# Cisco Nexus 3600 NX-OS Verified Scalability Guide, Release 70(3)I7(8)

# Introduction

This document describes the Cisco NX-OS configuration limits for the Cisco Nexus 3600 platform switch with N3K-C3636C-R and N3K-C36180YC-R line cards.

> **Note** All the limits are for the N3K-C36180YC-R TOR. The values specific to N3K-C3636C-R are indicated against the specific limit and the table.

The values that are provided in this guide should not be interpreted as theoretical system limits for Cisco Nexus 3600 platform hardware or the 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 Cisco NX-OS Release 7.0(3)I7(8). These limits are validated with a unidimensional configuration. The values provided in these tables focus on the scalability of one particular feature at a time.

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

*Table 1: Interfaces Verified Scalability Limits (Unidimensional)*

| Feature | Verified Limit |
|---|---|
| DHCP servers/relay IPs per switch | 5 (IPv4) + 5 (IPv6)[1] |
| Port channel member links | 32 |
| SVIs | 4,000 |
| vPCs | 48 |

[1] This limit has not been tested

*Table 2: Label Switching Verified Scalability Limits (Unidimensional)*

| Feature | Verified Limit |
|---|---|
| Forwarding Equivalence Classes (FECs) | 1,000 |
| Equal-cost multipaths (ECMPs) | 8 |
| FECs ECMPs | 4,000 |
| IAS option B labels | 450,000 |
| Layer 3 VPN routes | 450,000 |

| Feature | Verified Limit |
| --- | --- |
| ECMPs | 2,000 |

*Table 3: Layer 2 Switching Verified Scalability Limits (Unidimensional)*

| Feature | Verified Limit |
| --- | --- |
| MAC addresses | 192,000 |
| MST instances | 64 |
| MST virtual ports | 218,185 |
| RPVST virtual ports | 13,750 |
| VLANs | 3,967 |
| VLANs in RPVST mode | 250 |

*Table 4: Layer 3 Multicast Verified Scalability Limits (Unidimensional)*

| Feature | Verified Limit |
| --- | --- |
| IPv4 multicast routes | 32,000 (Layer 3) |
| Outgoing interfaces (OIFs) | 16 OIFs for 32K mroutes or 287 OIFs for 1000 mroutes |
| PIM neighbors | 500 |
| SVI | 50-60 |

*Table 5: Security Verified Scalability Limits (Unidimensional)*

| Feature | Verified Limit |
| --- | --- |
| IPv4 ingress access control entries (ACEs) | RACL-2000, PACL-1024 (without TCAM Carving) IPv4 52640 ACEs per system |
| IPv6 ingress access control entries (ACEs) | RACL-1000, PACL-1024 (without TCAM Carving) IPv6 25200 ACEs per system |

*Table 6: System Management Verified Scalability Limits (Unidimensional)*

| Feature | Verified Limit |
| --- | --- |
| **SPAN and ERSPAN** | |
| Configurable SPAN or ERSPAN sessions | 32 |
| Active SPAN or ERSPAN sessions | 32 |
| Active localized SPAN or ERSPAN session per line card | 32 sessions across ports on single line card |

| Feature | Verified Limit |
|---|---|
| Active localized SPAN or ERSPAN session (Rx and Tx, Rx, or Tx) | 32 sessions, 128 sources and 1 destination |
| Destination interfaces per SPAN session | 1 |
| Source VLANs per SPAN or ERSPAN | 6 |

*Table 7: Layer 3 Unicast Routing Verified Scalability Limits (Unidimensional)*

| Feature | Verified Limit |
|---|---|
| BFD sessions (echo mode) | 288 |
| BGP neighbors | 256 |
| HSRP groups | 498 |
| IPv4 ARP | 80,000 |
| IPv4 host routes | 750,000 |
| IPv6 host routes | 62,000 |
| IPv6 ND | 32,000 |
| IPv4 unicast routes (LPM) | 192,000 |
| IPv6 unicast routes (LPM) | 62,000 |
| OSPFv2 neighbors | 1,000 |
| OSPFv3 neighbors | 1,000 |
| OSPF/OSPFv3 LSA/LSDB size | 250,000 |
| OSPF/OSPFv3 areas | 15 |
| VRFs | 3,967 |
| **VRRP** | |
| VRRP groups per interface or I/O module | 15 |

*Table 8: HSRP Verified Scalability Limits (Unidimensional)*

| Feature | Verified Limit |
|---|---|
| Groups with default timers (3s/10s) and multiple group optimization. [There are 2 primary, one for IPv4 and the other for IPv6, and 7926 secondary] | 7,928 |

| Feature | Verified Limit |
|---|---|
| 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][2] | 7,928 |
| Groups per interface or I/0 module | Maximum 16 (Because 16 is the unique virtual MAC address limit) |
| HSRP groups | 8000 |

[2] If the user has Multi-protocol configuration, user should configure appropriate CoPP policies so as to avoid any control plane traffic drops.

