forwarding
Storage node MIP	LDAPS server	636 TCP/UDP	LDAPS lookup
Storage node MIP	Remote storage node MIP	2181	Intercluster communication for remote replication
Storage node SIP	S3/Swift endpoint	80	(Optional) HTTP communication to S3/Swift endpoint for backup and recovery
Storage node SIP	S3/Swift endpoint	443	(Optional) HTTPS communication to S3/Swift endpoint for backup and recovery
Storage node SIP	Remote storage node SIP	2181	Intercluster communication for remote replication

Source	Destination	Port	Description
Storage node SIP	Storage node SIP	3260	Internode iSCSI
Storage node SIP	Remote storage node SIP	4000 through 4020	Remote replication node-to-node data transfer
Storage node SIP	Compute node SIP	442	Compute node API, configuration and validation, and access to software inventory
System administrator PC	Storage node MIP	80	(NetApp HCI only) Landing page of NetApp Deployment Engine
System administrator PC	Management node	442	HTTPS UI access to management node
System administrator PC	Storage node MIP	442	HTTPS UI and API access to storage node, (NetApp HCI only) Configuration and deployment monitoring in NetApp Deployment Engine
System administrator PC	Management node	443	HTTPS UI and API access to management node
System administrator PC	Storage cluster MVIP	443	HTTPS UI and API access to storage cluster
System administrator PC	Storage node MIP	443	HTTPS storage cluster creation, post-deployment UI access to storage cluster
System administrator PC	Witness Node	8080	Witness Node per-node web UI
vCenter Server	Storage cluster MVIP	443	vCenter Plug-in API access
vCenter Server	Management node	8443	(Optional) vCenter Plug-in QoSSIOC service.
vCenter Server	Storage cluster MVIP	8444	vCenter VASA provider access (VVols only)

Source	Destination	Port	Description
vCenter Server	Management node	9443	vCenter Plug-in registration. The port can be closed after registration is complete.

Find more information

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

Network and switch requirements

The switches you use for NetApp HCI require specific configuration to ensure a successful deployment. See your switch documentation for specific instructions on implementing each of the following requirements for your environment.

A NetApp HCI deployment requires at least three network segments, one for each of the following types of traffic:

- Management
- VMware vMotion
- Storage/Data

Depending on the NetApp H-Series compute and storage node models and the planned cabling configuration, you can physically separate these networks using separate switches or logically separate them using VLANs. For most deployments, however, you need to logically separate these networks (and any other additional virtual machine networks) using VLANs.

Compute and storage nodes need to be able to communicate before, during, and after deployment. If you are implementing separate management networks for storage and compute nodes, ensure that these management networks have network routes between them. These networks must have gateways assigned, and there must be a route between the gateways. Ensure that each new node has a gateway assigned to facilitate communication between nodes and management networks.

NetApp HCI has the following switch requirements:

- All switch ports connected to NetApp HCI nodes must be configured as spanning tree edge ports.
 - On Cisco switches, depending on the switch model, software version and port type, you can do this with one of the following commands:
 - `spanning-tree port type edge`
 - `spanning-tree port type edge trunk`

- `spanning-tree portfast`
- `spanning-tree portfast trunk`
- On Mellanox switches, you can do this with the `spanning-tree port type edge` command.
- NetApp HCI nodes have redundant ports for all network functions except out-of-band management. For the best resiliency, divide these ports across two switches with redundant uplinks to either a traditional hierarchical architecture or a layer 2 spine-and-leaf architecture.
- The switches handling storage, virtual machine, and vMotion traffic must support speeds of at least 10GbE per port (up to 25GbE per port is supported).
- The switches handling management traffic must support speeds of at least 1GbE per port.
- You must configure jumbo frames on the switch ports handling storage and vMotion traffic. Hosts must be able to send 9000 byte packets end-to-end for a successful installation.
- Round-trip network latency between all storage and compute nodes should not exceed 2ms.

