



Migrate the switches

Install and maintain

NetApp
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Migrate the switches

Migrate CN1610 cluster switches to BES-53248 cluster switches

To migrate the CN1610 cluster switches in a cluster to Broadcom-supported BES-53248 cluster switches, review the migration requirements and then follow the migration procedure.

The following cluster switches are supported:

- CN1610
- BES-53248

Review requirements

Verify that your configuration meets the following requirements:

- Some of the ports on BES-53248 switches are configured to run at 10GbE.
- The 10GbE connectivity from nodes to BES-53248 cluster switches have been planned, migrated, and documented.
- The cluster is fully functioning (there should be no errors in the logs or similar issues).
- Initial customization of the BES-53248 switches is complete, so that:
 - BES-53248 switches are running the latest recommended version of EFOS software.
 - Reference Configuration Files (RCFs) have been applied to the switches.
 - Any site customization, such as DNS, NTP, SMTP, SNMP, and SSH, are configured on the new switches.

Node connections

The cluster switches support the following node connections:

- NetApp CN1610: ports 0/1 through 0/12 (10GbE)
- BES-53248: ports 0/1-0/16 (10GbE/25GbE)



Additional ports can be activated by purchasing port licenses.

ISL ports

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

- NetApp CN1610: ports 0/13 through 0/16 (10GbE)
- BES-53248: ports 0/55-0/56 (100GbE)

The [NetApp Hardware Universe](#) contains information about ONTAP compatibility, supported EFOS firmware, and cabling to BES-53248 cluster switches. See [What additional information do I need to install my equipment that is not in HWU?](#) for more information about switch installation requirements.

ISL cabling

The appropriate ISL cabling is as follows:

- **Beginning:** For CN1610 to CN1610 (SFP+ to SFP+), four SFP+ optical fiber or copper direct-attach cables.
- **Final:** For BES-53248 to BES-53248 (QSFP28 to QSFP28), two QSFP28 optical transceivers/fiber or copper direct-attach cables.

Migrate the switches

Follow this procedure to migrate CN1610 cluster switches to BES-53248 cluster switches.

About the examples

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

- The examples use two nodes, each deploying two 10 GbE cluster interconnect ports: e0a and e0b.
- The command outputs might vary depending on different releases of ONTAP software.
- The CN1610 switches to be replaced are CL1 and CL2.
- The BES-53248 switches to replace the CN1610 switches are cs1 and cs2.
- The nodes are node1 and node2.
- The switch CL2 is replaced by cs2 first, followed with CL1 by cs1.
- The BES-53248 switches are pre-loaded with the supported versions of Reference Configuration File (RCF) and Ethernet Fabric OS (EFOS) with ISL cables connected on ports 55 and 56.
- The cluster LIF names are node1_clus1 and node1_clus2 for node1, and node2_clus1 and node2_clus2 for node2.

About this task

This procedure covers the following scenario:

- The cluster starts with two nodes connected to two CN1610 cluster switches.
- CN1610 switch CL2 is replaced by BES-53248 switch cs2:
 - Shut down the ports to the cluster nodes. All ports must be shut down simultaneously to avoid cluster instability.
 - Disconnect the cables from all cluster ports on all nodes connected to CL2, and then use supported cables to reconnect the ports to the new cluster switch cs2.
- CN1610 switch CL1 is replaced by BES-53248 switch cs1:
 - Shut down the ports to the cluster nodes. All ports must be shut down simultaneously to avoid cluster instability.
 - Disconnect the cables from all cluster ports on all nodes connected to CL1, and then use supported cables to reconnect the ports to the new cluster switch cs1.



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

Step 1: Prepare for migration

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

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

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



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

The following command suppresses automatic case creation for two hours:

```
cluster1::*> system node autosupport invoke -node * -type all -message  
MAINT=2h
```

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

```
set -privilege advanced
```

The advanced prompt (*>) appears.

