

# Supported Topologies for Routing over Virtual Port Channel on Nexus Platforms

## Contents

[Introduction](#)

[Prerequisites](#)

[Supported Topologies for Routing in a vPC Environment](#)

[Important Notes and Caveats](#)

[Related Information](#)

## Introduction

This document describes supported and unsupported topologies when creating routing protocol or PIM adjacencies between external Layer 3 (L3) devices and Cisco Nexus switches in a Virtual Port Channel (vPC) environment. The term protocol adjacency is used throughout this document to represent the formation of a protocol neighbor relationship between the referenced devices. VPC+ is not covered by this article.

## Prerequisites

Cisco recommends that you have a basic understanding of how routing protocols are configured on Nexus switches and other L3 devices. It is also recommended to understand the configuration and operation of vPC including the forwarding characteristics, behavior of the **peer-gateway** and **layer3 peer-router** configuration options.

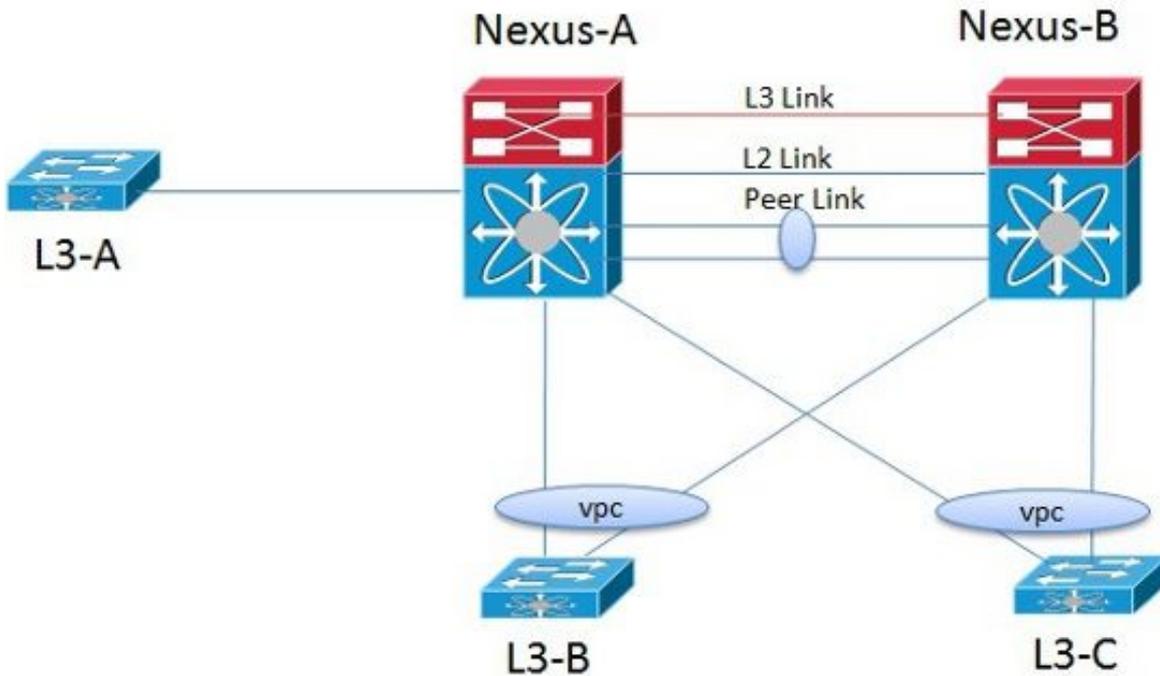
**Note:** The information in this document was created from the devices in a lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is handling production traffic, make sure that you understand the potential impact of any command before you make modifications to the environment.

## Supported Topologies for Routing in a vPC Environment

The topology shown in Figure 1 will be used to demonstrate the various connectivity options for protocol adjacencies in a vPC environment. The Nexus switches are in a vPC domain with these details:

- A pair of similar Nexus switches configured in a vPC domain.
- Three Layer 3 devices (L3-A, L3-B, and L3-C) connected to a pair of Nexus switches.
- L3-A is connected to an orphan port.
- L3-B and L3-C are connected with vPC to Nexus-A and Nexus-B.
- Nexus-A and Nexus-B have additional Layer2 and Layer3 links between them.

**Figure 1: *Supported Topologies for Routing in a vPC Environment***



Based on the topology in Figure 1, Table 1 describes which physical links support protocol adjacencies between the two Nexus switches and between a Nexus switch and an L3 device connected to its vPC peer. Each type of link used for the protocol adjacency is detailed and references any applicable caveats which are detailed in Table 1.

