Cisco Nexus 7000 Series Unicast Routing Command Reference

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Preface

Preface

This preface describes the audience, organization, and conventions of the Book Title. It also provides information on how to obtain related documentation.

This chapter includes the following topics:

Audience

This publication is for experienced network administrators who configure and maintain Cisco NX-OS on Cisco Nexus 7000 Series Platform switches.

Document Conventions

Note

- As part of our constant endeavor to remodel our documents to meet our customers' requirements, we have modified the manner in which we document configuration tasks. As a result of this, you may find a deviation in the style used to describe these tasks, with the newly included sections of the document following the new format.
- The Guidelines and Limitations section contains general guidelines and limitations that are applicable to all the features, and the feature-specific guidelines and limitations that are applicable only to the corresponding feature.

Command descriptions use the following conventions:

Convention	Description
bold	Bold text indicates the commands and keywords that you enter literally as shown.
Italic	Italic text indicates arguments for which the user supplies the values.

Convention	Description
[x]	Square brackets enclose an optional element (keyword or argument).
[x | y]	Square brackets enclosing keywords or arguments separated by a vertical bar indicate an optional choice.
{x | y}	Braces enclosing keywords or arguments separated by a vertical bar indicate a required choice.
[x {y | z}]	Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.
`variable`	Indicates a variable for which you supply values, in context where italics cannot be used.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Examples use the following conventions:

Convention	Description
`screen font`	Terminal sessions and information the switch displays are in screen font.
`boldface screen font`	Information you must enter is in boldface screen font.
italic screen font	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Related Documentation

Documentation for Cisco Nexus 7000 Series Switches is available at:

- Configuration Guides

http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-installation-and-configuration-guides-list.html

- Command Reference Guides

  http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-command-reference-list.html

- Release Notes

  http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-release-notes-list.html

- Install and Upgrade Guides

  http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-installation-guides-list.html

- Licensing Guide

  http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-licensing-information-listing.html

Documentation for Cisco Nexus 7000 Series Switches and Cisco Nexus 2000 Series Fabric Extenders is available at the following URL:

http://www.cisco.com/c/en/us/support/switches/nexus-2000-series-fabric-extenders/products-installation-and-configuration-guides-list.html

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to nexus7k-docfeedback@cisco.com. We appreciate your feedback.

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
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Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

A Commands

additional-paths

To configure the capability of sending and receiving additional paths to and from the BGP peers, use the **additional-paths** command. To disable this feature, use the **no** form of this command.

additional-paths {**receive** | **selection** **route-map** *map-name* | **send** | **install** **backup**}

Syntax Description

receive	Enables the receive capability of additional paths for all of the neighbors under this address family for which the capability has not been disabled.
selection	Specifies the capability of selecting additional paths for a prefix.
route-map	Specifies the route map for the additional paths selection.
map-name	Route map name. The maximum size is 63 alphanumeric character.
send	Enables the send capability of additional paths for all of the neighbors under this address family for which the capability has not been disabled.
install backup	Enables BGP to install the backup path to the routing table.

Command Default

None

Command Modes

address-family configuration mode

Command History

Release	Modification
6.2(8)	Added the install backup keywords.
6.1(1)	This command was introduced.

Usage Guidelines

The **additional-paths install backup** command enables BGP to install the backup path to the routing table. This command is required to support the BGP PIC edge active-backup path scenario.

Note The **additional-paths install backup** command is supported only with IPv4 unicast address-families.

This command does not require a license.

Examples

This example shows how to enable the additional paths send and receive capability for all neighbors under the specified address family for which this capability has not been disabled:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# router bgp 64496
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# additional-paths send
switch(config-router-af)#
```

```
switch(config-router-af)# additional-paths receive
switch(config-router-af)#
```

This example shows how to configure the additional paths selection under the specified address family:

```
switch# configure terminal
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# additional-paths selection route-map PATH_SELECTION_RMAP
switch(config-router-af)# #
```

This example shows how to configure the backup path to the routing table:

```
switch# configure terminal
switch(config)# router bgp 100
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# additional-paths install backup
```

Related Commands

Command	Description
address family (BGP)	Enters the address family configuration mode for BGP.
show vrrp	Displays VRRP configuration information.

address (VRRP)

To add a single, primary IP address to a virtual router, use the **address** command. To remove an IP address from a virtual router, use the **no** form of this command.

address *ip-address* [**secondary**]
no address

Syntax Description

ip-address	Virtual router address (IPv4). This address should be in the same subnet as the interface IP address.
secondary	(Optional) Specifies a secondary virtual router address.

Command Default

None

Command Modes

VRRP configuration mode

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

You can configure one virtual router IP address for a virtual router. If the configured IP address is the same as the interface IP address, this switch automatically owns the IP address. You can configure an IPv4 address only.

The master VRRP router drops the packets addressed to the virtual router's IP address because the virtual router is only intended as a next-hop router to forward packets. In NX-OS devices, some applications require that packets addressed to the virtual router's IP address be accepted and delivered. By using the **secondary** option to the virtual router IPv4 address, the VRRP router will accept these packets when it is the master.

This command does not require a license.

Examples

This example shows how to configure a virtual router IP address:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# vrrp 250
switch(config-if-vrrp)# address 10.0.0.10
```

This example shows how to remove all the IP addresses (primary and secondary) using a single command:

```
switch# configure terminal
switch(config-if-vrrp)# show run interface ethernet 9/10
version 4.0(1)

interface Ethernet9/10
  vrrp 1
    address 10.10.10.10
    address 10.10.10.11 secondary
  ip address 10.10.10.1/24
  no shutdown
```

```
switch(config-if-vrrp)# no address
switch(config-if-vrrp)# show run int e9/10
version 4.0(1)

interface Ethernet9/10
  vrrp 1
  ip address 10.10.10.1/24
  no shutdown

switch(config-if-vrrp)#
```

Related Commands

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

address-family (BGP)

To enter the address family mode or a virtual routing and forwarding (VRF) address-family mode and configure submode commands for the Border Gateway Protocol (BGP), use the**address-family** command. To disable the address family submode for configuring routing protocols, use the **no** form of this command.

address-family {**ipv4** | **ipv6**} {**multicast** | **unicast**}
no address-family {**ipv4** | **ipv6**} {**multicast** | **unicast**}

Syntax Description

ipv4	Specifies the IPv4 address family.
ipv6	Specifies the IPv6 address family.
multicast	Specifies multicast address support.
unicast	Specifies unicast address support.

Command Default

This command has no default settings.

Command Modes

Router configuration
Neighbor configuration
VRF configuration

Command History

Release	Modification
6.2(8)	Added support for IPv6 sessions.
4.0(1)	This command was introduced.

Usage Guidelines

Use the **address-family** command to enter various address family configuration modes while configuring BGP routing. When you enter the **address-family** command from router configuration mode, you enable the address family and enter global address family configuration mode. The prompt changes to switch(config-router-af)#.

You must configure the address families if you are using route redistribution, address aggregation, load balancing, and other advanced features. IPv4 neighbor sessions support IPv4 unicast and multicast address families. IPv6 neighbor sessions support IPv6 unicast and multicast address families.

Note Beginning with Cisco NX-OS Release 6.2(8) you can configure the **address-family ipv4 unicast** command in an IPv6 session.

From the address family configuration mode, the following parameters are available:

Note This applies to IPv4 multicast or unicast and IPv6 multicast or unicast.

- **aggregate-address**—Configures BGP aggregate prefixes. See the **aggregate-address** command for additional information.
- **client-to-client reflection**—Enables client-to-client route reflection. Route reflection allows a BGP speaker (route reflector) to advertise IBGP learned routes to certain IBGP peers. Use the **no** form of this command to disable client-to-client route reflection. Default: Enabled.
- **dampening** [*half-life* | **route-map***name*] —Configures the route flap dampening. Optionally, you can set the time (in minutes) after which a penalty is decreased. Once the route has been assigned a penalty, the penalty is decreased by half after the half-life period (which is 15 minutes by default). The process of reducing the penalty happens every 5 seconds. The default half-life is 15 minutes. Range: 1 to 45. Default: Disabled.
- **default-metric** *metric*—Sets the default flap metric of redistributed routes. The **default-metric** command is used to set the metric value for routes redistributed into BGP with the **redistribute** command. A default metric can be configured to solve the problem of redistributing routes with incompatible metrics. Assigning the default metric will allow redistribution to occur. This value is the Multi Exit Discriminator (MED) that is evaluated by BGP during the best path selection process. The MED is a non-transitive value that is processed only within the local autonomous system and adjacent autonomous systems. The default metric is not set if the received route has a MED value. Range: 0 to 4294967295.

Note When enabled, the **default-metric** command applies a metric value of 0 to redistributed connected routes. The **default-metric** command does not override metric values that are applied with the **redistribute** command.

- **default-originate**—Originates a default toward this peer.
- **distance** *ebgp-route ibgp-route local-route*—Configures a rating of the trustworthiness of a routing information source, such as an individual router or a group of routers. BGP does not use discard routes for next-hop resolution. In general, the higher the value, the lower the trust rating. An administrative distance of 255 means the routing information source cannot be trusted at all and should be ignored. Use this command if another protocol is known to be able to provide a better route to a node than was actually learned via external BGP (eBGP), or if some internal routes should be preferred by BGP. Range: 1 to 255. Default: EBGP—20, IBGP—200.

Caution Changing the administrative distance of internal BGP routes is considered dangerous and is not recommended. Improper configuration can introduce routing table inconsistencies and break routing.

- **exit**—Exits from the current command mode.
- **maximum-paths** [**ibgp**] *parallel-paths*—Configures the number of parallel paths to forward packets. The **maximum-paths ibgp** command is used to configure equal-cost or unequal-cost multipath load sharing for iBGP peering sessions. In order for a route to be installed as a multipath in the BGP routing table, the route cannot have a next hop that is the same as another route that is already installed. The BGP routing process will still advertise a best path to iBGP peers when iBGP multipath load sharing is configured. For equal-cost routes, the path from the neighbor with the lowest router ID is advertised as the best path. To configure equal-cost multipath load sharing, all path attributes must be the same. The path attributes include weight, local preference, autonomous system path (entire attribute and not just the length), origin code, Multi Exit Discriminator (MED), and Interior Gateway Protocol (IGP) distance. The optional **ibgp** keyword allows you to configure multipath for the IBGP paths. To return to the default, use the **no** form of this command. The range is from 1 to 16.
- **network**—Configures an IP prefix to advertise. See the network command for more information.

- nexthop—Enables nexthop tracking. See the nexthop route-map and nexthop trigger-delay command for more information.
- **no**—Negates a command or sets its defaults.
- **redistribute**—Enables the redistribution of routes learned by other protocols into BGP. Redistribution is supported for both IPv4 and IPv6 routes. To disable the redistribution of routes learned by other protocols into BGP, use the **no** form of this command.
  - **direct route-map** *name*—Specifies directly connected routes.
  - **eigrp** *AS-num* **route-map** *name*—Specifies Enhanced Interior Gateway Protocol routes. Range: 1 to 65535.
  - **isis** *src-protocol* **route-map** *name*—Specifies ISO IS-IS routes.
  - **ospf** *src-protocol* **route-map** *name*—Specifies Open Shortest Path First (OSPF) routes.
  - **rip** *src-protocol* **route-map** *name*—Specifies Routing Information Protocol (RIP) routes.
  - **static route-map** *name*—Specifies static routes.
- **suppress-inactive**—Advertises only active routes to peer. See the **suppress-inactive** command for additional information.

Use the neighbor command to enter neighbor address family configuration mode while configuring BGP routing. From the BGP neighbor configuration mode, you can perform the following actions:

- **advertise-map**—Specifies route-map for conditional advertisement. See the advertise-map command.
- **allowas-in**—Accepts as-path with my AS present in it.
- **as-override**—Overrides matching AS-number while sending update.
- **default-originate** {**route-map**}— Originates a default toward this peer.
- **disable-peer-as-check**—Disables checking of peer AS-number while advertising.
- **filter-list**—Applies AS-PATH filter list.
- **inherit**— Inherits a template.
- **maximum-prefix**—Specifies maximum number of prefixes from this neighbor.
- **next-hop-self**—Sets our peering address as nexthop.
- **next-hop-third-party**—Computes a third-party nexthop if possible.
- **no**—Negates a command or set its defaults.
- **prefix-list**—Applies a prefix list.
- **route-map**—Applies a route map to neighbor. See the route map command for more information.
- **route-reflector-client**—Configures a neighbor as a Route reflector client.
- **send-community**—Sends community attribute to this neighbor.
- **soft-reconfiguration**—Soft reconfiguration.
- **soo**—Specify site-of-origin extcommunity.

This command requires the Enterprise Services license.

Examples

This example shows how to place the router in global address family configuration mode for the IPv4 unicast address family:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# router bgp 64496
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)#
```

This example shows how to activate IPv4 multicast for neighbor 192.0.2.1 and place the device in neighbor address family configuration mode for the IPv4 multicast address family:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# router bgp 64496
switch(config-router)# address-family ipv4 multicast
switch(config-router-af)# exit
switch(config-router)# neighbor 192.0.2.1
switch(config-router-neighbor)# remote-as 64496
switch(config-router-neighbor)# address-family ipv4 multicast
switch(config-router-neighbor-af)
```

Related Commands

Command	Description
aggregate-address	Configures BGP summary addresses.
client-to-client	Configures route reflection.
dampening	Configures route flap dampening.
default-metric (BGP)	Configures the default metric for routes redistributed into BGP.
distance(BGP)	Configures the administrative distance.
feature bgp	Enables BGP configuration.
maximum-paths(BGP)	Configures the maximum number of equal-cost paths.
redistribute(BGP)	Configures route redistribution for BGP.
timers(BGP)	Configures the BGP timers.

address-family (EIGRP)

To configure an address family for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **address-family** command in router configuration mode.

address-family {**ipv4** | **ipv6**} **unicast**

Syntax Description

ipv4	Specifies the IPv4 address family.
ipv6	Specifies the IPv6 address family.
unicast	Specifies unicast address support.

Command Default

None

Command Modes

Router configuration
Address family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	The **ipv6**keyword was added.

Usage Guidelines

This command requires the Enterprise license.

Examples

This example shows how to set the IPv4 unicast address family for an EIGRP instance:

```
switch# configure terminal
switch(config)# router eigrp 201
switch(config-router)# address-family ipv4 unicast
```

Related Commands

Command	Description
default-information	Controls the distribution of a default route.
default-metric	Configures the default metric for routes redistributed into EIGRP.
distance	Configures the administrative distance.
maximum-paths	Configures the maximum number of equal-cost paths.
redistribute	Configures route redistribution for EIGRP.
router-id	Configures the router ID.
timers	Configures the EIGRP timers.

address-family (IS-IS)

To enter the address family mode or a virtual routing and forwarding (VRF) address-family mode and configure submode commands for the Intermediate System-to-Intermediate System Intradomain Routing Protocol (IS-IS), use the**address-family** command. To disable the address family submode for configuring routing protocols, use the **no** form of this command.

address-family {**ipv4** | **ipv6**} **unicast**
noaddress-family {**ipv4** | **ipv6**} **unicast**

Syntax Description

ipv4	Specifies the IPv4 address family.
ipv6	Specifies the IPv6 address family.
unicast	Specifies unicast address support.

Command Default

None

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **address-family** command to enter various address family configuration modes while configuring IS-IS routing. When you enter the **address-family** command from configuration mode, you enable the address family and enter global address family configuration mode. The prompt changes to switch(config-router-af)#.

You must configure the address families if you are using route redistribution, address aggregation, load balancing, and other advanced features. IPv4 neighbor sessions support IPv4 unicast address families.

IPv6 neighbor sessions support IPv6 unicast address familiesFrom the address family configuration mode, the following configuration modes are available:

- **adjacency-check**—Allows Intermediate System-to-Intermediate System (IS-IS)IPv6 or IPv4 protocol-support consistency checks to be performed on hello packets. To disable consistency checks on hello packets, use the **no** form of this command. Default: Enabled. IS-IS performs consistency checks on hello packets and will form an adjacency only with a neighboring router that supports the same set of protocols. A router running IS-IS for both IPv4 and IPv6 will not form an adjacency with a router running IS-IS for IPv4 only.

Use the **no adjacency-check** command in address-family configuration mode to suppress the consistency checks for IPv6 IS-IS and allow an IPv4 IS-IS router to form an adjacency with a router running IPv4 IS-IS and IPv6. IS-IS will never form an adjacency between a router running IPv4 IS-IS only and a router running IPv6 only.

Use the **no adjacency-check** configuration mode command to suppress the IPv4 subnet consistency check and allow IS-IS to form an adjacency with other routers regardless of whether or not they have an IPv4 subnet in common. By default, IS-IS makes checks in hello packets for IPv4 address subnet matching with a neighbor.

Tip Use the **debug isis adjacency packets** command in privileged EXEC mode to check for adjacency errors. Error messages in the output may indicate where routers are failing to establish adjacencies.

- **default-information originate** [**always**] [**route-map** *name*]—Controls the origination of a default route.
  - **always**—(Optional) Always advertises the default route.
  - **route-map** *name*—(Optional) Specifies the name of the route-map to announce the default routes.
- **distance** *value*—Specifies the administrative distance. To return to the default distance, use the **no** form of this command. An administrative distance of 255 means the routing information source cannot be trusted at all and should be ignored. Range: 1 to 255. Default: 115.
- **distribute** {**level-1** | **level-2**} **into** {**level-1** | **level-2**} {**all** | **route-map** *name*}—Configures domain-wide prefix distribution between levels.
  - **level-1**—Distributes the interarea routes into level-1 of this IS-IS instance.
  - **level-2**—Distributes the interarea routes into level-2 of this IS-IS instance.
  - **into**—Specifies from one level to another level.
  - **all**—Distributes all route levels.
  - **route-map** *name*—Prevents distribution of a specific route-map.
- **exit**—Exits from the current command mode.
- **no**—Negates a command or set its defaults.
- **redistribute** *protocol as-num.as-num*] [**route-map** *map-tag*]—Redistributes information from another routing protocol into IS-IS. To remove the **redistribute** command from the configuration file and return to the default setting, use the **no** form of this command. Default: Software does not redistribute routes. See the **redistribute (IS-IS)** command for information.
- **summary-address** {*ip-addr* | *ip-prefix*/*length* | *ipv6-addr* | *ipv6-prefix*/*length*} *level*—Creates the IS-IS aggregate addresses. To remove the aggregate address, use the **no** form of this command. See the **summary-address** command for information.

This command requires the Enterprise Services license.

Examples

This example shows how to place the router in address family configuration mode and specify unicast address prefixes for the IPv4 address family:

```
switch# configure terminal
switch(config)# router isis 100
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)#
```

This example shows how to redistribute directly connected routes into IS-IS. This example advertises only 10.1.0.0 into the IS-IS level-1 link-state PDU.

```
switch# configure terminal
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
```

This example shows how to introduce IPv6 into an existing IPv4 IS-IS network. To ensure that the checking of hello packet checks from adjacent neighbors is disabled until all the neighbor routers are configured to use IPv6, enter the **no adjacency-check** command.

```
switch# configure terminal
switch(config)# router isis test2
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# no adjacency-check
```

Related Commands

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

address-family (OSPFv3)

To enter address family mode for the Open Shortest Path First version 3(OSPFv3) protocol, use the **address-family**command.

address-family ipv6 unicast

Syntax Description

ipv6	Specifies the IPv6 address family.
unicast	Specifies unicast address support.

Command Default

This command has no default settings.

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to enter the IPv6 unicast address family for an OSPFv3v3 instance:

```
switch# configure terminal
switch(config)# router ospfv3v3 Enterprise
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)#
```

Related Commands

Command	Description
default-information (OSPFv3)	Controls the distribution of a default route.
default-metric (OSPFv3)	Configures the default metric for routes redistributed into OSPFv3.
distance (OSPFv3)	Configures the administrative distance.
maximum-paths (OSPFv3)	Configures the maximum number of equal-cost paths.
redistribute (OSPFv3)	Configures route redistribution for OSPFv3.
timers (OSPFv3)	Configures the OSPFv3 timers.

address-family (RIP)

To configure an address family for the Routing Information Protocol (RIP), use the **address-family**command in router configuration mode.

address-family {{**ipv4** | **ipv6**} | **ipv6**} **unicast**

Syntax Description

ipv4	Specifies the IPv4 address family.
ipv6	Specifies the IPv6 address family.
unicast	Specifies unicast address support.

Command Default

This command has no default settings.

Command Modes

Router configuration

Command History

Release	Modification
6.1(1)	Added IPv6 keyword to the syntax description.
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to set the IPv4 unicast address family for a RIP instance:

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router-af)# address-family ipv4 unicast
```

This example shows how to set the IPv6 unicast address family for a RIP instance:

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)#
```

Related Commands

Command	Description
default-information	Controls the distribution of a default route.
default-metric	Configures the default metric for routes redistributed into RIP.
distance	Configures the administrative distance.
maximum-paths	Configures the maximum number of equal-cost paths.
redistribute	Configures route redistribution for RIP.

Command	Description
timers	Configures the RIP timers.

address-family ipv6 (IS-IS)

To enter address family configuration mode for configuring Intermediate System-to-Intermediate System (IS-IS) routing sessions that use standard IPv6 address prefixes, use the **address-family ipv6** command. To disable the address family submode for configuring routing protocols, use the **no** form of this command.

address-family ipv6 unicast
no address-family ipv6 unicast

Syntax Description

unicast	Specifies IPv6 unicast address prefixes.

Command Default

None.

Command Modes

Router configuration

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

Use the **address-family ipv6** command to enter various address family configuration modes while configuring IS-IS routing. You must enter the **address-family ipv6** command from router isis configuration mode. The prompt changes to switch(config-router-af)#:

```
switch# configure terminal
switch(config)# router isis 100
switch(config-router)# address-family ipv6
switch(config-router-af)#
```

You must configure the address families if you are using route redistribution, address aggregation, load balancing, and other advanced features.

From the address family configuration mode, the following configuration modes are available:

- **adjacency-check**—Allows protocol-support consistency checks to be performed on hello packets. Default: Enabled. IS-IS performs consistency checks on hello packets and will form an adjacency only with a neighboring router that supports the same set of protocols.

Use the **no adjacency-check** command in in address-family configuration mode to suppress the consistency checks for IPv6 IS-IS and allow an IPv4 IS-IS router to form an adjacency with a router running IPv4 IS-IS and IPv6. IS-IS will never form an adjacency between a router running IPv4 IS-IS only and a router running IPv6 only.

Tip Use the **debug isis adjacency packets** command in privileged EXEC mode to check for adjacency errors. Error messages in the output may indicate where routers are failing to establish adjacencies.

- **default-information originate** [**always**] [**route-map** *name*]—Controls the origination of a default route.
  - **always**—(Optional) Always advertises the default route.
  - **route-map** *name*—(Optional) Specifies the name of the route-map to announce the default routes.

- **distance** *value*—Specifies the administrative distance. To return to the default distance, use the **no** form of this command. An administrative distance of 255 means the routing information source cannot be trusted at all and should be ignored. Range: 1 to 255. Default: 115.
- **distribute** {**level-1** | **level-2**} **into** {**level-1** | **level-2**} {**all** | **route-map** *name*}—Configures domain-wide prefix distribution between levels.
  - **level-1**—Distributes the interarea routes into level-1 of this IS-IS instance.
  - **level-2**—Distributes the interarea routes into level-2 of this IS-IS instance.
  - **into**—Specifies from one level to another level.
  - **all**—Distributes all route levels.
  - **route-map** *name*—Prevents distribution of a specific route-map.
- **exit**—Exits from the current command mode.
- **maximum-paths**—Controls the maximum number of parallel routes that an IP routing protocol can support.
- **multi-topology** [**transition**]—Enables multitopology for IPv6.
  - **transition**—(Optional) Enables multitopology transition mode.
- **no**—Negates a command or set its defaults.
- **redistribute** *protocol as-num.as-num*] [**route-map** *map-tag*]—Redistributes information from another routing protocol into IS-IS. To remove the **redistribute** command from the configuration file and return to the default setting, use the **no** form of this command. Default: Software does not redistribute routes. See the **redistribute (IS-IS)** command for information.
- **set-attached-bit**—Sets the attached (ATT) bit for this IS-IS instance.
- **summary-address** {*ip-addr* | *ip-prefix*/*length* | *ipv6-addr* | *ipv6-prefix*/*length*} *level*—Creates the IS-IS aggregate addresses. To remove the aggregate address, use the **no** form of this command. See the **summary-address** command for information.

This command requires the Enterprise Services license.

Examples

This example shows how to place the router in address family configuration mode and specify unicast address prefixes for the IPv6 address family:

```
switch# configure terminal
switch(config)# router isis 100
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)#
```

This example shows how to ensure that the checking of hello packet checks from adjacent neighbors is disabled until all the neighbor routers are configured to use IPv6:

```
switch# configure terminal
switch(config)# router isis test2
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# no adjacency-check
```

Related Commands

Command	Description
address-family (IS-IS)	Enters the address family configuration mode for IS-IS.
feature isis	Enables IS-IS on the router.
router isis	Enables IS-IS.

adjacency-check

To enable strict adjacency mode for the IPv4 and IPv6 address, use the **adjacency-check** command. To disable this feature, use the **no** form of this command.

adjacency-check
no adjacency-check

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

address-family configuration mode

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 configure the adjacency's protocol support consistency check:

```
switch# configure terminal
switch(config)# router isis Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# adjacency-check
```

Related Commands

Command	Description
feature isis	Enables IS-IS.

advertise-map

To configure Border Gateway Protocol (BGP) conditional advertisement, use the **advertise-map** command. To remove BGP conditional advertisement, use the **no** form of this command.

advertise-map *adv-map* {**exist-map** *exist-rmap* | **non-exist-map** *nonexist-rmap*}

Syntax Description

adv-map	Route map with match statements that the route must pass before BGP passes the route to the next route map. The *adv-map* is a case-sensitive, alphanumeric string up to 63 characters.
exist-map *exist-rmap*	Specifies a route map with match statements for a prefix list. A prefix in the BGP table must match a prefix in the prefix list before BGP will advertise the route. The *exist-rmap* is a case-sensitive, alphanumeric string up to 63 characters.
non-exist-map *nonexist-rmap*	Specifies a route map with match statements for a prefix list. A prefix in the BGP table must not match a prefix in the prefix list before BGP will advertise the route. The *nonexist-rmap* is a case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

BGP neighbor address-family command mode

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **advertise-map** command to conditionally advertise selected routes. The routes or prefixes that BGP conditionally advertises are defined in two route maps, the *adv-map* and an *exist-map* or *nonexist-map* . The *exist-map* or *nonexist-map* specifies the prefix that the BGP tracks. The *adv-map* specifies the prefix that BGP advertises to the specified neighbor when the condition is met.

This command requires the Enterprise Services license.

Examples

This example shows how to configure BGP conditional advertisement:

```
switch# configure terminal
switch(config)# router bgp 65536
switch(config-router)# neighbor 192.0.2.2 remote-as 65537
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# advertise-map advertise exist-map exist
switch(config-router-neighbor-af)# exit
switch(config-router-neighbor)# exit
switch(config-router)# exit
switch(config)# route-map advertise
switch(config-route-map)# match as-path pathList
switch(config-route-map)# exit
switch(config)# route-map exit
switch(config-route-map)# match ip address prefix-list plist
switch(config-route-map)# exit
switch(config)# ip prefix-list plist permit 209.165.201.0/27
```

Related Commands

Command	Description
feature bgp	Enables BGP.

advertisement-interval (VRRP)

To specify the time interval between the advertisement packets that are being sent to other Virtual Router Redundancy Protocol (VRRP) routers in the same group, use the **advertisement-interval** command. To return to the default interval value of 1 second, use the **no** form of this command.

advertisement-interval *seconds*
no advertisement-interval

Syntax Description

seconds	Number of seconds between advertisement frames being sent. For IPv4, the range is from 1 to 255 seconds.

Command Default

1 second

Command Modes

VRRP configuration

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

VRRP advertisements communicate the priority and state of the virtual router master. The advertisements are encapsulated in IP packets and are sent to the IPv4 multicast address that is assigned to the VRRP group.

VRRP uses a dedicated Internet Assigned Numbers Authority (IANA) standard multicast address (224.0.0.18) for VRRP advertisements. This addressing scheme minimizes the number of routers that must service the multicasts and allows test equipment to accurately identify VRRP packets on a segment. The IANA-assigned VRRP IP protocol number is 112.

This command does not require a license.

Examples

This example shows how to specify an advertisement interval of 200 seconds for VRRP group 250:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# vrrp 250
switch(config-if-vrrp)# advertisement-interval 200
```

Related Commands

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

aggregate-address

To create a summary address in a Border Gateway Protocol (BGP) routing table, use the **aggregate-address**command. To remove the summary address, use the **no** form of this command.

aggregate-address *address/ length* [**advertise-map** *map-name*] [**as-set**] [**attribute-map** *map-name*] [**summary-only**] [**suppress-map** *map-name*]
no aggregate-address *address/mask-length* [**advertise-map** *map-name*] [**as-set**] [**attribute-map** *map-name*] [**summary-only**] [**suppress-map** *map-name*]

Syntax Description

address/length	Aggregate IP address and mask length. Valid values for *length* are as follows: • IPv4 addresses—1 to 32 • IPv6 addresses—1 to 128
advertise-map *map-name*	(Optional) Specifies the name of the route map used to select attribute information from specific routes.
as-set	(Optional) Generates the autonomous system set path information and community information from the contributing paths.
attribute-map *map-name*	(Optional) Specifies the name of the route map used to set the attribute information for specific routes. The map-name is an alphanumeric string up to 63 characters.
summary-only	(Optional) Filters all more-specific routes from updates.
suppress-map *map-name*	(Optional) Specifies the name of the route map used to conditionally filter more specific routes. The map-name is an alphanumeric string up to 63 characters.

Command Default

The atomic aggregate attribute is set automatically when an aggregate route is created with this command unless the **as-set** keyword is specified.

Command Modes

Address-family configuration
Neighbor address-family configuration
Router BGP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You can implement aggregate routing in BGP and mBGP either by redistributing an aggregate route into BGP or mBGP, or by using the conditional aggregate routing feature.

Using the **aggregate-address** command with no keywords will create an aggregate entry in the BGP or mBGP routing table if any more-specific BGP or mBGP routes are available that fall within the specified range. (A longer prefix which matches the aggregate must exist in the RIB.) The aggregate route will be advertised as coming from your autonomous system and will have the atomic aggregate attribute set to show that information might be missing. (By default, the atomic aggregate attribute is set unless you specify the **as-set** keyword.)

Using the **as-set** keyword creates an aggregate entry using the same rules that the command follows without this keyword, but the path advertised for this route will be an AS_SET consisting of all elements contained in all paths that are being summarized. Do not use this form of the **aggregate-address** command when aggregating many paths, because this route must be continually withdrawn and updated as autonomous system path reachability information for the summarized routes changes.

Using the **summary-only** keyword not only creates the aggregate route (for example, 192.*.*.*) but also suppresses advertisements of more-specific routes to all neighbors. If you want to suppress only advertisements to certain neighbors, you may use the **neighbor distribute-list** command, with caution. If a more-specific route leaks out, all BGP or mBGP routers will prefer that route over the less-specific aggregate you are generating (using longest-match routing).

Using the **suppress-map** keyword creates the aggregate route but suppresses advertisement of specified routes. You can use the match clauses of route maps to selectively suppress some more-specific routes of the aggregate and leave others unsuppressed. IP access lists and autonomous system path access lists match clauses are supported.

Using the **advertise-map** keyword selects specific routes that will be used to build different components of the aggregate route, such as AS_SET or community. This form of the **aggregate-address** command is useful when the components of an aggregate are in separate autonomous systems and you want to create an aggregate with AS_SET, and advertise it back to some of the same autonomous systems. You must remember to omit the specific autonomous system numbers from the AS_SET to prevent the aggregate from being dropped by the BGP loop detection mechanism at the receiving router. IP access lists and autonomous system path access lists match clauses are supported.

Using the **attribute-map** keyword allows attributes of the aggregate route to be changed. This form of the **aggregate-address** command is useful when one of the routes forming the AS_SET is configured with an attribute such as the community no-export attribute, which would prevent the aggregate route from being exported. An attribute map route map can be created to change the aggregate attributes.

This command requires the Enterprise Services license.

AS-Set Example

In This example, an aggregate BGP address is created in router configuration mode. The path advertised for this route will be an AS_SET consisting of all elements contained in all paths that are being summarized.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# aggregate-address 10.0.0.0 255.0.0.0 as-set
```

Summary-Only Example

In This example, an aggregate BGP address is created in address family configuration mode and applied to the multicast database (SAFI) under the IP Version 4 address family. Because the **summary-only** keyword is configured, more-specific routes are filtered from updates.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# address-family ipv4 multicast
switch(config-router-af)# aggregate-address 10.0.0.0 255.0.0.0 summary-only
```

Conditional Aggregation Example

In This example, a route map called MAP-ONE is created to match on an as-path access list. The path advertised for this route will be an AS_SET consisting of elements contained in paths that are matched in the route map.

```
switch# configure terminal
switch(config)# ip as-path access-list 1 deny ^1234_
switch(config)# ip as-path access-list 1 permit .*
switch(config)# !

switch(config)# route-map MAP-ONE
switch(config-route-map)# match ip as-path 1
switch(config-route-map)# exit

switch(config)# router bgp 64496
switch(config-router)# address-family ipv4
switch(config-router-af)# aggregate-address 10.0.0.0 255.0.0.0 as-set advertise-map MAP-ONE

switch(config-router-af)# end
```

Related Commands

Command	Description
route-map	Creates a route map.

area authentication (OSPF)

To enable authentication for an Open Shortest Path First (OSPF) area, use the **area authentication** command. To remove authentication for an area, use the **no** form of this command.

area *area-id* **authentication** [**message-digest**]
no area *area-id* **authentication** [**message-digest**]

Syntax Description

area-id	Identifier for the OSPF area where you want to enable authentication. Specify as either a positive integer value or an IP address.
message-digest	(Optional) Enables Message Digest 5 (MD5) authentication on the area specified by the *area-id* argument.

Command Default

No authentication

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area authentication** command to configure the authentication mode for the entire OSPF area.

The authentication type and authentication password must be the same for all OSPF devices in an area. Use the **ip ospf authentication-key** command in interface configuration mode to specify this password.

If you enable MD5 authentication with the **message-digest** keyword, you must configure a password with the **ip ospf message-digest-key** command in interface configuration mode.

This command requires the Enterprise Services license.

Examples

This example shows how to configure authentication for area 0 of OSPF routing process 201:

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# area 0 authentication message-digest
switch(config-router)# interface ethernet 1/1
switch(config-if)# ip ospf area 0
switch(config)-if# ip ospf message-digest-key 10 md5 0 adcdefgh
```

Related Commands

Command	Description
ip ospf authentication-key	Assigns a password for simple password authentication for OSPF.
ip ospf message-digest-key	Assigns a password for OSPF MD5 authentication.

area authentication ipsec

To enable authentication of OSPFv3 packets on a per-interface basis at the Area level, use the **area authentication ipsec** command. To disable the authentication of OSPFv3 packets at the area level, use the **no** form of this command.

area *area-num* **authentication ipsec spi** *spi auth* [{**0** | **3** | **7**}] *key*
no authentication ipsec spi *spi*

Syntax Description

area-num	Area of the interfaces which need authentication.
spi	Specifies the Security Policy Index.
spi	Value of **spi**. It ranges from 256 to 4294967295.
auth	Authentication algorithm. Its value can be md1 / sha1 / null.
key	Authentication password.
0	Specifies that the authentication password is unencrypted.
3	Specifies that the authentication password is 3DES encrypted.
7	Specifies that the authentication password is Cisco type 7 encrypted.

Command Default

The OSPFv3 packets are not authenticated by default.

Command Modes

Router configuration (config-router).

Command History

Release	Modification
7.3(0)D1(1)	This command was introduced.

Usage Guidelines

Before running this command, ensure that you have enabled the authentication package with the **feature imp** command.

Examples

The following example shows how to authenticate OSPFv3 packets for all interfaces under area 0:

```
switch# configure terminal
switch(config)# feature imp
switch(config)# router ospfv3 1
switch(config-router)# area 0 authentication ipsec spi 301 md5 1234
```

Related Commands

Command	Description
authentication ipsec	Enables authentication of the OSPFv3 packets for all interfaces under the router.
ospfv3 authentication ipsec	Enables authentication of the OSPFv3 packets per interface.

area default-cost (OSPF)

To specify a cost for the default summary route sent into an Open Shortest Path First (OSPF) stub or not-so-stubby area (NSSA), use the **area default-cost**command. To remove the assigned default route cost, use the **no** form of this command.

area *area-id* **default-cost** *cost*
no area *area-id* **default-cost** *cost*

Syntax Description

area-id	Identifier for the OSPF area where you want to configure the default cost. Specify as either a positive integer value or an IP address.
cost	Cost for the default summary route used for a stub or NSSA. The range is from 0 to 16777215.

Command Default

The summary route cost is based on the area border router that generated the summary route.

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area default-cost** command on an Area Border Router (ABR) attached to a stub or NSSA to configure the metric for the summary default route generated by the ABR into the stub area.

This command requires the Enterprise Services license.

Examples

This example shows how to set a default cost of 20 to stub network 192.0.2.0:

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# area 192.0.2.0 stub
switch(config-router)# area 192.0.2.0 default-cost 20
```

Related Commands

Command	Description
area stub	Defines an area as a stub area.

area default-cost (OSPFv3)

To specify a cost for the default summary route sent into an Open Shortest Path First version 3(OSPFv3) stub or not-so-stubby area (NSSA), use the **area default-cost**command. To remove the assigned default route cost, use the **no** form of this command.

area *area-id* **default-cost** *cost*
no area *area-id* **default-cost** *cost*

Syntax Description

area-id	Identifier for the OSPFv3 area where you want to configure the default cost. Specify as either an IP address or a number from 0 to 4294967295.
cost	Cost for the default summary route used for a stub or NSSA. The range is from 0 to 16777215.

Command Default

The summary route cost is based on the area border router that generated the summary route.

Command Modes

Address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area default-cost** command on an Area Border Router (ABR) attached to a stub or NSSA to configure the metric for the summary default route generated by the ABR into the stub area.

This command requires the Enterprise Services license.

Examples

This example shows how to set a default cost of 20 to stub network 33:

```
switch# configure terminal
switch(config)# router ospfv3 201
switch(config-router)# area 33 stub
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# area 33 default-cost 20
```

Related Commands

Command	Description
area stub	Defines an area as a stub area.

area filter-list (OSPF)

To filter prefixes advertised in type 3 link-state advertisements (LSAs) between Open Shortest Path First (OSPF) areas of an Area Border Router (ABR), use the **area filter-list** command. To change or cancel the filter, use the **no** form of this command.

area *area-id* **filter-list route-map** *map-name* {**in** | **out**}
no area *area-id* **filter-list route-map** *map-name* {**in** | **out**}

Syntax Description

area-id	Identifier for the OSPF area where you want to configure filtering. Specify as either a positive integer value or an IP address.
route-map *map-name*	Specifies the name of a route map used as the filter policy. The *map-name* argument can be any alphanumeric string of up to 63 characters.
in	Filters networks sent to this area.
out	Filters networks sent from this area.

Command Default

None

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area filter-list** command to filter Type 3 LSAs. If you apply the route map with the **in** keyword, the route map filters all Type 3 LSAs originated by the ABR to this area, including Type 3 LSAs that originated as a result of the area range command in another area.

If you apply the route map with the **out** keyword, the route map filters all Type 3 LSAs that are advertised by the ABR to all other areas including Type 3 LSAs that originate locally as a result of the **area range** command configured in this area.

Cisco NX-OS implicitly denies any prefix that does not match an entry in the route map.

This command requires the Enterprise Services license.

Examples

This example shows how to filter prefixes that are sent from all other areas to area 1:

```
switch# configure terminal
switch(config)# router ospf 202
switch(config-router)# area 1 filter-list route-map FilterExternal in
```

Related Commands

Command	Description
area range	Consolidates and summarizes routes at an area boundary.

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

area filter-list (OSPFv3)

To filter prefixes advertised in type 3 link-state advertisements (LSAs) between Open Shortest Path First version 3 (OSPFv3) areas of an Area Border Router (ABR), use the **area filter-list** command. To change or cancel the filter, use the **no** form of this command.

area *area-id* **filter-list route-map** *map-name* {**in** | **out**}
no area *area-id* **filter-list route-map** *map-name* {**in** | **out**}

Syntax Description

area-id	Identifier for the OSPFv3 area where you want to configure filtering. Specify as either an IP address or a number from 0 to 4294967295.
route-map *map-name*	Specifies the name of a route map used as the filter policy. The *map-name* argument can be any alphanumeric string up to 63 characters.
in	Filters networks sent to this area.
out	Filters networks sent from this area.

Command Default

None

Command Modes

Address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area filter-list** command to filter Type 3 LSAs. If you apply the route map with the **in** keyword, the route map filters all Type 3 LSAs originated by the ABR to this area, including Type 3 LSAs that originated as a result of the area range command in another area.

If you apply the route map with the **out** keyword, the route map filters all Type 3 LSAs that are advertised by the ABR to all other areas including Type 3 LSAs that originate locally as a result of the area range command configured in this area.

Cisco NX-OS implicitly denies any prefix that does not match an entry in the route map.

This command requires the Enterprise Services license.

Examples

This example shows how to filter prefixes that are sent from all other areas to area 1:

```
switch# configure terminal
switch(config)# router ospfv3 201
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# area 1 filter-list route-map FilterExternal in
```

Related Commands

Command	Description
area range (OSPFv3)	Consolidates and summarizes routes at an area boundary.

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

area nssa (OSPF)

To configure an area as an Open Shortest Path First (OSPF) not-so-stubby area (NSSA), use the **area nssa**command. To remove the NSSA area, use the **no** form of this command.

area *area-id* **nssa** [**default-information-originate** [**route-map** *map-name*]] [**no-redistribution**] [**no-summary**] [**translate type7** [{**always** | **never**}] [**suppress-fa**]]
no area *area-id* **nssa** [**default-information-originate** [**route-map** *map-name*]] [**no-redistribution**] [**no-summary**] [**translate type7** [{**always** | **never**}] [**suppress-fa**]]

Syntax Description

area-id	Identifier for the OSPF NSSA area. Specify as either a positive integer value or an IP address.
default-information-originate	(Optional) Generates a Type 7 default into the NSSA area. This keyword takes effect only on NSSA ABR or NSSA ASBR.
route-map *map-name*	(Optional) Filters the Type 7 default generation based on the route map. The *map-name* argument can be any alphanumeric string up to 63 characters.
no-redistribution	(Optional) Blocks redistributed LSAs from entering this NSSA area. Use this keyword when the router is both an NSSA autonomous system border router (ASBR) and an NSSA area border router (ABR) and you want the **redistribute** command to import routes into the normal areas but not into the NSSA area.
no-summary	(Optional) Allows an area to be an NSSA area but not have summary routes injected into it.
translate type7	(Optional) Translates Type 7 LSAs to type 5 LSAs.
always	(Optional) Always translates LSAs.
never	(Optional) Never translates LSAs.
suppress-fa	(Optional) Suppresses the forwarding address in translated LSAs. The ABR uses 0.0.0.0 as the forwarding IPv4 address.

Command Default

None

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area nssa** command to create an NSSA area in an OSPF autonomous system. We recommend that you understand the network topology before configuring forwarding address suppression for translated LSAs. Suboptimal routing might result because there might be better paths to reach the destination's forwarding address.

This command requires the Enterprise Services license.

Examples

This example shows how to configure area 1 as an NSSA area:

```
switch# configure terminal
switch(config)# router ospf 10
switch(config-router)# area 1 nssa
```

This example shows how to configure area 1 as an NSSA area and translate Type 7 LSAs from area 1 to Type 5 LSAs, but not place the Type 7 forwarding address into the Type 5 LSAs. (OSPF places 0.0.0.0 as the forwarding address in the Type 5 LSAs.)

```
switch# configure terminal
switch(config)# router ospf 2
switch(config-router)# area 1 nssa translate type7 suppress-fa
```

Related Commands

Command	Description
redistribute	Redistributes routes learned from one routing protocol to another routing protocol domain.

area nssa (OSPFv3)

To configure an area as an Open Shortest Path First version 3 (osPFv3) not-so-stubby area (NSSA), use the **area nssa** command. To remove the NSSA area, use the **no** form of this command.

area *area-id* **nssa** [**default-information-originate** [**route-map** *map-name*]] [**no-redistribution**] [**no-summary**] [**translate type7** [{**always** | **never**}] [**suppress-fa**]]
no area *area-id* **nssa** [**default-information-originate** [**route-map** *map-name*]] [**no-redistribution**] [**no-summary**] [**translate type7** [{**always** | **never**}] [**suppress-fa**]]

Syntax Description

area-id	Identifier for the OSPFv3 NSSA area. Specify as either an IP address or a number from 0 to 4294967295.
default-information-originate	(Optional) Generates a Type 7 default into the NSSA area. This keyword takes effect only on NSSA ABR or NSSA ASBR.
route-map *map-name*	(Optional) Filters the Type 7 default generation based on the route map. The *map-name* argument can be any alphanumeric string up to 63 characters.
no-redistribution	(Optional) Blocks redistributed LSAs from entering this NSSA area. Use this keyword when the router is both an NSSA autonomous system border router (ASBR) and an NSSA area border router (ABR) and you want the **redistribute** command to import routes into the normal areas but not into the NSSA area.
no-summary	(Optional) Allows an area to be an NSSA area but not have summary routes injected into it.
translate type7	(Optional) Translates Type 7 LSAs to type 5 LSAs.
always	(Optional) Always translates LSAs.
never	(Optional) Never translates LSAs.
suppress-fa	(Optional) Suppresses the forwarding address in translated LSAs. The ABR uses 0.0.0.0 as the forwarding IPv4 address.

Command Default

None

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area nssa** command to create an NSSA area in an OSPFv3 autonomous system. We recommend that you understand the network topology before configuring forwarding address suppression for translated LSAs. Suboptimal routing might result because there might be better paths to reach the destination's forwarding address.

This command requires the Enterprise Services license.

Examples

This example shows how to configure area 1 as an NSSA area:

```
switch# configure terminal
switch(config)# router ospfv3 10
switch(config-router)# area 1 nssa
```

This example shows how to configure area 1 as an NSSA area and translate Type 7 LSAs from area 1 to Type 5 LSAs, but not place the Type 7 forwarding address into the Type 5 LSAs. (OSPFv3 places 0.0.0.0 as the forwarding address in the Type 5 LSAs.)

```
switch# configure terminal
switch(config)# router ospfv3 2
switch(config-router)# area 1 nssa translate type7 suppress-fa
```

Related Commands

Command	Description
redistribute (OSPFv3)	Redistributes routes learned from one routing protocol to another routing protocol domain.

area range (OSPF)

To consolidate and summarize routes at an Open Shortest Path First (OSPF) area boundary, use the **area range** command. To disable this function, use the **no** form of this command.

area *area-id* **range** *ip-prefix* [**not-advertise**] [**cost** *cost-value*]
no area *area-id* **range** *ip-prefix* [**not-advertise**] [**cost** *cost-value*]

Syntax Description

area-id	Identifier for the OSPF area where you want to summarize routes. Specify as either a positive integer value or an IP address.
ip-prefix	IP prefix specified as IP address/subnet mask length (A.B.C.D/LEN).
not-advertise	(Optional) Sets the address range status to DoNotAdvertise. The Type 3 summary LSA is suppressed, and the component networks remain hidden from other networks.
cost	(Optional) Specifies the cost to use during shortest path first (SPF) calculation for the summarized route.
cost-value	Cost value. The range is from 0 to 16777215.

Command Default

Disabled

Command Modes

Router configuration

Command History

Release	Modification
5.2(1)	Added the cost key word.
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area range** command only with Area Border Routers (ABRs) to consolidate or summarize routes for an area. The ABR advertises that a single summary route is advertised to other areas and condenses routing information at area boundaries.

You can configure OSPF to summarize addresses for many different sets of address ranges by configuring multiple **area range** commands.

This command requires the Enterprise Services license.

Examples

This example shows how to configure one summary route to be advertised by the ABR to other areas for all hosts on network 192.0.2.0:

```
switch# configure terminal
switch(config-if)# interface ethernet 1/2
switch(config-if)# ip address 192.0.2.201 255.255.255.0
switch(config-if)# ip ospf area 201
switch(config-router)# area 0 range 192.0.2.0 255.255.0.0
```

area range (OSPFv3)

To consolidate and summarize routes at an Open Shortest Path First version 3 (OSPFv3) area boundary, use the **area range** command. To disable this function, use the **no** form of this command.

area *area-id* **range** *ivp6-prefix/length* [**not-advertise**] [**cost** *cost-value*]
no area *area-id* **range** *ivp6-prefix* [**not-advertise**] [**cost** *cost-value*]

Syntax Description

area-id	Identifier for the OSPF area where you want to summarize routes. Specify as either an IP address or a number from 0 to 4294967295.
ipv6-prefix/length	IP prefix specified as IPv6 address/length (A:B::C:D/LEN). The *length* argument can be from 1 to 127.
not-advertise	(Optional) Sets the address range status to DoNotAdvertise. The Type 3 summary LSA is suppressed, and the component networks remain hidden from other networks.
cost	(Optional) Specifies the cost to use during shortest path first (SPF) calculation for the summarized route.
cost-value	Cost value. The range is from 0 to 16777215.

Command Default

Disabled

Command Modes

Router configuration

Command History

Release	Modification
5.2(1)	Added the cost key word.
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area range** command only with Area Border Routers (ABRs) to consolidate or summarize routes for an area. The ABR advertises that a single summary route is advertised to other areas and condenses routing information at area boundaries.

You can configure OSPFv3 to summarize addresses for many different sets of address ranges by configuring multiple **area range** commands.

This command requires the Enterprise Services license.

Examples

This example shows how to configure one summary route to be advertised by the ABR to other areas for all hosts on network 2001:0DB8::/32:

```
switch# configure terminal
switch(config)# router ospfv3 201
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# area 0 range 2001:0DB8::/32
```

area stub (OSPF)

To define an area as an Open Shortest Path First (OSPF) stub area, use the **area stub** command. To remove the area, use the **no** form of this command.

area *area-id* **stub** [**no-summary**]
no area *area-id* **stub** [**no-summary**]

Syntax Description

area-id	Identifier for the OSPF stub area. Specify as either a positive integer value or an IP address.
no-summary	(Optional) Prevents an Area Border Router (ABR) from sending summary link advertisements into the stub area.

Command Default

None

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area stub** command to configure all devices attached to the stub area. Use the **area default-cost** command on an area border router (ABR) attached to the stub area. The **area default-cost** command provides the metric for the summary default route generated by the ABR into the stub area.

To further reduce the number of link-state advertisements (LSAs) sent into a stub area, you can configure the **no-summary** keyword on the ABR to prevent it from sending Summary LSAs (Type 3 LSAs3) into the stub area.

This command requires the Enterprise Services license.

Examples

This example shows how to create stub area 33 in OSPF 209:

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# area 33 stub
```

Related Commands

Command	Description
area default-cost	Specifies a cost for the default summary route sent into a stub area.

area stub (OSPFv3)

To define an area as an Open Shortest Path First version 3 (OSPFv3) stub area, use the **area stub** command. To remove the area, use the **no** form of this command.

area *area-id* **stub** [**no-summary**]
no area *area-id* **stub** [**no-summary**]

Syntax Description

area-id	Identifier for the OSPFv3 stub area. Specify as either an IP address or a number from 0 to 4294967295.
no-summary	(Optional) Prevents an Area Border Router (ABR) from sending summary link advertisements into the stub area.

Command Default

None

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area stub** command to configure all devices attached to the stub area. Use the **area default-cost** command on an area border router (ABR) attached to the stub area. The **area default-cost** command provides the metric for the summary default route generated by the ABR into the stub area.

To further reduce the number of link-state advertisements (LSAs) sent into a stub area, you can configure the **no-summary** keyword on the ABR to prevent it from sending Summary LSAs (Type 3 LSAs3) into the stub area.

This command requires the Enterprise Services license.

Examples

This example shows how to create stub area 33 in OSPFv3 209:

```
switch# configure terminal
switch(config)# router ospfv3 201
switch(config-router)# area 33 stub
```

Related Commands

Command	Description
area default-cost (OSPFv3)	Specifies a cost for the default summary route sent into a stub area.

area virtual-link (OSPF)

To define an Open Shortest Path First (OSPF) virtual link, use the **area virtual-link** command. To remove a virtual link, use the **no** form of this command.

area *area-id* **virtual-link** *router-id*
no area *area-id* **virtual-link** *router-id*

Syntax Description

area-id	Identifier for the OSPF area assigned to the transit area for the virtual link. Specify as either a positive integer value or an IP address.
router-id	Router ID associated with the virtual link neighbor. Specify as an IP address. The router ID appears in the **show ip ospf neighbors** display.

Command Default

None

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area virtual-link** command to establish a virtual link from a remote area to the backbone area. In OSPF, all areas must be connected to a backbone area. If the connection to the backbone is lost, it can be repaired by establishing a virtual link.

Use the **area virtual-link** command to enter the virtual link configuration mode where you can use the following commands:

- **authentication [key-chain | message-digest | null]**
- **authentication-key [0 | 3]** *key*
- **dead-interval** *seconds*
- **hello-interval** *seconds*
- **message-digest-key** *key-id* **md5** *key*
- **retransmit-interval** *seconds*
- **transmit-delay** *seconds*

See each command for syntax and usage details.

You must configure both sides of a virtual link with the same area ID and the corresponding virtual link neighbor router ID. To see the router ID, use the **show ip ospf neighbors** command in any mode.

This command requires the Enterprise Services license.

Examples

This example shows how to establish a virtual link between two devices, A, and B, with default values for all optional parameters:

```
Device A:
switch# configure terminal
switch(config)# router ospf 1
```

```
switch(config-router)# router-id 192.0.2.2
switch(config-router)# area 1 virtual-link 192.0.2.1
Device B:
switch(config# router ospf 209
switch(config-router)# router-id 192.0.2.1
switch(config-router)# area 1 virtual-link 192.0.2.2
```

Related Commands

Command	Description
authentication (OSPF virtual link)	Enables authentication for an OSPF virtual link.
authentication-key (OSPF virtual link)	Assigns a password to be used by neighboring routers that are using the simple password authentication of OSPF.
dead-interval (OSPF virtual link)	Configures the dead interval for an OSPF virtual link.
hello-interval (OSPF virtual link)	Configures the hello interval for an OSPF virtual link.
message-digest-key (virtual link)	Enables OSPF MD5 authentication in an OSPF virtual link.
retransmit-interval (OSPF virtual link)	Configures the retransmit interval for an OSPF virtual link.
transmit-delay (OSPF virtual link)	Configures the transmit delay for an OSPF virtual link.

area virtual-link (OSPFv3)

To define an Open Shortest Path First version 3 (osPFv3) virtual link, use the **area virtual-link** command. To remove a virtual link, use the **no** form of this command.

area *area-id* **virtual-link** *router-id*
no area *area-id* **virtual-link** *router-id*

Syntax Description

area-id	Identifier for the OSPFv3 area assigned to the transit area for the virtual link. Specify as either an IP address or a number from 0 to 4294967295.
router-id	Router ID associated with the virtual link neighbor. Specify as an IP address. The router ID appears in the **show ospfv3 neighbors** display.

Command Default

None

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **area virtual-link** command to establish a virtual link from a remote area to the backbone area. In OSPFv3, all areas must be connected to a backbone area. If the connection to the backbone is lost, it can be repaired by establishing a virtual link.

Use the **area virtual-link** command to enter the virtual link configuration mode where you can use the following commands:

- **dead-interval** *seconds*
- **hello-interval** *seconds*
- **retransmit-interval** *seconds*
- **transmit-delay** *seconds*

See each command for syntax and usage details.

You must configure both sides of a virtual link with the same area ID and the corresponding virtual link neighbor router ID. To see the router ID, use the **show ospfv3 neighbors** command in any mode.

This command requires the Enterprise Services license.

Examples

This example shows how to establish a virtual link between two devices, A, and B, with default values for all optional parameters:

```
Device A:
switch(config)# router ospfv3 1
switch(config-router)# router-id 192.0.2.2
switch(config-router)# area 1 virtual-link 192.0.2.1
Device B:
switch(config# router ospfv3 209
```

```
switch(config-router)# router-id 192.0.2.1
switch(config-router)# area 1 virtual-link 192.0.2.2
```

Related Commands

Command	Description
dead-interval (OSPFv3 virtual link)	Configures the dead interval for an OSPFv3 virtual link.
hello-interval (OSPFv3 virtual link)	Configures the hello interval for an OSPFv3 virtual link.
retransmit-interval (OSPFv3 virtual link)	Configures the retransmit interval for an OSPFv3 virtual link.
transmit-delay (OSPFv3 virtual link)	Configures the transmit delay for an OSPFv3 virtual link.

as-format asdot

To configure the autonomous system number (ASN) notation to asdot, use the **as-format asdot** command. To delete the ASN notation configuration, use the **no** form of this command.

as-format asdot
no as-format asdot

Syntax Description

This command has no arguments or keywords.

Command Default

asplain

Command Modes

Global configuration mode

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 configure the ASN notation to asdot:

```
switch# configure terminal
switch(config)# as-format asdot
switch(config)#
```

This example shows how to delete the ASN notation configuration:

```
switch# configure terminal
switch(config)# no as-format asdot
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration change.

authentication (GLBP)

To configure an authentication for the Gateway Load Balancing Protocol (GLBP), use the **authentication** command. To disable authentication, use the **no** form of this command.

authentication {**text** *string* | **md5** {**key-string** [**encrypted**] *key* | **key-chain** *name-of-chain*}}
no authentication {**text** *string* | **md5** {**key-string** [{**0** | **7**}] *key* | **key-chain** *name-of-chain*}}

Syntax Description

text *string*	Specifies an authentication string. The range is from 1 to 255 characters.
md5	Specifies the Message Digest 5 (MD5) authentication.
key-string *key*	Specifies the secret key for MD5 authentication. The range is from 1 to 255 characters. We recommend that you use at least 16 characters.
encrypted	(Optional) Specifies the encrypted key.
key-chain *name-of-chain*	Identifies a group of authentication keys.

Command Default

No authentication of GLBP messages occurs.

Command Modes

GLBP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

To ensure interoperation, you must configure the same authentication method on all the gateways that are members of the same GLBP group. A gateway ignores all GLBP messages that contain the wrong authentication information.

This command does not require a license.

Examples

This example shows how to configure stringxyz as the authentication string for GLBP group 10:

```
switch#configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# glbp 10
switch(config-glbp)# authentication text stringxyz
```

This example shows how to configure GLBP to use the key chain “AuthenticateGLBP” to obtain the current live key and key ID for MD5 authentication:

```
switch#configure terminal
switch(config)# interface ethernet1/1
switch(config-if)# glbp 2
switch(config-glbp)# authentication md5 key-chain AuthenticateGLBP
```

Related Commands

Command	Description
glbp	Creates a GLBP group and enters GLBP configuration mode.
ip (GLBP)	Enables GLBP on an interface.
key chain	Creates a key chain.

authentication (HSRP)

To configure authentication for the Hot Standby Router Protocol (HSRP), use the **authentication** command. To disable authentication, use the **no** form of this command.

authentication {**text** *string* | **md5** {**key-chain** *key-chain* | **key-string** {**0** | **7**} *text* [**timeout** *seconds*]}}
no authentication {**text** *string* | **md5** {**key-chain** *key-chain* | **key-string** {**0** | **7**} *text* [**timeout** **seconds**]}}

Syntax Description

text *string*	Specifies an authentication string. The range is from 1 to 255 characters. The default string is “cisco”.
md5	Specifies the Message Digest 5 (MD5) authentication.
key-chain *key-chain*	Identifies a group of authentication keys.
key-string	Specifies the secret key for MD5 authentication.
0	Specifies a clear text string.
7	Specifies an encrypted string.
text	Secret key for MD5 authentication. The range is from 1 to 255 characters. We recommend that you use at least 16 characters.
timeout *seconds*	(Optional) Specifies the authentication timeout value. The range is from 0 to 32767.

Command Default

Disabled

Command Modes

HSRP configuration or HSRP template mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **authentication text** command to prevent misconfigured routers from participating in HSRP groups that they are not intended to participate in. The authentication string is sent unencrypted in all HSRP messages. The same authentication string must be configured on all routers in the same group to ensure interoperation. HSRP protocol packets that do not authenticate are ignored.

Caution If two routers are configured with identical HSRP IP addresses, but with different authentication strings, then neither router will be aware of the duplication.

This command does not require a license.

Examples

This example shows how to configure an authentication string for HSRP group 2:

```
switch# configure terminal
switch(config)# interface ethernet 0/1
switch(config-if)# ip address 10.0.0.1 255.255.255.0
switch(config-if)# hsrp 2
switch(config-if-hsrp)# priority 110
switch(config-if-hsrp)# preempt
switch(config-if-hsrp)# authentication text sanjose
switch(config-if-hsrp)# ip 10.0.0.3
switch(config-if-hsrp)# end
```

Related Commands

Command	Description
feature hsrp	Enable HSRP and enters HSRP configuration mode.
hsrp group	Creates an HSRP group.

authentication (OSPF virtual link)

To specify the authentication type for an Open Shortest Path First (OSPF) virtual link, use the **authentication** command. To remove the authentication type for a virtual link, use the **no** form of this command.

authentication [{**key-chain** *key-name* | **message-digest** | **null**}]
no ip ospf authentication

Syntax Description

key-chain *key-name*	(Optional) Specifies the key-chain to use. The *key-name* argument can be any alphanumeric string up to 63 characters.
message-digest	(Optional) Specifies to use message-digest authentication.
null	(Optional) Specifies no authentication is used. Disables authentication if configured for an area.

Command Default

Defaults to password authentication if you configure authentication with none of the optional keywords.

Command Modes

OSPF virtual link configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **authentication** command in virtual link configuration mode to configure the authentication method used on the virtual link. Use the **message-digest** keyword to configure MD5 message digest authentication and use the **message-digest-key** command to complete this authentication configuration. Use the **key-chain** keyword to configure password authentication using key chains and use the key chain command to complete this authentication configuration. Use the **authentication** command with no keywords to configure a password for the virtual link, and use the **authentication-key** command to complete this authentication configuration.

This command requires the Enterprise Services license.

Examples

This example shows how to enable message-digest authentication:

```
switch#configure terminal
switch(config)# router ospf 22
switch(config-router)# area 99 virtual-link 192.0.2.12
switch(config-router-vlink)# authentication message-digest
switch(config-router-vlink)# message-digest key 4 md5 0 abcd
```

Related Commands

Command	Description
area authentication	Enables authentication for an OSPF area.
authentication-key (OSPF virtual link)	Assigns a password to be used by neighboring routers that are using the password authentication of OSPF.
key chain	Creates a key chain for managing authentication keys.

Command	Description
message-digest-key (OSPF virtual link)	Enables OSPF MD5 authentication.

authentication (VRRP)

To configure an authentication for the Virtual Router Redundancy Protocol (VRRP), use the **authentication** command. To disable authentication, use the **no** form of this command.

authentication text *password*
no authentication

Syntax Description

text *password*	Selects to use simple text password of up to 8 alphanumeric characters.

Command Default

No authentication

Command Modes

VRRP configuration mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure md5 authentication for VRRP:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# vrrp 250
switch(config-if-vrrp)# authentication text mypassword
```

Related Commands

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

authentication key-chain (EIGRP)

To enable authentication for the Enhanced Interior Gateway Routing Protocol (EIGRP) packets and to specify the set of keys that can be used on an interface, use the **authentication key-chain** command. To prevent authentication, use the **no** form of this command.

authentication key-chain *name-of-chain*
no authentication key-chain *name-of-chain*

Syntax Description

name-of-chain	Group of keys that are valid.

Command Default

No authentication is provided for EIGRP packets.

Command Modes

Router configuration
Address family configuration
Router VRF configuration

Command History

Release	Modification
4.0(3)	This command was introduced.

Usage Guidelines

Set the authentication mode using the **authentication mode** command in VRF configuration mode. You must separately configure a key chain using the **key-chain** command to complete the authentication configuration for an interface.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the interface to accept and send any key that belongs to the key-chain trees:

```
switch#configure terminal
switch(config)# router eigrp 209
switch(config-router)# vrf red
switch(config-router-vrf)# authentication key-chain trees
```

Related Commands

Command	Description
authentication mode (EIGRP)	Sets the authentication mode for EIGRP in a VRF.
ip authentication key-chain eigrp	Enables authentication for EIGRP and specifies the set of keys that can be used on an interface.
key-chain	Creates a set of keys that can be used by an authentication method.

authentication key-chain (IS-IS)

To enable authentication for Intermediate System-to-Intermediate System (IS-IS), use the **authentication key-chain** configuration mode command. To disable such authentication, use the **no** form of this command.

authentication key-chain *auth-key* {**level-1** | **level-2**}
no authentication key-chain *auth-key* {**level-1** | **level-2**}

Syntax Description

auth-key	Authentication key chain.
level-1	Specifies the authentication key for level-1 link state packets (LSP), complete sequence number packets (CSNP), and partial sequence number packets (PSNP) only.
level-2	Specifies the authentication key for level-2 LSP, CSNP and PSNP packets only.

Command Default

No key chain authentication is provided for IS-IS packets at the router level.

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

If no key chain is configured with the **authentication key-chain** command, no key chain authentication is performed.

Key chain authentication could apply to clear text authentication or MD5 authentication. The mode is determined by the authentication mode command.

Only one authentication key chain is applied to IS-IS at one time. For example, if you configure a second **authentication key-chain** command, the first authentication key chain is overridden.

You can specify authentication for an individual IS-IS interface by using the **isis authentication key-chain** command.

This command requires the Enterprise Services license.

Examples

This example shows how to configure IS-IS to accept and send any key belonging to the key chain named site1:

```
switch#configure terminal
switch(config)# router isis real_secure_network
switch(config-router)# authentication key-chain site1 level-1
```

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
isis authentication key-chain	Enables authentication for an individual IS-IS interface.

Command	Description
router isis	Enables IS-IS.

authentication mode (EIGRP)

To specify the type of authentication used in the Enhanced Interior Gateway Routing Protocol (EIGRP) packets, use the **authentication mode** command. To remove authentication, use the **no** form of this command.

authentication mode md5
no authentication mode md5

Syntax Description

md5	Specifies Message Digest 5 (MD5) authentication.

Command Default

None

Command Modes

Router configuration
Address family configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to configure the interface to use MD5 authentication:

```
switch#configure terminal
switch(config)# router eigrp 209
switch(config-router)# vrf red
switch(config-router-vrf)# authentication mode md5
```

Related Commands

Command	Description
authentication key-chain eigrp	Enables authentication for EIGRP and specifies the set of keys that can be used on an interface.
ip authentication mode eigrp	Configures the authentication mode for EIGRP on an interface.
key chain	Creates a set of keys that can be used by an authentication method.

authentication-check

To specify for the Intermediate System-to-Intermediate System (IS-IS) instance that authentication is performed only on IS-IS packets being sent (not received), use the **authentication-check** configuration mode command. To configure for the IS-IS instance that if authentication is configured at the router level, such authentication be performed on packets being sent and received, use the **no** form of this command.

authentication-check {**level-1** | **level-2**}
no authentication-check

Syntax Description

level-1	Specifies that authentication is performed only on level-1 packets that are being sent (not received)
level-2	Specifies that authentication is performed only on level-2 packets that are being sent (not received).

Command Default

If authentication is configured at the router level, it applies to IS-IS packets being sent and received.

Command Modes

Router configurationVRF configuration

Usage Guidelines

Enter the **authentication-check** command before configuring the authentication mode and authentication key chain. Entering the **authentication-check** command allows the routers to have more time for the keys to be configured on each router if authentication is inserted only on the packets being sent, not checked on packets being received. After you enter the authentication-check command on all communicating routers, enable the authentication mode and key chain on each router. Then enter the **no authentication-check** command to disable the command.

This command could apply to clear text authentication or Message Digest 5 (MD5) authentication. The mode is determined by the authentication mode command.

You can specify authentication for an individual IS-IS interface by using the **isis authentication-check** {**level-1** | **level-2**} interface configuration mode command.

This command requires the Enterprise Services license.

Examples

This example shows how to configure IS-IS level-1 packets to use clear text authentication on packets being sent (not received):

```
switch#configure terminal
switch(config)# router isis test1
switch(config-router)# authentication-check level-1
switch(config-router)# authentication key-chain site1 level-1
switch(config-router)#
```

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
isis authentication-check	Enables authentication on IS-IS packets being sent (not received) from a specific interface.
router isis	Enables IS-IS.

authentication ipsec

To enable authentication of OSPFv3 packets on a per-interface basis at the Router level, use the **authentication ipsec** command. To disable the authentication of OSPFv3 packets, use the **no** form of this command.

authentication ipsec spi *spi auth* [{**0** | **3** | **7**}] *key*
no authentication ipsec spi *spi*

Syntax Description

spi	Specifies the Security Policy Index.
spi	Value of **spi**. It ranges from 256 to 4294967295.
auth	Authentication algorithm. Its value can be md1 / sha1 / null.
key	Authentication password.
0	Specifies that the authentication password is unencrypted.
3	Specifies that the authentication password is 3DES encrypted.
7	Specifies that the authentication password is Cisco type 7 encrypted.

Command Default

The OSPFv3 packets are not authenticated by default.

Command Modes

Router configuration (config-router).

Command History

Release	Modification
7.3(0)D1(1)	This command was introduced.

Usage Guidelines

Before running this command, ensure that you have enabled the authentication package with the **feature imp** command.

Examples

The following example shows how to authenticate OSPFv3 packets using md5, at the Router level for default VRF:

```
switch# configure terminal
switch(config)# feature imp
switch(config)# router ospfv3 1
switch(config-router)# authentication ipsec spi 301 md5 1234
```

Related Commands

Command	Description
area authentication ipsec	Enables authentication of the OSPFv3 packets for all interfaces under the area.
ospfv3 authentication ipsec	Enables authentication of the OSPFv3 packets per interface.

authentication-key (OSPF virtual link)

To assign a password to be used by an Open Shortest Path First (OSPF) virtual link, use the **authentication-key** command. To remove a previously assigned OSPF password, use the **no** form of this command.

authentication-key [{**0** | **3**}] *password*
no authentication-key

Syntax Description

0	(Optional) Specifies an unencrypted authentication key.
3	(Optional) Specifies a 3DES encrypted authentication key.
password	Any continuous string of characters that can be entered from the keyboard up to 8 bytes.

Command Default

Unencrypted password

Command Modes

OSPF virtual link configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **authentication-key** command to configure the password for password authentication on an OSPF virtual link. All devices on the same virtual link must have the same password to be able to exchange OSPF information.

This command requires the Enterprise Services license.

Examples

This example shows how to enable the authentication key with the string yourpass:

```
switch#configure terminal
switch(config)# router ospf 22
switch(config-router)# area 99 virtual-link 192.0.2.12
switch(config-router-vlink)# authentication
switch(config-router-vlink)# authentication-key yourpass
```

Related Commands

Command	Description
authentication (virtual link)	Enables authentication for an OSPF virtual link.

authentication-type

To specify the type of authentication used in Intermediate System-to-Intermediate System (IS-IS) packets for the IS-IS instance, use the **authentication-type** configuration mode command. To restore clear text authentication, use the **no** form of this command.

authentication-type {**cleartext** | **md5**} [{**level-1** | **level-2**}]
no authentication-type

Syntax Description

cleartext	Specifies clear text authentication.
md5	Specifies Message Digest 5 (MD5) authentication.
level-1	Enables the specified authentication for level-1 link state packet (LSP), complete sequence number packet (CSNP) and partial sequence number packet (PSNP) packets only.
level-2	Enables the specified authentication for level-2 LSP, CSNP and PSNP packets only.

Command Default

No authentication is provided for IS-IS packets at the router level by use of this command.

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

If you do not enter the **level-1** or **level-2** keywords, the mode applies to both levels.

You can specify the type of authentication and the level to which it applies for a single IS-IS interface, rather than per IS-IS instance, by using the **authentication-type** command.

You can specify authentication type for an individual IS-IS interface by using the **isis authentication-type** {**cleartext** | **md5**} [**level-1** | **level-2**] interface configuration mode command.

Examples

This example shows how to configure the IS-IS instance that Message Digest 5 (MD5) authentication is performed on level-1 packets:

```
switch#configure terminal
switch(config)# router isis TEST1
switch(config-router)# authentication-type md5 level-1
switch(config-router)#
```

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
isis authentication-type	Specifies the authentication type for an individual IS-IS interface.

Command	Description
router isis	Enables IS-IS.

auto-cost (OSPF)

To control how Open Shortest Path First (OSPF) calculates default metrics for an interface, use the **auto-cost** command. To assign the default reference bandwidth of 40Gb/s, use the **no** form of this command.

auto-cost reference-bandwidth *bandwidth* [{**Gbps** | **Mbps**}]
no auto-cost reference-bandwidth

Syntax Description

reference-bandwidth *bandwidth*	Sets the reference bandwidth used to calculate the default metrics for an interface. The range depends on whether you use the **Gbps** or **MBps** keywords.
Gbps	(Optional) Specifies the rate in Gbps (bandwidth). The range is from 1 to 4000; the default is 40.
Mbps	(Optional) Specifies the rate in Mbps (bandwidth). The range is from 1 to 4000000; the default is 40000.

Command Default

40 Gb/s. The bandwidth defaults to Gb/s if you do not specify the **Gpbs** or **Mbps** keyword .

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **auto-cost** command to set the reference bandwidth used by the OSPF cost-metric calculation.

The value set by the **ip ospf cost** command overrides the cost that results from the **auto-cost** command.

This command requires the Enterprise Services license.

Examples

This example shows how to set the reference bandwidth for all local interfaces in an OSPF instance:

```
switch#configure terminal
switch(config)# router ospf 201
switch(config-router)# auto-cost reference-bandwidth 10
```

Related Commands

Command	Description
ip ospf cost	Explicitly specifies the cost of sending a packet on an interface.

auto-cost (OSPFv3)

To control how Open Shortest Path First version 3 (OSPFv3) calculates default metrics for an interface, use the **auto-cost** command. To assign the default reference bandwidth of 40Gb/s, use the **no** form of this command.

auto-cost reference-bandwidth *bandwidth* [{**Gbps** | **Mbps**}]
no auto-cost reference-bandwidth

Syntax Description

reference-bandwidth *bandwidth*	Sets the reference bandwidth used to calculate the default metrics for an interface. The range depends on whether you use the **Gbps** or **MBps** keywords.
Gbps	(Optional) Specifies the rate in Gbps (bandwidth). The range is from 1 to 4000; the default is 40.
Mbps	(Optional) Specifies the rate in Mbps (bandwidth). The range is from 1 to 4000000; the default is 40000.

Command Default

40 Gb/s. The bandwidth defaults to Gb/s if you do not specify the **Gpbs** or **Mbps** keyword .

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **auto-cost** command to set the reference bandwidth used by the OSPFv3 cost-metric calculation.

The value set by the **ipv6 ospfv3 cost** command overrides the cost that results from the **auto-cost** command.

This command requires the Enterprise Services license.

Examples

This example shows how to set the reference bandwidth for all local interfaces in an OSPFv3 instance:

```
switch#configure terminal
switch(config)# router ospfv3 201
switch(config-router)# auto-cost reference-bandwidth 10
```

Related Commands

Command	Description
ipv6 ospfv3 cost	Explicitly specifies the cost of sending a packet on an interface.

autonomous-system

To configure the autonomous system number for an Enhanced Interior Gateway Routing Protocol (EIGRP) address family, use the **autonomous-system** command. To revert to default, use the **no** form of this command.

autonomous-system *as-number*
no autonomous-system *as-number*

Syntax Description

as-number	Autonomous system number. The range is from 1 to 65535.

Command Default

None

Command Modes

Address family configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **autonomous-system** command to set a common AS number for all EIGRP instances in an address family.

This command requires the Enterprise Services license.

Examples

This example shows how to set an AS number for EIGRP for IPv6 unicast:

```
switch#configure terminal
switch(config)# router eigrp 201
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# autonomous-system 64496
```

Related Commands

Command	Description
address-family (EIGRP)	Enters the address family configuration mode for EIGRP.

B Commands

bestpath

To change the default bestpath selection algorithm, use the **bestpath** router bgp configuration mode command. To return the BGP routing process to the default operation, use the **no** form of this command.

bestpath {**always-compare-med** | **as-path multipath-relax** | **compare-routerid** | **cost-community ignore** | **med** {**confed** | **missing-as-worst** | **non-deterministic**}}
no bestpath {**always-compare-med** | **as-path multipath-relax** | **compare-routerid** | **cost-community ignore** | **med** {**confed** | **missing-as-worst** | **non-deterministic**}}

Syntax Description

always-compare-med	Compares the multi-exit discriminator MED on paths from different autonomous systems.
as-path multipath-relax	Allows load sharing across providers with different (but equal- length) autonomous system paths. Without this option, the AS paths must be identical for load sharing.
compare-routerid	Compares the router IDs for identical eBGP paths.
cost-community ignore	Ignores the cost community for BGP best-path calculations. For more information on the BGP cost community, see the "Configuring MLPS Layer 3 VPN Load Balancing" chapter of the Cisco Nexus 7000 Series NX-OS MPLS Configuration Guide.
med confed	Forces bestpath to do a MED comparison only between paths originated within a confederation.
med missing-as-worst	Treats a missing MED as the highest MED.
med non-deterministic	Does not always pick the best MED path from among the paths from the same autonomous system.

None

Command Modes

Router BGP configuration
Neighbor configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You must ensure that BGP is enabled prior to entering this command for this command to be supported. You can enter the **feature bgp** global configuration mode command to enable BGP.

To enable the comparison of the MED for paths from neighbors in different autonomous systems, use the **bgp always-compare-med** command.

This command requires the Enterprise Services license.

Examples

This example shows how to change the default bestpath selection algorithm to compare the MED on paths from different AS:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# bestpath always-compare-med
```

Related Commands

Command	Description
feature bgp	Enables BGP globally.

C Commands

capability additional-paths

To configure BGP to advertise the capability of sending and receiving additional paths to and from the BGP peers, use the **capability additional-paths** command. To disable the capability additional-path, use the **no** form of this command.

capability additional-paths {**receive** | **send**} [**disable**]

Syntax Description

receive	Advertises the capability to receive additional paths from the BGP peer.
send	Advertises the capability to send additional paths to the BGP peer.
disable	(Optional) Disables the advertising capability of sending additional paths.

Command Default

None

Command Modes

neighbor address-family configuration mode

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 configure BGP to advertise the capability to send and receive additional paths to the BGP peer:

```
switch# configure terminal
switch(config)# router bgp 100
switch(config-router)# neighbor 10.131.31.2 remote-as 100
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# capability additional-path send
switch(config-router-neighbor-af)#
switch(config-router-neighbor-af)# capability additional-paths receive
switch(config-router-neighbor-af)#
```

clear bgp

To clear Border Gateway Protocol (BGP) routes from the BGP table, use the **clear bgp** command.

clear bgp {{**ipv4** | **ipv6**} {**unicast** | **multicast**} | **all**} {*neighbor* | ***as-number* | **peer-template** *nameprefix*} [**vrf** *vrf-name*]

Syntax Description

ipv4	(Optional) Clears the BGP information for the IPv4 address family.
ipv6	(Optional) Clears the BGP information for the IPv6 address family.
unicast	Clears BGP information for the unicast address family.
multicast	Clears BGP information for the multicast address family.
all	(Optional) Clears the BGP information for all address families.
neighbor	Network address. The format is A.B.C.D for IPv4 and A:B::C:D for IPv6.
as-number	Autonomous system number. The range is from 1 to 65535.
peer-template *name*	Specifies a BGP peer template. The name can be any case-sensitive, alphanumeric string up to 63 characters.
prefix	A prefix from the selected address family. The format is A.B.C.D/length for IPv4 and A:B::C:D/length for IPv6.
vrf *vrf-name*	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	Added support for IPv6 prefixes.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear all BGP entries:

```
switch# clear bgp all *
```

clear bgp dampening

To clear Border Gateway Protocol (BGP) route flap dampening information, use the **clear bgp dampening** command.

clear bgp {{**ipv4** | **ipv6**} {**unicast** | **multicast**} | **all**} **dampening** [{*neighborprefix*}] [**vrf** *vrf-name*]

Syntax Description

ipv4	(Optional) Clears BGP information for IPv4 address family.
ipv6	(Optional) Clears BGP information for IPv6 address family.
unicast	Clears BGP information for unicast address family.
multicast	Clears BGP information for multicast address family.
all	(Optional) Clears BGP information for all address families.
neighbor	Neighbor from the selected address family. The format is A.B.C.D for IPv4.
prefix	Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
vrf *vrf-name*	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear BGP route flap dampening information:

```
switch# clear bgp all dampening
```

clear bgp flap-statistics

To clear Border Gateway Protocol (BGP) route flap statistics, use the **clear bgp flap-statistics** command.

clear bgp flap-statistics [{*neighborprefix*}] [**vrf** *vrf-name*]

Syntax Description

neighbor	A neighbor from the selected address family. The format is A.B.C.D for IPv4.
prefix	A prefix from the selected address family. The format is A.B.C.D/length for IPv4.
vrf *vrf-name*	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear BGP route flap statistics:

```
switch# clear bgp flap-statistics
```

clear bgp policy statistics aggregate-address

To clear policy statistics for the Border Gateway Protocol (BGP) topology table, use the **clear bgp policy statistics aggregate address** command.

clear bgp policy statistics aggregate address *prefix* {**advertise-map** | **suppress-map**}

Syntax Description

prefix	Summary address. The format is x.x.x.x or x.x.x.x / length. The length range is from 1 to 32.
advertise-map	Clears policy statistics for the advertise policy
suppress-map	Clears policy statistics for the suppress policy.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear policy statistics for an aggregate address:

```
switch# clear bgp policy statistics aggregate-address 192.0.2.0/8
```

Related Commands

Command	Description
show bgp policy statistics	Displays policy statistics for bgp.

clear bgp policy statistics dampening

To clear policy statistics for the Border Gateway Protocol (BGP) dampening, use the **clear bgp policy statistics dampening** command.

clear bgp policy statistics dampening

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear policy statistics for dampening:

```
switch# clear bgp policy statistics dampening
```

Related Commands

Command	Description
show bgp policy statistics	Displays policy statistics for BGP.

clear bgp policy statistics neighbor

To clear policy statistics for the Border Gateway Protocol (BGP) neighbor, use the **clear bgp policy statistics neighbor** command.

clear bgp policy statistics neighbor *prefix* [{**default-originate** | {**filter-list** | **prefix-list** | **route-map**} {**in** | **out**}}]

Syntax Description

prefix	Neighbor address. The format is x.x.x.x.
default-originate	(Optional) Clears policy statistics for the default originate policy.
filter-list	Clears policy statistics for the neighbor filter list.
prefix-list	Clears policy statistics for the neighbor prefix list.
route-map	Clears policy statistics for the neighbor route map.
in	(Optional) Clears inbound policy statistics.
out	(Optional) Clears outbound policy statistics.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear policy statistics for an aggregate address:

```
switch# clear bgp policy statistics neighbor 192.0.2.1 filter-list in
```

Related Commands

Command	Description
show bgp policy statistics	Displays policy statistics for BGP.

clear bgp policy statistics redistribute

To clear policy statistics for the Border Gateway Protocol (BGP) topology table, use the **clear bgp policy statistics** command.

clear bgp policy statistics redistribute {**direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **rip** *id* | **static**} [**vrf** {*vrf-name* | *****}]

Syntax Description

direct	Clears policy statistics for directly connected routes only.
eigrp	Clears policy statistics for EIGRP.
isis	Clears policy statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospf	Clears policy statistics for the Open Shortest Path First (OSPF) protocol.
rip	Clears policy statistics for the Routing Information Protocol (RIP).
static	Clears policy statistics for IP static routes.
id	For the **eigrp** keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **isis** keyword, an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **ospf** keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*|*****	Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name is an alphanumeric string of up to 32 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear policy statistics for RIP:

```
switch# clear bgp policy statistics redistribute rip 201
```

Related Commands

Command	Description
show bgp policy statistics	Displays BGP policy statistics.

clear forwarding route

To clear forwarding information, use the **clear forwarding route** command.

clear forwarding {**ip** | **ipv4** | **ipv6**} **route** [{***prefix*}] [**vrf** *vrf-name*]

Syntax Description

ip	Clears an IPv4 route.
ipv4	Clears an IPv4 route.
ipv6	Clears an IPv6 route.
*****	Clears all routes.
prefix	IPv4 or IPv6 prefix. The IPv4 format is x.x.x.x/length. The IPv6 format is A:B::C:D/length.
vrf *vrf-name*	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(3)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clears a route from the FIB:

```
switch# clear forwarding ip 10.0.0.1/8
```

clear forwarding inconsistency

To clear the Layer 3 inconsistency checker for the Forwarding Information Base (FIB), use the **clear forwarding inconsistency** command.

clear forwarding inconsistency [{**ip** | **ipv4** | **ipv6**}] [**unicast**] [**vrf** *vrf-name*] [**module** {*slot* | **all**}]

Syntax Description

ip	(Optional) Specifies the inconsistency check for IPv4 routes.
ipv4	(Optional) Specifies the inconsistency check for IPv4 routes.
ipv6	(Optional) Specifies the inconsistency check for IPv6 routes.
unicast	(Optional) Specifies the inconsistency check for unicast routes.
vrf *vrf-name*	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 63 characters.
module	(Optional) Specifies the inconsistency check for one or more modules.
slot	Module number. The range depends on the platform.
all	(Optional) Specifies the inconsistency check for all modules.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.
4.2(1)	Added support for **ipv6** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear the Layer 3 inconsistency checker for all modules:

```
switch# clear forwarding inconsistency module all
```

Related Commands

Command	Description
show forwarding inconsistency	Displays information about the FIB inconsistencies.
test forwarding inconsistency	Triggers the forwarding inconsistency checker.

clear hardware ip verify

To clear IP packet verification, use the **clear hardware ip verify** command. To disable IP packet verification, use the **no**form of this command.

clear hardware ip verify {**checksum** | **fragment** | **protocol** | **tcp tiny-frag** | **version**}

Syntax Description

checksum	Drops IPv4 or IPv6 packets if the checksum is invalid.
fragment	Drops IPv4 or IPv6 packets if the packet fragment has a nonzero offset and the DF bit is active.
protocol	Drops IPv4 or IPv6 packets if the packet fragment has an invalid IP protocol number.
tcp tiny-frag	Drops IPv4 packets if the IP fragment offset is 1, or if the IP fragment offset is 0 and the IP payload length is less than 16.
version	Drops IPv4 packets if the EtherType is not set to 4 (IPv4).

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.1(3)	This command was introduced.
4.2(2)	Added **protocol** keyword.

Usage Guidelines

Use the **clear hardware ip verify** command to clear packet verification tests on IPv4 and IPv6 packets based on checksum or fragments.

This command does not require a license.

Examples

This example shows how to clear fragmented IPv4 or IPv6 packet tests:

```
switch# configure terminal
switch(config)# clear hardware ip verify fragment
```

Related Commands

Command	Description
hardware ip verify address	Configures IPv4 and IPv6 packet verification checks based on addresses.
hardware ip verify length	Configures IPv4 packet verification checks based on length.
hardware ipv6 verify	Configures IPv6 packet verification.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

clear hardware ip verify address

To clear packet verification tests on IP addresses, use the **clear hardware ip verify address** command. To disable packet verification tests, use the **no**form of this command.

clear hardware ip verify address {**destination zero** | **identical** | **reserved** | **source** {**broadcast** | **multicast**}}

Syntax Description

destination zero	Drops IP packets if the destination IPv4 address is 0.0.0.0 or if the IPv6 address is ::.
identical	Drops IP packets if the source IPv4 or IPv6 address is identical to the destination IPv4 or IPv6 address.
reserved	Drops IP packets if the IPv4 address is in the 127.x.x.x range or if the IPv6 address is in the ::1 range.
source	Drops IP packets based on the IP source address.
broadcast	Drops IP packets if the IP source address is 255.255.255.255.
multicast	Drops IP packets if the IPv4 source address is in the 224.x.x.x range or if the IPv6 source address is in the FF00::/8 range.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.1(3)	This command was introduced.

Usage Guidelines

Use the **clear hardware ip verify address** command to clear packet verification tests on IPv4 and IPv6 packets based on addresses.

This command does not require a license.

Examples

This example shows how to clear broadcast IPv4 packet tests:

```
switch# configure terminal
switch(config)# clear hardware ip verify address # source broadcast
```

Related Commands

Command	Description
hardware ip verify	Configures IPv4 and IPv6 packet verification checks based on checksum or fragments.
hardware ip verify length	Configures IPv4 packet verification checks based on length.

Command	Description
hardware ipv6 verify	Configures IPv6 packet verification.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

clear hardware ip verify length

To clear IPv4 packet verification tests based on packet length, use the **clear hardware ip verify length** command. To disable the tests, use the **no**form of this command.

clear hardware ip verify length {**consistent** | **maximum** {**max-frag** | **max-tcp** | **udp**} | **minimum**}

Syntax Description

consistent	Drops IPv4 packets where the Ethernet frame size is greater than or equal to the IP packet length plus the Ethernet header.
maximum	Specifies the maximum fragment offset.
max-frag	Specifies drops to IP packets if the maximum fragment offset is greater than 65536.
max-tcp	Specifies drops to IP packets if the TCP length is greater than the IP payload length.
udp	Specifies drops to IP packets if the IP payload length is less than the UDP packet length.
minimum	Drops IP packets if the Ethernet frame length is less than the IP packet length plus four octets (the CRC length).

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.1(3)	This command was introduced.

Usage Guidelines

Use the **clear hardware ip verify length** command to clear packet verification tests on IPv4 and IPv6 packets based on packet length.

This command does not require a license.

Examples

This example shows how to clear minimum-length IPv4 packet tests:

```
switch# configure terminal
switch(config)# clear hardware ip verify length minimum
```

Related Commands

Command	Description
hardware ip verify	Configures IPv4 packet verification checks based on checksum or fragments.
hardware ip verify address	Configures IPv4 and IPv6 packet verification checks based on addresses.
hardware ipv6 verify	Configures IPv6 packet verification.

Command	Description
show hardware forwarding ip verify	Displays information about IP packet verification checks.

clear hardware proxy layer-3 counters

To clear proxylayer 3 counters information, use the clear hardware proxy layer-3 counters command.

clear hardware proxy layer-3 counters

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
5.1(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear brief proxy layer 3 counters information:

```
switch# clear hardware proxy layer-3 counters
switch#
```

Related Commands

Command	Description
show hardware proxy layer-3 detail	Displays detail information on the proxylayer 3 functionality.

clear ip adjacency statistics

To clear adjacency statistics, use the **clear ip adjacency statistics** command.

clear ip adjacency statistics

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear the adjacency statistics:

```
switch# clear ip adjacency statistics
```

Related Commands

Command	Description
show ip adjacency	Displays adjacency information.

clear ip arp

To clear the Address Resolution Protocol (ARP) information, use the **clear ip arp** command.

clear ip arp [{*ip-addrinterface*}] [{**force-delete** | **statistics**}] [**vrf** *vrf-name*]

Syntax Description

ip-addr	(Optional) IPv4 source address. The format is x.x.x.x.
interface	(Optional) Interface. Use *?* to determine the supported interface types.
force-delete	(Optional) Clears the entries from the ARP table without a refresh.
statistics	(Optional) Clears ARP statistics.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.
5.0(2)	Added **force-delete** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear the ARP table:

```
switch# clear ip arp
```

Related Commands

Command	Description
show ip arp	Displays information about ARP.

clear ip bgp

To clear Border Gateway Protocol (BGP) routes from the BGP table, use the **clear ip bgp** command.

clear ip bgp [**ipv4** {**unicast** | **multicast**}] {*neighbor* | ***as-number* | **peer-template** *nameprefix*} [**vrf** *vrf-name*]

Syntax Description

ipv4	(Optional) Clears BGP information for the IPv4 address family.
unicast	Clears BGP information for the unicast address family.
multicast	Clears BGP information for the multicast address family.
neighbor	Network address. The format is A.B.C.D for IPv4 and A:B::C:D for IPv6.
as-number	Autonomous system number. The range is from 1 to 65535.
peer-template *name*	Specifies a BGP peer template. The name can be any case-sensitive, alphanumeric string up to 63 characters.
prefix	Prefix from the selected address family. The format is A.B.C.D/length for IPv4 and A:B::C:D/length for IPv6.
vrf *vrf-name*	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear all BGP entries for the IPv4 address family:

```
switch# clear ip bgp *
```

clear ip bgp dampening

To clear Border Gateway Protocol (BGP) route flap dampening information, use the **clear ip bgp dampening** command.

clear ip bgp ipv4 {**unicast** | **multicast**} **dampening** [{**neighbor** | **prefix**}] [**vrf** *vrf-name*]

Syntax Description

ipv4	(Optional) Clears BGP information for the IPv4 address family.
unicast	Clears BGP information for the unicast address family.
multicast	Clears BGP information for the multicast address family.
neighbor	Neighbor from the selected address family. The format is A.B.C.D for IPv4.
prefix	Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
vrf *vrf-name*	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear BGP route flap dampening information:

```
switch# clear ip bgp dampening
```

clear bgp flap-statistics

To clear Border Gateway Protocol (BGP) route flap statistics, use the **clear bgp flap-statistics** command.

clear bgp flap-statistics [{*neighborprefix*}] [**vrf** *vrf-name*]

Syntax Description

neighbor	A neighbor from the selected address family. The format is A.B.C.D for IPv4.
prefix	A prefix from the selected address family. The format is A.B.C.D/length for IPv4.
vrf *vrf-name*	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear BGP route flap statistics:

```
switch# clear bgp flap-statistics
```

clear ip eigrp accounting

To clear the prefix accounting information for the Enhanced Interior Gateway Routing Protocol (EIGRP) processes, use the **clear ip eigrp accounting** command.

clear ip eigrp [*instance-tag*] **accounting** [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Instance tag. This option is available when a virtual routing and forwarding (VRF) instance is not specified. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(3)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear the EIGRP accounting information:

```
switch# clear ip eigrp accounting
```

clear ip eigrp neighbors

To remove and reestablish the Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor entries from the appropriate table, use the **clear ip eigrp neighbors** command in EXEC mode.

clear ip eigrp [*instance-tag*] **neighbors** [{*****ip-address* | *interface-type interface-instance*}] [**soft**] [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Instance identifier. The instance-tag can be any case-sensitive, alphanumeric string up to 63 characters.
*	(Optional) Clears all neighbors.
ip-address	(Optional) Address of the neighbor.
interface-type	(Optional) Interface type. For more information, use the question mark (**?**) CLI help function.
interface-instance	(Optional) Either a physical interface instance or a virtual interface instance. Specifying these arguments removes the specified interface type from the neighbor table that all entries learned via this interface. For more information about the interface syntax, use the question mark (**?**) online help function.
soft	(Optional) Specifies soft reset for the neighbors.
vrf *vrf-name* | *****	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name is an alphanumeric string of up to 32 characters.

Command Default

When no autonomous system number, interface, or VRF instance is specified, all EIGRP neighbor entries are cleared from the table.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	Added ***** and **soft** keywords.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear all EIGRP entries for neighbors on Ethernet interface 2/1:

```
switch# clear ip eigrp vrf * neighbors ethernet 2/1
```

Related Commands

Command	Description
show ip eigrp interfaces	Displays information about interfaces configured for EIGRP.
show ip eigrp neighbors	Displays the neighbors discovered by EIGRP.

clear ip eigrp policy statistics redistribute

To clear policy statistics for routes redistributed into show ip rip policy statistics redistribute Enhanced Interior Gateway Routing Protocol (EIGRP) topology table, use the **clear ip eigrp policy statistics redistribute** command.

clear ip eigrp policy statistics redistribute {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **rip** *id* | **static**} [**vrf** {*vrf-name* | *****}]

Syntax Description

bgp	Clears policy statistics for the Border Gateway Protocol (BGP).
direct	Clears policy statistics for directly connected routes only.
eigrp	Clears policy statistics for EIGRP.
isis	Clears policy statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospf	Clears policy statistics for the Open Shortest Path First (OSPF) protocol.
rip	Clears policy statistics for the Routing Information Protocol (RIP).
static	Clears policy statistics for IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **eigrp** keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **isis** keyword, an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **ospf** keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*|*****	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name is an alphanumeric string of up to 32 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	This command was removed and replaced by the **clear ip eigrp route-map statistics** command.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear policy statistics for RIP:

```
switch# clear ip eigrp policy statistics redistribute rip 201
```

Related Commands

Command	Description
show ip eigrp policy statistics	Displays policy statistics for EIGRP.

clear ip eigrp redistribution

To clear redistribution information for Enhanced Interior Gateway Routing Protocol (EIGRP), use the **clear ip eigrp redistribution** command.

clear ip eigrp redistribution [**vrf** {*vrf-name* | *****}]

Syntax Description

vrf *vrf-name* **|***	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name is an alphanumeric string of up to 32 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear redistribution information:

```
switch# clear ip eigrp redistribution
```

Related Commands

Command	Description
feature eigrp	Enables the EIGRP feature.

clear ip eigrp traffic

To clear the Enhanced Interior Gateway Routing Protocol (EIGRP) traffic statistics, use the **clear ip eigrp traffic** command.

clear ip eigrp [*instance-tag*] **traffic** [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Instance of EIGRP. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

This command clears information for the default VRF if no VRF is specified.

Command Modes

Any

Command History

Release	Modification
4.0(3)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear the EIGRP traffic statistics:

```
switch# clear ip eigrp traffic
```

clear ip interface statistics

To clear IP interface statistics, use the **clear ip interface statistics** command.

clear ip interface statistics

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear the IP interface statistics:

```
switch# clear ip interface statistics
```

Related Commands

Command	Description
show ip interface	Displays IP interface information.

clear ip mbgp

To clear Multiprotocol Border Gateway Protocol (MBGP) routes from the BGP table, use the **clear ip mbgp** command.

clear ip mbgp {*neighbor* | ***as-number* | **peer-template** *nameprefix*} [**vrf** *vrf-name*]

Syntax Description

neighbor	Network address. The format is A.B.C.D for IPv4.
as-number	Autonomous system number. The range is from 1 to 65535.
peer-template *name*	Specifies a BGP peer template. The name can be any case-sensitive, alphanumeric string up to 63 characters.
prefix	Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
vrf *vrf-name*	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear all MBGP entries for the IPv4 address family:

```
switch# clear ip mbgp *
```

clear ip mbgp dampening

To clear Multiprotocol Border Gateway Protocol (MBGP) route flap dampening information, use the **clear ip mbgp dampening** command.

clear ip mbgp dampening {*neighborprefix*} [**vrf** *vrf-name*]

Syntax Description

neighbor	Neighbor from the selected address family. The format is A.B.C.D for IPv4.
prefix	Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
vrf *vrf-name*	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear MBGP route flap dampening information:

```
switch# clear ip mbgp dampening
```

clear ip mbgp flap-statistics

To clear Multiprotocol Border Gateway Protocol (MBGP) route flap statistics, use the **clear ip mbgp flap-statistics** command.

clear ip mbgp flap-statistics {*neighborprefix*} [**vrf** *vrf-name*]

Syntax Description

neighbor	Neighbor from the selected address family. The format is A.B.C.D for IPv4.
prefix	Prefix from the selected address family. The format is A.B.C.D/length for IPv4.
vrf *vrf-name*	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear MBGP route flap statistics:

```
switch# clear ip mbgp flap-statistics
```

clear ip ospf neighbor

To clear neighbor statistics and reset adjacencies for Open Shortest Path First (OSPF), use the **clear ip ospf neighbor** command.

clear ip ospf [*instance-tag*] **neighbor** {*****|*neighbor-id* | *interface-type number* | **loopback** *number* | **port-channel** *number*} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Instance tag. Specify as an alphanumeric string of up to 20 characters.
*****	Clears all neighbors.
neighbor-id	Neighbor ID (as an IP address) of the neighbor to clear.
interface-type number	Interface from which to clear all neighbors.
loopback *number*	Clears all neighbors on a loopback interface.
port-channel *number*	Clears all neighbors on a port-channel interface.
vrf *vrf-name*	(Optional) Specifies the name of the OSPF virtual routing and forwarding instance (VRF). The *vrf-name* argument can be any alphanumeric string of up to 32 characters, except “default” and “all”.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **clear ip ospf neighbor** command to clear neighbor information from the **show ip ospf neighbor** command. Use the *instance-tag* argument to clear the neighbor details from one OSPF instance. If you do not use the *instance-tag* argument, Cisco NX-OS clears the neighbor details from all OSPF instances. Use the **show ip ospf neighbor** command to find the neighbor ID.

This command requires the Enterprise Services license.

Examples

This example shows how to clear all OSPF neighbor details for neighbor 192.0.2.1 for instance tag 201:

```
switch# clear ip ospf 201 neighbor 192.0.2.1
```

This example shows how to clear all OSPF neighbor details for all OSPF instances:

```
switch# clear ip ospf neighbor *
```

This example shows how to clear all OSPF neighbor details for all neighbors on Ethernet interface 1/2 for OSPF instance 202:

```
switch# clear ip ospf 202 neighbor ethernet 1/2
```

Related Commands

Command	Description
show ip ospf neighbor	Displays details for OSPF neighbors including the neighbor ID.

clear ip ospf policy statistics

To clear policy statistics for Open Shortest Path First (OSPF), use the **clear ip ospf policy statistics** command.

clear ip ospf [*instance-tag*] **policy statistics** {**area** *area-id* **filter-list** {**in** | **out**} | **redistribute** {**bgp** *autonomous-system* | **direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **rip** *id* | **static**}} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Instance tag. Specify as an alphanumeric string of up to 20 characters.
area	Clears policy statistics for an area.
area-id	Area ID as an integer or IP address.
filter-list	Specifies the policy statistics for filtered prefixes between OSPF areas.
in	Filters prefixes sent into this OSPF area.
out	Filters prefixes sent from this OSPF area.
redistribution	Clears OSPF route redistribution statistics.
bgp *autonomous-system*	Specifies the autonomous system number for the Border Gateway Protocol. Specify the autonomous system number as*x.y*, where the range is from 1 to 65535 for both *x* and *y*, or as a single integer, where the range is from 1 to 65535.
direct	Specifies directly connected routes.
eigrp *id*	Specifies the autonomous system number for the Enhanced Interior Gateway Protocol. Specify the *id* argument as any case-sensitive, alphanumeric string.
isis *id*	Specifies the Intermediate System to Intermediate System instance. Specify the *id* argument as any case-sensitive, alphanumeric string.
ospf *id*	Specifies the Open Shortest Path First version 2 instance. Specify the *id* argument as any case-sensitive, alphanumeric string.
rip *id*	Specifies the Routing Information Protocol instance. Specify the *id* argument as any case-sensitive, alphanumeric string.
static	Specifies static routes.
vrf *vrf-name*	(Optional) Specifies the name of the OSPF virtual routing and forwarding instance (VRF). The *vrf-name* argument can be any alphanumeric string of up to 32 characters, except “default” and “all”.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **clear ip ospf statistics** command to learn the policy statistics shown in the **show ip ospf policy statistics** command. Use the *instance-tag* argument to clear the policy statistics from one OSPF instance. If you do not specify the instance tag.

Cisco NX-OS clears the policy statistics from all OSPF instances. Use the **show ip ospf policy statistics** command to to view the statistics that you are clearing.

This command requires the Enterprise Services license.

Examples

This example shows how to clear all OSPF policy statistics for area 99 inbound filtered routes for OSPF 201:

