

Cisco Nexus 9000 Series NX-OS Verified Scalability Guide, Release 10.4(1)F

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Preface

Audience

This publication is for network administrators who configure and maintain Cisco Nexus devices.

Document Conventions

Note As part of our constant endeavor to remodel our documents to meet our customers' requirements, we have modified the manner in which we document configuration tasks. As a result of this, you may find a deviation in the style used to describe these tasks, with the newly included sections of the document following the new format.

Command descriptions use the following conventions:

Convention	Description
bold	Bold text indicates the commands and keywords that you enter literally as shown.
Italic	Italic text indicates arguments for which the user supplies the values.
[x]	Square brackets enclose an optional element (keyword or argument).
[x | y]	Square brackets enclosing keywords or arguments separated by a vertical bar indicate an optional choice.
{x | y}	Braces enclosing keywords or arguments separated by a vertical bar indicate a required choice.
[x {y | z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
`variable`	Indicates a variable for which you supply values, in context where italics cannot be used.

Convention	Description
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Examples use the following conventions:

Convention	Description
`screen font`	Terminal sessions and information the switch displays are in screen font.
`boldface screen font`	Information you must enter is in boldface screen font.
italic screen font	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to: .

We appreciate your feedback.

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Introduction

This document describes the Cisco NX-OS configuration limits for Cisco Nexus 9000 Series switches.

The values provided in this guide should not be interpreted as theoretical system limits for Cisco NX-OS hardware or Cisco NX-OS software. These limits refer to values that have been validated by Cisco. They can increase over time as more testing and validation is done.

Verified Scalability Limits - Unidimensional

The tables in this section list the verified scalability limits for the Cisco Nexus 9000 Series switches for Cisco NX-OS Release 10.4(1)F.

These limits are validated with a unidimensional configuration. The values are provided in these tables focus on the scalability of one particular feature at a time.

Each number is the absolute maximum that is currently supported by this Cisco NX-OS release for the corresponding feature. If the hardware is capable of a higher scale, future software releases could increase this verified maximum limit. Results might differ from the values that are listed in this guide when you try to achieve maximum scalability with multiple features enabled.

Note

1. If only one number is provided, the verified limit applies to all supported platforms and line cards.
2. Verified limits are provided only for supported platforms.
3. If a feature is not supported for a particular platform, the verified limit is not provided.

Note You can deploy up to 500 commands under config-profile.

Table 1: Cisco Nexus 2000 Series Fabric Extenders (FEX) Straight Through Mode Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
Fabric Extenders[1] and Fabric Extender server interfaces	Nexus 9300-FX/FX2/FX3[2]/GX switches	16 and 768
VLANs across all Fabric Extenders	Nexus 9300-FX/FX2/FX3[2]/GX switches	562
VLANs per Fabric Extender server interface[3]	Nexus 9300-FX/FX2/FX3[2]/GX switches	75
Port channels	Nexus 9300-FX/FX2/FX3[2]/GX switches + FEX	511

[1] When FEX configured using "AA" mode, then the maximum number of 6 FEX on the NFE base ToR and 16 FEX for the LSE base ToR are supported.

[2] FEX is not supported on Nexus 9348GC-FX3, and 9348GC-FX3PH switches.
[3] For FEX HIF port channels, Cisco recommends that you enable STP port type edge using the **spanning tree port type edge [trunk]** command.

Table 2: ePBR Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
Maximum services per switch	Nexus 9300 and 9500 switches	150[4]
Endpoints per service	Nexus 9300 and 9500 switches	64
ePBR policies per switch	Nexus 9300 and 9500 switches	150
Policies per VRF	Nexus 9300 and 9500 switches	16
Services per chain	Nexus 9300 and 9500 switches	6
Match per policy	Nexus 9300 and 9500 switches	16
Aces per match	Nexus 9300 and 9500 switches	256

[4] Only 62 unique ACLs can be configured per slice of ASIC. Each ACL takes one label. If the same ACL is configured on multiple interfaces, the same label is shared. If each ACL has unique entries, the ACL labels are not shared, and the label limit is 62. In order to achieve 150 services per switch with the limitation of 62 ACLs per slice, the ingress interfaces should be spread across multiple slices of ASIC.

Note

1. For a list of platforms on which ePBR is supported, see the Nexus Switch Platform Support Matrix.
2. For the ACL limitations, see the Cisco Nexus 9000 Series NX-OS Security Configuration Guide.

Table 3: FC and FCoE Switch Level Configuration Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
FLOGI per port	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	256
FLOGI per switch	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	1000
Port channels	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	8[5]
Maximum number of member ports in a port channel	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	16
NPV switches per NPIV core switch	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	8[6]

Feature	Supported Platforms	Verified Limits
Maximum number of FC ports supported	Nexus 93180YC-FX switches	48
	Nexus 93360YC-FX2 switches	96
	Nexus 9336C-FX2-E switches	112
VFCs	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	512[7]
VSANs	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	32

[5] The number of SAN port channels and virtual FC port channels, together, can be only 8 on the Cisco Nexus 9000 Series switch.
[6] Tested with FC NPV.
[7] This is applicable only for the NPV mode.

Table 4: FC and FCoE Fabric Level Configuration Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
Zones	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	8000
Zone members	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	16,000
Zone sets	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	32
Zone database size	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	2 MB
FCNS entries in the fabric	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	10,000
Device Alias	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	8000
Switch hops from server to storage	Nexus 93180YC-FX, 93360YC-FX2, and 9336C-FX2-E switches	7

Table 5: Intelligent Traffic Director Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
Nodes per device group	Nexus 9300-FX switches	64
	Nexus X96136YC-R, X9636Q-R, X9636C-R, and X9636C-RX line cards	16
ITD services per switch	Nexus 9300-FX switches	150 [8]

Feature	Supported Platforms	Verified Limits
Buckets per ITD service	Nexus 9300-FX/FX2/FX3/GX/GX2 switches	256
	Nexus X96136YC-R, X9636Q-R, X9636C-R, and X9636C-RX line cards	64

[8] Only 62 unique ACLs can be configured per slice of ASIC. Each ACL takes one label. If the same ACL is configured on multiple interfaces, the same label is shared. If each ACL has unique entries, the ACL labels are not shared, and the label limit is 62. In order to achieve 150 ITD services per switch with the limitation of 62 ACLs per slice, the ingress interfaces should be spread across multiple slices of ASIC.

Note

1. For a list of platforms on which ITD is supported, see the *Cisco Nexus 9000 Series NX-OS Intelligent Traffic Director Configuration Guide*.
2. For the ACL limitations, see the *Cisco Nexus 9000 Series NX-OS Security Configuration Guide*.

Table 6: Interfaces Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
DHCP clients per switch	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	10 (IPv4) + 10 (IPv6)
	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	
Flex link	Nexus 9300-FX/FX2, and 9364C switches	12 pairs One pair consists of one each of active and backup interface. The active and backup interface can be either a physical port or port channel.
IP DHCP relay addresses (helper addresses) per interface	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 and Nexus 9808 switches	32 (IPv4) + 32 (IPv6)
	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	
Generic routing encapsulation (GRE) tunnels	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and 9804 switches	16
	Nexus X9716D-GX, Nexus 9700-EX/FX, Nexus X9836DM-A and X98900CD-A line cards	
LACP rate fast support during system switchover	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	606 ports in total on Nexus 9516 with 16 line cards

Feature	Supported Platforms	Verified Limits
Port channel links	Nexus 9300-FX/FX2/FX3[9]/GX2/H2R, Nexus 9408, 9804 switches and Nexus 9600-R, 9600-RX, 9700-EX, Nexus X9836DM-A and X98900CD-A line cards	32
SVIs	Nexus 9300-FX/FX2/GX/GX2 switches and Nexus 9408 switches	1000 (with HSRP) 1000 HSRP groups
	Nexus 9300-FX3 switches	510
	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	1000 (with HSRP), 1500 (without HSRP)
	Nexus 9600-R and 9600-RX line cards	3967
	Nexus X9636C-R, X9636Q-R, X9636C-RX and X96136YC-R line cards	350 (with HSRP), 3967 (without HSRP)
Selective Q-in-Q with Multiprovider tag	Nexus 9300-FX/FX2/FX3/H2R switches	Per port: 4000 mappings, 10 provider VLANs; System wide: 48,000 mappings, 512 Provider VLANs
SVI Unnumbered	Nexus 9300-FX/FX2/FX3/GX/GX2 switches	Primary (50); Secondary (450), 1 primary SVI can have a maximum of 50 secondary SVIs
	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	
vPCs	Nexus 9300-FX/FX3[9] switches	80
	Nexus 9300-FX2 switches	98
	Nexus 9300-GX2, Nexus 9408 switches	128
	Nexus 9300-GX switches	60 (for flat Layer 2 Network)
		56 (for L2/L3 Network)
	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	300
	Nexus 9600-R/RX line cards	255
	Nexus X9636C-R, X9636Q-R, X9636C-RX and X96136YC-R line cards	110
Static Network Address Translation (NAT)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	Non-Atomic mode: 1023 Atomic mode: 60% of Non-Atomic scale number is supported.

Feature	Supported Platforms	Verified Limits
Dynamic Network Address Translation (NAT)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	Non-Atomic mode: 1023 Atomic mode: 60% of Non-Atomic scale number is supported.
Static twice Network Address Translation (NAT)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	Non-Atomic mode: 580 Atomic mode: 60% of Non-Atomic scale number is supported.
Dynamic twice Network Address Translation (NAT)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	Non-Atomic mode: 875 Atomic mode: 60% of Non-Atomic scale number is supported.
Sub-interfaces	Nexus 9808/9804 switches and Nexus X9836DM-A and X98900CD-A line cards	2000
	Nexus 9300-FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	3900 **Note** It is recommended to configure 60% of the mentioned limits with higher route scale deployments.
	Nexus 9300-FX and 9300C switches	1900 **Note** It is recommended to configure 60% of the mentioned limits with higher route scale deployments.
Port VLAN translations under an interface	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	100
	Nexus 9300-FX/FX2/FX3[9]/GX/GX2/H2R and Nexus 9408 switches	3967
Port VLAN translations in a switch	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	2000
	Nexus 9300-FX/FX2/FX3[9]/GX/GX2/H2R and Nexus 9408 switches	24,000

[9] Nexus 9348GC-FX3PH switch has feature limitations due to Half Duplex only ports, see Cisco Nexus 9000 Series NX-OS Interfaces Configuration Guide, Release 10.4(x).

Note You must have TCAM space carved at 2048 for NAT to achieve this scale.

Table 7: Label Switching Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
Forwarding Equivalence Classes (FECs) (Node/Prefix/Adj/Binding SID)	Nexus 9300-FX/FX2/FX3[10]/GX/GX2 switches and Nexus 9700-EX/FX/GX line cards	MPLS Heavy Template: 4096 Default Template: 1024
	Nexus 9332D-H2R switches	Default Template: 1024
	Nexus 9600-R and 9600-RX line cards	1000
Equal-cost multipaths (ECMPs)	Nexus 9300-FX/FX2/FX3[10]/GX/GX2/H2R switches, and Nexus 9700-EX/FX/GX line cards	32
	Nexus 9600-R and 9600-RX line cards	8 - way
Equal-cost multipaths Groups (ECMPs)	Nexus 9300-FX2/FX3[10], and 9364C switches	MPLS Heavy Template: 7,166 (with 4-way ECMP) and 4096 (with 8-way ECMP) Default: 1024 **Note** After the ECMP objects are exhausted, there is a fallback to the adjacency for all further routes.
	Nexus 9300-FX/GX/GX2 switches	MPLS Heavy Template and Default Routing Mode: 7166 (with a 4-way ECMP) and 4096 (with 8-way ECMP) **Note** After the ECMP objects are exhausted, there is a fallback to the adjacency for all further routes.
	Nexus 9332D-H2R switches	4096 (with 8-way ECMP)
	Nexus 9600-RX line cards	24,000 ECMP Groups 2 paths per ECMP **Note** Supported only on Cisco NX-OS Release 9.2(4).
FECs * ECMPs	Nexus 9600-R and 9600-RX line cards	8000
Flex counters for segment-routing in ingress direction	Nexus 9300-FX/FX2/FX3[10]/GX/GX2/H2R and 9300C switches and Nexus 9700-EX/FX/GX line cards	Total ingress label stats: 4000; VRF ingress label stats: 1000; (MPLS Heavy Template)
Flex counters for segment-routing in Egress direction	Nexus 9300-FX/FX2/FX3[10]/GX/GX2/H2R and 9300C switches and Nexus 9700-EX/FX/GX line cards	Total ingress label stats: 48,000 (MPLS Heavy Template)

