

Configure a Cisco Nexus 9336C-FX2 cluster switch

Cluster and storage switches

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Table of Contents

C	onfigure a Cisco Nexus 9336C-FX2 cluster switch	1
	Configure a Cisco Nexus 9336C-FX2 cluster switch	1
	Initial installation of the Nexus 9336C-FX2 cluster switch	1
	Install the NX-OS software	6
	Install the Reference Configuration File (RCF)	3

Configure a Cisco Nexus 9336C-FX2 cluster switch

Configure a Cisco Nexus 9336C-FX2 cluster switch

You can configure a new Nexus 9336C-FX2 switch by completing the steps detailed in this chapter.

Installing the Nexus 9336C-FX2 switch on systems running ONTAP 9.8 and later, starts with setting up an IP address and configuration to allow the switch to communicate through the management interface. You can then install the NX-OS software and reference configuration file (RCF). This procedure is intended for preparing the Nexus 9336C-FX2 switch before controllers are added.

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

- The Nexus 9336C-FX2 switch names are cs1 and cs2.
- The example used in this procedure starts the upgrade on the second switch, *cs2*.
- The cluster LIF names are node1_clus1 and node1_clus2 for node1, and node2_clus1 and node2_clus2 for node2.
- · The IPspace name is Cluster.
- The cluster1::*> prompt indicates the name of the cluster.
- The cluster ports on each node are named e0a and e0b.

See the Hardware Universe for the actual cluster ports supported on your platform.

- The node connections supported for the Nexus 9336C-FX2 switches are ports 1/1 through 1/34.
- The Inter-Switch Links (ISLs) supported for the Nexus 9336C-FX2 switches are ports 1/35 and 1/36.
- The examples in this procedure use two nodes, but you can have up to 24 nodes in a cluster.

Initial installation of the Nexus 9336C-FX2 cluster switch

You can use this procedure to perform the initial installation of the Cisco Nexus 9336C-FX2 switch.

You can download the applicable NetApp Cisco NX-OS software for your switches from the NetApp Support Site at mysupport.netapp.com.

NX-OS is a network operating system for the Nexus series of Ethernet switches and MDS series of Fibre Channel (FC) storage area network switches provided by Cisco Systems.

This procedure provides a summary of the process to install your switches and get them running.

Steps

- 1. Connect the serial port to the host or serial port of your choice.
- 2. Connect the management port (on the non-port side of the switch) to the same network where your SFTP server is located.

- 3. At the console, set the host side serial settings:
 - · 9600 baud
 - 8 data bits
 - 1 stop bit
 - · parity: none
 - · flow control: none
- 4. Booting for the first time or rebooting after erasing the running configuration, the Nexus 9336C-FX2 switch loops in a boot cycle. Interrupt this cycle by typing **yes** to abort Power on Auto Provisioning. You are then presented with the System Admin Account setup:

```
$ VDC-1 %$ %POAP-2-POAP_INFO: - Abort Power On Auto Provisioning [yes - continue with normal setup, skip - bypass password and basic configuration, no - continue with Power On Auto Provisioning] (yes/skip/no) [no]: yes
Disabling POAP......Disabling POAP
2019 Apr 10 00:36:17 switch %$ VDC-1 %$ poap: Rolling back, please wait... (This may take 5-15 minutes)
---- System Admin Account Setup ----
```

5. Type **y** to enforce secure password standard:

```
Do you want to enforce secure password standard (yes/no) [y]: y
```

6. Enter and confirm the password for user admin:

```
Enter the password for "admin":
Confirm the password for "admin":
```

7. Enter the Basic System Configuration dialog:

This setup utility will guide you through the basic configuration of the system. Setup configures only enough connectivity for management of the system.

Please register Cisco Nexus9000 Family devices promptly with your supplier. Failure to register may affect response times for initial service calls. Nexus9000 devices must be registered to receive entitled support services.

Press Enter at anytime to skip a dialog. Use ctrl-c at anytime to skip the remaining dialogs.

