



Service Redirection in VXLAN Fabrics

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Service Redirection in VXLAN EVPN Fabrics

Today, insertion of service appliances (also referred to as service nodes or service endpoints) such as firewalls, load-balancers, etc are needed to secure and optimize applications within a data center. This section describes the Layer 4-Layer 7 service insertion and redirection features offered on VXLAN EVPN fabrics that provides sophisticated mechanisms to onboard and selectively redirect traffic to these services.

Guidelines and Limitations for Policy-Based Redirect

The following guidelines and limitations apply to PBR over VXLAN.

- The following platforms support PBR over VXLAN:
 - Cisco Nexus 9332C and 9364C switches
 - Cisco Nexus 9300-EX switches
 - Cisco Nexus 9300-FX/FX2/FX3 switches
 - Cisco Nexus 9300-GX switches
 - Cisco Nexus 9504 and 9508 switches with -EX/FX line cards
- PBR over VXLAN doesn't support the following features: VTEP ECMP, and the **load-share** keyword in the **set {ip | ipv6} next-hop ip-address** command.
- When you configure **bestpath as-path multipath-relax**, BGP installs all the multi-paths for IPv4 as best-path in URIB with least metric available among the paths.

- When you configure **bestpath as-path multipath-relax**, BGP doesn't install all the multi-paths for IPv6 as best-path in U6RIB. It will still have the individual metric available for those paths.

Enabling the Policy-Based Redirect Feature

To configure basic PBR, in cases where the advanced (and recommended) ePBR functions are not deployed, see the following sections:

- [Enabling the Policy-Based Redirect Feature, on page 2](#)
- [Configuring a Route Policy, on page 3](#)
- [Verifying the Policy-Based Redirect Configuration, on page 4](#)
- [Configuration Example for Policy-Based Redirect, on page 4](#)

Before you begin

Enable the policy-based redirect feature before you can configure a route policy.

SUMMARY STEPS

1. **configure terminal**
2. **[no] feature pbr**
3. (Optional) **show feature**
4. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: <code>switch# configure terminal</code>	Enters global configuration mode.
Step 2	[no] feature pbr Example: <code>switch(config)# feature pbr</code>	Enables the policy-based routing feature.
Step 3	(Optional) show feature Example: <code>switch(config)# show feature</code>	Displays enabled and disabled features.
Step 4	(Optional) copy running-config startup-config Example: <code>switch(config)# copy running-config startup-config</code>	Saves this configuration change.

Configuring a Route Policy

You can use route maps in policy-based routing to assign routing policies to the inbound interface. Cisco NX-OS routes the packets when it finds a next hop and an interface.



Note The switch has a RACL TCAM region by default for IPv4 traffic.

Before you begin

Configure the RACL TCAM region (using TCAM carving) before you apply the policy-based routing policy. For instructions, see the “Configuring ACL TCAM Region Sizes” section in the [Cisco Nexus 9000 Series NX-OS Security Configuration Guide, Release 9.2\(x\)](#).

SUMMARY STEPS

1. **configure terminal**
2. **interface** *type slot/port*
3. **{ip | ipv6} policy route-map** *map-name*
4. **route-map** *map-name* **[permit | deny]** *[seq]*
5. **match {ip | ipv6} address** **access-list-name** *name* *[name...]*
6. **set ip next-hop** *address1*
7. **set ipv6 next-hop** *address1*
8. (Optional) **set interface** **null0**
9. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: <code>switch# configure terminal</code>	Enters global configuration mode.
Step 2	interface <i>type slot/port</i> Example: <code>switch(config)# interface ethernet 1/2</code>	Enters interface configuration mode.
Step 3	{ip ipv6} policy route-map <i>map-name</i> Example: <code>switch(config-if)# ip policy route-map Testmap</code>	Assigns a route map for IPv4 or IPv6 policy-based routing to the interface.

	Command or Action	Purpose
Step 4	route-map <i>map-name</i> [permit deny] [<i>seq</i>] Example: <code>switch(config-inf) # route-map Testmap</code>	Creates a route map or enters route-map configuration mode for an existing route map. Use <i>seq</i> to order the entries in a route map.
Step 5	match { ip ipv6 } address <i>access-list-name name</i> [<i>name...</i>] Example: <code>switch(config-route-map) # match ip address access-list-name ACL1</code>	Matches an IPv4 or IPv6 address against one or more IPv4 or IPv6 access control lists (ACLs). This command is used for policy-based routing and is ignored by route filtering or redistribution.
Step 6	set ip next-hop <i>address1</i> Example: <code>switch(config-route-map) # set ip next-hop 192.0.2.1</code>	Sets the IPv4 next-hop address for policy-based routing.
Step 7	set ipv6 next-hop <i>address1</i> Example: <code>switch(config-route-map) # set ipv6 next-hop 2001:0DB8::1</code>	Sets the IPv6 next-hop address for policy-based routing.
Step 8	(Optional) set interface null0 Example: <code>switch(config-route-map) # set interface null0</code>	Sets the interface that is used for routing. Use the null0 interface to drop packets.
Step 9	(Optional) copy running-config startup-config Example: <code>switch(config-route-map) # copy running-config startup-config</code>	Saves this configuration change.

