NetApp

Cisco Nexus 9364D-GX2A

Install and maintain

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Cisco Nexus 9364D-GX2A

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Installation and setup workflow for Cisco 9364D-GX2A switches

The Cisco 9364D-GX2A switch is part of the Cisco Nexus 9000 platform. AFX systems switches allow you to build ONTAP clusters with more than two nodes.

Follow these workflow steps to install and setup your to Cisco 9364D-GX2A switches.

1 **Review the switch port details**

Review the port details for the Cisco 9364D-GX2A switch.

2 **Review the required documentation**

Review specific switch and controller documentation to set up your 9364D-GX2A switches and the ONTAP cluster.

3 **Review the Smart Call Home requirements**

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Port details for Cisco Nexus 9364D-GX2A switches

The Cisco Nexus 9364D-GX2A switch is part of the Cisco Nexus 9000 platform and can be installed in a NetApp system cabinet. 9364D-GX2A switches allow you to build ONTAP clusters with more than two nodes.

Cisco Nexus 9364D-GX2A port details

Ports	Description
Ethernet1/1/1-4 to Ethernet1/62/1-4	4x100GbE mode for cluster, HA, amd storage connections

Ports	Description
Ethernet1/63, Ethernet1/64	400GbE ISL

See the Hardware Universe for details of ports used by the platform.

Documentation requirements for Cisco Nexus 9364D-GX2A switches

For Cisco Nexus 9364D-GX2A switch installation and maintenance, be sure to review specific switch and controller documentation to set up your Cisco 9364D-GX2A switches and ONTAP cluster.

Switch documentation

To set up the Cisco Nexus 9364D-GX2A switches, you need the following documentation from the Cisco Nexus 9000 Series Switches Support page:

Document title	Description
Cisco Nexus 9364D-GX2A NX-OS Mode Switch Hardware Installation Guide	Provides detailed information about site requirements, switch hardware details, and installation options.
Cisco Nexus 9000 Series Switch Software Configuration Guides (choose the guide for the NX-OS release installed on your switches)	Provides initial switch configuration information that you need before you can configure the switch for ONTAP operation.
Cisco Nexus 9000 Series NX-OS Software Upgrade and Downgrade Guide (choose the guide for the NX-OS release installed on your switches)	Provides information on how to downgrade the switch to ONTAP supported switch software, if necessary.
Cisco Nexus 9000 Series NX-OS Command Reference	Provides links to the various command references provided by Cisco.
Cisco Nexus 9000 Series NX-OS System Message Reference	Describes the system messages for Cisco Nexus 9000 series switches, those that are informational, and others that might help diagnose problems with links, internal hardware, or the system software.
Cisco Nexus 9000 Series NX-OS Release Notes (choose the notes for the NX-OS release installed on your switches)	Describes the features, bugs, and limitations for the Cisco Nexus 9000 Series.
Regulatory Compliance and Safety Information for Cisco Nexus 9000 Series	Provides international agency compliance, safety, and statutory information for the Nexus 9000 series switches.

ONTAP systems documentation

To set up an ONTAP system, you need the following documents for your version of the operating system from the ONTAP 9 Documentation Center.

Name	Description
AFX systems documentation	Describes how to install NetApp hardware.
ONTAP documentation	Provides detailed information about all aspects of the ONTAP releases.
Hardware Universe	Provides NetApp hardware configuration and compatibility information.

Smart Call Home requirements

To use Smart Call Home, you must configure a cluster network switch to communicate using email with the Smart Call Home system. In addition, you can optionally set up your cluster network switch to take advantage of Cisco's embedded Smart Call Home support feature.

Smart Call Home monitors the hardware and software components on your network. When a critical system configuration occurs, it generates an email-based notification and raises an alert to all the recipients that are configured in your destination profile.

Smart Call Home monitors the hardware and software components on your network. When a critical system configuration occurs, it generates an email-based notification and raises an alert to all the recipients that are configured in your destination profile.

Before you can use Smart Call Home, be aware of the following requirements:

- An email server must be in place.
- The switch must have IP connectivity to the email server.
- The contact name (SNMP server contact), phone number, and street address information must be configured. This is required to determine the origin of messages received.
- A CCO ID must be associated with an appropriate Cisco SMARTnet Service contract for your company.
- Cisco SMARTnet Service must be in place for the device to be registered.

The Cisco support site contains information about the commands to configure Smart Call Home.

Install hardware

Go to the AFX install and setup workflow to learn how to install and setup the switch hardware and controller hardware for your system.

The AFX install and setup documentation includes information such as:

- Instructions for getting the site ready, unpacking the boxes and comparing the contents of the boxes to the packing slip, and registering the system to access support benefits.
- Instructions for installing the switches, controllers, and storage shelf in a NetApp cabinet or telco rack.

- Instructions for cabling your system, including cabling the controller storage to switch connections and cabling the shelf to switch connections.

Configure software

Configure software workflow for Cisco 9364D-GX2A switches

To install and configure the software for a Cisco 9364D-GX2A switch and to install or upgrade the Reference Configuration File (RCF), follow these steps:

1 **Configure the 9364D-GX2A switch**

Configure the Cisco 9364D-GX2A switch.

2 **Prepare to install the NX-OS software and RCF**

Install the Cisco NX-OS software and reference configuration files (RCFs) on the Cisco 9364D-GX2A switches.

3 **Install or upgrade the NX-OS software**

Download and install or upgrade the NX-OS software on the Cisco 9364D-GX2A switch.

4 **Install or upgrade the RCF**

Install or upgrade the RCF after setting up the Cisco 9364D-GX2A switch for the first time. You can also use this procedure to upgrade your RCF version.

5 **Verify SSH is enabled on the Nexus 9364D-GX2A switches**

Verify that SSH is enabled on the Cisco 9364D-GX2A switch for use with the Ethernet Switch Health Monitor (CSHM) and log collection features.

6 **Reset the switch to factory defaults**

Erase the Cisco 9364D-GX2A switch settings.

Once you have finished configuring your switches, go to Power on your AFX 1K storage system.

Configure the 9364D-GX2A switch

Follow this procedure to configure the Cisco Nexus 9364D-GX2A switch.

Before you begin
Make sure you have:

- Powered on your switches.

- Access to an HTTP, FTP, or TFTP server at the installation site to download the applicable NX-OS and Reference Configuration File (RCF) releases.
- Applicable NX-OS version, downloaded from the Cisco software download page.

> ℹ️
> - NX-OS 10.4.2 is the only supported version for Cisco Nexus 9364D-GX2A switches in an ONTAP cluster.
> - Do not upgrade or downgrade your NX-OS version to an unsupported version; only 10.4.2 is currently supported.

- Applicable licenses, network and configuration information, and cables.
- Applicable NetApp cluster network and management network RCFs downloaded from the NetApp Support Site at mysupport.netapp.com. All Cisco cluster network and management network switches arrive with the standard Cisco factory-default configuration. These switches also have the current version of the NX-OS software but do not have the RCFs loaded.
- Required switch and ONTAP documentation.

Steps

1. Perform an initial configuration of the cluster network switches.

   Provide applicable responses to the following initial setup questions when you first boot the switch. Your site's security policy defines the responses and services to enable.

Prompt	Response
Abort Auto Provisioning and continue with normal setup? (yes/no)	Respond with **yes**. The default is no.
Do you want to enforce secure password standard? (yes/no)	Respond with **yes**. The default is yes.
Enter the password for admin.	The default password is "admin"; you must create a new, strong password. A weak password can be rejected.
Would you like to enter the basic configuration dialog? (yes/no)	Respond with **yes** at the initial configuration of the switch.
Create another login account? (yes/no)	Your answer depends on your site's policies on alternate administrators. The default is **no**.
Configure read-only SNMP community string? (yes/no)	Respond with **no**. The default is no.
Configure read-write SNMP community string? (yes/no)	Respond with **no**. The default is no.
Enter the switch name.	Enter the switch name, which is limited to 63 alphanumeric characters.

Prompt	Response
Continue with Out-of-band (mgmt0) management configuration? (yes/no)	Respond with **yes** (the default) at that prompt. At the mgmt0 IPv4 address: prompt, enter your IP address: ip_address.
Configure the default-gateway? (yes/no)	Respond with **yes**. At the IPv4 address of the default-gateway: prompt, enter your default_gateway.
Configure advanced IP options? (yes/no)	Respond with **no**. The default is no.
Enable the telnet service? (yes/no)	Respond with **no**. The default is no.
Enabled SSH service? (yes/no)	Respond with **yes**. The default is yes. ⓘ SSH is recommended when using Ethernet Switch Health Monitor (CSHM) for its log collection features. SSHv2 is also recommended for enhanced security.
Enter the type of SSH key you want to generate (dsa/rsa/rsa1).	The default is **rsa**.
Enter the number of key bits (1024-2048).	Enter the number of key bits from 1024 to 2048.
Configure the NTP server? (yes/no)	Respond with **no**. The default is no.
Configure default interface layer (L3/L2)	Respond with **L2**. The default is L2.
Configure default switch port interface state (shut/noshut)	Respond with **noshut**. The default is noshut.
Configure CoPP system profile (strict/moderate/lenient/dense)	Respond with **strict**. The default is strict.
Would you like to edit the configuration? (yes/no)	You should see the new configuration at this point. Review and make any necessary changes to the configuration you just entered. Respond with **no** at the prompt if you are satisfied with the configuration. Respond with **yes** if you want to edit your configuration settings.

Prompt	Response
Use this configuration and save it? (yes/no)	Respond with **yes** to save the configuration. This automatically updates the kickstart and system images. ⓘ If you do not save the configuration at this stage, none of the changes will be in effect the next time you reboot the switch.

2. Verify the configuration choices you made in the display that appears at the end of the setup, and make sure that you save the configuration.

3. Check the version on the cluster network switches, and if necessary, download the NetApp-supported version of the software to the switches from the Cisco software download page.

What's next?

After you've configured your switches, you prepare to install NX-OS and RCF.

Prepare to install NX-OS software and RCF

Before you install the NX-OS software and the Reference Configuration File (RCF), follow this procedure.

About the examples

The examples in this procedure use the following switch and node nomenclature:

- The names of the two Cisco switches are cs1 and cs2.
- The node names are node1-01, node1-02, node1-03, and node1-04.
- The cluster LIF names are:
    - node1-01_clus1 and node1-01_clus2 for node1-01
    - node1-02_clus1 and node1-02_clus2 for node1-02
    - node1-03_clus1 and node1-03_clus2 for node1-03
    - node1-04_clus1 and node1-04_clus2 for node1-04
- The `cluster1::*>` prompt indicates the name of the cluster.

About this task

The procedure requires the use of both ONTAP commands and Cisco Nexus 9000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

Steps

1. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=x h`

   where x is the duration of the maintenance window in hours.

   ⓘ The AutoSupport message notifies technical support of this maintenance task so that automatic case creation is suppressed during the maintenance window.

2. Change the privilege level to advanced, entering **y** when prompted to continue:

```
set -privilege advanced
```

The advanced prompt (`*>`) appears.

3. Check the administrative and operational status of each port.

    a. **Cluster ports**

        i. Display how many cluster interconnect interfaces are configured in each node for each cluster interconnect switch:

```
network device-discovery show -protocol cdp
```

Show example

```
cluster1::*> network device-discovery show -protocol cdp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID) Interface
Platform
----------- ------ ----------------------- ----------------
----------------
node1-02/cdp
            e10a   cs1(FLMXXXXXXXX)         Ethernet1/16/3
N9K-C9364D-GX2A
            e10b   cs2(FDOXXXXXXXX)         Ethernet1/13/3
N9K-C9364D-GX2A
            e11a   cs1(FLMXXXXXXXX)         Ethernet1/16/4
N9K-C9364D-GX2A
            e11b   cs2(FDOXXXXXXXX)         Ethernet1/13/4
N9K-C9364D-GX2A
            e1a    cs1(FLMXXXXXXXX)         Ethernet1/16/1
N9K-C9364D-GX2A
            e1b    cs2(FDOXXXXXXXX)         Ethernet1/13/1
N9K-C9364D-GX2A
              .
              .
              .
            e7a    cs1(FLMXXXXXXXX)         Ethernet1/16/2
N9K-C9364D-GX2A
            e7b    cs2(FDOXXXXXXXX)         Ethernet1/13/2
N9K-C9364D-GX2A

node1-01/cdp
            e10a   cs1(FLMXXXXXXXX)         Ethernet1/16/3
N9K-C9364D-GX2A
            e10b   cs2(FDOXXXXXXXX)         Ethernet1/13/3
N9K-C9364D-GX2A
            e11a   cs1(FLMXXXXXXXX)         Ethernet1/16/4
N9K-C9364D-GX2A
            e11b   cs2(FDOXXXXXXXX)         Ethernet1/13/4
N9K-C9364D-GX2A
            e1a    cs1(FLMXXXXXXXX)         Ethernet1/16/1
N9K-C9364D-GX2A
            e1b    cs2(FDOXXXXXXXX)         Ethernet1/13/1
N9K-C9364D-GX2A
              .
              .
              .
            e7a    cs1(FLMXXXXXXXX)         Ethernet1/16/2
```

```
N9K-C9364D-GX2A
            e7b     cs2(FDOXXXXXXXX)          Ethernet1/13/2
N9K-C9364D-GX2A
 .
 .
 .
```

ii. Display the network port attributes:

```
network port show -ipspace Cluster
```

Show example

```
cluster1::*> network port show -ipspace Cluster

Node: node1-01

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster      Cluster          up   9000 auto/100000
healthy false
e7b       Cluster      Cluster          up   9000 auto/100000
healthy false


Node: node1-02

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster      Cluster          up   9000 auto/100000
healthy false
e7b       Cluster      Cluster          up   9000 auto/100000
healthy false


Node: node1-03

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster      Cluster          up   9000 auto/100000
healthy false
e7b       Cluster      Cluster          up   9000 auto/100000
```

```
healthy false


Node: node1-04

Ignore

                                          Speed(Mbps)
Health   Health
Port      IPspace        Broadcast Domain Link MTU  Admin/Oper
Status    Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster            up   9000  auto/100000
healthy false
e7b       Cluster       Cluster            up   9000  auto/100000
healthy false

8 entries were displayed.
```

iii. Display information about the cluster LIFs:

```
network interface show -vserver Cluster
```

Show example

```
cluster1::*> network interface show -vserver Cluster

          Logical        Status     Network
Current    Current Is
Vserver    Interface     Admin/Oper Address/Mask       Node
Port   Home
---------- ------------- ---------- ------------------
--------- ------- ----
Cluster
          node1-01_clus1 up/up      169.254.36.44/16   node1-
01  e7a      true
          node1-01_clus2 up/up      169.254.7.5/16     node1-
01  e7b      true
          node1-02_clus1 up/up      169.254.197.206/16 node1-
02  e7a      true
          node1-02_clus2 up/up      169.254.195.186/16 node1-
02  e7b      true
          node1-03_clus1 up/up      169.254.192.49/16  node1-
03  e7a      true
          node1-03_clus2 up/up      169.254.182.76/16  node1-
03  e7b      true
          node1-04_clus1 up/up      169.254.59.49/16   node1-
04  e7a      true
          node1-04_clus2 up/up      169.254.62.244/16  node1-
04  e7b      true

8 entries were displayed.
```

b. **HA ports**

i. Display information about the HA ports:

```
ha interconnect status show -node <node-name>
```

Show example

```
cluster1::*> ha interconnect status show -node node1-01
   (system ha interconnect status show)

                       Node: node1-01
              Link 0 Status: up
              Link 1 Status: up
           Is Link 0 Active: true
           Is Link 1 Active: true
         IC RDMA Connection: up
                       Slot: 0
             Debug Firmware: no



Interconnect Port 0 :
                  Port Name: e1a-17
                        MTU: 4096
           Link Information: ACTIVE



Interconnect Port 1 :
                  Port Name: e1b-18
                        MTU: 4096
           Link Information: ACTIVE

cluster1::*> ha interconnect status show -node node1-02
   (system ha interconnect status show)

                       Node: node1-02
              Link 0 Status: up
              Link 1 Status: up
           Is Link 0 Active: true
           Is Link 1 Active: true
         IC RDMA Connection: up
                       Slot: 0
             Debug Firmware: no



Interconnect Port 0 :
                  Port Name: e1a-17
                        MTU: 4096
           Link Information: ACTIVE



Interconnect Port 1 :
```

```
                    Port Name: e1b-18
                          MTU: 4096
             Link Information: ACTIVE
  .
  .
  .
```

c. **Storage ports**

   i. Display information about the storage ports:

```
storage port show -port-type ENET
```

Show example

```
cluster1::*> storage port show -port-type ENET

                                   Speed
Node              Port Type  Mode   (Gb/s) State     Status
----------------- ---- ----- ------- ------ --------
-----------
node1-01
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
                  e11b ENET  -          100 enabled  online
node1-02
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
                  e11b ENET  -          100 enabled  online
node1-03
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
node1-04
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
                  e11b ENET  -          100 enabled  online
16 entries were displayed.
```

d. **Storage shelf ports**

i. Verify that all the storage shelf ports are up with a healthy status:

```
storage shelf port show
```

Show example

```
cluster1::*> storage shelf port show

Shelf ID Module State         Internal?
----- -- ------ ------------ ---------
1.1
      0 A      connected    false
      1 A      connected    false
      2 A      connected    false
      3 A      connected    false
      4 A      connected    false
      5 A      connected    false
      6 A      connected    false
      7 A      connected    false
      8 B      connected    false
      9 B      connected    false
     10 B      connected    false
     11 B      connected    false
     12 B      connected    false
     13 B      connected    false
     14 B      connected    false
     15 B      connected    false

16 entries were displayed.
```

ii. Verify the connection status of all the storage shelf ports:

```
storage shelf port show -fields remote-device,remote-
port,connector-state
```

Show example

```
cluster1::*> storage shelf port show -fields remote-
device,remote-port,connector-state

shelf id connector-state remote-port     remote-device
----- -- --------------- -------------- -----------------
1.1   0  connected       Ethernet1/17/1 CX9332D-cs1
1.1   1  connected       Ethernet1/15/1 CX9364D-cs1
1.1   2  connected       Ethernet1/17/2 CX9332D-cs1
1.1   3  connected       Ethernet1/15/2 CX9364D-cs1
1.1   4  connected       Ethernet1/17/3 CX9332D-cs1
1.1   5  connected       Ethernet1/15/3 CX9364D-cs1
1.1   6  connected       Ethernet1/17/4 CX9332D-cs1
1.1   7  connected       Ethernet1/15/4 CX9364D-cs1
1.1   8  connected       Ethernet1/19/1 CX9332D-cs1
1.1   9  connected       Ethernet1/17/1 CX9364D-cs1
1.1   10 connected       Ethernet1/19/2 CX9332D-cs1
1.1   11 connected       Ethernet1/17/2 CX9364D-cs1
1.1   12 connected       Ethernet1/19/3 CX9332D-cs1
1.1   13 connected       Ethernet1/17/3 CX9364D-cs1
1.1   14 connected       Ethernet1/19/4 CX9332D-cs1
1.1   15 connected       Ethernet1/17/4 CX9364D-cs1

16 entries were displayed.
```

4. Verify the connectivity of the remote cluster interfaces.

   a. You can use the `network interface check cluster-connectivity show` command to
      display the details of an accessibility check for cluster connectivity:

   ```
   network interface check cluster-connectivity show
   ```

Show example

```
cluster1::*> network interface check cluster-connectivity show

                                     Source          Destination
Packet
Node   Date                          LIF             LIF
Loss
------ ------------------------- ----------------
-------------- -----------
node1-01
       6/4/2025 03:13:33 -04:00    node1-01_clus2  node1-02_clus1
none
       6/4/2025 03:13:34 -04:00    node1-01_clus2  node1-02_clus1
none


node1-02
       6/4/2025 03:13:33 -04:00    node1-02_clus2  node1-01_clus1
none
       6/4/2025 03:13:34 -04:00    node1-02_clus2  node1-01_clus2
none
 .
 .
 .
```

b. Alternatively, you can use the `cluster ping-cluster -node <node-name>` command to check the connectivity:

```
cluster ping-cluster -node <node-name>
```

Show example

```
cluster1::*> cluster ping-cluster -node local
Host is node1-04
Getting addresses from network interface table...
Cluster node1-01_clus1 169.254.36.44 node1-01 e7a
Cluster node1-01_clus2 169.254.7.5   node1-01 e7b
Cluster node1-02_clus1 169.254.197.206 node1-02 e7a
Cluster node1-02_clus2 169.254.195.186 node1-02 e7b
Cluster node1-03_clus1 169.254.192.49 node1-03 e7a
Cluster node1-03_clus2 169.254.182.76 node1-03 e7b
Cluster node1-04_clus1 169.254.59.49 node1-04 e7a
Cluster node1-04_clus2 169.254.62.244 node1-04 e7b
Local = 169.254.59.49 169.254.62.244
Remote = 169.254.36.44 169.254.7.5 169.254.197.206
169.254.195.186 169.254.192.49 169.254.182.76
Cluster Vserver Id = 4294967293
Ping status:
............
Basic connectivity succeeds on 12 path(s)
Basic connectivity fails on 0 path(s)
................................................
Detected 9000 byte MTU on 12 path(s):
    Local 169.254.59.49 to Remote 169.254.182.76
    Local 169.254.59.49 to Remote 169.254.192.49
    Local 169.254.59.49 to Remote 169.254.195.186
    Local 169.254.59.49 to Remote 169.254.197.206
    Local 169.254.59.49 to Remote 169.254.36.44
    Local 169.254.59.49 to Remote 169.254.7.5
    Local 169.254.62.244 to Remote 169.254.182.76
    Local 169.254.62.244 to Remote 169.254.192.49
    Local 169.254.62.244 to Remote 169.254.195.186
    Local 169.254.62.244 to Remote 169.254.197.206
    Local 169.254.62.244 to Remote 169.254.36.44
    Local 169.254.62.244 to Remote 169.254.7.5
Larger than PMTU communication succeeds on 12 path(s)
RPC status:
6 paths up, 0 paths down (tcp check)
6 paths up, 0 paths down (udp check)
```

5. Verify that the auto-revert command is enabled on all cluster LIFs:

```
network interface show -vserver Cluster -fields auto-revert
```

Show example

```
cluster1::*> network interface show -vserver Cluster -fields auto-
revert
        Logical
Vserver Interface         Auto-revert
------- ------------------ -----------
Cluster node1-01_clus1     true
Cluster node1-01_clus2     true
Cluster node1-02_clus1     true
Cluster node1-02_clus2     true
Cluster node1-03_clus1     true
Cluster node1-03_clus2     true
Cluster node1-04_clus1     true
Cluster node1-04_clus2     true

8 entries were displayed.
```

What's next?

