



S Commands

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set as-path

To modify an autonomous system path (as-path) for Border Gateway Protocol (BGP) routes, use the **set as-path** command. To not modify the autonomous system (AS) path, use the **no** form of this command.

```
set as-path {tag| {prepend as-num [... as-num]} last-as num}
```

```
no as-path {tag| {prepend as-num [... as-num]} last-as num}
```

Syntax Description

tag	Converts the tag of a route into an autonomous system path. Applies only when redistributing routes into BGP.
prepend as-num	Appends the specified AS number to the autonomous system path of the route that is matched by the route map. Applies to both inbound and outbound BGP route maps. The range is from 1 to 65535. You can configure more than one AS number.
last-asnum	Prepends the last AS numbers to the AS path. The range is from 1 to 10.

Command Default

The Autonomous system path is not modified.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You must enter the **feature pbr** command to enable policy-based routing (PBR) before entering the **route-map** command.

Use the **route-map** command to enter route-map configuration mode. Once you enter the **route-map** command, the prompt changes to the following:

```
switch(config-route-map)#
```

Once you enter route-map configuration mode, you can enter the **set** command.

The only global BGP metric available to influence the best-path selection is the autonomous system path length. By varying the length of the autonomous system path, a BGP speaker can influence the best-path selection by a peer further away.

By allowing you to convert the tag into an autonomous system path, the **set as-path tag** variation of this command modifies the autonomous system length. The **set as-path prepend** variation allows you to prepend an arbitrary autonomous system path string to BGP routes. Usually, the local autonomous system number is prepended multiple times which increasing the autonomous system path length.

Examples

This example shows how to convert the tag of a redistributed route into an autonomous system path:

```
switch(config)# route-map test1
switch(config-route-map)# set as-path tag
```

This example shows how to prepend 100 to all the routes advertised to 10.108.1.1:

```
switch(config)# route-map test1
switch(config-route-map)# match as-path 1
switch(config-route-map)# set as-path prepend 100
!
switch(config)# router bgp 64496
switch(config-router)# neighbor 10.108.1.1 remote-as 64497
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# route-map set-as-path test1 out
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.

Command	Description
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

set comm-list delete

To remove communities from the community attribute of an inbound or outbound update, use the **set comm-list delete** command. To remove a previous **set comm-list delete** command, use the **no** form of this command.

set comm-list *community-list-name* **delete**

no set comm-list

Syntax Description

<i>community-list-name</i>	Standard or expanded community list name. The name is any alphanumeric string up to 63 characters.
----------------------------	--

Command Default

No communities are removed.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This set command removes communities from the community attribute of an inbound or outbound update using a route map to filter and determine the communities to be deleted. Depending upon whether the route map is applied to the inbound or outbound update for a neighbor, each community that passes the route map permit clause and matches the given community list is removed from the community attribute being received from or sent to the Border Gateway Protocol (BGP) neighbor.

Each entry of a standard community list should list only one community when used with the **set comm-list delete** command. For example, in order to be able to delete communities 10:10 and 10:20, you must use the following format to create the entries:

```
switch(config)# ip community-list 500 permit 10:10
switch(config)# ip community-list 500 permit 10:20
```

The following format for a community list entry, while acceptable otherwise, does not work with the **set comm-list delete** command:

```
switch(config)# ip community-list 500 permit 10:10 10:20
```

When both the **set community** *community-number* and **set comm-list delete** commands are configured in the same sequence of a route-map attribute, the deletion operation (**set comm-list delete**) is performed before the set operation (**set community** *community-number*).

This command does not require a license.

Examples

This example shows how to remove communities from the community attribute of an inbound or outbound update:

```
switch(config)# route-map test1
switch(config-route-map)# match as-path 1
switch(config-route-map)# set comm-list list1 delete
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.

Command	Description
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

set community

To set the Border Gateway Protocol (BGP) communities attribute, use the **set community** command. To delete the entry, use the **no** form of this command.

```
set community {none| {aa : nn [... aa:nn]} additive| local-as| no-advertise| no-export}}
```

```
no set community {none| {aa : nn} additive| local-as| no-advertise| no-export}}
```

Syntax Description

none	(Optional) Specifies the no community attribute. You cannot configure any other keyword if you configure the none keyword.
<i>aa:nn</i>	Autonomous system (AS) number and network number entered in the 4-byte new community format. This value is configured with two 2-byte numbers separated by a colon. A number from 1 to 65535 can be entered for each 2-byte number. A single community can be entered or multiple communities can be entered, each separated by a space. You can configure one or more AS numbers.
additive	(Optional) Adds to existing community. You can configure one or more keywords.
local-AS	(Optional) Specifies the local-as community (well-known community). Routes with community are advertised to only peers that are part of the local autonomous system or to only peers within a subautonomous system of a confederation. These routes are not advertised external peers or to other subautonomous systems within a confederation. You can configure one or more keywords.
no-advertise	(Optional) Specifies the no-advertise community (well-known community). Routes with this community are not advertised to any peer (internal or external). You can configure one or more keywords.

no-export	(Optional) Specifies the no-export community (well-known community). Routes with this community are advertised to only peers in the same autonomous system or to only other subautonomous systems within a confederation. These routes are not advertised to external peers. You can configure one or more keywords.
------------------	---

Command Default No BGP communities attributes exist.

Command Modes Route-map configuration (config-route-map)

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines

You must have a match clause (even if it points to a “permit everything” list) if you want to set tags. Use the **route-map** global configuration command, and the **match** and **set** route map configuration commands, to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria* —the conditions under which redistribution is allowed for the current **route-map** command. The set commands specify the *set actions* —the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set** route map configuration commands specify the redistribution *set actions* to be performed when all of the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command does not require a license.

Examples

This example shows how to configure the routes that pass the autonomous system path access list 1 have the community set to 109:02 and 33:40. Routes that pass the autonomous system path access list 2 have the community set to no-export (these routes will not be advertised to any external BGP [eBGP] peers).

```
switch(config)# route-map test1 10 permit
switch(config-route-map)# match as-path 1
switch(config-route-map)# set community 109:02 33:40
switch(config-route-map)# exit
switch(config)# route-map test1 20 permit
switch(config-route-map)# match as-path 2
switch(config-route-map)# set community no-export
```

This example shows how to configure the routes that pass the autonomous system path access list 1 have the community set to 109:30. Routes that pass the autonomous system path access list 2 have the community set to local-as (the router will not advertise this route to peers outside the local autonomous system .

```
switch(config)# route-map test1 10 permit
```

```

switch(config-route-map)# match as-path 1
switch(config-route-map)# set community 109:30 additive
switch(config-route-map)# exit
switch(config)# route-map test1 20 permit
switch(config-route-map)# match as-path 2
switch(config-route-map)# set community local-as

```

Related Commands

Command	Description
ip community-list	Creates a community list for BGP and control access to it.
match community	Matches a BGP community.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set comm-list delete	Removes communities from the community attribute of an inbound or outbound update.
show ip bgp community	Displays routes that belong to specified BGP communities.

set distance

To set the administrative distance of route, use the **set distance** command. To disable this function, use the **no** form of this command.

set distance *value*

no set distance

Syntax Description

<i>value</i>	Specifies the administrative distance for IGP or EBGp routes. The range is from 1 to 255.
--------------	---

Command Default

None

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
6.1(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to set the administrative distance of route:

```
switch(config)# route-map test1
switch(config-route-map) set distance 200
switch(config-route-map)#
```

Related Commands

Command	Description
set as-path	Modifies an autonomous system path for BGP routes.

set extcomm-list delete

To remove extended communities from the extended community attribute of an inbound or outbound Border Gateway Protocol (BGP) update, use the **set extcomm-list delete** command. To remove a previous **set extcomm-list delete** command, use the **no** form of this command.

set extcomm-list *community-list-name* **delete**
no set extcomm-list

Syntax Description

<i>community-list-name</i>	Standard or expanded extended community list name. The name is any alphanumeric string up to 63 characters.
----------------------------	---

Command Default

No communities are removed.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **set extcomm-list** command in a route map to delete the extended community attribute in a BGP route. You must have a match clause in a route-map (even if it points to a “permit everything” list) if you want to use the **set** commands.

The **set** commands specify the *set actions* to be performed when all of the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

When you configure both the **set extcommunity** *community-number* and **set ext comm-list delete** commands in the same sequence of a route-map attribute, the deletion operation (**set extcomm-list delete**) is performed before the set operation (**set extcommunity** *community-number*).

This command does not require a license.