```
switch# clear ip ospf 201 policy statistics area 99 filter-list in
```

This example shows how to clear all OSPF policy statistics for all BGP redistributed routes for OSPF 202:

```
switch# clear ip ospf 202 policy statistics redistribute bgp
```

Related Commands

Command	Description
show ip ospf policy statistics	Displays details for OSPF policies.

clear ip ospf redistribution

To clear redistribution information for Open Shortest Path First (OSPF), use the **clear ip ospf redistribution** command.

clear ip ospf redistribution [**vrf** { *vrf-name* | ***** }]

Syntax Description

vrf *vrf-name*|*****	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name is an alphanumeric string of up to 32 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear redistribution information:

```
switch# clear ip ospf redistribution
```

Related Commands

Command	Description
feature ospf	Enables the OSPF feature.

clear ip ospf statistics

To clear Open Shortest Path First (OSPF) event statistics, use the **clear ip ospf** statistics command.

clear ip ospf [*instance-tag*] **statistics** [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Instance tag. Specify as an alphanumeric string of up to 20 characters.
vrf *vrf-name*	(Optional) Specifies the name of the OSPF virtual routing and forwarding instance (VRF). The *vrf-name* argument can be any alphanumeric string of up to 32 characters, except “default” and “all”.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **clear ip ospf statistics** command to clear the event statistics from one or more OSPF instances. If you do not specify the *instance-tag* argument, Cisco NX-OS clears statistics from all OSPF instances. Use the **show ip ospf statistics** command to to view the statistics that you are clearing.

This command requires the Enterprise Services license.

Examples

This example shows how to clear all OSPF event statistics:

```
switch# clear ip ospf statistics
```

Related Commands

Command	Description
show ip ospf statistics	Displays event statistics for OSPF.

clear ip ospf traffic

To clear Open Shortest Path First (OSPF) traffic statistics, use the **clear ip ospf traffic** command.

clear ip ospf [*instance-tag*] **traffic** *[interface]* [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Instance tag. Specify as an alphanumeric string of up to 20 characters.
interface	(Optional) Interface to clear traffic statistics for. Use the **?** option to see the interface options.
vrf *vrf-name*	(Optional) Specifies the name of the OSPF virtual routing and forwarding instance (VRF). The *vrf-name* argument can be any alphanumeric string of up to 32 characters, except “default” and “all”.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	Added *interface* argument.

Usage Guidelines

Use the **clear ip ospf traffic** command to clear the traffic statistics from one or more OSPF instances. If you do not specify the *instance-tag* argument, Cisco NX-OS clears traffic statistics from all OSPF instances. Use the **show ip ospf traffic statistics** command to to view the statistics that you are clearing.

This command requires the Enterprise Services license.

Examples

This example shows how to clear OSPF traffic statistics for OSPF 100:

```
switch# clear ip ospf 100 traffic
```

Related Commands

Command	Description
show ip ospf traffic statistics	Displays OSPF traffic statistics.

clear ip rip policy statistics redistribute

To clear policy statistics for routes redistributed into the the Routing Information Protocol (RIP) topology table, use the **clear ip rip policy statistics redistribute** command in any mode.

clear ip rip policy statistics redistribute {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **ospfv3** *id* | **static**} [**vrf** *vrf-name*]

Syntax Description

bgp	Clears policy statistics for the Border Gateway Protocol (BGP).
direct	Clears policy statistics for directly connected routes only.
eigrp	Clears policy statistics for the Enhanced Interior Gateway Routing Protocol (EIGRP).
isis	Clears policy statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospf	Clears policy statistics for the Open Shortest Path First (OSPF) protocol.
ospfv3	Clears policy statistics for the Open Shortest Path First version 3 (OSPFv3) protocol.
static	Clears policy statistics for IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **eigrp** keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **isis** keyword, an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it d internally as a string. For the **ospf** keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. Length is up to 32 alphanumeric characters.

Command Default

This command has no default settings.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear policy statistics for EIGRP:

```
switch# clear ip rip policy statistics redistribute eigrp 201
```

Related Commands

Command	Description
show ip rip policy statistics	Displays policy statistics for RIP.

clear ip rip statistics

To clear the the Routing Information Protocol (RIP) statistics, use the **clear ip rip statistics** command in any mode.

clear ip rip statistics [**interface** *type instance*] [**vrf** *vrf-name*]

Syntax Description

interface *type instance*	(Optional) Specifies the interface to clear topology entries.
vrf *vrf-name*	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name is up to 32 alphanumeric characters.

Command Default

This command has no default settings.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear all RIP statistics:

```
switch# clear ip rip statistics
```

Related Commands

Command	Description
show rip statistics	Displays database and interface entry information for the RIP process.

clear ip route

To clear individual routes from the unicast RIB, use the **clear ip route** command.

clear ip route [{*****_addrprefix_}] [**vrf** _vrf-name_]

Syntax Description

*****	(Optional) Clears all routes.
addr	(Optional) Clears this route. The format is x.x.x.x.
prefix	(Optional) Clears this prefix. The format is x.x.x.x / length.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(3)	This command was introduced.

Usage Guidelines

Use the **clear ip route** command to clear individual routes from the route table.

Note The ***** keyword is severely disruptive to routing.

This command does not require a license.

Examples

This example shows how to clear the individual route:

```
switch(config)# clear ip route 192.0.2.1
```

Related Commands

Command	Description
show ip route	Displays entries in the route table.

clear ip traffic

To clear IP traffic information, use the **clear ip traffic** command.

clear ip traffic

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear the IP traffic information:

```
switch(config)# clear ip traffic
```

Related Commands

Command	Description
show ip traffic	Displays IP traffic information.

clear ip wccp

To remove Web Cache Communication Protocol (WCCP) statistics (counts) maintained on the router for a particular service, use the **clear ip wccp** command.

clear ip wccp [**vrf** *vrf-name*] {*service-number* | **web-cache**}

Syntax Description

vrf *vrf-name*	(Optional) Specifies the VRF in which the service group needs to be created. If no VRF is specified, then the service number is created in the default global VRF. The *vrf-name* can be any case-sensitive, alphanumeric string up to 32 characters.
service-number	Dynamic service identifier. The *service-number* range is from 1 to 255.
web-cache	Specifies the web-cache well-known service.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.2(0) to 6.1(0)	This command has been deprecated from 5.2(0) to 6.1(0) onwards.
4.2(1)	This command was introduced.

Usage Guidelines

Use the **clear ip wccp** command to clear the WCCP statistics.

This command does not require a license.

Examples

This example shows how to clear the WCCP statistics for the web cache service:

```
switch(config)# clear ip wccp web-cache
```

Related Commands

Command	Description
feature wccp	Enables the WCCP feature.
ip wccp	Enables WCCP redirection for a service.
show ip wccp	Displays global statistics related to WCCP.

clear ipv6 adjacency statistics

To clear adjacency statistics, use the **clear ipv6 adjacency statistics** command.

clear ipv6 adjacency statistics

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear the adjacency statistics:

```
switch# clear ipv6 adjacency statistics
```

Related Commands

Command	Description
show ipv6 adjacency	Displays adjacency information.

clear ipv6 eigrp accounting

To clear the prefix accounting information for the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 processes, use the **clear ipv6 eigrp accounting** command.

clear ipv6 eigrp [*instance-tag*] **accounting** [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Instance tag. This option is available when a virtual routing and forwarding (VRF) instance is not specified. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear the EIGRP accounting information:

```
switch# clear ipv6 eigrp accounting
```

clear ipv6 eigrp neighbors

To remove and reestablish the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 neighbor entries from the appropriate table, use the **clear ipv6 eigrp neighbors** command in EXEC mode.

clear ipv6 eigrp [*instance-tag*] **neighbors** [{*****ipv6-address* | *interface-type interface-instance*}] [**soft**] [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Instance identifier. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
*****	(Optional) Clears all neighbors.
ipv6-address	(Optional) Address of the neighbor. The format is A:B::C:D.
interface-type	(Optional) Interface type. For more information, use the question mark (**?**) CLI help function.
interface-instance	(Optional) Either a physical interface instance or a virtual interface instance. Specifying these arguments removes the specified interface type from the neighbor table that all entries learned through this interface. For more information about the interface syntax, use the question mark (**?**) online help function.
soft	(Optional) Specifies a soft reset for the neighbors.
vrf *vrf-name* | *****	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances. The VRF name is an alphanumeric string of up to 32 characters.

Command Default

Clears all instances if no instance is specified. Clears the default VRF if no VRF is specified.

Command Modes

Any

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear all EIGRP entries for neighbors on Ethernet interface 2/1:

```
switch# clear ipv6 eigrp vrf * neighbors ethernet 2/1
```

Related Commands

Command	Description
show ipv6 eigrp interfaces	Displays information about interfaces configured for EIGRP.

Command	Description
show ipv6 eigrp neighbors	Displays the neighbors discovered by EIGRP.

clear ipv6 eigrp route-map statistics redistribute

To clear statistics for routes redistributed into the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 topology table, use the **clear ipv6 eigrp route-map statistics redistribute** command.

clear ipv6 eigrp route-map statistics redistribute {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospfv3** *id* | **rip** *id* | **static**} [**vrf** {*vrf-name* | *****}]

Syntax Description

bgp	Clears policy statistics for the Border Gateway Protocol (BGP).
direct	Clears policy statistics for directly connected routes only.
eigrp	Clears policy statistics for EIGRP.
isis	Clears policy statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospv3f	Clears policy statistics for the Open Shortest Path First (OSPF) version 3 protocol.
rip	Clears policy statistics for the Routing Information Protocol (RIP).
static	Clears policy statistics for IP static routes.
id	For the **bgp** keyword, the *id* is an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **eigrp** keyword, the *id* is an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **isis** keyword, the *id* is an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **ospf** keyword, the *id* is an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*|*****	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name is an alphanumeric string of up to 32 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear policy statistics for RIP:

```
switch# clear ipv6 eigrp route-map statistics redistribute rip 201
```

Related Commands

Command	Description
show ipv6 eigrp route-map statistics	Displays redistribution statistics for EIGRP.

clear ipv6 eigrp redistribution

To clear redistribution information for Enhanced Interior Gateway Routing Protocol (EIGRP), use the **clear ipv6 eigrp redistribution** command.

clear ipv6 eigrp redistribution [**vrf** {*vrf-name* | *****}]

Syntax Description

vrf *vrf-name*|*****	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name is an alphanumeric string of up to 32 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear redistribution information:

```
switch# clear ipv6 eigrp redistribution
```

Related Commands

Command	Description
feature eigrp	Enables the EIGRP feature.

clear ipv6 eigrp traffic

To clear the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 traffic statistics, use the **clear ipv6 eigrp traffic** command.

clear ipv6 eigrp [*instance-tag*] **traffic** [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Instance of EIGRP. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

This command clears information for the default VRF if no VRF is specified.

Command Modes

Any

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear the EIGRP traffic statistics:

```
switch# clear ipv6 eigrp traffic
```

clear ipv6 icmp interface statistics

To clear statistics about ICMPv6, use the **clear ipv6 icmp interface statistics** command.

clear ipv6 icmp interface statistics [*type number*]

Syntax Description

type	(Optional) Interface type. Use **?** to see the list of supported interfaces.
number	(Optional) Interface number. Use **?** to see the range.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear the ICMPv6 statistics:

```
switch(config-if)# clear ipv6 icmp interface statistics
```

Related Commands

Command	Description
ipv6 icmp	Configures ICMPv6 on an interface.

clear ipv6 nd interface statistics

To clear information about Neighbor Discovery (ND), use the **clear ipv6 nd interface statistics** command.

clear ipv6 nd interface statistics [*type number*]

Syntax Description

type	(Optional) Interface type. Use **?** to see the list of supported interfaces.
number	(Optional) Interface number. Use **?** to see the range.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear the ND information:

```
switch(config-if)# clear ipv6 nd interface statistics
```

Related Commands

Command	Description
ipv6 nd	Configures ICMPv6 ND on an interface.

clear ipv6 neighbor

To clear IPv6 neighbors, use the **clear ipv6 neighbor** command.

clear ipv6 neighbor [*type number*] [**force-clear**] [**vrf** *vrf-name*]

Syntax Description

type	(Optional) Interface type. Use **?** to see the list of supported interfaces.
number	(Optional) Interface number. Use **?** to see the range.
force-clear	(Optional) Clears the IPv6 neighbor cache without a refresh.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	Added **force-clear** keyword.
4.0(1)	This command was introduced.

Usage Guidelines

Use the **clear ipv6 neighbor** command to clear the IPv6 adjacency table.

This command does not require a license.

Examples

This example shows how to clear the IPv6 neighbors:

```
switch# clear ipv6 neighbor
```

Related Commands

Command	Description
ipv6 nd	Configures ICMPv6 ND on an interface.

clear ipv6 route

To clear individual routes from the unicast RIB, use the **clear ipv6 route** command.

clear ipv6 route [{*****addrprefix}] [**vrf** *vrf-name*]

Syntax Description

*****	(Optional) Clears all routes.
addr	(Optional) Clears this route. The format is A:B::C:D.
prefix	(Optional) Clears this prefix. The format is A:B::C:D/length.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(3)	This command was introduced.

Usage Guidelines

Use the **clear ipv6 route** command to clear individual routes from the route table.

Note The ***** keyword is severely disruptive to routing.

This command does not require a license.

Examples

This example shows how to clear the individual route:

```
switch(config)# clear ipv6 route 2001:0DB8::/8
```

Related Commands

Command	Description
show ipv6 route	Displays entries in the route table.

clear ipv6 traffic

To clear IPv6 traffic information, use the **clear ipv6 traffic** command.

clear ipv6 traffic

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear the IPv6 traffic information:

```
switch# configure terminal
switch(config)# clear ip traffic
```

Related Commands

Command	Description
show ipv6 traffic	Displays IPv6 traffic information.

clear isis adjacency

To clear adjacency information for Intermediate-System-to-Intermediate System (IS-IS), use the **clear isis adjacency** command.

clear isis *[instance-tag]* **adjacency** [{*****interface* | **system-id** *sid*}] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
*****	(Optional) Clears all adjacency information for all interfaces.
interface	(Optional) Interface. Use **?** to determine the supported interface types.
system-id*sid*	(Optional) Clears the adjacency information for this system ID. The *sid* format is XXXX.XXXX.XXXX.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear all the adjacency information:

```
switch# clear isis adjacency *
```

Related Commands

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

clear isis ip route-map statistics redistribute

To clear statistics for route redistribution for Intermediate-System-to-Intermediate System (IS-IS), use the **clear isis ip route-map statistics redistribute** command.

clear isis [*instance-tag*] **ip route-map statistics redistribute** {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **rip** *id* | **static**} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. Specify as an alphanumeric string.
bgp	Clears statistics for the Border Gateway Protocol (BGP).
direct	Clears statistics for directly connected routes only.
eigrp	Clears statistics for the Enhanced Interior Gateway Protocol (EIGRP) routing protocol.
isis	Clears statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospf	Clears statistics for the Open Shortest Path First (OSPF) protocol.
rip	Clears statistics for the Routing Information Protocol (RIP).
static	Clears statistics for IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **isis**, **eigrp**, and **rip** keywords, an instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display policy statistics for redistributed routes:

```
switch# clear isis ip route-map statistics redistribute bgp
```

Related Commands

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

clear isis redistribution

To clear redistribution information for Intermediate-System-to-Intermediate System (IS-IS), use the **clear isis redistribution** command.

clear isis *instance-tag* **redistribution** [**vrf** {*vrf-name* | **all**}]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. Specify as an alphanumeric string.
vrf *vrf-name*| **all**	(Optional) Specifies a particular virtual routing and forwarding (VRF) instance. The VRF name is an alphanumeric string of up to 32 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear the redistribution information:

```
switch# clear isis redistribution
```

Related Commands

Command	Description
feature isis	Enables the IS-IS feature.

clear isis route-map statistics distribute

To clear statistics for route distribution between level-1 and level-2 areas for Intermediate-System-to-Intermediate System (IS-IS), use the **clear isis route-map statistics distribute** command.

clear isis *[instance-tag]* [{**ip** | **ipv6**}] **route-map statistics distribute** [{**level-1** | **level-2**}] **into** [{**level-1** | **level-2**}] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
ip	(Optional) Clears statistics for IPv4.
ipv6	(Optional) Clears statistics for IPv6.
level-1	(Optional) Clears Level 1 distribution statistics.
level-2	(Optional) Clears Level 2 distribution statistics.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear the distribution information:

```
switch# clear isis route-map statistics distribute level-1 into level 2
```

Related Commands

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

clear isis statistics

To clear statistics for Intermediate-System-to-Intermediate System (IS-IS), use the **clear isis statistics** command.

clear isis *instance-tag* **statistics** [{*****interface*}] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
*****	(Optional) Clears the statistics for all interfaces.
interface	(Optional) Interface name and interface number. Use **?** to see a list of interfaces.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear the IS-IS statistics:

```
switch# clear isis statistics ethernet 7/45
```

Related Commands

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

clear isis traffic

To clear traffic statistics for Intermediate-System-to-Intermediate System (IS-IS), use the **clear isis traffic** command.

clear isis *[instance-tag]* **traffic** [{*****interface}] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
*****	(Optional) Clears the traffic statistics for all interfaces.
interface	(Optional) Interface name and interface number. Use **?** to see a list of interfaces.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to clear the traffic statistics:

```
switch# clear isis traffic ethernet 7/45


IS-IS process: test1
VRF: default
IS-IS Traffic for Ethernet7/45:
%PDU        Received        Sent  RcvAuthErr OtherRcvErr  ReTransmit
LAN-IIH            0           0           0           0         n/a
P2P-IIH            0           0           0           0         n/a
CSNP               0           0           0           0         n/a
PSNP               0           0           0           0         n/a
LSP                0           0           0           0           0
```

Related Commands

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

clear ospfv3 neighbor

To clear neighbor statistics and reset adjacencies for Open Shortest Path First version 3 (OSPFv3), use the **clear ospfv3 neighbor** command.

clear ospfv3 [*instance-tag*] **neighbor** {***neighbor-id** | *interface-type number* | **loopback** *number* | **port-channel** *number*} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Instance tag. Specify as an alphanumeric string of up to 32 characters.
*	Clears all neighbors.
neighbor-id	Neighbor ID (as an IP address) of the neighbor to clear.
interface-type number	Interface from which to clear all neighbors.
loopback *number*	Clears all neighbors on a loopback interface.
port-channel *number*	Clears all neighbors on a port-channel interface.
vrf *vrf-name*	(Optional) Specifies the name of the OSPFv3 virtual routing and forwarding instance (VRF). The *vrf-name* argument can be any alphanumeric string up to 32 characters, except “default” and “all”.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **clear ospfv3 neighbor** command to clear neighbor information from the **show ospfv3 neighbors** command. Use the *instance-tag* argument to clear the neighbor details from one OSPFv3 instance. If you do not use the *instance-tag* argument, Cisco NX-OS clears the neighbor details from all OSPFv3 instances. Use the **show ospfv3 neighbors** command to find the neighbor ID.

This command requires the Enterprise Services license.

Examples

This example shows how to clear all OSPFv3 neighbor details for neighbor 192.0.2.1 for instance tag 201:

```
switch# clear ospfv3 201 neighbor 192.0.2.1
```

This example shows how to clear all OSPFv3 neighbor details for all OSPFv3 instances:

```
switch# clear ospfv3 neighbor *
```

This example shows how to clear all OSPFv3 neighbor details for all neighbors on Ethernet interface 1/2 for OSPFv3 instance 202:

```
switch# clear ospfv3 202 neighbor ethernet 1/2
```

Related Commands

Command	Description
show ospfv3 neighbor	Displays details for OSPFv3 neighbors including the neighbor ID.

clear ospfv3 policy statistics

To clear policy statistics for Open Shortest Path First version 3 (osPFv3), use the **clear ospfv3 policy statistics** command.

clear ospfv3 [*instance-tag*] **policy statistics** {**area** *area-id* **filter-list** {**in** | **out**} | **redistribute** {**bgp** *autonomous-system* | **direct** | **eigrp** *id* | **isis** *id* | **rip** *id* | **static**}} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Instance tag. Specify as an alphanumeric string of up to 32 characters.
area	Clears policy statistics for an area.
area-id	Area ID as an integer or IP address.
filter-list	Specifies the policy statistics for filtered prefixes between OSPFv3 areas.
in	Filters prefixes sent into this OSPFv3 area.
out	Filters prefixes sent from this OSPFv3 area.
redistribution	Clears OSPFv3 route redistribution statistics.
bgp *autonomous-system*	Specifies the autonomous system number for the Border Gateway Protocol. Specify the autonomous system number as*x.y*, where the range is from 1 to 65535 for both *x* and *y*, or as a single integer, where the range is from 1 to 65535.
direct	Specifies directly connected routes.
eigrp *id*	Specifies the EIGRP instance. Specify the *id* argument as any alphanumeric string.
isis *id*	Specifies the Intermediate System to Intermediate System instance. Specify the *id* argument as any alphanumeric string.
rip *id*	Specifies the Routing Information Protocol instance. Specify the *id* argument as any alphanumeric string.
static	Specifies static routes.
vrf *vrf-name*	(Optional) Specifies the name of the OSPFv3 virtual routing and forwarding instance (VRF). The *vrf-name* argument can be any alphanumeric string up to 32 characters, except “default” and “all”.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **clear ospfv3 statistics** command to learn the policy statistics shown in the **show ospfv3 policy statistics** command. Use the *instance-tag* argument to clear the policy statistics from one OSPFv3 instance.

Cisco NX-OS clears the policy statistics from all OSPFv3 instances. Use the **show ospfv3 policy statistics** command to to view the statistics that you are clearing.

This command requires the Enterprise Services license.

Examples

This example shows how to clear all OSPFv3 policy statistics for area 99 inbound filtered routes for OSPFv3 201:

```
switch# clear ospfv3 201 policy statistics area 99 filter-list in
```

This example shows how to clear all OSPFv3 policy statistics for all BGP redistributed routes for OSPFv3 202:

```
switch# clear ospfv3 202 policy statistics redistribute bgp
```

Related Commands

Command	Description
show ospfv3 policy statistics	Displays details for OSPFv3 policies.

clear ospfv3 statistics

To clear Open Shortest Path First version 3 (OSPFv3) event statistics, use the **clear ospfv3** statistics command.

clear ospfv3 [*instance-tag*] **statistics** [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Instance tag. Specify as an alphanumeric string of up to 32 characters.
vrf *vrf-name*	(Optional) Specifies the name of the OSPFv3 virtual routing and forwarding instance (VRF). The *vrf-name* argument can be any alphanumeric string up to 32 characters, except “default” and “all”.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **clear ospfv3 statistics** command to clear the event statistics from one or more OSPFv3 instances. If you do not specify the *instance-tag* argument, Cisco NX-OS clears statistics from all OSPFv3 instances. Use the **show ospfv3 statistics** command to to view the statistics that you are clearing.

This command requires the Enterprise Services license.

Examples

This example shows how to clear all OSPFv3 event statistics:

```
switch# clear ospfv3 statistics
```

Related Commands

Command	Description
show ospfv3 statistics	Displays event statistics for OSPFv3.

clear ospfv3 traffic

To clear Open Shortest Path First version 3 (OSPFv3) traffic statistics, use the **clear ospfv3 traffic** command.

clear ospfv3 [*instance-tag*] **traffic** [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Instance tag. Specify as an alphanumeric string of up to 32 characters.
vrf *vrf-name*	(Optional) Specifies the name of the OSPFv3 virtual routing and forwarding instance (VRF). The *vrf-name* argument can be any alphanumeric string up to 32 characters, except “default” and “all”.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **clear ospfv3 traffic** command to clear the traffic statistics from one or more OSPFv3 instances. If you do not specify the *instance-tag* argument, Cisco NX-OS clears traffic statistics from all OSPFv3 instances. Use the **show ospfv3 traffic statistics** command to to view the statistics that you are clearing.

This command requires the Enterprise Services license.

Examples

This example shows how to clear OSPFv3 traffic statistics for OSPFv3 100:

```
switch# clear ospfv3 100 traffic
```

Related Commands

Command	Description
show ospfv3 traffic statistics	Displays OSPFv3 traffic statistics.

clear route-map pbr-statistics

To clear policy-based statistics for a route map, use the **clear route-map pbr statistics** command..

clear route-map *name* **pbr-statistics**

Syntax Description

name	Name of the route map. The name can be any alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **clear route-map pbr-statistics** command to clear policy-based routing statistics enabled by the **route-map pbr-statistic**s command.

This command requires the Enterprise Services license.

Examples

This example shows how to clear the policy-based routing statistics for a route map:

```
switch# clear route-map testmap pbr-statistics
```

Related Commands

Command	Description
route-map pbr-statistics	Enables policy-based routing statistics for a route map.

clear sockets statistics

To clear the socket statistics, use the **clear sockets statistics** command.

clear sockets statistics [{**all** | **raw** | **raw6** | **tcp** | **tcp6** | **udp** | **udp6**}]

Syntax Description

all	(Optional) Clears all the socket statistics.
raw	(Optional) Clears the socket statistic for the raw IPv4 protocols.
raw6	(Optional) Clears the socket statistic for the raw IPv6 protocols.
tcp	(Optional) Clears the socket statistic for the TCP IPv4 protocols.
tcp6	(Optional) Clears the socket statistic for the TCP IPv6 protocols.
udp	(Optional) Clears the socket statistic for the UDP IPv4 protocols.
udp6	(Optional) Clears the socket statistic for the UDP IPv6 protocols.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear the TCP socket statistics:

```
switch# clear sockets statistics tcp
```

Related Commands

Command	Description
show sockets statistics	Displays information about the socket statistics.
show sockets client	Displays information about the socket client information.
show sockets connection	Displays information about the socket connection.

clear vrrp

To clear the Virtual Router Redundancy Protocol (VRRP) statistics, use the **clear vrrp** command.

clear vrrp {**statistics** | [{**ipv4** | **vr** *id*}] **interface** *if-number*}

Syntax Description

statistics	(Optional) Clears all VRRP statistics.
ipv4	(Optional) Clears VRRP statistics on an interface.
vr *id*	(Optional) Clears VRRP statistics in a VRRP group on an interface.
interface *if-number*	(Optional) Clears VRRP statistics on an interface. Use **?** to see a list of supported interfaces.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to clear VRRP statistics:

```
switch# configure terminal
switch(config)# clear vrrp
```

Related Commands

Command	Description
feature vrrp	Enables the VRRP feature.
clear vrrp	Clears VRRP statistics.

confederation

To configure the confederation parameters for the Border Gateway Protocol (BGP, use the **confederation** command.

confederation {**identifier** | **peers**} *as-number*

Syntax Description

identifier	Sets the routing domain confederation AS number.
peers	Sets the peer AS numbers for a BGP confederation.
as-number	Autonomous system number. The AS number can be a 16-bit integer or a 32-bit integer in the form of <higher 16-bit decimal number>.<lower 16-bit decimal number>.

Command Default

None

Command Modes

Router configurationRouter VRF mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to configure the confederation identifier:

```
switch# configure terminal
switch(config)# router bgp 65536.33
switch(config-router)# confederation identifier 65536.33
```

Related Commands

Command	Description
show bgp	Displays information about BGP.

D Commands

dead-interval (OSPF virtual link)

To set the interval during which at least one hello packet must be received from a neighbor on an Open Shortest Path First (OSPF) virtual link before the router declares that neighbor as down, use the **dead interval** command. To restore the default, use the **no** form of this command.

dead-interval *seconds*
no dead-interval

Syntax Description

seconds	Interval (in seconds) during which the router must receive at least one hello packet from a neighbor or that neighbor is removed from the peer list and does not participate in routing. The range is from 1 to 65535. The value must be the same for all nodes on the virtual link.

Command Default

The default value for *seconds* is our times the interval set by the **hello-interval** command.

Command Modes

Virtual link configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **dead interval** command in virtual link configuration mode to configure the dead interval advertised in OSPF hello packets. This value must be the same for all networking devices on the virtual link.

You can configure a shorter dead interval (*seconds*) to detect a down neighbor faster and improve convergence. A shorter dead interval may lead to virtual link instability by incorrectly declaring a slow neighbor as down.

Use the **show ip ospf virtual-links** command to verify the dead interval.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the OSPF dead interval to 20 seconds:

```
switch# configure terminal
switch(config)# ospf 201
switch(config-router)# area 99 virtual-link 192.0.2.4
switch(config-router-vlink)# dead-interval 20
```

Related Commands

Command	Description
hello-interval (OSPF virtual link)	Configures the Interval between hello packets that Cisco NX-OS sends on the virtual link.
show ip ospf virtual-link	Displays OSPF-related information for a virtual link.

dead-interval (OSPFv3 virtual link)

To set the interval during which at least one hello packet must be received from a neighbor on an Open Shortest Path First version 3 (OSPFv3) virtual link before the router declares that neighbor as down, use the **dead interval** command. To restore the default, use the **no** form of this command.

dead-interval *seconds*
no dead-interval

Syntax Description

seconds	Interval (in seconds) during which the router must receive at least one hello packet from a neighbor or that neighbor is removed from the peer list and does not participate in routing. The range is from 1 to 65535. The value must be the same for all nodes on the virtual link.

Command Default

The default value for *seconds* is our times the interval set by the **hello-interval** command.

Command Modes

Virtual link configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **dead interval** command in virtual link configuration mode to configure the dead interval advertised in OSPFv3 hello packets. This value must be the same for all networking devices on the virtual link.

You can configure a shorter dead interval (*seconds*) to detect a down neighbor faster and improve convergence. A shorter dead interval may lead to virtual link instability by incorrectly declaring a slow neighbor as down.

Use the **show ospfv3 virtual-links** command to verify the dead interval.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the OSPFv3 dead interval to 20 seconds:

```
switch# configure terminal
switch(config)# ospfv3 201
switch(config-router)# area 99 virtual-link 192.0.2.4
switch(config-router-vlink)# dead-interval 20
```

Related Commands

Command	Description
hello-interval (OSPFv3 virtual link)	Configures the interval between hello packets that Cisco NX-OS sends on the virtual link.
show ospfv3 virtual-link	Displays OSPFv3-related information for a virtual link.

default-information originate (EIGRP)

To generate a default route into the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **default-information originate** command in the appropriate configuration mode. To disable this feature, use the **no** form of this command.

default-information originate [**always**] [**route-map** *map-name*]
no default-information originate

Syntax Description

always	(Optional) Generates the default route if the route is not in the EIGRP routing information base.
route-map *map-name*	(Optional) Generates the default route only if the route is permitted by the route map. The map name is an alphanumeric string of up to 63 characters.

Command Default

Disabled

Command Modes

Address-family configuration
Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to originate a default route (0.0.0.0/0) to all routes that pass the Condition route map.

```
switch# configure terminal
switch(config)# router eigrp 201
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# default-information originate route-map Condition
```

Related Commands

Command	Description
address-family	Enters address-family configuration mode.
default-metric	Sets the metric for routes redistributed into EIGRP.
redistribute	Redistributes routes from other routing protocols into EIGRP.

default-information originate (IS-IS)

To control the origination of a default route, use the **default-information originate** command.

default-information originate [**always**] [**route-map** *name*]

Syntax Description

always	(Optional) Specifies always to advertise the default route.
route-map *name*	(Optional) Specifies the name of the routing rules route map to announce default routes. The name can be up to 63 characters.

Command Default

The default route is not redistributed into the IS-IS routing domain.

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You can force a default route into an IS-IS routing domain. Whenever you specifically configure redistribution of routes into an IS-IS routing domain, by default, the default route is not redistributed into the IS-I S routing domain. The **default-information originate route-map** command generates a default route into IS-IS, which can be controlled by a route map. You can use the route map to identify the level into which the default route is to be announced, and you can specify other filtering options configurable under a route map. You can use a route map to conditionally advertise the default route, depending on the existence of another route in the routing table of the router.

Examples

This example shows how to always advertise the default route:

```
switch# configure terminal
switch(config)# router isis TEST1
switch(config-router)# default-information originate always
switch(config-router)#
```

This example shows how to specify a route map to conditionally advertise the default route:

```
switch# configure terminal
switch(config)# router isis TEST1
switch(config-router)# default-information originate route-map CORE1
switch(config-router)#
```

Related Commands

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

default-information originate (OSPF)

To generate a default external route into an Open Shortest Path First (OSPF) routing domain, use the **default-information originate** command. To disable this feature, use the **no** form of this command.

default-information originate [**always**] [**route-map** *map-name*]
no default-information originate [**always**] [**route-map** *map-name*]

Syntax Description

always	(Optional) Specifies to always advertise the default route regardless of whether the route table has a default route.
route-map *map-name*	(Optional) Specifies to advertise the default route if the route map is satisfied. The *map-name* argument can be any alphanumeric string up to 63 characters.

Command Default

Advertises the default route if the route is in the route table.

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **default-information originate** command to assign a default route for redistributed routes. Whenever you use the **redistribute** command to redistribute routes into an OSPF routing domain, Cisco NX-OS automatically becomes an Autonomous System Boundary Router (ASBR). However, an ASBR does not, by default, generate a default route into the OSPF routing domain.

Use the **route-map** keyword to filter redistributed routes so that Cisco NX-OS generates a default route only for routes that pass the route map. Use the **always** keyword to generate the default route regardless of whether the default route is in the route table.

Note The **default-information originate** command ignores **match** statements in the optional route map.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the default route redistributed into the OSPF routing domain for the Enhanced Interior Gateway Protocol (EIGRP):

```
switch# configure terminal
switch(config)# router ospf 109
switch(config-router)# redistribute eigrp 108 route-map EigrpPolicy
switch(config-router)# default-information originate always
```

Related Commands

Command	Description
redistribute (OSPF)	Redistributes routes from one routing domain into OSPF.

Command	Description
route-map	Defines a filter policy for routes.

default-information originate (OSPFv3)

To generate a default external route into an Open Shortest Path First version 3 (OSPFv3) routing domain, use the **default-information originate** command. To disable this feature, use the **no** form of this command.

default-information originate [**always**] [**route-map** *map-name*]
no default-information originate [**always**] [**route-map** *map-name*]

Syntax Description

always	(Optional) Specifies to always advertise the default route regardless of whether the route table has a default route.
route-map *map-name*	(Optional) Specifies to advertise the default route if the route map is satisfied. The *map-name* argument can be any alphanumeric string up to 63 characters.

Command Default

Advertises the default route if the route is in the route table.

Command Modes

Address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **default-information originate** command to assign a default route for redistributed routes. Whenever you use the **redistribute** command to redistribute routes into an OSPFv3 routing domain, Cisco NX-OS automatically becomes an Autonomous System Boundary Router (ASBR). However, an ASBR does not, by default, generate a default route into the OSPFv3 routing domain.

Use the **route-map** keyword to filter redistributed routes so that Cisco NX-OS generates a default route only for routes that pass the route map. Use the **always** keyword to generate the default route regardless of whether the default route is in the route table.

Note The **default-information originate** command ignores **match** statements in the optional route map.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the default route redistributed into the OSPFv3 routing domain for the Border Gateway Protocol (BGP):

```
switch# configure terminal
switch(config)# router ospfv3 109
switch(config-router)# redistribute bgp 108 route-map bgpPolicy
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# default-information originate always
```

Related Commands

Command	Description
redistribute (OSPFv3)	Redistributes routes from one routing domain into OSPFv3.
route-map	Defines a filter policy for routes.

default-information originate (RIP)

To generate a default route into the Routing Information Protocol (RIP), use the **default-information originate** command in router address-family configuration mode. To disable this feature, use the **no** form of this command.

default-information originate [**always**] [**route-map** *map-name*]
no default-information originate

Syntax Description

always	(Optional) Generates the default route if the route is not in the RIP routing information base.
route-map *map-name*	(Optional) Generates the default route only if the route is permitted by the route map. The map name is any alphanumerical string up to 63 characters.

Command Default

This command is disabled by default.

Command Modes

Router address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to originate a default route (0.0.0.0/0) to all routes that pass the Condition route map:

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# default-information originate route-map Condition
```

Related Commands

Command	Description
address-family	Enters address-family configuration mode.
default-metric	Sets the metric for routes redistributed into RIP.
redistribute	Redistributes routes from other routing protocols into RIP.

default isis passive-interface

To allow all Intermediate System-to-Intermediate System (IS-IS) interfaces to be set as passive by default, use the **default isis passive-interface** command.

default isis passive-interface {**level-1** | **level-1-2** | **level-2**}

Syntax Description

level-1	(Optional) Suppresses level-1 PDU.
level-1-2	(Optional) Suppresses level-1 and level-2 PDU.
level-2	(Optional) Suppresses level-2 PDU.

Command Default

None

Command Modes

Interface configuration mode

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 allow all IS-IS interfaces to be set as passive by default:

```
switch# configure terminal
switch(config)# router isis 1
switch(config-router)# passive-interface default level-1
switch(config-router)# exit

switch# configure terminal
switch(config)# interface GigabitEthernet 0/0/0
switch(config-if)# isis passive-interface level-1
switch(config-if)# no isis passive-interface level-1
switch(config-if)# default isis passive-interface level-1
switch(config-if#
```

Related Commands

Command	Description
isis passive-interface	Blocks sending of routing updates on an IS-IS interface.
no isis passive-interface	Re-enables sending of routing updates on an IS-IS interface and activates only those interfaces that need adjacencies.

default-metric (EIGRP)

To set metrics for an Enhanced Interior Gateway Routing Protocol (EIGRP), use the **default-metric** command. To remove the metric value and restore the default state, use the **no** form of this command.

default-metric *bandwidth delay reliability loading mtu*
no default-metric

Syntax Description

bandwidth	Minimum bandwidth of the route in kilobits per second. The range is from 1 to 16777215. The default value is 100000.
delay	Route delay in tens of microseconds. The range is from 1 to 16777215. The default value is 100 (tens of microseconds).
reliability	Likelihood of successful packet transmission expressed as a number between 0 and 255. The value 255 means 100-percent reliability; 0 means no reliability. The default value is 255.
loading	Effective bandwidth of the route expressed as a number from 1 to 255 (255 is 100-percent loading). The default value is 1.
mtu	Minimum maximum transmission unit (MTU) size of the route in bytes. The range is from 1 to 4294967295. The default value is 1492.

Command Default

bandwidth: 100000

delay: 100 (tens of microseconds)

reliability: 255

loading: 1

MTU: 1500

Command Modes

Address-family configuration
Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	Changed the default value for MTU to 1492.

Usage Guidelines

Use the **default-metric** command with the **redistribute** command to use the same metric value for all redistributed routes. A default metric helps solve the problem of redistributing routes with incompatible metrics. Whenever external metrics do not convert to EIGRP metrics, you can use a default metric to provide a reasonable substitute to the external metric and enable the redistribution to proceed.

This command requires the Enterprise Services license.

Examples

This example shows how to take redistributed Routing Information Protocol (RIP) metrics and translate them into EIGRP metrics with the following values: bandwidth = 1000, delay = 100, reliability = 250, loading = 100, and MTU = 1500.

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# redistribute rip 100 route-map FilterRIP
switch(config-router-af)# default-metric 1000 100 250 100 1500
```

Related Commands

Command	Description
redistribute	Redistributes routes from one routing domain into another routing domain.

default-metric (OSPF)

To set default metric values for the Open Shortest Path First (OSPF) routing protocol, use the **default-metric** command. To return to the default state, use the **no** form of this command.

default-metric *metric-value*
no default-metric *metric-value*

Syntax Description

metric-value	Default metric value appropriate for the specified routing protocol. The range is from 1 to 1677214.

Command Default

The metric for redistributed, connected, and static routes is set to 20.

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **default-metric** command with the **redistribute** command to configure the same metric value for all redistributed routes except static and directly connected routes. A default metric helps to redistribute routes with incompatible metrics. Whenever external route metrics do not convert to an OSPF metric, use a default metric to enable the redistribution to proceed.

Note The **default-metric** command does not apply to the redistribution of directly connected routes into OSPF. Use a route map to change the default metric for directly connected routes.

This command requires the Enterprise Services license.

Examples

This example shows how to configure OSPF to redistribute RIP and BGP and set the default metric to 10:

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# default-metric 10
switch(config-router)# redistribute rip 109 route-map FilterRip
switch(config-router)# redistribute bgp 4 route-map FilterBgp
```

Related Commands

Command	Description
redistribute (OSPF)	Redistributes routes from another routing domain into OSPF.

default-metric (OSPFv3)

To set default metric values for the Open Shortest Path First version 3 (OSPFv3) routing protocol, use the **default-metric** command. To return to the default state, use the **no** form of this command.

default-metric *metric-value*
no default-metric *metric-value*

Syntax Description

metric-value	Default metric value appropriate for the specified routing protocol. The range is from 1 to 1677214.

Command Default

The metric for redistributed, connected, and static routes is set to 20.

Command Modes

Address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **default-metric** command with the **redistribute** command to configure the same metric value for all redistributed routes except directly connected routes. A default metric helps to redistribute routes with incompatible metrics. Whenever external route metrics do not convert to an OSPFv3 metric, use a default metric to enable the redistribution to proceed.

Note The **default-metric** command does not apply to the redistribution of directly connected routes into OSPF. Use a route map to change the default metric for directly connected routes.

This command requires the Enterprise Services license.

Examples

This example shows how to configure OSPFv3 to redistribute RIP and BGP and set the default metric to 10:

```
switch# configure terminal
switch(config)# router ospfv3 201
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# default-metric 10
switch(config-router-af)# exit
switch(config-router)# redistribute rip 109 route-map FilterRip
switch(config-router)# redistribute bgp 4 route-map FilterBgp
```

Related Commands

Command	Description
redistribute (OSPFv3)	Redistributes routes from another routing domain into OSPFv3.

default-metric (RIP)

To set default metric values for the Routing Information Protocol (RIP), use the **default-metric** command in router address-family configuration mode. To return to the default state, use the **no** form of this command.

default-metric *value*
no default-metric [*value*]

Syntax Description

value	Default metric value. The range is from 1 to 15.

Command Default

value: 1

Command Modes

Router address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **default-metric** command with the **redistribute** command to use the same metric value for all redistributed routes. A default metric helps solve the problem of redistributing routes with incompatible metrics. Whenever external metrics do not convert to RIP metrics, you can use a default metric to provide a reasonable substitute to the external metric and enable the redistribution to proceed.

This command does not require a license.

Examples

This example shows how to advertise Open Shortest Path First (OSPF) routes using RIP and assign the OSPF-derived routes with a RIP metric of 10:

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# default-metric 10
switch(config-router-af)# redistribute ospf 109 route-map FilterOSPF
```

Related Commands

Command	Description
address-family	Enters address-family configuration mode.
default-information originate	Generates a default route for routes redistributed into RIP.
redistribute	Redistributes routes from one routing domain into another routing domain.

delay

To delay a state change for Object Tracking, use the **delay** command. To disable this function, use the **no** form of this command.

delay {**up** *up-time* [**down** *down-time*] | **down** *down-time* [**up** *up-time*]}
no delay

Syntax Description

up *up-time*	Delays the object track state change for an up condition. The range is from 0 to 180 seconds.
down *down-time*	Delays the object track state change for a down condition. The range is from 0 to 180 seconds.

Command Default

None

Command Modes

Object track mode

Command History

Release	Modification
4.2(4)	This command was introduced.

Usage Guidelines

Use the **delay** command to delay when object tracking detects an up or down state change for a tracked object or track list. This delay helps prevent state flapping.

This command does not require a license.

Examples

This example shows how to configure the delay timer for a tracked object:

```
switch# configure terminal
switch(config)# configure terminal
switch(config)# track 1 interface ethernet 1/2 line-protocol
switch(config-track)# delay up 30 down 30
```

Related Commands

Command	Description
track	Configures a tracked object or track list.

delay minimum

To delay Hot Standby Router Protocol (HSRP) initialization after a reload or after an interface comes up, use the **delay minimum** command. To disable this function, use the **no** form of this command.

delay minimum [*min-delay*] **reload** [*reload-delay*]
no delay minimum [*min-delay*] **reload** [*reload-delay*]

Syntax Description

delay minimum *min-delay*	Specifies the minimum time (in seconds) to delay HSRP group initialization after an interface comes up. This period applies to all subsequent interface events. The default is 0 seconds.
reload *reload-delay*	Specifies the time period to delay HSRP group initialization after the router has reloaded. This period applies only to the first interface-up event after the router has reloaded. The default is 0 seconds.

Command Default

The HSRP delay default is 0 seconds.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use **delay minimum** command to delay HSRP initialization either after a reload or after an interface comes up. This configuration allows the interface and router to stabilize after the interface comes up and helps prevent HSRP state flapping.

This command does not require a license.

Examples

This example shows how to configure a minimum delay of 3 seconds, and a group initialization delay of 10 seconds:

```
switch(config)# configure terminal
switch(config)# interface ethernet 0
switch(config)# ip address 172.16.6.5 255.255.255.0
switch(config)# hsrp 1
switch(config)# delay minimum 3 reload 10
switch(config)# ip 172.16.6.100
```

Related Commands

Command	Description
feature hsrp	Enables HSRP configuration.

disable-peer-as-check (BGP)

To disable checking the peer autonomous system number (ASN) during route advertisement, use the **disable-peer-as-check** command.

disable-peer-as-check

Syntax Description

This command has no arguments or keywords.

Command Default

Checking the ASN during route advertisement is enabled.

Command Modes

config-router-vrf-neighbor-af mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to disable checking the peer ASN during a route advertisement:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# feature-set mpls
switch(config)# feature mpls l3vpn
switch(config)# feature bgp
switch(config)# router bgp 1.1
switch(config-router)# neighbor 33.0.1.63 remote-as 100
switch (config-router-vrf-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# neighbor 33.0.1.63 remote-as 100
switch(config-router-vrf-neighbor)# address-family ipv4 unicast
switch(config-router-vrf-neighbor-af)# disable-peer-as-check
switch(config-router-vrf-af)#
```

Related Commands

Command	Description
address-family ipv4 unicast	Enters address family configuration mode for configuring routing sessions that use standard IPv4 address prefixes.
allowas-in	Allows duplicate autonomous system number (ASN) in the AS path. Configure this parameter in the VPN address family configuration mode at the PE spokes and at the neighbor mode at the PE hub.
neighbor	Adds an entry to the BGP or multiprotocol BGP neighbor table for this VRF.

discard-route

For Cisco NX-OS to automatically configure a discard route for the summary address to prevent routing black holes and route loops, use the **discard-route** command. To prevent the discard routes from being created, use the **no** form of this command.

discard-route {**internal** | **external**}
no discard-route {**internal** | **external**}

Syntax Description

internal	(Optional) Specifies internal route.
external	(Optional) Specifies external route.

Command Default

Enabled

Command Modes

config-router mode

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 automatically configure a discard route for the summary address to prevent routing black holes and route loops:

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# area 0.0.0.10 range 10.3.0.0/16
switch(config-router)# summary-address 10.5.0.0/16 tag 2
switch(config-router)# no discard-route internal
switch(config-router)#
```

This example shows how to prevent the discard routes from being created:

```
switch(config-router)# no discard-route internal
```

Related Commands

Command	Description
router ospf	Configures an Open Shortest Path First (OSPF) routing instance.

distance (EIGRP)

To allow the use of two administrative distances—internal and external—for the Enhanced Interior Gateway Routing Protocol (EIGRP) that could provide a better route to a node, use the **distance** command. To reset to default, use the **no** form of this command.

distance *internal-distance external-distance*
no distance

Syntax Description

internal-distance	Administrative distance for EIGRP internal routes. Internal routes are routes that are learned from another entity within the same autonomous system (AS). The distance can be a value from 1 to 255. The default value is 90.
external-distance	Administrative distance for EIGRP external routes. External routes are routes for which the best path is learned from a source external to this autonomous system. The distance can be a value from 1 to 255. The default value is 170.

Command Default

internal-distance: 90

external-distance: 170

Command Modes

Address-family configuration
Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

An administrative distance is a rating of the trustworthiness of a routing information source, such as an individual router or a group of routers. Numerically, an administrative distance is an integer from 0 to 255. In general, the higher the value, the lower the trust rating. An administrative distance of 255 means that the routing information source cannot be trusted and should be ignored.

Use the **distance** command if another protocol is known to provide a better route to a node than was actually learned through the external EIGRP or some internal routes should be preferred by EIGRP.

This command requires the Enterprise Services license.

Examples

This example shows how to set the administrative distance of all EIGRP 1 internal routes to 80 and all EIGRP external routes to 130:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# distance 80 130
```

Related Commands

Command	Description
show ip eigrp	Displays information about the Enhanced Interior Gateway Routing Protocol (EIGRP) running on the router.

distance (IS-IS)

To define an administrative distance for routes that are inserted into the routing table, use the **distance** configuration mode command. To return the administrative distance to its default distance definition, use the **no** form of this command.

distance *value*
no distance

Syntax Description

value	Administrative distance. Range: 1 to 255. Default: 115.

Command Default

The default route is not redistributed into the IS-I S routing domain.

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

An administrative distance is a rating of the trustworthiness of a routing information source, such as an individual router or a group of routers. Numerically, an administrative distance is an integer from 0 to 255. In general, the higher the value, the lower the trust rating. An administrative distance of 255 means the routing information source cannot be trusted at all and should be ignored.

This command requires the Enterprise Services license.

Examples

This example shows how to set the administrative distance to 90:

```
switch# configure terminal
switch(config)# router isis TEST1
switch(config-router)# distance 90
```

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
net	Specifies the Network Entity Title (NET) for an IS-IS process.
router isis	Enables IS-IS.

distance (OSPF)

To define the Open Shortest Path First (OSPF) route administrative distance, use the **distance** command. To restore the default, use the **no** form of this command.

distance *distance*
no distance

Syntax Description

distance	Administrative distance for all routes local to this OSPF process. The range is from 1 to 255.

Command Default

110

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **distance** command to set a distance for an entire group of routes. Use the **distance** command when you configure multiple routing protocols, and you want to choose one set of routes over the other.

This command requires the Enterprise Services license.

Examples

This example shows how to set the distance to 200, making the route less reliable:

```
switch# configure terminal
switch(config)# router ospf 1
switch(config-router)# distance 200
switch(config-router)# router ospf 2
switch(config-router)# distance 20
```

distance (OSPFv3)

To define the Open Shortest Path First version 3 (osPFv3) route administrative distance, use the **distance** command. To restore the default, use the **no** form of this command.

distance *distance*
no distance

Syntax Description

distance	Administrative distance for all routes local to this OSPFv3 process. The range is from 1 to 255.

Command Default

110

Command Modes

Address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **distance** command to set a distance for an entire group of routes. Use the **distance** command when you configure multiple routing protocols, and you want to choose one set of routes over the other.

This command requires the Enterprise Services license.

Examples

This example shows how to set the distance to 200, making the route less reliable:

```
switch# configure terminal
switch(config)# router ospfv3 1
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# distance 200
```

distance (RIP)

To define the administrative distance assigned to routes discovered by the Routing Information Protocol (RIP), use the **distance** command in the router address-family configuration mode. To remove the distance and restore the system to its default condition, use the **no** form of this command.

distance *admin-distance*
no distance *admin-distance*

Syntax Description

admin-distance	Administrative distance to be assigned to RIP routes. The range is from 0 to 255.

Command Default

admin-distance: 120

Command Modes

Router address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **distance** command to change the preference of RIP routes over other protocol routes. Numerically, an administrative distance is an integer from 0 to 255. In general, a higher value indicates a lower trust rating. An administrative distance of 255 means that the routing information source cannot be trusted at all and should be ignored.

The following table lists default administrative distances.

Table 1: Default Administrative Distances of Routing Protocols

Routing Protocols	Administrative Distance Value
Connected interface	0
Static route out an interface	0
Static route to next hop	1
EIGRP Summary Route	5
External BGP	20
Internal EIGRP	90
OSPF	110
IS-IS	115
RIP	120
External EIGRP	170

Routing Protocols	Administrative Distance Value
Internal BGP	200
Unknown	255

This command does not require a license.

Examples

This example shows how to set the administrative distance for RIP:

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# distance 85
```

Related Commands

Command	Description
address-family	Enters address-family configuration mode.
redistribute	Redistributes routes from one routing domain into RIP.

distribute

To distribute routes between specific IS-IS levels, use the **distribute** command. To return to the default setting, use the **no** form of this command.

distribute {**level-1** | **level-2**} **into** {**level-1** | **level-2**} {**all** | **route-map** *name*}

Syntax Description

level-1	Distributes the interarea routes into level-1 of this IS-IS instance.
level-2	Distributes the interarea routes into level-2 of this IS-IS instance.
into	Specifies from one level to another level.
all	Distributes all route levels.
route-map *name*	Prevents distribution of a specific route-map. The name can be any alphanumeric string up to 63 characters.

Command Default

The default route is not distributed into the IS-S routing domain. If enabled, IS-IS allows distribution of route between level-1 and level-2 such that optimal inter-area routing could be obtained.

This command requires the Enterprise Services license.

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

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-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.

In IS-IS, all areas are stub areas, which means that no routing information is leaked from the backbone (level-2) into areas (level-1). Level-1-only routers use default routing to the closest level-1-level-2 router in their area. This command enables you to redistribute level-2 IP routes into level-1 areas. This redistribution enables level-1-only routers to pick the best path for an IP prefix to get out of the area. This is an IP-only feature, CLNS routing is still stub routing.

For more control and scalability, a distribute list or a route map can control which level-2 IP routes can be redistributed into level-1. This command allows large IS-IS-IP networks to use areas for better scalability.

Examples

This example distributes level-1 routes into a level-2 network:

```
switch# configure terminal
switch(config)# distribute level-1 into level-2
```

down-bit-ignore

To disable down bit (DN bit) checking on a provider edge (PE) router, use the **down-bit-ignore** command in OSPF VRF configuration mode. To return to the default setting, use the **no** form of this command.

down-bit-ignore
no down-bit-ignore

Syntax Description

This command has no keywords or arguments.

Command Default

By default, the down bit (DN bit) checking is enabled. The information from the link-state advertisement (LSA) for which the DN bit is set is ignored during Open Shortest Path First (OSPF) route calculation.

Command Modes

OSPF VRF configuration

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command is supported only in the OSPF VRF mode on a PE router. This command is not supported in OSPF VRF mode on a non-PE router.

When a PE receives a type 3, 5, or 7 LSA with the DN bit set from a customer edge (CE) router, the information from the LSA is not used during OSPF route calculation. The DN bit ignore feature enables a PE router to process type-3, type-5, and type-7 LSAs that are received from a CE router when the DN bit is set. When you configure the DN bit ignore feature, the PE router includes these LSAs in OSPF route computation.

The DN bit is used to prevent routing loops in Layer 3 virtual private network (VPN) configurations using OSPF in a PE-CE scenario. The DN bit ignore feature is applicable for only certain topologies, such as a hub and spoke topology of PE routers with multiple virtual routing and forwarding (VRF) CEs connected to the hub PE. You should be use this command with caution because it can cause routing loops.

E Commands

ebgp multihop

To configure the exterior Border Gateway Protocol (eBGP) time-to-live (TTL) value to support eBGP multihop, use the **ebgp multihop** command. To reset to default, use the **no** form of this command.

ebgp multihop *ttl-value*
no ebgp multihop *ttl-value*

Syntax Description

ttl-value	TTL value for eBGP multihop. The range is from 2 to 255. You must manually reset the BGP sessions after using this command.

Command Default

None

Command Modes

BGP neighbor configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ebgp multihop** command to configure the eBGP time-to-live (TTL) value to support eBGP multihop. In some situations, an eBGP peer is not directly connected to another eBGP peer and requires multiple hops to reach the remote eBGP peer. You can configure the eBGP TTL value for a neighbor session to allow these multihop sessions.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the eBGP multihop value:

```
switch# configure terminal
switch(config)# router bgp 1.1
switch(config-router)# neighbor 192.0.2.1 remote-as 1.2
switch(config-route-neighbor) ebgp multihop 2
```

Related Commands

Command	Description
feature bgp	Enables the BGP feature.

eigrp graceful-restart

To enable graceful restart for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **eigrp graceful-restart** command. To reset to default, use the **no** form of this command.

eigrp graceful-restart
no eigrp graceful restart

Syntax Description

This command has no arguments or keywords.

Command Default

Enabled

Command Modes

Address-family configurationRouter configurationRouter VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	Replaced by **graceful-restart** command.

Usage Guidelines

Use the **eigrp graceful-restart** command to allow EIGRP to remain in the data forwarding path through a process restart. This command is the same as the **nsf** command.

This command requires the Enterprise Services license.

Examples

This example shows how to enable graceful restart:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# eigrp graceful-restart
```

Related Commands

Command	Description
graceful-restart	Enables graceful restart.
timers nsf	Configures timers for nonstop forwarding and graceful restart.

eigrp log-neighbor-changes

To enable the logging of changes in Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor adjacencies, use the **eigrp log-neighbor-changes** command. To disable the logging of changes in EIGRP neighbor adjacencies, use the **no** form of this command.

eigrp log-neighbor-changes
no eigrp log-neighbor-changes

Syntax Description

This command has no arguments or keywords.

Command Default

Adjacency changes are logged.

Command Modes

Address-family configuration
Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	Replaced by **log-neighbor-changes** command.

Usage Guidelines

Use the **eigrp log-neighbor-changes** command to log neighbor adjacency changes to monitor the stability of the routing system and to detect problems. Logging is enabled by default. To disable the logging of neighbor adjacency changes, use the **no** form of this command.

This command requires the Enterprise Services license.

Examples

This example shows how to enable logging of neighbor changes for EIGRP process 209:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# eigrp log-neighbor-changes
```

Related Commands

Command	Description
log-neighbor-changes	Enables logging of EIGRP neighbor changes.
log-neighbor-warnings	Enables logging of EIGRP neighbor warnings.
log-adjacency-changes	Enables logging of EIGRP adjacency state changes.

eigrp log-neighbor-warnings

To enable the logging of Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor warning messages, use the **eigrp log-neighbor-warnings** command. To disable the logging of EIGRP neighbor warning messages, use the **no** form of this command.

eigrp log-neighbor-warnings [*seconds*]
no eigrp log-neighbor-warnings

Syntax Description

seconds	(Optional) Time interval (in seconds) between repeated neighbor warning messages. The range of seconds is from 1 to 65535.

Command Default

Neighbor warning messages are logged.

Command Modes

Address-family configuration
Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	Replaced by **log-neighbor-warnings** command.

Usage Guidelines

Use the **eigrp log-neighbor-warnings** command to enable neighbor warning messages and to configure the interval between repeated neighbor warning messages.

This command requires the Enterprise Services license.

Examples

This example shows how to log neighbor warning messages for EIGRP process 209 and to repeat the warning messages in 5-minute (300 seconds) intervals:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# eigrp log-neighbor-warnings 30
```

Related Commands

Command	Description
log-neighbor-changes	Enables logging of EIGRP neighbor changes.
log-neighbor-warnings	Enables logging of EIGRP neighbor warnings.
log-adjacency-changes	Enables logging of EIGRP adjacency state changes.

eigrp router-id

To set the router ID used by the Enhanced Interior Gateway Routing Protocol (EIGRP) when communicating with its neighbors, use the **eigrp router-id** command. To remove the configured router ID, use the **no** form of this command.

eigrp router-id *ip-address*
no eigrp router-id *ip-address*

Syntax Description

ip-address	Router ID in dotted decimal notation.

Command Default

EIGRP automatically selects an IP address to use as the router ID when an EIGRP process is started. The highest local IP address is selected and loopback interfaces are preferred. The router ID is not changed unless the EIGRP process is removed with the **no router eigrp** command or if the router ID is manually configured with the **eigrp router-id** command.

Command Modes

Address-family configuration
Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	Replaced by **router-id** command.

Usage Guidelines

Use the **eigrp router-id** command to manually configure the router ID for EIGRP. The router ID is used to identify the originating router for external routes. If an external route is received with the local router ID, the route is discarded. The router ID can be configured with any IP address with two exceptions; 0.0.0.0 and 255.255.255.255 are not legal values and cannot be entered. You should configure unique value for each router.

This command requires the Enterprise Services license.

Examples

This example shows how to configure 172.16.1.3 as a fixed router ID:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# eigrp router-id 172.16.1.3
```

eigrp stub

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

eigrp stub [{**direct** | **leak-map** *map-name* | **receive-only** | **redistributed**}]
no eigrp stub [{**direct** | **leak-map** *map-name* | **receive-only** | **redistributed**}]

Syntax Description

direct	(Optional) Advertises directly connected routes.
leak-map *map-name*	(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
4.0(1)	This command was introduced.
4.0(3)	Replaced by **stub** command.

Usage Guidelines

Use the **eigrp 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 **eigrp stub** command, only the route types specified by the particular keyword(s) are advertised.

This command requires the Enterprise Services license.

Usage Guidelines

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

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

event fib resource tcam usage

To configure an event statement for the policy, use the **event fib resource tcam usage** command.

event fib resource tcam usage

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

config-applet mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

By using the **event fib resource tcam usage** command, you can configure a policy in the Embedded Event Manager (EEM) to monitor TCAM utilization on Cisco Nexus 7000 M1 Series modules.

The **event fib resource tcam usage** command triggers an event each time the TCAM utilization percentage becomes a multiple of 5, in either direction.

This command requires the Enterprise Services license.

Examples

This example shows how to configure an event statement for the policy:

```
switch# configure terminal
switch(config)# event manager applet Test1
switch(config-applet)# description "checks TCAM usage threshold on M1 card"
switch(config-applet)# event fib resource tcam usage
switch(config-applet#
```

Related Commands

Command	Description
show event manager policy-state	Displays information about the status of the specified event policy.

event fib route

To configure an event statement for the policy, use the event fib route command. To remove an event statement from an Embedded Event Manager (EEM) policy, use the no form of this command.

event fib route {**inconsistent** | **missing** | **failure**}
no event fib route {**inconsistent** | **missing** | **failure**}

Syntax Description

inconsistent	Triggers an event if the route or adjacency programming is changed in the hardware configuration.
missing	Triggers an event if the route is deleted in the unicast Forward Information Base (FIB).
failure	Triggers an event if a route fails to be inserted in the unicast FIB.

Command Default

None

Command Modes

config-applet mode

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 configure an event statement for the policy:

```
switch# configure terminal
switch(config)# event manager applet Route1
switch(config-applet)# description "checks for missing routes in FIB"
switch(config-applet)# event fib route missing
switch(config-applet)#
```

Related Commands

Command	Description
show event manager policy-state	Displays information about the status of the specified event policy.

export vrf

To export IP prefixes to the default VRF (global routing table) from any other VRF, use the **export vrf** command.

export vrf default [*prefix-limit*] **map** *route-map*

Syntax Description

prefix-limit	Number of routes that can be exported in order to avoid the global table being over-loaded. The default value is 1000.
map	Specifies the route map.
route-map	Name of the route map. It is case-sensitive, alphanumeric character string with a maximum length of 63 characters.

Command Modes

Address Family Configuration (config-vrf-af)

Command History

Release	Modification
7.3(0)D1(1)	This command was introduced.

.

Examples

The following example shows how to export the route-map, BgpMap, to default VRF, and verify the configuration:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# vrf context vpn1
switch(config-vrf)# address-family ipv4 unicast
switch(config-vrf-af)# export vrf default 3 map BgpMap
switch(config-vrf-af)# exit
switch(config)# show gp process vrf vpn1
```

Related Commands

Command	Description
import vrf	Import IP prefixes from default VRF.

F Commands

feature bgp

To enable the Border Gateway Protocol (BGP), use the **feature bgp** command. To disable BGP, use the **no** form of this command.

feature bgp
no feature bgp

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration.

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

You must enable the BGP feature before you can configure BGP.

This command requires the Enterprise Services license.

Examples

This example shows how to enable a BGP configuration:

```
switch# configure terminal
switch(config)# feature bgp
```

Related Commands

Command	Description
show bgp	Displays BGP configuration information.
router bgp	Creates a BGP instance.

feature eigrp

To enable the Enhanced Interior Gateway Protocol (EIGRP), use the **feature eigrp** command. To disable EIGRP, use the **no** form of this command.

feature eigrp
no feature eigrp

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

You must enable the EIGRP feature before you can configure EIGRP.

This command requires the Enterprise Services license.

Examples

This example shows how to enable the EIGRP feature:

```
switch# configure terminal
switch(config)# feature eigrp
```

Related Commands

Command	Description
show {**ip** | **ipv6**} **eigrp**	Displays EIGRP configuration information.
router eigrp	Creates a EIGRP instance.

feature glbp

To enable the Gateway Load Balancing Protocol (GLBP), use the **feature glbp** command. To disable GLBP, use the **no** form of this command.

feature glbp
no feature glbp

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You must globally enable GLBP before you can configure any GLBP options or create a GLBP group.

This command does not require a license.

Examples

This example shows how to enable GLBP:

```
switch# configure terminal
switch(config)# feature glbp
```

Related Commands

Command	Description
authentication	Configures an authentication string for the GLBP group.
forwarder preempt	Configures a gateway to take over as AVF for a GLBP group if it has a higher priority than the current AVF.
ip (GLBP)	Activates the GLBP group.
load-balancing	Specifies the load-balancing method used by the AVG of GLBP.
preempt	Configures the gateway to take over as AVG for a GLBP group if it has a higher priority than the current AVG.
priority	Sets the priority level of the gateway within a GLBP group.
show glbp	Displays GLBP information.
timers	Configures the time between hello packets sent by the GLBP gateway and the time for which the virtual gateway and virtual forwarder information is considered valid.
timers redirect	Configures the time during which the AVG for a GLBP group continues to redirect clients to a secondary AVF.

Command	Description
track	Configures an interface to be tracked where the GLBP weighting changes are based on the state of the interface.
weighting	Specifies the initial weighting value of the GLBP gateway.
weighting track	Specifies a tracking object where the GLBP weighting changes are based on the availability of the object being tracked.

feature hsrp

To enter Hot Standby Router Protocol (HSRP) configuration mode and enable HSRP, use the **feature hsrp** command. To disable HSRP, use the **no** form of this command.

feature hsrp
no feature hsrp

Syntax Description

The command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **feature hsrp** command to enter HSRP configuration mode and enable HSRP.

This command does not require a license.

Examples

This example shows how to enable HSRP on Ethernet interface 1/1:

```
switch# configure terminal
switch(config)# feature hsrp
switch(config-hsrp)#
```

Related Commands

Command	Description
hsrp group	Creates and activates an HSRP group.
show hsrp	Displays HSRP information.

feature imp

To enable the authentication package for Open Short Path First version 3 (OSPFv3) packets, use the **feature imp** command. To disable the authentication package, use the **no** form of this command.

feature imp
no feature imp

Syntax Description

The command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modification
7.3(1)D1(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to enable authentication package:

```
switch# configure terminal
switch(config)# feature imp
switch(config)#
```

feature isis

To enable the Intermediate System to Intermediate System Protocol (IS-IS), use the **feature isis** command. To disable ISIS, use the **no** form of this command.

feature isis
no feature isis

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

You must enable the IS-IS feature before you can configure IS-IS.

This command requires the Enterprise Services license.

Examples

This example shows how to enable the IS-IS feature:

```
switch# configure terminal
switch(config)# feature isis
```

Related Commands

Command	Description
show isis	Displays IS-IS configuration information.
router isis	Creates an IS-IS instance.

feature ospf

To enable the Open Shortest Path First Protocol (OSPF), use the **feature ospf** command. To disable OSPF, use the **no** form of this command.

feature ospf
no feature ospf

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

You must enable the OSPF feature before you can configure OSPF.

This command requires the Enterprise Services license.

Examples

This example shows how to enable the OSPF feature:

```
switch# configure terminal
switch(config)#feature ospf
```

Related Commands

Command	Description
show ospf	Displays OSPF configuration information.
router ospf	Creates an OSPF instance.

feature ospfv3

To enable the Open Shortest Path First version 3 Protocol (OSPFv3), use the **feature ospfv3** command. To disable OSPFv3, use the **no** form of this command.

feature ospfv3
no feature ospfv3

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

You must enable the OSPFv3 feature before you can configure OSPFv3.

This command requires the Enterprise Services license.

Examples

This example shows how to enable the OSPv3 feature:

```
switch# configure terminal
switch(config)# feature ospfv3
```

Related Commands

Command	Description
show ospfv3	Displays OSPFv3 configuration information.
router ospfv3	Creates an OSPFv3 instance.

feature pbr

To enable the policy-based routing (PBR) feature, use the **feature pbr** command. To disable PBR, use the **no** form of this command.

feature pbr
no feature pbr

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

You must enable the PBR feature before you can configure policy-based routing.

This command requires the Enterprise Services license.

Examples

This example shows how to enable the PBR feature:

```
switch# configure terminal
switch(config)# feature pbr
```

Related Commands

Command	Description
ip policy route-map	Assigns a policy-based route map to an interface.
show ip policy	Displays information about policy-based routing.

feature rip

To enable the Routing Information Protocol (RIP), use the **feature rip** command. To disable RIP, use the **no** form of this command.

feature rip
no feature rip

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

You must enable the RIP feature before you can configure RIP.

This command does not require a license.

Examples

This example shows how to enable the RIP feature:

```
switch# configure terminal
switch(config)# feature rip
```

Related Commands

Command	Description
show rip	Displays RIP configuration information.
router rip	Creates a RIP instance.

feature vrrp

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

feature vrrp
no feature vrrp

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

You must enable the VRRP feature before you can configure VRRP.

This command does not require a license.

Examples

This example shows how to enable the VRRP feature:

```
switch# configure terminal
switch(config)# feature vrrp
```

Related Commands

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

feature vrrpv3

To enable Virtual Router Redundancy Protocol (VRRP) version 3 and Virtual Router Redundancy Service (VRRS), use the **feature vrrpv3** command. To disable VRRPv3 and VRRS in a VDC, use the **no** form of this command.

feature vrrpv3
no feature vrrpv3

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

If VRRPv2 is configured, use the no feature vrrp command in global configuration mode to remove the VRRPv2 configuration and then use the feature vrrpv3 command to enable VRRPv3.

This command requires the Enterprise Services license.

Examples

This example shows how to enable VRRPv3 and VRRS:

```
switch# configure terminal
switch(config)# feature vrrpv3
```

This example shows how to disable VRRPv3 and VRRS:

```
switch# configure terminal
switch(config)# no feature vrrpv3
```

Related Commands

Command	Description
vrrpv3 address-family	Creates a VRRPv3 group and enters VRRPv3 group configuration mode.

feature wccp

To enable the Web Cache Communication Protocol (WCCP), use the **feature wccp** command. To disable WCCP, use the **no** form of this command.

feature wccp
no feature wccp

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modified
4.2(1)	This command was introduced.

Usage Guidelines

You must enable the WCCP feature before you can configure WCCPv2.

This command does not require a license.

Examples

This example shows how to enable the WCCP feature:

```
switch# configure terminal
switch(config)# feature wccp
switch(config)# show ip wccp

Global WCCP information:
Router information:
Router Identifier: 20.20.20.2
Protocol Version: 2.0
```

Related Commands

Command	Description
clear ip wccp	Clears all the software counters for WCCPv2.
show running-config wccp	Displays the WCCPv2 configuration.
show ip wccp	Displays the status of the WCCP service group.

flush-routes (OSPF)

To flush routes on a nongraceful controlled restart for the Open Shortest Path First (OSPF) protocol, use the **flush-routes** command. To disable this feature, use the **no** form of this command.

flush-routes
no flush-routes

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **flush-routes** command when the OSPF Graceful Restart feature is not enabled.

This commands causes OSPF to unregister from the unicast RIB when OSPF shuts down. The unicast RIB removes all the routes associated with this OSPF instance. If you do not configure the **flush-routes** command, OSPF will not unregister and the OSPF routes will be stale. The OSPF routs are eventually removed from the unicast RIB after a timeout period. If OSPF comes back up in p in graceful restart mode, the routes will be refreshed in the unicast RIB.

This command requires the Enterprise Services license.

Examples

This example shows how to flush routes for a nongraceful restart:

```
switch# configure terminal
switch(config)# router ospf 202
switch(config-router)# flush-routes
```

Related Commands

Command	Description
graceful-restart	Enables OSPF Graceful Restart.

flush-routes (OSPFv3)

To flush routes on a nongraceful controlled restart for the Open Shortest Path First version 3 (OSPFv3) protocol, use the **flush-routes** command. To disable this feature, use the **no** form of this command.

flush-routes
no flush-routes

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **flush-routes** command when the OSPFv3 Graceful Restart feature is not enabled.

This commands causes OSPF to unregister from the unicast RIB when OSPFv3 shuts down. The unicast RIB removes all the routes associated with this OSPF instance. If you do not configure the **flush-routes** command, OSPFv3 will not unregister and the OSPFv3 routes will be stale. The OSPFv3 routs are eventually removed from the unicast RIB after a timeout period. If OSPFv3 comes back up in p in graceful restart mode, the routes will be refreshed in the unicast RIB.

This command requires the Enterprise Services license.

Examples

This example shows how to flush routes for a nongraceful restart:

```
switch# configure terminal
switch(config)# router ospfv3 202
switch(config-router)# flush-routes
```

Related Commands

Command	Description
graceful-restart	Enables OSPFv3 graceful restart.

follow

To configure a regular Hot Standby Redundancy Protocol (HSRP) group as a slave group, use the **follow** command. To return the slave group to a regular HSRP group, use the **no** form of this command.

follow *master-group*
no follow *master-group*

Syntax Description

master-group	Master group.

Command Default

None

Command Modes

config-if-hsrp mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

Configuring an HSRP group as a slave group clears the group's other configurations, such as its virtual IP address without notification, so you must enter the follow command before you enter the ip command.

Slave groups may forward reference master group names that are undefined.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a regular HSRP group as a slave group:

```
switch# configure terminal
switch(config)# interface ethernet 3/5
switch(config-if)# ip address 11.0.0.1/24
switch(config-if)# hsrp version 2
switch(config-if)# hsrp mac-refresh 90
switch(config-if)# hsrp 10
switch(config-if-hsrp)# name Master-Group-1
switch(config-if-hsrp)# follow Master-Group-1
switch(config-if-hsrp)#
```

This example shows how to remove a regular HSRP group from a slave group:

```
switch(config-if-hsrp)# no follow Master-Group-1
```

Related Commands

Command	Description
hsrp	Creates an HSRP group and enters HSRP configuration mode.

forwarder preempt

To configure a gateway to take over as the active virtual forwarder (AVF) for a Gateway Load Balancing Protocol (GLBP) group if the current AVF falls below its low weighting threshold, use the **forwarder preempt** command. To disable this function, use the **no** form of this command.

forwarder preempt [**delay minimum** *seconds*]
no forwarder preempt [**delay minimum** *seconds*]

Syntax Description

delay minimum *seconds*	(Optional) Specifies a minimum number of seconds that the gateway delays before taking over the role of AVF. The range is from 0 to 3600 seconds with a default delay of 30 seconds.

Command Default

Forwarder preemption is enabled with a default delay of 30 seconds.

Command Modes

GLBP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure a gateway to preempt the current AVF when the current AVF falls below its low weighting threshold. If the gateway preempts the current AVF, it waits 60 seconds before taking over the role of the AVF.

```
switch# configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# glbp 2
switch(config-glbp)# forwarder preempt delay minimum 60
```

Related Commands

Command	Description
glbp	Enters GLBP configuration mode and creates a GLBP group.

G Commands

glbp

To enter GLBP configuration mode and create a Gateway Load Balancing Protocol (GLBP) group, use the **glbp** command. To delete a GLBP group, use the **no** form of this command.

glbp *group*
no glbp *group*

Syntax Description

group	GLBP group number. The range is from 0 to 1023.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **glbp** command to enter GLBP configuration mode and create a GLBP group if the group does not exist.

Note You must configure all GLBP options before you use the **ip** command to assign a virtual IP address and activate the GLBP group.

This command does not require a license.

Examples

This example shows how to create GLBP group 10 on Ethernet interface 1/1:

```
switch# configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# glbp 10
```

Related Commands

Command	Description
ip (GLBP)	Configures a virtual IP address and activates the GLBP group.
show glbp	Displays GLBP information.

glbp timers extended-hold

To enabled extended hold timers for the Gateway Load Balancing Protocol (GLBP), use the **glbp timers extended-hold** command. To revert to default, use the **no** form of this command.

glbp timers extended-hold [*timer*]
no glbp timers extended-hold

Syntax Description

timer	(Optional) Extended hold time, in seconds. The range is from 10 to 255.

Command Default

10 seconds

Command Modes

Global configuration

Command History

Release	Modification
5.0(2)	This command was introduced.

Usage Guidelines

Use the **glbp timers extended-hold** command to configure extended Non-stop Forwarding (NSF) support for GLBP.

Note You must configure extended hold timers on all GLBP gateways if you configure non-default extended hold timers. You can configure different extended holdtimer values on each GLBP gateway, based on the expected system switchover delays.

This command does not require a license.

Examples

This example shows how to configure the extended hold time for GLBP:

```
switch# configure terminal
switch(config)# glbp timers extended-hold 30
```

Related Commands

Command	Description
ip (GLBP)	Configures a virtual IP address and activates the GLBP group.
show glbp	Displays GLBP information.

graceful-restart (BGP)

To enable the graceful restart and the graceful restart helper capability, use the **graceful-restart** or the graceful-restart-helper router BGP configuration mode command. To disable graceful restart and the graceful restart helper capability, use the **no** form of this command.

graceful-restart [{**restart-time** *restart-time* | **stalepath-time** *stalepath-time*}] **graceful-restart-helper**
{**no graceful-restart** {**restart-time** *restart-time* | **stalepath-time** *stalepath-time*} | **graceful-restart-helper**}

Syntax Description

restart-time *restart-time*	(Optional) Sets the maximum time period that the local router will wait for a graceful-restart-capable neighbor to return to normal operation after a restart event occurs. Range: 1 to 3600. Default: 120.
stalepath-time *stalepath-time*	(Optional) Sets the maximum time period that the local router will hold stale paths for a restarting peer. All stale paths are deleted after this timer expires. The range is from1 to 3600.
graceful-restart-helper	Enables the graceful restart helper capability.

Command Default

Graceful restart and graceful restart helper are enabled by default. The following default values are used when the **graceful-restart** command is entered without any keywords or arguments:

- *restart-time*: 120 seconds
- *stalepath-time*: 300 seconds

Note Changing the restart and stalepath timer values is not required to enable the BGP graceful restart capability. The default values are optimal for most network deployments, and these values should be adjusted only by an experienced network operator.

Command Modes

Neighbor address-family configurationRouter bgp configuration VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The **graceful-restart** command is used to configure or disable the graceful restart capability on a router in a BGP network.If the graceful restart capability is enabled after a BGP session has been established, you will need to restart the session with a soft or hard reset.

The default timer values for this feature are optimal for most network deployments. We recommend that they are adjusted only by experienced network operators. When adjusting the timer values, the restart timer should not be set to a value greater than the hold time that is carried in the OPEN message. If consecutive restart operations occur, routes (from a restarting router) that were previously marked as stale will be deleted.

The **graceful-restart-helper** command is used to configure the local BGP router to support the graceful restart of a remote BGP peer.

Examples

This example shows how to enable the BGP graceful restart capability:

```
switch(config-router)# graceful-restart
switch(config-router)#
```

This example shows how to set the restart timer is set to 240 seconds:

```
switch(config-router)# graceful-restart restart-timer 240
switch(config-router)#
```

graceful-restart (EIGRP)

To enable graceful restart for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **graceful-restart** command. To reset to default, use the **no** form of this command.

graceful-restart
no graceful restart

Syntax Description

This command has no arguments or keywords.

Command Default

Enabled

Command Modes

Address-family configurationRouter configurationRouter VRF configuration

Command History

Release	Modification
4.0(3)	This command was introduced.

Usage Guidelines

Use the **graceful-restart** command to allow EIGRP to remain in the data forwarding path through a process restart.

This command requires the Enterprise Services license.

Examples

This example shows how to enable graceful restart:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# graceful-restart
```

Related Commands

Command	Description
timers nsf	Configures timers for nonstop forwarding and graceful restart.

graceful-restart (IS-IS)

To enable the graceful restart for an IS-IS process, use the **graceful-restart** configuration mode command. To disable graceful restart, use the **no** form of this command.

graceful-restart
no graceful-restart

Syntax Description

This command has no arguments or keywords.

Command Default

Graceful restart is enabled by default.

Command Modes

Address-family configurationRouter configuration VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The **graceful-restart** command is used to configure or disable the graceful restart capability on a router in an IS-IS network. If the graceful restart capability is enabled after an IS-IS session has been established, you will need to restart the session with a soft or hard reset.

This command requires the Enterprise Services license.

Examples

This example shows how to enable the graceful restart capability:

```
switch(config-router)# graceful-restart
switch(config-router)#
```

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
router isis	Creates an IS-IS instance.

graceful-restart (OSPF)

To configure nonstop forwarding for Open Shortest Path First (OSPF), use the **graceful-restart** command. To disable this feature, use the **no** form of this command.

graceful-restart [{**grace-period** *seconds* | **helper-disable** | **planned-only**}]
no graceful-restart [{**grace-period** *seconds* | **helper-disable** | **planned-only**}]

Syntax Description

grace-period *seconds*	(Optional) Configures the maximum interval (in seconds) that another router should wait for this router to gracefully restart. The range is from 5 to 1800.
helper-disable	Optional) Disables helper mode. The router will not participate in the graceful restart of a neighbor router.
planned-only	Optional) Enables graceful restart for controlled restarts only.

Command Default

Enabled by default. Grace period: 60 seconds

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **graceful-restart** command to allow OSPF to remain in the data forwarding path through a process restart. Set the grace period long enough to allow a typical reboot cycle for Cisco NX-OS. Do not set the grace period too long or your network will be relying on old route information.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a graceful restart to occur only for a planned restart:

```
switch# configure terminal
switch(config)# router ospf 202
switch(config-router)# graceful-restart grace-period 300 planned-only
```

Related Commands

Command	Description
flush-routes	Flushes routes on a nongraceful controlled restart.

graceful-restart (OSPFv3)

To configure nonstop forwarding for Open Shortest Path First version 3 (OSPFv3), use the **graceful-restart** command. To disable this feature, use the **no** form of this command.

graceful-restart [{**grace-period** *seconds* | **helper-disable** | **planned-only**}]
no graceful-restart [{**grace-period** *seconds* | **helper-disable** | **planned-only**}]

Syntax Description

grace-period *seconds*	(Optional) Configures the maximum interval (in seconds) that another router should wait for this router to gracefully restart. The range is from 5 to 1800.
helper-disable	Optional) Disables helper mode. The router will not participate in the graceful restart of a neighbor router.
planned-only	Optional) Enables graceful restart for controlled restarts only.

Command Default

Enabled by default. Grace period: 60 seconds

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **graceful-restart** command to allow OSPFv3 to remain in the data forwarding path through a process restart. Set the grace period long enough to allow a typical reboot cycle for Cisco NX-OS. Do not set the grace period too long or your network will be relying on old route information.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a graceful restart to occur only for a planned restart:

```
switch# configure terminal
switch(config)# router ospfv3 202
switch(config-router)# graceful-restart grace-period 300 planned-only
```

Related Commands

Command	Description
flush-routes	Flushes routes on a nongraceful controlled restart.

graceful-restart t3 manual

To configure the time that Intermediate-System-to-Intermediate System (IS-IS) announces as the adjacency remaining time in its hello message when IS-IS acknowledges a peer restart, use the **graceful-restart t3 manual** command. To revert to the default setting, use the **no** form of this command.

graceful-restart t3 manual *time*
no graceful-restart t3 manual

Syntax Description

time	Time in seconds. The range is from 30 to 65535.

Command Default

60 seconds

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **graceful-restart t3 manual** command to set the T3 timer, as defined in RFC 3847.

This command requires the Enterprise Services license.

Examples

This example shows how to set the T3 timer:

```
switch# configure terminal
switch(config-router)# graceful-restart t3 manual 90
switch(config-router)#
```

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
router isis	Creates an IS-IS instance.

H Commands

hardware ejector enable

To enable the hardware when both ejectors are open, card is powered down, use the **hardware ejector enable** command.

hardware ejector enable

Syntax Description

This command has no arguments or keywords.

Command Default

Enabled

Command Modes

Global configuration mode

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to enable the hardware when both ejectors are open:

```
switch# configure terminal
switch(config)# hardware ejector enable
```

Related Commands

Command	Description
show hardware forwarding dynamic-allocation	Displays information about dynamic TCAM allocation for each module.

hardware forwarding dynamic-allocation

To enable or disable dynamic TCAM block allocation in the Forwarding Information Base (FIB), use the **hardware forwarding dynamic-allocation** command.

hardware forwarding dynamic-allocation {**enable** | **disable**}

Syntax Description

enable	Enables dynamic TCAM allocation.
disable	Disables dynamic TCAM allocation.

Command Default

Enabled

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	This command was introduced.
5.0(x)	This command was deprecated.

Usage Guidelines

As of Cisco NX-OS Release 5.0(x), dynamic TCAM allocation is enabled by default and cannot be disabled.

Use the **hardware forwarding dynamic-allocation enable** command to reallocate unused blocks in the FIB.

Use the **hardware forwarding dynamic-allocation disable** command to disable the dynamic TCAM allocation. This command returns the TCAM to the default allocation if there are no routes in the reallocated blocks.

This command does not require a license.

Examples

This example shows how to enable dynamic TCAM allocation:

```
switch# configure terminal
switch(config)# hardware forwarding dynamic-allocation enable
```

Related Commands

Command	Description
show hardware forwarding dynamic-allocation	Displays information about dynamic TCAM allocation for each module.

hardware forwarding l3 resource route non-deterministic

To expand the number of routes available on the Cisco NX-OS device, use the **hardware forwarding l3 resource route non-deterministic** command. To set the revert to the default settings, use the **no** form of the command.

hardware forwarding l3 resource route non-deterministic
no hardware forwarding l3 resource route non-deterministic

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

We recommend that you use the **hardware forwarding l3 resource route non-deterministic** command only under the advisement of Cisco.

This command does not require a license.

Examples

This example shows how to expand the number of routes available on the Cisco NX-OS device:

```
switch# configure terminal
switch(config)# hardware forwarding l3 resource route non-deterministic
```

This example shows how to remove the route expansion on the Cisco NX-OS device:

```
switch# configure terminal
switch(config)# no hardware forwarding l3 resource route non-deterministic
```

Related Commands

Command	Description
hardware forwarding dynamic-allocation	Enable or disable dynamic TCAM block allocation in the Forwarding Information Base (FIB).

hardware ip glean throttle

To enable Address Resolution Protocol (ARP) throttling, use the **hardware ip glean throttle** command. To return to the default setting, use the **no** form of this command.

hardware ip glean throttle
no hardware ip glean throttle

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modification
5.1(1)	This command was introduced.
4.2(8)	This command was introduced.

Usage Guidelines

Note We recommend that you configure the IP glean throttle feature by using the **hardware ip glean throttle** command to filter the unnecessary glean packets that are sent to the supervisor for ARP resolution for the next hops that are not reachable or do not exist. IP glean throttling boosts software performance and helps to manage traffic more efficiently.

This command does not require a license.

Examples

This example shows how to enable ARP throttling:

```
switch# configure terminal
switch(config)# hardware ip glean throttle
switch(config)#
```

Related Commands

Command	Description
show hardware proxy layer-3 detail	Displays Layer-3 proxy detail information.

hardware ip glean throttle maximum

To limit the maximum number of drop adjacencies that will be installed in the Forwarding Information Base (FIB), use the **hardware ip glean throttle maximum** command. If **no** form is used, default limits will be applied.

hardware ip glean throttle maximum *count*
no hardware ip glean throttle maximum *count*

Syntax Description

count	Maximum count. The range is from 0 to 2147483647.

Command Default

The default value for count is 1000. The minimum value is 0 and the maximum value is 32767 entries

Command Modes

Global configuration

Command History

Release	Modification
5.1(1)	This command was introduced.
4.2(8)	This command was introduced.

Usage Guidelines

If the maximum number of entries are exceeded, the packets for which ARP is not resolved continue to be processed in the software instead of getting dropped in the hardware.

This command does not require a license.

Examples

This example shows how to limit the maximum number of drop adjacencies that are installed in the FIB:

```
switch# configure terminal
switch(config)# hardware ip glean throttle maximum 2134
switch(config)#
```

Related Commands

Command	Description
show hardware proxy layer-3 detail	Displays Layer-3 proxy detail information.

hardware ip glean throttle syslog

To generate a syslog if the number of packets that get dropped for a specific flow exceeds the configured packet count, use the **hardware ip glean throttle syslog** command. To return to the default setting, use the **no** form of this command.

hardware ip glean throttle syslog *pkt-count*
no hardware ip glean throttle syslog *pkt-count*

Syntax Description

pkt-count	Packet count. The range is from 0 to 2147483647.

Command Default

The default value for count is 10000. The minimum value is 0 and the maximum value is 64 k (65535) packets

Command Modes

Global configuration

Command History

Release	Modification
5.1(1)	This command was introduced.
4.2(8)	This command was introduced.

Usage Guidelines

After the timeout period is exceeded, the drop adjacencies are removed from the FIB.

This command does not require a license.

Note The Adjmgr generates a syslog for the configured packet count that will not be accurate to the glean packets dropped hit in FIB. The drop statistics collected from the FIB in S/w (Adjmgr) occurs every two minutes. The Adjmgr generates a syslog only after it receives the stats from the FIB every two minutes only for the adjacencies where the drop count exceeds the configured packet count.

Examples

This example shows how to generate a syslog if the number of packets that get dropped for a specific flow exceed the configured packet count:

```
switch# configure terminal
switch(config)# hardware ip glean throttle syslog 1030
switch(config)#
```

Related Commands

Command	Description
show hardware proxy layer-3 detail	Displays Layer-3 proxy detail information.

hardware ip glean throttle timeout

To configure a timeout for the installed drop adjacencies to remain in the Forwarding Information Base (FIB), use the **hardware ip glean throttle timeout** command. To return to the default setting, use the **no** form of this command.

hardware ip glean throttle timeout *timeout-in-sec*
no hardware ip glean throttle timeout *timeout-in-sec*

Syntax Description

timeout-in-sec	Timeout value in seconds. The range is from 300 to 1800.

Command Default

300 seconds

Command Modes

Global configuration

Command History

Release	Modification
5.1(1)	This command was introduced.
4.2(8)	This command was introduced.

Usage Guidelines

After the timeout period is exceeded, the drop adjacencies are removed from the FIB.

This command does not require a license.

Examples

This example shows how to limit the maximum number of drop adjacencies that are installed in the FIB:

```
switch# configure terminal
switch(config)# hardware ip glean throttle timeout 300
switch(config)#
```

Related Commands

Command	Description
show hardware proxy layer-3 detail	Displays Layer-3 proxy detail information.

hardware ip verify

To configure IP packet verification, use the **hardware ip verify** command. To disable IP packet verification, use the **no**form of this command.

hardware ip verify {**checksum** | **fragment** | **protocol** | **tcp tiny-frag** | **version**}
no hardware ip verify {**checksum** | **fragment**}

Syntax Description

checksum	Drops IPv4 or IPv6 packets if the checksum is invalid.
fragment	Drops IPv4 or IPv6 packets if the packet fragment has a nonzero offset and the DF bit is active.
protocol	Drops IPv4 or IPv6 packets if the packet fragment has an invalid IP protocol number.
tcp tiny-frag	Drops IPv4 packets if the IP fragment offset is 1, or if the IP fragment offset is 0 and the IP payload length is less than 16.
version	Drops IPv4 packets if the Ethertype is not set to 4 (IPv4).

Command Default

All address tests disabled (since Cisco NX-OS Release 5.1(3)).

Command Modes

Global configuration

Command History

Release	Modification
4.1(3)	This command was introduced.
4.2(2)	Added **protocol** keyword.

Usage Guidelines

Use the **hardware ip verify** command to configure packet verification tests on IPv4 and IPv6 packets based on checksum or fragments.

This command is not supported in F Series modules.

This command replaces the **platform ip verify** command.

This command does not require a license.

Examples

This example shows how to drop fragmented IPv4 or IPv6 packets:

```
switch# configure terminal
switch(config)# hardware ip verify fragment
```

Related Commands

Command	Description
hardware ip verify address	Configures IPv4 and IPv6 packet verification checks based on addresses.
hardware ip verify length	Configures IPv4 packet verification checks based on length.

Command	Description
hardware ipv6 verify	Configures IPv6 packet verification.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

hardware ip verify address

To enable packet verification tests on IP addresses, use the **hardware ip verify address** command. To disable packet verification tests, use the **no**form of this command.

hardware ip verify address {**destination zero** | **identical** | **reserved** | **source** {**broadcast** | **multicast**}}
no hardware ip verify address {**destination zero** | **identical** | **reserved** | **source** {**broadcast** | **multicast**}}

Syntax Description

destination zero	Drops IP packets if the destination IPv4 address is 0.0.0.0 or if the IPv6 address is ::.
identical	Drops IP packets if the source IPv4 or IPv6 address is identical to the destination IPv4 or IPv6 address.
reserved	Drops IP packets if the IPv4 address is in the 127.x.x.x range or if the IPv6 address is in the ::1 range.
source	Drops IP packets based on the IP source address.
broadcast	Drops IP packets if the IP source address is 255.255.255.255.
multicast	Drops IP packets if the IPv4 source address is in the 224.x.x.x range or if the IPv6 source address is in the FF00::/8 range.

Command Default

All values are disabled (since Cisco NX-OS Release 5.1(3)).

Command Modes

Global configuration

Command History

Release	Modification
4.1(3)	This command was introduced.

Usage Guidelines

Use the **hardware ip verify address** command to configure packet verification tests on IPv4 and IPv6 packets based on addresses.

This command replaces the **platform ip verify address** command.

Prior to Cisco NX-OS Release 5.1(3), for Fabric Extender (FEX), you must manually disable the hardware ip verify address reserved option.

In Cisco NX-OS Release 5.1(3), you must disable the hardware ip verify address identical option before enabling the Multiprotocol Label Switching (MPLS) feature.

This command is not supported in F-Series modules.

This command does not require a license.

Examples

This example shows how to drop broadcast IPv4 packets:

```
switch# configure terminal
switch(config)# hardware ip verify address source broadcast
```

Related Commands

Command	Description
hardware ip verify	Configures IPv4 and IPv6 packet verification checks based on checksum or fragments.
hardware ip verify length	Configures IPv4 packet verification checks based on length.
hardware ipv6 verify	Configures IPv6 packet verification.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

hardware ip verify length

To configure IPv4 packet verification tests based on packet length, use the **hardware ip verify length** command. To disable the tests, use the **no**form of this command.

hardware ip verify length {**consistent** | **maximum** {**max-frag** | **max-tcp** | **udp**} | **minimum**}
no hardware ip verify length {**consistent** | **maximum** {**max-frag** | **max-tcp** | **udp**} | **minimum**}

Syntax Description

consistent	Drops IPv4 packets where the Ethernet frame size is greater than or equal to the IP packet length plus the Ethernet header.
maximum	Drops IP packets if the Ethernet frame length is more than the IP packet length.
max-frag	Drops IP packets if the maximum fragment offset is greater than 65536.
max-tcp	Drops IP packets if the TCP length is greater than the IP payload length.
udp	Drops IP packets if the IP payload length is less than the UDP packet length.
minimum	Drops IP packets if the Ethernet frame length is less than the IP packet length plus four octets (the CRC length).

Command Default

All address tests are enabled.

Command Modes

Global configuration

Command History

Release	Modification
4.1(3)	This command was introduced.

Usage Guidelines

Use the **hardware ip verify length** command to configure packet verification tests on IPv4 and IPv6 packets based on packet length.

This command replaces the **platform ip verify length** command.

This command is not supported in F Series modules.

This command does not require a license.

Examples

This example shows how to drop minimum-length IPv4 packets:

```
switch# configure terminal
switch(config)# hardware ip verify length minimum
```

Related Commands

Command	Description
hardware ip verify	Configures IPv4 packet verification checks based on checksum or fragments.

Command	Description
hardware ip verify address	Configures IPv4 and IPv6 packet verification checks based on addresses.
hardware ipv6 verify	Configures IPv6 packet verification.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

hardware ipv6 verify

To configure IPv6 packet verification tests, use the **hardware ipv6 verify** command. To disable the tests, use the **no**form of this command.

hardware ipv6 verify length {**consistent** | **maximum** {**max-frag** | **max-tcp** | **udp**} | **tcp tiny-frag** | **version**}
no hardware ip verify {**checksum** | **fragment**}

Syntax Description

length	Drops IPv6 packets based on length.
consistent	Drops IPv6 packets where the Ethernet frame size is greater than or equal to the IPv6 packet length plus the Ethernet header.
maximum	Drops IP packets if the Ethernet frame length is more than the IP packet length.
max-frag	Drops IP packets if the maximum fragment offset is greater than 65536.
max-tcp	Drops IP packets if the TCP length is greater than the IP payload length.
udp	Drops IP packets if the IP payload length is less than the UDP packet length.
tcp tiny-frag	Drops IPv6 packets if the IP fragment offset is 1, or if the IPv6 fragment offset is 0 and the IPv6 payload length is less than 16.
version	Drops IPv6packets if the Ethertype is not set to 6 (IPv6).

Command Default

All address tests are enabled.

Command Modes

Global configuration

Command History

Release	Modification
4.1(3)	This command was introduced.

Usage Guidelines

Use the **hardware ipv6 verify** command to configure packet verification tests on IPv6 packets.

This command replaces the **platform ipv6 verify** command.

This command does not require a license.

Examples

This example shows how to drop all IPv4 packets:

```
switch# configure terminal
switch(config)# hardware ipv6 verify version
```

Related Commands

Command	Description
hardware ip verify address	Configures IPv4 and IPv6 packet verification checks based on addresses.
hardware ip verify length	Configures IPv4 packet verification checks based on length.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

hardware proxy layer-3 forwarding

To configure hardware proxy layer 3 forwarding information, use the **hardware proxy layer-3 forwarding** command. To set the default value, use the **no** form of the command.

hardware proxy layer-3 forwarding {**exclude**|**use**} **{{none}** {**interface ethernet** *slot/port*|**module** *slot-number*} [**module-type f1**]
no hardware proxy layer-3 forwarding

Syntax Description

use	Specifies members.
exclude	Specifies all available members to exclude.
none	Specifies no modules or interface.
module	Specifies modules.
slot-number	Slot number. The range is from 1 to 18.
interface	Specifies interfaces.
slot/port	Slot or port number. The range is from 1 to 253.
module-type f1	(Optional) Specifies type of modules to perform proxyl ayer 3 forwarding for hardware proxy layer 3 forwarding exclude interface ethernet F1 modules.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
5.1(1)	This command was introduced.

Usage Guidelines

The N7K-F132-15 module only runs Layer 2 switching. So, when you have both this module and an M Series module in one Nexus 7000 Series chassis and you are performing Layer 3 procedures, the system uses proxy routing.

This command does not require a license.

Examples

This example shows how to configure hardware proxy forwarding information:

```
switch# configure terminal
switch(config)# hardware proxy layer-3 forwarding exclude interface ethernet 2/1-16, ethernet
 3/1, ethernet 4/1-2
switch(config)#
```

Related Commands

Command	Description
show hardware proxy layer-3 detail	Displays detail information on the proxylayer 3 functionality.

hello-interval (OSPF virtual link)

To specify the interval between hello packets that Cisco NX-OS sends on an Open Shortest Path First (OSPF) virtual link, use the **hello-interval** command. To return to the default, use the **no**form of this command.

hello-interval *seconds*
no hello-interval

Syntax Description

seconds	Hello interval (in seconds). The value must be the same for all nodes on a specific virtual link. The range is from 1 to 65535.

Command Default

10 seconds

Command Modes

Virtual link configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **hello-interval** command in virtual link configuration mode to set the hello interval for OSPF across a virtual link. A shorter hello interval detects topological changes faster but causes more routing traffic. The hello interval must be the same for all devices on a virtual link.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the hello interval to 15 seconds:

```
switch# configure terminal
switch(config)# router ospf 202
switch(config-router)# ip ospf area 99 virtual-link 192.0.2.4
switch(config-router-vlink)# hello-interval 15
```

Related Commands

Command	Description
dead-interval (virtual link)	Sets the time period to declare a neighbor as down if the local device receives no hello packets.

hello-interval (OSPFv3 virtual link)

To specify the interval between hello packets that Cisco NX-OS sends on an Open Shortest Path First version 3 (OSPFv3) virtual link, use the **hello-interval** command. To return to the default, use the **no**form of this command.

hello-interval *seconds*
no hello-interval

Syntax Description

seconds	Hello interval (in seconds). The value must be the same for all nodes on a specific virtual link. The range is from 1 to 65535.

Command Default

10 seconds

Command Modes

Virtual link configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **hello-interval** command in virtual link configuration mode to set the hello interval for OSPFv3 across a virtual link. A shorter hello interval detects topological changes faster but causes more routing traffic. The hello interval must be the same for all devices on a virtual link.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the hello interval to 15 seconds:

```
switch# configure terminal
switch(config)# router ospfv3 202
switch(config-router)# ipv6 ospfv3 area 99 virtual-link 192.0.2.4
switch(config-router-vlink)# hello-interval 15
```

Related Commands

Command	Description
dead-interval (OSPFv3 virtual link)	Sets the time period to declare a neighbor as down if the local device receives no hello packets.

hostname dynamic

To enable the exchange of the dynamic host name for IS-IS, use the **hostname dynamic** configuration mode command. To disable the exchange of the dynamic host name for IS-IS, use the **no** form of this com mand

hostname dynamic
no hostname dynamic

Syntax Description

This command has no arguments or keywords.

Command Default

Dynamic hostname is disabled by default.

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The **hostname dynamic** command allows you to enable the IS-IS routers to flood their host name to system ID mapping information across the IS-IS network.

This command requires the Enterprise Services license.

Examples

This example shows how to enable the exchange of the dynamic host name for IS-IS:

```
switch# configure terminal
switch(config-router)# hostname dynamic
switch(config-router)#
```

This example shows how to disable the exchange of the dynamic host name for IS-IS:

```
switch# configure terminal
switch(config-router)# no hostname dynamic
switch(config-router)#
```

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
router isis	Enables IS-IS.
show isis hostname	Displays the IS-IS dynamic host name exchange information.

hsrp

To enter Hot Standby Router Protocol (HSRP) configuration mode and create an HSRP group, use the **hsrp** command. To disable HSRP, use the **no** form of this command.

hsrp *group-number* [{**ipv4** | **ipv6**}]
no hsrp *group-number* [{**ipv4** | **ipv6**}]

Syntax Description

group-number	Number of HSRP groups that can be configured on a Gigabit Ethernet port, including the main interfaces and subinterfaces. For HSRP version 1, the range is from 0 to 255. For HSRP version 2, the range is from 0 to 4096. The default value is 0.
ipv4	(Optional) Sets the HSRP group for IPv4.
ipv6	(Optional) Sets the HSRP group for IPv6.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Added the IPv4 keyword.
5.0(2)	Added the IPv6 keyword.
5.1(1)	Added an example on how to configure an IPv6 HSRP group.

Usage Guidelines

You must globally enable HSRP before you can configure any HSRP options or create an HSRP group.

The switch creates an IPv4 HSRP group if the **ipv6** keyword is not specified.

The keyword **ipv4** is optional if only IPv4 with the group ID exists on the interface. If both the IPv4 and IPv6 groups exist on the same interface, you must specify the address type as IPv4 or IPv6.

To configure IPv6 HRSP groups, you must configure HSRP version 2 on the interface.

The IPv4 and IPv6 groups can share the same group ID within an interface.

This command does not require a license.

Examples

This example shows how to create and activate an HSRP group:

```
switch# configure terminal
switch(config)# interface ethernet 0
switch(config-if)# ip address 172.16.65. 255.255.255.0
switch(config-if)# hsrp 1
switch(config-if-hsrp)#
```

This example shows how to create and activate an IPv6 HSRP group:

```
switch# configure terminal
switch(config)# interface ethernet 5/2
switch(config)# ipv6 address 2001:0DB8:0001:0001:/64
switch(config-if-hsrp)# hsrp version 2
switch(config-if)# hsrp 10 ipv6
switch(config-if-hsrp)#
```

Related Commands

Command	Description
feature hsrp	Enables HSRP configuration.
show hsrp	Displays HSRP information.
ip address	Creates a virtual IP address for the HSRP group. The IP address must be in the same subnet as the interface IP address

hsrp ipv6

To create an Hot Standby Redundancy Protocol (HSRP) group and enter HSRP configuration mode, use the **hsrp** command. To remove the HSRP group configuration, use the **no** form of this command.

hsrp *group-number* [**ipv6**]
no hsrp *group-number* [**ipv6**]

Syntax Description

group-number	Group number. The range is from 0 to 4095.
ipv6	(Optional) Specifies the IPv6 address.

Command Default

None

Command Modes

Interface configuration mode

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 create an HSRP group and enter HSRP configuration mode:

```
switch# configure terminal
switch(config)# interface ethernet 3/5
switch(config-if)# ip address 11.0.0.1/24
switch(config-if)# hsrp version 2
switch(config-if)# hsrp 10
switch(config-if-hsrp)#
```

This example shows how to remove the HSRP group configuration:

```
switch(config-if)# no hsrp 10
```

Related Commands

Command	Description
hsrp version 2	Configures the HSRP version 2.

hsrp mac-refresh

To configure the MAC refresh interval for the Hot Standby Redundancy Protocol (HSRP) slave group, use the hsrp mac-refresh command.

hsrp mac-refresh *seconds*

Syntax Description

seconds	Interval in seconds. The range is from 0 to 10000.

Command Default

60 seconds

Command Modes

Interface configuration mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

You can use the **hsrp mac-refresh** command to minimize the number of hello messages that are sent out and reduce HSRP protocol overheads and CPU utilization when multiple subinterfaces are configured.

The **hsrp mac-refresh** command is not available for individual subinterfaces. It applies to all groups on all subinterfaces.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the MAC refresh interval for an HSRP slave group:

```
switch# configure terminal
switch(config)# interface ethernet 3/5
switch(config-if)# ip address 11.0.0.1/24
switch(config-if)# hsrp version 2
switch(config-if)# hsrp mac-refresh 90
switch(config-if)#
```

Related Commands

Command	Description
follow	Configures a regular HSRP group as a slave group.

hsrp timers extended-hold

To enabled extended hold timers for the Hot Standby Router Protocol (HSRP), use the **hsrp timers extended-hold** command. To revert to default, use the **no** form of this command.

hsrp timers extended-hold [*timer*]
no hsrp timers extended-hold

Syntax Description

timer	(Optional) Extended hold time, in seconds. The range is from 10 to 255.

Command Default

10 seconds

Command Modes

Global configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **hsrp timers extended-hold** command to configure extended Non-stop Forwarding (NSF) support for HSRP.

Note You must configure extended hold timers on all HSRP routers if you configure non-default extended hold timers. You can configure different extended holdtimer values on each HSRP routers, based on the expected system switchover delays.

This command does not require a license.

Examples

This example shows how to configure the extended hold time for HSRP:

```
switch# configure terminal
switch(config)# hsrp timers extended-hold 30
```

Related Commands

Command	Description
feature hsrp	Enables the HSRP feature.
show hsrp	Displays HSRP information.

hsrp version 2

To configure the Hot Standby Redundancy Protocol (HSRP) version 2, use the **hsrp version 2** command.

hsrp version 2

Syntax Description

This command has no arguments or keywords.

Command Default

Version 1

Command Modes

Interface configuration mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

Because the multiple group optimization (MGO) supports only HSRP version 2, you must set the HSRP version to version 2.

This command requires the Enterprise Services license.

Examples

This example shows how to configures the HSRP version:

```
switch# configure terminal
switch(config)# interface ethernet 3/5
switch(config-if)# ip address 11.0.0.1/24
switch(config-if)# hsrp version 2
switch(config-if)#
```

Related Commands

Command	Description
hsrp	Configures the HSRP version.

I Commands

inject-map

To specify the inject-map and exist-map routes for conditional route injection, use the **inject-map** command.

inject-map *inject-map-name* **exist-map** *exist-map-name* [**copy-attributes**]

Syntax Description

inject-map-name	Inject map route map. An inject map defines the prefixes that are created and installed into the local Border Gateway Protocol (BGP) table.
exist-map	Specifies the prefixes that BGP tracks.
exist-map-name	Exist map route name
copy-attributes	(Optional) Specifies that the injected route inherits the attributes of the aggregate route.

Command Default

None

Command Modes

config-router-neighbor-af mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

The BGP conditional route injection option is available only for IPv4 and IPv6 unicast address families in all VRF instances.

This command requires the Enterprise Services license.

Examples

This example shows how to specify the inject-map and exist-map routes for conditional route injection:

```
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)#
```

Related Commands

Command	Description
ip prefix-list	Configures a prefix list.
router-map	Configures a route map and enters route-map configuration mode.

ip (GLBP)

To activate the Gateway Load Balancing Protocol (GLBP) for a group, use the **ip** command. To disable GLBP in the group, use the **no** form of this command.

ip [*ip-address* [**secondary**]]
no ip [*ip-address* [**secondary**]]

Syntax Description

ip-address	(Optional) Virtual IP address for the GLBP group. The IP address must be in the same subnet as the interface IP address.
secondary	(Optional) Indicates that the IP address is a secondary GLBP virtual address.

Command Default

Disabled

Command Modes

GLBP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip** command to activate GLBP on the configured interface. If you configure a virtual IP address, that address is the designated virtual IP address for the entire GLBP group. If you do not configure a virtual IP address, the gateway learns the virtual IP address from another gateway in the same GLBP group. To allow GLBP to elect an active virtual gateway (AVG), you must configure at least one gateway on the LAN with a virtual IP address.

Configuring the virtual IP address on the AVG always overrides a virtual IP address that is in use.

When you configure the **ip** command on an interface, the handling of proxy Address Resolution Protocol (ARP) requests changes (unless proxy ARP was disabled). Hosts send ARP requests to map an IP address to a MAC address. The GLBP gateway intercepts the ARP requests and replies to the ARP requests on behalf of the connected nodes. If a forwarder in the GLBP group is active, proxy ARP requests are answered using the MAC address of the first active forwarder in the group. If no forwarder is active, proxy ARP responses are suppressed.

Note You must configure all GLBP options before you use the **ip** command to assign a virtual IP address and activate the GLBP group.

This command does not require a license.

Examples

This example shows how to activate GLBP for group 10 on Ethernet interface 1/1. The virtual IP address used by the GLBP group is set to 192.0.2.10.