Step 2: Configure ports and cabling

1. On the new switches, confirm that the ISL is cabled and healthy between switches cs1 and cs2:

```
show port-channel
```

Show example

The following example shows that the ISL ports are **up** on switch cs1:

```
(cs1)# show port-channel 1/1
Local Interface..... 1/1
Channel Name..... Cluster-ISL
Link State..... Up
Admin Mode..... Enabled
Type..... Dynamic
Port channel Min-links..... 1
Load Balance Option..... 7
(Enhanced hashing mode)

Mbr      Device/      Port      Port
Ports   Timeout     Speed     Active
-----
0/55    actor/long   100G Full  True
        partner/long
0/56    actor/long   100G Full  True
        partner/long
(cs1) #
```

The following example shows that the ISL ports are **up** on switch cs2:

```
(cs2)# show port-channel 1/1
Local Interface..... 1/1
Channel Name..... Cluster-ISL
Link State..... Up
Admin Mode..... Enabled
Type..... Dynamic
Port channel Min-links..... 1
Load Balance Option..... 7
(Enhanced hashing mode)

Mbr      Device/      Port      Port
Ports   Timeout     Speed     Active
-----
0/55    actor/long   100G Full  True
        partner/long
0/56    actor/long   100G Full  True
        partner/long
```

2. Display the cluster ports on each node that is connected to the existing cluster switches:

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

Show example

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

```
cluster1::*> network device-discovery show -protocol cdp
Node/          Local  Discovered
Protocol       Port   Device (LLDP: ChassisID)  Interface
Platform
-----
node2          /cdp
               e0a    CL1                       0/2
CN1610
               e0b    CL2                       0/2
CN1610
node1          /cdp
               e0a    CL1                       0/1
CN1610
               e0b    CL2                       0/1
CN1610
```

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

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

```
network port show -ip-space Cluster
```

Show example

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

Node: node1

Ignore

Health      Health
Port        IPspace    Broadcast Domain Link MTU  Admin/Oper
Status      Status
-----
-----
e0a         Cluster    Cluster          up   9000  auto/10000
healthy    false
e0b         Cluster    Cluster          up   9000  auto/10000
healthy    false

Node: node2

Ignore

Health      Health
Port        IPspace    Broadcast Domain Link MTU  Admin/Oper
Status      Status
-----
-----
e0a         Cluster    Cluster          up   9000  auto/10000
healthy    false
e0b         Cluster    Cluster          up   9000  auto/10000
healthy    false
```

- b. Verify that all the cluster interfaces (LIFs) are on their home ports:

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

Show example

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

Current Is	Logical	Status	Network	Current
Vserver	Interface	Admin/Oper	Address/Mask	Node
Port	Home			

Cluster				
e0a	node1_clus1	up/up	169.254.209.69/16	node1
e0b	true			
e0a	node1_clus2	up/up	169.254.49.125/16	node1
e0b	true			
e0a	node2_clus1	up/up	169.254.47.194/16	node2
e0b	true			
e0a	node2_clus2	up/up	169.254.19.183/16	node2
e0b	true			

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

ONTAP 9.8 and later

Beginning with ONTAP 9.8, use the command: `system switch ethernet show -is-monitoring-enabled-operational true`

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

Switch	Type	Address	Model
CL1	cluster-network	10.10.1.101	CN1610
Serial Number: 01234567			
Is Monitored: true			
Reason:			
Software Version: 1.3.0.3			
Version Source: ISDP			
CL2	cluster-network	10.10.1.102	CN1610
Serial Number: 01234568			
Is Monitored: true			
Reason:			
Software Version: 1.3.0.3			
Version Source: ISDP			

```
cluster1::*>
```

ONTAP 9.7 and earlier

For ONTAP 9.7 and earlier, use the command: `system cluster-switch show -is-monitoring-enabled-operational true`

```

cluster1::*> system cluster-switch show -is-monitoring-enabled
-operational true
Switch                                     Type                Address              Model
-----
CL1                                         cluster-network     10.10.1.101         CN1610
    Serial Number: 01234567
    Is Monitored: true
    Reason:
    Software Version: 1.3.0.3
    Version Source: ISDP

CL2                                         cluster-network     10.10.1.102         CN1610
    Serial Number: 01234568
    Is Monitored: true
    Reason:
    Software Version: 1.3.0.3
    Version Source: ISDP
cluster1::*>

```

5. Disable auto-revert on the cluster LIFs.

