



# Cisco Nexus 9000 Series NX-OS Release Notes, Release 7.0(3)I4(4)

This document describes the features, caveats, and limitations for Cisco NX-OS Release 7.0(3)I4(4) software for use on the following switches:

- Cisco Nexus 9000 Series
- Cisco Nexus 31128PQ
- Cisco Nexus 3164Q
- Cisco Nexus 3232C
- Cisco Nexus 3264Q

Use this document in combination with documents listed in *Related Documentation*.

[Table 1](#) shows the online change history for this document.

Table 1 Online History Change

Date	Description
July 11, 2018	Added CSCuy08187 to the <a href="#">Open Caveats</a> .
September 4, 2017	Updated the instructions for upgrading from Cisco NX-OS Releases 7.0(3)I1(2), 7.0(3)I1(3), or 7.0(3)I1(3a).
June 21, 2017	Replace X9564TX2 with X9464TX2.
January 25, 2017	Revised <a href="#">Limitations</a> for upgrading from N9K-X94xx, N9K-X95xx, and N9K-X96xx line cards to N9K-X9732C-EX line cards.
December 8, 2016	Updated the DHCP entry in the Unsupported Features section.
November 7, 2016	Added CSCvb37238 to the Resolved Caveats table.
October 26, 2016	Added Quality of Service features to the <a href="#">New Software Features</a> section.
October 25, 2016	Created the release notes for Release 7.0(3)I4(4).

Introduction

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## Introduction

Cisco NX-OS software is a data center-class operating system designed for performance, resiliency, scalability, manageability, and programmability at its foundation. The Cisco NX-OS software provides a robust and comprehensive feature set that meets the requirements of virtualization and automation in mission-critical data center environments. The modular design of the Cisco NX-OS operating system makes zero-impact operations a reality and enables exceptional operational flexibility.

The Cisco Nexus 9000 Series uses an enhanced version of Cisco NX-OS software with a single binary image that supports every switch in the series, which simplifies image management.

## System Requirements

This section includes the following sections:

- Supported Cisco Software Releases
- Supported Device Hardware
- Supported Optics
- Supported FEX Modules

## Supported Cisco Software Releases

[Table 2](#) summarizes information about the Cisco Nexus platforms and software release versions that Cisco OpenFlow Plug-in supports.

Table 2 Cisco Plug-in for OpenFlow Compatibility Matrix

Switches	Cisco Plug-in for OpenFlow
Cisco Nexus 9300 Series switches and Cisco Nexus 31128PQ, 3232C, and 3264Q switches NX-OS 7.0(3)I3(1) and later	ofa-2.1.4-r2-nxos-SPA-k9.ova
Cisco Nexus 9300 Series switches and Cisco Nexus 31128PQ switches NX-OS 7.0(3)I2(1)	ofa-2.1.0-r1-nxos-SPA-k9.ova

## Supported Device Hardware

The tables below list the Cisco Nexus 9000 Series hardware that Cisco NX-OS Release 7.0(3)I4(4) supports. For additional information about the supported hardware, see the *Hardware Installation Guide* for your Cisco Nexus 9000 Series device.

- [Table 3](#) lists the Cisco Nexus 9000 Series fabric modules

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- [Table 4](#) lists the Cisco Nexus 9000 Series fans and fan trays
- [Table 5](#) lists the Cisco Nexus 9000 Series line cards
- [Table 6](#) lists the Cisco Nexus 9000 Series power supplies
- [Table 7](#) lists the Cisco Nexus 9000 Series supervisor modules
- [Table 8](#) lists the Cisco Nexus 9000 Series system controllers
- [Table 9](#) lists the Cisco Nexus 9000 Series uplink modules
- [Table 11](#) lists the 3232C and 3264Q switch hardware
- [Table 12](#) lists the Cisco Nexus 3164Q switch hardware
- [Table 13](#) lists the Cisco Nexus 31128PQ switch hardware

Table 3 Cisco Nexus 9000 Series Fabric Modules

Product ID	Hardware	Quantity
N9K-C9504-FM	Cisco Nexus 9504 40-Gigabit fabric module	3 to 6 depending on line cards
N9K-C9504-FM-E	100-Gigabit -E fabric module (for the Cisco Nexus 9504 chassis) that supports the 100-Gigabit (-EX) line cards. When used, there must be 4 of these fabric modules installed in fabric slots 22, 23, 24, and 26.	4
N9K-C9504-FM-S	100-Gigabit -S fabric module (for the Cisco Nexus 9504 chassis) that supports the 100-Gigabit (-S) line cards. When used, there must be 4 of these fabric modules installed in fabric slots 22, 23, 24, and 26.	4
N9K-C9508-FM	Cisco Nexus 9508 Series 40-Gigabit fabric module	3-6 depending on the line cards
N9K-C9508-FM-E	100-Gigabit -E fabric module (for the Cisco Nexus 9508 chassis) that supports the 100-Gigabit (-EX) line cards. When used, there must be 4 of these fabric modules installed in fabric slots 22, 23, 24, and 26.	4
N9K-C9508-FM-S	100-Gigabit -S fabric module (for the Cisco Nexus 9508 chassis) that supports the 100-Gigabit (-S) line cards. When used, there must be 4 of these fabric modules installed in fabric slots 22, 23, 24, and 26.	4
N9K-C9516-FM	Cisco Nexus 9500 platform 40-Gigabit fabric module	3-6 depending on the line cards

Table 4 Cisco Nexus 9000 Series Fans and Fan Trays

Product ID	Hardware	Quantity
N9K-C9300-FAN1	Cisco Nexus 9300 fan 1 module with port-side intake airflow (burgundy coloring)  <i>Note:</i> Supports early versions of the Cisco Nexus 9396 switch (N9K-C9396PX).	3
N9K-C9300-FAN1-B	Cisco Nexus 9300 fan 1 module with port-side exhaust airflow (blue coloring)  <i>Note:</i> Supports early versions of the Cisco Nexus 9396 switch (N9K-C9396PX).	3
N9K-C9300-FAN2	Cisco Nexus 9300 fan 2 module with port-side intake airflow (burgundy coloring)  <i>Note:</i> Supports the Cisco Nexus 93128TX, 9396PX, and 9396TX switches.	3
N9K-C9300-FAN2-B	Cisco Nexus 9300 fan 2 module with port-side exhaust airflow (blue coloring)  <i>Note:</i> Supports the Cisco Nexus 93128TX, 9396PX, and 9396TX switches.	3
N9K-C9300-FAN3	Cisco Nexus 9300 fan 2 module with port-side intake airflow (burgundy coloring)  <i>Note:</i> Supports the Cisco Nexus 93120TX, 92304QC, and 9272Q switches.	2
N9K-C9300-FAN3-B	Cisco Nexus 9300 fan 2 module with port-side exhaust airflow (blue coloring)  <i>Note:</i> Supports the Cisco Nexus 93120TX, 92304QC, and 9272Q switches.	2
N9K-C9504-FAN	Cisco Nexus 9504 fan tray	3
N9K-C9508-FAN	Cisco Nexus 9508 fan tray	3

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NXA-FAN-30CFM-B	Cisco Nexus 9200 and 9300 fan module with port-side intake airflow (burgundy coloring)  <i>Note:</i> Supports the Cisco Nexus 92160YC-X, 9236C, 93108TC-EX, 93180YC-EX, 9332PQ, 9372PX, 9372PX-E, 9372TX, and 9372TX-E switches.	4
NXA-FAN-30CFM-F	Cisco Nexus 9200 and 9300 fan module with port-side exhaust airflow (blue coloring)  <i>Note:</i> Supports the Cisco Nexus 92160YC-X, 9236C, 93108TC-EX, 93180YC-EX, 9332PQ, 9372PX, 9372PX-E, 9372TX, and 9372TX-E switches.	4

Table 5 Cisco Nexus 9500 Platform Line Cards

Product ID	Description	Quantity
N9K-X9408PC-CFP2	Line card with 8 100-Gigabit CFP2 ports (supported by 40-Gigabit fabric modules [N9K-C9504-FM, N9K-C9508-FM, and N9K-9516FM])	<ul style="list-style-type: none"> <li>■ 4 (Cisco Nexus 9504)</li> <li>■ 8 (Cisco Nexus 9508)</li> <li>■ 16 (Cisco Nexus 9516)</li> </ul>
N9K-X9432C-S	Line card with 32 100-Gigabit QSFP28 ports (supported by four 100-Gigabit -S fabric modules [N9K-C9504-FM-S and N9K-C9508-FM-S])	<ul style="list-style-type: none"> <li>■ 4 (Cisco Nexus 9504)</li> <li>■ 8 (Cisco Nexus 9508)</li> </ul>
N9K-X9432PQ	Line card with 32 40-Gigabit QSFP+ ports (supported by 40-Gigabit fabric modules [N9K-C9504-FM, N9K-C9508-FM, and N9K-9516FM])  <i>Note:</i> This line card supports static breakout.	<ul style="list-style-type: none"> <li>■ 4 (Cisco Nexus 9504)</li> <li>■ 8 (Cisco Nexus 9508)</li> <li>■ 16 (Cisco Nexus 9516)</li> </ul>
N9K-X9464PX	Line card with 48 10-Gigabit SFP+ ports and 4 40-Gigabit QSFP+ ports (supported by 40-Gigabit fabric modules [N9K-C9504-FM, N9K-C9508-FM, and N9K-9516FM])	<ul style="list-style-type: none"> <li>■ 4 (Cisco Nexus 9504)</li> <li>■ 8 (Cisco Nexus 9508)</li> <li>■ 16 (Cisco Nexus 9516)</li> </ul>