```
switch# configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# ip address 192.0.2.32 255.255.255.0
```

```
switch(config-if)# glbp 10
switch(config-glbp)# ip 192.0.2.10
```

This example shows how to activate GLBP for group 10 on Ethernet interface 2/1. The virtual IP address used by the GLBP group will be learned from another gateway configured to be in the same GLBP group.

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# glbp 10
switch(config-glbp)# ip
```

Related Commands

Command	Description
glbp	Enters GLBP configuration mode and creates a GLBP group.
show glbp	Displays GLBP information.

ip (HSRP)

To assign a virtual address to an HSRP group, use the **ip** command. To disable HSRP in the group, use the **no** form of this command.

ip [{**autoconfig** | *ip-address* [**secondary**]}]
no ip [{**autoconfig** | *ip-address* [**secondary**]}]

Syntax Description

autoconfig	(Optional) Generates a link-local address from the link-local prefix and a modified EUI-64 format Interface Identifier, where the EUI-64 Interface Identifier is created from the relevant HSRP virtual MAC address. You cannot configure this option if there are global unicast virtual IPv6 addresses configured.
ip-address	(Optional) Virtual IP address for the virtual router (HSRP group). The IP address must be in the same subnet as the interface IP address. You must configure the virtual IP address for at least one of the routers in the HSRP group. Other routers in the group will pick up this address. The IP address can be an IPv4 or an IPv6 address.
secondary	(Optional) Indicates that the IPv4 address is a secondary HSRP virtual address. HSRP IPv6 groups do no have secondary addresses.

Command Default

Disabled

Command Modes

HSRP configuration

Command History

Release	Modification
5.0(2)	Added IPv6 support and the **autoconfig** keyword.
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip** command to activate HSRP on the configured interface. If you configure a virtual IP address, that address is the designated virtual IP address for the entire HSRP group. For IPv4 groups, if you do not configure a virtual IP address, the gateway learns the virtual IP address from another gateway in the same HSRP group. To allow HSRP to elect an active group, you must configure at least one gateway on the LAN with a virtual IP address. For IPv6 groups, you can generate the virtual IP address using the **autoconfig** keyword.

If a configured IPv6 address as a link-local address, there are no HSRP ipv6 secondary addresses.

Note You must configure all HSRP options before you use the **ip** command to assign a virtual IP address and activate the HSRP group. This helps you to avoid authentication error messages and unexpected state changes that can occur in other routers when a group is enabled first and then there is a delay before the configuration is created. We recommend that you always specify an IP address

This command does not require a license.

Examples

This example shows how to activate HSRP for group 10 on Ethernet interface 1/1. The virtual IP address used by the HSRP group is set to 192.0.2.10.

```
switch# configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# ip address 192.0.2.32 255.255.255.0
switch(config-if)# hsrp 10
switch(config-hsrp)# ip 192.0.2.10
```

This example shows how to activate HSRP for group 10 on Ethernet interface 2/1. The virtual IP address used by the HSRP group will be learned from another gateway configured to be in the same HSRP group.

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# hsrp 10
switch(config-hsrp)# ip
```

This example shows how to activate HSRP for group 2 on Ethernet interface 1/1 and creates a secondary IP address on the interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# ip address 20.20.20.1 255.255.255.0 secondary
switch(config-if)# ip address 10.10.10.1 255.255.255.0
switch(config-if)# hsrp 2
switch(config-if-hsrp)# ip 10.10.10.2
switch(config-if-hsrp)# ip 20.20.20.2 secondary
```

Related Commands

Command	Description
feature hsrp	Enables the HSRP configuration.
show hsrp	Displays HSRP information.

ip adjacency notify

To specify the notify interval for the IP adjacency manager, use the **ip adjacency notify** command. To remove the notify interval, use the **no** form of this command.

ip adjacency notify interval *interval*
no ip adjacency notify interval *interval*

Syntax Description

interval *interval*	Specifies the notify interval for the adjacency manager. The default is 500 milliseconds.
ipv6	Specifies the IPv6 address family.

Command Default

The notify interval is 500 milliseconds.

Command Modes

Global

Command History

Release	Modification
6.2(8)	This command was introduced.

Usage Guidelines

To get optimal BGP PIC convergence, the *interval* value should be set to 100 milliseconds.

This command does not require a license.

Examples

This example shows how to specify the notify interval as 100 milliseconds:

```
switch(config)# ip adjacency notify interval 100
```

Related Commands

Command	Description
additional-paths	Configure the capability of sending and receiving additional paths to and from the BGP peers.
address family (BGP)	Enters the address family configuration mode for BGP.

ip arp

To configure a static Address Resolution Protocol (ARP) entry, use the **ip arp** command. To remove a static ARP entry, use the **no** form of this command.

ip arp *ip-address mac-address*
no ip arp *ip-address*

Syntax Description

ip-address	IPv4 address, in A.B.C.D format.
mac-address	MAC address in one of the following formats: • E.E.E • EE-EE-EE-EE-EE-EE • EE:EE:EE:EE:EE:EE • EEEE.EEEE.EEEE

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.2(1)	Support added for multicast static MAC addresses.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure a static ARP entry on interface Ethernet 2/1:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip arp 192.0.2.1 0150.5a03.efab
```

Related Commands

Command	Description
show ip arp	Displays ARP entries.

ip arp cache limit

To configure the maximum number of Address Resolution Protocol (ARP) entries in the neighbor adjacency table, use the **ip arp cache limit** command. To delete the ARP entries configuration, use the **no** form of this command.

ip arp cache limit *max-arp-entries* [**syslog** *syslogs-per-second*]
no ip arp cache limit *max-arp-entries* [**syslog** *syslogs-per-second*]

Syntax Description

max-arp-entries	Maximum ARP entries. The range is from 1 to 409600.
syslog	(Optional) Specifies syslog messages. The range is from 1 to 1000.
syslogs-per-second	Syslogs per second.

Command Default

1

Command Modes

Global configuration mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

If you do not configure a limit, system logs appear on the console when you try to add an adjacency after reaching the default limit. If you configure a limit for IPv4 ARP entries, system logs appear when you try to add an adjacency after reaching the configured limit.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the maximum number of ARP entries in the neighbor adjacency table:

```
switch# configure terminal
switch(config)# ip arp cache limit 4000 syslog 4
switch(config)#
```

This example shows how to delete the ARP cache limit configuration:

```
switch# configure terminal
switch(config)# no ip arp cache limit 4000 syslog 4
switch(config)#
```

Related Commands

Command	Description
show ip adjacency summary	Displays the global limit of the neighbor adjacency table and a summary of throttle adjacencies.

ip arp fast-path

To enable glean optimization, use the **ip arp fast-path** command. To disable enable glean optimization, use the **no** form of this command.

ip arp fast-path
no ip arp fast-path

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration mode

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 enable glean optimization:

```
switch# configure terminal
switch(config)# ip arp fast-path
switch(config)#
```

This example shows how to disable glean optimization:

```
switch# configure terminal
switch(config)# no ip arp fast-path
switch(config)#
```

ip arp gratuitous

To enable gratuitous Address Resolution Protocol (ARP), use the **ip arp gratuitous** command. To disable gratuitous ARP, use the **no** form of this command.

ip arp gratuitous {**hsrp duplicate** | **request** | **update**}
no ip arp gratuitous {**hsrp duplicate** | **request** | **update**}

Syntax Description

hsrp duplicate	Specifies duplicate HSRP address detection.
request	Enables sending gratuitous ARP requests when a duplicate address is detected.
update	Enables ARP cache updates for gratuitous ARP.

Command Default

Enabled

Command Modes

Interface configuration

Command History

Release	Modification
4.2(8)	Added keywords **hsrp duplicate** to the syntax description.
4.0(3)	This command was introduced.

Usage Guidelines

This command is typically useful in case of Data Center interconnection (DCI) scenario between multiple datacenters.

In a DCI scenario, typically it is desirable to have active /standby HSRP pair of routers on all sites so that each site has an active forwarder from the data plane perspective.To achieve this, a PACL denying the HSRP hello packets could be applied on the DCI facing links on each of the sites. This way HSRP hellos are dropped on the DCI links, and each site has a local HSRP active/standby router.

This command helps suppress duplicate IP detection when hosts do an ARP for HSRP active or when HSRP active sends a GARP for its own virtual IP.

This command does not require a license.

Examples

This example shows how to enable HSRP duplicate address detection:

```
switch# configure terminal
switch(config)# interface vlan 10
switch(config-if)# no ip arp gratuitous hsrp duplicate
switch(config-if)#
```

This example shows how to enable gratuitous ARP request on interface Ethernet 2/1:

```
switch# configure terminal
switch(config)# interface vlan 10
switch(config-if)# ip arp gratuitous request
switch(config-if)#
```

Related Commands

Command	Description
ip arp	Configures a static ARP entry.

ip as-path access-list

To configure an access-list filter for Border Gateway Protocol (BGP) autonomous system (AS) number, use the **ip as-path access-list** command. To remove the filter, use the **no** form of this command.

ip as-path access-list *name* {**deny** | **permit**} *regexp*
no ip as-path access-list *name* {**deny** | **permit**} *regexp*

Syntax Description

name	AS path access list name. The name can be any alphanumeric string up to 63 characters.
deny	Rejects packets with AS numbers that match the regexp argument.
permit	Allows packets with AS numbers that match the regexp argument.
regexp	Regular expression to match BGP AS paths. See the Cisco Nexus 7000 Series NX-OS Fundamentals Configurat http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/6_x/nx-os/fundamentals/configuration/guide/b_Cis

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip as-path access-list** command to configure an autonomous system path filter. You can apply autonomous system path filters to both inbound and outbound BGP paths. Each filter is defined by the regular expression. If the regular expression matches the representation of the autonomous system path of the route as an ASCII string, then the permit or deny condition applies. The autonomous system path should not contain the local autonomous system number.

This command does not require a license.

Examples

This example shows how to configure an AS path filter for BGP to permit AS numbers 55:33 and 20:01 and apply it to a BGP peer for inbound filtering:

```
switch# configure terminal
switch(config)# ip as-path access-list filter1 permit 55:33,20:01
switch(config) router bgp 65536:20
switch(config-router)# neighbor 192.0.2.1/16 remote-as 65536:20
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# filter-list filter1 in
```

Related Commands

Command	Description
filter-list	Assigns an AS path filter to a BGP peer.
show ip as-path access-list	Displays information about IP AS path access lists.

ip authentication key-chain eigrp

To enable authentication for the Enhanced Interior Gateway Routing Protocol (EIGRP) packets and to specify the set of keys that can be used on an interface, use the **ip authentication key-chain eigrp** command. To prevent authentication, use the **no** form of this command.

ip authentication key-chain eigrp *instance-tag name-of-chain*
no ip authentication key-chain eigrp *instance-tag name-of-chain*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
name-of-chain	Group of keys that are valid.

Command Default

No authentication is provided for EIGRP packets.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You must set the authentication mode using the **ip authentication mode eigrp** command in interface configuration mode. You must separately configure a key chain using the **key-chain** command to complete the authentication configuration for an interface.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the interface to accept and send any key that belongs to the key-chain trees:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 1/2
switch(config-if)# ip authentication key-chain eigrp 209 trees
```

Related Commands

Command	Description
ip authentication mode eigrp	Sets the authentication mode for EIGRP on an interface.
key-chain	Creates a set of keys that can be used by an authentication method.

ip authentication mode eigrp

To specify the type of authentication used in the Enhanced Interior Gateway Routing Protocol (EIGRP) packets, use the **ip authentication mode** eigrp command. To remove authentication, use the **no** form of this command.

ip authentication mode eigrp *instance-tag* **md5**
no ip authentication mode eigrp *instance-tag* **md5**

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
md5	Specifies Message Digest 5 (MD5) authentication.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to configure the interface to use MD5 authentication:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 1/2
switch(config-if)# ip authentication mode eigrp 209 md5
```

Related Commands

Command	Description
authentication mode (EIGRP)	Configures the authentication mode for EIGRP in a VRF.
ip authentication key-chain eigrp	Enables authentication for EIGRP and specifies the set of keys that can be used on an interface.
key chain	Creates a set of keys that can be used by an authentication method.

ip bandwidth eigrp

To configure the bandwidth metric on an Enhanced Interior Gateway Routing Protocol (EIGRP) interface, use the **ip bandwidth eigrp** command. To restore the default, use the **no** form of this command.

ip bandwidth eigrp *instance-tag bandwidth*
no ip bandwidth eigrp

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
bandwidth	Bandwidth value. The range is from 1 to 2,560,000,000 kilobits.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to configure EIGRP to use a bandwidth metric of 10000 in autonomous system 209:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ip
 bandwidth eigrp 209 10000
```

Related Commands

Command	Description
ip bandwidth-percent eigrp	Sets the percent of the interface bandwidth that EIGRP can use.

ip bandwidth-percent eigrp

To configure the percentage of bandwidth that may be used by the Enhanced Interior Gateway Routing Protocol (EIGRP) on an interface, use the **ip bandwidth-percent eigrp** command. To restore the default, use the **no** form of this command.

ip bandwidth-percent eigrp *instance-tag percent*
no ip bandwidth-percent eigrp

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
percent	Percentage of bandwidth that EIGRP may use.

Command Default

percent: 50

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

EIGRP uses up to 50 percent of the bandwidth of a link, as defined by the **ip bandwidth** interface configuration command. Use the **ip bandwidth-percent** command to change this default percent.

This command requires the Enterprise Services license.

Examples

This example shows how to configure EIGRP to use up to 75 percent of an interface in autonomous system 209:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ip
 bandwidth-percent eigrp 209 75
```

Related Commands

Command	Description
ip bandwidth eigrp	Sets the EIGRP bandwidth value for an interface.

ip community-list

To create a community list entry, use the **ip community-list** command. To remove the entry, use the **no** form of this command.

ip community-list standard *list-name* {**deny** | **permit**} {*aa*:*nn* | **internet** | **local-AS** | **no-advertise** | **no-export**}
no ip community-list standard *list-name*
ip community-list expanded *list-name* {**deny** | **permit**} *regexp*
no ip community-list expanded *list-name*

Syntax Description

standard *list-name*	Configures a named standard community list.
permit	Permits access for a matching condition.
deny	Denies access for a matching condition.
aa:*nn*	(Optional) Autonomous system number and network number entered in the 4-byte new community form 65535 can be entered each 2-byte number. A single community can be entered or multiple communities You can pick more than one of these optional community keywords.
internet	(Optional) Specifies the Internet community. Routes with this community are advertised to all peers (in You can pick more than one of these optional community keywords.
no-export	(Optional) Specifies the no-export community. Routes with this community are advertised to only peers These routes are not advertised to external peers. You can pick more than one of these optional community keywords.
local-AS	(Optional) Specifies the local-as community. Routes with community are advertised to only peers that a confederation. These routes are not advertised external peers or to other subautonomous systems within You can pick more than one of these optional community keywords.
no-advertise	(Optional) Specifies the no-advertise community. Routes with this community are not advertised to any You can pick more than one of these optional community keywords.
expanded *list-name*	Configures a named expanded community list.
regexp	Regular expression that is used to specify a pattern to match against an input string. See the Cisco Nexu details on regular expressions: http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/6_x/nx-os/fundamentals/configuration/gui **Note** Regular expressions can be used with expanded community lists only.

Command Default

Community exchange is not enabled by default.

Command Modes

Global configuration (config)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The **ip community-list** command is used to configure BGP community filtering. BGP community values are configured as a 4-byte number. The first two bytes represent the autonomous system number, and the trailing two bytes represent a user-defined network number. BGP community attribute exchange between BGP peers is enabled when the send-community command is configured for the specified neighbor. The BGP community attribute is defined in RFC 1997 and RFC 1998.

BGP community exchange is not enabled by default. Use the **send-community** command in BGP neighbor fix-family configuration mode to enable BGP community attribute exchange between BGP peers.

The Internet community is applied to all routes or prefixes by default, until any other community value is configured with this command or the **set community** command.

Once you configure a permit value to match a given set of communities, the community list defaults to an implicit deny for all other community values. Use the **internet** community to apply an implicit permit to the community list.

Standard Community Lists

Standard community lists are used to configure well-known communities and specific community numbers. You can pick more than one of the optional community keywords. A maximum of 32 communities can be configured in a standard community list. If you attempt to configure, the trailing communities that exceed the limit are not processed or saved to the running configuration file. The route-map can also match up to 32 community lists in one sequence.

Expanded Community Lists

Expanded community lists are used to filter communities using a regular expression. Regular expressions are used to configure patterns to match community attributes. The order for matching using the * or + character is longest construct first. Nested constructs are matched from the outside in. Concatenated constructs are matched beginning at the left side. If a regular expression can match two different parts of an input string, it will match the earliest part first.

Community List Processing

When multiple values are configured in the same community list statement, a logical AND condition is created. All community values must match to satisfy an AND condition. When multiple values are configured in separate community list statements, a logical OR condition is created. The first list that matches a condition is processed.

This command does not require a license.

Examples

This example shows how to configure a standard community list where the routes with this community are advertised to all peers (internal and external):

```
switch# configure terminal
switch(config)# ip community-list standard test1 permit internet
switch(config)#
```

In this example, a standard community list is configured that permits routes from:

- Network 40 in autonomous system 65534 and from network 60 in autonomous system 65412.
- Peers in the same autonomous system or from subautonomous system peers in the same confederation.

This example shows how to configure a logical AND condition; all community values must match in order for the list to be processed:

```
switch# configure terminal
switch(config)# ip community-list standard test1 permit 65534:40 65412:60 no-export
switch(config)#
```

This example shows how to configure a standard community list that will deny routes that carry communities from network 40 in autonomous system 65534 and from network 60 in autonomous system 65412. This example shows a logical AND condition; all community values must match in order for the list to be processed.

```
switch# configure terminal
switch(config)# ip community-list standard test2 deny 65534:40 65412:60
```

This example shows how to configure a named standard community list that permits all routes within the local autonomous system or permits routes from network 20 in autonomous system 40000. This example shows a logical OR condition; the first match is processed.

```
switch# configure terminal
switch(config)# ip community-list standard RED permit local-AS
switch(config)# ip community-list standard RED permit 40000:20
switch(config)#
```

In this example, an expanded community list is configured that will deny routes that carry communities from any private autonomous system:

```
switch# configure terminal
switch(config)# ip community-list expanded 500 deny _64[6-9][0-9][0-9]_|_65[0-9][0-9][0-9]_

switch(config)#
```

In this example, a named expanded community list configured that denies routes from network 1 through 99 in autonomous system 50000:

```
switch# configure terminal
switch(config)# ip community-list list expanded BLUE deny 50000:[0-9][0-9]_
switch(config)#
```

Related Commands

Command	Description
feature bgp	Enables BGP.
match community	Matches an community in a route map.
send-community	Configures BGP to propagate community attributes to BGP peers.
set community	Sets an community in a route map.

ip delay eigrp

To configure the throughput delay for the Enhanced Interior Gateway Routing Protocol (EIGRP) on an interface, use the **ip delay eigrp** command. To restore the default, use the **no** form of this command.

ip delay eigrp *instance-tag seconds* **picoseconds**
no ip delay eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
seconds	Throughput delay, in microseconds. The range is from 1 to 16777215.
picoseconds	Specifies the delay units in picoseconds.

Command Default

100 (10-microsecond units)

Command Modes

Interface configuration

Command History

Release	Modification
5.2(1)	Added the picoseconds keyword.
4.0(1)	This command was introduced.

Usage Guidelines

You configure the throughput delay on an interface in 10-microsecond units. For example, if you set the **ip delay eigrp** command to 100, the throughput delay is 1000 microseconds.

The picoseconds option is supported only supported in 64-bit mode.

This command requires the Enterprise Services license.

Examples

This example shows how to set the delay to 40 microseconds for the interface:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# interface ethernet 2/1
switch(config-if)# ip delay eigrp 1 40
```

Related Commands

Command	Description
ip hello-interval eigrp	Configures the hello interval on an interface for the EIGRP routing process that is designated by an autonomous system number.

ip directed-broadcast

To enable the translation of a directed broadcast to physical broadcasts, use the **ip directed-broadcast** command. To disable this function, use the **no** form of this command.

ip directed-broadcast [*acl-name*]
ip directed-broadcast [{*acl-name* | **hw-assist**[**drop**]}]

Syntax Description

acl-name	Access control list (ACL) name. An ACL name can be any case-sensitive, alphanumeric string up to 63 characters.
hw-assist	Enable forwarding of all IP directed broadcast traffic on an interface in the hardware.

Command Default

Disabled; all IP directed broadcasts are dropped.

Command Modes

Interface configuration

Command History

Release	Modification
8.2(1)	The keyword **hw-assist** was introduced.
4.0(1)	This command was introduced.

Usage Guidelines

An IP directed broadcast is an IP packet whose destination address is a valid broadcast address for some IP subnet, but which originates from a node that is not itself part of that destination subnet.

A device that is not directly connected to its destination subnet forwards an IP directed broadcast in the same way it would forward unicast IP packets destined to a host on that subnet. When a directed broadcast packet reaches a device that is directly connected to its destination subnet, that packet is exploded as a broadcast on the destination subnet. The destination address in the IP header of the packet is rewritten to the configured IP broadcast address for the subnet, and the packet is sent as a link-layer broadcast.

If directed broadcast is enabled for an interface, incoming IP packets whose addresses identify them as directed broadcasts intended for the subnet to which that interface is attached will be exploded as broadcasts on that subnet.

When you configure **ip directed-broadcast** *acl-name* command with the acl-name as**hw-assist** , you cannot delete this configuration after the ISSU. This is applicable to releases prior to Cisco NX-OS Release 8.2(1).

If the **no ip directed-broadcast** command has been configured for an interface, directed broadcasts destined for the subnet to which that interface is attached will be dropped, rather than being broadcast.

Note Because directed broadcasts, and particularly Internet Control Message Protocol (ICMP) directed broadcasts, have been abused by malicious persons, we recommend that security-conscious users disable the **ip directed-broadcast** command on any interface where directed broadcasts are not needed and that they use access lists to limit the number of exploded packets.

This command does not require a license.

Examples

This example shows how to enable forwarding of IP directed broadcasts on Ethernet interface 2/1:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip directed-broadcast
```

ip directed-broadcast hw-assist

To enable forwarding of all IP directed broadcast packets, use the **ip directed-broadcast** command. To disable this function, use the **no** form of this command.

ip directed-broadcast hw-assist [**drop**]
no ip directed-broadcast hw-assist [**drop**]

Syntax Description

drop	Enables dropping of all directed broadcast traffic on an interface in the hardware.

Command Default

None

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
8.2(1)	This command was introduced.

Usage Guidelines

You can use the **ip directed-broadcast hw-assist** command on an interface on which you have already used the **ip directed-broadcast** command. This will enable IP directed broadcast with hardware assist on that interface and prevent the IP directed broadcast traffic from being sent to the supervisor.

Use the **no ip directed-broadcast hw-assist** command to disable hardware forwarding of IP directed broadcast traffic and to disable dropping of all the directed broadcast traffic on a specific interface in the hardware if the **ip directed-broadcast hw-assist drop** command is used. Use the **no ip directed-broadcast hw-assist drop** command to disable dropping of all directed broadcast traffic on a specific interface in the hardware.

This command does not require a license.

Examples

This example shows how to enable hardware forwarding of IP directed broadcasts on Ethernet interface 2/1:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip directed-broadcast hw-assist
```

This example shows how to enable dropping of all directed broadcast traffic on Ethernet interface 2/1 in the hardware:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip directed-broadcast hw-assist drop
```

This example shows how to disable hardware forwarding of IP directed broadcasts on Ethernet interface 2/1 and to disable dropping of all directed broadcast traffic on Ethernet interface 2/1 in the hardware if the **ip directed-broadcast hw-assist drop** command is used:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no ip directed-broadcast hw-assist
```

This example shows how to disable dropping of all directed broadcast traffic on Ethernet interface 2/1 in the hardware if the **ip directed-broadcast hw-assist drop** command is used:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no ip directed-broadcast hw-assist drop
```

ip distribute-list eigrp

To configure a distribution list for the Enhanced Interior Gateway Routing Protocol (EIGRP) on an interface, use the **ip distribute-list eigrp** command. To restore the default, use the **no** form of this command.

ip distribute-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**}
no ip distribute-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**}

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
prefix-list *list-name*	Specifies the name of an IP prefix list to filter EIGRP routes.
route-map *map-name*	Specifies the name of a route map to filter EIGRP routes.
in	Applies the route policy to incoming routes.
out	Applies the route policy to outgoing routes.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip distribute-list eigrp** command to configure a route filter policy on an interface. You must configure the named route map or prefix list to complete this configuration.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a route map for all EIGRP routes coming into the interface:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ip distribute-list eigrp 209 route-map InputFilter in
```

Related Commands

Command	Description
prefix-list	Configures a prefix list.
route-map	Configures a route map.

ip domain-list

To configure the IP domain list, use the **ip domain-list** command. To disable the IP domain list, use the **no** form of the command.

ip domain-list *domain-name* [**use-vrf** *name*]
no ip domain-list *domain-name* [**use-vrf** *name*]

Syntax Description

domain-list	Specifies the domain name for the IP domain list. The name can be any case-sensitive, alphanumeric string up to 63 characters.
use-vrf *name*	(Optional) Specifies the virtual routing and forwarding (VRF) to use to resolve the domain name for the IP domain list. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Global configurationVRF context configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip domain-list** command to configure additional domain names for the device. Use the vrf context command to enter the VRF context mode to configure additional domain names for a particular VRF.

This command does not require a license.

Examples

This example shows how to configure the IP domain list for the default VRF:

```
switch# configure terminal
switch(config)# ip domain-list Mysite.com
```

This example shows how to configure the IP domain list for the management VRF:

```
switch# configure terminal
switch(config)# vrf context management
switch(config-vrf)# ip domain-list Mysite.com
```

This example configures the IP domain list for the default VRF to use the management VRF as a backup if the domain name cannot be resolved through the default VRF.

```
switch# configure terminal
switch(config)# ip domain-list Mysite.com use-vrf management
```

Related Commands

Command	Description
show hosts	Displays information about the IP domain name configuration.

ip domain-lookup

To enable the Domain Name Server (DNS) lookup feature, use the **ip domain-lookup** command. Use the **no** form of this command to disable this feature.

ip domain-lookup
no ip domain-lookup

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Global configuration.

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip domain-lookup** command to enable DNS.

This command does not require a license.

Examples

This example shows how to configure a DNS server lookup feature:

```
switch# configure terminal
switch(config)# ip domain-lookup
```

Related Commands

Command	Description
show hosts	Displays information about the DNS.

ip domain-name

To configure a domain name, use the **ip domain-name** command. To delete a domain name, use the **no** form of the command.

ip domain-name *domain-name* [**use-vrf** *name*]
no ip domain-name *domain-name* [**use-vrf** *name*]

Syntax Description

domain-name	Specifies the domain name. The name can be any case-sensitive, alphanumeric string up to 63 characters.
use-vrf*name*	(Optional) Specifies the virtual routing and forwarding (VRF) to use to resolve the domain name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Global configuration
VRF context configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip domain-name** command to configure the domain name for the device. Use the vrf context command to enter the VRF context mode to configure the domain monastery a particular VRF.

This command does not require a license.

Examples

This example shows how to configure the IP domain name for the default VRF:

```
switch# configure terminal
switch(config)# ip domain-name Mysite.com
```

This example shows how to configure the IP domain name for the management VRF:

```
switch# configure terminal
switch(config)# vrf context management
switch(config-vrf)# ip domain-name Mysite.com
```

This example shows how to configure the IP domain name for the default VRF to use the management VRF as a backup if the domain name cannot be resolved through the default VRF:

```
switch# configure terminal
switch(config)# ip domain-name Mysite.com use-vrf management
```

Related Commands

Command	Description
show hosts	Displays information about the IP domain name configuration.

ip dscp-lop

To set the DSCP value for locally originated packets for IPv4 and IPv6, use the **ip dscp-lop** command. To restore the default, use the **no** form of this command.

ip dscp-lop *dscp-value*
no ip dscp-lop

Syntax Description

dscp-value	The range is from 0 to 63. • af11—AF11 dscp (001010) • af12—AF12 dscp (001100) • af13—AF13 dscp (001110) • af21—AF21 dscp (010010) • af22—AF22 dscp (010100) • af23—AF23 dscp (010110) • af31—AF31 dscp (011010) • af32—AF32 dscp (011100) • af33—AF33 dscp (011110) • af41—AF41 dscp (100010) • af42—AF42 dscp (100100) • af43—AF43 dscp (100110) • cs1—CS1(precedence 1) dscp (001000) • cs2—CS2(precedence 2) dscp (010000) • cs3—CS3(precedence 3) dscp (011000) • cs4—CS4(precedence 4) dscp (100000) • cs5—CS5(precedence 5) dscp (101000) • cs6—CS6(precedence 6) dscp (110000) • cs7—CS7(precedence 7) dscp (111000) • default—Default dscp (000000) • ef—EF dscp (101110)

Command Default

0

Command Modes

Global configuration

Command History

Release	Modification
6.2(12)	This command was introduced.

Usage Guidelines

Use the **ip dscp-lop** command to set the dscp value of all locally originated packets unless they are set by the application.

For values 40-63, a warning is also thrown as this could contend with higher priority traffic.

This command applies to IPv4 and IPv6.

This command affects all protocols from the SUP which do not have explicitly specified markers and sets the marker to 0.

For example, if BGP has a dscp marker of cs6 while TFTP has a dscp marker of 0. BGP packets will not be affected by this command.

Examples

This example shows how to set the dscp value to 16:

```
switch# configure terminal
switch(config)# ip dscp-lop 16
```

This example shows how to set the dscp value to 45:

```
switch# configure terminal
switch(config)# ip dscp-lop 45

DSCP 40-63 are used for high priority traffic. Set dscp to a lower value to avoid contention.

DSCP for Locally Originated packet for
Telnet/SSH/SNMP/Syslog/TFTP/ICMP/Netflow/DNS/TACACS/RADIUS/FTP is set to 45
```

ip eigrp shutdown

To shut down the Enhanced Interior Gateway Routing Protocol (EIGRP) on an interface, use the **ip eigrp shutdown** command. To restore the default, use the **no** form of this command.

ip eigrp *instance-tag* **shutdown**
no ip eigrp *instance-tag* **shutdown**

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip eigrp shutdown** command to shut down the interface for EIGRP and prevent EIGRP adjacency for the interface for maintenance purposes. The network address for the interface does not show up in the EIGRP topology table.

Use the **ip passive-interface eigrp** command to prevent EIGRP adjacency but keep the network address in the topology table.

This command requires the Enterprise Services license.

Examples

This example shows how to disable EIGRP on an interface:

```
switch# configure terminal
switch(config)# router eigrp 201
switch(config-router)# interface ethernet 2/1
switch(config-if)# ip eigrp 201 shutdown
```

Related Commands

Command	Description
ip passive-interface eigrp	Configures an instance of EIGRP.
router eigrp	Configures an instance of EIGRP.

ip extcommunity-list

To create an extended community list entry, use the **ip extcommunity-list** command. To remove the entry, use the **no** form of this command.

ip extcommunity-list standard *list-name* {**deny** | **permit**} **generic** {**transitive** | **nontransitive**} *aa4* **:** *nn*
no ip extcommunity-list standard generic {**transitive** | **nontransitive**} *list-name*
ip extcommunity-list expanded *list-name* {**deny** | **permit**} **generic** {**transitive** | **nontransitive**} *regexp*
no ip extcommunity-list expanded generic {**transitive** | **nontransitive**} *list-name*

Syntax Description

standard*list-name*	Configures a named standard extended community list.
deny	Denies access for a matching condition.
permit	Permits access for a matching condition.
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.
*aa4***:***nn*	(Optional) Autonomous system number and network number. This value is configured with a 4-1 to 4294967295 in plaintext notation, or from 1.0 to 56636.65535 in AS.dot notation. You can
expanded *list-name*	Configures a named expanded extended community list.
regexp	Regular expression that is used to specify a pattern to match against an input string. See the Cis details on regular expressions: http://www.cisco.com/c/en/us/td/docs/switches/datacenter/sw/6_x/nx-os/fundamentals/configura **Note** Regular expressions can be used with expanded extended community lists only.

Command Default

Community exchange is not enabled by default.

Command Modes

Global configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **ip extcommunity-list** command to configure extended community filtering for BGP. Extended community values are configured as a 6-byte number. The first four bytes represent the autonomous system number, and the last two bytes represent a user-defined network number. The BGP generic specific community attribute is defined in draft-ietf-idr-as4octet-extcomm-generic-subtype-00.txt.

BGP extended community exchange is not enabled by default. Use the **send-extcommunity** command in BGP neighbor fix-family configuration mode to enable extended community attribute exchange between BGP peers.

Once you configure a permit value to match a given set of extended communities, the extended community list defaults to an implicit deny for all other extended community values.

Standard Extended Community Lists

Use standard extended community lists to configure specific extended community numbers. You can configure a maximum of 16 extended communities in a standard extended community list.

Expanded Extended Community Lists

Use expanded extended community lists to filter communities using a regular expression. Use regular expressions to configure patterns to match community attributes. The order for matching using the * or + character is longest construct first. Nested constructs are matched from the outside in. Concatenated constructs are matched beginning at the left side. If a regular expression can match two different parts of an input string, it will match the earliest part first.

Community List Processing

When you configure multiple values in the same extended community list statement, a logical AND condition is created. All extended community values must match to satisfy the AND condition. When you configure multiple values in separate community list statements, a logical OR condition is created. The first list that matches a condition is processed.

This command does not require a license.

Examples

This example shows how to configure a standard generic specific extended community list that permits routes from network 40 in autonomous system 1.65534 and from network 60 in autonomous system 1.65412.

This example shows how to configure a logical AND condition:

```
switch# configure terminal
switch(config)# ip extcommunity-list standard test1 permit generic transitive 1.65534:40
1.65412:60
switch(config)#
```

All community values must match in order for the list to be processed.

Related Commands

Command	Description
feature bgp	Enables BGP.
match extcommunity	Matches an extended community in a route map.
send-community	Configures BGP to propagate community attributes to BGP peers.
set extcommunity	Sets an extended community in a route map.

ip forward

To allow IPv4 traffic on an interface even when there is no IP address configuration on that interface, use the **ip forward** command. To disable this function, use the **no** form of this command.

ip forward
no ip forward

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modification
6.2(8)	This command was introduced.

Usage Guidelines

Beginning with Cisco NX-OS Release 6.2(8), BGP supports RFC 5549 which allows an IPv4 prefix to be carried over an IPv6 next hop.

Use the **ip forward** command to do the following:

- Accept IPv4 packets on an interface that has no IPv4 interface address configured on that interface.
- Reply with IPv4 ICMP over IPv6.

This command requires the Enterprise Services license.

Examples

This example shows how allow IPv4 traffic on an interface:

```
switch# configure terminal
switch(config)# interface ethernet 0/2
switch(config-if)# ipv6 address ABCF:1::3/64
switch(config-if)# ip forward
```

Command	Description
ipv6 nd mac-extract	Enables any next hop that matches the IPv6 prefix on that interface to be treated as an MEv6 address,

ip hello-interval eigrp

To configure the Enhanced Interior Gateway Routing Protocol (EIGRP) hello interval for an interface, use the **ip hello-interval eigrp** command. To restore the default, use the **no** form of this command.

ip hello-interval eigrp *instance-tag seconds*
no ip hello-interval eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
seconds	Hello interval (in seconds). The range is from 1 to 65535.

Command Default

5 seconds

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to set the hello interval to 10 seconds for the interface:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# interface ethernet 2/1
switch(config-if)# ip hello-interval eigrp 1 10
```

ip hold-time eigrp

To configure the hold time for an Enhanced Interior Gateway Routing Protocol (EIGRP) interface, use the **ip hold-time eigrp** command. To restore the default, use the **no** form of this command.

ip hold-time eigrp *instance-tag seconds*
no ip hold-time eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
seconds	Hold time (in seconds). The range is from 1 to 65535.

Command Default

15 seconds

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip hold-time eigrp** command to increase the default hold time on very congested and large networks,

We recommend that you configure the hold time to be at least three times the hello interval. If a router does not receive a hello packet within the specified hold time, routes through this router are considered unavailable.

Increasing the hold time delays route convergence across the network.

This command requires the Enterprise Services license.

Examples

This example shows how to set the hold time to 40 seconds for the interface:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ip hold-time eigrp 209 40
```

Related Commands

Command	Description
ip hello-interval eigrp	Configures the hello interval on an interface for the EIGRP routing process designated by an autonomous system number.

ip host

To define static hostname-to-address mappings in the Domain Name System (DNS) hostname cache, use the **ip host** command. To remove a hostname-to-address mapping, use the **no** form of this command.

ip host *name address1* [*address2* **...** *address6*]
no ip host *name address1* [*address2* **...** *address6*]

Syntax Description

name	Host name. The *name* can be any case-sensitive, alphanumeric string up to 80 characters.
address1	IPv4 address in the x.x.x.x format.
address2 ...address6	(Optional) Up to five additional IPv4 addresses in the x.x.x.x format.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip host** command to add a static host name to DNS.

This command does not require a license.

Examples

This example shows how to configure a static hostname:

```
switch# configure terminal
switch(config)# ip host mycompany.com 192.0.2.1
```

Related Commands

Command	Description
ipv6 host	Configures a static host name in the DNS database.

ip load-sharing address

To configure the load-sharing algorithm used by the unicast Forwarding Information Base (FIB), use the **ip load-sharingaddress** command. To restore the default, use the **no** form of this command.

ip load-sharing address {**destination port destination** | **source-destination** [**port source-destination**]} [**universal-id** *seed*]
gtp-teid
no ip load-sharing address {**destination port destination** | **source-destination** [**port source-destination**]} [**universal-id** *seed*]
gtp-teid

Syntax Description

destination port destination	Sets the load-sharing algorithm based on destination address and port.
source-destination	Sets the load-sharing algorithm based on source and destination address.
port source-destination	(Optional) Sets the load-sharing algorithm based on source and destination address and port address.
universal-id *seed*	(Optional) Sets the random seed for the load sharing hash algorithm. The range is from 1 to 4294967295.
gtp-teid	(Optional) Includes the 32-bit TEID value in the path selection calculation. This option is only supported on M3 line cards.

Command Default

Destination address and port address

Command Modes

Global configuration

Command History

Release	Modification
7.3(2)	Added support for **gtp-teid** value in path selection calculation for M3 line cards.
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip load-sharing address** command to set the load-sharing algorithm that the unicast FIB uses to select a path from the equal-cost paths in the Router Information Base (RIB).

For M3 line cards, you can specify the **gtp-teid** keyword to include the 32-bit TEID value in the path calculation for packets that contain GTP header. To consider this value in path calculation, a packet must enter the port through the M3 line card. The **gtp-teid** keyword will not have an effect on the packets that enter the port on any other line card (like F3) and exit through the M3 card.

Packets with a GTP header is structured as follows:

- Type of packet - IPv4 or IPv6.
- UDP header with destination port 2152.
- GTP version 1 header with payload type 1.

This command does not require a license.

Examples

This example shows how to set the load-sharing algorithm to use source and destination address:

```
switch# configure terminal
switch(config)# ip load-sharing address source-destination
```

Related Commands

Command	Description
show ip load-sharing	Displays the load-sharing algorithm.
show routing hash	Displays the path the RIB and FIB select for a source/destination pair.

ip load-sharing per-packet

To configure per-packet load sharing on an interface, use the **ip load-sharing per-packet** command. To restore the default, use the **no** form of this command.

ip load-sharing per-packet
no load-sharing per-packet

Syntax Description

This command has no keywords or arguments.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **ip load-sharing per-packet** command to set the load-sharing algorithm on an interface. This command overrides the **ip load-sharing address** command.

Note Using per-packet load sharing can result in out-of-order packets. Packets for a given pair of source-destination hosts might take different paths and arrive at the destination out of order. Make sure you understand the implications of out-of-order packets to your network and applications. Per-packet load sharing is not appropriate for all networks. Per-flow load sharing ensures packets always arrive in the order that they were sent.

You configure per-packet load sharing on the input interface. This configuration determines the output interface that Cisco NX-OS chooses for the packet.

For example, if you have ECMP paths on two output interfaces, Cisco NX-OS uses the following load-sharing methods for input packets on Ethernet 1/1:

- Per-packet load sharing if you configure per-packet load sharing on Ethernet 1/1.
- Per-flow load sharing.

The configuration for the other interfaces have no effect on the load-sharing method used for Ethernet 1/1 in this example.

This command does not require a license.

Examples

This example shows how to enable per-packet load-sharing on interface Ethernet 1/2:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip load-sharing per-packet
```

Related Commands

Command	Description
ip load-sharing	Configures the per-flow load-sharing algorithm.
show ip load-sharing	Displays the load-sharing algorithm.

ip name-server

To configure a name server, use the **ip name-server** command. To disable this feature, use the **no** form of the command.

ip name-server *ip-address* [**use-vrf** *name*]
no ip name-server *ip-address* [**use-vrf** *name*]

Syntax Description

ip-address	IP address for the name server.
use-vrf *name*	(Optional) Specifies the virtual routing and forwarding (VRF) to use to reach the name-server. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Global configurationVRF context configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip name-server** command to configure the name server for the device. Use the vrf context command to enter the VRF context mode to configure the domain names for a particular VRF.

This command does not require a license.

Examples

This example shows how to configure the IP name server for the default VRF:

```
switch# configure terminal
switch(config)# ip name-server 192.0.2.1
```

This example shows how to configure the IP name server for the management VRF:

```
switch# configure terminal
switch(config)# vrf context management
switch(config-vrf)# ip name-server 192.0.2.1
```

This example configures the IP name server for the default VRF to use the management VRF as a backup if show ip rip policy statistics redistributeIP name server cannot be reached through the default VRF:

```
switch# configure terminal
switch(config)# ip name-server 192.0.2.1 use-vrf management
```

Related Commands

Command	Description
show hosts	Displays information about the IP domain name configuration.

ip next-hop-self eigrp

To instruct the Enhanced Interior Gateway Routing Protocol (EIGRP) process to use the local IP address as the next-hop address when advertising these routes, use the **ip next-hop-self eigrp** command. To use the received next-hop value, use the **no** form of this command.

ip next-hop-self eigrp *instance-tag*
no ip next-hop-self eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

EIGRP always sets the IP next-hop value to be itself.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

EIGRP, by default, sets the IP next-hop value to be itself for routes that it is advertising, even when advertising those routes on the same interface from which the router learned them. To change this default, you must use the **no ip next-hop-self eigrp** interface configuration command to instruct EIGRP to use the received next-hop value when advertising these routes.

Examples

This example shows how to change the default IP next-hop value and instruct EIGRP to use the received next-hop value:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-eigrp-af-if)# no ip next-hop-self eigrp 209
```

ip offset-list eigrp

To configure an offset list for the Enhanced Interior Gateway Routing Protocol (EIGRP) on an interface, use the **ip offset-list eigrp** command. To restore the default, use the **no** form of this command.

ip offset-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**} *offset*
no ip offset-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**} *offset*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
prefix-list *list-name*	Specifies the name of an IP prefix list to filter EIGRP routes.
route-map *map-name*	Specifies the name of a route map to filter EIGRP routes.
in	Applies route policy to incoming routes.
out	Applies route policy to outgoing routes.
offset	Value to add to the EIGRP metric.

Command Default

This command has no defaults.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip offset-list eigrp** command to influence which route is advertised on an interface. Cisco NX-OS adds the configured offset value to any routes that match the configure prefix list or route map. You must configure the named route map or prefix list to complete this configuration.

This command requires the Enterprise Services license.

Examples

This example shows how to configure an offset list filter to add 20 to the metric for EIGRP routes coming into the interface that match the route map OffsetFilter:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ip offset-list eigrp 209 route-map OffsetFilter in 20
```

Related Commands

Command	Description
prefix-list	Configures a prefix list.
route-map	Configures a route map.

ip ospf authentication

To specify the authentication type for an Open Shortest Path First (OSPF) interface, use the **ip ospf authentication** command. To remove the authentication type for an interface, use the **no** form of this command.

ip ospf authentication [{**key-chain** *key-name* | **message-digest** | **null**}]
no ip ospf authentication

Syntax Description

key-chain *key-name*	(Optional) Specifies a key chain to use for authentication. The *key-name* argument can be any alphanumeric string.
message-digest	(Optional) Specifies that message-digest authentication will be used.
null	(Optional) Specifies that no authentication is used. Use the keyword to override any other authentication configured for an area.

Command Default

No authentication

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf authentication** command to configure the authentication mode for an OSPF interface. If you use this command with no keywords, use the **ip ospf authentication-key** command to configure the password. If you use the **message-digest** keyword, use the **ip ospf message-digest-key** command to configure the message-digest key for the interface.

The authentication that you configure on an interface overrides the authentication that you configure for the area.

This command requires the Enterprise Services license.

Examples

This example shows how to configure message-digest authentication:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip ospf authentication message-digest
switch(config-if)# ip ospf message-digest-key 33 md5 0 mypassword
```

Related Commands

Command	Description
area authentication	Enables authentication for an OSPF area.
ip ospf authentication-key	Assigns a password to be used by neighboring routers that are using the password authentication of OSPF.
ip ospf message-digest-key	Configures the OSPF MD5 message-digest key.

ip ospf authentication-key

To assign a password for simple password authentication to be used by neighboring Open Shortest Path First (OSPF) routers, use the **ip ospf authentication-key** command. To remove a previously assigned OSPF password, use the **no** form of this command.

ip ospf authentication-key [{**0** | **3**}] *password*
no ip ospf authentication-key

Syntax Description

0	(Optional) Configures an unencrypted password.
3	(Optional) Configure a 3DES encrypted password string.
password	Any continuous string of characters that can be entered from the keyboard up to 8 bytes.

Command Default

Unencrypted password

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf authentication-key** command to configure a password for simple password authentication. The password created by this command is used as a key that is inserted directly into the OSPF header when Cisco NX-OS originates routing protocol packets. You can assign a separate password to each network on a per-interface basis. All neighboring routers on the same network must have the same password to be able to exchange OSPF information.

Note Cisco NX-OS uses this key when you enable authentication for an interface with the **ip ospf authentication** interface configuration command or if you configure the area for authentication with the **area authentication** command in router configuration mode.

This command requires the Enterprise Services license.

Examples

This example shows how to configure an unencrypted authentication key with the string yourpass:

```
switch# configure terminal
switch(config-if)# ip ospf authentication-key yourpass
```

Related Commands

Command	Description
area authentication	Specifies the authentication type for an OSPF area.
ip ospf authentication	Specifies the authentication type for an interface.

ip ospf cost

To specify the cost of sending a packet on an interface, use the **ip ospf cost** command. To reset the path cost to the default, use the **no** form of this command.

ip ospf cost *interface-cost*
no ip ospf cost *interface-cost*

Syntax Description

interface-cost	Unsigned integer value expressed as the link-state metric. The range is from 1 to 65535.

Command Default

Calculates the cost based on the reference bandwidth divided by the configured interface bandwidth. You can configure the reference bandwidth or it defaults to 40 Gb/s.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf cost** command to configure the cost metric manually for each interface. This command overrides any settings for the reference bandwidth that you set using the reference-bandwidth command in router configuration mode.

If this command is not used, the link cost is calculated using the following formula:

link cost = reference bandwidth / interface bandwidth

This command requires the Enterprise Services license.

Examples

This example shows how to configure the interface cost value to 65:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip ospf cost 65
```

Related Commands

Command	Description
reference-bandwidth	Specifies the reference bandwidth that OSPF uses to calculate the link cost.

ip ospf dead-interval

To set the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down, use the **ip ospf dead-interval** command. To restore the default, use the **no** form of this command.

ip ospf dead-interval *seconds*
no ip ospf dead-interval

Syntax Description

seconds	Interval (in seconds) during which the router must receive at least one hello packet from a neighbor or that neighbor adjacency is removed from the local router and does not participate in routing. The range is from 1 to 65535. The value must be the same for all nodes on the network.

Command Default

The default for *seconds* is four times the interval set by the **ip ospf hello-interval** command.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf dead-interval** command to set the dead interval that OSPF advertises in hello packets. This value must be the same for all networking devices on a specific network.

Aggressive protocol timers are not supported in the Virtual Port-Channel (vPC) environment and they are also not supported from the in-service software updates (ISSU) perspective. We recommend that you retain the default value.

Configure a shorter dead interval to detect down neighbors faster and improve convergence. Very short dead intervals could cause routing instability.

Use the **show ip ospf interface** command to verify the dead interval and hello interval.

This command requires the Enterprise Services license.

Examples

This example shows how to set the OSPF dead interval to 20 seconds:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip ospf dead-interval 20
```

Related Commands

Command	Description
ip ospf hello-interval	Interval between hello packets that OSPF sends on the interface.
show ip ospf interface	Displays OSPF-related information.

ip ospf hello-interval

To specify the interval between hello packets that Open Shortest Path First (OSPF) sends on the interface, use the **ip ospf hello-interval** command. To return to the default, use the **no** form of this command.

ip ospf hello-interval *seconds*
no ip ospf hello-interval

Syntax Description

seconds	Interval (in seconds). The value must be the same for all nodes on a specific network. The range is from 1 to 65535.

Command Default

10 seconds

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf hello-interva**l command to set the rate at which OSPF advertises hello packets. Shorter hello intervals allow OSPF to detect topological changes faster. This value must be the same for all routers and access servers on a specific network.

Aggressive protocol timers are not supported in the Virtual Port-Channel (vPC) environment and they are also not supported from the in-service software updates (ISSU) perspective. We recommend that you retain the default value.

This command requires the Enterprise Services license.

Examples

This example shows how to set the interval between hello packets to 15 seconds:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip ospf hello-interval 15
```

Related Commands

Command	Description
ip ospf dead-interval	Sets the time period for which hello packets must not have been seen before neighbors declare the router as down.

ip ospf message-digest-key

To enable Open Shortest Path First (OSPF) Message Digest 5 (MD5) authentication, use the **ip ospf message-digest-key** command. To remove an old MD5 key, use the **no**form of this command.

ip ospf message-digest-key *key-id* **md5** [{**0** | **3**}] *key*
no ip ospf message-digest-key *key-id*

Syntax Description

key-id	Identifier in the range from 1 to 255.
0	(Optional) Specifies an unencrypted password to generate the md5 key.
3	(Optional) Specifies an encrypted 3DES password to generate the md5 key.
key	An alphanumeric password of up to 16 bytes.

Command Default

Unencrypted

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf message-digest-key** command when you configure the MD5 digest authentication mode. All neighbor routers must have the same *key* value on the network.

This command requires the Enterprise Services license.

Examples

This example shows how to set key 19 with the password 8ry4222:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip ospf message-digest-key 19 md5 8ry4222
```

Related Commands

Command	Description
area authentication	Enables authentication for an OSPF area.
ip ospf authentication	Specifies the authentication type for an interface.

ip ospf mtu-ignore

To disable Open Shortest Path First (OSPF) maximum transmission unit (MTU) mismatch detection on received Database Descriptor (DBD) packets, use the **ip ospf mtu-ignore** command. To return to the default, use the **no** form of this command.

ip ospf mtu-ignore
no ip ospf mtu-ignore

Syntax Description

This command has no arguments or keywords.

Command Default

OSPF MTU mismatch detection is enabled.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf mtu-ignore** command to disable MTU mismatch detection on an interface. By default, OSPF checks whether neighbors are using the same MTU on a common interface. If the receiving MTU is higher than the IP MTU configured on the incoming interface, OSPF does not establish adjacencies. Use the **ip ospf mtu-ignore** command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

This command requires the Enterprise Services license.

Examples

This example shows how to disable MTU mismatch detection on received DBD packets:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip ospf mtu-ignore
```

ip ospf network

To configure the Open Shortest Path First (OSPF) network type to a type other than the default for an interface, use the **ip ospf network** command. To return to the default, use the **no**form of this command.

ip ospf network {**broadcast** | **point-to-point**}
no ip ospf network

Syntax Description

broadcast	Sets the network type as broadcast.
point-to-point	Sets the network type as point-to-point.

Command Default

Depends on the network type.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The network type influences the behavior of the OSPF interface. OSPF network type is usually broadcast, which uses OSPF multicasting capabilities. Under this network type a designated router and backup designated router are elected. For point-to-point networks there are only two neighbors and multicast is not required. For routers on an interface to become neighbors the network type for all should match.

This command overrides the **medium** {**broadcast** | **p2p**} command in interface configuration mode.

This command requires the Enterprise Services license.

Examples

This example shows how to set an OSPF network as a broadcast network:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip address 192.0.2.33 255.255.255.0
switch(config-if)# ip ospf network broadcast
```

ip ospf passive-interface

To suppress Open Shortest Path First (OSPF) routing updates on an interface, use the **ip ospf passive-interface** command. To return to the default, use the **no**form of this command.

ip ospf passive-interface
no ip ospf passive-interface

Syntax Description

This command has no keywords or arguments.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

If an interface is configured as passive-interface it does not participate in the OSPF protocol and will not establish adjacencies or send routing updates. However the interface is announced as part of the routing network.

This command requires the Enterprise Services license.

Examples

This example shows how to set an interface as passive:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip ospf passive-interface
```

ip ospf priority

To set the router priority for an Open Shortest Path First (OSPF) interface, use the **ip ospf priority** command. To return to the default, use the **no** form of this command.

ip ospf priority *number-value*
no ip ospf priority *number-value*

Syntax Description

number-value	Number value that specifies the priority of the router. The range is from 0 to 255.

Command Default

Priority of 1

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf priority** command to set the router priority, which determines the designated router for this network. When two routers are attached to a network, both attempt to become the designated router. The router with the higher router priority takes precedence. If there is a tie, the router with the higher router ID takes precedence. A router with a router priority set to zero cannot become the designated router or backup designated router.

Cisco NX-OS uses this priority value when you configure OSPF for broadcast networks using the **neighbor** command in router configuration mode.

This command requires the Enterprise Services license.

Examples

This example shows how to set the router priority value to 4:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip ospf priority 4
```

Related Commands

Command	Description
ip ospf network	Configures the OSPF network type to a type other than the default for a given medium.

ip ospf retransmit-interval

To specify the time between Open Shortest Path First (OSPF) link-state advertisement (LSA) retransmissions for adjacencies belonging to the interface, use the **ip ospf retransmit-interval** command. To return to the default, use the **no**form of this command.

ip ospf retransmit-interval *seconds*
no ip ospf retransmit-interval

Syntax Description

seconds	Time (in seconds) between retransmissions. The time must be greater than the expected round-trip delay between any two routers on the attached network. The range is from 1 to 65535 seconds. The default is 5 seconds.

Command Default

5 seconds

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf retransmit-interval** command to set the time between LSA retransmissions. When a router sends an LSA to its neighbor, it keeps the LSA until it receives an acknowledgment message from the neighbor. If the router receives no acknowledgment within the retransmit interval, the local router resends the LSA.

This command requires the Enterprise Services license.

Examples

This example shows how to set the retransmit interval value to 8 seconds:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip ospf retransmit-interval 8
```

ip ospf shutdown

To shut down an Open Shortest Path First (OSPF) interface, use the **ip ospf shutdown** command. To return to the default, use the **no**form of this command.

ip ospf shutdown
no ip ospf shutdown

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf shutdown** command to shut down OSPF on this interface.

This command requires the Enterprise Services license.

Examples

This example shows how to shut down OSPF on an interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip ospf shutdown
```

ip ospf transmit-delay

To set the estimated time required to send an Open Shortest Path First (OSPF) link-state update packet on the interface, use the **ip ospf transmit-delay** command. To return to the default, use the **no**form of this command.

ip ospf transmit-delay *seconds*
no ip ospf transmit-delay

Syntax Description

seconds	Time (in seconds) required to send a link-state update. The range is from 1 to 450 seconds.

Command Default

1 second

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf transmit-delay** command to set the estimated time needed to send an LSA update packet. OSPF increments the LSA age time by transmit delay amount before transmitting the LSA update. You should take into account the transmission and propagation delays for the interface when you set this value.

This command requires the Enterprise Services license.

Examples

This example shows how to set the transmit delay value to 8 seconds:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip ospf transmit-delay 8
```

ip passive-interface eigrp

To suppress all routing updates on an Enhanced Interior Gateway Routing Protocol (EIGRP) interface, use the **ip passive-interface eigrp** command. To re-enable the sending of routing updates, use the **no** form of this command. To remove the interface-level configuration for the passive-interface, use the **default ip passive-interface eigrp** command.

ip passive-interface eigrp *instance-tag*
no ip passive-interface eigrp *instance-tag*
default ip passive-interface eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The*instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

Routing updates are sent on the interface.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
6.2(2)	The default form of this command was added.

Usage Guidelines

Use the **ip passive-interface eigrp** command to stop all routing updates on an interface and suppress the formation of EIGRP adjacencies. The network address for the interface remains in the EIGRP topology table. To remove this command from the interface, use the **default ip passive-interface eigrp** command. The final behavior of this command depends on **passive-interface default (EIGRP) command.**

The following table sums up the behavior of this command:

Table 2: Behavior of combination of commands

VRF mode (deafult passive-interface)	Interface mode (passive)	Result (interface passive ?)
TRUE	FALSE	FALSE
TRUE	TRUE	TRUE
TRUE	NONE	TRUE
FALSE	TRUE	TRUE
FALSE	FALSE	FALSE
FALSE	NONE	FALSE

Default configuration at interface-level corresponds to NONE state.

This command requires the Enterprise Services license.

Examples

This example shows how to stop EIGRP routing updates on Ethernet 2/1:

```
switch# configure terminal
switch(config)# router eigrp 201
switch(config-router)# interface ethernet 2/1
switch(config-if)# ip passive-interface eigrp 201
```

Related Commands

Command	Description
passive-interface default (EIGRP)	Suppresses the EIGRP hellos.

ip policy route-map

To identify a route map to use for policy routing on an interface, use the **ip policy route-map** command. To remove the route map, use the **no** form of this command.

ip policy route-map *name*
no ip policy route-map *[name]*

Syntax Description

name	Name of the route map. The name can be any alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip policy route-map** command to identify a route map to use for policy routing. Use the **route-map** command to create the rout map. 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 is allowed for the interface, based on the destination IP address of the packet. The **set** commands specify the set actions—the particular policy routing actions to perform if the criteria enforced by the **match** commands are met. The **no ip policy route-map** command deletes the pointer to the route map.

You can perform policy-based routing on any match criteria that can be defined in an expanded IP access list when using the **match ip address** command and referencing an expanded IP access list.

You must enable policy-based routing with the **feature pbr** command before you can use the **ip policy route-map** command.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a policy-based route map to an interface:

```
switch# configure terminal
switch(config)# feature pbr
switch(config)# interface ethernet 2/1
switch(config-if)# ip policy route-map policymap
```

Related Commands

Command	Description
feature pbr	Enabled the policy-based routing feature.
route-map	Creates a route map.
show route-map pbr-statistics	Displays statistics about policy-based route maps

ip port-unreachable

To enable the generation of Internet Control Message Protocol (ICMP) port unreachable messages, use the **ip port-unreachable** command. To disable this function, use the no form of this command.

ip port-unreachable
no ip port-unreachable

Syntax Description

This command has no keywords or arguments.

Command Default

Enabled

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to enable the generation of ICMP port unreachable messages, as appropriate, on an interface:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip port-unreachable
```

Related Commands

Command	Description
ip unreachables	Sends ICMP unreachable messages.

ip prefix-list

To create a prefix list to match IP packets or routes against, use the ip prefix-list command. To remove the prefix-list, use the **no** form of this command.

ip prefix-list *name* [**seq** *number*] {**permit** | **deny**} *prefix* [{**eq** *length* | [**ge** *length*] [**le** *length*]}]
no prefix-list *name* [**seq** *number*] {**permit** | **deny**} *prefix* [{**eq** *length* | [**ge** *length*] [**le** *length*]}]

Syntax Description

name	IP prefix list name. The name can be any alphanumeric string up to 63 characters.
seq *number*	(Optional) Specifies the number to order entries in the prefix list. The range is from 1 to 4294967294.
permit	Allows routes or IP packets that match the prefix list.
deny	Rejects routes or IP packets that match the prefix list.
prefix	IP prefix in A.B.C.D/length format.
eq*length*	(Optional) Specifies the prefix length to match. The range is from 1 to 32.
ge*length*	(Optional) Specifies the prefix length to match. The range is from 1 to 32.
le*length*	(Optional) Specifies the prefix length to match. The range is from 1 to 32.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip prefix-list** command to configure IP prefix filtering. You configure prefix lists with permit or deny keywords to either permit or deny the prefix based on the matching condition. A prefix list consists of an IP address and a bit mask. The bit mask is entered as a number from 1 to 32. An implicit deny is applied to traffic that does not match any prefix-list entry.

You can configure prefix lists to match an exact prefix length or a prefix range. Use the **ge** and **le** keywords to specify a range of the prefix lengths to match, providing more flexible configuration than can be configured with just the network/length argument. Cisco NX-OS processes the prefix list using an exact match when you do not configure either neither the **ge** nor **le** keyword. If you configure both the **ge***length* and **le***length* keywords and arguments, the allowed prefix length range falls between the values used for the ge-length and le-length arguments. The following formula shows this behavior:

network/length < ge ge-length < le le-length <= 32

If you do not configure a sequence number, Cisco NX-OS applies a a default sequence number of 5 to the prefix list, and subsequent prefix list entries will be increment by 5 (for example, 5, 10, 15, and onwards). If you configure a sequence number for the first prefix list entry but not subsequent entries, then Cisco NX-OS

increments the subsequent entries by 5 (For example, if the first configured sequence number is 3, then subsequent entries will be 8, 13, 18, and onwards). Default sequence numbers can be suppressed by entering the no form of this command with the seq keyword.

Cisco NX-OS evaluates prefix lists starting with the lowest sequence number and continues down the list until a match is made. Once a match is made that covers the network the **permit** or **deny** statement is applied to that network and the rest of the list is not evaluated.

Tip For best performance, the most frequently processed prefix list statements should be configured with the lowest sequence numbers. The seq number keyword and argument can be used for resequencing.

The prefix list is applied to inbound or outbound updates for specific peer by entering the **prefix-list** command in neighbor address-family mode. Prefix list information and counters are displayed in the output of the **show ip prefix-list** command. Prefix-list counters can be reset by entering the **clear ip prefix-list** command.

This command does not require a license.

Examples

This example shows how to configure a prefix list and apply it to a BGP peer:

```
switch# configure terminal
switch(config)# ip prefix-list allowprefix 10 permit 192.0.2.0 eq 24
switch(config)# ip prefix-list allowprefix 20 permit 209.165.201.0 eq 27
switch(config) router bgp 65536:20
switch(config-router)# neighbor 192.0.2.1/16 remote-as 65536:20
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# prefix-list allowprefix in
```

Related Commands

Command	Description
clear ip prefix-list	Clears counters for IP prefix lists.
prefix-list	Applies a prefix list to BGP peer.
show ip prefix-list	Displays information about IP prefix lists.

ip prefix-list description

To configure a description string for an IP prefix-list, use the **ip prefix-list description** command. To revert to default, use the **no** form of this command.

ip prefix-list *name* **description** *string*
no ip prefix-list *name* **description**

Syntax Description

name	Name of prefix list. The name can be any alphanumeric string up to 63 characters.
string	Descriptive string for the prefix list. The string can be any alphanumeric string up to 90 characters.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure a description for an IP prefix list:

```
switch# configure terminal
switch(config)# ip prefix-list test1 description "this is a test"
```

Related Commands

Command	Description
ip prefix-list	Creates an IPv6 prefix list
show ip prefix-list	Displays information about IPv6 prefix lists.

ip proxy-arp

To enable proxy Address Resolution Protocol (ARP) on an interface, use the **ip proxy-arp** command. To disable proxy ARP on the interface, use the **no** form of this command.

ip proxy-arp
no ip proxy-arp

Syntax Description

This command has no keywords or arguments.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to enable proxy ARP:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip proxy-arp
```

ip rip authentication key-chain

To enable authentication for the Routing Information Protocol (RIP) Version 2 packets and to specify the set of keys that can be used on an interface, use the **ip rip authentication key-chain** command in interface configuration mode. To prevent authentication, use the **no** form of this command.

ip rip authentication key-chain *name-of-chain*
no ip rip authentication key-chain [*name-of-chain*]

Syntax Description

name-of-chain	Group of keys that are valid.

Command Default

No authentication is provided for RIP packets.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You must separately configure a key chain using the **key-chain** command to complete the authentication configuration for an interface.

This command does not require a license.

Examples

This example shows how to configure the interface to accept and send any key that belongs to the key-chain trees:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip rip authentication key-chain trees
```

Related Commands

Command	Description
key-chain	Creates a set of keys that can be used by an authentication method.

ip rip authentication mode

To specify the type of authentication used in the Routing Information Protocol (RIP) Version 2 packets, use the **ip rip authentication mode** command in interface configuration mode. To restore clear text authentication, use the **no** form of this command.

ip rip authentication mode {**text** | **md5**}
no ip rip authentication mode

Syntax Description

text	Specifies the clear text authentication.
md5	Specifies the message Digest 5 (MD5) authentication.

Command Default

Clear text authentication is provided for RIP packets if you configured a key chain.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

RIP for IPv6 uses the authentication built into IPv6.

This command does not require a license.

Examples

This example shows how to configure the interface to use MD5 authentication:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip rip authentication mode md5
```

Related Commands

Command	Description
ip rip authentication key-chain	Enables authentication for RIP Version 2 packets and specifies the set of keys that can be used on an interface.
key chain	Enables authentication for routing protocols.

ip rip metric-offset

To add an additional value to the incoming IP Routing Information Protocol (RIP) route metric for an interface, use the **ip rip metric-offset** command in interface configuration mode. To return the metric to its default value, use the **no** form of this command.

ip rip metric-offset *value*
no ip rip metric-offset

Syntax Description

value	Value to add to the incoming route metric for an interface. The range is from 1 to 15. The default is 1.

Command Default

value: 1

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip route metric-offset** command to influence which routes are used by Cisco NX-OS. This command allows you to add a fixed offset to the route metric of all incoming routes on an interface. For example, if you set the metric-offset to 5 on an interface and the incoming route metric is 5,.Cisco NX-OS adds the route to the route table with a metric of 10.

This command does not require a license.

Examples

This example shows how to configure a metric offset of 10 for all incoming RIP routes on Ethernet interface 2/1:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip rip metric-offset 10
```

Related Commands

Command	Description
ip rip offset-list	Adds an offset value to incoming RIP route metrics.

ip rip offset-list

To add an offset to incoming and outgoing metrics to routes learned via Routing Information Protocol (RIP), use the **ip rip offset-list** command in interface configuration mode. To remove an offset list, use the **no** form of this command.

ip rip offset-list *value*
no ip rip offset-list

Syntax Description

value	Value to add to the incoming route metric for an interface. The range is from 1 to 15. The default is 1.

Command Default

value: 1

Command Modes

Router address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure an offset of 10 for all incoming RIP routes on Ethernet interface 2/1:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip rip offset-list 10
```

Related Commands

Command	Description
ip rip metric-offset	Adds an offset value to incoming RIP route metrics.

ip rip passive-interface

To suppress the sending of the Routing Information Protocol (RIP) updates on an interface, use the **ip rip passive-interface** command in interface configuration mode. To unsuppress updates, use the **no** form of this command.

ip rip passive-interface
no ip rip passive-interface

Syntax Description

This command has no arguments or keywords.

Command Default

RIP updates are sent on the interface.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

While RIP stops sending routing updates to the multicast (or broadcast) address on a passive interface, RIP continues to receive and process routing updates from its neighbors on that interface.

This command does not require a license.

Examples

This example shows how to configure Ethernet 1/2 as a passive interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip rip passive-interface
```

ip rip poison-reverse

To enable poison-reverse processing of the Routing Information Protocol (RIP) router updates, use the **ip rip poison-reverse** command in interface configuration mode. To disable poison-reverse processing of RIP updates, use the **no** form of this command.

ip rip poison-reverse
no ip rip poison-reverse

Syntax Description

This command has no arguments or keywords.

Command Default

Split horizon is always enabled. Poison-reverse processing is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip rip poison-reverse** command to enable poison-reverse processing of RIP router updates. By default, Cisco NX-OS does not advertise RIP routes out the interface over which they were learned (split horizon). If you configure both poison reverse and split horizon, then Cisco NX-OS advertises the learned routes as unreachable over the interface on which the route was learned.

This command does not require a license.

Examples

This example shows how to enable poison-reverse processing for an interface running RIP:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip rip poison-reverse
```

ip rip route-filter

To filter the Routing Information Protocol (RIP) routes coming in or out of an interface, use the **route-filter** command in interface configuration mode. To remove filtering from an interface, use the **no** form of this command.

ip rip route filter {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**}

Syntax Description

prefix-list *list-name*	Associates a prefix list to filter RIP packets.
route-map*map-name*	Associates a route map to set the redistribution policy for RIP.
in	Filters incoming routes.
out	Filters outgoing routes.

Command Default

Route filtering is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip rip route-filter** command to filter incoming or outgoing routes on an interface.

This command does not require a license.

Examples

This example shows how to use a route map to filter routes for a RIP interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip rip route-filter route-map InRipFilter in
```

Related Commands

Command	Description
route-map	Creates a route map.
prefix-list	Creates a prefix list.

ip rip summary-address

To configure a summary aggregate address under an interface for the Routing Information Protocol (RIP), use the **ip rip summary-address** command in interface configuration mode. To disable summarization of the specified address or subnet, use the **no** form of this command.

ip rip summary-address *ip-prefix/mask*
noip rip summary-address *ip-prefix/mask*

Syntax Description

ip-prefix/length	IP prefix and prefix length to be summarized.

Command Default

Disabled.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The **ip rip summary-address** command summarizes an address or subnet under a specific interface.

This command does not require a license.

Examples

This example shows how to configure the summary address192.0.2.0 that is advertised out Ethernet interface 1/2:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip summary-address rip 192.0.2.0/24
```

ip route

To configure a static route, use the **ip route** command. To remove the static route, use the **no** form of this command.

ip route *ip-prefix/mask [interface] next-hop [preference]* [**tag** *id*] [**name** *nexthop-name*]
noip route *ip-prefix/mask [interface] next-hop [preference]* [**tag** *id*] [**name** *nexthop-name*]

Syntax Description

ip-prefix/length	IP prefix and prefix length. The format is x.x.x.x/length. The length is 1 to 32.
interface	(Optional) The interface on which all packets are sent to reach this route. Use **?** to display a list of supported interfaces.
next-hop	IP address of the next-hop that can be used to reach that network. You can specify an IP address and an interface type and interface number. The format is x.x.x.x/length. The length is 1 to 32.
preference	(Optional) Sets the route preference, used as the administrative distance to this route. The range is from 1 to 255. The default is 1.
tag *id*	(Optional) Assigns a route tag that can be used to match against in a route map. The range is from 0 to 4294967295. The default is 0.
name	(Optional) Specifies the name of the nexthop.
nexthop-name	(Optional) Name of the nexthop. The maximum size is 50 characters.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
5.1(1)	Added **name** *nexthop-name* option in the syntax description.
4.0(1)	This command was introduced.

Usage Guidelines

Static routes have a default administrative distance of 1. If you want a dynamic routing protocol to take precedence over a static route, you must configure the static route preference argument to be greater than the administrative distance of the dynamic routing protocol. For example, routes derived with Enhanced Interior Gateway Routing Protocol (EIGRP) have a default administrative distance of 100. To have a static route that would be overridden by an EIGRP dynamic route, specify an administrative distance greater than 100.

This command does not require a license.

Examples

This example shows how to create a static route for destinations with the IP address prefix 192.168.1.1/32, reachable through the next-hop address 10.0.0.2:

```
switch# configure terminal
switch(config)# ip route 192.168.1.1/32 10.0.0.2
```

This example shows how to assign a tag to the previous example so that you can configure a route map that can match on this static route:

```
switch# configure terminal
switch(config)# ip route 192.168.1.1/32 10.0.0.2 tag 5
```

This example shows how to choose a preference of 110. In this case, packets for prefix 10.0.0.0 will be routed to a router at 172.31.3.4 if dynamic route information with an administrative distance less than 110 is not available.

```
ip route 10.0.0.0/8 172.31.3.4 110
```

Related Commands

Command	Description
ipv6 route	Configures an IPv6 static route.
match tag	Matches the tag value associated with a route.

ip route track

To configure a static route associated with the track object, use the **ip route track** command.

ip route track route *ip-prefix ip-mask ip-addr* **track** *object-number*

Syntax Description

ip-prefix	IP address prefix.
ip-mask	IP mask.
ip-addr	IPv4 or IPv6 address.
track	(Optional) Specifies the object to be tracked.
object-number	Object number. The range is from 1 to 500.

Command Default

None

Command Modes

Global configuration mode.

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 configure a static route associated with the track object:

```
switch# configure terminal
switch(config)# ip route 0.0.0.0 0.0.0.0 10.1.1.242 track 123
switch(config)#
```

Related Commands

Command	Description
show static-route track-table	Displays information about the IPv4 or IPv6 static-route track table.

ip router eigrp

To specify the Enhanced Interior Gateway Routing Protocol (EIGRP) instance for an interface, use the **ip router eigrp** command. To return to the default, use the **no**form of this command.

ip router eigrp *instance-tag*
no ip router eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip router eigrp** command to specify the EIGRP instance for the interface.

This command requires the Enterprise Services license.

Examples

This example shows how to set the EIGRP instance for an interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip router eigrp Base
```

ip router ospf area

To specify the Open Shortest Path First (OSPF) instance and area for an interface, use the **ip router ospf area** command. To return to the default, use the **no**form of this command.

ip router ospf *instance-tag* **area** *area-id* [**secondaries none**]
no ip router ospf *instance-tag* **area** *area-id* [**secondaries none**]

Syntax Description

instance-tag	Instance tag. Specify as an alphanumeric string.
area-id	Identifier for the OSPF area where you want to enable authentication. Specify as either a positive integer value or an IP address.
secondaries none	(Optional) Excludes secondary IP addresses.

Command Default

10 seconds

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip router ospf area** command to specify the area and OSPF instance for the interface.

This command requires the Enterprise Services license.

Examples

This example shows how configure an interface for OSPF:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip router ospf Base area 33
```

ip router ospf multi-area

To configure multi-area adjacency on an Open Shortest Path First (OSPF) interface, use the **ip router ospf multi-area** command. To return to the default, use the **no** form of this command.

ip router ospf *instance-tag* **multi-area** *area-id*
no ip router ospf *instance-tag* **multi-area** *area-id*

Syntax Description

instance-tag	Instance tag. Specify as an case-sensitive alphanumeric string up to 63 characters.
area-id	Identifier for the OSPF area where you want to add as another area to the primary interface. Specify as either a positive integer value or an IP address.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **ip router ospf multi-area** command to specify additional areas on an OSPF interface.

This command requires the Enterprise Services license.

Examples

This example shows how to configure multi-area adjacency:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip router ospf Base area 33
switch(config-if)# ip router ospf Base multi-area 99
```

ip source-route

To handle IP datagrams with source routing header options, use the **ip source-route** command. To have the software discard any IP datagram containing a source-route option, use the **no** form of this command.

ip source-route
no ip source-route

Syntax Description

This command has no keywords or arguments.

Command Default

Enabled

Command Modes

Global configuration

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to enable the handling of IP datagrams with source routing header options:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip source-route
```

ip split-horizon eigrp

To enable split horizon for an Enhanced Interior Gateway Routing Protocol (EIGRP) process, use the **ip split-horizon eigrp** command. To disable split horizon, use the **no** form of this command.

ip split-horizon eigrp *instance-tag*
no ip split-horizon eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

Enabled

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **no ip split-horizon eigrp** command to disable split horizon on an interface.

This command requires the Enterprise Services license.

Examples

This example shows how to disable split horizon an an Ethernet link:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-eigrp-af-if)# no ip split-horizon eigrp 209
```

ip summary-address eigrp

To configure a summary aggregate address for the specified Enhanced Interior Gateway Routing Protocol (EIGRP) interface, use the **ip summary-address eigrp** command. To disable a configuration, use the **no** form of this command.

ip summary-address eigrp *instance-tag* {*ip-address* */length* | *ip-address mask*} *[admin-distance]*
ip summary-address eigrp *instance-tag* {*ip-address* */length* | *ip-address mask*}

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
ip-address/length	Summary IP prefix and prefix length to apply to an interface in four-part, dotted-decimal notation. For example, /8 indicates that the first eight bits in the IP prefix are network bits. If *length* is used, the slash is required.
ip-address	Summary IP address to apply to an interface in four-part, dotted-decimal notation.
mask	IP address mask.
admin-distance	(Optional) Administrative distance. The range is from 1 to 255.

Command Default

An administrative distance of 5 is applied to EIGRP summary routes.
No summary addresses are predefined.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip summary-address eigrp** command to configure interface-level address summarization. EIGRP summary routes are given an administrative distance of 5.

This command requires the Enterprise Services license.

Examples

This example shows how to configure an administrative distance of 95 on an EIGRP interface for the 192.168.0.0/16 summary address:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ip summary-address eigrp 209 192.168.0.0/16 95
```

ip tcp path-mtu-discovery

To enable path MTU discovery on an IPv4 or IPv6 interface, use the **ip tcp path-mtu discovery** command. To disable this feature, use the **no** form of this command.

ip ip tcp path-mtu discovery
no ip tcp path-mtu discovery

Syntax Description

This command has no keywords or arguments

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
5.0(2)	Added support for IPv6 path MTU discovery.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to enable path MTU discovery for both IPv4 and IPV6:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip tcp path-mtu-discovery
```

ip unreachables

To enable the generation of Internet Control Message Protocol (ICMP) unreachable messages, use the **ip unreachables** command. To disable this function, use the no form of this command.

ip unreachables
no ip unreachables

Syntax Description

This command has no keywords or arguments.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the ip unreachables command to enable the generation of ICMP unreachable messages on a Layer-3 VLAN interface.

Hosts use maximum transmission unit (MTU) path discovery to find the largest MTU along the path. They do this by setting the DF bit and sending a large packet. If the packet exceeds the physical port or port-channel MTU, the packet is dropped and GIANTS and INPUT DISCARDS are incremented in the **show interface** command output.

By default, a Cisco Nexus 7000 Series switch does not send back an ICMP Unreachable Packet-Too-Big message that notifies the host that the MTU of a packet is too large. The switch silently drops inbound packets that are larger than the physical port, port-channel, or Layer-3 VLAN interface MTU.

If a packet is routed, the Layer-3 VLAN MTU is checked and if the packet is too big, the output of the **show ip traffic** command indicates outfrag fails and packets with DF increments.

The system jumbomtu sets the upper limit for configuration of the MTU on a Cisco Nexus 7000 Series switch and can be seen with the **show run all | include jumbomtu** command.

The **show run all** command shows the default commands. The default MTU for interfaces and physical ports is 1500 bytes (1472 in pings with encapsulation overhead).

This command does not require a license.

Examples

This example shows how to enable the generation of ICMP unreachable messages, as appropriate, on an interface:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip unreachables
```

Related Commands

Command	Description
ip port-unreachable	Sends ICMP port unreachable messages.

ip wccp

To enable a Web Cache Communication Protocol (WCCP) service in a service group, use the **ip wccp** command. To disable the service group, use the **no** form of this command.

ip wccp { *service-number* | **web-cache** [{**hia-timeout timeout** *seconds* | **mode** {**open** [**redirect-list** *access-list*] | **closed service-list** *service-access-list*}}] [**password** [**0-7**] *password*]}
noip wccp { *service-number* | **web-cache** [{**hia-timeout timeout** *seconds* | **mode** {**open** [**redirect-list** *access-list*] | **closed service-list** *service-access-list*}}] [**password** [**0-7**] *password*]}

Syntax Description

service-number	Dynamic service identifier. The *service-number* range is from 1 to 255.
web-cache	Specifies the web-cache well-known service.
hia-timeout	(Optional) Specifies the service group timeout.
timeout*seconds*	Timeout in seconds. The range is from 2 to 15 seconds.
mode	(Optional) Configures a a route tag value for local or direct routes.
open	Identifies the service as open.
redirect-list *access-list*	(Optional) Specifies the access list that controls traffic redirected to this service group. The *access-list* can be any case-sensitive, alphanumeric string up to 64 characters.
closed service-list *service-access-list*	(Optional) Identifies the service as closed. The service list identifies a named IP access list that defines the packets that match the service. The *service-access-list* can be any case-sensitive, alphanumeric string up to 64 characters.
password [**0-7**]	(Optional) Configures the message digest algorithm 5 (MD5) authentication for messages received from the service group. WCCP discards messages that are not accepted by the authentication. The encryption type can be any value between 0 and 7 (inclusive), where 0 is unencrypted and 7 indicates proprietary encryption.
password	MD5 password. The *password* can be any case-sensitive, alphanumeric string up to eight characters.

Command Default

None

Command Modes

Global configuration

VRF configuration

Command History

Release	Modification
5.1(1)	Added the hia-timeout keyword to the syntax description.

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

The **redirect-list** keyword instructs the router to use an access list to control the traffic that is redirected to the cache engines of the service group. The *access list* specifies the traffic that is permitted to be redirected. The default is to redirect TCP traffic.

Use the **service-list** keyword only for closed mode services. When a WCCP service is closed, WCCP discards packets that do not have a client application registered to receive the traffic. Use the **service-list** keyword and *service-access-list* argument to register an application protocol type or port number.

The password can be up to seven characters. When you designate a password, the messages that are not accepted by the authentication are discarded. The password name is combined with the HMAC MD5 value to create a secure connection between the router and the cache engine.

Use **password 0** *pwstring* to store the password in clear text. Use **password 7** *pwstring* to store the password in encrypted form. You can use the **password 7** keywords for an already encrypted password.

If you set the timer to 2 seconds and the timeout occurs at 10 seconds then at every 5 second interval, the service is lost due to the removal query.

Wildcard masks are not supported for the WCCPv2 redirect list.

Note You must enter the **ip wccp** command with all your required parameters. Any subsequent entry of the **ip wccp** command overwrites the earlier configuration.

This command does not require a license.

Examples

This example shows how to configure a service group timeout in seconds:

```
switch# configure terminal
switch(config)# ip wccp 23 hia-timeout 14
switch(config)#
```

This example shows how to configure a router to redirect web-related packets without a destination of 10.168.196.51 to the web cache:

```
switch# configure terminal
switch(config)# access-list 100
switch(config-acl)# permit ip any any
switch(config-acl)# exit
switch(config)# ip wccp web-cache redirect-list 100
switch(config)# interface ethernet 2/1
switch(config-if)# ip wccp web-cache redirect out
```

This example shows how to configure a closed WCCP service:

```
switch# configure terminal
switch(config)# ip wccp 99 service-list access1 mode closed
```

Related Commands

Command	Description
feature wccp	Enables the WCCP feature.

Command	Description
show ip wccp	Displays the status of the WCCP service group.

ip wccp redirect

To redirect a packet on an outbound or inbound interface using the Web Cache Communication Protocol (WCCP), use the **ip wccp redirect** command. To disable WCCP redirection, use the **no** form of this command.

ip wccp {*service-number* | **web-cache**} **redirect** {**in** | **out**}
no ip wccp {*service-number* | **web-cache**} **redirect** {**in** | **out**}

Syntax Description

service-number	Dynamic service identifier. The *service-number* range is from 1 to 255.
web-cache	Specifies the web-cache well-known service.
in	Redirects a packet on an inbound interface.
out	Redirects a packet on an outbound interface.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

WCCPv2 is only supported on Layer 3 interfaces, including Layer 3 subinterfaces, VLAN interfaces, Layer 3 and port channels.

Use the **ip wccp redirect in** command to configure WCCP redirection on an interface that receives inbound network traffic. When you configure the command on an interface, all packets that arrive at that interface are compared against the criteria defined by the specified WCCP service. If the packets match the criteria, they are redirected.

Use the **ip wccp redirect out** command to configure the WCCP redirection check at an outbound interface.

You can also include a redirect list when you configure a service group. The redirect list allows you to deny packets with a NAT (source) IP address and prevent redirection. See the **ip wccp** command for information about configuring the redirect list and service group.

To prevent redirection of any packets from the cache engine, use the **ip wccp redirect exclude in** command on the router interface that faces the cache engine.

Note Do not use the **ip wccp redirect** {**in** | **out**} command and the **ip wccp redirect exclude in** command on the same interface. The **ip wccp redirect exclude in** command overrides the **ip wccp redirect** {**in** | **out**} command.

This command does not require a license.

Examples

This example shows how to configure a session in which WCCP redirects outgoing packets on Ethernet interface 2/2 to a cache engine:

```
switch# configure terminal
switch(config)# ip wccp 99
switch(config)# interface ethernet 2/2
switch(config-if)# ip wccp 99 redirect out
```

This example shows how to configure a session in which HTTP traffic arriving on Ethernet interface 2/1 is redirected to a cache engine:

```
switch# configure terminal
switch(config)# ip wccp web-cache
switch(config)# interface ethernet 0/1
switch(config-if)# ip wccp web-cache redirect in
```

Related Commands

Command	Description
feature wccp	Enables the WCCP feature.
ip wccp redirect exclude in	Excludes WCCP redirection on an interface.
show ip wccp	Displays the status of the WCCP service group.

ip wccp redirect exclude in

To exclude inbound packets on an interface from Web Cache Communication Protocol (WCCP) redirection checks, use the **ip wccp redirect exclude** in command. To disable the ability of a router to exclude packets from redirection checks, use the **no** form of this command.

ip wccp redirect exclude in
no ip wccp redirect exclude in

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **ip wccp redirect exclude in** command to exclude inbound packets on an interface from any redirection check that may occur at the outbound interface. This command is affects all the services and should be applied to any inbound interface that will be excluded from redirection.

Note Do not use the **ip wccp redirect** {**in** | **out**} command and the **ip wccp redirect exclude in** command on the same interface. The **ip wccp redirect exclude in** command overrides the **ip wccp redirect** {**in** | **out**} command.

This command does not require a license.

Examples

This example shows how to exclude packets that arrive on Ethernet interface 2/1 from all WCCP redirection checks:

```
switch# configure terminal
switch(config)# interface ethernet 2/2
switch(config-if)# ip wccp redirect exclude in
```

Related Commands

Command	Description
feature wccp	Enables the WCCP feature.
ip wccp redirect	Configures WCCP redirection on an interface.
show ip wccp	Displays the status of the WCCP service group.

ipv4 local policy route-map

To configure IPv4 local policy route maps for packets generated by the device, use the **ipv4 local policy route-map** command.

ipv4 local policy route-map *map-name*

Syntax Description

map-name	Map name. The *map-name*string can be up to 63 alphanumeric characters.

Command Default

None

Command Modes

Global configuration mode

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 configure IPv4 local policy route maps for packets generated by the device:

```
switch# configure terminal
switch(config)# ip local policy route-map pbr-src-90
switch(config)#
```

Related Commands

Command	Description
ipv6 local policy route-map	Configures IPv6 local policy route maps for packets generated by the device.

ipv6 address

To configure an IPv6 address on an interface, use the **ipv6 address** command. To remove the address, use the **no** form of this command.

ipv6 address {*addr* [**eui64**] [**route-preference** *preference*] [**secondary**] **tag** *tag-id* | **use-link-local-only**} **noipv6 address** {*addr* [**eui64**] [**route-preference** *preference*] [**secondary**] **tag** *tag-id* | **use-link-local-only**}

Syntax Description

addr	IPv6 address. The format is A:B::C:D/length. The length range is 1 to 128.
eui64	(Optional) Configures the Extended Unique Identifier (EUI64) for the low-order 64 bits of the address.
route-preference*preference*	(Optional) Sets the route preference for local or direct routes. The range is from 0 to 255.
secondary	(Optional) Creates a secondary IPv6 address.
tag*tag-id*	(Optional) Configures a a route tag value for local or direct routes.
use-link-local-only	Specifies IPv6 on the interface using only a single link-local.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	Added **tag** keyword.

Usage Guidelines

Use the **ipv6 address** command to configure an IPv6 address or secondary address on an interface.

This command does not require a license.

Examples

This example shows how to configure an IPv6 address:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 address 2001:0DB8::3/48
```

Related Commands

Command	Description
ip address	Configures an IPv4 address on an interface.

ipv6 authentication key-chain eigrp

To enable authentication for the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 packets and to specify the set of keys that can be used on an interface, use the **ipv6 authentication key-chain eigrp** command. To prevent authentication, use the **no** form of this command.

ipv6 authentication key-chain eigrp *instance-tag name-of-chain*
no ipv6 authentication key-chain eigrp *instance-tag name-of-chain*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
name-of-chain	Name of a key chain. The key chain name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

No authentication is provided for EIGRP packets.

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

You must set the authentication mode using the **ipv6 authentication mode eigrp** command in interface configuration mode. You must separately configure a key chain using the **key-chain** command to complete the authentication configuration for an interface.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the interface to accept and send any key that belongs to the key-chain trees:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 1/2
switch(config-if)# ipv6 authentication key-chain eigrp 209 trees
```

Related Commands

Command	Description
ipv6 authentication mode eigrp	Sets the authentication mode for EIGRP for an IPv6 interface.
key-chain	Creates a set of keys that can be used by an authentication method.

ipv6 authentication mode eigrp

To specify the type of authentication used in the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 packets, use the **ipv6 authentication mode** eigrp command. To remove authentication, use the **no** form of this command.

ipv6 authentication mode eigrp *instance-tag* **md5**
no ipv6 authentication mode eigrp *instance-tag* **md5**

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
md5	Specifies Message Digest 5 (MD5) authentication.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to configure the interface to use MD5 authentication:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 1/2
switch(config-if)# ipv6 authentication mode eigrp 209 md5
```

Related Commands

Command	Description
authentication mode (EIGRP)	Configures the authentication mode for EIGRP in address-family mode.
iv6p authentication key-chain eigrp	Enables authentication for EIGRP and specifies the set of keys that can be used on an interface.
key chain	Creates a set of keys that can be used by an authentication method.

ipv6 bandwidth eigrp

To configure the bandwidth metric on an Enhanced Interior Gateway Routing Protocol (EIGRP) for the IPv6 interface, use the **ipv6 bandwidth eigrp** command. To restore the default, use the **no** form of this command.

ipv6 bandwidth eigrp *instance-tag bandwidth*
no ipv6 bandwidth eigrp

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
bandwidth	Bandwidth value. The range is from 1 to 2,560,000,000 kilobits.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to configure EIGRP to use a bandwidth metric of 10000 in autonomous system 209:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ipv6 bandwidth eigrp 209 10000
```

Related Commands

Command	Description
ipv6 bandwidth-percent eigrp	Sets the percent of the interface bandwidth that EIGRP can use.

ipv6 bandwidth-percent eigrp

To configure the percentage of bandwidth that may be used by the Enhanced Interior Gateway Routing Protocol (EIGRP) for an IPv6 interface, use the **ipv6 bandwidth-percent eigrp** command. To restore the default, use the **no** form of this command.

ipv6 bandwidth-percent eigrp *instance-tag percent*
no ipv6 bandwidth-percent eigrp

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
percent	Percentage of bandwidth that EIGRP may use.

Command Default

percent: 50

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

EIGRP uses up to 50 percent of the bandwidth of a link, as defined by the **ip bandwidth** interface configuration command. Use the **ip bandwidth-percent** command to change this default percent.

This command requires the Enterprise Services license.

Examples

This example shows how to configure EIGRP to use up to 75 percent of an interface in autonomous system 209:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ipv6 bandwidth-percent eigrp 209 75
```

Related Commands

Command	Description
ipv6 bandwidth eigrp	Sets the EIGRP bandwidth value for an interface.

ipv6 delay eigrp

To configure the throughput delay for the Enhanced Interior Gateway Routing Protocol (EIGRP) for an IPv6 interface, use the **ipv6 delay eigrp** command. To restore the default, use the **no** form of this command.

ipv6 delay eigrp *instance-tag seconds*
no ipv6 delay eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
seconds	Throughput delay, in tens of microseconds. The range is from 1 to 16777215.

Command Default

100 (10-microsecond units)

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

You configure the throughput delay on an interface in 10-microsecond units. For example, if you set the **ipv6 delay eigrp** command to 100, the throughput delay is 1000 microseconds.

This command requires the Enterprise Services license.

Examples

This example shows how to set the delay to 400 microseconds for the interface:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# interface ethernet 2/1
switch(config-if)# ipv6 delay eigrp 1 40
```

Related Commands

Command	Description
ipv6 hello-interval eigrp	Configures the hello interval on an interface for the EIGRP routing process that is designated by an autonomous system number.

ipv6 distribute-list eigrp

To configure a distribution list for the Enhanced Interior Gateway Routing Protocol (EIGRP) for an IPv6 interface, use the **ipv6 distribute-list eigrp** command. To restore the default, use the **no** form of this command.

ipv6 distribute-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**}
no ipv6 distribute-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**}

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
prefix-list *list-name*	Specifies the name of an IPv6 prefix list to filter EIGRP routes.
route-map *map-name*	Specifies the name of a route map to filter EIGRP routes.
in	Applies the route policy to incoming routes.
out	Applies the route policy to outgoing routes.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **ipv6 distribute-list eigrp** command to configure a route filter policy on an interface. You must configure the named route map or prefix list to complete this configuration.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a route map for all EIGRP routes coming into the interface:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ipv6 distribute-list eigrp 209 route-map InputFilter in
```

Related Commands

Command	Description
prefix-list	Configures a prefix list.
route-map	Configures a route map.

ipv6 eigrp shutdown

To shut down the Enhanced Interior Gateway Routing Protocol (EIGRP) for an IPv6 interface, use the **ipv6 eigrp shutdown** command. To restore the default, use the **no** form of this command.

ipv6 eigrp *instance-tag* **shutdown**
no ipv6 eigrp *instance-tag* **shutdown**

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to disable EIGRP on an interface:

```
switch# configure terminal
switch(config)# router eigrp 201
switch(config-router)# interface ethernet 2/1
switch(config-if)# ipv6 eigrp 201 shutdown
```

Related Commands

Command	Description
router eigrp	Configures an instance of EIGRP.

ipv6 hello-interval eigrp

To configure the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 hello interval for an interface, use the **ipv6 hello-interval eigrp** command. To restore the default, use the **no** form of this command.

ipv6 hello-interval eigrp *instance-tag seconds*
no ipv6 hello-interval eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
seconds	Hello interval (in seconds). The range is from 1 to 65535.

Command Default

5 seconds

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to set the hello interval to 10 seconds for the interface:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# interface ethernet 2/1
switch(config-if)# ipv6 hello-interval eigrp 1 10
```

ipv6 hold-time eigrp

To configure the hold time for an Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 interface, use the **ipv6 hold-time eigrp** command. To restore the default, use the **no** form of this command.

ipv6 hold-time eigrp *instance-tag seconds*
no ipv6 hold-time eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
seconds	Hold time (in seconds). The range is from 1 to 65535.

Command Default

15 seconds

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **ipv6 hold-time eigrp** command to increase the default hold time on very congested and large networks.

We recommend that you configure the hold time to be at least three times the hello interval. If a router does not receive a hello packet within the specified hold time, routes through this router are considered unavailable.

Increasing the hold time delays route convergence across the network.

This command requires the Enterprise Services license.

Examples

This example shows how to set the hold time to 40 seconds for the interface:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ipv6 hold-time eigrp 209 40
```

Related Commands

Command	Description
ipv6 hello-interval eigrp	Configures the hello interval on an interface for the EIGRP routing process designated by an autonomous system number.

ipv6 host

To define static hostname-to-address mappings in the Domain Name System (DNS) hostname cache, use the **ipv6 host** command. To remove a hostname-to-address mapping, use the **no** form of this command.

ipv6 host *name address1* [*address2 ... address6*]
no ipv6 host *name address1* [*address2 ... address6*]

Syntax Description

name	Hostname. The *name* can be any case-sensitive, alphanumeric string up to 80 characters.
address1	IPv6 address in the A:B::C:D format.
address2 ...address6	(Optional) Up to five additional IPv6 addresses in the A:B::C:D format.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **ipv6 host** command to add a static hostname to DNS.