Feature	Supported Platforms	Verified Limits
Egress Peer Engineering	Nexus 9300-FX/FX2/FX3[10]/GX/GX2/H2R and 9300C switches and Nexus 9700-EX/FX/GX line cards	64
IAS option B labels	Nexus 9600-R and 9600-RX line cards	450,000
Label-switched paths (LSPs) for label stack imposition[11]	Nexus 9300-FX/FX2/FX3[10]/GX/GX2/H2R switches and Nexus 9700-EX/FX/GX line cards	256 (with 32 - way ECMP and 5 label stack push)
Layer 3 VPN routes	Nexus 9600-R and 9600-RX line cards	450,000
	Nexus 9332D-H2R switches	400,000 (IPv4 routes) 90,000 (IPv6 routes)
Layer 3 EVPN Labels	Nexus 9300-FX/FX2/FX3[10]/GX/GX2/H2R switches and Nexus 9700-EX/FX/GX line cards	1000 (With MPLS Heavy Template)
LDP session	Nexus 9600-R and 9600-RX line cards[12]	200
Node Sid/Prefix SID	Nexus 9300-FX/FX2/FX3[10]/GX/GX2/H2R switches and Nexus 9700-EX/FX/GX line cards	4000
Adjacency SID	Nexus 9300-FX/FX2/FX3[10]/GX/GX2/H2R switches and Nexus 9700-EX/FX/GX line cards	112
Binding SID	Nexus 9300-FX/FX2/FX3[10]/GX/GX2/H2R switches and Nexus 9700-EX/FX/GX line cards	1000
SRTE Policy		
SRTE policy with PBR	Nexus 9300-FX/FX2/FX3[10]/GX/GX2 and 9364C switches	512 per slice with 4 way ECMP/1024 per slice with 2 way ECMP
	Nexus 9332D-H2R switches	512
Number of route-maps with SRTE policy (IPv4/IPv6)	Nexus 9300-FX/FX2/FX3[10]/GX/GX2/H2R and 9364C switches	256 (IPv4) + 256 (IPv6) per slice with 4 way ECMP

[10] Nexus 9348GC-FX3PH switch has feature limitations due to Half Duplex only ports, see Cisco Nexus 9000 Series NX-OS Label Switching Configuration Guide Release 10.4(x).

[11] For Cisco Nexus 9300 and 9500 Series switches, LSPs *ECMP* label stack push cannot exceed 1500.

[12] Nexus X9636C-RX, X9636C-R, X9636Q-R, and 96136YC-R

Note For network scalability, Cisco recommends using a hierarchical routing design with multi-hop BGP for advertising the attached prefixes from a top-of-rack (ToR) or border leaf switch.

Table 8: Private VLANs (PVLANs) Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
Primary VLANs **Note** The 400 PVLAN-mapping scale per PVLAN port is only applicable when port is configured as promiscuous trunk port.	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	16
	Nexus 9300-FX/FX2/FX3/GX/H2R switches	400
Secondary VLANs **Note** The 400 PVLAN-mapping scale per PVLAN port is only applicable when port is configured as promiscuous trunk port.	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	20
	Nexus 9300-FX/FX2/FX3/GX/H2R switches	400
Ports in Community host mode	Nexus 9300-FX/FX2/FX3/GX/H2R switches	40
	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	
Ports in isolated host mode	Nexus 9300-FX/FX2/FX3/GX/H2R switches	40
	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	
Ports in isolated trunk host mode	Nexus 9300-FX/FX2/FX3/GX/H2R switches	40
	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	
Ports in promiscuous mode	Nexus 9300-FX switches	10
	Nexus 9300-FX2/FX3/GX/H2R switches, Nexus X9716D-GX and Nexus 9700-EX/FX line cards	5
Ports in promiscuous trunk mode	Nexus 9300-FX switches	10
	Nexus 9300-FX2/FX3/GX/H2R switches, Nexus -X9716D-GX, and Nexus 9700-EX/FX line cards	5

Feature	Supported Platforms	Verified Limits
PVLANs allowed on a PVLAN port **Note** The 400 PVLAN-mapping scale per PVLAN port is only applicable when port is configured as promiscuous trunk port.	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	16
	Nexus 9300-FX/FX2/FX3/GX/H2R switches	400

Table 9: Layer 2 Switching Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
MAC addresses	Nexus 9300-FX/FX2/FX3[13]/GX/GX2/H2R and Nexus 9408 switches	92,000 (default system routing mode)
	Nexus 9300-GX/GX2/H2R/H1 and Nexus 9408 switches	200,000 (system routing mode L2-heavy) [14]
	Nexus 9364C switches	90,000 (default system routing mode without system routing layer 3 scale) 32,000 (default system routing mode with system routing layer 3 scale)
	Nexus X9716D-GX and Nexus 9700-EX/FX line cards	92,000
	Nexus 9600-R and 9600-RX line cards	192,000
MST instances	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, 9408 switches and Nexus 9600-R, 9600-RX, Nexus X9716D-GX, and 9700-EX/FX line cards	64
MST PV count with single instances 0	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, 9408 switches	190,000
MST virtual ports with more than 1 MST instance	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, 9408 switches	48,000
	Nexus X9716D-GX and 9700-EX/FX line cards	85,000
	Nexus 9600-R and 9600-RX line cards	236,000
RPVST virtual ports (physical ports * VLANs)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, 9408 switches	48,000
	Nexus X9716D-GX and 9700-EX/FX line cards	65,000
	Nexus 9600-R and 9600-RX line cards	13,750

Feature	Supported Platforms	Verified Limits
RPVST logical ports (logical ports * VLANs)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, 9408 switches	22,000
	Nexus X9716D-GX and 9700-EX/FX line cards	45,000
	Nexus 9600-R and 9600-RX line cards	13,750
VLANs in MST mode	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, 9408 switches and Nexus X9716D-GX, 9600-R/RX, and 9700-EX/FX line cards	3967 (the remaining 127 VLANs are reserved)
	Nexus 92348GC-X switches	3967
VLANs in RPVST mode	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	3967
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	3967[15]
	Nexus 9600-R and 9600-RX line cards	250
Total number of VLANs × ports with switch port isolated (3967 VLANs x 48 ports)	Nexus 9300-FX/FX2/FX3[13]/GX/GX2/H2R, 9408 switches, and Nexus 9700-EX/FX, and Nexus X9716D-GX line cards	190,000
Total number of VLANs × ports with switch port isolated (3967 VLANs x 144 ports)	Nexus X9636C-R, X9636Q-R, X9636C-RX, and X96136YC-R line cards	571,248

[13] Nexus 9348GC-FX3PH switch has feature limitations due to Half Duplex only ports, see Cisco Nexus 9000 Series NX-OS Layer 2 Switching Configuration Guide, Release 10.4(x).

[14] Layer 2 unidimensional scale only. SVI, Layer 3 interface, and VXLAN VLANs are not supported. 200K MAC is enabled only when " system routing template-l2-heavy" is configured and the system is reloaded.

[15] On EOR, support is for 12,000 PV count with 3967 vlans and RPVST with default timers. If 22,000 PV count is needed with 3968 vlans and RPVST, recommended hello timer value is 4 or higher. It is also recommended to tune forward delay and max age accordingly.

[16] Nexus 9348GC-FX3PH switch has feature limitations due to Half Duplex only ports, see Cisco Nexus 9000 Series NX-OS Layer 2 Switching Configuration Guide, Release 10.4(x).

Note

- For more information on STP scale considerations, see Spanning Tree Protocol scale considerations, on page 59.
- The number of supported VLANs per vPC should be within the MST or RPVST virtual port count that is specified in this table, depending on the topology.
- The number of supported STP VLAN port instances, for Fabric Extender host interface ports, should be less than 13000.
- The ports with switch port isolated are only supported on Layer 2 ports. However, on Layer 2 the following port types are not supported:
  - FEX host interfaces
  - FEX host interface port channels
  - PVLAN ports

Table 10: Multicast Routing Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
Egress NAT	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches	2000
Ingress NAT	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches	2000
Egress and Ingress NAT	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches	2000

Feature	Supported Platforms	Verified Limits
IPv4 multicast routes **Note** The limits are for a combination of IPv4 and IPv6 multicast routes. Layer 2 multicast entries are a part of the total 120K limits. For example, 110K IPv4 + 2K IPv6 multicast routes + 8K Layer 2 multicast entries.	Nexus 9348GC-FXP switches	8192 (Layer 2 + Layer 3)
	Nexus 9700-EX line cards	8192 (Layer 2 + Layer 3); 32,768 (layer 2 + Layer 3 with system routing template - multicast -heavy mode); 8192 (with system routing template - lpm - heavy mode)
	Nexus 9332C and 9364C switches	16,384 (Layer 2 + Layer 3) with the default template and the system routing layer 3 scale configuration.
	Nexus 9300-FX2 switches	8192 (Layer 2 + Layer 3); 32,768 (Layer 2 + Layer 3 with system routing template -multicast -heavy mode); 131,072 (with system routing template -multicast - ext - heavy mode)
	Nexus 9700-FX line cards	8192 (Layer 2 + Layer 3); 32,768 (layer 2 + Layer 3 with system routing template - multicast -heavy mode); 131,072 (with system routing template - multicast - ext - heavy mode) [17]
	Nexus 9408 switches	8192 (Layer 2 + Layer 3); 32,768 (layer 2 + Layer 3 with system routing template - multicast -heavy mode); 131,072 (with system routing template - multicast - ext - heavy mode) [18]
	Nexus 9300-FX/FX3/GX/GX2/H2R	32,768 (layer 2 + Layer 3 with system routing template - default, multicast -heavy mode); 131,072 (with system routing template - multicast - ext - heavy mode)
	Nexus 9600-R and 9600-line cards	32,768 (Layer 3)
	Nexus X9716D-GX line card	131,072 (65,536 *,G + 65,536 S,G)
	Nexus 9808 switches	32,768 (Layer 3)

Feature	Supported Platforms	Verified Limits
IPv6 multicast routes	Nexus 9300-FX, and 9500 switches	8192 (Layer 3 with system routing template - default, multicast - heavy, multicast - ext - heavy and multicast - heavy, multicast - ext - heavy, dual - stack - multicast)
	Nexus 9300-FX2 and 9364C switches	8192 (Layer 3 with system routing template - multicast - heavy mode)
	Nexus 9300-FX3 switches and Nexus X9716D-GX line card	8192 (4096 - *, G + 4096 - S,G)
	Nexus 9332C and 9364C switches	8192 (Layer 2 + Layer 3 with system routing template - multicast -heavy mode)
	Nexus 9348GC-FXP switches	8192 (layer 2 + Layer 3 with system routing template - multicast - heavy - multicast - ext - heavy mode)
	Nexus 9300-GX/GX2/H2R, Nexus 9408 switches	8192
MLD snooping groups	Nexus 9300-FX/FX2/FX3/GX/GX2 switches,and Nexus X9716D-GX and Nexus 9700-EX/FX line cards	8192
Multicast FPV	Nexus 9300-FX2 switches	8000 (with system routing template - default), 32,000 (with system routing template - multicast -heavy - multicast - ext - heavy mode)
	Nexus 9300-FX/FX3/GX/GX2/H2R, and Nexus 9408 switches	IPv4 32,000 (Layer 2 + Layer 3) multicast routes
Outgoing interfaces (OIFs)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches, Nexus X9716D-GX and Nexus 9700-EX/FX line cards	40 (SVI + physical layer 3) or 256 (physical layer 3)
	Nexus 9600-R and 9600-RX line cards	16 OIFs for 32K mroutes or 287 OIFs for 1000 mroutes
	Nexus 9808 switches	256 (physical layer 3)

Feature	Supported Platforms	Verified Limits
IGMP snooping groups	Nexus 9700-EX line cards	8000
	Nexus 9300-FX2 switches and Nexus 9700-FX line cards	8000 (with system routing template - default), 16000 (with system routing template - multicast - heavy - multicast - ext - heavy mode)
	Nexus 9600-R, 9600-RX, and 9600-R2 line cards	8000
	Nexus 9300-FX/FX3/GX/GX2/H2R switches, Nexus X9716D-GX line card	16,000
PIM neighbors	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches	250
	Nexus 9808 switches	500
	Nexus 9600-R, 9600-RX and 9700-EX/FX line cards	500
MVPN - unidimensional		
Multicast VRFs	Nexus 9600-R and 9600-RX line cards (except the Nexus X96136YC-R line card)	300
Default MDT groups	Nexus 9600-R and 9600-RX line cards (except the Nexus X96136YC-R line card)	300
MVPN Peers (PIM neighbors) per device	Nexus 9600-R and 9600-RX line cards (except the Nexus X96136YC-R line card)	900
Maximum number of PEs per VRF	Nexus 9600-R and 9600-RX line cards (except the Nexus X96136YC-R line card)	200 PEs per VRF with up to 3 VRFs (600 PIM neighbors)
Maximum number of Data MDT groups per VRF on a PE	Nexus 9600-R and 9600-RX line cards (except the Nexus X96136YC-R line card)	1000
Maximum number of Data MDT groups across all VRFs on a PE	Nexus 9600-R and 9600-RX line cards (except the Nexus X96136YC-R line card)	10,000
Maximum number of MDT groups across all VRFs on PE	Nexus 9600-R and 9600-RX line cards (except the Nexus X96136YC-R line card)	10,300 (10,000 Data + 300 default DMT)

Feature	Supported Platforms	Verified Limits
Maximum number of Multicast routes on a PE node	Nexus 9600-R and 9600-RX line cards (except the Nexus X96136YC-R line card)	32,000

[17] All line cards must have the FX type.
[18] All line cards must have the FX type.

