



# Migrating a CN1610 switch to a Cisco® Nexus 3232C cluster switch

You must be aware of certain configuration information, port connections, and cabling requirements when you replace CN1610 cluster switches with Cisco Nexus 3232C cluster switches.

The cluster switches support the following node connections:

- NetApp CN1610: ports 0/1 through 0/12 (10 GbE)
- Cisco Nexus 3232C: ports e1/1-30 (100 or 40 or 4x10GbE)

The cluster switches use the following inter-switch link (ISL) ports.

- NetApp CN1610: ports 0/13 through 0/16 (10 GbE)
- Cisco Nexus 3232C: ports 1/31-32 (100GbE)

**Note:** You must use 4x10G breakout cables on the Cisco Nexus 3232C cluster switch.

The following table shows the cabling connections that are required at each stage as you make the transition from NetApp CN1610 switches to Cisco Nexus 3232C cluster switches:

Stage	Description	Required cables
Initial	CN1610 to CN1610 (SFP+ to SFP+)	4 SFP+ optical fiber or copper direct-attach cables
Transition	CN1610 to 3232C (QSFP to SFP+)	1 QSFP and 4 SFP+ optical fiber or copper breakout cables
Final	3232C to 3232C (QSFP to QSFP)	2 QSFP optical fiber or copper direct-attach cables

You must have the following reference configuration files (RCFs):

- X3232\_RCF\_v1.0\_72p10g\_14p100g.txt  
100G/40G ports 1/1 -1/6 are configured as 4x10G ports 1/1-6/1-4.
- NX3232\_RCF\_v1.0\_24p10g\_26p100g.txt  
100G/40G ports 1/1 -1/18 are configured as 4x10G ports 1/1-18/1-4.

The ONTAP and NX-OS versions that are supported in this procedure are listed on the [Cisco Ethernet Switches](#) page.

[Cisco Ethernet Switches](#)

The ONTAP and FASTPATH versions that are supported in this procedure are listed on the [NetApp CN1601 and CN1610 Switches](#) page.

[NetApp CN1601 and CN1610 Switches](#)

# How to migrate a CN1610 cluster switch to a Cisco Nexus 3232C cluster switch

To replace the existing CN1610 cluster switches in a cluster with Cisco Nexus 3232C cluster switches, you must perform a specific sequence of tasks.

## About this task

The cluster switches support the following node connections:

- NetApp CN1610: ports 0/1 through 0/12 (10 GbE)
- Cisco Nexus 3232C: ports e1/1-30 (100 or 40 or 4x10GbE)

The cluster switches use the following inter-switch link (ISL) ports.

- NetApp CN1610: ports 0/13 through 0/16 (10 GbE)
- Cisco Nexus 3232C: ports 1/31-32 (100GbE)

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

- The nodes are n1, n2, n3, and n4.
- The command outputs might vary depending on different releases of ONTAP software.
- The CN1610 switches to be replaced are CL1 and CL2.
- The Nexus 3232C 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 number of 10GbE and 40/100GbE ports are defined in the reference configuration files (RCF):

- NX3132\_RCF\_v1.1\_24p10g\_26p40g.txt  
The RCF has e1/1/1-4 to e1/6/1-4 24x10 GbE ports and e1/7 to 1/32 26x100/40GbE ports.
- NX3232\_RCF\_v1.0\_72p10g\_12p100g.txt  
The RCF has e1/1/1-4 to e1/18/1-4 72x10 GbE ports and e1/19 to 1/32 14x100/40GbE ports.

## Procedure summary

The following list describes the stages you must complete when changing the cluster switches:

- I. Replace cluster switch CL2 with C2 ([Steps 1-22](#) on page 3)
- II. Replace cluster switch CL1 with C1 ([Steps 23-40](#) on page 10)

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 GbE cluster interconnect fiber cables: e4a and e4e. The *Hardware Universe* has information about the cluster fiber cables on your platforms.

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

### Example

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.

2. Determine the administrative or operational status for each cluster interface.
  - a. Display the cluster network port attributes: **network port show -role cluster**

### Example

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

Node: n1		Broadcast Domain	Link	MTU	Speed (Mbps) Admin/Open	Health Status	Ignore Health Status
Port	IPspace						
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		Broadcast Domain	Link	MTU	Speed (Mbps) Admin/Open	Health Status	Ignore Health Status
Port	IPspace						
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 -role cluster**

### Example

```
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**

**Example**

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 displayed.

