Configuring Policy-Based Redirect

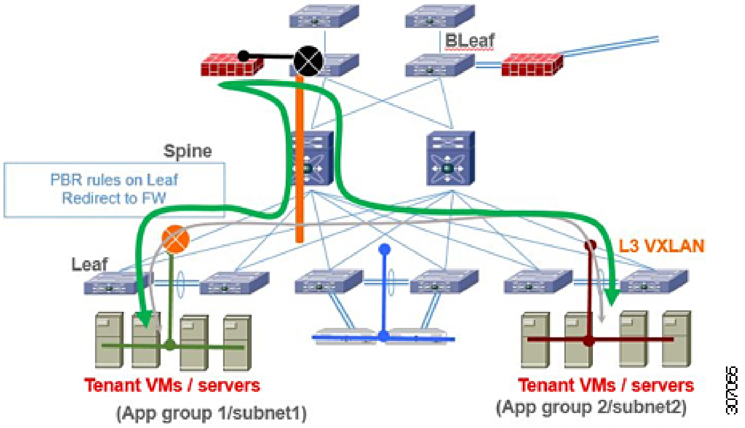
This chapter contains the following sections:

About Policy-Based Redirect

Policy-based redirect (PBR) provides a mechanism to bypass a routing table lookup and redirect traffic to a next-hop IP reachable over VXLAN. The feature enables service redirection to Layer 4-Layer 7 devices such as firewalls and load balancers.

PBR involves configuring a route-map with rules that dictate where traffic must be forwarded. The route map is applied on the tenant SVI to influence traffic coming from the host-facing interfaces to a next hop reachable via the fabric.

In scenarios where traffic is coming to a VTEP from the overlay and needs to be redirected to another next hop, the PBR policy must be applied on the fabric facing L3VNI SVI.



In the previous figure, communication between App group 1 and App group 2 takes place via inter-VLAN/VNI routing in the tenant VRF by default. If there is a requirement where traffic from App group 1 to App group 2 has to go through a firewall, a PBR policy can be used to redirect traffic. The following configuration snippet provides the necessary configuration that redirects the traffic flow

For more information on PBR, see PBR on NX-OS.

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 platform switches
  - Cisco Nexus 9300-EX platform switches
  - Cisco Nexus 9300-FX/FX2/FX3 platform switches
  - Cisco Nexus 9300-GX platform switches
  - Cisco Nexus 9504 and 9508 platform switches with -EX/FX line cards
- Beginning with Cisco NX-OS Release 10.2(3), PBR over VXLAN is supported on the Cisco Nexus 9300-GX2 platform switches.
- Beginning with Cisco NX-OS Release 10.2(3), the VXLAN PBR feature is supported with VXLANv6 on all TOR switches.
- PBR over VXLAN doesn't support the following features: IP SLAs, VTEP ECMP, and the **load-share** keyword in the **set {ip | ipv6} next-hop** *ip-address* command.

Enabling the Policy-Based Redirect Feature

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

	Command or Action	Purpose
Step 1	**configure terminal** **Example:**	Enters global configuration mode.

	Command or Action	Purpose
	switch# **configure terminal**	
Step 2	**[no] feature pbr** **Example:** switch(config)# **feature pbr**	Enables the policy-based routing feature.
Step 3	(Optional) **show feature** **Example:** switch(config)# **show feature**	Displays enabled and disabled features.
Step 4	(Optional) **copy running-config startup-config** **Example:** switch(config)# **copy running-config startup-config**	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

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `switch# configure terminal`	Enters global configuration mode.
Step 2	**interface** *type slot/port* **Example:** `switch(config)# interface ethernet 1/2`	Enters interface configuration mode.
Step 3	**{ip | ipv6} policy route-map** *map-name* **Example:** `switch(config-inf)# ip policy route-map Testmap`	Assigns a route map for IPv4 or IPv6 policy-based routing to the interface.
Step 4	**route-map** *map-name* **[permit | deny]** [*seq*] **Example:** `switch(config-inf)# route-map Testmap`	Creates a route map or enters route-map configuration mode for an existing route map. Use *seq* to order the entries in a route map.
Step 5	**match {ip | ipv6} address access-list-name** *name* [*name...*] **Example:** `switch(config-route-map)# match ip address access-list-name ACL1`	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** *address1* **Example:** `switch(config-route-map)# set ip next-hop 192.0.2.1`	Sets the IPv4 next-hop address for policy-based routing.
Step 7	**set ipv6 next-hop** *address1* **Example:** `switch(config-route-map)# set ipv6 next-hop 2001:0DB8::1`	Sets the IPv6 next-hop address for policy-based routing.
Step 8	(Optional) **set interface null0** **Example:** `switch(config-route-map)# set interface null0`	Sets the interface that is used for routing. Use the **null0** interface to drop packets.
Step 9	(Optional) **copy running-config startup-config** **Example:** `switch(config-route-map)# copy running-config startup-config`	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 [*name*]	Displays information about an IPv4 or IPv6 policy.
show route-map [*name*] **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_group1
  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
```