Note

- The IPv4 multicast routes and the IPv4/IPv6 host routes share the same hardware table. Limits are provided for both the default line card mode and the max host line card mode.
- High availability (graceful restart and stateful switchover) is not supported when unicast or multicast aggressive timers are configured at any scale.
- The hash table is subject to collisions. Depending on the host route pattern, collisions might occur with an expected hashing efficiency of about 80%.

Table 11: IP Fabric for Media Solution Verified Scalability Limits (Unidimensional)

Description	Verified Limit			
	NBM-Active Mode Only	NBM-Passive Mode Only	Mixed Mode	
			NBM-Active VRF	NBM-Passive VRF
Switches	120	32	32	
Number of flows	32000	32000	32000	
VRFs	16	16	16	
Host Policy - Sender	16000	N/A	16000	N/A
Host Policy - Receiver	16000	N/A	16000	N/A
Host Policy - PIM	2000	N/A	2000	N/A
Flow Policy	32000	N/A	32000	N/A
ASM group-range	20	N/A	20	N/A
NBM Static Receiver				
Per Switch Maximum (receiver leaf where the static OIF will be programmed)	1500	8000	1500	
Per Fabric Maximum	8000	32000	8000	
NBM IGMP Receivers				
Per Switch Maximum	8000	N/A	8000	N/A
Per Fabric Maximum	24000	N/A	24000	N/A

Description	Verified Limit			
	NBM-Active Mode Only	NBM-Passive Mode Only	Mixed Mode	
			NBM-Active VRF	NBM-Passive VRF
NBM NAT Flows				
Egress-NAT (E-NAT)	2000	2000	1000	1000
Ingress-NAT (I-NAT)	2000	2000	1000	1000
Multicast-Unicast NAT (MU-NAT)	2000	2000	1000	1000
Unicast-Multicast NAT (UM-NAT)	2000	2000	1000	1000
Mixed Mode (E-NAT, I-NAT, MU-NAT, UM-NAT together)	2000	2000	1000	1000
RTP Flow Monitoring with ACL				
ACL	128 IPv4 ACL entries or 64 IPv6 ACL entries (total 128 TCAM spaces) **Note** With combined IPv4 and IPv6 ACL entries, the scale limit cannot exceed 128 TCAM spaces.			

Table 12: IP Fabric for Media Solution Policer Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
IPFM		
NBM Flow Policers (Slice/System)	Nexus 9300-FX/FX3 switches	1536/1536
	Nexus 9300-FX2 switches	1536/3072
	Nexus 9300-GX/GX2B switches	1536/6144
	Nexus 9300-GX2A switches	1536/12288
	Nexus X9636C-R line cards	2048/12288
	Nexus X9636Q-R line cards	2048/6144
	Nexus X9636C-RX line cards	2048/8192
	Nexus X9624D-R2 line cards	2048/8192
	Nexus X9836DM-A line cards	700/6300
	Nexus 9332D-H2R switches	1536/6144
	Nexus 9348GC-FX3 switches	1536/1536
	Nexus X98900CD-A line cards	700/4200

Note When storm control is enabled on Nexus 9300-FX3/GX/GX2/H2R Platform Series switches, the maximum supported scale for NBM flow policers is limited to 1534.

For a list of supported platforms, see Cisco Nexus 9000 Series NX-OS IP Fabric for Media Solution Guide.

Note For a list of supported platforms, see Cisco Nexus 9000 Series NX-OS IP Fabric for Media Solution Guide.

Table 13: Programmability Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
gNMI		
VRF - Default	Nexus 9300-FX/FX2/FX3[19]/GX/GX2 switches and Nexus 9700-FX line cards	16 concurrent subscriptions
VRF - Management	Nexus 9300-FX/FX2/FX3[19]/GX/GX2 switches and Nexus 9700-FX line cards	16 concurrent subscriptions
VRF - Default and Management	Nexus 9300-FX/FX2/FX3[19]/GX/GX2 switches and Nexus 9700-FX line cards	32 concurrent subscriptions
Paths	Nexus 9300-FX/FX2/FX3[19]/GX/GX2 switches and Nexus 9700-FX line cards	48 paths in a single subscription
Message size	Nexus 9300-FX/FX2/FX3[19]/GX/GX2 switches and Nexus 9700-FX line cards	Less than 12 MB
Aggregate MO's	Nexus 9300-FX/FX2/FX3[19]/GX/GX2 switches and Nexus 9700-FX line cards	150,000
NX-API See **Guidelines and Limitations** for NX-API limitations.		
Maximum Number of concurrent VSH session	Nexus 9000 switches and line cards	5 concurrent VSH sessions and 5 persistent VSH sessions per worker process.
Number of worker processes in Nginx	Nexus 9000 switches and line cards	4 worker processes
Number of VSH sessions per worker process	Nexus 9000 switches and line cards	A maximum of 5 persistent VSH sessions are supported for each worker process
Maximum response size supported in output	Nexus 9000 switches and line cards	10 MB

Feature	Supported Platforms	Verified Limits
Maximum number of concurrent session supported for chunk mode. See **Configuring the Message Format and Command Type** to know more about chunk mode	Nexus 9000 switches and line cards	2
Maximum size of response supported in chunk mode	Nexus 9000 switches and line cards	After 10.3(1) release, the maximum size supported in chunk mode is the same as the amount of space available in volatile.

[19] gNMI scale is not qualified on Nexus 9348GC-FX3PH, and N9K-C9332D-H2R switches.

Table 14: QoS Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
Class maps per policy map	Nexus 9300-GX/GX2/FX2/FX3[20]/H2R, Nexus 9408, and Nexus 9808/9804 switches	128
AFD	Nexus 9300-GX/GX2/FX2/FX3[20]/H2R, and Nexus 9408 switches	30 profiles
WRED	Nexus 9300-GX/GX2/FX2/FX3[20]/H2R, and Nexus 9408 switches	30 profiles
	Nexus 9808/9804 switches	14 Profiles
Ingress 1R2C	Nexus 9300-GX/GX2/FX2/FX3[20]/H2R, Nexus 9408, and Nexus 9808/9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	1280 per ASIC
Ingress	Nexus 9808/9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	• 6300 Policer / LC – PMN use case • QoS on physical or SI – Limited by 128 unique ACLs / ASIC
Egress 1R2C	Nexus 9300-GX/GX2/FX2/FX3[20]/H2R, and Nexus 9408 switches	256
Ingress 2R3C	Nexus 9300-GX/GX2/FX2/FX3[20]/H2R, and Nexus 9408 switches	766
Total policy maps	Nexus 9300-GX/GX2/FX2/FX3[20]/H2R, Nexus 9408, and Nexus 9808/9804 switches	4000
QoS unique burst profiles	Nexus 9808/9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	4/ASIC
TCAM label	Nexus 9300-FX3[20]	64

[20] Nexus 9348GC-FX3PH switch has feature limitations due to Half Duplex only ports, see Cisco Nexus 9000 Series NX-OS Quality of Service Configuration Guide, Release 10.4(x).

Table 15: Security Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
Egress ACLs	Nexus 9600-R line cards	20,000
System ACLs	Nexus 9600-R line cards	4000 TCAM entries in internal TCAM 64,000 TCAM entries in external TCAM

Feature	Supported Platforms	Verified Limits
ACL	Nexus 9300-FX/FX2/FX3/GX/GX2 switches	IPv4 Ingress - 3584 IPv6 Ingress - 1792
	Nexus 9332D-H2R switches	Total TCAM region size is 14,336 (Default TCAM carving: 10,240 Ingress and 4096 Egress) • 4 slice with 8 interface • 510 Ingress - RACL per slice • 254 Egress - RACL per slice • 30 PACL and Egress PACL per slice **Note** Optionally, you can carve a flexible TCAM region. However, you can carve it as either ingress or egress only, with a maximum size of 13056, as a few TCAM regions occupy the rest of the region size as follows: • ing-sup carving occupies 512 (default size) • egr-sup carving occupies 256 (default size) • Any region that is carved as the first TCAM region, for example, ing-ifacl, occupies a minimum size of 512. However, the ing-sup region cannot be carved as the first TCAM region.
	Nexus 9808/9804 switches	

Feature	Supported Platforms	Verified Limits
		• IPv4 Ingress 14,000 per slice • RACL on physical or sub-interfaces – Limited by 128 unique ACLs / ASIC • 126 Unique labels Ingress IPv4 per ASIC • 126 Unique labels Ingress IPv6 per ASIC • 14 Unique labels for Egress IPv4 per ASIC • 14 Unique labels for Egress IPv6 per ASIC • Ingress ACL Group (QOS + RACL) 252 per ASIC • Egress ACL Group (RACL) 60 per ASIC
RACL Labels (maximum)	Nexus 9504 and 9508 switches	4000
ACL LOU Threshold Support	Nexus 9500-R line cards	24 LOUs per line card
DHCP snooping bindings	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches, Nexus X9716D-GX and Nexus 9700-EX/FX line cards	2048
IPv4 ingress access control entries (ACEs)	Nexus 9600-R and 9600-RX line cards	• RACL on LC Nexus X9636C-RX: 100,000 • PACL on LC Nexus X9636C-RX: 12,000 • RACL-2048, PACL-1024 (without TCAM Carving) IPv4 52,640 ACEs per system • PACL IPv4: 1024 TCAM entries in internal TCAM • PACL MAC: 2048 TCAM entries in internal TCAM • RACL IPv4: 2048 TCAM entries in internal TCAM

Feature	Supported Platforms	Verified Limits
IPv6 ingress access control entries (ACEs)	Nexus 9600-R and 9600-RX line cards	• RACL-1024, PACL-1024 (without TCAM Carving) IPv6 25,200 ACEs per system • PACL IPv6: 1024 TCAM entries in internal TCAM • RACL IPv6: 1024 TCAM entries in internal TCAM
IPv4 ingress TCAM entries	Nexus 9300-FX/FX2/FX3[21] switches, Nexus X9716D-GX and Nexus 9700-EX/FX line cards	3582 (per slice of the forwarding engine)
	Nexus 9300-GX/GX2 switches	4608
IPv4 egress TCAM entries	Nexus 9300-FX/FX2/FX3[21]/GX/GX2 switches, Nexus X9716D-GX and Nexus 9700-EX/FX line cards	1792 (per slice of the forwarding engine)
	Nexus 92348GC-X switches	Ingress - 3072 IPv4, 1792 IPv6
IPv6 ingress TCAM entries	Nexus 9300-FX/FX2/FX3[21]/GX/GX2 switches, Nexus X9716D-GX and Nexus 9700-EX/FX line cards	1792 (per slice of the forwarding engine)
IPv6 egress TCAM entries	Nexus 9300-FX/FX2/FX3[21]/GX/GX2 switches, Nexus X9716D-GX and Nexus 9700-EX/FX line cards	896 (per slice of the forwarding engine)
	Nexus 92348GC-X switches	Ingress - 3072 IPv4, 1792 IPv6
Ingress RACLv4	Nexus 9808 switches	9216
	Nexus 9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	• Physical: 14,000 per slice • Port-Channel: 5000
Ingress QoSv4	Nexus 9808 switches	9216
	Nexus 9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	• Physical: 9000 per slice • Port-Channel: 5000
Ingress SPAN filter v4	Nexus 9808 switches	9216
	Nexus 9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	Physical: 14,000 per slice

Feature	Supported Platforms	Verified Limits
Egress RACLv4	Nexus 9808 switches	9216
	Nexus 9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	• Physical: 9000 per slice • Port-Channel: 5000
Ingress RACLv6	Nexus 9808 switches	4608 [22]
	Nexus 9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	• Physical: 7000 per slice • Port-Channel: 2500
Ingress QoSv6	Nexus 9808 switches	4608 [22]
	Nexus 9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	• Physical: 7000 per slice • Port-Channel: 2500
Ingress SPAN filter v6	Nexus 9808 switches	4608 [22]
	Nexus 9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	Physical: 7000 per slice
Egress RACL v6	Nexus 9808 switches	4608 [22]
	Nexus 9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	• Physical: 4500 per slice • Port-Channel: 2500
Number of unique ACLs each for RACLv4, RACLv6, QoS, ACL SPAN	Nexus 9808/9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	• 127 (per unit) each for ingress and QoS • 15 (per unit) each for egress (IPv4 and IPv6 RACL)
Number of unique ACL combinations	Nexus 9808/9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	• 252 (per unit) for ingress • 60 (per unit) for egress
Key Chain Keys Verified Scalability Limits (Unidimensional)		
Type-6 Keys	Nexus 9000 Series switches	5000

[21] Nexus 9348GC-FX3PH switch has feature limitations due to Half Duplex only ports, see Cisco Nexus 9000 Series NX-OS Security Configuration Guide, Release 10.4(x).

