



Work with per-node utilities for storage nodes

Element Software

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Work with per-node utilities for storage nodes

You can use the per-node utilities to troubleshoot network problems if the standard monitoring tools in the NetApp Element software UI do not give you enough information for troubleshooting. Per-node utilities provide specific information and tools that can help you troubleshoot network problems between nodes or with the management node.

Find more information

- [Access per-node settings using the per-node UI](#)
- [Network settings details from the per-node UI](#)
- [Cluster settings details from the per-node UI](#)
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Access per-node settings using the per-node UI

You can access network settings, cluster settings, and system tests and utilities in the per-node user interface after you enter the management node IP and authenticate.

If you want to modify settings of a node in an Active state that is part of a cluster, you must log in as a cluster administrator user.



You should configure or modify one node at a time. You should ensure that the network settings specified are having the expected effect, and that the network is stable and performing well before you make modifications to another node.

1. Open the per-node UI using one of the following methods:
 - Enter the management IP address followed by :442 in a browser window, and log in using an admin user name and password.
 - In the Element UI, select **Cluster > Nodes**, and click the management IP address link for the node you want to configure or modify. In the browser window that opens, you can edit the settings of the node.

NetApp

Hybrid Cloud Control

Node01

Node01

NETWORK SETTINGS

CLUSTER SETTINGS

SYSTEM TESTS

SYSTEM UTILITIES

Network Settings

Bond1G

Bond10G

Reset Changes

Method

static

Link Speed

1000

IPv4 Address

IPv4 Subnet Mask

255.255.255.0

IPv4 Gateway Address

IPv6 Address

IPv6 Gateway Address

MTU

1500

DNS Servers

Search Domains

Bond Mode

Status

Network settings details from the per-node UI

You can change the storage node network settings to give the node a new set of network attributes.

You can see the network settings for a storage node on the **Network Settings** page when you log in to the node (<https://<node IP>:442/hcc/node/network-settings>). You can select either **Bond1G** (management) or **Bond10G** (storage) settings. The following list describes the settings that you can modify when a storage node is in Available, Pending, or Active state:

- **Method**

The method used to configure the interface. Possible methods:

- loopback: Used to define the IPv4 loopback interface.
- manual: Used to define interfaces for which no configuration is done by default.
- dhcp: Used to obtain an IP address via DHCP.
- static: Used to define Ethernet interfaces with statically allocated IPv4 addresses.

- **Link Speed**

The speed negotiated by the virtual NIC.

- **IPv4 Address**

The IPv4 address for the eth0 network.

- **IPv4 Subnet Mask**

Address subdivisions of the IPv4 network.

- **IPv4 Gateway Address**

Router network address to send packets out of the local network.

- **IPv6 Address**

The IPv6 address for the eth0 network.

- **IPv6 Gateway Address**

Router network address to send packets out of the local network.

- **MTU**

Largest packet size that a network protocol can transmit. Must be greater than or equal to 1500. If you add a second storage NIC, the value should be 9000.

- **DNS Servers**

Network interface used for cluster communication.

- **Search Domains**

Search for additional MAC addresses available to the system.

- **Bond Mode**

Can be one of the following modes:

- ActivePassive (default)
- ALB
- LACP

- **Status**

Possible values:

- UpAndRunning
- Down
- Up

- **Virtual Network Tag**

Tag assigned when the virtual network was created.

- **Routes**

Static routes to specific hosts or networks via the associated interface the routes are configured to use.

Cluster settings details from the per-node UI

You can verify cluster settings for a storage node after cluster configuration and modify the node hostname.

The following list describes the cluster settings for a storage node indicated from the **Cluster Settings** page of the per-node UI (<https://<node IP>:442/hcc/node/cluster-settings>).

- **Role**

Role the node has in the cluster. Possible values:

- Storage: Storage or Fibre Channel node.
- Management: Node is a management node.

- **Hostname**

Name of the node.

- **Cluster**

Name of the cluster.

- **Cluster Membership**

State of the node. Possible values:

- Available: The node has no associated cluster name and is not yet part of a cluster.
- Pending: The node is configured and can be added to a designated cluster. Authentication is not required to access the node.
- PendingActive: The system is in the process of installing compatible software on the node. When complete, the node will move to the Active state.
- Active: The node is participating in a cluster. Authentication is required to modify the node.

- **Version**

Version of the Element software running on the node.

- **Ensemble**

Nodes that are part of the database ensemble.

- **Node ID**

ID assigned when a node is added to the cluster.

- **Cluster Interface**

Network interface used for cluster communication.

- **Management Interface**

Management network interface. This defaults to Bond1G but can also use Bond10G.