All NetApp HCI nodes provide additional out-of-band management capabilities via a dedicated management port. NetApp H300S, H300E, H500S, H500E, H700S, H700E and H410C nodes also allow for IPMI access via Port A. As a best practice, you should ease remote management of NetApp HCI by configuring out-of-band management for all nodes in your environment.



The management network of the management node needs a configuration that includes a gateway address to be able to communicate with NetApp Cloud Services. Enabling NetApp cloud services will fail if a valid gateway address is not in place.

Find more information

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

Network cable requirements

You can use the following guidelines to ensure that you have enough of the right type of network cables for the size of your deployment. For RJ45 ports, you must use Cat 5e or Cat 6 rated cables.

- Two-cable compute node configuration: Each compute node must to be connected to a 10/25GbE network via two SFP+/SFP28 interfaces (one additional Cat 5e/6 cable is optional for out-of-band management).
- Six-cable compute node configuration: Each compute node must to be connected to a 10/25GbE network via four SFP+/SFP28 interfaces and to a 1/10GbE network via two Cat 5e/6 cables (one additional Cat 5e/6 cable is optional for out-of-band management).
- Each storage node must be connected to a 10/25GbE network via two SFP+/SFP28 interfaces and to

a 1/10GbE network via two Cat 5e/6 cables (one additional Cat 5e/6 cable is optional for out-of-band management).

- Ensure the network cables you use to connect the NetApp HCI system to your network are long enough to comfortably reach your switches.

For example, a deployment containing four storage nodes and three compute nodes (using the six-cable configuration) requires the following number of network cables:

- (14) Cat 5e/6 cables with RJ45 connectors (plus seven cables for IPMI traffic, if desired)
- (20) Twinax cables with SFP28/SFP+ connectors

This is due to the following reasons:

- Four storage nodes require eight (8) Cat 5e/6 cables and eight (8) Twinax cables.
- Three compute nodes using the six-cable configuration require six (6) Cat 5e/6 cables and twelve (12) Twinax cables.

Find more information

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

IP address requirements

NetApp HCI has specific IP address requirements that depend on the size of your deployment. Note that by default the initial IP addresses you assign to each node before using the NetApp Deployment Engine to deploy the system are temporary and cannot be reused. You need to set aside a second permanent set of unused IP addresses that you can assign during final deployment.

Number of IP addresses needed per NetApp HCI deployment

The NetApp HCI storage network and management network should each use separate contiguous ranges of IP addresses. Use the following table to determine how many IP addresses you need for your deployment:

System component	Management network IP addresses needed	Storage network IP addresses needed	vMotion network IP addresses needed	Total IP addresses needed per component
Compute node	1	2	1	4
Storage node	1	1		2

System component	Management network IP addresses needed	Storage network IP addresses needed	vMotion network IP addresses needed	Total IP addresses needed per component
Storage cluster	1	1		2
VMware vCenter	1			1
Management node	1	1		2
Witness Node	1	1		2 per Witness Node (two Witness Nodes are deployed for each two-node or three-node storage cluster)

IP addresses reserved by NetApp HCI

NetApp HCI reserves the following IP address ranges for system components. When planning your network, avoid using these IP addresses:

IP address range	Description
10.0.0.0/24	Docker overlay network
10.0.1.0/24	Docker overlay network
10.255.0.0/16	Docker swarm ingress network
169.254.100.1/22	Docker bridge network
169.254.104.0/22	Docker bridge network

Find more information

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

Network configuration

NetApp HCI can utilize multiple different network cabling and VLAN configurations. It is important to plan your network configuration to ensure a successful deployment.

Required network segments

NetApp HCI requires a minimum of three network segments: management, storage, and virtualization traffic (which includes virtual machines and vMotion traffic). You can also separate virtual machine and vMotion traffic. These network segments usually exist as logically separated VLANs in the NetApp HCI network infrastructure.

