Install Upgrade on Nexus Switches in vPC with NX-OS

Contents

Introduction

This document describes the upgrade procedure of Cisco Nexus 9000 switches in vPC with Cisco NX-OS.

Prerequisites

Requirements

Cisco recommends knowledge of these topics:

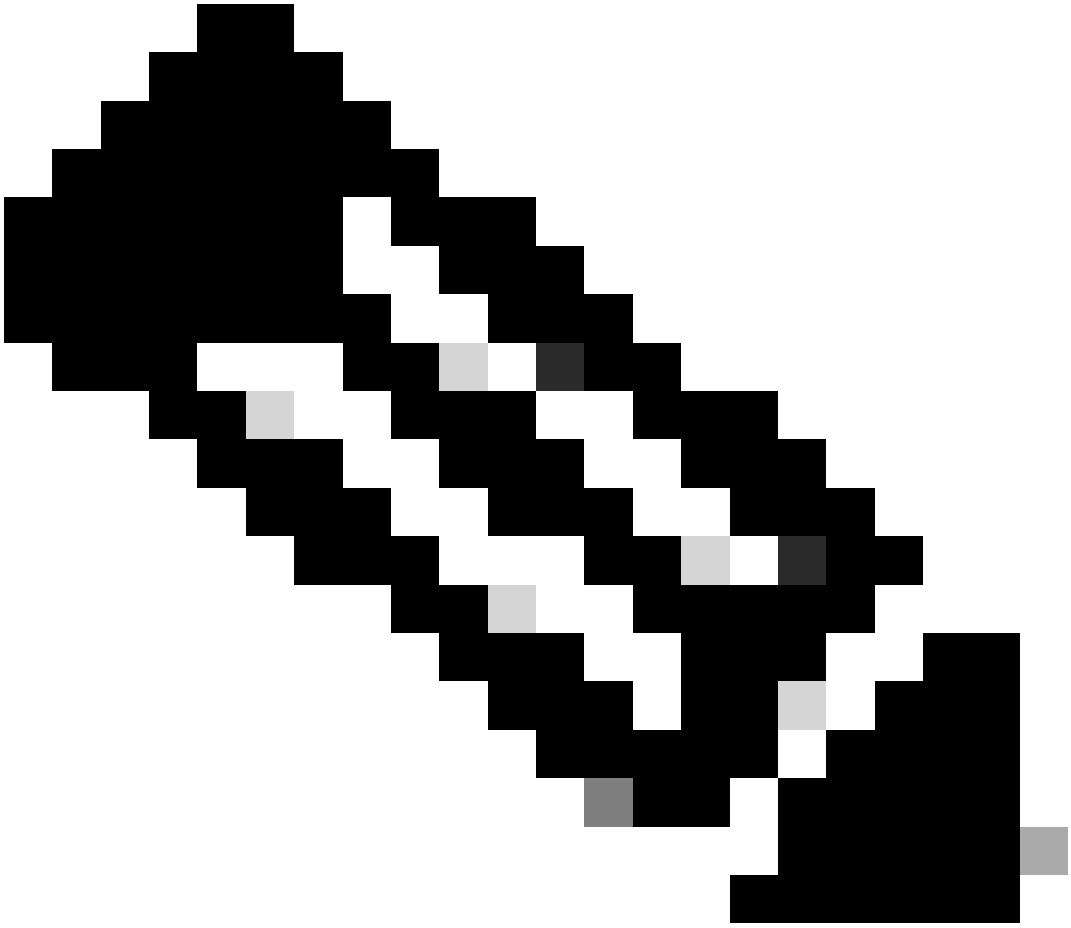
- Nexus NX-OS Software.
- Virtual Port Channel (vPC).
- Use the Device File Systems, Directories, and Files on Cisco Nexus switches.
- Log into Software Download.
- Cisco recommends to schedule a maintenance window since this procedure is disruptive.

Components Used

The information in this document is based on these software and hardware versions:

- Cisco Nexus 9000 with Cisco NX-OS.

