



Replace switches

Install and maintain

NetApp

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Replace switches

Replace a Cisco Nexus 3232C cluster switch

Follow these steps to replace a defective Cisco Nexus 3232C switch in a cluster. This is a non-disruptive procedure.

Review requirements

What you'll need

Make sure that the existing cluster and network configuration has the following characteristics:

- The Nexus 3232C cluster infrastructure are redundant and fully functional on both switches. The Cisco Ethernet Switches page has the latest RCF and NX-OS versions on your switches.
- All cluster ports must be in the **up** state.
- Management connectivity must exist on both switches.
- All cluster logical interfaces (LIFs) are in the **up** state and are not migrated.

The replacement Cisco Nexus 3232C switch has the following characteristics:

- Management network connectivity is functional.
- Console access to the replacement switch is in place.
- The appropriate RCF and NX-OS operating system image is loaded onto the switch.
- Initial customization of the switch is complete.

For more information

See the following:

- [Cisco Ethernet Switches](#)
- [Hardware Universe](#)
- [What additional information do I need to install my equipment that is not in HWU?](#)

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 this task

This replacement procedure describes the following scenario:

- The cluster initially has four nodes connected to two Nexus 3232C cluster switches, CL1 and CL2.
- You plan to replace cluster switch CL2 with C2 (steps 1 to 21):
 - On each node, you migrate the cluster LIFs connected to cluster switch CL2 to cluster ports connected to cluster switch CL1.
 - You disconnect the cabling from all ports on cluster switch CL2 and reconnect the cabling to the same ports on the replacement cluster switch C2.
 - You revert the migrated cluster LIFs on each node.

About the examples

This replacement procedure replaces the second Nexus 3232C cluster switch CL2 with the new 3232C switch C2.

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

- The four nodes are n1, n2, n3, and n4.
- n1_clus1 is the first cluster logical interface (LIF) connected to cluster switch C1 for node n1.
- n1_clus2 is the first cluster LIF connected to cluster switch CL2 or C2 for node n1.
- n1_clus3 is the second LIF connected to cluster switch C2 for node n1.-
- n1_clus4 is the second LIF connected to cluster switch CL1, for node n1.

The number of 10 GbE and 40/100 GbE ports are defined in the reference configuration files (RCFs) available at [Cisco® Cluster Network Switch Reference Configuration File Download](#).

The examples in this replacement procedure use four nodes. Two of the nodes use four 10 GB cluster interconnect ports: e0a, e0b, e0c, and e0d. The other two nodes use two 40 GB cluster interconnect ports: e4a and e4e. See the [Hardware Universe](#) to verify the correct cluster ports for your platform.

Step 1: Display and migrate the cluster ports to switch

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
```

Show example

```
cluster::> network device-discovery show
      Local   Discovered
      Node    Port    Device           Interface      Platform
-----  -----  -----
-----  -----
n1      /cdp
      e0a    CL1           Ethernet1/1/1    N3K-C3232C
      e0b    CL2           Ethernet1/1/1    N3K-C3232C
      e0c    CL2           Ethernet1/1/2    N3K-C3232C
      e0d    CL1           Ethernet1/1/2    N3K-C3232C

n2      /cdp
      e0a    CL1           Ethernet1/1/3    N3K-C3232C
      e0b    CL2           Ethernet1/1/3    N3K-C3232C
      e0c    CL2           Ethernet1/1/4    N3K-C3232C
      e0d    CL1           Ethernet1/1/4    N3K-C3232C

n3      /cdp
      e4a    CL1           Ethernet1/7     N3K-C3232C
      e4e    CL2           Ethernet1/7     N3K-C3232C

n4      /cdp
      e4a    CL1           Ethernet1/8     N3K-C3232C
      e4e    CL2           Ethernet1/8     N3K-C3232C
```

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

a. Display the network port attributes:

```
network port show -role cluster
```

Show example

```
cluster::>*> network port show -role cluster
(network port show)
Node: n1

Ignore
                                         Speed (Mbps)

Health  Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   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

Ignore
                                         Speed (Mbps)

Health  Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   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

Ignore
                                         Speed (Mbps)

Health  Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper
Status   Status
-----  -----
e4a     Cluster       Cluster          up   9000  auto/40000  -
-
e4e     Cluster       Cluster          up   9000  auto/40000  -
```

Node: n4

Ignore

		Speed (Mbps)				
Health	Health					
Port Status	IPspace Status	Broadcast	Domain	Link	MTU	Admin/Oper
<hr/>						
<hr/>						
e4a	Cluster	Cluster		up	9000	auto/40000
e4e	Cluster	Cluster		up	9000	auto/40000

b. Display information about the logical interfaces (LIFs):

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

Show example

```
cluster::*> network interface show -role cluster
      Logical      Status      Network      Current
      Current Is
      Vserver      Interface  Admin/Oper Address/Mask      Node
      Port      Home
      -----
      -----
      Cluster
      e0a      n1_clus1      up/up      10.10.0.1/24      n1
      e0b      n1_clus2      up/up      10.10.0.2/24      n1
      e0c      n1_clus3      up/up      10.10.0.3/24      n1
      e0d      n1_clus4      up/up      10.10.0.4/24      n1
      e0a      n2_clus1      up/up      10.10.0.5/24      n2
      e0b      n2_clus2      up/up      10.10.0.6/24      n2
      e0c      n2_clus3      up/up      10.10.0.7/24      n2
      e0d      n2_clus4      up/up      10.10.0.8/24      n2
      e0a      n3_clus1      up/up      10.10.0.9/24      n3
      e0e      n3_clus2      up/up      10.10.0.10/24     n3
      e0a      n4_clus1      up/up      10.10.0.11/24     n4
      e0e      n4_clus2      up/up      10.10.0.12/24     n4
```

c. Display the discovered cluster switches:

```
system cluster-switch show
```

Show example

The following output example displays the cluster switches:

```
cluster::> system cluster-switch show
Switch          Type          Address
Model
-----
-----
CL1            cluster-network  10.10.1.101
NX3232C
    Serial Number: FOX000001
    Is Monitored: true
    Reason: None
    Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version 7.0(3)I6(1)
    Version Source: CDP

CL2            cluster-network  10.10.1.102
NX3232C
    Serial Number: FOX000002
    Is Monitored: true
    Reason: None
    Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version 7.0(3)I6(1)
    Version Source: CDP
```

4. Verify that the appropriate RCF and image are installed on the new Nexus 3232C switch and make any necessary site customizations.

- a. Go to the NetApp Support Site.

mysupport.netapp.com

- b. Go to the **Cisco Ethernet Switches** page and note the required software versions in the table.

[Cisco Ethernet Switches](#)

- c. Download the appropriate version of the RCF.
- d. Click **CONTINUE** on the **Description** page, accept the license agreement, and then navigate to the **Download** page.
- e. Download the correct version of the image software from the **Cisco® Cluster and Management Network Switch Reference Configuration File Download** page.

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

5. Migrate the cluster LIFs to the physical node ports connected to the replacement switch C2:

```
network interface migrate -vserver vserver-name -lif lif-name -source-node
node-name -destination-node node-name -destination-port port-name
```

Show example

You must migrate all the cluster LIFs 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
cluster::*> network interface migrate -vserver Cluster -lif n3_clus2
-source-node n3 -destination-
node n3 -destination-port e4a
cluster::*> network interface migrate -vserver Cluster -lif n4_clus2
-source-node n4 -destination-
node n4 -destination-port e4a
```

6. Verify the status of the cluster ports and their home designations:

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

Show example

```
cluster::*> network interface show -role cluster
(network interface show)
      Logical      Status      Network      Current
Current Is
Vserver      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
      n3_clus1  up/up      10.10.0.9/24      n3
e4a      true
      n3_clus2  up/up      10.10.0.10/24      n3
e4a      false
      n4_clus1  up/up      10.10.0.11/24      n4
e4a      true
      n4_clus2  up/up      10.10.0.12/24      n4
e4a      false
```

7. Shut down the cluster interconnect ports that are physically connected to the original switch CL2:

```
network port modify -node node-name -port port-name -up-admin false
```

Show example

The following example shows the cluster interconnect ports are 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
cluster::*> network port modify -node n3 -port e4e -up-admin false
cluster::*> network port modify -node n4 -port e4e -up-admin false
```

8. Verify the connectivity of the remote cluster interfaces:

ONTAP 9.9.1 and later

You can use the `network interface check cluster-connectivity` command to start an accessibility check for cluster connectivity and then display the details:

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

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

NOTE: Wait for a number of seconds before running the `show` command to display the details.

```
cluster1::*> network interface check cluster-connectivity show  
Source Destination  
Packet  
Node Date LIF LIF  
Loss  
-----  
-----  
n1  
3/5/2022 19:21:18 -06:00 n1_clus2 n2-clus1  
none  
3/5/2022 19:21:20 -06:00 n1_clus2 n2_clus2  
none  
.  
.n2  
3/5/2022 19:21:18 -06:00 n2_clus2 n1_clus1  
none  
3/5/2022 19:21:20 -06:00 n2_clus2 n1_clus2  
none  
.n3  
.n4  
.n5
```

All ONTAP releases

For all ONTAP releases, you can also use the `cluster ping-cluster -node <name>` command to check the connectivity:

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

```

cluster1::*> cluster ping-cluster -node local
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
Cluster n3_clus1 n4          e0a    10.10.0.9
Cluster n3_clus2 n3          e0e    10.10.0.10
Cluster n4_clus1 n4          e0a    10.10.0.11
Cluster n4_clus2 n4          e0e    10.10.0.12
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 10.10.0.9 10.10.0.10
10.10.0.11
10.10.0.12 Cluster Vserver Id = 4294967293 Ping status:
....
Basic connectivity succeeds on 32 path(s)
Basic connectivity fails on 0 path(s) .....
Detected 9000 byte MTU on 32 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 10.10.0.1 to Remote 10.10.0.9
  Local 10.10.0.1 to Remote 10.10.0.10
  Local 10.10.0.1 to Remote 10.10.0.11
  Local 10.10.0.1 to Remote 10.10.0.12
  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 10.10.0.2 to Remote 10.10.0.9
  Local 10.10.0.2 to Remote 10.10.0.10
  Local 10.10.0.2 to Remote 10.10.0.11
  Local 10.10.0.2 to Remote 10.10.0.12
  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 10.10.0.3 to Remote 10.10.0.9
  Local 10.10.0.3 to Remote 10.10.0.10

```