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Product ID	Description	Quantity
N9K-X9464TX	Line card with 48 10GBASE-T ports and 4 40-Gigabit QSFP+ ports (supported by 40-Gigabit fabric modules [N9K-C9504-FM, N9K-C9508-FM, and N9K-9516FM])	<ul style="list-style-type: none"> <li>■ 4 (Cisco Nexus 9504)</li> <li>■ 8 (Cisco Nexus 9508)</li> <li>■ 16 (Cisco Nexus 9516)</li> </ul>
N9K- X9464TX2	Line card with 48 1-/10GBASE-T ports and 4 40-Gigabit QSFP+ ports (supported by 40-Gigabit fabric modules [N9K-C9504-FM, N9K-C9508-FM, and N9K-9516FM])	<ul style="list-style-type: none"> <li>■ 4 (Cisco Nexus 9504)</li> <li>■ 8 (Cisco Nexus 9508)</li> <li>■ 16 (Cisco Nexus 9516)</li> </ul>
N9K-X9536PQ	Line card with 36 40-Gigabit Ethernet QSFP+ ports (supported by 40-Gigabit fabric modules [N9K-C9504-FM, N9K-C9508-FM, and N9K-9516FM])	<ul style="list-style-type: none"> <li>■ 4 (Cisco Nexus 9504)</li> <li>■ 8 (Cisco Nexus 9508)</li> <li>■ 16 (Cisco Nexus 9516)</li> </ul>
N9K-X9564PX	Line card with 48 1-/10-Gigabit SFP+ ports and 4 40-Gigabit QSFP+ ports (supported by 40-Gigabit fabric modules [N9K-C9504-FM, N9K-C9508-FM, and N9K-9516FM])	<ul style="list-style-type: none"> <li>■ 4 (Cisco Nexus 9504)</li> <li>■ 8 (Cisco Nexus 9508)</li> <li>■ 16 (Cisco Nexus 9516)</li> </ul>
N9K-X9564TX	Line card with 48 1-/10-GBASE-T ports and 4 40-Gigabit QSFP+ ports (supported by 40-Gigabit fabric modules [N9K-C9504-FM, N9K-C9508-FM, and N9K-9516FM])	<ul style="list-style-type: none"> <li>■ 4 (Cisco Nexus 9504)</li> <li>■ 8 (Cisco Nexus 9508)</li> <li>■ 16 (Cisco Nexus 9516)</li> </ul>
N9K-X9636PQ	Line card with 36 40-Gigabit QSFP+ ports (supported by 40-Gigabit fabric modules [N9K-C9504-FM and N9K-C9508-FM])  <b>Note:</b> Not supported on the Cisco Nexus 9516 switch (N9K-C9516).	<ul style="list-style-type: none"> <li>■ 4 (Cisco Nexus 9504)</li> <li>■ 8 (Cisco Nexus 9508)</li> </ul>

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Product ID	Description	Quantity
N9K-X9732C-EX	Line card with 32 40-/100-Gigabit Ethernet QSFP28 ports (supported by 100-Gigabit -E fabric modules [N9K-C9504-FM-E and N9K-C9508-FM-E])	<ul style="list-style-type: none"> <li>■ 4 (Cisco Nexus 9504)</li> <li>■ 8 (Cisco Nexus 9508)</li> </ul>

Table 6 Cisco Nexus 9000 Series Power Supplies

Product ID	Hardware	Quantity
N9K-PAC-650W	650-W AC power supply, port-side intake airflow (burgundy coloring)  <i>Note:</i> Supports the Cisco Nexus 9332PQ, 9372PX, 9372PX-E, 9372TX, 9372TX-E, 9396PX, and 9396TX switches.	2
N9K-PAC-650W-B	650-W AC power supply, port-side exhaust airflow (blue coloring)  <i>Note:</i> Supports the Cisco Nexus 9332PQ, 9372PX, 9372PX-E, 9372TX, 9372TX-E, 9396PX, and 9396TX switches.	2
N9K-PAC-1200W	1200-W AC power supply, port-side intake airflow (burgundy coloring)  <i>Note:</i> Supports the Cisco Nexus 93120TX switches.	2
N9K-PAC-1200W-B	1200-W AC power supply, port-side exhaust airflow (blue coloring)  <i>Note:</i> Supports the Cisco Nexus 93120TX switches.	2
N9K-PAC-3000W-B	3000-W AC power supply  <i>Note:</i> Supports the Cisco Nexus 9504, 9508, and 9516 switches.	<ul style="list-style-type: none"> <li>■ Up to 4 (Cisco Nexus 9504)</li> <li>■ Up to 8 (Cisco Nexus 9508)</li> <li>■ Up to 10 (Cisco Nexus 9516)</li> </ul>
N9K-PDC-3000W-B	3000-W DC power supply  <i>Note:</i> Supports the Cisco Nexus 9504, 9508, and 9516 switches.	<ul style="list-style-type: none"> <li>■ Up to 4 (Cisco Nexus 9504)</li> <li>■ Up to 8 (Cisco Nexus 9508)</li> <li>■ Up to 10 (Cisco Nexus 9516)</li> </ul>



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N9K-PUV-1200W	1200-W AC power supply (airflow direction determined by the installed fan modules)  <i>Note:</i> Supports all of the Cisco Nexus 9200 and 9300 NX-OS mode switches.	2
N9K-PUV-3000W-B	3000-W Universal AC/DC power supply	<ul style="list-style-type: none"> <li>■ Up to 4 (Cisco Nexus 9504)</li> <li>■ Up to 8 (Cisco Nexus 9508)</li> <li>■ Up to 10 (Cisco Nexus 9516)</li> </ul>
NXA-PAC-650W-PE	Nexus 650W power supply port side exhaust.  <i>Note:</i> Supports the Cisco Nexus 92160YC-X, 92304QC, and 9236C switches.	2
NXA-PAC-650W-PI	Nexus 6500W power supply port side intake.  <i>Note:</i> Supports the Cisco Nexus 92160YC-X, 92304QC, and 9236C switches.	2
UCSC-PSU-930WDC	930-W DC power supply with port-side intake airflow  <i>Note:</i> Supports all Cisco Nexus 9200 and 9300 NX-OS mode switches.	2
UCS-PSU-6332-DC	930-W DC power supply with port-side exhaust airflow  <i>Note:</i> Supports all Cisco Nexus 9200 and 9300 NX-OS mode switches.	2

Table 7 Cisco Nexus 9500 Platform Supervisor Modules

Product ID	Hardware	Quantity
N9K-SUP-A	Cisco Nexus 9500 platform supervisor A module with 4 cores	2
N9K-SUP-B	Cisco Nexus 9500 platform supervisor B module with 6 cores	2

Table 8 Cisco Nexus 9000 Series Switches

Product ID	Description	Quantity
N9K-C9236C	Cisco Nexus 9236C 1-RU switch with 36 40-/100-Gigabit QSFP28 ports (144 10-/25-Gigabit ports when using breakout cables).  <i>Note:</i> Beginning with Cisco NX-OS Release 7.0(3)I4(3), 25G CVR-2QSFP28-8SFP adapters are supported on the Cisco Nexus 9236C switches.	1
N9K-C9272Q	Cisco Nexus 9272Q 2-RU switch with 72 40-Gigabit Ethernet QSFP+ ports (up to 35 of the ports [ports 37-71] also support breakout cables providing up to 140 10-Gigabit connections)	1
N9K-C9332PQ	Cisco Nexus 9332PQ 1-RU switch with 32 40-Gigabit Ethernet QSFP+ ports and supports 4x10G breakout mode for ports 1 to 26 (except ports 13 and 14). Ports 27 to 32 (ALE uplink ports) support using the QSFP-to-SFP+ Adapter (QSA) for 10-Gigabit SFP/SFP+ transceivers in QSFP+ ports.	1
N9K-C9372PX	Cisco Nexus 9372PX 1-RU switch with 48 1-/10-Gigabit Ethernet SFP+ ports and 6 40-Gigabit Ethernet QSFP+ ports.	1
N9K-C9372PX-E	An enhanced version of the N9K-C9372PX switch.	1
N9K-C9372TX	Cisco Nexus 9372TX 1-RU switch with 48 1/10GBASE-T ports and 6 40-Gigabit Ethernet QSFP+ ports.	1
N9K-C9372TX-E	An enhanced version of the N9K-C9372TX switch.	1
N9K-C9396PX	Cisco Nexus 9396PX 1-RU switch with 48 1-/10-Gigabit Ethernet SFP+ ports and an uplink module with up to 12 40-Gigabit Ethernet QSPF+ ports	1
N9K-C9396TX	Cisco Nexus 9396TX 1-RU switch with 48 1/10GBASE-T and an uplink module with up to 12 40-Gigabit Ethernet QSFP+ ports	1
N9K-C9504	Cisco Nexus 9504 4-slot modular switch	1