This command does not require a license.

Examples

This example shows how to configure a static hostname:

```
switch# configure terminal
switch(config)# ipv6 host mycompany.com 2001:0DB8::4
```

Related Commands

Command	Description
ip host	Configures a static hostname.

ipv6 local policy route-map

To configure IPv6 local policy route maps for packets generated by the device, use the **ipv6 local policy route-map** command.

ipv6 local policy route-map *map-name*

Syntax Description

map-name	Map name. The *map-name*string can be up to 63 alphanumeric characters.

Command Default

None

Command Modes

Global configuration mode

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 configure IPv6 local policy route maps for packets generated by the device:

```
switch# configure terminal
switch(config)# ip local policy route-map pbr-src-90
switch(config)#
```

Related Commands

Command	Description
ipv4 local policy route-map	Configures IPv4 local policy route maps for packets generated by the device.

ipv6 nd cache limit

To configure the maximum number of entries in the neighbor adjacency table, use the **ipv6 nd cache limit** command.

ipv6 nd cache limit *max-nd-adj* [**syslog** *syslogs-per-second*]

Syntax Description

max-nd-adj	Maximum number of entries in the neighbor adjacency table. The range is from 1 to 409600.
syslog	(Optional) Specifies syslog messages.
syslogs-per-second	Number of system logs per second. The range is from 1 to 1000.

Command Default

None

Command Modes

Global Configuration mode

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 configure the maximum number of entries in the neighbor adjacency table:

```
switch# configure terminal
switch(config-if)# interface ethernet 2/1
switch(config-if)# ipv6 nd cache 1000 syslog 100
switch(config)#
```

Related Commands

Command	Description
ipv6 nd dad attempts	Sets the number of consecutive neighbor solicitation messages that the device sends from the IPv6 interface for duplicate address detection (DAD) validation.
ipv6 nd fast-path	Improves the performance of glean packets by reducing the processing of the packets in the supervisor.

ipv6 nd dad attempts

To set the number of consecutive neighbor solicitation messages that the device sends from the IPv6 interface for the duplicate address detection (DAD) validation, use the **ipv6 nd dad attempts** command.

ipv6 nd dad attempts *number*

Syntax Description

number	Number of attempts.

Command Default

1

Command Modes

Interface configuration mode

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 set the number of consecutive neighbor solicitation messages that the device sends from the IPv6 interface for the DAD validation:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 nd dad attempts 3
switch(config-if)#
```

Related Commands

Command	Description
ipv6 nd cache limit	Configures the maximum number of entries in the neighbor adjacency table.
ipv6 nd fast-path	Improves the performance of glean packets by reducing the processing of the packets in the supervisor.

ipv6 nd fast-path

To improve the performance of glean packets by reducing the processing of the packets in the supervisor, use the **ipv6 nd fast-path** command. To remove the fast path configuration, use the no form of this command.

ipv6 nd fast-path
no ipv6 nd fast-path

Syntax Description

This command has no arguments or keywords.

Command Default

Enabled

Command Modes

config-router-neighbor-af mode

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 improve the performance of glean packets by reducing the processing of the packets in the supervisor:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 nd fast-path
switch(config-if)#
```

This example shows how to delete the fast path configuration:

```
switch(config-if)# no ipv6 nd fast-path
```

Related Commands

Command	Description
ipv6 nd dad attempts	Sets the number of consecutive neighbor solicitation messages that the device sends from the IPv6 interface for duplicate address detection (DAD) validation.

ipv6 nd hop-limit

To advertise the hop limit in IPv6 neighbor discovery packets, use the **ipv6 nd hop-limit** command. To return to default, use the **no** form of this command.

ipv6 nd hop-limit *hop-limit*
no ipv6 nd hop-limit *[hop-limit]*

Syntax Description

hop-limit	Hop limit in IPv6 header. The range is from 0 to 255.

Command Default

64

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure the IPv6 hop limit:

```
switch# configure terminal
switch(config)#interface ethernet 2/1
switch(config-if)# ipv6 nd hop-limit 55
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 nd mac-extract

To enable any next hop that matches the IPv6 prefix on that interface to be treated as a MAC Embedded IPv6 (MEv6) address, use the **ipv6 nd mac-extract** command. To disable this function, use the **no** form of this command.

ipv6 nd mac-extract
no ipv6 nd mac-extract

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modification
6.2(8)	This command was introduced.

Usage Guidelines

Beginning with Cisco NX-OS Release 6.2(8), BGP supports RFC 5549 which allows an IPv4 prefix to be carried over an IPv6 next hop.

The IPv6 next hop is leveraged to remove neighbor discover (ND) related traffic from the network by embedding the MAC address directly in the global IPv6 next-hop address. This address is called a MAC Embedded IPv6 (MEv6) address. The router extracts the MAC address directly from the MEv6 address instead of through ND.

This command requires the Enterprise Services license.

Examples

This example shows how to configure an IPv4 route over an IPv6 next-hop:

```
switch# configure terminal
switch(config)# interface ethernet 0/1
switch(config-if)# mac-address mac3
switch(config-if)# ipv6 address ABCD:1::/64 eui-64
switch(config-if)# ipv6 nd mac-extract
switch(config-if)# ip forward
switch(config)# interface ethernet 0/2
switch(config-if)# ipv6 address ABCF:1::3/64
switch(config-if)# ip forward
```

Related Commands

Command	Description
ip forward	Allows IPv4 traffic on an interface even when there is no IP address configuration on that interface.

ipv6 nd managed-config-flag

To advertise in ICMPv6 Router-Advertisement messages to use stateful address auto-configuration to obtain address information, use the **ipv6 nd managed-config-flag** command. To revert to default, use the **no** form of this command.

ipv6 nd managed-config-flag
no ipv6 nd managed-config-flag

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to advertise in ICMPv6 Router-Advertisement messages to use stateful address auto-configuration to obtain address information:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 nd managed-config-flag
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 nd mtu

To advertise the Maximum Transmission Unit (MTU) in ICMPv6 Router-Advertisement messages on this link, use the **ipv6 nd mtu** command. To revert to default, use the **no** form of this command.

ipv6 nd mtu *mtu*
no ipv6 nd mtu *[mtu]*

Syntax Description

mtu	MTU in bytes. The range is from 1280 to 65535.

Command Default

1500

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure the MTU value to advertise on a link:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 nd mtu 1280
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 nd ns-interval

To configure the retransmission interval between IPv6 neighbor solicitation messages, use the **ipv6 nd ns-interval** command. To revert to default, use the **no** form of this command.

ipv6 nd ns-interval *interval*
no ipv6 nd ns-interval *[interval]*

Syntax Description

interval	Interval in milliseconds. The range is from 1000 to 3600000.

Command Default

1000

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure the neighbor solicitation interval:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 nd ns-interval 1280
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 nd other-config-flag

To indicate in ICMPv6 router advertisement messages that hosts use stateful auto configuration to obtain nonaddress related information, use the **ipv6 nd other-config-flag** command. To revert to the default, use the **no** form of this command.

ipv6 nd other-config-flag
no ipv6 nd other-config-flag

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure stateful autoconfiguration in ICMPv6 router advertisement messages:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 nd other-config-flag
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 nd prefix

To advertise the IPv6 prefix in the router advertisement messages, use the **ipv6 nd prefix** command. To revert to the default, use the **no** form of this command.

ipv6 nd prefix {*ipv6-address*/*prefix-length* | **default**} {*valid-lifetime* | **infinite** | **no-advertise**} {*preferred-lifetime* | **infinite**} [**no-autoconfig**] [**no-onlink**] [**off-link**]
no ipv6 nd prefix {*ipv6-address* | **default**}

Command Default

ipv6-address	IPv6 prefix.
prefix-length	Length of the IPv6 prefix. A decimal value that indicates how many of the high-order contiguous bits of the address comprise the prefix (the network portion of the address). A slash mark must precede the decimal value.
default	Specifies that default values are used.
valid-lifetime	Amount of time (in seconds) that the specified IPv6 prefix is advertised as being valid. The range is from 0 to 4294967295.
infinite	Specifies that the valid lifetime is infinite.
no-advertise	Specifies that the prefix is not advertised.
preferred-lifetime	Amount of time (in seconds) that the specified IPv6 prefix is advertised as being preferred. The range is from 0 to 4294967295.
no-autoconfig	(Optional) Indicates to hosts on the local link that the specified prefix cannot be used for IPv6 autoconfiguration. The prefix is advertised with the A-bit clear.
no-onlink	(Optional) Configures the specified prefix as not on-link. The prefix is advertised with the L-bit clear.
off-link	(Optional) Configures the specified prefix as off-link. The prefix is advertised with the L-bit clear. The prefix is not inserted into the routing table as a connected prefix. If the prefix is already present in the routing table as a connected prefix (for example, because the prefix was also configured using the **ipv6 address** command), it will be removed.

Command Default

All prefixes are advertised as an autoconfiguration prefix (for example, the A-bit is set in the advertisement).

Command Modes

Interface configuration

Command History

Release	Modification
6.2(8)	The no-autoconfig keyword was added.
5.2(1)	This command was introduced.

Usage Guidelines

This command allows control over the individual parameters per prefix, including whether the prefix should be advertised.

By default, prefixes configured as addresses on an interface using the ipv6 address command are advertised in router advertisements. If you configure prefixes for advertisement using the ipv6 nd prefix command, only these prefixes are advertised.

Default Parameters

The default keyword can be used to set default parameters for all prefixes.

Prefix Lifetime and Expiration

A date can be set to specify the expiration of a prefix. The valid and preferred lifetimes are counted down in real time. When the expiration date is reached, the prefix is no longer advertised.

On-Link

When on-link is on (by default), the specified prefix is assigned to the link. Nodes sending traffic to such addresses that contain the specified prefix consider the destination to be locally reachable on the link. When autoconfiguration is on (the default), it indicates to hosts on the local link that the specified prefix can be used for IPv6 autoconfiguration.

The configuration options affect the L-bit and A-bit settings associated with the prefix in the IPv6 neighbor discovery (ND) router advertisement, and presence of the prefix in the routing table, as follows:

- Default L=1 A=1 In Routing Table
- no-onlink L=0 A=1 In Routing Table
- no-autoconfig L=1 A=0 In Routing Table
- no-onlink no-autoconfig L=0 A=0 In Routing Table
- off-link L=0 A=1 Not in Routing Table
- off-link no-autoconfig L=0 A=0 Not in Routing Table

This command does not require a license.

Examples

This example shows how to include the IPv6 prefix 2001:0DB8::/35 in router advertisements sent out Ethernet interface 0/0 with a valid lifetime of 1000 seconds and a preferred lifetime of 900 seconds:

```
switch# configure terminal
switch(config)# interface ethernet 0/0
switch(config-if)# ipv6 nd prefix 2001:0DB8::/35 1000 900
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 nd ra-interval

To configure the interval between sending ICMPv6 router advertisement messages, use the **ipv6 nd ra-interval** command. To revert to default, use the **no** form of this command.

ipv6 nd ra-interval *interval*
no ipv6 nd ra-interval *[interval]*

Syntax Description

interval	Interval between sending router advertisement messages in seconds. The range is from 4 to 1800.

Command Default

600

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure the ICMPv6 router advertisement message interval:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 nd ra-interval 500
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 nd ra-lifetime

To advertise the router lifetime of a default router in ICMPv6 router advertisement messages, use the **ipv6 nd ra-lifetime** command. To revert to the default, use the **no** form of this command.

ipv6 nd ra-lifetime *lifetime*
no ipv6 nd ra-lifetime *[lifetime]*

Syntax Description

lifetime	Lifetime in seconds. The range is from 0 to 9000. If 0, this router will not be the default router.

Command Default

Three times the router advertisement interval.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure the ICMPv6 router advertisement message lifetime:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 nd ra-lifetime 1500
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 nd reachable-time

To advertise the time when a node considers a neighbor up after receiving a reachability confirmation in ICMPv6 router advertisement messages, use the **ipv6 nd reachable-time** command. To revert to the default, use the **no** form of this command.

ipv6 nd reachable-time *time*
no ipv6 nd reachable-time *[time]*

Syntax Description

lifetime	Lifetime in seconds. The range is from 0 to 9000. If 0, this router will not be the default router.

Command Default

0

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure the ICMPv6 router advertisement reachability time:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 nd reachable-time 1500
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 nd redirects

To enable sending ICMPv6 redirect messages, use the **ipv6 redirects** command. To revert to the default, use the **no** form of this command.

ipv6 nd redirects
no ipv6 nd redirects

Syntax Description

This command has no keywords or arguments.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to disable the ICMPv6 router advertisement messages:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)#ipv6 nd redirects
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 nd retrans-timer

To advertise the time between neighbor solicitation (NS) messages in ICMPv6 router advertisement messages, use the **ipv6 nd retrans-timer** command. To revert to the default, use the **no** form of this command.

ipv6 nd retrans-timer *time*
no ipv6 nd retrans-timer *[time]*

Syntax Description

lifetime	Lifetime in seconds. The range is from 0 to 9000. If 0, this router will not be the default router.

Command Default

0

Command Modes

if-igp configuration (config-xxx)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure the ICMPv6 router advertisement reachability time:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 nd retrans-timer
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 nd suppress-ra

To disable sending ICMPv6 router advertisement messages, use the **ipv6 nd suppress-ra** command. To revert to default, use the **no** form of this command.

ipv6 nd suppress-ra
no ipv6 nd suppress-ra

Syntax Description

This command has no keywords or arguments.

Command Default

Enabled

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to disable the ICMPv6 router advertisement messages:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 nd suppress-ra
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

ipv6 neighbor

To configure a static entry in the IPv6 neighbor discovery cache, use the **ipv6 neighbor** command. To remove a static IPv6 entry from the IPv6 neighbor discovery cache, use the **no** form of this command.

ipv6 neighbor *pv6-address interface-type interface-number hardware-address*
no ipv6 neighbor *ipv6-address interface-type interface-number hardware-address*

Syntax Description

ipv6-address	IPv6 address that corresponds to the local data-link address. This argument must be in the form documented in RFC 2373 where the address is specified in hexadecimal using 16-bit values between colons.
interface-type	Interface type. For supported interface types, use the question mark (?) online help function.
interface-number	Interface number.
hardware-address	Local data-link address (a 48-bit address).

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ipv6 neighbor** command to create a static entry. If an entry for the specified IPv6 address already exists in the neighbor discovery cache—learned through the IPv6 neighbor discovery process—the entry is automatically converted to a static entry.

Use the **show ipv6 neighbors** command to view static entries in the IPv6 neighbor discovery cache. A static entry in the IPv6 neighbor discovery cache can have one of the following states:

- INCMP (Incomplete)—The interface for this entry is down.
- REACH (Reachable)—The interface for this entry is up.

Note Reachability detection is not applied to static entries in the IPv6 neighbor discovery cache; therefore, the descriptions for the INCMP and REACH states are different for dynamic and static cache entries. See the show ipv6 neighbors command for descriptions of the INCMP and REACH states for dynamic cache entries.

The **clear ipv6 neighbors** command deletes all entries in the IPv6 neighbor discovery cache, except static entries. The **no ipv6 neighbor** command deletes a specified static entry from the neighbor discovery cache; the command does not remove dynamic entries—learned from the IPv6 neighbor discovery process—from the cache. Disabling IPv6 on an interface by using the **no ipv6 enable** command or the **no ipv6 unnumbered**

command deletes all IPv6 neighbor discovery cache entries configured for that interface, except static entries (the state of the entry changes to INCMP).

Static entries in the IPv6 neighbor discovery cache are not modified by the neighbor discovery process.

Examples

This example configures a static entry in the IPv6 neighbor discovery cache for a neighbor with the IPv6 address 2001:0DB8::45A and link-layer address 0002.7D1A.9472 on Ethernet interface 2/1:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 neighbor 2001:0DB8::45A ethernet 2/10002.7D1A.9472
```

ipv6 next-hop-self eigrp

To instruct the Enhanced Interior Gateway Routing Protocol (EIGRP) for an IPv6 process to use the local IPv6 address as the next-hop address when advertising these routes, use the **next-hop-self eigrp** command. To use the received next-hop value, use the **no** form of this command.

ipv6 next-hop-self eigrp *instance-tag*
no ipv6 next-hop-self eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

EIGRP always sets the IPv6 next-hop value to be itself.

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

EIGRP, by default, sets the IPv6 next-hop value to be itself for routes that it is advertising, even when advertising those routes on the same interface from which the router learned them. To change this default, you must use the **no ipv6 next-hop-self eigrp** interface configuration command to instruct EIGRP to use the received next-hop value when advertising these routes.

Examples

This example shows how to change the default IPv6 next-hop value and instruct EIGRP to use the received next-hop value:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-eigrp-af-if)# no ipv6 next-hop-self eigrp 209
```

ipv6 offset-list eigrp

To configure an offset list for the Enhanced Interior Gateway Routing Protocol (EIGRP) for an IPv6 interface, use the **ipv6 offset-list eigrp** command. To restore the default, use the **no** form of this command.

ipv6 offset-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**} *offset*
no ipv6 offset-list eigrp *instance-tag* {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**} *offset*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
prefix-list *list-name*	Specifies the name of an IPv6 prefix list to filter EIGRP routes.
route-map *map-name*	Specifies the name of a route map to filter EIGRP routes.
in	Applies a route policy to incoming routes.
out	Applies a route policy to outgoing routes.
offset	Value to add to the EIGRP metric.

Command Default

This command has no defaults.

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **ipv6 offset-list eigrp** command to influence which route is advertised on an interface. Cisco NX-OS adds the configured offset value to any routes that match the configure prefix list or route map. You must configure the named route map or prefix list to complete this configuration.

This command requires the Enterprise Services license.

Examples

This example shows how to configure an offset list filter to add 20 to the metric for EIGRP routes coming into the interface that match the route map OffsetFilter:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ipv6 offset-list eigrp 209 route-map OffsetFilter in 20
```

Related Commands

Command	Description
prefix-list	Configures a prefix list.
route-map	Configures a route map.

ipv6 passive-interface eigrp

To suppress all routing updates on an Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 interface, use the **ipv6 passive-interface eigrp** command. To reenable the sending of routing updates, use the **no** form of this command.

ipv6 passive-interface eigrp *instance-tag*
no ipv6 passive-interface eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

Routing updates are sent on the interface.

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **ipv6 passive-interface eigrp** command to stop all routing updates on an interface and suppress the formation of EIGRP adjacencies.

This command requires the Enterprise Services license.

Examples

This example shows how to stop EIGRP routing updates on Ethernet 2/1:

```
switch# configure terminal
switch(config)# router eigrp 201
switch(config-router)# interface ethernet 2/1
switch(config-if)# ipv6 passive-interface eigrp 201
```

ipv6 policy route-map

To identify a route map to use for policy routing on an interface, use the **ipv6 policy route-map** command. To remove the route map, use the **no** form of this command.

ipv6 policy route-map *name*
no ipv6 policy route-map [*name*]

Syntax Description

name	Name of the route map. The name can be any alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **iv6 policy route-map** command to identify a route map to use for policy routing on an IPv6 interface. Use the **route-map** command to create the rout map. 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 is allowed for the interface, based on the destination IPv6 address of the packet. The **set** commands specify the set actions—the particular policy routing actions to perform if the criteria enforced by the **match** commands are met. The **no ipv6 policy route-map** command deletes the pointer to the route map.

You can perform policy-based routing on any match criteria that can be defined in an IPv6 access list when using the **match ipv6 address** command and referencing an IPv6 access list.

You must enable policy-based routing with the **feature pbr** command before you can use the **ipv6 policy route-map** command.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a policy-based route map to an interface:

```
switch# configure terminal
switch(config)# feature pbr
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 policy route-map policymap
```

Related Commands

Command	Description
feature pbr	Enabled the policy-based routing feature.
route-map	Creates a route map.
show route-map pbr-statistics	Displays statistics about policy-based route maps
show ipv6 policy	Displays information about IPv6 policies

ipv6 prefix-list

To create a prefix list to match IPv6 packets or routes again, use the **ipv6 prefix-list** command. To remove the prefix-list, use the **no** form of this command.

ipv6 prefix-list *name* [**seq** *number*] {**permit** | **deny**} *prefix* [{**eq** *length* | [**ge** *length*] [**le** *length*]}]
no ipv6 prefix-list name [**seq** *number*] {**permit** | **deny**} *prefix* [{**eq** *length* | [**ge** *length*] [*le length*]}]

Syntax Description

name	IPv6 prefix list name. The name can be any alphanumeric string up to 63 characters.
seq*number*	(Optional) Specifies the sequence number to order entries in the prefix list. The range is from 1 to 4294967294.
permit	Allows routes or IP packets that match the prefix list.
deny	Rejects routes or IP packets that match the prefix list.
prefix	IP prefix in A:B::C:D/length format.
eq *length*	(Optional) Specifies the exact prefix length to match. The range is from 1 to 128.
ge *length*	(Optional) Specifies the maximum prefix length to match. The range is from 1 to 128.
le *length*	(Optional) Specifies the minimum prefix length to match. The range is from 1 to 128.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ipv6 prefix-list** command to configure IPv6 prefix filtering. You configure prefix lists with permit or deny keywords to either permit or deny the prefix based on the matching condition. A prefix list consists of an IPv6 address and a bit mask. The bit mask is entered as a number from 1 to 128. An implicit deny is applied to traffic that does not match any prefix-list entry.

You can configure prefix lists to match an exact prefix length or a prefix range. Use the **ge** and **le** keywords to specify a range of the prefix lengths to match, providing more flexible configuration than can be configured with just the network/length argument. Cisco NX-OS processes the prefix list using an exact match when you do not configure either the **ge** nor **le** keyword. If you configure both the **ge** *length* and **le** *length* keywords and arguments, the allowed prefix length range falls between the values used for the ge-length and le-length arguments. The following formula shows this behavior:

network/length < ge ge-length < le le-length <= 32

If you do not configure a sequence number, Cisco NX-OS applies a a default sequence number of 5 to the prefix list, and subsequent prefix list entries will be increment by 5 (for example, 5, 10, 15, and onwards). If you configure a sequence number for the first prefix list entry but not subsequent entries, then Cisco NX-OS

increments the subsequent entries by 5 (For example, if the first configured sequence number is 3, then subsequent entries will be 8, 13, 18, and onwards). Default sequence numbers can be suppressed by entering the no form of this command with the seq keyword.

Cisco NX-OS evaluates prefix lists starting with the lowest sequence number and continues down the list until a match is made. Once a match is made that covers the network the **permit** or **deny** statement is applied to that network and the rest of the list is not evaluated.

Tip For best performance, the most frequently processed prefix list statements should be configured with the lowest sequence numbers. The seq number keyword and argument can be used for resequencing.

The prefix list is applied to inbound or outbound updates for specific peer by entering the **prefix-list** command in neighbor address-family mode. Prefix list information and counters are displayed in the output of the **show ipv6 prefix-list** command. Prefix-list counters can be reset by entering the **clear ipv6 prefix-list** command.

This command does not require a license.

Examples

This example shows how to configure an IPv6 prefix list and apply it to a BGP peer:

```
switch# configure terminal
switch(config)# ipv6 prefix-list allowprefix 10 permit 2001:0DB8::/48 eq 24
switch(config) router bgp 65536:20
switch(config-router)# neighbor 2001:0DB8::1/64 remote-as 65536:20
switch(config-router-neighbor)# address-family ipv6 unicast
switch(config-router-neighbor-af)# prefix-list allowprefix in
```

Related Commands

Command	Description
clear ip prefix-list	Clears counters for IP prefix lists.
prefix-list	Applies a prefix list to BGP peer.
show ip prefix-list	Displays information about IP prefix lists.

ipv6 prefix-list description

To configure a description string for an IPv6 prefix-list, use the **ipv6 prefix-list description** command. To revert to default, use the **no** form of this command.

ipv6 prefix-list *name* **description** *string*
no ipv6 prefix-list *name* **description**

Syntax Description

name	Name of the prefix list. The name can be any alphanumeric string up to 63 characters.
string	Descriptive string for the prefix list. The string can be any alphanumeric string up to 90 characters.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure a description for an IPv6 prefix list:

```
switch# configure terminal
switch(config)# ipv6 prefix-list test1 description "this is a test"
```

Related Commands

Command	Description
ipv6 prefix-list	Creates an IPv6 prefix list.
show ipv6 prefix-list	Displays information about IPv6 prefix lists.

ipv6 rip metric-offset

To add an additional value to the incoming IP Routing Information Protocol (RIP) route metric for an interface, use the **ipv6 rip metric-offset** command in interface configuration mode. To return the metric to its default value, use the **no** form of this command.

ipv6 rip metric-offset *value*
no ipv6 rip metric-offset

Syntax Description

value	Value to add to the incoming route metric for an interface. The range is from 1 to 15. The default is 1.

Command Default

value: 1

Command Modes

Interface configuration

network-adminvdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ipv6 route metric-offset** command to influence which routes are used by Cisco NX-OS. This command allows you to add a fixed offset to the route metric of all incoming routes on an interface. For example, if the you set the metric-offset to 5 on an interface and the incoming route metric is 5, then Cisco NX-OS adds the route to the route table with a metric of 10.

This command does not require a license.

Examples

The following example shows how to configure a metric offset of 10 for all incoming RIP routes on Ethernet interface 2/1:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 rip metric-offset 10
```

Related Commands

Command	Description
ipv6 rip offset-list	Adds an offset value to incoming RIP route metrics.

ipv6 rip offset-list

To add an offset to incoming and outgoing metrics to routes learned via Routing Information Protocol (RIP), use the **ipv6 rip offset-list** command in interface configuration mode. To remove an offset list, use the **no** form of this command.

ipv6 rip offset-list *value*
no ipv6 rip offset-list

Syntax Description

value	Value to add to the incoming route metric for an interface. The range is from 1 to 15. The default is 1.

Command Default

value: 1

Command Modes

Router address-family configuration

network-adminvdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

The following example shows how to configure an offset of 10 for all incoming RIP routes on Ethernet interface 2/1:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 rip offset-list 10
```

Related Commands

Command	Description
ipv6 rip metric-offset	Adds an offset value to incoming RIP route metrics.

ipv6 rip passive-interface

To suppress the sending of the Routing Information Protocol (RIP) updates on an interface, use the **ipv6 rip passive-interface** command in interface configuration mode. To unsuppress updates, use the **no** form of this command.

ipv6 rip passive-interface
no ipv6 rip passive-interface

Syntax Description

This command has no arguments or keywords.

Command Default

RIP updates are sent on the interface.

Command Modes

Interface configuration

network-adminvdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

While RIP stops sending routing updates to the multicast (or broadcast) address on a passive interface, RIP continues to receive and process routing updates from its neighbors on that interface.

This command does not require a license.

Examples

The following example shows how to configure Ethernet 1/2 as a passive interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ipv6 rip passive-interface
```

ipv6 rip poison-reverse

To enable poison-reverse processing of the Routing Information Protocol (RIP) router updates, use the **ipv6 rip poison-reverse** command in interface configuration mode. To disable poison-reverse processing of RIP updates, use the **no** form of this command.

ipv6 rip poison-reverse
no ipv6 rip poison-reverse

Syntax Description

This command has no arguments or keywords.

Command Default

Split horizon is always enabled. Poison-reverse processing is disabled.

Command Modes

Interface configuration

network-adminvdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip v6rip poison-reverse** command to enable poison-reverse processing of RIP router updates. By default, Cisco NX-OS does not advertise RIP routes out the interface over which they were learned (split horizon). If you configure both poison reverse and split horizon, then Cisco NX-OS advertises the learned routes as unreachable over the interface on which the route was learned.

This command does not require a license.

Examples

The following example shows how to enable poison-reverse processing for an interface running RIP:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ipv6 rip poison-reverse
```

ipv6 rip route-filter

To filter the Routing Information Protocol (RIP) routes coming in or out of an interface, use the **ipv6 rip route-filter** command in interface configuration mode. To remove filtering from an interface, use the **no** form of this command.

ipv6 rip route filter {**prefix-list** *list-name* | **route-map** *map-name*} {**in** | **out**}

Syntax Description

prefix-list *list-name*	Associates a prefix list to filter RIP packets.
route-map *map-name*	Associates a route map to set the redistribution policy for RIP.
in	Filters incoming routes.
out	Filters outgoing routes.

Command Default

Route filtering is disabled.

Command Modes

Interface configuration

network-adminvdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ipv6 rip route-filter** command to filter incoming or outgoing routes on an interface.

This command does not require a license.

Examples

The following example shows how to use a route map to filter routes for a RIP interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ipv6 rip route-filter route-map InRipFilter in
```

Related Commands

Command	Description
route-map	Creates a route map.
prefix-list	Creates a prefix list.

ipv6 rip summary-address

To configure a summary aggregate address under an interface for the the Routing Information Protocol (RIP), use the **ipv6 rip summary-address** command in interface configuration mode. To disable summarization of the specified address or subnet, use the **no** form of this command.

ipv6 rip summary-address *ipv6-prefix/length*
noipv6 rip summary-address *ipv6-prefix/length*

Syntax Description

iv6p-prefix/length	IPv6 prefix and prefix length to be summarized.

Command Default

Disabled by default.

Command Modes

Interface configuration

network-adminvdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The **ipv6 rip summary-address** command summarizes an address or subnet under a specific interface.

This command does not require a license.

Examples

The following example shows that the summary address2001:0DB8::/48 is advertised out Ethernet interface 1/2:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ipv6 summary-address rip 2001:0DB8::/48
```

ipv6 route

To configure a static IPv6 route, use the **ipv6 route** command. To remove this static route, use the **no** form of this command.

ipv6 route *ipv6-prefix/length* {{*next-hop-addr*|*next-hop-prefix*}|*interface*|*link-local-addr*} *[preference]* [**tag** *tag-id*]
no ipv6 route *ipv6-prefix/length*

Syntax Description

ipv6-prefix/length	IPv6 prefix and prefix length. The format is A:B::C:D/length. The length range is from 1 to 128.
next-hop-addr	Next-hop address. The format is A:B::C:D.
next-hop-prefix	Next-hop prefix and length. The format is A:B::C:D/length. The length range is from 1 to 128.
interface	Interface to reach this route. Use **?** to display a list of supported interfaces.
link-local-addr	IPv6 link-local address. The format is A:B::C:D.
preference	(Optional) Sets the route preference, used as the administrative distance to this route. The range is from 1 to 255. The default is 1.
tag *id*	(Optional) Assigns a route tag that can be used to match against in a route map. The range is from 0 to 4294967295. The default is 0.

Command Default

Disabled

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to create an IPv6 static route:

```
switch# configure terminal
switch(config)# ipv6 route 2001:0DB8::/48 2b11::2f01:4c
```

Related Commands

Command	Description
ip route	Configures an IPv4 static route.

ipv6 router eigrp

To specify the Enhanced Interior Gateway Routing Protocol (EIGRP) for an IPv6 interface, use the **ipv6 router eigrp** command. To return to the default, use the **no**form of this command.

ipv6 router eigrp *instance-tag*
no ipv6 router eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **ipv6 router eigrp** command to specify the EIGRP instance for the interface.

This command requires the Enterprise Services license.

Examples

This example shows how to set the EIGRP instance for an interface:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ipv6 router eigrp Base
```

ipv6 router ospfv3 area

To specify the Open Shortest Path First version 3(OSPFv3) instance and area for an interface, use the **ipv6 router ospfv3 area** command. To return to the default, use the **no**form of this command.

ipv6 router ospfv3 *instance-tag* **area** *area-id* [**secondaries none**]
no ipv6 router ospfv3 *instance-tag* **area** *area-id* [**secondaries none**]

Syntax Description

instance-tag	Instance tag. Specify as an alphanumeric string.
area-id	Identifier for the OSPFv3 area where you want to enable authentication. Specify as either a positive integer value or an IP address.
secondaries none	(Optional) Excludes secondary IP addresses.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ipv6 router ospfv3 area** command to specify the area and OSPFv3 instance for the interface.

This command requires the Enterprise Services license.

Examples

This example shows how configure an interface for OSPFv3:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ipv6 router ospfv3 Base area 33
```

ipv6 router ospfv3 multi-area

To configure multi-area adjacency on an Open Shortest Path First version 3 (OSPFv3) interface, use the **ipv6 router ospfv3 multi-area** command. To return to the default, use the **no** form of this command.

ipv6 router ospfv3 *instance-tag* **multi-area** *area-id*
no ipv6 router ospfv3 *instance-tag* **multi-area** *area-id*

Syntax Description

instance-tag	Instance tag. Specify as an case-sensitive alphanumeric string up to 63 characters.
area-id	Identifier for the OSPF area where you want to add as another area to the primary interface. Specify as either a positive integer value or an IP address.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **ipv6 router ospfv3 multi-area** command to specify additional areas on an OSPFv3 interface.

This command requires the Enterprise Services license.

Examples

This example shows how to configure multi-area adjacency:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ipv6 router ospfv3 Base area 33
switch(config-if)# ipv6 router ospfv3 Base multi-area 99
```

ipv6 split-horizon eigrp

To enable split horizon for an Enhanced Interior Gateway Routing Protocol (EIGRP) for an IPv6 process, use the **ipv6 split-horizon eigrp** command. To disable split horizon, use the **no** form of this command.

ipv6 split-horizon eigrp *instance-tag*
no ipv6 split-horizon eigrp *instance-tag*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

Enabled

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **no ipv6 split-horizon eigrp** command to disable split horizon on an interface.

This command requires the Enterprise Services license.

Examples

This example shows how to disable split horizon an an Ethernet link:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-eigrp-af-if)# no ipv6 split-horizon eigrp 209
```

ipv6 summary-address eigrp

To configure a summary aggregate address for the specified Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 interface, use the **ipv6 summary-address eigrp** command. To disable a configuration, use the **no** form of this command.

ipv6 summary-address eigrp *instance-tag ipv6-address /length [admin-distance]*
no ipv6 summary-address eigrp *instance-tag ipv6-address /length*

Syntax Description

instance-tag	Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.
ipv6-address/length	Summary IPv6 prefix and prefix length to apply to an interface in A:B::C:D/length format. The length range is from 1 to 128.
admin-distance	(Optional) Administrative distance. The range is from 1 to 255.

Command Default

An administrative distance of 5 is applied to EIGRP summary routes. No summary addresses are predefined.

Command Modes

Interface configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **ipv6 summary-address eigrp** command to configure interface-level summary address. EIGRP summary routes are given an administrative distance of 5.

This command requires the Enterprise Services license.

Examples

This example shows how to configure an administrative distance of 95 on an EIGRP interface for the 2001:0DB8::/48 summary address:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# interface ethernet 2/1
switch(config-if)# ipv6 summary-address eigrp 209 2001:0DB8::/48 95
```

ipv6 unreachables

To enable sending ICMPv6 unreachable messages, use the **ipv6 unreachables** command. To revert to default, use the **no** form of this command.

ipv6 [**icmp**] **unreachables**
no ipv6 [**icmp**] **unreachables**

Syntax Description

icmp	(Optional) Specifies ICMPv6 commands.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Port-unreachable messages are always rate limit enabled.

This command does not require a license.

Examples

This example shows how to enable the ICMPv6 unreachable messages:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ipv6 unreachables
```

Related Commands

Command	Description
show ipv6 nd interface	Displays IPv6 neighbor discovery information for an interface.

is-type

To configure the routing level for an instance of the Intermediate System-to-Intermediate System (IS-IS) routing process, use the **is-type** command. To reset the default value, use the **no** form of this command.

is-type {**level-1** | **level-1-2** | **level-2**}
no is-type {**level-1** | **level-1-2** | **level-2**}

Syntax Description

level-1	Specifies that the router performs only level-1 (intraarea) routing.
level-1-2	Specifies that the router performs both level-1 and level-2 routing.
level-2	Specifies that the routing process acts as a level-2 (interarea) router only.

Command Default

Routers typically act as both a level-1 (intraarea) and a level-2 (interarea) router by default. In multiarea IS-IS configurations, the first instance of the IS-IS routing process configured is by default a level-1-2 (intraarea and interarea) router. The remaining instances of the IS-IS process configured by default are level-1 routers.

Command Modes

Router configurationVRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The routing levels for an instance of the IS-IS routing process are defined as follows:

- **level-1—**Specifies that the router performs only level-1 (intraarea) routing. This router learns only about destinations inside its area. Level-2 (interarea) routing is performed by the closest level-1-2 router.
- **level-1-2—**Specifies that the router performs both level-1 and level-2 routing. This router runs two instances of the routing process. It has one link-state packet database (LSDB) for destinations inside the area (level-1 routing) and runs a shortest path first (SPF) calculation to discover the area topology. It also has another LSDB with link-state packets (LSPs) of all other backbone (level-2) routers, and runs another SPF calculation to discover the topology of the backbone, and the existence of all other areas.
- **level-2—**Specifies that the routing process acts as a level-2 (interarea) router only. This router is part of the backbone, and does not communicate with level-1-only routers in its own area.

We recommend that you configure the type of IS-IS routing process. If you are configuring multiarea IS-IS, you must configure the type of the router, or allow it to be configured by default. By default, the first instance of the IS-IS routing process that you configure using the router isis command is a level-1-2 router.

If only one area is in the network, there is no need to run both level-1 and level-2 routing algorithms. If IS-IS is used for IP routing only (and there is only one area), you can run level-2 only everywhere. Areas you add after the level-1-2 area exists are by default level-1 areas.

If the router instance has been configured for level-1-2 (the default for the first instance of the IS-IS routing process in a Cisco device), you can remove level-2 (interarea) routing for the area using the is-type command. You can also use the is-type command to configure level-2 routing for an area, but it must be the only instance of the IS-IS routing process configured for level-2 on the Cisco device.

This command requires the Enterprise Services license.

Examples

This example specifies an area router:

```
switch# configure terminal
switch(config)# router isis
switch(config-router)# is-type level-2-only
```

Related Commands

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

isis authentication key-chain

To enable authentication for Intermediate System-to-Intermediate System (IS-IS) for an individual IS-IS interface, use the **isis authentication key-chain** command. To disable authentication, use the **no** form of this command.

isis authentication key-chain *auth-key* {**level-1** | **level-2**}
no isis authentication key-chain *auth-key* {**level-1** | **level-2**}

Syntax Description

auth-key	Authentication key chain.
level-1	Specifies the authentication key for level-1 link state packets (LSP), complete sequence number packets (CSNP), and partial sequence number packets (PSNP) only.
level-2	Specifies the authentication key for level-2 LSP, CSNP and PSNP packets only.

Command Default

No key chain authentication is provided for IS-IS packets at the router level.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

If no key chain is configured with the **isis authentication key-chain** command, no key chain authentication is performed.

Key chain authentication could apply to clear text authentication or MD5 authentication. The mode is determined by the authentication mode command.

Only one authentication key chain is applied to IS-IS at one time. For example, if you configure a second **isis authentication key-chain** command, the first authentication key chain is overridden.

You can configure key-chain authentication per IS-IS instance by using the **authentication key-chain** configuration command.

This command requires the Enterprise Services license.

Examples

This example shows how to configure IS-IS to accept and send any key belonging to the key chain named site1 on a specific interface:

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 2/5
switch(config-if)# isis authentication key-chain site1 level-1
switch(config-if)#
```

Related Commands

Command	Description
authentication key-chain	Enables authentication per IS-IS instance.

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

isis authentication-check

To specify for the Intermediate System-to-Intermediate System (IS-IS) instance that authentication is performed only on IS-IS packets being sent (not received) from an interface, use the **isis authentication-check** command. To configure for the IS-IS instance that if authentication is configured at the router level, such authentication be performed on packets being sent and received, use the **no** form of this command.

authentication-check {**level-1** | **level-2**}
no authentication-check

Syntax Description

level-1	Specifies that authentication is performed only on level-1 packets that are being sent (not received)
level-2	Specifies that authentication is performed only on level-2 packets that are being sent (not received).

Command Default

If authentication is configured at the router level, it applies to IS-IS packets being sent and received.

Command Modes

Interface configuration

Usage Guidelines

Enter the **isis authentication-check** command before configuring the authentication mode and authentication key chain. Entering the **isis authentication-check** command allows the routers to have more time for the keys to be configured on each router if authentication is inserted only on the packets being sent, not checked on packets being received. After you enter the authentication-check command on all communicating routers, enable the authentication mode and key chain on each router. Then enter the **no isis authentication-check** command to disable the command.

This command could apply to clear text authentication or Message Digest 5 (MD5) authentication. The mode is determined by the authentication mode command.

You can specify authentication check per IS-IS instance by using the **authentication-check** configuration mode command.

This command requires the Enterprise Services license.

Examples

This example shows how to configure IS-IS level-1 packets on a specific interface to use clear text authentication on packets being sent (not received):

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 2/5
switch(config-if)# isis authentication-check level-1
switch(config-if)# isis authentication key-chain site1 level-1
switch(config-if)#
```

Related Commands

Command	Description
authentication-check	Specifies that authentication is performed only on IS-IS packets being sent (not received).
feature isis	Enables IS-IS on the router.

Command	Description
router isis	Enables IS-IS.

isis authentication-type

To specify the type of authentication used in Intermediate System-to-Intermediate System (IS-IS) packets on a specific interface, use the **isis authentication-type** command. To restore clear text authentication, use the **no** form of this command.

isis authentication-type {**cleartext** | **md5**} [{**level-1** | **level-2**}]
no isis authentication-type

Syntax Description

cleartext	Specifies clear text authentication.
md5	Specifies Message Digest 5 (MD5) authentication.
level-1	Enables the specified authentication for level-1 link state packet (LSP), complete sequence number packet (CSNP) and partial sequence number packet (PSNP) packets only.
level-2	Enables the specified authentication for level-2 LSP, CSNP and PSNP packets only.

Command Default

No authentication is provided for IS-IS packets at the router level by use of this command.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

If you do not enter the **level-1** or **level-2** keywords, the mode applies to both levels.

You can specify the authentication type per IS-IS instance by using the **authentication-type** configuration mode command.

This command requires the Enterprise Services license.

Examples

This example configures for the IS-IS instance that Message Digest 5 (MD5) authentication is performed on level-1 packets on a specific interface:

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 2/5
switch(config-if)# isis authentication-type md5 level-1
switch(config-router)#
```

Related Commands

Command	Description
authentication-type	Specifies the authentication type per IS-IS instance.
feature isis	Enables IS-IS on the router.
router isis	Enables IS-IS.

isis circuit-type

To configure the type of adjacency, use the **isis circuit-type** command. To reset the circuit type to Level l and Level 2, use the **no** form of this command.

isis circuit-type {**level-1** | **level-1-2** | **level-2-only**}
no isis circuit-type

Syntax Description

level-1	Configures a router for Level 1 adjacency only.
level-1-2	Configures a router for Level 1 and Level 2 adjacency.
level-2-only	Configures a router for Level 2 adjacency only.

Command Default

A Level 1 and Level 2 adjacency is established.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You do not have to configure this command. We recommend that you configure a router as a Level 1-only, Level 1-2, or Level 2-only system. Only on routers that are between areas (Level 1-2 routers) should you configure some interfaces to be Level 2-only to prevent wasting bandwidth by sending out unused Level 1 hello packets. Note that on point-to-point interfaces, the Level 1 and Level 2 hellos are in the same packet.

A Level 1 adjacency may be established if there is at least one area address in common between this system and its neighbors. Level 2 adjacencies will never be established over this interface.

A Level 1 and Level 2 adjacency is established if the neighbor is also configured as level-1-2 and there is at least one area in common. If there is no area in common, a Level 2 adjacency is established. This is the default.

Level 2 adjacencies are established if the other routers are Level 2 or Level 1-2 routers and their interfaces are configured for Level 1-2 or Level 2. Level 1 adjacencies will never be established over this interface.

This command requires the Enterprise Services license.

Examples

This example shows how to configure an adjacency. In this example other routers on the Ethernet interface 2/5 are in the same area. Other routers on Ethernet interface 1 are in other areas, so the router will stop sending Level 1 hellos.

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 2/5
switch(config-if)# isis circuit-type level-2-only
switch(config-if)#
```

isis csnp-interval

To configure the Intermediate System-to-Intermediate System (IS-IS) complete sequence number (CSNPs) interval, use the **isis csnp-interval** command. To restore the default value, use the **no** form of this command.

isis csnp-interval *seconds* {**level-1** | **level-2**}
no isis csnp-interval [{**level-1** | **level-2**}]

Syntax Description

seconds	Interval of time (in seconds) between transmission of CSNPs on multiaccess networks. This interval only applies for the designated router. Range: 0 to 65535. Default: 10.
level-1	Configures the interval of time between transmission of CSNPs for Level 1 independently.
level-2	Configures the interval of time between transmission of CSNPs for Level 2 independently.

Command Default

The default settings are as follows:

- 10 seconds
- Level 1 and Level 2

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Normally, you will not have to change the default value of this command.

This command applies only for the designated router or a specified interface. Only designated routers send CSNP packets in order to maintain database synchronization. The CSNP interval can be configured independently for Level 1 and Level 2.

The **isis csnp-interval** command on point-to-point subinterfaces should be used only in combination with the IS-IS mesh-group feature.

This command requires the Enterprise Services license.

Examples

This example configures Ethernet interface 2/5 for sending CSNPs every 30 seconds:

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 2/5
switch(config-if)# isis csnp-interval 30 level-1
switch(config-if)#
```

Related Commands

show isis interface	Displays IS-IS information.

isis hello padding

To reenable Intermediate System-to-Intermediate System (IS-IS) hello padding at the interface level, use the **isis hello padding** command. To disable IS-IS hello padding, use the **no** form of this command.

isis hello padding
no isis hello padding

Syntax Description

This command has no arguments or keywords.

Command Default

IS-IS hello padding is enabled.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Intermediate System-to-Intermediate System (IS-IS) hellos are padded to the full maximum transmission unit (MTU) size. The benefit of padding IS-IS hellos to the full MTU is that it allows for early detection of errors that result from transmission problems with large frames or errors that result from mismatched MTUs on adjacent interfaces.

You can disable hello padding in order to avoid wasting network bandwidth in case the MTU of both interfaces is the same or, in case of translational bridging. While hello padding is disabled, Cisco routers still send the first five IS-IS hellos padded to the full MTU size, in order to maintain the benefits of discovering MTU mismatches.

To selectively disable hello padding for a specific interface, enter the **no isis hello padding** command in interface configuration mode. To disable hello padding for all interfaces on a router for the IS-IS routing process, enter the **no hello padding** command in router configuration mode.

This command requires the Enterprise Services license.

Examples

This example shows how to turn off hello padding at the interface level for the Ethernet interface 0/0, and enter interface configuration mode:

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 0/0
switch(config-if)# no isis hello padding
switch(config-if)#
```

Related Commands

Command	Description
hello padding	Reenables IS-IS hello padding at the router level.

isis hello-interval

To specify the length of time between hello packets that the Cisco NX-OS software sends, use the **isis hello-interval** command. To restore the default value, use the **no** form of this command.

isis hello-interval *seconds* {**level-1** | **level-2**}
no isis hello-interval {**level-1** | **level-2**}

Syntax Description

seconds	Length of time between hello packets, in seconds. By default, a value three times the hello interval *seconds* is advertised as the hold time in the hello packets sent. (Change the multiplier of 3 by specifying the **isis hello-multiplier** command.) With smaller hello intervals, topological changes are detected faster, but there is more routing traffic. Range: 0 to 65535. Default: 10. **Note** On designated intermediate system (DIS) interfaces, only one third of the configured value is used. The full value of the configured hello intervals is used only by non-DIS interfaces.
level-1	Configures the hello interval for Level 1 independently. Use this on X.25, Switched Multimegabit Data Service (SMDS), and Frame Relay multiaccess networks.
level-2	Configures the hello interval for Level 2 independently. Use this on X.25, SMDS, and Frame Relay multiaccess networks.

Command Default

The default settings are as follows:

- 10 seconds
- Level 1 and Level 2

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The hello interval multiplied by the hello multiplier equals the hold time.

The hello interval can be configured independently for Level 1 and Level 2. The **level-1** and **level-2** keywords are used on LAN interfaces.

A faster hello interval gives faster convergence, but increases bandwidth and CPU usage. It might also add to instability in the network. A slower hello interval saves bandwidth and CPU usage. Especially when used in combination with a higher hello multiplier, configuration of the slower hello interval may increase overall network stability. When the hello interval is configured on DIS interfaces, only one third of the interval value is used. Therefore, the hold time (hello interval multiplied by the hello multiplier) for DIS interfaces will also be one third the hold time for non-DIS interfaces.

Tune the hello interval and hello multiplier on point-to-point interfaces instead of LAN interfaces.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the Ethernet interface 2/3 to advertise hello packets every 5 seconds. The router is configured to act as a station router. This configuration will cause more traffic than the traffic generated by configuring a longer interval, but topological changes will be detected earlier.

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 2/3
switch(config-if)# isis hello-interval 5 level-1
switch(config-if)#
```

Related Commands

Command	Description
isis hello-multiplier	Specifies the number of IS-IS hello packets that a neighbor must miss before the router should declare the adjacency as down.

isis hello-multiplier

To specify the number of Intermediate System-to-Intermediate System (IS-IS) hello packets a neighbor must miss before the router should declare the adjacency as down, use the **isis hello-multiplier** command. To restore the default value, use the **no** form of this command.

isis hello-multiplier *multiplier* {**level-1** | **level-2**}
no isis hello-multiplier {**level-1** | **level-2**}

Syntax Description

multiplier	Integer value. Range: 3 to 1000. Default: 3.
level-1	Configures the hello multiplier independently for Level 1 adjacencies.
level-2	Configures the hello multiplier independently for Level 2 adjacencies.

Command Default

The default settings are as follows:

- *multiplier*: 3
- Level 1 and Level 2

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The holding time carried in an IS-IS hello packet determines how long a neighbor waits for another hello packet before declaring the neighbor to be down. This time determines how quickly a failed link or neighbor is detected so that routes can be recalculated. The advertised hold time in IS-IS hello packets will be set to the hello multiplier times the hello interval. Neighbors will declare an adjacency to this router down after not having received any IS-IS hello packets during the advertised hold time. The hold time (and thus the hello multiplier and the hello interval) can be set on a per-interface basis, and can be different between different routers in one area.

Using a smaller hello multiplier will give fast convergence, but can result in more routing instability. Increment the hello multiplier to a larger value to help network stability when needed. Never configure a hello multiplier lower than the default value of 3.

Use the **isis hello-multiplier** command in circumstances where hello packets are lost frequently and IS-IS adjacencies are failing unnecessarily. You can raise the hello multiplier and lower the hello interval (**isishello-interval** command) correspondingly to make the hello protocol more reliable without increasing the time required to detect a link failure.

On point-to-point links, there is only one hello for both Level 1 and Level 2, so different hello multipliers should be configured only for multiaccess networks such as Ethernet and FDDI. Separate Level 1 and Level 2 hello packets are also sent over nonbroadcast multiaccess (NBMA) networks in multipoint mode, such as X.25, Frame Relay, and ATM. However, we recommend that you run IS-IS over point-to-point subinterfaces over WAN NBMA media.

This command requires the Enterprise Services license.

Examples

This example shows how to increase network stability by making sure an adjacency will go down only when many (ten) hello packets are missed. The total time to detect link failure is 60 seconds. This configuration will ensure that the network remains stable, even when the link is fully congested.

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 2/3
switch(config-if)# ip router isis
switch(config-if)# isis hello-interval 6 level-1
switch(config-if)# isis hello-multiplier 10 level-1
```

Related Commands

Command	Description
isis hello-interval	Specifies the length of time between hello packets that the Cisco NX-OS software sends.

isis ipv6 metric

To differentiate between the link costs for Intermediate System-to-Intermediate System (IS-IS) IPv6 traffic, use the **isis ipv6 metric** command. To restore the default, use the **no** form of this command.

isis ipv6 metric *metric-value* {**level-1** | **level-2**}
no isis ipv6 metric *metric-value* {**level-1** | **level-2**}

Syntax Description

metric-value	Metric assigned to the link and used to calculate the cost from each other router via the links in the network to other destinations. You can configure this metric for Level 1 or Level 2 routing. Range: 1 to 16777215. Default: 10.
level-1	Specifies that this metric should be used only in the SPF calculation for Level 1 (intraarea) routing.
level-2	Specifies that this metric should be used only in the SPF calculation for Level 2 (interarea) routing.

Command Default

The default metric value is set to 10.

The metric is enabled on routing Level 1 and Level 2.

Command Modes

Address-family configuration mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

Specifying the **level-1** or **level-2** keyword resets the metric only for Level 1 or Level 2 routing, respectively.

We recommend that you configure metrics on all interfaces. If you do not configure metrics on all interfaces, the IS-IS metrics are similar to hop-count metrics.

This command requires the Enterprise Services license.

Examples

This example shows how to configure an IS-IS IPv6 metric:

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# isis ipv6 metric 5 level-1
```

Related Commands

Command	Description
isis metric	Configures the value of an IS-IS metric,

isis lsp-interval

To configure the time delay between successive Intermediate System-to-Intermediate System (IS-IS) link-state packet (LSP) transmissions, use the **isis lsp-interval** command. To restore the default value, use the **no** form of this command.

isis lsp-interval *milliseconds*
no isis lsp-interval

Syntax Description

milliseconds	Time delay between successive LSPs (in milliseconds). Range: 10 to 65535.

Command Default

The default time delay is 33 milliseconds.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

In topologies with a large number of IS-IS neighbors and interfaces, a router may have difficulty with the CPU load imposed by LSP transmission and reception. This command allows the LSP transmission rate (and the reception rate of other systems) to be reduced.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the system to send LSPs every 100 milliseconds (10 packets per second) on Ethernet interface 0/0:

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 0/0
switch(config-if)# isis lsp-interval 100
```

Related Commands

Command	Description
isis retransmit-interval	Configures the time between retransmission of each LSP (IS-IS link-state PDU) over point-to-point links.

isis mesh-group

To optimize link-state packet (LSP) flooding in nonbroadcast multiaccess (NBMA) networks with highly meshed, point-to-point topologies, use the **isis mesh-group** command. To remove a subinterface from a mesh group, use the **no** form of this command.

isis mesh-group {*number* | **blocked**}
no isis mesh-group {*number* | **blocked**}

Syntax Description

*num*ber	Number identifying the mesh group of which this interface is a member. Range: 1 to 4294967295.
blocked	Specifies that no LSP flooding take place on this subinterface.

Command Default

The interface performs normal flooding.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The LSPs that are first received on subinterfaces that are not part of a mesh group are flooded to all other subinterfaces in the usual way.

The LSPs that are first received on subinterfaces that are part of a mesh group are flooded to all interfaces except those in the same mesh group. If you enter the blocked keyword on a subinterface, then a newly received LSP is not flooded out over that interface.

To minimize the possibility of incomplete flooding, you should allow unrestricted flooding over at least a minimal set of links in the mesh. Selecting the smallest set of logical links that covers all physical paths results in very low flooding, but less robustness. Ideally, you should select only enough links to ensure that LSP flooding is not detrimental to scaling performance, but enough links to ensure that under most failure scenarios no router will be logically disconnected from the rest of the network. In other words, blocking flooding on all links permits the best scaling performance, but there is no flooding. Permitting flooding on all links results in very poor scaling performance.

This command requires the Enterprise Services license.

Examples

This example shows how to configure six interfaces are configured in three mesh groups. LSPs received are handled as follows:

- LSPs received first through Ethernet 1/0.1 are flooded to all interfaces except Ethernet 1/0.2 (which is part of the same mesh group) and Ethernet 1/2.1, which is blocked.
- LSPs received first through Ethernet 1/1.2 are flooded to all interfaces except Ethernet 1/1.1 (which is part of the same mesh group) and Ethernet 1/2.1, which is blocked.
- LSPs received first through Ethernet 1/2.1 are not ignored, but flooded as usual to all interfaces. LSPs received first through Ethernet 1/2.2 are flooded to all interfaces, except Ethernet 1/2.1, which is blocked.

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 1/0.1
switch(config-if)# isis mesh-group 10

switch(config)# router isis test1
switch(config-router)# interface ethernet 1/0.2
switch(config-if)# isis mesh-group 10

switch(config)# router isis test1
switch(config-router)# interface ethernet 1/1.1
switch(config-if)# isis mesh-group 11

switch(config)# router isis test1
switch(config-router)# interface ethernet 1/1.2
switch(config-if)# isis mesh-group 11

switch(config)# router isis test1
switch(config-router)# interface ethernet 1/2.1
switch(config-if)# isis mesh-group blocked

switch(config)# router isis test1
switch(config-router)# interface ethernet 1/2.2
switch(config-if)# isis mesh-group 12
```

Related Commands

Command	Description
router isis	Enables the IS-IS routing protocol and specifies an IS-IS process.

isis metric

To configure the value of an Intermediate System-to-Intermediate System (IS-IS) metric, use the **isis metric** command. To restore the default metric value, use the **no** form of this command.

isis metric *metric-value* {**level-1** | **level-2**}
no isis metric *metric-value* {**level-1** | **level-2**}

Syntax Description

metric-value	Metric assigned to the link and used to calculate the cost from each other router via the links in the network to other destinations. You can configure this metric for Level 1 or Level 2 routing. Range: 1 to 16777215. Default: 10.
level-1	Specifies that this metric should be used only in the SPF calculation for Level 1 (intraarea) routing. If you do not specify an optional keyword, the metric is enabled on routing Level 1 and Level 2.
level-2	Specifies that this metric should be used only in the SPF calculation for Level 2 (interarea) routing. If you do not specify a level, the metric is enabled on routing Level 1 and Level 2.

Command Default

The default metric value is set to 10.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Specifying the **level-1** or **level-2** keyword resets the metric only for Level 1 or Level 2 routing, respectively.

We recommend that you configure metrics on all interfaces. If you do not configure metrics on all interfaces, the IS-IS metrics are similar to hop-count metrics.

We recommend that you use the **metric-style wide** command to configure IS-IS to use the new-style type, length, value (TLV) because TLVs that are used to advertise IPv4 information in link-state packets (LSPs) are defined to use only expanded metrics. The Cisco NX-OS software provides support of a 24-bit metric field, the 24-bit metric field is called the *wide metric*. Using the new metric style, link metrics now have a maximum value of 16777215 with a total path metric of 4261412864.

This command requires the Enterprise Services license.

Examples

This example shows how to configure Ethernet interface 3/2 for a link-state metric cost of 15 for Level 1:

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 3/2
switch(config-if)# isis metric 15 level-1
```

Related Commands

Command	Description
metric-style wide	Configures a router running IS-IS so that it generates and accepts only new-style TLVs.

isis passive

To suppress adjacency forming on the interface, but still advertise the prefix associated with the interface, use the **isis passive** command. To disable suppression, use the **no** form of this command.

isis passive {**level-1** | **level-1-2** | **level-2-only**}
no isis passive {**level-1** | **level-1-2** | **level-2-only**}

Syntax Description

level-1	Suppresses Level 1 PDU only.
level-1-2	Suppresses Level 1 and Level 2 PDU.
level-2-only	Suppresses Level 2 PDU only.

Command Default

The default settings are as follows:

- This command is disabled by default.
- If enabled, the default is **level-1-2**.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command is not necessary on a loopback interface. Use the **ip router isis** command in interface configuration mode on a loopback interface to associate that interface with the IS-IS instance.

This command requires the Enterprise Services license.

Examples

This example suppresses adjacency for Ethernet interface 3/2 at Level 1:

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 3/2
switch(config-if)# isis passive level-1
```

isis passive-interface

To block sending of routing updates on an Intermediate System-to-Intermediate System (IS-IS) interface, use the **isis passive-interface** command. To revert to the default settings, use the no form of this command.

isis passive-interface {**level-1** | **level-1-2** | **level-2**}

Syntax Description

level-1	Suppresses level-1 PDU.
level-1-2	Suppresses level-1 and level-2 PDU.
level-2	Suppresses level-2 PDU.

Command Default

None

Command Modes

Interface configuration mode

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 block the sending of routing updates on an IS-IS interface:

```
switch# configure terminal
switch(config)# router isis 1
switch(config-router)# passive-interface default level-1
switch(config-router)# exit

switch# configure terminal
switch(config)# interface GigabitEthernet 0/0/0/
switch(config-if# isis passive-interface level-1
switch(config-if#
```

Related Commands

Command	Description
no isis passive-interface	Re-enables sending of routing updates on an IS-IS interface and activates only those interfaces that need adjacencies.

isis priority

To configure the priority of designated routers, use the **isis priority** command in interface configuration mode. To reset the default priority, use the **no** form of this command.

isis priority *number-value* [{**level-1** | **level-2**}]
no isis priority [{**level-1** | **level-2**}]

Syntax Description

number-value	Priority of a router and is a number from 0 to 127. The default value is 64.
level-1	(Optional) Sets the priority for Level 1 independently.
level-2	(Optional) Sets the priority for Level 2 independently.

Command Default

Priority of 64Level 1 and Level 2

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Priorities can be configured for Level 1 and Level 2 independently. Specifying the **level-1** or **level-2** keyword resets priority only for Level 1 or Level 2 routing, respectively.

The priority is used to determine which router on a LAN will be the designated router or Designated Intermediate System (DIS). The priorities are advertised in the hello packets. The router with the highest priority will become the DIS.

In Intermediate System-to-Intermediate System (IS-IS), there is no backup designated router. Setting the priority to 0 lowers the chance of this system becoming the DIS, but does not prevent it. If a router with a higher priority comes on line, it will take over the role from the current DIS. In the case of equal priorities, the highest MAC address breaks the tie.

This command requires the Enterprise Services license.

Examples

This example shows how to set the priority level to 80. So that the router is now more likely to become the DIS:

```
switch# configure terminal
switch(config)# router isis test1
switch(config-router)# interface ethernet 3/2
switch(config-if)# isis priority 80 level-1
```

L Commands

load-balancing

To specify the load-balancing method used by the active virtual gateway (AVG) of the Gateway Load Balancing Protocol (GLBP), use the **load-balancing** command. To disable load balancing, use the **no** form of this command.

load-balancing [{**host-dependent** | **round-robin** | **weighted**}]
no load-balancing

Syntax Description

host-dependent	(Optional) Specifies a load-balancing method based on the MAC address of a host where the same forwarder is always used for a particular host while the number of GLBP group members remains unchanged.
round-robin	(Optional) Specifies a load-balancing method where each virtual forwarder is included in Address Resolution Protocol (ARP) replies for the virtual IP address. This method is the default.
weighted	(Optional) Specifies a load-balancing method that is dependent on the weighting value advertised by the gateway.

Command Default

The round-robin method is the default.

Command Modes

GLBP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the host-dependent method of GLBP load balancing when you need each host to always use the same router. Use the weighted method of GLBP load balancing when you need unequal load balancing because gateways in the GLBP group have different forwarding capacities.

This command does not require a license.

Examples

This example show how to configure the host-dependent load-balancing method for the AVG of the GLBP group 10:

```
switch# configure terminal
switch(config)# interface ethernet 1/1
switch(config-if)# glbp 10
switch(config-glbp)# load-balancing host-dependent
```

Related Commands

Command	Description
glbp	Enters GLBP configuration mode and creates a GLBP group.
show glbp	Displays GLBP information.
weighting	Configures the weighting value and thresholds for the weighted load-balancing method.

Command	Description
weighting track	Configures object tracking for the weighted load-balancing method.

local-as

To configure the Border Gateway Protocol (BGP) local AS number, use the **local-as** command.

local-as *as-number*

Syntax Description

as-number	(Optional) Autonomous system number. The AS number can be a 16-bit integer or a 32-bit integer in the form of <higher 16-bit decimal number>.<lower 16-bit decimal number>.

Command Default

None

Command Modes

Router VRF mode

Command History

Release	Modification
4.0(3)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to configure the local AS number for BGP:

```
switch# configure terminal
switch(config)# router bgp 65536.33
switch(config-router)# vrf red
switch(config-router-vrf)# local-as 65536.33
```

Related Commands

Command	Description
show bgp	Displays information about BGP.

local-as (bgp)

To configure a router to appear as a member of a second autonomous system (AS) in addition to the real AS of the device, use the **local-as** command. To remove the **local-as** configuration from the device, use the **no** form of this command.

local-as *autonomous-system-number* [{**no-prepend** | **replace-as** [**dual-as**]}]
no local-as *autonomous-system-number* [{**no-prepend** | **replace-as** [**dual-as**]}]

Syntax Description

autonomous-system-number	AS number. The range is from 1 to 4294967295.
no-prepend	(Optional) Specifies not to prepend the local autonomous system number to any routes received from the external Border Gateway Protocol (eBGP) neighbor.
replace-as	(Optional) Specifies to prepend only the local-as number to updates to the eBGP neighbor.
dual-as	(Optional) Configures the eBGP neighbor to establish a peering session using the real autonomous system number (from the local BGP routing process) or by using the autonomous-system number.

Command Default

None

Command Modes

Neighbor configuration (config-router-neighbor)

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure a router to appear as a member of a second AS in addition to the real AS of the device:

```
switch# configure terminal
 switch(config)# router bgp 64496
switch(config-router)# neighbor 192.0.2.1
switch(config-router-neighbor)# local-as 429496 no-prepend replace-as dual-as
switch(config-router-neighbor)#
```

This example shows how to remove the local AS configuration from the device:

```
switch# configure terminal
 switch(config)# router bgp 64496
switch(config-router)# neighbor 192.0.2.1
switch(config-router-neighbor)# no local-as
switch(config-router-neighbor)#
```

Related Commands

Command	Description
router bgp	Creates a BGP instance.
show ip bgp	Displays entries in the BGP routing table.
show ip bgp neighbors	Displays information about BGP neighbors.

log-adjacency-changes (EIGRP)

To enable the logging of changes in Enhanced Interior Gateway Routing Protocol (EIGRP) adjacency state, use the **log-adjacency-changes** command. To disable the logging of changes in EIGRP adjacency state, use the **no** form of this command.

log-adjacency-changes
no log-adjacency-changes

Syntax Description

This command has no arguments or keywords.

Command Default

Adjacency changes are not logged.

Command Modes

Address-family configurationRouter configurationRouter VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to enable logging of adjacency state changes for EIGRP 1:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# address-family ipv6
switch(config-router-af)# log-adjacency-changes
```

Related Commands

Command	Description
ip eigrp log-neighbor-changes	Logs changes to neighbors for an interface.
ip eigrp log-neighbor-warnings	Logs neighbor warnings for an interface.

log-adjacency-changes (IS-IS)

To enable the router to send a syslog message when an Intermediate System-to-Intermediate System Intradomain Routing Protocol (IS-IS) neighbor goes up or down, use the **log-adjacency-changes** configuration mode command. To disable this function, use the **no** form of this command.

log-adjacency-changes
no log-adjacency-changes

Syntax Description

This command has no arguments or keywords.

Command Default

This command is enabled by default.

Command Modes

Router configurationVRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The **log-adjacency-changes** command is on by default but only up/down (full/down) events are reported.

Examples

This example configures the router to send a syslog message when an IS-IS neighbor state changes:

```
switch# configure terminal
switch(config)# router isis
switch(config-router)# log-adjacency-changes
```

Related Commands

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

log-adjacency-changes (OSPF)

To configure the router to send a syslog message when the state of an Open Shortest Path First (OSPF) neighbor changes, use the **log-adjacency-changes** command. To turn off this function, use the **no** form of this command.

log adjacency changes [**detail**]

Syntax Description

detail	(Optional) Provides all (DOWN, INIT, 2WAY, EXSTART, EXCHANGE, LOADING, FULL) adjacency state changes.

Command Default

The router sends a system message when the state of an OSPF neighbor changes.

Command Modes

Router configurationRouter VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **log-adjacency-changes** command to display high-level changes to the state of the OSPF neighbor relationship. This command is on by default but only reports the up/down (full/down) events if you do not use the **detail** keyword.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the router to send a system message when an OSPF neighbor state changes:

```
switch# configure terminal
switch(config)# router ospf 209
switch(config-router)# log-adjacency-changes detail
```

log-adjacency-changes (OSPFv3)

To configure the router to send a system message when the state of an Open Shortest Path First version 3 (OSPFv3) neighbor changes, use the **log-adjacency-changes** command. To turn off this function, use the **no** form of this command.

log adjacency changes [**detail**]

Syntax Description

detail	(Optional) Provides all (DOWN, INIT, 2WAY, EXSTART, EXCHANGE, LOADING, FULL) adjacency state changes.

Command Default

The router sends a system message when the state of an OSPFv3 neighbor changes.

Command Modes

Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **log-adjacency-changes** command to display high-level changes to the state of the OSPFv3 neighbor relationship. This command is on by default but only reports the up/down (full/down) events if you do not use the **detail** keyword.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the router to send a system message when an OSPFv3 neighbor state changes:

```
switch# configure terminal
switch(config)# router ospfv3 209
switch(config-router)# log-adjacency-changes detail
```

log-neighbor-warnings

To enable the logging of Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor warning messages, use the **log-neighbor-warnings** command. To disable the logging of EIGRP neighbor warning messages, use the **no** form of this command.

log-neighbor-warnings [*seconds*]
no log-neighbor-warnings

Syntax Description

seconds	(Optional) Time interval (in seconds) between repeated neighbor warning messages. The range of seconds is from 1 to 65535.

Command Default

Neighbor warning messages are logged.

Command Modes

Address-family configuration
Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(3)	This command was introduced.

Usage Guidelines

Use the **log-neighbor-warnings** command to enable neighbor warning messages and to configure the interval between repeated neighbor warning messages.

This command requires the Enterprise Services license.

Examples

This example shows how to log neighbor warning messages for EIGRP process 209 and to repeat the warning messages in 5-minute (300 seconds) intervals:

```
switch# configure terminal
switch(config)# router eigrp 209
switch(config-router)# log-neighbor-warnings 30
```

Related Commands

Command	Description
log-adjacency-changes	Enables logging of EIGRP adjacency state changes.

low-memory exempt

To exempt a Border Gateway Protocol (BGP) neighbor from a low-memory shutdown, use the **low-memory exempt** command. To make a BGP neighbor eligible for a low-memory shutdown, use the **no** form of this command.

low-memory exempt
no low-memory exempt

Syntax Description

This command has no arguments or keywords.

Command Default

Some eBGP peers shut down for severe memory alerts.

Command Modes

Neighbor configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to exempt a neighbor from low-memory shutdown:

```
switch# configure terminal
switch(config)# router bgp 1.0
switch(config-router)# neighbor 192.0.2.0/24 remote-as 1.5
switch(config-router-af)# low-memory exempt
```

Related Commands

Command	Description
feature bgp	Enables BGP.

lsp-gen-interval

To customize the IS-IS throttling of the LSP generation, use the **lsp-gen-interval** configuration mode command. To restore default values, use the **no** form of this command.

lsp-gen-interval {**level-1** | **level-2**} *lsp-max-wait* [*lsp-initial-wait* *lsp-second-wait*]
no lsp-gen-interval

Syntax Description

level-1	Applies intervals to level-1 areas only.
level-2	Applies intervals to level-2 areas only.
lsp-max-wait	Maximum interval (in seconds) between two consecutive occurrences of an LSP being generated. Range: 500 to 65535. Default: 5.
lsp-initial-wait	(Optional) Initial LSP generation delay (in milliseconds). Range: 50 to 65535. Default: 50.
lsp-second-wait	Hold time between the first and second LSP generation (in milliseconds). Range: 50 to 65535. Default: 50.

Command Default

The defaults are as follows:

- *lsp-max-wait*: 500
- *lsp-initial-wait*: 50
- *lsp-second-wait*: 50

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

When you change the default values of this command, use the following guidelines:

- The *lsp-initial-wait* argument indicates the initial wait time (in milliseconds) before generating the first LSP.
- The *lsp-second-wait* argument indicates the amount of time to wait (in milliseconds) between the first and second LSP generation.
- Each subsequent wait interval is twice as long as the previous one until the wait interval reaches the **lsp-max-wait** interval specified, so this value causes the throttling or slowing down of the LSP generation after the initial and second intervals. Once this interval is reached, the wait interval continues at this interval until the network calms down.
- After the network calms down and there are no triggers for 2 times the **lsp-max-wait** interval, fast behavior is restored (the initial wait time).

The **lsp-mtu** command sets the delay (in milliseconds) between successive LSPs being transmitted (including LSPs generated by another system and forwarded by the local system).

You can enter these commands in combination to control the rate of LSP packets being generated, transmitted, and retransmitted.

Examples

This example configures the interval for LSP generation:

```
switch# configure terminal
switch(config)# router isis
switch(config-router)# lsp-gen-interval 2 50 100
```

Related Commands

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

lsp-mtu

To set the maximum size of a link-state packet (LSP) generated by Cisco NX-OS software, use the **lsp-mtu** command. To restore the default Maximum Transmission Unit (MTU) size, use the **no** form of this command.

lsp-mtu *bytes*
no lsp-mtu

Syntax Description

bytes	Maximum LSP size in bytes. Range: 128 to 4352. Default: 1492.

Command Default

The default MTU size is 1492 bytes.

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You can increase the LSP MTU if there is a very large amount of information generated by a single router, because each device is limited to approximately 250 LSPs. In practice, this should never be necessary.

The LSP MTU must never be larger than the smallest MTU of any link in the area. This is because LSPs are flooded throughout the area.

The **lsp-mtu** command limits the size of LSPs generated by this router only.

Examples

This example sets the maximum LSP size to 1500 bytes:

```
switch# configure terminal
switch(config)# router isis
switch(config-router)# lsp-mtu 1500
```

Related Commands

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

M Commands

mac-list

To filter based on a MAC address, use the **mac-list** command. To remove the MAC list entry, use the **no** form of this command.

mac-list *name* [**seq** *number*] {**permit** | **deny**} *mac-address [mac-mask]*
mac-list *name* [**seq** *number*] {**permit** | **deny**} *mac-address [mac-mask]*

Syntax Description

name	MAC list name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
seq *number*	Creates an entry in the MAC list. The *seq* range is from 1 to 4294967294.
permit	Allows the packet or route that matches a MAC address in the MAC list.
deny	Blocks the packet or route that matches a MAC address in the MAC list.
mac-address	MAC address to filter against.
mac-mask	Portion of the MAC address to match against, in MAC address format.

Command Default

No match values are defined.

Command Modes

global configuration

Command History

Release	Modification
5.0(2)	This command was introduced.

Usage Guidelines

To filtean Overlay Transport Virtualization (OTV) packetr based on MAC address, use the mac-list command. You can match against this MAC list in a route map associated with OTV redistribution.

This command requires the LAN Enterprise license.

Examples

This example shows how to create the Red MAC list:

```
switch#configure terminal
switch(config)# mac-list Red seq 1 permit 0022.5579.a4c1 ffff.ffff.0000
```

Related Commands

Command	Description
match mac-list	Matches a MAC address in a MAC list for OTV.
show mac-list	Displays information about a MAC list.

mac address-table reserve-hsrp-vmac

To enable mac reservation for all vlan, use mac address-table reserve-hsrp-vmac command.

mac address-table reserve-hsrp-vmac [*vlan_id*]

Table 3: Syntax Description

vlan_id	Specifies the VLAN id to reserve the mac address table for HSRP.

Table 4: Command History

Release	Modification
8.4(6)	This command was introduced.

```
switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# mac address-table reserve-hsrp-vmac
switch(config)# interface vlan
<1-4094> Vlan interface number
switch(config)# interface vlan 1001
switch(config-if)# shut
switch(config-if)# show mac address-table vlan 1001
Note: MAC table entries displayed are getting read from software.
Use the 'hardware-age' keyword to get information related to 'Age'
Legend:
* - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
age - seconds since last seen,+ - primary entry using vPC Peer-Link, E - EVPN entry
(T) - True, (F) - False , ~~~ - use 'hardware-age' keyword to retrieve age info
VLAN/BD MAC Address Type age Secure NTFY Ports/SWID.SSID.LID
---------+-----------------+--------+---------+------+----+------------------
* 1001 0000.0044.0004 static - F F 10.0.3590
* 1001 0005.73a0.03e9 static - F F 10.0.3590
* 1001 8c60.4f9e.4fc2 static - F F 10.0.3590
* 1001 d867.d904.3ec3 dynamic ~~~ F F Po1
switch(config-if)# show mac address-table vlan 1001 address
E.E.E MAC Address (Option 1)
EE-EE-EE-EE-EE-EE MAC Address (Option 2)
EE:EE:EE:EE:EE:EE MAC Address (Option 3)
EEEE.EEEE.EEEE MAC Address (Option 4)
switch(config-if)# show mac address-table vlan 1001 address 0000.0044.0004
Note: MAC table entries displayed are getting read from software.
Use the 'hardware-age' keyword to get information related to 'Age'
Legend:
* - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
age - seconds since last seen,+ - primary entry using vPC Peer-Link, E - EVPN entry
(T) - True, (F) - False , ~~~ - use 'hardware-age' keyword to retrieve age info
VLAN/BD MAC Address Type age Secure NTFY Ports/SWID.SSID.LID
---------+-----------------+--------+---------+------+----+------------------
* 1001 0000.0044.0004 static - F F 10.0.3590
switch(config-if)#
```

match as-number

To match to a Border Gateway Protocol (BGP) autonomous system (AS) number, use the **match as-number** command. To remove an AS number list entry, use the **no** form of this command.

match as-number {*number [,number...]* | **as-path-access-list** *name* [**...** *name*]}
no match as-number {*number [, number...]* | **as-path-access-list** *name* [**...** *name*]}

Syntax Description

number	AS number. The range is from 1 to 65535.
...number	(Optional) AS number. The range is from 1 to 65535.
as-path-access-list *name*	Specifies an AS-path access list to match AS numbers against. The name can be any alphanumeric string up to 63 characters.
...name	(Optional) AS-path access list. The name can be any alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **match as-number** command to provide a list of AS numbers or an AS-path access list using a regular expression. BGP uses this match criteria to determine which BGP peers to create a BGP session with.

Use the route map to specify a range of AS numbers whose peers can establish session with the local BGP through prefix peering. Cisco NX-OS ignores any other **match** commands if the **match as-number** command is present in the route-map.

This command does not require a license.

Examples

This example shows how to configure a list of AS numbers:

```
switch#configure terminal
switch(config)# route-map IGP2BGP
switch(config-route-map)# match as-number 64496, 64498-64510
```

Related Commands

Command	Description
ip as-path access-list	Creates an AS-path list.
neighbor	Configures BGP peers.
route-map	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.

match as-path

To match a BGP autonomous system path access list, use the **match as-path** command in route-map configuration mode. To remove a path list entry, use the **no** form of this command.

match as-path *name* [**. . .** *name*]
no match as-path *name* [**. . .** *name*]

Syntax Description

name	Autonomous system path access list. The name can be any alphanumeric string up to 63 characters.
...name	(Optional) Autonomous system path access list. You can configure up to 32 access list names .

Command Default

No path lists are defined.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The values set by the **match as-path** command overrides global values.

A route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route-map section with an explicit match specified.

This command does not require a license.

Examples

This example sets the autonomous system path to match BGP autonomous system path access list 20:

```
switch#configure terminal
switch(config)# route-map IGP2BGP
switch(config-route-map)# match as-path 20
```

Related Commands

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 route-type	Redistributes routes of the specified type.

Command	Description
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	Modifies an autonomous system path for BGP routes.
set comm-list	Automatically computes the tag value in a route map configuration.
set community	Sets BGP community list (for deletion).
set level	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.
set tag	Sets the value of the destination routing protocol.
set vrf	Sets the VRF for next-hop resolution.
set weight	Specifies the BGP weight for the routing table.

match community

To match a Border Gateway Protocol (BGP) community, use the **match community** command. To remove the **match community** command from the configuration file and restore the system to its default condition where the software removes the BGP community list entry, use the **no** form of this command.

community *name* [**...** *name*] [**exact-match**]
no community *name* [**...** *name*] [**exact-match**]

Syntax Description

name	One or more community list names. The name can be any alphanumeric string up to 63 characters. You can configure a maximum of 32 community lists.
exact-match	(Optional) Indicates that an exact match is required. All of the communities and only those communities specified must be present.

Command Default

No community list is matched by the route map.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

A route map can have several parts. Any route that does not match at least one **match** command relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route-map section with an explicit match specified.

Matching that is based on the community list number is one of the types of **match** commands applicable to BGP.

This command does not require a license.

Examples

This example shows how to match two BGP communities:

```
switch#configure terminal
switch(config)# route-map test2
switch(config-route-map)# match community bgpLow bgpHigh
```

This example shows that the routes matching community list 1 will have the weight set to 200. Any route that has the standard community 109 only will have the weight set to 200.

```
switch#configure terminal
switch(config)# ip community-list standard bgpLow permit 109
switch(config)# route-map set_weight
switch(config-route-map)# match community bgpLow exact-match
switch(config-route-map)# set weight 200
```

This example shows that the routes that match the community list 500. Any route that has expanded community 1 will have the weight set to 150.

```
switch#configure terminal
switch(config)# ip community-list expanded 500 permit [0-9]*
switch(config)# route-map MAP_NAME permit 10
switch(config-route-map)# match community 500
switch(config-route-map)# set weight 150
```

Related Commands

Command	Description
ip community-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.
set weight	Specifies the BGP weight for the routing table.

match extcommunity

To match a Border Gateway Protocol (BGP) extended community in a route map, use the **match extcommunity** command. To remove the match from the route map, use the **no** form of this command.

extcommunity *name* [**. . .** *name*] [**exact-match**]
no extcommunity *name* [**. . .** *name*] [**exact-match**]

Syntax Description

name	One or more extended community list names. The name can be any alphanumeric string up to 63 characters. You can configure a maximum of 32 community lists.
exact-match	(Optional) Indicates that an exact match is required. All of the communities and only those extended communities specified must be present.

Command Default

No community list is matched by the route map.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

A route map can have several parts. Any route that does not match at least one **match** command in the route map will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route-map section with an explicit match specified.

Matching that is based on the extended community list number is one of the types of **match** commands applicable to BGP.

This command does not require a license.

Examples

This example shows how to match two BGP extended community lists:

```
switch#configure terminal
switch(config)# route-map test2
switch(config-route-map)# match extcommunity bgpLocal bgpRemote
```

This example shows how to that the routes that match the extended community list bgpLocal will change from nontransitive to transitive:

```
switch#configure terminal
switch(config)# ip extcommunity-list standard bgpLocal permit generic nontransitive 1.9
switch(config)# route-map deletCommunity
switch(config-route-map)# match extcommunity bgpLocal exact-match
switch(config-route-map)# set extcommunity generic transitive 1.9
```

Related Commands

Command	Description
ip extcommunity-list	Creates a community list for BGP and controls access to it.

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 an extended community in a route map.

match interface

To match an interface in a route map, use the **match interface** command. To remove the match, use the **no** form of this command.

match interface {*interface-type number* [, *interface-type number*...]}
nomatch interface {*interface-type number* [, *interface-type number*...]}

Syntax Description

interface-type	Interface type. Use **?** to see a list of supported interfaces.
number	(Optional) Interface number. Use **?** to see the range.

Command Default

None

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **match interface** command to provide a list of interfaces to match a route against. Route next-hop addresses that are reached by one of these interfaces result in a match for the route map.

A route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route-map section with an explicit match specified.

This command does not require a license.

Examples

This example shows how to configure a list of interfaces:

```
switch#configure terminal
switch(config)# route-map test1
switch(config-route-map)# match interface ethernet 2/1, ethernet 4/3
```

Related Commands

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

match ip address

To distribute any routes that have a destination IPv4 network number address that is permitted by a standard access list, an expanded access list, or a prefix list, or to perform policy routing on packets, use the **match ip address** command. To remove the **match ip address** entry, use the **no** form of this command.

match ip address {*access-list-name* [*access-list-name* **. . .**] | **prefix-list** *prefix-list-name* [*prefix-list-name* **. . .**]}
nomatch ip address {*access-list-name* [*access-list-name* **. . .**] | **prefix-list** *prefix-list-name* [*prefix-list-name* **. . .**]}

Syntax Description

access-list-name...	Name of a standard or expanded access list. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.
prefix-list *prefix-list-name...*	Distributes routes based on a prefix list. The prefix list name can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.

Command Default

No access list names or prefix lists are specified.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The *access-list-name* argument is supported in route maps for Policy based-routing (PBR) only.

An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the *access-list-name* or the *prefix-list-name* arguments .

Like matches in the same route map subblock are filtered with “or” semantics. If any one match clause is matched in the entire route map subblock, this match is treated as a successful match. Dissimilar match clauses are filtered with “and” semantics. Dissimilar matches are filtered logically. If the first set of conditions is not met, the second match clause is filtered. This process continues until a match occurs or there are no more match clauses.

Use route maps to redistribute routes or to subject packets to policy routing.

Redistribution

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

When you are passing routes through a route map, a route map can have several sections that contain specific **match** clauses. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route map section with an explicit match specified.

Policy Routing

Another purpose of route maps is to enable policy routing. The match ip address command allows you to policy route packets based on criteria that can be matched with an expanded access list; for example, a protocol, protocol service, and source or destination IP address. To define the conditions for policy routing packets, use the **ip policy route-map** interface configuration command, in addition to the **route-map** global configuration command, and the **match** and **set** route-map configuration commands. 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. You might want to policy route packets based on their source, for example, using an access list.

This command does not require a license.

Examples

This example shows how to match routes that have addresses specified by an access list test:

```
switch#configure terminal
switch(config)# feature pbr
switch(config)# interface ethernet 2/10
switch(config-if)# ip policy route-map chicago
switch(config-if)# exit
switch(config)# route-map chicago
switch(config-route-map)# match ip address test
```

Related Commands

Command	Description
ip policy route-map	Identifies a route map to use for policy routing on an interface.
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match interface	Distributes any routes that have their next hop out one of the interfaces specified.
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 length	Bases policy routing on the Level 3 length of a packet.
match metric	Redistributes routes with the metric specified.

Command	Description
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	Modifies an autonomous system path for BGP routes.
set automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
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 packets that pass a match clause of a route map for policy routing.
set level	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 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.

match ip multicast

To configure the IPv4 multicast features for the route-map matching, use the **match ip multicast** route-map configuration command. To remove the match, use the **no** form of this command.

match ip multicast {**group** *address*/*length* | **source** *address*/*length* | **rp** *address*/*length* [**rp-type** {**asm** | **bidir**}]}
no match ip multicast

Syntax Description

group *address*/*length*	Specifies the group address and the length of the network mask in bits, in this format: *A.B.C.D*/*length*. The network number can be any valid IP address or prefix. The bit mask can be a number from 0 to 32. You can configure group, source, and rp options.
source *address*/*length*	Specifies the source address and the length of the network mask in bits, in this format: *A.B.C.D*/*length*. The network number can be any valid IP address or prefix. The bit mask can be a number from 0 to 32. You can configure group, source, and rp options.
rp *address*/*length*	Specifies the IPv4 rendezvous prefix (RP) and the length of the IPv4 prefix mask in bits, in this format: *A.B.C.D*/*length*. The network number can be any valid IPv4 address or prefix. The bit mask can be a number from 0 to 32. You can configure group, source, and rp options.
rp-type	(Optional) Specifies the multicast rendezvous point type.
asm	Specifies the any-source multicast (ASM) rendezvous point type.
bidir	Specifies the bidirectional (bidir) multicast rendezvous point type.

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 **source** keyword.

Usage Guidelines

To specify the multicast attributes to match, use the **match ip multicast** 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 **match ip multicast** command.

You can configure both group and rp options.

This command does not require a license.

Examples

This example shows how to specify the group IPv4 prefix and the length of the IPv4 prefix for the neighbors to match:

```
switch#configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match ip multicast group 192.0.0.0/19
switch(config-route-map)#
```

This example shows how to specify both the group IPv4 prefix and the rendezvous point the IPv4 prefix for the neighbors to match:

```
switch#configure terminal
switch(config)# route-map raspberry
switch(config-route-map)# match ip multicast group 192.0.0.0/19 rp 209.165.201.0/27
switch(config-route-map)#
```

Related Commands

Command	Description
ip policy route-map	Identifies a route map to use for policy routing on an interface.
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match interface	Distributes any routes that have their next hop out one of the interfaces specified.
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 length	Bases policy routing on the Level 3 length of a packet.
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	Modifies an autonomous system path for BGP routes.
set automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.

Command	Description
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 packets that pass a match clause of a route map for policy routing.
set level	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 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.

match ip next-hop prefix-list

To redistribute any IPv4 routes that have a next hop router address passed by one of the access lists specified, use the **match ip next-hop prefix-list** command in route-map configuration mode. To remove the next hop entry, use the **no** form of this command.

match ip next-hop prefix-list *prefix-list-name* [**. . .***prefix-list-name*]
nomatch ip next-hop prefix-list *prefix-list-name* [**. . .***prefix-list-name*]

Syntax Description

prefix-list-name	Number or name of a prefix list. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.

Command Default

Routes are distributed freely, without being required to match a next hop address.

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 *prefix-list-name* argument .

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

When you are passing routes through a route map, a route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route map section with an explicit match specified.

This command does not require a license.

Examples

This example shows how to distributes routes that have a next hop router address passed by the prefix list test:

```
switch#configure terminal
switch(config)# route-map blue
switch(config-route-map)# match ip next-hop prefix-list test
```

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 route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
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	Modifies an autonomous system path for BGP routes.
set automatic-tag	Automatically computes the tag value.
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 (BGP,OSPF,RIP)	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.

match ip route-source prefix-list

To redistribute IPv4 routes that have been advertised by routers and access servers at the address specified by the access lists, use the **match ip route-source prefix-list** command in route-map configuration mode. To remove the route-source entry, use the **no** form of this command.

match ip route-source prefix-list *prefix-list-name* [**. . .***prefix-list-name*]
nomatch ip route-source prefix-list *prefix-list-name* [**. . .***prefix-list-name*]

Syntax Description

prefix-list-name	Number or name of a prefix list. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.

Command Default

No filtering on route source.

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 *prefix-list-name* argument .

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure second route map section with an explicit match specified.

There are situations in which the next hop and source router address of the route are not the same.

This command does not require a license.

Examples

This example shows how to distribute routes that have been advertised by routers and access servers at the addresses specified by access lists 5 and 80:

```
switch#configure terminal
switch(config)# route-map blue
switch(config-route-map)#  match ip route-source prefix-list 5 80
```

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 route-type	Redistributes routes of the specified type.
route-map	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 automatic-tag	Automatically computes the tag value.
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 (BGP,OSPF,RIP)	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.

match ipv6 address

To distribute any routes that have a destination IPv6 network number address that is permitted by a standard access list, an expanded access list, or a prefix list, or to perform policy routing on packets, use the **match ipv6 address** command in route-map configuration mode. To remove the **match** statement from the route map, use the **no** form of this command.

match ipv6 address {**prefix-list** *prefix-list-name* [*prefix-list-name* **. . .**]*access-list-name*}
nomatch ipv6 address {**prefix-list** *prefix-list-name* [*prefix-list-name* **. . .**]*access-list-name*}

Syntax Description

prefix-list *prefix-list-name...*	Distributes routes based on a prefix list. The prefix list name can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered. You can configure up to 32 prefix lists.
access-list-name...	Name of a standard or expanded access list. It can be any alphanumeric string up to 63 characters. You can only use access lists for policy-based routing.

Command Default

No access list names or prefix lists are specified.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The *access-list-name* argument is supported in route-maps for PBR only.

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

Like matches in the same route map subblock are filtered with “or” semantics. If any one match clause is matched in the entire route map subblock, this match is treated as a successful match. Dissimilar match clauses are filtered with “and” semantics. So dissimilar matches are filtered logically. If the first set of conditions is not met, the second match clause is filtered. This process continues until a match occurs or there are no more match clauses.

Use route maps to redistribute routes or to subject packets to policy routing. Both purposes are described in this section.

Redistribution

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

When you are passing routes through a route map, a route map can have several sections that contain specific **match** clauses. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route map section with an explicit match specified.

Policy Routing

Another purpose of route maps is to enable policy routing. The match ipv6 address command allows you to policy route packets based on criteria that can be matched with an expanded access list; for example, a protocol, protocol service, and source or destination IP address. To define the conditions for policy routing packets, use the **ipv6 policy route-map** interface configuration command, in addition to the **route-map** global configuration command, and the **match** and **set** route-map configuration commands. 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. You might want to policy route packets based on their source, for example, using an access list.

This command does not require a license.

Examples

This example shows how to match routes that have addresses specified by the access list named red:

```
switch#configure terminal
switch(config)# feature pbr
switch(config)# route-map blue
switch(config-route-map)# match ipv6 address red
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match interface	Distributes any routes that have their next hop out one of the interfaces specified.
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 length	Bases policy routing on the Level 3 length of a packet.
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.

Command	Description
route-map	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 automatic-tag	Automatically computes the tag value.
set community	Sets the BGP communities attribute.
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 packets that pass a match clause of a route map for policy routing.
set level	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 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.

match ipv6 multicast

To configure the IPv6 multicast features for the route-map matching, use the **match ipv6 multicast** route-map configuration command.

match ipv6 multicast {**group** *address*/*length* | **source** *address*/*length* | **rp** *address*/*length* [**rp-type** {**asm** | **bidir**}]}

Syntax Description

group *address*/*length*	Specifies the group address and the length of the network mask in bits, in this format: *A*:*B*::*C*:*D*/*length*. The network number can be any valid IPv6 address or prefix. The range for *length* is 0 to 0x7FFFFFFF . You can specify the **group**, **source**, and **rp** options.
source *address*/*length*	Specifies the source address and the length of the network mask in bits, in this format: *A*:*B*::*C*:*D*/*length*. The network number can be any valid IPv6 address or prefix. The range for *length* is 0 to 0x7FFFFFFF . You can specify the **group**, **source**, and **rp** options.
rp *address*/*length*	Specifies the IPv6 rendezvous prefix (RP) and the length of the IPv6 prefix mask in bits, in this format: *A*:*B*::*C*:*D*/*length*. The network number can be any valid IPv6 address or prefix. The bit mask can be a number from 0 to 32. You can specify the **group**, **source**, and **rp** options.
rp-type	(Optional) Specifies the multicast rendezvous point type.
asm	Specifies the any-source multicast (ASM) rendezvous point type.
bidir	Specifies the bidirectional (bidir) multicast rendezvous point type.

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 **source** keyword.

Usage Guidelines

To specify the multicast attributes to match, use the **match ipv6 multicast** route-map configuration command. You must enter the **feature pbr** global configuration mode command to enable 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 **match ipv6 multicast** command.

You can specify the **group, source,** and **rp** options.

This command does not require a license.

Examples

This example shows how to specify the group IPv6 prefix and the length of the IPv6 prefix for the neighbors to match:

```
switch#configure terminal
switch(config)# route-map blueberry
switch(config-route-map)#match ipv6 multicast group 30:0::0:0/12
switch(config-route-map)#
```

This example shows how to specify both the group IPv6 prefix and the rendezvous point IPv6 prefix for the neighbors to match:

```
switch#configure terminal
switch(config)# route-map red
switch(config-route-map)#match ipv6 multicast group 30:0::0:0/12 rp 2001:0DB8::/48
switch(config-route-map)#
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ipv6 next-hop	Redistributes any routes that have a next hop router address passed by one of the access lists specified.
match ipv6 route-source	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
match length	Bases policy routing on the Level 3 length of a packet.
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	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set ipv6 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 next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing.
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 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.

match ipv6 next-hop prefix-list

To redistribute any IPv6 routes that have a next hop router address passed by one of the access lists specified, use the **match ipv6 next-hop prefix-list** command. To remove the next hop entry, use the **no** form of this command.

match ipv6 next-hop prefix-list *name* [**. . .***name*]
nomatch ipv6 next-hop prefix-list *name* [**. . .***name*]

Syntax Description

name...	Prefix list name. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.

Command Default

Routes are distributed freely, without being required to match a next hop address.

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 *name* argument .

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

Note A permit route map containing only **set** commands and no **match** commands permits all routes.

When you are passing routes through a route map, a route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route map section with an explicit match specified.

This command does not require a license.

Examples

This example shows how to distribute routes that have a next hop router address passed by prefix list 5:

```
switch# configure terminal
switch(config)# route-map blue
switch(config-route-map)#match ipv6 next-hop prefix-list test
```

Related Commands

Command	Description
match as-path	Matches a BGP autonomous system path access list.
match community	Matches a BGP community.
match ipv6 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 length	Bases policy routing on the Level 3 length of a packet.
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	Modifies an autonomous system path for BGP routes.
set community	Sets the BGP communities attribute.
set ipv6 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 next-hop	Indicates where to output packets that pass a match clause of a route map for policy routing.
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.

match ipv6 route-source prefix-list

To redistribute IPv6 routes that have been advertised by routers and access servers at the address specified by the access lists, use the **match ipv6 route-source prefix-list** command in route-map configuration mode. To remove the route-source entry, use the **no** form of this command.

match ipv6 route-source prefix-list *name* [**. . .***name*]
nomatch ipv6 route-source prefix-list *name* [**. . .***name*]

Syntax Description

name...	Prefix list name. It can be any alphanumeric string up to 63 characters. The ellipsis indicates that multiple values can be entered, up to 32 prefix lists.

Command Default

No filtering on route source.

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 *name* argument .

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure second route map section with an explicit match specified.

There are situations in which the next hop and source router address of the route are not the same.

This command does not require a license.

Examples

This example shows how to distribute routes that have been advertised by routers and access servers at the addresses specified by the prefix list test:

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

```
switch(config-route-map)# match ipv6 route-source prefix-list test
```

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 route-type	Redistributes routes of the specified type.
route-map	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 automatic-tag	Automatically computes the tag value.
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 (BGP, OSPF, RIP)	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.

match length

To base policy routing on the Level 3 length of a packet, use the **match length** command. To remove the entry, use the **no** form of this command.

match length *minimum-length maximum-length*
no match length *minimum-length maximum-length*

Syntax Description

minimum-length	Minimum Level 3 length of the packet, inclusive, allowed for a match. Range: 0 to 2147483647.
maximum-length	Maximum Level 3 length of the packet, inclusive, allowed for a match. Range: 0 to 2147483647.

Command Default

No policy routing occurs on the length of a packet.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

In IPv4, use the **ip 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 **ip policy route-map** command identifies a route map by name. Each **route-map** 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.

In PBR for IPv6, use the **ipv6 policy route-map** or **ipv6 local policy route-map** command to define conditions for policy routing packets.

In IPv4, the **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the packet to be routed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

In IPv4, you might want to base your policy routing on the length of packets so that your interactive traffic and bulk traffic are directed to different routers.

This command does not require a license.

Examples

This example shows how to set the packets 3 to 200 bytes long:

```
switch# configure terminal
switch(config)# route-map blue
switch(config-route-map)# match length 3 200
```

Related Commands

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 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	Defines the conditions for redistributing routes from one routing protocol into 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 default next-hop	Specifies an IPv6 default next hop to which matching packets will be forwarded.
set ipv6 next-hop	Indicates where to output 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.

match metric

To redistribute routes in the routing table that match the routing metric value, use the **match metric**command. To remove the tag entry, use the **no** form of this command.

match metric *metric-value* **[**+-*deviation-number***]** [**. . .** **metric-value** **[**+-*deviation-number***]**]
nomatch metric *metric-value* **[**+-*deviation-number***]** [**. . .** **metric-value** **[**+-*deviation-number***]**]

Syntax Description

metric-value	Internal route metric. The range is from 1 to 4294967295.
+ -	Specifies a standard deviation range of the metric. The router will match any metric that falls inclusively in that range.
deviation-number	(Optional) Standard deviation number that will offset the number configured for the *metric-value* argument. The *deviation-number* argument can be any number. There is no default.

Command Default

No match values are defined.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
5.0(2)	This command was introduced.

Usage Guidelines

To redistribute routes with the specified metric, use the **match metric** command in route-map configuration mode. To remove the entry for the redistributed route from the routing table, use the no form of this command.

You can specify one or more metrics (or) range of metrics using the *deviation-number* argument. At least one of the specified metrics must match for the command to “pass”.

An ellipsis (...) in the command syntax indicates that your command input can include multiple values for the arguments .

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must “pass” to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure second route map section with an explicit match specified.

This command requires the LAN Enterprise license.

Examples

This example shows how to redistribute routes stored in the routing table with a metric of 5:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match metric 5
```

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	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.

match mac-list

To redistribute routes in the routing table that match a MAC address in the MAC list, use the **match mac-list**command in route-map configuration mode. To remove the tag entry, use the **no** form of this command.

match mac-list *listname*
no match mac-list *listname*

Syntax Description

listname	MAC list name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default

No match values are defined.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
5.0(2)	This command was introduced.

Usage Guidelines

To redistribute routes with the specified MAC address into an Overlay Transport Virtualization (OTV) network, use the **match mac-list** command in route-map configuration mode. To remove the entry for the redistributed route from the routing table, use the no form of this command.

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure second route map section with an explicit match specified.

This command requires the LAN Enterprise license.

Examples

This example shows how to redistribute routes stored in the routing table that match entries in the Red MAC list:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match mac-list Red
```

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	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.

match route-type

To redistribute routes of the specified type, use the **match route-type** command in route-map configuration mode. To remove the route type entry, use the **no** form of this command.

match route-type {**external** | **inter-area** | **internal** | **intra-area** | **level-1** | **level-2** | **local** | **nssa-external** | **type-1** | **type-2**}
no match route-type {**external** | **inter-area** | **internal** | **intra-area** | **level-1** | **level-2** | **local** | **nssa-external** | **type-1** | **type-2**}

Syntax Description

external	Specifies the external route (Border Gateway Protocol [BGP], Enhanced Interior Gateway Routing Protocol [EIGRP], and Open Shortest Path First [OSPF] type 1/2). You can specify more than one keyword.
inter-area	Specifies OSPF inter area route. You can specify more than one keyword.
internal	Specifies the internal route (including the OSPF intra/inter area). You can specify more than one keyword.
intra-area	Specifies OSPF intra area route. You can specify more than one keyword.
level-1	Specifies the Intermediate System-to-Intermediate System (IS-IS) level-1 route. You can specify more than one keyword.
level-2	Specifies the IS-IS level-2 route. You can specify more than one keyword.
local	Specifies the locally generated route. You can specify more than one keyword.
nssa-external	Specifies the nssa-external route (OSPF type 1/2). You can specify more than one keyword.
type-1	Specifies the OSPF external type 1 route. You can specify more than one keyword.
type-2	Specifies the OSPF external type 2 route. You can specify more than one keyword.

Command Default

This command is disabled by default.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
6.1(1)	Added inter-area and intra-area keywords to the syntax description.
4.0(1)	This command was introduced.

Usage Guidelines

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure second route map section with an explicit match specified.

You can specify more than one keyword.

This command does not require a license.

Examples

This example shows how to redistribute internal routes:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match route-type internal
```

This example shows how to redistribute internal routes and type-1 OSPF routes:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match route-type internal type-1
```

This example shows how to specifies OSPF inter area route:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match route-type inter-area
switch(config-route-map)#
```

This example shows how to specifies OSPF intra area route:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match route-type intra-area
switch(config-route-map)#
```

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 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	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.

match source-protocol

To specify a match clause that matches external routes from sources that match the source protocol, use the **match source-protocol** command.

match source-protocol *source-protocol* [*as-number*]

Syntax Description

source-protocol	Source protocol. The valid options are bgp, connected, eigrp, isis, ospf, rip, and static.
as-number	Autonomous System Number (ASN). The range is from 1 to 65535.

Command Default

None

Command Modes

config-router mode

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 a match clause that matches external routes from sources that match the source protocol:

```
switch# configure terminal
switch(config)# route-map metric-rangeouter eigrp Test1
switch(config-router)# match metric external 500 +- 100
switch(config-router)# match source-protocol bgp 45000
switch(config-router)#
```

Related Commands

Command	Description
set tag	Sets a tag value on the route in the destination routing protocol when all the match criteria of a route map are met.

match tag

To redistribute routes in the routing table that match the specified tags, use the **match tag**command. To remove the tag entry, use the **no** form of this command.

match tag *tag-value* [**...***tag-value*]
nomatch tag *tag-value* [**...***tag-value*]

Syntax Description

tag-value	List of one or more route tag values. Each can be an integer from 0 to 4294967295. You can configure up to 32 tags.

Command Default

No match tag values are defined.

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 *tag-value* argument .

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure second route map section with an explicit match specified.

This command does not require a license.

Examples

This example shows how to redistribute routes stored in the routing table with tag 5:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match tag 5
```

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	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.

match vlan

To filter routes with the specified VLAN, use the **match vlan** command. To remove the entry for the redistributed route from the routing table, use the **no** form of this command.

match vlan *vlan-range*
no match vlan *vlan-range*

Syntax Description

vlan-range	Range of VLAN that this command matches against. The range is from 1 to 4094.