[22] Each IPv6 ACL is limited to 1000 ACEs. This applies to all IPv6 ACLs (RACL, QoS or SPAN filter). No such limitation applies for IPv4 ACL.

Note

- The TCAM entries scalability limits also apply to policy-based TCAM entries (PBACLs).
- Only 62 unique ACLs can be configured. Each ACL takes one label. If the same ACL is configured on multiple interfaces, the same label is shared. If each ACL has unique entries, the ACL labels are not shared, and the label limit is 62.

Table 16: SRv6 Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
ARP	Nexus 9300-GX/GX2, and Nexus 9408 switches	48,000
Host and LPM IPv4 routes	Nexus 9300-GX/GX2, and Nexus 9408 switches	470,000
Host and LPM IPv6 routes	Nexus 9300-GX/GX2, and Nexus 9408 switches	256,000
Leaf	Nexus 9300-GX/GX2, and Nexus 9408 switches	256
SID DB	Nexus 9300-GX/GX2, and Nexus 9408 switches	2000
SRv6 and VXLAN Peer	Nexus 9300-GX/GX2, and Nexus 9408 switches	256
VRF	Nexus 9300-GX/GX2, and Nexus 9408 switches	1000
ND	Nexus 9300-GX/GX2, and Nexus 9408 switches	24,000
SRv6 Traffic Engineering policies	Nexus 9300-GX/GX2, and Nexus 9408 switches	1000
Number of prefixes (IPv4 and IPv6) that use SRv6 Traffic Engineering policies	Nexus 9300-GX/GX2, and Nexus 9408 switches	50,000
Maximum number of preferences per policy	Nexus 9300-GX/GX2, and Nexus 9408 switches	3
Maximum number of segment lists	Nexus 9300-GX/GX2, and Nexus 9408 switches	3000

Table 17: Egress NetFlow Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
Flow monitors	Nexus 9300-FX/FX2/GX/GX2 switches and 9500 with FX LC cards, 9500-GX LC cards	30 IPv4 flow monitor and each flow monitor with two exporters 28 IPv6 flow monitor and each flow monitor with two exporters 32 Layer 2 Flow monitor and each flow monitor with two exporters Maximum number of exporters supported per flow monitor is 2
Maximum number of flows in the software table (IPv4 or CE flows)	Nexus 9000 switches	100,000 flows using the **show flow cache** command on 9500 modular chassis per line card 1,000,000 flows (1 Million) using the **show flow cache** command on 9300 switches

Table 18: System Management Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
PTP		

Feature	Supported Platforms	Verified Limits
PTP ports	Nexus 9300-FX/GX switches	64 per system
	Nexus 93180YC-FX3 and 93180YC-FX3S switches	64 per system
	Nexus 9348GC-FX3 switches	28 per system
	N9K-C93108TC-FX3P switch	Default maximum supported scale in PHY mode: 25 per system Maximum supported scale in PHY mode with reduced packet rate: 35 per system (sync/delay - 4 pps)
	Nexus 9332D-H2R switches	128 per system
	Nexus 9300-FX2/GX2 switches	144 per system
	Nexus 9408 switches	144 per system 32 per LEM
	Nexus 9500 switches with 9700-EX/FX line cards	1305 per chassis The per line card limit is based on the maximum physical ports supported. **Note** PTP Offload is supported on 9700-EX/FX line cards.
	Nexus 9508 switches with -R line cards	64 per line card 300 per chassis **Note** PTP Offload is supported on 9508-R line cards.
	Nexus 9500 switches with 9600-RX line cards	128 per line card 512 per chassis
	Nexus 9508 switches with -R2 line cards	173 per chassis
	Nexus 9808 switches	64 per line card 512 per chassis
PTP clients per port	Nexus 9300-FX/FX2/FX3[23]/GX/GX2, 9408 and 9808 switches and Nexus 9500 switches with 9700-EX/FX, 9508-R and 9600-RX line cards	2
sFlow		

Feature	Supported Platforms	Verified Limits
sFlow ports	Nexus 9300-FX/FX2/GX switches	64
	Nexus 9300-FX3[23] switches	30
	Nexus 9700-EX/FX line cards	256
	Nexus X9716D-GX line card	16
SPAN and ERSPAN		
Configurable SPAN or ERSPAN sessions	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches, Nexus 9600-R, 9600-RX, and Nexus X9716D-GX line cards	32
	Nexus 9808/9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	10
Active SPAN or ERSPAN sessions[24]	Nexus 9300-FX/FX2/FX3/GX/H2R switches, and Nexus 9600-R, 9600-RX, and 9700-EX/FX/GX line cards	4 sessions (per chassis/ToR or based on the number of the line cards in the EoR. **Note** If the source interface configured for a monitor session is on the same line card, the maximum supported active SPAN sessions are 4. Based on the number of line cards in the EoR, the total number of active SPAN sessions are 4 x n, where n is the number of line cards on EoR, provided the source and destination interface are on the same line module. Port-channels count against all linecards when considering 4 x n scale of SPAN sessions when configured as a SPAN source, regardless of port-channel member interfaces.
	Nexus 9808/9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	10
Active localized SPAN or ERSPAN sessions per line card[25]	Nexus 9300-FX/FX2/FX3[23] switches, and Nexus 9700-EX/FX/GX line cards	4
	Nexus 9600-R and 9600-RX line cards	32 sessions across ports on single-line card
Active localized SPAN or ERSPAN session (Rx and Tx, Rx, or Tx)	Nexus 9600-R and 9600-RX line cards	32 sessions, 128 sources, and 1 destination
Source interfaces per SPAN or ERSPAN session (Rx and Tx, Rx, or Tx)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9808/9804 switches, and Nexus 9700-EX, X9716D-GX, X9836DM-A and X98900CD-A line cards	48

Feature	Supported Platforms	Verified Limits
Destination interfaces per SPAN session	Nexus 9300-FX/FX2/FX3[23]/GX/GX2 switches, and Nexus 9600-R, 9600-RX, X9716D-GX, and 9700-EX line cards	1 (physical/PO interface) **Note** Destination as PO interface is not supported for Nexus X9716D-GX line card.
	Nexus 9808/9804 switches, and Nexus X9836DM-A and X98900CD-A line cards	1 Physical only (no PO support).
Source VLANs per SPAN or ERSPAN session	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches, and Nexus 9600-R, 9600-RX, X9716D-GX, and 9700-EX line cards	32
Tap Aggregation		
Redirect interfaces in the redirect port list	Nexus 9300-FX/FX2/FX3/GX/H2R	18
	Nexus 9500 Merchant Silicon platform switches	12
	Nexus X9716D-GX line card	12
Redirect port lists per system	Nexus 9300-FX3/H2R switches	100
	Nexus X9716D-GX line card	12
Deduplication	Nexus 9300-GX/GX2B/FX3	240,000 (maximum supported flows)
	Nexus 9300-FX2/GX2A	120,000 (maximum supported flows)
NetFlow		
Flow monitors	Nexus 9500 switches with 9700-EX and FM-E fabric line cards	2 flow monitors per type (2 IPv4 flow monitors and 2 IPv6 flow monitors). 1 flow monitor for CE flows 2 exporters for each flow monitor. Hence, a total of 4 different exporters can be configured.
	Nexus 9300-FX/FX2/GX/GX2/FX3/H2R switches and 9500 switches with 9700-FX/GX line cards	30 IPv4 flow monitor and each flow monitor with two exporters 28 IPv6 flow monitor and each flow monitor with two exporters 32 Layer2 Flow monitor and each flow monitor with two exporters Maximum number of exporters supported per flow monitor is 2

Feature	Supported Platforms	Verified Limits
Maximum number of flows in the software table (IPv4 or IPv6 or CE flows)	Nexus 9000 switches	100,000 flows using the **show flow cache** command on 9500 modular chassis per line card 1,000,000 flows (1 Million) using the **show flow cache** command on 9300 switches

Maximum number of concurrent flows supported (IPv4 or IPv6 or CE flows)	Nexus 9300-FX/FX2 switches	6000 traffic flows.
		By increasing LCPU-PG-SIZE using the following command one can achieve Max 18000 concurrent flows, after modifying LCPU-PG-SIZE, the switch needs reboot after saving configuration
		`switch(config)# hardware qos lcpu-pg-size ?`
		`<200-10000>  Pool Group size`
		`switch(config)# hard qos lcpu-pg-size 5000`
		`Warning:Reload required for configured PG size to take effect. Save configuration and reload the system.`
		`switch(config)# copy running-config startup-config`
		In Cisco Nexus Release 9.3(3), the **hardware qos** command is not supported.

Netflow ingress VRF-id export support	Nexus 9300-FX/FX2/FX3[23]/GX/GX2, Nexus 9300C and 9408 switches and Nexus 9500 switches with EX/FX/GX line cards	500 different VRFs
Flow visibility in Nexus Dashboard Insights and NetFlow		
Flow monitors	Nexus 9300-FX/FX2/GX/GX2, Nexus 9408 switches and 9500 with FX/GX line cards	28 IPv4 flow monitor and each flow monitor with two exporters 26 IPv6 flow monitor and each flow monitor with two exporters
Maximum number of flows in the software table (IPv4 or IPv6 flows)	Nexus 9000 switches	20,000 flows using the **show flow cache** command

[23] Nexus 9348GC-FX3PH switch has feature limitations due to Half Duplex only ports, see Cisco Nexus 9000 Series NX-OS System Management Configuration Guide, Release 10.4(x).

[24] A single forwarding engine instance supports four SPAN or ERSPAN sessions. For Cisco Nexus 9300 Series switches, if the first three sessions have bidirectional sources, the fourth session has hardware resources only for Rx sources. This limitation might also apply to Cisco Nexus 9500 Series switches, depending on the SPAN or ERSPAN source's forwarding engine instance mappings.

[25] The number of SPAN or ERSPAN sessions per line card reduces to two if the same interface is configured as the bidirectional source in more than one session.

Table 19: NetFlow Scalability Support (Flows) for Cisco Nexus 9500 Family Switches

Feature	Platform	Scale Limitper Slice (Flows)
IP flow monitor	Nexus 9500-EX Line cards	2
IPv6 flow monitor		2
Layer 2 Flow monitor		1
Maximum number of exporters per each flow monitor		2
Flow Scale		24,000 per ASIC slice
IP flow monitor	Nexus 9500-FX Line cards	30
IPv6 flow monitor		28
Layer 2 Flow monitor		1
Maximum number of exporters per each flow monitor		2
Flow Scale		24,000 per ASIC slice

Note NetFlow scale limits are determined based on the interfaces of the line cards where the NetFlow configurations are attached in the modular switches.