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N9K-C9508	Cisco Nexus 9508 8-slot modular switch	1
N9K-C9516	Cisco Nexus 9516 16-slot modular switch	1
N9K-C92160YC-X	Cisco Nexus 92160YC-X 1-RU switch with 48 10-/25-Gigabit SFP+ ports and 6 40-Gigabit QSFP+ ports (4 of these ports support 100-Gigabit QSFP28 optics).	1
N9K-C92304QC	Cisco Nexus 92304QC 2-RU switch with 56 40-Gigabit Ethernet ports (64 10-Gigabit ports if using breakout cables) and 8 100-Gigabit ports.	1
N9K-C93120TX	Cisco Nexus 93120TX 2RU switch with 96 1/10GBASE-T ports and 6 40-Gigabit QSFP+ uplink ports.	1
N9K-C93128TX	Cisco Nexus 93128TX 3-RU switch with 96 1/10GBASE-T ports and an uplink module that supports up to 8 40-Gigabit Ethernet QSPF+ ports (the 1/10GBASE-T ports also support a speed of 100 Megabits per second.)	1
N9K-C93108TC-EX	Cisco Nexus 93108TC-EX 1-RU switch with 48 10GBASE-T ports and 6 40/100-Gigabit QSFP28 ports.	1
N9K-C93180YC-EX	Cisco Nexus 93180YC-EX 1-RU switch with 48 10-/25-Gigabit Ethernet ports and 6 40/100-Gigabit QSFP28 ports.	1

Table 9 Cisco Nexus 9000 Series Uplink Modules

Product ID	Hardware	Quantity
N9K-M4PC-CFP2	Cisco Nexus 9300 uplink module with 4 100-Gigabit Ethernet CFP2 ports. For the Cisco Nexus 93128TX switch, only two of the ports are active. For the Cisco Nexus 9396PX and 9396TX switches, all four ports are active.	1
N9K-M6PQ	Cisco Nexus 9300 uplink module with 6 40-Gigabit Ethernet QSFP+ ports for the Cisco Nexus 9396PX, 9396TX, and 93128TX switches.  <i>Note:</i> The front-panel ports on these uplink modules do not support auto negotiation with copper cables. You can manually configure the speed on the peer switch.	1

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N9K-M6PQ-E	An enhanced version of the Cisco Nexus N9K-M6PQ uplink module.	
N9K-M12PQ	Cisco Nexus 9300 uplink module with 12 40-Gigabit Ethernet QSFP+ ports.  <i>Note:</i> The front-panel ports on these uplink modules do not support auto negotiation with copper cables. You can manually configure the speed on the peer switch.	1 (required)

Table 10 Cisco Nexus 9500 Platform System Controller

Product ID	Hardware	Quantity
N9K-SC-A	Cisco Nexus 9500 Platform System Controller Module	2

Table 11 Cisco Nexus 3232C and 3264Q Switch Hardware

Product ID	Hardware	Quantity
N3K-C3232C	Cisco Nexus 3232C, 32 x 40G/100G 2 x 10G SFP+, 1-RU switch	1
N3K-C3264Q	Cisco Nexus 3264Q, 64 x 40G 2 x 10G SFP+, 2-RU switch	1

*Note:* Beginning with Cisco NX-OS Release 7.0(3)I4(3), 25G CVR-2QSFP28-8SFP is supported on the Cisco Nexus 3232C switches.

Table 12 Cisco Nexus 3164Q Switch Hardware

Product ID	Hardware	Quantity
N3K-C3164Q-40GE	Cisco Nexus 3164Q, 64 x 40G SFP+, 2-RU switch	1
N9K-C9300-FAN3	Cisco Nexus 3164Q fan module	3
N9K-PAC-1200W	Cisco Nexus 3164Q 1200W AC power supply	2

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Table 13 Cisco Nexus 31128PQ Switch Hardware

Product ID	Hardware	Quantity
N3K-C31128PQ-10GE	Nexus 31128PQ, 96 SFP+ ports, 8 QSFP+ ports, 2RU switch	1

Note: The Cisco Nexus M6PQ-E uplink module and the Cisco Nexus 9372PX-E and 9372TX-E switches need to run the following minimum Cisco NX-OS releases:

- 7.0(3)I2(2d)
- 7.0(3)I2(2e)
- 7.0(3)I3(2)
- 7.0(3)I4(1)

## Supported Optics

See the [Cisco 10-Gigabit Ethernet Transceiver Modules Compatibility Matrix](#) for a list of supported optical components.

## Supported FEX Modules

Cisco NX-OS Release 7.0(3)I4(4) supports the following FEXes (Fabric extenders) on Cisco Nexus 9332PQ, 9372PX, 9372PX-E, 9396PX and 9500 platform switches:

- Cisco Nexus 2224TP
- Cisco Nexus 2232PP
- Cisco Nexus 2232TM and 2232TM-E
- Cisco Nexus 2248PQ
- Cisco Nexus 2248TP and 2248TP-E
- Cisco Nexus 2348TQ
- Cisco Nexus 2348UPQ
- Cisco Nexus B22Dell
- Cisco Nexus B22HP
- Cisco Nexus NB22FTS
- Cisco Nexus NB22IBM

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Note: Please note the following:

- The 9408 and line card is not supported with the 2300 FEX.
- Cisco Nexus 9300 Series switches do not support FEX on uplink modules (ALE).
- For FEX HIF port channels, we recommend that you enable STP port type edge using the spanning tree port type edge [trunk] command.
- The Cisco 2248PQ, 2348TQ, and 2348UPQ FEXes support connections to the Nexus 9300 or 9500 switches by using supported breakout cables to connect a QSFP+ uplink on the FEX and an SFP+ link on the parent switch (4x10G links).

Note: For Cisco Nexus 9500 switches, 4x10G breakout for FEX connectivity is not supported.

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## New and Changed Information

This section lists the following topics:

- New Hardware Features in Cisco NX-OS Release 7.0(3)I4(4)
- New Software Features in Cisco NX-OS Release 7.0(3)I4(4)

### New Hardware Features in Cisco NX-OS Release 7.0(3)I4(4)

Cisco NX-OS Release 7.0(3)I4(4) does not include new hardware features.

### New Software Features in Cisco NX-OS Release 7.0(3)I4(4)

- LPM Heavy Mode—You can configure this LPM routing mode in order to support significantly more LPM routes. Only Cisco Nexus 9200 and 9300-EX Series switches and the Cisco Nexus 9508 switch with an X9732C-EX line card support this routing mode. For configuration information, see the [Cisco Nexus 9000 Series NX-OS Unicast Routing Configuration Guide](#). For a list of verified scalability numbers, see the [Cisco Nexus 9000 Series NX-OS Verified Scalability Guide, Release 7.0\(3\)I4\(4\)](#).
- Maximum queue occupancy support for Leaf Spine Engines (LSE)—Added maximum queue occupancy support for Leaf Spine Engine (LSE) enabled switches. For more information, see the [Cisco Nexus 9000 Series NX-OS Quality of Service Configuration Guide](#).
- Updated alpha values for dynamic queue size—Added updated alpha values for dynamic queue size. For more information, see the [Cisco Nexus 9000 Series NX-OS Quality of Service Configuration Guide](#).
- hardware qos q-noise percent <value> command—Added support for hardware qos q-noise percent <value> command to tune the random noise parameter on Leaf Spine Engine (LSE) enabled switches. For more information, see the [Cisco Nexus 9000 Series NX-OS Quality of Service Configuration Guide](#).

## Caveats

This section includes the following topics:

- Resolved Caveats—Cisco NX-OS Release 7.0(3)I4(4)

## Upgrade Instructions

- Open Caveats—Cisco NX-OS Release 7.0(3)I4(4)
- Known Behaviors—Cisco NX-OS Release 7.0(3)I4(4)

## Resolved Caveats—Cisco NX-OS Release 7.0(3)I4(4)

Table 15 lists the Resolved Caveats in Cisco NX-OS Release 7.0(3)I4(4). Click the bug ID to access the Bug Search tool and see additional information about the bug.

Table 14 Open Caveats in Cisco NX-OS Release 7.0(3)I4(4)

Bug ID	Description
<a href="#">CSCvb37238</a>	VPC port-channel mac learning disabled after removing one member link

There are no resolved caveats for this release.

## Open Caveats—Cisco NX-OS Release 7.0(3)I4(4)

Table 15 lists the Open Caveats in Cisco NX-OS Release 7.0(3)I4(4). Click the bug ID to access the Bug Search tool and see additional information about the bug.

Table 15 Open Caveats in Cisco NX-OS Release 7.0(3)I4(4)

Bug ID	Description
<a href="#">CSCuy08187</a>	If EPLD is not latest, abort non-disruptive ISSU
<a href="#">CSCvb04193</a>	Nexus 9000 ACL redirect does not work between uplink ports

## Known Behaviors—Cisco NX-OS Release 7.0(3)I4(4)

There are no known behavior changes for this release.

## Upgrade Instructions

To perform a software upgrade, follow the installation instructions in the *Cisco Nexus 9000 Series NX-OS Software Upgrade and Downgrade Guide*.

## Note:

- Upgrading from Cisco NX-OS Release 7.0(3)1(2), Release 7.0(3)1(3), or Release 7.0(3)1(3a), requires installing a patch for Cisco Nexus 9500 platform switches. For more information on the upgrade patch, see *Patch Upgrade Instructions*.