Would you like to enter the basic configuration dialog (yes/no):

8. Create another login account:

```
Create another login account (yes/no) [n]:
```

9. Configure read-only and read-write SNMP community strings:

```
Configure read-only SNMP community string (yes/no) [n]:

Configure read-write SNMP community string (yes/no) [n]:
```

10. Configure the cluster switch name:

```
Enter the switch name : cs2
```

11. Configure the out-of-band management interface:

```
Continue with Out-of-band (mgmt0) management configuration? (yes/no) [y]: y

Mgmt0 IPv4 address: 172.22.133.216

Mgmt0 IPv4 netmask: 255.255.224.0

Configure the default gateway? (yes/no) [y]: y

IPv4 address of the default gateway : 172.22.128.1
```

12. Configure advanced IP options:

```
Configure advanced IP options? (yes/no) [n]: n
```

13. Configure Telnet services:

```
Enable the telnet service? (yes/no) [n]: n
```

14. Configure SSH services and SSH keys:

```
Enable the ssh service? (yes/no) [y]: y

Type of ssh key you would like to generate (dsa/rsa) [rsa]: rsa

Number of rsa key bits <1024-2048> [1024]: 2048
```

15. Configure other settings:

```
Configure the ntp server? (yes/no) [n]: n

Configure default interface layer (L3/L2) [L2]: L2

Configure default switchport interface state (shut/noshut) [noshut]: noshut

Configure CoPP system profile (strict/moderate/lenient/dense)
[strict]: strict
```

16. Confirm switch information and save the configuration:

```
Would you like to edit the configuration? (yes/no) [n]: n

Use this configuration and save it? (yes/no) [y]: y

[################################## 100%

Copy complete, now saving to disk (please wait)...

Copy complete.
```

17. 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 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: csl
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.

18. 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-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: csl
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 9336C-FX2 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 9336C-FX2 switch.

```
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:

```
cs2# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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All rights reserved.
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owned by other third parties and used and distributed under their own
licenses, such as open source. This software is provided "as is," and
unless
otherwise stated, there is no warranty, express or implied, including
limited to warranties of merchantability and fitness for a particular
purpose.
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the GNU General Public License (GPL) version 2.0 or
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Lesser General Public License (LGPL) Version 2.0.
A copy of each such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
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
yes disruptive reset default upgrade is not
 1
hitless
```

```
Images will be upgraded according to following table:
Module Image Running-Version(pri:alt
                                                   New-Version
Upg-Required
_____
_____
                                                   9.3(5)
 1 nxos 9.3(4)
yes
       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

```
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
owned by other third parties and used and distributed under their own
licenses, such as open source. This software is provided "as is," and
unless
otherwise stated, there is no warranty, express or implied, including
```

```
but not
limited to warranties of merchantability and fitness for a particular
purpose.
Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or
GNU General Public License (GPL) version 3.0 or the GNU
Lesser General Public License (LGPL) Version 2.1 or
Lesser General Public License (LGPL) Version 2.0.
A copy of each such license is available at
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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 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 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.

cs2# show version module 1 epld EPLD Device Version _____ MI FPGA 0x7 IO FPGA 0x17 0x2MI FPGA2 GEM FPGA 0x2GEM FPGA 0x2GEM FPGA 0x2GEM FPGA 0x2cs2# install epld bootflash:n9000-epld.9.3.5.img module 1 Compatibility check: Upgradable Impact Reason Module Type 1 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 0x07 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.

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

cs2#	show ver	sion module 1 epld
EPLD	Device	Version
MI	FPGA	0x7
IO	FPGA	0x19
MI	FPGA2	0x2
GEM	FPGA	0x2

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.

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 arecluster1-01, 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 9000 Series Switches commands; ONTAP commands are used unless otherwise indicated.
- Before performing this procedure, make sure that you have a current backup of the switch configuration.

Steps

 Display the cluster ports on each node that are connected to the cluster switches: network devicediscovery show

		Discovered Device (LLDP: ChassisID)	Interface	Platform
cluster1-0	_			_
C9336C	e0a	cs1	Ethernet1/7	N9K-
C9336C	e0d	0.52	Ethernet1/7	NOV-
C9336C	eoa	C32	Ecuerueci//	NJK
cluster1-0	2/cdp			
	_	cs1	Ethernet1/8	N9K-
C9336C				
	e0d	cs2	Ethernet1/8	N9K-
C9336C				
cluster1-0	_			
	e0a	cs1	Ethernet1/1/1	N9K-
C9336C	01	0	D.1 .1/1/1	31077
C9336C	e0b	cs2	Ethernet1/1/1	N9K-
cluster1-0	4/cdn			
01400011 0	_	cs1	Ethernet1/1/2	N9K-
C9336C				
	e0b	cs2	Ethernet1/1/2	N9K-
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

Node: clu	ster1-02						
.vode. cra	02						
Ignore							
II a a l ± la						Speed (Mbps)	Health
Health Port	IPspace	Broadcast	Domain	Link	МТП	Admin/Oper	Status
Status	1156466	Diodadase	Domaii		1110	riamiri, oper	beacub
 e0a	 Cluster	Cluster		un	9000	auto/10000	n
coa healthy f		CIUSCCI		αр	3000	auco, 100000	S
_	Cluster	Cluster		up	9000	auto/100000)
healthy f	alse						
8 entries	were displa	yed.					
Node: clu	ster1-03						
Ignore	<u> </u>						
						Speed(Mbps)	Health
Health							
	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	Status
Status							
		_				4	
e0a false	Cluster	Cluster		up	9000	auto/10000	healthy
	Cluster	Cluster		up	9000	auto/10000	healths
false	OT UD CCT	CIGOCCI		αр	3000	4400/10000	iicai cii ₋
Node: clu	ster1-04						
Ignore							
-						Speed (Mbps)	Health
Health	TD	D 1 .	D .	T ' 1	NATE TO	7.1.1.70	
Port Status	IPspace	Broadcast	Domain	Link	M.T.N	Admin/Oper	Status
	Cluster	Cluster		up	9000	auto/10000	healthy
false							
	Cluster	Cluster		up	9000	auto/10000	health
<pre>false cluster1:</pre>	di S						

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

		Logical	Status	Network	Current
Cur	rent Is				
	rver		Admin/Oper	Address/Mask	Node
Por	t Hom	е			
Clu	ster				
		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	,	1.60 0.71 1.6/00	
0.4	•	cluster1-04_clus1	up/up	169.254.1.6/23	cluster1-
04	e0a	true	,	1.60 0.7.1 7.400	
0.4	0.1	cluster1-04_clus2	up/up	169.254.1.7/23	cluster1-
04	e0b	true ere displayed.			

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.

