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Configure software

Cluster and storage switches

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Configure software

Software install workflow for Cisco Nexus 9336C-FX2 storage switches

To install and configure software for a Cisco Nexus 9336C-FX2 switch, follow these steps:

- 1. Prepare to install NX-OS and RCF.
- 2. Install the NX-OS software.
- 3. Install the RCF config file.

Install the RCF after setting up the Nexus 9336C-FX2 switch for the first time. You can also use this procedure to upgrade your RCF version.

Prepare to install NX-OS software and RCF

Before you install the NX-OS software and the Reference Configuration File (RCF), follow this procedure.

About the examples

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.

About this task

The procedure requires the use of both ONTAP commands and Cisco Nexus 9000 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

Show example

```
cluster1::*> network device-discovery show -protocol cdp
Node/ Local Discovered
Protocol Port Device (LLDP: ChassisID) Interface
Platform
cluster1-02/cdp
          e0a cs1
                                        Eth1/2
                                                        N9K-
C9336C
                                        Eth1/2
          e0b
                 cs2
                                                        N9K-
C9336C
cluster1-01/cdp
          e0a
                 cs1
                                        Eth1/1
                                                        N9K-
C9336C
          e0b
                 cs2
                                        Eth1/1
                                                        N9K-
C9336C
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`
```

Node: clu	na+on1 00						
Node: Cit	isteri-02					Speed(Mbps)	
Health						speed (Hopo)	
Port	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	
Status							
	Cluster	Cluster		up	9000	auto/10000	
healthy	Cluster	Clustor		1110	0000	auto/10000	
healthy	Cluster	Clustel		uр	9000	aut0/10000	
noar ony							
Node: clu	ster1-01						
						Speed(Mbps)	
Health							
	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	
Status							
e0a	Cluster	Cluster		up	9000	auto/10000	
healthy				T			
	Cluster	Cluster		up	9000	auto/10000	
healthy							

b. Display information about the LIFs:

network interface show -vserver Cluster

```
cluster1::*> network interface show -vserver Cluster
        Logical Status Network
        Current Is
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

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:

 $\verb|system| switch| ethernet log setup-password| \verb|and| system| switch| ethernet log enable-collection|$

```
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 and system cluster-switch log enable-

```
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.

What's next?

Install the NX-OS software

Follow this procedure to install the NX-OS software on the Nexus 9336C-FX2 cluster switch.

Before you begin, complete the procedure in Prepare to install NX-OS and RCF.

Review requirements

What you'll need

- · A current backup of the switch configuration.
- A fully functioning cluster (no errors in the logs or similar issues).
- Cisco Ethernet switch page. Consult the switch compatibility table for the supported ONTAP and NX-OS versions.
- Appropriate software and upgrade guides available on the Cisco web site for the Cisco switch upgrade and downgrade procedures. See Cisco Nexus 9000 Series Switches.

About the examples

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.

Install the software

The procedure requires the use of both ONTAP commands and Cisco Nexus 9000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

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.

Show example

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 9336C-FX2 switch.

Show example

```
cs2# copy sftp: bootflash: vrf management
Enter source filename: /code/nxos.9.3.5.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.9.3.5.bin /bootflash/nxos.9.3.5.bin
/code/nxos.9.3.5.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.9.3.5.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.9.3.5.img /bootflash/n9000-
epld.9.3.5.img
/code/n9000-epld.9.3.5.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:

show version

```
cs2# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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http://opensource.org/licenses/gpl-3.0.html and
http://www.opensource.org/licenses/lgpl-2.1.php and
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 Nexus9000 C9336C-FX2 Chassis
  Intel(R) Xeon(R) CPU E5-2403 v2 @ 1.80GHz with 8154432 kB of
memory.
  Processor Board ID FOC20291J6K
  Device name: cs2
 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 Requested by CLI command reload
System version: 9.3(4)
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.9.3.5.bin
Installer will perform compatibility check first. Please wait.
Installer is forced disruptive
Verifying image bootflash:/nxos.9.3.5.bin for boot variable "nxos".
[############### 100% -- SUCCESS
Verifying image type.
[################ 100% -- SUCCESS
Preparing "nxos" version info using image bootflash:/nxos.9.3.5.bin.
[############### 100% -- SUCCESS
Preparing "bios" version info using image bootflash:/nxos.9.3.5.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
              disruptive
                           reset default upgrade is
       yes
not hitless
Images will be upgraded according to following table:
Module Image Running-Version(pri:alt
                                                  New-
Version
            Upg-Required
_____
_____
1 nxos 9.3(4)
                                                  9.3(5)
yes
1 bios v08.37(01/28/2020):v08.23(09/23/2015)
v08.38(05/29/2020) yes
```

```
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.
```

