



Replace CN1610 cluster switches with Cisco Nexus 3132Q-V cluster switches

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Table of Contents

- Replace CN1610 cluster switches with Cisco Nexus 3132Q-V cluster switches 1
 - How to replace CN1610 cluster switches with Cisco Nexus 3132Q-V cluster switches 2

Replace CN1610 cluster switches with Cisco Nexus 3132Q-V cluster switches

You must be aware of certain configuration information, port connections, and cabling requirements when you replace CN1610 cluster switches with Cisco Nexus 3132Q-V cluster switches.

- The following cluster switches are supported:
 - NetApp CN1610
 - Cisco Nexus 3132Q-V
- The cluster switches support the following node connections:
 - NetApp CN1610: ports 0/1 through 0/12 (10 GbE)
 - Cisco Nexus 3132Q-V: ports e1/1-30 (40/100 GbE)
- The cluster switches use the following inter-switch link (ISL) ports:
 - NetApp CN1610: ports 0/13 through 0/16 (10 GbE)
 - Cisco Nexus 3132Q-V: ports e1/31-32 (40/100 GbE)
- The [Hardware Universe](#) contains information about supported cabling to Nexus 3132Q-V switches:
 - Nodes with 10 GbE cluster connections require QSFP to SFP+ optical fiber breakout cables or QSFP to SFP+ copper breakout cables
 - Nodes with 40/100 GbE cluster connections require supported QSFP/QSFP28 optical modules with optical fiber cables or QSFP/QSFP28 copper direct-attach cables
- The appropriate ISL cabling is as follows:
 - Beginning: For CN1610 to CN1610 (SFP+ to SFP+), four SFP+ optical fiber or copper direct-attach cables
 - Interim: For CN1610 to Nexus 3132Q-V (QSFP to four SFP+ breakout), one QSFP to SFP+ optical fiber or copper breakout cable
 - Final: For Nexus 3132Q-V to Nexus 3132Q-V (QSFP28 to QSFP28), two QSFP28 optical fiber or copper direct-attach cables
- NetApp twinax cables are not compatible with Cisco Nexus 3132Q-V switches.

If your current CN1610 configuration uses NetApp twinax cables for cluster-node-to-switch connections or ISL connections and you want to continue using twinax in your environment, you need to procure Cisco twinax cables. Alternatively, you can use optical fiber cables for both the ISL connections and the cluster-node-to-switch connections.

- On Nexus 3132Q-V switches, you can operate QSFP/QSFP28 ports as either 40/100 Gb Ethernet or 4x 10 Gb Ethernet modes.

By default, there are 32 ports in the 40/100 Gb Ethernet mode. These 40 Gb Ethernet ports are numbered in a 2-tuple naming convention. For example, the second 40 Gb Ethernet port is numbered as 1/2. The process of changing the configuration from 40 Gb Ethernet to 10 Gb Ethernet is called *breakout* and the process of changing the configuration from 10 Gb Ethernet to 40 Gb Ethernet is called *breakin*. When you break out a 40/100 Gb Ethernet port into 10 Gb Ethernet ports, the resulting ports are numbered using a 3-tuple naming convention. For example, the breakout ports of the second 40 Gb Ethernet port are numbered as 1/2/1, 1/2/2, 1/2/3, and 1/2/4.

- On the left side of Nexus 3132Q-V switches is a set of four SFP+ ports multiplexed to the first QSFP port.

By default, the reference configuration file (RCF) is structured to use the first QSFP port.

You can make four SFP+ ports active instead of a QSFP port for Nexus 3132Q-V switches by using the `hardware profile front portmode sfp-plus` command. Similarly, you can reset Nexus 3132Q-V switches to use a QSFP port instead of four SFP+ ports by using the `hardware profile front portmode qsfp` command.



When you use the first four SFP+ ports, it will disable the first 40GbE QSFP port.

- You must have configured some of the ports on Nexus 3132Q-V switches to run at 10 GbE or 40/100 GbE.

You can break out the first six ports into 4x 10 GbE mode by using the `interface breakout module 1 port 1-6 map 10g-4x` command. Similarly, you can regroup the first six QSFP+ ports from *breakout* configuration by using the `no interface breakout module 1 port 1-6 map 10g-4x` command.

- You must have done the planning, migration, and read the required documentation on 10 GbE and 40/100 GbE connectivity from nodes to Nexus 3132Q-V cluster switches.
- The ONTAP and NX-OS versions that are supported in this procedure are listed on the [Cisco Ethernet Switches](#) page.
- The ONTAP and FASTPATH versions that are supported in this procedure are listed on the [NetApp CN1601 and CN1610 Switches](#) page.

How to replace CN1610 cluster switches with Cisco Nexus 3132Q-V cluster switches

To replace the existing CN1610 cluster switches in a cluster with Cisco Nexus 3132Q-V cluster switches, you must perform a specific sequence of tasks.

About this task

The examples in this procedure use four nodes: Two nodes use four 10 GbE cluster interconnect ports: e0a, e0b, e0c, and e0d. The other two nodes use two 40/100 GbE cluster interconnect fiber cables: e4a and e4e. The [Hardware Universe](#) has information about the cluster fiber cables on your platforms.

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

- The command outputs might vary depending on different releases of ONTAP software.
- The CN1610 switches to be replaced are CL1 and CL2.
- The Nexus 3132Q-V switches to replace the CN1610 switches are C1 and C2.
- n1_clus1 is the first cluster logical interface (LIF) that is connected to cluster switch 1 (CL1 or C1) for node n1.
- n1_clus2 is the first cluster LIF that is connected to cluster switch 2 (CL2 or C2) for node n1.
- n1_clus3 is the second LIF that is connected to cluster switch 2 (CL2 or C2) for node n1.
- n1_clus4 is the second LIF that is connected to cluster switch 1 (CL1 or C1) for node n1. The nodes are n1, n2, n3, and n4.
- The number of 10 GbE and 40/100 GbE ports are defined in the reference configuration files (RCFs) available on the [Cisco® Cluster Network Switch Reference Configuration File Download](#) page.