After you've prepared to install the NX-OS software and RCF, you install or upgrade the NX-OS software.

Install or upgrade the NX-OS software

Follow this procedure to install or upgrade the NX-OS software on the Nexus 9364D-GX2A switch.

Review requirements

Before you begin

Verify the following:

- Complete the procedure in Prepare to install NX-OS and RCF.
- A current backup of the switch configuration is available.
- A fully functioning cluster (no errors in the logs or similar issues) is in place.

Suggested documentation

- Cisco Ethernet switch page

  Consult the switch compatibility table for the supported ONTAP and NX-OS versions.

- Software Upgrade and downgrade guides

  Refer to the appropriate software and upgrade guides available on the Cisco website for complete documentation on the Cisco switch upgrade and downgrade procedures.

- Cisco Nexus 9000 and 3000 Upgrade and ISSU Matrix

Provides information on Disruptive Upgrade/Downgrade for Cisco NX-OS software on Nexus 9000 Series Switches
based on your current and target releases.

On the page, select **Disruptive Upgrade** and select your current release and target release from the dropdown list.

About the examples

The examples in this procedure use the following switch and node nomenclature:

- The names of the two Cisco switches are cs1 and cs2.
- The node names are node1-01, node1-02, node1-03, and node1-04.
- The cluster LIF names are node1-01_clus1, node1-01_clus2, node1-02_clus1, node1-02_clus2, node1-03_clus1, node1-03_clus2, node1-04_clus1, and node1-04_clus2.
- The `cluster1::*>` prompt indicates the name of the cluster.

Install the software

The procedure requires the use of both ONTAP commands and Cisco Nexus 9000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

> (i)
> - NX-OS 10.4.2 is the only supported version for Cisco Nexus 9364D-GX2A switches in an ONTAP cluster.
> - Do not upgrade or downgrade your NX-OS version to an unsupported version; only 10.4.2 is currently supported.

Steps

1. Connect the switch to the management network.
2. Use the ping command to verify connectivity to the server hosting the NX-OS software and the RCF.

   Show example

   This example verifies that the switch can reach the server at IP address 172.19.2.1:

   ```
   cs2# ping 172.19.2.1
   Pinging 172.19.2.1 with 0 bytes of data:

   Reply From 172.19.2.1: icmp_seq = 0. time= 5910 usec.
   ```

3. Display the cluster ports on each node that are connected to the cluster switches:

   ```
   network device-discovery show
   ```

Show example

```
cluster1::*> network device-discovery show

Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID) Interface
Platform
----------- ------ ---------------------- ----------------
----------------
node1-01/cdp
            e10a   cs1(FLMXXXXXXXX)         Ethernet1/16/3   N9K-
C9364D-GX2A
            e10b   cs2(FDOXXXXXXXX)         Ethernet1/13/3   N9K-
C9364D-GX2A
            e11a   cs1(FLMXXXXXXXX)         Ethernet1/16/4   N9K-
C9364D-GX2A
            e11b   cs2(FDOXXXXXXXX)         Ethernet1/13/4   N9K-
C9364D-GX2A
            e1a    cs1(FLMXXXXXXXX)         Ethernet1/16/1   N9K-
C9364D-GX2A
            e1b    cs2(FDOXXXXXXXX)         Ethernet1/13/1   N9K-
C9364D-GX2A
            .
            .
            .
            e7a    cs1(FLMXXXXXXXX)         Ethernet1/16/2   N9K-
C9364D-GX2A
            e7b    cs2(FDOXXXXXXXX)         Ethernet1/13/2   N9K-
C9364D-GX2A

node1-01/lldp
            e10a   cs1 (c8:60:8f:xx:xx:xx) Ethernet1/16/3   -
            e10b   cs2 (04:e3:87:xx:xx:xx) Ethernet1/13/3   -
            e11a   cs1 (c8:60:8f:xx:xx:xx) Ethernet1/16/4   -
            e11b   cs2 (04:e3:87:xx:xx:xx) Ethernet1/13/4   -
            e1a    cs1 (c8:60:8f:xx:xx:xx) Ethernet1/16/1   -
            e1b    cs2 (04:e3:87:xx:xx:xx) Ethernet1/13/1   -
            .
            .
            .
            e7a    cs1 (c8:60:8f:xx:xx:xx) Ethernet1/16/2   -
            e7b    cs2 (04:e3:87:xx:xx:xx) Ethernet1/13/2   -
.
.
.
```

4. Check the administrative and operational status of each port.

    a. **Cluster ports**

        i. Verify that all the cluster ports are up with a healthy status:

```
network port show -ipspace Cluster
```

Show example

```
cluster1::*> network port show -ipspace Cluster

Node: node1-01

Ignore
                                                  Speed(Mbps)
Health   Health
Port     IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster      Cluster          up   9000 auto/100000
healthy false
e7b       Cluster      Cluster          up   9000 auto/100000
healthy false

Node: node1-02

Ignore
                                                  Speed(Mbps)
Health   Health
Port     IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster      Cluster          up   9000 auto/100000
healthy false
e7b       Cluster      Cluster          up   9000 auto/100000
healthy false

Node: node1-03


Ignore
                                                  Speed(Mbps)
Health   Health
Port     IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster      Cluster          up   9000 auto/10000
healthy  false
e7b       Cluster      Cluster          up   9000 auto/10000
healthy  false
```

```
Node: node1-04

Ignore

                                            Speed(Mbps)
Health    Health
Port       IPspace       Broadcast Domain Link MTU   Admin/Oper
Status    Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster          up   9000  auto/10000
healthy  false
e7b       Cluster       Cluster          up   9000  auto/10000
healthy  false
```

ii. Verify that all the cluster interfaces (LIFs) are on the home port:

```
network interface show -role cluster
```

Show example

```
cluster1::*> network interface show -role cluster

          Logical          Status      Network
Current    Current Is
Vserver      Interface      Admin/Oper Address/Mask        Node
Port    Home
----------- --------------- ---------- ------------------
--------- ------- ----
Cluster
          node1-01_clus1  up/up       169.254.36.44/16
node1-01  e7a      true
          node1-01_clus2  up/up       169.254.7.5/16
node1-01  e7b      true
          node1-02_clus1  up/up       169.254.197.206/16
node1-02  e7a      true
          node1-02_clus2  up/up       169.254.195.186/16
node1-02  e7b      true
          node1-03_clus1  up/up       169.254.192.49/16
node1-03  e7a      true
          node1-03_clus2  up/up       169.254.182.76/16
node1-03  e7b      true
          node1-04_clus1  up/up       169.254.59.49/16
node1-04  e7a      true
          node1-04_clus2  up/up       169.254.62.244/16
node1-04  e7b      true

8 entries were displayed.
```

iii. Verify that the cluster displays information for both cluster switches:

```
system cluster-switch show -is-monitoring-enabled-operational true
```

Show example

```
cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true

Switch                           Type              Address
Model
-------------------------- ------------------
---------------- --------------
cs2(FDOXXXXXXXX)                 cluster-network   10.228.137.233
N9K-C9364D-GX2A
      Serial Number: FDOXXXXXXXX
        Is Monitored: true
              Reason: None
   Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                   10.4(2)
     Version Source: CDP/ISDP


cs1(FLMXXXXXXXX)                 cluster-network   10.228.137.253
N9K-C9364D-GX2A
      Serial Number: FLMXXXXXXXX
        Is Monitored: true
              Reason: None
   Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                   10.4(2)
     Version Source: CDP/ISDP

2 entries were displayed.
```

b. **HA ports**

i. Verify that all the HA ports are up with a healthy status:

```
ha interconnect status show -node <node-name>
```

Show example

```
cluster1::*> ha interconnect status show -node node1-01
  (system ha interconnect status show)

                        Node: node1-01
              Link 0 Status: up
              Link 1 Status: up
           Is Link 0 Active: true
           Is Link 1 Active: true
         IC RDMA Connection: up
                        Slot: 0
             Debug Firmware: no


Interconnect Port 0 :
                  Port Name: e1a-17
                        MTU: 4096
           Link Information: ACTIVE


Interconnect Port 1 :
                  Port Name: e1b-18
                        MTU: 4096
           Link Information: ACTIVE

cluster1::*> ha interconnect status show -node node1-02
  (system ha interconnect status show)

                        Node: node1-02
              Link 0 Status: up
              Link 1 Status: up
           Is Link 0 Active: true
           Is Link 1 Active: true
         IC RDMA Connection: up
                        Slot: 0
             Debug Firmware: no


Interconnect Port 0 :
                  Port Name: e1a-17
                        MTU: 4096
           Link Information: ACTIVE


Interconnect Port 1 :
```

```
                          Port Name: e1b-18
                                MTU: 4096
                   Link Information: ACTIVE
         .
         .
         .
```

c. **Storage ports**

   i. Verify that all the storage ports are up with a healthy status:

```
storage port show -port-type ENET
```

Show example

```
cluster1::*> storage port show -port-type ENET

                                         Speed
Node              Port Type  Mode    (Gb/s) State     Status
----------------- ---- ----- ------- ------ --------
-----------
node1-01
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
                  e11b ENET  -          100 enabled  online
node1-02
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
                  e11b ENET  -          100 enabled  online
node1-03
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
node1-04
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
                  e11b ENET  -          100 enabled  online
16 entries were displayed.
```

d. **Storage shelf ports**

i. Verify that all the storage shelf ports are up with a healthy status:

```
storage shelf port show
```

Show example

```
cluster1::*> storage shelf port show

Shelf ID Module State        Internal?
----- -- ------ ------------ ---------
1.1
        0 A      connected    false
        1 A      connected    false
        2 A      connected    false
        3 A      connected    false
        4 A      connected    false
        5 A      connected    false
        6 A      connected    false
        7 A      connected    false
        8 B      connected    false
        9 B      connected    false
       10 B      connected    false
       11 B      connected    false
       12 B      connected    false
       13 B      connected    false
       14 B      connected    false
       15 B      connected    false

16 entries were displayed.
```

ii. Verify the connection status of all the storage shelf ports:

```
storage shelf port show -fields remote-device,remote-
port,connector-state
```

Show example

```
cluster1::*> storage shelf port show -fields remote-
device,remote-port,connector-state

shelf id connector-state remote-port     remote-device
----- -- --------------- -------------- -----------------
1.1   0  connected       Ethernet1/17/1 CX9332D-cs1
1.1   1  connected       Ethernet1/15/1 CX9364D-cs1
1.1   2  connected       Ethernet1/17/2 CX9332D-cs1
1.1   3  connected       Ethernet1/15/2 CX9364D-cs1
1.1   4  connected       Ethernet1/17/3 CX9332D-cs1
1.1   5  connected       Ethernet1/15/3 CX9364D-cs1
1.1   6  connected       Ethernet1/17/4 CX9332D-cs1
1.1   7  connected       Ethernet1/15/4 CX9364D-cs1
1.1   8  connected       Ethernet1/19/1 CX9332D-cs1
1.1   9  connected       Ethernet1/17/1 CX9364D-cs1
1.1   10 connected       Ethernet1/19/2 CX9332D-cs1
1.1   11 connected       Ethernet1/17/2 CX9364D-cs1
1.1   12 connected       Ethernet1/19/3 CX9332D-cs1
1.1   13 connected       Ethernet1/17/3 CX9364D-cs1
1.1   14 connected       Ethernet1/19/4 CX9332D-cs1
1.1   15 connected       Ethernet1/17/4 CX9364D-cs1

16 entries were displayed.
```

5. Disable auto-revert on the cluster LIFs. The cluster LIFs fail over to the partner cluster switch and remain there as you perform the upgrade procedure on the targeted switch:

```
network interface modify -vserver Cluster -lif * -auto-revert false
```

6. Copy the NX-OS software and EPLD images to the Nexus 9364D-GX2A switch.

Show example

```
cs2# copy sftp: bootflash: vrf management
Enter source filename: /code/nxos.10.4.2.bin
Enter hostname for the sftp server: 172.19.2.1
Enter username: root

Outbound-ReKey for 172.19.2.1:22
Inbound-ReKey for 172.19.2.1:22
root@172.19.2.1's password:
sftp> progress
Progress meter enabled
sftp> get   /code/nxos.10.4.2.bin  /bootflash/nxos.10.4.2.bin
/code/nxos.10.4.2.bin  100% 1261MB   9.3MB/s   02:15
sftp> exit
Copy complete, now saving to disk (please wait)...
Copy complete.

cs2# copy sftp: bootflash: vrf management
Enter source filename: /code/n9000-epld.10.4.2.F.img
Enter hostname for the sftp server: 172.19.2.1
Enter username: user1

Outbound-ReKey for 172.19.2.1:22
Inbound-ReKey for 172.19.2.1:22
user1@172.19.2.1's password:
sftp> progress
Progress meter enabled
sftp> get   /code/n9000-epld.10.4.2.F.img  /bootflash/n9000-
epld.10.4.2.F.img
/code/n9000-epld.10.4.2.F.img  100%  161MB   9.5MB/s   00:16
sftp> exit
Copy complete, now saving to disk (please wait)...
Copy complete.
```

7. Verify the running version of the NX-OS software:

```
show version
```

Show example

```
cs2# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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All rights reserved.
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own
licenses, such as open source.  This software is provided "as is,"
and unless
otherwise stated, there is no warranty, express or implied,
including but not
limited to warranties of merchantability and fitness for a
particular purpose.
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the GNU General Public License (GPL) version 2.0 or
GNU General Public License (GPL) version 3.0  or the GNU
Lesser General Public License (LGPL) Version 2.1 or
Lesser General Public License (LGPL) Version 2.0.
A copy of each such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://opensource.org/licenses/gpl-3.0.html and
http://www.opensource.org/licenses/lgpl-2.1.php and
http://www.gnu.org/licenses/old-licenses/library.txt.


Software
  BIOS: version 01.14
  NXOS: version 10.4(1) [Feature Release]
  Host NXOS: version 10.4(1)
  BIOS compile time:  11/25/2024
  NXOS image file is: bootflash:///nxos64-cs.10.4.1.F.bin
  NXOS compile time:  11/30/2023 12:00:00 [12/14/2023 05:25:50]
  NXOS boot mode: LXC


Hardware
  cisco Nexus9000 C9332D-GX2B Chassis
  Intel(R) Xeon(R) CPU D-1633N @ 2.50GHz with 32802156 kB of memory.
  Processor Board ID FLMXXXXXXXX
  Device name: cs2
  bootflash:  115802886 kB
```

```
Kernel uptime is 5 day(s), 2 hour(s), 13 minute(s), 21 second(s)


Last reset at 3580 usecs after Thu Jun  5 15:55:08 2025
   Reason: Reset Requested by CLI command reload
   System version: 10.4(1)
   Service:



plugin
   Core Plugin, Ethernet Plugin



Active Package(s):

cs2#
```

8. Install the NX-OS image.

   Installing the image file causes it to be loaded every time the switch is rebooted.

