



Cisco Nexus 3232C switches

ONTAP Systems Switches

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Cisco Nexus 3232C switches

Cisco Nexus 3232C switches

You can use Cisco Nexus 3232C switches as cluster switches in your AFF or FAS cluster.

- You can install the switch, migrate from an existing switch, replace a switch, and update the RCF files on the switch.
- You can install NX-OS and reference configuration files (RCF's) on the Cisco Nexus 3232C cluster switch.
- You can migrate from a two-node switchless cluster to a cluster with Cisco Nexus 3232C cluster switches.
- You can replace a Cisco Nexus 3232C cluster or storage switch.
- You can install the Cisco Nexus 3232C switch (X190100) NetApp system cabinet with the custom brackets that come with the switch, or you can install it in a rack with the standard brackets that are also included with the switch.

Migrate a CN1610 switch to a Cisco Nexus 3232C cluster switch

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

The cluster switches support the following node connections:

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

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

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

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

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

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

Stage	Description	Required cables
Final	3232C to 3232C (QSFP to QSFP)	2 QSFP optical fiber or copper direct-attach cables

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

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

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

Install NX-OS software and RCFs on Cisco Nexus 3232C cluster switches

The Cisco NX-OS software and reference configuration files (RCFs) must be installed on Cisco Nexus 3232C cluster switches.

Before you begin

The following conditions must exist before you install the NX-OS software and Reference Configurations Files (RCFs) on the cluster switch:

- The cluster must be fully functioning (there should be no errors in the logs or similar -ssues).
- You must have checked or set your desired boot configuration in the RCF to reflect the desired boot images if you are installing only NX-OS and keeping your current RCF version.
- If you need to change the boot configuration to reflect the current boot images, you must do so before reapplying the RCF so that the correct version is instantiated on future reboots.
- You must have a console connection to the switch, required when installing the RCF.
- You must have consulted the switch compatibility table on the [Cisco Ethernet switch page](#) for the supported ONTAP, NX-OS, and RCF versions.
- There can be command dependencies between the command syntax in the RCF and that found in versions of NX-OS.
- You must have referred to the appropriate software and upgrade guides available on the Cisco web site for complete documentation on the Cisco switch upgrade and downgrade procedures on [Cisco Nexus 3000 Series Switches](#).
- You must have the current RCF.

About this task

The examples in this procedure use two nodes. These nodes use two 10GbE cluster interconnect ports e0a and e0b.

See the [Hardware Universe](#) to verify the correct cluster ports on your platforms.



The command outputs might vary depending on different releases of ONTAP.

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

- The names of the two Cisco switches are `cs1` and `cs2`.
- The node names are `cluster1-01` and `cluster1-02`.
- The cluster LIF names are `cluster1-01_clus1` and `cluster1-01_clus2` for `cluster1-01` and `cluster1-02_clus1` and `cluster1-02_clus2` for `cluster1-02`.
- The `cluster1::*>` prompt indicates the name of the cluster.



The procedure requires the use of both ONTAP commands and Cisco Nexus 3000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

Steps

1. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=x h`

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.

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

```
set -privilege advanced
```

The advanced prompt (`*>`) appears.

3. Display how many cluster interconnect interfaces are configured in each node for each cluster interconnect switch: `network device-discovery show -protocol cdp`

```
cluster1::*> network device-discovery show -protocol cdp
```

Node/ Protocol	Local Port	Discovered Device (LLDP: ChassisID)	Interface	Platform

cluster1-02/cdp				
	e0a	cs1	Eth1/2	N3K-
C3232C				
	e0b	cs2	Eth1/2	N3K-
C3232C				
cluster1-01/cdp				
	e0a	cs1	Eth1/1	N3K-
C3232C				
	e0b	cs2	Eth1/1	N3K-
C3232C				

```
4 entries were displayed.
```

4. Check the administrative or operational status of each cluster interface.

a. Display the network port attributes: `network port show -ipspace Cluster`

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

Node: cluster1-02

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

Node: cluster1-01

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

4 entries were displayed.

b. Display information about the LIFs: `network interface show -vserver Cluster`

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

Current Is	Logical	Status	Network	Current
Vserver	Interface	Admin/Oper	Address/Mask	Node
Port	Home			
Cluster				
	cluster1-01_clus1	up/up	169.254.209.69/16	
cluster1-01	e0a true			
	cluster1-01_clus2	up/up	169.254.49.125/16	
cluster1-01	e0b true			
	cluster1-02_clus1	up/up	169.254.47.194/16	
cluster1-02	e0a true			
	cluster1-02_clus2	up/up	169.254.19.183/16	
cluster1-02	e0b true			

4 entries were displayed.

5. Ping the remote cluster LIFs: `cluster ping-cluster -node node-name`

```

cluster1::*> **cluster ping-cluster -node cluster1-02**
Host is cluster1-02
Getting addresses from network interface table...
Cluster cluster1-01_clus1 169.254.209.69 cluster1-01      e0a
Cluster cluster1-01_clus2 169.254.49.125 cluster1-01      e0b
Cluster cluster1-02_clus1 169.254.47.194 cluster1-02      e0a
Cluster cluster1-02_clus2 169.254.19.183 cluster1-02      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. Verify that the auto-revert command is enabled on all cluster LIFs: network interface show -vserver Cluster -fields auto-revert

```

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

```

Vserver	Logical Interface	Auto-revert
Cluster	cluster1-01_clus1	true
	cluster1-01_clus2	true
	cluster1-02_clus1	true
	cluster1-02_clus2	true

4 entries were displayed.

7. For ONTAP 9.8 and later, enable the Ethernet switch health monitor log collection feature for collecting switch-related log files, using the commands: system switch ethernet log setup-password

```

system switch ethernet log enable-collection

```

```

cluster1::*> system switch ethernet log setup-password
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
cs1
cs2

cluster1::*> system switch ethernet log setup-password

Enter the switch name: cs1
RSA key fingerprint is e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] y

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

cluster1::*> system switch ethernet log setup-password

Enter the switch name: cs2
RSA key fingerprint is 57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] y

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

cluster1::*> system switch ethernet log enable-collection

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

Enabling cluster switch log collection.

cluster1::*>

```



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

8. For ONTAP releases 9.5P16, 9.6P12, and 9.7P10 and later patch releases, enable the Ethernet switch health monitor log collection feature for collecting switch-related log files, using the commands: `system cluster-switch log setup-password`

```
system cluster-switch log enable-collection
```



```

cluster1::*> system cluster-switch log setup-password
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
cs1
cs2

cluster1::*> system cluster-switch log setup-password

Enter the switch name: cs1
RSA key fingerprint is e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] y

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

cluster1::*> system cluster-switch log setup-password

Enter the switch name: cs2
RSA key fingerprint is 57:49:86:a1:b9:80:6a:61:9a:86:8e:3c:e3:b7:1f:b1
Do you want to continue? {y|n}:: [n] y

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

cluster1::*> system cluster-switch log enable-collection

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

Enabling cluster switch log collection.

cluster1::*>

```



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

Install the NX-OS software

You can use this procedure to install the NX-OS software on the Nexus 3232C cluster switch.

Steps

1. Connect the cluster switch to the management network.

2. Use the `ping` command to verify connectivity to the server hosting the NX-OS software and the RCF.

This example verifies that the switch can reach the server at IP address 172.19.2.1:

```
cs2# ping 172.19.2.1
Pinging 172.19.2.1 with 0 bytes of data:

Reply From 172.19.2.1: icmp_seq = 0. time= 5910 usec.
```

3. Copy the NX-OS software and EPLD images to the Nexus 3232C switch.