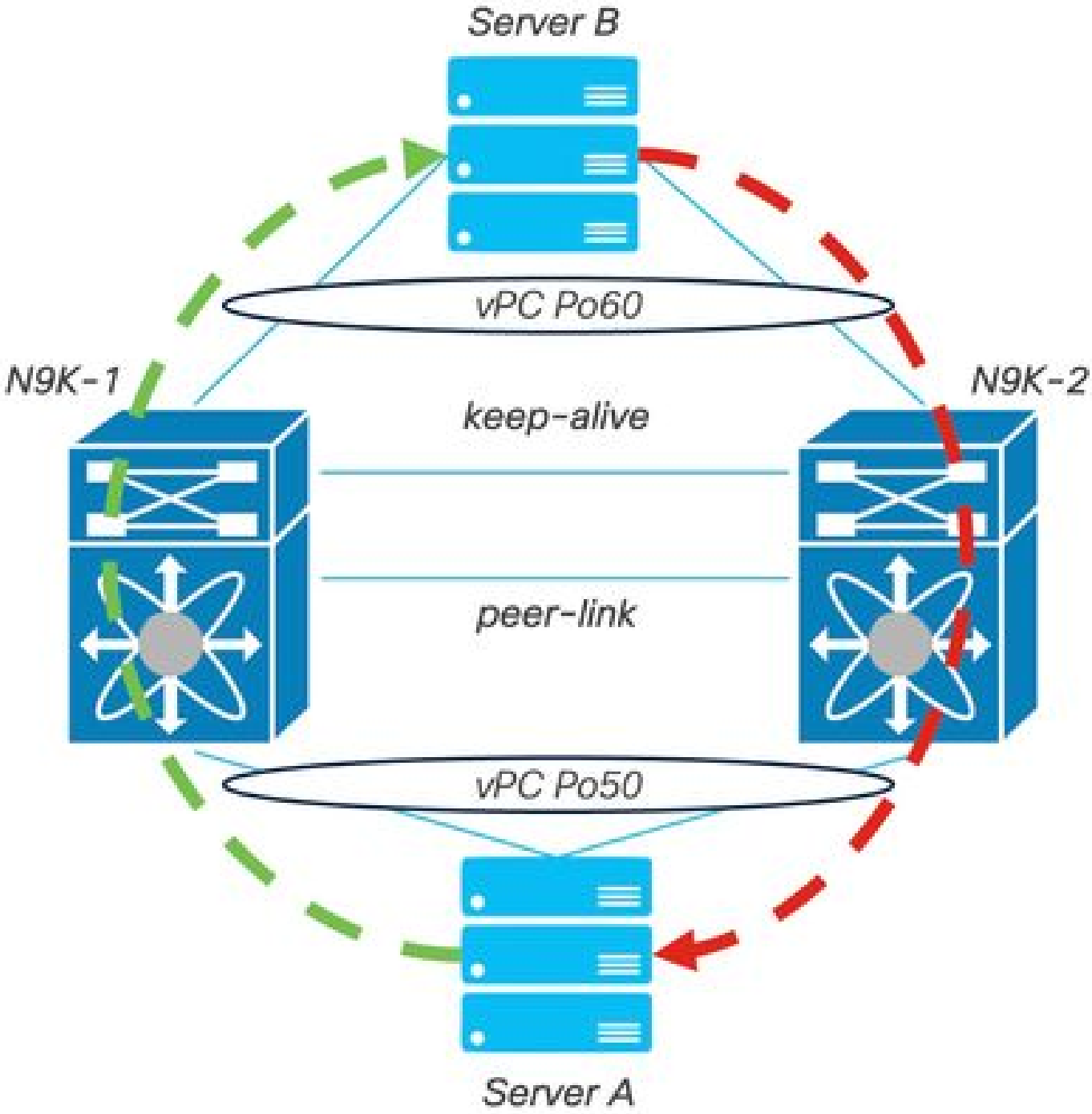
The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.



Note: The upgrade procedure for Cisco Nexus 7000 switches can be based on this document, although the commands and outputs can vary. For more information consult the official Cisco guides specific to your Cisco Nexus switch.

Configure

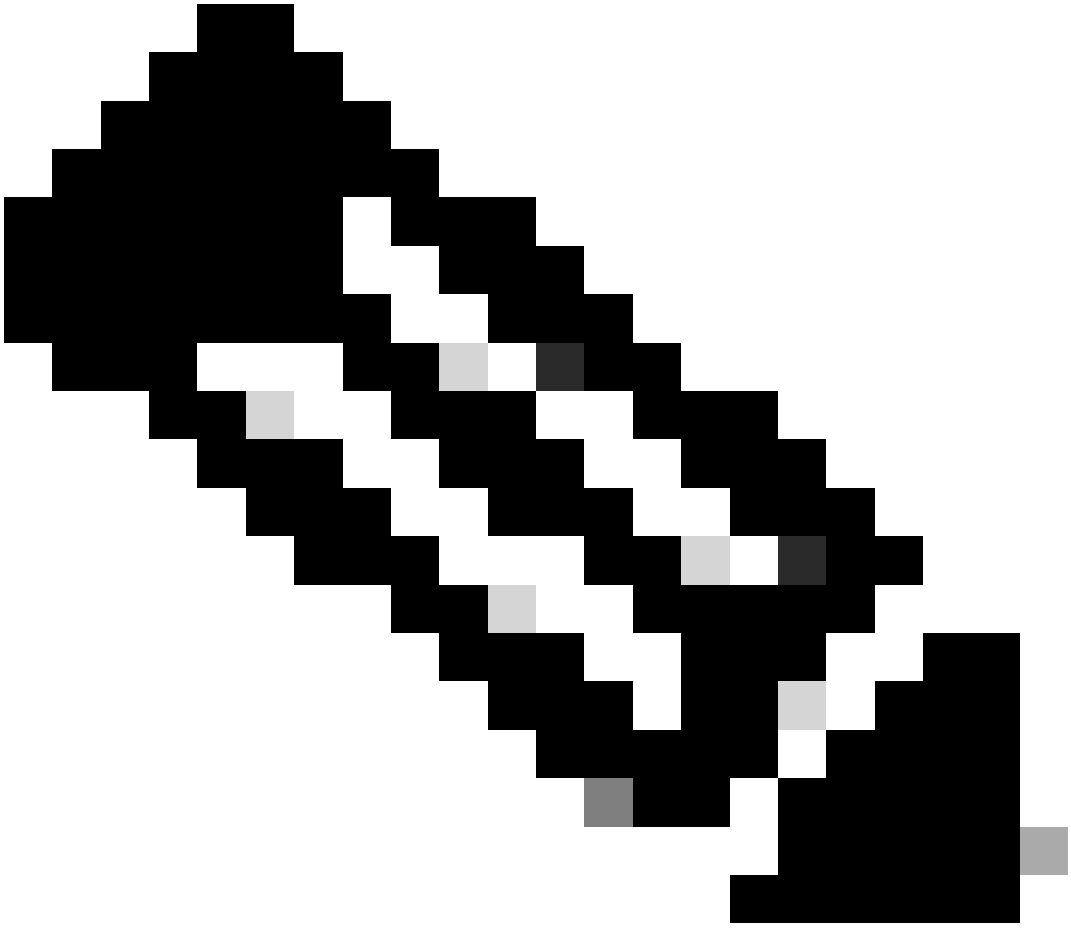
Network Diagram



Network Diagram

Background Information

- Suppose your are the network administrator of a Data Center where there are two N9K-C93180YC-FX-24.
- N9K-1 and N9K-2 have NX-OS 9.3(11).
- Server A and B are sending production traffic.
- The goal is upgrade both Nexus switches to NX-OS 10.2(5).



