



# Configuring a VXLANv6 Fabric

This chapter describes how to configure a VXLAN fabric with IPv6 underlay.

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- [Creating a VXLAN Fabric with IPv6 Underlay, on page 2](#)

## Overview

From Cisco DCNM Release 11.3(1), you can create an Easy fabric with IPv6 only underlay. The IPv6 underlay is supported only for the **Easy\_Fabric\_11\_1** template. In the IPv6 underlay fabric, intra-fabric links, routing loopback, vPC peer link SVI, and NVE loopback interface for VTEP are configured with IPv6 addresses. EVPN BGP neighbor peering is also established using IPv6 addressing.

The following guidelines are applicable for IPv6 underlay:

- IPv6 underlay is supported for the Cisco Nexus 9000 Series switches with Cisco NX-OS Release 9.3(1) or higher.
- VXLANv6 is only supported Cisco Nexus 9332C, Cisco Nexus C9364C, and Cisco Nexus modules that end with EX, FX, FX2, FX3, or FXP.



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**Note** VXLANv6 is defined as a VXLAN fabric with IPv6 underlay.

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- In VXLANv6, the platforms supported on spine are all Nexus 9000 Series and Nexus 3000 Series platforms.
- The overlay routing protocol supported for the IPv6 fabric is BGP EVPN.
- vPC with physical multichassis EtherChannel trunk (MCT) feature is supported for the IPv6 underlay network in DCNM. The vPC peer keep-alive can be loopback or management with IPv4 or IPv6 address.
- Brownfield migration is supported for the VXLANv6 fabrics. Note that L3 vPC keep-alive using IPv6 address is not supported for brownfield migration. This vPC configuration is deleted after the migration. However, L3 vPC keep-alive using IPv4 address is supported.
- DHCPv6 is supported for the IPv6 underlay network.
- The following features are not supported for VXLAN IPv6 underlay:

- Multicast underlay
- Tenant Routed Multicast (TRM)
- ISIS, OSPF, and BGP authentication
- VXLAN Multi-Site
- Dual stack underlay
- vPC Fabric Peering
- DCI SR-MPLS or MPLS-LDP handoff
- BFD
- Super Spine switch roles
- NGOAM

## Creating a VXLAN Fabric with IPv6 Underlay

This procedure shows how to create a VXLAN BGP EVPN fabric with IPv6 underlay. Only the fields for creating a VXLAN fabric with IPv6 underlay are documented. For information about the remaining fields, see [Creating a New VXLAN BGP EVPN Fabric](#).

### Procedure

**Step 1** Navigate to **Control > Fabric Builder**.

**Step 2** In the **Fabric Builder** window, click **Create Fabric**.

The **Add Fabric** window appears.

- **Fabric Name** - Enter the name of the fabric.
- **Fabric Template** - From the drop-down list, choose the **Easy\_Fabric\_11\_1** fabric template.

**Step 3** Enter the relevant values under the **General** tab.

General	Replication	vPC	Protocols	Advanced	Resources	Manageability	Bootstrap	Configuration Backup
* BGP ASN <input type="text"/> ? 1-4294967295   1-65535[0-65535]								
Enable IPv6 Underlay <input checked="" type="checkbox"/> ?								
Enable IPv6 Link-Local Address <input checked="" type="checkbox"/> ?								
Fabric Interface Numbering <input type="text"/> ? Numbered(Point-to-Point) or Unnumbered								
Underlay Subnet IP Mask <input type="text"/> ? Mask for Underlay Subnet IP Range								
Underlay Subnet IPv6 Mask <input type="text"/> ? Mask for Underlay Subnet IPv6 Range								
* Link-State Routing Protocol <input type="text"/> ? Supported routing protocols (OSPF/IS-IS)								
* Route-Reflectors <input type="text"/> ? Number of spines acting as Route-Reflectors								
* Anycast Gateway MAC <input type="text"/> ? Shared MAC address for all leaves (xxxx.xxxx.xxxx)								
NX-OS Software Image Version <input type="text"/> ? If Set, Image Version Check Enforced On All Switches. Images Can Be Uploaded From Control:Image Upload								

**BGP ASN:** Enter the BGP AS number for the fabric. You can enter either the 2 byte BGP ASN or 4 byte BGP ASN.

**Enable IPv6 Underlay:** Select this check box to enable the IPv6 underlay feature.

**Enable Link-Local Address:** Select this check box to use the link local addresses in the fabric between leaf-spine and spine-border interfaces. If you select this check box, the **Underlay Subnet IPv6 Mask** field is not editable. By default, the **Enable Link-Local Address** field is enabled.

