



Install NX-OS software and RCF on Cisco Nexus 92300YC cluster switches

ONTAP Systems Switches

NetApp
February 22, 2022

Table of Contents

- Install NX-OS software and RCF on Cisco Nexus 92300YC cluster switches. 1
 - Install NX-OS software and RCF on Cisco Nexus 92300YC cluster switches. 1
 - Install the NX-OS software. 6
 - Install the Reference Configuration File (RCF) 13

Install NX-OS software and RCF on Cisco Nexus 92300YC cluster switches

Install NX-OS software and RCF on Cisco Nexus 92300YC cluster switches

The Cisco NX-OS software and reference configuration files (RCFs) must be installed on Cisco Nexus 92300YC cluster switches.

What you'll need

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 consulted the switch compatibility table on the Cisco Ethernet switch page for the supported ONTAP, NX-OS, and RCF versions.

[Cisco Ethernet switch](#)

- 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 9000 Series Switches*.

[Cisco Nexus 9000 Series Switches](#)

- You must have the current RCF.

About this tasks

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 `node1` and `node2`.
- The cluster LIF names are `node1_clus1` and `node1_clus2` for `node1` and `node2_clus1` and `node2_clus2` for `node2`.

- 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.

Steps

1. Change the privilege level to advanced, entering **y** when prompted to continue:

```
set -privilege advanced
```

The advanced prompt (`*>`) appears.

2. 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.

The following command suppresses automatic case creation for two hours:

```
cluster1:> system node autosupport invoke -node * -type all -message  
MAINT=2h
```

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
node2	/cdp			
	e0a	cs1	Eth1/2	N9K-
C92300YC				
	e0b	cs2	Eth1/2	N9K-
C92300YC				
node1	/cdp			
	e0a	cs1	Eth1/1	N9K-
C92300YC				
	e0b	cs2	Eth1/1	N9K-
C92300YC				

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: node2

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

Node: node1

Port	IPspace	Broadcast Domain	Link	MTU	Speed(Mbps)		Health Status
					Admin/Oper		
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				
	node1_clus1	up/up	169.254.209.69/16	node1
e0a	true			
	node1_clus2	up/up	169.254.49.125/16	node1
e0b	true			
	node2_clus1	up/up	169.254.47.194/16	node2
e0a	true			
	node2_clus2	up/up	169.254.19.183/16	node2
e0b	true			

4 entries were displayed.

5. Ping the remote cluster LIFs:

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

```

cluster1::*> **cluster ping-cluster -node node2**
Host is node2
Getting addresses from network interface table...
Cluster node1_clus1 169.254.209.69 node1      e0a
Cluster node1_clus2 169.254.49.125 node1      e0b
Cluster node2_clus1 169.254.47.194 node2      e0a
Cluster node2_clus2 169.254.19.183 node2      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	node1_clus1	true
	node1_clus2	true
	node2_clus1	true
	node2_clus2	true

4 entries were displayed.

7. For ONTAP 9.4 and later, enable the cluster switch health monitor log collection feature for collecting switch-related log files:

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

```
cluster1::*> **system cluster-switch log setup-password**  
Enter the switch name: <return>  
The switch name entered is not recognized.  
Choose from the following list:  
NBS-NIC-NXYC-01  
NBS-NIC-NXYC-02  
  
cluster1::*> **system cluster-switch log setup-password**  
  
Enter the switch name: **NBS-NIC-NXYC-01**  
**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: **NBS-NIC-NXYC-02**  
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 92300YC 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 92300YC switch.

```
cs2# **copy sftp: bootflash: vrf management**
Enter source filename: **/code/nxos.9.2.2.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.9.2.2.bin /bootflash/nxos.9.2.2.bin
/code/nxos.9.2.2.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.9.2.2.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.9.2.2.img /bootflash/n9000-epld.9.2.2.img
/code/n9000-epld.9.2.2.img 100% 161MB 9.5MB/s 00:16
sftp> exit
Copy complete, now saving to disk (please wait)...
Copy complete.
```

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

```
cs2# **show version**
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (C) 2002-2018, 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
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 05.31
  NXOS: version 9.2(1)
  BIOS compile time: 05/17/2018
  NXOS image file is: bootflash:///nxos.9.2.1.bin
  NXOS compile time: 7/17/2018 16:00:00 [07/18/2018 00:21:19]

Hardware
  cisco Nexus9000 C92300YC Chassis
  Intel(R) Xeon(R) CPU D-1526 @ 1.80GHz with 16337884 kB of memory.
  Processor Board ID FDO220329V5

  Device name: cs2
  bootflash: 115805356 kB
Kernel uptime is 0 day(s), 4 hour(s), 23 minute(s), 11 second(s)

Last reset at 271444 usecs after Wed Apr 10 00:25:32 2019
  Reason: Reset Requested by CLI command reload
  System version: 9.2(1)
```