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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http://opensource.org/licenses/gpl-3.0.html and
http://www.opensource.org/licenses/lgpl-2.1.php and
http://www.gnu.org/licenses/old-licenses/library.txt.
Software
  BIOS: version 05.33
 NXOS: version 9.3(5)
  BIOS compile time: 09/08/2018
  NXOS image file is: bootflash://nxos.9.3.5.bin
  NXOS compile time: 11/4/2018 21:00:00 [11/05/2018 06:11:06]
Hardware
  cisco Nexus9000 C9336C-FX2 Chassis
  Intel(R) Xeon(R) CPU E5-2403 v2 @ 1.80GHz with 8154432 kB of
  Processor Board ID FOC20291J6K
  Device name: cs2
  bootflash: 53298520 kB
Kernel uptime is 0 day(s), 0 hour(s), 3 minute(s), 42 second(s)
```

```
Last reset at 277524 usecs after Mon Nov 2 22:45:12 2020
Reason: Reset due to upgrade
System version: 9.3(4)
Service:

plugin
Core Plugin, Ethernet Plugin

Active Package(s):
```

7. Upgrade the EPLD image and reboot the switch.

Shov	v example			

cs2# show version module 1 epld EPLD Device Version _____ MI FPGA 0x7 IO FPGA 0x17 0x2MI FPGA2 0x2GEM FPGA 0x2GEM FPGA GEM FPGA 0x2GEM FPGA 0x2cs2# install epld bootflash:n9000-epld.9.3.5.img module 1 Compatibility check: Upgradable Impact Reason Module Type SUP Yes disruptive Module Upgradable Retrieving EPLD versions.... Please wait. Images will be upgraded according to following table: Running-Version New-Version Upg-Module Type EPLD Required _____ 1 SUP MI FPGA 0x07 0×07 No 1 SUP IO FPGA 0x17 0x19 Yes 1 SUP MI FPGA2 0x02 0x02 No 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 EPLDs upgraded. Module 1 EPLD upgrade is successful.

8. After the switch reboot, log in again and verify that the new version of EPLD loaded successfully.

Show example

CSZ#	show version mode	ale I epid	
EPLD	Device	Version	
 4I	FPGA	0x7	
О	FPGA	0x19	
IP	FPGA2	0x2	
GEM	FPGA	0x2	

9. Repeat steps 1 to 8 to install the NX-OS software on switch cs1.

What's next?

Install RCF config file.

Install the Reference Configuration File (RCF)

You can install the RCF after setting up the Nexus 9336C-FX2 switch for the first time. You can also use this procedure to upgrade your RCF version.

Before you begin, complete the procedure in Prepare to install NX-OS and RCF.

Review requirements

What you'll need

- · A current backup of the switch configuration.
- · A fully functioning cluster (no errors in the logs or similar issues).
- The current RCF file.
- A console connection to the switch, required when installing the RCF.

Suggested documentation

- Cisco Ethernet switch page Consult the switch compatibility table for the supported ONTAP and RCF versions. Note that there can be command dependencies between the command syntax in the RCF and that found in versions of NX-OS.
- Cisco Nexus 3000 Series Switches. Refer to the appropriate software and upgrade guides available on the Cisco web site for complete documentation on the Cisco switch upgrade and downgrade procedures.

Install the RCF

About the examples

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 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.

About this task

The procedure requires the use of both ONTAP commands and Cisco Nexus 9000 Series Switches commands; ONTAP commands are used unless otherwise indicated.

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



Before installing a new switch software version and RCFs, you must erase the switch settings and perform basic configuration. You must be connected to the switch using the serial console. This task resets the configuration of the management network.

Step 1: Prepare for the installation

1. Display the cluster ports on each node that are connected to the cluster switches:

network device-discovery show

Node/	Local	Discovered		
Protocol Platform	Port	Device (LLDP: ChassisID) Interface	
				-
cluster1-0	1/cdp			
	e0a	cs1	Ethernet1/7	N9K-
C9336C				
	e0d	cs2	Ethernet1/7	N9K-
C9336C				
cluster1-0	_			
	e0a	cs1	Ethernet1/8	N9K-
C9336C	0.1			
202262	e0d	cs2	Ethernet1/8	N9K-
C9336C cluster1-0	3 / adn			
Clustell-0	_	cs1	Ethernet1/1/1	N9K-
C9336C	Coa	651	Helicine el/1/1	NOIL
	e0b	cs2	Ethernet1/1/1	N9K-
C9336C				
cluster1-0	4/cdp			
	e0a	cs1	Ethernet1/1/2	N9K-
C9336C				
	e0b	cs2	Ethernet1/1/2	№-
C9336C				

- 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
```