Command Default

No match VLAN values are defined.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
5.0(2)	This command was introduced.

Usage Guidelines

To filter routes with the specified VLAN, use the **match vlan** command You can specify one or more VLANs (or) range of VLANs. At least one of the specified VLANs must match for the command to pass. The command matches any VLAN that falls inclusive in the range.

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

A route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure second route map section with an explicit match specified.

This command does not require a license.

Examples

This example redistributes routes that match VLANs 5-10:

```
switch# configure terminal
switch(config)# route-map blueberry
switch(config-route-map)# match vlan 5-10
```

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	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.

max-lsp-lifetime

To set the maximum time for which link-state packets (LSPs) persist without being refreshed, use the **max-lsp-lifetime** command. To restore the default time, use the **no** form of this command.

max-lsp-lifetime *value*
no max-lsp-lifetime

Syntax Description

value	(Optional) Maximum LSP lifetime in seconds. Range: 1 to 65535. Default: 1200.

Command Default

The default is 1200 seconds.

Command Modes

Router configurationVRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The maximum LSP lifetime must be greater than the LSP refresh interval.

This command requires the Enterprise Services license.

Command Default

This example shows how to set the maximum time that the LSP persists to 11,000 seconds (more than three hours):

```
switch# configure terminal
switch(config)# router isis
switch(config-router)# max-lsp-lifetime 11000
```

Related Commands

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

max-metric router-lsa (OSPF)

To configure the Open Shortest Path First (OSPF) protocol to advertise a maximum metric so that other routers do not prefer the router as an intermediate hop in their shortest path first (SPF) calculations, use the **max-metric router-lsa** command. To disable the advertisement of a maximum metric, use the **no** form of this command.

max-metric router-lsa [**external-lsa** *[max-metric-value]* [**include-stub**]] [**on-startup** [{*seconds* | **wait-for bgp** *tag*}]] [**summary-lsa** *[max-metric-value]*]
nomax-metric router-lsa [**external-lsa** *[max-metric-value]* [**include-stub**]] [**on-startup** [{*seconds* | **wait-for bgp** *tag*}]] [**summary-lsa** *[max-metric-value]*]

Syntax Description

external-lsa	Specifies the external LSAs.
max-metric-value	(Optional) Specifies the max-metric values for external LSAs. The range is 1-65535.
include-stub	Advertises the max-metric for stub links.
on-startup	(Optional) Configures the router to advertise a maximum metric at startup.
seconds	(Optional) Maximum metric (in seconds) that is advertised for the specified time interval. The configurable range is from 5 to 86400 seconds. The default is 600 seconds.
wait-for bgp *tag*	(Optional) Advertises a maximum metric until Border Gateway Protocol (BGP) routing tables have converged or the default timer has expired. The default timer is 600 seconds.
summary-lsa	Specifies the summary LSAs.
max-metric-value	(Optional) Specifies the max-metric value for summary LSAs. The range is from 1-65535.

Command Default

Originates router link-state advertisements (LSAs) with normal link metrics.

Command Modes

Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Use the **max-metric router-lsa** command to originate LSAs with a maximum metric (LSInfinity: 0xFFFF) through all nonstub links, which allows BGP routing tables to converge without attracting transit traffic (if there are not alternate lower cost paths to the router). The router advertises accurate (normal) metrics after the configured or default timers expire or after BGP sends a notification that routing tables have converged.

Updates hold true to all releases that have this command and option.

wait-for-bgp is a feature to avoid the IGP from declaring its ready to be used for transit after a reload, if BGP on the device has not converged yet (received the entire routing table from its peers and installed in FIB). This prevents an upstream node sending externally bound (BGP) traffic to this node prematurely and causing traffic blackholing.

Note Directly connected links in a stub network are not affected by the configuration of a maximum or infinite metric because the cost of a stub link is always set to the output interface cost.

You can use the max-metric router-lsa command in the following situations:

- Reloading a router. After a router is reloaded, Interior Gateway Protocols (IGPs) converge very quickly, and other routers may try to forward traffic through the newly reloaded router. If the router is still building BGP routing tables, the packets that are destined for other networks that the router has not learned through BGP may be dropped.
- Introducing a router into a network without routing traffic through it. You may want to connect a router to an OSPF network but not want real traffic to flow through the router if there are better alternate paths. If no alternate paths exist, then this router would still accept transit traffic.
- Gracefully removing a router from a network. This feature allows you to gracefully remove a router from the network by advertising a maximum metric through all links, which allows other routers to select alternate paths for transit traffic to follow before the router is shut down.

Note You should not save the running configuration of a router that is configured for a graceful shutdown because the router will continue to advertise a maximum metric after it is reloaded.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a router that is running OSPF to advertise a maximum metric for 100 seconds:

```
switch# configure terminal
switch(config)# router ospf 100
switch(config-router)# max-metric router-lsa on-startup 100
```

This example shows how to configure a router to advertise a maximum metric until BGP routing tables converge or until the default timer expires (600 seconds):

```
switch# configure terminal
switch(config)# router ospf 100
switch(config-router)# max-metric router-lsa on-startup wait-for bgp bgpTag
```

Related Commands

Command	Description
show ip ospf	Displays general information about OSPF routing processes.

max-metric router-lsa (OSPFv2)

To configure the Open Shortest Path First version 2 (OSPFv2) protocol to advertise a maximum metric so that other routers do not prefer the router as an intermediate hop in their shortest path first (SPF) calculations, use the **max-metric router-lsa** (**OSPFv2**) command. To disable the advertisement of a maximum metric, use the **no** form of this command.

max-metric router-lsa [**external-lsa** [*max-metric-value*]] [**include-stub**] [{**on-startup** *[seconds]* | **wait-for bgp** *tag*}] [**summary-lsa** [*max-metric-value*]]
no max-metric router-lsa [**external-lsa** [*max-metric-value*]] [**include-stub**] [{**on-startup** *[seconds]* | **wait-for bgp** *tag*}] [**summary-lsa** [*max-metric-value*]]

Syntax Description

external-lsa	(Optional) Specifies the external link-state advertisements (LSAs).
max-metric-value	(Optional) Max-metric values for summary LSAs. The range is from 1 to 167777215.
include-stub	Advertises the max-metric for stub links.
on-startup	(Optional) Configures the router to advertise a maximum metric at startup.
seconds	(Optional) Maximum metric (in seconds) that is advertised for the specified time interval. The configurable range is from 5 to 86400 seconds. The default is 600 seconds.
wait-for bgp	(Optional) Advertises a maximum metric until Border Gateway Protocol (BGP) routing tables have converged or the default timer has expired. The default timer is 600 seconds.
tag	(Optional) Tag of the BGP instance. The maximum size is 20 characters.
summary-lsa	Specifies the summary LSAs.

Command Default

Originates router link-state advertisements (LSAs) with normal link metrics.

Command Modes

Router configuration
Router VRF configuration

Command History

Release	Modification
6.2(8)	This command was introduced.

Usage Guidelines

Use the **max-metric router-lsa** command to originate LSAs with a maximum metric (LSInfinity: 0xFFFF) through all nonstub links, which allows BGP routing tables to converge without attracting transit traffic (if there are not alternate lower cost paths to the router). The router advertises accurate (normal) metrics after the configured or default timers expire or after BGP sends a notification that routing tables have converged.

Updates hold true to all releases that have this command and option.

The **wait-for bgp** keywords allow you to avoid the IGP from declaring it is ready to be used for transit after a reload, if BGP on the device has not converged yet (received the entire routing table from its peers and installed in FIB). This process prevents an upstream node sending externally bound (BGP) traffic to this node prematurely and causing traffic blackholing.

Note Directly connected links in a stub network are not affected by the configuration of a maximum or infinite metric because the cost of a stub link is always set to the output interface cost.

You can use the **max-metric router-lsa** (**OSPFv2**) command in the following situations:

- Reloading a router. After a router is reloaded, Interior Gateway Protocols (IGPs) converge very quickly, and other routers might try to forward traffic through the newly reloaded router. If the router is still building BGP routing tables, the packets that are destined for other networks that the router has not learned through BGP might be dropped.
- Introducing a router into a network without routing traffic through it. You might want to connect a router to an OSPF network but not want real traffic to flow through the router if better alternate paths exist. If no alternate paths exist, then this router would still accept transit traffic.
- Gracefully removing a router from a network. This feature allows you to gracefully remove a router from the network by advertising a maximum metric through all links, which allows other routers to select alternate paths for transit traffic to follow before the router is shut down.

Note You should not save the running configuration of a router that is configured for a graceful shutdown because the router continues to advertise a maximum metric after it is reloaded.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a router that is running OSPF to advertise a maximum metric for 100 seconds:

```
switch# configure terminal
switch(config)# router ospf 100
switch(config-router)# max-metric router-lsa on-startup 100
```

This example shows how to configure a router to advertise a maximum metric until BGP routing tables converge or until the default timer expires (600 seconds):

```
switch# configure terminal
switch(config)# router ospf 100
switch(config-router)# max-metric router-lsa on-startup wait-for bgp bgpTag
```

Related Commands

Command	Description
max-metric router-lsa (**OSPFv3**)	Configures the OSPFv3 protocol to advertise a maximum metric.
show ip ospf	Displays general information about OSPF routing processes.

max-metric router-lsa (OSPFv3)

To configure the Open Shortest Path First version 3 (OSPFv3) protocol to advertise a maximum metric so that other routers do not prefer the router as an intermediate hop in their shortest path first (SPF) calculations, use the **max-metric router-lsa** (**OSPFv3**) command. To disable the advertisement of a maximum metric, use the **no** form of this command.

max-metric router-lsa [**external-lsa** [*max-metric-value*]] [**stub-prefix-lsa**] [{**on-startup** *[seconds]* | **wait-for bgp** *tag*}] [**inter-area-prefix-lsa** [*max-metric-value*]]
no max-metric router-lsa [**external-lsa** [*max-metric-value*]] [**stub-prefix-lsa**] [{**on-startup** *[seconds]* | **wait-for bgp** *tag*}] [**inter-area-prefix-lsa** [*max-metric-value*]]

Syntax Description

external-lsa	(Optional) Specifies the external link-state advertisements (LSAs).
max-metric-value	(Optional) Max-metric values for summary LSAs. The range is from 1 to 167777215.
stub-prefix-lsa	(Optional) Advertises the max-metric for the stub links.
on-startup	(Optional) Configures the router to advertise a maximum metric at startup.
seconds	(Optional) Maximum metric (in seconds) that is advertised for the specified time interval. The configurable range is from 5 to 86400 seconds. The default is 600 seconds.
wait-for bgp	(Optional) Advertises a maximum metric until Border Gateway Protocol (BGP) routing tables have converged or the default timer has expired. The default timer is 600 seconds.
tag	(Optional) Tag of the BGP instance. The maximum size is 20 characters.
inter-area-prefix-lsa	(Optional) Advertises the inter-area LSAs.

Command Default

Originates router link-state advertisements (LSAs) with normal link metrics.

Command Modes

Router configuration
Router VRF configuration

Command History

Release	Modification
6.2(8)	This command was introduced.

Usage Guidelines

Use the max-metric router-lsa (**OSPFv3**) command to originate LSAs with a maximum metric (LSInfinity: 0xFFFF) through all nonstub links, which allows BGP routing tables to converge without attracting transit traffic (if there are not alternate lower cost paths to the router). The router advertises accurate (normal) metrics after the configured or default timers expire or after BGP sends a notification that routing tables have converged.

Updates hold true to all releases that have this command and option.

The **wait-for bgp** keywords allow you to avoid the IGP from declaring it is ready to be used for transit after a reload, if BGP on the device has not converged yet (received the entire routing table from its peers and

installed in FIB). This process prevents an upstream node sending externally bound (BGP) traffic to this node prematurely and causing traffic blackholing.

Note Directly connected links in a stub network are not affected by the configuration of a maximum or infinite metric because the cost of a stub link is always set to the output interface cost.

You can use the max-metric router-lsa (**OSPFv3**) command in the following situations:

- Reloading a router. After a router is reloaded, Interior Gateway Protocols (IGPs) converge very quickly, and other routers might try to forward traffic through the newly reloaded router. If the router is still building BGP routing tables, the packets that are destined for other networks that the router has not learned through BGP might be dropped.
- Introducing a router into a network without routing traffic through it. You might want to connect a router to an OSPF network but not want real traffic to flow through the router if better alternate paths exist. If no alternate paths exist, this router would still accept transit traffic.
- Gracefully removing a router from a network. This feature allows you to gracefully remove a router from the network by advertising a maximum metric through all links, which allows other routers to select alternate paths for transit traffic to follow before the router is shut down.

Note You should not save the running configuration of a router that is configured for a graceful shutdown because the router continues to advertise a maximum metric after it is reloaded.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a router that is running OSPFv3 to advertise a maximum metric for 100 seconds:

```
switch# configure terminal
switch(config)# router ospfv3 200
switch(config-router)# max-metric router-lsa on-startup 100
```

This example shows how to configure a router to advertise a maximum metric for the stub links:

```
switch# configure terminal
switch(config)# router ospfv3 200
switch(config-router)# max-metric router-lsa stub-prefix-lsa
```

Related Commands

Command	Description
max-metric router-lsa (**OSPFv2**)	Configures the OSPFv2 protocol to advertise a maximum metric.
show ip ospf	Displays general information about OSPF routing processes.

maxas-limit

To configure the external Border Gateway Protocol (eBGP) to discard routes that have a high number of autonomous system (AS) numbers in the AS-path attribute, use the **maxas-limit** command. To revert to the default, use the **no** form of this command.

maxas-limit [*number*]
no maxas-limit

Syntax Description

number	(Optional) Maximum number of AS numbers allowed in the AS-path attribute. The range is from 1 to 2000.

Command Default

No limit

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Command Default

This example shows how to set the maximum number of AS numbers to 50:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# maxas-limit 50
```

Related Commands

Command	Description
feature bgp	Enables the BGP feature.
router bgp	Creates a BGP instance.

maximum-paths (BGP)

To control the maximum number of parallel routes that the Border Gateway Protocol (BGP) can support, use the **maximum-paths** command. To restore the default number of parallel routes, use the **no** form of this command.

maximum-paths [**ibgp**] *number-paths*
no maximum-paths [**ibgp**] *number-paths*

Syntax Description

ibgp	Configures the maximum interior BGP (iBGP) paths.
number-paths	Maximum number of parallel routes that an IP routing protocol installs in a routing table. The range is from 1 to 16. Starting from Cisco NX-OS Release 8.4(1), the range is from 1 to 64 on M3- and F3-Series I/O modules.

Command Default

1 path

Command Modes

Router address family configuration

Command History

Release	Modification
8.4(1)	The range for the *number-paths* variable was modified for M3- and F3-Series I/O modules. The range is now from 1 to 64.
4.0(1)	This command was introduced.

Usage Guidelines

There are no usage guidelines for this command.

Examples

This example shows how to allow a maximum of 16 paths to a destination for a BGP routing process:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# maximum-paths 16
```

This example shows how to allow a maximum of 64 paths to a destination for a BGP routing process:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# maximum-paths 64
```

Related Commands

Command	Description
feature bgp	Enables the BGP feature on the router.
router bgp	Enables BGP.

maximum-paths (EIGRP)

To control the maximum number of parallel routes that the Enhanced Interior Gateway Routing Protocol (EIGRP) can support, use the **maximum-paths** command. To remove the **maximum-paths** command from the configuration file and restore the default, use the **no** form of this command.

maximum-paths *maximum*
no maximum-paths

Syntax Description

maximum	Maximum number of parallel routes that EIGRP can install in a routing table. The range is from 1 to 16 routes.

Command Default

8 paths

Command Modes

Address-family configuration
Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(2)	The default maximum paths was *changed to 8 from 16.*

Usage Guidelines

Use the **maximum-paths** command to allow EIGRP to install multiple paths into the routing table for each prefix. Multiple paths are installed for both internal and external routes that are learned in the same autonomous system and that are equal cost (according to the EIGRP best path algorithm).

This command requires the Enterprise Services license.

Examples

This example shows how to allow a maximum of 10 paths to a destination:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router)# maximum-paths 10
```

maximum-paths (IS-IS)

To control the maximum number of parallel routes that an IP routing protocol can support, use the **maximum-paths** configuration mode command. To restore the default number of parallel routes, use the **no** form of this command.

maximum-paths *number-paths*
no maximum-paths

Syntax Description

number-paths	Maximum number of parallel routes that an IP routing protocol installs in a routing table. The range is from 1 to 16.

Command Default

8 paths

Command Modes

Router configurationVRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

There are no usage guidelines for this command.

Examples

This example shows how to allow a maximum of 16 paths to a destination for an IS-IS routing process:

```
switch# configure terminal
switch(config)# router isis 3
switch(config-router)# maximum-paths 16
```

Related Commands

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

maximum-paths (RIP)

To configure the maximum number of equal cost parallel routes that the Routing Information Protocol (RIP) will install into the routing table, use the **maximum-paths** command. To remove the **maximum-paths** command and restore the system to its default condition with respect to RIP, use the **no** form of this command.

maximum-paths *maximum*
no maximum-paths

Syntax Description

maximum	Maximum number of parallel routes that RIP can install in a routing table. The range is from 1 to 16.

Command Default

8 paths

Command Modes

Router address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to allow a maximum of 16 equal cost paths to a destination:

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# maximum-paths 16
```

Related Commands

Command	Description
address-family	Enters address-family configuration mode.

maximum-paths (OSPF)

To control the maximum number of parallel routes that Open Shortest Path First (OSPF) can support, use the **maximum-paths** command. To remove the **maximum-paths** command from the configuration file and restore the system to the default, use the **no** form of this command.

maximum-paths *maximum*
no maximum-paths

Syntax Description

maximum	Maximum number of parallel routes that OSPF can install in a routing table. The range is from 1 to 16 routes.

Command Default

8 paths

Command Modes

Router configuration
Router VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **maximum-paths** command to allow OSPF to install multiple paths into the routing table for each prefix. Multiple paths are installed for both internal and external routes that are learned in the same autonomous system and that have an equal cost (according to the OSPF shortest path first algorithm).

This command requires the Enterprise Services license.

Examples

This example shows how to allow a maximum of 10 paths to a destination:

```
switch# configure terminal
switch(config)# router ospf 1
switch(config-router)# maximum-paths 10
```

maximum-paths (OSPFv3)

To control the maximum number of parallel routes that Open Shortest Path First version 3 (OSPFv3) can support, use the **maximum-paths** command. To remove the **maximum-paths** command from the configuration file and restore the system to the default, use the **no** form of this command.

maximum-paths *maximum*
no maximum-paths

Syntax Description

maximum	Maximum number of parallel routes that OSPFv3 can install in a routing table. The range is from 1 to 16 routes.

Command Default

8 paths

Command Modes

Address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **maximum-paths** command to allow OSPFv3 to install multiple paths into the routing table for each prefix. Multiple paths are installed for both internal and external routes that are learned in the same autonomous system and that have an equal cost (according to the OSPFv3 shortest path first algorithm).

This command requires the Enterprise Services license.

Examples

This example shows how to allow a maximum of 10 paths to a destination:

```
switch# configure terminal
switch(config)# router ospfv3 1
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# maximum-paths 10
```

maximum-prefix

To control how many prefixes can be received from a neighbor, use the **maximum-prefix** command. To disable this function, use the **no** form of this command.

maximum-prefix *maximum* [**threshold**] [**restart** *restart-interval*] [**warning-only**]
no maximum-prefix

Syntax Description

maximum	Maximum number of prefixes allowed from the specified neighbor. The number of prefixes that can be configured is limited only by the available system resources on a router. Range: 1 to 300000.
threshold	(Optional) Specifies percentage of the maximum-prefix limit at which the router starts to generate a warning message. Range: 1 to 100. Default: 75.
restart *interval*	(Optional) Specifies the time interval (in minutes) that a peering session is reestablished. Range: 1 to 65535.
warning-only	(Optional) Allows the router to generate a syslog message when the maximum-prefix limit is exceeded, instead of terminating the peering session.

Command Default

This command is disabled by default. Peering sessions are disabled when the maximum number of prefixes is exceeded. If you do not configure the restart interval, a disabled session will stay down after the maximum-prefix limit is exceeded.

Command Modes

Peer template configuration
Router bgp configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The number of prefixes that can be configured is limited only by the available system resources on a router.

The **maximum-prefix** command allows you to configure a maximum number of prefixes that a Border Gateway Protocol (BGP) routing process will accept from the specified peer. This feature provides a mechanism (in addition to distribute lists, filter lists, and route maps) to control prefixes received from a peer.

When the number of received prefixes exceeds the maximum number configured, BGP disables the peering session (by default). If the **restart** keyword is configured, BGP will automatically reestablish the peering session at the configured time interval. If the **restart** keyword is not configured and a peering session is terminated because the maximum prefix limit has been exceed, the peering session will not be be reestablished until the **clear ip bgp** command is entered. If the **warning-only** keyword is configured, BGP sends only a log message and continues to peer with the sender.

There is no default limit on the number of prefixes that can be configured with this command. Limitations on the number of prefixes that can be configured are determined by the amount of available system resources.

Examples

In this example, the maximum prefixes that will be accepted from the 192.168.1.1 neighbor is set to 1000:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 1000
```

This example shows the maximum number of prefixes that will be accepted from the 192.168.2.2 neighbor is set to 5000. The router is also configured to display warning messages when 50 percent of the maximum-prefix limit (2500 prefixes) has been reached.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 5000 50
```

This example shows the maximum number of prefixes that will be accepted from the 192.168.3.3 neighbor is set to 2000. The router is also configured to reestablish a disabled peering session after 30 minutes.

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 2000 restart 30
```

This example shows the warning messages that will be displayed when the maximum-prefix limit (500) for the 192.168.4.4 neighbor is exceeded:

```
switch# configure terminal
switch(config)# router bgp 64496
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 500 warning-only
```

message-digest-key (OSPF virtual link)

To enable Open Shortest Path First (OSPF) Message Digest 5 (MD5) authentication on a virtual link, use the **message-digest-key** command. To remove an old MD5 key, use the **no**form of this command.

message-digest-key *key-id* **md5** [{**0** | **3**}] *key*
no message-digest-key *key-id*

Syntax Description

key-id	Identifier in the range from 1 to 255.
0	Specifies to use an unencrypted password to generate the md5 key.
3	Specifies to use an encrypted 3DES password to generate the md5 key.
key	Alphanumeric password of up to 16 bytes.

Command Default

Unencrypted

Command Modes

Virtual link configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **message-digest-key** command when you configure the MD5 digest authentication mode. Both interfaces on the virtual link must have the same *key* value.

This command requires the Enterprise Services license.

Examples

This example shows how to set key 19 with the password 8ry4222:

```
switch# configure terminal
switch(config-router)# area 22 virtual-link 192.0.2.2
switch(config-router-vlink)# message-digest-key 19 md5 8ry4222
```

Related Commands

Command	Description
authentication (virtual-link)	Configures the authentication mode on a virtual link.

metric direct 0

To enable the cost of direct routes, use the **metric direct 0** command. To disable this function, use the **no** form of this command.

metric direct 0
no metric direct 0

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

RIP router configuration mode

Command History

Release	Modification
6.1(1)	This command was introduced.

Usage Guidelines

When Cisco IOS and NX-OS are connected in a network, the **metric direct** command needs to be configured on all the NX-OS routers for them to be compatible with Cisco IOS RIP.

When **metric-direct 0** is enabled:

- All the local routes are installed with cost 0.
- All the RIP routes will be advertised with +1 metric.
- No metric will be added to the incoming routes by default (unless there is cost associated with the incoming interface).

When the **metric-direct** is disabled (which is the default behavior):

- All the local routes are installed with cost 1.
- All the RIP routes are advertised as-is.
- Default cost of +1 is added to the incoming routes by default.

This command requires the Enterprise Services license.

Examples

This example shows how to enable the cost of direct routes:

```
switch# configure terminal
switch(config)# feature rip
switch(config)# router rip 1
switch(config-router)# metric direct 0
```

Related Commands

Command	Description
metric weights	Tunes the EIGRP metric calculations.

metric maximum-hops

To advertise that those Enhanced Interior Gateway Routing Protocol (EIGRP) routes with a higher hop count than you specified are unreachable, use the **metric maximum-hops** command. To reset the value to the default, use the **no** form of this command.

metric maximum-hops *hops-number*
no metric maximum-hops

Syntax Description

hops-number	Maximum hop count. The range is from 1 to 255 hops.

Command Default

hops-number:100

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 **metric maximum-hops** command to provide a safety mechanism that causes EIGRP to advertise as unreachable routes with a hop count greater than the value assigned to the *hops-number* argument.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a hop count to 200:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# metric maximum-hops 200
```

Related Commands

Command	Description
metric weights	Tunes the EIGRP metric calculations.

metric rib-scale

To set the default metrics for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **metric rib-scale** command. To restore the default state, use the **no** form of this command.

metric rib-scale *scale-value*
no metric rib-scale *scale-value*

Syntax Description

scale-value	Scale value to divide the EIGRP wide metric by converting it to a 4-byte RIB metric. The range is from 1 to 256.

Command Default

128

Command Modes

Router eigrp submode

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

You can set or modify the rib scale value only in 64-bit metric mode.

This command does not require a license.

Examples

This example shows how to set the rib-scaling factor for EIGRP:

```
switch# configure terminal
switch(config)# router eigrp csco123
switch(config-router)# metric rib-scale 130
switch(config-router)#
```

This example shows how to remove the rib-scaling factor for EIGRP and restore the default state:

```
switch# configure terminal
switch(config)# router eigrp csco123
switch(config-router)# no metric rib-scale 130
switch(config-router
```

Related Commands

Command	Description
metric version	Changes the metric version to the 64-bit mode.
metric weights	Tunes the Enhanced Interior Gateway Routing Protocol (EIGRP) metric calculations.

metric weights

To tune the Enhanced Interior Gateway Routing Protocol (EIGRP) metric calculations, use the **metric weights** command. To reset the values to their defaults, use the **no** form of this command.

metric weights *tos k1 k2 k3 k4 k5 k6*
no metric weights

Syntax Description

tos	Type of service (ToS) which must always be zero.
k1 k2 k3 k4 k5 k6	Constants that convert an EIGRP metric vector into a scalar quantity. The arguments are as follows: • k1—The range is from 0 to 255. The default is 1. • k2—The range is from 0 to 255. The default is 0. • k3—The range is from 1 to 255. The default is 1. • k4—The range is from 0 to 255. The default is 0. • k5—The range is from 0 to 255. The default is 0. • k6—The range is from 0 to 255. The default is 0.

Command Default

tos: 0

k1: 1

k2: 0

k3: 1

k4: 0

k5: 0

k:6 0

Command Modes

Address-family configuration
Router configuration
Router VRF configuration

Command History

Release	Modification
5.2(1)	Added the k6 keyword.
4.0(1)	This command was introduced.

Usage Guidelines

Use the **metric weights** command to alter the default behavior of EIGRP routing and metric computation and allow the tuning of the EIGRP metric calculation for a particular ToS.

If k5 equals 0, Cisco NX-OS computes the composite EIGRP metric according to the following formula:

metric = [k1 x bandwidth + (k2 x bandwidth)/(256 – load) + k3 x delay]

If k5 does not equal zero, Cisco NX-OS performs an additional calculation:

metric = metric x [k5/(reliability + k4)]

Use the **bandwidth** command in interface configuration mode to set the bandwidth metric.

Use the **delay** command in interface configuration mode to set the delay.

255 is a reliability of 100 percent or a perfectly stable link. A load of 255 indicates a completely saturated link.

Configuration of k6 is supported only in 64-bit metric version mode.

This command requires the Enterprise Services license.

Examples

This example shows how to set the metric weights to change the default values:

```
switch# configure terminal
switch(config)# router eigrp 1
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# metric weights 0 2 0 2 0 2
```

Related Commands

Command	Description
bandwidth	Sets the EIGRP bandwidth metric in interface configuration mode.
delay	Sets the EIGRP delay metric in interface configuration mode.

metric-style transition

To configure the metric style that Intermediate-System-to-Intermediate System (IS-IS) uses in advertised link-state update messages (LSPs), use the **metric-style transition** command. To revert to the default setting, use the **no** form of this command.

metric-style transition
no metric-style transition

Syntax Description

This command has no keywords or arguments.

Command Default

Wide metric style

Command Modes

Router configuration
VRF configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **metric-style transition** command to configure IS-IS to generate and accept both narrow metric style and wide metric style Type Length Value (TLV) objects.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the metric style:

```
switch# configure terminal
switch(config-router)# metric-style transition
switch(config-router)#
```

Related Commands

Command	Description
feature isis	Enables IS-IS on the router.
router isis	Creates an IS-IS instance.

metric version

To configure the switch to run in the 64-bit metric version, use the **metric version** command. To restore the default state, use the **no** form of this command.

metric version 64bit
no metric version 64bit

Syntax Description

64-bit	64-bit metric version.

Command Default

32-bit mode

Command Modes

Router eigrp submode
VRF submode

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure the switch to run in the 64-bit metric version:

```
switch# configure terminal
switch(config)# router eigrp csco123
switch(config-router)# metric version 64bits
switch(config-router)#
```

This example shows how to remove the 64-bit metric version configuration from the switch:

```
switch(config-router)# no metric version 64bits
switch(config-router)#
```

Related Commands

Command	Description
metric rib-scale	Sets the default metrics for Enhanced Interior Gateway Routing Protocol (EIGRP).
metric weights	Tunes the Enhanced Interior Gateway Routing Protocol (EIGRP) metric calculations.

N Commands

name

To specify a master group name, use the name command. To revert to the default setting, use the no form of this command.

name [*master-group-name*]
no name [*master-group-name*]

Syntax Description

master-group-name	Master group name.

Command Default

None

Command Modes

config-if-hsrp mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

The name command changes a regular Hot Standby Redundancy Protocol (HSRP) group into a master group.

If you do not specify a name, a unique name is automatically generated.

This command requires the Enterprise Services license.

Examples

This example shows how to specify a master group name:

```
switch# configure terminal
switch(config)# interface ethernet 3/5
switch(config-if)# ip address 11.0.0.1/24
switch(config-if)# hsrp version 2
switch(config-if)# hsrp 10
switch(config-if-hsrp)# name Master-Group-1
switch(config-if-hsrp)#
```

Related Commands

Command	Description
hsrp version 2	Configures the HSRP version 2.

name-lookup

To enable the translation of Open Shortest Path First (OSPF) router IDs to host names, either by looking up the local hosts database or querying domain name server (DNS) names in IPv6, use the name-lookup command. To stop displaying OSPF router IDs as DNS names, use the no form of this command.

name-lookup
no name-lookup

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

config-router mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

The name-lookup command makes it easier to identify a device because it displays the device by name rather than by its router ID or neighbor ID.

This command requires the Enterprise Services license.

Examples

This example shows how to enable the translation of OSPF router IDs to host names, either by looking up the local hosts database or querying DNS names in IPv6:

```
switch# configure terminal
switch(config)# router ospf 201
switch(config-router)# distance 25
switch(config-router)# log-adjacency-changes
switch(config-router)# maximum-paths 4
switch(config-router)# name-lookup
switch(config-router)#
```

This example shows how to stop displaying OSPF router IDs as DNS names:

```
switch(config-router)# no name-lookup
switch(config-router)#
```

Related Commands

Command	Description
router ospf	Configures an Open Shortest Path First (OSPF) routing instance.

neighbor

To configure a BGP neighbor (router, vrf) and enter the neighbor configuration mode, use the **neighbor** command. To remove an entry, use the **no** form of this command.

neighbor {*ip-addr* | *ip-prefix* / *lengthipv6-addr* | *ipv6-prefix* / *length*} [**remote-as** {*as-num* [**.** *as-num*] | **route-map** *name*}]
no neighbor {*ip-addr* | *ip-prefix* / *lengthipv6-addr* | *ipv6-prefix* / *length*} [**remote-as** {*as-num* [**.** *as-num*] | **route-map** *name*}]

Syntax Description

ip-addr	IP address of the neighbor in this format: A.B.C.D.
ip-prefix/*length*	IP prefix and the length of the IP prefix. The format is x.x.x.x/*length* . The *length* range is from 1 to 32.
ipv6-addr	IPv6 address of the neighbor. The format is A:B::C:D.
ipv6-prefix/*length*	IPv6 prefix and the length of the IPv6 prefix for neighbors. The format is A:B::C:D/*length*. The *length* range is from 1 to 128.
remote-as	(Optional) Specifies the autonomous system number of the neighbor.
as-num	Number of an autonomous system that identifies the router to other BGP routers and tags the routing information passed along. The range is from 1 to 65535.
.*as-num*	(Optional) Number of an autonomous system that identifies the router to other BGP routers and tags the routing information passed along. The range is from 1 to 65535.
route-map *name*	(Optional) Specifies a route map that matches the BGP peer AS number against a list of AS numbers or a regular expression. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

This command has no default settings.

Command Modes

Neighbor address-family configurationRouter bgp configuration

Command History

Release	Modification
4.1(2)	Added support for the **route-map** keyword.
4.0(1)	This command was introduced.

Usage Guidelines

Use the **neighbor** command to enter the BGP neighbor configuration mode. When you enter the **neighbor** command, the prompt changes to switch(config-router-neighbor)#.

From the BGP neighbor configuration mode, you can perform the following actions:

- **address-family**—Configure an address-family (router, neighbor, vrf). See the **address-family (BGP)** command for information.
- **description***description*— Describes the neighbor. You can enter up to 80 characters including spaces.

- **disable-connected-check**—Disables the connection verification for the directly connected peer. Use the **disable-connected-check** command is to disable a check for an eBGP peer that is directly connected to the local router. BGP triggers a connection check automatically for all eBGP peers that are known to be single hop away, unless you disable this check with the **disable-connected-check** command. BGP does not bring up sessions if the check fails. BGP considers an EBGP peer is a single hop away, if the eBGP peer does does not have the **ebgp-multihop** command configured (that is, the time-to-live (TTL) value is one).

This command is ignored if the **route-map** keyword is used in the **neighbor** command.

- **dont-capability-negotiate**—Turns off the negotiate capability with this neighbor.
- **dynamic-capability**—Enables the dynamic capability.
- **ebgp-multihop**—Accepts and attempts BGP connections to external peers that reside on networks that are not directly connected. This command is ignored if the **route-map** keyword is used in the **neighbor** command.

Note You should enter this command under the guidance of Cisco technical support staff only.

- **exit**—Exits from the current command mode.
- **inheritpeer-session***session-name*—Configures a peer to inherit the configuration from another peer-session template. To remove an inherit statement from a peer-session template, use the **no** form of this command.
- **no**—Negates a command or sets its defaults.
- **transport connection-mode passive**—Allows a passive connection setup only. To remove the restriction, use the no form of this command.
- **remove-private-as**—Removes the private AS number from the outbound updates.
- **shutdown**—Administratively shuts down this neighbor.
- **timers** *keepalive-time*—Configures keepalive and hold timers in seconds. The range is from 0 to 3600. The default is 60.
- **update-source** {**ethernet***modport* | **loopback***virtual-interface* | **port-channel** *number***.***sub-interface*]} —Specifies the source of the BGP session and updates. The range for *virtual-interface* is from 0 to 1023. The range for *number* is from 0 to 4096. The range for *sub-interface* is from 1 to 4093.

The Cisco NX-OS software allows BGP sessions to use any operational interface for TCP connections, when you enter the **update-source** command in neighbor configuration mode. To restore the interface assignment to the closest interface, which is called the best local address, use the **no** form of this command.

You must use the **update-source** command must to enable IPv6 link-local peering for internal or external BGP sessions.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a single-hop eBGP peering session between two BGP peers that are reachable on the same network segment through a local loopback interfaces on each router:

BGP Peer 1

```
switch(config)# interface loopback 1
switch(config-if)# ip address 10.0.0.100 255.255.255
switch(config-if)# exit
```

```
switch(config)# router bgp 64497
switch(config-router)# neighbor 192.168.0.200 remote-as 64496
switch(config-router-neighbor)# update-source loopback 1
switch(config-router-neighbor)# disable-connected-check
```

BGP Peer 2

```
switch(config)# interface loopback 2

switch(config-if)# ip address 192.168.0.200 255.255.255
switch(config-if)# exit

switch(config)# router bgp 64496

switch(config-router)# neighbor 10.0.0.100 remote-as 64497

switch(config-router-neighbor)# update-source loopback 2
switch(config-router-neighbor)# disable-connected-check
```

This example shows how to source BGP TCP connections for the specified neighbor with the IP address of the loopback interface rather than the best local address:

```
switch(config)# router bgp 64496
switch(config-router)# neighbor 172.16.0.0 remote-as 64496
switch(config-router-neighbor)# update-source Loopback0
```

This example shows how to source IPv6 BGP TCP connections for the specified neighbor in autonomous system 64496 with the global IPv6 address of loopback interface 0 and the specified neighbor in autonomous system 64498 with the link-local IPv6 address of Ethernet interface 2/1:

```
switch(config)# router bgp 64497
switch(config-router)# neighbor 3ffe::3 remote-as 64496
switch(config-router-neighbor)# update-source Loopback0
switch(config-router-neighbor)# neighbor fe80::2 remote-as 64498
switch(config-router-neighbor)# update-source Ethernet 2/1
```

Related Commands

Command	Description
feature bgp	Enables BGP on the router.
route-map	Creates a route map.

net

To configure an Intermediate System-to-Intermediate System (IS-IS) network entity (NET) for the routing process, use the **net** command. To remove a NET, use the **no** form of this command.

net *net*
no net *net*

Syntax Description

net	NET network services access point (NSAP) name or address for the IS-IS routing process; see the "Usage Guidelines" section for additional information about valid values.

Command Default

The defaults are as follows:

- No NET is configured.
- The IS-IS process is disabled.

Command Modes

Router configurationVRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

An IS (intermediate system) is identified by an address known as a network access point (NASAP). The NSAP is divided up into three parts as specified by ISO/AI 10589:

- Area address—This field is of variable length, composed of high order octets, and it excludes the System ID and N-selector (NSEL) fields. This area address is associated with a single area within the routing domain.
- System ID—This field is 6 octets long and should be set to a unique value with level-1 and level 2. The system IS defines an end system (ES) or an IS in an area. You configure the area address and the system ID with the NET command. You can display the system ID with the show isis topology command.
- NSEL—This field is called the N-selector, also referred to as the NSAP, and it specifies the upper-layer protocol. The NSEL is the last byte of the NSAP and identifies a network service user. A network service user is a transport entity or the IS network entity itself. When the N-selector is set to zero, the entire NSAP is called a network entity title (NET).

A NET is an NSAP where the last byte is always the n-selector and is always zero. A NET can be from 8 to 20 bytes in length. The NET is formatted as follows: XX.AAAA.AAAA.AAAA[.AAAA].XX.

Under most circumstances, you should configure one NET only. It is possible to configure two or three NETs, but you should not configure more than one NET except for the following unusual circumstances:

- A network configuration has multiple areas that are merged.
- One area in the IS-IS process is being split into multiple areas.

Configuring multiple NETs in these two circumstances can be temporarily useful because multiple area addresses enable you to renumber an area individually as needed.

If you are using IS-IS to perform IP routing only (no connectionless network service routing is enabled), you must configure a NET to define the router ID and area ID.

Examples

This example shows how to configure a router with a NET which consists of the system ID 0000.0c11.1110 and area address 47.0004.0(1)04d.0001:

```
switch(config)# router isis firstcompany
switch(config-router)# net 47.0004.0(1)04d.0001.00
```

Related Commands

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

network

To configure an IP prefix to advertise, use the **network** command. To remove the IP prefix to advertise, use the **no** form of this command.

network *ip-addr* | *ip-prefix* / *length* **mask** *mask-num* [**route-map** *name*]
no network *ip-network* | *ip-prefix* / *length* **mask** *mask-num* [**route-map** *name*]

Syntax Description

ip-addr	IP network address to advertise; use the following format: A.B.C.D.
ip-prefix/*length*	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 comprise the prefix (the network portion of the address). A slash mark must precede the decimal value. Use the following format: A.B.C.D/length.
mask*mask-num*	Configures the mask of the IP prefix to advertise in dotted 4-octet format.
route-map*name*	(Optional) Specifies the name of the route-map to modify attributes.

Command Default

This command has no default settings.

Command Modes

Neighbor address-family configurationRouter bgp configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The IP prefix to advertise is considered for bestpath and advertisement to peers only if a route of equal or more specificity is present in the routing table.

Examples

This example shows how to configure an IP prefix to advertise:

```
switch(config-router-af)# network 2.2.2.2 mask 3.3.3.3 route-map test
switch(config-router-af)#
```

nexthop route-map

To specify that Border Gateway Protocol (BGP) routes are resolved using only next hops whose routes match specific characteristics, use the **nexthop route-map** command. To remove the route map, use the **no** form of this command.

nexthop route-map *name*
no nexthop route-map *name*

Syntax Description

name	Route map name. The name can be any alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Address-family configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **nexthop route-map** command to configure route policy filtering for next hops.

BGP next-hop filtering allows you to specify that when a next-hop address is checked with the RIB, the underlying route for that next-hop address is passed through the route map. If the route map rejects the route, the next-hop address is treated as unreachable.

BGP marks all next hops that are rejected by the route policy as invalid and does not calculate the best path for the routes that use the invalid next-hop address.

This command requires an Enterprise Services license.

Examples

This example shows how to configure a route map to filter the next-hop address:

```
switch# config t
switch(config)# route-map CHECK-BGP25 deny 10
switch(config-route-map)# match ip address prefix-list FILTER25
switch(config-route-map)# match source-protocol ospf-o1
switch(config-route-map)# exit
switch(config)# ip prefix-list FILTER25 seq 5 permit 0.0.0.0/0 le 25
switch(config)# router bgp 1.0
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# nexthop route-map
CHECK-BGP25
```

Related Commands

Command	Description
feature bgp	Enables BGP.
nexthop trigger-delay	Configures the delay timers for BGP next-hop address tracking.
route-map	Defines the conditions for redistributing routes from one routing protocol into another.

nexthop trigger-delay

To specify that Border Gateway Protocol (BGP) delay for triggering next-hop calculations, use the **nexthop trigger-delay** command. To set the trigger delay to the default value, use the **no** form of this command.

nexthop trigger-delay {**critical** *delay* | **non-critical** *delay*}
no nexthop trigger-delay {**critical** *delay***delay** | **non-critical** *delay*}

Syntax Description

critical *delay*	Specifies the critical next-hop trigger delay, in milliseconds. The range is from 0 to 4294967295. The default is 3000.
non-critical *delay*	Specifies the noncritical next-hop trigger delay, in milliseconds. The range is from 0 to 4294967295. The default is 10000.

Command Default

Critical delay: 3000 milliseconds.Noncritical delay: 10000 milliseconds.

Command Modes

Address-family configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **nexthop trigger-delay** command to modify when BGP processes next-hop address tracking events.

The **non-critical** *delay* value must always be set to at least equal or greater than the **critical** *delay* value.

The delay should be slightly higher than the time it takes for the Interior Gateway Protocol (IGP) to settle into a steady state after some event (IGP convergence time).

This command requires an Enterprise Services license.

Examples

This example shows how to modify the next-hop address tracking delay:

```
switch# config t
switch(config)# router bgp 1.0
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# nexthop trigger-delay critical 5000 non-critical 20000
```

Related Commands

Command	Description
feature bgp	Enables BGP.
nexthop route-map	Configures a route map for BGP next-hop address tracking.

no isis passive-interface

To re-enable the sending of routing updates on an Intermediate System-to-Intermediate System (IS-IS) interface and activates only those interfaces that need adjacencies, use the no isis passive-interface command.

no isis passive-interface {**level-1** | **level-1-2** | **level-2**}

Syntax Description

level-1	(Optional) Suppresses level-1 PDU.
level-1-2	(Optional) Suppresses level-1 and level-2 PDU.
level-2	(Optional) Suppresses level-2 PDU.

Command Default

None

Command Modes

Interface configuration mode

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 re-enable sending of routing updates on an IS-IS interface and activates only those interfaces that need adjacencies:

```
switch# configure terminal
switch(config)# router isis 1
switch(config-router)# passive-interface default level-1
switch(config-router)# exit
switch# configure terminal
switch(config)# interface GigabitEthernet 0/0/0/
switch(config-if# isis passive-interface level-1
switch(config-if)# no isis passive-interface level-1
switch(config-if#
```

Related Commands

Command	Description
isis passive-interface	Blocks sending of routing updates on an IS-IS interface.
default isis passive-interface	Allows all IS-IS interfaces to be set as passive by default.

O Commands

object

o specify an object for a tracked list, use the **object** command. To remove the object from the tracked list, use the **no** form of this command.

object object-number [**not**] [**weight** *weight-number*]
no object object-number

Syntax Description

not	(Optional) Negates the state of an object. **Note** The **not** keyword cannot be used in a weight or percentage threshold list. It can only be used in a Boolean list.
weight *weight-number*	(Optional) Specifies a threshold weight for each object.

Command Default

None

Command Modes

tracking configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

You can configure an object track list that contains multiple tracked objects. A tracked list contains one or more objects.

The Boolean expression enables two types of calculation by using either “and” or “or” operators.

You can also configure an object track list that contains a percentage threshold.The percentage of up objects must exceed the configured track list up percent threshold before the track list is in an up state. For example, if the tracked list has three objects, and you configure an up threshold of 60%, two of the objects must be in the up state (66% of all objects) for the track list to be in the up state.

You can also configure an object track list that contains a weight threshold. A tracked list contains one or more objects. The combined weight of up objects must exceed the configured track list up weight threshold before the track list is in an up state. For example, if the tracked list has three objects with the default weight of 10 each, and you configure an up threshold of 15, two of the objects must be in the up state (combined weight of 20) for the track list to be in the up state.

This command does not require a license.

Examples

This example shows how to configure a track list with an up weight threshold of 30 and a down threshold of 10:

```
switch(config)# track 1 list threshold weight
switch(config-track)# threshold weight up 30 down 10
switch(config-track)# object 10 weight 15
switch(config-track)# object 20 weight 15
switch(config-track)# object 30
```

Related Commands

Command	Description
track list	Configures a track list for object tracking.

ospfv3 authentication ipsec

To enable authentication of OSPFv3 packets for a particular interface, use the **ospfv3 authentication ipsec** command at the interface level. To disable the authentication of OSPFv3 packets, use the **no** form of this command.

ospfv3 authentication ipsec spi *spi auth* [{**0** | **3** | **7**}] *key*
no ospfv3 authentication ipsec spi *spi*

Syntax Description

spi	Specifies the Security Policy Index.
spi	Value of **spi**. It ranges from 256 to 4294967295.
auth	Authentication algorithm. Its value can be md1 / sha1 / null.
key	Authentication password.
0	Specifies that the authentication password is unencrypted.
3	Specifies that the authentication password is 3DES encrypted.
7	Specifies that the authentication password is Cisco type 7 encrypted.

Command Default

The OSPFv3 packets are not authenticated by default.

Command Modes

Interface configuration (config-if).

Command History

Release	Modification
7.3(0)D1(1)	This command was introduced.

Usage Guidelines

Before running this command, ensure that you have enabled the authentication package with the **feature imp** command.

Examples

The following example shows how to authenticate OSPFv3 packets at the ethernet interface 2/1:

```
switch# configure terminal
switch(config)# feature imp
witch(config)# interface ethernet 2/1
switch(config-if)# ipv6 router ospfv3 1
switch(config-if)# ospfv3 authentication ipsec spi 301 md5 1234
```

Related Commands

Command	Description
area authentication ipsec	Enables authentication of the OSPFv3 packets for all interfaces under the area.
authentication ipsec	Enables authentication of the OSPFv3 packets at the router level.

ospfv3 esp at router level

To enable encryption of OSPFv3 packets on a per interface basis at router level, use below commands.

encryption ipsec spi <*spi_val*> **esp** { **3des [0|3|7] <key>** | **aes 128 [0|3|7] <key>** | **null** } **authentication** { **sha1 [0|3|7] <key>** | **null** }

To disable the encryption of OSPFv3 packets, use the **no** form of this command.

no encryption ipsec spi <*spi_val*> **esp** { **3des [0|3|7] <key>** | **aes 128 [0|3|7] <key>** | **null** } **authentication** { **sha1 [0|3|7] <key>** | **null** }

Syntax Description

Syntax	Description
spi	Specifies security policy index.
spi val	Value of **spi**. It ranges from 256 to 4294967295.
esp	Encryption algorithm. Its value can be 3des / aes / null.
authentication	Authentication algorithm. Its value can be sha1 / null.
0	Specifies an unencrypted password.
3	Specifies 3DES unencrypted password.
7	Specifies Cisco Type 7 encrypted password.
WORD	Specifies unencrypted (cleartext) password.

Note You cannot configure both *esp* and *auth* algorithms as null in one esp CLI.

Command Default

The OSPFv3 packets are not encrypted by default.

Command History

Release	Modification
8.4.4	This command was introduced.

ospfv3 esp at area level

To enable encryption of OSPFv3 packets on a per interface basis at area level, use below commands.

area *area_id* **encryption** {**disable** | **ipsec spi** *spi_val* **esp** { **3des [0 | 3 | 7]** *key* | **aes 128 [0 | 3 | 7]** *key* | **null** } **authentication** { **sha1 [0 | 3 | 7]** *key* | **null** } }

To disable the encryption of OSPFv3 packets, use the **no** form of this command.

no area *area_id* **encryption** { **disable** | **ipsec spi** *spi_val* **esp** { **3des [0 | 3 | 7]** *key* | **aes 128 [0 | 3 | 7]** *key* | **null** } **authentication** { **sha1 [0 | 3 | 7]** *key* | **null** } }

Syntax Description

Syntax	Description
area_id	Specifies area to which esp to be configured.
spi	Specifies security policy index.
disable	Disable encryption for the area.
spi_val	Value of **spi**. It ranges from 256 to 4294967295.
esp	Encryption algorithm. Its value can be 3des / aes / null.
authentication	Specifies authentication algorithm. Its value can be sha1 / null
0	Specifies an unencrypted password.
3	Specifies 3DES unencrypted password.
7	Specifies that the password is cisco type 7 encrypted password.
WORD	Specifies unencrypted (cleartext) password.

Command Default

The OSPFv3 packets are not encrypted by default.

Command History

Release	Modification
8.4.4	This command was introduced.

ospfv3 encryption at interface level

To enable encryption of OSPFv3 packets at interface level, use below commands.

ospfv3 encryption { **disable** | **ipsec spi** *spi_val* **esp** { **3des [0 | 3 | 7]** *key* | **aes 128 [0 | 3 | 7]** *key* | **null** } **authentication** { **sha1 [0 | 3 | 7]** *key* | **null** } }

Use below command to disable encryption of OSPFv3 packets at interface level.

no ospfv3 encryption { **disable** | **ipsec spi** *spi_val* **esp** { **3des [0 | 3 | 7]** *key* | **aes 128 [0 | 3 | 7]** *key* | **null** } **authentication** { **sha1 [0 | 3 | 7]** *key* | **null** } }

Syntax Description

Syntax	Description
spi	Specifies security policy index.
disable	Disables encryption for the Interface.
spi_val	Value of **spi**. It ranges from 256 to 4294967295.
esp	Encryption algorithm. Its value can be 3des / aes / null.
authentication	Authentication algorithm. Its value can be 3des/ sha1 / null.
0	Specifies an unencrypted password.
3	Specifies 3DES unencrypted password.
7	Specifies that the password is cisco type 7 encrypted password.
WORD	Specifies unencrypted (cleartext) password.

Note You cannot configure both *esp* and *auth* algorithms as null in one esp CLI.

Table 5: Password Length

Password	Description
AES 128	0 - 32 HEX CHAR 3 - 64 HEX CHAR 7 - 66 HEX CHAR WORD- 32 HEX CHAR

Password	Description
3DES	0 - 48 HEX CHAR 3 - 96 HEX CHAR 7 - 98 HEX CHAR WORD- 48 HEX CHAR
SHA1	0 - 40 HEX CHAR 3 - 80 HEX CHAR 7 - 82 HEX CHAR WORD- 40 HEX CHAR

Command Default

The OSPFv3 packets are not encrypted by default.

Command History

Release	Modification
8.4.4	This command was introduced.

Usage Guidelines

Before running this command, ensure that you configure **feature imp** and **feature ospfv3** commands.

Examples

The following example shows how to encrypt OSPFv3 packets at the ethernet interface 3/2:

```
switch (config)# feature ospfv3
switch (config)# feature imp
switch(config)# interface Ethernet3/2
switch(config-if)# ipv6 router ospfv3 1 area 0
switch(config-if)# ospfv3 encryption ipsec spi 40040 esp aes 128 0
123456789A123456789B123456789C12 authentication sha1 0
0DA293FA8B0BBC1AA4CC425FDB6784A723456789
switch (config-if)# sh running-config interface Ethernet3/2

Command: show running-config interface Ethernet3/2
Running configuration last done at: Mon Feb  1 05:39:38 2021
Time: Mon Feb  1 05:42:11 2021
version 8.4(4)
interface Ethernet3/2
 ospfv3 encryption ipsec spi 40040 esp aes 128 3
762bc328e3bdf235a526a5c4787faed5b590430ca971a52f60d848eb18a115b1 authentication sha1 3
1626937cb7784c9055f0b4c791721d1149c4d1c29b15a62365baee4f8997b69e62787a37d4c0b374
 ipv6 address 100:300:1:1::2/64
 ipv6 router ospfv3 1 area 0.0.0.0
 no shutdown
```

ospfv3 esp at virtual link level

To enable encryption of OSPFv3 packets on virtual link level using the following commands.

encryption ipsec spi *spi_val* **esp** { **3des [0 | 3 | 7]** *key* | **aes** { **128 [0 | 3 | 7]** *key* | **null** } **authentication** { **sha1 [0 | 3 | 7]** *key* | **null** } }

To disable the encryption of OSPFv3 packets, use the **no** form of this command.

no encryption ipsec spi *spi_val* **esp** { **3des [0 | 3 | 7]** *key* | **aes** { **128 [0 | 3 | 7]** *key* | **null** } **authentication** { **sha1 [0 | 3 | 7]** *key* | **null** } }

Syntax Description

Syntax	Description
spi	Specifies security policy index.
spi_val	Value of **spi**. It ranges from 256 to 4294967295.
esp	Encryption algorithm. Its value can be 3des / aes / null.
authentication	Authentication algorithm. Its value can be sha1 / null.
0	Specifies an unencrypted password.
3	Specifies 3DES unencrypted password.
7	Specifies that the password is cisco type 7 encrypted password.
WORD	Specifies unencrypted (cleartext) password.

Note You cannot configure both *esp* and *auth* algorithms as null in one esp CLI.

Command Default

The OSPFv3 packets are not encrypted by default.

Command History

Release	Modification
8.4.4	This command was introduced.

Usage Guidelines

Before running this command, ensure that you configure **feature imp** and **feature ospfv3** commands.

Examples

The following example shows how to encrypt OSPFv3 packets for virtual links:

```
switch (config)# feature ospfv3
switch (config)# feature imp
switch (config)# router ospfv3 1
switch (config-router)# area 0.0.0.1 virtual-link 44.40.1.1
switch (config-router-vlink)# encryption ipsec spi 10010 esp aes 128 3
2810136407eb188a4645b57f18df3b4f72fa9eab7eb1294770aa2ff708298064 authentication sha1
```

```
FEF91D1D46E01005CBE8F3A8FCDF14F534567890
switch (config-router-vlink)# exit
```

ospfv3 cost

To specify the cost of sending a packet on an interface, use the **ospfv3 cost** command. To reset the path cost to the default, use the **no** form of this command.

ospfv3 cost *interface-cost*
no ospfv3 cost *interface-cost*

Syntax Description

interface-cost	Unsigned integer value expressed as the link-state metric. The range is from 1 to 65535.

Command Default

Calculates the cost based on the reference bandwidth divided by the configured interface bandwidth. You can configure the reference bandwidth or it defaults to 40 Gb/s.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ospfv3 cost** command to configure the cost metric manually for each interface. This command overrides any settings for the reference bandwidth that you set using the auto-cost command in router configuration mode.

If this command is not used, the link cost is calculated using the following formula:

link cost = reference bandwidth / interface bandwidth

This command requires the Enterprise Services license.

Examples

This example shows how to configure the interface cost value to 65:

```
switch(config)# interface ethernet 1/2
switch(config-if)#ospfv3 cost 65
```

Related Commands

Command	Description
auto-cost (OSPFv3)	Specifies the reference bandwidth that OSPFv3 uses to calculate the link cost.

ospfv3 dead-interval

To set the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down, use the **ospfv3 dead-interval** command. To restore the default, use the **no** form of this command.

ospfv3 dead-interval *seconds*
no ospfv3 dead-interval

Syntax Description

seconds	Interval (in seconds) during which the router must receive at least one hello packet from a neighbor or that neighbor adjacency is removed from the local router and does not participate in routing. The range is from 1 to 65535. The value must be the same for all nodes on the network.

Command Default

The default for *seconds* is four times the interval set by the **ospfv3 hello-interval** command.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ospfv3 dead-interval** command to set the dead interval that OSPFv3 advertises in hello packets. This value must be the same for all networking devices on a specific network.

Configure a shorter dead interval to detect down neighbors faster and improve convergence. Very short dead intervals could cause routing instability.

Use the **show ospfv3 interface** command to verify the dead interval and hello interval.

This command requires the Enterprise Services license.

Examples

This example shows how to set the OSPFv3 dead interval to 20 seconds:

```
switch(config)# interface ethernet 1/2
switch(config-if)#ospfv3 dead-interval 20
```

Related Commands

Command	Description
ospfv3 hello-interval	Interval between hello packets that OSPFv3 sends on the interface.
show ospfv3 interface	Displays OSPFv3-related information.

ospfv3 hello-interval

To specify the interval between hello packets that Open Shortest Path First version 3 (OSPFv3) sends on the interface, use the **ospfv3 hello-interval** command. To return to the default, use the **no** form of this command.

ospfv3 hello-interval *seconds*
no ospfv3 hello-interval

Syntax Description

seconds	Specifies the interval (in seconds). The value must be the same for all nodes on a specific network. The range is from 1 to 65535.

Command Default

10 seconds

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ospfv3 hello-interva**l command to set the rate at which OSPFv3 advertises hello packets. Shorter hello intervals allow OSPFv3 to detect topological changes faster. This value must be the same for all routers and access servers on a specific network.

This command requires the Enterprise Services license.

Examples

This example shows how to set the interval between hello packets to 15 seconds:

```
switch(config)# interface ethernet 1/2
switch(config-if)# ospfv3 hello-interval 15
```

Related Commands

Command	Description
ospfv3 dead-interval	Sets the time period for which hello packets must not have been seen before neighbors declare the router as down.

ospfv3 mtu-ignore

To disable Open Shortest Path First version 3 (OSPFv3) maximum transmission unit (MTU) mismatch detection on received Database Descriptor (DBD) packets, use the **ospfv3 mtu-ignore** command. To return to the default, use the **no** form of this command.

ospfv3 mtu-ignore
no ospfv3 mtu-ignore

Syntax Description

This command has no arguments or keywords.

Command Default

OSPFv3 MTU mismatch detection is enabled.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ospfv3 mtu-ignore** command to disable MTU mismatch detection on an interface. By default, OSPFv3 checks whether neighbors are using the same MTU on a common interface. If the receiving MTU is higher than the IP MTU configured on the incoming interface, OSPFv3 does not establish adjacencies. Use the **ospfv3 mtu-ignore** command to disable this check and allow adjacencies when the MTU value differs between OSPFv3 neighbors.

This command requires the Enterprise Services license.

Examples

This example shows how to disable MTU mismatch detection on received DBD packets:

```
switch(config)# interface ethernet 1/2
switch(config-if)# ospfv3 mtu-ignore
```

ospfv3 network

To configure the Open Shortest Path First version 3 (OSPFv3) network type to a type other than the default for an interface, use the **ospfv3 network** command. To return to the default, use the **no** form of this command.

ospfv3 network {**broadcast** | **point-to-point**}
no ospfv3 network

Syntax Description

broadcast	Sets the network type as broadcast.
point-to-point	Sets the network type as point-to-point.

Command Default

Depends on the network type.

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The network type influences the behavior of the OSPF interface. OSPF network type is usually broadcast, which uses OSPF multicasting capabilities. Under this network type a designated router and backup designated router are elected. For point-to-point networks there are only two neighbors and multicast is not required. For routers on an interface to become neighbors the network type for all should match.

This command requires the Enterprise Services license.

Examples

This example shows how to set an OSPFv3 network as a broadcast network:

```
switch(config)# interface ethernet 1/2
switch(config-if)# ipv6 address 2001:0DB8::1/8
switch(config-if)# ospfv3 network broadcast
```

ospfv3 passive-interface

To suppress Open Shortest Path First version 3 (OSPFv3) routing updates on an interface, use the **ospfv3 passive-interface** command. To return to the default, use the **no** form of this command.

ospfv3 passive-interface
no ospfv3 passive-interface

Syntax Description

This command has no keywords or arguments.

Command Default

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

If an interface is configured as passive-interface it does not participate in the OSPF protocol and will not establish adjacencies or send routing updates. However the interface is announced as part of the routing network.

This command requires the Enterprise Services license.

Examples

This example shows how to set an interface as passive:

```
switch(config)# interface ethernet 1/2
switch(config-if)# ospfv3 passive-interface
```

ospfv3 priority

To set the router priority for an Open Shortest Path First version 3 (osPFv3) interface, use the **ospfv3 priority** command. To return to the default, use the **no** form of this command.

ospfv3 priority *number-value*
no ospfv3 priority *number-value*

Syntax Description

number-value	Number value that specifies the priority of the router. The range is from 0 to 255.

Command Default

Priority of 1

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ospfv3 priority** command to set the router priority, which determines the designated router for this network. When two routers are attached to a network, both attempt to become the designated router. The router with the higher router priority takes precedence. If there is a tie, the router with the higher router ID takes precedence. A router with a router priority set to zero cannot become the designated router or backup designated router.

This command requires the Enterprise Services license.

Examples

This example shows how to set the router priority value to 4:

```
switch(config)# interface ethernet 1/2
switch(config-if)# ospfv3 priority 4
```

Related Commands

Command	Description
ospfv3 network	Configures the OSPFv3 network type to a type other than the default for a given medium.

ospfv3 retransmit-interval

To specify the time between Open Shortest Path First version 3 (OSPFv3) link-state advertisement (LSA) retransmissions for adjacencies belonging to the interface, use the **ospfv3 retransmit-interval** command. To return to the default, use the **no** form of this command.

ospfv3 retransmit-interval *seconds*
no ospfv3 retransmit-interval

Syntax Description

seconds	Time (in seconds) between retransmissions. The time must be greater than the expected round-trip delay between any two routers on the attached network. The range is from 1 to 65535 seconds. The default is 5 seconds.

Command Default

5 seconds

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ospfv3 retransmit-interval** command to set the time between LSA retransmissions. When a router sends an LSA to its neighbor, it keeps the LSA until it receives an acknowledgment message from the neighbor. If the router receives no acknowledgment within the retransmit interval, the local router resends the LSA.

This command requires the Enterprise Services license.

Examples

This example shows how to set the retransmit interval value to 8 seconds:

```
switch(config)# interface ethernet 1/2
switch(config-if)# ospfv3 retransmit-interval 8
```

ospfv3 shutdown

To shut down an Open Shortest Path First version 3 (osPFv3) interface, use the **ospfv3 shutdown** command. To return to the default, use the **no** form of this command.

ospfv3 shutdown
no ospfv3 shutdown

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ospfv3 shutdown** command to shut down OSPFv3 on this interface.

This command requires the Enterprise Services license.

Examples

This example shows how to shut down OSPFv3 on an interface:

```
switch(config)# interface ethernet 1/2
switch(config-if)#ospfv3 shutdown
```

ospfv3 transmit-delay

To set the estimated time required to send an Open Shortest Path First version 3 (OSPFv3) link-state update packet on the interface, use the **ospfv3 transmit-delay** command. To return to the default, use the **no** form of this command.

ospfv3 transmit-delay *seconds*
no ospfv3 transmit-delay

Syntax Description

seconds	Time (in seconds) required to send a link-state update. The range is from 1 to 450 seconds.

Command Default

1 second

Command Modes

Interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ospfv3 transmit-delay** command to set the estimated time needed to send an LSA update packet. OSPFv3 increments the LSA age time by transmit delay amount before transmitting the LSA update. You should take into account the transmission and propagation delays for the interface when you set this value.

This command requires the Enterprise Services license.

Examples

This example shows how to set the transmit delay value to 8 seconds:

```
switch(config)# interface ethernet 1/2
switch(config-if)# ospfv3 transmit-delay 8
```

P Commands

passive-interface

To suppress routing updates on an interface, use the **passive-interface** command. To revert to the default settings, use the no form of this command.

passive-interface default
no passive-interface default

Syntax Description

default	Specifies interfaces that are passive by default.

Command Default

None

Command Modes

Router configuration

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to suppress routing updates on the interface:

```
switch# configure terminal
 switch(config)# interface ethernet 5/4
switch(config-if)# router ospf 2
switch(config-router)# passive-interface default
switch(config-router)#
```

This example shows how to **remove** the configuration for the routing updates suppression**:**

```
switch# configure terminal
 switch(config)# interface ethernet 5/4
switch(config-if)# router ospf 2
switch(config-router)# no passive-interface default
```

Related Commands

Command	Description
ip ospf passive-interface	Suppresses (OSPF routing updates on an interface.

passive-interface default

To remove the **passive-interface** commands on the interface (if any) and return the interface to the default configuration, use the **passive-interface default** command.

passive-interface default {**level-1** | **level-1-2** | **level-2**}

Syntax Description

level-1	Suppresses level-1 PDU.
level-1-2	Suppresses level-1 and level-2 PDU.
level-2	Suppresses level-2 PDU.

Command Default

None

Command Modes

Router configuration (config-router) mode

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 remove the passive-interface commands on the interface and return the interface to the default configuration:

```
switch# configure terminal
switch(config)# router isis 1
switch(config-router)# passive-interface default level-1
switch(config-router)# exit
switch(config)#
```

Related Commands

Command	Description
router isis	Creates a new IS-IS instance and enters router configuration mode.

passive-interface default (EIGRP)

To suppress Enhanced Interior Gateway Routing Protocol (EIGRP) hellos, use the **passive-interface default** command. To revert to the default, use the no form of this command.

passive-interface default
no passive-interface default

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

config-router-mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

Suppressing the EIGRP hellos prevents neighbors from forming and sending routing updates on all EIGRP interfaces.

This command requires the Enterprise Services license.

Examples

This example shows how to suppress EIGRP hellos:

```
switch# configure terminal
switch(config)# router eigrp Test1
switch(config-router)# passive-interface default
switch(config-router)#
```

Related Commands

Command	Description
router isis	Creates a new IS-IS instance and enters router configuration mode.
ip passive-interface eigrp	Suppresses all routing updates on EIGRP interface.

protocol shutdown (OSPFv3)

To shut down an Open Shortest Path First version 3 (OSPFv3) instance, use the **protocol shutdown** command. To disable this function, use the **no** form of this command.

protocol shutdown
no protocol shutdown

Syntax Description

This command has no keywords or arguments.

Command Default

The OSPFv3 instance is enabled by default when configured.

Command Modes

Router configurationRouter VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **protocol shutdown** command to configure disable an instance of OSPFv3 without removing the configuration.

This command requires the Enterprise Services license.

Examples

This example shows how to disable OSPFv3 209:

```
switch(config) router ospfv3 209
switch(config-router)# protocol shutdown
```

peer-gateway exclude

To exclude a VLAN from peer gateway, when a VLAN interface is used for Layer 3 backup routing on the virtual port-channel (vPC) peer devices and an F1 module is used as peer-link, use the **vpc peer-gateway exclude-vlan** command. To revert to the default settings, use the **no** form of this command.

peer-gateway exclude-vlan *vlan-number*
peer-gateway exclude-vlan *vlan-number*

Syntax Description

vlan-number	VLAN number. The range is from 1 to 2499 and from 2628 to 4093.

Command Default

None

Command Modes

vPC configuration (config-vpc-domain)

Command History

Release	Modification
5.1(3)	This command was introduced.

Usage Guidelines

Use the **peer-gateway exclude-vlan** command to configure a Layer 3 backup routing VLAN whenever you use the vPC peer-gateway feature.

If the vPC peer link is configured on a Cisco Nexus 32-port 1/10 Gigabit Ethernet (F1-Series) module (N7K-F132XP-15), then you must include the Layer 3 backup routing VLAN in the VLAN list specified by the **vpc peer-gateway exclude** command.

If the vPC peer link is configured on an M1 series module, then you should include the Layer 3 backup routing VLAN in the VLAN list specified by the **vpc peer-gateway exclude** command, but it is not required.

The peer-gateway functionality is not enabled for those VLANs specified in the exclude VLAN list. If no exclude VLAN list is specified, then this functionality is enabled for all VLANs.

The latest occurrence of this configuration overwrites all previous configurations.

The **no vpc peer-gateway** command also disables IP redirects on all VLANs.

This command does not require a license.

Examples

This example shows how to exclude a VLAN from peer gateway:

```
switch# configure terminal

switch(config)# vpc domain 2
switch(config-vpc-domain)# peer-gateway exclude-vlan 1-34, 2700-2900
switch(config-vpc-domain)#
```

This example shows how to **disable the peer-gateway functionality:**

```
switch(config-vpc-domain)# no peer-gateway
switch(config-vpc-domain)#
```

Related Commands

Command	Description
vpc domain	Creates a virtual port-channel (vPC) domain.

platform ip verify

To configure IP packet verification, use the **platform ip verify** command. To return to default, use the **no** form of this command.

platform ip verify {**checksum** | **fragment** | **tcp tiny-frag** | **version**}
no platform ip verify {**checksum** | **fragment**}

Syntax Description

checksum	Drops IPv4 or IPv6 packets if the checksum is invalid
fragment	Drops IPv4 or IPv6 packets if the packet fragment has a nonzero offset and the DF bit is active.
tcp tiny-frag	Drops IPv4 packets if the IP fragment offset is 1, or if the IP fragment offset is 0 and the IP payload length is less than 16.
version	Drops IPv4 packets if the Drops IPv6packets if the Ethertype is not set to 4 (IPv4).

Command Default

All address tests are enabled.

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(3)	This command was replaced by the **hardware ip verify** command.

Usage Guidelines

Use the **platform ip verify** command to configure packet verification tests on IPv4 and IPv6 packets based on checksum or fragments.

This command does not require a license.

Examples

This example shows how to drop fragmented IPv4 or IPv6 packets:

```
switch(config)# platform ip verify fragment
```

Related Commands

Command	Description
platform ip verify address	Configures IPv4 and IPv6 packet verification checks based on addresses.
platform ip verify length	Configures IPv4 packet verification checks based on length.
platform ipv6 verify	Configures IPv6 packet verification.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

platform ip verify address

To packet verification on IP addresses, use the **platform ip verify address** command. To return to default, use the **no** form of this command.

platform ip verify address {**destination zero** | **identical** | **reserved** | **source** {**broadcast** | **multicast**}}
no platform ip verify address {**destination zero** | **identical** | **reserved** | **source** {**broadcast** | **multicast**}}

Syntax Description

destination zero	Drops IP packets if the destination IPv4 address is 0.0.0.0 or if the IPv6 address is ::.
identical	Drops IP packets if the source IPv4 or IPv6 address is identical to the destination IPv4 or IPv6 address.
reserved	Drops IP packets if the IPv4 address is in the 127.x.x.x range or if the IPv6 address is in the ::1 range.
source	Drops IP packets based on the IP source address.
broadcast	Drops IP packets if the IP source address is 255.255.255.255.
multicast	Drops IP packets if the IPv4 source address is in the 224.x.x.x range or if the IPv6 source address is in the FF00::/8 range.

Command Default

All address tests are enabled.

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(3)	This command was replaced by the **hardware ip verify address** command.

Usage Guidelines

Use the **platform ip verify address** command to configure packet verification tests on IPv4 and IPv6 packets based on addresses.

This command does not require a license.

Examples

This example shows how to drop broadcast IPv4 packets:

```
switch(config)# platform ip verify address source broadcast
```

Related Commands

Command	Description
platform ip verify	Configures IPv4 and IPv6 packet verification checks based on checksum or fragments.
platform ip verify length	Configures IPv4 packet verification checks based on length.

Command	Description
platform ipv6 verify	Configures IPv6 packet verification.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

platform ip verify length

To configure IPv4 packet verification based on packet length, use the **platform ip verify length** command. To return to the default, use the **no** form of this command.

platform ip verify length {**consistent** | **maximum** {**max-frag** | **max-tcp** | **udp**} | **minimum**}
no platform ip verify length {**consistent** | **maximum** {**max-frag** | **max-tcp** | **udp**} | **minimum**}

Syntax Description

consistent	Drops IPv4 packets where the Ethernet frame size is greater than or equal to the IP packet length plus the Ethernet header.
maximum	Specifies maximum IP packets.
max-frag	Specifies the IP packets if the maximum fragment offset is greater than 65536.
max-tcp	Specifies the IP packets if the TCP length is greater than the IP payload length.
udp	Specifies the IP packets if the IP payload length is less than the UDP packet length.
minimum	Specifies the IP packets if the Ethernet frame length is less than the IP packet length plus four octets (the CRC length).

Command Default

All address tests are enabled.

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(3)	This command was replaced by the **hardware ip verify length** command.

Usage Guidelines

Use the **platform ip verify length** command to configure packet verification tests on IPv4 and IPv6 packets based on packet length

This command does not require a license.

Examples

This example shows how to drop minimum-length IPv4 packets:

```
switch(config)# platform ip verify length minimum
```

Related Commands

Command	Description
platform ip verify	Configures IPv4 packet verification checks based on checksum or fragments.
platform ip verify address	Configures IPv4 and IPv6 packet verification checks based on addresses.

Command	Description
platform ipv6 verify	Configures IPv6 packet verification.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

platform ipv6 verify

To configure IPv6 packet verification, use the **platform ipv6 verify** command. To return to default, use the **no** form of this command.

platform ipv6 verify length {**consistent** | **maximum** {**max-frag** | **max-tcp** | **udp**} | **tcp tiny-frag** | **version**}
no platform ip verify {**checksum** | **fragment**}

Syntax Description

length	Drops IPv6 packets based on length.
consistent	Drops IPv6 packets where the Ethernet frame size is greater than or equal to the IPv6 packet length plus the Ethernet header.
maximum	Specifies maximum IP packets.
max-frag	Specifies the IP packets if the maximum fragment offset is greater than 65536.
max-tcp	Specifies the IP packets if the TCP length is greater than the IP payload length.
udp	Specifies the IP packets if the IP payload length is less than the UDP packet length.
tcp tiny-frag	Drops IPv6 packets if the IP fragment offset is 1, or if the IPv6 fragment offset is 0 and the IPv6 payload length is less than 16.
version	Drops IPv6 packets if the EtherType is not set to 6 (IPv6).

Command Default

All address tests are enabled.

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(3)	This command was replaced by the **hardware ipv6 verify** command.

Usage Guidelines

Use the **platform ipv6 verify** command to configure packet verification tests on IPv6 packets.

This command does not require a license.

Examples

This example shows how to drop all IPv4 packets:

```
switch(config)# platform ipv6 verify version
```

Related Commands

Command	Description
platform ip verify address	Configures IPv4 and IPv6 packet verification checks based on addresses.

Command	Description
platform ip verify length	Configures IPv4 packet verification checks based on length.
show hardware forwarding ip verify	Displays information about IP packet verification checks.

preempt (GLBP)

To configure the gateway to take over as active virtual gateway (AVG) for a Gateway Load Balancing Protocol (GLBP) group if it has a higher priority than the current AVG, use the **glbp preempt** command. To disable this feature, use the **no** form of this command.

Cisco NX-OS Release 4.1(3) and later syntax:
preempt [**delay minimum** *seconds*]
no preempt [**delay minimum** *seconds*]
Cisco NX-OS Release 4.1(2) and earlier syntax:
preempt [**delay minimum** *seconds*]
no preempt [**delay minimum** *seconds* [**sync seconds**]]

Syntax Description

delay minimum *seconds*	(Optional) Specifies a minimum number of seconds that the gateway delays before taking over the role of AVG. The range is from 0 to 3600 seconds with a default delay of 30 seconds.
sync *seconds*	(Optional) Specifies a number of seconds that the gateway waits for the synchronization to complete. The range is from 0 to 3600 seconds.

Command Default

A GLBP gateway with a higher priority than the current AVG cannot assume the role of AVG.The default delay value is 30 seconds.

Command Modes

GLBP configuration

Command History

Release	Modification
4.1(3)	Removed **sync** the keyword.
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure a router to preempt the current AVG when its priority of 254 is higher than the current AVG. If the router preempts the current AVG, it waits 60 seconds before assuming the role of AVG.

```
switch(config-if)# glbp 10
switch(config-glbp)# preempt delay minimum 60
switch(config-glbp)# priority 254
```

Related Commands

Command	Description
glbp	Enters GLBP configuration mode and creates a GLBP group.
priority	Sets the priority level of the router within a GLBP group.

preempt (HSRP)

To configure a preemption delay, use the **preempt** command. To disable this feature, use the **no** form of this command.

preempt [**delay** {**minimum** *min-delay* | **reload** **rel-delay** | **sync** **sync-delay**}]
no **preempt** [**delay** {**minimum** *min-delay* | **reload** **rel-delay** | **sync** **sync-delay**}]

Syntax Description

delay minimum *min-delay*	(Optional) Specifies the minimum number of seconds that preemption is delayed to allow routing tables to be updated before a router becomes active. The default value is 0.
reload*rel-delay*	(Optional) Specifies the time delay after the router has reloaded. This period applies only to the first interface-up event after the router has reloaded. The default value is 0.
sync sync-delay	(Optional) Specifies the maximum number of seconds to allow IP redundancy clients to prevent preemption. When this period expires, preemption occurs regardless of the state of the IP redundancy clients. The default value is 0.

Command Default

The default delay time for all options is 0 seconds.

Command Modes

Interface configuration or HSRP template mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Specifying a minimum delay allows routing tables to be updated before a router becomes active. When a router first comes up, it does not have a complete routing table. A high-priority router will only delay preemption if it first receives a Hello packet from a low-priority active router. If the high-priority router does not receive a Hello packet from the low-priority active router when it is starting up, then it assumes there is no active router for the group and will become active as soon as possible.

Examples

This example shows how to configure a delay when a router becomes active when its priority is 110:

```
switch# configure terminal
switch(config)# interface ethernet 0/1
switch(config-if)# ip address 10.0.0.1 255.255.255.0
switch(config-if)# hsrp 4
switch(config-if-hsrp)# priority 110
switch(config-if-hsrp)# preempt
switch(config-if-hsrp)# authentication text sanjose
switch(config-if-hsrp)# ip 10.0.0.3
switch(config-if-hsrp)# end
```

Related Commands

Command	Description
feature hsrp	Enables HSRP configuration.
show hsrp	Displays HSRP information.

preempt (VRRP)

To enable a high-priority backup virtual router to preempt the low-priority master virtual router, use the **preempt** command. To disable a high-priority backup virtual router from preempting the low-priority master virtual router, use the **no** form of this command.

preempt
no preempt

Syntax Description

This command has no arguments or keywords.

Command Default

Enabled

Command Modes

VRRP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

VRRP enables you to preempt a virtual router backup that has taken over for a failing virtual router master with a high-priority virtual router backup that has become available.

By default, a preemptive scheme is enabled. A backup high-priority virtual router that becomes available takes over for the backup virtual router that was elected to become the virtual router master. If you disable preemption, then the backup virtual router that is elected to become the virtual router master remains the master until the original virtual router master recovers and becomes the master again.

If the virtual IP address is also the IP address for the interface, then preemption is applied.

No license is required to use this command.

Examples

This example shows how to enable the backup high-priority virtual router to preempt the low-priority master virtual router:

Note This preemption does not apply to the primary IP address.

```
switch# config t
switch(config)# interface ethernet 2/1
switch(config-if)# vrrp 250
switch(config-if-vrrp)# preempt
```

Related Commands

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

priority (GLBP)

To set the priority level of the gateway within a Gateway Load Balancing Protocol (GLBP) group, use the **priority** command. To remove the priority level of the gateway, use the **no** form of this command.

priority *level*
no priority

Syntax Description

level	Priority of the gateway within the GLBP group. The range is from 1 to 255. The default is 100.

Command Default

level: 100

Command Modes

GLBP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **priority** command to control which virtual gateway becomes the active virtual gateway (AVG). GLBP compares the priorities of all virtual gateways in the GLBP group and selects the gateway with the numerically highest priority as the AVG. If two virtual gateways have equal priority, GLBP selects the gateway with the highest IP address.

This command does not require a license.

Examples

This example shows how to configure a virtual gateway with a priority of 254:

```
switch(config-if)# glbp 10
switch(config-glbp)# priority 254
```

Related Commands

Command	Description
glbp	Enters GLBP configuration mode and creates a GLBP group.
preempt	Configures a gateway to take over as the AVG for a GLBP group if it has a higher priority than the current AVG.

priority (HSRP)

To set the priority level within a Hot Standby Router Protocol (HSRP) group, use the **priority** command. To remove the priority level, use the **no** form of this command.

priority *level* [**forwarding-threshold lower lower-value upper upper-value**]
no priority *level* [**forwarding-threshold lower lower-value upper upper-value**]

Syntax Description

level	Interface priority for a virtual router. The range of values is from 1 to 255. If this router is the owner of the IP addresses, then the value is automatically set to 255. The default is 100.
forwarding-threshold	(Optional) Sets the threshold used by a virtual port channel (vPC) to determine when to fail over to the vPC trunk.
lower *lower-value*	(Optional) Sets the low threshold value. The *lower-value* range is from 1 to 255. The default is 1.
upper *upper-value*	(Optional) Sets the upper threshold value. The *upper-value* range is from 1 to 255. The default is 255.

Command Default

level: 100*lower-value* : 1*upper-value* : 255

Command Modes

HSRP configuration or HSRP template mode

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(3)	Added support for **forwarding-threshold**, **lower**, and **upper** keywords**.**

Usage Guidelines

Use the **priority** command to control which virtual router becomes the active router. HSRP compares the priorities of all virtual routers in the HSRP group and selects the router with the numerically highest priority. If two virtual routers have equal priority, HSRP selects the router with the highest IP address.

This command does not require a license.

Examples

This example shows how to configure a virtual router with a priority of 254:

```
switch# configure terminal
switch(config)# interface ethernet 0/1
switch(config-if)# ip address 10.0.0.1 255.255.255.0
switch(config-if)# hsrp 4
switch(config-if-hsrp)# priority 254
```

Related Commands

Command	Description
feature hsrp	Enables the HSRP configuration.

Command	Description
show hsrp	Displays HSRP information.

priority (VRRP)

To set the priority for the Virtual Router Redundancy Protocol (VRRP), use the **priority** command. To revert to the default value, use the **no** form of this command.

priority *level* [**forwarding-threshold lower lower-value upper upper-value**]
no priority *level* [**forwarding-threshold lower lower-value upper upper-value**]

Syntax Description

level	Interface priority for a virtual router. The range of values is from 1 to 255. If this router is the owner of the IP addresses, then the value is automatically set to 255. The default is 100.
forwarding-threshold	(Optional) Sets the threshold used by a virtual port channel (vPC) to determine when to fail over to the vPC trunk.
lower *lower-value*	(Optional) Sets the low threshold value. The *lower-value* range is from 1 to 255. The default is 1.
upper *upper-value*	(Optional) Sets the upper threshold value. The *upper-value* range is from 1 to 255. The default is 255.

Command Default

The default value is 100. For switches whose interface IP address is the same as the primary virtual IP address, the default value is 255.

Command Modes

VRRP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.2(1)	Added support for **forwarding-threshold**, **lower**, and **upper** keywords**.**

Usage Guidelines

The priority determines whether or not a VRRP router functions as a virtual router backup, the order of ascendancy for the VRRP router to become a virtual router master if the virtual router master fails, the role that each VRRP router plays, and what happens if the virtual router master fails.

If a VRRP router owns the IP address of the virtual router and the IP address of the physical interface, then this router will function as a virtual router master.

By default, a preemptive scheme is enabled. A backup high-priority virtual router that becomes available takes over for the backup virtual router that was elected to become the virtual router master. If you disable preemption, then the backup virtual router that is elected to become the virtual router master remains the master until the original virtual router master recovers and becomes the master again.

No license is required to use this command.

Examples

This example shows how to specify the priority for a virtual router:

```
switch# config t
switch(config)# interface ethernet 2/1
```

```
switch(config-if)# vrrp 250
switch(config-if-vrrp)# priority 2
```

Related Commands

Command	Description
feature vrrp	Enables VRRP.
show vrrp	Displays VRRP configuration information.

protocol shutdown (OSPF)

To shut down an Open Shortest Path First (OSPF) instance, use the **protocol shutdown** command. To disable this function, use the **no** form of this command.

protocol shutdown
no protocol shutdown

Syntax Description

This command has no keywords or arguments.

Command Default

The OSPF instance is enabled by default when configured.

Command Modes

Router configurationRouter VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **protocol shutdown** command to configure disable an instance of OSPF without removing the configuration.

This command requires the Enterprise Services license.

Examples

This example shows how to disable OSPF 209:

```
switch(config) router ospf 209
switch(config-router)# protocol shutdown
```

R Commands

redistribute (BGP)

To inject routes from one routing domain into the Border Gateway Protocol (BGP), use the **redistribute** command. To remove the **redistribute** command from the configuration file and restore the system to its default condition in which the software does not redistribute routes, use the **no** form of this command.

redistribute {**direct** | **eigrp** *instance-tag* | **isis** *instance-tag* | **ospf** *instance-tag* | **rip** *instance-tag* | **static**} [**route-map** *map-name*]
no redistribute {**direct** | **eigrp** *instance-tag* | **isis** *instance-tag* | **ospf** *instance-tag* | **rip** *instance-tag* | **static**} [**route-map** *map-name*]

Syntax Description

direct	Distributes routes that are directly connected on an interface.
eigrp *instance-tag*	Specifies the name of an EIGRP instance. The instance-tag can be any case-sensitive, alphanumeric string up to 20 characters.
isis *instance-tag*	Distributes routes from the IS-IS protocol. The instance-tag can be any case-sensitive, alphanumeric string up to 64 characters.
ospf *instance-tag*	Distributes routes from the OSPF protocol. This protocol is supported in the IPv4 address family. The instance-tag can be any case-sensitive, alphanumeric string up to 64 characters.
rip *instance-tag*	Distributes routes from the RIP protocol. The instance-tag can be any case-sensitive, alphanumeric string up to 64 characters.
static	Redistributes IP static routes.
route-map *map-name*	(Optional) Specifies the identifier of a configured route map. Use a route map to filter which routes are redistributed into EIGRP.

Command Default

Disabled

Command Modes

Address family configurationRouter configurationRouter VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Added the **eigrp** keyword.

Usage Guidelines

Use the **redistribute** command to import routes from other routing protocols into BGP. You should always use a route map to filter these routes to ensure that BGP redistributes only the routes that you intend to redistribute.

You must configure a default metric to redistribute routes from another protocol into BGP. You can configure the default metric with the **default-metric** command or with the route map configured with the **redistribute** command.

This command requires the Enterprise Services license.

Examples

This example shows how to redistribute BGP routes into an EIGRP autonomous system:

```
switch(config)# router bgp 64496
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# redistribute eigrp 100
```

Related Commands

Command	Description
default-metric (BGP)	Sets the default metrics for routes redistributed into BGP.

redistribute (EIGRP)

To inject routes from one routing domain into the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **redistribute** command. To remove the **redistribute** command from the configuration file and restore the system to its default condition in which the software does not redistribute routes, use the **no** form of this command.

redistribute {**bgp** *as-number* | **direct** | **eigrp** *id* | **isis** *instance-tag* | **ospf** *instance-tag* | **rip** *instance-tag* | **static**} [**route-map** *map-name*]
no redistribute {**bgp** *as-number* | **direct** | **eigrp** *as-number* | **isis** *instance-tag* | **ospf** *instance-tag* | **rip** *instance-tag* | **static**}

Syntax Description

bgp *as-number*	Distributes routes from BGP. The as-number is a 2-byte or 4-byte autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535.
direct	Distributes routes that are directly connected on an interface.
eigrp *id*	Specifies the name of an EIGRP instance. The instance-tag can be any case-sensitive, alphanumeric string up to 20 characters.
isis *instance-tag*	Distributes routes from the IS-IS protocol.
ospf *instance-tag*	Distributes routes from the OSPF protocol. This protocol is supported in the IPv4 address family.
rip *instance-tag*	Distributes routes from the RIP protocol.
static	Redistributes IP static routes.
route-map *map-name*	(Optional) Specifies the identifier of a configured route map. Use a route map to filter which routes are redistributed into EIGRP.

Command Default

Disabled

Command Modes

Address family configurationRouter configurationRouter VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **redistribute** command to import routes from other routing protocols into EIGRP. You should always use a route map to filter these routes to ensure that EIGRP redistributes only the routes that you intend to redistribute.

You must configure a default metric to redistribute routes from another protocol into EIGRP. You can configure the default metric with the **default-metric** command or with the route map configured with the **redistribute** command.

This command requires the Enterprise Services license.

Examples

This example shows how to redistribute cause BGP routes into an EIGRP autonomous system:

```
switch(config)# router eigrp 209
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# redistribute bgp 64496
```

This example shows how to redistribute the specified IS-IS process routes into an EIGRP autonomous system within a virtual routing and forwarding instance (VRF). The IS-IS routes are redistributed using route map IsIsMap.

```
switch(config)# router eigrp 109
switch(config-router)# vrf Red
switch(config-router-vrf)# redistribute isis 108 route-map IsIsMap
```

Related Commands

Command	Description
default-metric (EIGRP)	Sets the default metrics for routes redistributed into EIGRP.

redistribute (IS-IS)

To redistribute other protocol routes into Intermediate System-to-Intermediate System (IS-IS), use the **redistribute** command. To disable the redistribution, use the **no** form of this command.

{**redistribute** *protocol as-num* [**.** *as-num*] | *process-tag* **route-map** *name*}
{**no redistribute** *protocol as-num* [**.** *as-num*] | *process-tag* **route-map** *name*}

Syntax Description

protocol	Source protocol from which routes are being redistributed ; see the "Usage Guidelines" section for additional information about valid values.
as-num	AS number. Range: 1 to 65535
.as-num	(Optional) AS number. Range: 0 to 65535
process-tag	Process tag.
route-map *name*	Prevents distribution of a specific route map.

Command Default

Cisco NX-OS software does not redistribute routes.

Command Modes

Address family configurationRouter configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The command syntax is supported for IPv4 and IPv6.

The valid values for the *protocol* argument are as follows:

- **bgp** *as-num.as-num*] **route-map** *name*—Specifies the route map for the Border Gateway Protocol (BGP) routes. Range: 1 to 65535. Range: 0 to 65535 for the optional *as-num* argument.
- **direct route-map** *name*—Specifies the route map for the directly connected routes.
- **eigrp** *process-tag* **route-map** *name*—Specifies the route map for the Enhanced Interior Gateway Protocol (EIGRP) routes.
- **isis** *process-tag* **route-map** *name*—Specifies the route map for the ISO IS-IS routes.
- **ospf** *process-tag* **route-map** *name*—Specifies the route map for the Open Shortest Path First (OSPF) routes.
- **rip** *process-tag* **route-map** *name*—Specifies the route map for the Routing Information Protocol (RIP) routes for IPv4.
- **static route-map** *name*—Specifies the route map for the static routes.

Examples

This example shows how to redistribute routes from an IS-IS routing process into a BGP system:

```
switch(config)# router isis firstcompany
switch(config-router)# redistribute bgp 34535 route-map test1
```

This example shows how to disable redistribution:

```
switch(config)# router isis firstcompany
switch(config-router)# no redistribute bgp 34535 route-map test1
```

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.

redistribute maximum-prefix

To limit the number of routes redistributed into Open Shortest Path First (OSPF), use the **redistribute maximum-prefix** command. To return to the default setting, use the **no** form of this command.

redistribute maximum-prefix max [**threshold**] [{**warning-only** | **withdraw** [**num-retries timeout**]}]
no redistribute maximum-prefix max [**threshold**] [{**warning-only** | **withdraw** [**num-retries timeout**]}]

Syntax Description

max	Maximum number of prefixes that OSPF will distribute. The range is from 0 to 65536.
threshold	(Optional) Percentage of maximum prefixes that will trigger a warning message. The range is from 1 to 100. The default is 75%.
warning-only	(Optional) Logs a warning message when the maximum number of prefixes is exceeded.
withdraw	(Optional) Withdraws all redistributed routes.
num-retries	(Optional) Number of times OSPF will try to retrieve the redistributed routes. The range is from 1 to 12. The default is 1.
timeout	(Optional) Time between retry attempts. The range is from 60 to 600 seconds. The default is 300.

Command Default

No limit

Command Modes

Router configurationVRF configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **redistribute maximum-prefix** command to limit the number of routes redistributed into OSPF. Use the **clear ip ospf redistribute** command if all routes are withdrawn.

This command requires the Enterprise Services license.

Examples

This example shows how to limit the number of redistributed routes into OSPF:

```
switch# config t
switch(config)# router ospfv3 201
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# redistribute bgp route-map FilterExternalBGP
switch(config-router-af)# redistribute maximum-prefix 1000 75
```

Related Commands

Command	Description
feature ospf	Enables the OSPF feature.

Command	Description
feature ospfv3	Enables the OSPFv3 feature.

redistribute maximum-prefix (EIGRP)

To limit the number of routes redistributed into Enhanced Interior Gateway Routing Protocol (EIGRP), use the **redistribute maximum-prefix** command. To return to the default setting, use the **no** form of this command.

redistribute maximum-prefix max [**threshold**] [{**warning-only** | **withdraw** [**num-retries timeout**]}]
no redistribute maximum-prefix max [**threshold**] [{**warning-only** | **withdraw** [**num-retries timeout**]}]

Syntax Description

max	Maximum number of prefixes that EIGRP will distribute. The range is from 0 to 65536.
threshold	(Optional) Percentage of maximum prefixes that will trigger a warning message. The range is from 1 to 100. The default is 75%.
warning-only	(Optional) Logs a warning message when the maximum number of prefixes is exceeded.
withdraw	(Optional) Withdraws all redistributed routes.
num-retries	(Optional) Number of times EIGRP will try to retrieve the redistributed routes. The range is from 1 to 12. The default is 1.
timeout	(Optional) Time between retry attempts. The range is from 60 to 600 seconds. The default is 300.

Command Default

No limit

Command Modes

Router configurationVRF configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **redistribute maximum-prefix** command to limit the number of routes redistributed into IEIGR. Use the **clear ip eigrp redistribute** command if all routes are withdrawn.

Examples

This example shows how to limit the number of redistributed routes into EIGRP:

```
switch# config t
switch(config)# router eigrp 201
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# redistribute bgp route-map FilterExternalBGP
switch(config-router-af)# redistribute maximum-prefix 1000 75
```

Related Commands

Command	Description
feature eigrp	Enables the EIGRP feature.
redistribute (EIGRP)	Configures route redistribution for EIGRP.

redistribute maximum-prefix (IS-IS)

To limit the number of routes redistributed into Intermediate System to Intermediate System (IS-IS), use the **redistribute maximum-prefix** command. To return to the default setting, use the **no** form of this command.

redistribute maximum-prefix max [**threshold**] [{**warning-only** | **withdraw** [**num-retries timeout**]}]
no redistribute maximum-prefix max [**threshold**] [{**warning-only** | **withdraw** [**num-retries timeout**]}]

Syntax Description

max	Maximum number of prefixes that IS-IS will distribute. The range is from 0 to 65536.
threshold	(Optional) Percentage of maximum prefixes that will trigger a warning message. The range is from 1 to 100. The default is 75%.
warning-only	(Optional) Logs a warning message when the maximum number of prefixes is exceeded.
withdraw	(Optional) Withdraws all redistributed routes.
num-retries	(Optional) Number of times IS-IS will try to retrieve the redistributed routes. The range is from 1 to 12. The default is 1.
timeout	(Optional) Time between retry attempts. The range is from 60 to 600 seconds. The default is 300.

Command Default

No limit

Command Modes

Router configurationVRF configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **redistribute maximum-prefix** command to limit the number of routes redistributed into IS-IS. Use the **clear isis redistribute** command if all routes are withdrawn.

Examples

This example shows how to limit the number of redistributed routes into IS-IS:

```
switch# config t
switch(config)# router isis 201
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# redistribute bgp route-map FilterExternalBGP
switch(config-router-af)# redistribute maximum-prefix 1000 75
```

Related Commands

Command	Description
feature isis	Enables the IS-IS feature.
redistribute (IS-IS)	Configures route redistribution for IS-IS.

redistribute (OSPF)

To inject routes from one routing domain into Open Shortest Path First (OSPF), use the **redistribute** command. To remove the **redistribute** command from the configuration file and restore the system to its default condition in which the software does not redistribute routes, use the **no** form of this command.

redistribute {**bgp** *as-number* | **direct** | **eigrp** *id* | **isis** *instance-tag* | **ospf** *instance-tag* | **rip** *instance-tag* | **static**} [**route-map** *map-name*]
no redistribute {**bgp** *as-number* | **direct** | **eigrp** *as-number* | **isis** *instance-tag* | **ospf** *instance-tag* | **rip** *instance-tag* | **static**}

Syntax Description

bgp *as-number*	(Optional) Distributes routes from BGP. The as-number is a 2-byte or 4-byte autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535.
direct	Distributes routes that are directly connected on an interface.
eigrp *id*	Distributes routes from EIGRP. The *instance-tag* argument can be any case-sensitive, alphanumeric string.
isis *instance-tag*	Distributes routes from the IS-IS protocol. The *instance-tag* argument can be any case-sensitive, alphanumeric string.
ospf *instance-tag*	Distributes routes from the OSPF protocol. This protocol is supported in the IPv4 address family. The *instance-tag* argument can be any case-sensitive, alphanumeric string.
static	Redistributes IP static routes, including the default static route.
route-map *map-name*	(Optional) Specifies the identifier of a configured route map. Use a route map to filter which routes are redistributed into EIGRP. The *route-map* argument can be any alphanumeric string.

Command Default

Route redistribution is disabled.

Command Modes

Router configurationRouter VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Changed the **eigrp** keyword to use a process tag.

Usage Guidelines

Use the **redistribute** command to import routes from other routing protocols into OSPF. You should always use a route map to filter these routes to ensure that OSPF redistributes only the routes that you intend.

You need to configure a default metric to redistribute routes from another protocol into OSPF. You can configure the default metric with the **default-metric** command or with the route map configured with the **redistribute** command.

Note If you redistribute static routes, Cisco NX-OS also redistributes the default static route.

This command requires the Enterprise Services license.

Examples

This example shows how to redistribute BGP routes into an OSPF autonomous system:

```
switch(config)# router ospf 209
switch(config-router)# redistribute bgp 64496
```

This example shows how to redistribute the specified IS-IS process routes into an OSPF autonomous system within a virtual routing and forwarding instance (VRF). The IS-IS routes are redistributed using route map IsIsMap.