```
cs2# copy sftp: bootflash: vrf management
Enter source filename: /code/nxos.9.3.4.bin
Enter hostname for the sftp server: 172.19.2.1
Enter username: user1

Outbound-ReKey for 172.19.2.1:22
Inbound-ReKey for 172.19.2.1:22
user1@172.19.2.1's password:
sftp> progress
Progress meter enabled
sftp> get /code/nxos.9.3.4.bin /bootflash/nxos.9.3.4.bin
/code/nxos.9.3.4.bin 100% 1261MB 9.3MB/s 02:15
sftp> exit
Copy complete, now saving to disk (please wait)...
Copy complete.

cs2# copy sftp: bootflash: vrf management
Enter source filename: /code/n9000-epld.9.3.4.img
Enter hostname for the sftp server: 172.19.2.1
Enter username: user1

Outbound-ReKey for 172.19.2.1:22
Inbound-ReKey for 172.19.2.1:22
user1@172.19.2.1's password:
sftp> progress
Progress meter enabled
sftp> get /code/n9000-epld.9.3.4.img /bootflash/n9000-epld.9.3.4.img
/code/n9000-epld.9.3.4.img 100% 161MB 9.5MB/s 00:16
sftp> exit
Copy complete, now saving to disk (please wait)...
Copy complete.
```

4. Verify the running version of the NX-OS software:

```
cs2# show version
```

```
Cisco Nexus Operating System (NX-OS) Software
```

```
TAC support: http://www.cisco.com/tac
```

```
Copyright (C) 2002-2019, Cisco and/or its affiliates.
```

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```

```
http://www.gnu.org/licenses/old-licenses/library.txt.
```

Software

```
BIOS: version 08.37
```

```
NXOS: version 9.3(3)
```

```
BIOS compile time: 01/28/2020
```

```
NXOS image file is: bootflash:///nxos.9.3.3.bin
```

```
NXOS compile time: 12/22/2019 2:00:00 [12/22/2019 14:00:37]
```

Hardware

```
cisco Nexus3000 C3232C Chassis (Nexus 9000 Series)
```

```
Intel(R) Xeon(R) CPU E5-2403 v2 @ 1.80GHz with 8154432 kB of memory.
```

```
Processor Board ID FO??????GD
```

```
Device name: cs2
```

```
bootflash: 53298520 kB
```

```
Kernel uptime is 0 day(s), 0 hour(s), 3 minute(s), 36 second(s)
```

```
Last reset at 74117 usecs after Tue Nov 24 06:24:23 2020
```

```
Reason: Reset Requested by CLI command reload
```

```
System version: 9.3(3)
```

```
Service:
```

```

plugin
  Core Plugin, Ethernet Plugin

Active Package(s):

cs2#

```

5. Install the NX-OS image.

Installing the image file causes it to be loaded every time the switch is rebooted.

```

cs2# install all nxos bootflash:nxos.9.3.4.bin
Installer will perform compatibility check first. Please wait.
Installer is forced disruptive

Verifying image bootflash:/nxos.9.3.4.bin for boot variable "nxos".
[#####] 100% -- SUCCESS

Verifying image type.
[#####] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos.9.3.4.bin.
[#####] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos.9.3.4.bin.
[#####] 100% -- SUCCESS

Performing module support checks.
[#####] 100% -- SUCCESS

Notifying services about system upgrade.
[#####] 100% -- SUCCESS

Compatibility check is done:
Module  bootable          Impact          Install-type  Reason
-----  -
      1      yes          disruptive          reset          default
upgrade is not hitless

Images will be upgraded according to following table:
Module      Image      Running-Version(pri:alt)      New-
Version      Upg-Required
-----

```

```

1          nxos          9.3(3)          9.3(4)
yes
1          bios          v08.37(01/28/2020):v08.32(10/18/2016)
v08.37(01/28/2020)      no

Switch will be reloaded for disruptive upgrade.
Do you want to continue with the installation (y/n)?  [n] y

Install is in progress, please wait.

Performing runtime checks.
[#####] 100% -- SUCCESS

Setting boot variables.
[#####] 100% -- SUCCESS

Performing configuration copy.
[#####] 100% -- SUCCESS

Module 1: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS

Finishing the upgrade, switch will reboot in 10 seconds.
cs2#

```

6. Verify the new version of NX-OS software after the switch has rebooted: show version

```

cs2# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (C) 2002-2020, Cisco and/or its affiliates.
All rights reserved.
The copyrights to certain works contained in this software are
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```

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http://www.opensource.org/licenses/lgpl-2.1.php and  
http://www.gnu.org/licenses/old-licenses/library.txt.
```

Software

```
BIOS: version 08.37  
NXOS: version 9.3(4)  
BIOS compile time: 01/28/2020  
NXOS image file is: bootflash:///nxos.9.3.4.bin  
NXOS compile time: 4/28/2020 21:00:00 [04/29/2020 06:28:31]
```

Hardware

```
cisco Nexus3000 C3232C Chassis (Nexus 9000 Series)  
Intel(R) Xeon(R) CPU E5-2403 v2 @ 1.80GHz with 8154432 kB of memory.  
Processor Board ID FO?????GD  
  
Device name: rtpnpi-mcc01-8200-ms-A1  
bootflash: 53298520 kB  
Kernel uptime is 0 day(s), 0 hour(s), 3 minute(s), 14 second(s)
```

```
Last reset at 196755 usecs after Tue Nov 24 06:37:36 2020  
Reason: Reset due to upgrade  
System version: 9.3(3)  
Service:
```

plugin

```
Core Plugin, Ethernet Plugin
```

```
Active Package(s):
```

```
cs2#
```

7. Upgrade the EPLD image and reboot the switch.

```
cs2# show version module 1 epld
```

EPLD Device	Version
MI FPGA	0x12
IO FPGA	0x11

```
cs2# install epld bootflash:n9000-epld.9.3.4.img module 1
```

Compatibility check:

Module	Type	Upgradable	Impact	Reason
1	SUP	Yes	disruptive	Module Upgradable

Retrieving EPLD versions.... Please wait.

Images will be upgraded according to following table:

Module	Type	EPLD	Running-Version	New-Version	Upg-Required
1	SUP	MI FPGA	0x12	0x12	No
1	SUP	IO FPGA	0x11	0x12	Yes

The above modules require upgrade.

The switch will be reloaded at the end of the upgrade

Do you want to continue (y/n) ? [n] y

Proceeding to upgrade Modules.

Starting Module 1 EPLD Upgrade

Module 1 : IO FPGA [Programming] : 100.00% (64 of 64 sectors)

Module 1 EPLD upgrade is successful.

Module	Type	Upgrade-Result
1	SUP	Success

Module 1 EPLD upgrade is successful.

```
cs2#
```

8. After the switch reboot, log in again, upgrade the EPLD golden image and reboot the switch once again.

```

cs2# install epld bootflash:n9000-epld.9.3.4.img module 1 golden
Digital signature verification is successful
Compatibility check:
Module          Type          Upgradable          Impact          Reason
-----
1              SUP              Yes              disruptive      Module Upgradable

Retrieving EPLD versions.... Please wait.
The above modules require upgrade.
The switch will be reloaded at the end of the upgrade
Do you want to continue (y/n) ? [n] y

Proceeding to upgrade Modules.

Starting Module 1 EPLD Upgrade

Module 1 : MI FPGA [Programming] : 100.00% (      64 of      64 sect
Module 1 : IO FPGA [Programming] : 100.00% (      64 of      64 sect
Module 1 EPLD upgrade is successful.
Module          Type  Upgrade-Result
-----
1              SUP      Success

EPLDs upgraded.

Module 1 EPLD upgrade is successful.
cs2#

```

9. After the switch reboot, log in to verify that the new version of EPLD loaded successfully.