Show example

```
cs2# install all nxos bootflash:nxos.10.4.2.bin

Installer will perform compatibility check first. Please wait.
Installer is forced disruptive

Verifying image bootflash:/nxos.10.4.2.bin for boot variable "nxos".
[] 100% -- SUCCESS

Verifying image type.
[] 100% -- SUCCESS

Preparing "nxos" version info using image
bootflash:/nxos.10.4.2.bin.
[] 100% -- SUCCESS

Preparing "bios" version info using image
bootflash:/nxos.10.4.2.bin.
[] 100% -- SUCCESS

Performing module support checks.
[] 100% -- SUCCESS

Notifying services about system upgrade.
[] 100% -- SUCCESS


Compatibility check is done:
Module  Bootable  Impact          Install-type  Reason
------  --------  --------------- ------------  ---------
  1      yes       Disruptive      Reset         Default upgrade is
not hitless



Images will be upgraded according to following table:

Module   Image    Running-Version(pri:alt)                      New-
Version        Upg-Required
-------  -------- -----------------------------------------
------------------ ------------
  1      nxos     10.4(1)                                       10.4(2)
Yes
  1      bios     xx.xx.:xx.xx                                  xxx
No
```

```
Switch will be reloaded for disruptive upgrade.

Do you want to continue with the installation (y/n)? [n] y

Install is in progress, please wait.

Performing runtime checks.
[] 100% -- SUCCESS

Setting boot variables.
[] 100% -- SUCCESS

Performing configuration copy.
[] 100% -- SUCCESS

Module 1: Refreshing compact flash and upgrading
bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[] 100% -- SUCCESS

Finishing the upgrade, switch will reboot in 10 seconds.
```

9. Verify the new version of NX-OS software after the switch has rebooted:

```
show version
```

Show example

```
cs2# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under their
own
licenses, such as open source.  This software is provided "as is,"
and unless
otherwise stated, there is no warranty, express or implied,
including but not
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particular purpose.
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GNU General Public License (GPL) version 3.0  or the GNU
Lesser General Public License (LGPL) Version 2.1 or
Lesser General Public License (LGPL) Version 2.0.
A copy of each such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://opensource.org/licenses/gpl-3.0.html and
http://www.opensource.org/licenses/lgpl-2.1.php and
http://www.gnu.org/licenses/old-licenses/library.txt.


Software
  BIOS: version 01.14
  NXOS: version 10.4(2) [Feature Release]
  Host NXOS: version 10.4(2)
  BIOS compile time:  11/25/2024
  NXOS image file is: bootflash:///nxos64-cs.10.4.2.F.bin
  NXOS compile time:  11/30/2023 12:00:00 [12/14/2023 05:25:50]
  NXOS boot mode: LXC


Hardware
  cisco Nexus9000 C9332D-GX2B Chassis
  Intel(R) Xeon(R) CPU D-1633N @ 2.50GHz with 32802156 kB of memory.
  Processor Board ID FLMXXXXXXXX
  Device name: cs2
  bootflash:  115802886 kB
```

```
Kernel uptime is 5 day(s), 2 hour(s), 13 minute(s), 21 second(s)


Last reset at 3580 usecs after Thu Jun  5 15:55:08 2025
  Reason: Reset Requested by CLI command reload
  System version: 10.4(2)
  Service:


plugin
  Core Plugin, Ethernet Plugin


Active Package(s):

cs2#
```

10. Upgrade the EPLD image and reboot the switch.

Show example

```
cs2# show version module 1 epld

EPLD Device                      Version
----------------------------------------
MI   FPGA                        0x7
IO   FPGA                        0x17
MI   FPGA2                       0x2
GEM  FPGA                        0x2
GEM  FPGA                        0x2
GEM  FPGA                        0x2
GEM  FPGA                        0x2

cs2# install epld bootflash:n9000-epld.10.4.2.F.img module all
Compatibility check:
Module          Type          Upgradable          Impact     Reason
------  ------------------ ----------------- --------- -----------
    1          SUP          Yes          disruptive  Module Upgradable


Retrieving EPLD versions.... Please wait.
Images will be upgraded according to following table:
Module  Type   EPLD              Running-Version   New-Version   Upg-
Required
------- ------ ---------------- ----------------- ------------
------------
    1  SUP    MI FPGA           0x07              0x07          No
    1  SUP    IO FPGA           0x17              0x19          Yes
    1  SUP    MI FPGA2          0x02              0x02          No
The above modules require upgrade.
The switch will be reloaded at the end of the upgrade
Do you want to continue (y/n) ?  [n] y


Proceeding to upgrade Modules.


Starting Module 1 EPLD Upgrade


Module 1 : IO FPGA [Programming] : 100.00% (     64 of      64
sectors)
Module 1 EPLD upgrade is successful.
Module   Type  Upgrade-Result
-------- ----- --------------
    1   SUP    Success


EPLDs upgraded.


Module 1 EPLD upgrade is successful.
```

11. After the switch reboot, log in again and verify that the new version of EPLD loaded successfully.

Show example

```
cs2# show version module 1 epld

EPLD Device                          Version
----------------------------------------
MI    FPGA                           0x7
IO    FPGA                           0x19
MI    FPGA2                          0x2
GEM   FPGA                           0x2
GEM   FPGA                           0x2
GEM   FPGA                           0x2
GEM   FPGA                           0x2
```

12. Verify the health of all of the ports on the cluster.
    a. **Cluster ports**
       i. Verify that cluster ports are up and healthy across all nodes in the cluster:

       ```
       network port show -ipspace Cluster
       ```

Show example

```
cluster1::*> network port show -ipspace Cluster

Node: node1-01

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster          up   9000  auto/10000
healthy  false
e7b       Cluster       Cluster          up   9000  auto/10000
healthy  false

Node: node1-02

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster          up   9000  auto/10000
healthy  false
e7b       Cluster       Cluster          up   9000  auto/10000
healthy  false

Node: node1-03

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster          up   9000  auto/100000
healthy false
e7b       Cluster       Cluster          up   9000  auto/100000
healthy false
```

```
  Node: node1-04

  Ignore

                                              Speed(Mbps)
Health    Health
Port      IPspace        Broadcast Domain Link MTU   Admin/Oper
Status    Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster      Cluster            up   9000  auto/100000
healthy false
e7b       Cluster      Cluster            up   9000  auto/100000
healthy false
```

ii. Verify the switch health from the cluster:

```
network device-discovery show -protocol cdp
```

```
system cluster-switch show -is-monitoring-enabled-operational true
```

Show example

```
cluster1::*> network device-discovery show -protocol cdp

node1-01/cdp
            e10a    cs1(FLMXXXXXXXX)         Ethernet1/16/3
N9K-C9364D-GX2A
            e10b    cs2(FDOXXXXXXXX)         Ethernet1/13/3
N9K-C9364D-GX2A
            e11a    cs1(FLMXXXXXXXX)         Ethernet1/16/4
N9K-C9364D-GX2A
            e11b    cs2(FDOXXXXXXXX)         Ethernet1/13/4
N9K-C9364D-GX2A
            e1a     cs1(FLMXXXXXXXX)         Ethernet1/16/1
N9K-C9364D-GX2A
            e1b     cs2(FDOXXXXXXXX)         Ethernet1/13/1
N9K-C9364D-GX2A
              .
              .
              .
            e7a     cs1(FLMXXXXXXXX)         Ethernet1/16/2
N9K-C9364D-GX2A
            e7b     cs2(FDOXXXXXXXX)         Ethernet1/13/2
N9K-C9364D-GX2A

node1-02/cdp
            e10a    cs1(FLMXXXXXXXX)         Ethernet1/16/3
N9K-C9364D-GX2A
            e10b    cs2(FDOXXXXXXXX)         Ethernet1/13/3
N9K-C9364D-GX2A
            e11a    cs1(FLMXXXXXXXX)         Ethernet1/16/4
N9K-C9364D-GX2A
            e11b    cs2(FDOXXXXXXXX)         Ethernet1/13/4
N9K-C9364D-GX2A
            e1a     cs1(FLMXXXXXXXX)         Ethernet1/16/1
N9K-C9364D-GX2A
            e1b     cs2(FDOXXXXXXXX)         Ethernet1/13/1
N9K-C9364D-GX2A
              .
              .
              .
            e7a     cs1(FLMXXXXXXXX)         Ethernet1/16/2
N9K-C9364D-GX2A
            e7b     cs2(FDOXXXXXXXX)         Ethernet1/13/2
N9K-C9364D-GX2A
 .
```

```
.
.
cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                          Type              Address
Model
-------------------------- ------------------
---------------- ---------------
cs2(FDOXXXXXXXX)                 cluster-network    10.228.137.233
N9K-C9364D-GX2A
      Serial Number: FDOXXXXXXXX
        Is Monitored: true
              Reason: None
   Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    10.4(2)
     Version Source: CDP/ISDP


cs1(FLMXXXXXXXX)                 cluster-network    10.228.137.253
N9K-C9364D-GX2A
      Serial Number: FLMXXXXXXXX
        Is Monitored: true
              Reason: None
   Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    10.4(2)
     Version Source: CDP/ISDP
```

b. **HA ports**

   i. Verify that all the HA ports are up with a healthy status:

```
ha interconnect status show -node <node-name>
```

Show example

```
cluster1::*> ha interconnect status show -node node1-01
  (system ha interconnect status show)

                        Node: node1-01
              Link 0 Status: up
              Link 1 Status: up
           Is Link 0 Active: true
           Is Link 1 Active: true
        IC RDMA Connection: up
                        Slot: 0
              Debug Firmware: no


Interconnect Port 0 :
                 Port Name: e1a-17
                       MTU: 4096
          Link Information: ACTIVE


Interconnect Port 1 :
                 Port Name: e1b-18
                       MTU: 4096
          Link Information: ACTIVE

cluster1::*> ha interconnect status show -node node1-02
  (system ha interconnect status show)

                        Node: node1-02
              Link 0 Status: up
              Link 1 Status: up
           Is Link 0 Active: true
           Is Link 1 Active: true
        IC RDMA Connection: up
                        Slot: 0
              Debug Firmware: no


Interconnect Port 0 :
                 Port Name: e1a-17
                       MTU: 4096
          Link Information: ACTIVE


Interconnect Port 1 :
```

```
                         Port Name: e1b-18
                               MTU: 4096
                 Link Information: ACTIVE
     .
     .
     .
```

c. **Storage ports**

   i. Verify that all the storage ports are up with a healthy status:

```
storage port show -port-type ENET
```

Show example

```
cluster1::*> storage port show -port-type ENET

                                    Speed
Node              Port Type  Mode   (Gb/s) State     Status
----------------- ---- ----- ------- ------ --------
-----------
node1-01
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
                  e11b ENET  -          100 enabled  online
node1-02
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
                  e11b ENET  -          100 enabled  online
node1-03
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
node1-04
                  e10a ENET  -          100 enabled  online
                  e10b ENET  -          100 enabled  online
                  e11a ENET  -          100 enabled  online
                  e11b ENET  -          100 enabled  online
16 entries were displayed.
```

d. **Storage shelf ports**

i. Verify that all the storage shelf ports are up with a healthy status:

```
storage shelf port show
```

Show example

```
cluster1::*> storage shelf port show

Shelf ID Module State        Internal?
-----  -- ------ ------------ ---------
1.1
       0 A      connected    false
       1 A      connected    false
       2 A      connected    false
       3 A      connected    false
       4 A      connected    false
       5 A      connected    false
       6 A      connected    false
       7 A      connected    false
       8 B      connected    false
       9 B      connected    false
      10 B      connected    false
      11 B      connected    false
      12 B      connected    false
      13 B      connected    false
      14 B      connected    false
      15 B      connected    false

16 entries were displayed.
```

ii. Verify the connection status of all the storage shelf ports:

```
storage shelf port show -fields remote-device,remote-port,connector-state
```

Show example

```
cluster1::*> storage shelf port show -fields remote-
device,remote-port,connector-state

shelf id connector-state remote-port     remote-device
----- -- --------------- -------------- -----------------
1.1   0  connected       Ethernet1/17/1 CX9332D-cs1
1.1   1  connected       Ethernet1/15/1 CX9364D-cs1
1.1   2  connected       Ethernet1/17/2 CX9332D-cs1
1.1   3  connected       Ethernet1/15/2 CX9364D-cs1
1.1   4  connected       Ethernet1/17/3 CX9332D-cs1
1.1   5  connected       Ethernet1/15/3 CX9364D-cs1
1.1   6  connected       Ethernet1/17/4 CX9332D-cs1
1.1   7  connected       Ethernet1/15/4 CX9364D-cs1
1.1   8  connected       Ethernet1/19/1 CX9332D-cs1
1.1   9  connected       Ethernet1/17/1 CX9364D-cs1
1.1   10 connected       Ethernet1/19/2 CX9332D-cs1
1.1   11 connected       Ethernet1/17/2 CX9364D-cs1
1.1   12 connected       Ethernet1/19/3 CX9332D-cs1
1.1   13 connected       Ethernet1/17/3 CX9364D-cs1
1.1   14 connected       Ethernet1/19/4 CX9332D-cs1
1.1   15 connected       Ethernet1/17/4 CX9364D-cs1

16 entries were displayed.
```

13. Verify that the cluster is healthy:

```
cluster show
```

Show example

```
cluster1::*> cluster show


Node                 Health  Eligibility  Epsilon
-------------------- ------- -----------  ------------
node1-01             true    true         false
node1-02             true    true         false
node1-03             true    true         false
node1-04             true    true         true

4 entries were displayed.
```

14. Repeat steps 6 to 13 to install the NX-OS software on switch cs1.

15. Enable auto-revert on the cluster LIFs.

```
network interface modify -vserver Cluster -lif * -auto-revert true
```

16. Verify that the cluster LIFs have reverted to their home port:

```
network interface show -role cluster
```

Show example

```
cluster1::*> network interface show -role cluster

          Logical         Status     Network               Current
Current Is
Vserver     Interface     Admin/Oper Address/Mask          Node
Port    Home
----------- -------------- ---------- ------------------
----------- ------- ----
Cluster
          node1-01_clus1  up/up      169.254.36.44/16    node1-01
e7a      true
          node1-01_clus2  up/up      169.254.7.5/16      node1-01
e7b      true
          node1-02_clus1  up/up      169.254.197.206/16 node1-02
e7a      true
          node1-02_clus2  up/up      169.254.195.186/16 node1-02
e7b      true
          node1-03_clus1  up/up      169.254.192.49/16   node1-03
e7a      true
          node1-03_clus2  up/up      169.254.182.76/16   node1-03
e7b      true
          node1-04_clus1  up/up      169.254.59.49/16    node1-04
e7a      true
          node1-04_clus2  up/up      169.254.62.244/16   node1-04
e7b      true
```

If any cluster LIFs have not returned to their home ports, revert them manually from the local node:

```
network interface revert -vserver Cluster -lif <lif-name>
```

What's next?

After you've installed or upgraded the NX-OS software, you install or upgrade the Reference Configuration File (RCF).

Install or upgrade the RCF

Install or upgrade the Reference Configuration File (RCF) overview

You install the Reference Configuration File (RCF) after setting up the Nexus 9364D-GX2A switch for the first time. You upgrade your RCF version when you have an existing version of the RCF file installed on your switch.

See the Knowledge Base article How to clear configuration on a Cisco interconnect switch while retaining remote connectivity for further information when installing or upgrading your RCF.

Available RCF configuration

- **Cluster-HA-Storage AFX** - All ports are configured in 4x100GbE breakout mode that universally supports AFX node clusters, HA, storage ports, and NX224 storage shelf ports. 400GbE ISL between switches. (*Cluster-HA-Storage AFX RCF_vxx.x*).

For specific port and VLAN usage details, refer to the banner and important notes section in your RCF. See Cisco Ethernet Switches for more information.

Suggested documentation

- Cisco Ethernet Switches (NSS)

  Consult the switch compatibility table for the supported ONTAP and RCF versions on the NetApp Support Site. Note that there can be command dependencies between the command syntax in the RCF and the syntax found in specific versions of NX-OS.

- Cisco Nexus 3=9000 Series Switches

  Refer to the appropriate software and upgrade guides available on the Cisco website for complete documentation on the Cisco switch upgrade and downgrade procedures.

About the examples

The examples in this procedure use the following switch and node nomenclature:

- The names of the two Cisco switches are cs1 and cs2.

- The node names are node1-01, node1-02, node1-03, and node1-04.

- The cluster LIF names are node1-01_clus1, node1-01_clus2, node1-02_clus1, node1-02_clus2, node1-03_clus1, node1-03_clus2, node1-04_clus1, and node1-04_clus2.

- The `cluster1::*>` prompt indicates the name of the cluster.

See the Hardware Universe to verify the correct cluster ports on your platforms.

> ⓘ The command outputs might vary depending on different releases of ONTAP.

Commands used

The procedure requires the use of both ONTAP commands and Cisco Nexus 9000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

What's next?

After you've reviewed the install RCF or upgrade RCF procedure, you install the RCF or upgrade your RCF as required.

Install the Reference Configuration File (RCF)

You install the Reference Configuration File (RCF) after setting up the Nexus 9364D-GX2A switch for the first time.

Before you begin

Verify the following installations and connections:

- A console connection to the switch. The console connection is optional if you have remote access to the switch.
- Switch cs1 and switch cs2 are powered up and the initial switch setup is complete (the Management IP address and SSH is setup).
- The desired NX-OS version has been installed.
- ISL connections between switches are connected.
- ONTAP node cluster ports are not connected.

Step 1: Install the RCF on the switches

1. Login to switch cs1 using SSH or by using a serial console.

2. Copy the RCF to the bootflash of switch cs1 using one of the following transfer protocols: FTP, TFTP, SFTP, or SCP.

   For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series NX-OS Command Reference guides.

   Show example

   > This example shows TFTP being used to copy an RCF to the bootflash on switch cs1:
   >
   > ```
   > cs1# copy tftp: bootflash: vrf management
   > Enter source filename: NX9364D-GX2A-RCF-v10.0-Shared.txt
   > Enter hostname for the tftp server: 172.22.201.50
   > Trying to connect to tftp server......Connection to Server
   > Established.
   > TFTP get operation was successful
   > Copy complete, now saving to disk (please wait)...
   > ```

3. Apply the RCF previously downloaded to the bootflash.

   For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series NX-OS Command Reference guides.

Show example

This example shows the RCF file `NX9364D-GX2A-RCF-v10.0-Shared.txt` being installed on switch cs1:

```
cs1# copy NX9364D-GX2A-RCF-v10.0-Shared.txt running-config echo-
commands
```

4. Examine the banner output from the `show banner motd` command. You must read and follow these instructions to ensure the proper configuration and operation of the switch.

Show example

```
cs1# show banner motd

***********************************************************************
**********
* NetApp Reference Configuration File (RCF)
*
* Switch   : NX9364D-GX2A
* Filename : NX9364D-GX2A-RCF-v10.0-Shared.txt
* Date     : 05-09-2025
* Version  : v10.0
* Port Usage:
* Ports  1-62: 100GbE Intra-Cluster/HA/Storage Ports, int e1/{1-
62}/1-4
* Ports 63-64: Intra-Cluster ISL Ports, int e1/63-64
*
* IMPORTANT NOTES
* Interface port-channel999 is reserved to identify the version of
this file.
*
***********************************************************************
**********
```

5. Verify that the RCF file is the correct newer version:

```
show running-config
```

When you check the output to verify you have the correct RCF, make sure that the following information is correct:

- The RCF banner
- The node and port settings

- ◦ Customizations

    The output varies according to your site configuration. Check the port settings and refer to the release notes for any changes specific to the RCF that you have installed.

6. Save basic configuration details to the `write_erase.cfg` file on the bootflash.

    (i) Make sure to configure the following:

    - ◦ Username and password
    - ◦ Management IP address
    - ◦ Default gateway
    - ◦ Switch name

```
cs1# show run | i "username admin password" > bootflash:write_erase.cfg

cs1# show run | section "vrf context management" >> bootflash:write_erase.cfg

cs1# show run | section "interface mgmt0" >> bootflash:write_erase.cfg

cs1# show run | section "switchname" >> bootflash:write_erase.cfg

cs1# echo "hardware access-list tcam region ing-racl 1024" >>
bootflash:write_erase.cfg

cs1# echo "hardware access-list tcam region egr-racl 1024" >>
bootflash:write_erase.cfg

cs1# echo "hardware access-list tcam region ing-l2-qos 1536" >>
bootflash:write_erase.cfg
```

    See the Knowledge Base article How to clear configuration on a Cisco interconnect switch while retaining remote connectivity for further details.