```
switch(config)# router ospf 109
switch(config-router)# vrf Red
switch(config-router-vrf)# redistribute isis 108 route-map IsIsMap
```

Related Commands

Command	Description
default-metric (OSPF)	Sets the default metrics for routes redistributed into OSPF.

redistribute (OSPFv3)

To inject routes from one routing domain into Open Shortest Path First version 3 (OSPFv3), use the **redistribute** command. To remove the **redistribute** command from the configuration file and restore the system to its default condition in which the software does not redistribute routes, use the **no** form of this command.

redistribute {**bgp** *as-number* | **direct** | **isis** *instance-tag* | **rip** *instance-tag* | **static**} [**route-map** *map-name*]
no redistribute {**bgp** *as-number* | **direct** | **eigrp** *as-number* | **isis** *instance-tag* | **ospfv3** *instance-tag* | **rip** *instance-tag* | **static**}

Syntax Description

bgp *as-number*	(Optional) Distributes routes from the BGP protocol. The as-number is a 2-byte or 4-byte autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535.
direct	Distributes routes that are directly connected on an interface.
eigrp as-number	Distributes routes from EIGRP. The *instance-tag* argument can be any case-sensitive, alphanumeric string.
isis *instance-tag*	Distributes routes from the IS-IS protocol.The *instance-tag* argument can be any case-sensitive, alphanumeric string.
static	Redistributes IP static routes, including the default static route.
route-map *map-name*	(Optional) Specifies the identifier of a configured route map. Use a route map to filter which routes are redistributed into EIGRP. The *route-map* argument can be any alphanumeric string.

Command Default

Route redistribution is disabled.

Command Modes

Address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Changed the **eigrp** keyword to use a process tag.

Usage Guidelines

Use the **redistribute** command to import routes from other routing protocols into OSPFv3. You should always use a route map to filter these routes to ensure that OSPFv3 redistributes only the routes that you intend.

You need to configure a default metric to redistribute routes from another protocol into OSPFv3. You can configure the default metric with the **default-metric** command or with the route map configured with the **redistribute** command.

Note If you redistribute static routes, Cisco NX-OS also redistributes the default static route.

This command requires the Enterprise Services license.

Examples

This example shows how to redistribute BGP routes into an OSPFv3 autonomous system:

```
switch(config)# router ospfv3 209
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# redistribute bgp 64496
```

Related Commands

Command	Description
default-metric (OSPFv3)	Sets the default metrics for routes redistributed into OSPFv3.

redistribute (RIP)

To redistribute routes from another routing domain into the Routing Information Protocol (RIP), use the **redistribute** command. To restore the system to its default condition in which the software does not redistribute routes, use the **no** form of this command.

redistribute {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **ospfv3** *id* | **static**} **route-map** *map-name*

Syntax Description

bgp	Redistributes routes from the Border Gateway Protocol (BGP).
direct	Redistributes routes from directly connected routes only.
eigrp	Redistributes routes from the Enhanced Interior Gateway Routing Protocol (EIGRP).
isis	Redistributes routes from the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospf	Redistributes routes from the Open Shortest Path First (OSPF) protocol.
ospfv3	Redistributes routes from the Open Shortest Path First version 3 (OSPFv3) protocol.
static	Redistributes routes from IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **eigrp** keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter decimal number, but Cisco NX-OS stores it internally as a string. For the **isis** keyword, an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. You can enter decimal number, but Cisco NX-OS stores it internally as a string. For the **ospf** keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. A decimal number can be entered, but it is stored internally as a string.
route-map *map-name*	Associates a route map to set the redistribution policy for RIP.

Command Default

Route redistribution is disabled.

Command Modes

Router address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Cisco NX-OS filters redistributed routing information using a route map. You can configure the route map to set the RIP metric used for redistributed routes. If you do not set the RIP metric with a route map, Cisco

NX-OS determines the metric based on the redistributed protocol or by the **default-metric** command. If Cisco NX-OS cannot determine a valid metric, then it does not redistribute the routes.

This command does not require a license.

Examples

This example shows how to redistribute BGP routes into a RIP process:

```
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# redistribute bgp 64496
```

Related Commands

Command	Description
address-family	Enters address-family configuration mode.
default-information originate	Generates a default route for routes redistributed into RIP.
default-metric	Sets default metric values for routes redistributed from other protocols into RIP.

redistribute static route-map allow

To redistribute the default route, use the **redistribute static route-map allow** command.

redistribute static route-map allow

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

config-router-af mode

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 redistributes the default route:

```
switch# configure terminal
switch(config)# route map allow permit
switch(config)# ip route 0.0.0.0 0.0.0.0 null 0
switch(config)# router bgp 100
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# default-information originate
switch(config-router-af)# redistribute static route-map allow
switch(config-router-af)#
```

Related Commands

Command	Description
route map allow permit	Enters router map configuration mode and defines the conditions for redistributing routes.

reference-bandwidth

To change the reference bandwidth used to assign the IS-IS cost, use the **reference-bandwidth** command. To return to the default setting, use the no form of this command.

reference-bandwidth {*gbpsmbps*} [{*gbps* | **mbps**}]
no reference-bandwidth

Syntax Description

gbps	Reference bandwidth in gigabits per second (gbps). Range: 1 to 4000. Default: 40.
mbps	Reference bandwidth in megabits per second (mbps). Range: 1 to 4000000. Default: 40000.
gbps	(Optional) Specifies Gbps.
mbps	(Optional) Specifies Mbps.
route-map *name*	Prevents distribution of a specific route map.

Command Default

Bandwidth is in Mbps.

Command Modes

Router configurationVRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

If you do not enter the **gbps** or the **mbps** keyword, Mbps is the default.

The cost of interfaces is calculated by comparing the interface bandwidth with a reference bandwidth. The **reference-bandwidth** command configures the reference bandwidth.

Examples

This example shows how to set the reference bandwidth to 3500 Gbps:

```
switch(config)# router isis firstcompany
switch(config-router)# reference-bandwidth 3500 gbps
```

This example shows how to return to the default reference bandwidth:

```
switch(config)# router isis firstcompany
switch(config-router)# no reference-bandwidth
```

Related Commands

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

remote-as

To specify the autonomous system (AS) number for a neighbor, use the **remote-as** command. To remove an AS number, use the **no** form of this command.

remote-as number
no remote-as number

Syntax Description

number	AS number. The format is x for a two-byte value or x.x for a four-byte value. The range is from 1 to 65535.

Command Default

None

Command Modes

Neighbor configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to configure the neighbor AS number:

```
switch(config)# router bgp 64496
switch(config-router)# neighbor 10.0.0.100
switch(config-router-neighbor)# remote-as 64497
```

Related Commands

Command	Description
feature bgp	Enables BGP on the router.
neighbor	Configures BGP peers.

retransmit-interval (OSPF virtual link)

To specify the time between link-state advertisement (LSA) retransmissions for adjacencies that belong to the virtual link, use the **retransmit-interval** command. To return to the default, use the **no** form of this command.

retransmit-interval *seconds*
retransmit-interval

Syntax Description

seconds	Time (in seconds) between retransmissions. The time must be greater than the expected round-trip delay between any two routers on the attached network. The range is from 1 to 65535 seconds. The default is 5 seconds.

Command Default

5 seconds

Command Modes

Virtual link configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **retransmit-interval** command to set the LSA retransmission time. If a router receives no acknowledgment that an LSA was received, the router resends the LSA at the retransmission interval.

You should set this value larger for virtual links.

This command requires the Enterprise Services license.

Examples

This example shows how to set the retransmit interval value to 8 seconds:

```
switch(config)# router ospf 109
switch(config-router)# area 33 virtual-link 192.0.2.2
switch(config-router-vrf)# retransmit-interval 8
```

Related Commands

Command	Description
area virtual-link	Creates a virtual link in an OSPF area.

retransmit-interval (OSPFv3 virtual link)

To specify the time between link-state advertisement (LSA) retransmissions for adjacencies that belong to the virtual link, use the **retransmit-interval** command. To return to the default, use the **no** form of this command.

retransmit-interval *seconds*
retransmit-interval

Syntax Description

seconds	Time (in seconds) between retransmissions. The time must be greater than the expected round-trip delay between any two routers on the attached network. The range is from 1 to 65535 seconds. The default is 5 seconds.

Command Default

5 seconds

Command Modes

Virtual link configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **retransmit-interval** command to set the LSA retransmission time. If a router receives no acknowledgment that an LSA was received, the router resends the LSA at the retransmission interval.

You should set this value larger for virtual links.

This command requires the Enterprise Services license.

Examples

This example shows how to set the retransmit interval value to 8 seconds:

```
switch(config)# router ospfv3 109
switch(config-router)# area 33 virtual-link 192.0.2.2
switch(config-router-vrf)# retransmit-interval 8
```

Related Commands

Command	Description
area virtual-link	Creates a virtual link in an OSPFv3 area.

rfc1583compatibility

To configure RFC 1583 compatibility as the method used to calculate summary route costs and select AS-external paths, use the **rfc1583compatibility** command. To disable RFC 1583 compatibility, use the **no** form of this command.

rfc1583compatibility
no rfc1583compatibility

Syntax Description

This command has no arguments or keywords.

Command Default

RFC 1583 compatibility is disabled.

Command Modes

Router configuration

Command History

Release	Modification
5.0(2a)	This command was introduced.

Usage Guidelines

To minimize the chance of routing loops, all Open Shortest Path First (OSPF) routers in an OSPF routing domain should have RFC compatibility set identically.

OSPFv2 on Cisco NX-OS supports RFC 2328. This RFC introduced a different method to calculate route summary costs which is not compatible with the calculation used by RFC1583. RFC 2328 also introduced different selection criteria for AS-external paths. It is important to ensure that all routers support the same RFC. Use the rfc1583compatibility command if your network includes routers that are only compliant with RFC1583. The default supported RFC standard for OSPFv2 may be different for Cisco NX-OS and Cisco IOS. You must make adjustments to set the values identically. For more OSPF RFC Compatibility Mode example, see the Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide, Release 6.x.

You must configure RFC 1583 compatibility on any virtual routing and forwarding (VRF) that connects to routers running only RFC1583 compatible OSPF.

Note The default values for Cisco NX-OS might be different from that of Cisco IOS. You should make adjustments to set the values identically.

Examples

This example shows how to specify that the router process is compatible with RFC 1583:

```
switch# configure terminal
switch(config)# feature ospf
switch(config)# router ospf Test1
switch(config-router)# rfc1583compatibility
switch(config-router)# vrf A
switch(config-router-vrf)# rfc1583compatibility
```

route-map

To create a route map, enter the route-map configuration mode, or define the conditions for redistributing routes from one routing protocol into another, use the **route-map** command. To delete an entry, use the **no** form of this command.

route-map *map-tag* [{**deny** | **permit**}] [*sequence-number*]
no route-map *map-tag* [{**permit** | **deny**}] [*sequence-number*]

Syntax Description

map-tag	Route map name.
deny	(Optional) Specifies that the route or packet is not distributed as follows: • If the match criteria are met for the route map, the route is not redistributed. • With policy routing, the packet is not policy routed and route maps sharing the same map tag name are not examined. If the packet is not policy routed, the normal forwarding algorithm is used.
permit	(Optional) Specifies that the route or packet is distributed as follows: • If the match criteria for this route are met, the route is redistributed as controlled by the set actions. With policy routing, the packet is policy routed. • If the match criteria are not met, the next route map with the same map tag is tested. If a route does not pass any of the match criteria for the set of route maps sharing the same name, it is not redistributed by that set.
sequence-number	(Optional) Number that indicates the position a new route map will have in the list of route maps already configured with the same name. The **no** form of this command deletes the position of the route map. Range: 0 to 65535.

Command Default

The **permit** keyword is the default.

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You must enter the **feature pbr** global configuration mode command to enable 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)#
```

If you make changes to a route map that is used by a client, you must exit the route-map configuration submode before the changes take effect in the client. The route-map changes are not propagated to its clients until you exit from the route-map configuration submode or 60 seconds expires since entering the submode.

Once you enter the route-map configuration mode, the following keywords are available:

- **continue** *sequence-number*—Continues on a different entry within the route-map. Range: 0 to 65535.
- **description** *description*—Provides a description of the route-map. The description can be any alphanumeric string up to 90 characters.
- **exit**—Exits from the current command mode.
- **match**—Matches the values from the specified routing table. The following keywords and arguments are available:
  - **as-path** *name* [*name*] —Specifies the autonomous system (AS) path access list to match. The name can be any alphanumeric string up to 63 characters. See the **match as-path** command for additional information.
  - **community** *name* [*name* | **exact-match**]— Specifies the BGP community list name to match. See the **match community** command for additional information.
  - **ip**—Configures the IPv4 features. The follow keywords and arguments are available:

address {*access-list-name* [*access-list-name*] | **prefix-list** *ipv4-list-name ipv4-list-name*]}— Specifies the address of the route or packet to match. See the **match ip address** command for additional information.

multicast {**group** *address/length* | **rp** *address/length*}—Specifies the multicast attributes to match. See the **match ip multicast** command for additional information.

next-hop—Matches the next-hop address of route. See the **match ip next-hop** command for additional information.

route-source—Matches the advertising source address of route. See the **match ip route-source** command for additional information.

- • **ipv6**—Configures the IPv6 features. The follow keywords and arguments are available

address {*access-list-name* [*access-list-name*] | **prefix-list** *ipv6-list-name ipv6-list-name*]}— Specifies the address of the route or packet to match. See the **match ipv6 address prefix-list** command for additional information.

Note The IPv6 access-list name is for use in route-maps for PBR only.

multicast {**group** *address/length* | **rp** *address/length*}—Specifies the multicast attributes to match. See the **match ipv6 multicast** command for additional information.

next-hop prefix-list—Matches the next-hop address of route. See the **match ipv6 next-hop prefix-list** command for additional information.

route-source—Matches the advertising source address of route. See the **match ipv6 route-source prefix-list** command for additional information.

- • **length** *minimum-length maximum-length*—Defines the minimum and maximum packet length. See the **match length** command for additional information.
  - **route-type**—Matches the route-type of the route. See the **match route-type** command for additional information.
  - **tag**—Matches the metric of route. See the **match tag** command for additional information.

Note The **default-information originate** command ignores **match** statements in the optional route map.

- **no**—Negates a command or set its defaults.
- **set**—Sets the values in the destination routing protocol. The **set** commands specify the routing actions to perform if the criteria enforced by the **match** commands are met. You might want to policy route packets some way other than the obvious shortest path. The following keywords and arguments are available:
  - **as-path**—Prepends a string for a BGP AS-path attribute. See the **set as-path** command for additional information.
  - **comm-list**—Sets the BGP community list (for deletion). See the **set comm-list** command for additional information.
  - **community**—Sets the BGP community attribute. See the **set community** command for additional information.
  - **dampening**—Sets the BGP route flap dampening parameters. See the **set dampening** command for additional information.
  - **forwarding-address**—Sets the forwarding address. See the **set forwarding-address** command for additional information.
  - **ip**—Configures the IP features. The following keywords and arguments are available:

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. See the **set ip default next-hop** command for additional information.

set ip next-hop—Indicates where to output packets that pass a match clause of a route map for policy routing. See the **set ip next-hop** command for additional information.

- • **ipv6**—Configures the IPv6 features. The following keywords and arguments are available:

set ipv6 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. See the **set ipv6 default next-hop** command for additional information.

set ipv6 next-hop—Indicates where to output packets that pass a match clause of a route map for policy routing. See the **set ipv6 next-hop** command for additional information.

- • **level**—Specifies where to import the route. See the **set level** command for additional information.
  - **local-preference**—Specifies the BGP local preference path attribute. See the **set local-preference** command for additional information.
  - **metric**—Sets the metric for destination routing protocol. See the **set metric** command for additional information.
  - **metric-type**—Sets the type of metric for destination routing protocol. See the **set metric-type** command for additional information.
  - **origin**—Specifies the BGP origin code. See the **set origin** command for additional information.
  - **tag**—Specifies the tag value for destination routing protocol. See the **set tag** command for additional information.
  - **vrf**—Sets the VRF for next-hop resolution. See the **set vrf** command for additional information.
  - **weight**—Sets the BGP weight for the routing table. See the **set weight** command for additional information.

Use route maps to redistribute routes or to subject packets to policy routing. Both purposes are described in this section.

Redistribution

The **redistribute** router configuration command uses the *map-tag* name to reference the route map. Multiple route maps may share the same map tag name.

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 **match** route-map configuration command has multiple formats. The **match** commands can be given in any order, and all **match** commands must "pass" to cause the route to be redistributed according to the *set actions* given with the **set** commands. The **no** forms of the **match** commands remove the specified match criteria.

Use route maps when you want detailed control over how routes are redistributed between routing processes. The destination routing protocol is the one you specify with the **router** global configuration command. The source routing protocol is the one you specify with the **redistribute** router configuration command. See the "Examples" section for an illustration of how route maps are configured.

When you are passing routes through a route map, a route map can have several parts. Any route that does not match at least one **match** clause relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route map section with an explicit match specified.

Policy Routing

Use the ip policy route-maor **ipv6 policy route-map**p command, in addition to the **route-map** command, and the **match** and **set** commands to define the conditions for policy routing packets. The **match** commands specify the conditions under which policy routing occurs. The **set** commands specify the routing actions to perform if the criteria enforced by the **match** commands are met. You might want to policy route packets some way other than the obvious shortest path.

The guidelines for the *sequence-number* argument are as follows:

1. If no entry is defined with the supplied tag, an entry is created with the *sequence-number* argument set to 10.
2. If only one entry is defined with the supplied tag, that entry becomes the default entry for the following **route-map** command. The *sequence-number* argument of this entry is unchanged.
3. If more than one entry is defined with the supplied tag, an error message is printed to indicate that the *sequence-number* argument is required.

If the **no route-map** *map-tag* command is specified (with no *sequence-number* argument), the whole route map is deleted.

Examples

This example shows how to redistribute Routing Information Protocol (RIP) routes with a hop count equal to 1 into Open Shortest Path First (OSPF). These routes will be redistributed into OSPF as external link-state advertisements (LSAs) with a metric type of Type 1, and a tag equal to 1.

```
switch(config)# router ospf 109
switch(config-route-map)# redistribute rip route-map rip-to-ospf
switch(config-route-map)# route-map rip-to-ospf permit
switch(config-route-map)# set metric 5
switch(config-route-map)# set metric-type type1
switch(config-route-map)# set tag 1
```

This example for IPv6 shows how to redistribute Routing Information Protocol (RIP) routes with a hop count equal to 1 into Open Shortest Path First (OSPF). These routes will be redistributed into OSPF as external link-state advertisements (LSAs) with a tag equal to 42 and a metric type equal to type1.

```
switch(config)# router 1
switch(config-route-map)# redistribute rip one route-map ripng-to-ospfv3
switch(config)# route-map ripng-to-ospfv3
switch(config-route-map)# match tag 42
switch(config-route-map)# set metric-type type1
```

This example sets the autonomous system path to match BGP autonomous system path access list 20:

```
switch(config)#route-map IGP2BGP
switch(config-route-map)#match as-path 20
```

This example shows how to configure that the routes matching community list 1 will have the weight set to 100. Any route that has community 109 will have the weight set to 100.

```
switch(config)#ip community-list 1 permit 109
switch(config)#route-map set_weight
switch(config-route-map)#match community 1
switch(config-route-map)#set weight 100
```

This example shows how to configure that the routes matching community list 1 will have the weight set to 200. Any route that has community 109 alone will have the weight set to 200.

```
switch(config)#ip community-list 1 permit 109
switch(config)#route-map set_weight
switch(config-route-map)#match community 1 exact
switch(config-route-map)#set weight 200
```

This example shows how to configure that the routes match community list LIST_NAME will have the weight set to 100. Any route that has community 101 alone will have the weight set to 100.

```
switch(config)#ip community-list 1 permit 101
switch(config)#route-map set_weight
switch(config-route-map)#match community LIST_NAME
switch(config-route-map)#set weight 100
```

route-map allow permit

To enter router map configuration mode and define the conditions for redistributing routes, use the **route-map allow permit** command. To delete the configuration for redistributing routes, use the no form of this command.

route-map allow permit
no route-map allow permit

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Global configuration mode

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 enter router map configuration mode and define the conditions for redistributing routes:

```
switch# configure terminal
switch(config)# route map allow permit
switch(config)#
```

This example shows how to delete the configuration for redistributing routes:

```
switch(config)# no route map allow permit
switch(config)#
```

Related Commands

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

route-map (BGP)

To set the Border Gateway Protocol (BGP) route dampening factors, use the **route-map** command. To disable this function, use the **no** form of this command.

half-life reuse suppress max-suppress-time
half-life reuse suppress max-suppress-time

Syntax Description

half-life	Time (in minutes) after which a penalty is decreased. Once the route has been assigned a penalty, the penalty is decreased by half after the half life period (which is 15 minutes by default). The process of reducing the penalty happens every 5 seconds. Range: 1 to 45. Default: 15.
reuse	Routes that are unsuppressed if the penalty for a flapping route decreases enough to fall below this value. The process of unsuppressing routes occurs at 10-second increments. Range: 1 to 20000. Default: 750.
suppress	Route that is suppressed when its penalty exceeds this limit. Range: 1 to 20000. Default: 2000.
max-suppress-time	Maximum time (in minutes) a route can be suppressed. Range: 1 to 255. Default: Four times the *half-life* value. If the *half-life* value is allowed to default, the maximum suppress time defaults to 60 minutes.

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** 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.

When a BGP peer is reset, the route is withdrawn and the flap statistics cleared. In this instance, the withdrawal does not incur a penalty even though route flap dampening is enabled.

This command does not require a license.

Examples

This example shows how to set the half life to 30 minutes, the reuse value to 1500, the suppress value to 10000; and the maximum suppress time to 120 minutes:

```
switch(config)# route-map test1 10 permit
switch(config-route-map)#  30 1500 10000 120
```

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.

route-map pbr-statistics

To enable policy-based statistics for a route map, use the **route-map pbr statistics** command. To disable statistics, use the **no** form of this command.

route-map name pbr-statistics
no route-map name pbr-statistics

Syntax Description

name	Name of the route map. The name can be any alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **route-map pbr-statistics** command to enable policy-based routing statistics. You must enable policy-based routing with the **feature pbr** command before you can enable policy-based routing statistics.

Note This command may fail if the same interface is configured for some other policy such as ACLs.

This command requires the Enterprise Services license.

Examples

This example shows how to enable the policy-based routing statistics for a route map:

```
switch(config)# feature pbr
switch(config)# route-map testmap pbr-statistics
```

Related Commands

Command	Description
clear route-map pbr-statistics	Clears policy-based routing statistics for a route map.

router bgp

To assign an autonomous system (AS) number to a router and enter the router BGP configuration mode, use the **router bgp** command. To remove an AS number assignment, use the **no** form of this command.

router bgp *as-num* [**.** *as-num*]
no router bgp *as-num* [**.** *as-num*]

Syntax Description

as-num	Number of an autonomous system that identifies the router to other BGP routers and tags the routing information passed along; valid values are from 1 to 65535.
.as-num	(Optional) Number of an autonomous system that identifies the router to other BGP routers and tags the routing information passed along; valid values are from 0 to 65535.

Command Default

No BGP routing process is enabled by default.

Command Modes

Address-family configurationNeighbor address-family configurationRouter BGP configuration

Usage Guidelines

The *as-num* is the number for the local BGP speaker and allows you to create a unique identifier for the BGP process on the router.

Once you enter the router BGP configuration mode, the following parameters are available:

- **address-family**—Configures an address-family (router, neighbor, vrf). See the **address-family (BGP)** command for information.
- **bestpath**—Changes the default bestpath selection algorithm. See the **bestpath** command for information.
- **cluster-id** {*cluster-id* | *cluster-ip-addr*} —Configures the Route Reflector Cluster-ID (router, vrf). Range: 1 to 4294967295. You can enter the cluster identification as a 32-bit quantity or as an IP address. To remove the cluster ID, use the **no** form of this command.
- **confederation** {**identifier***as-num***.***as-num*] | **peer***as-num***.***as-num*]} —Configures the AS confederation parameters as the routing domain confederation AS or the peer AS in the BGP confederation. To remove the confederation identifier, use the **no** form of this command.

The **confederation** command is used to configure a single autonomous system number to identify a group of smaller autonomous systems as a single confederation.You can use a confederation to divide a large single autonomous system into multiple subautonomous systems and then group them into a single confederation. The subautonomous systems within the confederation exchange routing information. External peers interact with the confederation as if it is a single autonomous system.

Each subautonomous system is fully meshed within itself and has a few connections to other autonomous systems within the confederation. Next hop, Multi Exit Discriminator (MED), and local preference information is preserved throughout the confederation, allowing you enables to you to retain a single Interior Gateway Protocol (IGP) for all the autonomous systems.

- **enforce-first-as**—Forces BGP to compare an external peer's configured AS number with the first AS in the AS-PATH of the routes received from the peer. In case of mismatch of AS numbers, the peer is sent an error code update notification message. To disable, use the **no** form of this command.
- **exit**—Exits from the current command mode.
- **fast-external-fallover**—Configures a Border Gateway Protocol (BGP) routing process to immediately reset external BGP peering sessions if the link used to reach these peers goes down. To disable BGP fast external fallover, use the **no** form of this command.

The **fast-external-fallover** command is used to disable or enable fast external fallover for BGP peering sessions with directly connected external peers. The session is immediately reset if link goes down. Only directly connected peering sessions are supported.

If BGP fast external fallover is disabled, the BGP routing process will wait until the default hold timer expires (three keepalives) to reset the peering session.

- **graceful-restart**—Configures the Graceful Restart functionality (router, vrf). See the **graceful-restart (BGP)** command for additional information.
- **graceful-restart-helper**—Configures the Graceful Restart Helper mode functionality (router, vrf). See the **graceful-restart (BGP)** command for additional information.
- **log-neighbor-changes**—Enables logging of the BGP neighbor resets. To disable the logging of changes in BGP neighbor adjacencies, use the **no** form of this command. The **log-neighbor-changes** command enables logging of BGP neighbor status changes (up or down) and resets for troubleshooting network connectivity problems and measuring network stability. Unexpected neighbor resets might indicate high error rates or high packet loss in the network and should be investigated.

Using the **log-neighbor-changes** command to enable status change message logging does not cause a substantial performance impact, unlike, for example, enabling per BGP update debugging. If the UNIX syslog facility is enabled, messages are sent to the UNIX host running the syslog daemon so that the messages can be stored and archived. If the UNIX syslog facility is not enabled, the status change messages are retained in the internal buffer of the router, and are not stored to disk. You can set the size of this buffer, which is dependent upon the available RAM, using the **logging buffered** command.

The neighbor status change messages are not tracked if the bgp log-neighbor-changes command is not enabled, except for the reset reason, which is always available as output of the **show ip bgp neighbors** and **show bgp ipv6 neighbors** commands.

The **eigrp log-neighbor-changes** command enables logging of Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor adjacencies, but messages for BGP neighbors are logged only if they are specifically enabled with the bgp log-neighbor-changes command.

Use the **show logging command** to display the log for the BGP neighbor changes.

- **neighbor**—Configures a BGP neighbor (router, vrf). See the **neighbor** command for additional information.
- **no**—Negates a command or set its defaults.
- *router-id*— Specifies the IP address to use as router-id (router, vrf).
- **template**—Enters the template command mode. See the **neighbor** command for additional information.
- **timers**—Configures the BGP-related timers (router, vrf).
  - **bestpath-limit** *interval*—Configures the timeout for first bestpath after restart in seconds. Range: 1 to 3600. Default: 300.
  - **bgp** *interval*—Configures the different BGP keepalive and holdtimes in seconds. Range: 0 to 3600. Default: 60.
  - **prefix-peer-timeout** *interval*—Configures how long a prefix peer is maintained in seconds. Range: 0 to 1200. Default: 300:
- **vrf**—Configures the virtual router context.
  - *vrf-name*—Specifies the VRF name.
  - **management**—Specifies the configurable VRF name.

Examples

This example shows how to configure a BGP process for autonomous system 120:

```
switch(config)# router bgp 120
switch(config-router)#
```

This example shows how to log neighbor changes for BGP in router configuration mode:

```
switch(config# bgp router 40000
switch(config-router)# log-neighbor-changes
```

In This example, the BGP fast external fallover feature is disabled. If the link through which this session is carried flaps, the connection will not be reset.

```
switch(config# bgp router 64496
switch(config-router)# no fast-external-fallover
```

In This example, all incoming updates from eBGP peers are examined to ensure that the first autonomous system number in the AS_PATH is the local AS number of the transmitting peer. In the follow example, updates from the 10.100.0.1 peer will be discarded if the first AS number is not 65001.

```
switch(config# router bgp 64496
switch(config-router)# bgp enforce-first-as
switch(config-router)# address-family ipv4
switch(config-router-af)# neighbor 10.100.0.1 remote-as 64496
switch(config-router-af)#
```

router eigrp

To configure a routing process and enter router configuration mode for Enhanced Interior Gateway Routing Protocol (EIGRP), use the **router eigrp** command. To turn off the EIGRP routing process, use the **no** form of this command.

router eigrp *instance-tag*
no router eigrp *instance-tag*

Syntax Description

instance-tag	Name of an EIGRP instance. The instance-tag can be any case-sensitive, alphanumeric string up to 20 characters.

Command Default

None

Command Modes

Global

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to configure a routing process for EIGRP:

```
switch(config)# router eigrp 1
switch(config-router)#
```

Related Commands

Command	Description
default-information	Controls the distribution of a default route.
default-metric	Configures the default metric for routes redistributed into EIGRP.
distance	Configures the administrative distance.
maximum-paths	Configures the maximum number of equal-cost paths.
redistribute	Configures route redistribution for EIGRP.
router-id	Configures the router ID.
timers	Configures the EIGRP timers.

router isis

To configure a routing process and enter router configuration mode for Intermediate System to Intermediate System (IS-IS), use the **router isis** command. To turn off the IS-IS routing process, use the **no** form of this command.

router isis *instance-tag*
no router isis *instance-tag*

Syntax Description

instance-tag	Instance name. The name can be any alphanumeric string up to 20 characters.

Command Default

None

Command Modes

Global

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to configure a routing process for IS-IS:

```
switch(config)# router isis test1
switch(config-router)#
```

Related Commands

Command	Description
default-information	Controls the distribution of a default route.
distance	Configures the administrative distance.
maximum-paths	Configures the maximum number of equal-cost paths.
redistribute	Configures route redistribution for IS-IS.

router ospf

To configure an Open Shortest Path First (OSPF) routing instance, use the **router ospf** command. To terminate an OSPF routing process, use the **no** form of this command.

router ospf *instance-tag*
no router ospf *instance-tag*

Syntax Description

instance-tag	Internally used identification parameter for an OSPF routing instance. It is locally assigned and can be any word or positive integer. The *instance-tag* argument can be any alphanumeric string.

Command Default

No OSPF routing instance is defined.

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **router ospf** command to specify multiple OSPF routing instances in each router.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a basic OSPF instance:

```
switch(config)# router ospf 12
```

router ospf p1

To configure an Open Shortest Path First (OSPF) process tag, use the router ospf p1 command. To terminate an OSPF process tag, use the **no** form of this command.

router ospf p1
no router ospf p1

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

Global configuration

Command History

Release	Modification
4.0	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to configure an Open Shortest Path First (OSPF) process tag:

```
switch(config)# router ospf p1
switch(config)#
```

router ospfv3

To configure an Open Shortest Path First version 3 (OSPFv3) routing instance, use the **router ospfv3** command. To terminate an OSPFv3 routing process, use the **no** form of this command.

router ospfv3 *instance-tag*
no router ospfv3 *instance-tag*

Syntax Description

instance-tag	Internally used identification parameter for an OSPFv3 routing instance. It is locally assigned and can be any word or positive integer. The *instance-tag* argument can be any alphanumeric string.

Command Default

No OSPFv3 routing instance is defined.

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **router ospfv3** command to specify multiple OSPFv3 routing instances in each router.

This command requires the Enterprise Services license.

Examples

This example shows how to configure a basic OSPFv3 instance:

```
switch(config)# router ospfv3 12
```

router rip

To configure the Routing Information Protocol (RIP) routing process, use the **router rip** command. To turn off the RIP routing process, use the **no** form of this command.

router rip instance-tag
no router rip

Syntax Description

instance-tag	Name for this RIP instance.

Command Default

No RIP routing process is defined.

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Examples

This example shows how to begin the RIP routing process:

```
switch(config)# router rip Enterprise
```

Related Commands

Command	Description
ip router rip	Specifies a RIP instance for an interface.

router-id (EIGRP)

To configure a router ID for an Enhanced Interior Gateway Routing Protocol (EIGRP) process, use the **router-id** command. To cause the software to use the default method of determining the router ID, use the **no** form of this command.

router-id *router-id*
no router-id

Syntax Description

router-id	32-bit router ID value specified in four-part, dotted-decimal notation.

Command Default

If this command is not configured, EIGRP chooses an IPv4 address as the router ID from one of its interfaces.

Command Modes

Address family configurationRouter configurationRouter VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **router-id** command to manually specify a unique 32-bit numeric value for the router ID. This action ensures that EIGRP can function regardless of the interface address configuration.

This command requires the Enterprise Services license.

Examples

This example shows how to assign the IP address of 192.0.2.1 to the EIGRP process 1:

```
switch(config)# router eigrp 1
switch(config-router) address-family ipv4
switch(config-router-af)# router-id 192.0.2.1
```

router-id (OSPF)

To use a fixed router ID for an Open Shortest Path First (OSPF) instance, use the **router-id** command. To revert to the previous OSPF router ID behavior, use the **no** form of this command.

router-id *ip-address*
no router-id *ip-address*

Syntax Description

ip-address	Router ID in IP address format.

Command Default

If this command is not configured, OSPF chooses an IPv4 address as the router ID from one of its interfaces.

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **router-id** command to manually specify a unique 32-bit numeric value for the router ID.

If this command is used on an OSPF instance that has neighbors, the connections to the neighbors are re-established and the new router ID is available immediately for use by OSPF.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the router ID:

```
switch(config)# router ospf 12
switch(config-router)# router-id 192.0.2.1
```

Related Commands

Command	Description
router ospf	Configures the OSPF routing process.

router-id (OSPFv3)

To use a fixed router ID for an Open Shortest Path First version 3 (OSPFv3) instance, use the **router-id** command. To revert to the previous OSPFv3 router ID behavior, use the **no** form of this command.

router-id *ip-address*
no router-id *ip-address*

Syntax Description

ip-address	Router ID in IP address format.

Command Default

If this command is not configured, OSPFv3 chooses an IPv4 address as the router ID from one of its interfaces.

Command Modes

Router configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **router-id** command to manually specify a unique 32-bit numeric value for the router ID.

If this command is used on an OSPFv3 instance that has neighbors, the connections to the neighbors are re-established and the new router ID is available immediately for use by OSPFv3.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the router ID:

```
switch(config)# router ospfv3 12
switch(config-router)# router-id 192.0.2.1
```

Related Commands

Command	Description
router ospfv3	Configures the OSPFv3 routing process.

routing-context vrf

To set the virtual routing and forwarding (VRF) scope for all EXEC commands, use the **routing-context vrf** command. To revert to default behavior, use the **no** form of this command.

routing-context vrf *vrf-name*
no routing-context vrf *vrf-name*

Syntax Description

vrf-name	Name of the VRF instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

default VRF

Command Modes

EXEC

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **routing-context vrf** command to set the VRF scope for all EXEC commands (for example, show commands). This automatically restricts the scope of the output of EXEC commands to the configured VRF. You can override this scope by using the VRF keywords available for some EXEC commands.

This command does not require a license.

Examples

This example shows how to limit EXEC commands to the management VRF:

```
switch# routing-context vrf management
switch%management#
```

Related Commands

Command	Description
show routing-context	Displays the current routing context.

S Commands

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-as*num*	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 converts 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.
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

community-list-name	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.
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.
aa:*nn*	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 ore 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

value	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

community-list-name	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.
aa4:*nn*	(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.
community-id	Community ID. The range is from 0 to 255.
cost-value	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 submode

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: • • 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.

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 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

prefix-list-name	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.
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

ip-address	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 externet 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.
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 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

ip-address	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.
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.

Command	Description
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

precedence-value	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

prefix-list-name	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.
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

ipv6-address	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

ipv6-address	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

precedence-value	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.

Command	Description
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

number-value	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.

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 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.
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.
bandwidth-metric	Interior Gateway Routing Protocol (IGRP) bandwidth metric, in Kb/s. The range is from 0 to 4294967295.
delay-metric	(Optional) Interior Gateway Routing Protocol (IGRP) delay metric, in 10 microsecond units. The range is from 1 to 4294967295.
reliability-metric	(Optional) IGRP reliability metric. The range is from 0 to 255.
load-metric	(Optional) IGRP load metric. The range is from 1 to 255.
mtu	(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.
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.
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 *as-num*	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.

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 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 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

tag-value	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.
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.

Command	Description
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

vrf-name	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

number	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.
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.

Command	Description
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 configurationVRF 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-bi**t 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.
spf-max-wait	Maximum interval (in milliseconds) between two consecutive SPF calculations. The range is from 500 to 65535. The default is 8000.
spf-initial-wait	(Optional) Initial SPF calculation delay (in milliseconds) after a topology change. The range is from 50 to 65535. The default is 50.
spf-second-wait	(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 *map-name*	(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* / *lengthipv6-addr* | *ipv6-prefix* / *length*} *level*

Syntax Description

ip-addr	IP address of the neighbor in this format: A.B.C.D.
ip-prefix/*length*	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/*length*.
ipv6-addr	IPv6 address of the neighbor in this format: A:B::C:D.
ipv6-prefix/*length*	IPv6 prefix and the length of the IPv6 prefix for neighbors in this format: A:B::C:D/*length*.
level	Level number. Default: All routes are advertised individually. Valid values are as follows: • **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

ip-prefix/length	IP prefix designated for a range of addresses, including the prefix length. Specify *ip-prefix* as an IP address. Specify *length* as a number from 1 to 31.
not-advertise	(Optional) Suppresses routes that match the specified prefix/length pair.
tag *tag*	(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

ipv6-prefix/length	IP prefix designated for a range of addresses, including the prefix length. Specify *ip-prefix* as an IPv6 address. Specify *length* as a number from 1 to 128.
not-advertise	(Optional) Suppresses routes that match the specified prefix/length pair.
tag *tag*	(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.

Show Commands

show bgp

To display Border Gateway Protocol (BGP) routes, use the **show bgp** command.

show bgp {{**ipv4** | **ipv6**} {**unicast** | **multicast**} | **all**} [{**addr** | **prefix** [**longer-prefixes**]}] [**vrf** **vrf-name**]

Syntax Description

ipv4	Displays BGP information for the IPv4 address family.
ipv6	Displays BGP information for the IPv4 address family.
unicast	Displays BGP information for the unicast address family.
multicast	Displays BGP information for the multicast address family.
all	Displays BGP information for all address families.
addr	(Optional) Network from the selected address family. The format is A.B.C.D for IPv4 and A:B::C:D for IPv6.
prefix	Optional) Prefix from the selected address family. The format is A.B.C.D/length for IPv4 and A:B::C:D/length for IPv6.
longer-prefixes	(Optional) Displays the prefix and any more specific routes.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
6.1(1)	Changed the command output.(existing command will show the configured weight value).
4.0(1)	This command was introduced.
4.2(1)	Added support for IPv6 addresses and prefixes.

Usage Guidelines

Use the **show bgp** command to display information about BGP.This command does not require a license.

Examples

This example shows how to display an entry in the BGP table:

```
switch(config-router)# show bgp ipv6 unicast
BGP routing table information for VRF default, address family IPv4 Unicast
BGP table version is 10, local router ID is 3.3.3.3
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath
   Network            Next Hop            Metric     LocPrf     Weight Path
* i200.0.1.100/32     201.0.25.1                          100        100 6553601 i
```

```
*>e                   201.0.13.1                               0 6553601 i
* i200.0.2.100/32     201.0.25.1                    100      100 6553601 i
*>e                   201.0.13.1                               0 6553601 i
*>l200.0.3.100/32     0.0.0.0                       100    32768 i
```

Related Commands

Command	Description
clear bgp	Clears entries in the BGP table.

show bgp community

To display Border Gateway Protocol (BGP) routes that match a community, use the **show bgp community** command.

show bgp {{**ipv4** | **ipv6**} {**unicast** | **multicast**} | **all**} **community** [*as-number*] [**internet**] [**no-advertise**] [**no-export**] [**no-export-subconfed**] [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

ipv4	Displays BGP information for the IPv4 address family.
ipv6	Displays BGP information for the IPv4 address family.
unicast	Displays BGP information for the unicast address family.
multicast	Displays BGP information for the multicast address family.
all	Displays BGP information for all address families.
as-number	(Optional) AS number. The AS number can be a 16-bit integer or a 32-bit integer in the form of <higher 16-bit decimal number>.<lower 16-bit decimal number>.
internet	(Optional) Displays the internet community.
no-advertise	(Optional) Displays the no-advertise community.
no-export	(Optional) Displays the no-export community.
no-export-subconfed	(Optional) Displays the no-export-subconfed community.
exact-match	(Optional) Displays an exact match of the community.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community:

```
switch(config)# show bgp ip unicast community
```

Related Commands

Command	Description
ip community-list	Creates a community list.

show bgp community-list

To display Border Gateway Protocol (BGP) routes that match a community list, use the **show bgp community-list** command.

show bgp {{**ipv4** | **ipv6**} {**unicast** | **multicast**} | **all**} **community-list commlist-name** [**exact-match**] [**vrf vrf-name**]

Syntax Description

ipv4	Displays BGP information for the IPv4 address family.
ipv6	Displays BGP information for the IPv4 address family.
unicast	Displays BGP information for the unicast address family.
multicast	Displays BGP information for the multicast address family.
all	Displays BGP information for all address families.
commlist-name	Name of a community-list. The commlist-name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the communities.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community list:

```
switch(config)# show bgp ip unicast community-list test1
```

Related Commands

Command	Description
ip community-list	Creates a community list.

show bgp extcommunity

To display Border Gateway Protocol (BGP) routes that match an extended community, use the **show bgp extcommunity** command.

show bgp {{**ipv4** | **ipv6**} {**unicast** | **multicast**} | **all**} **extcommunity generic** {**non-transitive** | **transitive**} [*as4-number*] [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

ipv4	Displays BGP information for the IPv4 address family.
ipv6	Displays BGP information for the IPv4 address family.
unicast	Displays BGP information for the unicast address family.
multicast	Displays BGP information for the multicast address family.
all	Displays BGP information for all address families.
generic	Displays the routes that match the generic specified extended communities.
non-transitive	Displays the routes that match the non-transitive extended communities.
transitive	Displays the routes that match the transitive extended communities.
as4-number	AS number. The *as4-number* is a 32-bit integer in the form of a plaintext integer or <higher 16-bit decimal number>.<lower 16-bit decimal number>.
exact-match	(Optional) Displays an exact match of the extended community.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows hoe to display routes that match an extended community:

```
switch(config)# show bgp ip unicast extcommunity generic transitive 1.3:30
```

Related Commands

Command	Description
ip extcommunity-list	Creates an extended community list.

show bgp extcommunity-list

To display Border Gateway Protocol (BGP) routes that match an extended community list, use the **show bgp extcommunity-list** command.

show bgp {{**ipv4** | **ipv6**} {**unicast** | **multicast**} | **all**} **extcommunity-list** *commlist-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

ipv4	Displays BGP information for the IPv4 address family.
ipv6	Displays BGP information for the IPv4 address family.
unicast	Displays BGP information for the unicast address family.
multicast	Displays BGP information for the multicast address family.
all	Displays BGP information for all address families.
commlist-name	Name of an extended community-list. The *commlist-name* can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the extended communities.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community list:

```
switch(config)# show bgp ipv6 unicast extcommunity-list test1
```

Related Commands

Command	Description
ip extcommunity-list	Creates an extended community list.

show bgp ipv4 unicast labels

To display Border Gateway Protocol (BGP) labels for prefixes, use the **show bgp ipv4 unicast labels** command.

show bgp ipv4 unicast labels vrf {*vrf-name* | **all** | **default** | **management**}

Syntax Description

vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 32 characters.
all	Specifies all VRF.
default	Specifies default VRF name.
management	Specifies management VRF name.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
15.2(2)SNG	This command was implemented on the Cisco ASR 901 Series Aggregation Services Router.
4.1(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display BGP labels for prefixes:

```
switch(config)# show bgp ipv4 unicast labels
```

Related Commands

Command	Description
show ip bgp neighbors	Displays the IPv4 BGP information.

show bgp neighbors

To display Border Gateway Protocol (BGP) neighbors, use the **show bgp neighbors** command.

show bgp {**ip** | **ipv6**} {**unicast** | **multicast**} **neighbors** [{*addr* [{**advertised-routes** | **flap-statistics** | **paths** | **received-routes** | **routes** [{**advertised** | **dampened** | **received**}]}]*prefix*}] [**vrf** {**all***vrf-name*}]

Syntax Description

ip	Displays the IPv4 neighbor information.
ipv6	Displays the IPv6 neighbor information.
unicast	Displays the unicast neighbor information.
multicast	Displays the multicast neighbor information.
addr	IPv4 address. The format is x.x.x.x
advertised-routes	(Optional) Displays all the routes advertised to this neighbor.
flap-statistics	(Optional) Displays flap statistics for the routes received from this neighbor.
paths	(Optional) Displays AS paths learned from this neighbor.
received-routes	(Optional) Displays all the routes received from this neighbor.
routes	(Optional) Displays the routes received or advertised to or from this neighbor.
advertised	(Optional) Displays all the routes advertised for this neighbor.
dampened	(Optional) Displays all dampened routes received from this neighbor.
received	(Optional) Displays all the routes received from this neighbor.
prefix	(Optional) IPv6 prefix. The format is x.x.x.x/length.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.
all	Specifies all VRF.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Added the **paths** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP neighbors:

```
switch(config)# show bgp ip unicast neighbors
```

Related Commands

Command	Description
show ip bgp neighbors	Displays the IPv4 BGP information.
show ipv6 bgp neighbors	Displays the IPv6 BGP information.

show bgp sessions

To display Border Gateway Protocol (BGP) sessions, use the **show bgp sessions** command.

show bgp sessions [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display BGP sessions:

```
switch# show bgp sessions
Total peers 0, established peers 0
ASN 33.33
VRF default, local ASN 33.33
peers 0, established peers 0, local router-id 192.168.1.222
State: I-Idle, A-Active, O-Open, E-Established, C-Closing, S-Shutdown
Flaps LastUpDn|LastRead|LastWrit St Port(L/R)  Notif(S/R)
```

Related Commands

Command	Description
clear bgp	Clears BGP sessions.

show bgp vpnv4 unicast

To display VPNv4 routes from BGP table, use the **show bgp vpnv4 unicast** command.

show bgp vpnv4 unicast [{*ip-prefix/length* [**longer-prefixes**] | *network-address* [*mask*] [**longer-prefixes**]}] [**community** *community*] [**community-list** *community-list*] [**dampening**] [**extcommunity** *extcommunity*] [**extcommunity-list** *extcommunity-list*] [**filter-list** *filter-list*] [**flap-statistics**] [**neighbors** *neighbor*] [**nexthop** [*nexthop*]] [**regexp** *regexp*] [**imported**] [**exported**] [**summary**] [**labels**] {**vrf** {*vrf-name* | **all**} | **rd** *route-distinguisher*}

Syntax Description

ip-prefix/length	(Optional) IP prefix address in the dotted decimal format and the length of the mask from 0 to 32.
longer-prefixes	(Optional) Displays the entry, if any, that exactly matches the specified prefix parameter and all entries that match the prefix in a "longest-match" sense. That is, prefixes for which the specified prefix is an initial substring.
network-address	(Optional) IP address of a network in the BGP routing table.
mask	(Optional) Mask of the network address, in dotted decimal format.
community *community*	(Optional) Displays routes that match this community.
community-list *community-list*	(Optional) Displays routes that match this community list.
dampening	(Optional) Displays dampening information.
extcommunity *extcommunity*	(Optional) Displays routes that match this extcommunity.
extcommunity-list *extcommunity-list*	(Optional) Displays routes that match this extcommunity list.
filter-list *filter-list*	(Optional) Displays routes that match this filter list.
flap-statistics	(Optional) Displays route flap statistics.
neighbors *neighbor*	(Optional) Displays all configured BGP neighbors.
nexthop *nexthop*	(Optional) Displays routes that match this nexthop.
regexp *regexp*	(Optional) Displays routes that match AS path regular expression.
imported	(Optional) Displays imported routes only.
exported	(Optional) Displays exported routes only.
summary	(Optional) Displays summarized information of BGP state.
labels	(Optional) Displays incoming and outgoing BGP labels for each NLRI prefix.
vrf *vrf-name*	Displays routes for a specific VRF.

all	Displays routes for all VRFs.
rd *route-distinguisher*	Displays routes matching specified route-distinguisher.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display VPNv4 routes from BGP table:

```
switch# show bgp vpnv4 unicast summary
BGP summary information for VRF default, address family VPNv4 Unicast
switch#
```

Related Commands

Command	Description
show bgp vpnv6 unicast	Displays VPNv6 routes from BGP table.

show bgp vpnv6 unicast

To display VPNv6 routes from BGP table, use the show bgp vpnv6 unicast command.

show bgp vpnv6 unicast [{*ipv6-prefix/length* [**longer-prefixes**] | *network-address* [*mask*] [**longer-prefixes**]}] [**community** *community*] [**community-list** *community-list*] [**dampening**] [**extcommunity** *extcommunity*] [**extcommunity-list** *extcommunity-list*] [**filter-list** *filter-list*] [**flap-statistics**] [**neighbors** *neighbor*] [**nexthop** [*nexthop*]] [**regexp** *regexp*] [**imported**] [**exported**] [**summary**] [**labels**] {**vrf** {*vrf-name* | **all**} | **rd** *route-distinguisher*}

Syntax Description

ipv6-prefix/length	(Optional) IPv6 prefix address.
longer-prefixes	(Optional) Displays the entry, if any, that exactly matches the specified prefix parameter and all entries that match the prefix in a "longest-match" sense. That is, prefixes for which the specified prefix is an initial substring.
network-address	(Optional) IP address of a network in the BGP routing table.
mask	(Optional) Mask of the network address, in dotted decimal format.
community *community*	(Optional) Displays routes that match this community.
community-list *community-list*	(Optional) Displays routes that match this community list.
dampening	(Optional) Displays dampening information.
extcommunity *extcommunity*	(Optional) Displays routes that match this extcommunity.
extcommunity-list *extcommunity-list*	(Optional) Displays routes that match this extcommunity list.
filter-list *filter-list*	(Optional) Displays routes that match this filter list.
flap-statistics	(Optional) Displays route flap statistics.
neighbors *neighbor*	(Optional) Displays all configured BGP neighbors.
nexthop *nexthop*	(Optional) Displays routes that match this nexthop.
regexp *regexp*	(Optional) Displays routes that match AS path regular expression.
imported	(Optional) Displays imported routes only.
exported	(Optional) Displays exported routes only.
summary	(Optional) Displays summarized information of BGP state.
labels	(Optional) Displays incoming and outgoing BGP labels for each NLRI prefix.
vrf *vrf-name*	Displays routes for a specific VRF.
all	Displays routes for all VRFs.

rd *route-distinguisher*	Displays routes matching specified route-distinguisher.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display VPNv6 routes from BGP table:

```
switch# show bgp vpnv6 unicast vrf all
l3dc3-1# show bgp vpnv6 unicast vrf all
BGP routing table information for VRF default, address family VPNv6 Unicast
BGP table version is 4, local router ID is 1.1.1.1
Status: s-suppressed, x-deleted, S-stale, d-dampened, h-history, *-valid, >-best
Path type: i-internal, e-external, c-confed, l-local, a-aggregate, r-redist
Origin codes: i - IGP, e - EGP, ? - incomplete, | - multipath
   Network            Next Hop            Metric     LocPrf     Weight Path
Route Distinguisher: 1.1.1.1:1     (VRF redist-bgp-l3vpn)
*>i100:1:1::1/128     20:5::2                              100          0 i
*>e200:1:1::1/128     20:6::2                                           0 200 i
switch#
```

Related Commands

Command	Description
show bgp vpnv4 unicast	Displays VPNv4 routes from BGP table.

show event manager events action-log policy

To display an event action log for the specified Embedded Event Manager (EEM) policy, use the show event manager events action-log policy command.

show event manager events action-log policy *applet-name*

Syntax Description

applet-name	Applet name. The maximum range is 29 alphanumeric, case-sensitive characters.

Command Default

None

Command Modes

Any command mode

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 display an event action log for the specified EEM policy:

```
switch# show event manager events action-log policy Route1
switch#
```

Related Commands

Command	Description
show event manager policy-state	Displays information about the status of the specified event policy.

show event manager policy-state

To display information about the status of the specified event policy, use the show event manager policy-state command.

show event manager policy-state *applet-name*

Syntax Description

applet-name	Applet name. The maximum range is 29 alphanumeric, case-sensitive characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display information about the status of the specified event policy:

```
switch# show event manager policy-state applet 1
switch#
```

Related Commands

Command	Description
show event manager events action-log policy	Displays an event action log for the specified EEM policy.

show fhrp

To display First Hop Redundancy Protocol (FHRP) information, use the **show fhrp** command.

show fhrp [*interface-type interface-number*] [**verbose**]

Syntax Description

interface-type	Interface type.
interface-number	Interface number.
verbose	(Optional) Specifies verbose.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

Use the **verbose** keyword to view detailed information.

This command does not require a license.

Examples

This example shows how to display FHRP information:

```
switch# show fhrp port-channel 101 verbose
Interface                               L2    IPv4  IPv6  Hardware     Ref Cnt
Ethernet6/1                             down  down  down  present            3
switch#
```

Related Commands

Command	Description
vfhrp delay	Specifies the delay period for the initialization of First Hop Redundancy Protocol (FHRP) clients.

show forwarding

To display forwarding information, use the **show forwarding** command.

show forwarding [{**ip** | **ipv4** | **ipv6**}] {**adjacency** | **interfaces** | **route** | **trace** [**clear**] | **table id pss route**} [**module slot**] [**vrf vrf-name**]

Syntax Description

ip	(Optional) Displays the IPv4 forwarding information.
ipv4	(Optional) Displays the IPv4 forwarding information.
ipv6	(Optional) Displays the IPv6 forwarding information.
adjacency	Displays the adjacency information.
interfaces	Displays the forwarding information for interfaces on a module.
route	Displays the forwarding information for routes on a module.
trace	Displays the forwarding trace buffer on a module.
clear	(Optional) Clears the forwarding trace buffer on a module.
table *id*	Displays the forwarding information for a route table. The *id* range is from 0 to 2147483647.
pss route	Displays route information from persistent storage.
module *slot*	(Optional) Displays information for the module. The slot range depends on the hardware platform.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Added the **trace** and **clear** keywords.
4.2(1)	Added the **table pss route** keywords.

Usage Guidelines

Use the **show forwarding** command on the supervisor to view forwarding information on a module. Optionally, you can use the **attach module** command to attach to a module and use the **show forwarding** command on the module.

This command does not require a license.

Examples

This example shows how to display forwarding information for module 2:

```
switch# show forwarding route module 2
IPv4 routes for table default/base
------------------+------------------+---------------------
Prefix            | Next-hop         | Interface
------------------+------------------+---------------------
0.0.0.0/32          Drop               Null0
255.255.255.255/32  Receive            sup-eth1
```

Related Commands

Command	Description
show ip fib	Displays information about the FIB.

show forwarding distribution

To display forwarding distribution information, use the **show forwarding distribution** command.

show forwarding distribution [{**clients** | **fib-state**}]

Syntax Description

clients	(Optional) Displays the forwarding distribution information for unicast clients.
fib-state	(Optional) Displays the forwarding distribution state for unicast Forwarding Information Base (FIB).

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display forwarding information for unicast clients:

```
switch# show forwarding distribution clients
id  pid    shmem-start  shmem-end  shmem-name
--  -----  -----------  ---------  ----------
 1  3646   0x64f70120  0x64fc0000  u6rib-ufdm
 2  3647   0x64b50120  0x64d50000  urib-ufdm
```

Related Commands

Command	Description
show ip fib distribution	Displays distribution information about the FIB.

show forwarding inconsistency

To display the results of the forwarding inconsistency checker, use the **show forwarding inconsistency** command.

show forwarding inconsistency [{**ip** | **ipv4** | **ipv6**}] [**unicast**] **module** *slot* [**vrf** *vrf-name*]

Syntax Description

ip	(Optional) Displays the IPv4 forwarding inconsistency information.
ipv4	(Optional) Displays the IPv4 forwarding inconsistency information.
ipv6	(Optional) Displays the IPv6 forwarding inconsistency information.
unicast	(Optional) Displays the forwarding inconsistency information for unicast routes
module *slot*	Displays inconsistency information for the module. The slot range depends on the hardware platform.
vrf *vrf-name*	(Optional) Displays inconsistency information for the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(3)	This command was introduced.
4.2(1)	Added support for **ipv6** keyword.

Usage Guidelines

Use the **show forwarding inconsistency** command to display the results of the **test forwarding inconsistency** command.

This command does not require a license.

Examples

This example shows how to display forwarding inconsistency information for module 2:

```
switch# show forwarding inconsistency module 2
Consistency check : table_id(0x1) slot(2)
No inconsistent adjacencies.
No inconsistent routes.
```

Related Commands

Command	Description
clear forwarding inconsistency	Clears the forwarding inconsistency checker.
test forwarding inconsistency	Triggers the forwarding inconsistency checker.

show glbp

To display Gateway Load Balancing Protocol (GLBP) information, use the **show glbp** command.

show glbp [**interface** *type number*] [**group** *number*] [*state*] [**brief**] [**vrf vrf-name**]

Syntax Description

interface *type number*	(Optional) Specifies the interface to display GLBP information.
group *number*	(Optional) Specifies the GLBP group number. The range is from 0 to 1023.
state	(Optional) State of the GLBP router. The states are as follows: **active**, **disabled**, **init**, **listen**, or **standby**.
brief	(Optional) Summarizes each virtual gateway or virtual forwarder with a single line of output.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings "default" and "all" are reserved VRF names. Supported in Cisco NX-OS Release 4.0(2) and later releases.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(2)	Added support for **vrf** keyword.

Usage Guidelines

Use the **show glbp** command to display information about GLBP groups. The **brief** keyword displays a single line of information about each virtual gateway or virtual forwarder.

This command does not require a license.

Examples

This example shows how to display GLBP information:

```
switch# show glbp
Ethernet2/1 - Group 10
  State is Active
    2 state changes, last state change 23:50:33
  Virtual IP address is 192.0.2.10
  Hello time 5 sec, hold time 18 sec
    Next hello sent in 4.300 secs
  Redirect time 600 sec, forwarder time-out 7200 sec
  Authentication MD5, key "ThisStringIsTheSecretKey"
  Preemption enabled, min delay 60 sec
  Active is local
  Standby is unknown
  Priority 254 (configured)
  Weighting 105 (configured 110), thresholds: lower 95, upper 105
```

```
    Track object 2 state Down decrement 5
  Load balancing: host-dependent
  Group members:
    0016.C76C.85DC (7.199.10.1) local
  There is 1 forwarder (1 active)
  Forwarder 1
    State is Active
      1 state change, last state change 23:50:15
    MAC address is 0007.b400.0101 (default)
    Owner ID is 0005.0050.6c08
    Redirection enabled
    Preemption enabled, min delay 60 sec
    Active is local, weighting 105
```

This example shows how to display a brief summary of GLBP information:

```
switch# show glbp brief
Interface   Grp  Fwd Pri State    Address         Active router   Standby router
Eth2/1      10   -   254 Active   192.0.2.10       local           unknown
Eth1/2      10   1   7   Active   0007.b400.0101   local           -
```

This example shows how to specify the GLBP interface and group number:

```
switch# show glbp interface ethernet2/2 group 1
Ethernet2/2 - Group 1
 State is Listen
   64 state changes, last state change 00:00:54
 Virtual IP address is 10.1.0.7
 Hello time 50 msec, hold time 200 msec
   Next hello sent in 0.030 secs
 Redirect time 600 sec, forwarder time-out 14400 sec
 Authentication text "authword"
 Preemption enabled, min delay 0 sec
 Active is 10.1.0.2, priority 105 (expires in 0.184 sec)
 Standby is 10.1.0.3, priority 100 (expires in 0.176 sec)
 Priority 96 (configured)
 Weighting 100 (configured 100), thresholds: lower 95, upper 100
   Track object 1 state Up decrement 10
 Load balancing: round-robin
  Group members:
   0004.4d83.4801 (10.0.0.0)
   0010.7b5a.fa41 (10.0.0.1)
   00d0.bbd3.bc21 (10.0.0.2) local
```

The following table describes the significant fields shown in the displays.

Table 6: show glbp Field Descriptions

Field	Description
Ethernet2/1 - Group	Interface type and number and GLBP group number for the interface.

Field	Description		
State is	State of the virtual gateway. For a virtual gateway, the state can be one of the following: • Active—The gateway is the active virtual gateway (AVG) and is responsible for responding to Address Resolution Protocol (ARP) requests for the virtual IP address. • Disabled—The virtual IP address has not been configured or learned yet, but another GLBP configuration exists. • Initial—The virtual IP address has been configured or learned, but the virtual gateway configuration is not complete. An interface must be up and configured to route IP, and an interface IP address must be configured. • Listen—The virtual gateway is receiving hello packets and is ready to change to the Speak state if the active or standby virtual gateway becomes unavailable. • Speak—The virtual gateway is attempting to become the active or standby virtual gateway. • Standby—The gateway is next in line to be the AVG. For a virtual forwarder, the state can be one of the following: • Active—The gateway is the active virtual forwarder (AVF) and is responsible for forwarding packets sent to the virtual forwarder MAC address. • Disabled—The virtual MAC address has not been assigned or learned. This state is transitory because a virtual forwarder that changes to a disabled state is deleted. • Initial—The virtual MAC address is known, but the virtual forwarder configuration is not complete. An interface must be up and configured to route IP, an interface IP address must be configured, and the virtual IP address must be known. • Listen—The virtual forwarder is receiving hello packets and is ready to change to the Active state if the AVF becomes unavailable.	Virtual IP address is	Virtual IP address of the GLBP group. All secondary virtual IP addresses are listed on separate lines. If a virtual IP address is a duplicate of an address configured for another device, it will be marked as a duplicate. A duplicate address indicates that the router has failed to defend its ARP cache entry.
Hello time, hold time	Time between hello packets, in seconds or milliseconds, that indicates the hello time. The hold time is the time (in seconds or milliseconds) before other routers declare the active router to be down. All routers in a GLBP group use the hello-time and hold-time values of the current AVG. If the locally configured values are different, the configured values appear in parentheses after the hello-time and hold-time values.		
Redirect time, forwarder time-out	Redirect and timeout times for an AVF transition to a standby virtual forwarder. The redirect time is the time during which the AVG for a GLBP group continues to redirect clients to a secondary AVF. The timeout is the time (in seconds) before the secondary virtual forwarder becomes unavailable.		

Field	Description
Preemption	Whether GLBP gateway preemption is enabled. If enabled, the minimum delay is the time, in seconds, for which a higher-priority nonactive router will wait before preempting the lower-priority active router. This field is also displayed under the forwarder section where it indicates GLBP forwarder preemption.
Active is	Active state of the virtual gateway. The value can be local, unknown, or an IP address. The address (and the expiration date of the address) is the address of the current AVG. This field is also displayed under the forwarder section where it indicates the address of the current AVF.
Standby is	Standby state of the virtual gateway. The value can be local, unknown, or an IP address. The address (and the expiration date of the address) is the address of the standby gateway (the gateway that is next in line to be the AVG).
Weighting	Initial weighting value with lower and upper threshold values.
Track object	List of objects that are being tracked and their corresponding states.
Load balancing	Load-balancing method configured for the GLBP group.
Group members	List of gateways that are members of this group.
Forwarder	List of forwarders in this group.

The following table describes the fields for the **show glbp brief** command output.

Table 7: show glbp brief Field Descriptions

Field	Description
Interface	Interface type and number. GLBP group number for the interface.
Grp	GLBP group number for the interface.
Fwd	Number of forwarders in the GLBP group.
Pri	Configured priority for this gateway.

Field	Description
State is	State of the virtual gateway. For a virtual gateway, the state can be one of the following: • Active—The gateway is the active virtual gateway (AVG) and is responsible for responding to Address Resolution Protocol (ARP) requests for the virtual IP address. • Disabled—The virtual IP address has not been configured or learned yet, but another GLBP configuration exists. • Initial—The virtual IP address has been configured or learned, but the virtual gateway configuration is not complete. An interface must be up and configured to route IP, and an interface IP address must be configured. • Listen—The virtual gateway is receiving hello packets and is ready to change to the Speak state if the active or standby virtual gateway becomes unavailable. • Speak—The virtual gateway is attempting to become the active or standby virtual gateway. • Standby—The gateway is next in line to be the AVG. For a virtual forwarder, the state can be one of the following: • Active—The gateway is the active virtual forwarder (AVF) and is responsible for forwarding packets sent to the virtual forwarder MAC address. • Disabled—The virtual MAC address has not been assigned or learned. This state is transitory because a virtual forwarder that changes to a disabled state is deleted. • Initial—The virtual MAC address is known, but the virtual forwarder configuration is not complete. An interface must be up and configured to route IP, an interface IP address must be configured, and the virtual IP address must be known. • Listen—The virtual forwarder is receiving hello packets and is ready to change to the Active state if the AVF becomes unavailable.
Active router	IP address of the AVG.
Standby router	IP address of the standby virtual gateway.

Address	Virtual IP address of the GLBP group. All secondary virtual IP addresses are listed on separate lines. If a virtual IP address is a duplicate of an address configured for another device, it will be marked as a duplicate. A duplicate address indicates that the router has failed to defend its ARP cache entry.

Related Commands

Command	Description
glbp ip	Enables GLBP.
glbp timers	Configures the time between hello messages and the time before other routers declare the active GLBP router to be down.
glbp weighting track	Specifies an object to be tracked that affects the weighting of a GLBP gateway.

show glbp capability

To display which interfaces support Gateway Load Balancing Protocol (GLBP), use the **show glbp capability** command.

show glbp [**interface** *type number*] [**port-channel** *number*] [**vlan** *number*]

Syntax Description

interface *type number*	(Optional) Specifies the interface for which output is displayed.
port-channel *number*	(Optional) Specifies the port channel for which output is displayed.
vlan *number*	(Optional) VLAN for which output is displayed.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show glbp capability** command to display which interfaces support GLBP.

This command does not require a license.

Examples

This example shows how to display the interfaces that support **GLBP**:

```
switch# show glbp capability
                Nexus 7010 (10 Slot) Chassis * means interface may support GLBP
                                                |
         Interface                         Type |  Potential Max Groups
            Eth1/1   2     Gigabit Ethernet *  1024
            Eth1/2   2     Gigabit Ethernet *  1024
            Eth2/1   2     Gigabit Ethernet *  1024
            Eth2/2   2     Gigabit Ethernet *  1024
            Eth2/3   2     Gigabit Ethernet *  1024
            Eth2/4   2     Gigabit Ethernet *  1024
            Eth2/5   2     Gigabit Ethernet *  1024
            Eth2/6   2     Gigabit Ethernet *  1024
            Eth2/7   2     Gigabit Ethernet *  1024
            Eth2/8   2     Gigabit Ethernet *  1024
             mgmt0   5  Management Sup Port    0
   Eth Inband Port  21         Inband  Port    0
   Eth Inband Port  21         Inband  Port    0
   Eth Inband Port  21         Inband  Port    0
```

The following table describes the significant fields shown in the output.

Table 8: show glbp capability Field Descriptions

Field	Description
Interface	Interface name.

Field	Description
Type	Interface type.
GLBP support (represented by the | character)	* indicates the interface may support GLBP.
Potential Max Groups	Maximum number of groups supported by this interface.

Related Commands

Command	Description
glbp ip	Enables GLBP.
glbp timers	Configures the time between hello messages and the time before other routers declare the active GLBP router to be down.
glbp weighting track	Specifies an object to be tracked that affects the weighting of a GLBP gateway.

show hardware forwarding dynamic-allocation status

To display information about the ternary content addressable memory (TCAM) allocation in the Forwarding Information Base (FIB), use the **show hardware forwarding dynamic-allocation status** command.

show hardware forwarding dynamic-allocation status

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	This command was introduced.
5.0(x)	This command was deprecated.

Usage Guidelines

As of Cisco NX-OS Release 5.0(x), dynamic TCAM allocation is enabled by default and cannot be disabled.

Use the **show hardware forwarding dynamic-allocation status** command to display the TCAM allocation for one or more modules.

This command does not require a license.

Examples

This example shows how to display the TCAM allocation:

```
switch(config)# show
 hardware forwarding dynamic-allocation status
slot  7
=======
Num 288 bit blocks : 1 (Same as default setting)
Num 144 bit blocks : 8 (Same as default setting)
Num  72 bit blocks : 7 (Same as default setting)
slot 12
=======
Num 288 bit blocks : 1 (Same as default setting)
Num 144 bit blocks : 7 (Different from default setting)
Num  72 bit blocks : 9 (Different from default setting)
```

Related Commands

Command	Description
hardware forwarding dynamic-allocation	Configures dynamic TCAM allocation for each module.

show hardware forwarding ip verify

To display information about IP packet verification, use the **show hardware forwarding ip verify** command.

show hardware forwarding ip verify

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to configure IP packet verification settings:

```
switch# show hardware forwarding ip verify
IPv4 and v6 IDS Checks         Status     Packets Failed
-----------------------------+---------+------------------
address source broadcast       Enabled    0
address source multicast       Enabled    0
address destination zero       Enabled    0
address identical              Enabled    0
address source reserved        Enabled    0
address class-e                Disabled   0
checksum                       Enabled    0
protocol                       Enabled    0
fragment                       Enabled    0
length minimum                 Enabled    0
length consistent              Enabled    0
length maximum max-frag        Enabled    0
length maximum udp             Disabled   0
length maximum max-tcp         Enabled    0
tcp flags                      Disabled   0
tcp tiny-frag                  Enabled    0
version                        Enabled    0
-----------------------------+---------+------------------
IPv6 IDS Checks                Status     Packets Failed
-----------------------------+---------+------------------
length consistent              Enabled    0
length maximum max-frag        Enabled    0
length maximum udp             Disabled   0
length maximum max-tcp         Enabled    0
tcp tiny-frag                  Enabled    0
version                        Enabled    0
```

Related Commands

Command	Description
platform ip verify address	Configures IPv4 and IPv6 packet verification checks based on addresses.

Command	Description
platform ip verify length	Configures IPv4 packet verification checks based on length.
platform ipv6 verify	Configures IPv6 packet verification.

show hardware proxy layer-3 counters

To displays proxy layer 3 counter information, use the show hardware proxy layer-3 counters command.

show hardware proxy layer-3 counters {**brief** | **detail**}

Syntax Description

brief	Displays brief information for the proxy.
detail	Displays detailed information for the proxy.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
5.1(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display brief proxy layer 3 counters information:

```
switch# show hardware proxy layer-3 counters brief
Summary:
--------
Proxy packets sent by all F-series module:
------------------------------------------------------------------------
Router Interfaces Tx-Pkts Tx-Rate (pkts/sec approx.
------------------------------------------------------------------------
Eth6/1 0 0
Eth6/2 0 0
Eth6/3 0 0
Eth6/4 0 0
Eth6/5 0 0
Eth6/6 0 0
Eth6/7 0 0
Eth6/8 0 0
Eth7/1-12 0 0
Eth7/13-24 0 0
Eth7/25-36 0 0
Eth7/37-48 0 0
Eth8/1-12 0 0
Eth8/13-24 0 0
Eth8/25-36 0 0
Eth8/37-48 0 0
switch#
```

This example shows how to display detailed proxy layer 3 counters information:

```
switch# show hardware proxy layer-3 counters detail
Proxy packets sent by F-series module: 5
------------------------------------------------------------------------
Router Interfaces Tx-Pkts Tx-Rate (pkts/sec approx.
------------------------------------------------------------------------
```

```
Eth6/1 0 0
Eth6/2 0 0
Eth6/3 0 0
Eth6/4 0 0
Eth6/5 0 0
Eth6/6 0 0
Eth6/7 0 0
Eth6/8 0 0
Eth7/1-12 0 0
Eth7/13-24 0 0
Eth7/25-36 0 0
Eth7/37-48 0 0
Eth8/1-12 0 0
Eth8/13-24 0 0
Eth8/25-36 0 0
Eth8/37-48 0 0
=============================================================
Total 0 0
=============================================================
--More--
```

Related Commands

Command	Description
show hardware proxy layer-3 detail	Displays detail information on the proxy layer 3 functionality.

show hardware proxy layer-3 detail

To displays detail proxy layer 3 forwarding information, use the show hardware proxy layer-3 detail command.

show hardware proxy layer-3 detail

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
5.1(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display detail proxy layer 3 forwarding information:

```
switch# show hardware proxy layer-3 detail
Global Information:
        F1 Modules:     Count: 0         Slot:
        M1 Modules:     Count: 0         Slot:
Replication Rebalance Mode:             Manual
        Number of proxy layer-3 forwarders:     0
        Number of proxy layer-3 replicators:    0
switch#
```

Related Commands

Command	Description
show hardware proxy layer-3 detail	Displays detail information on the proxy layer 3 functionality.

show hsrp

To display Hot Standby Router Protocol (HSRP) information for each HSRP group, use the **show hsrp** command.

show hsrp [**interface** *type number*] [**group** *group-number*] [{**active** | **init** | **listen** | **standby**}] [*all*] [**brief all**] [**detail**] [{**ipv4** | **ipv6**}]

Syntax Description

interface *type number*	(Optional) Specifies the interface type and number for which to display HSRP information.
group *group-number*	(Optional) Specifies the HSRP group number of the interface to display information about.
active	(Optional) Displays HSRP groups that are in an active state.
init	(Optional) Displays HSRP groups that are in an initialization state.
listen	(Optional) Displays HSRP groups that are in an listen state.
standby	(Optional) Displays HSRP groups that are in an standby state.
all	(Optional) Displays all HSRP groups.
brief	(Optional) Summarizes each virtual gateway or virtual forwarder with a single line of output.
all	(Optional) Displays all the virtual IPs on the group only for the IPV6 HSRP groups.
detail	(Optional) Displays detailed information about HSRP groups.
ipv4	(Optional) Displays only IPv4 HSRP groups.
ipv6	(Optional) Displays only IPv6 HSRP groups.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Added the **ipv4** keyword.
4.2(1)	Added the **detail** keyword.
5.0(2)	Added the **ipv6** keyword.
5.1(1)	Added **all** to the **brief** keyword.

Usage Guidelines

Use the **show hsrp** command to display information about HSRP groups. The **brief** keyword displays a single line of information about each virtual gateway or virtual forwarder.

If you have not configured authentication, the **show hsrp** command will display the following string:

```
Authentication text "cisco"
```

This is the default behavior of HSRP as defined in RFC 2281 :

```
If no authentication data is configured, the RECOMMENDED defaultvalue is 0x63 0x69 0x73
0x63 0x6F 0x00 0x00 0x00.
```

This command does not require a license.

Examples

This example shows how to display the default information about HSRP:

```
switch# show hsrp
Vlan1 - Group 1 (HSRP-V1) (IPv4)
  Local state is Active, priority 150 (Cfged 150), may preempt
    Forwarding threshold(for vPC), lower: 1 upper: 150
  Preemption Delay (Seconds) Reload:300
  Hellotime 3 sec, holdtime 10 sec
  Next hello sent in 0.793000 sec(s)
  Virtual IP address is 10.1.1.3 (Cfged)
  Active router is local
  Standby router is unknown
  Authentication text "cisco"
  Virtual mac address is 0000.0c07.ac01 (Default MAC)
  17 state changes, last state change 1w0d
  IP redundancy name is hsrp-Vlan1-1 (default)
...
```

Note The authentication text string in the preceding example indicates that authentication has not been configured on the interface.

This example shows how to display a brief summary of HSRP information:

```
switch# show hsrp brief all
P indicates configured to preempt.
                     |
 Interface   Grp Prio P State    Active addr      Standby addr     Group
 addr
 Eth1/1      1   100    Active   local            unknown
 fe80::5:73ff:f
 ea0:1 (conf auto EUI64)
 Eth1/1      1   100    Active   local            unknown          1::2

 Eth1/1      1   100    Active   local            unknown          1::1
```

Related Commands

Command	Description
feature hsrp	Enables the HSRP feature.

show hsrp bfd-sessions

To display Hot Standby Router Protocol (HSRP) bfd sessions, use the **show hsrp bfd-sessions** command.

show hsrp bfd-sessions

Syntax Description

This command has no keywords or arguments

Command Default

None

Command Modes

Any

Command History

Release	Modification
5.0(2)	This command was introduced.

Usage Guidelines

Use the **show hsrp bfd-sessions** command to display information about HSRP BFD sessions.

This command does not require a license.

show hsrp delay

To display Hot Standby Router Protocol (HSRP) group delay information, use the **show hsrp delay** command.

show hsrp delay [**interface** *type number*] [**group** *group-number*] [**all**] [**brief**]

Syntax Description

interface *type number*	(Optional) Specifies the interface type and number for which to display HSRP information.
group *group-number*	(Optional) Specifies the HSRP group number of the interface to display information about.
all	(Optional) Specifies all HSRP information.
brief	(Optional) Specifies brief HSRP information.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show hsrp delay** command to display delay information about HSRP groups.

This command does not require a license.

Examples

This example shows how to display GLBP delay information:

```
switch# show hsrp delay
```

show hsrp mgo

To display the relationships between Hot Standby Redundancy Protocol (HSRP) groups that are in use for multiple group optimization (MGO) and their slave sessions, use the show hsrp mgo command.

show hsrp mgo name *name* [**brief**]

Syntax Description

name	Restricts the output to the session with a matching configured name.
name	HRSP group name.
brief	(Optional) Provides a summary of each MGO session with the associated slave sessions

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the relationships between HSRP groups that are in use for MGO and their slave sessions:

```
switch# show hsrp mgo name Master_Group-1
switch#
```

Related Commands

Command	Description
show hsrp	Displays HSRP information.

show hsrp summary

To display Hot Standby Router Protocol (HSRP) summary information for each HSRP group, use the **show hsrp summary** command.

show hsrp summary

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **show hsrp summary** command to display summary information about HSRP groups.

This command does not require a license.

Examples

This example shows how to display a summary of HSRP information:

```
switch# show hsrp summary
PHSRP Summary:
--------------------------------
Extended-hold (NSF) disabled
Total Groups: 1
     Version:: V1-IPV4: 1    V2-IPV4: 0
       State::  Active: 0    Standby: 0    Listen: 0
Total HSRP Enabled interfaces: 1
Total Packets:
             Tx - Pass: 0       Fail: 0
             Rx - Good: 0
Packet for unknown groups: 0
Total MTS: Rx: 142
--------------------------------
```

Related Commands

Command	Description
feature hsrp	Enables the HSRP feature.

show ip adjacency

To display adjacency information, use the **show ip adjacency** command.

show ip adjacency [{*ip-addrinterface*}] [**detail**] [**non-best**] [**statistics**] [**summary**] [**vrf vrf-name**]

Syntax Description

ip-addr	(Optional) IPv4 source address. The format is x.x.x.x.
interface	(Optional) Interface. Use *?* to determine the supported interface types.
detail	(Optional) Displays detailed adjacency information.
non-best	(Optional) Displays both the best and nonbest adjacency information.
statistics	(Optional) Displays adjacency statistics.
summary	(Optional) Displays a summary of the adjacency information.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
6.1	Modified the command output.
4.0(1)	This command was introduced.

Usage Guidelines

The counter values in the output of **show ip adjacency** {**statistics** | **detail**} command are cleared after a supervisor module switchover.

This command does not require a license.

Examples

This example shows how to display the adjacencies of vPC peer with G/W MAC:

```
switch(config)# show ip adjacency
Flags: # - Adjacencies Throttled for Glean
G - Adjacencies of vPC peer with G/W bit
IP Adjacency Table for VRF default
Total number of entries: 3
Address MAC Address Pref Source Interface
1.1.1.2 0018.bad8.457e 50 arp Ethernet2/11
10.10.10.2 0018.bad8.457e 50 arp Vlan100 G
```

This example shows how to display a summary of the adjacency information:

```
switch# show ip adjacency summary
IP AM Table - Adjacency Summary
Static : 1
```

```
Dynamic : 22
Others : 0
Total : 23
```

Related Commands

Command	Description
show forwarding adjacency	Displays forwarding adjacency information.

show ip adjacency summary

To display an IP adjacency summary, use the show ip adjacency summary command.

show ip adjacency summary

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.2(8)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display an IP adjacency summary:

```
switch# show ip adjacency summary
IP AM Table - Adjacency Summary
Static  : 0
  Dynamic : 0
  Others  : 0 (Throttled : 0)
  Total   : 0
switch#
```

Related Commands

Command	Description
ip arp timeout	Configures ARP.

show ip adjacency throttle statistics

To display all the throttled adjacency statistics, use the show ip adjacency throttle statistics command.

show ip adjacency throttle statistics

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.2(8)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display all the throttled adjacency statistics:

```
switch# show ip adjacency throttle statistics
No. of Adjacency hit with type INVALID: Packet count 0, Byte count 0
No. of Adjacency hit with type GLOBAL DROP: Packet count 0, Byte count 0
No. of Adjacency hit with type GLOBAL PUNT: Packet count 0, Byte count 0
No. of Adjacency hit with type GLOBAL GLEAN: Packet count 0, Byte count 0
No. of Adjacency hit with type GLEAN: Packet count 0, Byte count 0
No. of Adjacency hit with type NORMAL: Packet count 0, Byte count 0
Adjacency statistics last updated before: 00:01:05
IP Adjacency Table for VRF default
Total number of entries: 0
Address         MAC Address     Interface        Packet Count   Byte Count
switch#
```

Related Commands

Command	Description
show hardware proxy layer-3 detail	Displays layer-3 proxy detail information.

show ip arp

To display the Address Resolution Protocol (ARP) information, use the **show ip arp** command.

show ip arp [{*ip-addrinterface*}] [**client**] [**static**] [**statistics**] [**summary**] [**vrf vrf-name**]

Syntax Description

ip-addr	(Optional) IPv4 source address. The format is x.x.x.x.
interface	(Optional) Interface. Use *?* to determine the supported interface types.
client	(Optional) Displays the ARP client table.
static	(Optional) Displays static ARP entries.
statistics	(Optional) Displays ARP statistics.
summary	(Optional) Displays a summary of the ARP table.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display a summary of the ARP table:

```
switch# show ip arp summary
IP ARP Table - Adjacency Summary
  Resolved   : 33
  Incomplete : 0
  Unknown    : 0
  Total      : 33
```

Related Commands

Command	Description
ip arp timeout	Configures ARP.

show ip arp summary

To display an Address Resolution Protocol (ARP) adjacency summary, use the show ip arp summary command.

show ip arp summary

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.2(8)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display an ARP adjacency summary:

```
switch# show ip arp summary
IP ARP Table - Adjacency Summary
Resolved   : 0
  Incomplete : 0 (Throttled : 0)
  Unknown    : 0
  Total      : 0
switch#
```

Related Commands

Command	Description
ip arp timeout	Configures ARP.

show ip as-path-access-list

To display the Autonomous System (AS) Path access lists for the Border Gateway Protocol (BGP), use the **show ip as-path-access-list** command.

show ip as-path-access-list [*name*]

Syntax Description

name	(Optional) AS path access list name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the AS path access lists:

```
switch# show ip as-path-access-list
ip as-path access-list Test1 permit "10.0.0.1"
```

Related Commands

Command	Description
ip as-path access-list	Configures an AS path access list.

show ip bgp

To display entries in the Border Gateway Protocol (BGP) table, use the **show ip bgp** command.

show ip bgp [{*ip-addr* | *ip-prefix* [**longer-prefixes**]}] [**received-paths**] [**regexp expression**] [**route-map map-name**] [**summary**] [**vrf vrf-name**]

Syntax Description

ip-addr	(Optional) Network from the BGP route table. The format is x.x.x.x.
ip-prefix	(Optional) Prefix from the BGP route table. The format is x.x.x.x/length.
longer-prefixes	(Optional) Displays the prefix and any more specific routes.
received-paths	(Optional) Displays paths stored for soft reconfiguration.
regexp *expression*	(Optional) Displays information that matches the regular expression.
route-map *map-name*	(Optional) Displays routes that match the route map. The map name can be any case-sensitive, alphanumeric string up to 63 characters.
summary	(Optional) Displays the summary of the routes.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP route table:

```
switch(config-router)# show ip bgp
BGP routing table information for VRF default, address family IPv4 Unicast
```

Related Commands

Command	Description
clear ip bgp	Clears entries in the BGP route table.

show ip bgp community-list

To display Border Gateway Protocol (BGP) routes that match a community list, use the **show ip bgp community-list** command.

show ip bgp [{**ipv4** {**unicast** | **multicast**} | **all**}] **community-list** *commlist-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

ipv4	(Optional) Displays BGP information for the IPv4 address family.
ipv6	(Optional) Display BGP information for the IPv4 address family.
unicast	Displays BGP information for the unicast address family.
multicast	Displays BGP information for the multicast address family.
all	Displays BGP information for all address families.
community-list *commlist-name*	Display routes matching the community-list. The commlist-name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the communities.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community list:

```
switch(config)# show ip bgp community-list test1
```

Related Commands

Command	Description
ip community-list	Creates a community list.

show ip bgp dampening

To display Border Gateway Protocol (BGP) dampening information, use the **show ip bgp dampening** command.

show ip bgp [{**ipv4** {**unicast** | **multicast**} | **all**}] **dampening** {**dampened-paths** [**regexp expression**] | **flap-statistics** | **history-paths** [**regexp** *expression*] | **parameters**} [**vrf** *vrf-name*]

Syntax Description

ipv4	(Optional) Displays BGP information for the IPv4 address family.
ipv6	(Optional) Displays BGP information for the IPv4 address family.
unicast	Displays BGP information for the unicast address family.
multicast	Displays BGP information for the multicast address family.
all	Displays BGP information for all address families.
dampened-paths	Displays all dampened paths.
regexp *expression*	(Optional) Display information that matches the regular expression.
flap-statistics	Displays flap statistics for routes.
history-paths	Displays all history paths.
parameters	Displays all dampening parameters.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display dampening information:

```
switch(config)# show ip bgp dampening dampened-paths
```

Related Commands

Command	Description
show ipv6 bgp dampening	Displays BGP dampening information.

show ip bgp extcommunity

To display Border Gateway Protocol (BGP) routes that match an extended community, use the **show ip bgp extcommunity** command.

show ip bgp extcommunity generic {**non-transitive** | **transitive**} [*as4-number*] [**exact-match**] [**vrf vrf-name**]

Syntax Description

generic	Displays the routes that match the generic specified extended communities.
non-transitive	Displays the routes that match the non-transitive extended communities.
transitive	Displays the routes that match the transitive extended communities.
as4-number	(Optional) AS number. The *as4-number* is a 32-bit integer in the form of a plaintext integer or <higher 16-bit decimal number>.<lower 16-bit decimal number>.
exact-match	(Optional) Displays an exact match of the extended community.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match an extended community:

```
switch(config)# show ip bgp extcommunity generic transitive 1.3:30
```

Related Commands

Command	Description
ip extcommunity-list	Creates an extended community list.

show ip bgp extcommunity-list

To display Border Gateway Protocol (BGP) routes that match an extended community list, use the **show ip bgp extcommunity-list** command.

show ip bgp extcommunity-list *commlist-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

commlist-name	Name of an extended community-list. The *commlist-name* can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the extended communities.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community list:

```
switch(config)# show ip bgp extcommunity-list test1
```

Related Commands

Command	Description
ip extcommunity-list	Creates an extended community list.

show ip bgp filter-list

To display Border Gateway Protocol (BGP) routes that match a filter list, use the **show ip bgp filter-list** command.

show ip bgp filter-list *list-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

list-name	Name of a filter list. The name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the filter.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a filter list:

```
switch(config)# show ip bgp filter-list test1
```

Related Commands

Command	Description
show ipv6 bgp filter-list	Displays BGP routes that match a filter list.

show ip bgp flap-statistics

To display Border Gateway Protocol (BGP) flap statistics, use the **show ip bgp flap-statistics** command.

show ip bgp flap-statistics [*prefix*] [**vrf** *vrf-name*]

Syntax Description

prefix	(Optional) IPv6 prefix. The format is x.x.x.x/length.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the flap statistics:

```
switch(config)# show ip bgp flap-statistics
```

Related Commands

Command	Description
show ipv6 bgp	Displays BGP information.

show ip bgp history-paths

To display Border Gateway Protocol (BGP) history paths, use the **show ip bgp history-paths** command.

show ip bgp [{**ipv4** {**unicast** | **multicast**} | **all**}] **history-paths** [**regexp expression**] [**vrf vrf-name**]

Syntax Description

ipv4	(Optional) Displays BGP information for the IPv4 address family.
unicast	Displays BGP information for the unicast address family.
multicast	Displays BGP information for the multicast address family.
all	(Optional) Displays BGP information for all address families.
history-paths	Specifies history path for the BGP information.
regexp *expression*	(Optional) Displays information that matches the regular expression.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display BGP history path information:

```
switch(config)# show ip bgp history-paths
```

Related Commands

Command	Description
show ipv6 bgp history-paths	Displays BGP history paths information.

show ip bgp neighbors

To display Border Gateway Protocol (BGP) neighbors, use the **show ip bgp neighbors** command.

show ip bgp neighbors [{*addr* [{**advertised-routes** | **flap-statistics** | **paths** | **received-routes** | **routes** [{**advertised** | **dampened** | **received**}]}]*prefix*}] [**vrf** {**all** | **vrf-name**}]

Syntax Description

addr	IPv4 address. The format is x.x.x.x
advertised-routes	(Optional) Displays all the routes advertised to this neighbor.
flap-statistics	(Optional) Displays flap statistics for the routes received from this neighbor.
paths	(Optional) Displays AS paths learned from this neighbor.
received-routes	(Optional) Displays all the routes received from this neighbor.
routes	(Optional) Displays the routes received or advertised to or from this neighbor.
advertised	(Optional) Displays all the routes advertised for this neighbor.
dampened	(Optional) Displays all dampened routes received from this neighbor.
received	(Optional) Displays all the routes received from this neighbor.
prefix	(Optional) IPv6 prefix. The format is x.x.x.x/length.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.
all	(Optional) Specifies all VRF.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Added **paths** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP neighbors:

```
switch(config)# show ip bgp neighbors
```

Related Commands

Command	Description
show ipv6 bgp neighbors	Displays BGP information.

show ip bgp nexthop

To display Border Gateway Protocol (BGP) next hop information, use the **show ip bgp nexthop** command.

show ip bgp nexthop *addr* [**vrf** *vrf-name*]

Syntax Description

addr	IPv4 address. The format is x.x.x.x
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP next-hop information:

```
switch(config)# show ip bgp nexthop 192.0.2.1
```

Related Commands

Command	Description
show ipv6 bgp nexthop	Displays BGP information.

show ip bgp nexthop-database

To display Border Gateway Protocol (BGP) next-hop database, use the **show ip bgp nexthop-database** command.

show ip bgp nexthop-database [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP next-hop database:

```
switch(config)# show ip bgp nexthop-database
```

Related Commands

Command	Description
show ipv6 bgp nexthop-database	Displays BGP information.

show ip bgp peer-policy

To display Border Gateway Protocol (BGP) peer policy template information, use the **show ip bgp peer-policy** command.

show ip bgp peer-policy *name*

Syntax Description

name	Name of a BGP template. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP peer policy:

```
switch(config)# show ip bgp peer-policy test1
Commands configured in this template:
  Send Community
  Suppress Inactive
  Default Originate - route-map:
Inherited commands:
Inherited by the following peers:
  VRF default: 192.0.2.3
```

Related Commands

Command	Description
inherit peer-policy	Inherits a peer policy template for a neighbor.
template peer-policy	Configures a peer policy template.

show ip bgp peer-session

To display Border Gateway Protocol (BGP) peer session template information, use the **show ip bgp peer-session** command.

show ip bgp peer-session *name*

Syntax Description

name	Name of a BGP template. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP peer session:

```
switch(config)# show ip bgp peer-session test1
Commands configured in this template:
  Update Source - interface: Vlan33
  EBGP Multihop - hop limit: 33
Inherited commands:
Inherited by the following peers:
  VRF default: 192.0.2.3
```

Related Commands

Command	Description
inherit peer-session	Inherits a peer session template for a neighbor.
template peer-session	Configures a peer session template.

show ip bgp peer-template

To display Border Gateway Protocol (BGP) peer template information, use the **show ip bgp peer-template** command.

show ip bgp peer-template *name*

Syntax Description

name	Name of a BGP template. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP peer template:

```
switch(config)# show ip bgp peer-template peer1
BGP peer-template is peer1
  Connected check is disabled
  Hold time = 0, keepalive interval is 0 seconds
  Message statistics:
                              Sent               Rcvd
  Opens:                         0                  0
  Notifications:                 0                  0
  Updates:                       0                  0
  Keepalives:                    0                  0
  Route Refresh:                 0                  0
  Capability:                    0                  0
  Total:                         0                  0
  Total bytes:                   0                  0
  Bytes in queue:                0                  0
Members of peer-template peer1:
default:192.0.2.3
```

Related Commands

Command	Description
inherit peer-template	Inherits a peer template for a neighbor.
template peer	Configures a peer template.

show ip bgp prefix-list

To display Border Gateway Protocol (BGP) routes that match a prefix list, use the **show ip bgp prefix-list** command.

show ip bgp prefix-list *list-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

list-name	Name of a prefix list. The commlist-name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the filter.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a prefix list:

```
switch(config)# show ip bgp prefix-list test1
```

Related Commands

Command	Description
show ipv6 bgp prefix-list	Displays BGP routes that match a prefix list.

show ip client

To display information about the internal IP clients, use the **show ip client** command.

show ip client [*name*]

Syntax Description

name	(Optional) Name of the client.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the IP client information for ARP:

```
switch(config)# show ip client arp
Client: arp, uuid: 268, pid: 3687, extended pid: 3687
  Protocol: (none), client-index: 2, routing VRF id: 255
  Data MTS-SAP: 0
  Data messages, send successful: 33, failed: 0
```

Related Commands

Command	Description
show ip process	Displays information about the IP process.

show ip community-list

To display community lists for the Border Gateway Protocol (BGP), use the **show ip community-list** command.

show ip community-list [*name*]

Syntax Description

name	(Optional) Name of the community list. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the community lists:

```
switch(config)# show ip community-list
Standard Community List test2
    permit internet local-AS
```

Related Commands

Command	Description
ip community-list	Configures a BGP community list.

show ip eigrp

To display a summary of the Enhanced Interior Gateway Routing Protocol (EIGRP) processes, use the **show ip eigrp** command.

show ip eigrp [*instance-tag*]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The *instance-tag* can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(3)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display all the EIGRP instances:

```
switch# show ip eigrp foo
P-EIGRP AS 0 ID 0.0.0.0 VRF default
 Process-tag: foo
 Status: shutdown
 Authentication mode: none
 Authentication key-chain: none
 Metric weights: K1=1 K2=0 K3=1 K4=0 K5=0 K6=0
 Rib scale: 128
 metric version: 64bit
 IP proto: 88 Multicast group: 224.0.0.10
 Int distance: 90 Ext distance: 170
 Max paths: 8
 Number of EIGRP interfaces: 0 (0 loopbacks)
 Number of EIGRP passive interfaces: 0
 Number of EIGRP peers: 0
 Graceful-Restart: Enabled
 Stub-Routing: Disabled
 NSF converge time limit/expiries: 120/0
 NSF route-hold time limit/expiries: 240/0
 NSF signal time limit/expiries: 20/0
 Redistributed max-prefix: Disabled
```

show ip eigrp accounting

To display prefix accounting information for the Enhanced Interior Gateway Routing Protocol (EIGRP) processes, use the **show ip eigrp accounting** command.

show ip eigrp [*instance-tag*] **accounting** [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. This option is available when a virtual routing and forwarding (VRF) instance is not specified. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the EIGRP accounting information:

```
switch# show ip eigrp accounting
IP-EIGRP accounting for AS(100)/ID(192.0.2.1) vrf RED
Total Prefix Count: 4
States: A-Adjacency, P-Pending, D-Down
State Address/Source   Interface        Prefix   Restart  Restart/
                                        Count     Count   Reset(s)
 P    Redistributed     ----               0           3         211
 A    192.0.2.2          e2/1              2           0          84
 P    192.0.2.4          e3/3              0           2         114
 D    192.0.2.3          e4/1              0           3           0
```

The following table describes the significant fields shown in the display.

Table 9: show ip eigrp accounting Field Descriptions

Field	Description
IP-EIGRP accounting for AS...	EIGRP instance, AS number, router ID, and table ID.
Total Prefix Count:	Aggregate sum of the prefixes in an EIGRP instance topology table. The count includes prefixes learned from all neighbors or from redistribution.

Field	Description
States: A-Adjacency, P-Pending, D-Down	A-Adjacency: Indicates a stable adjacency with the neighbor or a normal redistribution state. P-Pending: Neighbor adjacency or redistribution is suspended or in a penalized state because the maximum prefix limit was exceeded. D-Down: Neighbor adjacency or redistribution is suspended permanently until a manual reset is performed with the **clear route** command.
Address/Source	Peer IP address of the redistribution source.
Prefix Count	Total number of learned prefixes by source. **Note** Routes can be learned for the same prefix from multiple sources, and the sum of all prefix counts in this column may be greater than the figure displayed in the "Prefix Count" field.
Restart Count	Number of times that a route source exceeded the maximum prefix limit.
Restart Reset(s)	Time, in seconds, that a route source is in a P (penalized) state. If the route source is in an A (stable or normal) state, the displayed time, in seconds, is the time period until penalization history is reset.

show ip eigrp interfaces

To display information about interfaces configured for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show ip eigrp interfaces** command.

show ip eigrp [*instance-tag*] **interfaces** [*type instance*] [**brief**] [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
instance	(Optional) Either a physical interface instance or a virtual interface instance. Specifying *instance* removes all entries learned through this interface from the neighbor table. The *instance* argument has the following syntax: • Physical interface instance. Naming notation is *slot/port* and a slash mark between values is required as part of the notation. • Virtual interface instance. The number range varies depending on the interface type. For more information about the syntax for the router, use the question mark (**?**) online help function.
brief	(Optional) Displays a brief summary of EIGRP interface information.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

This command shows all interfaces for the default VRF if no VRF or no interface is specified.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	Added the **brief** keyword.

Usage Guidelines

Use the **show ip eigrp interfaces** command to determine on which interfaces EIGRP is active and learn information about EIGRP related to those interfaces.

If you specify an interface, only that interface is displayed. Otherwise, all interfaces on which EIGRP is running are displayed.

If you specify an autonomous system, only the routing process for the specified autonomous system is displayed. Otherwise, all EIGRP processes are displayed.

This command requires the Enterprise Services license.

Examples

This example shows how to display information about EIGRP interfaces:

```
switch# show ip eigrp interfaces brief
IP EIGRP interfaces for process 1 vrf default
                          Xmit Queue    Mean   Pacing Time   Multicast   Pending
Interface        Peers    Un/Reliable   SRTT   Un/Reliable   Flow Timer  Routes
e2/2               0        0/0          0      11/434          0          0
e2/20              1        0/0        337       0/10           0          0
e4/2               1        0/0         10       1/63         103          0
e3/2               1        0/0        330       0/16           0          0
switch#
```

The following table describes the significant fields shown in the display.

Table 10: show ip eigrp interfaces Field Descriptions

Field	Description
Interface	Interface over which EIGRP is configured.
Peers	Number of directly connected EIGRP neighbors.
Xmit Queue Un/Reliable	Number of packets remaining in the unreliable and reliable transmit queues.
Mean SRTT	Mean smoothed round-trip time (SRTT) internal (in milliseconds).
Pacing Time Un/Reliable	Pacing time used to determine when EIGRP packets should be sent out the interface (unreliable and reliable packets).
Multicast Flow Timer	Maximum number of seconds in which the router sends multicast EIGRP packets.
Pending Routes	Number of routes in the packets in the transmit queue waiting to be sent.

Related Commands

Command	Description
show ip eigrp neighbors	Displays the neighbors discovered by EIGRP.

show ip eigrp neighbors

To display information about neighbors discovered by the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show ip eigrp neighbors** command.

show ip eigrp [*instance-tag*] **neighbors** [**detail**] [*interface-type interface-instance*] [**static**] [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
detail	(Optional) Displays detailed EIGRP neighbor information.
interface-type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-instance	(Optional) Either a physical interface instance or a virtual interface instance. Specifying *instance* removes all entries learned through this interface from the neighbor table. The *instance* argument has the following syntax: • Physical interface instance. Naming notation is *slot/port* and a slash mark between values is required as part of the notation. • Virtual interface instance. The number range varies depending on the interface type. For more information about the syntax for the router, use the question mark (**?**) online help function.
static	(Optional) Displays static EIGRP interface information.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

This command displays all neighbors for the default VRF on all interfaces if no VRF or interface is specified.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip eigrp neighbors** command to determine when neighbors become active and inactive. This command is also useful for debugging certain types of transport problems.

This command requires the Enterprise Services license.

Examples

This example shows how to display information about EIGRP neighbors:

```
switch# show ip eigrp neighbors
IP-EIGRP Neighbors for process 77 vrf default
Address                 Interface     Holdtime Uptime   Q      Seq  SRTT  RTO
                                      (secs)   (h:m:s)  Count  Num  (ms)  (ms)
192.0.2.28                e1/3          13       0:00:41  0      11   4     20

192.0.2.2                 e4/4          14       0:02:01  0      10   12    24
switch#
```

The following table describes the significant fields shown in the display.

Table 11: show ip eigrp neighbors Field Descriptions

Field	Description
process	Autonomous system number specified in the router configuration command.
vrf	VRF name.
Address	IP address of the EIGRP peer.
Interface	Interface on which the router is receiving hello packets from the peer.
Holdtime	Length of time (in seconds) that the Cisco NX-OS oftware waits to hear from the peer before declaring that the peer is down.
Uptime	Elapsed time (in hours, minutes, and seconds) since the local router first heard from this neighbor.
Q Count	Number of EIGRP packets (update, query, and reply) that the software waits to send.
Seq Num	Sequence number of the last update, query, or reply packet that was received from this neighbor.
SRTT	Smoothed round-trip time. This field indicates the number of milliseconds required for an EIGRP packet to be sent to this neighbor and for the local router to receive an acknowledgment of that packet.
RTO	Retransmission timeout (in milliseconds). This field indicates the amount of time that the software waits before resending a packet from the retransmission queue to a neighbor.

This example shows how to display detailed information about EIGRP neighbors:

```
switch# show ip eigrp neighbors detail

IP-EIGRP neighbors for AS 1 vrf default
H   Address                 Interface       Hold Uptime   SRTT   RTO  Q  Seq
                                            (sec)         (ms)       Cnt Num
0   192.0.2.10               e1/5            14 01:00:52    3    200   0  10
   Version 12.4/1.2, Retrans: 0, Retries: 0, Prefixes: 3
switch#
```

The following table describes the significant fields shown in the display.

Table 12: show ip eigrp neighbors detail Field Descriptions

Field	Description
Version	Version of EIGRP software running on the node and neighbor.
Retrans:	Number of retransmissions sent to this neighbor.
Retries:	Number of retransmissions sent to this neighbor since the last acknowledgment (ACK).
Prefixes	Number of prefixes learned from this neighbor.

Related Commands

Command	Description
clear ip eigrp neighbors	Clears neighbors for EIGRP.

show ip eigrp policy statistics

To display the policy statistics for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show ip eigrp policy statistics** command in any mode.

show ip eigrp [*instance-tag*] **policy statistics redistribute** {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **rip** *id* | **static**} [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
bgp	Displays policy statistics for the Border Gateway Protocol (BGP).
direct	Displays policy statistics for directly connected routes only.
eigrp	Displays policy statistics for EIGRP.
isis	Displays policy statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospf	Displays policy statistics for the Open Shortest Path First (OSPF) protocol.
rip	Displays policy statistics for the Routing Information Protocol (RIP).
static	Displays policy statistics for IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **eigrp** keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **isis** keyword, an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **ospf** keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(13	This command was removed and replaced by the **show ip eigrp route-map statistics** command.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display policy statistics for EIGRP:

```
switch(config)# show ip eigrp policy statistics redistribute direct
C: No. of comparisons, M: No. of matches

route-map rmap1 permit 1

Total accept count for policy: 10
Total reject count for policy: 0
```

Related Commands

Command	Description
clear ip eigrp policy statistics	Clears policy statistics for EIGRP.
show ip eigrp traffic	Displays EIGRP traffic statistics.

show ip eigrp route-map statistics

To display the route redistribution statistics for the Enhanced Interior Gateway Routing Protocol (EIGRP, use the **show ip eigrp route-map statistics** command in any mode.

show ip eigrp [*instance-tag*] [**route-map statistics redistribute** {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **rip** *id* | **static**} **vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
bgp	Displays policy statistics for the Border Gateway Protocol (BGP).
direct	Displays policy statistics for directly connected routes only.
eigrp	Displays policy statistics for EIGRP.
isis	Displays policy statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospf	Displays policy statistics for the Open Shortest Path First (OSPF) protocol.
rip	Displays policy statistics for the Routing Information Protocol (RIP).
static	Displays policy statistics for IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **eigrp** keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **isis** keyword, an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **ospf** keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(3)	This command was introduced.