Table 20: NetFlow SVI Verified Scalability Limits (Unidimensional)

Platform (VLAN Ports)	SVI			VLAN			SVI + VLAN		
	IPv4	IPv6	IPv4 + IPv6	IPv4	IPv6	IPv4 + IPv6	IPv4	IPv6	IPv4 + IPv6
Member ports from Cisco Nexus 9300-FX switches	Total interfaces supported in the system								
Member ports from Nexus 9300-FX switches (EOR chassis)	474	118	94	474	118	94	237	61	38

Note The scale numbers are based on the TCAM space available on the Cisco Nexus 9300-FX switches. A IPv4 flow monitor uses 4 TCAM space for the Cisco Nexus 9300-FX switches. Similarly, a IPv6 flow monitor uses 2 TCAM space for the Cisco Nexus 9300-FX switches.

For port channels, SVIs, and VLANs that have port from both 9300-EX and 9300-FX switches, the lower common denominator limit of the 9300-EX and 9300-FX switches is applied.

Table 21: Unicast Routing Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
IPv4 ARP and IPv6 ND Scale		
IPv4 ARP (Default routing template)	Nexus 9364C switches	32,000
	Nexus 9600-R, 9600-RX, and 9700-EX/FX line cards	48,000
	Nexus 9300-FX2 switches	48,000 (without URPF) 32,000 (with URPF enabled)
	Nexus 9300-FX/FX3/GX/GX2/H2R switches and Nexus X9716D-GX line card	98,000 (Hash Table: Shared between IPv6 ND, IPv4 ARP)
	Nexus 9408 switches	49,152
	Nexus 9808 switches	4000
IPv6 ND (Default routing template)	Nexus 9364C, 9300-FX2 switches	32,000 (default), 16,000 (lpm heavy)
	Nexus 9300-FX/FX3/GX/GX2/H2R switches	98,000 (in default routing mode, Hash Table: Shared between IPv6 ND, IPv4 ARP)
	Nexus 9408 switches	32,768
	Nexus 9600-R, 9600-RX, and 9700-EX/FX line cards	32,000
	Nexus 9808 switches	4000
IPv4 ARP (Internet peering mode)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches and Nexus 9700-EX/FX/GX line cards	32,000 (Hash Table: Shared between IPv6 ND, IPv4 ARP, and protocol learned IPv6 host) over L3 interface and 16,000 over a SVI/VLAN (as the upper limit of the dynamic learned MAC address in the "internet peering" mode is 16,000
	Nexus 9408 switches	32768

Feature	Supported Platforms	Verified Limits
IPv6 ND (Internet-peering mode)	Nexus 9300-FX2 switches and Nexus 9700-EX/FX line cards	16,000 (Hash Table: Shared between IPv6 ND, IPv4 ARP, and protocol learned IPv6 host)
	Nexus 9300-FX/FX3/GX/GX2/H2R switches and Nexus X9716D-GX line cards	32,000 (Hash Table: Shared between IPv6 ND, IPv4 ARP, and protocol learned IPv6 host) over L3 interface and 16,000 over a SVI/VLAN (as the upper limit of the dynamic learned MAC address in the "internet Peering" mode is 16,000
	Nexus 9408 switches	16384
IPv4 ARP (Dual-host mode)	Nexus 9364C switches	64,000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	98,000
IPv6 ND (Dual-host mode)	Nexus 9364C switches	64,000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	98,000
IPv4 and IPv6 Route Scale		
IPv4 host routes (Default routing template) [26]	Nexus 9364C switches	96,000 (default system routing mode without system routing layer 3 scale) 128,000 (default system routing mode with system routing layer 3 scale)
	Nexus 9300-FX2 switches	524,000 / 471,000 (without / with urpf enabled)
	Nexus 9300-FX/FX3/GX/GX2/H2R switches	1,153,000
	Nexus 9408 switches	734,003
	Nexus 9700-EX and	589,000
	Nexus 9600-R/RX and Nexus X9716D-GX line cards	1,000,000 (default routing template)
	Nexus 9808 switches	256,000

Feature	Supported Platforms	Verified Limits
IPv6 host routes (Default routing template) [27]	Nexus 9364C switches	48,000 (default system routing mode without system routing layer 3 scale) 64,000 (default system routing mode with system routing layer 3 scale)
	Nexus 9300-FX2 switches	265,000
	Nexus 9300-FX/FX3/GX/GX2/H2R switches	628,000
	Nexus 9408 switches	412,876
	Nexus 9700-EX/FX line cards	FM-E: 32,000 FM-E2: 235,000 FM-G: 235,000
	Nexus 9600-RX line cards	256,000
	Nexus X9716D-GX line card	235,000
	Nexus 9808 switches	64,000

Feature	Supported Platforms	Verified Limits
IPv4 LPM routes (Default routing template)	Nexus 9364C switches	Default system routing mode without system routing layer 3 scale: • Default values: 8000 (IPv4), 1900 (IPv6), and 2000 (multicast) • With hardware profile multicast max-limit lpm-entries 0 configured: 10,000 (IPv4), 1900 (IPv6), and 0 (multicast) • With hardware profile ipv6 lpm-entries maximum 0 configured: 14,000 (IPv4), 0 (IPv6), and 2000 (multicast) • With hardware profile ipv6 lpm-entries maximum 4096 and hardware profile multicast max - limit lpm - entries 0 configured: 4000 (IPv4), 4096 (IPv6), and 0 (multicast) • When you allocate the entire table for IPv4 or IPv6 LPM unicast routes, the other address family cannot be used. 128,000 (default system routing mode with system routing layer 3 scale)
	Nexus 9300-FX switches	1,153,000 / 996,000 (without / with urpf enabled)
	Nexus 9300-FX2 switches	524,000 / 471,000 (without / with urpf enabled)
	Nexus 9300-FX3/GX/GX2/H2R switches	1,153,000
	Nexus 9408 switches	734,003
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	589,000
	Nexus 9600-R line cards	192,000
	Nexus 9600-RX line cards	1,000,000
	Nexus 9808 switches	400,000

Feature	Supported Platforms	Verified Limits
IPv6 LPM routes (Default routing template)	Nexus 9364C switches	Default system routing mode without system routing layer 3 scale • Default values: 8000 (IPv4), 1900 (IPv6), and 2000 (multicast) • With hardware profile multicast max-limit lpm-entries 0 configured: 10,000 (IPv4), 1900 (IPv6), and 0 (multicast) • With hardware profile ipv6 lpm-entries maximum 0 configured: 14,000 (IPv4), 0 (IPv6), and 2000 (multicast) • With hardware profile ipv6 lpm-entries maximum 4096 and hardware profile multicast max - limit lpm - entries 0 configured: 4000 (IPv4), 4096 (IPv6), and 0 (multicast) • When you allocate the entire table for IPv4 or IPv6 LPM unicast routes, the other address family cannot be used 64,000 (default system routing mode with system routing layer 3 scale)
	Nexus 9300-FX switches	628,000 / 560,000 (without / with urpf enabled)
	Nexus 9300-FX2 switches	294,000 / 265,000 (without / with urpf enabled)
	Nexus 9300-FX3/GX/GX2/H2R switches	628,000 / 628,000 (without/with urpf enabled)
	Nexus 9408 switches	412,876
	Nexus 9500 switches	20,000 (default system routing mode) 4000 (max-host routing mode) 80,000 with no IPv4 routes (64-bit ALPM routing mode)
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	FM-E: 176,000 (/64 prefix length); 3900 (non /64 prefix length) FM-E2: 235,000 (any prefix length) FM-G: 235,000
	Nexus 9600-R line cards	62,000

Feature	Supported Platforms	Verified Limits
	Nexus 9600-RX line cards	256,000
	Nexus 9808 switches	250,000
IPv4 host routes (LPM heavy mode)	Nexus 9364C switches	262,000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches	786,000 / 734,000 (with out/with urpf enabled)
	Nexus 9408 switches	1,048,576
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	786,000
	Nexus 9808 switches	256,000
IPv6 host routes (LPM heavy mode)	Nexus 9364C switches	131,000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches	442,000 / 412,000 (with out/with urpf enabled)
	Nexus 9408 switches	589,824
	Nexus 9700-EX/FX line cards	FM-E: 32,000 (shared between IPv6 ND and protocol learned host) FM-E2: 235,000 FM-G: 235,000
	Nexus X9716D-GX line card	235,000
	Nexus 9808 switches	64,000
IPv4 LPM routes (LPM heavy mode)	Nexus 9364C switches	262,000
	Nexus 9300-FX/FX3/FX2/GX/GX2/H2R switches	786,000 / 734,000 (with out/with urpf enabled)
	Nexus 9408 switches	1,048,576
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	786,000
	Nexus 9808 switches	900,000

Feature	Supported Platforms	Verified Limits
IPv6 LPM routes (LPM heavy mode)	Nexus 9364C switches	131,000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches	442,000 / 412,000 (with out/with urpf enabled)
	Nexus 9408 switches	589,824
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	FM-E: 235,000 (/64 prefix length); 3900 (non /64 prefix length) FM-E2: 235,000 (any prefix len) FM-G: 235,000
	Nexus 9808 switches	250,000
IPv4 host routes (dual-host mode)	Nexus 9364C switches	163,000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	262,000
	Nexus 9808 switches	256,000
IPv6 host routes (dual-host mode)	Nexus 9364C switches	81,000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	131,000
	Nexus 9808 switches	64,000
IPv4 LPM routes (dual-host mode)	Nexus 9300-FX and 9364C switches	8000
	Nexus 9300-FX2/GX/GX2/H2R, and Nexus 9408 switches	10,000
	Nexus 9300-FX3 switches	7000
IPv6 LPM routes (dual-host mode)	Nexus 9300-FX/FX3, and Nexus 9364C switches	1900
	Nexus 9300-FX2/GX/GX2/H2R, and Nexus 9408 switches	3900
IPv4 host routes (internet-peering mode)	Nexus 9300-FX2 switches and Nexus 9700-EX/FX and 9700-GX line cards	1,000,000
	Nexus 9300-FX switches	1,256,000
	Nexus 9300-FX3/H2R/GX/GX2 switches	2,000,000
	Nexus 9408 switches	1,468,006

Feature	Supported Platforms	Verified Limits
IPv6 host routes (internet-peering mode)	Nexus 9300-FX2 switches and Nexus 9700-FX/GX line cards	500,000
	Nexus 9300-FX/FX3/GX/GX2/H2R switches	628,224
	Nexus 9408 switches	412,876
	Nexus 9700-EX line cards	16,000 (Hash Table: Shared between IPv6 ND and protocol learned IPv6 host)
IPv4 LPM routes (internet-peering mode)	Nexus 9300-FX2 switches	1,000,000
	Nexus 9300-FX switches	1,256,000
	Nexus 9300-FX3/GX/GX2/H2R switches and Nexus 9700 GX line cards	2,000,000 **Note** Nexus 9300-FX3 switches supports 200,000 IPv6 LPM routes along with 1,800,000 IPv4 LPM routes using 16-way ECMP.
	Nexus 9408 switches	1,468,006
	Nexus 9700-EX/FX line cards	1,000,000
IPv6 LPM routes (internet-peering mode)	Nexus 9300-FX2 switches	500,000
	Nexus 9300-FX/FX3/GX/GX2/H2R switches	628,224
	Nexus 9408 switches	412,876
	Nexus 9700-EX line cards	500,000 (Prefix length 48-83) protocol learned 1900 (Prefix length /84-127)
	Nexus 9700-FX/GX line cards	500,000 (Prefix length 48-128) protocol learned
	Nexus 9500 switches with the FM-E2 fabric line cards	176,000 (Prefix length 0–47) protocol learned host
	Nexus 9500 switches with the FM-G fabric line cards	500,000
IPv4 LPM routes (l3-heavy mode)	Nexus 9600-RX line cards	1,800,000
IPv6 LPM routes (l3-heavy mode)	Nexus 9600-RX line cards	750,000
Routes (internet-peering mode)	Nexus 9600-R and 9600-RX line cards	1 Million[28]

Feature	Supported Platforms	Verified Limits
IPv4 routes (internet-peering mode)	Nexus 9600-R and 9600-RX line cards	852,000[29]
IPv6 routes (internet-peering mode)	Nexus 9600-R line cards	175,000[30]
Routes (internet-peering mode)	Nexus 9600-R line cards	852,000
IPv4 routes (internet-peering mode)	Nexus 9600-R line cards	750,000
IPv6 routes (internet-peering mode)	Nexus 9600-R line cards	71,000
Unicast Protocol Scale		
Bidirectional Forwarding Detection (BFD) Scale		