	::*> network	port show -role	e cluster		
Node: cl	uster1-01				
Ignore					Speed(Mbps)
Health	Health				speed (nops)
Port	IPspace	Broadcast Do	main Link	MTU	Admin/Oper
Status	Status				
e0a	Cluster	Cluster	up	9000	auto/100000
healthy			2.12		2, 2, 2, 3, 5, 5, 5
_	Cluster	Cluster	up	9000	auto/100000
healthy	false				
Node: cl	uster1-02				
Ignore					Cnood (Mb)
Health	Health				Speed (Mbps)
		Broadcast Do	main Link	MTU	Admin/Oper
Status					-
	Cluster	Cluster	up	9000	auto/100000
healthy			1		
e0d	Cluster	Cluster	up	9000	auto/100000
healthy					
o entrie	s were displa	ayea.			
Node: cl	uster1-03				
Ignor	е				
					Speed(Mbps)
	Health	December 1		Maria	7 almost 15 / 05
	irspace	Broadcast Do	wain Link	M.T.O	Admin/Oper
Port	Ctatua				
	Status				
Port Status 					
Port Status e0a	 Cluster	Cluster	up	9000	auto/10000
Port Status e0a healthy	 Cluster		-		auto/10000 auto/10000

b. Verify that all the cluster interfaces (LIFs) are on the home port:

network interface show -role cluster

	Logical		Status	Network	
Current	Current	Is			
Vserver	Interface	9	Admin/Oper	Address/Mask	Node
Port Home)				
Cluster					
	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					
		_	up/up	169.254.1.3/23	
cluster1-03					
		_	up/up	169.254.1.1/23	
cluster1-03					
			up/up	169.254.1.6/23	
cluster1-04			,	160 054 : = /	
		-	up/up	169.254.1.7/23	
cluster1-04 8 entries we					

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
                           cluster-network 10.233.205.90
cs1
N9K-C9336C
    Serial Number: FOCXXXXXXGD
     Is Monitored: true
           Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                   9.3(5)
   Version Source: CDP
cs2
                          cluster-network 10.233.205.91
N9K-C9336C
    Serial Number: FOCXXXXXXGS
     Is Monitored: true
           Reason: None
  Software Version: Cisco Nexus Operating System (NX-OS)
Software, Version
                   9.3(5)
   Version Source: CDP
cluster1::*>
```

3. Disable auto-revert on the cluster LIFs.

Show example

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

Step 2: Configure ports

1. 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
```

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

network interface show -role cluster

Show example

	Logical	Status	Network	Current
Current Is				
Vserver	Interface	Admin/Oper	Address/Mask	Node
Port Home	e 			
				- -
Cluster				
	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	e0a false			
	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	e0a false			
	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	e0a false			
	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	e0a false			
8 entries we	ere displayed.			

3. Verify that the cluster is healthy:

cluster show

```
cluster1::*> cluster show
                    Health Eligibility
                                         Epsilon
cluster1-01
                                         false
                    true
                           true
cluster1-02
                                         false
                   true
                           true
cluster1-03
                                         true
                   true
                           true
cluster1-04
                                         false
                    true
                           true
4 entries were displayed.
cluster1::*>
```

4. If you have not already done so, save a copy of the current switch configuration by copying the output of the following command to a text file:

```
show running-config
```

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



When updating or applying a new RCF, you must erase the switch settings and perform basic configuration. You must be connected to the switch serial console port to set up the switch again.

a. Clean the configuration:

Show example

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

b. Perform a reboot of the switch:

Show example

```
(cs2)# {\bf reload} Are you sure you would like to reset the system? (y/n) {\bf y}
```

6. 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 9000 Series NX-OS Command Reference guides.

