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Cisco Nexus 5000 Series Configuration Limits

for Cisco NX-OS Release 5.1(3)N1(1)

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This document describes the Cisco Nexus 5000 Series switch configuration limits for Cisco NX-OS Release 5.1(3)N1(1). Use this document in combination with documents listed in the "Related Documentation" section on page 10.

Contents

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Introduction

The Cisco Nexus 5000 Series switches include a family of line-rate, low-latency, lossless 10-Gigabit Ethernet, Cisco Data Center Ethernet, Fibre Channel over Ethernet (FCoE), and now native Fibre Channel switches for data center applications. The Cisco Nexus 5000 Series includes the Cisco Nexus 5500 Platform and the Cisco Nexus 5000 Platform.

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Cisco NX-OS Software Release 5.0(3)N2(1) introduces two new Cisco Nexus 5500 Platform switches that extend the versatility of the data-center class Cisco Nexus 5000 Series switches and provide higher density, lower latency, multilayer services.

The Cisco Nexus 5000 Platform includes the following switches:

- Cisco Nexus 5020 switch
- Cisco Nexus 5010 switch

For information about the Cisco Nexus 5000 Series, see the *Cisco Nexus 5000 Series and Cisco Nexus 5500 Platform Hardware Installation Guide*.

Cisco Nexus 5000 Series and Cisco Nexus 5500 Platform switches have been tested for scaling purposes under the following deployment scenarios:

- Layer 2-only deployments
- Layer 2 and Layer 3 combined deployments
- Fibre Channel and FCoE deployments

Note Verification topologies included all listed features configured to theverified limits simultaneously. The maximum limit for a given feature is the configuration limit or the hardware limit on a specific platform.

Cisco Nexus 5500 Platform Switch Layer 2 Topology Configuration Limits

This section describes the configuration limits in topologies that include only Layer 2 feature configurations.

Table 1 shows the Layer 2 configuration limits for the Cisco Nexus 5500 Platform switch with Cisco NX-OS Release 5.1(3)N1(1).

Table 1 Cisco NX-OS Release 5.1(3) Layer 2 Topology Configuration Limits for the Cisco Nexus 5500 Platform Switch

	Cisco Nexus 5500 Platform	
Feature	**Verified Topology[1]**	**Maximum Limits[2]**
Active VLANs/VSANs per switch	1000[3]	4013 (31 reserved for VSANs)
VLAN/VSAN ID space	4013 unreserved space	4013 unreserved space
Logical interfaces[4]	16,000[5]	32,000[6]
VLAN ACLs (VACLs) per switch	128 (10 Unique VACLs)	1024 (62 unique VACLs with upto 2048 ACE entries across all VACLs)
Port ACLs (PACLs) per switch	1152	1152
Member interfaces per EtherChannel	16	16
IGMP snooping groups	4000	4000
Maximum FEXs per Cisco Nexus 5500 Series Switch	24	24
Maximum FEXs dual homed to a vPC Cisco Nexus 5500 Series switch pair	24	24

Table 1 Cisco NX-OS Release 5.1(3) Layer 2 Topology Configuration Limits for the Cisco Nexus 5500 Platform Switch (continued)

Feature	Cisco Nexus 5500 Platform	
	Verified Topology[1]	Maximum Limits[2]
MAC table size	25000 unicast entries and 4000 multicastentries	32000
Number of Switch port EtherChannels	48- Nexus 5548 or Nexus 5548UP switch	48-Nexus 5548 or Nexus 5548UP switch 96- Nexus 5596 switch
Number of FEX port channels/vPCs (across maximum number of FEXs)	576	1152
Number of SVIs	2	256
FabricPath VLANs	1000[7]	4000
FabricPath Switch IDs	128	128
FabricPath multicast tree	2	2
Number of FabricPath topologies	1	1
Number of FabricPath core port-channels	4 core links with 4 ports each	16

1. Verified Topology—Indicates the verified scaling capabilities with all listed features enabled at the same time. The numbers listed here exceed that used by most customers in their topologies. The scale numbers listed here are not the maximum verified values if each feature is viewed in isolation.
2. Maximum Limits—Indicates the maximum scale capability tested for the corresponding feature individually. This number is the absolute maximum currently supported by Cisco NX-OS Release 5.1(3)N1(1) software for the corresponding feature. If the hardware is capable of a higher scale, future software releases may increase this maximum limit.
3. 4013 VLANs have been verified in Layer 2 switching, Fibre Channel and FCoE topology configuration limits
4. Logical interfaces are a product of the number of VLANs times the number of ports. This parameter reflects the load of handling port programming, and is not dependent on the spanning-tree mode or configuration.
5. 32,000 STP logical interfaces has been verified in topology.
6. 32,000 PV scaling number applies to PVST, MST, and non STP modes.
7. 4000 FabricPath VLANs have been tested in the unified fabric topology.