Examples

This example shows how to remove extended communities from the extended community attribute of an inbound or outbound update:

```
switch(config)# route-map test1
switch(config-route-map)# match as-path 1
switch(config-route-map)# set extcomm-list list1 delete
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match extcommunity	Matches a BGP extended community.
set extcommunity	Sets the BGP extended communities attribute.

set extcommunity

To set the Border Gateway Protocol (BGP) extended communities attribute, use the **set extcommunity** command. To delete the entry, use the **no** form of this command.

set extcommunity {**none**| **generic** {**transitive**| **nontransitive**} *aa4* : *nn* [... *aa4:nn*]} **additive**}

no set extcommunity {**none**| **generic** {**transitive**| **nontransitive**} *aa4* : *nn* [... *aa4:nn*]} **additive**}

Syntax Description

none	(Optional) Specifies the no community attribute.
generic	Specifies the generic specific extended community type.
transitive	Configures BGP to propagate the extended community attributes to other autonomous systems.
nontransitive	Configures BGP to propagate the extended community attributes to other autonomous systems.
<i>aa4:nn</i>	(Optional) Autonomous system number and network number. This value is configured with a 4-byte AS number and a 2-byte network number separated by a colon. The 4-byte AS number range is from 1 to 4294967295 in plaintext notation, or from 1.0 to 56636.65535 in AS.dot notation. You can enter a single community or multiple communities, each separated by a space.
additive	(Optional) Adds to existing community.

Command Default

No BGP communities attributes exist.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **set extcommunity** command in a route map to set the extended community attribute in a BGP route.

You must have a match clause in a route map (even if it points to a “permit everything” list) if you want to use **set** commands.

The **set** commands specify the *set actions* to be performed when all of the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command does not require a license.

Examples

This example shows how to configure a route map that sets the extended community to 1.5:

```
switch(config)# route-map test1 10 permit
switch(config-route-map)# match as-path 1
switch(config-route-map)# set extcommunity generic transitive 1.5
switch(config-route-map)# exit
```

Related Commands

Command	Description
ip extcommunity-list	Creates a community list for BGP and controls access to it.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
send-community	Configures BGP to propagate community attributes to BGP peers.
match extcommunity	Matches an extended community in a route map.
ip extcommunity-list	Creates a community list for BGP and controls access to it.

set extcommunity cost

To configure the Border Gateway Protocol (BGP) cost-extended community attribute, use the **set extcommunity cost** command. To remove the BGP cost-extended community attribute, use the no form of this command.

set extcommunity cost [**0-255**] **igp** *community-id cost-value* | **pre-bestpath** *community-id cost-value*]

no set extcommunity cost [**0-255**] **igp** *community-id cost-value* | **pre-bestpath** *community-id cost-value*]

Syntax Description

0-255	(Optional) Specifies the community ID. The range is from 0 to 255.
igp	(Optional) Specifies the Interior Gateway Protocol (IGP) cost extended community value.
<i>community-id</i>	Community ID. The range is from 0 to 255.
<i>cost-value</i>	Cost value. The range is from 0 to 4294967295.
pre-bestpath	(Optional) Specifies the best path calculation for the cost-extended community attribute.

Command Default

None

Command Modes

Route-map config submenu

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

You can configure multiple cost community attributes in each route map block or sequence. Each cost community set clause must have a unique ID.

The cost community set clause with the lowest cost is preferred by the best-path selection process when all other attributes are equal.

If you configure a new cost-extended community attribute against an existing community ID, the new cost replaces the old cost.

This command does not require a license.

Examples

This example shows how to configure the BGP cost-extended community value:

```
switch# configure terminal
switch(config)# route-map IGP2BGP
switch(config-route-map)# set extcommunity cost igp 23 34512
switch(config-route-map)#
```

This example shows how to remove the BGP cost-extended community value:

```
switch# configure terminal
switch(config)# route-map IGP2BGP
switch(config-route-map)# no set extcommunity cost igp 23 34512
switch(config-route-map)#
```

Related Commands

Command	Description
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
send-community	Configures BGP to propagate community attributes to BGP peers.
set extcommunity	Sets the Border Gateway Protocol (BGP) extended community attributes.
set extcommunity rt	Configure the Border Gateway Protocol (BGP) route target (RT) extended community attributes.

set extcommunity rt

To configure the Border Gateway Protocol (BGP) route target RT-extended community attribute, use the **set extcommunity rt** command. To remove the BGP RT attribute, use the no form of this command.

```
set extcommunity rt {extended-community [additive]} [additive];
```

```
no set extcommunity rt {extended-community [additive]} [additive];
```

Syntax Description

extended-community	Specifies the extended community name. The extended community name can be specified in the following format: <ul style="list-style-type: none"> ◦ ASN2:NN: Autonomous system number in the range from 1 to 65535 followed by an integer in the range from 1 to 4294967295. ◦ ASN4:NN: Extended community number in the AA4:NN2 format: 1-4294967295:1-65535 (or) in the AA2.AA2:NN2 format: 1-65535.1-65535:1-65535. ◦ IPV4:NN: IP address in the dotted decimal format followed by an integer, the range is from 1 to 65535.
additive	Adds to an existing route target RT-extended community.

Command Default None

Command Modes Route-map config submode

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

Use the show running-config command to display the format in which the RT-extended communities were configured. The RT extended communities are stored in an ascending order.

This command does not require a license.

Examples

This example shows how to configure the BGP RT-extended community attribute:

```
switch# configure terminal
switch(config)# route-map IGP2BGP
switch(config-route-map)# set extcommunity rt 10.20:30 additive
switch(config-route-map)#
```

This example shows how to remove the BGP RT-extended community attribute:

```
switch# configure terminal
switch(config)# route-map IGP2BGP
switch(config-route-map)# no set extcommunity rt 10.20:30 additive
switch(config-route-map)#
```

Related Commands

Command	Description
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
send-community	Configures BGP to propagate community attributes to BGP peers.
set extcommunity	Configures the BGP extended communities attribute.
set extcommunity cost	Configures the BGP cost-extended community attribute.

set forwarding-address

To set the Open Shortest Path First (OSPF) forwarding address for redistributed type-5 link-state advertisements (LSAs), use the **set forwarding-address** command. To remove the address, use the **no** form of this command.

set forwarding-address

no forwarding-address

Syntax Description This command has no arguments or keywords.

Command Default No forwarding address is set as a default.

Command Modes Route-map configuration (config-route-map)

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines This command is used by the OSPF to set the forwarding address for the redistributed type-5 LSAs. The value of the forwarding address specified by the autonomous system boundary router (ASBR) can be either 0.0.0.0 or non zero. The 0.0.0.0 address indicates that the originating router (the ASBR) is the next hop:

The forwarding address is set to 0.0.0.0 if the ASBR redistributes routes and OSPF is not enabled on the next hop interface for those routes. This is true if Router 1 does not have OSPF enabled on the Ethernet interface.

All of the following conditions must be met to set the forwarding address field to a nonzero address:

- OSPF is enabled on the ASBR's next-hop interface.
- ASBR's next-hop interface is non passive under OSPF.
- ASBR's next-hop interface is not point to point.
- ASBR's next-hop interface is not point to multipoint.

Any other conditions besides those listed previously, set the forwarding address to 0.0.0.0.

This command does not require a license.

Examples This example shows how to set the forwarding address:

```
switch(config)# route-map test1 10 permit
switch(config-route-map)# set forwarding-address
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

set interface

To configure an interface to be used for routing, use the set interface command. To revert to the default settings, use the no form of this command.

set interface [**null 0**| **tunnel-te**]

no set interface [**null 0**| **tunnel-te**]

Syntax Description

null 0	(Optional) Specifies the null interface. The valid value is 0.
tunnel-te	(Optional) Specifies the traffic engineering (TE) interface. The range is from 0 to 65503.

Command Default

None

Command Modes

Route-map config submode

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

The **set interface** command is used only for policy-based routing (PBR) and is ignored if it is present in a route map that is used for route redistribution or filtering. To remove the static routing for tunnels, use the no set interface command.

When you enter the **null 0** keywords, packets drop.

When you enter the **tunnel-te** keyword, packet are redirected to that TE tunnel if the TE tunnel is up. If the TE tunnel is down, packets are routed to the default tunnel.

This command does not require a license.