Show example

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_9336C_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)...
```

7. Apply the RCF previously downloaded to the bootflash.

For more information on Cisco commands, see the appropriate guide in the Cisco Nexus 9000 Series NX-OS Command Reference guides.

Show example

This example shows the RCF file Nexus_9336C_RCF_v1.6-Cluster-HA-Breakout.txt being installed on switch cs2:

```
cs2# copy Nexus_9336C_RCF_v1.6-Cluster-HA-Breakout.txt running-config echo-commands
```

8. Examine the banner output from the show banner moted command. You must read and follow these instructions to ensure the proper configuration and operation of the switch.

```
cs2# show banner motd
******************
* NetApp Reference Configuration File (RCF)
* Switch : Nexus N9K-C9336C-FX2
* Filename : Nexus 9336C RCF v1.6-Cluster-HA-Breakout.txt
* Date : 10-23-2020
* Version : v1.6
* Port Usage:
* Ports 1- 3: Breakout mode (4x10G) Intra-Cluster Ports, int
e1/1/1-4, e1/2/1-4
e1/3/1-4
* Ports 4- 6: Breakout mode (4x25G) Intra-Cluster/HA Ports, int
e1/4/1-4, e1/5/
1-4, e1/6/1-4
* Ports 7-34: 40/100GbE Intra-Cluster/HA Ports, int e1/7-34
* Ports 35-36: Intra-Cluster ISL Ports, int e1/35-36
* Dynamic breakout commands:
* 10G: interface breakout module 1 port <range> map 10g-4x
* 25G: interface breakout module 1 port <range> map 25g-4x
* Undo breakout commands and return interfaces to 40/100G
configuration in confi
q mode:
* no interface breakout module 1 port <range> map 10q-4x
* no interface breakout module 1 port <range> map 25g-4x
* interface Ethernet <interfaces taken out of breakout mode>
* inherit port-profile 40-100G
* priority-flow-control mode auto
* service-policy input HA
* exit
********************
*****
```

9. 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.

10. 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 9000 Series NX-OS Command Reference guides.

Show example

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

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

Show example

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

- 12. 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
```

	i // Network	port show -role	cluster		
Node: cl	luster1-01				
Ignore					Q., (Ml)
Health	Health				Speed (Mbps)
		Broadcast Doma	ain Link	MTU	Admin/Oper
Status	Status				
	 Cluster	Cluster	up	9000	auto/10000
healthy			-		
e0b	Cluster	Cluster	up	9000	auto/10000
healthy	false				
Node: cl	luster1-02				
Ignore					a 1(10)
∐ool+h	Health				Speed(Mbps)
		Broadcast Doma	nin T₁ink	МТП	Admin/Oper
	Status	220000000 201110			risimiri, oper
e0a	Cluster	Cluster	up	9000	auto/10000
healthy	false				
e0b healthy	Cluster false	Cluster	up	9000	auto/10000
Node: cl	luster1-03				
Ignore					
-					Speed (Mbps)
	Health	_ ,			- 1 /-
	_	Broadcast Doma	in Link	MTU	Admin/Oper
status 	Status 				
	 Cluster	Cluston	1170	9000	211+0/100000
eua healthy		Cluster	uр	9000	auto/100000
_	Cluster	Cluster	ир	9000	auto/100000
	false	0140001	αp	3000	3455, 100000

Ignore						
rgnore						Speed(Mbps)
Health	Health					- F (F - /
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 entrie	s were displa	aved.				

b. Verify the switch health from the cluster (this might not show switch cs2, since LIFs are not homed on e0d).