Cisco Nexus 5000 Platform Switch Layer 2 Topology Configuration Limits

This section describes the configuration limits in topologies that include only Layer 2 feature configurations.

Table 2 shows the Layer 2 configuration limits for the Cisco Nexus 5000 Platform switch with Cisco NX-OS Release 5.1(3)N1(1).

Table 2 Cisco NX-OS Release 5.1(3) Layer 2 Topology Configuration Limits for the Cisco Nexus 5000 Platform Switch

Feature	Cisco Nexus 5000 Platform	
	Verified Topology[1]	Maximum Limits[2]
Active VLANs/VSANs per switch	507	507 (504 when FCoE is enabled - 31 are set aside for SANs)
VLAN/VSAN ID space	4013 unreserved space	4013 unreserved space
Logical interfaces[3]	12,000	12,000
VLAN ACLs (VACLs) per switch	128 (10 unique VACLs)	1,024 (128 unique VACLs)
Port ACLs (PACLs) per switch	576	576
Member interfaces per EtherChannel	16	16
IGMP snooping Groups	1000	1000
Maximum FEXs per Cisco Nexus 5000 Series	12	12
Maximum FEXs dual homed to a vPC Cisco Nexus 5000 Series	12	12
MAC table size	13,800	16,000
Number of switchport EtherChannels	16 (with the combination not exceeding 16, and not more than a total of 16 ports per EtherChannel)	16 (with the combination not exceeding 16, and not more than a total of 16 ports per EtherChannel)
Number of FEX Port channels/vPCs (across maximum number of FEXs)	576	576
SPAN sessions	2 active sessions 32 source VLANs as a TX source	2 active sessions 32 source VLANs as a TX source
Configurable QoS groups (including class default)	5	5
No-drop qos-groups	1 class - FCoE no-drop	3 (including FCoE)

1. Verified Topology—Indicates the verified scaling capabilities with all listed features enabled at the same time. The numbers listed here exceed that used by most customers in their topologies. The scale numbers listed here are not the maximum verified values if each feature is viewed in isolation.
2. Maximum Limits—Indicates the maximum scale capability tested for the corresponding feature individually. This number is the absolute maximum currently supported by Cisco NX-OS Release 5.0(3)N2(1) software for the corresponding feature. If the hardware is capable of a higher scale, future software releases may increase this maximum limit.
3. Logical interfaces are a product of the number of VLANs times the number of ports. This parameter reflects the load of handling port programming, and is not dependent on the spanning-tree mode or configuration.

Layer 2 and Layer 3 Topology Configuration Limits

Table 3 shows the configuration limits when using a Layer 3 module (N55-D160L3, N55-M160L3) on the Cisco Nexus 5500 Platform switch with Cisco NX-OS Release 5.1(3)N1(1):

Table 3 Cisco NX-OS Release 5.1(3) Layer 2 and Layer 3 Configuration Limits for the Cisco Nexus 5500 Platform Switch

	Cisco Nexus 5500 Platform	
Feature	**Verified Topology[1]**	**Maximum Limits[2]**
Active VLANs/VSANs per switch	1000[3]	4013 (31 are reserved for VSANs)
VLAN/VSAN ID space	4013 unreserved space	4013 unreserved space
STP instances	16,000	16,000
Member interfaces per EtherChannel	16	16
IGMP snooping groups	4000	4000
Maximum FEXs per Cisco Nexus 5500 Series switch	16[4]	16[4]
Maximum FEXs dual homed to a vPC switch pair	16[4]	16[4]
MAC table size	23,400 unicast entries and 4000 multicast entries	32,000[5] entries
Number of FEX port channels/vPCs (across the maximum number of FEXs)	470	768
SPAN Sessions	2 active sessions 32 source VLANs as a TX source	4 active sessions 32 source VLANs as a TX source
Number of SVIs	256	256
Dynamic routes[6]	7200	7200
Multicast routes	2000	4000
RACLs	62 Ingress RACLs with up to 1664 ACE entries across all the RACLs	62 Ingress RACLs with up to 1664 ACE entries across all the RACLs
VRFs	25	1000
ARPs	6500[7]	8000
HSRP groups	256	256
VRRP groups	256	256

1. Verified Topology—Indicates the verified scaling capabilities with all listed features enabled at the same time. The numbers listed here exceed that used by most customers in their topologies. The scale numbers listed here are not the maximum verified values if each feature is viewed in isolation.
2. Maximum Limits—Indicates the maximum scale capability tested for the corresponding feature individually. This number is the absolute maximum currently supported by Cisco NX-OS Release 5.0(3)N2(1) software for the corresponding feature. If the hardware is capable of a higher scale, future software releases may increase this maximum limit.
3. 4013 VLANs have been verified in Layer 2 switching, Fibre Channel and FCoE topology configuration limits.
4. 24 FEXs have been verified in the Layer 2 topology.