```

cluster1::*> network interface modify -vserver Cluster -lif * -auto
-revert false

```

6. On cluster switch CL2, shut down the ports connected to the cluster ports of the nodes in order to fail over the cluster LIFs:

```

(CL2)# configure
(CL2) (Config)# interface 0/1-0/16
(CL2) (Interface 0/1-0/16)# shutdown
(CL2) (Interface 0/1-0/16)# exit
(CL2) (Config)# exit
(CL2)#

```

7. Verify that the cluster LIFs have failed over to the ports hosted on cluster switch CL1. This might take a few seconds.

```

network interface show -vserver Cluster

```

Show example

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

Current Is	Logical	Status	Network	Current
Vserver	Interface	Admin/Oper	Address/Mask	Node
Port	Home			

Cluster				
e0a	node1_clus1	up/up	169.254.209.69/16	node1
	true			
e0a	node1_clus2	up/up	169.254.49.125/16	node1
	false			
e0a	node2_clus1	up/up	169.254.47.194/16	node2
	true			
e0a	node2_clus2	up/up	169.254.19.183/16	node2
	false			

8. Verify that the cluster is healthy:

```
cluster show
```

Show example

```
cluster1::*> cluster show
```

Node	Health	Eligibility	Epsilon

node1	true	true	false
node2	true	true	false

9. Move all cluster node connection cables from the old CL2 switch to the new cs2 switch.

10. Confirm the health of the network connections moved to cs2:

```
network port show -ip-space Cluster
```

Show example

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

```
Node: node1
```

```
Ignore
```

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

```
-----
```

e0a	Cluster	Cluster		up	9000	auto/10000			
healthy	false								
e0b	Cluster	Cluster		up	9000	auto/10000			
healthy	false								

```
Node: node2
```

```
Ignore
```

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

```
-----
```

e0a	Cluster	Cluster		up	9000	auto/10000			
healthy	false								
e0b	Cluster	Cluster		up	9000	auto/10000			
healthy	false								

All cluster ports that were moved should be up.

11. Check neighbor information on the cluster ports:

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

Show example

```
cluster1::*> network device-discovery show -protocol cdp
Node/          Local  Discovered
Protocol       Port   Device (LLDP: ChassisID)  Interface
Platform
-----
node2          /cdp
               e0a    CL1                       0/2
CN1610
               e0b    cs2                       0/2          BES-
53248
node1          /cdp
               e0a    CL1                       0/1
CN1610
               e0b    cs2                       0/1          BES-
53248
```

12. Confirm the switch port connections are healthy from switch cs2's perspective:

```
cs2# show interface all
cs2# show isdp neighbors
```

13. On cluster switch CL1, shut down the ports connected to the cluster ports of the nodes in order to fail over the cluster LIFs:

```
(CL1)# configure
(CL1) (Config)# interface 0/1-0/16
(CL1) (Interface 0/1-0/16)# shutdown
(CL1) (Interface 0/13-0/16)# exit
(CL1) (Config)# exit
(CL1)#
```

All cluster LIFs failover to the cs2 switch.

14. Verify that the cluster LIFs have failed over to the ports hosted on switch cs2. This might take a few seconds:

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

Show example

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

Current	Is	Logical	Status	Network	Current
Vserver	Port	Interface	Admin/Oper	Address/Mask	Node
	Home				

Cluster					
e0b	false	node1_clus1	up/up	169.254.209.69/16	node1
e0b	true	node1_clus2	up/up	169.254.49.125/16	node1
e0b	false	node2_clus1	up/up	169.254.47.194/16	node2
e0b	true	node2_clus2	up/up	169.254.19.183/16	node2

15. Verify that the cluster is healthy:

```
cluster show
```

Show example

```
cluster1::*> cluster show
```

Node	Health	Eligibility	Epsilon

node1	true	true	false
node2	true	true	false

16. Move the cluster node connection cables from CL1 to the new cs1 switch.

17. Confirm the health of the network connections moved to cs1:

```
network port show -ipSPACE Cluster
```

Show example

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