Node/	Local	Discovere	ed	
Protocol	Port	Device (1	LLDP: ChassisID)	Interface
Platform				
	1 /1			
cluster1-01	_	a a 1		Ethernet1/7
N9K-C9336C	e0a	CSI		Etherneti//
N9K-C9330C	e0d	0.5.2		Ethernet1/7
N9K-C9336C	eva	C3Z		Edieliedi//
cluster01-2	2/cdn			
Clustel01-2	_	cs1		Ethernet1/8
N9K-C9336C	Cua	CSI		Helierlieer/ 0
11011 000000	e0d	cs2		Ethernet1/8
N9K-C9336C	Cou	CSZ		Helicilice1/0
cluster01-3	3/cdn			
CIUBCCIOI	e0a	cs1		Ethernet1/1/1
N9K-C9336C	Coa	031		Helicilice1/1/1
NJI 055500	e0b	cs2		Ethernet1/1/1
N9K-C9336C	COD	052		Delicine et/ 1/ 1
cluster1-04	1/cdn			
CIUSCCII O	e0a	cs1		Ethernet1/1/2
N9K-C9336C	coa	001		
	e0b	cs2		Ethernet1/1/2
N9K-C9336C	002	002		
cluster1::	<pre> syste </pre>	m cluster	-switch show -is-	monitoring-enabled
	_			_
	al true			
-operation	al true		Type	Address
-operationa Switch	al true		Туре	Address
-operationa Switch	al true		Туре	Address
-operationa Switch	al true		Type	Address
-operationa Switch Model 	al true		Type cluster-network	
-operationa Switch Model cs1	al true			
-operational Switch Model		: : FOCXXXXX	cluster-network	
-operational Switch Model cs1 NX9-C9336C Serial			cluster-network	
-operational Switch Model cs1 NX9-C9336C Serial	L Number		cluster-network	
-operational Switch Model cs1 NX9-C9336C Serial Is Mo	l Number onitored Reason	: true : None	cluster-network	10.233.205.90
-operational Switch Model cs1 NX9-C9336C Serial Is Mo	l Number onitored Reason Version	: true : None	cluster-network	10.233.205.90
-operational Switch Model cs1 NX9-C9336C Serial Is Mo	l Number onitored Reason Version	: true : None	cluster-network	10.233.205.90
-operations Switch Model cs1 NX9-C9336C Serial Is Mo Software Software, N	l Number onitored Reason Version	: true : None : Cisco Ne	cluster-network	10.233.205.90
-operations Switch Model cs1 NX9-C9336C Serial Is Mo Software Software, N	l Number onitored Reason Version Version	: true : None : Cisco Ne	cluster-network	10.233.205.90

```
NX9-C9336C

Serial Number: FOCXXXXXXGS

Is Monitored: true

Reason: None

Software Version: Cisco Nexus Operating System (NX-OS)

Software, Version

9.3(5)

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.
```

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

Show example

The following example uses the interface example output:

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

14. 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

	Logical	Status	Network	Current
Current Is				
Vserver	Interface	Admin/Oper	Address/Mask	Node
Port Home	9			
				_
 Cluster				
	cluster1-01 clus1	מוו/מוו	169 254 3 4/23	
	e0d fai		103.201.0.1/20	
	cluster1-01 clus2		169.254.3.5/23	
	e0d tr			
	cluster1-02 clus1	up/up	169.254.3.8/23	
	e0d fai			
	cluster1-02_clus2	up/up	169.254.3.9/23	
cluster1-02	e0d tru	ıe		
	cluster1-03_clus1	up/up	169.254.1.3/23	
cluster1-03	e0b fai	lse		
	cluster1-03_clus2	up/up	169.254.1.1/23	
cluster1-03	e0b tr	ıe		
	cluster1-04_clus1		169.254.1.6/23	
cluster1-04	e0b fal	lse		
	cluster1-04_clus2		169.254.1.7/23	
cluster1-04	e0b tr	ıe		
8 entries we	ere displayed.			

15. Verify that the cluster is healthy:

cluster show

```
cluster1::*> cluster show
                             Eligibility
                                          Epsilon
cluster1-01
                                          false
                    true
                             true
cluster1-02
                                          false
                   true
                            true
cluster1-03
                   true
                                          true
                             true
cluster1-04
                                          false
                    true
                             true
4 entries were displayed.
cluster1::*>
```

- 16. Repeat steps 4 to 11 on switch cs1.
- 17. Enable auto-revert on the cluster LIFs.

Show example

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

18. 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.