```

3. Verify that the appropriate RCF and image are installed on the new 3232C switches as necessary for your requirements, and make any essential site customizations.

You should prepare both switches at this time. If you need to upgrade the RCF and image, you must complete the following procedure:

a. See the *Cisco Ethernet Switch* page on the NetApp Support Site.

[Cisco Ethernet Switch](#)

b. Note your switch and the required software versions in the table on that page.

c. Download the appropriate version of the RCF.

d. Click **CONTINUE** on the **Description** page, accept the license agreement, and then follow the instructions on the **Download** page to download the RCF.

e. Download the appropriate version of the image software.

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

4. Migrate the LIFs associated with the second CN1610 switch that you plan to replace: **network interface migrate -vserver cluster -lif lif-name -source-node source-node-name destination-node destination-node-name -destination-port destination-port-name**

**Example**

You must migrate each LIF individually as shown in the following example:

```

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

```

```
cluster::*> network interface migrate -vserver cluster -lif n2_clus3 -source-node n2
-destination-node n2 -destination-port e0d
```

5. Verify the cluster's health: **network interface show -role cluster**

**Example**

```
cluster::*> network interface show -role cluster
(network interface show)
Vserver Logical Status Network Current Current Is
Interface Admin/Oper Address/Mask Node Port 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.
```

6. 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.

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

7. Shut down the cluster interconnect ports that are physically connected to switch CL2: **network port modify -node node-name -port port-name -up-admin false**

**Example**

The following example shows the four cluster interconnect ports being shut down for node n1 and node n2:

```
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
```

8. Ping the remote cluster interfaces, and then perform a remote procedure call server check: **cluster ping-cluster -node node-name**

**Example**

The following example shows node n1 being pinged and the RPC status indicated afterward:

```
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 9000 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)

```

9. Shut down the ISL ports 13 through 16 on the active CN1610 switch CL1 using the appropriate Cisco command.

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

#### Example

The following example shows ISL ports 13 through 16 being shut down 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)#

```

10. Build a temporary ISL between CL1 and C2:

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

#### Example

The following example shows a temporary ISL being built between CL1 (ports 13-16) and C2 (ports e1/24/1-4) using the Cisco switchport mode trunk command:

```

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
```

11. Remove the cables that are attached to the CN1610 switch CL2 on all the nodes.

Using supported cabling, you must reconnect the disconnected ports on all the nodes to the Nexus 3232C switch C2.

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

You must attach the appropriate Cisco QSFP28 to SFP+ breakout cables connecting port 1/24 on the new Cisco 3232C switch C2 to ports 13 to 16 on the existing CN1610 switch CL1.

**Note:** When reconnecting any cables to the new Cisco 3232C switch, the cables used must be either optical fiber or Cisco twinax cables.

13. Make the ISL dynamic by configuring the ISL interface 3/1 on the active CN1610 switch to disable the static mode.

This configuration matches with the ISL configuration on the 3232C switch C2 when the ISLs are brought up on both switches in [Step 10](#) on page 6.

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

### Example

The following example shows the ISL interface 3/1 being configured 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)#
```

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

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

### Example

The following example shows ISL ports 13 through 16 being brought up 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)#
```

15. Verify that the ISLs are **up** on the CN1610 switch CL1.

### Example

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.

The following example shows the ISLs being verified as **up** on the CN1610 switch CL1:

```
(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   Device/      Port      Port
Ports Timeout      Speed     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
```

16. Verify that the ISLs are **up** on the 3232C switch C2: **show port-channel summary**

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

### Example

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.

The following example shows the ISLs being verified as **up** on the 3232C switch C2:

```
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)
```

17. Bring up all of the cluster interconnect ports that are connected to the 3232C switch C2 on all of the nodes: **network port modify -node node-name -port port-name -up-admin true**

### Example

The following example shows how to bring up the cluster interconnect ports connected to the 3232C 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
```

18. Revert all of the migrated cluster interconnect LIFs that are connected to C2 on all of the nodes: **network interface revert -vserver cluster -lif lif-name**