```
Node: node1
```

```
Ignore
```

```
Speed(Mbps) Health
```

```
Health
```

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

```
Status
```

```
-----  
-----  
e0a      Cluster      Cluster      up    9000 auto/10000  
healthy  false  
e0b      Cluster      Cluster      up    9000 auto/10000  
healthy  false
```

```
Node: node2
```

```
Ignore
```

```
Speed(Mbps) Health
```

```
Health
```

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

```
Status
```

```
-----  
-----  
e0a      Cluster      Cluster      up    9000 auto/10000  
healthy  false  
e0b      Cluster      Cluster      up    9000 auto/10000  
healthy  false
```

All cluster ports that were moved should be up.

18. Check neighbor information on the cluster ports:

```
network device-discovery show
```

Show example

```
cluster1::*> network device-discovery show -protocol cdp
Node/          Local  Discovered
Protocol      Port   Device (LLDP: ChassisID)  Interface
Platform
-----
-----
node1         /cdp
              e0a   cs1                       0/1          BES-
53248
              e0b   cs2                       0/1          BES-
53248
node2         /cdp
              e0a   cs1                       0/2          BES-
53248
              e0b   cs2                       0/2          BES-
53248
```

19. Confirm the switch port connections are healthy from switch cs1's perspective:

```
cs1# show interface all
cs1# show isdp neighbors
```

20. Verify that the ISL between cs1 and cs2 is still operational:

```
show port-channel
```

Show example

The following example shows that the ISL ports are **up** on switch cs1:

```
(cs1)# show port-channel 1/1
Local Interface..... 1/1
Channel Name..... Cluster-ISL
Link State..... Up
Admin Mode..... Enabled
Type..... Dynamic
Port channel Min-links..... 1
Load Balance Option..... 7
(Enhanced hashing mode)

Mbr      Device/      Port      Port
Ports   Timeout     Speed     Active
-----
0/55    actor/long   100G Full  True
        partner/long
0/56    actor/long   100G Full  True
        partner/long
(cs1) #
```

The following example shows that the ISL ports are **up** on switch cs2:

```
(cs2)# show port-channel 1/1
Local Interface..... 1/1
Channel Name..... Cluster-ISL
Link State..... Up
Admin Mode..... Enabled
Type..... Dynamic
Port channel Min-links..... 1
Load Balance Option..... 7
(Enhanced hashing mode)

Mbr      Device/      Port      Port
Ports   Timeout     Speed     Active
-----
0/55    actor/long   100G Full  True
        partner/long
0/56    actor/long   100G Full  True
        partner/long
```

21. Delete the replaced CN1610 switches from the cluster's switch table, if they are not automatically removed:

ONTAP 9.8 and later

Beginning with ONTAP 9.8, use the command: `system switch ethernet delete -device device-name`

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

ONTAP 9.7 and earlier

For ONTAP 9.7 and earlier, use the command: `system cluster-switch delete -device device-name`

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

Step 3: Verify the configuration

1. Enable auto-revert on the cluster LIFs.

```
cluster1::*> network interface modify -vserver Cluster -lif * -auto
-revert true
```

2. On switch cs2, shut down and restart all cluster ports to trigger an auto-revert of all cluster LIFs that are not on their home ports.

```
cs2> enable
cs2# configure
cs2(config)# interface 0/1-0/16
cs2(config-if-range)# shutdown

(Wait for 5-10 seconds before re-enabling the ports)

cs2(config-if-range)# no shutdown

(After executing the no shutdown command, the nodes detect the change
and begin to auto-revert the cluster LIFs to their home ports)

cs2(config-if-range)# exit
cs2(config)# exit
cs2#
```

3. Verify that the cluster LIFs have reverted to their home ports (this might take a minute):

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

If any of the cluster LIFs have not reverted to their home port, manually revert them. You must connect to each node-mgmt LIF or SP/BMC system console of the local node that owns the LIF:

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

4. Verify that the cluster is healthy:

```
cluster show
```

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
```

Packet	Source	Destination	
Node	Date	LIF	LIF
Loss			
node1	3/5/2022 19:21:18 -06:00	node1_clus2	node2_clus1
node1	3/5/2022 19:21:20 -06:00	node1_clus2	node2_clus2
node2	3/5/2022 19:21:18 -06:00	node2_clus2	node1_clus1
node2	3/5/2022 19:21:20 -06:00	node2_clus2	node1_clus2

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 node2
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 169.254.19.183 to Remote 169.254.209.69
    Local 169.254.19.183 to Remote 169.254.49.125
    Local 169.254.47.194 to Remote 169.254.209.69
    Local 169.254.47.194 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, re-enable it by invoking an AutoSupport message:

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

```
cluster1::~*> system node autosupport invoke -node * -type all -message
MAINT=END
```

What's next?

