Nodes

HCI

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NetApp®

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Nodes

Nodes are hardware or virtual resources that are grouped into a cluster to provide block storage and compute capabilities.

NetApp HCI and Element software defines various node roles for a cluster. The four types of node roles are **management node, storage node, compute node,** and **NetApp HCI Witness Nodes.**

Management node

The management node (mNode) interacts with a storage cluster to perform management actions, but is not a member of the storage cluster. Management nodes periodically collect information about the cluster through API calls and report this information to Active IQ for remote monitoring (if enabled). Management nodes are also responsible for coordinating software upgrades of the cluster nodes.
The management node is a virtual machine that runs in parallel with one or more Element software-based storage clusters. In addition to upgrades, it is used to provide system services including monitoring and telemetry, manage cluster assets and settings, run system tests and utilities, and enable NetApp Support access for troubleshooting.
As of the Element 11.3 release, the management node functions as a microservice host, allowing for quicker updates of select software services outside of major releases. These microservices or management services, such as the Active IQ collector, QoSSIOC for the vCenter Plug-in, and mNode service, are updated frequently as service bundles.

Storage nodes

NetApp HCI storage nodes are hardware that provide the storage resources for a NetApp HCI system. Drives in the node contain block and metadata space for data storage and data management. Each node contains a factory image of NetApp Element software. NetApp HCI storage nodes can be managed using the NetApp Element Management extension point.

Compute nodes

NetApp HCI compute nodes are hardware that provides compute resources, such as CPU, memory, and networking, that are needed for virtualization in the NetApp HCI installation. Because each server runs VMware ESXi, NetApp HCI compute node management (adding or removing hosts) must be done outside of the plug-in within the Hosts and Clusters menu in vSphere. Regardless of whether it is a four-node storage cluster or a two-node storage cluster, the minimum number of compute nodes remains two for a NetApp HCI deployment.

Witness Nodes

NetApp HCI Witness nodes are virtual machines that run on compute nodes in parallel with an

Element software-based storage cluster. Witness Nodes do not host slice or block services. A Witness Node enables storage cluster availability in the event of a storage node failure. You can manage and upgrade Witness Nodes in the same way as other storage nodes. A storage cluster can have up to four Witness Nodes. Their primary purpose is to ensure that enough cluster nodes exist to form a valid ensemble quorum.

Learn more about Witness Node resource requirements and Witness Node IP address requirements.

In a two-node storage cluster, a minimum of two Witness Nodes are deployed for redundancy in the event of a Witness Node failure.
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 Redeploying Witness Nodes for two and three-node storage clusters.

Find more information

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