Show example

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

Step 3: Verify the configuration

1. Verify that the switch ports connected to the cluster ports are **up**.

show interface brief

```
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) --
       1 eth trunk up
Eth1/8
                                none
100G(D) --
```

2. Verify that the expected nodes are still connected:

show cdp neighbors

Show example

```
cs1# show cdp neighbors
Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-
Bridge
               S - Switch, H - Host, I - IGMP, r - Repeater,
               V - VoIP-Phone, D - Remotely-Managed-Device,
               s - Supports-STP-Dispute
Device-ID
               Local Intrfce Hldtme Capability Platform
Port ID
               Eth1/1
                            133 н
node1
                                            FAS2980
e0a
node2
              Eth1/2
                            133 H FAS2980
e0a
cs2
             Eth1/35 175 R S I s N9K-C9336C
Eth1/35
cs2
                Eth1/36 175 R S I s N9K-C9336C
Eth1/36
Total entries displayed: 4
```

3. Verify that the cluster nodes are in their correct cluster VLANs using the following commands:
show vlan brief
show interface trunk

VLAN Name	Status Ports	
1 default	active Pol, Eth1/1, Et	h1/2,
Eth1/3		
Eth1/6, Eth1/7	Eth1/4, Eth1/5,	
	Eth1/8, Eth1/35	,
Eth1/36	Eth1/9/1, Eth1/	9/2,
Eth1/9/3	F-1/0/4 F-1/	10/1
Eth1/10/2	Eth1/9/4, Eth1/	10/1,
17 VLAN0017	Eth1/10/3, Eth1 active Eth1/1, Eth1/2,	
Eth1/3, Eth1/4	active Ethi/1, Ethi/2,	
Eth1/7, Eth1/8	Eth1/5, Eth1/6,	
	Eth1/9/1, Eth1/	9/2,
Eth1/9/3	Eth1/9/4, Eth1/	10/1,
Eth1/10/2		
18 VLAN0018	Eth1/10/3, Eth1 active Eth1/1, Eth1/2,	
Eth1/3, Eth1/4	D+1.1/F D+1.1/C	
Eth1/7, Eth1/8	Eth1/5, Eth1/6,	
E+b1/0/2	Eth1/9/1, Eth1/	9/2,
Eth1/9/3	Eth1/9/4, Eth1/	10/1,
Eth1/10/2	Eth1/10/3, Eth1	/10/4
31 VLAN0031	active Eth1/11, Eth1/1	
Eth1/13	Eth1/14, Eth1/1	5,
Eth1/16		·
Eth1/19	Eth1/17, Eth1/1	8,
D+1-1 /00	Eth1/20, Eth1/2	1,
Eth1/22 32 VLAN0032	active Eth1/23, Eth1/2	4,
Eth1/25		

_	,			
			Eth1/26,	Eth1/27,
	Eth1/28			
			Eth1/29,	Eth1/30,
	Eth1/31			
			Eth1/32,	Eth1/33,
	Eth1/34		•	. ,
	33 VLAN0033	active	Eth1/11.	Eth1/12.
	Eth1/13	accive	LC111/11/	LCIII / 12 /
			E+b1/1/	D+b1 /15
	D-1/16		Eth1/14,	ECHI/IJ,
	Eth1/16			1 4 /4 0
			Eth1/17,	Eth1/18,
	Eth1/19			
			Eth1/20,	Eth1/21,
	Eth1/22			
	34 VLAN0034	active	Eth1/23,	Eth1/24,
	Eth1/25			
			Eth1/26,	Eth1/27,
	Eth1/28			·
			Eth1/29,	Eth1/30.
	Eth1/31		_3111, _3,	_ 3111 / 3 0 /
	10111/01		Eth1/32,	E+b1/33
	D-1/24		EUIII/JZ,	EUIII/JJ,
	Eth1/34			