After you've migrated your switches, you can [configure switch health monitoring](#).

Migrate to a switched NetApp cluster environment

If you have an existing two-node *switchless* cluster environment, you can migrate to a two-node *switched* cluster environment using Broadcom-supported BES-53248 cluster switches, which enables you to scale beyond two nodes in the cluster.

The migration process works for all cluster node ports using optical or Twinax ports, but it is not supported on this switch if nodes are using onboard 10GBASE-T RJ45 ports for the cluster network ports.

Review requirements

Review the following requirements for the cluster environment.

- Be aware that most systems require two dedicated cluster-network ports on each controller.
- Make sure that the BES-53248 cluster switch is set up as described in [Replace requirements](#) before starting this migration process.
- For the two-node switchless configuration, ensure that:
 - The two-node switchless configuration is properly set up and functioning.
 - The nodes are running ONTAP 9.5P8 and later. Support for 40/100 GbE cluster ports starts with EFOS firmware version 3.4.4.6 and later.
 - All cluster ports are in the **up** state.
 - All cluster logical interfaces (LIFs) are in the **up** state and on their home ports.
- For the Broadcom-supported BES-53248 cluster switch configuration, ensure that:
 - The BES-53248 cluster switch is fully functional on both switches.
 - Both switches have management network connectivity.
 - There is console access to the cluster switches.
 - BES-53248 node-to-node switch and switch-to-switch connections are using Twinax or fiber cables.

The [NetApp Hardware Universe](#) contains information about ONTAP compatibility, supported EFOS firmware, and cabling to BES-53248 switches. See [What additional information do I need to install my equipment that is not in HWU?](#) for more information about switch installation requirements.

- Inter-Switch Link (ISL) cables are connected to ports 0/55 and 0/56 on both BES-53248 switches.
- Initial customization of both the BES-53248 switches is complete, so that:
 - BES-53248 switches are running the latest version of software.
 - BES-53248 switches have optional port licenses installed, if purchased.
 - Reference Configuration Files (RCFs) are applied to the switches.
- Any site customization (SMTP, SNMP, and SSH) are configured on the new switches.

Port group speed constraints

- The 48 10/25GbE (SFP28/SFP+) ports are combined into 12 x 4-port groups as follows: Ports 1-4, 5-8, 9-12, 13-16, 17-20, 21-24, 25-28, 29-32, 33-36, 37-40, 41-44, and 45-48.
- The SFP28/SFP+ port speed must be the same (10GbE or 25GbE) across all ports in the 4-port group.
- If speeds in a 4-port group are different, the switch ports will not operate correctly.

Migrate to the cluster environment

About the examples

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

- The names of the BES-53248 switches are `cs1` and `cs2`.
- The names of the cluster SVMs are `node1` and `node2`.
- The names of the LIFs are `node1_clus1` and `node1_clus2` on node 1, and `node2_clus1` and `node2_clus2` on node 2.

node2_clus2 on node 2 respectively.

- The `cluster1::*>` prompt indicates the name of the cluster.
- The cluster ports used in this procedure are e0a and e0b.

The [NetApp Hardware Universe](#) contains the latest information about the actual cluster ports for your platforms.

Step 1: Prepare for migration

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

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

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



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

The following command suppresses automatic case creation for two hours:

```
cluster1::*> system node autosupport invoke -node * -type all -message MAINT=2h
```

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

```
set -privilege advanced
```

The advanced prompt (`*>`) appears.

Step 2: Configure ports and cabling

1. Disable all activated node-facing ports (not ISL ports) on both the new cluster switches **cs1** and **cs2**.



You must not disable the ISL ports.