Note: Start the upgrade with the primary switch or the secondary switch does not yield any functional distinction. Nevertheless, initiating with the primary switch guarantees that both devices return to their initially configured primary and secondary roles. Although it is important to know some of the functions of the Nexus as operationally primary in vPC.

vPC Operational Primary Tasks

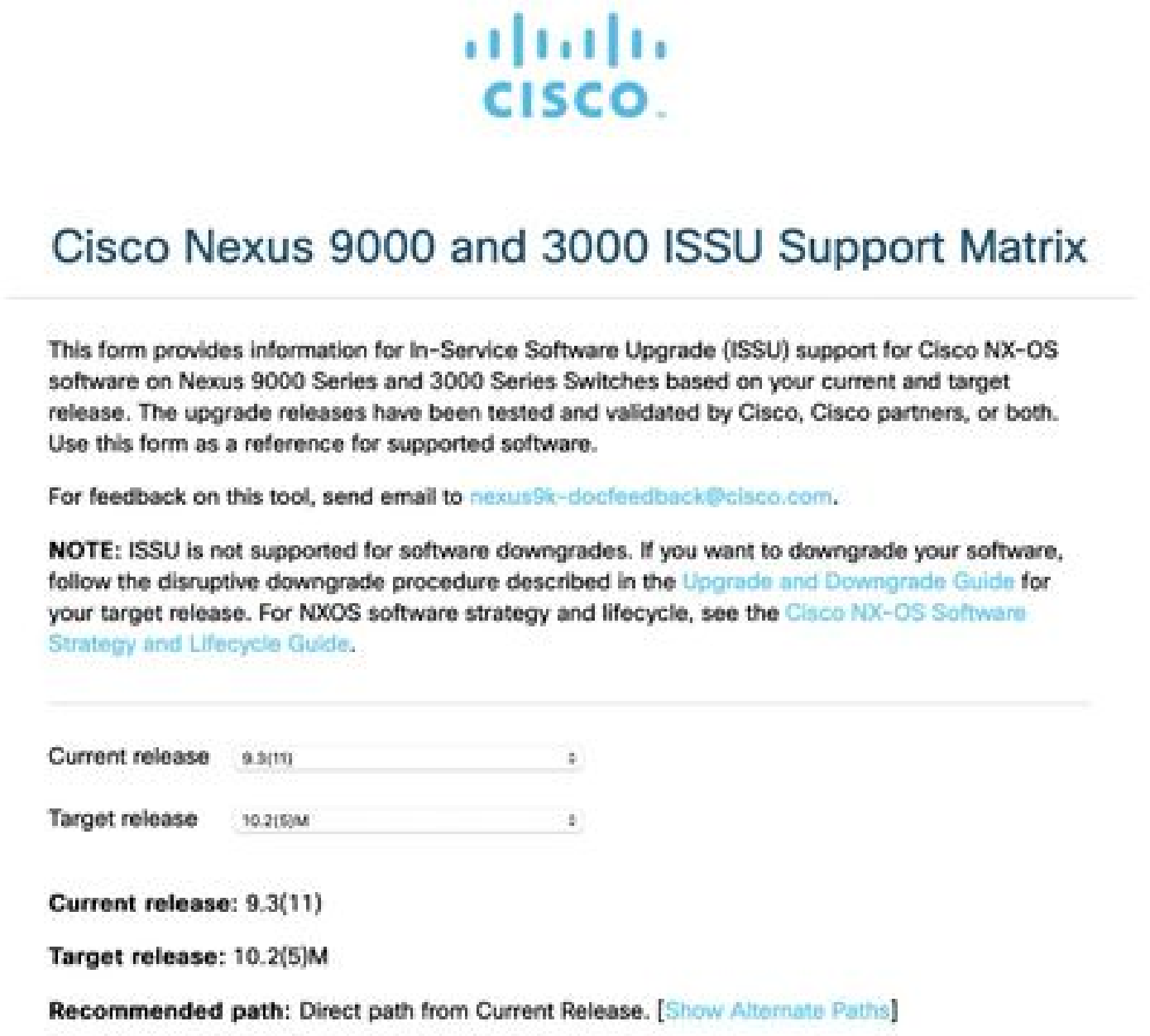
- Answer ARP requests even with FHRP.
- Processes Bridge Protocol Data Units (BPDUs).
- Forwards PIM Multicast traffic.
- Control-plane packets of IGMP.
- No shutdown of vPC member ports when peer-link down.