Examples

This example shows how to configure an interface to be used for routing:

```
switch# configure terminal
switch(config)# route-map routemap123
switch(config-route-map)# set interface tunnel-te 25
switch(config-route-map)#
```

This example shows how to remove the static routing for tunnels:

```
switch# configure terminal
switch(config)# route-map routemap123
```

```
switch(config-route-map)# no set interface tunnel-te 25  
switch(config-route-map)#
```

Related Commands

Command	Description
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
set local-preference	Specifies a preference value for the autonomous system path.

set ip address prefix-list

To specify the IPv4 map routes to be injected, use the set ip address prefix-list command. To remove the prefix-list, use the **no** form of this command.

set ip address prefix-list *prefix-list-name*

no set ip address prefix-list *prefix-list-name*

Syntax Description

<i>prefix-list-name</i>	Prefix list name.
-------------------------	-------------------

Command Default

None

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to specify the map routes to be injected:

```
switch# configure terminal
switch(config)# router bgp 40000
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# inject-map ORIGINATE exist-map AGGREGATEcopy-attributes
switch(config-router-af)# exit
switch(config-router)# exit
switch(config)# ip prefix-list AGGREGATE-Route seq 5 permit 10.1.1.0/24
switch(config)# route-map AGGREGATE permit 10
switch(config-route-map)# match ip address prefix-list AGGREGATE-Route
switch(config-route-map)# match ip route-source prefix-list AGGREGATE-Source
switch(config-route-map)# exit
switch(config)# ip prefix-list ORIGINATE-Route seq 4 permit 10.1.1.128/25
switch(config)# route-map ORIGINATE permit 10
switch(config-route-map)# set ip address prefix-list ORIGINATE-Route
switch(config-route-map)#
```

Related Commands

Command	Description
inject-map	Specifies the inject-map and exist-map routes for conditional route injection.

Command	Description
router bgp	Enters Border Gateway Protocol (BGP) configuration mode and assigns the autonomous system number to the local BGP speaker.

set ip default next-hop

To configure a route map that sets the next-hop IPv4 address as the default, use the **set ip default next-hop** command. To delete an entry, use the **no** form of this command.

set ip default next-hop *ip-address* [...*ip-address*] [**load-share**| **verify-availability**]

set ip default next-hop *ip-address*

Syntax Description

<i>ip-address</i>	IPv4 address of the next hop to which packets are output. The next hop must be an adjacent router. You can configure up to 32 IP addresses.
load-share	(Optional) Enables load sharing.
verify-availability	(Optional) Verifies the reachability of the tracked object.

Command Default

Disabled

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the *ip-address* argument .

Use this command to provide certain users a different default route. If the software has no explicit route for the destination in the packet, it routes the packet to this next hop. The first next hop specified with the **set ip default next-hop** command needs to be adjacent to the router. The optional specified IP addresses are tried in turn.

Use the ip policy route-map command, the **route-map** global configuration command, and the **match** and **set** commands to define the conditions for policy routing packets. The **ip policy route-map** command identifies a route map by name. Each **route-map** command has a list of match and set commands associated with it. The match commands specify the *match criteria*—the conditions under which policy routing occurs. The **set** commands specify the *set actions*—the particular routing actions to perform if the criteria enforced by the **match** commands are met.

The set clauses can be used with one another. They are evaluated in the following order:

1 set ip next-hop

2 set ip default next-hop



Note

The **set ip next-hop** and **set ip default next-hop** commands are similar but have a different order of operations. Configuring the **set ip next-hop** command causes the system to use policy routing first and then use the routing table. Configuring the **set ip default next-hop** command causes the system to use the routing table first and then policy route the specified next hop.

For software-forwarded traffic, the route that is present in the unicast routing table (of the VRF in which packet was received) for the packet-specified destination takes preference over what is specified in the **set ip default next-hop** command when there is condition match. Even if there is a default route present in the VRF, that default route overrides what is set in the command. This applies to software-forwarded traffic only.

This command does not require a license.

Examples

This example shows how to configure a route map that sets the IPv4 default next-hop address as the default:

```
switch(config)# ip access-list test
switch(config-ip-acl)# permit ip 192.0.2.0/24 any
switch(config-ip-acl)# exit
switch(config)# route-map equal-access
switch(config-route-map)# match ip address test
switch(config-route-map)# set ip default next-hop 192.0.2.3
switch(config-route-map)# exit
switch(config)# interface ethernet 2/1
switch(config-if)# ip policy route-map equal-access
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match ip next-hop	Redistributes any routes that have a next hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match tag	Redistributes routes in the routing table that match the specified tags.

Command	Description
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set next-hop	Specifies the address of the next hop.
set tag	Sets a tag value of the destination routing protocol.
set weight	Specifies the BGP weight for the routing table.

set ip next-hop

To configure a route map that sets the next-hop IPv4 address, use the **set ip next-hop** command in route-map configuration mode. To delete an entry, use the **no** form of this command.

```
set ip next-hop {ip-address [... ip-address] [load-share] | peer-address | unchanged | verify-availability}
no set ip next-hop {ip-address [... ip-address] [load-share] | peer-address | unchanged | verify-availability}
```

Syntax Description

<i>ip-address</i>	IP address of the next hop to which packets are output. The next-hop does not need to be adjacent router. You can configure one or more IP addresses.
load-share	(Optional) Enables load sharing.
peer-address	Sets the next hop to be the Border Gateway Protocol (BGP) peering address.
unchanged	Specifies that the next-hop attribute in the BGP update to the eBGP peer is unmodified.
verify-availability	Verifies the reachability of the tracked object.

Command Default

This command is disabled by default.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
6.2(8)	Added the unchanged keyword.
4.0(1)	This command was introduced.

Usage Guidelines

An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the *ip-address* argument .

Use the **ip policy route-map** command, the **route-map** command, and the **match** and **set** commands to define the conditions for policy routing packets. The **ip policy route-map** command identifies a route map by name. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which policy routing occurs. The **set** commands specify the *set actions*—the particular routing actions to perform if the criteria enforced by the **match** commands are met.

If the first next hop specified with the **set ip next-hop** command is down, the optionally specified IP addresses are tried in turn.

When the **set ip next-hop** command is used with the **peer-address** keyword in an inbound route map of a BGP peer, the next hop of the received matching routes will be set to be the neighbor peering address, overriding any third-party next hops. The same route map can be applied to multiple BGP peers to override third-party next hops.

When the **set ip next-hop** command is used with the **peer-address** keyword in an outbound route map of a BGP peer, the next-hop of the advertised matching routes will be set to be the peering address of the local router which disables the next-hop calculation. The **set ip next-hop** command has finer granularity than the (per-neighbor) **neighbor next-hop-self** command, because you can set the next hop for some routes, but not for others. The **neighbor next-hop-self** command sets the next hop for all routes sent to that neighbor.

The set clauses can be used with one another. They are evaluated in the following order:

- 1 **set ip next-hop**
- 2 **set ip default next-hop**

By default, for eBGP, the next hop to reach a connected network is the IP address of the neighbor that sent the update. Therefore, as an update goes from device to device, the next hop typically changes to be the address of the neighbor that sent the update (the device's own address).

However, there might be a scenario where you want the next hop to remain unchanged. The **set ip next-hop unchanged** command is used to propagate the next hop unchanged for multihop eBGP peering sessions.

This command does not require a license.

Examples

This example shows three routers on the same LAN (with IP addresses 10.1.1.1, 10.1.1.2, and 10.1.1.3). Each router is in a different autonomous system. The **set ip next-hop peer-address** configuration specifies that traffic:

- from the router (10.1.1.3) in remote autonomous system 64496
- for the router (10.1.1.1) in remote autonomous system 64497
- that matches the route map

is passed through the router bgp 64498 and is not sent directly to the router (10.1.1.1) in autonomous system 100.

The **set ip next-hop unchanged** command specifies that the next hop attribute in the BGP update to the eBGP peer is unmodified.