# Verified Scalability Limits (Multidimensional)

The tables in this section list the verified scalability limits for Cisco NX-OS Release 7.0(3)I7(8). These limits are validated with a multidimensional configuration. The values provided in these tables focus on the scalability of one particular feature at a time.

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

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**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.

*Table 9: MSDC Profile Verified Scalability Limits (Multidimensional)*

| Feature | Verified Limit |
|---|---|
| Number of 100G ports | 6 |
| vPC port channels | 10 |
| ISIS IPv4 /32 unicast routes | 1,291 |
| ISIS IPv6 /128 unicast routes | 1,291 |
| Multicast IPv4 SSM | 10,000 |
| VRF IPv4/IPv6 | 100 |
| PIM neighbors | 100 |
| IGMP snooping database entries | 240 |
| VRRP IPv4 and IPv6 | 1,000 vlans |
| Multicast SSM | 10,000 |
| HSRP IPv4 and IPv6 | 1,000 VLANs |

| Feature | Verified Limit |
|---|---|
| SVI | 100 (N3K-C3636C-R) |
| Sub-interfaces | 100 (N3K-C3636C-R) |
| MAC | 1000 (N3K-C3636C-R) |
| BGP IPv4/IPv6 VLSM routes | 1000 (N3K-C3636C-R) |
| BGP IPv4/IPv6 Unicast routes | 10,000 (N3K-C3636C-R) |
| ECMP | 16-way Upstream (N3K-C3636C-R) |
| SPAN sessions | 1 local SPAN session (N3K-C3636C-R) |

*Table 10: MPLS Verified Scalability Limits (Multidimensional)*

| Feature | Verified Limit |
|---|---|
| MPLS L3VPN | 3,715 |
| VPE | 3,715 |
| PE nodes | Nil |
| PE routes | Nil |
| ACL (IPv4) | 1,100 |
| ACL (IPv6) | 440 |
| HSRP and IPv6 VIP | 3.715 each for v4 and v6 |
| vPC uRPF | Nil |
| Strict uRPF | Yes |
| VRF | 3,715 |
| SVI | 3,715 |
| Layer 3 VPN routes IP ECMP | <500 |
| MPLS LSR ECMP | <500 |
| VPN IPv4 routes | 65,000 |
| VPN IPv6 routes | 25,000 |
| EBGP neighbors | Nil |

*Table 11: L2/L3 TOR Boundary Verified Scalability Limits (Multidimensional)*

| Feature | Verified Limit |
|---|---|
| ECMP | 16-way (Upstream) |
| vPC port channels | 44 |
| OSPFv2 neighbors | 16 |
| OSPFv3 neighbors | 16 |
| OSPF IPv4 /32 unicast routes | 45,000 |
| OSPF IPv4 VLSM unicast routes | 1,000 |
| OSPF IPv6 /128 unicast routes | 25,000 |
| OSPF IPv6 VLSM unicast routes | 1,000 |
| BFD sessions | 230 |
| VLAN | 1,250 |
| SVI | 1,000<br>1250 (N3K-C3636C-R) |
| Sub-interfaces | 250 per interface and 500 across the system (N3K-C3636C-R) |
| VRRP v4 groups | 1,000 VRRS / 8 VRRPv3 |
| VRRP v6 groups | 1,000 VRRS / 8 VRRPv3 |
| PIM neighbors | 230 |
| IPv4 (*,G) multicast routes | 300 |
| IPv6 (S,G) multicast routes | 2,320 |
| IGMP snooping database entries | 6,300 |
| sFlow enabled interfaces | 63 |
| UDLD enabled interfaces | 65 |
| SPAN sessions | 1 local SPAN session |
| MVR VLANs | 250 |
| MVR receiver ports | 10 |
| MVR multicast groups | 1,000 |
| MAC | 20,000 (N3K-C3636C-R) |
| Q-in-Q tunnel ports | 26 |

| Feature | Verified Limit |
| --- | --- |
| RSTP VLANS (tunneled over L2PT) | 3,960 |