```

cs2# show version module 1 epld

EPLD Device          Version
-----
MI    FPGA            0x12
IO    FPGA            0x12

```

Install the Reference Configuration File (RCF)

You can install the RCF after setting up the Nexus 3232C switch for the first time. You can also use this procedure to upgrade your RCF version.

About this task

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

- The names of the two Cisco switches are `cs1` and `cs2`.
- The node names are `cluster1-01`, `cluster1-02`, `cluster1-03`, and `cluster1-04`.
- The cluster LIF names are `cluster1-01_clus1`, `cluster1-01_clus2`, `cluster1-02_clus1`, `cluster1-02_clus2`, `cluster1-03_clus1`, `cluster1-03_clus2`, `cluster1-04_clus1`, and `cluster1-04_clus2`.
- The `cluster1::*>` prompt indicates the name of the cluster.



The procedure requires the use of both ONTAP commands and Cisco Nexus 3000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

Steps

1. Display the cluster ports on each node that are connected to the cluster switches: `network device-discovery show`

```
cluster1::*> network device-discovery show
Node/      Local   Discovered
Protocol   Port    Device (LLDP: ChassisID)  Interface      Platform
-----
cluster1-01/cdp
           e0a     cs1                      Ethernet1/7     N3K-
C3232C
           e0d     cs2                      Ethernet1/7     N3K-
C3232C
cluster1-02/cdp
           e0a     cs1                      Ethernet1/8     N3K-
C3232C
           e0d     cs2                      Ethernet1/8     N3K-
C3232C
cluster1-03/cdp
           e0a     cs1                      Ethernet1/1/1   N3K-
C3232C
           e0b     cs2                      Ethernet1/1/1   N3K-
C3232C
cluster1-04/cdp
           e0a     cs1                      Ethernet1/1/2   N3K-
C3232C
           e0b     cs2                      Ethernet1/1/2   N3K-
C3232C
cluster1::*>
```

2. Check the administrative and operational status of each cluster port.
 - a. Verify that all the cluster ports are up with a healthy status: `network port show -role cluster`

```
cluster1::*> network port show -role cluster
```

Node: cluster1-01

Ignore

						Speed(Mbps)	Health
Health							
Port	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	Status
Status							
-----	-----	-----		----	----	-----	
-----	-----						
e0a	Cluster	Cluster		up	9000	auto/100000	
healthy	false						
e0d	Cluster	Cluster		up	9000	auto/100000	
healthy	false						

Node: cluster1-02

Ignore

						Speed(Mbps)	Health
Health							
Port	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	Status
Status							
-----	-----	-----		----	----	-----	
-----	-----						
e0a	Cluster	Cluster		up	9000	auto/100000	
healthy	false						
e0d	Cluster	Cluster		up	9000	auto/100000	
healthy	false						

8 entries were displayed.

Node: cluster1-03

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: cluster1-04

```

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
cluster1::*>

```

- b. Verify that all the cluster interfaces (LIFs) are on the home port: `network interface show -role cluster`

```

cluster1::*> network interface show -role cluster
Logical      Status      Network      Current
Current Is
Vserver      Interface      Admin/Oper Address/Mask  Node
Port      Home
-----
Cluster
01  e0a      cluster1-01_clus1  up/up      169.254.3.4/23  cluster1-
true
01  e0d      cluster1-01_clus2  up/up      169.254.3.5/23  cluster1-
true
02  e0a      cluster1-02_clus1  up/up      169.254.3.8/23  cluster1-
true
02  e0d      cluster1-02_clus2  up/up      169.254.3.9/23  cluster1-
true
03  e0a      cluster1-03_clus1  up/up      169.254.1.3/23  cluster1-
true
03  e0b      cluster1-03_clus2  up/up      169.254.1.1/23  cluster1-
true
04  e0a      cluster1-04_clus1  up/up      169.254.1.6/23  cluster1-
true
04  e0b      cluster1-04_clus2  up/up      169.254.1.7/23  cluster1-
true
8 entries were displayed.
cluster1::*>

```

- c. Verify that the cluster displays information for both cluster switches: `system cluster-switch show -is-monitoring-enabled-operational true`

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

Switch	Type	Address	Model
cs1	cluster-network	10.233.205.92	
NX3232C			
Serial Number: FOXXXXXXXXGS			
Is Monitored: true			
Reason: None			
Software Version: Cisco Nexus Operating System (NX-OS) Software,			
Version			
9.3(4)			
Version Source: CDP			
cs2	cluster-network	10.233.205.93	
NX3232C			
Serial Number: FOXXXXXXXXGD			
Is Monitored: true			
Reason: None			
Software Version: Cisco Nexus Operating System (NX-OS) Software,			
Version			
9.3(4)			
Version Source: CDP			

2 entries were displayed.

3. Disable auto-revert on the cluster LIFs.

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

4. On cluster switch cs2, shut down the ports connected to the cluster ports of the nodes.

```
cs2(config)# interface eth1/1/1-2,eth1/7-8
cs2(config-if-range)# shutdown
```

5. Verify that the cluster ports have migrated to the ports hosted on cluster switch cs1. This might take a few seconds.

network interface show -role cluster

```

cluster1::*> network interface show -role cluster

```

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

Cluster				
e0a	true	cluster1-01_clus1 up/up	169.254.3.4/23	cluster1-01
e0a	false	cluster1-01_clus2 up/up	169.254.3.5/23	cluster1-01
e0a	true	cluster1-02_clus1 up/up	169.254.3.8/23	cluster1-02
e0a	false	cluster1-02_clus2 up/up	169.254.3.9/23	cluster1-02
e0a	true	cluster1-03_clus1 up/up	169.254.1.3/23	cluster1-03
e0a	false	cluster1-03_clus2 up/up	169.254.1.1/23	cluster1-03
e0a	true	cluster1-04_clus1 up/up	169.254.1.6/23	cluster1-04
e0a	false	cluster1-04_clus2 up/up	169.254.1.7/23	cluster1-04

```

8 entries were displayed.
cluster1::*>

```

6. Verify that the cluster is healthy: `cluster show`

```

cluster1::*> cluster show

```

Node	Health	Eligibility	Epsilon
cluster1-01	true	true	false
cluster1-02	true	true	false
cluster1-03	true	true	true
cluster1-04	true	true	false

```

4 entries were displayed.
cluster1::*>

```

7. Clean the configuration on switch cs2 and perform a basic setup.

- a. Clean the configuration. This step requires a console connection to the switch.

```

cs2# write erase
Warning: This command will erase the startup-configuration.
Do you wish to proceed anyway? (y/n)  [n] y
cs2# reload
This command will reboot the system. (y/n)?  [n] y
cs2#

```

b. Perform a basic setup of the switch.

8. Copy the RCF to the bootflash of switch cs2 using one of the following transfer protocols: FTP, TFTP, SFTP, or SCP. For more information on Cisco commands, see the appropriate guide in the [Cisco Nexus 3000 Series NX-OS Command Reference](#) guides.

This example shows TFTP being used to copy an RCF to the bootflash on switch cs2:

```

cs2# copy tftp: bootflash: vrf management
Enter source filename: Nexus_3232C_RCF_v1.6-Cluster-HA-Breakout.txt
Enter hostname for the tftp server: 172.22.201.50
Trying to connect to tftp server.....Connection to Server Established.
TFTP get operation was successful
Copy complete, now saving to disk (please wait)...

```

9. Apply the RCF previously downloaded to the bootflash.

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

This example shows the RCF file `Nexus_3232C_RCF_v1.6-Cluster-HA-Breakout.txt` being installed on switch cs2:

```

cs2# copy Nexus_3232C_RCF_v1.6-Cluster-HA-Breakout.txt running-config
echo-commands

```

10. Examine the banner output from the `show banner motd` command. You must read and follow the instructions under **Important Notes** to ensure the proper configuration and operation of the switch.