```
switch(config)# router bgp 64498
switch(config-router)# neighbor 10.1.1.3 remote-as 64496
switch(config-router)# neighbor 10.1.1.3 route-map set-peer-address out
switch(config-router)# neighbor 10.1.1.1 remote-as 64497
switch(config-router)# exit
switch(config)# route-map set-peer-address permit 10
switch(config-route-map)# set ip next-hop peer-address
switch(config-route-map)# set ip next-hop unchanged
```

Related Commands

Command	Description
ip policy route-map	Identifies a route map to use for policy routing on an interface.

Command	Description
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match length	Bases policy routing on the Level 3 length of a packet.
route-map	Defines the conditions for redistributing routes from one routing protocol to another, or enables policy routing.
set ip default next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing and for which the Cisco NX-OS software has no explicit route to a destination.

set ip precedence

To set the precedence value in the IPv4 packet header, use the **set ip precedence** command in route-map configuration mode. To remove the precedence value, use the **no** form of this command.

set ip precedence *precedence-value*

no set ip precedence

Syntax Description

<i>precedence-value</i>	A number from 0 to 7 that sets the precedence bit in the packet header.
-------------------------	---

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

The way the network gives priority (or some type of expedited handling) to the marked traffic is through the application of weighted fair queuing (WFQ) or weighted random early detection (WRED) at points downstream in the network. Typically, you would set IPv4 precedence at the edge of the network (or administrative domain) and have queuing act on it thereafter. WFQ can speed up handling for high precedence traffic at congestion points. WRED ensures that high precedence traffic has lower loss rates than other traffic during times of congestion.

The mapping from keywords such as routine and priority to a precedence value is useful only in some instances. That is, the use of the precedence bit is evolving. You can define the meaning of a precedence value by enabling other features that use the value. In the case of Cisco high-end Internet quality of service (QoS), IPv4 precedences can be used to establish classes of service that do not necessarily correspond numerically to better or worse handling in the network. For example, IPv4 precedence 2 can be given 90 percent of the bandwidth on output links in the network, and IPv4 precedence 6 can be given 5 percent using the distributed weight fair queuing (DWFQ) implementation on the Versatile Interface Processors (VIPs).

Use the **route-map** global configuration command with **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another, or for policy routing. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution or policy routing is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution or policy routing actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set route-map** configuration commands specify the redistribution set actions to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

Examples

The following example sets the IPv4 precedence value to 5 for packets that pass the route map match:

```
route-map cisco1
 match length 68 128
 set ip precedence 5
```

Related Commands

Command	Description
ip policy route-map	Configures IPv4 PBR on an interface.
ipv4 local policy route-map	Identifies a route map to use for local IPv4 PBR.
match ip address	Specifies an IPv4 access list to use to match packets for PBR for IPv4.
match length	Bases policy routing on the Level 3 length of a packet.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol to another, or enables policy routing.
set default interface	Indicates where to output packets that pass a match clause of a route map for policy routing and have no explicit route to the destination.
set interface	Indicates where to output packets that pass a match clause of a route map for policy routing.
set ip default next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing and for which the Cisco NX-OS software has no explicit route to a destination.
set ip next-hop	Indicates where to output IPv6 packets that pass a match clause of a route map for policy routing.
set ipv6 precedence	Sets the precedence value in the IPv6 packet header.

set ipv6 address prefix-list

To specify the IPv6 map routes to be injected, use the `set ipv6 address prefix-list` command. To remove the prefix-list, use the **no** form of this command

set ipv6 address prefix-list *prefix-list-name*

no set ipv6 address prefix-list *prefix-list-name*

Syntax Description

<i>prefix-list-name</i>	Prefix list name.
-------------------------	-------------------

Command Default

None

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to specify the map routes to be injected:

```
switch(config)# router bgp 40000
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# inject-map ORIGINATE exist-map AGGREGATE
switch(config-router-af)# ipv6 prefix-list AGGREGATE-Route seq 5 permit 2001::/64
switch(config)# route-map AGGREGATE permit 10
switch(config-route-map)# match ipv6 address prefix-list AGGREGATE-Route
switch(config-route-map)# exit
switch(config)# ipv6 prefix-list ORIGINATE-Route seq 4 permit 2001::1/128
switch(config)# route-map ORIGINATE permit 10
switch(config-route-map)# set ipv6 address prefix-list ORIGINATE-Route
switch(config-route-map)#
```

Related Commands

Command	Description
inject-map	Specifies the inject-map and exist-map routes for conditional route injection.

Command	Description
router bgp	Enters Border Gateway Protocol (BGP) configuration mode and assigns the autonomous system number to the local BGP speaker.

set ipv6 default next-hop

To indicate where to output packets that pass a match clause of a route map for policy routing and for which the Cisco NX-OS software has no explicit route to a destination, use the **set ipv6 default next-hop** command in route-map configuration mode. To delete an entry, use the **no** form of this command.

```
set ipv6 default next-hop ipv6-address [...ipv6-address] [load-share| verify-availability]
```

```
no set ipv6 default next-hop ipv6-address [...ipv6-address] [load-share| verify-availability]
```

Syntax Description

<i>ipv6-address</i>	IP address of the next hop to which packets are output. The next hop must be an adjacent router. You can enter one or more IP addresses.
load-share	(Optional) Enables load sharing.

Command Default

This command is disabled by default.

Command Modes

Route-map configuration (config-route-map)
network-adminvdc-admin

Command History

Release	Modification
4.0	This command was introduced.

Usage Guidelines

An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the *ipv6-address* argument .

Use this command to provide certain users a different default route. If the software has no explicit route for the destination in the packet, then it routes the packet to this next hop. The first next hop specified with the **set ipv6 default next-hop** command needs to be adjacent to the router. The optional specified IP addresses are tried in turn.

Use the **ipv6 policy route-map** interface configuration command, the **route-map** global configuration command, and the **match** and **set** route-map configuration commands to define the conditions for policy routing packets. The **ipv6 policy route-map** command identifies a route map by name. Each **route-map** command has a list of match and set commands associated with it. The match commands specify the *match criteria*—the conditions under which policy routing occurs. The **set** commands specify the *set actions*—the particular routing actions to perform if the criteria enforced by the **match** commands are met.

The set clauses can be used in conjunction with one another. They are evaluated in the following order:

1 set ipv6 next-hop

2 set ipv6 default next-hop



Note

The set ipv6 next-hop and set ipv6 default next-hop are similar commands but have a different order of operations. Configuring the set ipv6 next-hop command causes the system to use policy routing first and then use the routing table. Configuring the set ipv6 default next-hop command causes the system to use the routing table first and then policy route the specified next hop.

This command does not require a license.

Examples

The following example provides two sources with equal access to two different service providers. Packets arriving on an Ethernet interface 1 from the source 10.1.1.1 are sent to the router at 172.16.6.6 if the software has no explicit route for the destination of the packet. Packets arriving from the source 10.2.2.2 are sent to the router at 172.17.7.7 if the software has no explicit route for the destination of the packet. All other packets for which the software has no explicit route to the destination are discarded.

```
switch(config)# access-list 1 permit ip 10.1.1.1 0.0.0.0
switch(config)# access-list 2 permit ip 10.2.2.2 0.0.0.0
!
switch(config)# interface ethernet 1
switch(config-if)# ip policy route-map equal-access
!
switch(config-route-map)# route-map equal-access permit 10
switch(config-route-map)# match ipv6 address 1
switch(config-route-map)# set ipv6 default next-hop 172.16.6.6
switch(config-route-map)# route-map equal-access permit 20
switch(config-route-map)# match ip address 2
switch(config-route-map)# set ipv6 default next-hop 172.17.7.7
switch(config-route-map)# route-map equal-access permit 30
switch(config-route-map)# set default interface null0
```

Related Commands

Command	Description
ip policy route-map	Identifies a route map to use for policy routing on an interface.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match length	Bases policy routing on the Level 3 length of a packet.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set ip next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing.

set ipv6 next-hop

To indicate where to output packets that pass a match clause of a route map for policy routing, use the **set ipv6 next-hop** command in route-map configuration mode. To delete an entry, use the **no** form of this command.

```
set ipv6 next-hop {ipv6-address [... ipv6-address] [load-share] | peer-address | unchanged | verify-availability}
no set ipv6 next-hop {ipv6-address [... ipv6-address] [load-share] | peer-address | unchanged |
verify-availability}
```

Syntax Description

<i>ipv6-address</i>	IP address of the next hop to which packets are output. It need not be an adjacent router. You can configure one or more IP addresses.
load-share	(Optional) Enables load sharing.
peer-address	Sets the next hop to be the BGP peering address.

Command Default

This command is disabled by default.

Command Modes

Route-map configuration (config-route-map)
network-adminvdc-admin

Command History

Release	Modification
4.0	This command was introduced.

Usage Guidelines

An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the *ipv6-address* argument .

Use the **ipv6 policy route-map** interface configuration command, the **route-map** global configuration command, and the **match** and **set** route-map configuration commands to define the conditions for policy routing packets. The **ipv6 policy route-map** command identifies a route map by name. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria* —the conditions under which policy routing occurs. The **set** commands specify the *set actions* —the particular routing actions to perform if the criteria enforced by the **match** commands are met.

If the first next hop specified with the **set ipv6 next-hop** command is down, the optionally specified IPv6 addresses are tried in turn.

When the **set ipv6 next-hop** command is used with the **peer-address** keyword in an inbound route map of a BGP peer, the next hop of the received matching routes will be set to be the neighbor peering address, overriding

any third-party next hops. So the same route map can be applied to multiple BGP peers to override third-party next hops.

When the **set ipv6 next-hop** command is used with the **peer-address** keyword in an outbound route map of a BGP peer, the next hop of the advertised matching routes will be set to be the peering address of the local router, thus disabling the next hop calculation. The **set ipv6 next-hop** command has finer granularity than the (per-neighbor) **neighbor next-hop-self** command, because you can set the next hop for some routes, but not others. The **neighbor next-hop-self** command sets the next hop for all routes sent to that neighbor.

The set clauses can be used in conjunction with one another. They are evaluated in the following order:

- 1 **set ipv6 next-hop**
- 2 **set ipv6 default next-hop**

This command does not require a license.

Examples

In the following example, three routers are on the same LAN (with IP addresses 10.1.1.1, 10.1.1.2, and 10.1.1.3). Each is in a different autonomous system. The **set ip next-hop peer-address** command specifies that traffic from the router (10.1.1.3) in remote autonomous system 300 for the router (10.1.1.1) in remote autonomous system 100 that matches the route map is passed through the router bgp 200, rather than sent directly to the router (10.1.1.1) in autonomous system 100 over their mutual connection to the LAN.