Upgrade Methodology

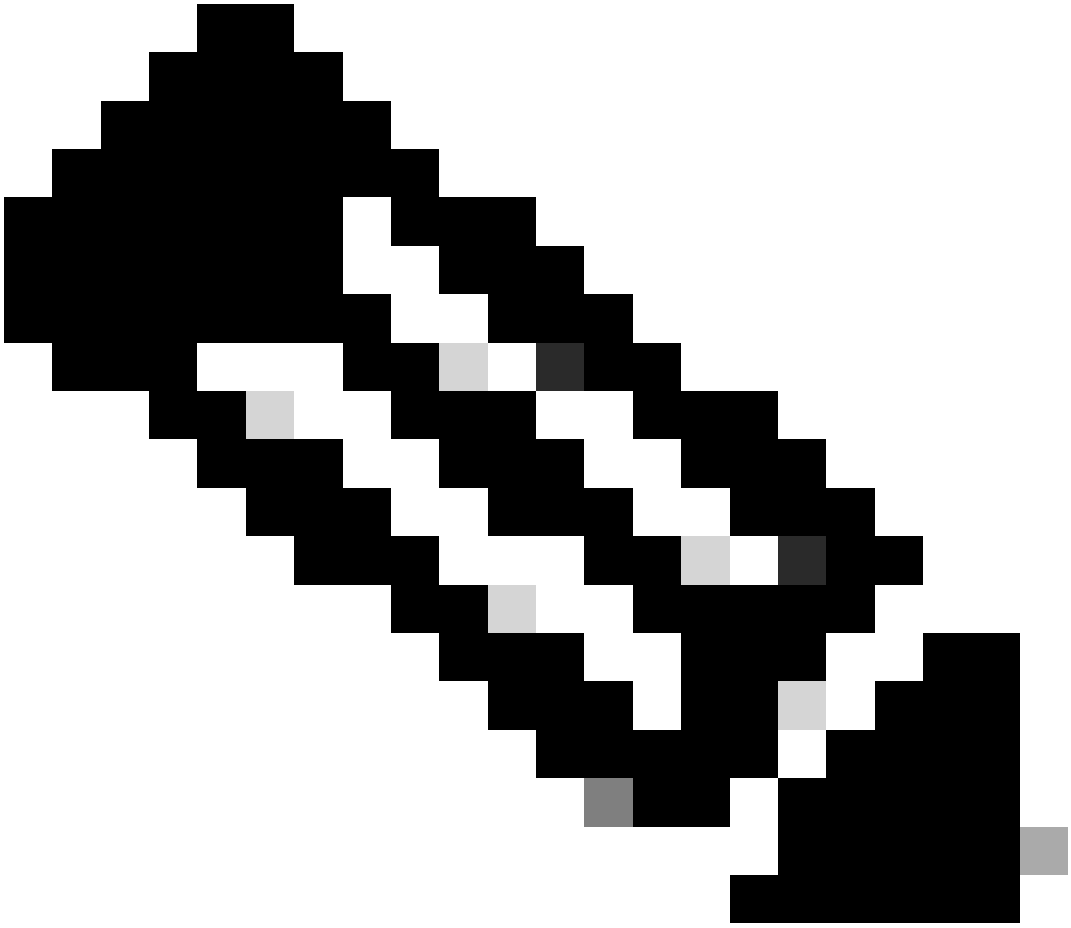
Step 1. Open Cisco Nexus 9000 and 3000 ISSU Support Matrix

1. Select the **Current release**.

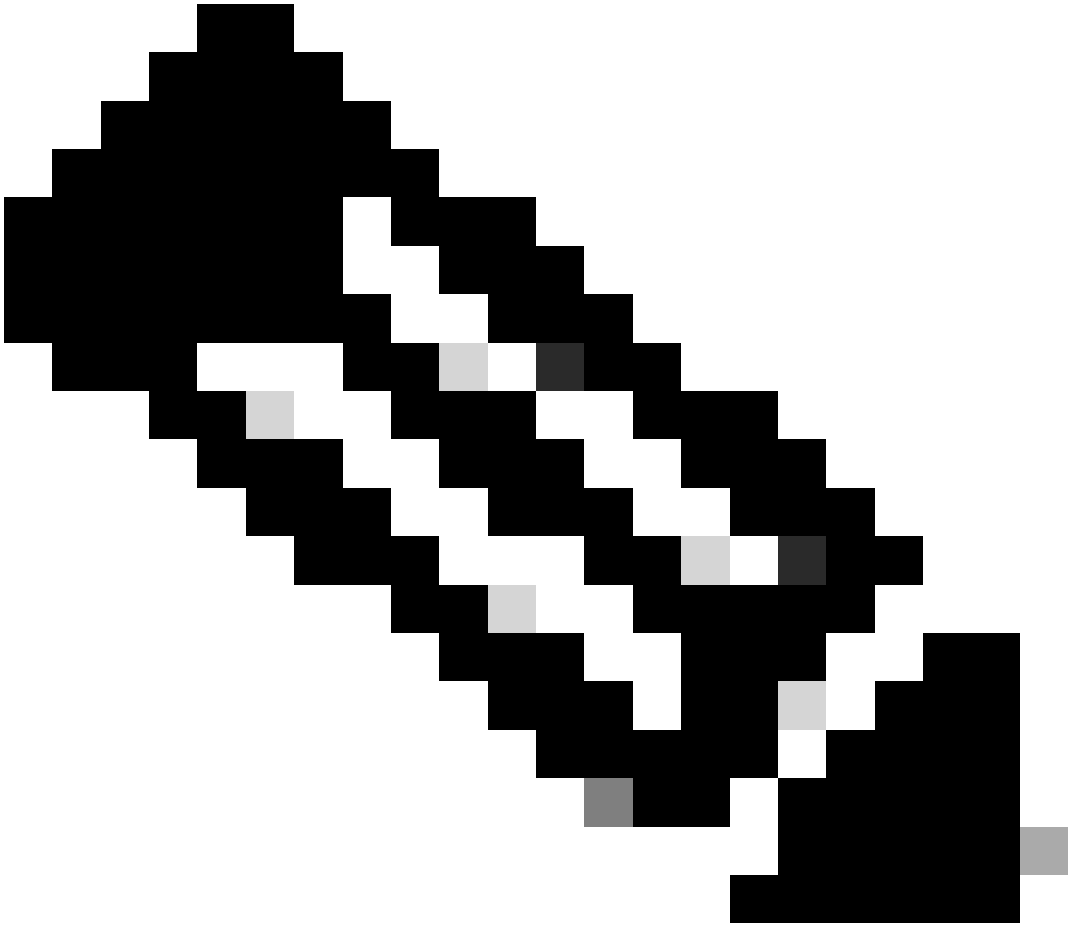
2. Select the **Target release**.