7. Verify that the `write_erase.cfg` file is populated as expected:

    show file bootflash:write_erase.cfg

8. Issue the `write erase` command to erase the current saved configuration:

```
cs1# write erase

Warning: This command will erase the startup-configuration.

Do you wish to proceed anyway? (y/n) [n] y
```

9. Copy the previously saved basic configuration into the startup configuration.

    `cs1# ` **`copy bootflash:write_erase.cfg startup-config`**

10. Reboot the switch:

```
cs1# reload

This command will reboot the system. (y/n)? [n] y
```

11. Repeat steps 1 through 10 on switch cs2.

12. Connect the ports of all nodes in the ONTAP cluster to switches cs1 and cs2.

Step 2: Verify the switch connections

1. Verify that the switch ports connected to the cluster ports are up:

```
show interface brief
```

Show example

```
cs1# show interface brief | grep up
.
.
Eth1/9/3        1        eth  trunk  up       none
100G(D) --
Eth1/9/4        1        eth  trunk  up       none
100G(D) --
Eth1/15/1       1        eth  trunk  up       none
100G(D) --
Eth1/15/2       1        eth  trunk  up       none
100G(D) --
Eth1/15/3       1        eth  trunk  up       none
100G(D) --
Eth1/15/4       1        eth  trunk  up       none
100G(D) --
Eth1/16/1       1        eth  trunk  up       none
100G(D) --
Eth1/16/2       1        eth  trunk  up       none
100G(D) --
Eth1/16/3       1        eth  trunk  up       none
100G(D) --
Eth1/16/4       1        eth  trunk  up       none
100G(D) --
Eth1/17/1       1        eth  trunk  up       none
100G(D) --
Eth1/17/2       1        eth  trunk  up       none
100G(D) --
Eth1/17/3       1        eth  trunk  up       none
100G(D) --
Eth1/17/4       1        eth  trunk  up       none
100G(D) --
.
.
```

2. Verify that the cluster nodes are in their correct cluster VLANs using the following commands:

```
show vlan brief
```

```
show interface trunk
```

Show example

```
cs1# show vlan brief

VLAN Name                           Status    Ports
---- -------------------------------- ---------
--------------------------------
1    default                         active    Po1, Po999, Eth1/63,
Eth1/64
                                               Eth1/65, Eth1/66,
Eth1/1/1
                                               Eth1/1/2, Eth1/1/3,
Eth1/1/4
                                               Eth1/2/1, Eth1/2/2,
Eth1/2/3
                                               Eth1/2/4, Eth1/3/1,
Eth1/3/2
                                               Eth1/3/3, Eth1/3/4,
Eth1/4/1
                                               Eth1/4/2, Eth1/4/3,
Eth1/4/4
                                               Eth1/5/1, Eth1/5/2,
Eth1/5/3
                                               Eth1/5/4, Eth1/6/1,
Eth1/6/2
                                               Eth1/6/3, Eth1/6/4,
Eth1/7/1
                                               Eth1/7/2, Eth1/7/3,
Eth1/7/4
                                               Eth1/8/1, Eth1/8/2,
Eth1/8/3
                                               Eth1/8/4, Eth1/9/1,
Eth1/9/2
                                               Eth1/9/3, Eth1/9/4,
Eth1/10/1
                                               Eth1/10/2,
Eth1/10/3, Eth1/10/4
                                               Eth1/11/1,
Eth1/11/2, Eth1/11/3
                                               Eth1/11/4,
Eth1/12/1, Eth1/12/2
                                               Eth1/12/3,
Eth1/12/4, Eth1/13/1
                                               Eth1/13/2,
Eth1/13/3, Eth1/13/4
                                               Eth1/14/1,
```

```
Eth1/14/2, Eth1/14/3
                                                    Eth1/14/4,
Eth1/15/1, Eth1/15/2
                                                    Eth1/15/3,
Eth1/15/4, Eth1/16/1
                                                    Eth1/16/2,
Eth1/16/3, Eth1/16/4
                                                    Eth1/17/1,
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                                                    Eth1/17/4,
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                                                    Eth1/18/3,
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                                                    Eth1/19/2,
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                                                    Eth1/20/1,
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                                                    Eth1/20/4,
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                                                    Eth1/21/3,
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                                                    Eth1/22/2,
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                                                    Eth1/23/1,
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                                                    Eth1/23/4,
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                                                    Eth1/24/3,
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                                                    Eth1/25/2,
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                                                    Eth1/26/1,
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                                                    Eth1/26/4,
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                                                    Eth1/27/3,
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                                                    Eth1/28/2,
Eth1/28/3, Eth1/28/4
                                                    Eth1/29/1,
Eth1/29/2, Eth1/29/3
                                                    Eth1/29/4,
Eth1/30/1, Eth1/30/2
                                                    Eth1/30/3,
Eth1/30/4, Eth1/31/1
                                                    Eth1/31/2,
```

```
Eth1/31/3, Eth1/31/4
                                          Eth1/32/1,
Eth1/32/2, Eth1/32/3
                                          Eth1/32/4,
Eth1/33/1, Eth1/33/2
                                          Eth1/33/3,
Eth1/33/4, Eth1/34/1
                                          Eth1/34/2,
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                                          Eth1/35/4,
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Eth1/37/3, Eth1/37/4
                                          Eth1/38/1,
Eth1/38/2, Eth1/38/3
                                          Eth1/38/4,
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                                          Eth1/39/3,
Eth1/39/4, Eth1/40/1
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Eth1/40/3, Eth1/40/4
                                          Eth1/41/1,
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                                          Eth1/41/4,
Eth1/42/1, Eth1/42/2
                                          Eth1/42/3,
Eth1/42/4, Eth1/43/1
                                          Eth1/43/2,
Eth1/43/3, Eth1/43/4
                                          Eth1/44/1,
Eth1/44/2, Eth1/44/3
                                          Eth1/44/4,
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                                          Eth1/45/3,
Eth1/45/4, Eth1/46/1
                                          Eth1/46/2,
Eth1/46/3, Eth1/46/4
                                          Eth1/47/1,
Eth1/47/2, Eth1/47/3
                                          Eth1/47/4,
Eth1/48/1, Eth1/48/2
                                          Eth1/48/3,
```

```
                                          Eth1/48/4, Eth1/49/1
                                                        Eth1/49/2,
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                                                        Eth1/50/1,
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                                                        Eth1/59/4,
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                                                        Eth1/60/3,
Eth1/60/4, Eth1/61/1
                                                        Eth1/61/2,
Eth1/61/3, Eth1/61/4
                                                        Eth1/62/1,
Eth1/62/2, Eth1/62/3
                                                        Eth1/62/4
17   VLAN0017                         active    Eth1/1/1, Eth1/1/2,
Eth1/1/3
                                                        Eth1/1/4, Eth1/2/1,
Eth1/2/2
                                                        Eth1/2/3, Eth1/2/4,
Eth1/3/1
                                                        Eth1/3/2, Eth1/3/3,
Eth1/3/4
```

```
Eth1/4/1, Eth1/4/2,
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Eth1/20/4, Eth1/21/1
```

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Eth1/23/4, Eth1/24/1

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Eth1/24/3, Eth1/24/4

Eth1/25/1,
Eth1/25/2, Eth1/25/3

Eth1/25/4,
Eth1/26/1, Eth1/26/2

Eth1/26/3,
Eth1/26/4, Eth1/27/1

Eth1/27/2,
Eth1/27/3, Eth1/27/4

Eth1/28/1,
Eth1/28/2, Eth1/28/3

Eth1/28/4,
Eth1/29/1, Eth1/29/2

Eth1/29/3,
Eth1/29/4, Eth1/30/1

Eth1/30/2,
Eth1/30/3, Eth1/30/4

Eth1/31/1,
Eth1/31/2, Eth1/31/3

Eth1/31/4,
Eth1/32/1, Eth1/32/2

Eth1/32/3,
Eth1/32/4, Eth1/33/1

Eth1/33/2,
Eth1/33/3, Eth1/33/4

Eth1/34/1,
Eth1/34/2, Eth1/34/3

Eth1/34/4,
Eth1/35/1, Eth1/35/2

Eth1/35/3,
Eth1/35/4, Eth1/36/1

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Eth1/36/3, Eth1/36/4

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        Eth1/62/1, Eth1/62/2
                                                           Eth1/62/3, Eth1/62/4


        cs1# show interface trunk


        --------------------------------------------------------
        Port            Native  Status          Port
                        Vlan                    Channel
        --------------------------------------------------------
        Eth1/1/1        1       trunking        --
        Eth1/1/2        1       trunking        --
        Eth1/1/3        1       trunking        --
        Eth1/1/4        1       trunking        --
        Eth1/2/1        1       trunking        --
        Eth1/2/2        1       trunking        --
        Eth1/2/3        1       trunking        --
        Eth1/2/4        1       trunking        --
        .
        .
        .
        Eth1/62/2       none
        Eth1/62/3       none
        Eth1/62/4       none
        Eth1/63         none
        Eth1/64         none
        Po1             1
```

ⓘ For specific port and VLAN usage details, refer to the banner and important notes section in
   your RCF.

3. Verify that the ISL between cs1 and cs2 is functional:

```
show port-channel summary
```

Show example

```
cs1# show port-channel summary
Flags:  D - Down        P - Up in port-channel (members)
        I - Individual  H - Hot-standby (LACP only)
        s - Suspended   r - Module-removed
        b - BFD Session Wait
        S - Switched    R - Routed
        U - Up (port-channel)
        p - Up in delay-lacp mode (member)
        M - Not in use. Min-links not met
--------------------------------------------------------------------
------------
Group Port-        Type     Protocol  Member Ports
      Channel
--------------------------------------------------------------------
------------
1     Po1(SU)      Eth      LACP      Eth1/63(P)   Eth1/64(P)
999   Po999(SD)    Eth      NONE      --
cs1#
```

Step 3: Set up your ONTAP cluster

NetApp recommends that you use System Manager to set up new clusters.

System Manager provides a simple and easy workflow for cluster set up and configuration including assigning a node management IP address, initializing the cluster, creating a local tier, configuring protocols and provisioning initial storage.

Go to Configure ONTAP on a new cluster with System Manager for setup instructions.

What's next?

After you've installed the RCF, you verify the SSH configuration.

Upgrade your Reference Configuration File (RCF)

You upgrade your RCF version when you have an existing version of the RCF file installed on your operational switches.

Before you begin

Make sure you have the following:

- A current backup of the switch configuration.
- A fully functioning cluster (no errors in the logs or similar issues).
- The current RCF.
- If you are updating your RCF version, you need a boot configuration in the RCF that reflects the desired

boot images.

If you need to change the boot configuration to reflect the current boot images, you must do so before reapplying the RCF so that the correct version is instantiated on future reboots.

> ⓘ No operational inter-switch link (ISL) is needed during this procedure. This is by design because RCF version changes can affect ISL connectivity temporarily. To ensure non-disruptive cluster operations, the following procedure migrates all of the cluster LIFs to the operational partner switch while performing the steps on the target switch.

> ⚠ Before installing a new switch software version and RCFs, you must erase the switch settings and perform basic configuration. You must be connected to the switch using the serial console or have preserved basic configuration information prior to erasing the switch settings.

Step 1: Prepare for the upgrade

1. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message:

   ```
   system node autosupport invoke -node * -type all -message MAINT=xh
   ```

   where *x* is the duration of the maintenance window in hours.

2. Change the privilege level to advanced, entering **y** when prompted to continue:

   ```
   set -privilege advanced
   ```

   The advanced prompt (*>) appears.

3. Display the cluster ports on each node that are connected to the switches:

   ```
   network device-discovery show
   ```

Show example

```
cluster1::*> network device-discovery show
Node/      Local  Discovered
Protocol   Port   Device (LLDP: ChassisID)  Interface
Platform
-----------  ------  ------------------------  ----------------
--------
node1-01/cdp
           e10a   cs1(FLMXXXXXXXX)          Ethernet1/16/3    N9K-
C9364D-GX2A
           e10b   cs1(FDOXXXXXXXX)          Ethernet1/13/3    N9K-
C9364D-GX2A
           e11a   cs1(FLMXXXXXXXX)          Ethernet1/16/4    N9K-
C9364D-GX2A
           e11b   cs1(FDOXXXXXXXX)          Ethernet1/13/4    N9K-
C9364D-GX2A
           e1a    cs1(FLMXXXXXXXX)          Ethernet1/16/1    N9K-
C9364D-GX2A
           e1b    cs1(FDOXXXXXXXX)          Ethernet1/13/1    N9K-
C9364D-GX2A
           .
           .
           .
           e7a    cs1(FLMXXXXXXXX)          Ethernet1/16/2    N9K-
C9364D-GX2A
           e7b    cs1(FDOXXXXXXXX)          Ethernet1/13/2    N9K-
C9364D-GX2A
node1-01/lldp
           e10a   cs1 (c8:60:8f:xx:xx:xx)  Ethernet1/16/3    -
           e10b   cs2 (04:e3:87:xx:xx:xx)  Ethernet1/16/3    -
           e11a   cs1 (c8:60:8f:xx:xx:xx)  Ethernet1/16/4    -
           e11b   cs2 (04:e3:87:xx:xx:xx)  Ethernet1/16/4    -
           e1a    cs1 (c8:60:8f:xx:xx:xx)  Ethernet1/16/1    -
           e1b    cs2 (04:e3:87:xx:xx:xx)  Ethernet1/16/1    -
           .
           .
           .
           e7a    cs1 (c8:60:8f:xx:xx:xx)  Ethernet1/16/2    -
           e7b    cs2 (04:e3:87:xx:xx:xx)  Ethernet1/16/2    -
.
.
.
```

4. Check the administrative and operational status of each port.

   a. **Cluster ports**

      i. Verify that all the cluster ports are up with a healthy status:

```
network port show -ipspace Cluster
```

Show example

```
cluster1::*> network port show -ipspace Cluster

Node: node1-01

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ --------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster          up   9000  auto/100000
healthy false
e7b       Cluster       Cluster          up   9000  auto/100000
healthy false

Node:node1-02

Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ --------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster          up   9000  auto/100000
healthy false
e7b       Cluster       Cluster          up   9000  auto/100000
healthy false

Node: node1-03


Ignore
                                                  Speed(Mbps)
Health   Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ --------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster          up   9000  auto/10000
healthy  false
e7b       Cluster       Cluster          up   9000  auto/10000
healthy  false
```

```
Node: node1-04

Ignore

                                         Speed(Mbps)
Health    Health
Port       IPspace       Broadcast Domain Link MTU  Admin/Oper
Status    Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster           up   9000  auto/10000
healthy  false
e7b       Cluster       Cluster           up   9000  auto/10000
healthy  false
cluster1::*>
```

ii. Verify that all the cluster interfaces (LIFs) are on the home port:

```
network interface show -role cluster
```

Show example

```
cluster1::*> network interface show -role cluster
           Logical          Status      Network
Current       Current Is
Vserver      Interface       Admin/Oper  Address/Mask
Node         Port    Home
----------- ---------------- ----------- -----------------
------------ ------- ----
Cluster
           node1-01_clus1   up/up        169.254.3.4/23
node1-01     e7a      true
           node1-01_clus2   up/up        169.254.3.5/23
node1-01     e7b      true
           node1-02_clus1   up/up        169.254.3.8/23
node1-02     e7a      true
           node1-02_clus2   up/up        169.254.3.9/23
node1-02     e7b      true
           node1-03_clus1   up/up        169.254.1.3/23
node1-03     e7a      true
           node1-03_clus2   up/up        169.254.1.1/23
node1-03     e7b      true
           node1-04_clus1   up/up        169.254.1.6/23
node1-04     e7a      true
           node1-04_clus2   up/up        169.254.1.7/23
node1-04     e7b      true
8 entries were displayed.
```

iii. Verify that the cluster displays information for both switches:

```
system cluster-switch show -is-monitoring-enabled-operational true
```

Show example

```
cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                          Type               Address
Model
--------------------------- ------------------
--------------- -----
cs1(FDOXXXXXXXX)                cluster-network    10.228.137.233
N9K-C9364D-GX2A
      Serial Number: FDOXXXXXXXX
        Is Monitored: true
              Reason: None
    Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    10.4(2)
      Version Source: CDP/ISDP

cs2(FLMXXXXXXXX)                cluster-network    10.228.137.234
N9K-C9364D-GX2A
      Serial Number: FLMXXXXXXXX
        Is Monitored: true
              Reason: None
    Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                    10.4(2)
      Version Source: CDP/ISDP
```

b. **HA ports**

   i. Verify that all the HA ports are up with a healthy status:

   ```
   ha interconnect status show -node <node-name>
   ```

Show example

```
cluster1::*> ha interconnect status show -node node1-01
   (system ha interconnect status show)

                       Node: node1-01
              Link 0 Status: up
              Link 1 Status: up
           Is Link 0 Active: true
           Is Link 1 Active: true
         IC RDMA Connection: up
                       Slot: 0
             Debug Firmware: no


Interconnect Port 0 :
                  Port Name: e1a-17
                        MTU: 4096
           Link Information: ACTIVE


Interconnect Port 1 :
                  Port Name: e1b-18
                        MTU: 4096
           Link Information: ACTIVE

cluster1::*> ha interconnect status show -node node1-01
   (system ha interconnect status show)

                       Node: node1-01
              Link 0 Status: up
              Link 1 Status: up
           Is Link 0 Active: true
           Is Link 1 Active: true
         IC RDMA Connection: up
                       Slot: 0
             Debug Firmware: no


Interconnect Port 0 :
                  Port Name: e1a-17
                        MTU: 4096
           Link Information: ACTIVE


Interconnect Port 1 :
```

```
                     Port Name: e1b-18
                           MTU: 4096
              Link Information: ACTIVE
      .
      .
      .
```

c. **Storage ports**

    i. Verify that all the storage ports are up with a healthy status:

```
storage port show -port-type ENET
```

Show example

```
cluster1::*> storage port show -port-type ENET


                                       Speed
Node                 Port Type  Mode   (Gb/s) State     Status
------------------ ---- ----- ------- ------ --------
-----------
node1-01
                   e10a ENET  -          100 enabled  online
                   e10b ENET  -          100 enabled  online
                   e11a ENET  -          100 enabled  online
                   e11b ENET  -          100 enabled  online
node1-02
                   e10a ENET  -          100 enabled  online
                   e10b ENET  -          100 enabled  online
                   e11a ENET  -          100 enabled  online
                   e11b ENET  -          100 enabled  online
node1-03
                   e10a ENET  -          100 enabled  online
                   e10b ENET  -          100 enabled  online
                   e11a ENET  -          100 enabled  online
node1-04
                   e10a ENET  -          100 enabled  online
                   e10b ENET  -          100 enabled  online
                   e11a ENET  -          100 enabled  online
                   e11b ENET  -          100 enabled  online
16 entries were displayed.
```

d. **Storage shelf ports**

   i. Verify that all the storage shelf ports are up with a healthy status:

```
storage shelf port show
```

Show example

```
cluster1::*> storage shelf port show

Shelf ID Module State        Internal?
----- -- ------ ------------ ---------
1.1
        0 A      connected    false
        1 A      connected    false
        2 A      connected    false
        3 A      connected    false
        4 A      connected    false
        5 A      connected    false
        6 A      connected    false
        7 A      connected    false
        8 B      connected    false
        9 B      connected    false
       10 B      connected    false
       11 B      connected    false
       12 B      connected    false
       13 B      connected    false
       14 B      connected    false
       15 B      connected    false

16 entries were displayed.
```

   ii. Verify the connection status of all the storage shelf ports:

```
storage shelf port show -fields remote-device,remote-
port,connector-state
```

Show example

```
cluster1::*> storage shelf port show -fields remote-
device,remote-port,connector-state

shelf id connector-state remote-port     remote-device
----- -- --------------- -------------- -----------------
1.1   0  connected       Ethernet1/17/1 CX9332D-cs1
1.1   1  connected       Ethernet1/15/1 CX9364D-cs1
1.1   2  connected       Ethernet1/17/2 CX9332D-cs1
1.1   3  connected       Ethernet1/15/2 CX9364D-cs1
1.1   4  connected       Ethernet1/17/3 CX9332D-cs1
1.1   5  connected       Ethernet1/15/3 CX9364D-cs1
1.1   6  connected       Ethernet1/17/4 CX9332D-cs1
1.1   7  connected       Ethernet1/15/4 CX9364D-cs1
1.1   8  connected       Ethernet1/19/1 CX9332D-cs1
1.1   9  connected       Ethernet1/17/1 CX9364D-cs1
1.1   10 connected       Ethernet1/19/2 CX9332D-cs1
1.1   11 connected       Ethernet1/17/2 CX9364D-cs1
1.1   12 connected       Ethernet1/19/3 CX9332D-cs1
1.1   13 connected       Ethernet1/17/3 CX9364D-cs1
1.1   14 connected       Ethernet1/19/4 CX9332D-cs1
1.1   15 connected       Ethernet1/17/4 CX9364D-cs1

16 entries were displayed.
```

5. Disable auto-revert on the cluster LIFs:

```
network interface modify -vserver Cluster -lif * -auto-revert false
```

Step 2: Configure ports

1. On switch cs1, shut down the ports connected to all the ports of the nodes.

```
cs1# config
cs1(config)# interface e1/1/1-4,e1/2/1-4,e1/3/1-4,e1/4/1-4,e1/5/1-
4,e1/6/1-4,e1/7/1-4,e1/8/1-4
cs1(config-if-range)# shutdown
cs1(config)# interface e1/9/1-4,e1/10/1-4,e1/11/1-4,e1/12/1-4,e1/13/1-
4,e1/14/1-4,e1/15/1-4,e1/16/1-4
cs1(config-if-range)# shutdown
cs1(config)# interface e1/17/1-4,e1/18/1-4,e1/19/1-4,e1/20/1-4,e1/21/1-
4,e1/22/1-4,e1/23/1-4,e1/24/1-4
cs1(config-if-range)# shutdown
cs1(config)# interface e1/25/1-4,e1/26/1-4,e1/27/1-4,e1/28/1-4,e1/29/1-
4,e1/30/1-4,e1/31/1-4,e1/32/1-4
cs1(config-if-range)# shutdown
cs1(config)# interface e1/33/1-4,e1/34/1-4,e1/35/1-4,e1/36/1-4,e1/37/1-
4,e1/38/1-4,e1/39/1-4,e1/40/1-4
cs1(config-if-range)# shutdown
cs1(config)# interface e1/41/1-4,e1/42/1-4,e1/43/1-4,e1/44/1-4,e1/35/1-
4,e1/46/1-4,e1/47/1-4,e1/48/1-4
cs1(config-if-range)# shutdown
cs1(config)# interface e1/49/1-4,e1/50/1-4,e1/51/1-4,e1/52/1-4,e1/53/1-
4,e1/54/1-4,e1/55/1-4,e1/56/1-4
cs1(config-if-range)# shutdown
cs1(config)# interface e1/57/1-4,e1/58/1-4,e1/59/1-4,e1/60/1-4,e1/61/1-
4,e1/62/1-4
cs1(config-if-range)# shutdown
cs1(config-if-range)# exit
cs1(config)# exit
```

> ⚠ Make sure to shutdown **all** connected ports to avoid any network connection issues.
> See the Knowledge Base article Node out of quorum when migrating cluster LIF during
> switch OS upgrade for further details.

2. Verify that the cluster LIFs have failed over to the ports hosted on cluster switch cs1. This might take a few
   seconds.