Usage Guidelines

This command replaces the **show ip eigrp policy statistics** command. This command does not require a license.

Examples

This example shows how to display route-map statistics for EIGRP:

```
switch(config)# show ip eigrp route-map statistics redistribute direct
C: No. of comparisons, M: No. of matches

route-map rmap1 permit 1

Total accept count for policy: 10
Total reject count for policy: 0
```

Related Commands

Command	Description
clear ip eigrp route-map statistics	Clears route-map statistics for EIGRP.
show ip eigrp traffic	Displays EIGRP traffic statistics.

show ip eigrp topology

To display the Enhanced Interior Gateway Routing Protocol (EIGRP) topology table, use the **show ip eigrp topology** command.

show ip eigrp [*instance-tag*] **topology** [*ip-address/length*] [{**active** | **all-links** | **detail-links** | **pending** | **summary** | **zero-successors**}] [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
ip-address/length	(Optional) IP address in four-part, dotted-decimal notation with a network mask indicated as a slash (/) and number. For example, /8 indicates that the first 8 bits of the mask are 1s, and the corresponding bits of the address are the network address.
active	(Optional) Displays only active entries in the EIGRP topology table.
all-links	(Optional) Displays all entries in the EIGRP topology table.
detail-links	(Optional) Displays detailed information for all entries in the EIGRP topology table.
pending	(Optional) Displays all entries in the EIGRP topology table that are waiting for an update from a neighbor or are waiting to reply to a neighbor.
summary	(Optional) Displays a summary of the EIGRP topology table.
zero-successors	(Optional) Displays available routes in the EIGRP topology table.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

This command displays information for the default VRF if no VRF is specified.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip eigrp topology** command to determine Diffusing Update Algorithm (DUAL) states and to debug possible DUAL problems.

When you use the show ip eigrp topology command without any keywords or arguments, Cisco NX-OS displays only routes that are feasible successors.

This command requires the Enterprise Services license.

Examples

This example shows how to display the EIGRP topology table. The EIGRP metrics for specified internal routes and external routes are displayed.

```
switch# show ip eigrp topology 192.0.2.0/24
IP-EIGRP (AS 1): Topology entry for 192.0.2.0/24
  State is Passive, Query origin flag is 1, 1 Successor(s), FD is 281600
  Routing Descriptor Blocks:
   192.0.2.22 (Ethernet 2/1), from 192.0.2.1, Send flag is 0x0
    Composite metric is (409600/128256), Route is External
    Vector metric:
      Minimum bandwidth is 10000 Kbit
      Total delay is 6000 microseconds
      Reliability is 255/255
      Load is 1/255
      Minimum MTU is 1500
      Hop count is 1
    External data:
      Originating router is 10.89.245.1
      AS number of route is 0 External protocol is Connected, external metric is 0
      Administrator tag is 0 (0x00000000)
switch#
```

This example show how to use **all-links** option:

```
switch(config)# show ip eigrp topology all-links
IP-EIGRP Topology Table for AS(100)/ID(4.4.4.4) VRF default
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status
P 3.3.3.0/24, 1 successors, FD is 130816, serno 58
        via 192.168.6.2 (130816/128256), Ethernet2/2
        via 192.168.5.2 (153856/128256), Ethernet2/1
P 2.2.2.0/24, 1 successors, FD is 130816, serno 57
        via 192.168.6.2 (130816/128256), Ethernet2/2
        via 192.168.5.2 (153856/128256), Ethernet2/1
P 1.1.1.0/24, 1 successors, FD is 130816, serno 56
        via 192.168.6.2 (130816/128256), Ethernet2/2
        via 192.168.5.2 (153856/128256), Ethernet2/1
P 192.168.6.0/24, 1 successors, FD is 2816, serno 25
        via Connected, Ethernet2/2
        via 192.168.5.2 (26112/2816), Ethernet2/1
P 6.6.6.0/24, 1 successors, FD is 128256, serno 24
        via Connected, loopback6
P 5.5.5.0/24, 1 successors, FD is 128256, serno 23
        via Connected, loopback5
P 4.4.4.0(1)/24, 1 successors, FD is 128256, serno 16
        via Connected, loopback4
P 192.168.5.0/24, 1 successors, FD is 25856, serno 1
        via Connected, Ethernet2/1
        via 192.168.6.2 (3072/2816), Ethernet2/2
```

This example shows how to display more details:

```
switch(config)# show ip eigrp topology detail-links
IP-EIGRP Topology Table for AS(100)/ID(4.4.4.4) VRF default
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status
P 3.3.3.0/24, 1 successors, FD is 130816, serno 58
        via 192.168.6.2 (130816/128256), Ethernet2/2
        via 192.168.5.2 (153856/128256), Ethernet2/1
P 2.2.2.0/24, 1 successors, FD is 130816, serno 57
        via 192.168.6.2 (130816/128256), Ethernet2/2
```

```
        via 192.168.5.2 (153856/128256), Ethernet2/1
P 1.1.1.0/24, 1 successors, FD is 130816, serno 56
        via 192.168.6.2 (130816/128256), Ethernet2/2
        via 192.168.5.2 (153856/128256), Ethernet2/1
P 192.168.6.0/24, 1 successors, FD is 2816, serno 25
        via Connected, Ethernet2/2
        via 192.168.5.2 (26112/2816), Ethernet2/1
P 6.6.6.0/24, 1 successors, FD is 128256, serno 24
        via Connected, loopback6
P 5.5.5.0/24, 1 successors, FD is 128256, serno 23
        via Connected, loopback5
P 4.4.4.0(1)/24, 1 successors, FD is 128256, serno 16
        via Connected, loopback4
P 192.168.5.0/24, 1 successors, FD is 25856, serno 1
        via Connected, Ethernet2/1
        via 192.168.6.2 (3072/2816), Ethernet2/2
```

This example shows how to display a summary of the topology table:

```
switch(config)# show ip eigrp topology summary
IP-EIGRP Topology Table for AS(100)/ID(4.4.4.4) VRF default
Head serial 1, next serial 59
8 routes, 0 pending replies, 0 dummies
IP-EIGRP(0) enabled on 5 interfaces, 2 neighbors present on 2 interfaces
Quiescent interfaces:  Eth2/2 Eth2/1
```

This example shows how to display the active entries in the topology table:

```
switch(config-if)# show ip eigrp topology active
IP-EIGRP Topology Table for AS(101)/ID(80.86.2.3) VRF default
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
        r - reply Status, s - sia Status
A 8.3.2.0/24, 1 successors, FD is Inaccessible
     1 replies, active 00:00:04, query-origin: Local origin
         via Connected (Infinity/Infinity), loopback8
       Remaining replies:
          via 5.5.5.6, r, Ethernet2/6
```

This example shows how to display zero-successors in the topology table:

```
switch(config-router)# show ip eigrp topology zero-successors
IP-EIGRP Topology Table for AS(101)/ID(10.1.48.4) VRF default
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
        r - reply Status, s - sia Status
P 10.1.49.0/24, 0 successors, FD is Inaccessible
         via 5.5.5.5 (28416/28160), Ethernet2/6
```

This example shows how to display pending entries:

```
switch(config)# show ip eigrp topology pending
IP-EIGRP Topology Table for AS(100)/ID(1.1.1.1) VRF default

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 6.6.6.0/24, 1 successors, FD is 130816, U
        via 192.168.5.1 (130816/128256), Ethernet2/1
P 5.5.5.0/24, 1 successors, FD is 130816, U
        via 192.168.5.1 (130816/128256), Ethernet2/1
P 4.4.4.0(1)/24, 1 successors, FD is 130816, U
        via 192.168.5.1 (130816/128256), Ethernet2/1
```

```
P 8.8.8.0/24, 1 successors, FD is 130816, U
        via 192.168.5.1 (130816/128256), Ethernet2/1
```

The following table describes the significant fields shown in the display.

Table 13: show ip eigrp topology Field Descriptions

Field	Description
Query origin	Query origin state.
Successors	Number of feasible successors for this prefix.
FD	Feasible distance for this prefix.
192.0.2.22(Ethernet 2/1)	Next hop and interface from which this path was learned.
from 192.0.2.1	Information source for this path.
Send flag	Status of whether the sending of this prefix is pending to this neighbor.
Composite metric is...	The first number is the EIGRP metric that represents the cost to the destination. The second number is the EIGRP metric that this peer advertised.
Route is	Type of route (internal or external).
Vector Metric	Metric (bandwidth, delay, reliability, load, MTU, and hop count) advertised by the neighbor.
External Data	External information (originating router ID, AS number, external protocol, metric, and tag) advertised by the neighbor.

show ip eigrp traffic

To display the number of Enhanced Interior Gateway Routing Protocol (EIGRP) packets sent and received, use the **show ip eigrp traffic** command.

show ip eigrp [*instance-tag*] **traffic** [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

This command displays information for the default VRF if no VRF is specified.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip eigrp traffic** command to find the number of packets sent and received by this EIGRP instance.

In addition, this command is useful in determining whether packets from one node are not reaching the neighboring node due to connectivity or configuration problems.

This command requires the Enterprise Services license.

Examples

This example shows how to display the EIGRP traffic statistics:

```
switch# show ip eigrp traffic
IP-EIGRP Traffic Statistics for AS 1 vrf default
  Hellos sent/received: 736/797
  Updates sent/received: 6/6
  Queries sent/received: 0/1
  Replies sent/received: 1/0
  Acks sent/received: 6/6
  Input queue high water mark 0, 0 drops
  SIA-Queries sent/received: 0/0
  SIA-Replies sent/received: 0/0
```

The following table describes the significant fields shown in the display.

Table 14: show ip eigrp traffic Field Descriptions

Field	Description
AS	Autonomous system number specified in the **router eigrp** command.

Field	Description
vrf	VRF specified in the **show** command.
Hellos sent/received:	Number of hello packets sent and received.
Updates sent/received:	Number of update packets sent and received.
Queries sent/received:	Number of query packets sent and received.
Replies sent/received:	Number of reply packets sent and received.
Acks sent/received:	Number of acknowledgment packets sent and received.
Input queue high water mark	Maximum number of packets in the input queue and number of drops.
SIA-Queries sent/received	Number of Stuck-in-Active query packets sent and received.
SIA-Replies sent/received:	Number of Stuck-in-Active reply packets sent and received.

show ip fib

To display forwarding information, use the **show ip fib** command.

show ip fib {**adjacency** | **interfaces** | **route**} **module** *slot*

Syntax Description

adjacency	Displays the adjacency information.
interfaces	Displays the forwarding information for interfaces on a module.
route	Displays the forwarding information for routes on a module.
module *slot*	Displays information for the module. The slot range depends on the hardware platform.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip fib** command on the supervisor to view forwarding information on a module. Optionally, you can use the **attach module** command to attach to a module and use the **show ip fib** command on the module.

This command does not require a license.

Examples

This example shows how to display forwarding information for module 2:

```
switch# show ip fib route module 2
IPv4 routes for table default/base
------------------+------------------+---------------------
Prefix            | Next-hop         | Interface
------------------+------------------+---------------------
0.0.0.0/32          Drop               Null0
255.255.255.255/32  Receive            sup-eth1
```

Related Commands

Command	Description
show forwarding	Displays information about the FIB.

show ip fib distribution

To display forwarding distribution information, use the **show ip fib distribution** command.

show ip fib distribution [{**clients** | **state**}]

Syntax Description

clients	(Optional) Displays the forwarding distribution information for unicast clients.
state	(Optional) Displays the forwarding distribution state for unicast Forwarding Information Base (FIB).

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display forwarding information for unicast clients:

```
switch# show ip fib distribution clients
id  pid    shmem-start  shmem-end  shmem-name
--  -----  -----------  ---------  ----------
 1  3646   0x64f70120  0x64fc0000  u6rib-ufdm
 2  3647   0x64b50120  0x64d50000  urib-ufdm
```

Related Commands

Command	Description
show forwarding distribution	Displays distribution information about the FIB.

show ip interface

To display IP information for an interface, use the **show ip interface** command.

show ip interface [*type number*] [**brief**] [**vrf** *vrf-name*]

Syntax Description

type	(Optional) Interface type. Use **?** to see the options.
number	(Optional) Interface number. Use **?** to see the range.
brief	(Optional) Displays a summary of IP information.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

If the **ip load-sharing per-packet** command is configured, the output for the **show ip interface** command shows per-packet load sharing as enabled.

If the **ip load-sharing per-packet** command is not configured, the output of the **show ip interface** command shows the load sharing mode as none.

If the **ip load-sharing address** {**destination port destination** | **source-destination** [**port source-destination**]} [**universal-id** *seed*] command is configured, then the load-sharing mode can be checked by using the **show ip load-sharing** command.

This command does not require a license.

Examples

This example shows how to display IP information for Ethernet 4/17:

```
switch# show ip interface ethernet 4/17
IP Interface Status for VRF "default"(1)
Ethernet4/17, Interface status: protocol-down/link-down/admin-up, iod: 102,
IP address: 192.168.17.1, IP subnet: 192.168.17.0/24
IP broadcast address: 255.255.255.255
IP multicast groups locally joined: none
IP MTU: 1500 bytes (using link MTU)
IP primary address route-preference: 0, tag: 0
IP proxy ARP : disabled
IP Local Proxy ARP : disabled
IP multicast routing: disabled
IP icmp redirects: enabled
IP directed-broadcast: disabled
IP icmp unreachables (except port): disabled
IP icmp port-unreachable: enabled
IP unicast reverse path forwarding: none
IP load sharing: none
```

```
IP interface statistics last reset: never
IP interface software stats: (sent/received/forwarded/originated/consumed)
 Unicast packets    : 0/0/0/0/0
 Unicast bytes      : 0/0/0/0/0
 Multicast packets  : 0/0/0/0/0
 Multicast bytes    : 0/0/0/0/0
 Broadcast packets  : 0/0/0/0/0
 Broadcast bytes    : 0/0/0/0/0
 Labeled packets    : 0/0/0/0/0
 Labeled bytes      : 0/0/0/0/0
WCCP Redirect outbound: disabled
WCCP Redirect inbound: disabled
WCCP Redirect exclude: disabled
```

Related Commands

Command	Description
show ipv6 interface	Displays IPv6 information about an interface.

show ip load-sharing

To display IP load sharing information, use the **show ip load-sharing** command.

show ip load-sharing

Syntax Description

This command has no arguments or keywords.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display IP load sharing information:

```
switch# show ip load-sharing
IPv4/IPv6 ECMP load sharing:
Universal-id (Random Seed): 2823428857
Load-share mode : address source-destination port source-destination Broadcast bytes    :
0/0/0/0/0
    Labeled packets    : 0/0/0/0/0
    Labeled bytes      : 0/0/0/0/0
```

Related Commands

Command	Description
show ip load-sharing	Displays IP load sharing.

show ip mbgp

To display entries in the Multiprotocol Border Gateway Protocol (MP-BGP) table, use the **show ip mbgp** command.

show ip mbgp [{*ip-addr* | *ip-prefix* [**longer-prefixes**]}] [**received-paths**] [**regexp expression**] [**route-map map-name**] [**summary**] [**vrf vrf-name**]

Syntax Description

ip-addr	(Optional) Network from the MBGP route table. The format is x.x.x.x.
ip-prefix	(Optional) Prefix from the MBGP route table. The format is x.x.x.x/length.
longer-prefixes	(Optional) Displays the prefix and any more specific routes.
received-paths	(Optional) Displays paths stored for soft reconfiguration.
regexp *expression*	(Optional) Displays information that matches the regular expression.
route-map *map-name*	(Optional) Displays routes that match the route map. The map name can be any case-sensitive, alphanumeric string up to 63 characters.
summary	(Optional) Displays the summary of the routes.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the MBGP route table:

```
switch(config-router)# show ip mbgp
BGP routing table information for VRF default, address family IPv4 Multicast
```

Related Commands

Command	Description
clear ip mbgp	Clears entries in the MBGP route table.

show ip mbgp community

To display Multiprotocol Border Gateway Protocol (MP-BGP) routes that match a community, use the **show ip mbgp community** command.

show ip mbgp community [*as-number*] [**internet**] [**no-advertise**] [**no-export**] [**no-export-subconfed**] [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

as-number	Autonomous system (AS). The AS number can be a 16-bit integer or a 32-bit integer in the form of <higher 16-bit decimal number>.<lower 16-bit decimal number>.
internet	(Optional) Displays the internet community.
no-advertise	(Optional) Displays the no-advertise community.
no-export	(Optional) Displays the no-export community.
no-export-subconfed	(Optional) Displays the no-export-subconfed community.
exact-match	(Optional) Displays an exact match of the community.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community:

```
switch(config)# show ip mbgp community
```

Related Commands

Command	Description
ip community-list	Creates a community list.

show ip mbgp community-list

To display Multiprotocol Border Gateway Protocol (MP-BGP) routes that match a community list, use the **show ip mbgp community-list** command.

show ip mbgp community-list *commlist-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

commlist-name	Name of a community-list. The commlist-name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the communities.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community list:

```
switch(config)# show ip mbgp community-list test1
```

Related Commands

Command	Description
ip community-list	Creates a community list.

show ip mbgp dampening

To display Multiprotocol Border Gateway Protocol (MP-BGP) dampening information, use the **show ip mbgp dampening** command.

show ip mbgp dampening {**dampened-paths** [**regexp** *expression*] | **flap-statistics** | **history-paths** [**regexp expression**] | **parameters**} [**vrf** *vrf-name*]

Syntax Description

dampened-paths	Displays all dampened paths.
regexp *expression*	(Optional) Displays information that matches the regular expression.
flap-statistics	(Optional) Displays flap statistics for routes.
history-paths	(Optional) Displays all history paths.
parameters	Displays all dampening parameters.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display dampening information:

```
switch(config)# show ip mbgp dampening dampened-paths
```

Related Commands

Command	Description
show ipv6 bgp dampening	Displays BGP dampening information.

show ip mbgp extcommunity

To display Multiprotocol Border Gateway Protocol (MP-BGP) routes that match an extended community, use the **show ip mbgp extcommunity** command.

show ip mbgp extcommunity generic {**non-transitive** | **transitive**} [*as4-number*] [**exact-match**] [**vrf vrf-name**]

Syntax Description

generic	Displays the routes that match the generic specific extended communities.
non-transitive	Displays the routes that match the non-transitive extended communities.
transitive	Displays the routes that match the transitive extended communities.
as4-number	AS number. The *as4-number* is a 32-bit integer in the form of a plaintext integer or <higher 16-bit decimal number>.<lower 16-bit decimal number>.
exact-match	(Optional) Displays an exact match of the extended community.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match an extended community:

```
switch(config)# show ip mbgp extcommunity generic transitive 1.3:30
```

Related Commands

Command	Description
ip extcommunity-list	Creates an extended community list.

show ip mbgp extcommunity-list

To display Multiprotocol Border Gateway Protocol (MP-BGP) routes that match an extended community list, use the **show ip mbgp extcommunity-list** command.

show ip mbgp extcommunity-list *commlist-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

commlist-name	Name of an extended community-list. The *commlist-name* can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the extended communities.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community list:

```
switch(config)# show ip mbgp extcommunity-list test1
```

Related Commands

Command	Description
ip extcommunity-list	Creates an extended community list.

show ip mbgp filter-list

To display Multiprotocol Border Gateway Protocol (MP-BGP) routes that match a filter list, use the **show ip mbgp filter-list** command.

show ip mbgp filter-list *list-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

list-name	Name of a filter list. The name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the filter.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a filter list:

```
switch(config)# show ip mbgp filter-list test1
```

Related Commands

Command	Description
show ipv6 bgp filter-list	Displays BGP routes that match a filter list.

show ip mbgp flap-statistics

To display Multiprotocol Border Gateway Protocol (MP-BGP) flap statistics, use the **show ip mbgp flap-statistics** command.

show ip mbgp flap-statistics [*prefix*] [**vrf** *vrf-name*]

Syntax Description

prefix	(Optional) IPv6 prefix. The format is x.x.x.x/length.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the flap statistics:

```
switch(config)# show ip mbgp flap-statistics
```

Related Commands

Command	Description
show ipv6 bgp	Displays BGP information.

show ip mbgp history-paths

To display Multiprotocol Border Gateway Protocol (MP-BGP) history paths, use the **show ip mbgp history-paths** command.

show ip mbgp history-paths [**regexp** *expression*] [**vrf** *vrf-name*]

Syntax Description

regexp *expression*	(Optional) Displays information that matches the regular expression.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display BGP history path information:

```
switch(config)# show ip mbgp history-paths
```

Related Commands

Command	Description
show ipv6 bgp history-paths	Displays BGP history paths information.

show ip mbgp neighbors

To display Multiprotocol Border Gateway Protocol (MP-BGP) neighbors, use the **show ip mbgp neighbors** command.

show ip bgp neighbors [{*addr* [{**advertised-routes** | **flap-statistics** | **paths** | **received-routes** | **routes** [{**advertised** | **dampened** | **received**}]}]*prefix*}] [**vrf** {**all***vrf-name*}]

Syntax Description

addr	IPv4 address. The format is x.x.x.x
advertised-routes	(Optional) Displays all the routes advertised to this neighbor.
flap-statistics	(Optional) Displays flap statistics for the routes received from this neighbor.
paths	(Optional) Displays AS paths learned from this neighbor.
received-routes	(Optional) Displays all the routes received from this neighbor.
routes	(Optional) Displays the routes received or advertised to or from this neighbor.
advertised	(Optional) Displays all the routes advertised for this neighbor.
dampened	(Optional) Displays all dampened routes received from this neighbor.
received	(Optional) Displays all the routes received from this neighbor.
prefix	(Optional) IPv6 prefix. The format is x.x.x.x/length.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.
all	(Optional) Specifies all VRFs.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Added **paths** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the MBGP neighbors:

```
switch(config)# show ip mbgp neighbors
```

Related Commands

Command	Description
show ipv6 bgp neighbors	Displays BGP information.

show ip mbgp nexthop

To display Multiprotocol Border Gateway Protocol (MP-BGP) next hop information, use the **show ip mbgp nexthop** command.

show ip mbgp nexthop *addr* [**vrf** *vrf-name*]

Syntax Description

addr	IPv4 address. The format is x.x.x.x
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP next-hop information:

```
switch(config)#show ip mbgp nexthop 192.0.2.1
```

Related Commands

Command	Description
show ipv6 bgp nexthop	Displays BGP information.

show ip mbgp nexthop-database

To display Multiprotocol Border Gateway Protocol (MP-BGP) next-hop database, use the **show ip mbgp nexthop-database** command.

show ip mbgp nexthop-database [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP next-hop database:

```
switch(config)# show ip mbgp nexthop-database
```

Related Commands

Command	Description
show ipv6 bgp nexthop-database	Displays BGP information.

show ip mbgp prefix-list

To display Multiprotocol Border Gateway Protocol (MP-BGP) routes that match a prefix list, use the **show ip mbgp prefix-list** command.

show ip mbgp prefix-list *list-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

list-name	Name of a prefix list. The commlist-name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the filter.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a prefix list:

```
switch(config)# show ip mbgp prefix-list test1
```

Related Commands

Command	Description
show ipv6 bgp prefix-list	Displays BGP routes that match a prefix list.

show ip ospf

To display general information about Open Shortest Path First (OSPF) routing instances, use the **show ip ospf** command.

show ip ospf [*instance-tag*] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Use this tag to display OSPF information about a specific OSPF instance. The *instance-tag* argument can be any alphanumeric string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf** command to display information about one or more OSPF instances.

This command requires the Enterprise Services license.

The following example shows how to display information about all OSPF instances:

```
switch# show ip ospf
Routing Process 201 with ID 192.0.2.1 VRF default
Stateful High Availability enabled
Graceful-restart is configured
Grace period: 60 state: Inactive
Last graceful restart exit status: None
Supports only single TOS(TOS0) routes
Supports opaque LSA
This router is an autonomous system boundary
Redistributing External Routes from
bgp-1
Maximum limit: 1000 (warning-only)
Threshold: message 750
Current count: 0
Administrative distance 110
Reference Bandwidth is 40000 Mbps
Initial SPF schedule delay 3000.000 msecs,
minimum inter SPF delay of 2000.000 msecs,
maximum inter SPF delay of 4000.000 msecs
Initial LSA generation delay 3000.000 msecs,
minimum inter LSA delay of 6000.000 msecs,
maximum inter LSA delay of 6000.000 msecs
Minimum LSA arrival 2000.000 msec
Maximum paths to destination 3
Originating router LSA with maximum metric
Condition: Always
Number of external LSAs 0, checksum sum 0
```

```
Number of opaque AS LSAs 0, checksum sum 0
Number of areas is 3, 3 normal, 0 stub, 0 nssa
Number of active areas is 0, 0 normal, 0 stub, 0 nssa
Area BACKBONE(0.0.0.0) (Inactive)
Area has existed for 00:22:49
Interfaces in this area: 1 Active interfaces: 0
Passive interfaces: 0 Loopback interfaces: 0
No authentication available
SPF calculation has run 3 times
Last SPF ran for 0.000036s
Area ranges are
Number of LSAs: 0, checksum sum 0
Area (0.0.0.10) (Inactive)
Area has existed for 00:41:30
Interfaces in this area: 0 Active interfaces: 0
Passive interfaces: 0 Loopback interfaces: 0
Summarization is disabled
Simple password authentication
SPF calculation has run 8 times
Last SPF ran for 0.000150s
Area ranges are
10.3.0.0/16 Passive (Num nets: 0) Advertise
Area-filter in 'FilterLSAs'
Number of LSAs: 0, checksum sum 0
Area (0.0.0.15) (Inactive)
Area has existed for 00:49:30
Interfaces in this area: 1 Active interfaces: 0
Passive interfaces: 1 Loopback interfaces: 0
No authentication available
SPF calculation has run 8 times
Last SPF ran for 0.000021s
Area ranges are
Number of LSAs: 0, checksum sum 0
switch#
```

Examples

The following example shows how to display information about one specific OSPF instance:

```
switch# show ip ospf 201
 Routing Process 201 with ID 192.0.2.15 vrf default
 Stateful High Availability enabled
 Graceful-restart is configured
 Notify period: 15, grace period: 60, state: Inactive
 Last graceful restart exit status: (null)
 Supports only single TOS(TOS0) routes
 Supports opaque LSA
 Reference Bandwidth is 40000 Mbps
 Initial SPF schedule delay 200.000 msecs,
 minimum inter SPF delay of 1000.000 msecs,
 maximum inter SPF delay of 5000.000 msecs
 Minimum hold time for Router LSA throttle 5000.000 ms
 Minimum hold time for Network LSA throttle 5000.000 ms
 Minimum LSA arrival 1000.000 msec
 Maximum paths to destination 8
 Number of external LSAs 0, checksum sum 0
 Number of opaque AS LSA 0, checksum sum 0
 Number of areas is 2, 2 normal, 0 stub, 0 nssa
 Number of active areas is 0, 0 normal, 0 stub, 0 nssa
 BFD is enabled
   Area BACKBONE(0) (Inactive)
        Area has existed for 1w0d
        Interfaces in this area: 1 Active interfaces: 0
        No authentication available
```

```
      SPF calculation has run 3 times
       Last SPF ran for 0.000132s
      Area ranges are
      Number of LSAs: 0, checksum sum 0
Area (10) (Inactive)
      Area has existed for 1w0d
      Interfaces in this area: 1 Active interfaces: 0
      No authentication available
      SPF calculation has run 3 times
       Last SPF ran for 0.000035s
      Area ranges are
      Number of LSAs: 0, checksum sum 0
```

The following table describes the significant fields shown in the display.

Table 15: show ip ospf Field Descriptions

Field	Description
Routing Process...	OSPF instance tag and OSPF router ID.
Stateful High Availability	Status of stateful restart capability.
Graceful-restart	Status of graceful restart configuration.
grace period	Number of seconds that OSPF has to trigger a graceful restart.
Last graceful restart exit status	Exit status for last graceful restart.
Supports...	Number of types of service supported (Type 0 only).
Reference Bandwidth	Bandwidth used for cost calculation.
Initial SPF schedule delay	Delay time of SPF calculations.
Minimum LSA arrival	Minimum interval between link-state advertisements.
Number of...	Number and type of link-state advertisements that have been received.
Number of areas is...	Number and type of areas configured for the router.

show ip ospf border-routers

To display the Open Shortest Path First (OSPF) routing table entries to an Area Border Router (ABR) and Autonomous System Boundary Router (ASBR), use the **show ip ospf border-routers** command.

show ip ospf [*instance-tag*] **border-routers** [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Use this tag to display OSPF information about a specific OSPF instance. The *instance-tag* argument can be any alphanumeric string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf border-routers** command to display information on ABRs. and ASBRs.

This command requires the Enterprise Services license.

Examples

This example shows how to display information about border routers:

```
switch# show ip ospf border-routers
OSPF Process ID p1, vrf default Internal Routing Table
Codes: i - Intra-area route, I - Inter-area route

i 40.40.40.40 [10], ABR, Area 0.0.0.0, SPF 71 via
              192.0.2.1, Ethernet2/1
i 60.60.60.60 [20], ABR, Area 0.0.0.0, SPF 71 via
              192.0.2.1, Ethernet2/1
i 40.40.40.40 [10], ABR, Area 0.0.0.1, SPF 71 via
              192.0.2.1, Ethernet2/2
i 60.60.60.60 [20], ABR, Area 0.0.0.1, SPF 71 via
              192.0.2.1, Ethernet2/2
```

The following table describes the significant fields shown in the display.

Table 16: show ip ospf border-routers Field Descriptions

Field	Description
40.40.40.40	Router ID of the destination.
[10]	Cost of using this route.
ABR	Router type of the destination; the type is either an ABR, ASBR, or both.

Field	Description
Area	Area ID of the area from which this route is learned.
SPF 71	Internal number of the shortest path first (SPF) calculation that installs this route.
via 192.0.2.1	Next hop toward the destination.
Ethernet2/1	Interface type for the outgoing interface.

show ip ospf database

To display the Open Shortest Path First (OSPF) database for a specific router, use the **show ip ospf database** command.

show ip ospf [*instance-tag*] **database** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show ip ospf [*instance-tag*] **database asbr-summary** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show ip ospf [*instance-tag*] **database database-summary** [**vrf** *vrf-name*]
show ip ospf [*instance-tag*] **database external** [**ext_tag** *value*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show ip ospf [*instance-tag*] **database network** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show ip ospf [*instance-tag*] **database nssa-external** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show ip ospf [*instance-tag*] **database opaque-area** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show ip ospf [*instance-tag*] **database opaque-as** [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show ip ospf [*instance-tag*] **database opaque-link** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show ip ospf [*instance-tag*] **database router** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show ip ospf [*instance-tag*] **database summary** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
area-id	(Optional) Area number used to define the particular area. Specify as either an IP address or a number from 0 to 4294967295.
link-state-id	(Optional) Portion of the Internet environment that is being described by the advertisement. The value entered depends on the advertisement's link-state type. Specify in the form of an IP address.
adv-router*ip-address*	(Optional) Displays all the link-state advertisements (LSAs) of the specified router.
self-originate	(Optional) Displays self-originated LSAs (from the local router).
asbr-summary	(Optional) Displays information about the autonomous system boundary router summary LSAs.
database-summary	(Optional) Displays each type of LSA for each area in the database, and the total number of LSAs.
external	(Optional) Displays information about the external LSAs.
ext_tag *value*	(Optional) Displays information based on an external tag. The range is from 1 to 4294967295.

network	(Optional) Displays information about the network LSAs.
nssa-external	(Optional) Displays information about the not-so-stubby area (NSSA) external LSAs.
opaque-area	(Optional) Displays information about the opaque area LSAs.
opaque-as	(Optional) Displays information about the opaque AS LSAs.
opaque-link	(Optional) Displays information about the opaque link-local LSAs.
router	(Optional) Displays information about the router LSAs.
summary	(Optional) Displays information about the summary LSAs.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf database** command to display information about different OSPF LSAs.

When the link state advertisement is describing a network, the *link-state-id* argument can take one of two forms:

- The network’s IP address (such as Type 3 summary link advertisements and autonomous system external link advertisements).
- A derived address obtained from the link state ID. (Note that masking a network links advertisement’s link state ID with the network’s subnet mask yields the network’s IP address.)
- When the link state advertisement is describing a router, the link state ID is always the described router’s OSPF router ID.
- When an autonomous system external advertisement (LS Type = 5) is describing a default route, its link state ID is set to Default Destination (0.0.0.0).

This command requires the Enterprise Services license.

Examples

This example shows how to display the OSPF database:

```
Router# show ip ospf database
OSPF Router with ID (50.50.50.50) (Process ID p1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link Count
40.40.40.40     40.40.40.40     930         0x80000004 0x2ea1   3
50.50.50.50     50.50.50.50     935         0x80000002 0x8b52   1
60.60.60.60     60.60.60.60     943         0x800003c5 0x9854   2
```

```
                Network Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum
209.165.201.3   60.60.60.60     944         0x80000001 0x7179
192.0.2.1       50.50.50.50     935         0x80000001 0x516a

                Summary Network Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum
209.165.201.1   40.40.40.40     929         0x80000001 0x2498
209.165.201.1   50.50.50.50     928         0x80000001 0x5b2f
209.165.201.1   60.60.60.60     1265        0x800003c3 0xf49b
192.0.2.0       40.40.40.40     943         0x80000001 0x53f3
192.0.2.0       50.50.50.50     935         0x80000001 0x26f8
192.0.2.0       60.60.60.60     930         0x80000001 0x7b51
```

The following table describes the significant fields shown in the display.

Table 17: show ip ospf database Field Descriptions

Field	Description
Link ID	Router ID number.
ADV Router	Advertising router's ID.
Age	Link state age.
Seq#	Link state sequence number (detects old or duplicate link state advertisements).
Checksum	Checksum of the complete contents of the link state advertisement.
Link count	Number of interfaces detected for the router.

This example shows how to display a summary of autonomous system border routers:

```
Router# show ip ospf database asbr-summary
OSPF Router with id(192.168.239.66) (Process ID 300)
                Displaying Summary ASB Link States(Area 0.0.0.0)
 LS age: 1463
 Options: (No TOS-capability)
 LS Type: Summary Links(AS Boundary Router)
 Link State ID: 172.16.245.1 (AS Boundary Router address)
 Advertising Router: 172.16.241.5
 LS Seq Number: 80000072
 Checksum: 0x3548
 Length: 28
 Network Mask: 0.0.0.0 TOS: 0  Metric: 1
```

The following table describes the significant fields shown in the display.

Table 18: show ip ospf database asbr-summary Field Descriptions

Field	Description
OSPF Router with id	Router ID number.
Process ID	OSPF process ID.
LS age	Link state age.

Field	Description
Options	Type of service options (Type 0 only).
LS Type	Link state type.
Link State ID	Link state ID (autonomous system boundary router).
Advertising Router	Advertising router's ID.
LS Seq Number	Link state sequence (detects old or duplicate link state advertisements).
Checksum	Checksum of the complete contents of the link state advertisement.
Length	Length in bytes of the link state advertisement.
Network Mask	Network mask implemented.
TOS	Type of service.
Metric	Link state metric.

This example shows how to display information about external links:

```
Router# show ip ospf database external
OSPF Router with id(192.168.239.66) (Autonomous system 300)
                  Displaying AS External Link States
LS age: 280
Options: (No TOS-capability)
LS Type: AS External Link
Link State ID: 10.105.0.0 (External Network Number)
Advertising Router: 172.16.70.6
LS Seq Number: 80000AFD
Checksum: 0xC3A
Length: 36
Network Mask: 255.255.0.0
       Metric Type: 2 (Larger than any link state path)
       TOS: 0
       Metric: 1
       Forward Address: 0.0.0.0
       External Route Tag: 0
```

The following table describes the significant fields shown in the display.

Table 19: show ip ospf database external Field Descriptions

Field	Description
OSPF Router with id	Router ID number.
Autonomous system	OSPF autonomous system number (OSPF process ID).
LS age	Link state age.
Options	Type of service options (Type 0 only).
LS Type	Link state type.

Field	Description
Link State ID	Link state ID (external network number).
Advertising Router	Advertising router's ID.
LS Seq Number	Link state sequence number (detects old or duplicate link state advertisements).
Checksum	Checksum of the complete contents of the LSA.
Length	Length in bytes of the link state advertisement.
Network Mask	Network mask implemented.
Metric Type	External type.
TOS	Type of service.
Metric	Link state metric.
Forward Address	Forwarding address. Data traffic for the advertised destination will be forwarded to this address. If the forwarding address is set to 0.0.0.0, data traffic will be forwarded instead to the advertisement's originator.
External Route Tag	External route tag; a 32-bit field attached to each external route. This field is not used by the OSPF protocol itself.

This example shows how to display a summary of the OSPF database:

```
Router# show ip ospf database database-summary
OSPF Router with ID (100.0.0.1) (Process ID 1)
Area 0 database summary
  LSA Type      Count    Delete   Maxage
  Router        3        0        0
  Network       0        0        0
  Summary Net   0        0        0
  Summary ASBR  0        0        0
  Type-7 Ext    0        0        0
    Self-originated Type-7  0
Opaque Link     0        0        0
  Opaque Area   0        0        0
  Subtotal      3        0        0
Process 1 database summary
  LSA Type      Count    Delete   Maxage
  Router        3        0        0
  Network       0        0        0
  Summary Net   0        0        0
  Summary ASBR  0        0        0
  Type-7 Ext    0        0        0
  Opaque Link   0        0        0
  Opaque Area   0        0        0
  Type-5 Ext    0        0        0
      Self-originated Type-5  200
Opaque AS       0        0        0
  Total       203        0        0
```

The following table describes the significant fields shown in the display.

Table 20: show ip ospf database database-summary Field Descriptions

Field	Description
Area 0 database summary	Area number.
Count	Count of LSAs of the type identified in the first column.
Router	Number of router link state advertisements in that area.
Network	Number of network link state advertisements in that area.
Summary Net	Number of summary link state advertisements in that area.
Summary ASBR	Number of summary autonomous system boundary router (ASBR) link state advertisements in that area.
Type-7 Ext	Type-7 LSA count.
Self-originated Type-7	Self-originated Type-7 LSA.
Opaque Link	Type-9 LSA count.
Opaque Area	Type-10 LSA count.
Subtotal	Sum of LSAs for that area.
Delete	Number of link state advertisements that are marked “Deleted” in that area.
Maxage	Number of link state advertisements that are marked “Maxaged” in that area.
Process 1 database summary	Database summary for the process.
Count	Count of LSAs of the type identified in the first column.
Router	Number of router link state advertisements in that process.
Network	Number of network link state advertisements in that process.
Summary Net	Number of summary link state advertisements in that process.
Summary ASBR	Number of summary autonomous system boundary router (ASBR) link state advertisements in that process.
Type-7 Ext	Type-7 LSA count.
Opaque Link	Type-9 LSA count.
Opaque Area	Type-10 LSA count.
Type-5 Ext	Type-5 LSA count.
Self-Originated Type-5	Self-originated Type-5 LSA count.
Opaque AS	Type-11 LSA count.
Total	Sum of LSAs for that process.

show ip ospf interface

To display Open Shortest Path First (OSPF)-related interface information, use the **show ip ospf interface** command.

show ip ospf interface [*instance-tag*] [*interface-type interface-number*] [**brief**] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
interface-type	(Optional) Interface type. If the *interface-type* argument is included, only information for the specified interface type is included. Type ? on the CLI for help on available options for this argument.
interface-number	(Optional) Interface number. If the *interface-number* argument is included, only information for the specified interface number is included. Type ? on the CLI for help on available options for this argument.
brief	(Optional) Displays brief overview information for OSPF interfaces, states, addresses, masks, and areas on the router.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf interface** command to display the OSPF status for the interface.

This command requires the Enterprise Services license.

Examples

This example shows how to display OSPF information for Ethernet interface 1/2:

```
switch# show ip ospf interface ethernet 1/2
Ethernet1/2 is up, line protocol is up
   IP address 192.0.2.1, Process ID 201 vrf default, area 10
   State UP, Network type BROADCAST, cost 65535
   Index 2, Transmit delay 1 sec, Router Priority 1
   No designated router on this network
   No backup designated router on this network
   0 Neighbors, flooding to 0, adjacent with 0
   Timer intervals: Hello 10, Dead 40, Wait 40, Retransmit 5
   Simple authentication
   Number of link LSAs: 0, checksum sum 0
```

The following table describes the significant fields shown in the display.

Table 21: show ip ospf interface Field Descriptions

Field	Description
Ethernet	Status of physical link and operational status of protocol.
IP Address	Interface IP address, subnet mask, and area address.
vrf	Virtual routing and forwarding (VRF) instance.
Transmit Delay	Transmit delay, interface state, and router priority.
designated router	Designated router ID and interface IP address.
backup designated router	Backup designated router ID and interface IP address.
Timer intervals	Configuration of timer intervals.
Hello	Number of seconds until next hello packet is sent out this interface.

show ip ospf lsa-content-changed-list

To display a list of all link-state advertisements (LSAs) with changed content, use the **show ip ospf lsa-content-changed-list** command.

show ip ospf lsa-content-changed-list *neighbor-id interface-type interface-number*

Syntax Description

neighbor id	Router ID for the neighbor.
interface-type	(Optional) Interface type. If the *interface-type* argument is included, only information for the specified interface type is included. Type ? on the CLI for help on available options for this argument.
interface-number	(Optional) Interface number. If the *interface-number* argument is included, only information for the specified interface number is included. Type ? on the CLI for help on available options for this argument.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display a list of LSAs that changed for Ethernet 2/1:

```
Router# show ip ospf lsa-content-changed-list 192.0.2.2 ethernet 2/1
```

show ip ospf memory

To display the memory usage statistics for the Open Shortest Path First (OSPF) protocol, use the **show ip ospf memory** command.

show ip ospf memory

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.
4.0(3)	This command was removed.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the memory statistics for OSPF:

```
Router# show ip ospf memory
 OSPF Process ID sd, Memory statistics
  Process memory: 2096 KB
  Byte usage:    needed 0, overhead 192, using 192 bytes
  Allocations:   current 6, created 6, failed 0, free 0
  Bitfields:     current 30, created 30, failed 0, free 0, using 248010 bytes
  Slabs:         current 2, created 2, failed 0, free 0, using 80 bytes
  Index failure: Interface 0, Neighbor 0
  Slab Memory
  OSPF vertex slab
  Alloc 1, max allocs 1, total allocs 1, total frees 0
  Total block allocs 1, total block frees 0, max blocks 1
  Bytes (size/allocated) 68/69720
  OSPF IPv4 prefix routes slab
  Alloc 0, max allocs 0, total allocs 0, total frees 0
  Total block allocs 0, total block frees 0, max blocks 0
  Bytes (size/allocated) 188/64
  OSPF router routes slab
  Alloc 0, max allocs 0, total allocs 0, total frees 0
  Total block allocs 0, total block frees 0, max blocks 0
  Bytes (size/allocated) 100/64
  OSPF IPv4 next-hops slab
  Alloc 1, max allocs 1, total allocs 1, total frees 0
  Total block allocs 1, total block frees 0, max blocks 1
  Bytes (size/allocated) 32/262232
```

show ip ospf neighbors

To display Open Shortest Path First (OSPF)-neighbor information on a per-interface basis, use the **show ip ospf neighbor** command.

show ip ospf [*instance-tag*] **neighbors** [*interface-type interface-number*] [*neighbor-id*] [**detail**] [**summary**] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
area-id	(Optional) Area number used to define the particular area. Specify as an IP address or a number from 0 to 4294967295.
interface-type	(Optional) Interface type. If the *interface-type* argument is included, only information for the specified interface type is included. Type ? on the CLI for help on available options for this argument.
interface-number	(Optional) Interface number. If the *interface-number* argument is included, only information for the specified interface number is included. Type ? on the CLI for help on available options for this argument.
neighbor-id	(Optional) Router ID of the neighbor. Specify as an IP address.
detail	(Optional) Displays all neighbors given in detail (lists all neighbors).
summary	(Optional) Displays a summary of the neighbors.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf neighbors** command to display information about all or some of the neighbors for this OSPF instance.

This command requires the Enterprise Services license.

Examples

This example shows how to display the summary information about the neighbor that matches the neighbor ID:

```
Router# show ip ospf neighbors 10.199.199.137

Neighbor 10.199.199.137, interface address 192.0.2.37
```

```
    In the area 0.0.0.0 via interface Ethernet2/1
    Neighbor priority is 1, State is FULL
    Options 2
    Dead timer due in 0:00:32
    Link State retransmission due in 0:00:04
 Neighbor 10.199.199.137, interface address 209.165.201.189
    In the area 0.0.0.0 via interface Ethernet4/3
    Neighbor priority is 5, State is FULL
    Options 2
    Dead timer due in 0:00:32
    Link State retransmission due in 0:00:03
```

This example shows how to display the neighbors that match the neighbor ID on an interface:

```
Router# show ip ospf neighbors ethernet 2/1 10.199.199.137
Neighbor 10.199.199.137, interface address 192.0.2.37
    In the area 0.0.0.0 via interface Ethernet2/1
    Neighbor priority is 1, State is FULL
    Options 2
    Dead timer due in 0:00:37
    Link State retransmission due in 0:00:04
```

This example shows how to display detailed information about OSPF neighbors:

```
Router# show ip ospf neighbors detail

Neighbor 192.168.5.2, interface address 10.225.200.28
    In the area 0 via interface GigabitEthernet1/0/0
    Neighbor priority is 1, State is FULL, 6 state changes
    DR is 10.225.200.28 BDR is 10.225.200.30
    Options is 0x42
    LLS Options is 0x1 (LR), last OOB-Resync 00:03:08 ago
    Dead timer due in 00:00:36
    Neighbor is up for 00:09:46
   Index 1/1, retransmission queue length 0, number of retransmission 1
    First 0x0(0)/0x0(0) Next 0x0(0)/0x0(0)
    Last retransmission scan length is 1, maximum is 1
    Last retransmission scan time is 0 msec, maximum is 0 msec
```

The following table describes the significant fields shown in the displays.

Table 22: show ip ospf neighbor detail Field Descriptions

Field	Description
Neighbor	Neighbor router ID.
interface address	IP address of the interface.
In the area	Area and interface through which the OSPF neighbor is known.
Neighbor priority	Router priority of the neighbor.
State	OSPF state.
state changes	Number of state changes since the neighbor was created.This value can be reset using the **clear ip ospf counters neighbor** command.
DR is	Router ID of the designated router for the interface.

Field	Description
BDR is	Router ID of the backup designated router for the interface.
Options	Hello packet options field contents. (E-bit only. Possible values are 0 and 2; 2 indicates the area is not a stub; 0 indicates the area is a stub.)
LLS Options..., last OOB-Resync	Link-Local Signaling and out-of-band (OOB) link-state database resynchronization performed hours:minutes:seconds ago (NSF information). The field indicates the last successful out-of-band resynchronization with the NSF-capable router.
Dead timer due in	Expected time before Cisco NX-OS declares the neighbor dead.
Neighbor is up for	Number of hours:minutes:seconds since the neighbor went into a two-way state.
Index	Neighbor location in the area-wide and autonomous system-wide retransmission queue.
retransmission queue length	Number of elements in the retransmission queue.
number of retransmission	Number of times that update packets have been resent during flooding.
First	First memory location of the flooding details.
Next	Next memory location of the flooding details.
Last retransmission scan length	Number of link state advertisements (LSAs) in the last retransmission packet.
maximum	Maximum number of LSAs sent in any retransmission packet.
Last retransmission scan time	Time taken to build last retransmission packet.
maximum	Maximum time taken to build any retransmission packet.

show ip ospf policy statistics area

To display Open Shortest Path First (OSPF) policy statistics for an area, use the **show ip ospf policy statistics area** command.

show ip ospf [*instance-tag*] **policy statistics area** *area id* **filter-list** {**in** | **out**} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
area *area-id*	Specifies the area number used to define the particular area. Specify as an IP address or a number from 0 to 4294967295.
filter-list	Filters prefixes between OSPF areas.
in	Displays policy statistics for incoming routes.
out	Displays policy statistics for outgoing routes.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf policy statistics area** command to display information about the filter lists applied to an area.

This command requires the Enterprise Services license.

Examples

This example shows how to display policy statistics for OSPF:

```
switch# show ip ospf policy statistics area 201
```

show ip ospf policy statistics redistribute

To display Open Shortest Path First (OSPF) policy statistics, use the **show ip ospf policy statistics redistribute** command.

show ip ospf [*instance-tag*] **policy statistics redistribute** {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **rip** *id* | **static**} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
bgp	Displays policy statistics for the Border Gateway Protocol (BGP).
direct	Displays policy statistics for directly connected routes only.
eigrp	Displays policy statistics for the Enhanced Interior Gateway Routing Protocol (EIGRP).
isis	Displays policy statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospf	Displays policy statistics for OSPF.
rip	Displays policy statistics for the Routing Information Protocol (RIP).
static	Displays policy statistics for IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **eigrp** keyword, an autonomous system number. The range is from 1 to 65535. For the **isis**. **ospf**, and **rip** keywords, an instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf policy statistics redistribute** command to display redistribution statistics.

This command requires the Enterprise Services license.

Examples

This example shows how to display policy statistics for redistributed routes:

```
switch# show ip ospf policy statistics redistribute
```

show ip ospf request-list

To display a list of all link-state advertisements (LSAs) requested by a router, use the **show ip ospf request-list** command.

show ip ospf request-list *neighbor-id interface interface-number*

Syntax Description

neighbor-id	Router ID of the neighbor. Specify as an IP address.
interface-type	Interface type. If the *interface-type* argument is included, only information for the specified interface type is included. Type ? on the CLI for help on available options for this argument.
interface-number	Interface number. If the *interface-number* argument is included, only information for the specified interface number is included. Type ? on the CLI for help on available options for this argument.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf request-list** command to troubleshoot Open Shortest Path First (OSPF) routing operations.

This command requires the Enterprise Services license.

Examples

This example shows how to display a list of all LSAs requested by a router:

```
Router# show ip ospf request-list 40.40.40 ethernet 2/1
 OSPF Process ID p1
 Neighbor 40.40.40.40, interface Ethernet2/1, address 192.0.2.1
 1 LSAs on request-list
  Type  LS ID           ADV RTR          Seq NO      Age    Checksum
    1  192.0.2.12      192.0.2.12          0x8000020D  8      0x6572
```

The following table describes the significant fields shown in the displays.

Table 23: show ip ospf request-list Field Descriptions

Field	Description
Type	LSA type.
LS ID	IP address of the neighbor router.
ADV RTR	IP address of the advertising router.
Seq NO	Packet sequence number of the LSA.

Field	Description
Age	Age, in seconds, of the LSA.
Checksum	Checksum number of the LSA.

show ip ospf retransmission-list

To display a list of all link-state advertisements (LSAs) waiting to be resent to neighbors, use the **show ip ospf retransmission-list** command.

show ip ospf retransmission-list *neighbor-id interface interface-number*

Syntax Description

neighbor-id	Router ID of the neighbor. Specify as an IP address.
interface-type	Interface type. If the *interface-type* argument is included, only information for the specified interface type is included. Type ? on the CLI for help on available options for this argument.
interface-number	Interface number. If the *interface-number* argument is included, only information for the specified interface number is included. Type ? on the CLI for help on available options for this argument.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf retransmission-list** command to troubleshoot Open Shortest Path First (OSPF) routing operations.

This command requires the Enterprise Services license.

Examples

This example shows how to display all LSAs waiting to be resent to neighbors:

```
Router# show ip ospf retransmission-list 192.0.2.11 ethernet 2/1

             OSPF Router with ID (192.0.2.12) (Process ID 1)

  Neighbor 192.0.2.11, interface Ethernet2/1 address 209.165.201.11
  Link state retransmission due in 3764 msec, Queue length 2

  Type  LS ID             ADV RTR          Seq NO      Age    Checksum
     1  192.0.2.12      192.0.2.12          0x80000210  0      0xB196
```

The following table describes the significant fields shown in the displays.

Table 24: show ip ospf retransmission-list Field Descriptions

Field	Description
Type	LSA type.
LS ID	IP address of the neighbor router.

Field	Description
ADV RTR	IP address of the advertising router.
Seq NO	Packet sequence number of the LSA.
Age	Age, in seconds, of the LSA.
Checksum	Checksum number of the LSA.

show ip ospf routes

To display the Open Shortest Path First (OSPF) topology table, use the **show ip ospf routes** command.

show ip ospf [*instance-tag*] **routes** [{*prefix* / *length* | **summary**}] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
prefix */length*	(Optional) IP prefix, which limits output to a specific route. Indicate the length as a slash (/) and number from 1 to 31. For example, /8 indicates that the first eight bits in the IP prefix are network bits.
summary	(Optional) Displays a summary of all routes.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospf routes** command to display the OSPF private routing table (which contains only routes that are calculated by OSPF). If something is wrong with a route in the routing information base (RIB), then you should check the OSPF copy of the route to determine if it matches the RIB contents. If it does not match, a synchronization problem exists between OSPF and the RIB.

This command requires the Enterprise Services license.

Examples

This example shows how to display OSPF routes:

```
RP/0/RP0/CPU0:router# show ip ospf routes
 OSPF Process ID sd vrf default, Routing Table
  (D) denotes route is directly attached      (R) denotes route is in RIB
 61.61.61.61/32 (i) area 1
     via 192.168.2.1/Ethernet2/2, cost 21
 100.100.2.0/24 (i) area 1
     via 192.168.2.1/Ethernet2/22, cost 20
 192.168.2.0/24 (i) area 1
     via directly connected
```

The following table describes the significant fields shown in the display.

Table 25: show ospf route Field Descriptions

Field	Description
61.61.61.61/32	Router ID for the router that advertised this route.
via...	Packets destined for the given prefix are sent over the listed interface or directly connected to this device.

show ip ospf statistics

To display Open Shortest Path First (OSPF) shortest path first (SPF) calculation statistics, use the **show ip ospf statistics** command.

show ip ospf [*instance-tag*] **statistics** [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string up to 20 characters.
vrf *vrf-name*	(Optional) Name of the VRF. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf statistics** command to display information about link-state advertisements (LSAs). This information can be useful for both OSPF network maintenance and troubleshooting. For example, we recommend that you use the **show ip ospf statistics** command as the first troubleshooting step for LSA flapping.

This command requires the Enterprise Services license.

Examples

This example shows how to display information about the SPF calculations:

```
Router# show ip ospf statistics
OSPF Process p1 vrf default, Event statistics (cleared 2w3d ago)
  Router ID changes: 0
  DR elections: 50
  Older LSAs received: 16
  Neighbor state changes: 82
  Neighbor dead postponed: 0
  Neighbor dead interval expirations: 2
  Neighbor bad lsreqs: 0
  Neighbor sequence number mismatches: 0
  SPF computations:  101 full, 23 summary, 23 external

         LSA Type Generated Refreshed   Flushed  Aged out
           Router         41      1678         4         3
          Network         12         2        15         1
      Summary Net         53         6       120         6
     Summary ASBR          0         0         0         0
      AS External          0         0         0         0
      Opaque Link          0         0         0         0
      Opaque Area          0         0         0         0
        Opaque AS          0         0         0         0

Following counters can not be reset:
```

```
LSA deletions: 0 pending, 14 hwm, 183 deleted, 14 revived, 27 runs
Hello queue: 0/200, hwm 2, drops 0
Flood queue: 0/100, hwm 2, drops 0
LSDB additions failed: 0

       Buffers:    in use       hwm permanent     alloc      free
     128 bytes          0         2         2    350300    350300
     512 bytes          0         2         2       114       114
    1520 bytes          0         0         0         0         0
    4500 bytes          0         1         1       355       355
          huge          0         0         0         0         0
```

The following table describes the significant fields shown in the display.

Table 26: show ip ospf statistics Field Descriptions

Field	Description
OSPF process	Unique value assigned to the OSPF instance in the configuration.
vrf	Virtual routing and forwarding (VRF) for this OSPF instance.
DR elections	Number of times that a new designated router was elected.
Neighbor...	Details about neighbors.
LSA Type	Number of each type of LSA sent.
Hello queue	Queue of hello packets to be processed: • current number in queue/maximum number allowed in queue • hwm—high water mark. The maximum number of packets ever stored in the queue. • drops—The number of packets dropped because the queue was full.
flood queue	Queue of flood packets to be processed.
buffers	Chunks of memory used to store packets.

show ip ospf summary-address

To display a list of all summary address redistribution information configured in an Open Shortest Path First (OSPF) instance, use the **show ip ospf summary-address** command.

show ip ospf [*instance-tag*] **summary-address** [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display information about summary addresses:

```
Router# show ip ospf summary-address

OSPF Process 2, Summary-address
10.2.0.0/255.255.0.0 Metric -1, Type 0, Tag 0
10.2.0.0/255.255.0.0 Metric -1, Type 0, Tag 10
```

Table 17-17 describes the significant fields shown in the displays.

Table 27: show ip ospf summary-address Field Descriptions

Field	Description
10.2.0.0/255.255.0.0	IP address and mask of the router for the OSPF process.
Metric -1	OSPF metric type.
Type 0	Type of LSA.
Tag 0	OSPF process tag identifier.

show ip ospf traffic

To display Open Shortest Path First (OSPF) traffic statistics, use the **show ip ospf traffic** command.

show ip ospf [*instance-tag*] **traffic** [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf traffic** command to display traffic statistics for one or more OSPF instances.

This command requires the Enterprise Services license.

Examples

This example shows how to display OSPF traffic statistics:

```
Router# show ip ospf traffic
 OSPF Process ID p1, vrf Red, Packet Counters (cleared 2w3d ago)
  Total: 1690 in, 349230 out
  LSU transmissions: first 100, rxmit 108, for req 16
  Flooding packets output throttled (IP/tokens): 0 (0/0)
  Ignored LSAs: 0, LSAs dropped during SPF: 0
  LSAs dropped during graceful restart: 0
  Errors: drops in        0, drops out       0, errors in       0
          errors out      0, unknown in      0, unknown out     0
          no ospf         0, bad version     0, bad crc         0
          dup rid         0, dup src         0, invalid src     0
          invalid dst     0, no nbr          0, passive         0
          wrong area      0, nbr changed rid/ip addr            0
          bad auth        0

           hellos       dbds     lsreqs       lsus       acks
   In:       1411         70         16        136         57
  Out:     348871         62          4        224         69
```

The following table describes the significant fields shown in the display.

Table 28: show ospf traffic Field Descriptions

Field	Description
OSPF Process	OSPF instance tag for these traffic statistics.

Field	Description
vrf	Virtual routing and forwarding (VRF) for this OSPF instance.
Errors	
drops	Number of packets dropped.
bad version	Number of packets received with bad version.
dup rid	Number of packets with a duplicate router-id.
dup src	Number of packets with a duplicate source address.
no nbr	Number of packets from a router that is not a full neighbor.
nbr changed rid/ip addr	Number of packets with router-id/ip address pair not matching our neighbor's values.
lsreq	Number of packets of type LSREQ (LSA required).
lsacks	Number of packets of type LSACK (LSA acknowledged).s

Related Commands

Command	Description
clear ip ospf traffic	Clears OSPF traffic statistics.

show ip ospf virtual-links

To display parameters and the current state of Open Shortest Path First (OSPF) virtual links, use the **show ip ospf virtual-links** command.

show ip ospf [*instance-tag*] **virtual-links** [**brief**] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Instance tag. Specify as an alphanumeric string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
instance-tag	(Optional) Instance tag. Use this tag to display OSPF information about a specific OSPF instance.
brief	(Optional) Displays a summary of the configured virtual links.
vrf *vrf-name*	(Optional) Name of the OSPF VRF. The *vrf-name* argument can be specified as an arbitrary string. The strings “default” and “all” are reserved *vrf-names*.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ip ospf virtual-links** command to display information about configured virtual links.

This command requires the Enterprise Services license.

Examples

This example shows how to display information about virtual links:

```
Router# show ip ospf virtual-links
Virtual link 2 to router 40.40.40.40 is up
    Process ID p1 vrf default, Transit area 1, via interface Ethernet1/2, cost 10
    Local Address 192.0.2.2, Remote Address 192.0.2.1
    Index 4, Transmit delay 1 sec
    1 Neighbors, flooding to 1, adjacent with 1
    Timer intervals: hello 10, dead 40, wait 40, retransmit 5
      Hello timer due in 00:00:04
    No authentication
    Number of link LSAs: 0, checksum sum 0
    Neighbor State is FULL, 4 state changes, last change 00:00:03
    Hello options 0x2, dbd options 0x42
    Last non-hello packet received 00:00:01
      Dead timer due in 00:00:36
```

The following table describes the significant fields shown in the display.

Table 29: show ip ospf virtual-links Field Descriptions

Field	Description
Virtual Link	OSPF neighbor and whether the link to that neighbor is up or down.
vrf	Virtual routing and forwarding (VRF) for this OSPF instance.
Transit area...	Transit area through which the virtual link is formed.
via interface...	Interface through which the virtual link is formed.
cost	Cost of reaching the OSPF neighbor through the virtual link.
Transmit delay	Transmit delay (in seconds) on the virtual link.
Timer intervals...	Various timer intervals configured for the link.
Hello timer due in 0:00:04	Time when the next hello is expected from the neighbor.

show ip policy

To display the route policy information, use the **show ip policy** command.

show ip policy [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows the policies attached to interfaces:

```
switch(config-if)# show ip policy
Interface                Route-map           Status    VRF-Name
Ethernet2/45             floor1               Inactive    --
```

Related Commands

Command	Description
ip policy	Configures a route policy on an interface.

show ip prefix-list

To display prefix lists for the Border Gateway Protocol (BGP), use the **show ip prefix-list** command.

show ip prefix-list [*name*]

Syntax Description

name	(Optional) Name of community list. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the prefix lists:

```
switch(config)# show ip prefix-list
ip prefix-list test2: 1 entries
   seq 5 permit 10.0.0.0/8
```

Related Commands

Command	Description
ip prefix-list	Configures a BGP prefix list.

show ip process

To display information about the IP process, use the **show ip process** command.

show ip process [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows details on the IP process:

```
switch(config)# show ip process
VRF default
  VRF id is 1
  Base table id is 1
  Auto discard is disabled
  Auto discard is not added
  Auto Null broadcast is configured
  Auto Punt broadcast is configured
  Static discard is not configured
  Number of static default route configured is 0
  Number of ip unreachable configured is 0
  Iodlist: 80
  Local address list:
```

Related Commands

Command	Description
show ipv6 process	Displays information about the IPv6 process.

show ip rip

To display the configuration and status of the Routing Information Protocol (RIP), use the **show ip rip** command in any mode.

show ip rip [*instance-tag*] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Selects a RIP instance.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display RIP information:

```
switch(config-if)# show ip rip
Process Name "rip-sd" vrf "default"
RIP port 520, multicast-group 224.0.0.9
Admin-distance: 40
Updates every 30 sec, expire in 180 sec
Collect garbage in 120 sec
Default-metric: 1
Max-paths: 8
Process is up and running
  Interfaces supported by ipv4 RIP :
     Ethernet1/2
```

The following table describes the significant fields shown in the display.

Table 30: show ip rip Field Descriptions

Field	Description
Process Name	RIP instance tag.
Admin-distance	Administrative distance assigned to RIP. You can configure this value using the **distance** command in router address-family configuration mode.
Updates	Timer value for RIP updates. Configure this value with the **ip rip timer basic** command in interface configuration mode.

Field	Description
expire	Timer value for expiring RIP updates. Configure this value with the **ip rip timer basic** command in interface configuration mode.
Collect garbage	Timer value for garbage collecting in the RIP route table. Configure this value with the **ip rip timer basic** command in interface configuration mode.
Default metric	Default metric value. Configure this value with the **default-metric** command in router address-family mode.
Max-paths	Number of maximum paths allowed per RIP route. Configure this value with the **max-paths** command in router address-family mode.
Process	Administrative and operational state of this RIP instance.
Interfaces supported	RIP version and list of interfaces configured for this RIP instance. Add or remove interfaces using the **ip router rip** command in interface configuration mode.

Related Commands

Command	Description
show ip rip interface	Displays RIP information for an interface.
show ip rip policy statistics	Displays RIP policy statistics.
show ip rip route	Displays RIP route information.
show ip rip statistics	Displays RIP statistics.

show ip rip interface

To display interface entry information from the Routing Information Protocol (RIP) topology table, use the **show ip rip interface** command in any mode.

show ip rip interface [*type instance*] [**vrf** *vrf-name*]

Syntax Description

interface *type slot/port*	(Optional) Specifies the interface.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

This command has no default settings.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display interface entry information from the RIP topology table:

```
switch(config-if)# show ip rip interface ethernet 1/2
Process Name "rip-sd" vrf "default"
RIP-configured interface information
GigabitEthernet1/2, protocol-down/link-down/admin-down, RIP state : down
  address/mask NotConfigured, metric 1, split-horizon
```

The following table describes the significant fields shown in the display.

Table 31: show ip rip interface Field Descriptions

Field	Description
Process Name	RIP instance tag.
vrf	Virtual routing and forwarding (VRF) of this interface.
Interface information	Interface administrative and operational state.
RIP state	RIP information for this interface.

Related Commands

Command	Description
show ip rip	Displays RIP information.

Command	Description
show ip rip policy statistics	Displays RIP policy statistics.
show ip rip route	Displays RIP route information.
show ip rip statistics	Displays RIP statistics.

show ip rip neighbor

To display the neighbor information from the Routing Information Protocol (RIP) topology table, use the command in any mode.

show ip rip neighbor [*interface-type instance*] [**vrf** *vrf-name*]

Syntax Description

interface-type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
instance	(Optional) Either a physical interface instance or a virtual interface instance.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

The following example shows how to display neighbor information from the RIP topology table:

```
switch(config-if)#
Process Name "rip-sd" vrf "default"
RIP Neighbor Information (number of neighbors = 0)
('dead' means more than 300 seconds ago)
```

The following table describes the significant fields shown in the display.

Table 32: Field Descriptions

Field	Description
Process Name	RIP instance tag.
vrf	Virtual routing and forwarding (VRF) of this interface.
Neighbor information	Number of RIP neighbors recognized on this interface.

Related Commands

Command	Description
show ip rip	Displays RIP information.
show ip rip interface	Displays RIP information for an interface.

Command	Description
show ip rip policy statistics	Displays RIP policy statistics.
show ip rip route	Displays RIP route information.
show ip rip statistics	Displays RIP statistics.

show ip rip policy statistics

To display the policy statistics for the Routing Information Protocol (RIP), use the **show ip rip policy statistics** command in any mode.

show ip rip policy statistics redistribute {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **ospfv3** *id* | **static**} [**vrf** *vrf-name*]

Syntax Description

bgp	Displays policy statistics for the Border Gateway Protocol (BGP).
direct	Displays policy statistics for directly connected routes only.
eigrp	Displays policy statistics for Enhanced Interior Gateway Routing Protocol (EIGRP).
isis	Displays policy statistics for Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospf	Displays policy statistics for Open Shortest Path First (OSPF) protocol.
ospfv3	Displays policy statistics for Open Shortest Path First version 3 (OSPFv3) protocol.
static	Displays policy statistics for IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **eigrp** keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **isis** keyword, an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **ospf** keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display policy statistics for EIGRP:

```
switch# show ip rip policy statistics redistribute eigrp 201
```

Related Commands

Command	Description
clear ip rip policy statistics	Clears policy statistics for RIP.
show ip rip	Displays RIP information.
show ip rip interface	Displays RIP information for an interface.
show ip rip route	Displays RIP route information.
show ip rip statistics	Displays RIP statistics.

show ip rip route

To display route information from the Routing Information Protocol (RIP) topology table, use the **show ip rip route** command in any mode.

show ip rip route [*prefix/length*] [**summary**] [**vrf** *vrf-name*]

Syntax Description

prefix/length	(Optional) IP or IPv6 prefix about which routing information should be displayed.
summary	(Optional) Displays information about summary routes.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

The following is sample output from the **show ip rip route** command:

```
:switch# show ip rip route
```

Related Commands

Command	Description
show ip rip	Displays RIP information.
show ip rip interface	Displays RIP information for an interface.
show ip rip policy statistics	Displays policy statistics for RIP.
show ip rip statistics	Displays RIP statistics.

show ip rip statistics

To display statistical entry information from the Routing Information Protocol (RIP) topology table, use the **show ip rip statistics** command in any mode.

show ip rip statistics [*interface-type instance*] [**vrf** *vrf-name*]

Syntax Description

interface-type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
instance	(Optional) Either a physical interface instance or a virtual interface instance.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example is sample output from the **show ip rip statistics** command:

```
switch# show ip rip statistics
Global update stats:
   Sent Multicast Updates: periodic 0,triggered 0
   Sent Multicast Requests: 0
   Sent Unicast Updates: 544
   Sent Unicast Requests: 544
   Recv Multicast Updates: 0
   Recv Multicast Requests: 0
   Recv Unicast Updates: 500
   Recv Unicast Requests: 544
   Recv Bad Pkts: 0
   Recv Bad Routes: 0
```

The following table describes the significant fields shown in the display.

Table 33: show rip statistics Field Descriptions

Field	Description
Sent Multicast Updates:	Number of RIP multicast updates sent.
Sent Multicast Requests:	Number of RIP multicast requests sent.
Sent Unicast Updates:	Number of RIP unicast updates sent.

Field	Description
Sent Unicast Requests:	Number of RIP unicast requests sent.
Recv Multicast Updates:	Number of RIP multicast updates received.
Recv Multicast Requests:	Number of RIP multicast requests received.
Recv Unicast Updates:	Number of RIP unicast updates received.
Recv Unicast Requests:	Number of RIP unicast requests received.
Recv Bad Pkts:	Number of bad RIP packets received.
Recv Bad Routes:	Number of bad RIP routes received.

Related Commands

Command	Description
show ip rip	Displays RIP information.
show ip rip interface	Displays RIP information for an interface.
show ip rip policy statistics	Displays policy statistics for RIP.
show ip rip route	Displays RIP route information.

show ip route

To display routes from the unicast RIB, use the **show ip route** command.

show ip route [{**all***addrhostnameprefixroute-type* | **interface** *type number* | **next-hop** *addr*}] [**vrf** *vrf-name*]

Syntax Description

all	(Optional) Displays all routes.
addr	(Optional) IPv4 address. The format is x.x.x.x.
hostname	(Optional) Host name. The *name* can be any case-sensitive, alphanumeric string up to 80 characters.
prefix	(Optional) IPv4 prefix. The format is x.x.x.x/length. The length range is from 1 to 32.
route-type	(Optional) Type of route. Use **?** to see the list of types.
interface *type number*	(Optional) Displays the routes for an interface. Use **?** to see the supported interfaces.
next-hop *addr*	(Optional) Displays routes with this next-hop address. The format is x.x.x.x.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(3)	This command was introduced.
4.1(2)	Added *hostname* argument.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the route table:

```
switch(config)# show ip route all
IP Route Table for VRF "default"
'*' denotes best ucast next-hop       '**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
0.0.0.0/32, 1 ucast next-hops, 0 mcast next-hops
   *via Null0, [220/0], 00:45:24, local, discard
255.255.255.255/32, 1 ucast next-hops, 0 mcast next-hops
   *via sup-eth1, [0/0], 00:45:24, local
```

Related Commands

Command	Description
clear ip route	Clears entries in the route table.

show ip static-route

To display static routes from the unicast RIB, use the **show ip static-route** command.

show ip static-route [**vrf** {*vrf-name* | **all**}]

Syntax Description

vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.
all	(Optional) Specifies all virtual router contexts (VRF) name.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.
4.2(1)	Added **all** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the static routes:

```
switch(config)# show ip static-route
IPv4 Unicast Static Routes:
Total number of routes: 0, unresolved: 0
```

Related Commands

Command	Description
ip route	Configures a static route.

show ip static-route track-table

To display information on the IPv4 or IPv6 static-route track table, use the show ip static-route track-table command.

show {**ipv4** | **ipv6**} **static-route track-table**

Syntax Description

This command does not have any arguments or keywords.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display information about the IPv4 or IPv6 static-route track table:

```
switch# show ip static-route track-table
Static-route for VRF "default"(1)
IPv4 Unicast Static Routes:
  0.0.0.0/0, configured nh: 0.0.0.0/32 Null0
    (installed in urib)
    rnh(not installed in urib)
switch(config)#
```

Related Commands

Command	Description
ip route track	Configures a static route associated with the track object.

show ip traffic

To display IP traffic information, use the **show ip traffic** command.

show ip traffic

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the IP traffic information:

```
switch(config)# show ip traffic
IP Software Processed Traffic Statistics
----------------------------------------
Transmission and reception:
  Packets received: 14121, sent: 3415, consumed: 0,
  Forwarded, unicast: 0, multicast: 0, Label: 0
Opts:
  end: 0, nop: 0, basic security: 0, loose source route: 0
  timestamp: 0, extended security: 0, record route: 0
  stream ID: 0, strict source route: 0, alert: 45, cipso: 0, ump: 0
  other: 0
Errors:
  Bad checksum: 0, packet too small: 0, bad version: 0,
  Bad header length: 0, bad packet length: 0, bad destination: 0,
  Bad ttl: 0, could not forward: 126, no buffer dropped: 0,
  Bad encapsulation: 0, no route: 0, non-existent protocol: 0
Fragmentation/reassembly:
  Fragments received: 0, fragments sent: 0, fragments created: 0,
  Fragments dropped: 0, packets with DF: 0, packets reassembled: 0,
  Fragments timed out: 0
ICMP Software Processed Traffic Statistics
------------------------------------------
Transmission:
  Redirect: 0, unreachable: 0, echo request: 0, echo reply: 1,
  Mask request: 0, mask reply: 0, info request: 0, info reply: 0,
  Parameter problem: 0, source quench: 0, timestamp: 0,
  Timestamp response: 0, time exceeded: 0,
  Irdp solicitation: 0, irdp advertisement: 0
Reception:
  Redirect: 0, unreachable: 337, echo request: 1, echo reply: 0,
  Mask request: 0, mask reply: 0, info request: 0, info reply: 0,
  Parameter problem: 0, source quench: 0, timestamp: 0,
  Timestamp response: 0, time exceeded: 0,
  Irdp solicitation: 0, irdp advertisement: 0,
```

```
  Format error: 0, checksum error: 0
Statistics last reset: never
```

Related Commands

Command	Description
show ip process	Displays information about the IP process.

show ip wccp

To display global statistics that are related to the Web Cache Communication Protocol (WCCP), use the **show ip wccp** command.

show ip wccp [**vrf** *vrf-name*] [{*service-number* | **web-cache**}] [{**detail** | **mask** | **service** | **view**}]

Syntax Description

vrf *vrf-name*	(Optional) Specifies the VRF in which the service group needs to be created. If no VRF is specified, then the service number is created in the default global VRF. The *vrf-name* can be any case-sensitive, alphanumeric string up to 32 characters.
service-number	(Optional) Dynamic service identifier. The *service-number* range is from 1 to 255.
web-cache	(Optional) Displays information about the web-cache well-known service.
detail	(Optional) Displays information about the device and all web caches.
mask	(Optional) Displays information about the WCCP mask.
service	(Optional) Displays information about the WCCP service.
view	(Optional) Displays information about the members of a service group that have or have not been detected.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.2(0) to 6.1(0)	Changed the command output.
4.2(1)	This command was introduced.

Usage Guidelines

Use the **show ip wccp** *service-number* command to provide the Total Packets Redirected count. The Total Packets Redirected count is the number of flows, or sessions, that are redirected.

Use the **show ip wccp** *service-number* **detail** command to provide the Packets Redirected count. The Packets Redirected count is the number of flows, or sessions, that are redirected.

This command does not require a license.

Examples

This example shows how to display the WCCP information:

```
switch# show ip wccp
Global WCCP information:
    Router information:
        Router Identifier:                   10.10.12.10
        Protocol Version:                    2.0
    Service Identifier: 61
        Number of Service Group Clients:     1
```

```
        Number of Service Group Routers:      1
        Service mode:                         Open
        Service Access-list:                  -none-
        Redirect Access-list:                 -none-
    Service Identifier: 62
        Number of Service Group Clients:      1
        Number of Service Group Routers:      1
        Service mode:                         Open
        Service Access-list:                  -none-
        Redirect Access-list:                 -none-
switch#
```

The following table describes the significant fields shown in the display.

Table 34: show ip wccp Field Descriptions

Field	Description
Service Identifier	Service that is detailed.
Number of Service Group Clients	Number of clients in the service group.
Number of Service Group Routers	Number of routers in the service group.
Service mode	WCCP service mode. Options are open or closed.
Service Access-list	Named IP access list that defines the packets that match the service.
Redirect Access-list	Name of the access list that determines which packets are redirected.

This example shows how to display the WCCP group member details for service 10:

```
switch(config)# show ip wccp 10 view
WCCP Router Informed of:
 10.168.88.10
 10.168.88.20
WCCP Cache Engines Visible
 10.168.88.11
 10.168.88.12
WCCP Cache Engines Not Visible:
 -none-
```

If any cache engine is displayed under the WCCP Cache Engines Not Visible field, the router needs to be reconfigured to map the cache engine that is not visible to it.

The following table describes the significant fields shown in the display.

Table 35: show ip wccp view Field Descriptions

Field	Description
WCCP Router Informed of	List of routers detected by the current router.
WCCP Clients Visible	List of clients that is visible to the router and other clients in the service group.
WCCP Clients Not Visible	List of clients in the service group that is not visible to the router and other clients in the service group.

This example shows how to display the WCCP client information and WCCP router statistics that include the type of services:

```
switch(config)# show ip wccp 91 detail
WCCP Client information:
    WCCP Client ID:          10.1.1.1
    Protocol Version:        2.0
    State:                   Usable (Usable)
    Redirection:             L2
    Packet Return:           L2
    Packets Redirected:      0
    Connect Time:            00:01:15
    Assignment:              MASK
    Bypassed Packets:        0
    Mask  SrcAddr    DstAddr    SrcPort DstPort
    ----  -------    -------    ------- -------
    0001: 0x00000001 0x00000000 0x0000  0x0000
    Value SrcAddr    DstAddr    SrcPort DstPort CE-IP
    ----- -------    -------    ------- ------- -----
    0001: 0x00000000 0x00000000 0x0000  0x0000   0x0a010101 (10.1.1.1)
    0002: 0x00000001 0x00000000 0x0000  0x0000   0x0a010101 (10.1.1.1)
```

The following table describes the significant fields shown in the display.

Table 36: show ip wccp detail Field Descriptions

Field	Description
WCCP Router information	Header for the area that contains fields for the IP address and version of WCCP associated with the router connected to the cache engine in the service group.
IP Address	IP address of the router connected to the cache engine in the service group.
WCCP Client Information	Header for the area that contains fields for information on clients.
IP Address	IP address of the cache engine in the service group.
State	Whether the cache engine is operating properly and can be contacted by a router and other cache engines in the service group.
Packets Redirected	Number of packets that are redirected to the cache engine.
Connect Time	Amount of time that the cache engine is connected to the router.
Bypassed Packets	Number of packets that-are bypassed.

Related Commands

Command	Description
clear ip wccp	Clears the counter for packets redirected by WCCP.
ip wccp	Enables WCCP on a router and specifies the type of services to be used.
show ip interface	Lists a summary of the IP information and status of an interface.

show ipv6 adjacency

To display adjacency information, use the **show ipv6 adjacency** command.

show ipv6 adjacency [{*ipv6-addrinterface*}] [**detail**] [**non-best**] [**statistics**] [**summary**] [**vrf** *vrf-name*]

Syntax Description

ipv6-addr	(Optional) An IPv6 source address. The format is A:B::C:D
interface	(Optional) An interface. Use *?* to determine the supported interface types.
detail	(Optional) Displays detailed adjacency information.
non-best	(Optional) Displays the best adjacency entries and the alternate adjacency entries.
statistics	(Optional) Displays adjacency statistics.
summary	(Optional) Displays a summary of the adjacency information.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
6.1	Modified the command output.
4.2(1)	Added **non-best** and **summary** keywords.
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display IPv6 adjacency table information:

```
switch(config)# show ipv6 adjacency
Flags: # - Adjacencies Throttled for Glean
G - Adjacencies of vPC peer with G/W bit
IPv6 Adjacency Table for VRF default
Total number of entries: 1
Address Age MAC Address Pref Source Interface
10::20 07:52:52 0018.bad8.457e 50 icmpv6 Vlan100 G
```

This example shows how to display a summary of the adjacency information:

```
switch# show ipv6 adjacency summary
IPv6 Adjacency Table for VRF default
Total number of entries: 0
Address         Age       MAC Address     Pref Source     Interface
```

Related Commands

Command	Description
show forwarding adjacency	Displays forwarding adjacency information.

show ipv6 bgp

To display entries in the Border Gateway Protocol (BGP) table, use the **show ipv6 bgp** command.

show iv6p bgp [{*ipv6-addr* | *ipv6-prefix* [**longer-prefixes**]}] [**received-paths**] [**regexp** *expression*] [**route-map** *map-name*] [**summary**] [**vrf** *vrf-name*]

Syntax Description

ipv6-addr	(Optional)A network from the BGP route table. The format is A:B::C:D.
ipv6-prefix	(Optional) A prefix from the BGP route table. The format isA:B::C:D/length.
longer-prefixes	(Optional) Displays the prefix and any more specific routes.
received-paths	(Optional) Displays paths stored for soft reconfiguration.
regexp *expression*	(Optional) Display information that matches the regular expression.
route-map *map-name*	(Optional) Displays routes that match the route map. The map name can be any case-sensitive, alphanumeric string up to 63 characters.
summary	(Optional) Displays the summary of the routes.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP route table:

```
switch(config-router)# show ipv6 bgp
BGP routing table information for VRF default, address family IPv6 Unicast
```

Related Commands

Command	Description
clear bgp	Clears entries in the BGP route table.

show ipv6 bgp community

To display Border Gateway Protocol (MP-BGP) routes that match a community, use the **show ipv6 bgp community** command.

show iv6 bgp community [*as-number*] [**internet**] [**no-advertise**] [**no-export**] [**no-export-subconfed**] [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

as-number	AS number. The AS number can be a 16-bit integer or a 32-bit integer in the form of <higher 16-bit decimal number>.<lower 16-bit decimal number>.
internet	(Optional) Displays the internet community.
no-advertise	(Optional) Displays the no-advertise community.
no-export	(Optional) Displays the no-export community.
no-export-subconfed	(Optional) Displays the no-export-subconfed community.
exact-match	(Optional) Displays an exact match of the community.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community:

```
switch(config)# show ipv6 bgp community
```

Related Commands

Command	Description
ip community-list	Creates a community list.

show ipv6 bgp community-list

To display Border Gateway Protocol (BGP) routes that match a community list, use the **show ipv6 bgp community-list** command.

show ipv6 bgp [**community-list** *commlist-name* [**exact-match**]] [**vrf** *vrf-name*]

Syntax Description

community-list *commlist-name*	Display routes matching the community-list. The commlist-name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the communities.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community list:

```
switch(config)# show ipv6 bgp community-list test1
```

Related Commands

Command	Description
ip community-list	Creates a community list.

show ipv6 bgp dampening

To display Border Gateway Protocol (BGP) dampening information, use the **show ipv6 bgp dampening** command.

show ipv6 bgp dampening {**dampened-paths** [**regexp** *expression*] | **flap-statistics** | **history-paths** [**regexp expression**] | **parameters**} [**vrf** *vrf-name*]

Syntax Description

dampened-paths	Display all dampened paths.
regexp *expression*	(Optional) Display information that matches the regular expression.
flap-statistics	Displays flap statistics for routes.
history-paths	Displays all history paths.
parameters	Displays all dampening parameters.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display dampening information:

```
switch(config)# show ipv6 bgp dampening dampened-paths
```

Related Commands

Command	Description
show ip bgp dampening	Displays BGP dampening information.

show ipv6 bgp extcommunity-list

To display Border Gateway Protocol (BGP) routes that match an extended community list, use the **show ipv6 bgp extcommunity-list** command.

show ipv6 bgp extcommunity-list commlist-name [**exact-match**] [**vrf vrf-name**]

Syntax Description

commlist-name	Name of an extended community-list. The *commlist-name* can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the extended communities.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community list:

```
switch(
config
)#
show ipv6 bgp extcommunity-list test1
```

Related Commands

Command	Description
ip extcommunity-list	Creates an extended community list.

show ipv6 bgp filter-list

To display Border Gateway Protocol (BGP) routes that match a filter list, use the **show ipv6 bgp filter-list** command.

show ipv6 bgp filter-list list-name [**exact-match**] [**vrf vrf-name**]

Syntax Description

list-name	Name of a filter-list. The commlist-name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the filter.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a filter list:

```
switch(
config
)#
show ipv6 bgp filter-list test1
```

Related Commands

Command	Description
show ip bgp filter-list	Displays BGP routes that match a filter list.

show ipv6 bgp flap-statistics

To display Border Gateway Protocol (BGP) flap statistics, use the **show ipv6 bgp flap-statistics** command.

show ipv6 bgp flap-statistics [*prefix*] [**vrf vrf-name**]

Syntax Description

prefix	(Optional) IPv6 prefix. The format is A:B::C:D/length.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the flap statistics:

```
switch(config)# show ipv6 bgp flap-statistics
```

Related Commands

Command	Description
show ip bgp	Displays BGP information.

show ipv6 bgp history-paths

To display Border Gateway Protocol (BGP) history paths, use the **show ipv6 bgp history-paths** command.

show ipv6 bgp history-paths [**regexp** *expression*] [**vrf** *vrf-name*]

Syntax Description

regexp *expression*	(Optional) Display information that matches the regular expression.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display BGP history path information:

```
switch(config)# show ipv6 bgp history-paths
```

Related Commands

Command	Description
show ip bgp history-paths	Displays BGP history paths information.

show ipv6 bgp neighbors

To display Border Gateway Protocol (BGP) neighbors, use the **show ipv6 bgp neighbors** command.

show ipv6 bgp neighbors [{*addr* [{**advertised-routes** | **flap-statistics** | **paths** | **received-routes** | **routes** [{**advertised** | **dampened** | **received**}]}] | **prefix**}] [**vrf** {**all** | **vrf-name**}]

Syntax Description

vrf-name	IPv6 address. The format is A:B::C:D.
advertised-routes	(Optional) Displays all the routes advertised to this neighbor.
flap-statistics	(Optional) Displays flap statistics for the routes received from this neighbor.
paths	(Optional) Displays AS paths learned from this neighbor.
received-routes	(Optional) Displays all the routes received from this neighbor.
routes	(Optional) Displays the routes received or advertised to or from this neighbor.
advertised	(Optional) Displays all the routes advertised for this neighbor.
dampened	(Optional) Displays all dampened routes received from this neighbor.
received	(Optional) Displays all the routes received from this neighbor.
prefix	(Optional) IPv6 prefix. The format is A:B::C:D/length.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.
all	(Optional) Specifies all VRFS.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Added **paths** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP neighbors:

```
switch(config)# show ipv6 bgp neighbors
```

Related Commands

Command	Description
show ip bgp neighbors	Displays BGP information.

show ipv6 bgp nexthop

To display Border Gateway Protocol (BGP) next hop information, use the **show ipv6 bgp nexthop** command.

show ipv6 bgp nexthop *addr* [**vrf** *vrf-name*]

Syntax Description

addr	IPv4 address. The format is A:B::C:D.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP next-hop information:

```
switch(config)# show ipv6 bgp nexthop 2001:0DB8::1
```

Related Commands

Command	Description
show ip bgp nexthop	Displays BGP information.

show ipv6 bgp nexthop-database

To display Border Gateway Protocol (BGP) next-hop database, use the **show ipv6 bgp nexthop-database** command.

show ipv6 bgp nexthop-database [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the BGP next-hop database:

```
switch(config)# show ipv6 bgp nexthop-database
```

Related Commands

Command	Description
show ip bgp nexthop-database	Displays BGP information.

show ipv6 bgp prefix-list

To display Border Gateway Protocol (BGP) routes that match a prefix list, use the **show ipv6 bgp prefix-list** command.

show ipv6 bgp prefix-list *list-name* [**exact-match**] [**vrf**]

Syntax Description

list-name	Name of a prefix list. The commlist-name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the filter.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a prefix list:

```
switch(config)# show ipv6 bgp prefix-list test1
```

Related Commands

Command	Description
show ip bgp prefix-list	Displays BGP routes that match a prefix list.

show ipv6 client

To display information about the internal IPv6 clients, use the **show ipv6 client** command.

show ipv6 client [*name*]

Syntax Description

name	(Optional) Name of client.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the IPv6 client information for ICMPv6:

```
switch(config-if)# show ipv6 client icmpv6
IPv6 Registered Client Status
Client: icmpv6, status: up, pid: 3688, extended pid: 3688
  Protocol: 58, pib-index: 2, routing context id: 255
  Control mts SAP: 1551
  Data mts SAP: 1552
  IPC messages to control mq: 3
  IPC messages to data mq: 0
```

Related Commands

Command	Description
show ipv6 process	Displays information about the IPv6 process.

show ipv6 eigrp

To display a summary of the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 processes, use the **show ipv6 eigrp** command.

show ipv6 eigrp [*instance-tag*]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display all the EIGRP for IPv6 instances:

```
switch# show ipv6 eigrp
IP-EIGRP AS 0 ID 0.0.0.0 VRF default
  Process-tag: Test1
  Status: shutdown
  Authentication mode: none
  Authentication key-chain: none
  Metric weights: K1=1 K2=0 K3=1 K4=0 K5=0
  IP proto: 88 Multicast group: ff02::000a
  Int distance: 90 Ext distance: 170
  Max paths: 8
  Number of EIGRP interfaces: 0 (0 loopbacks)
  Number of EIGRP peers: 0
```

show ipv6 eigrp accounting

To display prefix accounting information for the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 processes, use the **show ipv6 eigrp accounting** command.

show ipv6 eigrp [*instance-tag*] **accounting** [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. This option is available when a virtual routing and forwarding (VRF) instance is not specified. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the EIGRP accounting information:

```
switch# show ipv6 eigrp accounting
IPv6-EIGRP accounting for AS(100)/ID(192.0.2.1) vrf RED
Total Prefix Count: 4
States: A-Adjacency, P-Pending, D-Down
State Address/Source   Interface        Prefix   Restart  Restart/
                                        Count     Count   Reset(s)
 P    Redistributed     ----               0           3         211
 A    2001:0DB8::2       e2/1              2           0          84
 P    2001:0DB8::3       e3/3              0           2         114
 D    2001:0DB8::4       e4/1              0           3           0
```

Table 17-4 describes the significant fields shown in the display.

Table 37: show ipv6 eigrp accounting Field Descriptions

Field	Description
IPv6-EIGRP accounting for AS...	EIGRP instance, AS number, router ID, and table ID.
Total Prefix Count:	Aggregate sum of the prefixes in an EIGRP instance topology table. The count includes prefixes learned from all neighbors or from redistribution.

Field	Description
States: A-Adjacency, P-Pending, D-Down	A-Adjacency—Indicates a stable adjacency with the neighbor or a normal redistribution state. P-Pending—Neighbor adjacency or redistribution is suspended or in a penalized state because the maximum prefix limit was exceeded. D-Down—Neighbor adjacency or redistribution is suspended permanently until a manual reset is performed with the **clear route** command.
Address/Source	Peer IP address of the redistribution source.
Prefix Count	Total number of learned prefixes by source. **Note** Routes can be learned for the same prefix from multiple sources, and the sum of all prefix counts in this column may be greater than the figure displayed in the “Prefix Count” field.
Restart Count	Number of times that a route source exceeded the maximum prefix limit.
Restart Reset(s)	Time, in seconds, that a route source is in a P (penalized) state. If the route source is in an A (stable or normal) state, the displayed time, in seconds, is the time period until penalization history is reset.

show ipv6 eigrp interfaces

To display information about interfaces configured for the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6, use the **show ipv6 eigrp interfaces** command.

show ipv6 eigrp [*instance-tag*] **interfaces** [*type instance*] [**brief**] [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
vrf *	(Optional) Specifies all VRF instances.
type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
instance	(Optional) Either a physical interface instance or a virtual interface instance. Specifying *instance* removes all entries learned through this interface from the neighbor table. For more information, use the question mark (**?**) online help function.
brief	(Optional) Displays a brief summary of EIGRP interface information.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

This command shows all interfaces for the default VRF if no VRF or interface is specified.

Command Modes

Any

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **show ipv6 eigrp interfaces** command to determine on which interfaces EIGRP is active and to learn information about EIGRP related to those interfaces.

If you specify an interface, only that interface is displayed. Otherwise, all interfaces on which EIGRP is running are displayed.

If you specify an autonomous system, only the routing process for the specified autonomous system is displayed. Otherwise, all EIGRP processes are displayed.

This command requires the Enterprise Services license.

Examples

This example shows how to display information about EIGRP interfaces:

```
switch# show ipv6 eigrp interfaces brief
IPv6 EIGRP interfaces for process 1 vrf default
                          Xmit Queue    Mean   Pacing Time   Multicast   Pending
Interface        Peers    Un/Reliable   SRTT   Un/Reliable   Flow Timer  Routes
e2/2               0        0/0          0      11/434          0          0
```

```
e2/20              1        0/0        337       0/10           0           0
e4/2               1        0/0         10       1/63         103           0
e3/2               1        0/0        330       0/16           0           0
switch#
```

Table 17-5 describes the significant fields shown in the display.

Table 38: show ip eigrp interfaces Field Descriptions

Field	Description
Interface	Interface over which EIGRP is configured.
Peers	Number of directly connected EIGRP neighbors.
Xmit Queue Un/Reliable	Number of packets remaining in the unreliable and reliable transmit queues.
Mean SRTT	Mean smoothed round-trip time (SRTT) internal (in milliseconds).
Pacing Time Un/Reliable	Pacing time used to determine when EIGRP packets should be sent out the interface (unreliable and reliable packets).
Multicast Flow Timer	Maximum number of seconds in which the router sends multicast EIGRP packets.
Pending Routes	Number of routes in the packets in the transmit queue waiting to be sent.

Related Commands

Command	Description
show ipv6 eigrp neighbors	Displays the neighbors discovered by EIGRP.

show ipv6 eigrp neighbors

To display information about neighbors discovered by the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6, use the **show ipv6 eigrp neighbors** command.

show ipv6 eigrp [*instance-tag*] **neighbors** [**detail**] [*interface-type interface-instance*] [**static**] [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
vrf *	(Optional) Specifies all VRF instances.
detail	(Optional) Displays detailed EIGRP neighbor information.
interface-type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-instance	(Optional) Either a physical interface instance or a virtual interface instance. Specifying *instance* removes all entries learned through this interface from the neighbor table. For more information about the syntax for the router, use the question mark (**?**) online help function.
static	(Optional) Displays static EIGRP interface information.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

This command displays all neighbors for the default VRF on all interfaces if no VRF or interface is specified.

Command Modes

Any

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **show ipv6 eigrp neighbors** command to determine when neighbors become active and inactive. This command is also useful for debugging certain types of transport problems.

This command requires the Enterprise Services license.

Examples

This example shows how to display information about EIGRP neighbors:

```
switch# show ipv6 eigrp neighbors
IPv6-EIGRP Neighbors for process 77 vrf default
Address                 Interface     Holdtime Uptime   Q      Seq  SRTT  RTO
                                      (secs)   (h:m:s)  Count  Num  (ms)  (ms)
```

```
2001:0DB8::28                  e1/3          13        0:00:41  0       11    4     20

2001:0DB8:2                   e4/4          14        0:02:01  0       10    12    24
switch#
```

Table 17-6 describes the significant fields shown in the display.

Table 39: show ip eigrp neighbors Field Descriptions

Field	Description
process	Autonomous system number specified in the router configuration command.
vrf	VRF name.
Address	IPv6 address of the EIGRP peer.
Interface	Interface on which the router is receiving hello packets from the peer.
Holdtime	Length of time (in seconds) that the Cisco NX-OS oftware waits to hear from the peer before declaring that the peer is down.
Uptime	Elapsed time (in hours, minutes, and seconds) since the local router first heard from this neighbor.
Q Count	Number of EIGRP packets (update, query, and reply) that the software waits to send.
Seq Num	Sequence number of the last update, query, or reply packet that was received from this neighbor.
SRTT	Smoothed round-trip time. This field indicates the number of milliseconds required for an EIGRP packet to be sent to this neighbor and for the local router to receive an acknowledgment of that packet.
RTO	Retransmission timeout (in milliseconds). This field indicates the amount of time that the software waits before resending a packet from the retransmission queue to a neighbor.

This example shows how to display detailed information about EIGRP neighbors:

```
switch# show ipv6 eigrp neighbors detail

IPv6-EIGRP neighbors for AS 1 vrf default
H   Address                 Interface       Hold Uptime   SRTT   RTO  Q  Seq
                                            (sec)         (ms)       Cnt Num
0   2001:0DB9::10           e1/5             14 01:00:52    3    200   0  10
   Version 12.4/1.2, Retrans: 0, Retries: 0, Prefixes: 3
switch#
```

Table 17-7 describes the significant fields shown in the display.

Table 40: show ip eigrp neighbors detail Field Descriptions

Field	Description
Version	Version of EIGRP software running on the node and neighbor.
Retrans:	Number of retransmissions sent to this neighbor.
Retries:	Number of retransmissions sent to this neighbor since the last acknowledgment (ACK).

Field	Description
Prefixes	Number of prefixes learned from this neighbor.

Related Commands

Command	Description
clear ipv6 eigrp neighbors	Clears neighbors for EIGRP.

show ipv6 eigrp route-map statistics

To display the route redistribution statistics for the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6, use the **show ipv6 eigrp route-map statistics** command in any mode.

show ipv6 eigrp [*instance-tag*] **route-map statistics redistribute** {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospfv3** *id* | **rip** *id* | **static**} [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
vrf *	(Optional) Specifies all VRF instances.
bgp	Displays the policy statistics for the Border Gateway Protocol (BGP).
direct	Displays the policy statistics for directly connected routes only.
eigrp	Displays the policy statistics for EIGRP.
isis	Displays the policy statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospfv3	Displays the policy statistics for the Open Shortest Path First (OSPF) version 3 protocol.
rip	Displays the policy statistics for the Routing Information Protocol (RIP).
static	Displays the policy statistics for IP static routes.
id	For the **bgp** keyword, the *id* is an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **eigrp** keyword, the *id* is an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **isis** keyword, the *id* is an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **ospf** keyword, the *id* is an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display route-map statistics for EIGRP:

```
switch(config)# show ipv6 eigrp route-map statistics redistribute direct
C: No. of comparisons, M: No. of matches

route-map rmap1 permit 1

Total accept count for policy: 10
Total reject count for policy: 0
```

Related Commands

Command	Description
clear ipv6 eigrp route-map statistics	Clears route-map statistics for EIGRP.
show ipv6 eigrp traffic	Displays EIGRP traffic statistics.

show ipv6 eigrp topology

To display the Enhanced Interior Gateway Routing Protocol (EIGRP) for an IPv6 topology table, use the **show ipv6 eigrp topology** command.

show ipv6 eigrp [*instance-tag*] **topology** [*ipv6-address/length*] [{**active** | **all-links** | **detail-links** | **pending** | **summary** | **zero-successors**}] [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
ipv6-address/length	(Optional) IP address in A:B::C:D format with a network mask indicated as a slash (/) and number. The length range is from 1 to 128.
active	(Optional) Displays only active entries in the EIGRP topology table.
all-links	(Optional) Displays all entries in the EIGRP topology table.
detail-links	(Optional) Displays detailed information for all entries in the EIGRP topology table.
pending	(Optional) Displays all entries in the EIGRP topology table that are waiting for an update from a neighbor or are waiting to reply to a neighbor.
summary	(Optional) Displays a summary of the EIGRP topology table.
zero-successors	(Optional) Displays available routes in the EIGRP topology table.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

This command displays information for the default VRF if no VRF is specified.

Command Modes

Any

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **show ipv6 eigrp topology** command to determine Diffusing Update Algorithm (DUAL) states and to debug possible DUAL problems.

When you use the show ipv6 eigrp topology command without any keywords or arguments, Cisco NX-OS displays only routes that are feasible successors.

This command requires the Enterprise Services license.

Examples

This example shows how to display the EIGRP topology table. The EIGRP metrics for specified internal routes and external routes are displayed.

```
switch# show ipv6 eigrp topology 2001:0DB8::/24
IP-EIGRP (AS 1): Topology entry for 2001:0DB8::/24
  State is Passive, Query origin flag is 1, 1 Successor(s), FD is 281600
  Routing Descriptor Blocks:
   2001:0DB8::10 (Ethernet 2/1), from 2001:0DB8::1, Send flag is 0x0
    Composite metric is (409600/128256), Route is External
    Vector metric:
      Minimum bandwidth is 10000 Kbit
      Total delay is 6000 microseconds
      Reliability is 255/255
      Load is 1/255
      Minimum MTU is 1500
      Hop count is 1
    External data:
      Originating router is 192.0.2.1
      AS number of route is 0
      External protocol is Connected, external metric is 0
      Administrator tag is 0 (0x00000000)
switch#
```

Table 17-8 describes the significant fields shown in the display.

Table 41: show ip eigrp topology Field Descriptions

Field	Description
Query origin	Query origin state.
Successors	Number of feasible successors for this prefix.
FD	Feasible distance for this prefix.
2001:0DB8::10 (Ethernet 2/1)	Next hop and interface from which this path was learned.
from 2001:0DB8::1	Information source for this path.
Send flag	Status of whether the sending of this prefix is pending to this neighbor.
Composite metric is...	The first number is the EIGRP metric that represents the cost to the destination. The second number is the EIGRP metric that this peer advertised.
Route is	Type of route (internal or external).
Vector Metric	Metric (bandwidth, delay, reliability, load, MTU, and hop count) advertised by the neighbor.
External Data	External information (originating router ID, AS number, external protocol, metric, and tag) advertised by the neighbor.

show ipv6 eigrp traffic

To display the number of Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 packets sent and received, use the **show ipv6 eigrp traffic** command.

show ipv6 eigrp [*instance-tag*] **traffic** [**vrf** {*vrf-name* | *****}]

Syntax Description

instance-tag	(Optional) Name of the EIGRP instance. The instance tag can be any case-sensitive, alphanumeric string up to 63 characters.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.
vrf *	(Optional) Specifies all VRF instances.

Command Default

This command displays information for the default VRF if no VRF is specified.

Command Modes

Any

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **show ipv6 eigrp traffic** command to find the number of packets sent and received by this EIGRP instance.

In addition, this command is useful in determining whether packets from one node are not reaching the neighboring node due to connectivity or configuration problems.

This command requires the Enterprise Services license.

Examples

This example shows how to display the EIGRP traffic statistics:

```
switch# show ipv6 eigrp traffic
IPv6-EIGRP Traffic Statistics for AS 1 vrf default
  Hellos sent/received: 736/797
  Updates sent/received: 6/6
  Queries sent/received: 0/1
  Replies sent/received: 1/0
  Acks sent/received: 6/6
  Input queue high water mark 0, 0 drops
  SIA-Queries sent/received: 0/0
  SIA-Replies sent/received: 0/0
```

Table 17-9 describes the significant fields shown in the display.

Table 42: show ipv6 eigrp traffic Field Descriptions

Field	Description
AS	Autonomous system number specified in the **router eigrp** command.