**Table 1: Routing Protocol Adjacencies Supported over Physical Interfaces**

Nexus Switch Series	Protocol Adjacency between Nexus-A and Nexus-B	Protocol Adjacency between and Nexus-B
Nexus 95xx-R and 3xxx-R	L3 link: supported L2 link: supported Peer Link: supported PIM Adjacency over the peer-link: supported ***	L3 link: N/A L2 link: supported% Peer Link: Supported with Table requirements PIM Adjacency: supported **
Nexus 3000/3100/3200/3400/3600 Series	L3 link: supported L2 link: supported* Peer Link: supported PIM Adjacency over the peer-link: supported ***	L3 link: N/A L2 link: supported*% Peer Link: Supported with Table requirements PIM Adjacency: supported **
Nexus 3500 Series	L3 link: supported L2 link: not supported Peer Link: supported PIM Adjacency over the peer-link: supported ***	L3 link: N/A L2 link: not supported Peer Link: Supported see Table requirements PIM Adjacency: supported **
Nexus 5000 Series	L3 link: supported L2 link: not supported Peer Link: supported PIM Adjacency over the peer-link: supported ***	L3 link: N/A L2 link: not supported Peer Link: Supported see Table requirements PIM Adjacency: supported **
Nexus 6000 Series	L3 link: supported L2 link: not supported Peer Link: supported PIM Adjacency over the peer-link:	L3 link: N/A L2 link: not supported Peer Link: Supported, see Table requirements

<b>Nexus 7000 Series</b>	supported *** L3 link: supported L2 link: supported Peer Link: supported PIM Adjacency over the peer-link: supported ***	PIM Adjacency: supported ** L3 link: N/A L2 link: supported% Peer Link: Supported, see Table requirements
<b>Nexus 9000 Series</b>	L3 link: supported L2 link: supported* Peer Link: supported PIM Adjacency over the peer-link: supported ***	PIM Adjacency: supported ** L3 link: N/A L2 link: supported*% Peer Link: Supported, see Table requirements PIM Adjacency: supported **

\* Configure user defined MAC address for VLAN Switch Virtual Interface (SVI).

\*\* Although L3-A is supported as an orphan port, PIM adjacency is not supported for L3-B or L3-C to Nexus-A and Nexus-B.

\*\*\* PIM adjacency is supported between Nexus-A and Nexus-B however the type of PIM sparse-mode supported (ie SSM, ASM, BiDIR) varies by platform. See the platform configuration guides.

% Alternatively, use Layer3 peer-router feature and utilize the vPC peer-link (without a parallel L2 link).

Table 2 describes which routing protocol adjacencies are supported over vPC VLANs based on the topology in Figure 1.

**Note:** With the introduction of the Layer3 peer-router feature, all Nexus switching platforms now support unicast routing protocol adjacencies across the vPC peer-link. Prior to development of this feature, support varied by platform. Upgrading to a version of NX-OS that contains support for the Layer3 peer-router feature from an earlier release might break existing topologies until the Layer3 peer-router command is enabled in the vPC configuration.

**Table 2: Routing Protocols Adjacencies Support over vPC VLANs**

<b>Nexus Switch Series</b>	<b>L3-A to L3-B or L3-A to L3-C</b>	<b>L3-A, L3-B or L3-C to Nexus-A or Nexus-B</b>
<b>Nexus 95xx-R and 3xxxx-R Series</b>	Yes	*7.0(3)F3(3) and later with Layer3 peer-router configured
<b>Nexus 3000/3100/3200/3400/3600 Series</b>	Yes	* 7.0(3)I5(1) and later with Layer3 peer-router configured
<b>Nexus 3500 Series</b>	Yes	* 6.0(2)A8 and later with Layer3 peer-router configured
<b>Nexus 5000 Series</b>	Yes	* 7.3(0)N1(1) and later with Layer3 peer-router configured
<b>Nexus 6000 Series</b>	Yes	* 7.3(0)N1(1) and later with Layer3 peer-router configured
<b>Nexus 7000 Series</b>	Yes	* ** 7.2(0)D1(1) and later with Layer3 peer-router configured
<b>Nexus 9000 Series</b>	Yes	* 7.0(3)I5(1) and later with Layer3 peer-router configured

\* Feature requires explicit configuration "layer3 peer-router".

\*\* Unsupported on M1, F1, F2, M2 series linecards.

## Important Notes and Caveats

- L3-A to Nexus-A peering is always supported for L2/L3.
- L3-B to L3-C peering is always supported for L2/L3.
- When a BFD session is over SVI using virtual port-channel(vPC) peer-link, the BFD echo function is not supported. You must disable the BFD echo function for all sessions over SVI between vPC peer nodes using `no bfd echo` at the SVI configuration level.
- If the vPC peer link is configured on a Cisco Nexus 32-port 1/10 Gigabit Ethernet (F1-Series) module (N7K-F132XP-15), you must include the L3 backup routing VLAN in the VLAN list specified by the **peer-gateway exclude-vlan** command.
- For the Nexus 5000 switches where PIM adjacency is not supported over the vPC Peer-link, a Layer3 connection from the router to each of the Nexus 5000 is required.
- Additionally, when you have a vPC topology with orphan ports or Layer 3 connections and multicast traffic must go through the peer-link to reach these receivers, it is not sent out to the receiver unless you have the command **vpc bind-vrf default vlan *vlan\_id***. For each VRF, a separate *vlan\_id* should be configured, where the VLAN is not already used for production traffic. See reference *Binding a VRF Instance to a vPC*.

## Related Information

- [vPC Layer 3 Backup Routing with F1 and Peer-Gateway](#)
- [N5500/N6000 Binding a VRF instance to a vPC](#)
- [Technical Support & Documentation - Cisco Systems](#)