### Example

```
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
```

19. Verify that all of the cluster interconnect ports are reverted to their home ports: **network interface show -role cluster**

**Example**

The following example shows that the LIFs on clus2 are reverted to their home ports; 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   Status   Network   Current   Current   Is
Interface Interface Admin/Oper Address/Mask Node      Port      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.
```

20. Verify that all of the cluster ports are connected: **network port show -role cluster**

**Example**

The following example shows the output verifying all of the cluster interconnects are **up**:

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

Node: n1
Port   IPspace   Broadcast   Link   MTU   Speed (Mbps)   Health   Ignore
      IPspace   Domain      Link   MTU   Admin/Open     Status   Health Status
-----
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   Link   MTU   Speed (Mbps)   Health   Ignore
      IPspace   Domain      Link   MTU   Admin/Open     Status   Health Status
-----
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.
```

21. Ping the remote cluster interfaces and then perform a remote procedure call server check: **cluster ping-cluster -node node-name**

## Example

The following example shows node n1 being pinged and the RPC status indicated afterward:

```
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)
```

22. Migrate the LIFs that are associated with the first CN1610 switch CL1: **network interface migrate -vserver cluster -lif lif-name -source-node node-name**

## Example

You must migrate each cluster LIF individually to the appropriate cluster ports hosted on cluster switch C2 as shown in the following example:

```
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
```

23. Verify the cluster's status: **network interface show -role cluster**

### Example

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 Status Network Current Current Is
Interface Admin/Oper Address/Mask Node Port 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.
```

24. Shut down the node ports that are connected to CL1 on all of the nodes: **network port modify -node node-name -port port-name -up-admin false**

### Example

The following example shows specific ports being shut down 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
```

25. Shut down the ISL ports 24, 31, and 32 on the active 3232C switch C2.

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

### Example

The following example shows ISLs 24, 31, and 32 being shut down on the active 3232C 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#
```

26. Remove the cables that are attached to the CN1610 switch CL1 on all of the nodes.  
Using the appropriate cabling, you must reconnect the disconnected ports on all the nodes to the Nexus 3232C switch C1.
27. Remove the QSFP28 cables from Nexus 3232C 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 QSFP28 optical fiber or direct-attach cables.
28. Restore the configuration on port 24 and remove the temporary port-channel 2 on C2:

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

### Example

The following example shows the running-configuration file being copied 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 10GbE/40GbE Node Port
C2(config-if)# spanning-tree port type edge
Edge port type (portfast) should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface when edge port type (portfast) is enabled, can cause temporary bridging loops.
Use with CAUTION

Edge Port Type (Portfast) has been configured on Ethernet 1/24 but will only
have effect when the interface is in a non-trunking mode.

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.
```

29. Bring up ISL ports 31 and 32 on C2, the active 3232C switch.

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

### Example

The following example shows ISLs 31 and 32 being brought upon the 3232C 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.
```

30. Verify that the ISL connections are **up** on the 3232C switch C2.

For more information on Cisco commands, see the guides listed in the [Cisco Nexus 3000 Series NX-OS Command References](#).

### Example

The following example shows the ISL connections being verified. Ports Eth1/31 and Eth1/32 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
-----
1      Pol(SU)    Eth       LACP      Eth1/31(P)  Eth1/32(P)

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
-----
1      Pol(SU)    Eth       LACP      Eth1/31(P)  Eth1/32(P)

```

31. Bring up all of the cluster interconnect ports connected to the new 3232C switch C1 on all of the nodes: **network port modify -node *node-name* -port *port-name* -up-admin true**

#### Example

The following example shows all of the cluster interconnect ports connected to the new 3232C switch C1 being brought up:

```

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

```

32. Verify the status of the cluster node port: **network port show -role cluster**

#### Example

The following example shows output that verifies that the cluster interconnect ports on nodes n1 and n2 on the new 3232C switch C1 are up:

```

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

Node: n1
-----
Port  IPspace  Broadcast  Link  MTU  Speed (Mbps)  Health  Ignore
-----
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  Link  MTU  Speed (Mbps)  Health  Ignore
-----
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.