Cisco Nexus 9000 and 3000 ISSU Support Matrix



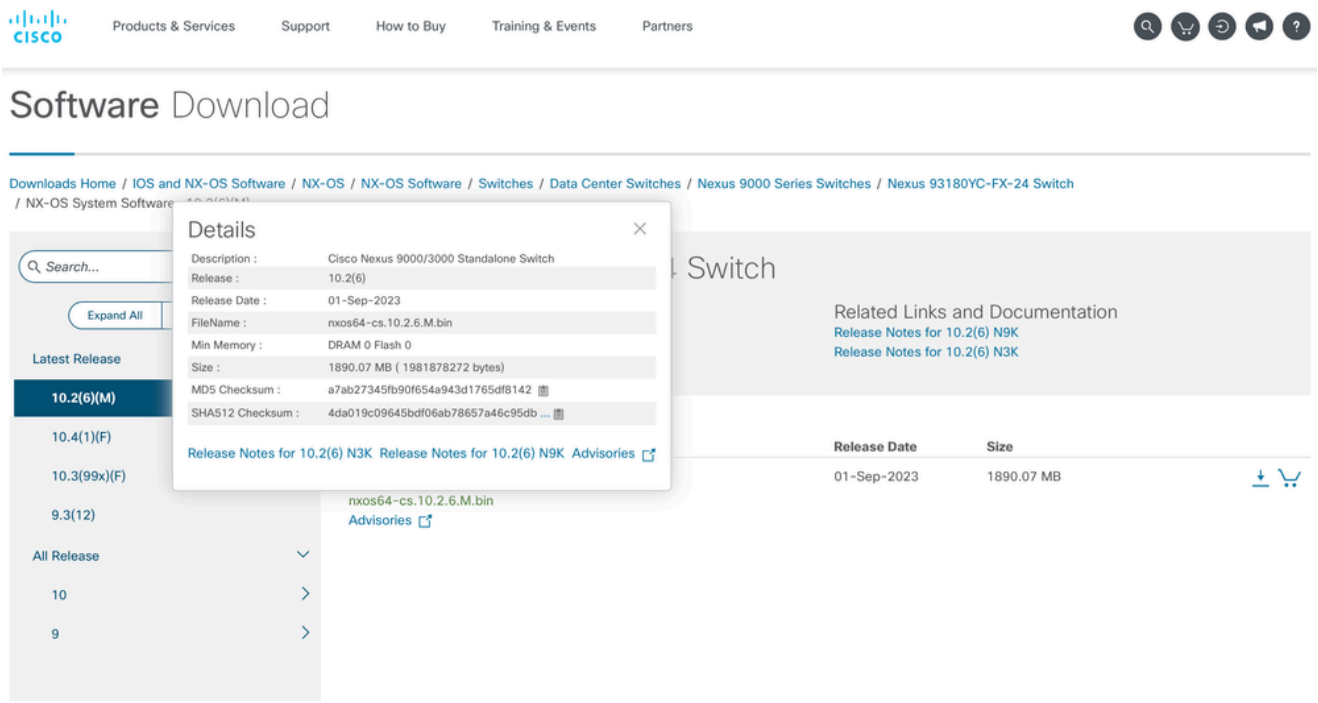
Note: Cisco TAC recommends that you always use disruptive (reload) upgrade option with recommended path.



Note: The recommended path can show multiple jumps. For each hop, steps 2 to 11 must be repeated until both Cisco Nexus switches have the target NX-OS version.

Step 2. Download all Cisco NX-OS files stated in recommend path depending on your Cisco Nexus switch linecard.

1. Log into Software Download
2. Navigate to section **Download and Upgrade** and open **Access Downloads**.
3. Click **Browse all** > **Cisco IOS and NX-OS Software** > **NX-OS – NX-OS Software** > **Switches** > **Data Center Switches** > Select your Nexus series > Select your linecard > **NX-OS System Software** > Select NX-OS version to download.
4. Move the cursor over the file name to display file details, copy the MD5 checksum value and download the NX-OS file.



Software Download

5. Transfer NX-OS files to bootflash on both Cisco Nexus switches in vPC via SCP, SFTP, TFTP or USB. If one of the first three options is selected, verify that there is a ping to the server by specifying the expected VRF. In this example SFTP server has IP address 192.168.9.9 reachable via Virtual Routing Forwarding (VRF) Management.

```
N9K-1(config)# ping 192.168.9.9 vrf management

N9K-1(config)# copy sftp: bootflash:
Enter source filename: nxos64-cs.10.2.5.M.bin
Enter vrf (If no input, current vrf 'default' is considered): management
Enter hostname for the sftp server: 192.168.9.9
Enter username: admin
The authenticity of host '192.168.9.9 (192.168.9.9)' can't be established.
RSA key fingerprint is SHA256:ABCDEFGHIJK.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.9.9' (RSA) to the list of known hosts.
Inbound-ReKey for 192.168.9.9
User Access Verification
Password: cisco
```

6. Once the file transfer is complete, verify that the NX-OS files is in bootflash with command **dir**.
7. Obtain the MD5 checksum from NX-OS file with command **show file bootflash**.
8. Compare this value with the one copied from the Software Download. Both values must match, otherwise NX-OS file is corrupted or not legit.

```
N9K-1(config)# dir | include nxos
 1978203648    Mar 31 01:36:06 2023  nxos.9.3.11.bin
 1943380992    Mar 17 09:54:16 2023  nxos64-cs.10.2.5.M.bin
Usage for bootflash://
20548902912 bytes used
96040308736 bytes free
116589211648 bytes total
```

```
N9K-1(config)# show file bootflash:nxos64-cs.10.2.5.M.bin md5sum
2f60a186cb9c2d55c90086302e51f655
```

Step 3. Identify the operational role in vPC for each Cisco Nexus switch.