```
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

		Logical	Status	Network	Current
Current	Is				
Vserver		Interface	Admin/Oper	Address/Mask	Node
Port	Home	е			
Cluster					
		cluster1-01_clus1	up/up	169.254.3.4/23	cluster1-01
e0a	true		,		
0	6 7	cluster1-01_clus2	up/up	169.254.3.5/23	cluster1-01
e0a	fals		,	1.60 054 0 0/00	
- 0 -	4	cluster1-02_clus1	up/up	169.254.3.8/23	cluster1-02
e0a	true		/	169.254.3.9/23	cluster1-02
e0a	fals	cluster1-02_clus2	up/up	169.234.3.9/23	Cluster1-02
eva	Iali	cluster1-03 clus1	11n / 11n	169.254.1.3/23	cluster1-03
e0a	true	-	ир/ир	107.234.1.3/23	Clustell 05
Coa	CIU	cluster1-03 clus2	ıın/ıın	169.254.1.1/23	cluster1-03
e0a	fals	_	αργαρ	103.201.1.1, 20	CIUDCCII 03
coa	141	cluster1-04 clus1	מנו/מנו	169.254.1.6/23	cluster1-04
e0a	true	_	αρ, α _Ρ	103,1201,110,20	01000011 01
		cluster1-04 clus2	up/up	169.254.1.7/23	cluster1-04
e0a	fals	-	I . I		
		ere displayed.			

6. Verify that the cluster is healthy: cluster show

<pre>cluster1::*> cluster Node</pre>		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 displa	ayed.		
cluster1::*>			

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

```
show running-config
```

- 8. 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.
- 9. 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.

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)...
```

10. 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.

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
```

11. 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 10g-4x
* no interface breakout module 1 port <range> map 25q-4x
* interface Ethernet <interfaces taken out of breakout mode>
* inherit port-profile 40-100G
* priority-flow-control mode auto
* service-policy input HA
* exit
******************
*****
```

12. 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.
- 13. 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.

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

14. 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
```