```

33. Revert all of the migrated cluster interconnect LIFs that were originally connected to C1 on all of the nodes: **network interface revert -server cluster -lif *lif-name***

## Example

You must migrate each LIF individually as shown in the following example:

```
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
```

34. Verify that the interface is now home: **network interface show -role cluster**

## Example

The following example shows the status of cluster interconnect interfaces is **up** and “Is Home” for nodes n1 and n2:

```
cluster::*> network interface show -role cluster
(network interface show)
Vserver      Logical      Status      Network      Current      Current      Is
-----      -
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.
```

35. Ping the remote cluster interfaces and then perform a remote procedure call server check: **cluster ping-cluster -node host-name**

## Example

The following example shows node n1 being pinged and the RPC status indicated afterward:

```
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 9000 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)
3 paths up, 0 paths down (udp check)

```

36. Expand the cluster by adding nodes to the Nexus 3232C cluster switches.

37. 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 3232C cluster switches. Both nodes are joined to the cluster. The 40 GbE cluster interconnect ports used are e4a and e4e.

### Example

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

Node	Local Port	Discovered Device	Interface	Platform
n1	/cdp			
	e0a	C1	Ethernet1/1/1	N3K-C3232C
	e0b	C2	Ethernet1/1/1	N3K-C3232C
	e0c	C2	Ethernet1/1/2	N3K-C3232C
n2	e0d	C1	Ethernet1/1/2	N3K-C3232C
	/cdp			
	e0a	C1	Ethernet1/1/3	N3K-C3232C
	e0b	C2	Ethernet1/1/3	N3K-C3232C
n3	e0c	C2	Ethernet1/1/4	N3K-C3232C
	e0d	C1	Ethernet1/1/4	N3K-C3232C
	/cdp			
n3	e4a	C1	Ethernet1/7	N3K-C3232C
	e4e	C2	Ethernet1/7	N3K-C3232C
n4	/cdp			
	e4a	C1	Ethernet1/8	N3K-C3232C
	e4e	C2	Ethernet1/8	N3K-C3232C

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 Status
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 Status
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 Status
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 Status
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	NX3232C
Serial Number: FOX000001 Is Monitored: true Reason: Software Version: Cisco Nexus Operating System (NX-OS) Software, Version 7.0(3)I6(1) Version Source: CDP			
C2	cluster-network	10.10.1.104	NX3232C
Serial Number: FOX000002 Is Monitored: true Reason: Software Version: Cisco Nexus Operating System (NX-OS) Software, Version 7.0(3)I6(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.

```

38. Remove the replaced CN1610 switches if they are not automatically removed: **system cluster-switch delete -device switch-name**

#### Example

You must delete both devices individually as shown in the following example:

```

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

```

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

#### Example

The following example shows cluster switches C1 and C2 are being monitored:

```

cluster::> system cluster-switch show

Switch                Type                Address             Model
-----
C1                    cluster-network    10.10.1.103       NX3232C

  Serial Number: FOX000001
  Is Monitored: true
  Reason:
  Software Version: Cisco Nexus Operating System (NX-OS) Software, Version
                    7.0(3)I6(1)
  Version Source: CDP

C2                    cluster-network    10.10.1.104       NX3232C

  Serial Number: FOX000002
  Is Monitored: true
  Reason:
  Software Version: Cisco Nexus Operating System (NX-OS) Software, Version
                    7.0(3)I6(1)
  Version Source: CDP

2 entries were displayed.

```

40. 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](#)

# How to send comments about documentation and receive update notifications

You can help us to improve the quality of our documentation by sending us your feedback. You can receive automatic notification when production-level (GA/FCS) documentation is initially released or important changes are made to existing production-level documents.

If you have suggestions for improving this document, send us your comments by email.

[doccomments@netapp.com](mailto:doccomments@netapp.com)

To help us direct your comments to the correct division, include in the subject line the product name, version, and operating system.

If you want to be notified automatically when production-level documentation is released or important changes are made to existing production-level documents, follow Twitter account @NetAppDoc.

You can also contact us in the following ways:

- NetApp, Inc., 495 East Java Drive, Sunnyvale, CA 94089 U.S.
- Telephone: +1 (408) 822-6000
- Fax: +1 (408) 822-4501
- Support telephone: +1 (888) 463-8277

## Trademark information

NETAPP, the NETAPP logo, and the marks listed on the NetApp Trademarks page are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.

<http://www.netapp.com/us/legal/netapptmlist.aspx>