```
Local 10.10.0.3 to Remote 10.10.0.11
Local 10.10.0.3 to Remote 10.10.0.12
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
Local 10.10.0.4 to Remote 10.10.0.9
Local 10.10.0.4 to Remote 10.10.0.10
Local 10.10.0.4 to Remote 10.10.0.11
Local 10.10.0.4 to Remote 10.10.0.12
Larger than PMTU communication succeeds on 32 path(s) RPC status:
8 paths up, 0 paths down (tcp check)
8 paths up, 0 paths down (udp check)
```

Step 2: Migrate ISLs to switch CL1 and C2

1. Shut down the ports 1/31 and 1/32 on cluster switch CL1.

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

Show example

```
(CL1) # configure
(CL1) (Config) # interface e1/31-32
(CL1) (config-if-range) # shutdown
(CL1) (config-if-range) # exit
(CL1) (Config) # exit
(CL1) #
```

2. Remove all the cables attached to the cluster switch CL2 and reconnect them to the replacement switch C2 for all the nodes.
3. Remove the inter-switch link (ISL) cables from ports e1/31 and e1/32 on cluster switch CL2 and reconnect them to the same ports on the replacement switch C2.
4. Bring up ISL ports 1/31 and 1/32 on the cluster switch CL1.

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

Show example

```
(CL1) # configure
(CL1) (Config) # interface e1/31-32
(CL1) (config-if-range) # no shutdown
(CL1) (config-if-range) # exit
(CL1) (Config) # exit
(CL1) #
```

5. Verify that the ISLs are up on CL1.

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

Ports Eth1/31 and Eth1/32 should indicate (P), which means that the ISL ports are up in the port-channel:

Show example

```
CL1# 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)
```

6. Verify that the ISLs are up on cluster switch C2.

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

Show example

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

```
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 (P)      Eth1/32 (P)
```

7. On all nodes, bring up all the cluster interconnect ports connected to the replacement switch C2:

```
network port modify -node node-name -port port-name -up-admin true
```

Show example

```
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
cluster::*> network port modify -node n3 -port e4e -up-admin true
cluster::*> network port modify -node n4 -port e4e -up-admin true
```

Step 3: Revert all LIFs to originally assigned ports

1. Revert all the migrated cluster interconnect LIFs on all the nodes:

```
network interface revert -vserver cluster -lif lif-name
```

Show example

You must revert all the cluster interconnect LIFs individually as shown in the following 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
Cluster::*> network interface revert -vserver cluster -lif n3_clus2
Cluster::*> network interface revert -vserver cluster -lif n4_clus2
```

2. Verify that the cluster interconnect ports are now reverted to their home:

```
network interface show
```

Show example

The following example shows that all the LIFs have been successfully reverted because the ports listed under the `Current Port` column have a status of `true` in the `Is Home` column. If a port has a value of `false`, the LIF has not been reverted.

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

3. Verify that the cluster ports are connected:

```
network port show -role cluster
```

Show example

```
cluster::*> network port show -role cluster
  (network port show)
Node: n1

Ignore
                                         Speed(Mbps)  Health
Health
Port      IPspace      Broadcast  Domain  Link  MTU  Admin/Oper  Status
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

Ignore
                                         Speed(Mbps)  Health
Health
Port      IPspace      Broadcast  Domain  Link  MTU  Admin/Oper  Status
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

Ignore
                                         Speed(Mbps)  Health
Health
Port      IPspace      Broadcast  Domain  Link  MTU  Admin/Oper  Status
Status

-----
-----
e4a      Cluster      Cluster      up      9000  auto/40000  -
e4e      Cluster      Cluster      up      9000  auto/40000  -
-
Node: n4
```

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

4. Verify the connectivity of the remote cluster interfaces:

ONTAP 9.9.1 and later

You can use the `network interface check cluster-connectivity` command to start an accessibility check for cluster connectivity and then display the details:

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

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

NOTE: Wait for a number of seconds before running the `show` command to display the details.

```
cluster1::*> network interface check cluster-connectivity show  
Source Destination  
Packet  
Node Date LIF LIF  
Loss  
-----  
-----  
n1  
3/5/2022 19:21:18 -06:00 n1_clus2 n2-clus1  
none  
3/5/2022 19:21:20 -06:00 n1_clus2 n2_clus2  
none  
.  
.n2  
3/5/2022 19:21:18 -06:00 n2_clus2 n1_clus1  
none  
3/5/2022 19:21:20 -06:00 n2_clus2 n1_clus2  
none  
.n3  
.n4  
.n5
```

All ONTAP releases

For all ONTAP releases, you can also use the `cluster ping-cluster -node <name>` command to check the connectivity:

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

```
cluster1::*> cluster ping-cluster -node local
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
Cluster n3_clus1 n4          e0a    10.10.0.9
Cluster n3_clus2 n3          e0e    10.10.0.10
Cluster n4_clus1 n4          e0a    10.10.0.11
Cluster n4_clus2 n4          e0e    10.10.0.12
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 10.10.0.9 10.10.0.10
10.10.0.11
10.10.0.12 Cluster Vserver Id = 4294967293 Ping status:
....
Basic connectivity succeeds on 32 path(s)
Basic connectivity fails on 0 path(s) .....
Detected 9000 byte MTU on 32 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 10.10.0.1 to Remote 10.10.0.9
  Local 10.10.0.1 to Remote 10.10.0.10
  Local 10.10.0.1 to Remote 10.10.0.11
  Local 10.10.0.1 to Remote 10.10.0.12
  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 10.10.0.2 to Remote 10.10.0.9
  Local 10.10.0.2 to Remote 10.10.0.10
  Local 10.10.0.2 to Remote 10.10.0.11
  Local 10.10.0.2 to Remote 10.10.0.12
  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 10.10.0.3 to Remote 10.10.0.9
  Local 10.10.0.3 to Remote 10.10.0.10
```

```
Local 10.10.0.3 to Remote 10.10.0.11
Local 10.10.0.3 to Remote 10.10.0.12
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
Local 10.10.0.4 to Remote 10.10.0.9
Local 10.10.0.4 to Remote 10.10.0.10
Local 10.10.0.4 to Remote 10.10.0.11
Local 10.10.0.4 to Remote 10.10.0.12
Larger than PMTU communication succeeds on 32 path(s) RPC status:
8 paths up, 0 paths down (tcp check)
8 paths up, 0 paths down (udp check)
```

Step 4: Verify all ports and LIF are correctly migrated

1. Display the information about the devices in your configuration by entering the following commands:

You can execute the following commands in any order:

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

Show example

```
cluster::> network device-discovery show
      Local  Discovered
      Node    Port   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
      e0d    C1          Ethernet1/1/2    N3K-C3232C
n2      /cdp
      e0a    C1          Ethernet1/1/3    N3K-C3232C
      e0b    C2          Ethernet1/1/3    N3K-C3232C
      e0c    C2          Ethernet1/1/4    N3K-C3232C
      e0d    C1          Ethernet1/1/4    N3K-C3232C
n3      /cdp
      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

cluster::*> network port show -role cluster
  (network port show)
Node: n1

Ignore
Health
  Speed(Mbps)  Health
  Port      IPspace      Broadcast  Domain  Link  MTU  Admin/Oper  Status
  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

Ignore
Health
  Speed(Mbps)  Health
```

Port	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	Status
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

Ignore

Port	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	Speed (Mbps)	Health
Status								
e4a	Cluster	Cluster		up	9000	auto/40000	-	
e4e	Cluster	Cluster		up	9000	auto/40000	-	

Node: n4

Ignore

Port	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	Speed (Mbps)	Health
Status								
e4a	Cluster	Cluster		up	9000	auto/40000	-	
e4e	Cluster	Cluster		up	9000	auto/40000	-	

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

Current Is	Logical	Status	Network	Current
Vserver	Interface	Admin/Oper	Address/Mask	Node
Port	Home			
Cluster				
e0a	nm1_clus1	up/up	10.10.0.1/24	n1
	true			
e0b	n1_clus2	up/up	10.10.0.2/24	n1
	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			

```
cluster::*> system cluster-switch show
Switch                               Type          Address
Model
-----
-----
CL1                                cluster-network 10.10.1.101
NX3232C
    Serial Number: FOX000001
    Is Monitored: true
    Reason: None
    Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version 7.0(3)I6(1)
    Version Source: CDP
CL2                                cluster-network 10.10.1.102
NX3232C
    Serial Number: FOX000002
    Is Monitored: true
    Reason: None
    Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version 7.0(3)I6(1)
    Version Source: CDP
C2                                cluster-network 10.10.1.103
NX3232C
    Serial Number: FOX000003
```

```

Is Monitored: true
Reason: None
Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version 7.0(3)I6(1)
Version Source: CDP 3 entries were displayed.

```

2. Delete the replaced cluster switch CL2 if it has not been removed automatically:

```
system cluster-switch delete -device cluster-switch-name
```

3. Verify that the proper cluster switches are monitored:

```
system cluster-switch show
```

Show example

The following example shows the cluster switches are monitored because the Is Monitored state is true.

```

cluster::> system cluster-switch show
Switch          Type          Address
Model
-----
-----
CL1            cluster-network 10.10.1.101
NX3232C
          Serial Number: FOX000001
          Is Monitored: true
          Reason: None
          Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version 7.0(3)I6(1)
          Version Source: CDP

C2            cluster-network 10.10.1.103
NX3232C
          Serial Number: FOX000002
          Is Monitored: true
          Reason: None
          Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version 7.0(3)I6(1)
          Version Source: CDP

```

4. 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 switch, you can [configure switch health monitoring](#).

Replace Cisco Nexus 3232C cluster switches with switchless connections

You can migrate from a cluster with a switched cluster network to one where two nodes are directly connected for ONTAP 9.3 and later.

Review requirements

Guidelines

Review the following guidelines:

- Migrating to a two-node switchless cluster configuration is a nondisruptive operation. Most systems have two dedicated cluster interconnect ports on each node, but you can also use this procedure for systems with a larger number of dedicated cluster interconnect ports on each node, such as four, six or eight.
- You cannot use the switchless cluster interconnect feature with more than two nodes.
- If you have an existing two-node cluster that uses cluster interconnect switches and is running ONTAP 9.3 or later, you can replace the switches with direct, back-to-back connections between the nodes.