Feature	Supported Platforms	Verified Limits
BFD sessions (echo mode)	Nexus 9364C switches	128 when the BFD intervals are set to default, which is 50 ms 2048 when the BFD intervals are relaxed to 300 ms
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	128 when the BFD intervals are set to default, which is 50 ms 2048 sessions when the BFD intervals are relaxed to 300 ms
	Nexus 9700-EX/FX line cards	128 when the BFD intervals are set to default, which is 50 ms 2048 sessions when the BFD intervals are relaxed to 300 ms **Note** On EoR, per line card session limit will be 256.
	Nexus X9716D-GX line card	512 when the BFD intervals are set to default, which is 50 ms 1024 when the BFD intervals are relaxed to 300 ms **Note** On EoR, per line card session limit will be 256.
	Nexus 9600-R and 9600-RX line cards	288
	Nexus N9K-X9836DM-A line cards	768
	Nexus N9K-X98900CD-A line cards	512
	Nexus 9808 switch (single hop)	128 when the BFD intervals are set to default, which is 50 ms 1000 (IPv4 and IPv6) sessions when the BFD intervals are relaxed to 300 ms **Note** For Nexus 9800 switches, the maximum session limit per L3 port channel and its subinterfaces is 128.
Border Gateway Protocol (BGP) Scale		

Feature	Supported Platforms	Verified Limits
BGP neighbors (IPv4 and IPv6 combined)	Nexus 92348GC-X switches	141
	Nexus 9364C, 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	1024
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	2000
	Nexus 9600-R, 9600-RX and 9600-R2 line cards	1024
	Nexus 9808 switches	1000 (IPv4 and IPv6)
HSRP Scale		
HSRP groups	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	1000 [31]
	Nexus 9700-EX/FX switches and Nexus X9716D-GX line cards	1000 (virtual MAC address support)[32]
	Nexus 9600-R and 9600-RX line cards	16 [33]
EIGRP Scale		
EIGRP routes	Nexus 9364C, 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, and 9808 switches	20,000
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	50,000
EIGRP neighbors	Nexus 9364C, 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, and 9808 switches	256
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	2000
IS-IS Scale		
IS-ISv4 adjacencies (either L1, L2, or sum of L1 and L2 with default timers)	Nexus 9364C, and 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9700-EX/FX and Nexus X9716D-GX line cards	255
IS-ISv4 BFD sessions (with default timers)	Nexus 9364C, 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9700-EX/FX and Nexus X9716D-GX line cards	255

Feature	Supported Platforms	Verified Limits
IS-ISv4 routes	Nexus 9364C, 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, and Nexus 9700-EX/FX and Nexus X9716D-GX line cards	10,000
Groups with default timers (3s/10s) and multiple group optimizations. [There are 2 primary, one for IPv4 and the other for IPv6, and 7926 secondary]	Nexus X9636C-R/RX and X9636Q-R line cards	7928
Groups with aggressive timers (1s/3s) and multiple groups optimization. [There are 2 primary, one for IPv4 and the other for IPv6, and 7926 secondary][34]	Nexus X9636C-R/RX and X9636Q-R line cards	7928
Groups per interface or I/ module	Nexus X9636C-R/RX and X9636Q-R line cards	Maximum 16 (Because 16 is the unique virtual MAC address limit)
OSPFv2 and OSPFv3 Scale		
OSPFv2/OSPFv3 LSA/LSDB size	Nexus 9600-R and 9600-RX line cards	250,000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9364C, and 9808 switches Nexus 9700-EX/FX and Nexus X9716D-GX line cards	100,000
OSPFv2/OSPFv3 areas	Nexus 9600-R and 9600-RX line cards	200
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9364C, and 9808 switches Nexus 9700-EX/FX and Nexus X9716D-GX line cards	100
OSPFv2/OSPFv3 neighbors	Nexus 9600-R, 9600-RX, Nexus X9716D-GX, and 9700-EX/FX line cards	1000
	Nexus 9364C, and 9300-FX3/GX2/H2R, and 9808 switches	256
	Nexus 9300-FX/FX2/GX	650
Static Routes Scale		
IPv4 Static routes	Nexus 9364C, 9300-FX/FX2/FX3/GX/GX2/H2R, and 9808 switches, and Nexus 9700-EX/FX and Nexus X9716D-GX line cards	8000

Feature	Supported Platforms	Verified Limits
IPv6 Static routes	Nexus 9364C, 9300-FX/FX2/FX3/GX/GX2/H2R, and 9808 switches, and Nexus 9700-EX/FX and Nexus X9716D-GX line cards	8000
Virtual Routing and Forwarding (VRF) Scale		
VRFs	Nexus 9364C, and 9300-FX/FX2/FX3/GX/GX2/H2R and 9808 switches, and Nexus 9700-EX/FX and Nexus X9716D-GX line cards	1000
	Nexus 9600-R and 9600-RX line cards	3967
Policy Based Routing (PBR) Scale		
Configured sequences per policy	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and 9408 switches, and Nexus 9700-EX/FX and Nexus X9716D-GX line cards	128
Next-hop addresses per policy	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and 9408 switches, and Nexus 9700-EX/FX and Nexus X9716D-GX line cards	32
IPv4 ACEs (unidimensional)	Nexus 9300-FX/FX2/FX3/GX/GX2 and 9408 switches, and Nexus 9700-EX/FX and Nexus X9716D-GX line cards	3582 (per network forwarding engine)
IPv6 ACEs (unidimensional)	Nexus 9300-FX/FX2/FX3/GX/GX2 and 9408 switches	1792 (per network forwarding engine)
IPv4 and IPv6 ACEs	Nexus 9300-FX/FX2/FX3/GX/GX2 and 9408 switches	1024 IPv4 + 128 IPv6
	Nexus 9700-EX/FX/GX line cards	1024 IPv4
Interfaces with PBR policy	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and 9408 switches and Nexus 9700-EX/FX line cards	512
	Nexus X9716D-GX line card	256
VRRP Scale		
VRRP groups per interface or I/O module	Nexus 9364C, and 9300-FX/FX2/FX3/GX/GX2/H2R switches, and Nexus 9700-EX/FX and Nexus X9716D-GX line cards	250
VRRPv3 groups per interface	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches and Nexus 9700-EX/FX line cards	255
	Nexus X9716D-GX line card	250

Feature	Supported Platforms	Verified Limits
VRRPv3 groups with default timers (1 s)	Nexus 9700-EX/FX line cards	490
	Nexus 9300-FX/FX2/FX3 switches	255
	Nexus 9300-GX/GX2/H2R switches and Nexus 9700-GX line cards	250
VRRPv3 groups with relaxed timers (3 s)	Nexus 9700-EX/FX line cards	490
	Nexus 9300-FX/FX2/FX3 switches	255
	Nexus 9300-GX/GX2/H2R switches and Nexus 9700-GX line cards	250
Pathways with one VRRPv3 group with default timer (1 s)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches and Nexus 9700-EX/FX line cards	489
VRRPv3 groups and pathways combined	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches and Nexus 9700-EX/FX line cards	490
	Nexus X9716D-GX line card	250
ECMP Scale		
ECMP Paths - IPv4 (internet-peering mode)	Nexus 9300-FX/FX3/GX/GX2, and Nexus 9408 switches	16
ECMP Paths - IPv6 (internet-peering mode)	Nexus 9300-FX/FX3/GX/GX2, and Nexus 9408 switches	16
ECMP Paths (IPv4 and IPv6 Unicast Address-family)	Nexus 9300-FX/FX2/FX3/FXP/GX/GX2/H2R, 9408, and 9808 switches, and Nexus X9716D-GX line cards	128[35]
	Nexus 9504/9508 switches with -R/RX line cards and	64
ECMP Groups	Nexus 9808 switches	4000
Internet Peering ECMP Scale		
Maximum ECMP paths (Route scale: 1,800,000 million IPv4 + 200,000 IPv6 LPM routes)	Nexus 9300-GX/GX2/H2R **Note** Required RAM 64 GB	32
	Nexus 9300-GX/GX2/H2R **Note** Required RAM 32 GB	16

[26] The hash table is subject to collisions. Depending on the host route pattern, collisions might occur.

[27] The hash table is subject to collisions. Depending on the host route pattern, collisions might occur.
[28] Contains internet peering profile with additional IPv4 and IPv6 routes.
[29] Internet profile with additional IPv4 routes (total of 914K routes consisting of IPv4 and 62K of IPv6)
[30] Internet profile with additional IPv6 routes (total of 871K routes consisting of IPv6 and 696K of IPv4)
[31] If you have more than 490 groups, then only one group per SVI. SVIs cannot have a user defined MAC or any VRRP group with it.
[32] If you have more than 490 groups, then only one group per SVI. SVIs cannot have a user defined MAC or any VRRP group with it.
[33] For vPC configuration, HSRP maximum scale is 16 groups, 15 groups with vPC peer-gateway configured.
[34] If the user has Multi-protocol configuration, user should configure appropriate CoPP policies to avoid any control plane traffic drops.
[35] 128-way ECMP paths are not supported for MPLS, VXLAN, and L3 tunnels. Resilient hashing is not supported on Cisco Nexus 9808 switch for routing, PBR and Port-channel.



Note

- With IPv6 scale, traffic loss could be there for a few seconds during switchover.
- The maximum number of PBR next-hops based on 4 FM-E supported is 192 per slice of the forwarding engine
  - The IPv4/IPv6 host routes and the IPv4 multicast routes share the same hardware table. Limits are provided for both the default line card mode and the max host line card mode.
  - The IPv4 and IPv6 unicast routes share the same hardware table. Limits are provided for both the default line card mode and the max host line card mode.
  - High availability (graceful restart and stateful switchover) is not supported when unicast or multicast aggressive timers are configured at any scale.

Guidelines and Limitations for OSPF Verified Scalability Limits

- To achieve the highest scale, we recommend that you use a single OSPF instance instead of multiple instances.
- Each OSPFv2 and OSPFv3 scale value might vary when combined with other parameters.
- The graceful restart timeout value might be increased in multidimensional scenarios.

Table 22: PVLAN VXLAN Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
Primary VLANs	Nexus 9300-FX/FX2/FX3/H2R switches	16
Secondary VLANs	Nexus 9300-FX/FX2/FX3/H2R switches	20
Ports in community host mode	Nexus 9300-FX/FX2/FX3/H2R switches	40
Port in Isolated host mode	Nexus 9300-FX/FX2/FX3/H2R switches	40
Ports in isolated trunk mode	Nexus 9300-FX/FX2/FX3/H2R switches	40
Ports in promiscuous mode	Nexus 9300-FX/FX2/FX3/H2R switches	5
PVLANs allowed on a PVLAN port	Nexus 9300-FX/FX2/FX3/H2R switches	16

Note The above scale numbers are applicable for both IPv4 and IPv6 Underlay. However, for Nexus 9300-H2R switches the above scale is applicable only for IPv4 Underlay.

Table 23: VXLAN Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
VTEP Peers[36]	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9600-R, 9600-RX, 9700-EX/FX, and X9716D-GX line cards	512
Underlay multicast groups	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9700-EX/FX and X9716D-GX line cards	512
Maximum policy scale or number of VNIs to which a policy can be applied	Nexus 9300-FX2/FX3/GX/GX2/H2R switches, and Nexus 9408 switches	510 **Note** The default scale for Nexus 9300-FX/FX2 ToR switches is 60. To increase the scale to 510, use the `hardware access-list tcam label ing-racl 9` command. This command is supported only on Nexus 9300-FX/FX2 ToR switches.
	Nexus 9300-FX platform switches and Nexus 9700-FX and 9700-GX line cards	60
IGMP snooping over VXLAN		
VXLAN VLANs	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9700-EX/FX and X9716D-GX line cards	1000
Multi-Site [37]		
Asymmetric VNIs per peer	Nexus 9332C, 9364C, 9300-FX/FX2/FX3/FXP/GX/GX2/H2R, Nexus 9408 switches and Nexus 9700-EX/FX/GX line cards	3900
Number of Tunnel Encryption sessions	Nexus 9300, 9336C-FX2, 93240YC-FX2, 93360YC-FX2, 93216TC-FX2, 93180YC-FX3, and C93108TC-FX3P switches [39]	128[38]
Number of BGWs per site for Secure VXLAN EVPN Multi-Site using CloudSec	Nexus 9336C-FX2/FX3, 93240YC-FX2/FX3, 93360YC-FX2/FX3, and 93216TC-FX2/FX3 switches [39]	6 per 10 sites