This procedure covers the following scenario:

- The cluster starts with two nodes connected to two CN1610 cluster switches.
- Cluster switch CL2 to be replaced by C2 ([Steps 2 - 22](#))
 - Traffic on all cluster ports and LIFs on all nodes connected to CL2 are migrated onto the first cluster ports and LIFs connected to CL1.
 - Disconnect cabling from all cluster ports on all nodes connected to CL2, and then use supported breakout cabling to reconnect the ports to new cluster switch C2.
 - Disconnect cabling between ISL ports CL1 and CL2, and then use supported breakout cabling to reconnect the ports from CL1 to C2.
 - Traffic on all cluster ports and LIFs connected to C2 on all nodes is reverted.
- Cluster switch CL1 to be replaced by C1 ([Steps 23 - 43](#))
 - Traffic on all cluster ports and LIFs on all nodes connected to CL1 are migrated onto the second cluster ports and LIFs connected to C2.
 - Disconnect cabling from all cluster ports on all nodes connected to CL1, and then use supported breakout cabling to reconnect the ports to new cluster switch C1.
 - Disconnect cabling between ISL ports CL1 and C2, and then use supported breakout cabling to reconnect the ports from C1 to C2.
 - Traffic on all migrated cluster ports and LIFs connected to C1 on all nodes is reverted.



The procedure requires the use of both ONTAP commands and Cisco Nexus 3000 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=xh
```

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. Display information about the devices in your configuration: `network device-discovery show`

The following example displays how many cluster interconnect interfaces have been configured in each node for each cluster interconnect switch:

```
cluster::> network device-discovery show
```

| Node | Local Port | Discovered Device | Interface | Platform |
|------|------------|-------------------|-----------|----------|
| n1 | /cdp | | | |
| | e0a | CL1 | 0/1 | CN1610 |
| | e0b | CL2 | 0/1 | CN1610 |
| | e0c | CL2 | 0/2 | CN1610 |
| | e0d | CL1 | 0/2 | CN1610 |
| n2 | /cdp | | | |
| | e0a | CL1 | 0/3 | CN1610 |
| | e0b | CL2 | 0/3 | CN1610 |
| | e0c | CL2 | 0/4 | CN1610 |
| | e0d | CL1 | 0/4 | CN1610 |

8 entries were displayed.

3. Determine the administrative or operational status for each cluster interface.

a. Display the cluster network port attributes: `network port show`

The following example displays the network port attributes on a system:

```
cluster::*> network port show -role cluster
(network port show)
```

Node: n1

| Port | IPspace | Broadcast Domain | Link | MTU | Speed (Mbps) Admin/Open | Health Status | Ignore Health |
|------|---------|------------------|------|------|----------------------------|---------------|---------------|
| e0a | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0b | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0c | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0d | cluster | cluster | up | 9000 | auto/10000 | - | - |

Node: n2

| Port | IPspace | Broadcast Domain | Link | MTU | Speed (Mbps) Admin/Open | Health Status | Ignore Health |
|------|---------|------------------|------|------|----------------------------|---------------|---------------|
| e0a | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0b | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0c | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0d | cluster | cluster | up | 9000 | auto/10000 | - | - |

8 entries were displayed.

b. Display information about the logical interfaces: `network interface show`

The following example displays the general information about all of the LIFs on your system:

```
cluster::*> network interface show -role cluster
(network interface show)
```

| Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home |
|---------|-------------------|-------------------|----------------------|--------------|--------------|---------|
| Cluster | | | | | | |
| | n1_clus1 | up/up | 10.10.0.1/24 | n1 | e0a | true |
| | n1_clus2 | up/up | 10.10.0.2/24 | n1 | e0b | true |
| | n1_clus3 | up/up | 10.10.0.3/24 | n1 | e0c | true |
| | n1_clus4 | up/up | 10.10.0.4/24 | n1 | e0d | true |
| | n2_clus1 | up/up | 10.10.0.5/24 | n2 | e0a | true |
| | n2_clus2 | up/up | 10.10.0.6/24 | n2 | e0b | true |
| | n2_clus3 | up/up | 10.10.0.7/24 | n2 | e0c | true |
| | n2_clus4 | up/up | 10.10.0.8/24 | n2 | e0d | true |

8 entries were displayed.

c. Display information about the discovered cluster switches: `system cluster-switch show`

The following example displays the cluster switches that are known to the cluster, along with their management IP addresses:

```
cluster::*> system cluster-switch show
```

| Switch | Type | Address | Model |
|---------------------------|-----------------|-------------|--------|
| CL1 | cluster-network | 10.10.1.101 | CN1610 |
| Serial Number: 01234567 | | | |
| Is Monitored: true | | | |
| Reason: | | | |
| Software Version: 1.2.0.7 | | | |
| Version Source: ISDP | | | |
| CL2 | cluster-network | 10.10.1.102 | CN1610 |
| Serial Number: 01234568 | | | |
| Is Monitored: true | | | |
| Reason: | | | |
| Software Version: 1.2.0.7 | | | |
| Version Source: ISDP | | | |

2 entries were displayed.

4. Set the `-auto-revert` parameter to false on cluster LIFs `clus1` and `clus4` on both nodes: `network interface modify`