*Table 12: Layer 2/Layer 3 Spine Boundary (for N3K-C3636C-R) Verified Scalability Limits (Multidimensional)*

| Feature | Verified Limit |
| --- | --- |
| Number of 100G ports | 36 |
| Number of 10G/25 ports | 36 x 4 (Breakout) |
| ECMP | 16-way (Upstream) |
| vPC port channels | 40 |
| OSPFv2 neighbors | 100 |
| OSPFv3 neighbors | 100 |
| OSPF IPv4 /32 unicast routes | 45,000 |
| OSPF IPv4 VLSM unicast routes | 1,000 |
| OSPF IPv6 /128 unicast routes | 25,000 |
| OSPF IPv6 VLSM unicast routes | 1,000 |
| BFD sessions | 280 |
| VLAN | 3.967 |
| SVI | 3,967 |
| Sub-interfaces | 250 per interface and 511 across system |
| VRRP IPv4 groups | 1,996 VRRS / 4 VRRPv3 |
| VRRP IPv6 groups | 1,996 VRRS / 4 VRRPv3 |
| HSRP IPv4 | 1,743 Secondary Groups / 7 Primary Groups |
| HSRP IPv6 | 1,743 Secondary Groups / 7 Primary Groups |
| PIM neighbors | 230 |
| IPv4 (*,G) multicast routes | 2,000 |
| IPv6 (S,G) multicast routes | 30,000 |
| IGMP snooping database entries | 6,300 |
| Sflow enabled interfaces | 45 |
| UDLD enabled interfaces | 48 |

| Feature | Verified Limit |
|---|---|
| SPAN sessions | 1 local SPAN session |
| MAC | 50,000 |

*Table 13: Segment Routing Verified Scalability Limits (Multidimensional)*

| Feature | Verified Limit |
|---|---|
| LACP | 26 |
| LACP members | 1 or 4 |
| eBGP IPv6 neighbors | 25 |
| eBGP IPv4 LU neighbors | 24 |
| IPv4 (LU) routes | 1,537 |
| IPv4 (LU) paths | 6,987 |
| IPv6 routes | 1,486 |
| IPv6 paths | 6,915 |
| SR ECMP (maximum) | 18 |
| MPLS HW entries | 6,868 |

*Table 14: Segment Routing (for N3K-C3636C-R) Verified Scalability Limits (Multidimensional)*

| Feature | Verified Limit |
|---|---|
| VLAN | 100 |
| SVI | 100 |
| MAC entries | 10,000 |
| ARP entries | 70 |
| HSRPv4, HSRPv6 VIPs | 100, 100 |
| LACP | 3 |
| LACP members | 4 |
| eBGP IPv6 neighbors | 2 |
| eBGP IPv4 neihbors | 2 |
| IPv4 (LU) routes | 6,848 |
| IPv4 (LU) paths | 8,187 |

| Feature | Verified Limit |
| --- | --- |
| IPv6 routes | 6,640 |
| IPv6 paths | 7,975 |
| SR ECMP | 2 |
| MPLS HW entries | 2,682 |

*Table 15: VXLAN Profile Verified Scalability Limits (Multidimensional)*

| Feature | Verified Limit |
| --- | --- |
| Number of ports | 16 |
| ECMP | 8-way (Upstream) |
| BGP neighbors | 2 |
| BGP EVPN L2VPN host routes | 60,000 |
| BGP IPv4 VLSM unicast routes or ospf | 10,000 |
| BGP IPv6 VLSM unicast routes or ospf | 2,000 |
| BFD sessions | 10 |
| PIM neighbors | 10 |
| IPv4 (*,G) multicast routes (co-existing) | 4,000 |
| IPv4 (S,G) multicast routes (co-existing) | 2,000 |
| Layer 3 VNI | 100 |
| Layer 2 VNI | 400 |
| Local VTEP | 1 |
| Remote VTEPs | 205 |
| VLAN | 400 |
| SVI | 100 |
| MAC | 80,000 |
| vPC hosts | 1 |