Before you begin

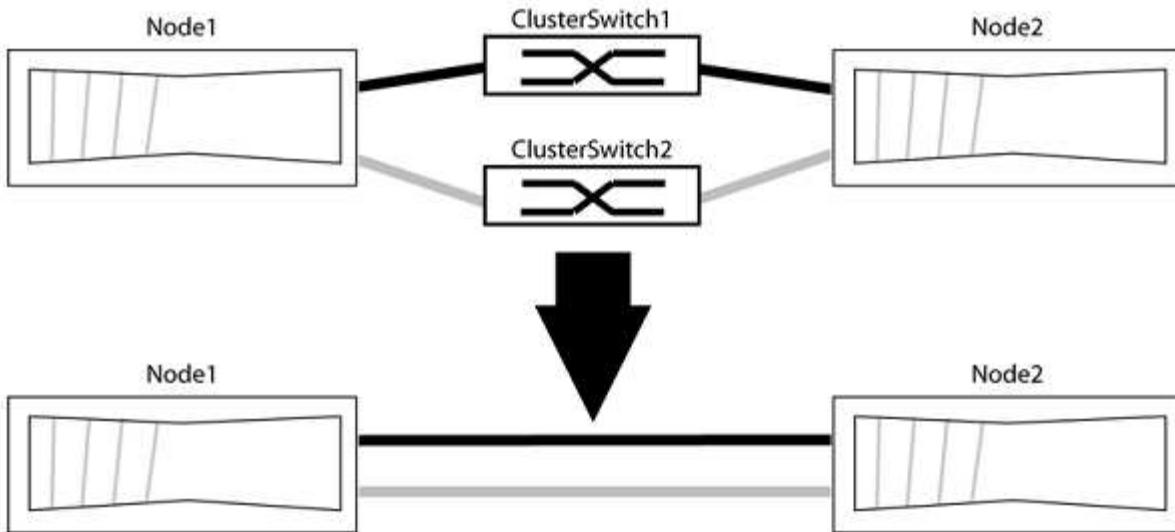
Make sure you have the following:

- A healthy cluster that consists of two nodes connected by cluster switches. The nodes must be running the same ONTAP release.
- Each node with the required number of dedicated cluster ports, which provide redundant cluster interconnect connections to support your system configuration. For example, there are two redundant ports for a system with two dedicated cluster interconnect ports on each node.

Migrate the switches

About this task

The following procedure removes the cluster switches in a two-node cluster and replaces each connection to the switch with a direct connection to the partner node.



About the examples

The examples in the following procedure show nodes that are using "e0a" and "e0b" as cluster ports. Your nodes might be using different cluster ports as they vary by system.

Step 1: Prepare for migration

1. Change the privilege level to advanced, entering `y` when prompted to continue:

```
set -privilege advanced
```

The advanced prompt `*>` appears.

2. ONTAP 9.3 and later supports automatic detection of switchless clusters, which is enabled by default.

You can verify that detection of switchless clusters is enabled by running the advanced privilege command:

```
network options detect-switchless-cluster show
```

Show example

The following example output shows if the option is enabled.

```
cluster::*> network options detect-switchless-cluster show
(network options detect-switchless-cluster show)
Enable Switchless Cluster Detection: true
```

If "Enable Switchless Cluster Detection" is false, contact NetApp support.

3. 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=<number_of_hours>h
```

where h is the duration of the maintenance window in hours. The message notifies technical support of this maintenance task so that they can suppress automatic case creation during the maintenance window.

In the following example, the command suppresses automatic case creation for two hours:

Show example

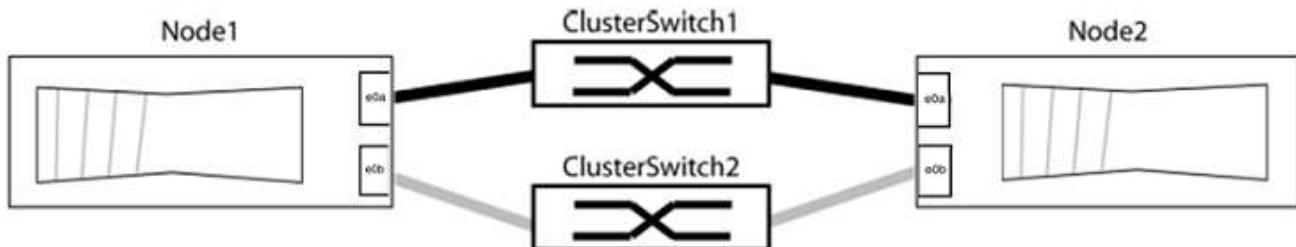
```
cluster::*> system node autosupport invoke -node * -type all  
-message MAINT=2h
```

Step 2: Configure ports and cabling

1. Organize the cluster ports on each switch into groups so that the cluster ports in group1 go to cluster switch1 and the cluster ports in group2 go to cluster switch2. These groups are required later in the procedure.
2. Identify the cluster ports and verify link status and health:

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

In the following example for nodes with cluster ports "e0a" and "e0b", one group is identified as "node1:e0a" and "node2:e0a" and the other group as "node1:e0b" and "node2:e0b". Your nodes might be using different cluster ports because they vary by system.



Verify that the ports have a value of `up` for the "Link" column and a value of `healthy` for the "Health Status" column.

Show example

3. Confirm that all the cluster LIFs are on their home ports.

Verify that the “is-home” column is true for each of the cluster LIFs:

```
network interface show -vserver Cluster -fields is-home
```

Show example

```
cluster::*> net int show -vserver Cluster -fields is-home
(network interface show)
vserver  lif      is-home
-----
Cluster  node1_clus1  true
Cluster  node1_clus2  true
Cluster  node2_clus1  true
Cluster  node2_clus2  true
4 entries were displayed.
```

If there are cluster LIFs that are not on their home ports, revert those LIFs to their home ports:

```
network interface revert -vserver Cluster -lif *
```

4. Disable auto-revert for the cluster LIFs:

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

5. Verify that all ports listed in the previous step are connected to a network switch:

```
network device-discovery show -port cluster_port
```

The “Discovered Device” column should be the name of the cluster switch that the port is connected to.

Show example

The following example shows that cluster ports "e0a" and "e0b" are correctly connected to cluster switches "cs1" and "cs2".