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## Upgrade Instructions

- Use install all when upgrading to Cisco NX-OS Release 7.0(3)I4(x). Failing to follow this requirement requires console access to recover.
  - When upgrading to Cisco NX-OS Release 7.0(3)I4(4), Guest Shell automatically upgrades from 1.0 to 2.0. In the process, the contents of the guest shell 1.0 root filesystem will be lost. To keep from losing important content, copy any needed files to /bootflash or an off-box location before upgrading to Cisco NX-OS Release 7.0(3)I4(4).
  - An ISSU (In-Service Software Upgrades) can be performed only from a Cisco NX-OS Release 7.0(3)I3(1) or later image to a later image.
  - While performing a non-disruptive ISSU, VRRP and VRRPV3 will display the following messages:
    - If VRRPV3 is enabled:  

```
2015 Dec 29 20:41:44 MDP-N9K-6 %$ VDC-1 %$ %USER-0-SYSTEM_MSG: ISSU ERROR: Service "vrrpv3" has sent the following message: Feature vrrpv3 is configured. User can change vrrpv3 timers to 120 seconds or fine tune these timers based on upgrade time on all Vrrp Peers to avoid Vrrp State transitions. - sysmgr
```
    - If VRRP is enabled:  

```
2015 Dec 29 20:45:10 MDP-N9K-6 %$ VDC-1 %$ %USER-0-SYSTEM_MSG: ISSU ERROR: Service "vrrp-eng" has sent the following message: Feature vrrp is configured. User can change vrrp timers to 120 seconds or fine tune these timers based on upgrade time on all Vrrp Peers to avoid Vrrp State transitions. - sysmgr
```
  - Guest Shell is disabled during an ISSU and reactivated after the upgrade.
  - If you have ITD probes configured, you need to disable the ITD service (using the shutdown command) before upgrading to Cisco NX-OS Release 7.0(3)I4(4). After the upgrade, enter the feature sla sender command to enable IP SLA for ITD probes and then the no shutdown command to re-enable the ITD service. (If you upgrade without shutting down the service, you can enter the feature sla sender command after the upgrade.)
- 

## Patch Upgrade Instructions

- Upgrading from Cisco NX-OS Release 7.0(3)I1(2), Release 7.0(3)I1(3), or Release 7.0(3)I1(3a) requires installing a patch and then upgrading with install all. Failing to follow this requirement requires console access to recover.
- Upgrading from Cisco NX-OS Release 7.0(3)I1(2), Release 7.0(3)I1(3), or Release 7.0(3)I1(3a) to Release 7.0(3)I4(4) requires a patch for modular switches. A patch is available for each respective release. Please see the respective links below.

When upgrading from Cisco NX-OS Release 7.0(3)I1(1) or earlier, including all variants of 6.1(2) based releases, a patch is not required. You can upgrade directly using install all.

**Note:** The patch is only for upgrading. After the upgrade, the patch is automatically removed. If you decide not to upgrade after installing the patch, do not deactivate it. Deactivating the patch may cause a bios\_daemon crash.

Cisco NX-OS Release 7.0(3)I1(2) Upgrade Patch

<https://software.cisco.com/download/special/release.html?config=ea82d4567eeb829ad4f32ae29c627cfc>



Upgrade Instructions

Cisco NX-OS Release 7.0(3)I1(3) Upgrade Patch

<https://software.cisco.com/download/special/release.html?config=e3e68dd1e8db9633978e080b9b715df8>

Cisco NX-OS Release 7.0(3)I1(3a) Upgrade Patch

<https://software.cisco.com/download/special/release.html?config=0f2015eebc7ea0d606441171b4a3baf2>

To upgrade with the patch:

1. Add the patch.
2. Install the patch.
3. Commit the patch.
4. Upgrade using install all.

Table 16 Patch Upgrade Example

```
N9K-16(config)# install add bootflash:n9000-dk9.7.0.3.I1.2.CSCuy16604.bin
Install operation 16 completed successfully at Thu Mar  3 04:24:13 2016
N9K-16(config)# install add bootflash:n9000-dk9.7.0.3.I1.2.CSCuy16606.bin
Install operation 17 completed successfully at Thu Mar  3 04:24:43 2016

N9K-16(config)# install activate n9000-dk9.7.0.3.I1.2.CSCuy16604.bin
Install operation 18 completed successfully at Thu Mar  3 04:28:38 2016
N9K-16(config)# install activate n9000-dk9.7.0.3.I1.2.CSCuy16606.bin
Install operation 19 completed successfully at Thu Mar  3 04:29:08 2016

N9K-16(config)# install commit n9000-dk9.7.0.3.I1.2.CSCuy16604.bin
Install operation 20 completed successfully at Thu Mar  3 04:30:38 2016
N9K-16(config)# install commit n9000-dk9.7.0.3.I1.2.CSCuy16606.bin
Install operation 21 completed successfully at Thu Mar  3 04:31:16 2016

N9K-16(config)# install all nxos bootflash:Nxos.7.0.3.I4.4.bin
Installer will perform compatibility check first. Please wait.
uri is: /Nxos.7.0.3.I4.4.bin
Installer is forced disruptive

Verifying image bootflash:/Nxos.7.0.3.I4.4.bin for boot variable "nxos" .
[#####] 100% -- SUCCESS

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

Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.
[#####] 100% -- SUCCESS

Preparing "bios" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.
[#####] 100% -- SUCCESS
```

```
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos. 7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "nxos" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS  
  
Preparing "lcn9k" version info using image bootflash:/Nxos.7.0.3.I4.4.bin.  
[#####] 100% -- SUCCESS
```

Upgrade Instructions

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	Incompatible image
6	yes	disruptive	reset	Incompatible image
8	yes	disruptive	reset	Incompatible image
9	yes	disruptive	reset	Incompatible image
10	yes	disruptive	reset	Incompatible image
11	yes	disruptive	reset	Incompatible image
14	yes	disruptive	reset	Incompatible image
15	yes	disruptive	reset	Incompatible image
16	yes	disruptive	reset	Incompatible image
21	yes	disruptive	reset	Incompatible image
22	yes	disruptive	reset	Incompatible image
23	yes	disruptive	reset	Incompatible image
24	yes	disruptive	reset	Incompatible image
25	yes	disruptive	reset	Incompatible image
26	yes	disruptive	reset	Incompatible image
27	yes	disruptive	reset	Incompatible image
28	yes	disruptive	reset	Incompatible image
29	yes	disruptive	reset	Incompatible image
30	yes	disruptive	reset	Incompatible image

Images will be upgraded according to following table:

Module	Image	Running-Version(pri:alt)	New-Version	Upg-Required
1	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes
1	bios	v01.42(00:v01.42(00	v01.48(00	yes
6	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes
6	bios	v01.48(00:v01.48(00	v01.48(00	no
8	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes
8	bios	v01.48(00:v01.29(00	v01.48(00	no
9	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes
9	bios	v01.48(00:v01.35(00	v01.48(00	no
10	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes
10	bios	v01.48(00:v01.42(00	v01.48(00	no
11	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes
11	bios	v01.48(00:v01.52(00	v01.48(00	no
14	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes
14	bios	v01.48(00:v01.48(00	v01.48(00	no
15	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes
15	bios	v01.48(00:v01.40(00	v01.48(00	no
16	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes
16	bios	v01.48(00:v01.42(00	v01.48(00	no

## Upgrade Instructions

21	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes	
21	bios	v01.48(00:v01.42(00	v01.48(00	no	
22	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes	
22	bios	v01.48(00:v01.40(00	v01.48(00	no	
23	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes	
23	bios	v01.48(00:v01.40(00	v01.48(00	no	
24	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes	
24	bios	v01.48(00:v01.40(00	v01.48(00	no	
25	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes	
25	bios	v01.48(00:v01.40(00	v01.48(00	no	
26	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes	
26	bios	v01.48(00:v01.40(00	v01.48(00	no	
27	nxos	7.0(3)I1(2)	7.0(3)I4(4)	yes	
27	bios	v08.06(09/10/2014):v08.18(08/11/2015)	v08.26(01/12/2016)	yes	
28	nxos	7.0(3)I1(2)	7.0(3)I4(4)	yes	
28	bios	v08.06(09/10/2014):v08.26(01/12/2016)	v08.26(01/12/2016)	yes	
29	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes	
29	bios	v01.48(00:v01.35(00	v01.48(00	no	
30	lcn9k	7.0(3)I1(2)	7.0(3)I4(4)	yes	
30	bios	v01.48(00:v01.35(00	v01.48(00	no	

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

Syncing image bootflash:/Nxos.7.0.3.I4.4.bin to standby.

[#####] 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

Module 6: Refreshing compact flash and upgrading bios/loader/bootrom.

Warning: please do not remove or power off the module at this time.

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

Module 8: Refreshing compact flash and upgrading bios/loader/bootrom.

Warning: please do not remove or power off the module at this time.

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

Module 9: Refreshing compact flash and upgrading bios/loader/bootrom.

Upgrade Instructions

Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 10: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 11: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 14: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 15: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 16: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 21: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 22: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 23: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 24: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 25: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 26: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 27: Refreshing compact flash and upgrading bios/loader/bootrom.  
Warning: please do not remove or power off the module at this time.  
[#####] 100% -- SUCCESS

Module 28: Refreshing compact flash and upgrading bios/loader/bootrom.

Upgrade Instructions

Warning: please do not remove or power off the module at this time.

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

Module 29: Refreshing compact flash and upgrading bios/loader/bootrom.

Warning: please do not remove or power off the module at this time.

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

Module 30: 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.

N9K-16(config)#

User Access Verification

N9K-16 login: [ 2644.917727] [1456980048] writing reset reason 88,

CISCO SWITCH Ver 8.26

CISCO SWITCH Ver 8.26

Memory Size (Bytes): 0x0000000080000000 + 0x0000000380000000

Relocated to memory

Time: 6/3/2016 4:41:8

Detected CISCO IOFPGA

Booting from Primary Bios

Code Signing Results: 0x0

Using Upgrade FPGA

FPGA Revision : 0x27

FPGA ID : 0x1168153

FPGA Date : 0x20160111

Reset Cause Register: 0x22

Boot Ctrl Register : 0x60ff

EventLog Register1 : 0x2000000

EventLog Register2 : 0xfbe77fff

Version 2.16.1240. Copyright (C) 2013 American Megatrends, Inc.