- 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
      IPspace Broadcast Domain Link MTU Admin/Oper Status
Port
Status
e0a
                  Cluster up 9000 auto/10000 healthy
       Cluster
false
e0b
       Cluster Cluster up 9000 auto/10000 healthy
false
Node: cluster1-02
Ignore
                                            Speed (Mbps) Health
Health
                    Broadcast Domain Link MTU Admin/Oper Status
Port
        IPspace
```

Status							
	Cluster	Cluster		up	9000	auto/10000	healthy
false e0b	Cluster	Cluster		up	9000	auto/10000	healthy
false							
Node: clu	ster1-03						
Ignore							7.1
Health						Speed (Mbps)	Health
	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	Status
Status							
	Cluster	Cluster		up	9000	auto/100000	0
healthy f	alse Cluster	Cluster		up	9000	auto/10000	0
healthy f	alse			_			
Node: clu	ster1-04						
Ignore							
II a a l ± la						Speed(Mbps)	Health
Health Port	IPspace	Broadcast	Domain	Link	MTU	Admin/Oper	Status
Status							
e0a	Cluster	Cluster		up	9000	auto/10000	0
healthy f		01			0000	/10000	2
eua healthy f	Cluster alse	Cluster		up	9000	auto/100000	J
8 entries	were displaye	ed.					

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

cluster1-01	/cdp			D.1 .1/7	
				D.1 .1/7	
	e0a	cs1		Ethernet1/7	N9K-
C9336C					
	e0d	cs2		Ethernet1/7	N9K-
C9336C	000	002		_ 0110111001, ,	21,521
	/ a da				
cluster01-2	_			1	
	e0a	cs1		Ethernet1/8	N9K-
C9336C					
	e0d	cs2		Ethernet1/8	N9K-
C9336C					
cluster01-3	/cdp				
	e0a	cs1		Ethernet1/1/1	N9K-
C9336C				• •	
03000	e0b	cs2		Ethernet1/1/1	N9K-
002260	200	C32		Echerneci/1/1	NJI
C9336C	/ 1				
cluster1-04					
	e0a	cs1		Ethernet1/1/2	N9K-
C9336C					
	e0b	cs2		Ethernet1/1/2	N9K-
C9336C					
-operationa	_		witch show -is- ype	monitoring-enabled Address	d Mode
cluster1::*: -operationa Switch	_			-	
-operationa	_	т	ype 	-	Mode
-operationa Switch	_	т	ype 	Address	Mode
-operationa Switch cs1 C9336C	l true	т	ype luster-network	Address	Mode
-operationa Switch cs1 C9336C Serial	l true	T c	ype luster-network	Address	Mode
-operationa Switch cs1 C9336C Serial	l true Number	T c c : FOCXXXXXX	ype luster-network	Address	Mode
-operationa Switchcs1 C9336C Serial Is Mo	l true Number nitored Reason	T c : FOCXXXXXX : true : None	ype luster-network GD	Address 	Mode NX9-
-operationa Switch cs1 C9336C Serial Is Mo	l true Number nitored Reason	T c : FOCXXXXXX : true : None	ype luster-network GD	Address	Mode NX9-
-operationa Switch cs1 C9336C Serial Is Mo	l true Number nitored Reason	T c : FOCXXXXXX : true : None : Cisco Nex	ype luster-network GD	Address 	Mode NX9-
-operationa Switch cs1 C9336C Serial Is Mo	Number nitored Reason Version	Tocxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	ype luster-network GD	Address 	Mode NX9-
-operationa Switch cs1 C9336C Serial Is Mo	Number nitored Reason Version	Tocxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	ype luster-network GD	Address 	Mode NX9-
-operationa Switch cs1 C9336C Serial Is Mod Software Version Version	Number nitored Reason Version	Tocxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	ype luster-network GD us Operating Sy	Address	Mode NX9-
-operationa Switch cs1 C9336C Serial Is Mod Software Version Version	Number nitored Reason Version	Tocxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	ype luster-network GD us Operating Sy	Address 	Mode NX9-
-operationa Switch cs1 C9336C Serial Is Mod Software Version Version cs2 C9336C	Number nitored Reason Version	Tocxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	ype luster-network GD us Operating Sy luster-network	Address	Mode NX9-
-operationa Switch cs1 C9336C Serial Is Mod Software Version Version cs2 C9336C Serial	l true Number nitored Reason Version Source	T c FOCXXXXXX true None Cisco Nex 9.3(5) CDP c	ype luster-network GD us Operating Sy luster-network	Address	Mode NX9-
-operationa Switch cs1 C9336C Serial Is Mod Software Version Version cs2 C9336C Serial	Number nitored Reason Version	T c FOCXXXXXX true None Cisco Nex 9.3(5) CDP c	ype luster-network GD us Operating Sy luster-network	Address	Mode NX9-