```

cs2# show banner motd

*****
*****
* NetApp Reference Configuration File (RCF)
*
* Switch      : Cisco Nexus 3232C
* Filename    : Nexus_3232C_RCF_v1.6-Cluster-HA-Breakout.txt
* Date       : Oct-20-2020

```

```

* Version   : v1.6
*
* Port Usage : Breakout configuration
* Ports  1- 3: Breakout mode (4x10GbE) Intra-Cluster Ports, int e1/1/1-4,
* e1/2/1-4, e1/3/1-4
* Ports  4- 6: Breakout mode (4x25GbE) Intra-Cluster/HA Ports, int e1/4/1-4,
* e1/5/1-4, e1/6/1-4
* Ports  7-30: 40/100GbE Intra-Cluster/HA Ports, int e1/7-30
* Ports 31-32: Intra-Cluster ISL Ports, int e1/31-32
* Ports 33-34: 10GbE Intra-Cluster 10GbE Ports, int e1/33-34
*
* IMPORTANT NOTES
* - Load Nexus_3232C_RCF_v1.6-Cluster-HA.txt for non breakout config
*
* - This RCF utilizes QoS and requires TCAM re-configuration, requiring RCF
*   to be loaded twice with the Cluster Switch rebooted in between.
*
* - Perform the following 4 steps to ensure proper RCF installation:
*
*   (1) Apply RCF first time, expect following messages:
*       - Please save config and reload the system...
*       - Edge port type (portfast) should only be enabled on ports...
*       - TCAM region is not configured for feature QoS class IPv4 ingress...
*
*   (2) Save running-configuration and reboot Cluster Switch
*
*   (3) After reboot, apply same RCF second time and expect following messages:
*       - % Invalid command at '^' marker
*       - Syntax error while parsing...
*
*   (4) Save running-configuration again
*****
*****

```

11. Verify that the RCF file is the correct newer version: `show running-config`

When you check the output to verify you have the correct RCF, make sure that the following information is correct:

- The RCF banner
- The node and port settings

- Customizations The output varies according to your site configuration. Check the port settings and refer to the release notes for any changes specific to the RCF that you have installed.
12. After you verify the RCF versions and switch settings are correct, copy the running-config file to the startup-config file.

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

```
cs2# copy running-config startup-config
\[#####\] 100% Copy complete
```

13. Reboot switch cs2. You can ignore the "cluster ports down" events reported on the nodes while the switch reboots.

```
cs2# reload
This command will reboot the system. (y/n)? [n] y
```

14. Apply the same RCF and save the running configuration for a second time.

```
cs2# copy Nexus_3232C_RCF_v1.6-Cluster-HA-Breakout.txt running-config
echo-commands
cs2# copy running-config startup-config
[#####] 100% Copy complete
```

15. Verify the health of cluster ports on the cluster.

- a. Verify that e0d ports are up and healthy across all nodes in the cluster: `network port show -role cluster`

```
cluster1::*> network port show -role cluster

Node: cluster1-01

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: cluster1-02

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: cluster1-03

Ignore

Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
-----
e0a        Cluster      Cluster      up    9000  auto/100000
healthy false
e0d        Cluster      Cluster      up    9000  auto/100000
healthy false

Node: cluster1-04

Ignore

Speed(Mbps) Health
Health
Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
Status
-----
e0a        Cluster      Cluster      up    9000  auto/100000
healthy false
e0d        Cluster      Cluster      up    9000  auto/100000
healthy false
8 entries were displayed.

```

b. Verify the switch health from the cluster (this might not show switch cs2, since LIFs are not homed on

e0d).

```
cluster1::*> network device-discovery show -protocol cdp
```

Node/ Protocol Platform	Local Port	Discovered Device (LLDP: ChassisID)	Interface	
cluster1-01/cdp	e0a	cs1	Ethernet1/7	N3K-
C3232C	e0d	cs2	Ethernet1/7	N3K-
C3232C				
cluster01-2/cdp	e0a	cs1	Ethernet1/8	N3K-
C3232C	e0d	cs2	Ethernet1/8	N3K-
C3232C				
cluster01-3/cdp	e0a	cs1	Ethernet1/1/1	N3K-
C3232C	e0b	cs2	Ethernet1/1/1	N3K-
C3232C				
cluster1-04/cdp	e0a	cs1	Ethernet1/1/2	N3K-
C3232C	e0b	cs2	Ethernet1/1/2	N3K-
C3232C				

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

Switch	Type	Address	Model
cs1	cluster-network	10.233.205.90	N3K-
C3232C			
Serial Number: FOXXXXXXXXGD			
Is Monitored: true			
Reason: None			
Software Version: Cisco Nexus Operating System (NX-OS) Software,			
Version			
9.3(4)			
Version Source: CDP			
cs2	cluster-network	10.233.205.91	N3K-
C3232C			
Serial Number: FOXXXXXXXXGS			

```
Is Monitored: true
Reason: None
Software Version: Cisco Nexus Operating System (NX-OS) Software,
Version
9.3(4)
Version Source: CDP

2 entries were displayed.
```

You might observe the following output on the cs1 switch console depending on the RCF version previously loaded on the switch



```
2020 Nov 17 16:07:18 cs1 %$ VDC-1 %$ %STP-2-
UNBLOCK_CONSIST_PORT: Unblocking port port-channel1 on
VLAN0092. Port consistency restored.
2020 Nov 17 16:07:23 cs1 %$ VDC-1 %$ %STP-2-BLOCK_PVID_PEER:
Blocking port-channel1 on VLAN0001. Inconsistent peer vlan.
2020 Nov 17 16:07:23 cs1 %$ VDC-1 %$ %STP-2-BLOCK_PVID_LOCAL:
Blocking port-channel1 on VLAN0092. Inconsistent local vlan.
```

16. On cluster switch cs1, shut down the ports connected to the cluster ports of the nodes.

The following example uses the interface example output from step 1:

```
cs1(config)# interface eth1/1/1-2,eth1/7-8
cs1(config-if-range)# shutdown
```

17. Verify that the cluster LIFs have migrated to the ports hosted on switch cs2. This might take a few seconds.
network interface show -role cluster

```

cluster1::*> network interface show -role cluster

```

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

Cluster					
e0d	false	cluster1-01_clus1	up/up	169.254.3.4/23	cluster1-01
e0d	true	cluster1-01_clus2	up/up	169.254.3.5/23	cluster1-01
e0d	false	cluster1-02_clus1	up/up	169.254.3.8/23	cluster1-02
e0d	true	cluster1-02_clus2	up/up	169.254.3.9/23	cluster1-02
e0b	false	cluster1-03_clus1	up/up	169.254.1.3/23	cluster1-03
e0b	true	cluster1-03_clus2	up/up	169.254.1.1/23	cluster1-03
e0b	false	cluster1-04_clus1	up/up	169.254.1.6/23	cluster1-04
e0b	true	cluster1-04_clus2	up/up	169.254.1.7/23	cluster1-04

```

8 entries were displayed.
cluster1::*>

```

18. Verify that the cluster is healthy: cluster show

```

cluster1::*> cluster show

```

Node	Health	Eligibility	Epsilon
cluster1-01	true	true	false
cluster1-02	true	true	false
cluster1-03	true	true	true
cluster1-04	true	true	false

```

4 entries were displayed.
cluster1::*>

```

19. Repeat Steps 7 to 14 on switch cs1.

20. Enable auto-revert on the cluster LIFs.

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

21. Reboot switch cs1. You do this to trigger the cluster LIFs to revert to their home ports. You can ignore the "cluster ports down" events reported on the nodes while the switch reboots.

```
cs1# reload  
This command will reboot the system. (y/n)? [n] y
```

22. Verify that the switch ports connected to the cluster ports are up.