- **Storage Interface**

Storage network interface using Bond10G.

- **Encryption Capable**

Indicates whether or not the node supports drive encryption.

Run system tests using the per-node UI

You can test changes to the network settings after you commit them to the network configuration. You can run the tests to ensure that the storage node is stable and can be brought online without any issues.

You have logged in to the per-node UI for the storage node.

1. Click **System Tests**.
2. Click **Run Test** next to the test you want to run or select **Run All Tests**.



Running all test operations can be time consuming and should be done only at the direction of NetApp Support.

- **Test Connected Ensemble**

Tests and verifies the connectivity to a database ensemble. By default, the test uses the ensemble for the cluster the node is associated with. Alternatively you can provide a different ensemble to test connectivity.

- **Test Connect Mvip**

Pings the specified management virtual IP (MVIP) address and then executes a simple API call to the MVIP to verify connectivity. By default, the test uses the MVIP for the cluster the node is associated with.

- **Test Connect Svip**

Pings the specified storage virtual IP (SVIP) address using Internet Control Message Protocol (ICMP) packets that match the Maximum Transmission Unit (MTU) size set on the network adapter. It then connects to the SVIP as an iSCSI initiator. By default, the test uses the SVIP for the cluster the node is associated with.

- **Test Hardware Config**

Tests that all hardware configurations are correct, validates firmware versions are correct, and confirms all drives are installed and running properly. This is the same as factory testing.



This test is resource intensive and should only be run if requested by NetApp Support.

- **Test Local Connectivity**

Tests the connectivity to all of the other nodes in the cluster by pinging the cluster IP (CIP) on each node. This test will only be displayed on a node if the node is part of an active cluster.

- **Test Locate Cluster**

Validates that the node can locate the cluster specified in the cluster configuration.

- **Test Network Config**

Verifies that the configured network settings match the network settings being used on the system. This test is not intended to detect hardware failures when a node is actively participating in a cluster.

- **Test Ping**

Pings a specified list of hosts or, if none are specified, dynamically builds a list of all registered nodes in the cluster and pings each for simple connectivity.

- **Test Remote Connectivity**

Tests the connectivity to all nodes in remotely paired clusters by pinging the cluster IP (CIP) on each node. This test will only be displayed on a node if the node is part of an active cluster.

Run system utilities using the per-node UI

You can use the per-node UI for the storage node to create or delete support bundles, reset configuration settings for drives, and restart network or cluster services.

You have logged in to the per-node UI for the storage node.

1. Click **System Utilities**.
2. Click the button for the system utility that you want to run.

- **Control Power**

Reboots, power cycles, or shuts down the node.



This operation causes temporary loss of networking connectivity.

Specify the following parameters:

- Action: Options include Restart and Halt (power off).
- Wakeup Delay: Any additional time before the node comes back online.

- **Collect Node Logs**

Creates a support bundle under the node's /tmp/bundles directory.

Specify the following parameters:

- **Bundle Name:** Unique name for each support bundle created. If no name is provided, then "supportbundle" and the node name are used as the file name.
- **Extra Args:** This parameter is fed to the sf_make_support_bundle script. This parameter should be used only at the request of NetApp Support.
- **Timeout Sec:** Specify the number of seconds to wait for each individual ping response.

◦ **Delete Node Logs**

Deletes any current support bundles on the node that were created using **Create Cluster Support Bundle** or the CreateSupportBundle API method.

◦ **Reset Drives**

Initializes drives and removes all data currently residing on the drive. You can reuse the drive in an existing node or in an upgraded node.

Specify the following parameter:

- **Drives:** List of device names (not driveIDs) to reset.

◦ **Reset Network Config**

Helps resolve network configuration issues for an individual node and resets an individual node's network configuration to the factory default settings.

◦ **Reset Node**

Resets a node to the factory settings. All data is removed but network settings for the node are preserved during this operation. Nodes can only be reset if they are unassigned to a cluster and in Available state.



All data, packages (software upgrades), configurations, and log files are deleted from the node when you use this option.

◦ **Restart Networking**

Restarts all networking services on a node.



This operation can cause temporary loss of network connectivity.

◦ **Restart Services**

Restarts Element software services on a node.



This operation can cause temporary node service interruption. You should perform this operation only at the direction of NetApp Support.

Specify the following parameters:

- **Service:** Service name to be restarted.

- Action: Action to perform on the service. Options include start, stop and restart.

Work with the management node

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.



As a best practice, only associate one management node with one VMware vCenter instance, and avoid defining the same storage and compute resources or vCenter instances in multiple management nodes.

See [management node documentation](#) for more information.

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