Board type 1

IOFPGA @ 0xe8000000

SLOT\_ID @ 0x1b

Standalone chassis

check\_bootmode: grub: Continue grub

Trying to read config file /boot/grub/menu.lst.local from (hd0,4)

Filesystem type is ext2fs, partition type 0x83

Booting bootflash:/Nxos.7.0.3.I4.4.bin ...

Booting bootflash:/Nxos.7.0.3.I4.4.bin

Trying diskboot

Filesystem type is ext2fs, partition type 0x83

IOFPGA ID: 1168153

Image valid

Image Signature verification was Successful.

```
Boot Time: 3/3/2016 4:41:44
INIT: version 2.88 booting
Unsquashing rootfs ...

Loading IGB driver ...
Installing SSE module ... done
Creating the sse device node ... done
Loading I2C driver ...
Installing CCTRL driver for card_type 3 ...
CCTRL driver for card_index 21000 ...
old data: 4000004 new data: 1
Not Micron SSD...

Checking all filesystems.....
Installing default sprom values ...
done.Configuring network ...
Installing LC netdev ...
Installing psdev ...
Installing veobc ...
Installing OBFL driver ...
mounting plog for N9k!
tune2fs 1.42.1 (17-Feb-2012)
Setting reserved blocks percentage to 0% (0 blocks)
Starting portmap daemon...
creating NFS state directory: done
starting 8 nfsd kernel threads: done
starting mountd: done
starting statd: done
Saving image for img-sync ...
Loading system software
Installing local RPMS
Patch Repository Setup completed successfully
dealing with default shell..
file /proc/cmdline found, look for shell
unset shelltype, nothing to do..
user add file found..edit it
Uncompressing system image: Thu Jun 3 04:42:11 UTC 2016
blogger: nothing to do.

..done Thu Mar 3 04:42:11 UTC 2016
Creating /dev/mcelog
Starting mcelog daemon
Overwriting dme stub lib
Replaced dme stub lib
INIT: Entering runlevel: 3
Running S93thirdparty-script...

2016 Mar 3 04:42:37 N9K-16 %$ VDC-1 %$ %USER-2-SYSTEM_MSG: <<%USBHSD-2-MOUNT>> logflash: online -
usbhsd
2016 Mar 3 04:42:37 N9K-16 %$ VDC-1 %$ Mar 3 04:42:37 %KERN-2-SYSTEM_MSG: [ 12.509615] hwport mode=6
- kernel
```

```

2016 Mar 3 04:42:40 N9K-16 %$ VDC-1 %$ %VMAN-2-INSTALL_STATE: Installing virtual service 'guestshell+'
2016 Mar 3 04:42:40 N9K-16 %$ VDC-1 %$ %DAEMON-2-SYSTEM_MSG: <<%ASCII-CFG-2-CONF_CONTROL>>
Binary restore - ascii-cfg[13904]
2016 Mar 3 04:42:40 N9K-16 %$ VDC-1 %$ %DAEMON-2-SYSTEM_MSG: <<%ASCII-CFG-2-CONF_CONTROL>>
Restore DME database - ascii-cfg[13904]
2016 Mar 3 04:42:42 N9K-16 %$ VDC-1 %$ netstack: Registration with cli server complete
2016 Mar 3 04:43:00 N9K-16 %$ VDC-1 %$ %USER-2-SYSTEM_MSG: ssnmgr_app_init called on ssnmgr up - aclmgr
2016 Mar 3 04:43:09 N9K-16 %$ VDC-1 %$ %USER-0-SYSTEM_MSG: end of default policer - copp
2016 Mar 3 04:43:10 N9K-16 %$ VDC-1 %$ %VMAN-2-INSTALL_STATE: Install success virtual service 'guestshell+';
Activating
2016 Mar 3 04:43:10 N9K-16 %$ VDC-1 %$ %VMAN-2-ACTIVATION_STATE: Activating virtual service 'guestshell+'
2016 Mar 3 04:43:13 N9K-16 %$ VDC-1 %$ %CARDCLIENT-2-FPGA_BOOT_PRIMARY: IOFPGA booted from Primary
2016 Mar 3 04:43:18 N9K-16 %$ VDC-1 %$ %USER-2-SYSTEM_MSG: IPV6 Netlink thread init successful - icmpv6
2016 Mar 3 04:43:19 N9K-16 %$ VDC-1 %$ %VDC_MGR-2-VDC_ONLINE: vdc 1 has come online

```

#### User Access Verification

```

N9K-16 login: 2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of
Module 1
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 6
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 8
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 9
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 10
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 11
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 14
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 15
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 16
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 21
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 22
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 23
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 24
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 25
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 26
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 28
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 29
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PRESENT: Detected the presence of Module 30
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-PS_OK: Power supply 1 ok (Serial number
DTM173903QQ)
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-PS_FANOK: Fan in Power supply 1 ok
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-PS_OK: Power supply 2 ok (Serial number
DTM174000SB)
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-PS_FANOK: Fan in Power supply 2 ok
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-PS_OK: Power supply 3 ok (Serial number
DTM174000RR)
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-PS_FANOK: Fan in Power supply 3 ok
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-PS_OK: Power supply 4 ok (Serial number
DTM173903SH)
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-PS_FANOK: Fan in Power supply 4 ok
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-PS_OK: Power supply 5 ok (Serial number
DTM173903SR)
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-PS_FANOK: Fan in Power supply 5 ok

```



```
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-FANMOD_FAN_OK: Fan module 1 (Fan1(sys_fan1) fan)
ok
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-FANMOD_FAN_OK: Fan module 2 (Fan2(sys_fan2) fan)
ok
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-FANMOD_FAN_OK: Fan module 3 (Fan3(sys_fan3) fan)
ok
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 30 detected (Serial number
SAL1803KQ78) Module-Type System Controller Model N9K-SC-A
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 30 powered up (Serial number
SAL1803KQ78)
2016 Mar 3 04:43:52 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 28 detected (Serial number
:unavailable) Module-Type Supervisor Module Model :unavailable
2016 Mar 3 04:43:58 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 29 detected (Serial number
SAL1803KQAS) Module-Type System Controller Model N9K-SC-A
2016 Mar 3 04:43:58 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 29 powered up (Serial number
SAL1803KQAS)
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 21 detected (Serial number
SAL1813NZMB) Module-Type Fabric Module Model N9K-C9516-FM
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 22 detected (Serial number
SAL1811NE36) Module-Type Fabric Module Model N9K-C9516-FM
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 21 powered up (Serial number
SAL1813NZMB)
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 22 powered up (Serial number
SAL1811NE36)
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 23 detected (Serial number
SAL1813P9VN) Module-Type Fabric Module Model N9K-C9516-FM
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 23 powered up (Serial number
SAL1813P9VN)
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 24 detected (Serial number
SAL1811NE3U) Module-Type Fabric Module Model N9K-C9516-FM
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 24 powered up (Serial number
SAL1811NE3U)
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 25 detected (Serial number
SAL1813NZNB) Module-Type Fabric Module Model N9K-C9516-FM
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 25 powered up (Serial number
SAL1813NZNB)
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 26 detected (Serial number
SAL1811NE46) Module-Type Fabric Module Model N9K-C9516-FM
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 26 powered up (Serial number
SAL1811NE46)
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All Ejectors
closed for module 1. Ejector based shutdown enabled
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 1 detected (Serial number
SAL1817REUZ) Module-Type 32p 40G Ethernet Module Model N9K-X9432PQ
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 1 powered up (Serial number
SAL1817REUZ)
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All Ejectors
closed for module 9. Ejector based shutdown enabled
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 9 detected (Serial number
SAL1746G7Y3) Module-Type 48x1/10G-T 4x40G Ethernet Module Model N9K-X9564TX
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 9 powered up (Serial number
SAL1746G7Y3)
```

```
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All Ejectors
closed for module 10. Ejector based shutdown enabled
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 10 detected (Serial number
SAL1817REVT) Module-Type 32p 40G Ethernet Module Model N9K-X9432PQ
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 10 powered up (Serial number
SAL1817REVT)
2016 Mar 3 04:44:01 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All Ejectors
closed for module 11. Ejector based shutdown enabled
2016 Mar 3 04:44:02 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 11 detected (Serial number
SAL1820SKZ1) Module-Type 36p 40G Ethernet Module Model N9K-X9536PQ
2016 Mar 3 04:44:02 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 11 powered up (Serial number
SAL1820SKZ1)
2016 Mar 3 04:44:02 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All Ejectors
closed for module 15. Ejector based shutdown enabled
2016 Mar 3 04:44:02 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 15 detected (Serial number
SAL1812NTFC) Module-Type 36p 40G Ethernet Module Model N9K-X9536PQ
2016 Mar 3 04:44:02 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 15 powered up (Serial number
SAL1812NTFC)
2016 Mar 3 04:44:02 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All Ejectors
closed for module 16. Ejector based shutdown enabled
2016 Mar 3 04:44:02 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 16 detected (Serial number
SAL1816QGWW) Module-Type 48x1/10G SFP+ 4x40G Ethernet Module Model N9K-X9464PX
2016 Mar 3 04:44:02 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 16 powered up (Serial number
SAL1816QGWW)
2016 Mar 3 04:44:08 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All Ejectors
closed for module 14. Ejector based shutdown enabled
2016 Mar 3 04:44:08 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 14 detected (Serial number
SAL1910AP3B) Module-Type 8p 100G Ethernet Module Model N9K-X9408PC-CFP2
2016 Mar 3 04:44:08 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 14 powered up (Serial number
SAL1910AP3B)
2016 Mar 3 04:44:09 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All Ejectors
closed for module 6. Ejector based shutdown enabled
2016 Mar 3 04:44:09 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 6 detected (Serial number
SAL1910AP4E) Module-Type 8p 100G Ethernet Module Model N9K-X9408PC-CFP2
2016 Mar 3 04:44:09 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 6 powered up (Serial number
SAL1910AP4E)
2016 Mar 3 04:44:10 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MODULE_EJECTOR_POLICY_ENABLED: All Ejectors
closed for module 8. Ejector based shutdown enabled
2016 Mar 3 04:44:10 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_DETECT: Module 8 detected (Serial number
SAL1746G7Y8) Module-Type 48x1/10G-T 4x40G Ethernet Module Model N9K-X9564TX
2016 Mar 3 04:44:10 N9K-16 %$ VDC-1 %$ %PLATFORM-2-MOD_PWRUP: Module 8 powered up (Serial number
SAL1746G7Y8)
2016 Mar 3 04:44:56 N9K-16 %$ VDC-1 %$ %USBHSD-STANDBY-2-MOUNT: logflash: online
2016 Mar 3 04:47:31 N9K-16 %$ VDC-1 %$ %ASCII-CFG-2-CONF_CONTROL: System ready
2016 Mar 3 04:47:51 N9K-16 %$ VDC-1 %$ %VMAN-2-ACTIVATION_STATE: Successfully activated virtual service
'guestshell+'
2016 Mar 3 04:47:51 N9K-16 %$ VDC-1 %$ %VMAN-2-GUESTSHELL_ENABLED: The guest shell has been enabled.
The command 'guestshell' may be used to access it, 'guestshell destroy' to remove it.
```