Verifying the Policy-Based Redirect Configuration

To display the policy-based redirect configuration information, perform one of the following tasks:

Command	Purpose
show [ip ipv6] policy [<i>name</i>]	Displays information about an IPv4 or IPv6 policy.
show route-map [<i>name</i>] pbr-statistics	Displays policy statistics.

Use the **route-map** *map-name* **pbr-statistics** command to enable policy statistics. Use the **clear route-map** *map-name* **pbr-statistics** command to clear these policy statistics.

Configuration Example for Policy-Based Redirect

Perform the following configuration on all tenant VTEPs, excluding the service VTEP.

```

feature pbr

ipv6 access-list IPV6_App_group_1
10 permit ipv6 any 2001:10:1:1::0/64

ip access-list IPV4_App_group_1
10 permit ip any 10.1.1.0/24

ipv6 access-list IPV6_App_group_2
10 permit ipv6 any 2001:20:1:1::0/64

ip access-list IPV4_App_group_2
10 permit ip any 20.1.1.0/24

route-map IPV6_PBR_Appgroup1 permit 10
  match ipv6 address IPV6_App_group_2
  set ipv6 next-hop 2001:100:1:1::20 (next hop is that of the firewall)

route-map IPV4_PBR_Appgroup1 permit 10
  match ip address IPV4_App_group_2
  set ip next-hop 10.100.1.20 (next hop is that of the firewall)

route-map IPV6_PBR_Appgroup2 permit 10
  match ipv6 address IPV6_App_group_1
  set ipv6 next-hop 2001:100:1:1::20 (next hop is that of the firewall)

route-map IPV4_PBR_Appgroup2 permit 10
  match ip address IPV4_App_group_1
  set ip next-hop 10.100.1.20 (next hop is that of the firewall)

interface Vlan10
! tenant SVI appgroup 1
vrf member appgroup
  ip address 10.1.1.1/24
  no ip redirect
  ipv6 address 2001:10:1:1::1/64
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
ip policy route-map IPV4_PBR_Appgroup1
ipv6 policy route-map IPV6_PBR_Appgroup1
interface Vlan20
! tenant SVI appgroup 2
vrf member appgroup
  ip address 20.1.1.1/24
  no ip redirect
  ipv6 address 2001:20:1:1::1/64
  no ipv6 redirects
  fabric forwarding mode anycast-gateway
ip policy route-map IPV4_PBR_Appgroup2
ipv6 policy route-map IPV6_PBR_Appgroup2

```

On the service VTEP, the PBR policy is applied on the tenant VRF SVI. This ensures the traffic post decapsulation will be redirected to firewall.

```

feature pbr

ipv6 access-list IPV6_App_group_1
10 permit ipv6 any 2001:10:1:1::0/64

ip access-list IPV4_App_group_1
10 permit ip any 10.1.1.0/24

ipv6 access-list IPV6_App_group_2
10 permit ipv6 any 2001:20:1:1::0/64

```

```
ip access-list IPV4_App_group_2
10 permit ip any 20.1.1.0/24

route-map IPV6_PBR_Appgroup1 permit 10
  match ipv6 address IPV6_App_group_2
  set ipv6 next-hop 2001:100:1:1::20 (next hop is that of the firewall)

route-map IPV6_PBR_Appgroup permit 20
  match ipv6 address IPV6_App_group1
  set ipv6 next-hop 2001:100:1:1::20 (next hop is that of the firewall)

route-map IPV4_PBR_Appgroup permit 10
  match ip address IPV4_App_group_2
  set ip next-hop 10.100.1.20 (next hop is that of the firewall)

route-map IPV4_PBR_Appgroup permit 20
  match ip address IPV4_App_group_1
  set ip next-hop 10.100.1.20 (next hop is that of the firewall)

interface vlan1000
!L3VNI SVI for Tenant VRF
vrf member appgroup
ip forward
ipv6 forward
ipv6 ipv6 address use-link-local-only
ip policy route-map IPV4_PBR_Appgroup
ipv6 policy route-map IPV6_PBR_Appgroup
```