5. 24,000 entries are reserved for unicast MAC entries and 3,400 entries are reserved for IGMP groups.
6. Routing protocols including BGP/RIP/OSPF.
7. The maximum LPM entries plus ARP entries plus SVI route entries is 12,000 entries.

Layer 2 Switching, Fibre Channel, and FCoE Topology Configuration Limits

Table 4 shows the configuration limits in topologies that include Cisco Nexus 5500 series unified fabric switch with Layer 2 switching, Fibre Channel, and FCoE configurations.

Table 4 Cisco NX-OS Release 5.1(3) Layer 2 Switching, Fibre Channel, and FCoE Configuration Limits for the Cisco Nexus 5500 Platform Switch

	Cisco Nexus 5500 Platform	
Feature	**Verified Topology[1]**	**Maximum Limits[2]**
Active VLANs/VSANs per switch	4013	4,013 (31 are reserved for VSANs and the remaining are for VLANs)
VLAN/VSAN ID space	4013 unreserved space	4013 unreserved space
Logical interfaces[3]	32,000	32,000
IGMP snooping groups	4000	4000
Maximum FEXs per switch	9	24
MAC table size	23000[4] unicast and 4000 multicast	32,000
Number of switchport EtherChannels	8	48—Nexus 5548P and Nexus 5548UP switch 96—Nexus 5596UP switch
SPAN Sessions	2 active sessions 32 source VLANs as a TX source	4 active sessions 32 source VLANs as a TX source
Number of FEX Port channels/vPCs (across maximum number of FEXs)	288	768
FabricPath VLANs	4000	4000
FabricPath Switch IDs	128	128
FabricPath multicast trees	2	2
Number of FabricPath topologies	1	1
Number of FabricPath core links	2	16
Native FC links per switch	8	8—Nexus 5548 switch 48—Nexus 5548UP switch 96—Nexus 5596UP switch
FLOGIs or FDISCs per NPV port group	180	255
Zone sets per switch	32	500

Table 4 Cisco NX-OS Release 5.1(3) Layer 2 Switching, Fibre Channel, and FCoE Configuration Limits for the Cisco Nexus 5500 Platform Switch (continued)

Feature	Cisco Nexus 5500 Platform	
	Verified Topology[1]	Maximum Limits[2]
Zone members per physical fabric (includes all VSANs)	1280	8000
Zones per switch (includes all VSANs)	640	8000
Maximum diameter of a SAN Fabric	7	12
FSPF interface instances per switch	192	256—Nexus 5548 switch 1536—Nexus 5548UP switch 3072—Nexus 5596UP switch
ISL instances per switch	6	8—Nexus 5548 switch 48—Nexus 5548UP switch 96—Nexus 5596UP switch
VFC interfaces	288	288
Max FCIDs allocated	576	2048
Fibre Channel flows	32	32
SAN port channels	4	4

1. Verified Topology—Indicates the verified scaling capabilities with all listed features enabled at the same time. The numbers listed here exceed that used by most customers in their topologies. The scale numbers listed here are not the maximum verified values if each feature is viewed in isolation.
2. Maximum Limits—Indicates the maximum scale capability tested for the corresponding feature individually. This number is the absolute maximum currently supported by Cisco NX-OS Release 5.0(3)N2(1) software for the corresponding feature. If the hardware is capable of a higher scale, future software releases may increase this maximum limit.
3. Logical interfaces are a product of the number of VLANs times the number of ports. This parameter reflects the load of handling port programming, and is not dependent on the spanning-tree mode or configuration.
4. 24,000 entries are reserved for unicast MAC entries and 3,400 entries are reserved for IGMP groups.

Table 5 shows the configuration limits in topologies that include Cisco Nexus 5000 series unified fabric switch with Layer 2 switching, Fibre Channel, and FCoE configurations.