```
switch(config)# router bgp 200
switch(config-router)# neighbor 10.1.1.3 remote-as 300
switch(config-router)# neighbor 10.1.1.3 route-map set-peer-address out
switch(config-router)# neighbor 10.1.1.1 remote-as 100
!
switch(config)# route-map set-peer-address permit 10
switch(config-route-map)# set ipv6 next-hop peer-address
```

Related Commands

Command	Description
ip policy route-map	Identifies a route map to use for policy routing on an interface.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match length	Bases policy routing on the Level 3 length of a packet.
neighbor next-hop-self	Disables next hop processing of BGP updates on the router.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol to another, or enables policy routing.
set ip default next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing and for which the Cisco NX-OS software has no explicit route to a destination.

set ipv6 precedence

To set the precedence value in the IPv6 packet header, use the **set ipv6 precedence** command in route-map configuration mode. To remove the precedence value, use the **no** form of this command.

set ipv6 precedence *precedence-value*

no set ipv6 precedence *precedence-value*

Syntax Description

<i>precedence-value</i>	A number from 0 to 7 that sets the precedence bit in the packet header.
-------------------------	---

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

The way the network gives priority (or some type of expedited handling) to the marked traffic is through the application of weighted fair queueing (WFQ) or weighted random early detection (WRED) at points downstream in the network. Typically, you would set IPv6 precedence at the edge of the network (or administrative domain) and have queueing act on it thereafter. WFQ can speed up handling for high precedence traffic at congestion points. WRED ensures that high precedence traffic has lower loss rates than other traffic during times of congestion.

The mapping from keywords such as routine and priority to a precedence value is useful only in some instances. That is, the use of the precedence bit is evolving. You can define the meaning of a precedence value by enabling other features that use the value. In the case of Cisco high-end Internet quality of service (QoS), IPv6 precedences can be used to establish classes of service that do not necessarily correspond numerically to better or worse handling in the network. For example, IPv6 precedence 2 can be given 90 percent of the bandwidth on output links in the network, and IPv6 precedence 6 can be given 5 percent using the distributed weight fair queueing (DWFQ) implementation on the Versatile Interface Processors (VIPs).

Use the **route-map** global configuration command with **match** and **set** route-map configuration commands to define the conditions for redistributing routes from one routing protocol into another, or for policy routing. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution or policy routing is allowed for the current **route-map** command. The **set** commands specify the set actions—the particular redistribution or policy routing actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set route-map** configuration commands specify the redistribution set actions to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

Examples

The following example sets the IPv6 precedence value to 5 for packets that pass the route map match:

```
interface serial 0
  ipv6 policy route-map texas
!
route-map cisco1
  match length 68 128
  set ipv6 precedence 5
```

Related Commands

Command	Description
ipv6 local policy route-map	Identifies a route map to use for local IPv6 PBR.
ipv6 policy route-map	Configures IPv6 PBR on an interface.
match ipv6 address	Specifies an IPv6 access list to use to match packets for PBR for IPv6.
match length	Bases policy routing on the Level 3 length of a packet.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol to another, or enables policy routing.
set default interface	Indicates where to output packets that pass a match clause of a route map for policy routing and have no explicit route to the destination.
set interface	Indicates where to output packets that pass a match clause of a route map for policy routing.
set ip default next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing and for which the Cisco NX-OS software has no explicit route to a destination.
set ip precedence	Sets the precedence value in the IPv4 packet header.
set ipv6 next-hop	Indicates where to output IPv6 packets that pass a match clause of a route map for policy routing.

set level

To indicate where to import routes, use the **set level** command. To delete an entry, use the **no** form of this command.

```
set level {level-1| level-2| level-1-2}
```

```
no set level {level-1| level-2| level-1-2}
```

Syntax Description

level-1	Imports routes into a Level 1 area.
level-2	Imports routes into a Level 2 subdomain.
level-1-2	Imports routes into Level 1 and Level 2.

Command Default

This command is disabled by default.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **route-map** command, and the **match** and **set** commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set** route-map configuration commands specify the redistribution *set actions* to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command does not require a license.

Examples

This example shows how to import the routes into the Level 1 area:

```
switch(config-router)# route-map testcase
switch(config-route-map)# set level level-1
```

Related Commands

Command	Description
ip policy route-map	Identifies a route map to use for policy routing on an interface.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match length	Bases policy routing on the Level 3 length of a packet.
neighbor next-hop-self	Disables next hop processing of BGP updates on the router.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol to another, or enables policy routing.
set ip default next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing and for which the Cisco NX-OS software has no explicit route to a destination.

set local-preference

To specify a preference value for the autonomous system path, use the **set local-preference** command in route-map configuration mode. To delete an entry, use the **no** form of this command.

set local-preference *number-value*

no set local-preference *number-value*

Syntax Description

<i>number-value</i>	Preference value. The range is from 0 to 4294967295.
---------------------	--

Command Default

Preference value of 100.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The preference is sent only to all routers in the local autonomous system.

You must have a match clause (even if it points to a “permit everything” list) if you want to set tags.

Use the **route-map** command, and the **match** and **set** to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set** commands specify the redistribution *set actions* to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

You can change the default preference value with the **bgp default local-preference** command.

This command does not require a license.

Examples

This example shows how to set the local preference to 100 for all routes that are included in access list 1:

```
switch(config-router)# route-map map-preference
switch(config-route-map)# match as-path 1
switch(config-route-map)# set local-preference 100
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match interface (IP)	Distributes routes that have their next-hop out one of the interfaces specified.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric (IP)	Redistributes routes with the metric specified.
match route-type (IP)	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
set ip next-hop	Specifies the address of the next hop.
set level (IP)	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric (BGP, OSPF, RIP)	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set origin (BGP)	Sets the BGP origin code.

Command	Description
set tag (IP)	Sets the value of the destination routing protocol.

set metric

To set the metric value for a routing protocol, use the **set metric** command. To return to the default metric value, use the **no** form of this command.

set metric [**+** | **-**] *bandwidth-metric*

set metric *bandwidth-metric* [*delay-metric reliability-metric load-metric mtu*]

no set metric

Syntax Description

+	(Optional) Adds to the existing delay metric value.
-	(Optional) Subtracts from the existing delay metric value.
<i>bandwidth-metric</i>	Interior Gateway Routing Protocol (IGRP) bandwidth metric, in Kb/s. The range is from 0 to 4294967295.
<i>delay-metric</i>	(Optional) Interior Gateway Routing Protocol (IGRP) delay metric, in 10 microsecond units. The range is from 1 to 4294967295.
<i>reliability-metric</i>	(Optional) IGRP reliability metric. The range is from 0 to 255.
<i>load-metric</i>	(Optional) IGRP load metric. The range is from 1 to 255.
<i>mtu</i>	(Optional) IGRP maximum transmission unit (MTU) of the path. The range is from 1 to 4294967295.

Command Default

None

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Added the + and - keywords.

Usage Guidelines

Use the **set metric** command to modify the IGRP metric values.

**Note**

We recommend that you consult your Cisco technical support representative before changing the default value.

When you configure the *reliability-metric* and the *load-metric* arguments, 255 means 100 percent reliability.

Use the + or - keywords to modify the existing delay metric value. You can modify only the delay metric with these keywords.

Use the **route-map** command and the **match** and **set** command to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set** commands specify the redistribution *set actions* to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command does not require a license.

