



# Policy-Based Routing



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**Note** This feature is not applicable on the Cisco RSP3 module.

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The Policy-Based Routing feature is a process whereby a device puts packets through a route map before routing the packets. The route map determines which packets are routed next to which device. Policy-based routing is a more flexible mechanism for routing packets than destination routing.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <https://cfng.cisco.com/>. An account on Cisco.com is not required.

## Information About Policy-Based Routing

### Policy-Based Routing

Policy-based routing is a process whereby the device puts packets through a route map before routing them. The route map determines which packets are routed next to which device. You might enable policy-based routing if you want certain packets to be routed in a certain way other than the obvious shortest path. Possible applications for policy-based routing are to provide equal access, protocol-sensitive routing, source-sensitive

routing, routing based on interactive versus batch traffic, and routing based on dedicated links. Policy-based routing is a more flexible mechanism for routing packets than destination routing.

To enable policy-based routing, you must identify which route map to use for policy-based routing and create the route map. The route map itself specifies the match criteria and the resulting action if all of the match clauses are met.

To enable policy-based routing on an interface, indicate which route map the device should use by using the **ip policy route-map** *map-tag* command in interface configuration mode. A packet arriving on the specified interface is subject to policy-based routing except when its destination IP address is the same as the IP address of the device's interface. This **ip policy route-map** command disables fast switching of all packets arriving on this interface.

To define the route map to be used for policy-based routing, use the **route-map** *map-tag* [**permit**] [*sequence-number*] global configuration command.

To define the criteria by which packets are examined to learn if they will be policy-based routed, use the **match ip address** {*access-list-number* | *access-list-name*} command or both in route map configuration mode. No match clause in the route map indicates no packet match.

To display the cache entries in the policy route cache, use the **show ip cache policy** command.




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**Note** PBR is supported only in a video template.

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## Restrictions for Policy-Based Routing

- The following command is not supported:

```
ip local policy route-map <route-map_name>
```




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**Note** Local Policy based routing is not supported.

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- The following ACL statement is not supported:

```
permit ip any any
```




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**Note** Use a specific prefix match for policy-based routing to work.

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- The router does not support deny access control entries (ACE) in the access-lists when configured under route maps.
- If there is no match criteria in the route map, the traffic cannot be enabled for policy-based routing.

# How to Configure Policy-Based Routing

## Configuring Policy-Based Routing

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>sdm prefer video</b> <b>Example:</b> Router(config)#sdm prefer video	Configures the video mode. <b>Note</b> This requires a reload of the system. The configuration of the following steps will only be effective after the SDM template is changed to video template.
<b>Step 4</b>	<b>ip access-list extended &lt;name&gt;</b> <b>Example:</b> Router(config)#ip access-list extended pbr-acl1	Configures an Extended ACL named "pbr-acl1" and enters extended-acl configuration mode.
<b>Step 5</b>	<b>permit protocol source [source-wildcard] destination [destination-wildcard]</b> <b>Example:</b> Router(config-ext-nacl)#permit ip 10.0.0.0 0.255.255.255 200.0.0.0 0.255.255.255	Creates a match statement to match the specified source & destination IP address.
<b>Step 6</b>	<b>exit</b> <b>Example:</b> Router(config-ext-nacl)#exit	Returns to global configuration mode.
<b>Step 7</b>	<b>Route-map &lt;route_map_name&gt; permit &lt;sequence_number&gt;</b> <b>Example:</b>	Creates a Route-map statement named "pbr" for redistributing routes from one routing protocol into another routing protocol or

	Command or Action	Purpose
	<code>Router(config)#route-map pbr permit 10</code>	enables policy-based routing and enters route-map configuration mode.
<b>Step 8</b>	<b>match ip address &lt;match_criteria_name&gt;</b> <b>Example:</b> <code>Router(config-route-map)#match ip address pbr-acl1</code>	Defines the match criteria by which packets are examined to learn if they will be policy-based routed.
<b>Step 9</b>	<b>set ip next-hop &lt;ip_address&gt; set ip vrf &lt;vrf_name&gt; next-hop &lt;ip_address&gt; set vrf &lt;vrf_name&gt;</b> <b>Example:</b> <code>Router(config-route-map)#set ip next-hop 30.0.0.2</code> <code>Router(config-route-map)#set ip vrf vrf1 next-hop 30.0.0.1</code> <code>Router(config-route-map)#set vrf vrf1</code>	Specifies where to output packets that pass a match clause of a route map for policy routing.
<b>Step 10</b>	<b>exit</b> <b>Example:</b> <code>Router(config-route-map)#exit</code>	Returns to global configuration mode.
<b>Step 11</b>	<b>interface type number</b> <b>Example:</b> <code>Router(config)#interface Gi0/0/10</code>	Configures an interface type and enters interface configuration mode.
<b>Step 12</b>	<b>ip policy route-map &lt;route_map_name&gt;</b> <b>Example:</b> <code>Router(config-if)#ip policy route-map pbr</code>	Identifies a route map to use for policy routing on an interface.
<b>Step 13</b>	<b>exit</b> <b>Example:</b> <code>Router(config-if)#exit</code>	Returns to global configuration mode.

## Verifying Policy-Based Routing

Use this command to verify that the SDM template is changed to video template.

**show sdm prefer current**

```
PE1#show sdm prefer current
The current template is "video" template
```

Use this command to display the cache entries in the policy route cache.

### show ip cache policy

```
CE1#show ip policy
Interface      Route map
Gi0/0/10      equal-access
CE1#
```

## Configuration Examples for Policy-Based Routing

This section shows sample configuration for Policy-Based Routing.

### Example: Policy-Based Routing

The following is a sample configuration for Policy-Based Routing.

```
Device# conf t
Device(config)# access-list 1 permit host 10.1.1.1
Device(config)# access-list 2 permit host 172.17.2.2
Device(config)# exit

Device# conf t
Device(config)# route-map equal-access permit 10
Device(config-route-map)# match ip address 1
Device(config-route-map)# set ip next-hop 172.16.6.6
Device(config-route-map)# exit
Device(config)# route-map equal-access permit 20
Device(config-route-map)# match ip address 2
Device(config-route-map)# set ip next-hop 192.168.7.7
Device(config-route-map)# exit
Device(config)#exit

Device# conf t
Device(config)# interface GigabitEthernet0/0/2
Device(config-if)# ip policy route-map equal-access
Device(config-if)# exit
```

## Additional References

### Related Documents

Related Topic	Document Title
IP routing protocol-independent commands	<a href="#">Cisco IOS IP Routing: Protocol-Independent Command Reference</a>

**Technical Assistance**

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for Policy-Based Routing

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

**Table 1: Feature Information for Policy-Based Routing**