Feature	Supported Platforms	Verified Limits
Number of sites	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408, 9332C, 9364C, 9500 switches, and Nexus 9700-EX/FX/GX line cards	128
Number of sites for Secure VXLAN EVPN Multi-Site using CloudSec	Nexus 9300-FX2/FX3[39], and Nexus 9408 switches	10 sites
Number of sites for TRM	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408, 9332C, 9364C switches and Nexus 9700-EX/FX/GX line cards	16 sites
Number of BGWs per site[40]	Nexus 9332C and 9364C switches and Nexus 9700-EX/FX/GX line cards	4 (Anycast), 2(vPC)
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	6 (Anycast), 2 (vPC)
Number of BGWs per site with TRM enabled	Nexus 9332C, 9364C, 9500 switches and Nexus 9700-EX/FX/GX line cards	2 (Anycast), 2 (vPC)
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	6 (Anycast), 2 (vPC)
Number of Cloudsec Security Associations for Secure VXLAN EVPN Multi-Site using CloudSec sessions	Nexus 9300-FX2/FX3[39], and Nexus 9408 switches	128 [41]
Multisite-PIP ECMP	Nexus 9300-FX2/FX3[39]/GX/GX2 switches	1000[42]
VTEPs per Site	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches and Nexus 9700-EX/FX/GX line cards	512
Tenant Route Multicast Layer 3 Mode with VXLAN BGP eVPN		
VXLAN Layer 2 VNI	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches and Nexus 9700-EX/FX/GX line cards	1000
VXLAN Layer 3 VNI/VRFs	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches and Nexus 9700-EX/FX/GX line cards	250
VTEP Peers	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches and Nexus 9700-EX/FX/GX line cards	254
Underlay Multicast Group (PIM ASM Underlay)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches and Nexus 9700-EX/FX/GX line cards	512[43]

Feature	Supported Platforms	Verified Limits
Total Multicast routes (PIM ASM & PIM SSM)	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches and Nexus 9700-FX/GX line cards	31,200
	Nexus 9700-EX line card	7200
VXLAN Flood and Learn		
Virtual network identifiers (VNIs) or VXLAN-mapped VLANs	Nexus 9600-R and 9600-RX line cards	2000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408, Nexus 9700-EX/FX switches, and Nexus X9716D-GX line cards	3900
Underlay multicast groups	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	512
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	
Overlay MAC addresses	Nexus 9300-FX switches	90,000
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	
	Nexus 9300-FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	60,000
Ingress replication peers [44]	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	512
	Nexus 9700-EX/FX and Nexus X9716D-GX line card	
Ingress replication Layer 2 VNIs	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	1000
	Nexus 9700-EX/FX and Nexus X9716D-GX line card	
MAC addresses for ingress replication	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	90,000
	Nexus 9700-EX/FX and Nexus X9716D-GX line card	1000
Port VLAN translations under an interface	Nexus 9700-EX/FX and Nexus X9716D-GX line card	100
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	3967

Feature	Supported Platforms	Verified Limits
Port VLAN translations in a switch	Nexus 9700-EX/FX and Nexus X9716D-GX line card	2000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	24,000
Static MAC addresses pointing to a remote VTEP	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches	1000
	Nexus 9700-EX/FX and Nexus X9716D-GX line card	2000
VXLAN VLANs per FEX port (host interface)	Nexus 9300-FX2/FX3[39]/GX/GX2, and Nexus 9408 switches	75
Layer 2 routed VNIs for vPC-centralized gateway	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	450
	Nexus 9700-EX/FX and Nexus X9716D-GX line card	
IGMP groups	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	8192
	Nexus 9700-EX/FX and Nexus X9716D-GX line card	
Port Multi-VLAN Mapping[45]	Nexus 9300-FX2/GX/GX2/H2R switches	510[46]
	Nexus 9300-FX switches	368[47]
VXLAN BGP eVPN		
Layer 2 VNIs	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9700-EX/FX and Nexus X9716D-GX line cards	3900 [48], [49]
	Nexus 9600-R and 9600-RX line cards	2000
Xconnect VLANs	Nexus 9332C, 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	40
SVI with Distributed Anycast Gateway; Layer 2 VNI extended	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, and Nexus X9716D-GX line cards	3900
	Nexus 9700-EX/FX switches	1000

Feature	Supported Platforms	Verified Limits
Layer 3 VNIs / VRFs[50]	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches and Nexus X9716D-GX line cards	2000[51]
	Nexus 9600-R and 9600-RX line cards	900
	Nexus 9700-EX/FX line cards	750
Underlay multicast groups	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9700-EX/FX and Nexus X9716D-GX line cards	512
VTEPs	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9600-R, 9600-RX, 9700-EX/FX and Nexus X9716D-GX line cards	512
ARP	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	96,000 **Note** To scale ARP, use **system routing template-dual-stack-host-scale** command and reload the switch.
ND	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	96,000 **Note** To scale ND, use **system routing template-dual-stack-host-scale** command and reload the switch.
MAC addresses	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9700-EX/FX and Nexus X9716D-GX line cards	96,000 **Note** To scale MAC addresses, use **system routing template-dual-stack-host-scale** command and reload the switch.
Port VLAN translations under an interface (IPv4 and IPv6 Underlay)	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	100
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	3967
Port VLAN translations in a switch (IPv4 and IPv6 Underlay)	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	2000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	24,000

Feature	Supported Platforms	Verified Limits
IPv4 host routes	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	471,000
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	656,000
	Nexus 9600-R and 9600-RX line cards	128,000
IPv6 host routes	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	265,000
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	34,000
	Nexus 9600-R and 9600-RX line cards	32,000
Overlay IPv4 LPM routes	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches	471,000
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	656,000
Overlay IPv6 LPM routes	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches	265,000[52]
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	174,000[53]
Overlay IPv6 ND Suppression cache	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches	64,000
IGMP groups	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9700-EX/FX and Nexus X9716D-GX line cards	8192
BGP sessions over VRF peer at BGW/BL	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	4000
VXLAN BGP eVPN Ingress Replication		
Layer 2 VNIs	Nexus 9600-R and 9600-RX line cards	2000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408, 9700-EX/FX switches and Nexus X9716D-GX line cards	3900
Xconnect VLANs	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	40

Feature	Supported Platforms	Verified Limits
Selective Qinvni with multiprovider tag (IPv4 and IPv6 Underlay)	Nexus 93180YC-FX, 9336C-FX2, Nexus 9300-FX3/GX/GX2/H2R, and Nexus 9408 switches	Port level: 4000 mappings, 512 provider VLANs System wide: 48,000 mappings, 512 provider VLANs
SVI with Distributed Anycast Gateway; Layer 2 VNI extended	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	3900
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	1000
Layer 3 VNIs / VRFs[54]	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, and Nexus X9716D-GX line cards	2000
	Nexus 9600-R and 9600-RX line cards	900
	Nexus 9700-EX/FX line cards	750
VTEPs	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9700-EX/FX and Nexus X9716D-GX line cards	512
MAC addresses	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9700-EX/FX and Nexus X9716D-GX line cards	90,000
Port VLAN translations under an interface	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	100
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	3967
Port VLAN translations in a switch	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	2000
	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R and Nexus 9408 switches	24,000
IPv4 host routes	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	471,000
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	656,000
IPv6 host routes	Nexus 9300-FX/FX2/GX/GX2/H2R, and Nexus 9408 switches	265,000
	Nexus 9300-FX3 switches	500,000
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	34,000

Feature	Supported Platforms	Verified Limits
Overlay IPv4 LPM routes	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	471,500
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	656,000
Overlay IPv6 LPM routes	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, and Nexus 9408 switches	265,000[55]
	Nexus 9700-EX/FX and Nexus X9716D-GX line cards	174,000[56]
IGMP groups	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408 switches, Nexus 9700-EX/FX and Nexus X9716D-GX line cards	8192
VXLAN and IP-in-IP Tunneling		
IP-in-IP tunnels	Nexus 9300-FX2 switches	16
VXLAN Static Tunnels		
VNIs	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408, and 9364C switches	100
VRFs	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408, and 9364C switches	100
VTEP peers	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408, and 9364C switches	254
V4 routes	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R, Nexus 9408, and 9364C switches	10,000
DHCP Snooping Bindings		
DHCP snooping bindings	Nexus 9300-FX/FX2/FX3/GX/GX2/H2R switches, Nexus X9716D-GX and Nexus 9700-EX/FX line cards	2048

[36] In case of IR, each VNI can have a max of 64 peers.

[37] All the other BGW numbers (number of supported L2VNIs, L3VNIs, MAC addresses, IP addresses, and so on) match the values supported on a generic VXLAN EVPN VTEP node.

[38] Total number of Cloudsec Security Associations in hardware = 128 (M *N*L) where (M = no. of Cloudsec peers, N = no. of uplinks on each Cloudsec endpoint, L is number of border gateway nodes)

[39] This feature is not supported on Nexus 9348GC-FX3, 9348GC-FX3PH, and 9332D-H2R switches.

[40] Multi-Site enabled with TRM supported number of L2VNIs –1000 and L3VNIs –100. Maximum supported multicast underlay and overlay route is 8000. From Cisco NX-OS Release 10.2(3), Multi-Site enabled with TRM supported number of L3VNIs –250. Maximum supported multicast underlay and overlay route is 32000 for Nexus 9700-FX/FX3/GX/GX2 and 8000 for Nexus 9700-EX/FX2 and Nexus 9508.

[41] Total number of Cloudsec Security Associations in hardware = 128 (M *N*L) where (M = no. of Cloudsec peers, N = no. of uplinks on each Cloudsec endpoint, L is number of border gateway nodes)

[42] Number of vrfs * number of sites = 1000
[43] VXLAN underlay and overlay multicast routes shares the same hardware table. Maximum Multicast routes is 8000 in the default mode. If you want more overlay route scale, reduce the underlay multicast control group.
[44] In case of IR, each VNI can have a maximum number of 64 peers; 512 peers supported on 100 VNIs only.
[45] Only one provider VLAN is supported.
[46] The maximum number of Layer-2 subinterfaces is based on the available entries allocated for ing-pacl-sb tcam region.
[47] Since Nexus 9300-FX have only one slice, the maximum number of Layer-2 subinterfaces that can be created is lower than the limit for Nexus 9300-FX2.
[48] The full scale of 3900 L3VNI is only supported on the platforms with >24G memory. Nexus 93240YC-FX2, 93360YC-FX2, 93216TC-FX2, 93108TC-FX3P, 93180YC-FX3 would require add-on memory to support extended 3900 L3VNI scale. Nexus N9K-C9358GY-FXP and N9K-C92348GC-X can not support extended scale.
[49] Switches running scaled deployment, including scaled BGP EVPN VXLAN VNI, the memory alert may be seen during Non-Disruptive ISSU as the default system memory threshold has been lowered beginning with Cisco NX-OS Release 10.3(3)F release. To avoid system reacting to critical memory alert, before upgrade configure higher value for system memory thresholds. For example: Set system memory thresholds as 90 for minor, 94 for severe, and 95 for critical.
[50] ECMP objects are not shared across multiple VRFs.
[51] The full scale of 2000 L3VNI is only supported on the platforms with >24G memory. Nexus 93240YC-FX2, 93360YC-FX2, 93216TC-FX2, 93108TC-FX3P, 93180YC-FX3 would require add-on memory to support extended 2000 L3VNI scale. Nexus N9K-C9358GY-FXP and N9K-C92348GC-X can not support extended scale.Switches with <24G memory supports 2000 L2VNIs and 900 L3VNIs.
[52] All /64 routes + 4000 for non /64 routes.
[53] All /64 routes + 4000 for non /64 routes.
[54] ECMP objects are not shared across multiple VRFs.
[55] All /64 routes + 4000 for non /64 routes.
[56] All /64 routes + 4000 for non /64 routes.

Table 24: Tetration Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limit
TCAM size	9300-FX switches	1024 entries IPv4 –2 entries per rule (ICMP and IP) IPv6 –8 entries per rule (4 entries per ICMP and IPv6 for a total of 8 entries) 24 entries out of 1000 is consumed for default.
TCAM	Nexus 9300-FX switches	500 (IPv4) or 125 (IPv6)

The entire Cisco Tetration Analytics documentation set is available at the following URL:
https://www.cisco.com/c/en/us/support/data-center-analytics/tetration-analytics/tsd-products-support-series-home.html

Table 25: RIPng Verified Scalability Limits (Unidimensional)

Feature	Supported Platforms	Verified Limits
RIPng Neighbors	Nexus 9300 and 9500 switches	250
RIPng Routes	Nexus 9300 and 9500 switches	1500

Spanning Tree Protocol scale considerations

Spanning Tree Protocol (STP) scalability is assessed using two main metrics, each representing a different dimension of scale:

1. **STP Virtual Port Scale**

   Definition: Represents the total number of STP entities managed, considering both internal STP data structures and port-level MAC programming/VLAN allow lists.