Examples

This example shows how to set the bandwidth metric value for the routing protocol to 100:

```
switch(config)# route-map set-metric
switch(config-route-map)# set metric 100
```

This example shows how to increase the bandwidth metric value for the routing protocol by 100:

```
switch(config)# route-map set-metric
switch(config-route-map)# set metric +100
```

Related Commands

Command	Description
route-map	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.

set metric-type

To set the metric type for the destination routing protocol, use the **set metric-type** command. To return to the default, use the **no** form of this command.

```
set metric-type {internal| external| type-1| type-2}
```

```
no set metric-type {internal| external| type-1| type-2}
```

Syntax Description

internal	Specifies the Intermediate System-to-Intermediate System (IS-IS) internal metric, or the Interior Gateway Protocol (IGP) metric as the multi-exit discriminator (MED) for Border Gateway Protocol (BGP).
external	Specifies the IS-IS external metric.
type-1	Specifies the Open Shortest Path First (OSPF) external Type 1 metric.
type-2	Specifies the OSPF external Type 2 metric.

Command Default

This command is disabled by default.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **route-map** command with the **match** and **set** commands to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set** commands specify the redistribution *set actions* to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

**Note**

This command is not supported for redistributing routes into the Border Gateway Protocol (BGP).

This command does not require a license.

Examples

This example sets the metric type of the destination protocol to OSPF external Type 1:

```
switch(config)# route-map map-type
switch(config-route-map)# set metric-type type-1
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric (Redistributes routes with the metric specified.
match route-type	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Sets a BGP autonomous system path access list.
set community	Sets the BGP communities attribute.
set ip next-hop	Specifies the address of the next hop.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.

Command	Description
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set origin	Sets the BGP origin code.
set tag	Sets the value of the destination routing protocol.

set nssa-only

To set a type-7 link-state advertisement (LSA) generated on the Autonomous System Boundary Router (ASBR) with no P-bit set and prevent the type-7 to type-5 LSA conversion in Open Shortest Path First (OSPF), use the **set nssa-only** command. To remove the type-7 configuration control, use the **no** form of this command.

set nssa-only

no set nssa-only

Syntax Description This command has no arguments or keywords.

Command Default None

Command Modes Route-map config submode

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

When you use the **set nssa-only** command, the settings are applied to all not-so-stubby areas (NSSA) with the type-7 LSA that corresponding to that LSA with no has its P-bit set.

This command does not require a license.

Examples

This example shows how to set a type-7 LSA generated on the ASBR and with no P-bit set and prevent the type-7 to type-5 LSA conversion in OSPF:

```
switch# configure terminal
switch(config)# route-map IGP2BGP
switch(config-route-map)# set nssa-only
switch(config-route-map)#
```

This example shows how to remove the type-7 configuration control:

```
switch# configure terminal
switch(config)# route-map IGP2BGP
switch(config-route-map)# no set nssa-only
switch(config-route-map)#
```

Related Commands

Command	Description
nssa-external	Displays information about the NSSA external LSAs.

Command	Description
route-map	Defines the conditions for redistributing routes from one routing protocol into another.
show ip ospf	Displays general information about OSPF routing instances.

set origin

To set the Border gateway Protocol (BGP) origin code, use the **set origin** command. To delete the entry, use the **no** form of this command.

```
set origin {egp as-num [: as-num]| igp| incomplete}
```

```
no set origin
```

Syntax Description

egp <i>as-num</i>	Specifies the AS number for a remote exterior gateway protocol (EGP) system. You can specify the AS number as a 2-byte integer, or a 4-byte integer in aa:nn format. The range is from 1 to 65535.
igp	Specifies a local Interior Gateway Protocol (IGP) system.
incomplete	Specifies an unknown heritage.

Command Default

Default origin, based on route in main IP routing table.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You must have a match clause (even if it points to a “permit everything” list) if you want to set tags.

Use the **route-map** command, and the **match** and **set** command, to define the conditions for redistributing routes from one routing protocol into another. Each route-map command has a list of **match** and **set** commands associated with it. The **match** commands specify the match criteria—the conditions under which redistribution is allowed for the current route-map command. The **set** commands specify the set actions—the particular redistribution actions to perform if the criteria enforced by the match commands are met. The **no route-map** command deletes the route map.

The **set route-map** commands specify the redistribution set actions to be performed when all of the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command does not require a license.

Examples

This example shows how to set the origin of routes that pass the route map to IGP:

```
switch(config)# route-map set_origin
switch(config-route-map)# match as-path 10
switch(config-route-map)# set origin igp
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match route-type	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Sets a BGP autonomous system path access list.
set community	Sets the BGP communities attribute.
set ip next-hop	Specifies the address of the next hop.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.

Command	Description
set metric-type	Sets the metric type for the destination routing protocol.
set origin	Sets the BGP origin code.
set tag	Sets the value of the destination routing protocol.

set path-selection all advertise

To set the path selection criteria for Border Gateway Protocol (BGP), use the **set path-selection all advertise** command. To delete the entry, use the **no** form of this command.

set path-selection all advertise

Syntax Description This command has no arguments or keywords.

Command Default None.

Command Modes Route-map configuration (config-route-map)

Command History	Release	Modification
	6.1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to specify that all paths be advertised for the specified prefix:

```
switch(config)# route-map
Path_selection_rmap
switch(config-route-map)# match ip address prefix-list p1
switch(config-route-map)# set path-selection all advertise
switch(config-route-map)#
```

Related Commands	Command	Description
	route-map	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.

set tag

To set a tag value of the destination routing protocol, use the **set tag** command. To delete the entry, use the **no** form of this command.

set tag *tag-value*

no set tag *tag-value*

Syntax Description

<i>tag-value</i>	Name for the tag. The value is an integer from 0 to 4294967295.
------------------	---

Command Default

If not specified, the default action is to *forward* the tag in the source routing protocol onto the new destination protocol.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **route-map** command, and the **match** and **set** commands, to define the conditions for redistributing routes from one routing protocol into another. Each **route-map** command has a list of **match** and **set** commands associated with it. The **match** commands specify the *match criteria*—the conditions under which redistribution is allowed for the current **route-map** command. The **set** commands specify the *set actions*—the particular redistribution actions to perform if the criteria enforced by the **match** commands are met. The **no route-map** command deletes the route map.

The **set** commands specify the redistribution *set actions* to be performed when all the match criteria of a route map are met. When all match criteria are met, all set actions are performed.

This command does not require a license.

Examples

This example shows how to set the tag value of the destination routing protocol to 5:

```
switch(config)# route-map test
switch(config-route-map)# set tag 5
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.

Command	Description
match community	Matches a BGP community.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match route-type	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Sets a BGP autonomous system path access list.
set community	Sets the BGP communities attribute.
set ip next-hop	Specifies the address of the next hop.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set origin	Sets the BGP origin code.
set tag	Sets the value of the destination routing protocol.

set vrf

To enable a virtual routing and forwarding (VRF) instance selection within a route map for policy-based routing, use the **set vrf** command. To disable VRF selection within a route map, use the **no** form of this command.

set vrf {*vrf-name*| **default**| **management**}

no set vrf [*vrf-name*| **default**| **management**]

Syntax Description

<i>vrf-name</i>	Name assigned to the VRF.
default	Sets the VRF to the default VRF.
management	Sets the VRF to the management VRF.

Command Default

No default behavior or values

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The **set vrf** command was introduced with the MPLS VPN—VRF Selection using Policy Based Routing feature to provide a PBR mechanism for VRF selection. This command is used to enable VRF selection by policy routing packets through a route map. The route map is attached to the incoming interface. Match criteria is defined in an IP access list or in an IP prefix list. Match criteria can also be defined based on packet length with the **match length** route map command. You must define the VRF prior to the configuring this command, and you must configure the **ip policy route-map** interface configuration command must be configured to enable policy routing under the interface or subinterface. If the VRF instance is not defined or if policy routing is not enabled, an error message appears in the console when you attempt to configure the **set vrf** command.

A PBR routing route map can have only one match or set statement per route-map statement. In addition, a **match** command cannot refer to more than one Access Control list (ACL) for PBR.



Note

You cannot configure with the **set ip default next-hop**, and **set ip next-hop list** policy routing commands because a packet cannot be set to an interface and the next hop cannot be changed when the VRF instance is specified. An error message will appear in the console if you attempt to configure the **set vrf** command with any of the four above set clauses.

This command does not require a license.

Examples

This example shows how to configure a route-map sequence that selects and sets a VRF instance based on match criteria defined in three different access lists. (The access list configuration is not shown in this example.) If the route map falls through and a match does not occur, the packet is dropped if the destination is local.