How compute and storage nodes connect to these networks depends on how you design the network and cable the nodes. The sample network illustrations in this guide assume the following networks:

Network name	VLAN ID
Management	100
Storage	105
vMotion	107
Virtual machines	200, 201

For automatic discovery and configuration of your NetApp HCI nodes in the NetApp Deployment Engine, you must have a network segment that is available as an untagged or native VLAN on all switch ports that are used for the SFP+/SFP28 interfaces on the nodes. This will provide layer 2 communication between all nodes for discovery and deployment. Without a native VLAN, you must configure the SFP+/SFP28 interfaces of all nodes manually with a VLAN and IPv4 address to be discoverable. In the network configuration examples in this document, the management network (VLAN ID 100) is used for this purpose.

The NetApp Deployment Engine enables you to quickly configure networks for compute and storage nodes during the initial deployment. You can place certain built-in management components such as vCenter and the management node on their own network segment if needed. These network segments require routing to allow vCenter and the management node to communicate with storage and compute management networks. In most deployments those components use the same management network (in this example, VLAN ID 100).



You configure virtual machine networks using vCenter. The default virtual machine network (port group "VM_Network") in NetApp HCI deployments is configured without a VLAN ID. If you plan to use multiple tagged virtual machine networks (VLAN IDs 200, 201 in the example above), be sure to include them in the initial network planning.

Network configuration and cabling options

You can use a two-cable network configuration for the H300E, H500E, H700E, and H410C compute nodes, simplifying cable routing. This configuration uses two SFP+/SFP28 interfaces plus an optional (but recommended) RJ45 interface for IPMI communication. These nodes can also use a six-cable configuration with two RJ45 and four SFP28/SFP+ interfaces.

All storage nodes support a network topology that uses four network ports; this topology uses ports A through D on H300S, H500S, H700S, and H610S nodes. Compute nodes support three network topologies:

Configuration option	Cabling and description
Option A	Two-cable configuration using ports D and E (two SFP28/SFP+ interfaces) on H300E, H500E, H700E and H410C nodes
Option B	Six-cable configuration using ports A through F (two RJ45 and four SFP28/SFP+ interfaces) on H300E, H500E, H700E and H410C nodes
Option C	Cable configuration similar to option B, but using native VLANs (or "access ports") on the switch for the management, storage, and vMotion networks

Nodes that do not have the correct number of connected cables cannot participate in the deployment. For example, you cannot deploy a compute node in a six-cable configuration if it only has ports D and E connected.



You can adjust the NetApp HCI network configuration after deployment to meet infrastructure needs. However, when you expand NetApp HCI resources, remember that new nodes must have the same cable configuration as the existing compute and storage nodes.

Configuration option A: Two cables for compute nodes

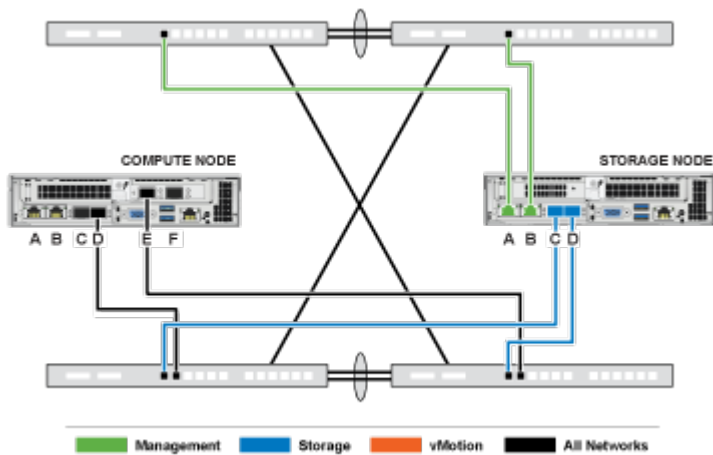
The NetApp H300E, H500E, H700E, H410C, and H610C compute nodes support using two network cables for connectivity to all NetApp HCI networks. This configuration requires that the storage, vMotion and any virtual machine networks use VLAN tagging. All compute and storage nodes must use the same VLAN ID scheme. This configuration uses vSphere Distributed Switches that require VMware vSphere Enterprise Plus licensing.