```
network interface show -role cluster
```

Show example

```
cluster1::*> network interface show -role cluster
           Logical                Status     Network                   Current
Current Is
Vserver     Interface           Admin/Oper Address/Mask        Node
Port     Home
----------- ---------------- ---------- ------------------
------------- ------- ----
Cluster
           node1-01_clus1     up/up      169.254.36.44/16    node1-01
e7a      true
           node1-01_clus2     up/up      169.254.7.5/16      node1-01
e7b      true
           node1-02_clus1     up/up      169.254.197.206/16 node1-02
e7a      true
           node1-02_clus2     up/up      169.254.195.186/16 node1-02
e7b      true
           node1-03_clus1     up/up      169.254.192.49/16   node1-03
e7a      true
           node1-03_clus2     up/up      169.254.182.76/16   node1-03
e7b      true
           node1-04_clus1     up/up      169.254.59.49/16    node1-04
e7a      true
           node1-04_clus2     up/up      169.254.62.244/16   node1-04
e7b      true
8 entries were displayed.
```

3. Verify that the cluster is healthy:

```
cluster show
```

Show example

```
cluster1::*> cluster show
Node              Health  Eligibility   Epsilon
---------------- ------- ------------ -------
node1-01          true    true          false
node1-02          true    true          false
node1-03          true    true          true
node1-04          true    true          false
4 entries were displayed.
```

4. If you have not already done so, save a copy of the current switch configuration by copying the output of the following command to a text file:

```
show running-config
```

   a. Record any custom additions between the current `running-config` and the RCF file in use (such as an SNMP configuration for your organization).

   b. For NX-OS 10.2 and newer use the `show diff running-config` command to compare with the saved RCF file in the bootflash. Otherwise, use a third part diff/compare tool.

5. Save basic configuration details to the `write_erase.cfg` file on the bootflash.

> (i) Make sure to configure the following:
>
>   ◦ Username and password
>   ◦ Management IP address
>   ◦ Default gateway
>   ◦ Switch name

```
cs1# show run | i "username admin password" > bootflash:write_erase.cfg

cs1# show run | section "vrf context management" >> bootflash:write_erase.cfg

cs1# show run | section "interface mgmt0" >> bootflash:write_erase.cfg

cs1# show run | section "switchname" >> bootflash:write_erase.cfg

cs1# echo "hardware access-list tcam region ing-racl 1024" >>
bootflash:write_erase.cfg

cs1# echo "hardware access-list tcam region egr-racl 1024" >>
bootflash:write_erase.cfg

cs1# echo "hardware access-list tcam region ing-l2-qos 1536" >>
bootflash:write_erase.cfg
```

See the Knowledge Base article How to clear configuration on a Cisco interconnect switch while retaining remote connectivity for further details.

6. Verify that the `write_erase.cfg` file is populated as expected:

show file bootflash:write_erase.cfg

7. Issue the `write erase` command to erase the current saved configuration:

```
cs1# write erase

Warning: This command will erase the startup-configuration.

Do you wish to proceed anyway? (y/n) [n] y
```

8. Copy the previously saved basic configuration into the startup configuration.

   ```
   cs1# copy bootflash:write_erase.cfg startup-config
   ```

9. Reboot the switch:

   ```
   cs1# reload
   ```

   ```
   This command will reboot the system. (y/n)? [n] y
   ```

10. After the management IP address is reachable again, log in to the switch through SSH.

    You may need to update host file entries related to the SSH keys.

11. Copy the RCF to the bootflash of switch cs1 using one of the following transfer protocols: FTP, TFTP, SFTP, or SCP.

    For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series NX-OS Command Reference guides.

    Show example

    > This example shows TFTP being used to copy an RCF to the bootflash on switch cs1:
    >
    > ```
    > cs1# copy tftp: bootflash: vrf management
    > Enter source filename: NX9364D-GX2A-RCF-v10.0-Shared.txt
    > Enter hostname for the tftp server: 172.22.201.50
    > Trying to connect to tftp server......Connection to Server
    > Established.
    > TFTP get operation was successful
    > Copy complete, now saving to disk (please wait)...
    > ```

12. Apply the RCF previously downloaded to the bootflash.

    For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series NX-OS Command Reference guides.

    This example shows the RCF file `NX9364D-GX2A-RCF-v10.0-Shared.txt` being installed on switch cs1:

    ```
    cs1# copy NX9364D-GX2A-RCF-v10.0-Shared.txt running-config echo-commands
    ```

    > ⚠️ Make sure to read thoroughly the **Installation notes**, **Important Notes**, and **banner** sections of your RCF. You must read and follow these instructions to ensure the proper configuration and operation of the switch.

13. Verify that the RCF file is the correct newer version:

```
show running-config
```

When you check the output to verify you have the correct RCF, make sure that the following information is correct:

- ◦ The RCF banner
- ◦ The node and port settings
- ◦ Customizations

  The output varies according to your site configuration. Check the port settings and refer to the release notes for any changes specific to the RCF that you have installed.

14. Reapply any previous customizations to the switch configuration.

15. After you verify the RCF versions, custom additions, and switch settings are correct, copy the running-config file to the startup-config file.

    For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series NX-OS Command Reference guides.

    ```
    cs1# copy running-config startup-config

    [] 100% Copy complete
    ```

16. Reboot switch cs1. You can ignore the "cluster switch health monitor" alerts and "cluster ports down" events reported on the nodes while the switch reboots.

    ```
    cs1# reload

    This command will reboot the system. (y/n)? [n] y
    ```

17. Verify the health of the ports on the cluster.

    a. **Cluster ports**

       i. Verify that cluster ports are up and healthy across all nodes in the cluster:

          ```
          network port show -ipspace Cluster
          ```

Show example

```
cluster1::*> network port show -ipspace Cluster

Node: node1-01

Ignore
                                                       Speed(Mbps)
Health   Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ --------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster          up   9000  auto/10000
healthy  false
e7b       Cluster       Cluster          up   9000  auto/10000
healthy  false

Node: node1-02

Ignore
                                                       Speed(Mbps)
Health   Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ --------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster          up   9000  auto/10000
healthy  false
e7b       Cluster       Cluster          up   9000  auto/10000
healthy  false

Node: node1-03

Ignore
                                                       Speed(Mbps)
Health   Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ --------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster          up   9000  auto/100000
healthy false
e7b       Cluster       Cluster          up   9000  auto/100000
healthy false
```

```
    Node: node1-04

    Ignore

                                              Speed(Mbps)
    Health   Health
    Port     IPspace       Broadcast Domain Link MTU  Admin/Oper
    Status   Status
    --------- ------------ ---------------- ---- ---- -----------
    -------- ------
    e7a       Cluster      Cluster          up   9000 auto/100000
    healthy false
    e7b       Cluster      Cluster          up   9000 auto/100000
    healthy false
    8 entries were displayed.
```

ii. Verify the switch health from the cluster.

```
network device-discovery show -protocol cdp
```

```
system cluster-switch show -is-monitoring-enabled-operational true
```

```
cluster1::*> network device-discovery show -protocol cdp
Node/       Local  Discovered
Protocol    Port   Device (LLDP: ChassisID)  Interface
Platform
----------- ------ ------------------------ ----------------
--------
node1-01/cdp
            e10a   cs1(FLMXXXXXXXX)          Ethernet1/16/3
N9K-C9364D-GX2A
            e10b   cs2(FDOXXXXXXXX)          Ethernet1/13/3
N9K-C9364D-GX2A
            e11a   cs1(FLMXXXXXXXX)          Ethernet1/16/4
N9K-C9364D-GX2A
            e11b   cs2(FDOXXXXXXXX)          Ethernet1/13/4
N9K-C9364D-GX2A
            e1a    cs1(FLMXXXXXXXX)          Ethernet1/16/1
N9K-C9364D-GX2A
            e1b    cs2(FLMXXXXXXXX)          Ethernet1/13/1
N9K-C9364D-GX2A
              .
              .
              .
            e7a    cs1(FLMXXXXXXXX)          Ethernet1/16/2
N9K-C9364D-GX2A
            e7b    cs2(FDOXXXXXXXX)          Ethernet1/13/2
N9K-C9364D-GX2A
node1-02/cdp
 .
 .
 .

cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                          Type              Address
Model
------------------------- ------------------
--------------- -----
cs2(FDOXXXXXXXX)                cluster-network   10.228.137.233
N9K-C9364D-GX2A
     Serial Number: FDOXXXXXXXX
      Is Monitored: true
            Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
```

```
                        10.4(2)
      Version Source: CDP/ISDP


cs1(FLMXXXXXXXX)                    cluster-network      10.228.137.234
N9K-C9364D-GX2A
        Serial Number: FLMXXXXXXXX
          Is Monitored: true
               Reason: None
    Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                        10.4(2)
      Version Source: CDP/ISDP


2 entries were displayed.
```

b. **HA ports**

   i. Verify that all the HA ports are up with a healthy status:

```
ha interconnect status show -node <node-name>
```

Show example

```
cluster1::*> ha interconnect status show -node node1-01
  (system ha interconnect status show)

                    Node: node1-01
           Link 0 Status: up
           Link 1 Status: up
        Is Link 0 Active: true
        Is Link 1 Active: true
      IC RDMA Connection: up
                    Slot: 0
          Debug Firmware: no



Interconnect Port 0 :
               Port Name: e1a-17
                     MTU: 4096
        Link Information: ACTIVE



Interconnect Port 1 :
               Port Name: e1b-18
                     MTU: 4096
        Link Information: ACTIVE

cluster1::*> ha interconnect status show -node node1-02
  (system ha interconnect status show)

                    Node: node1-02
           Link 0 Status: up
           Link 1 Status: up
        Is Link 0 Active: true
        Is Link 1 Active: true
      IC RDMA Connection: up
                    Slot: 0
          Debug Firmware: no



Interconnect Port 0 :
               Port Name: e1a-17
                     MTU: 4096
        Link Information: ACTIVE



Interconnect Port 1 :
```

```
                     Port Name: e1b-18
                           MTU: 4096
              Link Information: ACTIVE
   .
   .
   .
```

c. **Storage ports**

   i. Verify that all the storage ports are up with a healthy status:

```
storage port show -port-type ENET
```

Show example

```
cluster1::*> storage port show -port-type ENET


                                      Speed
Node                 Port Type  Mode  (Gb/s) State     Status
------------------ ---- ----- ------- ------ --------
-----------
node1-01
                     e10a ENET  -         100 enabled  online
                     e10b ENET  -         100 enabled  online
                     e11a ENET  -         100 enabled  online
                     e11b ENET  -         100 enabled  online
node1-02
                     e10a ENET  -         100 enabled  online
                     e10b ENET  -         100 enabled  online
                     e11a ENET  -         100 enabled  online
                     e11b ENET  -         100 enabled  online
node1-03
                     e10a ENET  -         100 enabled  online
                     e10b ENET  -         100 enabled  online
                     e11a ENET  -         100 enabled  online
node1-04
                     e10a ENET  -         100 enabled  online
                     e10b ENET  -         100 enabled  online
                     e11a ENET  -         100 enabled  online
                     e11b ENET  -         100 enabled  online
16 entries were displayed.
```

d. **Storage shelf ports**

   i. Verify that all the storage shelf ports are up with a healthy status:

```
storage shelf port show
```

Show example

```
cluster1::*> storage shelf port show

Shelf ID Module State         Internal?
----- -- ------ ------------ ---------
1.1
       0 A      connected    false
       1 A      connected    false
       2 A      connected    false
       3 A      connected    false
       4 A      connected    false
       5 A      connected    false
       6 A      connected    false
       7 A      connected    false
       8 B      connected    false
       9 B      connected    false
      10 B      connected    false
      11 B      connected    false
      12 B      connected    false
      13 B      connected    false
      14 B      connected    false
      15 B      connected    false

16 entries were displayed.
```

   ii. Verify the connection status of all the storage shelf ports:

```
storage shelf port show -fields remote-device,remote-
port,connector-state
```

Show example

```
cluster1::*> storage shelf port show -fields remote-
device,remote-port,connector-state

shelf id connector-state remote-port     remote-device
----- -- --------------- -------------- -----------------
1.1   0  connected       Ethernet1/17/1 CX9332D-cs1
1.1   1  connected       Ethernet1/15/1 CX9364D-cs1
1.1   2  connected       Ethernet1/17/2 CX9332D-cs1
1.1   3  connected       Ethernet1/15/2 CX9364D-cs1
1.1   4  connected       Ethernet1/17/3 CX9332D-cs1
1.1   5  connected       Ethernet1/15/3 CX9364D-cs1
1.1   6  connected       Ethernet1/17/4 CX9332D-cs1
1.1   7  connected       Ethernet1/15/4 CX9364D-cs1
1.1   8  connected       Ethernet1/19/1 CX9332D-cs1
1.1   9  connected       Ethernet1/17/1 CX9364D-cs1
1.1   10 connected       Ethernet1/19/2 CX9332D-cs1
1.1   11 connected       Ethernet1/17/2 CX9364D-cs1
1.1   12 connected       Ethernet1/19/3 CX9332D-cs1
1.1   13 connected       Ethernet1/17/3 CX9364D-cs1
1.1   14 connected       Ethernet1/19/4 CX9332D-cs1
1.1   15 connected       Ethernet1/17/4 CX9364D-cs1

16 entries were displayed.
```

18. Verify that the cluster is healthy:

```
cluster show
```

Show example

```
cluster1::*> cluster show
Node              Health   Eligibility   Epsilon
----------------- -------- ------------- -------
node1-01          true     true          false
node1-02          true     true          false
node1-03          true     true          true
node1-04          true     true          false
4 entries were displayed.
```

19. Repeat steps 4 to 18 on switch cs2.

20. Enable auto-revert on the cluster LIFs:

```
network interface modify -vserver Cluster -lif * -auto-revert True
```

Step 3: Verify the cluster network configuration and cluster health

1. Verify that the switch ports connected to the cluster ports are up.

```
show interface brief
```

Show example

```
cs1# show interface brief | grep up
.
.
Eth1/9/3        1        eth  trunk  up      none
100G(D) --
Eth1/9/4        1        eth  trunk  up      none
100G(D) --
Eth1/15/1       1        eth  trunk  up      none
100G(D) --
Eth1/15/2       1        eth  trunk  up      none
100G(D) --
Eth1/15/3       1        eth  trunk  up      none
100G(D) --
Eth1/15/4       1        eth  trunk  up      none
100G(D) --
Eth1/16/1       1        eth  trunk  up      none
100G(D) --
Eth1/16/2       1        eth  trunk  up      none
100G(D) --
Eth1/16/3       1        eth  trunk  up      none
100G(D) --
Eth1/16/4       1        eth  trunk  up      none
100G(D) --
Eth1/17/1       1        eth  trunk  up      none
100G(D) --
Eth1/17/2       1        eth  trunk  up      none
100G(D) --
Eth1/17/3       1        eth  trunk  up      none
100G(D) --
Eth1/17/4       1        eth  trunk  up      none
100G(D) --
.
.
.
```

2. Verify that the expected nodes are still connected:

```
show cdp neighbors
```

Show example

```
cs1# show cdp neighbors

Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-
Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute

Device-ID          Local Intrfce  Hldtme Capability  Platform
Port ID
cs2(FDOXXXXXXXX)    Eth1/63         179    R S I s   N9K-C9332D-GX2B
Eth1/31
cs2(FDOXXXXXXXX)    Eth1/64         179    R S I s   N9K-C9332D-GX2B
Eth1/32
node1-01            Eth1/4/1        123      H       AFX-1K
e1a
node1-01            Eth1/4/2        123      H       AFX-1K
e7a
node1-01            Eth1/4/3        123      H       AFX-1K
e10a
node1-01            Eth1/4/4        123      H       AFX-1K
e11a
node1-02            Eth1/9/1        138      H       AFX-1K
e1a
node1-02            Eth1/9/2        138      H       AFX-1K
e7a
node1-02            Eth1/9/3        138      H       AFX-1K
e10a
node1-02            Eth1/9/4        138      H       AFX-1K
e11a
node1-03            Eth1/15/1       138      H       AFX-1K
e1a
node1-03            Eth1/15/2       138      H       AFX-1K
e7a
node1-03            Eth1/15/3       138      H       AFX-1K
e10a
node1-03            Eth1/15/4       138      H       AFX-1K
e11a
node1-04            Eth1/16/1       173      H       AFX-1K
e1a
node1-04            Eth1/16/2       173      H       AFX-1K
e7a
node1-04            Eth1/16/3       173      H       AFX-1K
e10a
```

```
node1-04              Eth1/16/4      173   H            AFX-1K
e11a


Total entries displayed: 18
```

3. Verify that the cluster nodes are in their correct cluster VLANs using the following commands:

```
show vlan brief
```

```
show interface trunk
```

```
cs1# show vlan brief

VLAN Name                              Status    Ports
---- -------------------------------- ---------
--------------------------------
1    default                          active    Po1, Po999, Eth1/63,
Eth1/64

                                                Eth1/65, Eth1/66,
Eth1/1/1

                                                Eth1/1/2, Eth1/1/3,
Eth1/1/4

                                                Eth1/2/1, Eth1/2/2,
Eth1/2/3

                                                Eth1/2/4, Eth1/3/1,
Eth1/3/2

                                                Eth1/3/3, Eth1/3/4,
Eth1/4/1

                                                Eth1/4/2, Eth1/4/3,
Eth1/4/4

                                                Eth1/5/1, Eth1/5/2,
Eth1/5/3

                                                Eth1/5/4, Eth1/6/1,
Eth1/6/2

                                                Eth1/6/3, Eth1/6/4,
Eth1/7/1

                                                Eth1/7/2, Eth1/7/3,
Eth1/7/4

                                                Eth1/8/1, Eth1/8/2,
Eth1/8/3

                                                Eth1/8/4, Eth1/9/1,
Eth1/9/2

                                                Eth1/9/3, Eth1/9/4,
Eth1/10/1

                                                Eth1/10/2,
Eth1/10/3, Eth1/10/4

                                                Eth1/11/1,
Eth1/11/2, Eth1/11/3

                                                Eth1/11/4,
Eth1/12/1, Eth1/12/2

                                                Eth1/12/3,
Eth1/12/4, Eth1/13/1

                                                Eth1/13/2,
Eth1/13/3, Eth1/13/4

                                                Eth1/14/1,
```

```
Eth1/14/2, Eth1/14/3
                                        Eth1/14/4,
Eth1/15/1, Eth1/15/2
                                        Eth1/15/3,
Eth1/15/4, Eth1/16/1
                                        Eth1/16/2,
Eth1/16/3, Eth1/16/4
                                        Eth1/17/1,
Eth1/17/2, Eth1/17/3
                                        Eth1/17/4,
Eth1/18/1, Eth1/18/2
                                        Eth1/18/3,
Eth1/18/4, Eth1/19/1
                                        Eth1/19/2,
Eth1/19/3, Eth1/19/4
                                        Eth1/20/1,
Eth1/20/2, Eth1/20/3
                                        Eth1/20/4,
Eth1/21/1, Eth1/21/2
                                        Eth1/21/3,
Eth1/21/4, Eth1/22/1
                                        Eth1/22/2,
Eth1/22/3, Eth1/22/4
                                        Eth1/23/1,
Eth1/23/2, Eth1/23/3
                                        Eth1/23/4,
Eth1/24/1, Eth1/24/2
                                        Eth1/24/3,
Eth1/24/4, Eth1/25/1
                                        Eth1/25/2,
Eth1/25/3, Eth1/25/4
                                        Eth1/26/1,
Eth1/26/2, Eth1/26/3
                                        Eth1/26/4,
Eth1/27/1, Eth1/27/2
                                        Eth1/27/3,
Eth1/27/4, Eth1/28/1
                                        Eth1/28/2,
Eth1/28/3, Eth1/28/4
                                        Eth1/29/1,
Eth1/29/2, Eth1/29/3
                                        Eth1/29/4,
Eth1/30/1, Eth1/30/2
                                        Eth1/30/3,
Eth1/30/4, Eth1/31/1
                                        Eth1/31/2,
```