```
cs1# show interface brief \| grep up  
.  
.  
Eth1/1/1      1      eth  access up      none      10G(D)  
--  
Eth1/1/2      1      eth  access up      none      10G(D)  
--  
Eth1/7        1      eth  trunk  up      none      100G(D)  
--  
Eth1/8        1      eth  trunk  up      none      100G(D)  
--  
.  
.
```

23. Verify that the ISL between cs1 and cs2 is functional: `show port-channel summary`

```

cs1# 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
        b - BFD Session Wait
        S - Switched      R - Routed
        U - Up (port-channel)
        p - Up in delay-lacp mode (member)
        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)
cs1#

```

24. Verify that the cluster LIFs have reverted to their home port: `network interface show -role cluster`

```

cluster1::*> **network interface show -role cluster**

```

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

Cluster				
e0d	cluster1-01_clus1	up/up	169.254.3.4/23	cluster1-01
e0d	cluster1-01_clus2	up/up	169.254.3.5/23	cluster1-01
e0d	cluster1-02_clus1	up/up	169.254.3.8/23	cluster1-02
e0d	cluster1-02_clus2	up/up	169.254.3.9/23	cluster1-02
e0b	cluster1-03_clus1	up/up	169.254.1.3/23	cluster1-03
e0b	cluster1-03_clus2	up/up	169.254.1.1/23	cluster1-03
e0b	cluster1-04_clus1	up/up	169.254.1.6/23	cluster1-04
e0b	cluster1-04_clus2	up/up	169.254.1.7/23	cluster1-04

```

8 entries were displayed.
cluster1::*>

```

25. Verify that the cluster is healthy: `cluster show`

```

cluster1::*> cluster show

```

Node	Health	Eligibility	Epsilon
cluster1-01	true	true	false
cluster1-02	true	true	false
cluster1-03	true	true	true
cluster1-04	true	true	false

```

4 entries were displayed.
cluster1::*>

```

26. Ping the remote cluster interfaces to verify connectivity: `cluster ping-cluster -node local`

```

cluster1::*> cluster ping-cluster -node local
Host is cluster1-03
Getting addresses from network interface table...
Cluster cluster1-03_clus1 169.254.1.3 cluster1-03 e0a
Cluster cluster1-03_clus2 169.254.1.1 cluster1-03 e0b
Cluster cluster1-04_clus1 169.254.1.6 cluster1-04 e0a
Cluster cluster1-04_clus2 169.254.1.7 cluster1-04 e0b
Cluster cluster1-01_clus1 169.254.3.4 cluster1-01 e0a
Cluster cluster1-01_clus2 169.254.3.5 cluster1-01 e0d
Cluster cluster1-02_clus1 169.254.3.8 cluster1-02 e0a
Cluster cluster1-02_clus2 169.254.3.9 cluster1-02 e0d
Local = 169.254.1.3 169.254.1.1
Remote = 169.254.1.6 169.254.1.7 169.254.3.4 169.254.3.5 169.254.3.8
169.254.3.9
Cluster Vserver Id = 4294967293
Ping status:
.....
Basic connectivity succeeds on 12 path(s)
Basic connectivity fails on 0 path(s)
.....
Detected 9000 byte MTU on 12 path(s):
    Local 169.254.1.3 to Remote 169.254.1.6
    Local 169.254.1.3 to Remote 169.254.1.7
    Local 169.254.1.3 to Remote 169.254.3.4
    Local 169.254.1.3 to Remote 169.254.3.5
    Local 169.254.1.3 to Remote 169.254.3.8
    Local 169.254.1.3 to Remote 169.254.3.9
    Local 169.254.1.1 to Remote 169.254.1.6
    Local 169.254.1.1 to Remote 169.254.1.7
    Local 169.254.1.1 to Remote 169.254.3.4
    Local 169.254.1.1 to Remote 169.254.3.5
    Local 169.254.1.1 to Remote 169.254.3.8
    Local 169.254.1.1 to Remote 169.254.3.9
Larger than PMTU communication succeeds on 12 path(s)
RPC status:
6 paths up, 0 paths down (tcp check)
6 paths up, 0 paths down (udp check)

```

Migrate from a Cisco Nexus 5596 switch to a Cisco Nexus 3232C switch

You must be aware of certain configuration information, port connections and cabling requirements when you are replacing Cisco Nexus 5596 cluster switches with Cisco Nexus 3232C cluster switches.

- The following cluster switches are used as examples in this procedure:
 - Nexus 5596
 - Nexus 3232C
- The cluster switches use the following ports for connections to nodes:
 - Ports e1/1-40 (10 GbE): Nexus 5596
 - Ports e1/1-30 (10/40/100 GbE): Nexus 3232C
- The cluster switches use the following Inter-Switch Link (ISL) ports:
 - Ports e1/41-48 (10 GbE): Nexus 5596
 - Ports e1/31-32 (40/100 GbE): Nexus 3232C
- The *Hardware Universe* contains information about supported cabling to Nexus 3232C switches:
 - Nodes with 10 GbE cluster connections require QSFP to SFP+ optical fiber breakout cables or QSFP to SFP+ copper breakout cables.
 - Nodes with 40/100 GbE cluster connections require supported QSFP/QSFP28 optical modules with fiber cables or QSFP/QSFP28 copper direct-attach cables.
- The cluster switches use the appropriate ISL cabling:
 - Beginning: Nexus 5596 (SFP+ to SFP+)
 - 8x SFP+ fiber or copper direct-attach cables
 - Interim: Nexus 5596 to Nexus 3232C (QSFP to 4xSFP+ break-out)
 - 1x QSFP to SFP+ fiber break-out or copper break-out cables
 - Final: Nexus 3232C to Nexus 3232C (QSFP28 to QSFP28)
 - 2x QSFP28 fiber or copper direct-attach cables
- On Nexus 3232C switches, you can operate QSFP/QSFP28 ports in either 40/100 Gigabit Ethernet or 4x10 Gigabit Ethernet modes.

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

- On the left side of Nexus 3232C switches are 2 SFP+ ports, called 1/33 and 1/34.
- You have configured some of the ports on Nexus 3232C switches to run at 10 GbE or 40/100 GbE.



You can break out the first six ports into 4x10 GbE mode by using the `interface breakout module 1 port 1-6 map 10g-4x` command. Similarly, you can regroup the first six QSFP+ ports from breakout configuration by using the `no interface breakout module 1 port 1-6 map 10g-4x` command.

- You have done the planning, migration, and read the required documentation on 10 GbE and 40/100 GbE connectivity from nodes to Nexus 3232C cluster switches.
- The ONTAP and NX-OS versions supported in this procedure are on the [Cisco Ethernet Switches page](#).

Migrate from a two-node switchless cluster to a cluster with Cisco Nexus 3232C cluster switches

Replace a Cisco Nexus 3232C cluster switch

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

You must verify the following conditions exist before installing the NX-OS software and RCFs on a Cisco Nexus cluster switch:

- Your system can support Cisco Nexus 3232C switches.
- The cluster must be fully functioning.
- You must have consulted the switch compatibility table on the Cisco Ethernet Switch page for the supported ONTAP, NX-OS, and RCF versions.



You should be aware there can be dependencies between command syntax in the RCF and NX-OS versions.

- You must have referred to the appropriate software and upgrade guides available on the Cisco web site for complete documentation on the Cisco switch upgrade and downgrade procedures.
- You must have downloaded the applicable RCFs.

How to replace a Cisco Nexus 3232C cluster switch

You can nondisruptively replace a defective Cisco Nexus 3232C switch in a cluster by performing a specific sequence of tasks.

Before you begin

The existing cluster and network configuration must have the following characteristics:

- The Nexus 3232C cluster infrastructure must be 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) must be in the up state and must not have been migrated.

The replacement Cisco Nexus 3232C switch must have the following characteristics:

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

About this task

Procedure summary

- **Display and migrate the cluster ports to switch C2 (Steps 1-7)**
- **Reconnect ISL cables from switch CL2 to switch C2, then migrate ISLs to switch CL1 and C2 (Steps 8-14)**
- **Revert all LIFs to originally assigned ports (Steps 15-18)**
- **Verify all ports and LIF are correctly migrated (Steps 19-21)**

This 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 on the [Cisco® Cluster Network Switch Reference Configuration File Download](#) page.

The examples in this 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.

This 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.

Steps

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

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

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



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

1. Display information about the devices in your configuration:

```
network device-discovery show
```

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

Node	Local Port	Discovered 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

```
12 entries were displayed
```

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

a. Display the network port attributes:

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

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

```
(network port show)
```

```
Node: n1
```

```
Ignore
```

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

e4a      Cluster      Cluster      up    9000 auto/40000 -
e4e      Cluster      Cluster      up    9000 auto/40000 -

12 entries were displayed.