```
cluster::*> network interface modify -vserver node1 -lif clus1 -auto
-revert false
cluster::*> network interface modify -vserver node1 -lif clus4 -auto
-revert false
cluster::*> network interface modify -vserver node2 -lif clus1 -auto
-revert false
cluster::*> network interface modify -vserver node2 -lif clus4 -auto
-revert false
```

5. Verify that the appropriate RCF and image are installed on the new 3132Q-V switches as necessary for your requirements, and make any essential site customizations, such as users and passwords, network addresses, and so on.

You must prepare both switches at this time. If you need to upgrade the RCF and image, follow these steps:

- See the [Cisco Ethernet Switches](#) page on NetApp Support Site.
- Note your switch and the required software versions in the table on that page.
- Download the appropriate version of the RCF.
- Click **CONTINUE** on the **Description** page, accept the license agreement, and then follow the instructions on the **Download** page to download the RCF.
- Download the appropriate version of the image software.

[Cisco® Cluster and Management Network Switch Reference Configuration File Download](#)

6. Migrate the LIFs associated with the second CN1610 switch to be replaced: `network interface migrate`



You must migrate the cluster LIFs from a connection to the node, either through the service processor or node management interface, which owns the cluster LIF being migrated.

The following example shows `n1` and `n2`, but LIF migration must be done on all the nodes:

```
cluster::*> network interface migrate -vserver Cluster -lif n1_clus2
-destination-node n1 -destination-port e0a
cluster::*> network interface migrate -vserver Cluster -lif n1_clus3
-destination-node n1 -destination-port e0d
cluster::*> network interface migrate -vserver Cluster -lif n2_clus2
-destination-node n2 -destination-port e0a
cluster::*> network interface migrate -vserver Cluster -lif n2_clus3
-destination-node n2 -destination-port e0d
```

7. Verify the cluster's health: `network interface show`

The following example shows the result of the previous `network interface migrate` command:

```
cluster::*> network interface show -role cluster
(network interface show)
```

| Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home |
|---------|-------------------|-------------------|----------------------|--------------|--------------|---------|
| Cluster | n1_clus1 | up/up | 10.10.0.1/24 | n1 | e0a | true |
| | n1_clus2 | up/up | 10.10.0.2/24 | n1 | e0a | false |
| | n1_clus3 | up/up | 10.10.0.3/24 | n1 | e0d | false |
| | n1_clus4 | up/up | 10.10.0.4/24 | n1 | e0d | true |
| | n2_clus1 | up/up | 10.10.0.5/24 | n2 | e0a | true |
| | n2_clus2 | up/up | 10.10.0.6/24 | n2 | e0a | false |
| | n2_clus3 | up/up | 10.10.0.7/24 | n2 | e0d | false |
| | n2_clus4 | up/up | 10.10.0.8/24 | n2 | e0d | true |

8 entries were displayed.

8. Shut down the cluster interconnect ports that are physically connected to switch CL2: `network port modify`

The following commands shut down the specified ports on n1 and n2, but the ports must be shut down on all nodes:

```
cluster::*> network port modify -node n1 -port e0b -up-admin false
cluster::*> network port modify -node n1 -port e0c -up-admin false
cluster::*> network port modify -node n2 -port e0b -up-admin false
cluster::*> network port modify -node n2 -port e0c -up-admin false
```

9. Ping the remote cluster interfaces, and then perform a remote procedure call server check: `cluster ping-cluster`

The following example shows how to ping the remote cluster interfaces:

```

cluster::*> cluster ping-cluster -node n1
Host is n1
Getting addresses from network interface table...
Cluster n1_clus1 n1      e0a    10.10.0.1
Cluster n1_clus2 n1      e0b    10.10.0.2
Cluster n1_clus3 n1      e0c    10.10.0.3
Cluster n1_clus4 n1      e0d    10.10.0.4
Cluster n2_clus1 n2      e0a    10.10.0.5
Cluster n2_clus2 n2      e0b    10.10.0.6
Cluster n2_clus3 n2      e0c    10.10.0.7
Cluster n2_clus4 n2      e0d    10.10.0.8

Local = 10.10.0.1 10.10.0.2 10.10.0.3 10.10.0.4
Remote = 10.10.0.5 10.10.0.6 10.10.0.7 10.10.0.8
Cluster Vserver Id = 4294967293
Ping status:
....
Basic connectivity succeeds on 16 path(s)
Basic connectivity fails on 0 path(s)
.....
Detected 1500 byte MTU on 16 path(s):
  Local 10.10.0.1 to Remote 10.10.0.5
  Local 10.10.0.1 to Remote 10.10.0.6
  Local 10.10.0.1 to Remote 10.10.0.7
  Local 10.10.0.1 to Remote 10.10.0.8
  Local 10.10.0.2 to Remote 10.10.0.5
  Local 10.10.0.2 to Remote 10.10.0.6
  Local 10.10.0.2 to Remote 10.10.0.7
  Local 10.10.0.2 to Remote 10.10.0.8
  Local 10.10.0.3 to Remote 10.10.0.5
  Local 10.10.0.3 to Remote 10.10.0.6
  Local 10.10.0.3 to Remote 10.10.0.7
  Local 10.10.0.3 to Remote 10.10.0.8
  Local 10.10.0.4 to Remote 10.10.0.5
  Local 10.10.0.4 to Remote 10.10.0.6
  Local 10.10.0.4 to Remote 10.10.0.7
  Local 10.10.0.4 to Remote 10.10.0.8

Larger than PMTU communication succeeds on 16 path(s)
RPC status:
4 paths up, 0 paths down (tcp check)
4 paths up, 0 paths down (udp check)

```

10. Shut down the ISL ports 13 through 16 on the active CN1610 switch CL1: shutdown

The following example shows how to shut down ISL ports 13 through 16 on the CN1610 switch CL1:

```
(CL1)# configure
(CL1)(Config)# interface 0/13-0/16
(CL1)(Interface 0/13-0/16)# shutdown
(CL1)(Interface 0/13-0/16)# exit
(CL1)(Config)# exit
(CL1)#
```

11. Build a temporary ISL between CL1 and C2:

The following example builds a temporary ISL between CL1 (ports 13-16) and C2 (ports e1/24/1-4):

```
C2# configure
C2(config)# interface port-channel 2
C2(config-if)# switchport mode trunk
C2(config-if)# spanning-tree port type network
C2(config-if)# mtu 9216
C2(config-if)# interface breakout module 1 port 24 map 10g-4x
C2(config)# interface e1/24/1-4
C2(config-if-range)# switchport mode trunk
C2(config-if-range)# mtu 9216
C2(config-if-range)# channel-group 2 mode active
C2(config-if-range)# exit
C2(config-if)# exit
```

12. On all nodes, remove the cables that are attached to the CN1610 switch CL2.

With supported cabling, you must reconnect the disconnected ports on all of the nodes to the Nexus 3132Q-V switch C2.

13. Remove four ISL cables from ports 13 to 16 on the CN1610 switch CL1.

You must attach appropriate Cisco QSFP to SFP+ breakout cables connecting port 1/24 on the new Cisco 3132Q-V switch C2, to ports 13 to 16 on existing CN1610 switch CL1.



When reconnecting any cables to the new Cisco 3132Q-V switch, you must use either optical fiber or Cisco twinax cables.

14. To make the ISL dynamic, configure the ISL interface 3/1 on the active CN1610 switch to disable the static mode: `no port-channel static`

This configuration matches with the ISL configuration on the 3132Q-V switch C2 when the ISLs are brought up on both switches in step 11

The following example shows the configuration of the ISL interface 3/1 using the `no port-channel static` command to make the ISL dynamic:

```

(CL1)# configure
(CL1) (Config)# interface 3/1
(CL1) (Interface 3/1)# no port-channel static
(CL1) (Interface 3/1)# exit
(CL1) (Config)# exit
(CL1)#

```

15. Bring up ISLs 13 through 16 on the active CN1610 switch CL1.

The following example illustrates the process of bringing up ISL ports 13 through 16 on the port-channel interface 3/1:

```

(CL1)# configure
(CL1) (Config)# interface 0/13-0/16,3/1
(CL1) (Interface 0/13-0/16,3/1)# no shutdown
(CL1) (Interface 0/13-0/16,3/1)# exit
(CL1) (Config)# exit
(CL1)#

```

16. Verify that the ISLs are up on the CN1610 switch CL1: show port-channel

The "Link State" should be Up, "Type" should be Dynamic, and the "Port Active" column should be True for ports 0/13 to 0/16:

```

(CL1)# show port-channel 3/1
Local Interface..... 3/1
Channel Name..... ISL-LAG
Link State..... Up
Admin Mode..... Enabled
Type..... Dynamic
Load Balance Option..... 7
(Enhanced hashing mode)

```

| Mbr Ports | Device/Timeout | Port Speed | Port Active |
|-----------|----------------|------------|-------------|
| 0/13 | actor/long | 10 Gb Full | True |
| | partner/long | | |
| 0/14 | actor/long | 10 Gb Full | True |
| | partner/long | | |
| 0/15 | actor/long | 10 Gb Full | True |
| | partner/long | | |
| 0/16 | actor/long | 10 Gb Full | True |
| | partner/long | | |

17. Verify that the ISLs are up on the 3132Q-V switch C2: `show port-channel summary`

Ports Eth1/24/1 through Eth1/24/4 should indicate (P), meaning that all four ISL ports are up in the port-channel. Eth1/31 and Eth1/32 should indicate (D) as they are not connected:

```
C2# 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
        S - Switched      R - Routed
        U - Up (port-channel)
        M - Not in use. Min-links not met
```

```
-----
-----
Group Port-          Type      Protocol  Member Ports
      Channel
-----
-----
1      Po1(SU)        Eth      LACP      Eth1/31(D)  Eth1/32(D)
2      Po2(SU)        Eth      LACP      Eth1/24/1(P) Eth1/24/2(P)
Eth1/24/3(P)
                                   Eth1/24/4(P)
```

18. Bring up all of the cluster interconnect ports that are connected to the 3132Q-V switch C2 on all of the nodes: `network port modify`

The following example shows how to bring up the cluster interconnect ports connected to the 3132Q-V switch C2:

```
cluster::*> network port modify -node n1 -port e0b -up-admin true
cluster::*> network port modify -node n1 -port e0c -up-admin true
cluster::*> network port modify -node n2 -port e0b -up-admin true
cluster::*> network port modify -node n2 -port e0c -up-admin true
```

19. Revert all of the migrated cluster interconnect LIFs that are connected to C2 on all of the nodes: `network interface revert`

```
cluster::*> network interface revert -vserver cluster -lif n1_clus2
cluster::*> network interface revert -vserver cluster -lif n1_clus3
cluster::*> network interface revert -vserver cluster -lif n2_clus2
cluster::*> network interface revert -vserver cluster -lif n2_clus3
```

20. Verify that all of the cluster interconnect ports are reverted to their home ports: `network interface`

show

The following example shows that the LIFs on clus2 are reverted to their home ports, and shows that the LIFs are successfully reverted if the ports in the "Current Port" column have a status of `true` in the "Is Home" column. If the Is Home value is `false`, then the LIF is not reverted.

