Cisco Programmable Fabric with VXLAN BGP EVPN Verified Scalability Guide

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Preface

The Preface contains the following sections:

Audience

This publication is for experienced network administrators who configure and maintain Cisco Programmable Fabric.

Document Conventions

Command descriptions use the following 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.

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).

Convention	Description
[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.
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.

Related Documentation for Cisco Programmable Fabric

Software Downloads, Release, and General Information

Cisco Programmable Fabric Release Notes:

http://www.cisco.com/c/en/us/td/docs/switches/datacenter/pf/release_notes/programmable_fabric_rel_notes.html

Cisco DCNM Release Notes, Release 10:

http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/10_0_x/release_notes/b_dcnm_release_notes_10_0.html

Install and Upgrade Guides

Cisco DCNM 10 Installation Guide:

http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/10_0_x/installation/DCNM_Installation_Guide_10_0_x.html

Configuration Guides

Cisco Programmable Fabric Configuration Guide:

http://www.cisco.com/c/en/us/td/docs/switches/datacenter/pf/configuration/guide/b-pf-configuration.html

Cisco DCNM 10 Fundamentals Guide:

http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/10_0_x/fundamentals/DCNM_Fundamentals_10.html

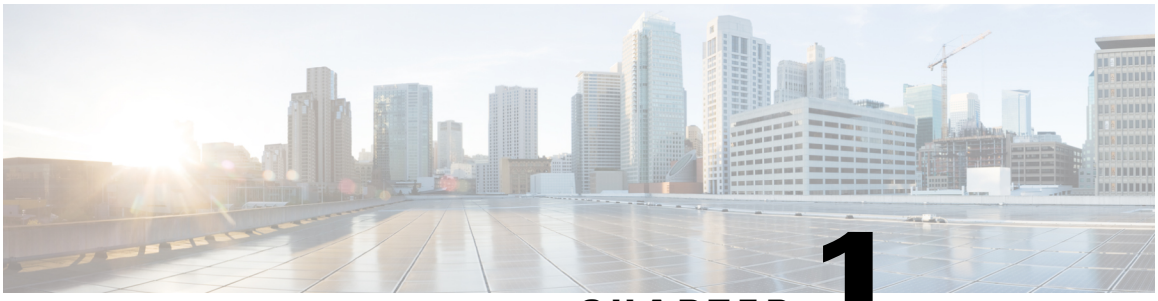
Cisco Nexus 1000V VDP Configuration Guide, Release 5.x:

http://www.cisco.com/c/en/us/support/switches/nexus-1000v-switch-vmware-vsphere/products-installation-and-configuration-guides-list.html

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/en/US/docs/general/whatsnew/whatsnew.html.

Subscribe to *What's New in Cisco Product Documentation*, which lists all new and revised Cisco technical documentation, as an RSS feed and deliver content directly to your desktop using a reader application. The RSS feeds are a free service.



CHAPTER 1

Verified Scalability for Cisco Programmable Fabric with VXLAN BGP EVPN

This chapter contains the following sections:

Overview of Verified Scalability

This document lists the verified scalability limits for Cisco Programmable Fabric with virtual extensible LAN (VXLAN) Border Gateway Protocol Ethernet VPN (BGP EVPN).

In the tables provided in this topic, the Verified Limit column lists the verified scaling capabilities, with all the listed features enabled at the same time. The numbers listed here exceed those 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.

The scale numbers in the table are the absolute maximum values that are supported by Cisco NX-OS release software for VXLAN with BGP EVPN control plane.

For information about the list of verified maximum scale capabilities tested for the corresponding features individually, refer to the respective Cisco Nexus 5600 Switches, Cisco Nexus 7000 Series Switches, Cisco Nexus 7700 Switches, and Cisco Nexus 9000 Series Switches scalability guides.

Note The scale numbers for the Cisco Nexus 9000 Series Switches as part of Cisco Programmable Fabric will be available in a subsequent release of the Verified Scalability Guide.