The following example shows that node-facing ports 1 through 16 are disabled on switch cs1:

```
(cs1)# configure
(cs1)(Config)# interface 0/1-0/16
(cs1)(Interface 0/1-0/16)# shutdown
(cs1)(Interface 0/1-0/16)# exit
(cs1)(Config)# exit
```

2. Verify that the ISL and the physical ports on the ISL between the two BES-53248 switches cs1 and cs2 are up:

```
show port-channel
```

Show example

The following example shows that the ISL ports are up on switch cs1:

```
(cs1)# show port-channel 1/1
Local Interface..... 1/1
Channel Name..... Cluster-ISL
Link State..... Up
Admin Mode..... Enabled
Type..... Dynamic
Port channel Min-links..... 1
Load Balance Option..... 7
(Enhanced hashing mode)

Mbr      Device/      Port      Port
Ports   Timeout      Speed     Active
-----  -
0/55    actor/long   100G Full  True
        partner/long
0/56    actor/long   100G Full  True
        partner/long
(cs1) #
```

The following example shows that the ISL ports are up on switch cs2:

```
(cs2)# show port-channel 1/1
Local Interface..... 1/1
Channel Name..... Cluster-ISL
Link State..... Up
Admin Mode..... Enabled
Type..... Dynamic
Port channel Min-links..... 1
Load Balance Option..... 7
(Enhanced hashing mode)

Mbr      Device/      Port      Port
Ports   Timeout      Speed     Active
-----  -
0/55    actor/long   100G Full  True
        partner/long
0/56    actor/long   100G Full  True
        partner/long
```

3. Display the list of neighboring devices:

```
show isdp neighbors
```

This command provides information about the devices that are connected to the system.

Show example

The following example lists the neighboring devices on switch cs1:

```
(cs1)# show isdp neighbors
```

```
Capability Codes: R - Router, T - Trans Bridge, B - Source Route  
Bridge,
```

```
          S - Switch, H - Host, I - IGMP, r - Repeater
```

Device ID	Intf	Holdtime	Capability	Platform	Port ID
cs2	0/55	176	R	BES-53248	0/55
cs2	0/56	176	R	BES-53248	0/56

The following example lists the neighboring devices on switch cs2:

```
(cs2)# show isdp neighbors
```

```
Capability Codes: R - Router, T - Trans Bridge, B - Source Route  
Bridge,
```

```
          S - Switch, H - Host, I - IGMP, r - Repeater
```

Device ID	Intf	Holdtime	Capability	Platform	Port ID
cs2	0/55	176	R	BES-53248	0/55
cs2	0/56	176	R	BES-53248	0/56

4. Verify that all cluster ports are up:

```
network port show -ipSpace Cluster
```

Show example

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

```
Node: node1
```

Port	IPspace	Broadcast Domain	Link	MTU	Speed(Mbps) Admin/Oper	Health Status
e0a	Cluster	Cluster	up	9000	auto/10000	healthy
e0b	Cluster	Cluster	up	9000	auto/10000	healthy

```
Node: node2
```

Port	IPspace	Broadcast Domain	Link	MTU	Speed(Mbps) Admin/Oper	Health Status
e0a	Cluster	Cluster	up	9000	auto/10000	healthy
e0b	Cluster	Cluster	up	9000	auto/10000	healthy

5. Verify that all cluster LIFs are up and operational:

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

Show example

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

Current Is	Logical	Status	Network	Current
Vserver	Interface	Admin/Oper	Address/Mask	Node
Port	Home			

Cluster				
e0a	node1_clus1	up/up	169.254.209.69/16	node1
	true			
e0b	node1_clus2	up/up	169.254.49.125/16	node1
	true			
e0a	node2_clus1	up/up	169.254.47.194/16	node2
	true			
e0b	node2_clus2	up/up	169.254.19.183/16	node2
	true			

6. Disable auto-revert on the cluster LIFs.

```
cluster1::*> network interface modify -vserver Cluster -lif * -auto  
-revert false
```

7. Disconnect the cable from cluster port e0a on node1, and then connect e0a to port 1 on cluster switch cs1, using the appropriate cabling supported by the BES-53248 switches.