Table 5 Cisco NX-OS Release 5.1(3) Layer 2 Switching, Fibre Channel, and FCoE Configuration Limits for the Cisco Nexus 5000 Platform Switch

Feature	Cisco Nexus 5000 Platform	
	Verified Topology[1]	Maximum Limits[2]
Active VLANs/VSANs per switch	504	507 (504 when FCoE is enabled) 31 are set aside for VSANs .
VLAN/VSAN ID space	4013 unreserved space	4013 unreserved space
STP instances	12,000	12,000
IGMP snooping groups	1000	1000

Table 5 Cisco NX-OS Release 5.1(3) Layer 2 Switching, Fibre Channel, and FCoE Configuration Limits for the Cisco Nexus 5000 Platform Switch (continued)

Feature	Cisco Nexus 5000 Platform	
	Verified Topology[1]	Maximum Limits[2]
Maximum FEXs per switch	12	12
MAC table size	13,800[3]	16,000
Number of switchport EtherChannels	16 units	16 units (With the combination not exceeding 16, and not more than a total of 16 ports per EtherChannels)
SPAN Sessions	2 active sessions 32 source VLANs as a TX source	2 active sessions 32 source VLANs as a TX source
Configurable QoS groups (including class default)	6	6
No-drop qos-groups	2 (including FCoE)	3 (including FCoE)
VLAN ACLs (VACLs) per switch	128 (10 Unique VACLs)	1024 (128 unique VACLs)
Member interface per EtherChannel	16	16
Number of FEX Port channels/vPCs (across maximum number of FEXs)	496	576
Native FC links per switch	16	16
FLOGIs or FDISCs per NPV port group	106	255
Zones per virtual or physical F port (includes all VSANs)	32	32
Zone sets per switch (includes all VSANs)	32	500
Zone members per physical fabric (includes all VSANs)	640	8000
Zones per switch (includes all VSANs)	320	8000
Maximum diameter of a SAN Fabric	7	12
FSPF interface instances per switch	192 units	512 units
ISL instances per switch	6 units	16 units
VFC interfaces	160	160
Maximum number of FCIDs allocated	320	2048
Fibre Channel flows	32	32

1. Verified Topology—Indicates the verified scaling capabilities with all listed features enabled at the same time. The numbers listed here exceed that used by most customers in their topologies. The scale numbers listed here are not the maximum verified values if each feature is viewed in isolation.
2. Maximum Limits—Indicates the maximum scale capability tested for the corresponding feature individually. This number is the absolute maximum currently supported by Cisco NX-OS Release 5.0(3)N2(1) software for the corresponding feature. If the hardware is capable of a higher scale, future software releases may increase this maximum limit.
3. 24,000 entries are reserved for unicast MAC entries and 3,400 entries are reserved for IGMP groups.

Layer 2 Switching Adapter-FEX/VM-FEX Configuration Limits

Table 6 shows the configuration limits in topologies that include Cisco Nexus 5500 series adapter-FEX/VM-FEX configurations.

Table 6 Cisco NX-OS Release 5.1(3) Layer 2 Switching Adapter-FEX/VM-FEX Configuration Limits

Feature	Cisco Nexus 5500 Platform	
	Verified Topology[1]	Maximum Limits[2]
Number of VFCs over Virtual Ethernet Interfaces	40	40
Cisco Nexus 5500 number of Port Profiles	1000	1000
Cisco Nexus 5500 number of Virtual Machines concurrently VMOTIONed	5 VMs with 10 vNICs each	5 VMs with 10 vNICs each
Number of Virtual Ethernet Interfaces enabled with VNIC shaping	2000	2000
Number of Virtual Ethernet Interfaces configured with Untagged Cos	2000	2000
Server - Number of adapters per server	1	1
Server - Number of VNICs per server	50	96

1. Verified Topology—Indicates the verified scaling capabilities with all listed features enabled at the same time. The numbers listed here exceed that used by most customers in their topologies. The scale numbers listed here are not the maximum verified values if each feature is viewed in isolation.
2. Maximum Limits—Indicates the maximum scale capability tested for the corresponding feature individually. This number is the absolute maximum currently supported by Cisco NX-OS Release 5.0(3)N2(1) software for the corresponding feature. If the hardware is capable of a higher scale, future software releases may increase this maximum limit.

Layer 2 Switching Cisco TrustSec Configuration Limits

Table 7 shows the configuration limits in topologies that include Cisco Nexus 5500 series Cisco TrustSec (CTS) configurations.