1. Use the command **show vpc role**.

```
N9K-1(config)# show vpc role

vPC Role status
----------------------------------------
vPC role                        : primary
Dual Active Detection Status    : 0
vPC system-mac                  : 00:23:04:ee:be:01
vPC system-priority             : 32667
vPC local system-mac            : 44:b6:be:11:17:67
vPC local role-priority         : 32667
vPC local config role-priority  : 32667
vPC peer system-mac             : f8:a7:3a:4e:40:07
vPC peer role-priority          : 32667
vPC peer config role-priority   : 32667
```

```
N9K-2(config)# show vpc role

vPC Role status
----------------------------------------
vPC role                        : secondary
Dual Active Detection Status    : 0
vPC system-mac                  : 00:23:04:ee:be:01
vPC system-priority             : 32667
vPC local system-mac            : f8:a7:3a:4e:40:07
vPC local role-priority         : 32667
vPC local config role-priority  : 32667
vPC peer system-mac             : 44:b6:be:11:17:67
vPC peer role-priority          : 32667
vPC peer config role-priority   : 32667
```

Step 4. Verify incompatibility for Cisco NX-OS on both Cisco Nexus switches in vPC.

1. Use the command **show incompatibility-all nxos bootflash**.

```
N9K-1(config)# show incompatibility-all nxos bootflash:nxos64-cs.10.2.5.M.bin
Checking incompatible configuration(s) for vdc 'N9K-1':
------------------------------------------------------
No incompatible configurations

Checking dynamic incompatibilities:
-----------------------------------
No incompatible configurations
```

Step 5. Verify the impact for Cisco NX-OS on both Cisco Nexus switches in vPC.

1. Use the command **show install all impact nxos bootflash**. This execute a preliminary diagnosis to validate that Cisco NX-OS version is compatible and installation can be done.

```
N9K-1(config)# show install all impact nxos bootflash:nxos64-cs.10.2.5.M.bin
Installer will perform impact only check. Please wait.

Verifying image bootflash:/nxos64-cs.10.2.5.M.bin for boot variable "nxos".
[####################] 100% -- SUCCESS

Verifying image type.
[####################] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos64-cs.10.2.5.M.bin.
[####################] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos64-cs.10.2.5.M.bin.
[####################] 100% -- SUCCESS

Performing module support checks.
[####################] 100% -- SUCCESS

Notifying services about system upgrade.
[####################] 100% -- SUCCESS

Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1       yes      disruptive         reset  default upgrade is not hitless

Images will be upgraded according to following table:
Module       Image                  Running-Version(pri:alt)           New-Version  Upg-Required
------  ----------  ----------------------------------------  --------------------
     1        nxos                                  9.3(11)                                10.2(5)
     1        bios     v05.47(04/28/2022):v05.43(11/22/2020)    v05.47(04/28/2022)            no

Additional info for this installation:
--------------------------------------

Service "vpc" in vdc 1: Vpc is enabled, Please make sure both Vpc peer switches have same boot mode usi
```

Step 6 (Optional). Export a backup of running-configuration from both Cisco Nexus switches in vPC.

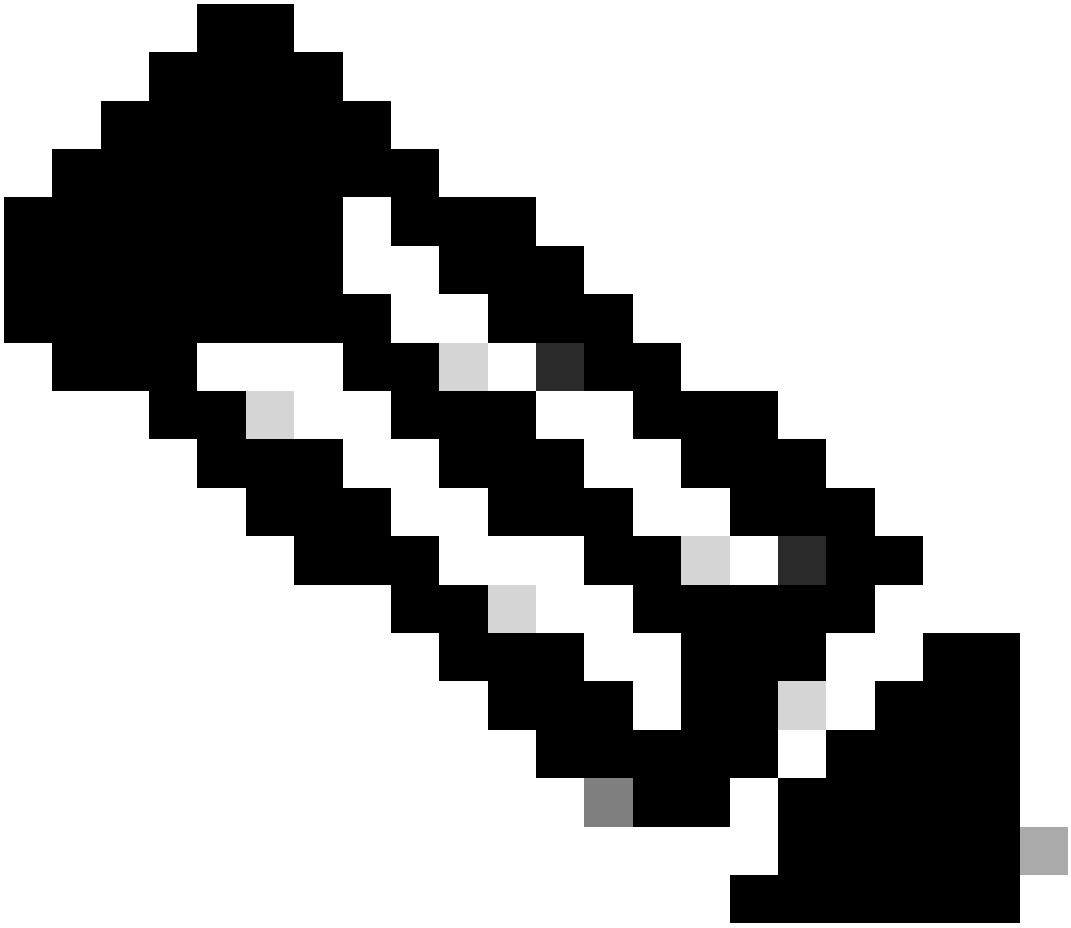
```
N9K-1(config)# copy running-config sftp:running-config-backup
Enter vrf (If no input, current vrf 'default' is considered): default
Enter hostname for the sftp server: 192.168.9.9
Enter username: admin

The authenticity of host '192.168.9.9 (192.168.9.9)' can't be established.
RSA key fingerprint is SHA256:ABDCEFGHI.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.9.9' (RSA) to the list of known hosts.
Inbound-ReKey for 192.168.9.9:22
User Access Verification
Password:
```

```
Connected to 192.168.9.9.
```