The [NetApp Hardware Universe](#) contains more information about cabling.

8. Disconnect the cable from cluster port e0a on node2, and then connect e0a to port 2 on cluster switch cs1, using the appropriate cabling supported by the BES-53248 switches.
9. Enable all node-facing ports on cluster switch cs1.

The following example shows that ports 1 through 16 are enabled on switch cs1:

```
(cs1)# configure  
(cs1) (Config)# interface 0/1-0/16  
(cs1) (Interface 0/1-0/16)# no shutdown  
(cs1) (Interface 0/1-0/16)# exit  
(cs1) (Config)# exit
```

10. Verify that all cluster ports are up:

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

Show example

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

```
Node: node1
```

```
Ignore
```

```
Speed(Mbps) Health
```

```
Health
```

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

```
-----
```

```
e0a      Cluster      Cluster      up    9000  auto/10000
```

```
healthy  false
```

```
e0b      Cluster      Cluster      up    9000  auto/10000
```

```
healthy  false
```

```
Node: node2
```

```
Ignore
```

```
Speed(Mbps) Health
```

```
Health
```

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

```
-----
```

```
e0a      Cluster      Cluster      up    9000  auto/10000
```

```
healthy  false
```

```
e0b      Cluster      Cluster      up    9000  auto/10000
```

```
healthy  false
```

11. Verify that all cluster LIFs are up and operational:

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

Show example

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

Current Is	Logical	Status	Network	Current	
Vserver	Interface	Admin/Oper	Address/Mask	Node	Port
Home					
-----	-----	-----	-----	-----	-----
Cluster					
true	node1_clus1	up/up	169.254.209.69/16	node1	e0a
true	node1_clus2	up/up	169.254.49.125/16	node1	e0b
true	node2_clus1	up/up	169.254.47.194/16	node2	e0a
true	node2_clus2	up/up	169.254.19.183/16	node2	e0b
true					

12. Display information about the status of the nodes in the cluster:

```
cluster show
```

Show example

The following example displays information about the health and eligibility of the nodes in the cluster:

```
cluster1::*> cluster show
```

Node	Health	Eligibility	Epsilon
-----	-----	-----	-----
node1	true	true	false
node2	true	true	false

13. Disconnect the cable from cluster port e0b on node1, and then connect e0b to port 1 on cluster switch cs2, using the appropriate cabling supported by the BES-53248 switches.
14. Disconnect the cable from cluster port e0b on node2, and then connect e0b to port 2 on cluster switch cs2, using the appropriate cabling supported by the BES-53248 switches.
15. Enable all node-facing ports on cluster switch cs2.

The following example shows that ports 1 through 16 are enabled on switch cs2:

```
(cs2)# configure
(cs2) (Config)# interface 0/1-0/16
(cs2) (Interface 0/1-0/16)# no shutdown
(cs2) (Interface 0/1-0/16)# exit
(cs2) (Config)# exit
```

16. Verify that all cluster ports are up:

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

Show example

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

```
Node: node1
```

```
Ignore
```

Port	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	Health Status
e0a	Cluster	Cluster		up	9000	auto/10000	healthy false
e0b	Cluster	Cluster		up	9000	auto/10000	healthy false

```
Node: node2
```

```
Ignore
```

Port	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	Health Status
e0a	Cluster	Cluster		up	9000	auto/10000	healthy false
e0b	Cluster	Cluster		up	9000	auto/10000	healthy false

Step 3: Verify the configuration

1. Enable auto-revert on the cluster LIFs.

```
cluster1::*> network interface modify -vserver Cluster -lif * -auto
-revert true
```

2. On switch cs2, shut down and restart all cluster ports to trigger an auto-revert of all cluster LIFs that are not on their home ports.

```
cs2> enable
cs2# configure
cs2(config)# interface 0/1-0/16
cs2(config-if-range)# shutdown

(Wait for 5-10 seconds before re-enabling the ports)

cs2(config-if-range)# no shutdown

(After executing the no shutdown command, the nodes detect the change
and begin to auto-revert the cluster LIFs to their home ports)

cs2(config-if-range)# exit
cs2(config)# exit
cs2#
```

3. Verify that the cluster LIFs have reverted to their home ports (this might take a minute):

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

If any of the cluster LIFs have not reverted to their home port, manually revert them. You must connect to each node-mgmt LIF or SP/BMC system console of the local node that owns the LIF:

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

4. Verify that all interfaces display true for Is Home:

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



This might take several minutes to complete.