```
cluster::*> network interface show -role cluster
(network interface show)
```

| Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home |
|---------|-------------------|-------------------|----------------------|--------------|--------------|---------|
| Cluster | | | | | | |
| | n1_clus1 | up/up | 10.10.0.1/24 | n1 | e0a | true |
| | n1_clus2 | up/up | 10.10.0.2/24 | n1 | e0b | true |
| | n1_clus3 | up/up | 10.10.0.3/24 | n1 | e0c | true |
| | n1_clus4 | up/up | 10.10.0.4/24 | n1 | e0d | true |
| | n2_clus1 | up/up | 10.10.0.5/24 | n2 | e0a | true |
| | n2_clus2 | up/up | 10.10.0.6/24 | n2 | e0b | true |
| | n2_clus3 | up/up | 10.10.0.7/24 | n2 | e0c | true |
| | n2_clus4 | up/up | 10.10.0.8/24 | n2 | e0d | true |

8 entries were displayed.

21. Verify that all of the cluster ports are connected: `network port show`

The following example shows the result of the previous `network port modify` command, verifying that all of the cluster interconnects are `up`:

```
cluster::*> network port show -role cluster
(network port show)
```

```
Node: n1
```

| Port | IPspace | Broadcast Domain | Link | MTU | Speed (Mbps) Admin/Open | Health Status | Ignore Health |
|------|---------|------------------|------|------|----------------------------|------------------|------------------|
| e0a | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0b | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0c | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0d | cluster | cluster | up | 9000 | auto/10000 | - | - |

```
Node: n2
```

| Port | IPspace | Broadcast Domain | Link | MTU | Speed (Mbps) Admin/Open | Health Status | Ignore Health |
|------|---------|------------------|------|------|----------------------------|------------------|------------------|
| e0a | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0b | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0c | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0d | cluster | cluster | up | 9000 | auto/10000 | - | - |

```
8 entries were displayed.
```

22. Ping the remote cluster interfaces and then perform a remote procedure call server check: `cluster ping-cluster`

The following example shows how to ping the remote cluster interfaces:


```

cluster::*> cluster ping-cluster -node n1
Host is n1
Getting addresses from network interface table...
Cluster n1_clus1 n1      e0a    10.10.0.1
Cluster n1_clus2 n1      e0b    10.10.0.2
Cluster n1_clus3 n1      e0c    10.10.0.3
Cluster n1_clus4 n1      e0d    10.10.0.4
Cluster n2_clus1 n2      e0a    10.10.0.5
Cluster n2_clus2 n2      e0b    10.10.0.6
Cluster n2_clus3 n2      e0c    10.10.0.7
Cluster n2_clus4 n2      e0d    10.10.0.8

Local = 10.10.0.1 10.10.0.2 10.10.0.3 10.10.0.4
Remote = 10.10.0.5 10.10.0.6 10.10.0.7 10.10.0.8
Cluster Vserver Id = 4294967293
Ping status:
....
Basic connectivity succeeds on 16 path(s)
Basic connectivity fails on 0 path(s)
.....
Detected 1500 byte MTU on 16 path(s):
  Local 10.10.0.1 to Remote 10.10.0.5
  Local 10.10.0.1 to Remote 10.10.0.6
  Local 10.10.0.1 to Remote 10.10.0.7
  Local 10.10.0.1 to Remote 10.10.0.8
  Local 10.10.0.2 to Remote 10.10.0.5
  Local 10.10.0.2 to Remote 10.10.0.6
  Local 10.10.0.2 to Remote 10.10.0.7
  Local 10.10.0.2 to Remote 10.10.0.8
  Local 10.10.0.3 to Remote 10.10.0.5
  Local 10.10.0.3 to Remote 10.10.0.6
  Local 10.10.0.3 to Remote 10.10.0.7
  Local 10.10.0.3 to Remote 10.10.0.8
  Local 10.10.0.4 to Remote 10.10.0.5
  Local 10.10.0.4 to Remote 10.10.0.6
  Local 10.10.0.4 to Remote 10.10.0.7
  Local 10.10.0.4 to Remote 10.10.0.8

Larger than PMTU communication succeeds on 16 path(s)
RPC status:
4 paths up, 0 paths down (tcp check)
4 paths up, 0 paths down (udp check)

```

23. On each node in the cluster, migrate the interfaces that are associated with the first CN1610 switch CL1, to be replaced: network interface migrate

The following example shows the ports or LIFs being migrated on nodes n1 and n2:

```
cluster::*> network interface migrate -vserver cluster -lif n1_clus1
-source-node n1
-destination-node n1 -destination-port e0b
cluster::*> network interface migrate -vserver cluster -lif n1_clus4
-source-node n1
-destination-node n1 -destination-port e0c
cluster::*> network interface migrate -vserver cluster -lif n2_clus1
-source-node n2
-destination-node n2 -destination-port e0b
cluster::*> network interface migrate -vserver cluster -lif n2_clus4
-source-node n2
-destination-node n2 -destination-port e0c
```

24. Verify the cluster status: network interface show

The following example shows that the required cluster LIFs have been migrated to the appropriate cluster ports hosted on cluster switch C2:

```
cluster::*> network interface show -role cluster
(network interface show)
```

| Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home |
|---------|-------------------|-------------------|----------------------|--------------|--------------|---------|
| Cluster | n1_clus1 | up/up | 10.10.0.1/24 | n1 | e0b | false |
| | n1_clus2 | up/up | 10.10.0.2/24 | n1 | e0b | true |
| | n1_clus3 | up/up | 10.10.0.3/24 | n1 | e0c | true |
| | n1_clus4 | up/up | 10.10.0.4/24 | n1 | e0c | false |
| | n2_clus1 | up/up | 10.10.0.5/24 | n2 | e0b | false |
| | n2_clus2 | up/up | 10.10.0.6/24 | n2 | e0b | true |
| | n2_clus3 | up/up | 10.10.0.7/24 | n2 | e0c | true |
| | n2_clus4 | up/up | 10.10.0.8/24 | n2 | e0c | false |

8 entries were displayed.

25. Shut down the node ports that are connected to CL1 on all of the nodes: network port modify

The following example shows how to shut down the specified ports on nodes n1 and n2:

```
cluster::*> network port modify -node n1 -port e0a -up-admin false
cluster::*> network port modify -node n1 -port e0d -up-admin false
cluster::*> network port modify -node n2 -port e0a -up-admin false
cluster::*> network port modify -node n2 -port e0d -up-admin false
```

26. Shut down the ISL ports 24, 31, and 32 on the active 3132Q-V switch C2: shutdown

The following example shows how to shut down ISLs 24, 31, and 32 on the active 3132Q-V switch C2:

```
C2# configure
C2(config)# interface ethernet 1/24/1-4
C2(config-if-range)# shutdown
C2(config-if-range)# exit
C2(config)# interface ethernet 1/31-32
C2(config-if-range)# shutdown
C2(config-if-range)# exit
C2(config)# exit
C2#
```

27. Remove the cables that are attached to the CN1610 switch CL1 on all of the nodes.

With supported cabling, you must reconnect the disconnected ports on all of the nodes to the Nexus 3132Q-V switch C1.

28. Remove the QSFP cables from Nexus 3132Q-V C2 port e1/24.

You must connect ports e1/31 and e1/32 on C1 to ports e1/31 and e1/32 on C2 using supported Cisco QSFP optical fiber or direct-attach cables.

29. Restore the configuration on port 24 and remove the temporary port-channel 2 on C2:

The following example copies the `running-configuration` file to the `startup-configuration` file:

```

C2# configure
C2(config)# no interface breakout module 1 port 24 map 10g-4x
C2(config)# no interface port-channel 2
C2(config-if)# interface e1/24
C2(config-if)# description 40GbE Node Port
C2(config-if)# spanning-tree port type edge
C2(config-if)# spanning-tree bpduguard enable
C2(config-if)# mtu 9216
C2(config-if-range)# exit
C2(config)# exit
C2# copy running-config startup-config
[#####] 100%
Copy Complete.

```

30. Bring up ISL ports 31 and 32 on C2, the active 3132Q-V switch: no shutdown

The following example shows how to bring up ISLs 31 and 32 on the 3132Q-V switch C2:

```

C2# configure
C2(config)# interface ethernet 1/31-32
C2(config-if-range)# no shutdown
C2(config-if-range)# exit
C2(config)# exit
C2# copy running-config startup-config
[#####] 100%
Copy Complete.

```

31. Verify that the ISL connections are up on the 3132Q-V switch C2: show port-channel summary

Ports Eth1/31 and Eth1/32 should indicate (P), meaning that both the ISL ports are up in the port-channel.

```
C1# 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
        S - Switched      R - Routed
        U - Up (port-channel)
        M - Not in use. Min-links not met
```

```
-----
-----
Group Port-          Type      Protocol  Member Ports
      Channel
-----
-----
1      Po1 (SU)      Eth       LACP      Eth1/31 (P)  Eth1/32 (P)
```

32. Bring up all of the cluster interconnect ports connected to the new 3132Q-V switch C1 on all of the nodes:
network port modify

The following example shows how to bring up all of the cluster interconnect ports connected to the new 3132Q-V switch C1:

```
cluster::*> network port modify -node n1 -port e0a -up-admin true
cluster::*> network port modify -node n1 -port e0d -up-admin true
cluster::*> network port modify -node n2 -port e0a -up-admin true
cluster::*> network port modify -node n2 -port e0d -up-admin true
```

33. Verify the status of the cluster node port: network port show

The following example verifies that all of the cluster interconnect ports on n1 and n2 on the new 3132Q-V switch C1 are up:

```
cluster::*> network port show -role cluster
(network port show)

Node: n1
```

| Port | IPspace | Broadcast Domain | Link | MTU | Speed (Mbps) Admin/Open | Health Status | Ignore Health |
|------|---------|------------------|------|------|----------------------------|------------------|------------------|
| e0a | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0b | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0c | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0d | cluster | cluster | up | 9000 | auto/10000 | - | - |

```
Node: n2
```

| Port | IPspace | Broadcast Domain | Link | MTU | Speed (Mbps) Admin/Open | Health Status | Ignore Health |
|------|---------|------------------|------|------|----------------------------|------------------|------------------|
| e0a | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0b | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0c | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0d | cluster | cluster | up | 9000 | auto/10000 | - | - |

```
8 entries were displayed.
```

34. Revert all of the migrated cluster interconnect LIFs that were originally connected to C1 on all of the nodes:
network interface revert

The following example shows how to revert the migrated cluster LIFs to their home ports:

```
cluster::*> network interface revert -vserver cluster -lif n1_clus1
cluster::*> network interface revert -vserver cluster -lif n1_clus4
cluster::*> network interface revert -vserver cluster -lif n2_clus1
cluster::*> network interface revert -vserver cluster -lif n2_clus4
```

35. Verify that the interface is now home: network interface show

The following example shows the status of cluster interconnect interfaces is up and Is home for n1 and n2:

```
cluster::*> network interface show -role cluster
(network interface show)
```

| Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home |
|---------|-------------------|-------------------|----------------------|--------------|--------------|---------|
| Cluster | n1_clus1 | up/up | 10.10.0.1/24 | n1 | e0a | true |
| | n1_clus2 | up/up | 10.10.0.2/24 | n1 | e0b | true |
| | n1_clus3 | up/up | 10.10.0.3/24 | n1 | e0c | true |
| | n1_clus4 | up/up | 10.10.0.4/24 | n1 | e0d | true |
| | n2_clus1 | up/up | 10.10.0.5/24 | n2 | e0a | true |
| | n2_clus2 | up/up | 10.10.0.6/24 | n2 | e0b | true |
| | n2_clus3 | up/up | 10.10.0.7/24 | n2 | e0c | true |
| | n2_clus4 | up/up | 10.10.0.8/24 | n2 | e0d | true |

8 entries were displayed.

36. Ping the remote cluster interfaces and then perform a remote procedure call server check: `cluster ping-cluster`

The following example shows how to ping the remote cluster interfaces:

```

cluster::*> cluster ping-cluster -node n1
Host is n1
Getting addresses from network interface table...
Cluster n1_clus1 n1      e0a      10.10.0.1
Cluster n1_clus2 n1      e0b      10.10.0.2
Cluster n1_clus3 n1      e0c      10.10.0.3
Cluster n1_clus4 n1      e0d      10.10.0.4
Cluster n2_clus1 n2      e0a      10.10.0.5
Cluster n2_clus2 n2      e0b      10.10.0.6
Cluster n2_clus3 n2      e0c      10.10.0.7
Cluster n2_clus4 n2      e0d      10.10.0.8

Local = 10.10.0.1 10.10.0.2 10.10.0.3 10.10.0.4
Remote = 10.10.0.5 10.10.0.6 10.10.0.7 10.10.0.8
Cluster Vserver Id = 4294967293
Ping status:
....
Basic connectivity succeeds on 16 path(s)
Basic connectivity fails on 0 path(s)
.....
Detected 1500 byte MTU on 16 path(s):
  Local 10.10.0.1 to Remote 10.10.0.5
  Local 10.10.0.1 to Remote 10.10.0.6
  Local 10.10.0.1 to Remote 10.10.0.7
  Local 10.10.0.1 to Remote 10.10.0.8
  Local 10.10.0.2 to Remote 10.10.0.5
  Local 10.10.0.2 to Remote 10.10.0.6
  Local 10.10.0.2 to Remote 10.10.0.7
  Local 10.10.0.2 to Remote 10.10.0.8
  Local 10.10.0.3 to Remote 10.10.0.5
  Local 10.10.0.3 to Remote 10.10.0.6
  Local 10.10.0.3 to Remote 10.10.0.7
  Local 10.10.0.3 to Remote 10.10.0.8
  Local 10.10.0.4 to Remote 10.10.0.5
  Local 10.10.0.4 to Remote 10.10.0.6
  Local 10.10.0.4 to Remote 10.10.0.7
  Local 10.10.0.4 to Remote 10.10.0.8

Larger than PMTU communication succeeds on 16 path(s)
RPC status:
4 paths up, 0 paths down (tcp check)
4 paths up, 0 paths down (udp check)

```

37. Expand the cluster by adding nodes to the Nexus 3132Q-V cluster switches.
38. Display the information about the devices in your configuration:

- ° network device-discovery show
- ° network port show -role cluster
- ° network interface show -role cluster
- ° system cluster-switch show

The following examples show nodes n3 and n4 with 40 GbE cluster ports connected to ports e1/7 and e1/8, respectively on both the Nexus 3132Q-V cluster switches, and both nodes have joined the cluster. The 40 GbE cluster interconnect ports used are e4a and e4e.

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

| Node | Local Port | Discovered Device | Interface | Platform |
|------|------------|-------------------|---------------|--------------|
| n1 | /cdp | | | |
| | e0a | C1 | Ethernet1/1/1 | N3K-C3132Q-V |
| | e0b | C2 | Ethernet1/1/1 | N3K-C3132Q-V |
| | e0c | C2 | Ethernet1/1/2 | N3K-C3132Q-V |
| | e0d | C1 | Ethernet1/1/2 | N3K-C3132Q-V |
| n2 | /cdp | | | |
| | e0a | C1 | Ethernet1/1/3 | N3K-C3132Q-V |
| | e0b | C2 | Ethernet1/1/3 | N3K-C3132Q-V |
| | e0c | C2 | Ethernet1/1/4 | N3K-C3132Q-V |
| | e0d | C1 | Ethernet1/1/4 | N3K-C3132Q-V |
| n3 | /cdp | | | |
| | e4a | C1 | Ethernet1/7 | N3K-C3132Q-V |
| | e4e | C2 | Ethernet1/7 | N3K-C3132Q-V |
| n4 | /cdp | | | |
| | e4a | C1 | Ethernet1/8 | N3K-C3132Q-V |
| | e4e | C2 | Ethernet1/8 | N3K-C3132Q-V |

12 entries were displayed.

```
cluster::*> network port show -role cluster
(network port show)
```

Node: n1

| Port | IPspace | Broadcast Domain | Link | MTU | Speed (Mbps) Admin/Open | Health Status | Ignore Health |
|------|---------|------------------|------|------|----------------------------|------------------|------------------|
| e0a | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0b | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0c | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0d | cluster | cluster | up | 9000 | auto/10000 | - | - |

Node: n2

| Port | IPspace | Broadcast Domain | Link | MTU | Speed (Mbps) Admin/Open | Health Status | Ignore Health |
|------|---------|------------------|------|------|----------------------------|------------------|------------------|
| e0a | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0b | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0c | cluster | cluster | up | 9000 | auto/10000 | - | - |
| e0d | cluster | cluster | up | 9000 | auto/10000 | - | - |

Node: n3

| Port | IPspace | Broadcast Domain | Link | MTU | Speed (Mbps) Admin/Open | Health Status | Ignore Health |
|------|---------|------------------|------|------|----------------------------|------------------|------------------|
| e4a | cluster | cluster | up | 9000 | auto/40000 | - | - |
| e4e | cluster | cluster | up | 9000 | auto/40000 | - | - |

Node: n4

| Port | IPspace | Broadcast Domain | Link | MTU | Speed (Mbps) Admin/Open | Health Status | Ignore Health |
|------|---------|------------------|------|------|----------------------------|------------------|------------------|
| e4a | cluster | cluster | up | 9000 | auto/40000 | - | - |
| e4e | cluster | cluster | up | 9000 | auto/40000 | - | - |

12 entries were displayed.

