



# **Install NX-OS software and RCFs on Cisco Nexus 3132Q-V cluster switches**

## **ONTAP Systems Switches**

NetApp  
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# Install NX-OS software and RCFs on Cisco Nexus 3132Q-V cluster switches

The Cisco NX-OS software and reference configuration files (RCFs) must be installed on Cisco Nexus 3132Q-V 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 issues).
- 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-
C3132Q-V				
	e0b	cs2	Eth1/2	N3K-
C3132Q-V				
cluster1-01/cdp				
	e0a	cs1	Eth1/1	N3K-
C3132Q-V				
	e0b	cs2	Eth1/1	N3K-
C3132Q-V				

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 by 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 by 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 3132Q-V 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 to the Nexus 3132Q-V 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: xxxxxxxx
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.
```

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
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```

#### Software

```
    BIOS: version 04.25
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 Nexus 3132QV Chassis (Nexus 9000 Series)
    Intel(R) Core(TM) i3- CPU @ 2.50GHz with 16399900 kB of memory.
    Processor Board ID FOxxxxxxx23
```

```
    Device name: cs2
    bootflash: 15137792 kB
    usb1: 0 kB (expansion flash)
```

```
Kernel uptime is 79 day(s), 10 hour(s), 23 minute(s), 53 second(s)
```

```
Last reset at 663500 usecs after Mon Nov 2 10:50:33 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	v04.25(01/28/2020):v04.25(10/18/2016)	
v04.25(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
```

```
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```

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```

```
Software
```

```
  BIOS: version 04.25
```

```
NXOS: version 9.3(4)
```

```
  BIOS compile time: 05/22/2019
```

```
  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 Nexus 3132QV Chassis (Nexus 9000 Series)
Intel(R) Core(TM) i3- CPU @ 2.50GHz with 16399900 kB of memory.
Processor Board ID FOxxxxxxx23
```

```
Device name: cs2
```

```
bootflash: 15137792 kB
```

```
usb1: 0 kB (expansion flash)
```

```
Kernel uptime is 79 day(s), 10 hour(s), 23 minute(s), 53 second(s)
```

```
Last reset at 663500 usecs after Mon Nov 2 10:50:33 2020
```

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

```
System version: 9.3(4)
```

```
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 3132Q-V 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-
C3132Q-V
              e0d     cs2                      Ethernet1/7     N3K-
C3132Q-V
cluster1-02/cdp
              e0a     cs1                      Ethernet1/8     N3K-
C3132Q-V
              e0d     cs2                      Ethernet1/8     N3K-
C3132Q-V
cluster1-03/cdp
              e0a     cs1                      Ethernet1/1/1   N3K-
C3132Q-V
              e0b     cs2                      Ethernet1/1/1   N3K-
C3132Q-V
cluster1-04/cdp
              e0a     cs1                      Ethernet1/1/2   N3K-
C3132Q-V
              e0b     cs2                      Ethernet1/1/2   N3K-
C3132Q-V
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

```

Current Is		Logical	Status	Network	Current
Vserver	Port	Interface	Admin/Oper	Address/Mask	Node
		cluster1-01_clus1	up/up	169.254.3.4/23	cluster1-
01	e0a	true			
		cluster1-01_clus2	up/up	169.254.3.5/23	cluster1-
01	e0d	true			
		cluster1-02_clus1	up/up	169.254.3.8/23	cluster1-
02	e0a	true			
		cluster1-02_clus2	up/up	169.254.3.9/23	cluster1-
02	e0d	true			
		cluster1-03_clus1	up/up	169.254.1.3/23	cluster1-
03	e0a	true			
		cluster1-03_clus2	up/up	169.254.1.1/23	cluster1-
03	e0b	true			
		cluster1-04_clus1	up/up	169.254.1.6/23	cluster1-
04	e0a	true			
		cluster1-04_clus2	up/up	169.254.1.7/23	cluster1-
04	e0b	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	10.0.0.1	NX3132QV
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	10.0.0.2	NX3132QV
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.

- 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_3132QV_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_3132QV_RCF_v1.6-Cluster-HA-Breakout.txt` being installed on switch cs2:

```
cs2# copy Nexus_3132QV_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 3132Q-V
* Filename  : Nexus_3132QV_RCF_v1.6-Cluster-HA-Breakout.txt
* Date      : Nov-02-2020
* Version   : v1.6
*
* Port Usage : Breakout configuration
* Ports 1- 6: Breakout mode (4x10GbE) Intra-Cluster Ports, int e1/1/1-
4,
* e1/2/1-4, e1/3/1-4,int e1/4/1-4, e1/5/1-4, e1/6/1-4
* Ports 7-30: 40GbE Intra-Cluster/HA Ports, int e1/7-30
* Ports 31-32: Intra-Cluster ISL Ports, int e1/31-32
*
* IMPORTANT NOTES
* - Load Nexus_3132QV_RCF_v1.6-Cluster-HA.txt for non breakout config
*
* - This RCF utilizes QoS and requires specific TCAM configuration,
requiring
*   cluster switch to be rebooted before the cluster becomes
operational.
*
* - Perform the following steps to ensure proper RCF installation:
*
*   (1) Apply RCF, 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...
*
*   (2) Save running-configuration and reboot Cluster Switch
*
*****
*****
```

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.

[illegible]

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_3l32QV_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-
C3132Q-V				
	e0d	cs2	Ethernet1/7	N3K-
C3132Q-V				
cluster01-2/cdp				
	e0a	cs1	Ethernet1/8	N3K-
C3132Q-V				
	e0d	cs2	Ethernet1/8	N3K-
C3132Q-V				
cluster01-3/cdp				
	e0a	cs1	Ethernet1/1/1	N3K-
C3132Q-V				
	e0b	cs2	Ethernet1/1/1	N3K-
C3132Q-V				
cluster1-04/cdp				
	e0a	cs1	Ethernet1/1/2	N3K-
C3132Q-V				
	e0b	cs2	Ethernet1/1/2	N3K-
C3132Q-V				

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

Switch	Type	Address	Model
cs1	cluster-network	10.233.205.90	N3K-
C3132Q-V			
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-
C3132Q-V
  Serial Number: FOXXXXXXXGS
    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-channell on
VLAN0092. Port consistency restored.
2020 Nov 17 16:07:23 cs1 %$ VDC-1 %$ %STP-2-BLOCK_PVID_PEER:
Blocking port-channell on VLAN0001. Inconsistent peer vlan.
2020 Nov 17 16:07:23 cs1 %$ VDC-1 %$ %STP-2-BLOCK_PVID_LOCAL:
Blocking port-channell 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	cluster1-01_clus1	up/up	169.254.3.4/23	cluster1-01
	false			
e0d	cluster1-01_clus2	up/up	169.254.3.5/23	cluster1-01
	true			
e0d	cluster1-02_clus1	up/up	169.254.3.8/23	cluster1-02
	false			
e0d	cluster1-02_clus2	up/up	169.254.3.9/23	cluster1-02
	true			
e0b	cluster1-03_clus1	up/up	169.254.1.3/23	cluster1-03
	false			
e0b	cluster1-03_clus2	up/up	169.254.1.1/23	cluster1-03
	true			
e0b	cluster1-04_clus1	up/up	169.254.1.6/23	cluster1-04
	false			
e0b	cluster1-04_clus2	up/up	169.254.1.7/23	cluster1-04
	true			

```

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      Pol (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
e0d	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
e0b	true			

```

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)

```



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