```

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

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

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

	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
e0a	true			
	n3_clus2	up/up	10.10.0.10/24	n3
e0e	true			
	n4_clus1	up/up	10.10.0.11/24	n4
e0a	true			
	n4_clus2	up/up	10.10.0.12/24	n4
e0e	true			

12 entries were displayed.

c. Display the discovered cluster switches:

```
system cluster-switch show
```

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:			
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:			
Software Version: Cisco Nexus Operating System (NX-OS) Software,			
Version			
7.0(3)I6(1)			
Version Source: CDP			

2 entries were displayed.

3. 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](#)

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

```
network interface migrate -vserver Cluster -lif lif-name -source-node node-
```

name -destination-node node-name -destination-port port-name

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 -destinationnode
n4 -destination-port e4a
```

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

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



```

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

```

Current Is	Logical	Status	Network	Current	
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					

12 entries were displayed.

6. 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`

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
```

7. Ping the remote cluster interfaces and perform an RPC server check:

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

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

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

8. 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](#).

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

9. Remove all the cables attached to the cluster switch CL2 and reconnect them to the replacement switch C2 for all the nodes.
10. 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.
11. 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](#).

```

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

```

12. 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:

```

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)

```

13. 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](#).

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

Example

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)
```

14. 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`

```
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
```

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

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

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
```

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

`network interface show`

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					

12 entries were displayed.

17. Verify that the cluster ports are connected:

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

```
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

Status

```

-----
e4a      Cluster      Cluster      up    9000 auto/40000 -
e4e      Cluster      Cluster      up    9000 auto/40000 -
12 entries were displayed.

```

18. Ping the remote cluster interfaces and perform an RPC server check:

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

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

```

cluster::*> cluster ping-cluster -node n1
Host is n1 Getting addresses from network interface table...
Cluster n1_clus1 n1      e0a    10.10.0.1
Cluster n1_clus2 n1      e0b    10.10.0.2
Cluster n1_clus3 n1      e0c    10.10.0.3
Cluster n1_clus4 n1      e0d    10.10.0.4
Cluster n2_clus1 n2      e0a    10.10.0.5
Cluster n2_clus2 n2      e0b    10.10.0.6
Cluster n2_clus3 n2      e0c    10.10.0.7
Cluster n2_clus4 n2      e0d    10.10.0.8
Cluster n3_clus1 n3      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 1500 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)
```

19. 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

```
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

12 entries were displayed.

```
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
Status							
-----	-----	-----	-----	-----	-----	-----	-----
-----	-----						
e4a	Cluster	Cluster		up	9000	auto/40000	-
e4e	Cluster	Cluster		up	9000	auto/40000	-

12 entries were displayed.

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

	Logical	Status	Network	Current
Current Is				
Vserver	Interface	Admin/Oper	Address/Mask	Node
Port	Home			
-----	-----	-----	-----	-----
-----	-----			
Cluster				
	nm1_clus1	up/up	10.10.0.1/24	n1
e0a	true			
	n1_clus2	up/up	10.10.0.2/24	n1
e0b	true			
	n1_clus3	up/up	10.10.0.3/24	n1
e0c	true			
	n1_clus4	up/up	10.10.0.4/24	n1
e0d	true			
	n2_clus1	up/up	10.10.0.5/24	n2
e0a	true			
	n2_clus2	up/up	10.10.0.6/24	n2
e0b	true			
	n2_clus3	up/up	10.10.0.7/24	n2
e0c	true			
	n2_clus4	up/up	10.10.0.8/24	n2
e0d	true			
	n3_clus1	up/up	10.10.0.9/24	n3
e4a	true			
	n3_clus2	up/up	10.10.0.10/24	n3
e4e	true			
	n4_clus1	up/up	10.10.0.11/24	n4
e4a	true			
	n4_clus2	up/up	10.10.0.12/24	n4
e4e	true			

12 entries were displayed.

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

Switch	Type	Address	Model
CL1	cluster-network	10.10.1.101	NX3232C
Serial Number: FOX000001			
Is Monitored: true			
Reason:			
Software Version: Cisco Nexus Operating System (NX-OS) Software, Version 7.0(3)I6(1)			
Version Source: CDP			
CL2	cluster-network	10.10.1.102	NX3232C
Serial Number: FOX000002			
Is Monitored: true			
Reason:			
Software Version: Cisco Nexus Operating System (NX-OS) Software, Version 7.0(3)I6(1)			
Version Source: CDP			
C2	cluster-network	10.10.1.103	NX3232C
Serial Number: FOX000003			
Is Monitored: true			
Reason:			
Software Version: Cisco Nexus Operating System (NX-OS) Software, Version 7.0(3)I6(1)			
Version Source: CDP 3 entries were displayed.			

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

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

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

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:
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:
Software Version: Cisco Nexus Operating System (NX-OS) Software, Version
7.0(3)I6(1)
Version Source: CDP
2 entries were displayed.

```

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

```

system cluster-switch log setup-password

system cluster-switch log enable-collection

```

```

cluster::*> system cluster-switch log setup-password
Enter the switch name: <return>
The switch name entered is not recognized.
Choose from the following list:
CL1
C2

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

Enter the switch name: CL1
**RSA key fingerprint is e5:8b:c6:dc:e2:18:18:09:36:63:d9:63:dd:03:d9:cc
Do you want to continue? {y|n}::[n] y

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

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

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

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

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

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

Enabling cluster switch log collection.

cluster::*>

```



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

23. If you suppressed automatic case creation, re-enable it by invoking an AutoSupport message:

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

Related information

[Cisco Ethernet Switch description page](#)

[Hardware Universe](#)

Replace a Cisco Nexus 3232C storage switch

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

You must verify the following conditions exist before installing the NX-OS software and RCFs on a Cisco Nexus storage switch:

- Your system can support Cisco Nexus 3232C storage switches.
- You must have consulted the switch compatibility table on the Cisco Ethernet Switch page for the supported ONTAP, NX-OS, and RCF versions.



You should be aware there can be dependencies between command syntax in the RCF and NX-OS versions.

- You must have referred to the appropriate software and upgrade guides available on the Cisco web site for complete documentation on the Cisco switch upgrade and downgrade procedures at [Cisco Nexus 3000 Series Switches](#).
- You must have downloaded the applicable RCFs.

Steps to replace a Cisco Nexus 3232C storage switch

You can nondisruptively replace a defective Cisco Nexus 3232C storage switch by performing a specific sequence of tasks.

Before you begin

The existing network configuration must have the following characteristics:

- The Cisco Ethernet Switches page has the latest RCF and NX-OS versions on your switches.
- Management connectivity must exist on both switches.



Make sure that all troubleshooting steps have been completed to confirm that your switch needs replacing.

The replacement Cisco Nexus 3232C switch must have the following characteristics:

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

Procedure summary:

- **Confirm the switch to be replaced is S2 (Steps 1-5)**
- **Disconnect the cables from switch S2 (Step 6)**
- **Reconnect the cables to switch NS2 (Step 7)**
- **Verify all device configurations on switch NS2 (Steps 8-10)**

- This procedure replaces the second Nexus 3232C storage switch S2 with the new 3232C switch NS2.
- The two nodes are node1 and node2.

Steps

1. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message: `system node autosupport invoke -node * -type all - message MAINT=xh`

x is the duration of the maintenance window in hours.