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.9.2.2.bin**
```

Installer will perform compatibility check first. Please wait.

Installer is forced disruptive

Verifying image bootflash:/nxos.9.2.2.bin for boot variable "nxos".

[#####] 100% -- SUCCESS

Verifying image type.

[#####] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos.9.2.2.bin.

[#####] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos.9.2.2.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	9.2(1)	
9.2(2)	yes		
1	bios	v05.31(05/17/2018):v05.28(01/18/2018)	
v05.33(09/08/2018)	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

2019 Apr 10 04:59:35 cs2 %\$ VDC-1 %\$ %VMAN-2-ACTIVATION_STATE:

Successfully deactivated virtual service 'guestshell+'

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>

Copyright (C) 2002-2018, 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 <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 05.33
NXOS: version 9.2(2)
BIOS compile time: 09/08/2018
NXOS image file is: bootflash:///nxos.9.2.2.bin
NXOS compile time: 11/4/2018 21:00:00 [11/05/2018 06:11:06]

Hardware

cisco Nexus9000 C92300YC Chassis
Intel(R) Xeon(R) CPU D-1526 @ 1.80GHz with 16337884 kB of memory.
Processor Board ID FDO220329V5

Device name: cs2
bootflash: 115805356 kB
Kernel uptime is 0 day(s), 0 hour(s), 3 minute(s), 52 second(s)

Last reset at 182004 usecs after Wed Apr 10 04:59:48 2019
Reason: Reset due to upgrade
System version: 9.2(1)
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
MI FPGA2	0x2
GEM FPGA	0x2
GEM FPGA	0x2
GEM FPGA	0x2
GEM FPGA	0x2

```
cs2# **install epld bootflash:n9000-epld.9.2.2.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	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.

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

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

EPLD Device                               Version
-----
MI  FPGA                                0x7
IO  FPGA                                0x19
MI  FPGA2                               0x2
GEM  FPGA                               0x2
GEM  FPGA                               0x2
GEM  FPGA                               0x2
GEM  FPGA                               0x2
```

Install the Reference Configuration File (RCF)

You can install the RCF after setting up the Nexus 92300YC switch for the first time.

Steps

1. Connect the cluster switch to the management network.
2. Use the ping command to verify connectivity to the server hosting 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 RCF to the Nexus 92300YC switch:

```
cs2# **copy sftp: bootflash: vrf management**
Enter source filename: **/code/Nexus_92300YC_RCF_v1.0.2.txt**
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/Nexus_92300YC_RCF_v1.0.2.txt
/bootflash/nxos.9.2.2.bin
/code/Nexus_92300YC_R  100% 9687    530.2KB/s    00:00
sftp> exit
Copy complete, now saving to disk (please wait)...
Copy complete.
```

4. Merge the RCF with the running-config of the switch:


```
cs2# **copy bootflash:Nexus_92300YC_RCF_v1.0.2.txt running-config**
```

Disabling ssh: as its enabled right now:

generating ecdsa key(521 bits).....

generated ecdsa key

Enabling ssh: as it has been disabled

this command enables edge port type (portfast) by default on all interfaces. You

should now disable edge port type (portfast) explicitly on switched ports leading to hubs,

switches and bridges as they may create temporary bridging loops.

Edge port type (portfast) should only be enabled on ports connected to a single

host. Connecting hubs, concentrators, switches, bridges, etc... to this

interface when edge port type (portfast) is enabled, can cause temporary bridging loops.

Use with CAUTION

Edge Port Type (Portfast) has been configured on Ethernet1/1 but will only

have effect when the interface is in a non-trunking mode.

...

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

Copy complete.

5. Verify on the switch that the RCF has been merged successfully:

```
show running-config
```

```

cs2# **show running-config**
!Command: show running-config
!Running configuration last done at: Wed Apr 10 06:32:27 2019
!Time: Wed Apr 10 06:36:00 2019

version 9.2(2) Bios:version 05.33
switchname cs2
vdc cs2 id 1
    limit-resource vlan minimum 16 maximum 4094
    limit-resource vrf minimum 2 maximum 4096
    limit-resource port-channel minimum 0 maximum 511
    limit-resource u4route-mem minimum 248 maximum 248
    limit-resource u6route-mem minimum 96 maximum 96
    limit-resource m4route-mem minimum 58 maximum 58
    limit-resource m6route-mem minimum 8 maximum 8

feature lacp

no password strength-check
username admin password 5
$5$HY9Kk3F9$YdCZ8iQJlRtoiEFa0sKP5IO/LNG1k9C4lSJfi5kesl
6  role network-admin
ssh key ecdsa 521

banner motd #
*****
*****
*
*
*   Nexus 92300YC Reference Configuration File (RCF) v1.0.2 (10-19-2018)
*
*
*
*   Ports 1/1 - 1/48: 10GbE Intra-Cluster Node Ports
*
*   Ports 1/49 - 1/64: 40/100GbE Intra-Cluster Node Ports
*
*   Ports 1/65 - 1/66: 40/100GbE Intra-Cluster ISL Ports
*
*
*
*****
*****

```

6. Save the running configuration so that it becomes the startup configuration when you reboot the switch:

```
cs2# **copy running-config startup-config**

[#####] 100%
Copy complete, now saving to disk (please wait)...
Copy complete.
```

7. For ONTAP 9.6P8 and later, enable the CSHM ASUP log collection feature for collecting switch-related log files: `system cluster-switch log setup-password` and `system cluster-switch log enable-collection`

```
cs2# **system cluster-switch log setup-password**
** Output example required here
cs2# **system cluster-switch log enable-collection**
** Output example required here too
```

8. Reboot the switch and verify that the running configuration is correct:

```
reload
```

```
cs2# **reload**

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

Copyright Information

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

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

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

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

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

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

Trademark Information

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