VLAN configuration

As a best practice, you should configure the required network segments on all switch ports that the nodes are using. For example:

Network name	VLAN ID	Switch port configuration
Management	100	Native
Storage	105	Tagged
vMotion	107	Tagged
Virtual machines	200, 201	Tagged

The following illustration shows the recommended cabling configuration for two-cable H300E, H500E, H700E, and H410C compute nodes and four-cable H300S, H500S, H700S, and H410S storage nodes. All switch ports in this example share the same configuration.



Example switch commands

You can use the following example commands to configure all switch ports used for NetApp HCI nodes. These commands are based on a Cisco configuration, but might require only small changes to apply to Mellanox switches. See your switch documentation for the specific commands you need to implement this configuration. Replace the interface name, description, and VLANs with the values for your environment.

```
interface {interface name, such as EthernetX/Y or GigabitEthernetX/Y/Z}
description {desired description, such as NetApp-HCI-NodeX-PortY}
mtu 9216
switchport mode trunk
switchport trunk native vlan 100
switchport trunk allowed vlan 105,107,200,201
spanning-tree port type edge trunk
```



Some switches might require inclusion of the native VLAN in the allowed VLAN list. See the documentation for your specific switch model and software version.

Configuration option B: Six cables for compute nodes

As a secondary network configuration option, the H300E, H500E, H700E and H410C compute nodes support using six network cables for connectivity to all NetApp HCI networks. This configuration requires that the storage, vMotion and any virtual machine networks use VLAN tagging. You can use this configuration with vSphere Standard Switches or vSphere Distributed Switches (which require VMware vSphere Enterprise Plus licensing).

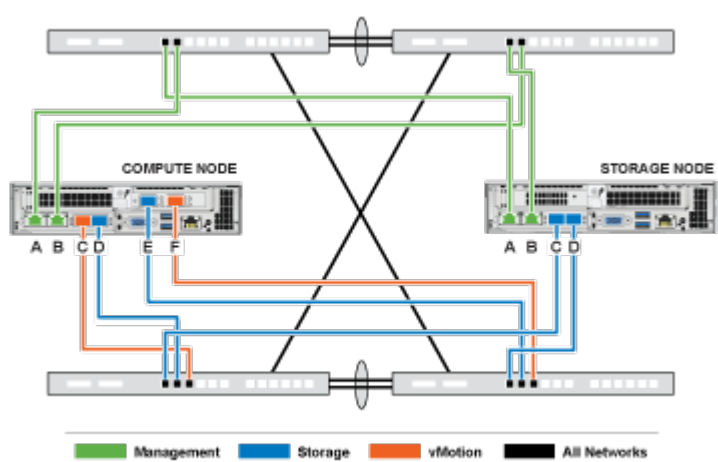
VLAN configuration

When you deploy compute nodes using six cables and storage nodes using four cables, as a best

practice, you should configure the required network segments on all switch ports that the nodes are using. For example:

Network name	VLAN ID	Switch port configuration
Management	100	Native
Storage	105	Tagged
vMotion	107	Tagged
Virtual machines	200, 201	Tagged

The following illustration shows the recommended cabling configuration for six-cable compute nodes and four-cable storage nodes. All switch ports in this example share the same configuration.



Example switch commands

You can use the following example commands to configure all switch ports used for NetApp HCI nodes. These commands are based on a Cisco configuration, but might require only small changes to apply to Mellanox switches. See your switch documentation for the specific commands you need to implement this configuration. Replace the interface name, description, and VLANs with the values for your environment.

```
interface {interface name, such as EthernetX/Y or GigabitEthernetX/Y/Z}  
description {desired description, such as NetApp-HCI-NodeX-PortY}  
mtu 9216  
switchport mode trunk  
switchport trunk native vlan 100  
switchport trunk allowed vlan 105,107,200,201  
spanning-tree port type edge trunk
```



Some switches might require inclusion of the native VLAN in the allowed VLAN list. See the documentation for your specific switch model and software version.