IPv6 underlay supports only the **p2p** networks. Therefore, the **Fabric Interface Numbering** drop-down list field is disabled.

**Underlay Subnet IPv6 Mask:** Specifies the subnet mask for the fabric interface IPv6 addresses.

**Link-State Routing Protocol:** The IGP used in the fabric, that is, OSPFv3 or IS-IS for VXLANv6.

**Step 4** Click the **Replication** tab.

IPv6 underlay supports only the ingress replication mode.

All the fields under this tab are disabled.

**Step 5** Click the **vPC** tab.

General	Replication	vPC	Protocols	Advanced	Resources	Manageability	Bootstrap	Configuration Backup
		* vPC Peer Link VLAN	3600					VLAN for vPC Peer Link SVI (Min:2, Max:3967)
		* vPC Peer Keep Alive option	management					Use vPC Peer Keep Alive with Loopback or Management
		* vPC Auto Recovery Time (In Seconds)	360					(Min:240, Max:3600)
		* vPC Delay Restore Time (In Seconds)	150					(Min:1, Max:3600)
		vPC Peer Link Port Channel ID	500					(Min:1, Max:4096)
		vPC IPv6 ND Synchronize	<input checked="" type="checkbox"/>					Enable IPv6 ND synchronization between vPC peers
		vPC advertise-pip	<input type="checkbox"/>					For Primary VTEP IP Advertisement As Next-Hop Of Prefix Routes
		Enable the same vPC Domain Id for all vPC Pairs	<input type="checkbox"/>					(Not Recommended)
		vPC Domain Id						vPC Domain Id to be used on all vPC pairs

**vPC Peer Keep Alive option** – Choose the management or loopback option. If you want to use IP addresses assigned to the management port and the management VRF, choose management. If you use IP addresses assigned to loopback interfaces (and a non-management VRF), choose loopback. Both the options are supported for IPv6 underlay.

**Step 6** Click the **Protocols** tab.

General	Replication	vPC	Protocols	Advanced	Resources	Manageability	Bootstrap	Configuration Backup
* Underlay Routing Loopback Id		<input type="text" value="0"/>		?		(Min:0, Max:1023)		
* Underlay VTEP Loopback Id		<input type="text" value="1"/>		?		(Min:0, Max:1023)		
* Underlay Anycast Loopback Id		<input type="text" value="10"/>		?		Used for vPC Peering in VXLANv6 Fabrics (Min:0, Max:1023)		
* Link-State Routing Protocol Tag		<input type="text" value="UNDERLAY"/>		?		Routing Process Tag (Max Size 20)		
* OSPF Area Id		<input type="text" value="0.0.0.0"/>		?		OSPF Area Id in IP address format		
Enable OSPF Authentication		<input type="checkbox"/>		?				
OSPF Authentication Key ID		<input type="text"/>		?		(Min:0, Max:255)		
OSPF Authentication Key		<input type="text"/>		?		3DES Encrypted		
IS-IS Level		<input type="text"/>		?		Supported IS types: level-1, level-2		
Enable IS-IS Authentication		<input type="checkbox"/>		?				
IS-IS Authentication Keychain Name		<input type="text"/>		?				
IS-IS Authentication Key ID		<input type="text"/>		?		(Min:0, Max:65535)		
IS-IS Authentication Key		<input type="text"/>		?		Cisco Type 7 Encrypted		
Enable BGP Authentication		<input type="checkbox"/>		?				
BGP Authentication Key Encryption Type		<input type="text"/>		?		BGP Key Encryption Type: 3 - 3DES, 7 - Cisco		
BGP Authentication Key		<input type="text"/>		?		Encrypted BGP Authentication Key based on type		

**Underlay Anycast Loopback Id:** Specifies the underlay anycast loopback ID for IPv6 underlay. Since an IPv6 address cannot be configured as secondary, an additional loopback interface is allocated on each vPC device. Its IPv6 address will be used as the VIP.

### Step 7

Click the **Resources** tab.