Step 7. Install NX-OS on Nexus switch with vPC Primary role.

1. Use the command **install all nxos bootflash**.

```
N9K-1(config)# install all nxos bootflash:nxos64-cs.10.2.5.M.bin
Installer will perform compatibility check first. Please wait.
Installer is forced disruptive

Verifying image bootflash:/nxos64-cs.10.2.5.M.bin for boot variable "nxos".
[####################] 100% -- SUCCESS

Verifying image type.
[####################] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos64-cs.10.2.5.M.bin.
[####################] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos64-cs.10.2.5.M.bin.
[####################] 100% -- SUCCESS

Performing module support checks.
[####################] 100% -- SUCCESS

Notifying services about system upgrade.
[####################] 100% -- SUCCESS



Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1       yes      disruptive         reset  default upgrade is not hitless



Images will be upgraded according to following table:
Module       Image                  Running-Version(pri:alt)           New-Version  Upg-Required
------  ----------  ------------------------------------------------------------
     1        nxos                                  9.3(11)                                10.2(5)
     1        bios     v05.47(04/28/2022):v05.43(11/22/2020)    v05.47(04/28/2022)            no


Additional info for this installation:
--------------------------------------

Service "vpc" in vdc 1: Vpc is enabled, Please make sure both Vpc peer switches have same boot mode usi



Switch will be reloaded for disruptive upgrade.
Do you want to continue with the installation (y/n)?  [n] y
```



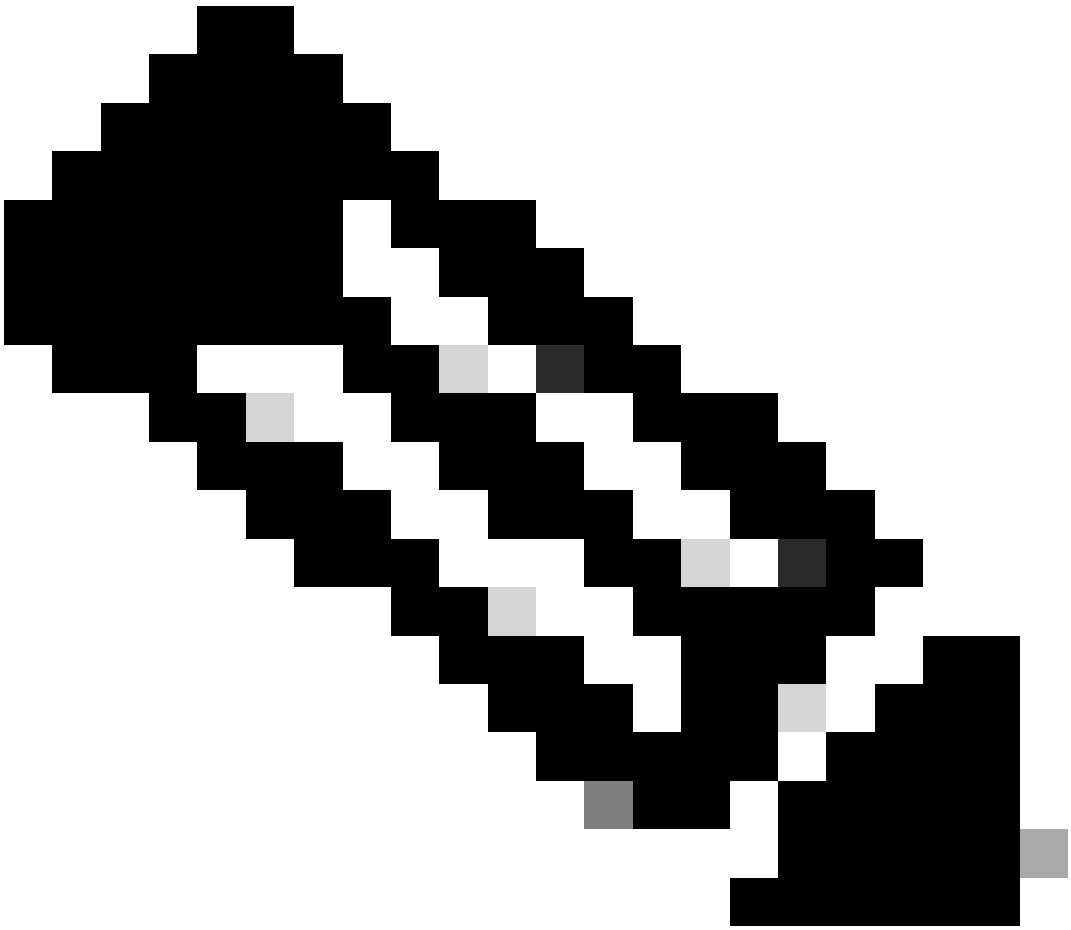
Note: You must read success without any error. After this, Cisco Nexus switch reboots and the installation process can take several minutes. This can vary on each Cisco Nexus switch.