-operationa Switch cs1 C9336C Serial Is Mod Software Version Version cs2 C9336C Serial	l true Number nitored Reason Version Source	To compare the com	ype luster-network GD us Operating Sy luster-network	Address	Mode NX9-
-operationa Switch cs1 C9336C Serial Is Mod Software Version Version cs2 C9336C Serial Is Mod	Number nitored Reason Version Source Number nitored Reason	T c FOCXXXXXX true None Cisco Nex 9.3(5) CDP c FOCXXXXXX true None	ype luster-network GD us Operating Sy luster-network GS	Address	Mode NX9- ware,
-operationa Switch cs1 C9336C Serial Is Mo Software Version Version cs2 C9336C Serial Is Mo Software	Number nitored Reason Version Source Number nitored Reason	T c FOCXXXXXX true None Cisco Nex 9.3(5) CDP c FOCXXXXXX true None	ype luster-network GD us Operating Sy luster-network GS	Address 10.233.205.90 Pstem (NX-OS) Software 10.233.205.91	Mode NX9- ware,
-operationa Switch cs1 C9336C Serial Is Mo Software Version Version cs2 C9336C Serial Is Mo Software	Number nitored Reason Version Source Number nitored Reason	TOCXXXXXX FOCXXXXXX True None Cisco Nex 9.3(5) CDP C FOCXXXXXX true None Cisco Nex	ype luster-network GD us Operating Sy luster-network GS	Address 10.233.205.90 Pstem (NX-OS) Software 10.233.205.91	Mode NX9- ware,
-operationa Switch cs1 C9336C Serial Is Mod Software Version Version cs2 C9336C Serial Is Mod	Number nitored Reason Version Source Number nitored Reason Version	T C FOCXXXXXX true None Cisco Nex 9.3(5) CDP C FOCXXXXXX true None Cisco Nex 9.3(5)	ype luster-network GD us Operating Sy luster-network GS	Address 10.233.205.90 Pstem (NX-OS) Software 10.233.205.91	Mode NX9- ware,



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

Cluster	1::">	> network interface			C
Current	Τα	Logical	Status	Network	Current
	_	Interface	Admin/Oper	Address/Mask	Node
Port			Admini/Oper	Address/Mask	Node
	_				
Cluster					
		cluster1-01_clus1	up/up	169.254.3.4/23	cluster1-01
e0d	fals	se			
		cluster1-01_clus2	up/up	169.254.3.5/23	cluster1-01
e0d	true	е			
		cluster1-02_clus1	up/up	169.254.3.8/23	cluster1-02
e0d	fals				
0.1		cluster1-02_clus2	up/up	169.254.3.9/23	cluster1-02
e0d	true	-	/	1.00 054 1 2/02	1 1 00
e0b	fals	cluster1-03_clus1	up/up	169.254.1.3/23	cluster1-03
eub	Idl		up/up	169.254.1.1/23	cluster1-03
e0b	true	-	up/up	109.254.1.1/25	Clustell-03
000	CIU	cluster1-04 clus1	מוו/מוו	169.254.1.6/23	cluster1-04
e0b	fals	-	αρ/αρ	103.201.1.0,20	01450011 01
		cluster1-04 clus2	up/up	169.254.1.7/23	cluster1-04
e0b	true	_			
8 entri	es we	ere displayed.			

18. Verify that the cluster is healthy: ${\tt cluster}$ show

cluster1::*> cluste	r 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 disp	layed.		
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
                                                      10G(D)
                eth access up
                                  none
Eth1/1/2 1 eth access up
                                                      10G(D)
                                  none
Eth1/7
           1
               eth trunk up
                                                      100G(D)
                                  none
Eth1/8
      1 eth trunk up
                                  none
                                                      100G(D)
--
```

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

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

	_	Logical	Status	Network	Current
Current		Interface	Admin/Onor	Address/Mask	Node
Port.			AdiiIII/Oper	Address/Mask	Node
		, 			
Cluster					
		cluster1-01_clus1	up/up	169.254.3.4/23	cluster1-01
e0d	true		,		
- O al	+	cluster1-01_clus2	up/up	169.254.3.5/23	cluster1-01
e0d	true	cluster1-02 clus1	110/110	169.254.3.8/23	cluster1-02
e0d	t.rue	_	ир/ ир	107.234.3.0/23	Clustell 02
		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
e0b	true				
		_	up/up	169.254.1.1/23	cluster1-03
e0b	true		/	160 054 1 6/00	-1+1 04
e0b	true	cluster1-04_clus1	up/up	169.254.1.6/23	cluster1-04
200	crue		מנו/מנו	169.254.1.7/23	cluster1-04
e0b	true	-	α ρ , α ρ	103,1201,11,1	01000011 01
8 entri	es we	ere displayed.			

25. Verify that the cluster is healthy: ${\tt cluster}\ {\tt show}$

<pre>cluster1::*> cluster Node</pre>	show 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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