User Access Verification

Upgrade Instructions

```
N9K-16# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
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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 08.26
  NXOS: version 7.0(3)I4(4)
  BIOS compile time: 06/12/2016
  NXOS image file is: bootflash:///Nxos.7.0.3.I4.4.bin
  NXOS compile time: 2/8/2016 20:00:00 [02/09/2016 05:18:17]

Hardware
  cisco Nexus9000 C9516 (16 Slot) Chassis ("Supervisor Module")
  Intel(R) Xeon(R) CPU E5-2403 0 @ 1.80GHz with 16401664 kB of memory.
  Processor Board ID SAL1745FTPW

  Device name: N9K-16
  bootflash: 20971520 kB
  Kernel uptime is 0 day(s), 0 hour(s), 8 minute(s), 13 second(s)

  Last reset at 235176 usecs after Thu Mar 3 04:40:48 2016

  Reason: Reset due to upgrade
  System version: 7.0(3)I1(2)
  Service:

plugin
  Core Plugin, Ethernet Plugin

Active Package(s):
N9K-16#
```

## Downgrade Instructions

Disable the Guest Shell if you need to downgrade from Cisco NX-OS Release 7.0(3)I4(4) to an earlier release.

- Performing an ISSU downgrade from Cisco NX-OS Release 7.0(3)I4(4) to Release 7.0(3)I4(1) with an FCoE (Fiber Channel over Ethernet) NPV (N-port Virtualization) configuration causes the port channel to crash with a core file:
 

```
[#####] 38%2016 Apr 18 20:52:35 n93-ns1 %$ VDC-1 %$ %SYSMGR-2-
SERVICE_CRASHED: Service "port-channel" (PID 14976) hasn't caught signal 11 (core will
be saved)
```
- ISSU (non-disruptive) downgrade is not supported.
- Downgrading with PVLANS (Private VLANs) configured is only supported with Cisco NX-OS 6.1(2)I3(4x) releases.
- For a boot-variable change and reload to Cisco NX-OS Release 7.0(3)I1(1x), the PVLAN process is not brought up, and the PVLAN ports are kept down. For a boot-variable change to the Cisco NX-OS Release 6.1(2)I3(3) and earlier, an ASCII replay will be tried, but feature PVLANS and other PVLAN configurations will fail.

## Software Maintenance Upgrades

For information about software maintenance upgrades, see the “Performing Software Maintenance Upgrades” section in the Cisco Nexus 9000 Series NX-OS System Management Configuration Guide.

Note: If you perform a software maintenance upgrade (SMU) and later upgrade your device to a new Cisco NX-OS software release, the new image will overwrite both the previous Cisco NX-OS release and the SMU package file.

## Limitations

This section lists limitations related to Cisco NX-OS Release 7.0(3)I4(4).

- Ingress queuing policy is supported only at the system level (and not at the interface level) for Cisco Nexus 9508 switches with the X9732C-EX line card and Cisco Nexus 93108TC-EX and 93180YC-EX switches.
- QinVNI has the following limitations:
  - Single tag is supported on Cisco Nexus 9300 Series switches. It can be enabled by unconfiguring the overlay-encapsulation vxlan-with-tag command from interface nve:

```
N9564PX-2 (config) # int nve 1
N9564PX-2 (config-if-nve) # no overlay-encapsulation vxlan-with-tag
N9564PX-2# sh run int nve 1
```

```
!Command: show running-config interface nve1
!Time: Wed Jul 20 23:26:25 2016
```

```
version 7.0(3u)I4(2u)
```

```
interface nve1
  no shutdown
  source-interface loopback0
```

## Limitations

```

host-reachability protocol bgp
member vni 900001 associate-vrf
member vni 2000980
  suppress-arp
  mcast-group 225.4.0.1

```

- Single tag is not supported on Cisco Nexus 9500 platform switches; only double tag is supported.
- When upgrading from Cisco Nexus 7.0(3)I3(1) or Release 7.0(3)I4(1) to Release 7.0(3)I4(4) with Cisco Nexus 9300 Series switches without the `overlay-encapsulation vxlan-with-tag` command under interface `nve`, you should add `overlay-encapsulation vxlan-with-tag` under the `nve` interface in the older release before starting the ISSU upgrade. We were only supporting double tag in Cisco Nexus 7.0(3)I3(1) and Release 7.0(3)I4(1). We now support single tag also in Release 7.0(3)I4(4).
- Resilient hashing (port-channel load-balancing resiliency) and VXLAN configurations are not compatible with VTEPs using ALE uplink ports. Please note that resilient hashing is disabled by default.
- Fast reload support is available for N9K-C9232C and N9K-C92304QC.
- CoPP (Control Plane Policing) cannot be disabled. If you attempt to disable it in Cisco NX-OS Release 7.0(3)I4(4), an error message appears. In previous releases, attempting to disable CoPP causes packets to be rate limited at 50 packets per seconds.
- Skip CoPP policy option has been removed from the Cisco NX-OS initial setup utility because using it can impact the control plane of the network.
- hardware profile front portmode command is not supported on the Cisco Nexus 9000 Series switches.
- PV (Port VLAN) configuration through an interface range is not supported.
- Layer 3 routed traffic for missing Layer 2 adjacency information is not flooded back onto VLAN members of ingress units when the source MAC address of routed traffic is a non-VDC (Virtual Device Context) MAC address. This limitation is for hardware flood traffic and can occur when the SVI (Switched Virtual Interface) has a user-configured MAC address.
- neighbor-down fib-accelerate command is supported in a BGP-only environment.
- Uplink modules should not be removed from a Cisco Nexus 9300 Series switch that is running Cisco NX-OS Release 7.0(3)I4(4). The ports on uplink modules should be used only for uplinks.
- PortLoopback and BootupPortLoopback tests are not supported.
- PFC (Priority Flow Control) and LLFC (Link-Level Flow Control) are supported for all Cisco Nexus 9300 and 9500 platform hardware except for the 100G 9408PC line card and the 100G M4PC generic expansion module (GEM).
- FEXes configured with 100/full-duplex speed, without explicitly configuring the neighboring device with 100/full-duplex speed, will not pass data packet traffic properly. This occurs with or without the link appearing to be “up.”
  - no speed-Auto negotiates and advertises all speeds (only full duplex).
  - speed 100-Does not auto negotiate; pause cannot be advertised. The peer must be set to not auto negotiate (only 100 Mbps full duplex is supported).
  - speed 1000-Auto negotiates and advertises pause (advertises only for 1000 Mbps full duplex).

## Limitations

- Eight QoS groups are supported only on modular platforms with the Cisco Nexus 9300 N9K-M4PC-CFP2 uplink module, and the following Cisco Nexus 9500 platform line cards:
  - N9K-X9432PQ
  - N9K-X9464PX
  - N9K-X9464TX
  - N9K-X9636PQ
- Flooding for Microsoft Network Load Balancing (NLB) unicast mode is supported only on Cisco Nexus 9500 platform switches. However, if the NLB servers are connected on FEX HIFs, the flooding does not work. NLB is not supported in max-host system routing mode, and NLB multicast mode is not supported.

*Note:* To work around the situation of Unicast NLB limitation, Cisco can statically hard code the *address resolution protocol (ARP)* and MAC address pointing to the correct interface. Please refer to bug ID CSCuq03168.
- TCAM resources are not shared when:
  - Applying VACL (VLAN ACL) to multiple VLANs
  - Routed ACL (Access Control List) is applied to multiple SVIs in the egress direction
- Cisco Nexus 9000 Series switch hardware does not support range checks (layer 4 operators) in egress TCAM. Because of this, ACL/QoS policies with layer 4 operations-based classification need to be expanded to multiple entries in the egress TCAM. Egress TCAM space planning should take this limitation into account.
- Applying the same QoS policy and ACL on multiple interfaces requires applying the qos-policy with the no-stats option to share the label.
- Multiple port VLAN mappings configured on an interface during a rollback operation causes the rollback feature to fail.
- The following switches support QSFP+ with the QSA (QSFP to SFP/SFP+ Adapter) (40G to 10G QSA):
  - N9K-C93120TX
  - N9K-C93128TX
  - N9K-C9332PQ
  - N9K-C9372PX
  - N9K-C9372PX-E
  - N9K-C9372TX
  - N9K-C9396PX

---

*Note:* The Cisco Nexus 9300 support for the QSFP+ breakout has the following limitations:

- Only 10G can be supported using QSA on 40G uplink ports on Cisco Nexus 9300 switches in NX-OS.
- 1G with QSA is not supported.