```
switch(config)# route-map PBR-VRF-Selection permit 10
switch(config-route-map)# match ip address 40
switch(config-route-map)# set vrf VRF_1
!
switch(config)# route-map PBR-VRF-Selection permit 20
switch(config-route-map)# match ip address 50
switch(config-route-map)# set vrf VRF_2
!
switch(config)# route-map PBR-VRF-Selection permit 30
switch(config-route-map)# match ip address 60
switch(config-route-map)# set vrf VRF_3
```

Related Commands

Command	Description
access-list (IP standard)	Defines a standard IP access list.
debug ip policy	Displays IP policy routing packet activity.
ip policy route-map	Identifies a route map to use for policy routing on an interface.
ip vrf	Configures a VRF routing table.
ip vrf receive	Inserts the IP address of an interface as a connected route entry in a VRF routing table.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, or performs policy routing on packets.
route-map	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.

set weight

To specify the Border Gateway Protocol (BGP) weight for the routing table, use the **set weight** command. To delete an entry, use the **no** form of this command.

set weight *number*

no set weight [*number*]

Syntax Description

<i>number</i>	Weight value. The range is from 0 to 65535.
---------------	---

Command Default

The weight is not changed by the specified route map.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The weight is based on the first matched autonomous system path. The weights assigned with the **set weight** command override the weights assigned using the **neighbor weight** command.

This command does not require a license.

Examples

This example shows how to set the BGP weight for the routes that match the autonomous system path access list to 200:

```
switch(config)# route-map set-weight
switch(config-route-map)# match as-path 10
switch(config-route-map)# set weight 200
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ip address	Distributes any routes that have a destination network number address that is permitted by a standard or expanded access list, and performs policy routing on packets.

Command	Description
match ip next-hop	Redistributes any routes that have a next-hop router address passed by one of the access lists specified.
match ip route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match metric	Redistributes routes with the metric specified.
match route-type	Redistributes routes of the specified type.
match tag	Redistributes routes in the routing table that match the specified tags.
route-map	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set as-path	Sets a BGP autonomous system path access list.
set community	Sets the BGP communities attribute.
set ip next-hop	Specifies the address of the next hop.
set level	Indicates where to import routes.
set local-preference	Specifies a preference value for the autonomous system path.
set metric	Sets the metric value for a routing protocol.
set metric-type	Sets the metric type for the destination routing protocol.
set origin	Sets the BGP origin code.
set tag	Sets the value of the destination routing protocol.

set-attached-bit

To set the attached (ATT) bit for Intermediate-System-to-Intermediate System (IS-IS), use the **set-attached-bit** command. To disable this function, use the **no** form of this command.

set-attached-bit

no set-attached-bit

Syntax Description This command has no arguments or keywords.

Command Default Enabled

Command Modes Router configuration VRF configuration

Command History	Release	Modification
	4.1(2)	This command was introduced.

Usage Guidelines Use the **set-attached-bit** command to configure whether to use a Level 1/Level 2 IS-IS router as the default router for Level 1 routers in the same area. If the **set-attached-bit** command is disabled, the attached-bit will not be advertised by the router in its Level 1 Link-State Packet (LSP), and other Level 1 routers in the area will not use this router as the default router outside the area.

This command requires the Enterprise Services license.

Examples This example shows how to unset the attached bit:

```
switch(config)# router isis Border1
switch(config-router)# no set-attached-bit
```

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
router isis	Enables IS-IS.

shutdown (BGP)

To shut down an instance of the Border Gateway Protocol (BGP), use the **shutdown** command. To disable this function, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Command Default Enabled

Command Modes Router configuration

Command History	Release	Modification
	4.1(2)	This command was introduced.

Usage Guidelines Use the **shutdown** command to disable an instance of BGP without removing the configuration. This command requires the Enterprise Services license.

Examples This example shows how to disable BGP 64496:

```
switch(config)# router BGP 64496  
switch(config-router)# shutdown
```

shutdown (EIGRP)

To shut down an instance of the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **shutdown** command. To disable this function, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Command Default Enabled

Command Modes Address family configuration
Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines Use the **shutdown** command to disable an instance of EIGRP without removing the configuration. This command requires the Enterprise Services license.

Examples

This example shows how to disable EIGRP 209:

```
switch(config)# router eigrp 209
switch(config-router)# shutdown
```

shutdown (IS-IS)

To stop an Intermediate System-to-Intermediate System (IS-IS) router process without removing the process configuration, use the **shutdown** command. To start a stopped IS-IS process, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Command Default No process is stopped.

Command Modes Router configuration
VRF configuration

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines Entering the **shutdown** command stops a router process but does not remove any configuration parameters. The **shutdown** command is displayed in the running configuration file when enabled.

This command requires the Enterprise Services license.

Examples This example shows how to stop an active IS-IS process:

```
switch(config)# router isis firstcompany
switch(config-router)# shutdown
```

This example shows how to start a stopped a IS-IS process:

```
switch(config)# router isis firstcompany
switch(config-router)# no shutdown
```

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
router isis	Enables IS-IS.

shutdown (OSPF)

To stop an Open Shortest Path First (OSPF) instance without removing the configuration, use the **shutdown** command. To start a stopped OSPF instance, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Command Default No process is stopped.

Command Modes Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Entering the **shutdown** command stops a router process but does not remove any configuration parameters. The **shutdown** command is displayed in the running configuration file when enabled.

This command requires the Enterprise Services license.

Examples

This example shows how to stop an active OSPF instance:

```
switch(config)# router ospf firstcompany
switch(config-router)# shutdown
```

Related Commands

Command	Description
feature ospf	Enables OSPF on the router.
router ospf	Configures an OSPF instance.

shutdown (OSPFv3)

To stop an Open Shortest Path First (OSPFv3) instance without removing the configuration, use the **shutdown** command. To start a stopped OSPF instance, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Command Default No process is stopped.

Command Modes Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Entering the **shutdown** command stops a router process but does not remove any configuration parameters. The **shutdown** command is displayed in the running configuration file when enabled.

This command requires the Enterprise Services license.

Examples

This example shows how to stop an active OSPFv3 instance:

```
switch(config)# router ospfv3 firstcompany
switch(config-router)# shutdown
```

Related Commands

Command	Description
feature ospfv3	Enables OSPFv3 on the router.
router ospfv3	Configures an OSPF v3 instance.

shutdown (VRRP)

To disable a Virtual Router Redundancy Protocol (VRRP) configuration, use the **shutdown** command. To enable a VRRP configuration, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Command Default Disabled

Command Modes VRRP configuration

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

Shut down the virtual router before configuring the virtual router parameters; you can only configure the virtual router after it is in an administrative shutdown state. Enter the **no shutdown** command to update the virtual router state after completing configuration.

This command does not require a license.

Examples

This example shows how to shut down a VRRP group:

```
switch(config-if)# vrrp 45
switch(config-if-vrrp)# shutdown
switch(config-if-vrrp)# address 6.6.6.45
switch(config-if-vrrp)# no shutdown
```

Related Commands

Command	Description
feature vrrp	Enables VRRP.
show vrrp	Displays VRRP configuration information.
clear vrrp	Clears all the software counters for the specified virtual router.

spf-interval

To configure the minimum interval between arrivals of a link-state advertisement (LSA), use the **spf-interval** command. To return to the default setting, use the **no** form of this command.

spf-interval [**level-1** | **level-2**] *spf-max-wait* [*spf-initial-wait* *spf-second-wait*]

no spf-interval

Syntax Description

level-1	Specifies the shortest path first (SPF) level-1 interval.
level-2	Specifies the SPF level-2 interval.
<i>spf-max-wait</i>	Maximum interval (in milliseconds) between two consecutive SPF calculations. The range is from 500 to 65535. The default is 8000.
<i>spf-initial-wait</i>	(Optional) Initial SPF calculation delay (in milliseconds) after a topology change. The range is from 50 to 65535. The default is 50.
<i>spf-second-wait</i>	(Optional) Hold time between the first and second SPF calculation (in milliseconds). The range is from 50 to 65535. The default is 50.

Command Default

The default are as follows: *spf-max-wait* is 8000 milliseconds; *spf-initial-wait* is 50 milliseconds, and *spf-second-wait* is 50 milliseconds.

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

An LSA is used to advertise connected networks.
This command requires the Enterprise Services license.