Configuration option C: Six cables for compute nodes with native VLANs

You can deploy NetApp HCI without using tagged VLANs for storage and virtualization traffic, and instead rely on the switch configuration to separate the network segments. You can use this configuration with vSphere Standard Switches or vSphere Distributed Switches (which require VMware vSphere Enterprise Plus licensing).

VLAN configuration

This topology option uses the following VLAN configuration:

Node ports used	Network name	VLAN ID	Connected switch port configuration
Ports A and B on compute and storage nodes	Management	100	Native
Ports D and E on compute nodes	Storage	105	Native
Ports C and D on storage nodes	Storage	105	Native
Ports C and F on compute nodes	vMotion	107	Native
Ports C and F on compute nodes	Virtual machines	200, 201	Tagged



Deploying this configuration requires careful switch port configuration. Configuration errors in this network topology can result in deployment problems that are difficult to diagnose.

The following illustration shows the network configuration overview for this topology option. In the example, individual switch ports are configured with the appropriate network segment as the native network.



Example switch commands

You can use the following example switch commands to configure switch ports used for the NetApp HCI nodes. These commands are based on a Cisco configuration, but might require only minimal changes to apply to Mellanox switches. See your switch documentation for the specific commands you need to implement this configuration.

You can use the following example commands to configure the switch ports used for the management network. Replace the interface name, description, and VLANs with the values for your configuration.

```
interface {interface name, such as EthernetX/Y or GigabitEthernetX/Y/Z}
description {desired description, such as NetApp-HCI-NodeX-PortA|B}
switchport access vlan 100
spanning-tree port type edge
```

You can use the following example commands to configure the switch ports used for the storage network. Replace the interface name, description, and VLANs with the values for your configuration.

```
interface {interface name, such as EthernetX/Y or GigabitEthernetX/Y/Z}
description {desired description, such as NetApp-HCI-NodeX-PortC|D}
mtu 9216
switchport access vlan 105
spanning-tree port type edge
```

You can use the following example commands to configure the switch ports used for the vMotion and virtual machines network. Replace the interface name, description, and VLANs with the values for your configuration.

```
interface {interface name, such as EthernetX/Y or GigabitEthernetX/Y/Z}
description {desired description, such as NetApp-HCI-NodeX-PortC|F}
mtu 9216
switchport mode trunk
switchport trunk native vlan 107
switchport trunk allowed vlan 200,201
```




Some switches might require inclusion of the native VLAN in the allowed VLAN list. See the documentation for your specific switch model and software version.

Find more information

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

DNS and timekeeping requirements

Before deployment, you need to prepare Domain Name System (DNS) records for your NetApp HCI system and gather NTP server information. NetApp HCI requires a DNS server with the correct DNS entries and an NTP server for a successful deployment.

Make the following DNS and timeserver preparations before deploying NetApp HCI:

- Create any needed DNS entries for hosts (such as individual compute or storage nodes) and document how the host entries map to the respective IP addresses. During deployment, you will need to assign a prefix to your storage cluster that will be applied to each host; to avoid confusion, keep your DNS naming plans in mind when choosing a prefix.
- If you are deploying NetApp HCI with a new VMware vSphere installation using a fully qualified domain name, you must create one Pointer (PTR) record and one Address (A) record for vCenter Server on any DNS servers in use before deployment.
- If you are deploying NetApp HCI with a new vSphere installation using only IP addresses, you do not need to create new DNS records for vCenter.
- NetApp HCI requires a valid NTP server for timekeeping. You can use a publicly available time server if you do not have one in your environment.

Find more information

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

Environmental requirements

Ensure that the power for the rack used to install NetApp HCI is supplied by AC power outlets, and that your datacenter provides adequate cooling for the size of your NetApp HCI installation.