```
Eth1/31/3, Eth1/31/4
                                        Eth1/32/1,
Eth1/32/2, Eth1/32/3
                                        Eth1/32/4,
Eth1/33/1, Eth1/33/2
                                        Eth1/33/3,
Eth1/33/4, Eth1/34/1
                                        Eth1/34/2,
Eth1/34/3, Eth1/34/4
                                        Eth1/35/1,
Eth1/35/2, Eth1/35/3
                                        Eth1/35/4,
Eth1/36/1, Eth1/36/2
                                        Eth1/36/3,
Eth1/36/4, Eth1/37/1
                                        Eth1/37/2,
Eth1/37/3, Eth1/37/4
                                        Eth1/38/1,
Eth1/38/2, Eth1/38/3
                                        Eth1/38/4,
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                                        Eth1/39/3,
Eth1/39/4, Eth1/40/1
                                        Eth1/40/2,
Eth1/40/3, Eth1/40/4
                                        Eth1/41/1,
Eth1/41/2, Eth1/41/3
                                        Eth1/41/4,
Eth1/42/1, Eth1/42/2
                                        Eth1/42/3,
Eth1/42/4, Eth1/43/1
                                        Eth1/43/2,
Eth1/43/3, Eth1/43/4
                                        Eth1/44/1,
Eth1/44/2, Eth1/44/3
                                        Eth1/44/4,
Eth1/45/1, Eth1/45/2
                                        Eth1/45/3,
Eth1/45/4, Eth1/46/1
                                        Eth1/46/2,
Eth1/46/3, Eth1/46/4
                                        Eth1/47/1,
Eth1/47/2, Eth1/47/3
                                        Eth1/47/4,
Eth1/48/1, Eth1/48/2
                                        Eth1/48/3,
```

```
                                             Eth1/48/4, Eth1/49/1
                                                         Eth1/49/2,
     Eth1/49/3, Eth1/49/4
                                                         Eth1/50/1,
     Eth1/50/2, Eth1/50/3
                                                         Eth1/50/4,
     Eth1/51/1, Eth1/51/2
                                                         Eth1/51/3,
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                                                         Eth1/52/2,
     Eth1/52/3, Eth1/52/4
                                                         Eth1/53/1,
     Eth1/53/2, Eth1/53/3
                                                         Eth1/53/4,
     Eth1/54/1, Eth1/54/2
                                                         Eth1/54/3,
     Eth1/54/4, Eth1/55/1
                                                         Eth1/55/2,
     Eth1/55/3, Eth1/55/4
                                                         Eth1/56/1,
     Eth1/56/2, Eth1/56/3
                                                         Eth1/56/4,
     Eth1/57/1, Eth1/57/2
                                                         Eth1/57/3,
     Eth1/57/4, Eth1/58/1
                                                         Eth1/58/2,
     Eth1/58/3, Eth1/58/4
                                                         Eth1/59/1,
     Eth1/59/2, Eth1/59/3
                                                         Eth1/59/4,
     Eth1/60/1, Eth1/60/2
                                                         Eth1/60/3,
     Eth1/60/4, Eth1/61/1
                                                         Eth1/61/2,
     Eth1/61/3, Eth1/61/4
                                                         Eth1/62/1,
     Eth1/62/2, Eth1/62/3
                                                         Eth1/62/4
     17   VLAN0017                         active    Eth1/1/1, Eth1/1/2,
     Eth1/1/3
                                                      Eth1/1/4, Eth1/2/1,
     Eth1/2/2
                                                      Eth1/2/3, Eth1/2/4,
     Eth1/3/1
                                                      Eth1/3/2, Eth1/3/3,
     Eth1/3/4
```

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Eth1/7/3
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Eth1/9/1
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Eth1/9/4
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Eth1/51/2,
Eth1/51/3, Eth1/51/4
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Eth1/52/2, Eth1/52/3
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Eth1/55/2, Eth1/55/3

```
                                                   Eth1/55/4,
Eth1/56/1, Eth1/56/2
                                                   Eth1/56/3,
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                                                   Eth1/57/2,
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                                                   Eth1/58/1,
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                                                   Eth1/58/4,
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                                                   Eth1/59/3,
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                                                   Eth1/60/2,
Eth1/60/3, Eth1/60/4
                                                   Eth1/61/1,
Eth1/61/2, Eth1/61/3
                                                   Eth1/61/4,
Eth1/62/1, Eth1/62/2
                                                   Eth1/62/3, Eth1/62/4
18   VLAN0018                         active       Eth1/1/1, Eth1/1/2,
Eth1/1/3
                                                   Eth1/1/4, Eth1/2/1,
Eth1/2/2
                                                   Eth1/2/3, Eth1/2/4,
Eth1/3/1
                                                   Eth1/3/2, Eth1/3/3,
Eth1/3/4
                                                   Eth1/4/1, Eth1/4/2,
Eth1/4/3
                                                   Eth1/4/4, Eth1/5/1,
Eth1/5/2
                                                   Eth1/5/3, Eth1/5/4,
Eth1/6/1
                                                   Eth1/6/2, Eth1/6/3,
Eth1/6/4
                                                   Eth1/7/1, Eth1/7/2,
Eth1/7/3
                                                   Eth1/7/4, Eth1/8/1,
Eth1/8/2
                                                   Eth1/8/3, Eth1/8/4,
Eth1/9/1
                                                   Eth1/9/2, Eth1/9/3,
Eth1/9/4
                                                   Eth1/10/1,
Eth1/10/2, Eth1/10/3
                                                   Eth1/10/4,
```

```
Eth1/11/1, Eth1/11/2
                                    Eth1/11/3,
Eth1/11/4, Eth1/12/1
                                    Eth1/12/2,
Eth1/12/3, Eth1/12/4
                                    Eth1/13/1,
Eth1/13/2, Eth1/13/3
                                    Eth1/13/4,
Eth1/14/1, Eth1/14/2
                                    Eth1/14/3,
Eth1/14/4, Eth1/15/1
                                    Eth1/15/2,
Eth1/15/3, Eth1/15/4
                                    Eth1/16/1,
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                                    Eth1/16/4,
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                                    Eth1/17/3,
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                                    Eth1/18/2,
Eth1/18/3, Eth1/18/4
                                    Eth1/19/1,
Eth1/19/2, Eth1/19/3
                                    Eth1/19/4,
Eth1/20/1, Eth1/20/2
                                    Eth1/20/3,
Eth1/20/4, Eth1/21/1
                                    Eth1/21/2,
Eth1/21/3, Eth1/21/4
                                    Eth1/22/1,
Eth1/22/2, Eth1/22/3
                                    Eth1/22/4,
Eth1/23/1, Eth1/23/2
                                    Eth1/23/3,
Eth1/23/4, Eth1/24/1
                                    Eth1/24/2,
Eth1/24/3, Eth1/24/4
                                    Eth1/25/1,
Eth1/25/2, Eth1/25/3
                                    Eth1/25/4,
Eth1/26/1, Eth1/26/2
                                    Eth1/26/3,
Eth1/26/4, Eth1/27/1
                                    Eth1/27/2,
Eth1/27/3, Eth1/27/4
                                    Eth1/28/1,
```

```
Eth1/28/2, Eth1/28/3
                                              Eth1/28/4,
Eth1/29/1, Eth1/29/2
                                              Eth1/29/3,
Eth1/29/4, Eth1/30/1
                                              Eth1/30/2,
Eth1/30/3, Eth1/30/4
                                              Eth1/31/1,
Eth1/31/2, Eth1/31/3
                                              Eth1/31/4,
Eth1/32/1, Eth1/32/2
                                              Eth1/32/3,
Eth1/32/4, Eth1/33/1
                                              Eth1/33/2,
Eth1/33/3, Eth1/33/4
                                              Eth1/34/1,
Eth1/34/2, Eth1/34/3
                                              Eth1/34/4,
Eth1/35/1, Eth1/35/2
                                              Eth1/35/3,
Eth1/35/4, Eth1/36/1
                                              Eth1/36/2,
Eth1/36/3, Eth1/36/4
                                              Eth1/37/1,
Eth1/37/2, Eth1/37/3
                                              Eth1/37/4,
Eth1/38/1, Eth1/38/2
                                              Eth1/38/3,
Eth1/38/4, Eth1/39/1
                                              Eth1/39/2,
Eth1/39/3, Eth1/39/4
                                              Eth1/40/1,
Eth1/40/2, Eth1/40/3
                                              Eth1/40/4,
Eth1/41/1, Eth1/41/2
                                              Eth1/41/3,
Eth1/41/4, Eth1/42/1
                                              Eth1/42/2,
Eth1/42/3, Eth1/42/4
                                              Eth1/43/1,
Eth1/43/2, Eth1/43/3
                                              Eth1/43/4,
Eth1/44/1, Eth1/44/2
                                              Eth1/44/3,
Eth1/44/4, Eth1/45/1
                                              Eth1/45/2,
```

```
Eth1/45/3, Eth1/45/4
                                        Eth1/46/1,
Eth1/46/2, Eth1/46/3
                                        Eth1/46/4,
Eth1/47/1, Eth1/47/2
                                        Eth1/47/3,
Eth1/47/4, Eth1/48/1
                                        Eth1/48/2,
Eth1/48/3, Eth1/48/4
                                        Eth1/49/1,
Eth1/49/2, Eth1/49/3
                                        Eth1/49/4,
Eth1/50/1, Eth1/50/2
                                        Eth1/50/3,
Eth1/50/4, Eth1/51/1
                                        Eth1/51/2,
Eth1/51/3, Eth1/51/4
                                        Eth1/52/1,
Eth1/52/2, Eth1/52/3
                                        Eth1/52/4,
Eth1/53/1, Eth1/53/2
                                        Eth1/53/3,
Eth1/53/4, Eth1/54/1
                                        Eth1/54/2,
Eth1/54/3, Eth1/54/4
                                        Eth1/55/1,
Eth1/55/2, Eth1/55/3
                                        Eth1/55/4,
Eth1/56/1, Eth1/56/2
                                        Eth1/56/3,
Eth1/56/4, Eth1/57/1
                                        Eth1/57/2,
Eth1/57/3, Eth1/57/4
                                        Eth1/58/1,
Eth1/58/2, Eth1/58/3
                                        Eth1/58/4,
Eth1/59/1, Eth1/59/2
                                        Eth1/59/3,
Eth1/59/4, Eth1/60/1
                                        Eth1/60/2,
Eth1/60/3, Eth1/60/4
                                        Eth1/61/1,
Eth1/61/2, Eth1/61/3
                                        Eth1/61/4,
Eth1/62/1, Eth1/62/2
                                        Eth1/62/3, Eth1/62/4
```

```
30   VLAN0030                         active      Eth1/1/1, Eth1/1/2,
Eth1/1/3
                                                  Eth1/1/4, Eth1/2/1,
Eth1/2/2
                                                  Eth1/2/3, Eth1/2/4,
Eth1/3/1
                                                  Eth1/3/2, Eth1/3/3,
Eth1/3/4
                                                  Eth1/4/1, Eth1/4/2,
Eth1/4/3
                                                  Eth1/4/4, Eth1/5/1,
Eth1/5/2
                                                  Eth1/5/3, Eth1/5/4,
Eth1/6/1
                                                  Eth1/6/2, Eth1/6/3,
Eth1/6/4
                                                  Eth1/7/1, Eth1/7/2,
Eth1/7/3
                                                  Eth1/7/4, Eth1/8/1,
Eth1/8/2
                                                  Eth1/8/3, Eth1/8/4,
Eth1/9/1
                                                  Eth1/9/2, Eth1/9/3,
Eth1/9/4
                                                  Eth1/10/1,
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                                                  Eth1/10/4,
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                                                  Eth1/11/3,
Eth1/11/4, Eth1/12/1
                                                  Eth1/12/2,
Eth1/12/3, Eth1/12/4
                                                  Eth1/13/1,
Eth1/13/2, Eth1/13/3
                                                  Eth1/13/4,
Eth1/14/1, Eth1/14/2
                                                  Eth1/14/3,
Eth1/14/4, Eth1/15/1
                                                  Eth1/15/2,
Eth1/15/3, Eth1/15/4
                                                  Eth1/16/1,
Eth1/16/2, Eth1/16/3
                                                  Eth1/16/4,
Eth1/17/1, Eth1/17/2
                                                  Eth1/17/3,
Eth1/17/4, Eth1/18/1
```

Eth1/18/2,
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Eth1/36/3, Eth1/36/4

Eth1/37/1,
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Eth1/41/4, Eth1/42/1

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Eth1/44/1, Eth1/44/2

Eth1/44/3,
Eth1/44/4, Eth1/45/1

Eth1/45/2,
Eth1/45/3, Eth1/45/4

Eth1/46/1,
Eth1/46/2, Eth1/46/3

Eth1/46/4,
Eth1/47/1, Eth1/47/2

Eth1/47/3,
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Eth1/48/3, Eth1/48/4

Eth1/49/1,
Eth1/49/2, Eth1/49/3

Eth1/49/4,
Eth1/50/1, Eth1/50/2

Eth1/50/3,
Eth1/50/4, Eth1/51/1

Eth1/51/2,
Eth1/51/3, Eth1/51/4

Eth1/52/1,
Eth1/52/2, Eth1/52/3

```
                                                 Eth1/52/4,
Eth1/53/1, Eth1/53/2
                                                 Eth1/53/3,
Eth1/53/4, Eth1/54/1
                                                 Eth1/54/2,
Eth1/54/3, Eth1/54/4
                                                 Eth1/55/1,
Eth1/55/2, Eth1/55/3
                                                 Eth1/55/4,
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                                                 Eth1/56/3,
Eth1/56/4, Eth1/57/1
                                                 Eth1/57/2,
Eth1/57/3, Eth1/57/4
                                                 Eth1/58/1,
Eth1/58/2, Eth1/58/3
                                                 Eth1/58/4,
Eth1/59/1, Eth1/59/2
                                                 Eth1/59/3,
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                                                 Eth1/60/2,
Eth1/60/3, Eth1/60/4
                                                 Eth1/61/1,
Eth1/61/2, Eth1/61/3
                                                 Eth1/61/4,
Eth1/62/1, Eth1/62/2
                                                 Eth1/62/3, Eth1/62/4
40   VLAN0040                       active       Eth1/1/1, Eth1/1/2,
Eth1/1/3
                                                 Eth1/1/4, Eth1/2/1,
Eth1/2/2
                                                 Eth1/2/3, Eth1/2/4,
Eth1/3/1
                                                 Eth1/3/2, Eth1/3/3,
Eth1/3/4
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Eth1/4/3
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Eth1/5/2
                                                 Eth1/5/3, Eth1/5/4,
Eth1/6/1
                                                 Eth1/6/2, Eth1/6/3,
Eth1/6/4
                                                 Eth1/7/1, Eth1/7/2,
Eth1/7/3
                                                 Eth1/7/4, Eth1/8/1,
```

Eth1/8/2	
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Eth1/9/1	
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Eth1/9/4	
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	Eth1/24/2,
Eth1/24/3, Eth1/24/4	
	Eth1/25/1,

```
Eth1/25/2, Eth1/25/3
                                                        Eth1/25/4,
Eth1/26/1, Eth1/26/2
                                                        Eth1/26/3,
Eth1/26/4, Eth1/27/1
                                                        Eth1/27/2,
Eth1/27/3, Eth1/27/4
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                                                        Eth1/29/3,
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                                                        Eth1/30/2,
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                                                        Eth1/31/1,
Eth1/31/2, Eth1/31/3
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                                                        Eth1/32/3,
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                                                        Eth1/33/2,
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                                                        Eth1/34/1,
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                                                        Eth1/34/4,
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                                                        Eth1/35/3,
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                                                        Eth1/36/2,
Eth1/36/3, Eth1/36/4
                                                        Eth1/37/1,
Eth1/37/2, Eth1/37/3
                                                        Eth1/37/4,
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                                                        Eth1/38/3,
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                                                        Eth1/39/2,
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                                                        Eth1/40/1,
Eth1/40/2, Eth1/40/3
                                                        Eth1/40/4,
Eth1/41/1, Eth1/41/2
                                                        Eth1/41/3,
Eth1/41/4, Eth1/42/1
                                                        Eth1/42/2,
```

```
Eth1/42/3, Eth1/42/4
                                        Eth1/43/1,
Eth1/43/2, Eth1/43/3
                                        Eth1/43/4,
Eth1/44/1, Eth1/44/2
                                        Eth1/44/3,
Eth1/44/4, Eth1/45/1
                                        Eth1/45/2,
Eth1/45/3, Eth1/45/4
                                        Eth1/46/1,
Eth1/46/2, Eth1/46/3
                                        Eth1/46/4,
Eth1/47/1, Eth1/47/2
                                        Eth1/47/3,
Eth1/47/4, Eth1/48/1
                                        Eth1/48/2,
Eth1/48/3, Eth1/48/4
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Eth1/56/4, Eth1/57/1
                                        Eth1/57/2,
Eth1/57/3, Eth1/57/4
                                        Eth1/58/1,
Eth1/58/2, Eth1/58/3
                                        Eth1/58/4,
Eth1/59/1, Eth1/59/2
                                        Eth1/59/3,
```

```
                   Eth1/59/4, Eth1/60/1
                                                        Eth1/60/2,
     Eth1/60/3, Eth1/60/4
                                                        Eth1/61/1,
     Eth1/61/2, Eth1/61/3
                                                        Eth1/61/4,
     Eth1/62/1, Eth1/62/2
                                                        Eth1/62/3, Eth1/62/4


     cs1# show interface trunk


     --------------------------------------------------------
     Port            Native  Status        Port
                     Vlan                  Channel
     --------------------------------------------------------
     Eth1/1/1        1       trunking      --
     Eth1/1/2        1       trunking      --
     Eth1/1/3        1       trunking      --
     Eth1/1/4        1       trunking      --
     Eth1/2/1        1       trunking      --
     Eth1/2/2        1       trunking      --
     Eth1/2/3        1       trunking      --
     Eth1/2/4        1       trunking      --
     .
     .
     .
     Eth1/62/2       none
     Eth1/62/3       none
     Eth1/62/4       none
     Eth1/63         none
     Eth1/64         none
     Po1             1
```

(i)   For specific port and VLAN usage details, refer to the banner and important notes section in your RCF.

4. Verify that the ISL between cs1 and cs2 is functional:

```
show port-channel summary
```

Show example

```
cs1# show port-channel summary
Flags:  D - Down          P - Up in port-channel (members)
        I - Individual  H - Hot-standby (LACP only)
        s - Suspended   r - Module-removed
        b - BFD Session Wait
        S - Switched    R - Routed
        U - Up (port-channel)
        p - Up in delay-lacp mode (member)
        M - Not in use. Min-links not met
--------------------------------------------------------------------
------------
Group Port-        Type      Protocol  Member Ports      Channel
--------------------------------------------------------------------
------------
1     Po1(SU)      Eth       LACP      Eth1/63(P)    Eth1/64(P)
999   Po999(SD)    Eth       NONE      --
cs1#
```

5. Verify that the cluster LIFs have reverted to their home port:

```
network interface show -role cluster
```

Show example

```
cluster1::*> network interface show -role cluster
            Logical              Status      Network                  Current
Current Is
Vserver       Interface         Admin/Oper Address/Mask         Node
Port    Home
----------- ------------------ ---------- ------------------
------------ ------- ----
Cluster
            node1-01_clus1     up/up       169.254.36.44/16     node1-
01      e7a      true
            node1-01_clus2     up/up       169.254.7.5/16       node1-
01      e7b      true
            node1-02_clus1     up/up       169.254.197.206/16 node1-
02      e7a      true
            node1-02_clus2     up/up       169.254.195.186/16 node1-
02      e7b      true
            node1-03_clus1     up/up       169.254.192.49/16    node1-
03      e7a      true
            node1-03_clus2     up/up       169.254.182.76/16    node1-
03      e7b      true
            node1-04_clus1     up/up       169.254.59.49/16     node1-
04      e7a      true
            node1-04_clus2     up/up       169.254.62.244/16    node1-
04      e7b      true