## Guidelines and Limitations for Private VLANs

- For the Cisco Nexus 9332PQ switch, all ports except 13-14 and 27-32 can support breakout
- All ports in the QSA speed group must operate at the same speed (see the configuration guide)

- 
- The following switches support the breakout cable (40G ports to 4x10G ports):
    - N9K-C9332PQ
    - N9K-X9436PQ
    - N9K-X9536PQ
    - N9K-C93180YC-EX
    - N9K-C93108TC-EX
    - N9K-X9732C-EX line card
  - Weighted ECMP (Equal-Cost Multi-Path) Nexus 3000 feature is not supported on the Cisco Nexus 9000 Series switch.
  - When upgrading from N9K-X94xx, N9K-X95xx, and N9K-X96xx line cards to N9K-X9732C-EX line cards and their fabric modules, upgrade the Cisco NX-OS software before inserting the line cards and fabric modules. Failure to do so can cause a diagnostic failure on the line card and no TCAM space to be allocated. You must use the write\_erase command followed by the reload command.
  - Limitations for ALE (Application Link Engine) uplink ports are listed at the following URL:  
[https://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus9000/sw/ale\\_ports/b\\_Limitations\\_for\\_ALE\\_Uplink\\_Ports\\_on\\_Cisco\\_Nexus\\_9000\\_Series\\_Switches.html](https://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus9000/sw/ale_ports/b_Limitations_for_ALE_Uplink_Ports_on_Cisco_Nexus_9000_Series_Switches.html)

## Guidelines and Limitations for Private VLANs

This section provides guidelines and limitations for configuring private VLANs.

- Configuring Private VLANs
- Secondary and Primary VLAN Configuration
- Private VLAN Port Configuration
- Limitations with Other Features

## Configuring Private VLANs

Private VLANs have the following configuration guidelines and limitations:

- Private VLANs must be enabled before the device can apply the private VLAN functionality.
- VLAN interface feature must be enabled before the device can apply this functionality.
- VLAN network interfaces for all VLANs that you plan to configure as secondary VLANs should be shut down before being configured.

- When a static MAC is created on a regular VLAN, and then that VLAN is converted to a secondary VLAN, the Cisco NX-OS maintains the MAC that was configured on the secondary VLAN as the static MAC.
- Private VLANs support port modes as follows:
  - Community host
  - Isolated host
  - Isolated host trunk
  - Promiscuous
  - Promiscuous trunk
- When configuring PVLAN promiscuous or PVLAN isolated trunks, it is recommended to allow non-private VLANs in the list specified by the switchport private-vlan trunk allowed id command.
- Private VLANs are mapped or associated depending on the PVLAN trunk mode.
- Private VLANs support the following:
  - Layer 2 forwarding
  - PACLs (Port Access Control Lists)
  - Promiscuous trunk
  - PVLAN across switches through a regular trunk port
  - RACLs (Router Access Control Lists)
- Private VLANs support SVIs as follows:
  - HSRP (Hot Standby Router Protocol) on the primary SVI
  - Primary and secondary IPs on the SVI
  - SVI allowed only on primary VLANs
- Private VLANs support STP as follows:
  - MST (Multiple Spanning Tree)
  - RSTP (Rapid Spanning Tree Protocol)
- Private VLANs port mode is not supported on the following:
  - 40G interfaces of the Cisco Nexus C9396PX or Cisco Nexus C93128TX
  - Cisco Nexus 3164Q
- Private VLANs do not provide port mode support for the following:
  - Port channels
  - vPC (Virtual Port Channel) interfaces
- Private VLANs do not provide support on breakout.



- Private VLANs do not provide support for the following:
  - DHCP (Dynamic Host Channel Protocol) snooping
  - IP multicast or IGMP snooping
  - PVLAN QoS
  - SPAN (Switch Port Analyzer) when the source is a PVLAN VLAN
  - Tunnels
  - VACLs
  - VTP (VLAN Trunk Protocol)
  - VXLANs
- Shared interfaces cannot be configured to be part of a private VLAN. For more details, see the *Cisco Nexus 9000 Series NX-OS Interfaces Configuration Guide*.
- Configuring multiple isolated VLAN configurations per PVLAN group is allowed by the Cisco NX-OS CLI. However, such a configuration is not supported. A PVLAN group can have at most one isolated VLAN.

## Secondary and Primary VLAN Configuration

Follow these guidelines when configuring secondary or primary VLANs in private VLANs:

- Default VLANs (VLAN1), or any of the internally allocated VLANs, cannot be configured as primary or secondary VLANs.
- VLAN configuration (config-vlan) mode must be used to configure private VLANs.
- Primary VLANs can have multiple isolated and community VLANs associated with it. An isolated or community VLAN can be associated with only one primary VLAN.
- Private VLANs provide host isolation at Layer 2. However, hosts can communicate with each other at Layer 3.
- PVLAN groups can have one isolated VLAN at most. Multiple isolated VLAN configurations per primary VLAN configurations are not supported.
- When a secondary VLAN is associated with the primary VLAN, the STP parameters of the primary VLAN, such as bridge priorities, are propagated to the secondary VLAN. However, STP parameters do not necessarily propagate to other devices. You should manually check the STP configuration to ensure that the spanning tree topologies for the primary, isolated, and community VLANs match exactly so that the VLANs can properly share the same forwarding database.
- For normal trunk ports, note the following:
  - Separate instances of STP exist for each VLAN in the private VLAN.
  - STP parameters for the primary and all secondary VLANs must match.
  - Primary and all associated secondary VLANs should be in the same MST instance.
- For non-trunking ports, STP is aware only of the primary VLAN for any private VLAN host port; STP runs only on the primary VLAN for all private VLAN ports.

Note: We recommend that you enable BPDU Guard on all ports that you configure as a host port; do not enable this feature on promiscuous ports.

- Private VLAN promiscuous trunk ports allow you to configure a maximum of 16 private VLAN primary and secondary VLAN pairs on each promiscuous trunk port.
- For private VLAN isolated trunk ports, note the following:
  - You can configure a maximum of 16 private VLAN primary and secondary VLAN pairs on each isolated trunk port.
  - The native VLAN must be either a normal VLAN or a private VLAN secondary VLAN. You cannot configure a private VLAN primary port as the native VLAN for a private VLAN isolated trunk port.
- Downgrading a system that has private VLAN ports configured requires unconfiguring the ports.
- Before configuring a VLAN as a secondary VLAN, you must shut down the VLAN network interface for the secondary VLAN.

## Private VLAN Port Configuration

Follow these guidelines when configuring private VLAN ports:

- Deleting a VLAN used in the private VLAN configuration causes private VLAN ports (promiscuous ports or host ports, not trunk ports) that are associated with the VLAN to become inactive.
- Layer 2 access ports that are assigned to the VLANs that you configure as primary, isolated, or community VLANs are inactive while the VLAN is part of the private VLAN configuration. Layer 2 trunk interfaces, which may carry private VLANs, are active and remain part of the STP database.
- Use only the private VLAN configuration commands to assign ports to primary, isolated, or community VLANs.

## Limitations with Other Features

Consider these configuration limitations with other features when configuring private VLANs:

Note: In some cases, the configuration is accepted with no error messages, but the commands have no effect.

- After configuring the association between the primary and secondary VLANs and deleting the association, all static MAC addresses that were created on the primary VLANs remain on the primary VLAN only.
- After configuring the association between the primary and secondary VLANs:
  - Static MAC addresses for the secondary VLANs cannot be created.
  - Dynamic MAC addresses that learned the secondary VLANs are aged out.
- Destination SPAN ports cannot be isolated ports. However, a source SPAN port can be an isolated port.
- Ensure consistent PVLAN type, states, and configuration across vPC peers. There is currently no PVLAN consistency check for vPC. Inconsistent PVLAN configs across vPV peers may end up in incorrect forwarding and impacts.
- In private VLANs, STP controls only the primary VLAN.

## Unsupported Features

- Private VLAN host or promiscuous ports cannot be SPAN destination ports.
- Private VLAN ports can be configured as SPAN source ports.
- vPC pairing between T2 and TH platforms is not recommended.

*Note:* See the *Cisco Nexus 9000 Series NX-OS Security Configuration Guide* for information on configuring static MAC addresses.

## Unsupported Features

This section lists features that are not supported for private VLANs in the current release.

- VXLAN
- DHCP
- FEX
- Cisco Nexus 3232C and 3264Q Switches
- Cisco 9200 Nexus Series, 93108TC-EX, and 93180YC-EX Switches
- Cisco Nexus 9408 Line Card and 9300 Series Switches
- Cisco Nexus 9732C-EX Line Card
- Other Unsupported Features

## VXLAN

This section lists VXLAN features that are not supported.