Table 7 Cisco NX-OS Release 5.1(3) Layer 2 Switching CTS Configuration Limits

Feature	Cisco Nexus 5500 Platform	
	Verified Topology[1]	Maximum Limits[2]
Security Group Access Control List ACEs	128	128
Security Group Access Control List VLANs	100	100
Security Group Access Control List SGT/DGT permission list	100	100
Number of SXP Connections	4	4
Number of IPv4-SGT mapping	2000	2000
Maximum number of CTS interfaces	192	192

1. Verified Topology—Indicates the verified scaling capabilities with all listed features enabled at the same time. The numbers listed here exceed that used by most customers in their topologies. The scale numbers listed here are not the maximum verified values if each feature is viewed in isolation.
2. Maximum Limits—Indicates the maximum scale capability tested for the corresponding feature individually. This number is the absolute maximum currently supported by Cisco NX-OS Release 5.0(3)N2(1) software for the corresponding feature. If the hardware is capable of a higher scale, future software releases may increase this maximum limit.

Related Documentation

Documentation for Cisco Nexus 5000 Series Switches and Cisco Nexus 2000 Series Fabric Extenders is available at the following URL:

http://www.cisco.com/en/US/products/ps9670/tsd_products_support_series_home.html

The following are related Cisco Nexus 5000 Series and Cisco Nexus 2000 Series Fabric Extender documents:

Release Notes

Cisco Nexus 5000 Series and Cisco Nexus 2000 Series Release Notes

Cisco Nexus 5000 Series Switch Release Notes

Configuration Guides

Cisco Nexus 5000 Series Configuration Limits for Cisco NX-OS Release 5.0(3)N1(1)

Cisco Nexus 5000 Series Configuration Limits for Cisco NX-OS Release 5.0(2)N1(1)

Cisco Nexus 5000 Series Configuration Limits for Cisco NX-OS Release 4.2(1)N1(1) and Release 4.2(1)N2(1)

Cisco Nexus 5000 Series NX-OS Fibre Channel over Ethernet Configuration Guide

Cisco Nexus 5000 Series NX-OS Layer 2 Switching Configuration Guide

Cisco Nexus 5000 Series NX-OS Multicast Routing Configuration Guide

Cisco Nexus 5000 Series NX-OS Quality of Service Configuration Guide

Cisco Nexus 5000 Series NX-OS SAN Switching Configuration Guide

Cisco Nexus 5000 Series NX-OS Security Configuration Guide

Cisco Nexus 5000 Series NX-OS System Management Configuration Guide

Cisco Nexus 5000 Series NX-OS Unicast Routing Configuration Guide

Cisco Nexus 5000 Series Switch NX-OS Software Configuration Guide

Cisco Nexus 5000 Series Fabric Manager Configuration Guide, Release 3.4(1a)

Cisco Nexus 7000 Series NX-OS Fundamentals Configuration Guide, Release 6.x

Cisco Nexus 2000 Series Fabric Extender Software Configuration Guide

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Maintain and Operate Guides

Cisco Nexus 5000 Series NX-OS Operations Guide

Installation and Upgrade Guides

Cisco Nexus 5000 Series and Cisco Nexus 5500 Platform Hardware Installation Guide

Cisco Nexus 2000 Series Hardware Installation Guide

Cisco Nexus 5000 Series NX-OS Software Upgrade and Downgrade Guide, Release 4.2(1)N1(1)

Regulatory Compliance and Safety Information for the Cisco Nexus 5000 Series Switches and Cisco Nexus 2000 Series Fabric Extenders

Licensing Guide

Cisco NX-OS Licensing Guide

Command References

Cisco Nexus 5000 Series NX-OS FabricPath Command Reference

Cisco Nexus 5000 Series NX-OS Fabric Extender Command Reference

Cisco Nexus 5000 Series NX-OS Fibre Channel Command Reference

Cisco Nexus 5000 Series NX-OS Fundamentals Command Reference

Cisco Nexus 5000 Series NX-OS Layer 2 Interfaces Command Reference

Cisco Nexus 5000 Series NX-OS Multicast Routing Command Reference

Cisco Nexus 5000 Series NX-OS QoS Command Reference

Cisco Nexus 5000 Series NX-OS Security Command Reference

Cisco Nexus 5000 Series NX-OS System Management Command Reference

Cisco Nexus 5000 Series NX-OS TrustSec Command Reference

Cisco Nexus 5000 Series NX-OS Unicast Routing Command Reference

Cisco Nexus 5000 Series NX-OS vPC Command Reference

Technical References

Cisco Nexus 5000 Series and Cisco Nexus 2000 Series Fabric Extender MIBs Reference

Error and System Messages

Cisco Nexus 5000 Series NX-OS System Messages Reference

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Troubleshooting Guide

Cisco Nexus 5000 Troubleshooting Guide

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see *What's New in Cisco Product Documentation* at: http://www.cisco.com/c/en/us/td/docs/general/whatsnew/whatsnew.html.

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