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

2. Check on the health status of the storage node ports to make sure that there is connection to storage switch S1: `storage port show -port-type ENET`

```
storage::*> storage port show -port-type ENET
```

Node	Port	Type	Mode	Speed (Gb/s)	State	Status	VLAN ID
node1	e3a	ENET	storage	100	enabled	online	30
	e3b	ENET	storage	0	enabled	offline	30
	e7a	ENET	storage	0	enabled	offline	30
	e7b	ENET	storage	0	enabled	offline	30
node2	e3a	ENET	storage	100	enabled	online	30
	e3b	ENET	storage	0	enabled	offline	30
	e7a	ENET	storage	0	enabled	offline	30
	e7b	ENET	storage	0	enabled	offline	30

3. Verify that storage switch S1 is available: `network device-discovery show`

```

storage::*> network device-discovery show
Node/      Local  Discovered
Protocol   Port   Device (LLDP: ChassisID)  Interface      Platform
-----
node1/cdp
           e3a    S1                      Ethernet1/1     NX3232C
           e4a    node2                   e4a             AFF-A700
           e4e    node2                   e4e             AFF-A700
node1/lldp
           e3a    S1                      Ethernet1/1     -
           e4a    node2                   e4a             -
           e4e    node2                   e4e             -
node2/cdp
           e3a    S1                      Ethernet1/2     NX3232C
           e4a    node1                   e4a             AFF-A700
           e4e    node1                   e4e             AFF-A700
node2/lldp
           e3a    S1                      Ethernet1/2     -
           e4a    node1                   e4a             -
           e4e    node1                   e4e             -

```

4. Run the `show lldp neighbors` command on the working switch to confirm that you can see both nodes and all shelves: `show lldp neighbors`

```

S1# show lldp neighbors
Capability codes:
  (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
  (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other
Device ID           Local Intf      Hold-time  Capability  Port ID
node1                Eth1/1         121        S           e3a
node2                Eth1/2         121        S           e3a
SHFGD2008000011     Eth1/5         121        S           e0a
SHFGD2008000011     Eth1/6         120        S           e0a
SHFGD2008000022     Eth1/7         120        S           e0a
SHFGD2008000022     Eth1/8         120        S           e0a

```

5. Verify the shelf ports in the storage system: `storage shelf port show -fields remote-device,remote-port`

```
storage::*> storage shelf port show -fields remote-device,remote-port
```

shelf	id	remote-port	remote-device
-----	--	-----	-----
3.20	0	Ethernet1/5	S1
3.20	1	-	-
3.20	2	Ethernet1/6	S1
3.20	3	-	-
3.30	0	Ethernet1/7	S1
3.20	1	-	-
3.30	2	Ethernet1/8	S1
3.20	3	-	-

6. Remove all cables attached to storage switch S2.
7. Reconnect all cables to the replacement switch NS2.
8. Recheck the health status of the storage node ports: `storage port show -port-type ENET`

```
storage::*> storage port show -port-type ENET
```

Node	Port	Type	Mode	Speed (Gb/s)	State	Status	VLAN ID
-----	----	-----	-----	-----	-----	-----	----
node1							
	e3a	ENET	storage	100	enabled	online	30
	e3b	ENET	storage	0	enabled	offline	30
	e7a	ENET	storage	0	enabled	offline	30
	e7b	ENET	storage	100	enabled	online	30
node2							
	e3a	ENET	storage	100	enabled	online	30
	e3b	ENET	storage	0	enabled	offline	30
	e7a	ENET	storage	0	enabled	offline	30
	e7b	ENET	storage	100	enabled	online	30

9. Verify that both switches are available: `network device-discovery show`

```

storage::*> network device-discovery show
Node/      Local   Discovered
Protocol   Port    Device (LLDP: ChassisID)  Interface      Platform
-----
node1/cdp
          e3a     S1                      Ethernet1/1     NX3232C
          e4a     node2                   e4a             AFF-A700
          e4e     node2                   e4e             AFF-A700
          e7b     NS2                     Ethernet1/1     NX3232C
node1/lldp
          e3a     S1                      Ethernet1/1     -
          e4a     node2                   e4a             -
          e4e     node2                   e4e             -
          e7b     NS2                     Ethernet1/1     -
node2/cdp
          e3a     S1                      Ethernet1/2     NX3232C
          e4a     node1                   e4a             AFF-A700
          e4e     node1                   e4e             AFF-A700
          e7b     NS2                     Ethernet1/2     NX3232C
node2/lldp
          e3a     S1                      Ethernet1/2     -
          e4a     node1                   e4a             -
          e4e     node1                   e4e             -
          e7b     NS2                     Ethernet1/2     -

```

10. Verify the shelf ports in the storage system: `storage shelf port show -fields remote-device,remote-port`

```

storage::*> storage shelf port show -fields remote-device,remote-port
shelf id remote-port remote-device
-----
3.20  0  Ethernet1/5 S1
3.20  1  Ethernet1/5 NS2
3.20  2  Ethernet1/6 S1
3.20  3  Ethernet1/6 NS2
3.30  0  Ethernet1/7 S1
3.20  1  Ethernet1/7 NS2
3.30  2  Ethernet1/8 S1
3.20  3  Ethernet1/8 NS2

```

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

Upgrade a Cisco Nexus 3232C storage switch

The Cisco NX-OS software and reference configuration files (RCFs) can be upgraded on Cisco Nexus 3232C storage switches.

Before you begin

The following conditions must exist before you upgrade the NX-OS software and RCFs on the storage switch:

- The switch must be fully functioning (there should be no errors in the logs or similar issues).
- You must have checked or set your desired boot variables in the RCF to reflect the desired boot images if you are installing only NX-OS and keeping your current RCF version.

If you need to change the boot variables to reflect the current boot images, you must do so before reapplying the RCF so that the correct version is instantiated on future reboots.

- You must have referred to the appropriate software and upgrade guides available on the [Cisco Nexus 3000 Series Switches](#) page for complete documentation on the Cisco storage upgrade and downgrade procedures.
- The number of 10 GbE and 40/100 GbE ports are defined in the reference configuration files (RCFs) available on the [Cisco® Ethernet Switches](#) page.

Procedure summary:

- I. Check the health status of switches and ports ([Steps 1 - 4](#))
- II. Copy the RCF to Cisco switch S2 ([Steps 5 - 8](#))
- III. Download the NX-OS image to Cisco switch S2 and reboot ([Steps 9 - 12](#))
- IV. Recheck the health status of switches and ports ([Steps 13 - 15](#))
- V. Repeat [Steps 1 - 17](#) for Cisco switch S1.

The examples in this procedure use two nodes; node1 with two storage ports and node2 with two storage ports. See the [Hardware Universe](#) to verify the correct storage ports on your platforms.



The command outputs might vary depending on different releases of ONTAP.

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

- The names of the two storage switches are S1 and S2.
- The nodes are node1 and node2.



The procedure requires the use of both ONTAP commands and Cisco Nexus 3000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

Steps

1. If AutoSupport is enabled on this cluster, suppress automatic case creation by invoking an AutoSupport message: `system node autosupport invoke -node * -type all - message MAINT=xh`

x is the duration of the maintenance window in hours.



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

2. Check that the storage switches are available: `system switch ethernet show`

```
storage::*> system switch ethernet show
Switch                               Type                               Address                               Model
-----
S1
                                     storage-network           172.17.227.5           NX3232C
    Serial Number: FOC221206C2
      Is Monitored: true
        Reason: None
    Software Version: Cisco Nexus Operating System (NX-OS) Software,
Version
                        9.3(3)
    Version Source: CDP

S2
                                     storage-network           172.17.227.6           NX3232C
    Serial Number: FOC220443LZ
      Is Monitored: true
        Reason: None
    Software Version: Cisco Nexus Operating System (NX-OS) Software,
Version
                        9.3(3)
    Version Source: CDP

2 entries were displayed.
storage::*>
```

3. Verify that the node ports are healthy and operational: `storage port show -port-type ENET`

```
storage::*> storage port show -port-type ENET
```

Node	Port	Type	Mode	Speed (Gb/s)	State	Status	VLAN ID

node1	e3a	ENET	storage	100	enabled	online	30
	e3b	ENET	storage	0	enabled	offline	30
	e7a	ENET	storage	0	enabled	offline	30
	e7b	ENET	storage	100	enabled	online	30
node2	e3a	ENET	storage	100	enabled	online	30
	e3b	ENET	storage	0	enabled	offline	30
	e7a	ENET	storage	0	enabled	offline	30
	e7b	ENET	storage	100	enabled	online	30

4. Check that there are no storage switch or cabling issues with the cluster: `system health alert show -instance`

```
storage::*> system health alert show -instance
There are no entries matching your query.
```

5. Copy the RCF on switch S2 to the switch bootflash using one of the following transfer protocols: FTP, HTTP, TFTP, SFTP, or SCP.