Examples

This example shows how to set the minimum interval time between arrivals of LSA:

```
switch(config)# router isis firstcompany  
switch(config-router)# spf-interval level-1 500 500 500
```

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
router isis	Enables IS-IS.

stub

To configure a router as a stub using the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **stub** command. To disable the EIGRP stub routing feature, use the **no** form of this command.

stub [**direct**|**static**|**summary**|**redistributed**] + [**leak-map** *map-name*|**receive-only**]

no stub [**direct**|**static**|**summary**|**redistributed**] + [**leak-map** *map-name*|**receive-only**]

Syntax Description

direct	(Optional) Advertises directly connected routes.
static	(Optional) Advertises static routes.
summary	(Optional) Advertises summary routes.
redistributed	(Optional) Advertises redistributed routes from other protocols and autonomous systems.
leak-map <i>map-name</i>	(Optional) Allows dynamic prefixes based on the leak map.
receive-only	(Optional) Sets the router as a receive-only neighbor.
redistributed	(Optional) Advertises redistributed routes from other protocols and autonomous systems.

Command Default

Disabled

Command Modes

Address-family configuration
 Router configuration
 Router VRF configuration

Command History

Release	Modification
5.2(5) and 6.1	Added static and summary keywords to the syntax description.
4.0(1)	This command was introduced.

Usage Guidelines

Use the **stub** command to configure a router as a stub where the router directs all IP traffic to a distribution router.

The **direct** keyword permits EIGRP stub routing to advertise connected routes. This option is enabled by default.

The **receive-only** keyword restricts the router from sharing any of its routes with any other router in that EIGRP autonomous system, and the **receive-only** keyword does not permit any other option to be specified because it prevents any type of route from being sent.

The **redistributed** keyword permits the EIGRP Stub Routing feature to send other routing protocols and autonomous systems. Without the configuration of this option, EIGRP will not advertise redistributed routes.

If you use any of these four keywords (**direct**, **leak-map**, **receive-only**, **redistributed**) with the **stub** command, only the route types specified by the particular keyword(s) are advertised.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the router as a receive-only neighbor:

```
switch(config)# router eigrp 1  
switch(config-router)# stub receive-only
```

summary-address

To create the Intermediate-System-to Intermediate System (IS-IS) aggregate addresses, use the **summary-address** command. To remove the aggregate address, use the **no** form of this command.

summary-address {*ip-addr*| *ip-prefix / length*| *ipv6-addr*| *ipv6-prefix / length*} *level*

Syntax Description

<i>ip-addr</i>	IP address of the neighbor in this format: A.B.C.D.
<i>ip-prefix/length</i>	IP prefix and the length of the IP prefix. The length of the IPv6 prefix is a decimal value that indicates how many of the high-order contiguous bits of the address make up the prefix (the network portion of the address). A slash mark must precede the decimal value. Use this format: A.B.C.D/ <i>length</i> .
<i>ipv6-addr</i>	IPv6 address of the neighbor in this format: A:B::C:D.
<i>ipv6-prefix/length</i>	IPv6 prefix and the length of the IPv6 prefix for neighbors in this format: A:B::C:D/ <i>length</i> .
<i>level</i>	<p>Level number. Default: All routes are advertised individually. Valid values are as follows:</p> <ul style="list-style-type: none"> • level-1—Summarizes the IP address into the level-1 area. Only routes redistributed into level 1 are summarized with the configured address and mask value. • level-1-2—Summarizes the IP address into the level-1 and level-2 areas. Summary routes are applied when redistributing routes into level-1 and level-2 IS-IS, and when level-2 IS-IS advertises level-1 routes as reachable in its area. • level-2—Summarizes the IP address into the level-2 area. Routes learned by level-1 routing are summarized into the level-2 backbone with the configured address and mask value. Redistributed routes into level-2 IS-IS will be summarized also.

Command Default None

Command Modes Address-family configuration

Router configuration

VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Multiple groups of addresses can be summarized for a given level. Routes learned from other routing protocols can also be summarized. The metric used to advertise the summary is the smallest metric of all the more specific routes. This command reduces the size of the routing table and also reduces the size of the link-state packets (LSPs) and the link-state database (LSDB). It also helps to stabilize the network stability because a summary advertisement depend on many specific routes. A single route flap does not cause the summary advertisement to flap in most cases.

Note that when using summary addresses, other routes might have less information to calculate because the most optimal routing table for all individual destinations are used.

This command requires the Enterprise Services license.

Examples

This example shows how to redistribute directly connected routes into IS-IS. Only the 10.1.0.0 address is advertised the IS-IS level-1 link-state protocol data unit (PDU). The summary address is tagged with 100.

```
switch(config)# router isis 100
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# redistribute direct route-map CORE1
switch(config-router-af)# summary-address 10.1.0.0 255.255.0.0
```

Related Commands

Command	Description
address-family	Enters the address family mode or a VRF address-family mode.
feature isis	Enables IS-IS on the router.
router isis	Enables IS-IS.

summary-address (OSPF)

To create aggregate addresses for the Open Shortest Path First (OSPF) protocol, use the **summary-address** command. To return to the default, use the no form of this command.

summary-address *ip-prefix/length* [**not-advertise**] [**tag** *tag*]

no summary-address *ip-prefix/length* [**not-advertise**] [**tag** *tag*]

Syntax Description

<i>ip-prefix/length</i>	IP prefix designated for a range of addresses, including the prefix length. Specify <i>ip-prefix</i> as an IP address. Specify <i>length</i> as a number from 1 to 31.
not-advertise	(Optional) Suppresses routes that match the specified prefix/length pair.
tag <i>tag</i>	(Optional) Specifies the tag value that can be used as a match value for controlling redistribution using route maps. The range is from 1 to 65535.

Command Default

None

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **summary-address** command to create an aggregate address to replace a series of more-specific addresses. The metric used to advertise the summary is the smallest metric of all the more specific routes.

Use this command to reduce the size of the routing table and allow an OSPF Autonomous System Boundary Router (ASBR) to advertise one external route as an aggregate for all redistributed routes that are covered by the address.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the summary address 192.0.0.0 to include address 192.0.1.0, 192.0.2.0, 192.0.3.0, and so on. Only the address 192.0.0.0 is advertised in an external link-state advertisement.

```
switch(config)# router ospf 201
switch(config-router)# summary-address 192.0.0.0/16
```

Related Commands

Command	Description
redistribute (OSPF)	Redistributes external routing protocol routes into OSPF.

summary-address (OSPFv3)

To create aggregate addresses for the Open Shortest Path First version 3 (OSPFv3) protocol, use the **summary-address** command. To return to the default, use the no form of this command.

summary-address *ipv6-prefix/length* [**not-advertise**] [**tag** *tag*]

no summary-address *ipv6-prefix/length* [**not-advertise**] [**tag** *tag*]

Syntax Description

<i>ipv6-prefix/length</i>	IP prefix designated for a range of addresses, including the prefix length. Specify <i>ip-prefix</i> as an IPv6 address. Specify <i>length</i> as a number from 1 to 128.
not-advertise	(Optional) Suppresses routes that match the specified prefix/length pair.
tag <i>tag</i>	(Optional) Specifies the tag value that can be used as a match value for controlling redistribution using route maps. The range is from 1 to 65535.

Command Default

None

Command Modes

Address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **summary-address** command to create an aggregate address to replace a series of more-specific addresses. The metric used to advertise the summary is the smallest metric of all the more specific routes.

Use this command to reduce the size of the routing table and allow an OSPFv3 Autonomous System Boundary Router (ASBR) to advertise one external route as an aggregate for all redistributed routes that are covered by the address.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the summary address 192.0.0.0 to include address 192.0.1.0, 192.0.2.0, 192.0.3.0, and so on. Only the address 192.0.0.0 is advertised in an external link-state advertisement.

```
switch(config)# router ospfv3 201
```

```
switch(config-router)# address-family ipv6 unicast
switch(config-router)# summary-address 2001:0DB8::0/16
```

Related Commands

Command	Description
redistribute (OSPFv3)	Redistributes external routing protocol routes into OSPFv3.

suppress-inactive

To advertise the active routes to a Border Gateway Protocol (BGP) peer only, use the **suppress-inactive** command. To remove the restriction, use the **no** form of this command. To return to the default setting, use the **default** form of this command.

suppress-inactive

{**no**| **default** **suppress-inactive**}

Syntax Description This command has no keywords or arguments.

Command Default BGP advertises routes to a peer as soon as they are installed in the local routing table, even if the routes are not the active routes in the table.

Command Modes Neighbor address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines Use the **suppress-inactive** command to advertise only active routes to a BGP peer. This command requires the Enterprise Services license.

Examples

This example shows how to create a summary address. The path advertised for this route is an autonomous system set consisting of all elements contained in all paths that are being summarized.

```
switch(config)# router bgp 64496
switch(config-router)# neighbor 192.0.2.1/8 remote-as 64497
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor af)#

suppress-inactive
```

Related Commands

Command	Description
route-map	Creates a route map.