Verified System-Level Scalability

This table lists the verified system-level scalability for Cisco Programmable Fabric with VXLAN BGP EVPN deployment.

Table 1: Verified System-Level Scalability for Cisco Programmable Fabric

Feature	Cisco Nexus 9300 Series Verified Limit	Cisco Nexus 5600 Series Verified Limit	Cisco Nexus 7000 Series and Cisco Nexus 7700 Verified Limit
Super Spine	2 (Cisco Nexus 7000 Series switches)	2	2
Spine	8 (Cisco Nexus 7000 Series switches)	8	8
Leaf	252	252	252
Route Reflector	2	2	2
Rendezvous Points	2	2	2
VTEP[1]	256	256	256
VRF (Layer-3) VNI	12,000	12,000	12,000
Layer-2 VNI	200,000	200,000	200,000
BGP EVPN Prefix	512,000	512,000	512,000

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- VXLAN tunnel endpoint (VTEP) numbers include leaf, border leaf, and border spine.
- VPC is counted as a single VTEP.

Verified Scalability for Leaf Switch

This table lists the verified scalability for a leaf switch in a Cisco Programmable Fabric with VXLAN BGP EVPN deployment.

Table 2: Verified Scalability for Cisco Programmable Fabric Leaf Switch

Feature	Cisco Nexus 9300 Series Verified Limit	Cisco Nexus 5600 and Cisco Nexus 2000[2] Series Verified Limit	Cisco Nexus 7000 Series, Cisco Nexus 7700 and Cisco Nexus 2000 Series Verified Limit
VNI [3]	Layer-3 (752) + Layer-2 (1000) , Layer-3 (100) + Layer-2 (500)	Layer-3 (250) + Layer-2 (1250), Layer-3 (500) + Layer-2 (1000)	Layer-3 (600) + Layer-2 (1000), Layer-3 (100) + Layer-2 (500)
IPV4 Routes	32,000	24,000	20,000[4]
IPV6 Routes	8,000	12,000	6000
MAC Address	40,000	36,000	26,000
vPC - HIF	44 Switch vPC	44 Switch vPC / 110 FEX HIF vPC	44 Switch vPC / 110 FEX HIF vPC
FEX	Not Applicable	24	30
Overlay Multicast Sources	300	1250	200
L2 Multicast Receivers IGMP Snooping	Not Applicable	Not Applicable[5]	1250
Equal-Cost Multipath (ECMP) Routing	8	8	8
Multicast routes - Underlay	128	250	600

2 Cisco Nexus 2200 and Cisco Nexus 2300 fabric extender models were used for verification. The scale numbers are independent of fabric extender usage.
3 These are tested profiles, reflective of potential customer deployments.
4 Cisco Nexus 7000 Series and Cisco Nexus 7700 F3 module supports 64,000 total TCAM lines that can be divided between IPv4 (1 TCAM line) and IPv6 (2 TCAM lines).
5 VXLAN extended VLANs are exempt from IGMP snooping. (IGMP snooping is disabled.)

Verified Scalability for Border Leaf Switch

This table lists the verified scalability for a border leaf switch in a Cisco Programmable Fabric with VXLAN BGP EVPN deployment.

Table 3: Verified Scalability for Cisco Programmable Fabric Border Leaf Switch

Feature	Cisco Nexus 5600 Verified Limit	Cisco Nexus 7000 Series and Cisco Nexus 7700 Verified Limit
VRF	800	1000[6]
VNI [7]	Layer-3 (200), Layer-2 ext (1000) / Layer-3 (750), Layer-2 ext (750)	Layer-3 (1000), Layer-2 ext (600)
IPV4 Routes	24,000	32,000
IPV6 Routes	8000	8000
Multicast Groups	800	1000
eBGP Neighbors	500	1000
Subinterfaces	500	1000

6 All VRFs can be extended with MPLS Layer-3 VPN (border PE).

7 These are tested profiles, reflective of potential customer deployments.