```
cluster::*> network interface show -role cluster
(network interface show)
```

| Vserver | Logical Interface | Status Admin/Oper | Network Address/Mask | Current Node | Current Port | Is Home |
|---------|-------------------|-------------------|----------------------|--------------|--------------|---------|
| ----- | | | | | | |
| ----- | | | | | | |
| Cluster | | | | | | |
| | n1_clus1 | up/up | 10.10.0.1/24 | n1 | e0a | true |
| | n1_clus2 | up/up | 10.10.0.2/24 | n1 | e0b | true |
| | n1_clus3 | up/up | 10.10.0.3/24 | n1 | e0c | true |
| | n1_clus4 | up/up | 10.10.0.4/24 | n1 | e0d | true |
| | n2_clus1 | up/up | 10.10.0.5/24 | n2 | e0a | true |
| | n2_clus2 | up/up | 10.10.0.6/24 | n2 | e0b | true |
| | n2_clus3 | up/up | 10.10.0.7/24 | n2 | e0c | true |
| | n2_clus4 | up/up | 10.10.0.8/24 | n2 | e0d | true |
| | n3_clus1 | up/up | 10.10.0.9/24 | n3 | e4a | true |
| | n3_clus2 | up/up | 10.10.0.10/24 | n3 | e4e | true |
| | n4_clus1 | up/up | 10.10.0.11/24 | n4 | e4a | true |
| | n4_clus2 | up/up | 10.10.0.12/24 | n4 | e4e | true |

12 entries were displayed.

```
cluster::> system cluster-switch show
```

| Switch | Type | Address | Model |
|--|-----------------|-------------|---------|
| C1 | cluster-network | 10.10.1.103 | NX3132V |
| Serial Number: FOX000001 | | | |
| Is Monitored: true | | | |
| Reason: | | | |
| Software Version: Cisco Nexus Operating System (NX-OS) Software, | | | |
| Version | | | |
| 7.0(3)I4(1) | | | |
| Version Source: CDP | | | |
| C2 | cluster-network | 10.10.1.104 | NX3132V |
| Serial Number: FOX000002 | | | |
| Is Monitored: true | | | |
| Reason: | | | |
| Software Version: Cisco Nexus Operating System (NX-OS) Software, | | | |
| Version | | | |
| 7.0(3)I4(1) | | | |
| Version Source: CDP | | | |
| CL1 | cluster-network | 10.10.1.101 | CN1610 |
| Serial Number: 01234567 | | | |
| Is Monitored: true | | | |
| Reason: | | | |
| Software Version: 1.2.0.7 | | | |
| Version Source: ISDP | | | |
| CL2 | cluster-network | 10.10.1.102 | CN1610 |
| Serial Number: 01234568 | | | |
| Is Monitored: true | | | |
| Reason: | | | |
| Software Version: 1.2.0.7 | | | |
| Version Source: ISDP | | | |

4 entries were displayed.

39. Remove the replaced CN1610 switches if they are not automatically removed: `system cluster-switch delete`

The following example shows how to remove the CN1610 switches:

```
cluster::> system cluster-switch delete -device CL1
cluster::> system cluster-switch delete -device CL2
```

40. Configure clusters clus1 and clus4 to -auto-revert on each node and confirm:

```
cluster::*> network interface modify -vserver node1 -lif clus1 -auto
-revert true
cluster::*> network interface modify -vserver node1 -lif clus4 -auto
-revert true
cluster::*> network interface modify -vserver node2 -lif clus1 -auto
-revert true
cluster::*> network interface modify -vserver node2 -lif clus4 -auto
-revert true
```

41. Verify that the proper cluster switches are monitored: system cluster-switch show

```
cluster::> system cluster-switch show
```

| Switch | Type | Address | Model |
|--|-----------------|-------------|---------|
| C1 | cluster-network | 10.10.1.103 | NX3132V |
| Serial Number: FOX000001 | | | |
| Is Monitored: true | | | |
| Reason: | | | |
| Software Version: Cisco Nexus Operating System (NX-OS) Software, | | | |
| Version | | | |
| 7.0(3)I4(1) | | | |
| Version Source: CDP | | | |
| C2 | cluster-network | 10.10.1.104 | NX3132V |
| Serial Number: FOX000002 | | | |
| Is Monitored: true | | | |
| Reason: | | | |
| Software Version: Cisco Nexus Operating System (NX-OS) Software, | | | |
| Version | | | |
| 7.0(3)I4(1) | | | |
| Version Source: CDP | | | |

2 entries were displayed.

42. Enable the cluster switch health monitor log collection feature for collecting switch-related log files:

```
system cluster-switch log setup-password

system cluster-switch log enable-collection
```

```
cluster::*> system cluster-switch log setup-password
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
C1
C2

cluster::*> system cluster-switch log setup-password

Enter the switch name: C1
RSA key fingerprint is e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] y

Enter the password: <enter switch password>
Enter the password again: <enter switch password>

cluster::*> system cluster-switch log setup-password

Enter the switch name: C2
RSA key fingerprint is 57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] y

Enter the password: <enter switch password>
Enter the password again: <enter switch password>

cluster::*> system cluster-switch log enable-collection

Do you want to enable cluster log collection for all nodes in the
cluster?
{y|n}: [n] y

Enabling cluster switch log collection.

cluster::*>
```



If any of these commands return an error, contact NetApp support.

43. If you suppressed automatic case creation, reenable it by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=END`

Related information

[NetApp CN1601 and CN1610 description page](#)

[Cisco Ethernet Switch description page](#)

[Hardware Universe](#)

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