8 entries were displayed.
```

If any cluster LIFs have not returned to their home ports, revert them manually from the local node:

`network interface revert -vserver vserver_name -lif <lif-name>`

6. Verify that the cluster is healthy:

`cluster show`

Show example

```
cluster1::*> cluster show
Node                Health  Eligibility   Epsilon
----------------    -------  ------------- -------
node1-01             true    true           false
node1-02             true    true           false
node1-03             true    true           true
node1-04             true    true           false
```

7. Verify the connectivity of the remote cluster interfaces:

   a. You can use the `network interface check cluster-connectivity show` command to display the details of an accessibility check for cluster connectivity:

   ```
   network interface check cluster-connectivity show
   ```

Show example

```
cluster1::*> network interface check cluster-connectivity show

                                    Source           Destination
Packet
Node   Date                         LIF              LIF
Loss
------ -------------------------- ----------------
-------------- -----------
node1-01
       6/4/2025 03:13:33 -04:00   node1-01_clus2   node1-02_clus1
none
       6/4/2025 03:13:34 -04:00   node1-01_clus2   node1-02_clus1
none


node1-02
       6/4/2025 03:13:33 -04:00   node1-02_clus2   node1-01_clus1
none
       6/4/2025 03:13:34 -04:00   node1-02_clus2   node1-01_clus2
none
   .
   .
   .
```

b. Alternatively, you can use the `cluster ping-cluster -node <node-name>` command to check the connectivity:

```
cluster ping-cluster -node <node-name>
```

Show example

```
cluster1::*> cluster ping-cluster -node local
Host is node1-04
Getting addresses from network interface table...
Cluster node1-01_clus1 169.254.36.44 node1-01 e7a
Cluster node1-01_clus2 169.254.7.5   node1-01 e7b
Cluster node1-02_clus1 169.254.197.206 node1-02 e7a
Cluster node1-02_clus2 169.254.195.186 node1-02 e7b
Cluster node1-03_clus1 169.254.192.49 node1-03 e7a
Cluster node1-03_clus2 169.254.182.76 node1-03 e7b
Cluster node1-04_clus1 169.254.59.49 node1-04 e7a
Cluster node1-04_clus2 169.254.62.244 node1-04 e7b
Local = 169.254.59.49 169.254.62.244
Remote = 169.254.36.44 169.254.7.5 169.254.197.206
169.254.195.186 169.254.192.49 169.254.182.76
Cluster Vserver Id = 4294967293
Ping status:
............
Basic connectivity succeeds on 12 path(s)
Basic connectivity fails on 0 path(s)
................................................
Detected 9000 byte MTU on 12 path(s):
    Local 169.254.59.49 to Remote 169.254.182.76
    Local 169.254.59.49 to Remote 169.254.192.49
    Local 169.254.59.49 to Remote 169.254.195.186
    Local 169.254.59.49 to Remote 169.254.197.206
    Local 169.254.59.49 to Remote 169.254.36.44
    Local 169.254.59.49 to Remote 169.254.7.5
    Local 169.254.62.244 to Remote 169.254.182.76
    Local 169.254.62.244 to Remote 169.254.192.49
    Local 169.254.62.244 to Remote 169.254.195.186
    Local 169.254.62.244 to Remote 169.254.197.206
    Local 169.254.62.244 to Remote 169.254.36.44
    Local 169.254.62.244 to Remote 169.254.7.5
Larger than PMTU communication succeeds on 12 path(s)
RPC status:
6 paths up, 0 paths down (tcp check)
6 paths up, 0 paths down (udp check)
```

What's next?

After you've upgraded your RCF, you verify the SSH configuration.

Verify your SSH configuration

If you are using the Ethernet Switch Health Monitor (CSHM) and log collection features, verify that SSH and SSH keys are enabled on the switches.

Steps

1. Verify that SSH is enabled:

   ```
   (switch) show ssh server
   ssh version 2 is enabled
   ```

2. Verify that the SSH keys are enabled:

   ```
   show ssh key
   ```

Show example

```
(switch)# show ssh key

rsa Keys generated:Thu May 15 15:09:55 2025

ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAAAgQDCQJPZk7OGhg0j1t0NWKylnI8R8zDpuMpU6KKA
jPOCShTFpibeYQqxOPTCAKACkut8dduZmc3bY9DIOle0cKYQ8PgS2mG9ovQ0RJ56RUNh
VNPdJuhXM4ckHoiVJxIAbHkbcw8rzawbkT6cNBUiZY3MrOMh0e0CnMRhh9we
MOo/vQ==


bitcount:1024
fingerprint:
SHA256:TMUXFgyRC3EcIZEVbQ/P0elDByBCJizPJ1XKMkIXfPI

could not retrieve dsa key information

ecdsa Keys generated:Thu May 15 15:12:09 2025


ecdsa-sha2-nistp521
AAAAE2VjZHNhLXNoYTItbmlzdHA1MjEAAAAIbmlzdHA1MjEAAACFBADquZcNSDA/eLAa
ItXyxVZxsSJSE3u4et9B6+RLq162zTe/3A6JTCyBrkfrMhQt9QMQ7XrMqJGxLSinXhyU
ClBxwQD/ZbkZueZHiFuYg5hKN97wUYvts+EwpG2mSVonxKKp
atmtgu48BqKfZTc4LZYL5vgdh5uuktJ0Z8mYHt3xKPXsvw==


bitcount:521
fingerprint:
SHA256:K8LDx6L7sJjLFn8iubUhjt66uk8TYmXwnQKWVD04C1o
**

(switch)# show feature | include scpServer
scpServer              1           enabled
(switch)# show feature | include ssh
sshServer              1           enabled
(switch)#
```

What's next?

After you've verified your SSH configuration, you [configure switch health monitoring](#).

Reset the 9364D-GX2A switch to factory defaults

To reset the 9364D-GX2A switch to factory defaults, you must erase the 9364D-GX2A switch settings.

About this task

- You must be connected to the switch using the serial console.
- This task resets the configuration of the management network.

Steps

1. Erase the existing configuration:

   write erase

   ```
   (cs2)# write erase

   Warning: This command will erase the startup-configuration.
   Do you wish to proceed anyway? (y/n) [n] y
   ```

2. Reload the switch software:

   reload

   ```
   (cs2)# reload

   This command will reboot the system. (y/n)? [n] y
   ```

   The system reboots and enters the configuration wizard. During the boot, if you receive the prompt "Abort Auto Provisioning and continue with normal setup? (yes/no)[n]", you should respond **yes** to proceed.

Replace a Cisco Nexus 9364D-GX2A switch

Follow these steps to replace a defective Nexus 9364D-GX2A switch in a cluster network. This is a nondisruptive procedure (NDU).

Review requirements

Before performing the switch replacement, make sure that:

- You have verified the switch serial number to ensure that the correct switch is replaced.
- On the existing cluster and network infrastructure:
  - The existing cluster is verified as completely functional, with at least one fully connected cluster switch.
  - All cluster ports are up.
  - All cluster logical interfaces (LIFs) are up and on their home ports.

- The ONTAP `cluster ping-cluster -node <node-name>` command must indicate that basic connectivity and larger than PMTU communication are successful on all paths.

- On the Nexus 9364D-GX2A replacement switch:

  - Management network connectivity on the replacement switch is functional.

  - Console access to the replacement switch is in place.

  - The node connections are ports 1/1 through 1/62.

  - All Inter-Switch Link (ISL) ports is disabled on ports 1/63 and 1/64.

  - The desired reference configuration file (RCF) and NX-OS operating system image switch is loaded onto the switch.

  - Initial customization of the switch is complete, as detailed in Configure the 9364D-GX2A cluster switch.

    Any previous site customizations, such as STP, SNMP, and SSH, are copied to the new switch.

- You have executed the command for migrating a cluster LIF from the node where the cluster LIF is hosted.

Enable console logging

NetApp strongly recommends that you enable console logging on the devices that you are using and take the following actions when replacing your switch:

- Leave AutoSupport enabled during maintenance.

- Trigger a maintenance AutoSupport before and after maintenance to disable case creation for the duration of the maintenance. See this Knowledge Base article SU92: How to suppress automatic case creation during scheduled maintenance windows for further details.

- Enable session logging for any CLI sessions. For instructions on how to enable session logging, review the "Logging Session Output" section in this Knowledge Base article How to configure PuTTY for optimal connectivity to ONTAP systems.

Replace the switch

About the examples
The examples in this procedure use the following switch and node nomenclature:

- The names of the existing Nexus 9364D-GX2A switches are cs1 and cs2.

- The name of the new Nexus 9364D-GX2A switch is newcs2.

- The node names are node1-01, node1-02, node1-03, and node1-04.

- The cluster LIF names are node1-01_clus1 and node1-01_clus2 for node1-01, node1-02_clus1 and node1-02_clus2 for node1-02, node1-03_clus1 and node1-03_clus2 for node1-03, and node1-04_clus1 and node1-04_clus2 for node1-04.

- The prompt for changes to all cluster nodes is cluster1::*>

About this task
The following procedure is based on the following cluster network topology:

Show example

```
cluster1::*> network port show -ipspace Cluster

Node: node1-01

Ignore
                                                  Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- ----------- --------
------
e7a       Cluster      Cluster          up   9000 auto/10000  healthy
false
e7b       Cluster      Cluster          up   9000 auto/10000  healthy
false

Node: node1-02

Ignore
                                                  Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- ----------- --------
------
e7a       Cluster      Cluster          up   9000 auto/10000  healthy
false
e7b       Cluster      Cluster          up   9000 auto/10000  healthy
false

Node: node1-03

Ignore
                                                  Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- ----------- --------
------
e7a       Cluster      Cluster          up   9000 auto/10000  healthy
false
e7b       Cluster      Cluster          up   9000 auto/10000  healthy
false
```

```
Node: node1-04

Ignore
                                               Speed(Mbps) Health
Health
Port      IPspace        Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ --------------- ---- ---- ---------- --------
------
e7a       Cluster        Cluster          up   9000  auto/10000 healthy
false
e7b       Cluster        Cluster          up   9000  auto/10000 healthy
false


cluster1::*> network interface show -vserver Cluster
           Logical           Status      Network              Current
Current Is
Vserver     Interface       Admin/Oper  Address/Mask         Node
Port    Home
----------- -------------- ---------- ---------------- -------------
------- ----
Cluster
           node1-01_clus1  up/up       169.254.209.69/16  node1-01
e7a     true
           node1-01_clus2  up/up       169.254.49.125/16  node1-01
e7b     true
           node1-02_clus1  up/up       169.254.47.194/16  node1-02
e7a     true
           node1-02_clus2  up/up       169.254.19.183/16  node1-02
e7b     true
.
.
.

cluster1::*> network device-discovery show -protocol cdp
Node/        Local  Discovered
Protocol     Port   Device (LLDP: ChassisID)  Interface        Platform
----------- ------ ------------------------ ----------------
----------------
node1-01/cdp
           e10a   cs1(FLMXXXXXXXX)          Ethernet1/16/3    N9K-
C9364D-GX2A
           e10b   cs2(FDOXXXXXXXX)          Ethernet1/16/3    N9K-
C9364D-GX2A
           e11a   cs1(FLMXXXXXXXX)          Ethernet1/16/4    N9K-
```

```
C9364D-GX2A
              e11b    cs2(FDOXXXXXXXX)            Ethernet1/16/4      N9K-
C9364D-GX2A
              e1a     cs1(FLMXXXXXXXX)            Ethernet1/16/1      N9K-
C9364D-GX2A
              e1b     cs2(FDOXXXXXXXX)            Ethernet1/16/1      N9K-
C9364D-GX2A
                      .
                      .
                      .
              e7a     cs1(FLMXXXXXXXX)            Ethernet1/16/2      N9K-
C9364D-GX2A
              e7b     cs2(FDOXXXXXXXX)            Ethernet1/16/2      N9K-
C9364D-GX2A
.
.
.


cs1# show cdp neighbors

Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute

Device-ID          Local Intrfce Hldtme Capability  Platform      Port
ID
Device-ID           Local Intrfce  Hldtme Capability  Platform
Port ID
newcs2(FDOXXXXXXXX)  Eth1/63       179    R S I s     N9K-C9332D-GX2B
Eth1/31
newcs2(FDOXXXXXXXX)  Eth1/64       179    R S I s     N9K-C9332D-GX2B
Eth1/32
node1-01             Eth1/4/1      123    H           AFX-1K
e1a
node1-01             Eth1/4/2      123    H           AFX-1K
e7a
node1-01             Eth1/4/3      123    H           AFX-1K
e10a
node1-01             Eth1/4/4      123    H           AFX-1K
e11a
node1-02             Eth1/9/1      138    H           AFX-1K
e1a
node1-02             Eth1/9/2      138    H           AFX-1K
e7a
node1-02             Eth1/9/3      138    H           AFX-1K
```

```
  e10a
  node1-02                Eth1/9/4        138    H            AFX-1K
  e11a
  node1-03                Eth1/15/1       138    H            AFX-1K
  e1a
  node1-03                Eth1/15/2       138    H            AFX-1K
  e7a
  node1-03                Eth1/15/3       138    H            AFX-1K
  e10a
  node1-03                Eth1/15/4       138    H            AFX-1K
  e11a
  node1-04                Eth1/16/1       173    H            AFX-1K
  e1a
  node1-04                Eth1/16/2       173    H            AFX-1K
  e7a
  node1-04                Eth1/16/3       173    H            AFX-1K
  e10a
  node1-04                Eth1/16/4       173    H            AFX-1K
  e11a


  Total entries displayed: 18



  newcs2# show cdp neighbors

  Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                    S - Switch, H - Host, I - IGMP, r - Repeater,
                    V - VoIP-Phone, D - Remotely-Managed-Device,
                    s - Supports-STP-Dispute

  Device-ID          Local Intrfce  Hldtme Capability  Platform
  Port ID
  cs1(FDOXXXXXXXX)   Eth1/63        179    R S I s     N9K-C9332D-GX2B
  Eth1/31
  cs1(FDOXXXXXXXX)   Eth1/64        179    R S I s     N9K-C9332D-GX2B
  Eth1/32
  node1-01           Eth1/4/1       123    H           AFX-1K
  e1a
  node1-01           Eth1/4/2       123    H           AFX-1K
  e7a
  node1-01           Eth1/4/3       123    H           AFX-1K
  e10a
  node1-01           Eth1/4/4       123    H           AFX-1K
  e11a
  node1-02           Eth1/9/1       138    H           AFX-1K
  e1a
```

```
node1-02              Eth1/9/2       138   H          AFX-1K
e7a
node1-02              Eth1/9/3       138   H          AFX-1K
e10a
node1-02              Eth1/9/4       138   H          AFX-1K
e11a
node1-03              Eth1/15/1      138   H          AFX-1K
e1a
node1-03              Eth1/15/2      138   H          AFX-1K
e7a
node1-03              Eth1/15/3      138   H          AFX-1K
e10a
node1-03              Eth1/15/4      138   H          AFX-1K
e11a
node1-04              Eth1/16/1      173   H          AFX-1K
e1a
node1-04              Eth1/16/2      173   H          AFX-1K
e7a
node1-04              Eth1/16/3      173   H          AFX-1K
e10a
node1-04              Eth1/16/4      173   H          AFX-1K
e11a

Total entries displayed: 18
```

Step 1: Prepare for replacement

1. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message:

   ```
   system node autosupport invoke -node * -type all -message MAINT=xh
   ```

   where x is the duration of the maintenance window in hours.

   > ⓘ The AutoSupport message notifies technical support of this maintenance task so that automatic case creation is suppressed during the maintenance window.

2. Install the appropriate RCF and image on the switch, newcs2, and make any necessary site preparations.

   If necessary, verify, download, and install the appropriate versions of the RCF and NX-OS software for the new switch. If you have verified that the new switch is correctly set up and does not need updates to the RCF and NX-OS software, continue to step 2.

   a. Go to the *NetApp Cluster and Management Network Switches Reference Configuration File Description Page* on the NetApp Support Site.

   b. Click the link for the *Cluster Network and Management Network Compatibility Matrix*, and then note the required switch software version.

c. Click your browser's back arrow to return to the Description page, click **CONTINUE**, accept the license agreement, and then go to the Download page.

d. Follow the steps on the Download page to download the correct RCF and NX-OS files for the version of ONTAP software you are installing.

3. On the new switch, log in as admin and shut down all of the ports that will be connected to the node cluster interfaces (ports 1/1 to 1/64).

   If the switch that you are replacing is not functional and is powered down, go to Step 4. The LIFs on the cluster nodes should have already failed over to the other cluster port for each node.

   Show example

   ```
   newcs2# config
   newcs2(config)# interface e1/1/1-4,e1/2/1-4,e1/3/1-4,e1/4/1-
   4,e1/5/1-4,e1/6/1-4,e1/7/1-4,e1/8/1-4
   newcs2(config-if-range)# shutdown
   newcs2(config)# interface e1/9/1-4,e1/10/1-4,e1/11/1-4,e1/12/1-
   4,e1/13/1-4,e1/14/1-4,e1/15/1-4,e1/16/1-4
   newcs2(config-if-range)# shutdown
   newcs2(config)# interface e1/17/1-4,e1/18/1-4,e1/19/1-4,e1/20/1-
   4,e1/21/1-4,e1/22/1-4,e1/23/1-4,e1/24/1-4
   csnewcs21(config-if-range)# shutdown
   newcs2(config)# interface e1/25/1-4,e1/26/1-4,e1/27/1-4,e1/28/1-
   4,e1/29/1-4,e1/30/1-4,e1/31/1-4,e1/32/1-4
   newcs2(config-if-range)# shutdown
   newcs2(config)# interface e1/33/1-4,e1/34/1-4,e1/35/1-4,e1/36/1-
   4,e1/37/1-4,e1/38/1-4,e1/39/1-4,e1/40/1-4
   newcs2(config-if-range)# shutdown
   newcs2(config)# interface e1/41/1-4,e1/42/1-4,e1/43/1-4,e1/44/1-
   4,e1/35/1-4,e1/46/1-4,e1/47/1-4,e1/48/1-4
   newcs2(config-if-range)# shutdown
   newcs2(config)# interface e1/49/1-4,e1/50/1-4,e1/51/1-4,e1/52/1-
   4,e1/53/1-4,e1/54/1-4,e1/55/1-4,e1/56/1-4
   newcs2(config-if-range)# shutdown\
   newcs2(config)# interface e1/57/1-4,e1/58/1-4,e1/59/1-4,e1/60/1-
   4,e1/61/1-4,e1/62/1-4
   newcs2(config-if-range)# shutdown
   newcs2(config-if-range)# exit
   newcs2(config)# exit
   ```

4. Verify that all cluster LIFs have auto-revert enabled:

   ```
   network interface show -vserver Cluster -fields auto-revert
   ```

Show example

```
cluster1::> network interface show -vserver Cluster -fields auto-
revert

            Logical
Vserver     Interface       Auto-revert
----------- --------------- -------------
Cluster     node1-01_clus1   true
Cluster     node1-01_clus2   true
Cluster     node1-02_clus1   true
Cluster     node1-02_clus2   true
Cluster     node1-03_clus1   true
Cluster     node1-03_clus2   true
Cluster     node1-04_clus1   true
Cluster     node1-04_clus2   true

8 entries were displayed.
```

5. Verify the connectivity of the remote cluster interfaces:

   a. You can use the `network interface check cluster-connectivity show` command to display the details of an accessibility check for cluster connectivity:

   ```
   network interface check cluster-connectivity show
   ```

Show example

```
cluster1::*> network interface check cluster-connectivity show
                                         Source          Destination
Packet
Node      Date                           LIF             LIF
Loss
--------- -------------------------- ---------------
--------------- -----------
node1-01
          6/4/2025 03:13:33 -04:00   node1-01_clus2  node1-
02_clus1  none
          6/4/2025 03:13:34 -04:00   node1-01_clus2  node1-
02_clus2  none
node1-02
          6/4/2025 03:13:33 -04:00   node1-02_clus2  node1-
01_clus1  none
          6/4/2025 03:13:34 -04:00   node1-02_clus2  node1-
01_clus2  none
  .
  .
  .
```

b. Alternatively, you can also use the `cluster ping-cluster -node <node-name>` command to check the connectivity:

```
cluster ping-cluster -node <node-name>
```

Show example

```
cluster1::*> cluster ping-cluster -node local
Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1 e0a
Cluster node1_clus2 169.254.49.125 node1 e0b
Cluster node2_clus1 169.254.47.194 node2 e0a
Cluster node2_clus2 169.254.19.183 node2 e0b
Local = 169.254.47.194 169.254.19.183
Remote = 169.254.209.69 169.254.49.125
Cluster Vserver Id = 4294967293
Ping status:
....
Basic connectivity succeeds on 4 path(s)
Basic connectivity fails on 0 path(s)
................
Detected 9000 byte MTU on 4 path(s):
Local 169.254.47.194 to Remote 169.254.209.69
Local 169.254.47.194 to Remote 169.254.49.125
Local 169.254.19.183 to Remote 169.254.209.69
Local 169.254.19.183 to Remote 169.254.49.125
Larger than PMTU communication succeeds on 4 path(s)
RPC status:
2 paths up, 0 paths down (tcp check)
2 paths up, 0 paths down (udp check)
```

Step 2: Configure cables and ports

1. Shut down the ISL ports 1/63 and 1/64 on the Nexus 9364D-GX2A switch cs1.