cs1# show interface trunk

Port	Native Vlan	Status	Port Channel
	1		
Eth1/1	1	trunking	
Eth1/2	1	trunking	
Eth1/3	1	trunking	
Eth1/4	1	trunking	
Eth1/5	1	trunking	
Eth1/6	1	trunking	
Eth1/7	1	trunking	
Eth1/8	1	trunking	
Eth1/9/1	1	trunking	
Eth1/9/2	1	trunking	
Eth1/9/3	1	trunking	
Eth1/9/4	1	trunking	
Eth1/10/1	1	trunking	
Eth1/10/2	1	trunking	
Eth1/10/3	1	trunking	
Eth1/10/4	1	trunking	
Eth1/11	33	trunking	

```
Eth1/12
            33
                    trunking
Eth1/13
            33
                    trunking
                                __
                    trunking
Eth1/14
            33
                                --
Eth1/15
            33
                    trunking
                                __
                    trunking
Eth1/16
            33
                                --
                    trunking
Eth1/17
            33
                                --
                   trunking
Eth1/18
            33
                                --
Eth1/19
            33
                    trunking
                    trunking
Eth1/20
            33
Eth1/21
            33
                    trunking
Eth1/22
            33
                    trunking
Eth1/23
            34
                   trunking
Eth1/24
            34
                   trunking
                                --
Eth1/25
            34
                   trunking
                                --
Eth1/26
            34
                   trunking
                                __
Eth1/27
            34
                   trunking
                                --
Eth1/28
            34
                   trunking
Eth1/29
            34
                    trunking
Eth1/30
            34
                   trunking
Eth1/31
            34
                   trunking
                                __
            34
                   trunking
Eth1/32
                                --
            34
                    trunking
Eth1/33
                                ___
            34
                   trunking
                                --
Eth1/34
            1
                   trnk-bndl
Eth1/35
                                Po1
Eth1/36
            1
                   trnk-bndl
                                Po1
                                ___
            1
                  trunking
Po1
            Vlans Allowed on Trunk
Port
_____
Eth1/1
            1,17-18
Eth1/2
            1,17-18
            1,17-18
Eth1/3
            1,17-18
Eth1/4
Eth1/5
            1,17-18
Eth1/6
            1,17-18
Eth1/7
            1,17-18
Eth1/8
            1,17-18
Eth1/9/1
            1,17-18
Eth1/9/2
            1,17-18
Eth1/9/3
            1,17-18
Eth1/9/4
            1,17-18
Eth1/10/1
            1,17-18
Eth1/10/2
            1,17-18
            1,17-18
Eth1/10/3
Eth1/10/4
            1,17-18
```

```
Eth1/11
               31,33
Eth1/12
               31,33
Eth1/13
               31,33
Eth1/14
               31,33
Eth1/15
               31,33
               31,33
Eth1/16
               31,33
Eth1/17
               31,33
Eth1/18
               31,33
Eth1/19
               31,33
Eth1/20
Eth1/21
               31,33
Eth1/22
               31,33
Eth1/23
               32,34
Eth1/24
               32,34
Eth1/25
               32,34
               32,34
Eth1/26
Eth1/27
               32,34
Eth1/28
               32,34
Eth1/29
               32,34
Eth1/30
               32,34
Eth1/31
               32,34
               32,34
Eth1/32
Eth1/33
               32,34
Eth1/34
               32,34
Eth1/35
               1
Eth1/36
               1
               1
Po1
 . .
```



For specific port and VLAN usage details, refer to the banner and important notes section in your RCF.

4. Verify that the ISL between cs1 and cs2 is functional:

show port-channel summary

5. Verify that the cluster LIFs have reverted to their home port:

network interface show -role cluster

	Logical	Status	Network	Current
Current Is				
Vserver	Interface	Admin/Oper	Address/Mask	Node
Port Home	Э			
				_
Cluster		,	1.60 054 0 4/00	
	cluster1-01_clus1		169.254.3.4/23	
	e0d tr		160 054 0 5/00	
	cluster1-01_clus2		169.254.3.5/23	
	e0d tr		160 054 0 0/00	
	cluster1-02_clus1		169.254.3.8/23	
	e0d tr		160 054 2 0/02	
	cluster1-02_clus2 e0d tr		109.234.3.9/23	
			160 054 1 2/02	
	cluster1-03_clus1 e0b tr		109.234.1.3/23	
	cluster1-03 clus2		160 254 1 1/22	
	e0b tr		109.234.1.1/23	
	cluster1-04 clus1		169 25/ 1 6/23	
	e0b tr		107.234.1.0/23	
	cluster1-04 clus2		169 254 1 7/23	
	e0b tr		103.234.1.7/23	
	ere displayed.	uc		

6. Verify that the cluster is healthy:

cluster show

```
cluster1::*> cluster show
               Health Eligibility Epsilon
----- -----
cluster1-01
              true true true
                              false
cluster1-02
                              false
cluster1-03
              true
                    true
                              true
cluster1-04 true
                    true false
4 entries were displayed.
cluster1::*>
```

7. 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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