For detailed capabilities of each component of NetApp HCI, see the NetApp HCI [datasheet](#).



The H410C compute node operates only on high-line voltage (200-240 VAC). You must ensure that the power requirements are met when you add H410C nodes to an existing NetApp HCI installation.

Find more information

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

Protection Domains

NetApp Element software supports Protection Domains functionality, which optimizes data layout on storage nodes for the best data availability. To use this feature, you should split storage capacity evenly across three or more NetApp H-series chassis for optimal storage reliability. In this scenario, the storage cluster automatically enables Protection Domains.

Find more information

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

Witness Node resource requirements for two-node storage clusters

NetApp HCI supports a minimum installation size of two storage nodes and two compute nodes. When you install NetApp HCI using a two or three-node storage cluster, you need to be aware of NetApp HCI Witness Nodes and their VM resource requirements.

When a storage cluster uses two or three nodes, it also deploys a pair of Witness Nodes alongside each storage cluster. Witness Nodes have the following VM resource requirements:

Resource	Requirement
vCPU	4
Memory	12GB
Disk size	67GB

NetApp HCI supports only certain storage node models in two-node or three-node storage clusters. For more information, see the Release Notes for your NetApp HCI version.



When the NetApp HCI installation process installs Witness Nodes, a virtual machine template is stored in VMware vCenter that you can use to redeploy a Witness Node in case it is accidentally removed, lost, or corrupted. You can also use the template to redeploy a Witness Node if you need to replace a failed compute node that was hosting the Witness Node. For instructions, see the [NetApp HCI documentation](#).

Find more information

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

Configuring LACP for optimal storage performance

For optimal NetApp HCI storage cluster performance, you should configure Link Aggregation Control Protocol (LACP) on the switch ports used for each of the storage nodes.

Before you begin

- You have configured the switch ports connected to the 10/25GbE interfaces of NetApp HCI storage nodes as LACP port channels.
- You have set the LACP timers on the switches handling storage traffic to “fast mode (1s)” for optimal failover detection time. During deployment, the Bond1G interfaces on all storage nodes are automatically configured for active/passive mode.
- You have configured Cisco Virtual PortChannel (vPC) or the equivalent switch stacking technology for the switches handling the storage network. Switch stacking technology eases configuration of LACP and port channels, and provides a loop-free topology between switches and the 10/25GbE ports on the storage nodes.

Steps

1. Follow your switch vendor recommendations for enabling LACP on the switch ports used for NetApp H-series storage nodes.
2. Change the bond mode on all storage nodes to LACP in the on-node user interface (also known as the terminal user interface, or TUI) before you deploy NetApp HCI.

Find more information

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

Validating your environment with Active IQ Config Advisor

Before you rack NetApp HCI hardware and perform the installation of NetApp HCI, you need to verify that your environment meets NetApp HCI networking requirements. Active IQ Config Advisor runs checks on your environment by validating network, switch, and VMware vSphere configurations. The tool generates a report which you can use to help you resolve issues, and you can forward the report to your Professional Services engineer to prepare and schedule an installation.

Installing Active IQ Config Advisor

Download and install Active IQ Config Advisor on a PC that has access to the NetApp HCI networks.

Steps

1. In a web browser, download the Active IQ Config Advisor tool from the [NetApp Support Site](#).

After you agree to the End User License Agreement (EULA), the Download page appears. Microsoft Windows, Linux, and Mac binaries are available in the **Client Tool** pane.

2. Run the executable.
3. Select a language, and click **OK**.
4. Click **Next**.
5. Read the EULA and click **I Agree**.
6. Click **Install**.
7. Ensure that **Run Active IQ Config Advisor** is selected, and click **Finish**.

After a short delay, the Active IQ Config Advisor UI opens in a new browser window or tab.

Using Active IQ Config Advisor

Active IQ Config Advisor runs in a browser window, collects information about your network and environment, and generates a report you can use to resolve any network or configuration issues that might interfere with NetApp HCI deployment.