```
cluster::> network device-discovery show -port e0a|e0b
(network device-discovery show)
Node/  Local  Discovered
Protocol  Port  Device (LLDP: ChassisID)  Interface  Platform
-----
node1/cdp
      e0a    cs1
      e0b    cs2
node2/cdp
      e0a    cs1
      e0b    cs2
4 entries were displayed.
```

6. Verify the connectivity of the remote cluster interfaces:

ONTAP 9.9.1 and later

You can use the `network interface check cluster-connectivity` command to start an accessibility check for cluster connectivity and then display the details:

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

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

NOTE: Wait for a number of seconds before running the `show` command to display the details.

```
cluster1::*> network interface check cluster-connectivity show
                                         Source          Destination
Packet
Node    Date          LIF          LIF
Loss
-----
-----
node1
    3/5/2022 19:21:18 -06:00  node1_clus2      node2-clus1
none
    3/5/2022 19:21:20 -06:00  node1_clus2      node2_clus2
none
node2
    3/5/2022 19:21:18 -06:00  node2_clus2      node1_clus1
none
    3/5/2022 19:21:20 -06:00  node2_clus2      node1_clus2
none
```

All ONTAP releases

For all ONTAP releases, you can also use the `cluster ping-cluster -node <name>` command to check the connectivity:

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

```

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)

```

7. Verify that the cluster is healthy:

```
cluster ring show
```

All units must be either master or secondary.

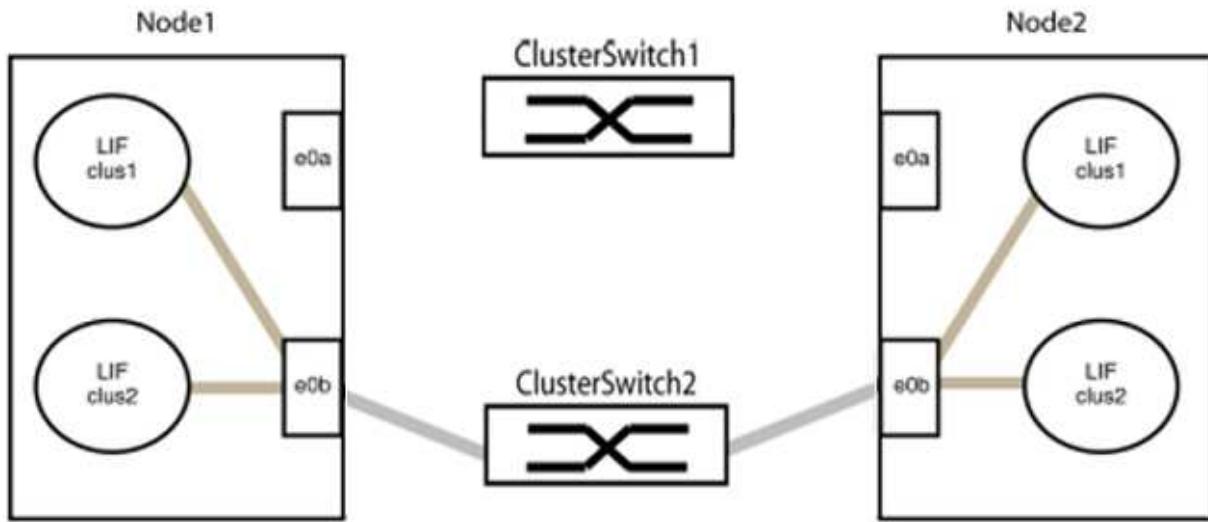
8. Set up the switchless configuration for the ports in group 1.



To avoid potential networking issues, you must disconnect the ports from group1 and reconnect them back-to-back as quickly as possible, for example, **in less than 20 seconds**.

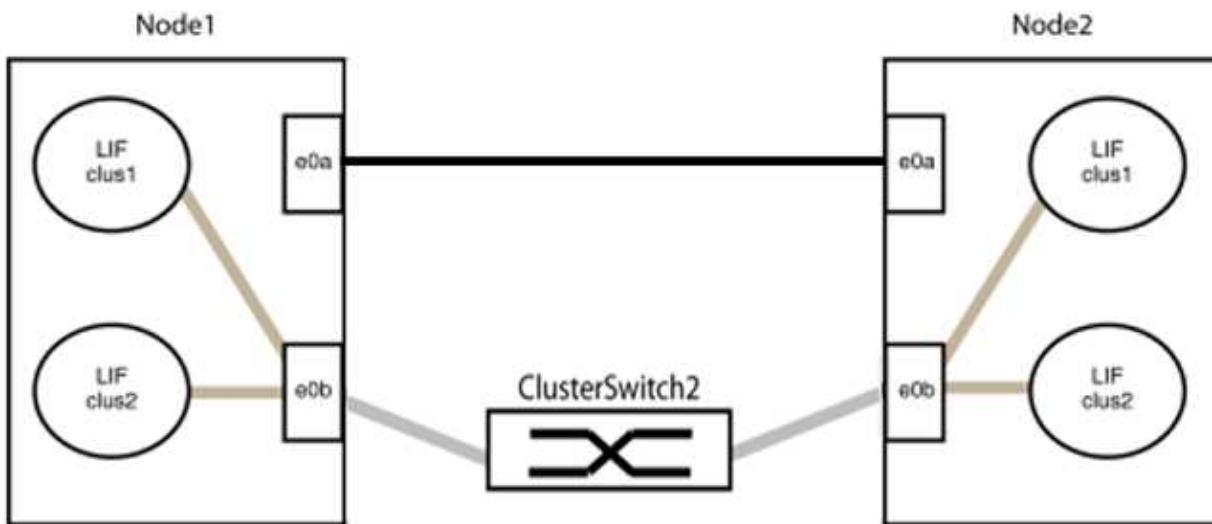
a. Disconnect all the cables from the ports in group1 at the same time.

In the following example, the cables are disconnected from port "e0a" on each node, and cluster traffic continues through the switch and port "e0b" on each node:



b. Cable the ports in group1 back-to-back.

In the following example, "e0a" on node1 is connected to "e0a" on node2:



9. The switchless cluster network option transitions from `false` to `true`. This might take up to 45 seconds. Confirm that the switchless option is set to `true`:

```
network options switchless-cluster show
```

The following example shows that the switchless cluster is enabled:

```
cluster::*> network options switchless-cluster show
Enable Switchless Cluster: true
```

10. Verify the connectivity of the remote cluster interfaces:

ONTAP 9.9.1 and later

You can use the `network interface check cluster-connectivity` command to start an accessibility check for cluster connectivity and then display the details:

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

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

NOTE: Wait for a number of seconds before running the `show` command to display the details.

```
cluster1::*> network interface check cluster-connectivity show
                                         Source          Destination
Packet
Node    Date          LIF          LIF
Loss
-----
-----
node1
    3/5/2022 19:21:18 -06:00  node1_clus2      node2-clus1
none
    3/5/2022 19:21:20 -06:00  node1_clus2      node2_clus2
none
node2
    3/5/2022 19:21:18 -06:00  node2_clus2      node1_clus1
none
    3/5/2022 19:21:20 -06:00  node2_clus2      node1_clus2
none
```

All ONTAP releases

For all ONTAP releases, you can also use the `cluster ping-cluster -node <name>` command to check the connectivity:

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

```

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)

```



Before proceeding to the next step, you must wait at least two minutes to confirm a working back-to-back connection on group 1.

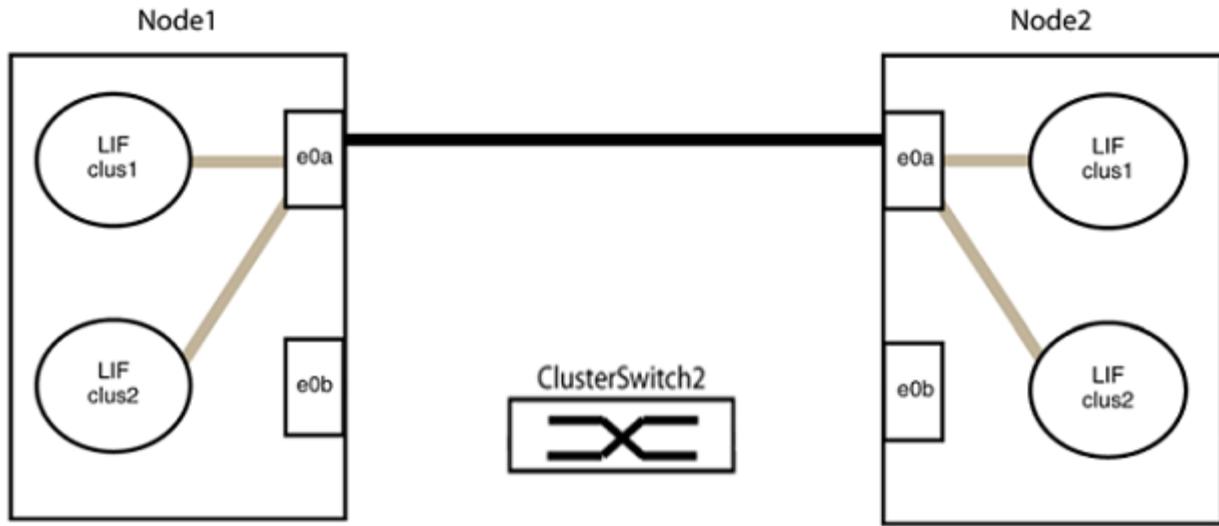
11. Set up the switchless configuration for the ports in group 2.



To avoid potential networking issues, you must disconnect the ports from group2 and reconnect them back-to-back as quickly as possible, for example, **in less than 20 seconds**.

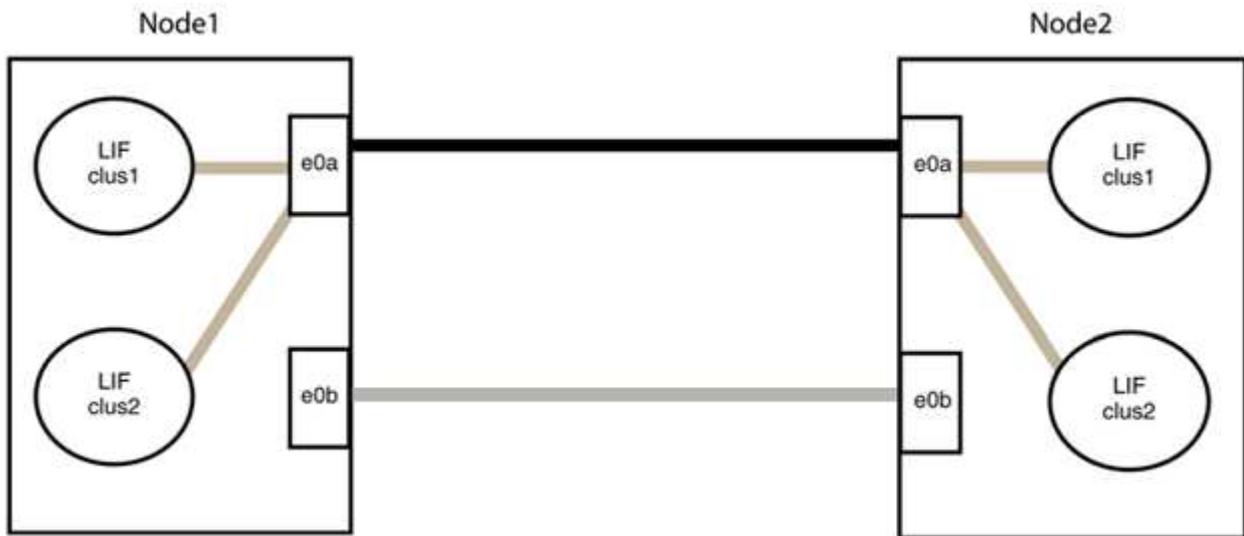
a. Disconnect all the cables from the ports in group2 at the same time.

In the following example, the cables are disconnected from port "e0b" on each node, and cluster traffic continues through the direct connection between the "e0a" ports:



b. Cable the ports in group2 back-to-back.

In the following example, "e0a" on node1 is connected to "e0a" on node2 and "e0b" on node1 is connected to "e0b" on node2:



Step 3: Verify the configuration

1. Verify that the ports on both nodes are correctly connected:

```
network device-discovery show -port cluster_port
```

Show example

The following example shows that cluster ports "e0a" and "e0b" are correctly connected to the corresponding port on the cluster partner:

```
cluster::> net device-discovery show -port e0a|e0b
(network device-discovery show)
Node/      Local   Discovered
Protocol   Port    Device (LLDP: ChassisID)  Interface  Platform
-----  -----  -----  -----  -----  -----
node1/cdp
      e0a    node2
      e0b    node2
node1/lldp
      e0a    node2 (00:a0:98:da:16:44)  e0a
      e0b    node2 (00:a0:98:da:16:44)  e0b
node2/cdp
      e0a    node1
      e0b    node1
node2/lldp
      e0a    node1 (00:a0:98:da:87:49)  e0a
      e0b    node1 (00:a0:98:da:87:49)  e0b
8 entries were displayed.
```

2. Re-enable auto-revert for the cluster LIFs:

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

3. Verify that all LIFs are home. This might take a few seconds.

```
network interface show -vserver Cluster -lif lif_name
```

Show example

The LIFs have been reverted if the “Is Home” column is true, as shown for `node1_clus2` and `node2_clus2` in the following example:

```
cluster::> network interface show -vserver Cluster -fields curr-
port,is-home
vserver    lif          curr-port is-home
-----
Cluster  node1_clus1  e0a        true
Cluster  node1_clus2  e0b        true
Cluster  node2_clus1  e0a        true
Cluster  node2_clus2  e0b        true
4 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 Cluster -lif lif_name
```

4. Check the cluster status of the nodes from the system console of either node:

```
cluster show
```

Show example

The following example shows epsilon on both nodes to be false:

```
Node  Health  Eligibility  Epsilon
-----
node1  true    true        false
node2  true    true        false
2 entries were displayed.
```

5. Verify the connectivity of the remote cluster interfaces:

ONTAP 9.9.1 and later

You can use the `network interface check cluster-connectivity` command to start an accessibility check for cluster connectivity and then display the details:

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

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

NOTE: Wait for a number of seconds before running the `show` command to display the details.

```
cluster1::*> network interface check cluster-connectivity show  
Source Destination  
Packet  
Node Date LIF LIF  
Loss  
-----  
-----  
node1  
3/5/2022 19:21:18 -06:00 node1_clus2 node2-clus1  
none  
3/5/2022 19:21:20 -06:00 node1_clus2 node2_clus2  
none  
node2  
3/5/2022 19:21:18 -06:00 node2_clus2 node1_clus1  
none  
3/5/2022 19:21:20 -06:00 node2_clus2 node1_clus2  
none
```

All ONTAP releases

For all ONTAP releases, you can also use the `cluster ping-cluster -node <name>` command to check the connectivity:

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

```

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)

```

6. If you suppressed automatic case creation, reenable it by invoking an AutoSupport message:

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

For more information, see [NetApp KB Article 1010449: How to suppress automatic case creation during scheduled maintenance windows.](#)

7. Change the privilege level back to admin:

```
set -privilege admin
```

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