   Calculation: Virtual Port Scale = (Number of physical STP-managed ports) × (Number of VLANs carried by those ports)

   Example (RPVST):

   - 100 VLANs
   - 4 individual L2 interfaces
   - 2 L2 port-channels (each with 8 member interfaces)
   - Calculation:

     (4 individual interfaces + 2 port-channels × 8 members each) × 100 VLANs

     = (4 + 16) × 100 = 2000 Virtual Ports

   Note All port-channel members are included in this calculation.

   MST Scenario:

   For Multiple Spanning Tree (MST), multiply the number of physical interfaces by the number of VLANs in the carried MST instances. If all 100 VLANs are in the same instance, the result is the same (2000 Virtual Ports).

2. **STP Logical Port Scale**

   Definition: Measures the maximum STP BPDU load per hello interval, especially relevant for RPVST, which generates a BPDU per VLAN. This metric helps evaluate control plane scalability. Hence, MST is recommended for large-scale environments, as it reduces Logical Port Scale concerns.

   Calculation: Logical Port Scale = (Number of individual L2 interfaces + Number of port-channels) × (Number of VLANs carried)

   Example:

   - 100 VLANs
   - 4 individual L2 interfaces
   - 2 L2 port-channels
   - Calculation:

     (4 interfaces + 2 port-channels) × 100 VLANs

     = 6 × 100 = 600 Logical Ports

   Note Port-channel members are not included in this calculation.

Note

- All computation will vary if interfaces have unique VLAN pruning lists or have different MST instances with unique VLAN counts. Always review STP scalability against actual hardware/software limits.
- For large deployments, prefer MST to minimize BPDU processing overhead.

Verified Scalability Limits - Multidimensional - 9500 R-Series

The tables in this section list the verified scalability limits for the Cisco Nexus 9508 switch with an X9636C-R, X9636C-RX, or X9636Q-R line card or a C9508-FM-R fabric module and Cisco Nexus 9504 with -R line cards. These limits are validated with a multidimensional configuration. The values provided in these tables focus on the scalability of all listed features at the same time.

Note These numbers are not the maximum verified values if each feature is viewed in isolation. For these numbers, see the corresponding "Verified Scalability Limits" section.

Table 26: eBGP/IS-IS Profile Verified Scalability Limits (Multidimensional)

Feature	Verified Limits
Number of 100G ports	288
ECMP	16-way (Upstream)
BGP neighbors	960
BGP IPv4 /32 unicast routes	30,000
BGP IPv4 VLSM unicast routes	18,000
BGP IPv6 /128 unicast routes	16,000
BGP IPv6 VLSM unicast routes	1000
IS-IS v2 neighbors	255
IS-IS v3 neighbors	255
IS-IS Layer 2 adjacency	16
IS-IS IPv4 /32 unicast routes	20,000
IS-IS IPv4 VLSM unicast routes	1000
IS-IS IPv6 /128 unicast routes	20,000
IS-IS IPv6 VLSM unicast routes	1000
BFD sessions	272

Feature	Verified Limits
PIM neighbors	256
ACL ACEs	15,000 500
Sub-interfaces	712
SPAN sessions	1 local SPAN session
Multicast SSM	20,000

Table 27: iBGP/OSPF Profile Verified Scalability Limits (Multidimensional)

Feature	Verified Limits
Number of 100G ports	180
Number of 40G ports	108
ECMP	8-way (Upstream)
BGP neighbors	8
BGP IPv4 VLSM unicast routes	40,000
BGP IPv6 VLSM unicast routes	10,000
OSPFv2 neighbors	108
OSPFv3 neighbors	30
OSPF IPv4 /32 unicast routes	100,000
OSPF IPv4 VLSM unicast routes	155,000
OSPFv3 IPv6 /128 unicast routes	1000
OSPFv3 IPv6 VLSM unicast routes	9000
BFD sessions	108
VRF	250
PIM neighbors	108
IPv4 (*,G) multicast routes	2000
IPv4 (S,G) multicast routes	10,000
ACL ACEs	500 (IPv4) 500 (IPv6)
SPAN sessions	1 local SPAN session

Table 28: iBGP/EIGRP Profile Verified Scalability Limits (Multidimensional)

Feature	Verified Limits
Number of 100G ports	180
Number of 40G ports	108
ECMP	16-way (Upstream)
BGP neighbors	8
BGP IPv4 VLSM unicast routes	40,000
BGP IPv6 VLSM unicast routes	10,000
EIGRP v4 neighbors	276
EIGRP v6 neighbors	276
EIGRP IPv4 /32 unicast routes	30,000
EIGRP IPv4 VLSM unicast routes	1000
EIGRP IPv6 /128 unicast routes	30,000
EIGRP IPv6 VLSM unicast routes	1000
BFD sessions	276
VRF	250
PIM neighbors	276
IPv4 (*,G) multicast routes	6000
IPv4 (S,G) multicast routes	16,000
ACL ACEs	500 (IPv4) 500 (IPv6)
SPAN sessions	1 local SPAN session

Table 29: MPLS Verified Scalability Limits (Multidimensional)

Feature	Verified Limits
MPLS L3VPN	3967
VPE	3967
PE nodes	3
PE routes	20,000
X9636C-RX line card: ACL scale-IPv4	95,000

Feature	Verified Limits
X9636C-RX line card: ACL scale-IPv6	20,000
HSRP, HSRP VIP	3967 each for v4 and v6
vPC uRPF	3967
Strict uRPF	Yes
VRF	3967
SVI	3967
Layer 3 VPN routes IP ECMP	2000
MPLS LSR ECMP	2000
VPNv4 routes	400,000
VPNv6 routes	90,000
EBGP neighbors	750

Table 30: Layer 2/Layer 3 Boundary Verified Scalability Limits (Multidimensional)

Feature	Verified Limits
MAC addresses	19,000
vPC Port channels	46
ECMP	16-way (Upstream)
OSPFv2 neighbors	47
OSPFv3 neighbors	47
OSPF IPv4 /32 unicast routes	45,000
OSPF IPv4 VLSM unicast routes	1000
OSPF IPv6 /128 unicast routes	20,000
OSPF IPv6 VLSM unicast routes	1000
BFD sessions	49
VRF	250
VLAN	3750
SVI	3750
VRRP v4 groups	1996 VRRS / 4 VRRPv3

Feature	Verified Limits
VRRP v6 groups	1996 VRRS / 4 VRRPv3
HSRP IPv4	1743 Secondary groups / 7 Primary groups
HSRP IPv6	1743 Secondary groups / 7 Primary groups
PIM neighbors	396
IPv4 (*,G) multicast routes	3080
IPv4 (S,G) multicast routes	26,600
IGMP snooping database entries	6400
sFlow enabled interfaces	83
UDLD enabled interfaces	93
SPAN sessions	1 local SPAN session

Table 31: Segment Routing Verified Scalability Limits (Multidimensional)

Feature	Verified Limits
VLAN	100
SVI	100
MAC entries	10,000
ARP entries	70
HSRPv4 VIPs	100
HSRpv6 VIPs	100
LACP	11
LACP members	4
eBGP IPv6 neighbors	9
eBGP IPv4 LU neighbors	9
IPv4 (LU) routes	6888
IPv4 (LU) paths	17580
IPv6 routes	6663
6PE routes	17,338
SR ECMP	18 (dual-homed)

Feature	Verified Limits
MPLS HW entries	11,957

Table 32: VXLAN Profile Verified Scalability Limits (Multidimensional)

Feature	Verified Limits
Ports	16
ECMP	8-way (Upstream)
BGP neighbors	200
BGP EVPN Layer 2 VPN host routes	64,000
BGP IPv4 VLSM unicast routes or OSPF	10,000
BGP IPv6 VLSM unicast routes or OSPF	6000
BFD sessions	20
PIM neighbors	20
IPv4 (*, G) multicast routes (co-existing)	4000
IPv4 (S,G) multicast routes (co-existing)	2000
Layer 3 VNI	900
Layer 2 VNI	2000
Local VTEP	1
Remote VTEPs	256
VLAN	3600
SVI	900
MAC	90,000

Deployment Case Studies

This section provides sample topologies for some common deployments. For each topology, the scalability numbers are the limits with all of the listed features enabled at the same time.

Attention These numbers are not the maximum verified values if each feature is viewed in isolation. For these numbers, see the "Verified Scalability Limits" section.

VXLAN BGP/eVPN iBGP Centric Topology

This VXLAN BGP/eVPN iBGP centric topology consists of Cisco Nexus 9300 and 9500 Platform switches acting as VXLAN vPC tunnel endpoints (VTEPs) and VXLAN non-vPC VTEPs. VXLAN VTEPs establish iBGP sessions to a Cisco Nexus 9508 switch (route reflector) acting as a spine node. VXLAN-distributed anycast gateway SVIs are configured for dual stack, and the traffic is dual stack.

The focus of this topology is to test VXLAN overlay network scale and underlay Layer 2 switching and other routing, multicast, and Layer 4 through Layer 7 features for management and operations. Underlay PIM neighbors and IS-IS adjacency were tested with the default timer and Bidirectional Forwarding Detection (BFD) enabled on all links.

In the following table, the Verified Limit column lists the verified scaling capabilities with all listed features enabled at the same time. These numbers are not the maximum verified values if each feature is viewed in isolation.

Table 33: VXLAN BGP/eVPN iBGP Centric Topology

Feature	Supported Platform	Verified Limit
System Routing Template	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408 switches, and 9500 switches with 9700-EX/FX/GX line cards	default
	Nexus 9364C switches	Not applicable
VXLAN VTEPs	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408, 9364C switches, and 9500 switches with 9700-EX/FX/GX line cards	128
VXLAN Layer 2 VNIs	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408, 9364C switches, and 9500 switches with 9700-EX/FX/GX line cards	2000
VXLAN Layer 3 VNIs/VRFs	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408, 9364C switches, and 9500 switches with 9700-EX/FX line cards	500
VXLAN multicast groups	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408, 9364C switches, and 9500 switches with 9700-EX/FX/GX line cards	128
VXLAN overlay MAC addresses	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408, 9364C switches, and 9500 switches with 9700-EX/FX line cards	64,000
VXLAN overlay IPv4 host routes	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408, 9364C switches, and 9500 switches with 9700-EX/FX/GX line cards	60,000
VXLAN overlay IPv6 host routes	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408 switches, and 9500 switches with 9700-EX/FX/GX line cards	16,000
	Nexus 9364C switches	Not applicable

Feature	Supported Platform	Verified Limit
VXLAN overlay IGMP Snooping groups	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408, 9364C switches, and 9500 switches with 9700-EX/FX/GX line cards	1000
VXLAN IPv4 LPM routes	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408, 9364C switches, and 9500 switches with 9700-EX/FX/GX line cards	5120
VXLAN IPv6 LPM routes	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408 switches, and 9500 switches with 9700-EX/FX/GX line cards	1500
	Nexus 9364C switches	Not applicable
VXLAN VLAN logical port VP count	Nexus 9364C switches	Not applicable
VLANs on VTEP node	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408, 9364C switches, and 9500 switches with 9700-EX/FX/GX line cards	1700 (total VLANs) 1500 (VXLAN VLANs) 200 (non-VXLAN VLANs)
MST instances	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408 switches, and 9500 switches with 9700-EX/FX/GX line cards	20
	Nexus 9364C switches	Not applicable
STP logical ports For more information on STP scale considerations, see Spanning Tree Protocol scale considerations, on page 59 section.	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408 switches, and 9500 switches with 9700-EX/FX/GX line cards	3500
	Nexus 9364C switches	Not applicable
vPC port channels	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408 switches, and 9500 switches with 9700-EX/FX/GX line cards	40
	Nexus 9364C switches	Not applicable
Underlay IS-IS neighbors	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408 switches, and 9500 switches with 9700-EX/FX/GX line cards	32
	Nexus 9364C switches	Not applicable
Underlay PIM neighbors	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408 switches, and 9500 switches with 9700-EX/FX/GX line cards	12
	Nexus 9364C switches	Not applicable
Underlay HSRP groups for regular VLANs	Nexus 9364C switches	Not applicable

Feature	Supported Platform	Verified Limit
Underlay vPC SVIs	Nexus 9300-FX/FX2/FX3/GX/GX2, 9408 switches, and 9500 switches with 9700-EX/FX/GX line cards	200
	Nexus 9364C switches	Not applicable

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