Before you begin

You have installed Active IQ Config Advisor on a device that can access the management network, VMware vCenter Server networking (if you are joining an existing VMware installation), and switches that will be used for NetApp HCI.



If you are using Mellanox switches and NetApp Professional Services is configuring them as part of deployment, you do not need to provide switch information.

About this task

Active IQ Config Advisor performs only read-only checks to gather information. No configuration is modified as part of the collection.

Steps

1. Open Active IQ Config Advisor.

Config Advisor appears with the **Basic Settings** window in a web browser. Here, you can define global collection settings and encrypt the collection results.

2. Enter a passphrase in the **Encryption Settings** section to encrypt the collection project.

This ensures that only you are able to load this collection project after it is created.

3. Identify this collection report as yours by entering your name and email address in the **User Verification** section.
4. Click **Save**.
5. Click **Create a new data collection**.
6. Select **Solution Based** in the **Collection Type** drop-down menu.
7. Select **NetApp HCI Pre Deployment** in the **Profile** drop-down menu.
8. For each type of device in the **Type** column, select the number of that type of device in your NetApp HCI network in the **Actions** drop-down menu.

For example, if you have three Cisco switches, choose 3 from the **Actions** column drop-down menu in that row. Three rows appear, one for each Cisco switch you identified.



If you are using Mellanox switches and NetApp Professional Services is configuring them as part of deployment, you do not need to provide switch information.

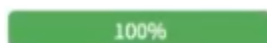
9. For any switches that you identified, enter the management IP address and administrator credentials.
10. For any VMware vCenter Servers you identified, do one of the following:
 - If you are deploying a new vCenter Server, provide the IP address or Fully Qualified Domain Name (FQDN) that is planned for the server.
 - If you are joining an existing vCenter Server, provide the IP address or FQDN and the administrator credentials for the server.
11. Optional: If you added information for switches, enter the number of compute and storage nodes in the **Switch Validation** section.

12. Choose which compute node cabling configuration you plan to use in the **Compute node network** section.
13. Enter individual switch ports and any VLAN tags you plan to use for the management, vMotion, and storage networks for any switches in the **Compute node network** section.
14. Enter individual switch ports and any VLAN tags you plan to use for the management and storage networks for any switches in the **Storage node network** section.
15. In the **Network Settings Check** section, enter the IP addresses and gateway IP address for the management network, followed by lists of servers for DNS, NTP, and vCenter Server (if you are deploying a new vCenter Server with NetApp HCI).

This section enables Active IQ Config Advisor to ensure that the management network is available for use, and also ensures that services such as DNS and NTP are working properly.

16. Click **Validate** to ensure all of the IP address information and credentials you have entered are valid.
17. Click **Save or Collect**.

This starts the collection process, and you can see the progress as the collection runs along with a real-time log of the collection commands. The **Progress** column shows color-coded progress bars for each collection task.



The progress bars use the following colors to show status:

- **Green:** The collection has finished with no command failures. You can see the deployment risks and recommendations by clicking the **View & Analyze** icon in the **Actions** menu.
 - **Yellow:** The collection has finished with some command failures. You can see the deployment risks and recommendations by clicking the **View & Analyze** icon in the **Actions** menu.
 - **Red:** The collection has failed. You need to resolve the errors and run the collection again.
18. Optional: When the collection is complete, you can click the binocular icon for any collection row to see the commands that were run and the data that was collected.
 19. Select the **View & Analyze** tab.

This page shows a general health report of your environment. You can select a section of the pie chart to see more details about those specific checks or descriptions of problems, along with recommendations on resolving any issues that might interfere with successful deployment. You can resolve these issues yourself or request help from NetApp Professional Services.

20. Click **Export** to export the collection report as a PDF or Microsoft Word document.



PDF and Microsoft Word document outputs include the switch configuration information for your deployment, which NetApp Professional Services uses to verify the network settings.