- ACL and QoS for VXLAN traffic in the network-to-access direction are not supported.
- Consistency checkers are not supported for VXLAN tables.
- DHCP snooping and DAI features are not supported on VXLAN VLANs.
- IGMP snooping is not supported on VXLAN VLANs.
- Native VLANs for VXLAN are not supported. All traffic on VXLAN Layer 2 trunks needs to be tagged.
- QoS buffer-boost is not applicable for VXLAN traffic.
- QoS classification is not supported for VXLAN traffic in the network-to-access direction.
- Static MAC pointing to remote VTEP (VXLAN Tunnel End Point) is not supported with BGP EVPN (Ethernet VPN).
- TX SPAN (Switched Port Analyzer) for VXLAN traffic is not supported for the access-to-network direction.
- VXLAN routing and VXLAN Bud Nodes features on the 3164Q platform are not supported.

## VXLAN ACL Limitations

The following ACL related features are not supported:

---

## Unsupported Features

- Ingress RACL that is applied on an uplink Layer 3 interface that matches on the inner or outer payload in the network-to-access direction (decapsulated path).
- Egress RACL that is applied on an uplink Layer 3 interface that matches on the inner or outer payload in the access-to-network direction (encapsulated path).
- Egress VACL for decapsulated VXLAN traffic.

Note: We recommend that you use a PACL or VACL on the access side to filter out traffic entering the overlay network.

## DHCP

DHCP subnet broadcast is not supported. Even though this feature is not supported, the CLI is still present to enable DHCP relay subnet broadcast via the `ip dhcp relay subnet-broadcast` command. If this command is enabled on multiple SVIs, the following issues might result:

- TCAM exhaustion for the redirect region due to the number of entries which are required to be programmed.
- After reload of the box or even shut/no-shut of interfaces (which are carrying the VLANs with relay configured), it might result in a situation where the TCAM is incorrectly or incompletely programmed for the redirect region.

## FEX

- VTEP connected to FEX host interface ports is not supported.
- ASCII replay with FEX needs be done twice for HIF configurations to be applied. The second time should be done after the FEXs have come up.
- Cisco Nexus 9300 Series switches do not support FEX on uplink modules (ALE).
- FEX is supported only on the Cisco Nexus 9332PQ, 9372PX, 9372PX-E, 9396PX, and 9500 platform switches (FEX is not supported on the N9K-X9732C-EX line card, 93180YC-EX and 93108TC-EX switches, and Cisco Nexus 9200 platforms).
- FEX vPC is not supported between any model of FEX and the Nexus 9300 (TOR) and 9500 Switches (EOR) as the parent switches.
- IPSG (IP Source Guard) is not supported on FEX ports.

## Cisco Nexus 3232C and 3264Q Switches

The following features are not supported for the Cisco Nexus 3232C and 3264Q switches:

- 3264Q and 3232C platforms do not support the PXE boot of the NXOS image from the loader.
- Automatic negotiation support for 25G and 50G ports on the Cisco Nexus 3232C switch
- Cisco Nexus 2000 Series Fabric Extenders (FEX)
- Cisco NX-OS to ACI conversion (The Cisco Nexus 3232C and 3264Q switches operate only in Cisco NX-OS mode.)
- DCBXP

## Unsupported Features

- Designated router delay
- DHCP subnet broadcast is not supported
- Due to a Poodle vulnerability, SSLv3 is no longer supported
- FCoE NPV
- Intelligent Traffic Director (ITD)
- ISSU
- Policy-based routing (PBR)
- Port loopback tests
- Resilient hashing
- SPAN on CPU as destination
- Virtual port channel (vPC) peering between Cisco Nexus 3232C or 3264Q switches and Cisco Nexus 9300 Series switches or between Cisco Nexus 3232C or 3264Q switches and Cisco Nexus 3100 Series switches
- VXLAN

## Cisco 9200 Nexus Series, 93108TC-EX, and 93180YC-EX Switches

The following features are not supported for the Cisco Nexus 9200 Series switches and the Cisco Nexus 93108TC-EX and 93180YC-EX switches:

- Segment routing, static MPLS, and MPLS stripping (supported for Cisco Nexus 9200 Series switches but not for Cisco Nexus 93108TC-EX and 93180YC-EX switches)
- 64-bit ALPM routing mode
- 9272PQ and 92160YC platforms do not support the PXE boot of the NXOS image from the loader.
- ACL filters to span subinterface traffic on the parent interface
- Cisco Nexus 2000 Series Fabric Extenders
- DCBXP for LLDP
- Egress port ACLs
- Egress QoS policer or marking
- FCoE NPV
- FEX
- GRE v4 payload over v6 tunnels
- Intelligent Traffic Director
- IP length-based matches
- IPinIP on 92160

## Unsupported Features

- ISSU
- Layer 2 Q-in-Q (Layer 2 Q-in-Q is supported on Cisco Nexus 93108TC-EX and 93180YC-EX switches. Note: Not supported on Cisco Nexus 9200 Series switches.)
- Micro-burst detection
- MTU (Multi Transmission Unit) checks for packets received with an MPLS header
- OpenFlow, due to a hardware limitation
- Packet-based statistics for traffic storm control (only byte-based statistics are supported)
- Policy-based routing
- PV routing for VXLAN
- PVLANS
- Q-in-VNI and Q-in-Q for VXLAN are not supported on Cisco Nexus 9200 Series switches, Cisco Nexus 93108TC-EX switches, and Cisco Nexus 93180YC-EX switches.
- Resilient hashing for ECMP
- Resilient hashing for port-channel
- Rx SPAN for multicast if the SPAN source and destination are on the same slice and no forwarding interface is on the slice
- sFlow
- Traffic storm control for copy-to-CPU packets
- Traffic storm control with unknown multicast traffic
- Tx SPAN for multicast, unknown multicast, and broadcast traffic
- VACL redirects for TAP aggregation

## Cisco Nexus 9408 Line Card and 9300 Series Switches

The following features are not supported for the Cisco Nexus N9K-X9408PC-CFP2 line card and Cisco Nexus 9300 Series switches **with generic expansion modules (N9K-M4PC-CFP2)**:

- Breakout ports
- Port-channel (No LACP)
- vPC
- MCT (Multichassis EtherChannel Trunk)
- FEX (this applies to the 9408 and -EX switches, not all 9300 switches)
- PTP (Precision Time Protocol)
- PFC/LLFC

## Related Documentation

- 802.3x
- PVLAN
- Storm Control
- VXLAN access port.
- SPAN destination/ERSPAN destination IP
- Shaping support on 100g port is limited
- Only support 40G flows

## Cisco Nexus 9732C-EX Line Card

The following features are not supported for Cisco Nexus 9508 switches with an N9K-X9732C-EX line card:

- FEX
- TAP aggregation
- SPAN port-channel destinations
- Marker packet support for ERSPAN Type 3

## Other Unsupported Features

The following lists other features not supported in the current release:

- Cisco Nexus 9300 Series switches do not support the 64-bit ALPM routing mode.
- Due to a Poodle vulnerability, SSLv3 is no longer supported.
- IPSG is not supported on the following:
  - The last six 40G physical ports on the 9372PX, 9372TX, and 9332PQ switches
  - All 40G physical ports on the 9396PX, 9396TX, and 93128TX switches

## Related Documentation

The entire Cisco Nexus 9000 Series NX-OS documentation set is available at the following URL:

<http://www.cisco.com/c/en/us/support/switches/nexus-9000-series-switches/tsd-products-support-series-home.html>

The Cisco Nexus 3164Q Switch - Read Me First is available at the following URL:

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus3164/sw/6x/readme/b\\_Cisco\\_Nexus\\_3164Q\\_Switch\\_Read\\_Me\\_First.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus3164/sw/6x/readme/b_Cisco_Nexus_3164Q_Switch_Read_Me_First.html)

The Cisco Nexus 31128PQ Switch - Read Me First is available at the following URL:

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus31128/sw/readme/b\\_Cisco\\_Nexus\\_31128PQ\\_Switch\\_Read\\_Me\\_First.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus31128/sw/readme/b_Cisco_Nexus_31128PQ_Switch_Read_Me_First.html)

The Cisco Nexus 3232C/3264Q Switch - Read Me First is available at the following URL:

[http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus3232and3264/sw/7x/readme/b\\_Cisco\\_Nexus\\_3232\\_C\\_and\\_3264Q\\_Switch\\_Read\\_Me\\_First.html](http://www.cisco.com/c/en/us/td/docs/switches/datacenter/nexus3232and3264/sw/7x/readme/b_Cisco_Nexus_3232_C_and_3264Q_Switch_Read_Me_First.html)

## New Documentation

The new Hardware Installation Guides are available:

- *Cisco Nexus 93108TC-EX NX-OS-Mode Switch Hardware Installation Guide*
- *Cisco Nexus 93180YC-EX NX-OS-Mode Switch Hardware Installation Guide*
- *Cisco Nexus 9000 Series NX-OS IP Fabric for Media Release Notes, Release 7.0(3)I4(4)*
- *Cisco Nexus 9000 Series NX-OS IP Fabric for Media Solution Guide*
- *Cisco IP Fabric for Media Solution video*

## Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to [nexus9k-docfeedback@cisco.com](mailto:nexus9k-docfeedback@cisco.com). We appreciate your feedback.

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For information on obtaining documentation and gathering additional information, see the monthly **What's New in Cisco Product Documentation**, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

Open a service request online at:

<https://tools.cisco.com/ServiceRequestTool/create/launch.do>

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This product includes cryptographic software written by Eric Young ([eay@cryptsoft.com](mailto:eay@cryptsoft.com)). This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (<http://www.openssl.org/>). This product includes software written by Tim Hudson ([tjh@cryptsoft.com](mailto:tjh@cryptsoft.com)).

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Cisco Nexus 9000 Series NX-OS Release Notes, Release 7.0(3)I4(4)

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