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

The following example shows HTTP being used to copy an RCF to the bootflash on switch S2:

```
S2# copy http://172.16.10.1//cfg/Nexus_3232C_RCF_v1.6-Storage.txt
bootflash: vrf management
% Total      % Received % Xferd  Average   Speed    Time     Time      Time
Current
                                Dload    Upload  Total    Spent    Left
Speed
  100          3254    100    3254      0      0      8175     0 --:
--:-- --:--:-- --:--:--    8301
Copy complete, now saving to disk (please wait)...
Copy complete.
S2#
```

6. Apply the RCF previously downloaded to the bootflash: `copy bootflash:`

The following example shows the RCF file `Nexus_3232C_RCF_v1.6-Storage.txt` being installed on switch S2:

```
S2# copy Nexus_3232C_RCF_v1.6-Storage.txt running-config echo-commands
```

7. Verify that the RCF file is the correct newer version: `show running-config`

When you check the output to verify you have the correct RCF, make sure that the following information is correct:

- The RCF banner
- The node and port settings
- Customizations The output varies according to your site configuration. Check the port settings and refer to the release notes for any changes specific to the RCF that you have installed.



In the banner output from the `show banner motd` command, you must read and follow the instructions in the **IMPORTANT NOTES** section to ensure the proper configuration and operation of the switch.


```
S2# show banner motd
```

```
*****
*****
* NetApp Reference Configuration File (RCF)
*
* Switch    : Cisco Nexus 3232C
* Filename  : Nexus_3232C_RCF_v1.6-Storage.txt
* Date      : Oct-20-2020
* Version   : v1.6
*
* Port Usage : Storage configuration
* Ports 1-32: Controller and Shelf Storage Ports
* Ports 33-34: Disabled
*
* IMPORTANT NOTES*
* - This RCF utilizes QoS and requires TCAM re-configuration, requiring
RCF
*   to be loaded twice with the Storage Switch rebooted in between.
*
* - Perform the following 4 steps to ensure proper RCF installation:
*
*   (1) Apply RCF first time, expect following messages:
*       - Please save config and reload the system...
*       - Edge port type (portfast) should only be enabled on ports...
*       - TCAM region is not configured for feature QoS class IPv4
ingress...
*
*   (2) Save running-configuration and reboot Cluster Switch
*
*   (3) After reboot, apply same RCF second time and expect following
messages:
*       - % Invalid command at '^' marker
*       - Syntax error while parsing...
*
*   (4) Save running-configuration again
*****
*****
S2#
```

8. After you verify that the software versions and switch settings are correct, copy the running-config file to the startup-config file on switch S2.

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

The following example shows the running-config file successfully copied to the startup-config file:

```
S2# copy running-config startup-config
[#####] 100% Copy complete.
```

9. Download the NX-OS image to switch S2.
10. Install the system image so that the new version will be loaded the next time switch S2 is rebooted.

The switch will be reboot in 10 seconds with the new image as shown in the following output:

```
S2# install all nxos bootflash:nxos.9.3.4.bin
Installer will perform compatibility check first. Please wait.
Installer is forced disruptive

Verifying image bootflash:/nxos.9.3.4.bin for boot variable "nxos".
[#####] 100% -- SUCCESS

Verifying image type.
[[#####] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos.9.3.4.bin.
[#####] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos.9.3.4.bin.
[#####] 100% -- SUCCESS

Performing module support checks.
[#####] 100% -- SUCCESS

Notifying services about system upgrade.
[#####] 100% -- SUCCESS


Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
-----  -
      1      yes      disruptive      reset  default upgrade is not
hitless

Images will be upgraded according to following table:
Module      Image                      Running-Version(pri:alt)
New-Version  Upg-Required
-----  -
-----  -
```

```
1          nxos          9.3(3)
9.3(4)          yes
1          bios          v08.37(01/28/2020):v08.23(09/23/2015)
v08.38(05/29/2020)          no
```

```
Switch will be reloaded for disruptive upgrade.
Do you want to continue with the installation (y/n)? [n] y
input string too long
Do you want to continue with the installation (y/n)? [n] y
```

```
Install is in progress, please wait.
```

```
Performing runtime checks.
[#####] 100% -- SUCCESS
```

```
Setting boot variables.
[#####] 100% -- SUCCESS
```

```
Performing configuration copy.
[#####] 100% -- SUCCESS
```

```
Module 1: Refreshing compact flash and upgrading bios/loader/bootrom.
Warning: please do not remove or power off the module at this time.
[#####] 100% -- SUCCESS
```

```
Finishing the upgrade, switch will reboot in 10 seconds.
S2#
```

11. Save the configuration.

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

You are prompted to reboot the system as shown in the following example:

```
S2# copy running-config startup-config
[#####] 100% Copy complete.
S2# reload
This command will reboot the system. (y/n)? [n] y
```

12. Confirm that the new NX-OS version number is on the switch:

```
S2# show version
Cisco Nexus Operating System (NX-OS) Software
```

TAC support: <http://www.cisco.com/tac>

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<http://www.gnu.org/licenses/old-licenses/library.txt>.

Software

BIOS: version 08.38

NXOS: version 9.3(4)

BIOS compile time: 05/29/2020

NXOS image file is: bootflash:///nxos.9.3.4.bin

NXOS compile time: 4/28/2020 21:00:00 [04/29/2020 02:28:31]

Hardware

cisco Nexus3000 C3232C Chassis (Nexus 9000 Series)

Intel(R) Xeon(R) CPU E5-2403 v2 @ 1.80GHz with 8154432 kB of memory.

Processor Board ID FOC20291J6K

Device name: S2

bootflash: 53298520 kB

Kernel uptime is 0 day(s), 0 hour(s), 3 minute(s), 42 second(s)

Last reset at 157524 usecs after Mon Nov 2 18:32:06 2020

Reason: Reset due to upgrade

System version: 9.3(3)

Service:

plugin

Core Plugin, Ethernet Plugin

Active Package(s) :

S2#

13. Recheck that the storage switches are available after the reboot: `system switch ethernet show`

```
storage::*> system switch ethernet show
```

Switch	Type	Address	Model

S1			
	storage-network	172.17.227.5	NX3232C
Serial Number: FOC221206C2			
Is Monitored: true			
Reason: None			
Software Version: Cisco Nexus Operating System (NX-OS) Software,			
Version			
9.3(4)			
Version Source: CDP			
S2			
	storage-network	172.17.227.6	NX3232C
Serial Number: FOC220443LZ			
Is Monitored: true			
Reason: None			
Software Version: Cisco Nexus Operating System (NX-OS) Software,			
Version			
9.3(4)			
Version Source: CDP			
2 entries were displayed.			
storage::*>			

14. Verify that the switch ports are healthy and operational after the reboot: `storage port show -port -type ENET`

```
storage::*> storage port show -port-type ENET
```

Node	Port	Type	Mode	Speed (Gb/s)	State	Status	VLAN ID
node1	e3a	ENET	storage	100	enabled	online	30
	e3b	ENET	storage	0	enabled	offline	30
	e7a	ENET	storage	0	enabled	offline	30
	e7b	ENET	storage	100	enabled	online	30
node2	e3a	ENET	storage	100	enabled	online	30
	e3b	ENET	storage	0	enabled	offline	30
	e7a	ENET	storage	0	enabled	offline	30
	e7b	ENET	storage	100	enabled	online	30

15. Recheck that there are no storage switch or cabling issues with the cluster: `system health alert show -instance`

```
storage::*> system health alert show -instance
There are no entries matching your query.
```

16. Repeat the procedure to upgrade the NX-OS software and RCF on switch S1.
17. If you suppressed automatic case creation, re-enable it by invoking an AutoSupport message: `system node autosupport invoke -node * -type all -message MAINT=END`

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