21. Send the exported report file to your NetApp Professional Services representative.

Find more information

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

Final preparations

After you have validated that your environment is ready to support NetApp HCI and resolved any potential issues, you need to complete some final tasks before deployment.

- Ensure you have a successful report from Active IQ Config Advisor.
- Gather all relevant information about your network, current or planned VMware infrastructure, and planned user credentials.
- Rack, cable, and power on the NetApp HCI installation.
- Ensure that storage capacity is split evenly across all chassis containing storage nodes. This ensures the best storage reliability possible.
- Configure IPMI access for each node.

Configure IPMI access for each node

After you have racked, cabled, and powered on your NetApp HCI hardware, you can configure Intelligent Platform Management Interface (IPMI) access for each node. Assign each IPMI port an IP address and change the default IPMI administrator password as soon as you have remote IPMI access to the node.

Manually assign the IPMI port IP address

Dynamic Host Configuration Protocol (DHCP) is enabled by default for the IPMI port of each NetApp HCI node. If your IPMI network does not use DHCP, you can manually assign a static IPv4 address to the IPMI port.

Before you begin

Ensure that you have a keyboard, video, and mouse (KVM) switch or monitor and keyboard you can use to access the BIOS of each node.

About this task

Use the arrow keys to navigate in the BIOS. Select a tab or option by pressing **Enter**. Go back to previous screens by pressing **ESC**.

Steps

1. Power on the node.
2. Upon booting, enter the BIOS by pressing the **Del** key.
3. Select the IPMI tab.
4. Select **BMC Network Configuration** and press **Enter**.
5. Choose **Yes** and press **Enter**.
6. Select **Configuration Address Source** and press **Enter**.
7. Choose **Static** and press **Enter**.
8. Select **Station IP address** and enter a new IP address for the IPMI port. Press **Enter** when finished.
9. Select **Subnet mask** and enter a new subnet mask for the IPMI port. Press **Enter** when finished.
10. Select **Gateway IP address** and enter a new gateway IP address for the IPMI port. Press **Enter** when finished.
11. Connect one end of an Ethernet cable to the IPMI port and the other end to a switch.

The IPMI port for this node is ready to use.

12. Repeat this procedure for any other NetApp HCI nodes with IPMI ports that are not configured.

Change the default IPMI password for H410C and H410S nodes

You should change the default password for the IPMI administrator account on each compute and storage node as soon as you configure the IPMI network port.

Before you begin

You have configured the IPMI IP address for each compute and storage node.

Steps

1. Open a web browser on a computer that can reach the IPMI network and browse to the IPMI IP address for the node.
2. Enter the user name **ADMIN** and password **ADMIN** in the login prompt.
3. Upon logging in, click the **Configuration** tab.
4. Click **Users**.
5. Select the **ADMIN** user and click **Modify User**.
6. Select the **Change Password** check box.
7. Enter a new password in the **Password** and **Confirm Password** fields.

8. Click **Modify**, and then click **OK**.
9. Repeat this procedure for any other NetApp HCI H410C and H410S nodes with default IPMI passwords.

Change the default IPMI password for H610C, H615C, and H610S nodes

You should change the default password for the IPMI administrator account on each compute and storage node as soon as you configure the IPMI network port.

Before you begin

You have configured the IPMI IP address for each compute and storage node.

Steps

1. Open a web browser on a computer that can reach the IPMI network and browse to the IPMI IP address for the node.
2. Enter the user name **root** and password **calvin** in the login prompt.
3. Upon logging in, click the menu navigation icon at the top left of the page to open the sidebar drawer.
4. Click **Settings**.
5. Click **User Management**.
6. Select the **Administrator** user from the list.
7. Enable the **Change Password** check box.
8. Enter a new, strong password in the **Password** and **Confirm Password** fields.
9. Click **Save** at the bottom of the page.
10. Repeat this procedure for any other NetApp HCI H610C, H615C, or H610S nodes with default IPMI passwords.

Find more information

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

Copyright Information

Copyright © 2020 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system-without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.