Cisco® Nexus Switches

Installing NX-OS and Reference Configuration Files (RCFs)

For Cisco Nexus 92300YC switches

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Contents

Installing 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.

Before you begin

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

- The cluster must be fully functioning (there should be no errors in the logs or similar issues).
- You must have checked or set your desired boot configuration in the RCF to reflect the desired boot images if you are installing only NX-OS and keeping your current RCF version.
- If you need to change the boot configuration to reflect the current boot images, you must do so before reapplying the RCF so that the correct version is instantiated on future reboots.
- You must have 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 task

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

See the *Hardware Universe* to verify the correct cluster ports on your platforms.

Hardware Universe

Note: 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.

Note: 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.

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

   #### Example

   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`

   #### Example

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

    Node/      Local  Discovered
   Protocol    Port   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`

      #### Example

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

      Node: node2
                                                                 Speed(Mbps) Health
      Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
      --------- ------------ ---------------- ---- ---- ----------- --------
      e0a       Cluster      Cluster          up   9000  auto/10000 healthy
      e0b       Cluster      Cluster          up   9000  auto/10000 healthy

      Node: node1
                                                                 Speed(Mbps) Health
      Port      IPspace      Broadcast Domain Link MTU  Admin/Oper  Status
      --------- ------------ ---------------- ---- ---- ----------- --------
      e0a       Cluster      Cluster          up   9000  auto/10000 healthy
      e0b       Cluster      Cluster          up   9000  auto/10000 healthy

      4 entries were displayed.
      ```

   b. Display information about the LIFs:

network interface show -vserver Cluster

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

            Logical    Status     Network            Current       Current Is
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*

   Example

```
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

   Example

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

          Logical
Vserver   Interface     Auto-revert
--------- ------------- ------------
Cluster
          node1_clus1   true
          node1_clus2   true
          node2_clus1   true
          node2_clus2   true

4 entries were displayed.
```

Installing 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.

   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 92300YC switch.

   Example

```
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:

   Example

```
cs2# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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http://www.gnu.org/licenses/old-licenses/library.txt.

Software
  BIOS: version 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.

   Example

```
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`

Example

```
cs2# show version

Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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http://www.opensource.org/licenses/lgpl-2.1.php and
http://www.gnu.org/licenses/old-licenses/library.txt.

Software
  BIOS: version 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.

Example

```
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.

Example

```
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
```

Installing 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.

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 RCF to the Nexus 92300YC switch:

Example

```
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:

Example

```
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`

Example

```
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$YdCZ8iQJ1RtoiEFa0sKP5IO/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:

Example

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

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

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

   `reload`

   Example

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

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