Step 8. Wait for the status to be active on Cisco Nexus switch.

1. Use the command **show module**.

```
N9K-1(config)# show module
Mod Ports             Module-Type                        Model              Status
--- ----- ------------------------------------ ------------------------------
1    54   24x10/25G/32G + 6x40/100G Ethernet/FC N9K-C93180YC-FX-24    active *

Mod  Sw                     Hw    Slot
---  ---------------------- ------ ----
1    9.3(11)                 1.0    NA


Mod  MAC-Address(es)                         Serial-Num
---  --------------------------------------  ----------
1    44-b6-aa-aa-aa-aa to 44-b6-be-bb-bb-bb  ABCDEFGHIJK
```

```
Mod  Online Diag Status
---  ------------------
1    Pass

* this terminal session
```



> **Note**: Please notice is possible that vPC keep-alive and/or peer-link can not be in UP state. This is expected since Cisco Nexus switches in vPC have different version of Cisco NX-OS which is unsupported.

Step 9. Install Cisco NX-OSon vPC peer Cisco Nexus switch.

```
N9K-2(config)# install all nxos bootflash:nxos64-cs.10.2.5.M.bin
Installer will perform compatibility check first. Please wait.
Installer is forced disruptive

Verifying image bootflash:/nxos64-cs.10.2.5.M.bin for boot variable "nxos".
```

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

Verifying image type.
[####################] 100% -- SUCCESS

Preparing "nxos" version info using image bootflash:/nxos64-cs.10.2.5.M.bin.
[####################] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/nxos64-cs.10.2.5.M.bin.
[####################] 100% -- SUCCESS

Performing module support checks.
[####################] 100% -- SUCCESS

Notifying services about system upgrade.
[####################] 100% -- SUCCESS



Compatibility check is done:
Module  bootable          Impact  Install-type  Reason
------  --------  --------------  ------------  ------
     1       yes      disruptive         reset  default upgrade is not hitless



Images will be upgraded according to following table:
Module       Image                  Running-Version(pri:alt)           New-Version  Upg-Required
------  ----------  ------------------------------------------------------------
     1        nxos                                    9.3(11)                                10.2(5)
     1        bios     v05.47(04/28/2022):v05.42(06/14/2020)    v05.47(04/28/2022)             no


Additional info for this installation:
--------------------------------------

Service "vpc" in vdc 1: Vpc is enabled, Please make sure both Vpc peer switches have same boot mode usi



Switch will be reloaded for disruptive upgrade.
Do you want to continue with the installation (y/n)?  [n] y
```

Step 10. Wait for the status to be active on Cisco Nexus switch.

1. Use the command **show module**.

```
N9K-2(config)# show module
Mod Ports             Module-Type                       Model           Status
--- ----- ------------------------------------ ---------------------- ---------
1    54   24x10/25G/32G + 6x40/100G Ethernet/FC N9K-C93180YC-FX-24    active *

Mod  Sw                     Hw    Slot
---  ---------------------- ------ ----
1    9.3(11)                1.0    NA


Mod  MAC-Address(es)                         Serial-Num
```

```
---  -------------------------------------  ----------
1    f8-a7-3a-nn-nn-nn to f8-a7-3a-n1-n1-n1  98765432109

Mod  Online Diag Status
---  ------------------
1    Pass

* this terminal session
```

Step 11. Verify the keep-alive, peer-link, and vPC port-channels are in UP state.

1. Use the command **show vpc**.

```
N9K-1(config)# show vpc
Legend:
                (*) - local vPC is down, forwarding via vPC peer-link

vPC domain id                     : 1
Peer status                       : peer adjacency formed ok
vPC keep-alive status             : peer is alive
Configuration consistency status  : success
Per-vlan consistency status       : success
Type-2 consistency status         : success
vPC role                          : primary
Number of vPCs configured         : 2
Peer Gateway                      : Enabled
Dual-active excluded VLANs        : -
Graceful Consistency Check        : Enabled
Auto-recovery status              : Disabled
Delay-restore status              : Timer is off.(timeout = 30s)
Delay-restore SVI status          : Timer is off.(timeout = 10s)
Operational Layer3 Peer-router    : Enabled
Virtual-peerlink mode             : Disabled

vPC Peer-link status
---------------------------------------------------------------------
id    Port   Status Active vlans
--    ----   ------ --------------------------------------------------
1     Po1    up     1

vPC status
----------------------------------------------------------------------
Id    Port          Status Consistency Reason                Active vlans
--    ------------  ------ ----------- ------  ---------------
50    Po50          up     success     success               1

60    Po60          up     success     success               1



N9K-2(config)# show vpc
Legend:
                (*) - local vPC is down, forwarding via vPC peer-link

vPC domain id                     : 1
Peer status                       : peer adjacency formed ok
vPC keep-alive status             : peer is alive
```

```
Configuration consistency status  : success
Per-vlan consistency status       : success
Type-2 consistency status         : success
vPC role                          : secondary
Number of vPCs configured         : 2
Peer Gateway                      : Enabled
Dual-active excluded VLANs        : -
Graceful Consistency Check        : Enabled
Auto-recovery status              : Disabled
Delay-restore status              : Timer is off.(timeout = 30s)
Delay-restore SVI status          : Timer is off.(timeout = 10s)
Operational Layer3 Peer-router    : Enabled
Virtual-peerlink mode             : Disabled

vPC Peer-link status
---------------------------------------------------------------------
id    Port   Status Active vlans
--    ----   ------ --------------------------------------------------
1     Po1    up     1

vPC status
----------------------------------------------------------------------------
Id    Port          Status Consistency Reason                Active vlans
--    ------------  ------ ----------- ------                ---------------
50    Po50          up     success     success               1

60    Po60          up     success     success               1
```

Related Information

- **Cisco Technical Support & Downloads**