General	Replication	vPC	Protocols	Advanced	Resources	Manageability	Bootstrap	Configuration Backup
Manual Underlay IP Address Allocation		<input type="checkbox"/>		?		Checking this will disable Dynamic Underlay IP Address Allocations		
Underlay Routing Loopback IP Range		<input type="text"/>		?		Typically Loopback0 IP Address Range		
Underlay VTEP Loopback IP Range		<input type="text"/>		?		Typically Loopback1 IP Address Range		
Underlay RP Loopback IP Range		<input type="text"/>		?		Anycast or Phantom RP IP Address Range		
Underlay Subnet IP Range		<input type="text"/>		?		Address range to assign Numbered and Peer Link SVI IPs		
Underlay MPLS Loopback IP Range		<input type="text"/>		?		Used for VXLAN to MPLS SR/LDP Handoff		
* Underlay Routing Loopback IPv6 Range		<input type="text" value="fd00::a02:0/119"/>		?		Typically Loopback0 IPv6 Address Range		
* Underlay VTEP Loopback IPv6 Range		<input type="text" value="fd00::a03:0/118"/>		?		Typically Loopback1 and Anycast Loopback IPv6 Address Range		
Underlay Subnet IPv6 Range		<input type="text"/>		?		IPv6 Address range to assign Numbered and Peer Link SVI IPs		
* BGP Router ID Range for IPv6 Underlay		<input type="text" value="10.2.0.0/23"/>		?				
* Layer 2 VXLAN VNI Range		<input type="text" value="30000-49000"/>		?		Overlay Network Identifier Range (Min:1, Max:16777214)		
* Layer 3 VXLAN VNI Range		<input type="text" value="50000-59000"/>		?		Overlay VRF Identifier Range (Min:1, Max:16777214)		
* Network VLAN Range		<input type="text" value="2300-2999"/>		?		Per Switch Overlay Network VLAN Range (Min:2, Max:3967)		
* VRF VLAN Range		<input type="text" value="2000-2299"/>		?		Per Switch Overlay VRF VLAN Range (Min:2, Max:3967)		
* Subinterface Dot1q Range		<input type="text" value="2-511"/>		?		Per Border Dot1q Range For VRF Lite Connectivity (Min:2, Max:4093)		

**Manual Underlay IP Address Allocation:** Select this check box to manually allocate underlay IP addresses. The dynamic underlay IP addresses fields are disabled.

**Underlay Routing Loopback IPv6 Range:** Specifies loopback IPv6 addresses for the protocol peering.

**Underlay VTEP Loopback IPv6 Range:** Specifies loopback IPv6 addresses for VTEPs. The IPv6 address for anycast will be assigned from this range.

**Underlay Subnet IPv6 Range:** Specifies the IPv6 address range that is used for assigning IP addresses for numbered and peer link SVIs. To edit this field, you need to unselect the **Enable Link-Local Address** check box under the **General** tab.

**Underlay BGP Router ID Range:** Specifies the address range to assign the BGP Router IDs.

**Step 8** Click the **Bootstrap** tab.

The screenshot displays the 'Bootstrap' configuration tab. It includes the following elements:

- Enable Bootstrap:** Checked. Help text: Automatic IP Assignment For POAP.
- Enable Local DHCP Server:** Checked. Help text: Automatic IP Assignment For POAP From Local DHCP Server.
- DHCP Version:** Dropdown menu set to 'DHCPv6'.
- DHCP Scope Start Address:** Input field. Help text: Start Address For Switch Out-of-Band POAP.
- DHCP Scope End Address:** Input field. Help text: End Address For Switch Out-of-Band POAP.
- Switch Mgmt Default Gateway:** Input field. Help text: Default Gateway For Management VRF On The Switch.
- Switch Mgmt IP Subnet Prefix:** Input field (disabled). Help text: (Min:8, Max:30).
- Switch Mgmt IPv6 Subnet Prefix:** Input field (disabled) with value '64'. Help text: (Min:64, Max:126).
- Enable AAA Config:** Unchecked. Help text: Include AAA configs from Manageability tab during device bootstrap.
- Bootstrap Freeform Config:** A large text area for custom configuration.
- Note:** A warning icon and text: 'Note ! All configs sh strictly match 'show run' c with respect to case and Any mismatches will yield unexpected diffs during a'.
- Buttons:** 'Save' and 'Cancel' buttons at the bottom right.

**DHCP Version** – Select DHCPv4 or DHCPv6 from this drop-down list. When you select DHCPv4, the **Switch Mgmt IPv6 Subnet Prefix** field is disabled. If you select DHCPv6, the **Switch Mgmt IP Subnet Prefix** is disabled.

**Switch Mgmt IPv6 Subnet Prefix** - Specifies the IPv6 prefix for the Mgmt0 interface on the switch. The prefix can be between 64 and 126. This field is editable if you enable IPv6 for DHCP.

For information about the remaining tabs and fields, see [Creating a New VXLAN BGP EVPN Fabric](#).

## What to do next

[Adding Switches to a Fabric](#)

