



# **Migrate to a two-node switched cluster**

## **Cluster and storage switches**

NetApp  
August 12, 2022

# Table of Contents

- Migrate to a two-node switched cluster ..... 1
  - Migrate to a two-node switched cluster with Broadcom-supported BES-53248 cluster switches ..... 1
  - Migrate to a switched NetApp cluster environment using Broadcom-supported BES-53248 cluster switches ..... 1

# Migrate to a two-node switched cluster

## Migrate to a two-node switched cluster with Broadcom-supported BES-53248 cluster switches

If you have a two-node switchless cluster, you can migrate, non-disruptively, to a two-node switched cluster that includes Broadcom-supported BES-53248 cluster switches. The documented process works for all cluster node ports using optical or Twinax ports but is not supported on this switch if nodes are using onboard 10GBASE-T RJ45 ports for the cluster network ports.

### About this task

Most systems require two dedicated cluster-network ports on each controller.

Ensure that the BES-53248 cluster switch is set up as described in [Broadcom-supported BES-53248 switches setup and configuration](#) before starting this migration process.



After your migration completes, you might need to install the required configuration file to support the Cluster Switch Health Monitor (CSHM) for BES-53248 cluster switches.

See [Installing the Cluster Switch Health Monitor \(CSHM\) configuration file](#) in the *Switch Setup and Configuration Guide for Broadcom-supported BES-53248 switches* guide.

Also, see [Install the Cluster Switch Health Monitor \(CSHM\) configuration file](#) and [Configure the cluster switch log collection feature](#) for the steps required to enable cluster health switch log collection used for collecting switch-related log files.

## Migrate to a switched NetApp cluster environment using Broadcom-supported BES-53248 cluster switches

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 to enable you to scale beyond two nodes in the cluster.

### What you'll need

Two-node switchless configuration:

- The two-node switchless configuration must be properly set up and functioning.
- The nodes must be 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 must be in the up state.
- All cluster logical interfaces (LIFs) must be in the up state and on their home ports.

Broadcom-supported BES-53248 cluster switch configuration:

- The BES-53248 cluster switch must be fully functional on both switches.
- Both switches must have management network connectivity.

- There must be console access to the cluster switches.
- BES-53248 node-to-node switch and switch-to-switch connections must use Twinax or fiber cables.

The [NetApp Hardware Universe](#) contains information about ONTAP compatibility, supported EFOS firmware, and cabling to BES-53248 switches.

- Inter-Switch Link (ISL) cables must be connected to ports 0/55 and 0/56 on both BES-53248 switches.
- Initial customization of both the BES-53248 switches must be completed. So that the:
  - BES-53248 switches are running the latest version of software
  - BES-53248 switches have optional port licenses installed, if purchased
  - Reference Configuration Files (RCFs) have been applied to the switches

Any site customization, such as SMTP, SNMP, and SSH must be configured on the new switches.

### About this task

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 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.

### Steps

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

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

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.

3. 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
```

4. 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
```

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

##### 5. Display the list of neighboring devices:

```
show isdp neighbors
```

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

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

6. Verify that all cluster ports are up:

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

Each port should display up for Link and healthy for Health Status.

```
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

7. Verify that all cluster LIFs are up and operational: `network interface show -vserver Cluster`

Each cluster LIF should display true for Is Home and have a Status Admin/Oper of up/up

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

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

- Verify that auto-revert is enabled on all cluster LIFs: `network interface show -vserver Cluster -fields auto-revert`

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

	Logical	
Vserver	Interface	Auto-revert
-----	-----	-----
Cluster		
node1_clus1	true	
node1_clus2	true	
node2_clus1	true	
node2_clus2	true	

- 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.

- 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.
- 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
```

12. Verify that all cluster LIFs are up, operational, and display as true for Is Home:

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

The following example shows that all of the LIFs are up on node1 and node2 and that Is Home results are true:

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

Is	Logical	Status	Network	Current	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					

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

```
cluster show
```

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

14. 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.
15. 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.
16. 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
```

17. Verify that all cluster ports are up:

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

The following example shows that all of the cluster ports are up on node1 and node2:

```
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							

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

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



This might take several minutes to complete.

The following example shows that all LIFs are up on node1 and node2 and that Is Home results are true:

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

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

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

```
show isdp neighbors
```

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

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

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

```
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

21. 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
```

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

```
cluster show
```

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

23. Ensure that the cluster network has full connectivity using the command:

```
cluster ping-cluster -node node-name
```

```
cluster1::*> cluster ping-cluster -node local

Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 192.168.168.26 node1 e0a
Cluster node1_clus2 192.168.168.27 node1 e0b
Cluster node2_clus1 192.168.168.28 node2 e0a
Cluster node2_clus2 192.168.168.29 node2 e0b
Local = 192.168.168.28 192.168.168.29
Remote = 192.168.168.26 192.168.168.27
Cluster Vserver Id = 4294967293
Ping status:
....
Basic connectivity succeeds on 4 path(s)
Basic connectivity fails on 0 path(s)
.....
Detected 1500 byte MTU on 4 path(s):
    Local 192.168.168.28 to Remote 192.168.168.26
    Local 192.168.168.28 to Remote 192.168.168.27
    Local 192.168.168.29 to Remote 192.168.168.26
    Local 192.168.168.29 to Remote 192.168.168.27
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)
```

24. Change the privilege level back to admin:

```
set -privilege admin
```

25. If you suppressed automatic case creation, reenable 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
```

### After you finish

See [Install the Cluster Switch Health Monitor \(CSHM\) configuration file](#) and [Configure the cluster switch log collection feature](#) for the steps required to enable cluster health switch log collection used for collecting switch-related log files.

### Related information

[NetApp Hardware Universe](#)

[Broadcom-supported BES-53248 switches setup and configuration](#)

[NetApp KB Article: How to suppress automatic case creation during scheduled maintenance windows](#)



## Copyright Information

Copyright © 2022 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system- without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

## Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.