Show example

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

	Logical	Status	Network	Current	
Current Is	Interface	Admin/Oper	Address/Mask	Node	Port
Home					
-----	-----	-----	-----	-----	-----
-----	-----				
Cluster					
true	node1_clus1	up/up	169.254.209.69/16	node1	e0a
true	node1_clus2	up/up	169.254.49.125/16	node1	e0b
true	node2_clus1	up/up	169.254.47.194/16	node2	e0a
true	node2_clus2	up/up	169.254.19.183/16	node2	e0b
true					

5. Verify that both nodes each have one connection to each switch:

```
show isdp neighbors
```

Show example

The following example shows the appropriate results for both switches:

```
(cs1)# show isdp neighbors
```

```
Capability Codes: R - Router, T - Trans Bridge, B - Source Route  
Bridge,
```

```
                  S - Switch, H - Host, I - IGMP, r - Repeater
```

```
Device ID          Intf          Holdtime  Capability  Platform  --  Port  
ID
```

```
-----  
-----  
node1              0/1          175      H          FAS2750    e0a  
node2              0/2          157      H          FAS2750    e0a  
cs2                0/55         178      R          BES-53248  0/55  
cs2                0/56         178      R          BES-53248  0/56
```

```
(cs2)# show isdp neighbors
```

```
Capability Codes: R - Router, T - Trans Bridge, B - Source Route  
Bridge,
```

```
                  S - Switch, H - Host, I - IGMP, r - Repeater
```

```
Device ID          Intf          Holdtime  Capability  Platform  Port  
ID
```

```
-----  
-----  
node1              0/1          137      H          FAS2750    e0b  
node2              0/2          179      H          FAS2750    e0b  
cs1                0/55         175      R          BES-53248  0/55  
cs1                0/56         175      R          BES-53248  0/56
```

6. Display information about the discovered network devices in your cluster:

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

Show example

```
cluster1::*> network device-discovery show -protocol cdp
Node/          Local  Discovered
Protocol      Port   Device (LLDP: ChassisID)  Interface
Platform
-----
node2         /cdp
              e0a    cs1                        0/2          BES-
53248
              e0b    cs2                        0/2          BES-
53248
node1         /cdp
              e0a    cs1                        0/1          BES-
53248
              e0b    cs2                        0/1          BES-
53248
```

7. Verify that the settings are disabled:

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



It might take several minutes for the command to complete. Wait for the '3 minute lifetime to expire' announcement.

The false output in the following example shows that the configuration settings are disabled:

```
cluster1::*> network options switchless-cluster show
Enable Switchless Cluster: false
```

8. Verify the status of the node members in the cluster:

```
cluster show
```

Show example

The following example shows information about the health and eligibility of the nodes in the cluster:

```
cluster1::*> cluster show
```

Node	Health	Eligibility	Epsilon
node1	true	true	false
node2	true	true	false

9. 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
```

Packet	Source	Destination
Node	LIF	LIF
Date		
Loss		
node1		
3/5/2022 19:21:18 -06:00	node1_clus2	node2_clus1
node		
3/5/2022 19:21:20 -06:00	node1_clus2	node2_clus2
node2		
3/5/2022 19:21:18 -06:00	node2_clus2	node1_clus1
node		
3/5/2022 19:21:20 -06:00	node2_clus2	node1_clus2
node		

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 node2
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 169.254.19.183 to Remote 169.254.209.69
    Local 169.254.19.183 to Remote 169.254.49.125
    Local 169.254.47.194 to Remote 169.254.209.69
    Local 169.254.47.194 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)

```

10. Change the privilege level back to admin:

```
set -privilege admin
```

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

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

Show example

```

cluster1::*> system node autosupport invoke -node * -type all
-messsage MAINT=END

```

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

What's next?

After you've migrated your switches, you can [configure switch health monitoring](#).

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