```
cs1# config
Enter configuration commands, one per line. End with CNTL/Z.
cs1(config)# interface e1/63-64
cs1(config-if-range)# shutdown
cs1(config-if-range)# exit
cs1(config)# exit
```

2. Remove all of the cables from the Nexus 9364D-GX2B cs2 switch, and then connect them to the same ports on the Nexus 9364D-GX2A newcs2 switch.

3. Bring up the ISLs ports 1/63 and 1/64 between the cs1 and newcs2 switches, and then verify the port channel operation status.

   Port-Channel should indicate Po1(SU) and Member Ports should indicate Eth1/63(P) and Eth1/64(P).

Show example

This example enables ISL ports 1/63 and 1/64 and displays the port channel summary on switch cs1:

```
cs1# config
Enter configuration commands, one per line. End with CNTL/Z.
cs1(config)# interface e1/63-64
cs1(config-if-range)# no shutdown
cs1(config-if-range)# exit
cs1(config)# exit
cs1#
cs1(config-if-range)# show port-channel summary
Flags:  D - Down         P - Up in port-channel (members)
        I - Individual  H - Hot-standby (LACP only)
        s - Suspended   r - Module-removed
        b - BFD Session Wait
        S - Switched    R - Routed
        U - Up (port-channel)
        p - Up in delay-lacp mode (member)
        M - Not in use. Min-links not met
--------------------------------------------------------------------------
------------
Group Port-         Type     Protocol  Member Ports
      Channel
--------------------------------------------------------------------------
------------
11     Po1(SU)     Eth      LACP      Eth1/63(P)   Eth1/64(P)
999    Po999(SD)   Eth      NONE      --
```

4. Verify that port e7b is up on all nodes:

```
network port show ipspace Cluster
```

Show example

The output should be similar to the following:

```
cluster1::*> network port show -ipspace Cluster

Node: node1-01

Ignore
                                                      Speed(Mbps) Health
Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster           up   9000  auto/100000
healthy false
e7b       Cluster       Cluster           up   9000  auto/100000
healthy false


Node: node1-02

Ignore
                                                      Speed(Mbps) Health
Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster           up   9000  auto/100000
healthy false
e7b       Cluster       Cluster           up   9000  auto/100000
healthy false


Node: node1-03

Ignore
                                                      Speed(Mbps) Health
Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster       Cluster           up   9000  auto/100000
```

```
healthy false
e7b      Cluster      Cluster          up    9000  auto/100000
healthy false


Node: node1-04

Ignore
                                          Speed(Mbps) Health
Health
Port     IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a      Cluster      Cluster          up    9000  auto/100000
healthy false
e7b      Cluster      Cluster          up    9000  auto/100000
healthy false

8 entries were displayed.
```

5. On the same node you used in the previous step, revert the cluster LIF associated with the port in the previous step by using the network interface revert command.

Show example

In this example, LIF node1-01_clus2 on node1-01 is successfully reverted if the Home value is true and the port is e7b.

The following commands return LIF `node1-01_clus2` on `node1-01` to home port `e7a` and displays information about the LIFs on both nodes. Bringing up the first node is successful if the Is Home column is true for both cluster interfaces and they show the correct port assignments, in this example `e7a` and `e7b` on node1-01.

```
cluster1::*> network interface show -vserver Cluster

          Logical          Status     Network            Current
Current Is
Vserver     Interface      Admin/Oper Address/Mask       Node
Port    Home
----------- --------------- ---------- ------------------ ----------
------- -----
Cluster
          node1-01_clus1  up/up      169.254.209.69/16  node1-01
e7a     true
          node1-01_clus2  up/up      169.254.49.125/16  node1-01
e7b     true
          node1-02_clus1  up/up      169.254.47.194/16  node1-02
e7b     true
          node1-02_clus2  up/up      169.254.19.183/16  node1-02
e7a     false
             .
             .
             .
```

6. Display information about the nodes in a cluster:

```
cluster show
```

Show example

This example shows that the node health for node1 and node2 in this cluster is true:

```
cluster1::*> cluster show

Node            Health  Eligibility
-------------   -------  ------------
node1-01         false   true
node1-02         true    true
node1-03         true    true
node1-04         true    true
```

7. Verify that all physical cluster ports are up:

```
network port show ipspace Cluster
```

Show example

```
cluster1::*> network port show -ipspace Cluster

Node: node1-01

Ignore
                                              Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ --------------- ---- ---- -----------
-------- ------
e7a       Cluster      Cluster          up   9000  auto/100000
healthy false
e7b       Cluster      Cluster          up   9000  auto/100000
healthy false


Node: node1-02

Ignore
                                              Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
--------- ------------ ---------------- ---- ---- -----------
-------- ------
e7a       Cluster      Cluster          up   9000  auto/100000
healthy false
e7b       Cluster      Cluster          up   9000  auto/100000
healthy false
.
.
.
```

8. Verify the connectivity of the remote cluster interfaces:

   a. You can use the `network interface check cluster-connectivity show` command to
      display the details of an accessibility check for cluster connectivity:

      ```
      network interface check cluster-connectivity show
      ```

Show example

```
cluster1::*> network interface check cluster-connectivity show
                                       Source          Destination
Packet
Node      Date                         LIF             LIF
Loss
--------- -------------------------- --------------- ----------------
-----------
node1-01
          6/4/2025 03:13:33 -04:00   node1-01_clus2  node1-02_clus1
none
          6/4/2025 03:13:34 -04:00   node1-01_clus2  node1-02_clus2
none
node1-02
          6/4/2025 03:13:33 -04:00   node1-02_clus2  node1-01_clus1
none
          6/4/2025 03:13:34 -04:00   node1-02_clus2  node1-01_clus2
none
          .
          .
          .
```

a. Alternatively, you can also use the `cluster ping-cluster -node <node-name>` command to check the connectivity:

`cluster ping-cluster -node <node-name>`

Show example

```
cluster1::*> cluster ping-cluster -node local
Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1 e0a
Cluster node1_clus2 169.254.49.125 node1 e0b
Cluster node2_clus1 169.254.47.194 node2 e0a
Cluster node2_clus2 169.254.19.183 node2 e0b
Local = 169.254.47.194 169.254.19.183
Remote = 169.254.209.69 169.254.49.125
Cluster Vserver Id = 4294967293
Ping status:
....
Basic connectivity succeeds on 4 path(s)
Basic connectivity fails on 0 path(s)
................
Detected 9000 byte MTU on 4 path(s):
Local 169.254.47.194 to Remote 169.254.209.69
Local 169.254.47.194 to Remote 169.254.49.125
Local 169.254.19.183 to Remote 169.254.209.69
Local 169.254.19.183 to Remote 169.254.49.125
Larger than PMTU communication succeeds on 4 path(s)
RPC status:
2 paths up, 0 paths down (tcp check)
2 paths up, 0 paths down (udp check)
```

Step 3: Verify the configuration

1. Verify the health of all the ports on the cluster.

   a. **Cluster ports**

      i. Verify that cluster ports are up and healthy across all nodes in the cluster:

```
network port show ipspace Cluster
```

```
network interface show -vserver cluster
```

```
network device-discovery show -protocol cdp
```

```
show cdp neighbors
```

Show example

```
cluster1::*> network port show -ipspace Cluster
Node: node1-01

Ignore
                                                           Speed(Mbps)
Health   Health
Port     IPspace     Broadcast Domain Link MTU  Admin/Oper
Status   Status
-------- ----------- ---------------- ---- ---- -----------
-------- ------
e7a      Cluster     Cluster          up   9000 auto/100000
healthy false
e7b      Cluster     Cluster          up   9000 auto/100000
healthy false


Node: node1-02

Ignore
                                                           Speed(Mbps)
Health   Health
Port     IPspace     Broadcast Domain Link MTU  Admin/Oper
Status   Status
-------- ----------- ---------------- ---- ---- -----------
-------- ------
e7a      Cluster     Cluster          up   9000 auto/100000
healthy false
e7b      Cluster     Cluster          up   9000 auto/100000
healthy false


Node: node1-03

Ignore
                                                           Speed(Mbps)
Health   Health
Port     IPspace     Broadcast Domain Link MTU  Admin/Oper
Status   Status
-------- ----------- ---------------- ---- ---- -----------
-------- ------
e7a      Cluster     Cluster          up   9000 auto/100000
healthy false
e7b      Cluster     Cluster          up   9000 auto/100000
healthy false
```

```
Node: node1-04

Ignore
                                                   Speed(Mbps)
Health   Health
Port      IPspace       Broadcast Domain Link MTU  Admin/Oper
Status   Status
--------- ------------ --------------- ---- ---- -----------
-------- ------
e7a       Cluster      Cluster            up  9000  auto/100000
healthy false
e7b       Cluster      Cluster            up  9000  auto/100000
healthy false


cluster1::*> network interface show -vserver cluster

          Logical          Status      Network
Current        Current Is
Vserver   Interface       Admin/Oper Address/Mask        Node
Port    Home
--------- --------------- ---------- ------------------
------------- ------- ----
Cluster
          node1-01_clus1  up/up       169.254.209.69/16  node1-
01      e7a      true
          node1-01_clus2  up/up       169.254.49.125/16  node1-
01      e7b      true
          node1-02_clus1  up/up       169.254.47.194/16  node1-
02      e7b      true
          node1-02_clus2  up/up       169.254.19.183/16  node1-
02      e7a      false
           .
           .
           .

cluster1::> network device-discovery show -protocol cdp

Node/      Local  Discovered
Protocol   Port   Device (LLDP: ChassisID)  Interface
Platform
----------- ------ ------------------------- ----------------
----------------
node1-01/cdp
```

```
                e10a    cs1(FLMXXXXXXXX)         Ethernet1/16/3
N9K-C9364D-GX2A
                e10b    cs2(FDOXXXXXXXX)         Ethernet1/16/3
N9K-C9364D-GX2A
                e11a    cs1(FLMXXXXXXXX)         Ethernet1/16/4
N9K-C9364D-GX2A
                e11b    cs2(FDOXXXXXXXX)         Ethernet1/16/4
N9K-C9364D-GX2A
                e1a     cs1(FLMXXXXXXXX)         Ethernet1/16/1
N9K-C9364D-GX2A
                e1b     cs2(FDOXXXXXXXX)         Ethernet1/16/1
N9K-C9364D-GX2A
                 .
                 .
                 .
                e7a     cs1(FLMXXXXXXXX)         Ethernet1/16/2
N9K-C9364D-GX2A
                e7b     cs2(FDOXXXXXXXX)         Ethernet1/16/2
N9K-C9364D-GX2A
 .
 .
 .

cs1# show cdp neighbors

Capability Codes: R - Router, T - Trans-Bridge, B - Source-
Route-Bridge
                  S - Switch, H - Host, I - IGMP, r -
Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute

Device-ID          Local Intrfce  Hldtme Capability
Platform       Port ID
newcs2(FDOXXXXXXXX)  Eth1/63       179    R S I s     N9K-
C9332D-GX2B    Eth1/31
newcs2(FDOXXXXXXXX)  Eth1/64       179    R S I s     N9K-
C9332D-GX2B    Eth1/32
node1-01             Eth1/4/1      123    H           AFX-1K
e1a
node1-01             Eth1/4/2      123    H           AFX-1K
e7a
node1-01             Eth1/4/3      123    H           AFX-1K
e10a
node1-01             Eth1/4/4      123    H           AFX-1K
e11a
```

```
node1-02                  Eth1/9/1       138    H          AFX-1K
e1a
node1-02                  Eth1/9/2       138    H          AFX-1K
e7a
node1-02                  Eth1/9/3       138    H          AFX-1K
e10a
node1-02                  Eth1/9/4       138    H          AFX-1K
e11a
node1-03                  Eth1/15/1      138    H          AFX-1K
e1a
node1-03                  Eth1/15/2      138    H          AFX-1K
e7a
node1-03                  Eth1/15/3      138    H          AFX-1K
e10a
node1-03                  Eth1/15/4      138    H          AFX-1K
e11a
node1-04                  Eth1/16/1      173    H          AFX-1K
e1a
node1-04                  Eth1/16/2      173    H          AFX-1K
e7a
node1-04                  Eth1/16/3      173    H          AFX-1K
e10a
node1-04                  Eth1/16/4      173    H          AFX-1K
e11a


Total entries displayed: 18


newcs2# show cdp neighbors

Capability Codes: R - Router, T - Trans-Bridge, B - Source-
Route-Bridge
                  S - Switch, H - Host, I - IGMP, r -
Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute

Device-ID          Local Intrfce  Hldtme Capability  Platform
Port ID
cs1(FDOXXXXXXXX)   Eth1/63        179    R S I s     N9K-
C9332D-GX2B   Eth1/31
cs1(FDOXXXXXXXX)   Eth1/64        179    R S I s     N9K-
C9332D-GX2B   Eth1/32
node1-01           Eth1/4/1       123    H           AFX-1K
e1a
node1-01           Eth1/4/2       123    H           AFX-1K
```

```
e7a
node1-01              Eth1/4/3        123    H              AFX-1K
e10a
node1-01              Eth1/4/4        123    H              AFX-1K
e11a
node1-02              Eth1/9/1        138    H              AFX-1K
e1a
node1-02              Eth1/9/2        138    H              AFX-1K
e7a
node1-02              Eth1/9/3        138    H              AFX-1K
e10a
node1-02              Eth1/9/4        138    H              AFX-1K
e11a
node1-03              Eth1/15/1       138    H              AFX-1K
e1a
node1-03              Eth1/15/2       138    H              AFX-1K
e7a
node1-03              Eth1/15/3       138    H              AFX-1K
e10a
node1-03              Eth1/15/4       138    H              AFX-1K
e11a
node1-04              Eth1/16/1       173    H              AFX-1K
e1a
node1-04              Eth1/16/2       173    H              AFX-1K
e7a
node1-04              Eth1/16/3       173    H              AFX-1K
e10a
node1-04              Eth1/16/4       173    H              AFX-1K
e11a

Total entries displayed: 18
```

b. **HA ports**

   i. Verify that all the HA ports are up with a healthy status:

   ```
   ha interconnect status show -node <node-name>
   ```

Show example

```
cluster1::*> ha interconnect status show -node node1-01
  (system ha interconnect status show)

                      Node: node1-01
             Link 0 Status: up
             Link 1 Status: up
          Is Link 0 Active: true
          Is Link 1 Active: true
        IC RDMA Connection: up
                      Slot: 0
            Debug Firmware: no



Interconnect Port 0 :
                 Port Name: e1a-17
                       MTU: 4096
          Link Information: ACTIVE



Interconnect Port 1 :
                 Port Name: e1b-18
                       MTU: 4096
          Link Information: ACTIVE

cluster1::*> ha interconnect status show -node node1-02
  (system ha interconnect status show)

                      Node: node1-02
             Link 0 Status: up
             Link 1 Status: up
          Is Link 0 Active: true
          Is Link 1 Active: true
        IC RDMA Connection: up
                      Slot: 0
            Debug Firmware: no



Interconnect Port 0 :
                 Port Name: e1a-17
                       MTU: 4096
          Link Information: ACTIVE



Interconnect Port 1 :
```

```
                    Port Name: e1b-18
                          MTU: 4096
              Link Information: ACTIVE
.
.
.
```

c. **Storage ports**

   i. Verify that all the storage ports are up with a healthy status:

```
storage port show -port-type ENET
```

Show example

```
cluster1::*> storage port show -port-type ENET


                                        Speed
Node                Port Type  Mode    (Gb/s) State     Status
------------------  ---- ----- ------- ------ --------
-----------
node1-01
                    e10a ENET  -          100 enabled   online
                    e10b ENET  -          100 enabled   online
                    e11a ENET  -          100 enabled   online
                    e11b ENET  -          100 enabled   online
node1-02
                    e10a ENET  -          100 enabled   online
                    e10b ENET  -          100 enabled   online
                    e11a ENET  -          100 enabled   online
                    e11b ENET  -          100 enabled   online
node1-03
                    e10a ENET  -          100 enabled   online
                    e10b ENET  -          100 enabled   online
                    e11a ENET  -          100 enabled   online
node1-04
                    e10a ENET  -          100 enabled   online
                    e10b ENET  -          100 enabled   online
                    e11a ENET  -          100 enabled   online
                    e11b ENET  -          100 enabled   online
16 entries were displayed.
```

d. **Storage shelf ports**

   i. Verify that all the storage shelf ports are up with a healthy status:

```
storage shelf port show
```

Show example

```
cluster1::*> storage shelf port show

Shelf ID Module State        Internal?
----- -- ------ ------------ ---------
1.1
       0 A      connected    false
       1 A      connected    false
       2 A      connected    false
       3 A      connected    false
       4 A      connected    false
       5 A      connected    false
       6 A      connected    false
       7 A      connected    false
       8 B      connected    false
       9 B      connected    false
      10 B      connected    false
      11 B      connected    false
      12 B      connected    false
      13 B      connected    false
      14 B      connected    false
      15 B      connected    false

16 entries were displayed.
```

   ii. Verify the connection status of all the storage shelf ports:

```
storage shelf port show -fields remote-device,remote-
port,connector-state
```

Show example

```
cluster1::*> storage shelf port show -fields remote-
device,remote-port,connector-state

shelf id connector-state remote-port     remote-device
----- -- --------------- -------------- -----------------
1.1   0  connected       Ethernet1/17/1 CX9332D-cs1
1.1   1  connected       Ethernet1/15/1 CX9364D-cs1
1.1   2  connected       Ethernet1/17/2 CX9332D-cs1
1.1   3  connected       Ethernet1/15/2 CX9364D-cs1
1.1   4  connected       Ethernet1/17/3 CX9332D-cs1
1.1   5  connected       Ethernet1/15/3 CX9364D-cs1
1.1   6  connected       Ethernet1/17/4 CX9332D-cs1
1.1   7  connected       Ethernet1/15/4 CX9364D-cs1
1.1   8  connected       Ethernet1/19/1 CX9332D-cs1
1.1   9  connected       Ethernet1/17/1 CX9364D-cs1
1.1   10 connected       Ethernet1/19/2 CX9332D-cs1
1.1   11 connected       Ethernet1/17/2 CX9364D-cs1
1.1   12 connected       Ethernet1/19/3 CX9332D-cs1
1.1   13 connected       Ethernet1/17/3 CX9364D-cs1
1.1   14 connected       Ethernet1/19/4 CX9332D-cs1
1.1   15 connected       Ethernet1/17/4 CX9364D-cs1

16 entries were displayed.
```

2. If you suppressed automatic case creation, re-enable it by invoking an AutoSupport message:

```
system node autosupport invoke -node * -type all -message MAINT=END
```

What's next?

After you've replaced your switches, you configure switch health monitoring.