Field	Description
vrf	VRF specified in the **show** command.
Hellos sent/received:	Number of hello packets sent and received.
Updates sent/received:	Number of update packets sent and received.
Queries sent/received:	Number of query packets sent and received.
Replies sent/received:	Number of reply packets sent and received.
Acks sent/received:	Number of acknowledgment packets sent and received.
Input queue high water mark	Maximum number of packets in the input queue and number of drops.
SIA-Queries sent/received	Number of Stuck-in-Active query packets sent and received.
SIA-Replies sent/received:	Number of Stuck-in-Active reply packets sent and received.

show ipv6 fragments

To display information about the IPv6 fragments queued, use the **show ipv6 fragments** command.

show ipv6 fragments [**ipv6-addr**]

Syntax Description

name	(Optional)IPv6 address. The format is A:B::C:D.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the IPv6 fragments:

```
switch(config-if)# show ipv6 fragments
No IPv6 fragments queued
```

Related Commands

Command	Description
show ipv6 process	Displays information about the IPv6 process.

show ipv6 icmp interface

To display information about the ICMPv6, use the **show ipv6 icmp interface** command.

show ipv6 icmp interface [*type number*] [**detail**] [**vrf** *vrf-name*]

Syntax Description

type	(Optional) Interface type. Use **?** to see the list of supported interfaces.
number	(Optional) Interface number. Use **?** to see the range.
detail	(Optional) Displays detailed ICMPv6 information.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display ICMPv6 information:

```
switch(config-if)# show ipv6 icmp interface
```

Related Commands

Command	Description
ipv6 icmp	Configures ICMPv6 on an interface.

show ipv6 interface

To display IPv6 information for an interface, use the **show ipv6 interface** command.

show ipv6 interface [*type number*] [**brief**] [**vrf** *vrf-name*]

Syntax Description

type	(Optional) Interface type. Use **?** to see the options.
number	(Optional) Interface number. Use **?** to see the range.
brief	(Optional) Displays a summary of IP information.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display IPv6 information for Ethernet 2/1:

```
switch# show ipv6 interface ethernet 2/1
Ethernet2/1, Interface status: protocol-down/link-down/admin-down, iod: 80
Context:"default"
  IPv6 address: 2001:0db8:0000:0000:0000:0000:0000:0001
  IPv6 subnet:  2001:0000:0000:0000:0000:0000:0000:0000/16
  IPv6 link-local address: fe80::0218:baff:fed8:3ffd (default)
  IPv6 multicast routing: disabled
  IPv6 multicast groups locally joined:
      ff02::0001:ff00:0001  ff02::0002  ff02::0001  ff02::0001:ffd8:3ffd
  IPv6 multicast (S,G) entries joined: none
  IPv6 MTU: 1500 (using link MTU)
  IPv6 RP inbound packet-filtering policy: none
  IPv6 RP outbound packet-filtering policy: none
  IPv6 inbound packet-filtering policy: none
  IPv6 outbound packet-filtering policy: none
  IPv6 interface statistics last reset: never
  IPv6 interface RP-traffic statistics: (forwarded/originated/consumed)
    Unicast packets:      0/0/0
    Unicast bytes:        0/0/0
    Multicast packets:    0/0/0
    Multicast bytes:      0/0/0
  IPv6 interface hardware statistics not available
    Reason: unsupported platform
```

Related Commands

Command	Description
show ip interface	Displays IP information about an interface.

show ipv6 mbgp

To display entries in the Multiprotocol Border Gateway Protocol (MP-BGP) table, use the **show ipv6 mbgp** command.

show ipv6 mbgp [{*ipv6-addr* | *ipv6-prefix* [**longer-prefixes**]}] [**vrf** *vrf-name*]

Syntax Description

ipv6-addr	(Optional)A network from the MBGP route table. The format is A:B::C:D.
ipv6-prefix	(Optional) A prefix from the MBGP route table. The format isA:B::C:D/length.
longer-prefixes	(Optional) Displays the prefix and any more specific routes.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the MBGP route table:

```
switch(config-router)# show ipv6 mbgp
BGP routing table information for VRF default, address family IPv6 Multicast
```

Related Commands

Command	Description
clear ip mbgp	Clears entries in the MBGP route table.

show ipv6 mbgp community

To display Multiprotocol Border Gateway Protocol (MP-BGP) routes that match a community, use the **show ipv6 mbgp community** command.

show ipv6 mbgp community [*as-number*] [**no-advertise**] [**no-export**] [**no-export-subconfed**] [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

as-number	AS number. The AS number can be a 16-bit integer or a 32-bit integer in the form of <higher 16-bit decimal number>.<lower 16-bit decimal number>.
no-advertise	(Optional) Displays the no-advertise community.
no-export	(Optional) Displays the no-export community.
no-export-subconfed	(Optional) Displays the no-export-subconfed community.
exact-match	(Optional) Displays an exact match of the community.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community:

```
switch(config)# show ipv6 mbgp community
```

Related Commands

Command	Description
ipv6 community-list	Creates a community list.

show ipv6 mbgp community-list

To display Multiprotocol Border Gateway Protocol (MP-BGP) routes that match a community list, use the **show ipv6 mbgp community-list** command.

show ipv6 mbgp community-list *commlist-name* [**exact-match**] [**vrf** *vrf-name*]

Syntax Description

community-list *commlist-name*	Display routes matching the community-list. The commlist-name can be any case-sensitive, alphanumeric string up to 63 characters.
exact-match	(Optional) Displays an exact match of the communities.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display routes that match a community list:

```
switch(config)# show ip v6mbgp community-list test1
```

Related Commands

Command	Description
ipv6 community-list	Creates a community list.

show ipv6 mbgp neighbors

To display Multiprotocol Border Gateway Protocol (MP-BGP) neighbors, use the **show ipv6 mbgp neighbors** command.

show ipv6 mbgp neighbors [{*addr* [{**advertised-routes** | **flap-statistics** | **paths** | **received-routes** | **routes** [{**advertised** | **dampened** | **received**}]}] | **prefix**}] [**vrf** {**all** | **vrf-name**}]

Syntax Description

addr	IPv6 address. The format is A:B::C:D.
advertised-routes	(Optional) Displays all the routes advertised to this neighbor.
flap-statistics	(Optional) Displays flap statistics for the routes received from this neighbor.
paths	(Optional) Displays AS paths learned from this neighbor.
received-routes	(Optional) Displays all the routes received from this neighbor.
routes	(Optional) Displays the routes received or advertised to or from this neighbor.
advertised	(Optional) Displays all the routes advertised for this neighbor.
dampened	(Optional) Displays all dampened routes received from this neighbor.
received	(Optional) Displays all the routes received from this neighbor.
prefix	(Optional) IPv6 prefix. The format is A:B::C:D/length.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.
all	(Optional) Specifies all VRFS.

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.
4.1(2)	Added **paths** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the MBGP neighbors:

```
switch(config)# show ipv6 mbgp neighbors
```

Related Commands

Command	Description
show ip mbgp neighbors	Displays BGP information.

show ipv6 nd interface

To display information about the Neighbor Discovery (ND), use the **show ipv6 nd interface** command.

show ipv6 nd interface [*type number*] [**detail**] [**vrf** *vrf-name*]

Syntax Description

type	(Optional) Interface type. Use **?** to see the list of supported interfaces.
number	(Optional) Interface number. Use **?** to see the range.
detail	(Optional) Displays detailed ND information.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display ND information:

```
switch(config-if)# show ipv6 nd interface
ICMPv6 ND Interfaces for VRF "default"
Ethernet2/45, Interface status: protocol-down/link-down/admin-down
  IPv6 address: 2001:0db8:0000:0000:0000:0000:0000:0001
  ICMPv6 active timers:
      Last Neighbor-Solicitation sent: never
      Last Neighbor-Advertisement sent: never
      Last Router-Advertisement sent: never
      Next Router-Advertisement sent in: 0.000000
  Router-Advertisement parameters:
      Periodic interval: 200 to 600 seconds
      Send "Managed Address Configuration" flag: false
      Send "Other Stateful Configuration" flag: false
      Send "Current Hop Limit" field: 64
      Send "MTU" option value: 1500
      Send "Router Lifetime" field: 1800 secs
      Send "Reachable Time" field: 0 ms
      Send "Retrans Timer" field: 0 ms
  Neighbor-Solicitation parameters:
      NS retransmit interval: 1000 ms
  ICMPv6 error message parameters:
      Send redirects: true
      Send unreachables: false
```

Related Commands

Command	Description
ipv6 nd	Configures ICMPv6 ND on an interface.

show ipv6 neighbor

To display IPv6 neighbors, use the **show ipv6 neighbor** command.

show ipv6 neighbor [{*ipv6-addrinterface*}] [**detail**] [**non-best**] [**statistics**] [**summary**] [**vrf** *vrf-name*]

Syntax Description

ipv6-addr	(Optional) An IPv6 source address. The format is A:B::C:D
interface	(Optional) An interface. Use *?* to determine the supported interface types.
detail	(Optional) Displays detailed neighbor information.
non-best	(Optional) Displays the best neighbor entries and the alternate neighbor entries.
statistics	(Optional) Displays neighbor statistics.
summary	(Optional) Displays a summary of the neighbor information.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	Added **non-best** and **summary** keywords.
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ipv6 neighbor** command to display the IPv6 adjacency table.

This command does not require a license.

Examples

This example shows how to display IPv6 neighbors:

```
switch# show ipv6 neigbhor
IPv6 Adjacency Table for VRF default
Total number of entries: 0
Address         Age       MAC Address     Pref Source     Interface
```

Related Commands

Command	Description
ipv6 nd	Configures ICMPv6 ND on an interface.

show ipv6 policy

To display the route policy information, use the **show ipv6 policy** command.

show ipv6 policy [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows the policies attached to interfaces:

```
switch(config-if)# show ipv6 policy
Interface               Route-map           Status    VRF-Name
Ethernet2/45            floor1               Inactive    --
```

Related Commands

Command	Description
ipv6 policy	Configures a route policy on an interface.

show ipv6 prefix-list

To display prefix lists for the Border Gateway Protocol (BGP), use the **show ipv6 prefix-list** command.

show ipv6 prefix-list [*name*]

Syntax Description

name	(Optional) Name of community list. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the prefix lists:

```
switch(config)# show ipv6 prefix-list
ip prefix-list test2: 1 entries
   seq 5 permit 2001:0DB8::/8
```

Related Commands

Command	Description
ipv6 prefix-list	Configures a BGP prefix list.

show ipv6 process

To display formation about the IPv6 process, use the **show ipv6 process** command.

show ipv6 process [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows details on the IPv6 process:

```
switch(config)# show ipv6 process
VRF default
  VRF id is 1
  Auto discard is disabled
  Auto discard is not added
  Static discard is not configured
  Number of static default route configured is 0
  Number of ipv6 unreachable configured is 0
  Iodlist: 80
  Local address list:  2001:0db8::0001  fe80::0218:baff:fed8:3ffd
```

Related Commands

Command	Description
show ip process	Displays information about the IPv4 process.

show ipv6 rip

To display the configuration and status of the Routing Information Protocol (RIP), use the **show ipv6 rip** command in any mode.

show ipv6 rip [*instance-tag*] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Selects a RIP instance.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

The following example is sample output from the **show ipv6 rip** command:

```
switch(config-if)# show ipv6 rip
Process Name "rip-sd" vrf "default"
RIP port 521, multicast-group ff02::0009
Admin-distance: 40
Updates every 30 sec, expire in 180 sec
Collect garbage in 120 sec
Default-metric: 1
Max-paths: 8
Process is up and running
  Interfaces supported by ipv6 RIP:
     Ethernet1/2
```

Table 1-26 describes the significant fields shown in the display.

Table 43: show ipv6 rip Field Descriptions

Field	Description
Process Name	The RIP instance tag.
Admin-distance	The administrative distance assigned to RIP. You can configure this value using the **distance** command in router address-family configuration mode.
Updates	Timer value for RIP updates. Configure this value with the **ip rip timer basic** command in interface configuration mode.

Field	Description
expire	Timer value for expiring RIP updates. Configure this value with the **ip rip timer basic** command in interface configuration mode.
Collect garbage	Timer value for garbage collecting in the RIP route table. Configure this value with the **ip rip timer basic** command in interface configuration mode.
Default metric	Default metric value. Configure this value with the **default-metric** command in router address-family mode.
Max-paths	Number of maximum paths allowed per RIP route. Configure this value with the **max-paths** command in router address-family mode.
Process	Administrative and operational state of this RIP instance.
Interfaces supported	RIP version and list of interfaces configured for this RIP instance. Add or remove interfaces using the **ip router rip** command in interface configuration mode.

Related Commands

Command	Description
show ipv6 rip interface	Displays RIP information for an interface.
show ipv6 rip neighbor	Displays RIP neighbor information.
show ipv6 rip policy statistics	Displays RIP policy statistics.
show ipv6 rip route	Displays RIP route information.
show ipv6 rip statistics	Displays RIP statistics.

show ipv6 rip interface

To display interface entry information from the the Routing Information Protocol (RIP) topology table, use the **show ipv6 rip interface** command in any mode.

show ipv6 rip interface [*type instance*] [**vrf** *vrf-name*]

Syntax Description

interface *type slot/port*	(Optional) Specifies the interface.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

This command has no default settings.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

The following example is sample output from the **show ipv6 rip interface** command:

```
switch(config-if)# show ipv6 rip interface ethernet 1/2
Process Name "rip-sd" vrf "default"
RIP-configured interface information
GigabitEthernet1/2, protocol-down/link-down/admin-down, RIP state: down
  address/mask NotConfigured, metric 1, split-horizon
```

The following table describes the significant fields shown in the display.

Table 44: show ipv6 rip interface Field Descriptions

Field	Description
Process Name	RIP instance tag.
vrf	the VRF of this interface.
Interface information	Interface administrative and operational state.
RIP state	RIP information for this interface.

Related Commands

Command	Description
show ipv6 rip	Displays RIP information.

Command	Description
show ipv6 rip neighbor	Displays RIP neighbor information.
show ipv6 rip policy statistics	Displays RIP policy statistics.
show ipv6 rip route	Displays RIP route information.
show ipv6 rip statistics	Displays RIP statistics.

show ipv6 rip neighbor

To display the neighbor information from the the Routing Information Protocol (RIP) topology table, use the **show ipv6 rip neighbor** command in any mode.

show ipv6 rip neighbor [*interface-type instance*] [**vrf** *vrf-name*]

Syntax Description

interface-type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
instance	(Optional) Either a physical interface instance or a virtual interface instance.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

The following is sample output from the **show ipv6 rip neighbor** command:

```
switch(config-if)# show ipv6 rip neighbor
Process Name "rip-sd" vrf "default"
RIP Neighbor Information (number of neighbors = 0)
('dead' means more than 300 seconds ago)
```

Table 1-28 describes the significant fields shown in the display.

Table 45: show ipv6 rip neighbor Field Descriptions

Field	Description
Process Name	RIP instance tag.
vrf	virtual routing and forwarding (VRF) of this interface.
Neighbor information	Number of RIP neighbors recognized on this interface.

Related Commands

Command	Description
show ipv6 rip	Displays RIP information.
show ipv6 rip interface	Displays RIP information for an interface.

Command	Description
show ipv6 rip policy statistics	Displays RIP policy statistics.
show ipv6 rip route	Displays RIP route information.
show ipv6 rip statistics	Displays RIP statistics.

show ipv6 rip policy statistics

To display the policy statistics for the Routing Information Protocol (RIP), use the **show ipv6 rip policy statistics** command in any mode.

show ipv6 rip policy statistics redistribute {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **ospfv3** *id* | **static**} [**vrf** *vrf-name*]

Syntax Description

bgp	Displays policy statistics for the Border Gateway Protocol (BGP).
direct	Displays policy statistics for directly connected routes only.
eigrp	Displays policy statistics for Enhanced Interior Gateway Routing Protocol (EIGRP).
isis	Displays policy statistics for Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospf	Displays policy statistics for Open Shortest Path First (OSPF) protocol.
ospfv3	Displays policy statistics for Open Shortest Path First version 3 (OSPFv3) protocol.
static	Displays policy statistics for IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **eigrp** keyword, an EIGRP instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **isis** keyword, an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string. For the **ospf** keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf*vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

The following example shows how to show policy statistics for EIGRP:

```
switch# show ipv6 rip policy statistics redistribute eigrp 201
```

Related Commands

Command	Description
clear ipv6 rip policy statistics	Clears policy statistics for RIP.
show ipv6 rip	Displays RIP information.
show ipv6 rip interface	Displays RIP information for an interface.
show ipv6 rip neighbor	Displays RIP information for a neighbor.
show ipv6 rip route	Displays RIP route information.
show ipv6 rip statistics	Displays RIP statistics.

show ipv6 rip route

To display route information from the the Routing Information Protocol (RIP) topology table, use the **show ipv6 rip route** command in any mode.

show ipv6 rip route [*prefix/length*] [**summary**] [**vrf** *vrf-name*]

Syntax Description

prefix/length	(Optional) IP or IPv6 prefix about which routing information should be displayed.
summary	(Optional) Displays information about summary routes.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

The following is sample output from the **show ipv6 rip route** command:

```
switch# show ipv6 rip route
```

Table 1-28 describes the significant fields shown in the display.

Table 46: show ipv6rip route Field Descriptions

Field	Description

Related Commands

Command	Description
show ipv6 rip	Displays RIP information.
show ipv6 rip interface	Displays RIP information for an interface.
show ipv6 rip neighbor	Displays RIP information for a neighbor.
show ipv6 rip policy statistics	Displays policy statistics for RIP.
show ipv6 rip statistics	Displays RIP statistics.

show ipv6 rip statistics

To display statistical entry information from the the Routing Information Protocol (RIP) topology table, use the **show ipv6 rip statistics** command in any mode.

show ipv6 rip statistics [*interface-type instance*] [**vrf** *vrf-name*]

Syntax Description

interface-type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
instance	(Optional) Either a physical interface instance or a virtual interface instance.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

No default behavior or values.

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

The following example is sample output from the **show ipv6 rip statistics** command:

```
switch# show ipv6 rip statistics
Global update stats:
   Sent Multicast Updates: periodic 0,triggered 0
   Sent Multicast Requests: 0
   Sent Unicast Updates: 544
   Sent Unicast Requests: 544
   Recv Multicast Updates: 0
   Recv Multicast Requests: 0
   Recv Unicast Updates: 500
   Recv Unicast Requests: 544
   Recv Bad Pkts: 0
   Recv Bad Routes: 0
```

The following table describes the significant fields shown in the display.

Table 47: show ipv6 rip statistics Field Descriptions

Field	Description
Sent Multicast Updates:	Number of RIP multicast updates sent.
Sent Multicast Requests:	Number of RIP multicast requests sent.
Sent Unicast Updates:	Number of RIP unicast updates sent.

Field	Description
Sent Unicast Requests:	Number of RIP unicast requests sent.
Recv Multicast Updates:	Number of RIP multicast updates received.
Recv Multicast Requests:	Number of RIP multicast requests received.
Recv Unicast Updates:	Number of RIP unicast updates received.
Recv Unicast Requests:	Number of RIP unicast requests received.
Recv Bad Pkts:	Number of bad RIP packets received.
Recv Bad Routes:	Number of bad RIP routes received.

Related Commands

Command	Description
show ipv6 rip	Displays RIP information.
show ipv6 rip interface	Displays RIP information for an interface.
show ipv6 rip neighbor	Displays RIP information for a neighbor.
show ipv6 rip policy statistics	Displays policy statistics for RIP.
show ipv6 rip route	Displays RIP route information.

show ipv6 route

To display routes from the unicast RIB, use the **show ipv6 route** command.

show ipv6 route [{*addrhostnameprefix*}] [*route-type*] [**summary**] [**vrf** *vrf-name*]

Syntax Description

addr	(Optional) IPv6 address. The format is A:B::C:D.
hostname	Host name. The *name* can be any case-sensitive, alphanumeric string up to 80 characters.
prefix	(Optional) IPv6 prefix. The format is A:B::C:D/length. The length range is from 1 to 128.
route-type	(Optional) Type of route. Use **?** to see the list of types.
summary	(Optional) Displays route counts.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(3)	This command was introduced.
4.1(2)	Added *hostname* argument.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the route table:

```
switch(config)# show ipv6 route
IPv6 Routing Table for VRF "default"
0::/127, ubest/mbest: 1/0
   *via 0::, Null0, [220/0], 18:03:20, discard, discard
fe80::/10, ubest/mbest: 1/0
   *via 0::, Null0, [220/0], 18:03:20, discard, discard
```

Related Commands

Command	Description
clear ipv6 route	Clears entries in the route table.

show ipv6 routers

To display IPv6 neighbor routers, use the **show ipv6 routers** command.

show ipv6 routers [**interface** *intif*] [**vrf** {*vrf-name* | **all**}]

Syntax Description

interface *intif*	(Optional) Specifies an interface. Use *?* to determine the supported interface types.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.1(2)	This command was introduced.
5.0(2)	Added **interface** and **vrf** keywords.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the IPv6 neighbors:

```
switch(config)# show ipv6 routers
```

Related Commands

Command	Description
clear ipv6 neighbors	Displays IPv6 neighbor details.

show ipv6 static-route

To display static routes from the unicast RIB, use the **show ipv6 static-route** command.

show ipv6 static-route [**vrf** {*vrf-name* | **all**}]

Syntax Description

vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.
all	(Optional) Specifies all virtual router contexts (VRF) name.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.
4.2(1)	Added **all** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the static routes:

```
switch(config)# show ipv6 static-route
IPv6 Unicast Static Routes:
```

Related Commands

Command	Description
ipv6 route	Configures a static route.

show ipv6 traffic

To display IPv6 traffic information, use the **show ipv6 traffic** command.

show ipv6 traffic

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the IPv6 traffic information:

```
switch(config)# show ipv6 traffic
IPv6 Software Processed Traffic and Error Statistics, last reset: never
RP-Traffic Statistics:
  Counter                 Unicast  Multicast
  -------                 -------  ---------
  Packets forwarded:            0  0
  Bytes forwarded:              0  0
  Packets originated:           0  0
  Bytes originated:             0  0
  Packets consumed:             0  0
  Bytes consumed:               0  0
  Fragments originated:         0  0
  Fragments consumed:           0  0
Error Statistics:
  Bad version: 0, route lookup failed: 0, hop limit exceeded: 0
  Option header errors: 0, payload length too small: 0
  PM errors: 0, MBUF errors: 0, encapsulation errors: 0
```

Related Commands

Command	Description
show ipv6 process	Displays information about the IPv6 process.

show isis

To display information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis** command.

show isis [*instance-tag*] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display information about IS-IS:

```
switch# show isis
ISIS process : foo
VRF: default
  System ID : None  IS-Type : L1-L2
  SAP : 412  Queue Handle : 12
  Maximum LSP MTU: 1492
  Stateful HA enabled
  Graceful Restart enabled. State: Inactive
  Last graceful restart status : none
  Start-Mode Cold
  BFD is enabled
  Metric-style : advertise(wide), accept(narrow, wide)
  Area address(es) :
    None
  Process is disabled because :
    NET is not specified
  VRF ID: 1
  Stale routes during non-graceful controlled restart
  Interfaces supported by IS-IS :
  Address family IPv4 unicast :
    Number of interface : 0
    Distance : 115
  Address family IPv6 unicast :
    Number of interface : 0
    Distance : 115
  Level1
  No auth type and keychain
  Auth check set
  Level2
  No auth type and keychain
```

```
  Auth check set
  L1 Next SPF: Inactive
  L2 Next SPF: Inactive
IS-IS process: test1
VRF: default
IS-IS Traffic for Ethernet7/45:
%PDU        Received        Sent  RcvAuthErr OtherRcvErr  ReTransmit
LAN-IIH            0           0           0           0         n/a
P2P-IIH            0           0           0           0         n/a
CSNP               0           0           0           0         n/a
PSNP               0           0           0           0         n/a
LSP                0           0           0           0           0
```

Related Commands

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

show isis adjacency

To display adjacency information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis adjacency** command.

show isis [*instance-tag*] **adjacency** [*interface*] [**detail**] [**summary**] [**system-id** *sid*] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
interface	(Optional) Interface name. Use *?* to determine the supported interface types.
detail	(Optional) Displays detailed adjacency information.
summary	(Optional) Displays a summary of the adjacency information.
system-id *sid*	(Optional) Displays the adjacency information for this system ID. The *sid* format is XXXX.XXXX.XXXX.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Note If the hostname is less than 14 characters in length, the **show isis adjacency** command displays the hostname instead of System ID.

Examples

This example shows how to display the adjacency information:

```
switch# show isis adjacency
IS-IS process: 1 VRF: default
IS-IS adjacency database:
System ID       SNPA            Level  State  Hold Time  Interface
test11-m9       001b.210d.e3bd  1      UP     00:00:07   Ethernet2/3
test11-m9       001b.210d.e3bd  2      UP     00:00:06   Ethernet2/3
test11-m9       0015.1757.d82c  1      UP     00:00:33   Ethernet2/4
test11-m9       0015.1757.d82c  2      UP     00:00:28   Ethernet2/4
test11-m9       N/A             1-2    UP     00:00:28   Ethernet2/5
test11-m9       0015.1757.d82f  1      UP     00:00:31   Ethernet2/7
test11-m9       0015.1757.d82f  2      UP     00:00:24   Ethernet2/7
```

This example shows how to display the adjacency information for Ethernet 2/3 and system ID test11-m9:

```
switch# show isis adjacency ethernet 2/3 system-id test1
IS-IS process: 1 VRF: default
IS-IS adjacency database for Ethernet2/3:
System ID       SNPA            Level  State  Hold Time  Interface
test11-m9       001b.210d.e3bd  1      UP     00:00:08   Ethernet2/3
  Up/Down transitions: 1, Last transition: 00:06:44 ago
  Circuit Type: L1-2
  IPv4 Address: 23.1.1.9
  IPv6 Address: 0::
  Circuit ID: test11-m9.01, Priority: 64
test11-m9       001b.210d.e3bd  2      UP     00:00:06   Ethernet2/3
  Up/Down transitions: 1, Last transition: 00:06:37 ago
  Circuit Type: L1-2
  IPv4 Address: 23.1.1.9
  IPv6 Address: 0::
  Circuit ID: test11-m9.01, Priority: 64
```

Related Commands

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

show isis database

To display database information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis database** command.

show isis [*instance-tag*] **database** [*lspid*] [{**detail** | **summary**}] [{**level-1** | **level-2**}] {[**adjacency sid**] | [{**ip** | **ipv6**} **prefix** *filter*] | [**router-id** *id*] | [**zero-sequence**]} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
lspid	(Optional) LSP ID. The *sid* format is XXXX.XXXX.XXXX.XX-XX.
detail	(Optional) Displays detailed database information.
summary	(Optional) Displays a summary of the database information.
level-1	(Optional) Displays Level 1 router database information.
level-2	(Optional) Displays Level 2 router database information.
adjacency *sid*	(Optional) Displays database information that matches the adjacency filter. The *sid* format is XXXX.XXXX.XXXX.XX.
{**ip** | **ipv6**} **prefix** *filter*	(Optional) Displays database information that matches the prefix filter. The *filter* format for IPv4 is x.x.x.x/length, where the length range is from 1 to 32. The *filter* format for IPv6 is A:B::C:D/length, where the length range is from 1 to 128.
router-id *id*	(Optional) Displays database information that matches the router ID. The *id* format is x.x.x.x.
zero-sequence	(Optional) Displays the database information for LSPs with zero sequence numbers.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the database information:

```
switch# show isis database
IIS-IS Process: 1 LSP database VRF: default
```

```
IS-IS Level-1 Link State Database
  LSPID                 Seq Number   Checksum  Lifetime   A/P/O/T
  test11-m9.00-00       0x000006AB   0xD715    1115       0/0/0/3
  test11-m9.01-00       0x00000002   0xB7DF    1008       0/0/0/3
  test-m10.00-00    * 0x0000000C   0xC457    1125       0/0/0/3
  test-m10.02-00    * 0x00000002   0x8673    1024       0/0/0/3
  test-m10.04-00    * 0x00000002   0x787F    1029       0/0/0/3
IS-IS Level-2 Link State Database
  LSPID                 Seq Number   Checksum  Lifetime   A/P/O/T
  test11-m9.00-00       0x0000065F   0x98A0    1115       0/0/0/3
  test11-m9.01-00       0x00000002   0xB7DF    1067       0/0/0/3
  test-m10.00-00    * 0x0000000C   0x1903    1125       0/0/0/3
  test-m10.02-00    * 0x00000002   0x8673    1018       0/0/0/3
  test-m10.04-00    * 0x00000002   0x787F    1040       0/0/0/3
```

This example shows how to display the detailed database information for test11-m9:

```
switch(config)# show isis database level-1 detail test11-m9.00-00
IS-IS Process: 1 LSP database VRF: default
IS-IS Level-1 Link State Database
  LSPID                 Seq Number   Checksum  Lifetime   A/P/O/T
  test11-m9.00-00       0x000006AB   0xD715    1079       0/0/0/3
    Instance      :  0x00000006
    Area Address  :  48
    NLPID         :  0xCC 0x8E
    Router ID     :  9.1.1.1
    IP Address    :  9.1.1.1
    Hostname      :  test11-m9          Length : 9
    Extended IS   :  test-m10.02      Metric : 40
    Extended IS   :  test-m10.04      Metric : 40
    Extended IS   :  test11-m9.01       Metric : 400
    Extended IS   :  test-m10.00      Metric : 40
    Extended IP   :        25.1.1.0/24  Metric : 40          (U)
    Extended IP   :        24.1.1.0/24  Metric : 40          (U)
    Extended IP   :        80.1.1.0/24  Metric : 10          (U)
    Extended IP   :        70.1.1.0/24  Metric : 10          (U)
    Extended IP   :        60.1.1.0/24  Metric : 10          (U)
    Extended IP   :        50.1.1.0/24  Metric : 10          (U)
    Extended IP   :        23.1.1.0/24  Metric : 400         (U)
    Extended IP   :         9.1.1.0/24  Metric : 1           (U)
    IPv6 Prefix   : 0027::/64  Metric : 40          (U/I)
    Digest Offset :  0
```

Related Commands

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

show isis hostname

To display hostname information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis hostname** command.

show isis [*instance-tag*] **hostname** [**detail**] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
detail	(Optional) Displays detailed hostname information.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the hostname information:

```
test11-m9# show isis hostname
IS-IS Process: 1 dynamic hostname table VRF: default
  Level  System ID       Dynamic hostname
  1      0015.1757.d82c  test11-m9
  1      0015.1757.d8c8* test-m10
```

Related Commands

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

show isis interface

To display interface information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis interface** command.

show isis [*instance-tag*] **interface** [*interface*] [**brief**] [{**level-1** | **level-2**}] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
interface	(Optional) Interface name and interface number. Use **?** to see a list of interfaces.
brief	(Optional) Displays a summary of the interface information.
level-1	(Optional) Displays Level 1 interface information.
level-2	(Optional) Displays Level 2 interface information.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display a brief view of the interface information:

```
switch# show isis interface brief
IIS-IS process: 1 VRF: default
Interface    Type  Idx State        Circuit   MTU  Metric  Priority  Adjs/AdjsUp
                                                  L1  L2  L1  L2    L1    L2
loopback1    Loop  5     Up/Ready   0x01/L1-2 1500 1   1   64  64    0/0   0/0
Ethernet2/3  Bcast 1     Up/Ready   0x01/L1-2 1500 400 400 64  64    1/1   1/1
Ethernet2/4  Bcast 2     Up/Ready   0x02/L1-2 1500 40  40  64  64    1/1   1/1
Ethernet2/5  P2P   3     Up/Ready   0x01/L1-2 1500 40  40  64  64    1/1   1/1
Ethernet2/6  Bcast 4   Down/Ready   0x03/L1-2 1500 40  40  64  64    0/0   0/0
Ethernet2/7  Bcast 6     Up/Ready   0x04/L1-2 1500 40  40  64  64    1/1   1/1
```

This example shows how to display the interface information for Ethernet 2/5:

```
switch# show isis interface ethernet 2/5
IS-IS process: 1 VRF: default
Ethernet2/5, Interface status: protocol-up/link-up/admin-up
  IP address: 192.0.2.1 IP subnet: 192.0.2.0/24
  IPv6 routing is disabled
  Index: 0x0003, Local Circuit ID: 0x01, Circuit Type: L1-2
```

```
Extended Local Circuit ID: 0x1A084000, P2P Circuit ID: 0000.0000.0000.00
Retx interval: 5, Retx throttle interval: 66 ms
LSP interval: 33 ms, MTU: 1500
P2P Adjs: 1, AdjsUp: 1, Priority 64
Hello Interval: 10, Multi: 3, Next IIH: 00:00:08
Level   Adjs   AdjsUp  Metric   CSNP  Next CSNP  Last LSP ID
1          1        1      40     60  00:00:48   ffff.ffff.ffff.ff-ff
2          1        1      40     60  00:00:19   ffff.ffff.ffff.ff-ff
```

Related Commands

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

show isis ip route-map statistics redistribute

To display statistics for route redistribution for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis ip route-map statistics redistribute** command.

show isis [*instance-tag*] **ip route-map statistics redistribute** {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospf** *id* | **rip** *id* | **static**} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
bgp	Displays statistics for the Border Gateway Protocol (BGP).
direct	Displays statistics for directly connected routes only.
eigrp	Displays statistics for the Enhanced Interior Gateway Protocol (EIGRP) routing protocol.
isis	Displays statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospf	Displays statistics for the Open Shortest Path First (OSPF) protocol.
rip	Displays statistics for the Routing Information Protocol (RIP).
static	Displays statistics for IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **isis**, **eigrp**, **ospf**, and **rip** keywords, an instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show isis ip route-map statistics redistribute** command to display redistribution statistics.

This command requires the Enterprise Services license.

Examples

This example shows how to display statistics for redistributed routes:

```
switch# show isis ip route-map statistics redistribute static
IS-IS process: 1
VRF: default
C: No. of comparisions, M: No. of matches
route-map rm10 permit 10
Total accept count for policy: 9
Total reject count for policy: 0
```

Related Commands

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

show isis ipv6 route-map statistics redistribute

To display statistics for route redistribution for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis ipv6 route-map statistics redistribute** command.

show isis [*instance-tag*] **ipv6 route-map statistics redistribute** {**bgp** *id* | **direct** | **eigrp** *id* | **isis** *id* | **ospfv3** *id* | **rip** *id* | **static**} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive alphanumeric string up to 63 characters.
bgp	Displays statistics for the Border Gateway Protocol (BGP).
direct	Displays statistics for directly connected routes only.
eigrp	Displays statistics for the Enhanced Interior Gateway Protocol (EIGRP) routing protocol.
isis	Displays statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
ospfv3	Displays statistics for the Open Shortest Path First (OSPF) version 3 protocol.
rip	Displays statistics for the Routing Information Protocol (RIP).
static	Displays statistics for IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **isis**, **eigrp**, **ospfv3**, and **rip** keywords, an instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show isis ipv6 route-map statistics redistribute** command to display redistribution statistics.

This command requires the Enterprise Services license.

Examples

This example shows how to display statistics for redistributed routes:

```
switch# show isis ipv6 route-map statistics redistribute static
IS-IS process: 1
VRF: default
C: No. of comparisions, M: No. of matches
route-map rm10 permit 10
Total accept count for policy: 9
Total reject count for policy: 0
```

Related Commands

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

show isis mesh-group

To display mesh groups for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis mesh-group** command.

show isis [*instance-tag*] **mesh-group** [*number*] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
number	(Optional) Number of the IS-IS mesh group. The range is from 1 to 4294967295.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the mesh groups:

```
switch# show isis mesh-group
IS-IS Process: Test1 mesh-groups VRF: default
 Mesh-group 33:
    Ethernet7/45
```

Related Commands

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

show isis protocol

To display process-level information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis protocol** command.

show isis [*instance-tag*] [**protocol**] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the IS-IS protocol information:

```
switch# show isis protocol
ISIS process : 1
VRF: default
  System ID : 0015.1757.d8c8  IS-Type : L1-L2
  SAP : 412  Queue Handle : 11
  Graceful Restart enabled
  Metric-style : advertise(wide), accept(narrow, wide)
  Area address(es) :
    48
  Process is up and running
  VRF ID: 1
  Stale routes during non-graceful controlled restart
  Interfaces supported by IS-IS :
    loopback1
    Ethernet2/3
    Ethernet2/4
    Ethernet2/5
    Ethernet2/6
    Ethernet2/7
  Address family IPv4 unicast :
    Number of interface : 5
    Distance : 115
  Address family IPv6 unicast :
    Number of interface : 1
    Distance : 115
  L1 Next SPF: Inactive
  L2 Next SPF: Inactive
```

Related Commands

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

show isis redistribute route

To display route redistribution information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis redistribute route** command.

show isis [*instance-tag*] [{**ip** | **ipv6**}] **redistribute route** [{*address* | *prefix* [**longer-prefixes** [**summary**]] | **summary**}] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
ip	(Optional) Displays route redistribution information for an IPv4 route.
ipv6	(Optional) Displays route redistribution information for an IPv6 route.
address	(Optional) Route redistribution information for a specific IPv4 or IPv6 address. The *address* format for IPv4 is x.x.x.x. The *address* format for IPv6 is A:B::C:D.
prefix	(Optional) Route redistribution information for a specific IPv4 or IPv6 address. The *prefix* format for IPv4 is x.x.x.x/length, where the length range is from 1 to 32. The *prefix* format for IPv6 is A:B::C:D/length, where the length range is from 1 to 128.
longer-prefixes	(Optional) Displays the exact match to the prefix as well as more specific routes.
summary	(Optional) Displays a summary of the route redistribution information.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the route redistribution information:

```
switch# show isis redistribute route
IS-IS process: 1 VRF: default
IS-IS IPv4 redistribute route
100.1.1.1/32, static,
  Redistributed into L1, metric 10
  Redistributed into L2, metric 10
100.1.1.2/32, static,
  Redistributed into L1, metric 10
  Redistributed into L2, metric 10
100.1.1.3/32, static,
```

```
  Redistributed into L1, metric 10
  Redistributed into L2, metric 10
100.1.1.4/32, static,
  Redistributed into L1, metric 10
  Redistributed into L2, metric 10
100.2.0.0/16, static,
  Redistributed into L1, metric 10
  Redistributed into L2, metric 10
100.2.1.0/24, static,
  Redistributed into L1, metric 10
  Redistributed into L2, metric 10
100.2.1.1/32, static,
  Redistributed into L1, metric 10
  Redistributed into L2, metric 10
```

This example shows how to display the route redistribution information for route 100.2.1.0:

```
test-m10(config)# show isis redistribute route 100.2.1.0/16 longer-prefixes
IS-IS process: 1 VRF: default
IS-IS IPv4 redistribute route
100.2.0.0/16, static,
  Redistributed into L1, metric 10
  Redistributed into L2, metric 10
100.2.1.0/24, static,
  Redistributed into L1, metric 10
  Redistributed into L2, metric 10
100.2.1.1/32, static,
  Redistributed into L1, metric 10
  Redistributed into L2, metric 10
```

Related Commands

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

show isis route

To display route information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis route** command.

show isis [*instance-tag*] [{**ip** | **ipv6**}] **route** [{*address* | *prefix* [**longer-prefixes** [**summary**]] [{**detail** | **summary**}] [**vrf** *vrf-name*]}]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
ip	(Optional) Displays route information for an IPv4 route.
ipv6	(Optional) Displays route information for an IPv6 route.
address	(Optional) Route information for a specific IPv4 or IPv6 address. The *address* format for IPv4 is x.x.x.x. The *address* format for IPv6 is A:B::C:D.
prefix	(Optional) Route information for a specific IPv4 or IPv6 address. The *prefix* format for IPv4 is x.x.x.x/length, where the length range is from 1 to 32. The *prefix* format for IPv6 is A:B::C:D/length, where the length range is from 1 to 128.
longer-prefixes	(Optional) Displays the exact match to the prefix as well as more specific routes.
summary	(Optional) Displays a summary of the route information.
detail	(Optional) Displays detailed route information.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the route information for IPv4:

```
switch# show isis route
IS-IS IPv4 routing table
10.1.1.0/24, L1, direct
   *via GigabitEthernet2/1, metric 40, L1, direct
    via GigabitEthernet2/1, metric 40, L2, direct
10.1.2.0/24, L1, direct
   *via GigabitEthernet2/2, metric 40, L1, direct
    via GigabitEthernet2/2, metric 40, L2, direct
```

```
100.0.0.2/32, L1, direct
   *via Loopback0, metric 1, L1, direct
    via Loopback0, metric 1, L2, direct
```

This example shows how to display the route information for IPv6:

```
switch# show isis ipv6 route
IS-IS IPv6 routing table
3000:0010:0001::/48, L1, direct
   *via GigabitEthernet2/1, metric 40, L1, direct
    via GigabitEthernet2/1, metric 40, L2, direct
```

This example shows how to display the route information for 10.0.0:

```
switch# show isis ip route 10.0.0.0/8 longer-prefixes
IS-IS IPv4 routing table
10.1.1.0/24, L1, direct
   *via GigabitEthernet2/1, metric 40, L1, direct
    via GigabitEthernet2/1, metric 40, L2, direct
10.1.2.0/24, L1, direct
   *via GigabitEthernet2/2, metric 40, L1, direct
    via GigabitEthernet2/2, metric 40, L2, direct
```

This example shows how to display a summary of the route information for 10.0.0:

```
test-i1# show isis ip route 10.0.0.0/8 longer-prefixes summary
IS-IS IPv4 routing table
Summary information for range 10.0.0.0/8
Total number of best routes  : 2
Total number of paths        : 4
Total number of best paths   : 2
Total number of backup paths : 2
Best routes per level
  L1         total    : 2
             direct   : 2
Best paths per level
  L1         total    : 2
             direct   : 2
Backup paths per level
  L2         total    : 2
             direct   : 2
Number of best routes per mask-length
  /24 : 2
```

Related Commands

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

show isis route-map statistics distribute

To display statistics for route distribution between Level-1 and Level-2 areas for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis route-map statistics distribute** command.

show isis [*instance-tag*] [{**ip** | **ipv6**}] **route-map statistics distribute** [{**level-1** | **level-2**}] **into** [{**level-1** | **level-2**}] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
ip	(Optional) Displays statistics for IPv4.
ipv6	(Optional) Displays statistics for IPv6.
level-1	(Optional) Displays Level 1 distribution statistics.
level-2	(Optional) Displays Level 2 distribution statistics.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display a summary of the distribute information:

```
switch# show isis route-map statistics distribute level-1 into level 2
```

Related Commands

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

show isis rrm

To display Retransmit-Routing-Message (RRM) information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis rrm** command.

show isis [*instance-tag*] **rrm** *interface* [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
interface	Interface name and interface number. Use **?** to see a list of interfaces.
vrf*vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the RRM statistics:

```
switch# show isis rrm ethernet 2/3
IS-IS process: 1
IS-IS RRM information for interface Ethernet2/3:
  No retransmission on non-P2P interface
test-m10(config)# show isis rrm eth 2/5
IS-IS process: 1
IS-IS RRM information for interface Ethernet2/5:
IS-IS Level-1 Link State Database
  Retx interval: 5, Retx throttle interval: 66 ms
  Retx queue length: 0, Next Retx: Inactive
  Retx queue HWM: 5, Retx queue exceed: 0
  LSPID                 Seq Number   Checksum  Lifetime   A/P/O/T  Ago
IS-IS Level-2 Link State Database
  Retx interval: 5, Retx throttle interval: 66 ms
  Retx queue length: 0, Next Retx: Inactive
  Retx queue HWM: 5, Retx queue exceed: 0
  LSPID                 Seq Number   Checksum  Lifetime   A/P/O/T  Ago
```

Related Commands

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

show isis spf-log

To display shortest path first (SPF) information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis srm** command.

show isis [*instance-tag*] **spf-log** [**detail**] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
detail*detail*	(Optional) Displays detailed information about the SPF calculation.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the SPF information:

```
switch# show isis spf-log
Total number of SPF calculations: 10
Log entry (current/max): 7/20
Ago       Level  Reason                                    Count  Total
1w0d      1      Adjust route distribution                 3
          2      Adjust route distribution                 3      0.000216
1w0d      1      New IP address on GigabitEthernet         1
          2      New IP address on GigabitEthernet         1      0.000229
1w0d      2      New NH to test-i2 on GigabitEthernet      1      0.000135
1w0d      2      New adj test-i2 on GigabitEthernet        4      0.000243
1w0d      1      New adj test-i2 on GigabitEthernet        3      0.000155
1w0d      1      New LSP test-i2.00-00                     2      0.000252
1w0d      1      Updated LSP test-i2.00-00                 1
```

Related Commands

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

show isis srm

To display Send-Routing-Message (SRM) information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis srm** command.

show isis [*instance-tag*] **srm** *interface* [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
interface	Interface name and interface number. Use **?** to see a list of interfaces.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the SRM statistics:

```
switch# show isis srm ethernet 2/3
IS-IS process: 1
IS-IS SRM information for interface Ethernet2/3:
IS-IS Level-1 Link State Database
  Interface is eligible for flooding LSP
  Interface is on stopped SRM list
  LSP interval: 33 ms, Next LSP: Inactive
  LSPID                 Seq Number   Checksum  Lifetime   A/P/O/T
IS-IS Level-2 Link State Database
  Interface is eligible for flooding LSP
  Interface is on stopped SRM list
  LSP interval: 33 ms, Next LSP: Inactive
  LSPID                 Seq Number   Checksum  Lifetime   A/P/O/T
```

Related Commands

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

show isis ssn

To display Send-Sequence-Number (SSN) information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis ssn** command.

show isis [*instance-tag*] **ssn** *interface* [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
interface	Interface name and interface number. Use **?** to see a list of interfaces.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the SSN statistics:

```
switch# show isis ssn ethernet 2/5
IS-IS SSN information for interface Ethernet2/5:
IS-IS Level-1 Link State Database
  Interface is eligible for sending PSNP
  Next PSNP: Inactive
  LSPID                 Seq Number   Checksum  Lifetime   A/P/O/T
IS-IS Level-2 Link State Database
  Interface is eligible for sending PSNP
  Next PSNP: Inactive
  LSPID                 Seq Number   Checksum  Lifetime   A/P/O/T
```

Related Commands

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

show isis statistics

To display statistics for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis statistics** command.

show isis [*instance-tag*] **statistics** [*interface*] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
interface	(Optional) Interface name and interface number. Use **?** to see a list of interfaces.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the IS-IS statistics:

```
switch# show isis statistics ethernet 7/45
VRF:                default
SPF calculations:   34
LSPs sourced:       6
LSPs refreshed:     42
LSPs purged:        0
DIS elections:      10
```

Related Commands

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

show isis summary-address

To display summary address information for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis summary-address** command.

show isis [*instance-tag*] [{**ip** | **ipv6**}] **summary-address** [{*addressprefix*}] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
ip	(Optional) Displays summary address information for IPv4.
ipv6	(Optional) Displays summary address information for IPv6.
address	(Optional) IPv4 or IPv6 address. The *address* format for IPv4 is x.x.x.x. The *address* format for IPv6 is A:B::C:D.
prefix	(Optional) IPv4 or IPv6 address. The *prefix* format for IPv4 is x.x.x.x/length, where the length range is from 1 to 32. The *prefix* format for IPv6 is A:B::C:D/length, where the length range is from 1 to 128.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display summary address information:

```
switch# show isis summary-address
IS-IS IPv4 summary address:
20.0.0.0/8, L1-2
  Summarize 0 routes into L1
  Summarize 0 routes into L2
```

Related Commands

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

show isis traffic

To display traffic statistics for Intermediate-System-to-Intermediate System (IS-IS), use the **show isis traffic** command.

show isis [**instance-tag**] **traffic** [**interface**] [**vrf vrf-name**]

Syntax Description

instance-tag	(Optional) Name of the IS-IS instance. The name can be any case-sensitive, alphanumeric string up to 63 characters.
interface	(Optional) Interface name and interface number. Use **?** to see a list of interfaces.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the traffic statistics:

```
switch# show isis traffic
IS-IS process: 1
VRF: default
IS-IS Traffic:
%PDU        Received        Sent  RcvAuthErr OtherRcvErr  ReTransmit
LAN-IIH        62156       87080           0           0         n/a
P2P-IIH         6232        6234           0           0         n/a
CSNP           11646       22356           0           0         n/a
PSNP             802         590           0           0         n/a
LSP             2385        3291           0           0           0
```

Related Commands

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

show local policy

To display the route map used for IPv4 or IPv6 local policy routing, use the show local policy command.

show {**ipv4** | **ipv6**} **local policy vrf** *vrf-name*

Syntax Description

ipv4	Displays IPv4 local policy routing.
ipv6	Displays IPv4 local policy routing.
vrf	Displays per virtual routing forwarding (VRF) information.
vrf-name	VRF name.

Command Default

None

Command Modes

Any

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the route map used for IPv4 or IPv6 local policy routing:

```
switch# show ipv4 local policy vrf 1switch#
```

Related Commands

Command	Description
local policy route-map	Configures IPv4 or IPv6 local policy route maps for packets generated by the device.

show mac-list

To display the entries in a MAC list, use the **show mac-list** command.

show mac-list [*name*]

Syntax Description

name	MAC list name. The name can be any case-sensitive, alphanumeric string up to 32 characters.

Command Default

No match values are defined.

Command Modes

global configuration

Command History

Release	Modification
5.0(2)	This command was introduced.

Usage Guidelines

This command requires the LAN Enterprise license.

Examples

This example shows how to display information about the Red MAC list.:

```
switch(config)# show mac-list Red
mac-list Red: 1 entries
   seq 1 permit 0022.5579.a4c1 ffff.ffff.0000
```

Related Commands

Command	Description
mac-list	Creates a MAC list.
match mac-list	Matches a MAC address in a MAC list.

show ospfv3

To display general information about Open Shortest Path First version 3 (OSPFv3) routing instances, use the **show ospfv3** command.

show [**ipv6**] **ospfv3** [*instance-tag*] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Use this tag to display OSPFv3 information about a specific OSPFv3 instance. The *instance-tag* argument can be any alphanumeric string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3** command to display information about one or more OSPFv3 instances.

This command requires the Enterprise Services license.

Examples

This example shows how to display information about one specific OSPFv3 instance:

```
switch# show ospfv3 201
Routing Process sd with ID 0.0.0.0 vrf default
Graceful-restart is configured
  grace period: 60, state: (null)
  Last graceful restart exit status: None
Supports only single TOS(TOS0) routes
Supports opaque LSA
Administrative distance 110
Reference Bandwidth is 40000 Mbps
Initial SPF schedule delay 200.000 msecs,
  minimum inter SPF delay of 1000.000 msecs,
  maximum inter SPF delay of 5000.000 msecs
Minimum hold time for Router LSA throttle 5000.000 ms
Minimum hold time for Network LSA throttle 5000.000 ms
Minimum hold time for Intra-Area-Prefix LSA throttle 5000.000 ms
Minimum hold time for Link LSA throttle 5000.000 ms
Minimum LSA arrival 1000.000 msec
Maximum paths to destination 8
Number of external LSAs 0, checksum sum 0
Number of areas is 2, 2 normal, 0 stub, 0 nssa
Number of active areas is 0, 0 normal, 0 stub, 0 nssa
 BFD is enabled
  Area BACKBONE(0) (Inactive)
       Area has existed for 01:13:04
       Interfaces in this area: 1 Active interfaces: 0
```

```
      SPF calculation has run 1 times
       Last SPF ran for 0.000433s
      Area ranges are
      Number of LSAs: 0, checksum sum 0
Area (33) (Inactive)
      Area has existed for 01:13:04
      Interfaces in this area: 0 Active interfaces: 0
      SPF calculation has run 1 times
       Last SPF ran for 0.000053s
      Area ranges are
      Number of LSAs: 0, checksum sum 0
```

Table 17-10 describes the significant fields shown in the display.

Table 48: show ospfv3 Field Descriptions

Field	Description
Routing Process...	OSPFv3 instance tag and OSPFv3 router ID.
Stateful High Availability	Status of stateful restart capability.
Graceful-restart	Status of graceful restart configuration.
grace period	Number of seconds that OSPFv3 has to trigger a graceful restart.
Last graceful restart exit status	Exit status for last graceful restart.
Supports...	Number of types of service supported (Type 0 only).
Reference Bandwidth	Bandwidth used for cost calculation.
Initial SPF schedule delay	Delay time of SPF calculations.
Minimum LSA arrival	Minimum interval between link-state advertisements.
Number of...	Number and type of link-state advertisements that have been received.
Number of areas is...	Number and type of areas configured for the router.

show ospfv3 border-routers

To display the Open Shortest Path First version 3 (OSPFv3) routing table entries to an Area Border Router (ABR) and Autonomous System Boundary Router (ASBR), use the **show ospfv3 border-routers** command.

show [**ipv6**] **ospfv3** [*instance-tag*] **border-routers** [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Use this tag to display OSPFv3 information about a specific OSPFv3 instance. The *instance-tag* argument can be any alphanumeric string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3 border-routers** command to display information on ABRs and ASBRs.

This command requires the Enterprise Services license.

Examples

This example shows how to display information about border routers:

```
switch# show ospfv3 border-routers
OSPFv3 Process ID p1, vrf default internal routing table
Codes: i - Intra-area route, I - Inter-area route

i 60.60.60.60 [10], ABR, Area 0.0.0.0, SPF 9
     via fe80::0206:d6ff:fec8:a41c, Ethernet2/5
i 60.60.60.60 [10], ABR, Area 0.0.0.1, SPF 9
     via fe80::0206:d6ff:fec8:a408, Ethernet2/6
```

Table 17-11 describes the significant fields shown in the display.

Table 49: show ospfv3 border-routers Field Descriptions

Field	Description
40.40.40.40	Router ID of the destination.
[10]	Cost of using this route.
ABR	Router type of the destination; the type is either an ABR, ASBR, or both.
Area	Area ID of the area from which this route is learned.

Field	Description
SPF 71	Internal number of the shortest path first (SPF) calculation that installs this route.
via fe80::0206:d6ff:fec8:a41c	Next hop toward the destination.
Ethernet2/1	Interface type for the outgoing interface.

show ospfv3 database

To display the Open Shortest Path First version 3 (OSPFv3) database for a specific router, use the **show ospfv3 database** command.

show [**ipv6**] **ospfv3** [*instance-tag*] **database** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show [**ipv6**] **ospfv3** [*instance-tag*] **database asbr-summary** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show [**ipv6**] **ospfv3** [*instance-tag*] **database database-summary** [**vrf** *vrf-name*]
show [**ipv6**] **ospfv3** [*instance-tag*] **database external** [**ext_tag** *value*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show [**ipv6**] **ospfv3** [*instance-tag*] **database network** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show [**ipv6**] **ospfv3** [*instance-tag*] **database nssa-external** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show [**ipv6**] **ospfv3** [*instance-tag*] **database opaque-area** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show [**ipv6**] **ospfv3** [*instance-tag*] **database opaque-as** [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show [**ipv6**] **ospfv3** [*instance-tag*] **database opaque-link** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show [**ipv6**] **ospfv3** [*instance-tag*] **database router** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]
show [**ipv6**] **ospfv3** [*instance-tag*] **database summary** [*area-id*] [*link-state-id*] [{**adv-router** *ip-address* | **self-originated**}] [**detail**] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
area-id	(Optional) Area number used to define the particular area. Specify as either an IP address or a number from 0 to 4294967295.
link-state-id	(Optional) Portion of the Internet environment that is being described by the advertisement. The value entered depends on the advertisement's link-state type. Specify in the form of an IP address.
adv-router*ip-address*	(Optional) Displays all the link-state advertisements (LSAs) of the specified router.
self-originate	(Optional) Displays self-originated LSAs (from the local router).
asbr-summary	(Optional) Displays information about the autonomous system boundary router summary LSAs.
database-summary	(Optional) Displays each type of LSA for each area in the database, and the total number of LSAs.
external	(Optional) Displays information about the external LSAs.
ext_tag *value*	(Optional) Displays information based on an external tag. The range is from 1 to 4294967295.

network	(Optional) Displays information about the network LSAs.
nssa-external	(Optional) Displays information about the not-so-stubby area (NSSA) external LSAs.
opaque-area	(Optional) Displays information about the opaque area LSAs.
opaque-as	(Optional) Displays information about the opaque AS LSAs.
opaque-link	(Optional) Displays information about the opaque link-local LSAs.
router	(Optional) Displays information about the router LSAs.
summary	(Optional) Displays information about the summary LSAs.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **ipv6 ospfv3 database** command to display information about different OSPFv3 LSAs.

When the link state advertisement is describing a network, the *link-state-id* argument can take one of two forms:

- The network’s IP address (such as Type 3 summary link advertisements and autonomous system external link advertisements).
- A derived address obtained from the link state ID. (Note that masking a network links advertisement’s link state ID with the network’s subnet mask yields the network’s IP address.)
- When the link state advertisement is describing a router, the link state ID is always the described router’s OSPFv3 router ID.
- When an autonomous system external advertisement (LS Type = 5) is describing a default route, its link state ID is set to Default Destination (0.0.0.0).

This command requires the Enterprise Services license.

Examples

This example shows how to display the OSPFv3 database:

```
Router# show ospfv3 database
OSPFv3 Router with ID (40.40.40.40) (Process ID p1)

                Router Link States (Area 0)

Link ID         ADV Router      Age  Seq#       Link Count
0.0.0.0         40.40.40.40     301  0x8000006d 1
0.0.0.0         60.60.60.60     1655 0x80000a59 1

                Network Link States (Area 0)
```

```
Link ID         ADV Router      Age  Seq#       Routers
0.0.0.5         60.60.60.60     1655 0x8000005c 2

                Inter-Area Prefix Link States (Area 0)

Link ID         ADV Router      Age  Seq#       Prefix
0.0.0.2         40.40.40.40     301  0x8000006a 1111:2222::/32
0.0.0.4         40.40.40.40     291  0x80000066 1111:6666::/32
0.0.0.6         40.40.40.40     291  0x80000066 6161:6161::6161/128
0.0.0.0         60.60.60.60     147  0x800009f6 6161:6161::6161/128
0.0.0.111       60.60.60.60     1655 0x8000005c 1111:6666::/32
0.0.0.112       60.60.60.60     1655 0x8000005c 1111:2222::/32

                Intra-Area Prefix Link States (Area 0)

Link ID         ADV Router      Age  Seq#       Ref-lstype Ref-LSID
1.0.0.0         40.40.40.40     301  0x8000006e Router     0.0.0.0
0.0.0.0         60.60.60.60     1655 0x80000a32 Router     0.0.0.0
0.0.3.237       60.60.60.60     1655 0x8000005c Network    0.0.0.5

                Link-Local Link States (Area 0)

Link ID         ADV Router      Age  Seq#       Interface
0.0.0.1         40.40.40.40     341  0x80000066 Enet2/1
0.0.0.3         40.40.40.40     341  0x80000066 Enet24
0.0.0.4         40.40.40.40     301  0x8000006d Enet25
0.0.0.5         60.60.60.60     147  0x80000917 Enet25

                Router Link States (Area 1)

Link ID         ADV Router      Age  Seq#       Link Count
0.0.0.0         40.40.40.40     291  0x8000006d 1
0.0.0.0         60.60.60.60     1655 0x80000abd 1

                Network Link States (Area 1)

Link ID         ADV Router      Age  Seq#       Routers
0.0.0.4         60.60.60.60     1655 0x8000005c 2

                Inter-Area Prefix Link States (Area 1)

Link ID         ADV Router      Age  Seq#       Prefix
0.0.0.1         40.40.40.40     291  0x8000006a 1111:1111::/32
0.0.0.3         40.40.40.40     331  0x80000066 1111:4444::0001/128
0.0.0.5         40.40.40.40     291  0x80000066 6060:6060::6060/128
0.0.0.0         60.60.60.60     147  0x800009f6 6060:6060::6060/128
0.0.0.156       60.60.60.60     409  0x8000005d 1111:5555::/32
0.0.0.158       60.60.60.60     1655 0x8000005c 1111:1111::/32
0.0.0.159       60.60.60.60     1655 0x8000005c 1111:4444::0001/128

                Intra-Area Prefix Link States (Area 1)

Link ID         ADV Router      Age  Seq#       Ref-lstype Ref-LSID
1.0.0.0         40.40.40.40     291  0x8000006e Router     0.0.0.0
0.0.0.0         60.60.60.60     1655 0x80000a54 Router     0.0.0.0
0.0.3.236       60.60.60.60     1655 0x8000005c Network    0.0.0.4

                Link-Local Link States (Area 1)

Link ID         ADV Router      Age  Seq#       Interface
0.0.0.2         40.40.40.40     341  0x80000066 Enet2/2
0.0.0.5         40.40.40.40     291  0x8000006d Enet2/6
0.0.0.4         60.60.60.60     1655 0x8000005d Enet2/6
```

Table 17-12 describes the significant fields shown in the display.

Table 50: show ospfv3 database Field Descriptions

Field	Description
Link ID	Router ID number.
ADV Router	Advertising router's ID.
Age	Link state age.
Seq#	Link state sequence number (detects old or duplicate link state advertisements).
Checksum	Checksum of the complete contents of the link state advertisement.
Link count	Number of interfaces detected for the router.

This example shows how to display a summary of autonomous system border routers:

```
Router# show ospfv3 database asbr-summary
OSPFv3 Router with id(192.168.239.66) (Process ID 300)
                Displaying Summary ASB Link States(Area 0.0.0.0)
 LS age: 1463
 Options: (No TOS-capability)
 LS Type: Summary Links(AS Boundary Router)
 Link State ID: 172.16.245.1 (AS Boundary Router address)
 Advertising Router: 172.16.241.5
 LS Seq Number: 80000072
 Checksum: 0x3548
 Length: 28
 Network Mask: 0.0.0.0 TOS: 0  Metric: 1
```

Table 17-13 describes the significant fields shown in the display.

Table 51: show ospfv3 database asbr-summary Field Descriptions

Field	Description
OSPFv3 Router with id	Router ID number.
Process ID	OSPFv3 process ID.
LS age	Link state age.
Options	Type of service options (Type 0 only).
LS Type	Link state type.
Link State ID	Link state ID (autonomous system boundary router).
Advertising Router	Advertising router's ID.
LS Seq Number	Link state sequence (detects old or duplicate link state advertisements).
Checksum	Checksum of the complete contents of the link state advertisement.
Length	Length in bytes of the link state advertisement.

Field	Description
Network Mask	Network mask implemented.
TOS	Type of service.
Metric	Link state metric.

This example shows how to display information about external links:

```
Router# show ospfv3 database external
OSPFv3 Router with id(192.168.239.66) (Autonomous system 300)
                   Displaying AS External Link States
LS age: 280
Options: (No TOS-capability)
LS Type: AS External Link
Link State ID: 10.105.0.0 (External Network Number)
Advertising Router: 172.16.70.6
LS Seq Number: 80000AFD
Checksum: 0xC3A
Length: 36
Network Mask: 255.255.0.0
       Metric Type: 2 (Larger than any link state path)
       TOS: 0
       Metric: 1
       Forward Address: 0.0.0.0
       External Route Tag: 0
```

Table 17-14 describes the significant fields shown in the display.

Table 52: show ospfv3 database external Field Descriptions

Field	Description
OSPFv3 Router with id	Router ID number.
Autonomous system	OSPFv3 autonomous system number (OSPFv3 process ID).
LS age	Link state age.
Options	Type of service options (Type 0 only).
LS Type	Link state type.
Link State ID	Link state ID (external network number).
Advertising Router	Advertising router's ID.
LS Seq Number	Link state sequence number (detects old or duplicate link state advertisements).
Checksum	Checksum of the complete contents of the LSA.
Length	Length in bytes of the link state advertisement.
Network Mask	Network mask implemented.
Metric Type	External type.

Field	Description
TOS	Type of service.
Metric	Link state metric.
Forward Address	Forwarding address. Data traffic for the advertised destination will be forwarded to this address. If the forwarding address is set to 0.0.0.0, data traffic will be forwarded instead to the advertisement's originator.
External Route Tag	External route tag; a 32-bit field attached to each external route. This field is not used by the OSPFv3 protocol itself.

This example shows how to display a summary of the OSPFv3 database:

```
Router# show ospfv3 database database-summary
OSPFv3 Router with ID (100.0.0.1) (Process ID 1)
Area 0 database summary
  LSA Type      Count    Delete   Maxage
  Router        3        0        0
  Network       0        0        0
  Summary Net   0        0        0
  Summary ASBR  0        0        0
  Type-7 Ext    0        0        0
    Self-originated Type-7  0
Opaque Link     0        0        0
  Opaque Area   0        0        0
  Subtotal      3        0        0
Process 1 database summary
  LSA Type      Count    Delete   Maxage
  Router        3        0        0
  Network       0        0        0
  Summary Net   0        0        0
  Summary ASBR  0        0        0
  Type-7 Ext    0        0        0
  Opaque Link   0        0        0
  Opaque Area   0        0        0
  Type-5 Ext    0        0        0
      Self-originated Type-5  200
Opaque AS       0        0        0
  Total       203        0        0
```

Table 17-15 describes the significant fields shown in the display.

Table 53: show ospfv3 database database-summary Field Descriptions

Field	Description
Area 0 database summary	Area number.
Count	Count of LSAs of the type identified in the first column.
Router	Number of router link state advertisements in that area.
Network	Number of network link state advertisements in that area.
Summary Net	Number of summary link state advertisements in that area.

Field	Description
Summary ASBR	Number of summary autonomous system boundary router (ASBR) link state advertisements in that area.
Type-7 Ext	Type-7 LSA count.
Self-originated Type-7	Self-originated Type-7 LSA.
Opaque Link	Type-9 LSA count.
Opaque Area	Type-10 LSA count.
Subtotal	Sum of LSAs for that area.
Delete	Number of link state advertisements that are marked “Deleted” in that area.
Maxage	Number of link state advertisements that are marked “Maxaged” in that area.
Process 1 database summary	Database summary for the process.
Count	Count of LSAs of the type identified in the first column.
Router	Number of router link state advertisements in that process.
Network	Number of network link state advertisements in that process.
Summary Net	Number of summary link state advertisements in that process.
Summary ASBR	Number of summary autonomous system boundary router (ASBR) link state advertisements in that process.
Type-7 Ext	Type-7 LSA count.
Opaque Link	Type-9 LSA count.
Opaque Area	Type-10 LSA count.
Type-5 Ext	Type-5 LSA count.
Self-Originated Type-5	Self-originated Type-5 LSA count.
Opaque AS	Type-11 LSA count.
Total	Sum of LSAs for that process.

show ospfv3 interface

To display Open Shortest Path First version 3 (OSPFv3)-related interface information, use the **show ospfv3 interface** command.

show [**ipv6**] **ospfv3 interface** [*instance-tag*] [*interface-type interface-number*] [**brief**] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
interface-type	(Optional) Interface type. If the *interface-type* argument is included, only information for the specified interface type is included. Type ? on the CLI for help on available options for this argument.
interface-number	(Optional) Interface number. If the *interface-number* argument is included, only information for the specified interface number is included. Type ? on the CLI for help on available options for this argument.
brief	(Optional) Displays brief overview information for OSPFv3 interfaces, states, addresses, masks, and areas on the router.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3 interface** command to display the OSPFv3 status for the interface.

This command requires the Enterprise Services license.

Examples

This example shows how to display OSPFv3 information for Ethernet interface 1/2:

```
switch# show ospfv3 interface ethernet 1/2
Ethernet1/2 is up, line protocol is up
   IP address 192.0.2.1, Process ID 201 vrf default, area 10
   IPv6 address 2001:0DB8::1
    Process ID sd vrf default, Instance ID 0, area 0
    State DOWN, Network type P2P, cost 65535
    Index 1, Transmit delay 1 sec
    0 Neighbors, flooding to 0, adjacent with 0
    Timer intervals: Hello 10, Dead 40, Wait 40, Retransmit 5
    Number of link LSAs: 0, checksum sum 0
```

Table 17-16 describes the significant fields shown in the display.

Table 54: show ospfv3 interface Field Descriptions

Field	Description
Ethernet	Status of physical link and operational status of protocol.
IPv6 Address	Interface IPv6 address.
vrf	Virtual routing and forwarding (VRF) instance.
Transmit Delay	Transmit delay, interface state, and router priority.
designated router	Designated router ID and interface IP address.
backup designated router	Backup designated router ID and interface IP address.
Timer intervals	Configuration of timer intervals.
Hello	Number of seconds until next hello packet is sent out this interface.

show ospfv3 memory

To display the memory usage statistics for the Open Shortest Path First version 3 (OSPFv3) protocol, use the **show ospfv3 memory** command.

show [ipv6] ospfv3 memory

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display the memory statistics for OSPFv3:

```
Router# show ospfv3 memory
 OSPFv3 Process ID sd, Memory statistics
  Process memory: 2096 KB
  Byte usage:    needed 0, overhead 192, using 192 bytes
  Allocations:   current 6, created 6, failed 0, free 0
  Bitfields:     current 30, created 30, failed 0, free 0, using 248010 bytes
  Slabs:         current 2, created 2, failed 0, free 0, using 80 bytes
  Index failure: Interface 0, Neighbor 0
  Slab Memory
  OSPFv3 vertex slab
  Alloc 1, max allocs 1, total allocs 1, total frees 0
  Total block allocs 1, total block frees 0, max blocks 1
  Bytes (size/allocated) 68/69720
  OSPFv3 IPv4 prefix routes slab
  Alloc 0, max allocs 0, total allocs 0, total frees 0
  Total block allocs 0, total block frees 0, max blocks 0
  Bytes (size/allocated) 188/64
  OSPFv3 router routes slab
  Alloc 0, max allocs 0, total allocs 0, total frees 0
  Total block allocs 0, total block frees 0, max blocks 0
  Bytes (size/allocated) 100/64
  OSPFv3 IPv4 next-hops slab
  Alloc 1, max allocs 1, total allocs 1, total frees 0
  Total block allocs 1, total block frees 0, max blocks 1
  Bytes (size/allocated) 32/262232
```

show ospfv3 neighbors

To display Open Shortest Path First version 3 (OSPFv3)-neighbor information on a per-interface basis, use the **show ospfv3 neighbor** command.

show [**ipv6**] **ospfv3** [*instance-tag*] **neighbors** [*interface-type interface-number*] [*neighbor-id*] [**detail**] [**summary**] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
area-id	(Optional) Area number used to define the particular area. Specify as an IP address or a number from 0 to 4294967295.
interface-type	(Optional) Interface type. If the *interface-type* argument is included, only information for the specified interface type is included. Type ? on the CLI for help on available options for this argument.
interface-number	(Optional) Interface number. If the *interface-number* argument is included, only information for the specified interface number is included. Type ? on the CLI for help on available options for this argument.
neighbor-id	(Optional) Router ID of the neighbor. Specify as an IP address.
detail	(Optional) Displays all neighbors given in detail (lists all neighbors).
summary	(Optional) Displays a summary of the neighbors.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3 neighbors** command to display information about all or some of the neighbors for this OSPFv3 instance.

This command requires the Enterprise Services license.

Examples

This example shows how to display the summary information about the neighbor that matches the neighbor ID:

```
Router# show ospfv3 neighbors
OSPFv3 Process ID p1 vrf Red
 Total number of neighbors: 2
```

```
Neighbor ID     Pri State            Up Time  Interface ID    Interface
60.60.60.60       1 FULL/DR          2d03h    5               GigE2/0/5
  Neighbor address fe80::0206:d6ff:fec8:a41c
60.60.60.60       1 FULL/DR          2d03h    4               GigE2/0/6
  Neighbor address fe80::0206:d6ff:fec8:a408
```

Table 17-17 describes the significant fields shown in the displays.

Table 55: show ospfv3 neighbors Field Descriptions

Field	Description
Neighbor ID	Neighbor router ID.
Pri State	OSPFv3 priority and state.
Up Time	Time since the OSPFv3 established adjacency with this neighbor.

show ospfv3 policy statistics area

To display Open Shortest Path First version 3 (OSPFv3) policy statistics for an area, use the **show ospfv3 policy statistics area** command.

show [**ipv6**] **ospfv3** [*instance-tag*] **policy statistics area** *area id* **filter-list** {**in** | **out**} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
area *area-id*	Specifies the area number used to define the particular area. Specify as an IP address or a number from 0 to 4294967295.
filter-list	Filters prefixes between OSPFv3 areas.
in	Displays policy statistics for incoming routes.
out	Displays policy statistics for outgoing routes.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3 policy statistics area** command to display information about the filter lists applied to an area.

This command requires the Enterprise Services license.

Examples

This example shows how to display policy statistics for OSPFv3:

```
switch# show ospfv3 policy statistics area
```

show ospfv3 policy statistics redistribute

To display Open Shortest Path First version 3 (OSPFv3) policy statistics, use the **show ospfv3 policy statistics redistribute** command.

show [**ipv6**] **ospfv3** [*instance-tag*] **policy statistics redistribute** {**bgp** *id* | **direct** | **isis** *id* | **rip** *id* | **static**} [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
bgp	Displays policy statistics for the Border Gateway Protocol (BGP).
direct	Displays policy statistics for directly connected routes only.
isis	Displays policy statistics for the Intermediate-System to Intermediate-System (IS-IS) routing protocol.
rip	Displays policy statistics for the Routing Information Protocol (RIP).
static	Displays policy statistics for IP static routes.
id	For the **bgp** keyword, an autonomous system number. The range for 2-byte numbers is from 1 to 65535. The range for 4-byte numbers is from 1.0 to 65535.65535. For the **isis** and **rip** keywords, an instance name from which routes are to be redistributed. The value takes the form of a string. You can enter a decimal number, but Cisco NX-OS stores it internally as a string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3 policy statistics redistribute** command to display redistribution statistics.

This command requires the Enterprise Services license.

Examples

This example shows how to display policy statistics for redistributed routes:

```
switch# show ospfv3 policy statistics redistribute
```

show ospfv3 request-list

To display a list of all link-state advertisements (LSAs) requested by a router, use the **show ospfv3 request-list** command.

show [**ipv6**] **ospfv3 request-list** *neighbor-id interface interface-number*

Syntax Description

neighbor-id	Router ID of the neighbor. Specify as an IP address.
interface-type	Interface type. If the *interface-type* argument is included, only information for the specified interface type is included. Type ? on the CLI for help on available options for this argument.
interface-number	Interface number. If the *interface-number* argument is included, only information for the specified interface number is included. Type ? on the CLI for help on available options for this argument.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3 request-list** command to troubleshoot Open Shortest Path First version 3 (osPFv3) routing operations.

This command requires the Enterprise Services license.

Examples

This example shows how to display a list of all LSAs requested by a router:

```
Router# show ospfv3 request-list 40.40.40 ethernet 2/1
 OSPFv3 Process ID p1
 Neighbor 40.40.40.40, interface Ethernet2/1, address 192.0.2.1
 1 LSAs on request-list
  Type  LS ID           ADV RTR          Seq NO      Age    Checksum
    1  192.0.2.12      192.0.2.12          0x8000020D  8      0x6572
```

Table 17-18 describes the significant fields shown in the displays.

Table 56: show ospfv3 request-list Field Descriptions

Field	Description
Type	LSA type.
LS ID	IP address of the neighbor router.
ADV RTR	IP address of the advertising router.
Seq NO	Packet sequence number of the LSA.

Field	Description
Age	Age, in seconds, of the LSA.
Checksum	Checksum number of the LSA.

show ospfv3 retransmission-list

To display a list of all link-state advertisements (LSAs) waiting to be resent to neighbors, use the **show ospfv3 retransmission-list** command.

show [**ipv6**] **ospfv3 retransmission-list** *neighbor-id interface interface-number*

Syntax Description

neighbor-id	Router ID of the neighbor. Specify as an IP address.
interface-type	Interface type. If the *interface-type* argument is included, only information for the specified interface type is included. Type ? on the CLI for help on available options for this argument.
interface-number	Interface number. If the *interface-number* argument is included, only information for the specified interface number is included. Type ? on the CLI for help on available options for this argument.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3 retransmission-list** command to troubleshoot Open Shortest Path First version 3 (osPFv3) routing operations.

This command requires the Enterprise Services license.

Examples

This example shows how to display all LSAs waiting to be resent to neighbors:

```
Router# show ospfv3 retransmission-list 192.0.2.11 ethernet 2/1

             OSPFv3 Router with ID (192.0.2.12) (Process ID 1)

  Neighbor 192.0.2.11, interface Ethernet2/1 address 209.165.201.11
  Link state retransmission due in 3764 msec, Queue length 2

  Type  LS ID             ADV RTR          Seq NO      Age    Checksum
     1  192.0.2.12      192.0.2.12          0x80000210  0      0xB196
```

Table 17-19 describes the significant fields shown in the displays.

Table 57: show ospfv3 retransmission-list Field Descriptions

Field	Description
Type	LSA type.
LS ID	IP address of the neighbor router.

Field	Description
ADV RTR	IP address of the advertising router.
Seq NO	Packet sequence number of the LSA.
Age	Age, in seconds, of the LSA.
Checksum	Checksum number of the LSA.

show ospfv3 routes

To display the Open Shortest Path First version 3 (OSPFv3) topology table, use the **show ospfv3 routes** command.

show [**ipv6**] **ospfv3** [*instance-tag*] **routes** [{*prefix*/*length* | **summary**}] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
prefix /*length*	(Optional) IP prefix, which limits output to a specific route. Indicate the length as a slash (/) and number from 1 to 255. For example, /8 indicates that the first eight bits in the IP prefix are network bits.
summary	(Optional) Displays a summary of all routes.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3 routes** command to display the OSPFv3 private routing table (which contains only routes that are calculated by OSPFv3). If something is wrong with a route in the routing information base (RIB), then you should check the OSPFv3 copy of the route to determine if it matches the RIB contents. If it does not match, a synchronization problem exists between OSPFv3 and the RIB.

This command requires the Enterprise Services license.

Examples

This example shows how to display OSPFv3 routes:

```
RP/0/RP0/CPU0:router# show ospfv3 routes
OSPFv3 routing table
1111:1111::/32 (i) area 0
     via directly connected
1111:2222::/32 (i) area 1
     via directly connected
1111:4444::0001/128 (i) area 0
     via directly connected
1111:5555::/32 (i) area 0
1111:6666::/32 (i) area 1
     via directly connected
6060:6060::6060/128 (i) area 0
     via fe80::0206:d6ff:fec8:a41c/Enet2/5, cost 10
6161:6161::6161/128 (i) area 1
     via fe80::0206:d6ff:fec8:a408/Enet2/6, cost 10
```

Table 17-20 describes the significant fields shown in the display.

Table 58: show ospfv3 route Field Descriptions

Field	Description
1111:1111::/32	Router ID for the router that advertised this route.
via...	Packets destined for the given prefix are sent over the listed interface or directly connected to this device.

show ospfv3 statistics

To display Open Shortest Path First version 3 (OSPFv3) shortest path first (SPF) calculation statistics, use the **show ospfv3 statistics** command.

show [**ipv6**] **ospfv3** [*instance-tag*] **statistics** [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3 statistics** command to display information about link-state advertisements (LSAs). This information can be useful for both OSPFv3 network maintenance and troubleshooting. For example, we recommend that you use the **show ospfv3 statistics** command as the first troubleshooting step for LSA flapping.

This command requires the Enterprise Services license.

Examples

This example shows how to display information about the SPF calculations:

```
Router# show ospfv3 statistics
OSPFv3 Process p1 vrf default, Event statistics (cleared 2w3d ago)
  Router ID changes: 0
  DR elections: 5
  Older LSAs received: 0
  Neighbor state changes: 10
  Neighbor dead postponed: 0
  Neighbor dead interval expirations: 0
  Neighbor bad lsreqs: 0
  Neighbor sequence number mismatches: 0
  SPF computations:  9 full, 0 summary, 0 external

          LSA Type Generated Refreshed   Flushed  Aged out
            Router         4       202         0         0
           Network         0         0         0         0
  Inter-Area-Prefix        0       606         7         0
  Inter-Area-Router        0         0         0         0
        AS External        0         0         0         0
         Link-Local        7       505         0         0
  Intra-Area-Prefix        6       202         0         0
           Unknown         0         0         0         0

Following counters can not be reset:
```

```
LSA deletions: 0 pending, 2 hwm, 16 deleted, 0 revived, 2 runs
Hello queue: 0/200, hwm 2, drops 0
Flood queue: 0/100, hwm 2, drops 0
LSDB additions failed: 0

       Buffers:    in use       hwm permanent     alloc      free
     128 bytes          0         2         1    142512    142512
     512 bytes          0         2         2       779       779
    1520 bytes          0         1         0         1         1
    4500 bytes          0         1         1       891       891
          huge          0         0         0         0         0
```

Table 17-21 describes the significant fields shown in the display.

Table 59: show ospfv3 statistics Field Descriptions

Field	Description
OSPFv3 process	Unique value assigned to the OSPFv3 instance in the configuration.
vrf	Virtual routing and forwarding (VRF) for this OSPFv3 instance.
DR elections	Number of times that a new designated router was elected.
Neighbor...	Details about neighbors.
LSA Type	Number of each type of LSA sent.

show ospfv3 summary-address

To display a list of all summary address redistribution information configured in an Open Shortest Path First version 3 (OSPFv3) instance, use the **show ospfv3 summary-address** command.

show [**ipv6**] **ospfv3** [*instance-tag*] **summary-address** [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the Enterprise Services license.

Examples

This example shows how to display information about summary addresses:

```
Router# show ospfv3 summary-address

OSPFv3 Router with ID (40.40.40.40) (Process ID p1Configured summary-address

2000::/8 Pending
6161::/16 Pending
```

Table 17-17 describes the significant fields shown in the displays.

Table 60: show ospfv3 summary-address Field Descriptions

Field	Description
10.2.0.0/255.255.0.0	IP address and mask of the router for the OSPFv3 process.
Metric -1	OSPFv3 metric type.
Type 0	Type of LSA.
Tag 0	OSPFv3 process tag identifier.

show ospfv3 traffic

To display Open Shortest Path First version 3 (OSPFv3) traffic statistics, use the **show ospfv3 traffic** command.

show [**ipv6**] **ospfv3** [*instance-tag*] **traffic** [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Specify as an alphanumeric string.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3 traffic** command to display traffic statistics for one or more OSPFv3 instances.

This command requires the Enterprise Services license.

Examples

This example shows how to display OSPFv3 traffic statistics:

```
Router# show ospfv3 traffic
 OSPFv3 Process ID p1, vrf Red, Packet Counters (cleared 2w3d ago)
  Total: 1690 in, 349230 out
  LSU transmissions: first 100, rxmit 108, for req 16
  Flooding packets output throttled (IP/tokens): 0 (0/0)
  Ignored LSAs: 0, LSAs dropped during SPF: 0
  LSAs dropped during graceful restart: 0
  Errors: drops in        0, drops out       0, errors in       0
          errors out      0, unknown in      0, unknown out     0
          no ospfv3         0, bad version     0, bad crc         0
          dup rid         0, dup src         0, invalid src     0
          invalid dst     0, no nbr          0, passive         0
          wrong area      0, nbr changed rid/ip addr            0
          bad auth        0

           hellos       dbds     lsreqs       lsus       acks
   In:       1411         70         16        136         57
  Out:     348871         62          4        224         69
```

Table 17-23 describes the significant fields shown in the display.

Table 61: show ospfv3 traffic Field Descriptions

Field	Description
OSPFv3 Process	OSPFv3 instance tag for these traffic statistics.

Field	Description
vrf	Virtual routing and forwarding (VRF) for this OSPFv3 instance.
Errors	
drops	Number of packets dropped.
bad version	Number of packets received with bad version.
dup rid	Number of packets with a duplicate router-id
dup src	Number of packets with a duplicate source address
no nbr	Number of packets from a router that is not a full neighbor.
nbr changed rid/ip addr	Number of packets with router-id/ip address pair not matching our neighbor's values.
lsreq	Number of packets of type LSREQ (LSA required)
lsacks	Number of packets of type LSACK (LSA acknowledged)

Related Commands

Command	Description
clear ipv6 ospfv3 traffic	Clears OSPFv3 traffic statistics.

show ospfv3 virtual-links

To display parameters and the current state of Open Shortest Path First version 3 (OSPFv3) virtual links, use the **show ospfv3 virtual-links** command.

show [**ipv6**] **ospfv3** [*instance-tag*] **virtual-links** [**brief**] [**vrf** *vrf-name*]

Syntax Description

instance-tag	(Optional) Name of the OSPF instance. Use this tag to display OSPFv3 information about a specific OSPFv3 instance.
brief	(Optional) Displays a summary of the configured virtual links.
vrf *vrf-name*	(Optional) Specifies the name of the virtual routing and forwarding (VRF) instance. The *vrf-name* argument can be specified as any case-insensitive alphanumeric string up to 32 characters. The strings “default” and “all” are reserved VRF names.

Command Default

None

Command Modes

Any

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **show ospfv3 virtual-links** command to display information about configured virtual links.

This command requires the Enterprise Services license.

Examples

This example shows how to display information about virtual links:

```
Router# show ospfv3 virtual-links
Virtual link 2 to router 40.40.40.40 is up
  Process ID p1 vrf default, Transit area 1, via interface Ethernet1/2, cost 10
  Transit area 33, remote addr 0::
  IPv6 address 0::
  Process ID sd vrf default, Instance ID 0, area 0
  State DOWN, Network type P2P, cost 65535
  Index 1, Transmit delay 1 sec
  0 Neighbors, flooding to 0, adjacent with 0
  Timer intervals: Hello 10, Dead 40, Wait 40, Retransmit 5
  Number of link LSAs: 0, checksum sum 0
  Adjacency Information
```

Table 17-24 describes the significant fields shown in the display.

Table 62: show ospfv3 virtual-links Field Descriptions

Field	Description
Virtual Link	OSPFv3 neighbor and whether the link to that neighbor is up or down.
vrf	Virtual routing and forwarding (VRF) for this OSPFv3 instance.

Field	Description
Transit area...	Transit area through which the virtual link is formed.
via interface...	Interface through which the virtual link is formed.
cost	Cost of reaching the OSPFv3 neighbor through the virtual link.
Transmit delay	Transmit delay (in seconds) on the virtual link.
Timer intervals...	Various timer intervals configured for the link.
Hello timer due in 0:00:04	Time when the next hello is expected from the neighbor.

show routing

To display routing information, use the **show routing** command.

show routing [{**ip** | **ipv4** | **ipv6**}] [{*addresshostnameprefixroute-type* | **clients** | **hidden-nh** **interface** *type number* | **next-hop** *addr* | **recursive-next-hop** [*addr*]}] [**vrf** *vrf-name*]

Syntax Description

address	(Optional) IPv4 or IPv6 address. IPv4 address format is x.x.x.x. IPv6 address format is A:B::C:D.
hostname	Host name. The *name* can be any case-sensitive, alphanumeric string up to 80 characters.
prefix	(Optional) IPv4 or IPv6 prefix. IPv4 prefix format is x.x.x.x/length. IPv6 address format is A:B::C:D/length.
route-type	(Optional) Type of route. Use **?** to see the list of types.
clients	(Optional) Displays the routing clients.
hidden-nh	(Optional) Displays hidden next-hop information.
interface *type number*	(Optional) Displays the routes for an interface. Use **?** to see the supported interfaces.
next-hop *addr*	(Optional) Displays routes with this next-hop address. The format is x.x.x.x.
recursive-next-hop *addr*	(Optional) Displays routes with this recursive next-hop address. The format is x.x.x.x.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modificaont
4.0(1)	This command was introduced.
4.1(2)	Added *hostname* argument.
4.2(1)	Added **hidden-nh** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the route table:

```
switch(config)# show ip routing
```

```
IP Route Table for VRF "default"
'*' denotes best ucast next-hop       '**' denotes best mcast next-hop
'[x/y]' denotes [preference/metric]
0.0.0.0/32, 1 ucast next-hops, 0 mcast next-hops
   *via Null0, [220/0], 00:45:24, local, discard
255.255.255.255/32, 1 ucast next-hops, 0 mcast next-hops
   *via sup-eth1, [0/0], 00:45:24, local
```

Related Commands

Command	Description
clear ip route	Clears entries in the route table.

show routing hash

To display the route selected for a particular source and destination address, use the **show routing hash** command.

show routing hash *source-addr dest-addr* [*source-port dest-port*] [**vrf** *vrf-name*]

Syntax Description

source-addr	Source IPv4 address. IPv4 address format is x.x.x.x.
dest-addr	Destination IPv4 address. IPv4 address format is x.x.x.x.
source-port	(Optional) Source port. The range is from 1 to 65535.
dest-port	(Optional) Destination port. The range is from 1 to 65535.
vrf *vrf-name*	(Optional) Specifies the virtual router context (VRF) name. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the route selected to reach 30.0.0.2 from 10.0.0.5:

```
switch# show routing hash  10.0.0.5 30.0.0.2
  Load-share parameters used for software forwarding:
  load-share mode: address source-destination port source-destination
  Universal-id seed: 0xe05e2e85
  Hash for VRF "default"
  Hashing to path *20.0.0.2 (hash: 0x0e), for route:
```

Related Commands

Command	Description
clear ip route	Clears entries in the route table.

show routing ipv6 memory estimate routes

To display routing information, use the **show routing ipv6 memory estimate routes** command.

show routing ipv6 memory estimate routes *routes-number* **next-hops** *next-hops number* **labels**

Syntax Description

routes-number	Displays the number of routes. The range is from 1000 to 1000000.
next-hops	Displays u6rib memory estimate for # next-hops per route.
next-hops number	Displays the number of next-hops per route.
labels	Displays routes that are associated with next hop labels.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
5.2(x)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the routes that are associated with next-hops labels:

```
switch# show routing ipv6 memory estimate routes 1000 next-hops 1 labels
Shared memory estimates:
  Current max     24 MB;  14882 routes with 16 nhs
          in-use   1 MB;      3 routes with  1 nhs (average)
  Configured max  24 MB;  14882 routes with 16 nhs
  Estimate         1 MB;   1000 routes with  1 nhs
switch#
```

Related Commands

Command	Description
clear ip route	Clears entries in the route table.

show routing memory estimate

To display an estimate of routing memory requirements, use the **show routing memory estimate** command.

{**show routing memory estimate** *num-routes* | **next-hops** *num-hop-addresses*}

Syntax Description

num-routes	Number of routes. The range is from 1000 to 112000.
num-hop-addresses	Number of next-hop addresses per route. The range is from 1 to 16.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **show routing memory estimate** command to estimate the memory required for a selected number of routes and number of next-hop addresses per route.

This command does not require a license.

Examples

This example shows how to display the route table:

```
switch# show routing ip unicast memory estimate routes 2000 next-hops 5 labels
Shared memory estimates:
  Current max     96 MB;  67884 routes with 16 nhs
          in-use   1 MB;    149 routes with  1 nhs (average)
  Configured max  96 MB;  67884 routes with 16 nhs
  Estimate         2 MB;   2000 routes with  5 nhs
  Variable overheads:
    14 bytes: per next hop per route in every MVPN enabled VRF
    24 bytes: per OSPF route in every VRF where OSPF is PE-CE protocol
    54 bytes: per EIGRP route in every VRF where EIGRP is PE-CE protocol
switch#
```

show routing-context

To display the virtual routing and forwarding (VRF) scope for all EXEC commands, use the **show routing-context** command.

show routing-context

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how display the current routing context:

```
switch%management# show routing-context
Current Route Context: management
```

Related Commands

Command	Description
routing-context vrf	Configures the routing context.

show running-config wccp

To display running configuration for WCCP, use the show **running-config wccp** command.

show running-config wccp

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
5.1(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the running configuration for WCCP:

```
switch# show running-config wccp
!Command: show running-config wccp
!Time: Tue Jul 13 12:18:37 2010
version 5.1(1)
feature wccp
ip wccp 1 hia-timeout 13
ip wccp 23 hia-timeout 14
ip wccp 61 hia-timeout 12
ip wccp 234 hia-timeout 2
switch#
```

Related Commands

Command	Description
routing-context vrf	Configures the routing context.

show sockets client

To display information about the sockets clients, use the **show sockets client** command.

show sockets client [**pid id**] [{**raw** | **tcp** | **udp**}] [**detail**]

Syntax Description

pid *id*	(Optional) Displays the socket client information for a specific process. The *id* range is from 1 to 65535.
raw	(Optional) Displays information about the raw client.
tcp	(Optional) Displays information about the TCP client.
udp	(Optional) Displays information about the UDP client.
detail	(Optional) Displays information about the detailed client.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the UDP socket client information:

```
switch# show socket client udp
Total number of UDP clients: 8
client: syslogd, pid: 3307, sockets: 1
client: ntp, pid: 3577, sockets: 2
client: ntpd, pid: 3660, sockets: 3
client: snmpd, pid: 3579, sockets: 2
client: hsrp_engine, pid: 3786, sockets: 2
client: pim, pid: 3782, sockets: 1
client: glbp, pid: 3783, sockets: 1
client: radiusd, pid: 3572, sockets: 2
```

Related Commands

Command	Description
clear sockets statistics	Clears socket statistics.
show sockets connection	Displays information about the socket connection.
show sockets statistics	Displays information about the socket statistics.

show sockets connection

To display information about the sockets connection, use the **show sockets connection** command.

show sockets connection [**pid** *id*] [{**local** *address* | **foreign** *address* | **raw** | **tcp** | **udp**}] [**detail**]

Syntax Description

pid *id*	(Optional) Displays the socket client information for a specific process. the *id* range is from 1 to 65535.
local *address*	(Optional) Displays information about all the TCP connections with the specified local address. The *address* can be an IPv4 or an IPv6 address.
foreign *address*	(Optional) Displays information about all the TCP connections with the specified foreign address. The *address* can be an IPv4 or an IPv6 address.
raw	(Optional) Displays information about the raw client.
tcp	(Optional) Displays information about the TCP client.
udp	(Optional) Displays information about the UDP client.
detail	(Optional) Displays information about the detailed client.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the TCP socket connection information:

```
switch# show socket connection tcp
Total number of tcp sockets: 10
Active connections (including servers)
Protocol State/       Recv-Q/   Local Address(port)/
         Context      Send-Q    Remote Address(port)
tcp6     LISTEN       0         *(22)
         Wildcard     0         *(*)
tcp6     LISTEN       0         *(23)
         Wildcard     0         *(*)
tcp      LISTEN       0         *(161)
         Wildcard     0         *(*)
tcp6     LISTEN       0         *(161)
         Wildcard     0         *(*)
tcp      LISTEN       0         *(179)
         Wildcard     0         *(*)
tcp6     LISTEN       0         *(179)
         Wildcard     0         *(*)
```

```
tcp      ESTABLISHED  0         172.28.230.85(22)
         management   0         172.28.254.254(1055)
tcp      ESTABLISHED  0         172.28.230.85(22)
         management   0         172.28.254.254(3353)
tcp      ESTABLISHED  0         172.28.230.85(23)
         management   0         10.82.232.102(2390)
tcp      ESTABLISHED  0         172.28.230.85(23)
         management   4         161.44.67.127(1242)
```

Related Commands

Command	Description
clear sockets statistics	Clears the socket statistics.
show sockets client	Displays information about the socket client.
show sockets statistics	Displays the socket statistics.

show sockets statistics

To display the socket statistics, use the **show sockets statistics** command.

show sockets statistics [{**all** | **raw** | **raw6** | **rawsum** | **tcp** | **tcp6** | **tcpsum** | **udp** | **udp6** | **udpsum**}]

Syntax Description

all	(Optional) Displays all the socket statistics.
raw	(Optional) Displays the socket statistics for the raw IPv4 protocol socket statistics.
raw6	(Optional) Displays the socket statistics for the raw IPv6 protocol socket statistics.
rawsum	(Optional) Displays a summary of the socket statistics for the raw IPv4 and IPv6 protocol socket statistics.
tcp	(Optional) Displays the socket statistics for the TCP IPv4 protocol.
tcp6	(Optional) Displays the socket statistics for the TCP IPv6 protocol.
tcpsum	(Optional) Displays a summary of the socket statistics for the TCP IPv4 and IPv6 protocols.
udp	(Optional) Displays the socket statistics for the UDP IPv4 protocol.
udp6	(Optional) Displays the socket statistics for the UDP IPv6 protocol.
udpsum	(Optional) Displays a summary of the socket statistics for the UDP IPv4 and IPv6 protocols.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the TCP socket statistics:

```
switch# show sockets statistics tcp
TCP v4 Received:
        36490 packets total
        0 checksum error, 0 bad offset, 0 too short, 0 MD5 error
        18711 packets (950071 bytes) in sequence
        2 duplicate packets (136 bytes)
        0 partially dup packets (0 bytes)
        1 out-of-order packets (0 bytes)
        0 packets (0 bytes) with data after window
        0 packets after close
        0 window probe packets, 0 window update packets
        17 duplicate ack packets, 0 ack packets with unsent data
        26130 ack packets (8137813 bytes)
```

```
TCP v4 Sent:
        44602 total, 0 urgent packets
        6 control packets
        43908 data packets (8137790 bytes)
        0 data packets (0 bytes) retransmitted
        688 ack only packets
        0 window probe packets, 0 window update packets
TCP v4:
0 connections initiated, 21 connections accepted, 21 connections established
18 connections closed (including 11 dropped, 0 embryonic dropped)
0 total rxmt timeout, 0 connections dropped in rxmt timeout
12 keepalive timeout, 12 keepalive probe, 0 connections dropped in keepalive
```

Related Commands

Command	Description
clear sockets statistics	Clears socket statistics.
show sockets client	Displays information about the socket client.
show sockets connection	Displays information about the socket connection.

show track

To show information about object tracking, use the **show track** command.

show track [*object-id*] [{**interface** | {**ip** | **ipv6**} **route**}] [**brief**]

Syntax Description

object-id	(Optional) Tracking ID. The range can be from 1 to 500.
interface	(Optional) Displays information about tracked interfaces.
ip route	(Optional) Displays information about tracked IP routes.
ipv6 route	(Optional) Displays information about tracked IPv6 routes.
brief	(Optional) Displays brief information about tracked objects.

Command Default

Display information for all tracked objects.

Command Modes

Any command mode

Command History

Release	Modification
4.1(2)	Added **ipv6** keyword
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display information about tracked interfaces:

```
switch# show track interface
Track 1
  Interface Ethernet1/2 IP Routing
  IP Routing is DOWN
  1 changes, last change 00:35:14
Track 2
  Interface Ethernet2/2 Line Protocol
  Line Protocol is DOWN
  1 changes, last change 00:33:55
Track 4
  Interface Ethernet2/45 IP Routing
  IP Routing is DOWN
  1 changes, last change 00:17:03
Track 6
  Interface Ethernet2/34 Line Protocol
  Line Protocol is DOWN
  1 changes, last change 00:15:12
```

This example shows how to display information about tracked IP routes:

```
switch# show track ip route
```

```
Track 3
  IP Route 10.10.10.0/8 Reachability
  Reachability is DOWN
  1 changes, last change 00:22:09
```

This example shows how to display brief information about tracked objects:

```
switch# show track brief
Track Type         Instance            Parameter      State  Last Change
1     Interface    Ethernet1/2         IP Routing     DOWN   00:36:42
2     Interface    Ethernet2/2         Line Protocol  DOWN   00:35:22
3     IP Route     10.10.10.0/8        Reachability   DOWN   00:22:47
4     Interface    Ethernet2/45        IP Routing     DOWN   00:18:31
6     Interface    Ethernet2/34        Line Protocol  DOWN   00:16:40
switch#
```

Related Commands

Command	Description
track interface	Tracks the state of an interface.
track ip route	Tracks the state of an IP route.
track ipv6 route	Tracks the state of an IPv6 route.

show version internal build-identifier

To display the build id of currently running software versions, use the **show version internal build-identifier** command.

show version internal build-identifier

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

Any

Command History

Release	Modification
5.1(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the build id of currently running software versions:

```
switch(config)# show version internal build-identifier
Kickstart image file: /bootflash/n7000-s1-kickstart.5.1.0.159.gbin.S19 :  S19
System image file: bootflash:///n7000-s1-dk9.5.1.0.159.gbin.S19 :  S19
switch(config)#
```

Related Commands

Command	Description
feature vrrp	Enables the VRRP feature.
clear vrrp	Clears VRRP statistics.

show vrrp

To show information about the Virtual Router Redundancy Protocol (VRRP), use the **show vrrp** command.

show vrrp [{**detail** | **statistics** | **summary**}] [**interface** *if-number*] [**vr** *id*] [{**master** | **backup** | **init**}]

Syntax Description

detail	(Optional) Displays detailed information about VRRP.
statistics	(Optional) Displays VRRP statistics.
summary	(Optional) Displays the VRRP summary.
interface *if-number*	(Optional) Displays information about VRRP on an interface. Use **?** to see a list of supported interfaces.
vr *id*	(Optional) Displays information about VRRP for a group. The *id* range is from 1 to 255.
master	(Optional) Displays information about VRRP groups in the master state.
backup	(Optional) Displays information about VRRP groups in the backup state.
init	(Optional) Displays information about VRRP groups in the init state.

Command Default

Display information for all VRRP groups.

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.
5.0(2)	Added the **summary** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display information about VRRP:

```
switch(config)# show vrrp
      Interface  VR IpVersion Pri   Time Pre State   VR IP addr
------------------------------------------------------------------
   Ethernet7/45  33   IPV4    100    1 s  Y    Init
   Ethernet7/45  99   IPV4    100    1 s  Y    Init
```

Related Commands

Command	Description
feature vrrp	Enables the VRRP feature.
clear vrrp	Clears VRRP statistics.

show vrrs client

To display the Virtual Router Redundancy Service (VRRS) client information, use the **show vrrs client** command.

show vrrs client client-name

Syntax Description

client-name	Client name.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the VRRS client information:

```
switch# show vrrs client client-1
switch#
```

Related Commands

Command	Description
show vrrs tag	Displays the VRRS tag information.
show vrrs server	Displays the VRRS server information.

show vrrs pathway

To display the Virtual Router Redundancy Service (VRRS) pathway information for different pathway states, such as active, inactive, and not ready, use the **show vrrs pathway** command.

show vrrs pathway *interface-type interface-number*

Syntax Description

interface-type	Interface type.
interface-number	Interface number.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the VRRS pathway information for different pathway states:

```
switch# show vrrs pathway
Pathway ["default"@Eth6/1]
  State is NOT READY [VRRS push "INIT"]
  Virtual MAC is 0000.5e00.0102 [Reserved] (0x1824)
  Address-family is v4
  Options: Default Pathway=1, Owner Mode=0, Accept-Mode=1, Configured vMAC=0
  Evaluation: No Shut=1, Connected=1, OIR=1, L2 Ready=0, L3 Ready=0, vMAC Ready
1, vIP Ready=0
  Virtual Address List:
switch#
```

Related Commands

Command	Description
show vrrs tag	Displays the VRRS tag information.
show vrrs client	Displays the VRRS client information.
show vrrs server	Displays the VRRS server information.

show vrrs server

To display the Virtual Router Redundancy Service (VRRS) server information, use the **show vrrs server** command.

show vrrs server

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the VRRS server information:

```
switch# show vrrs server
Server Name: vrrpEthernet6/1v42
  Address Family: IPv4
  Interface: Ethernet6/1
  State: INIT
  vMAC: 0000.5e00.0102
  vIP Address: AF-UNDEFINED
  Tags Connected:
switch#
```

Related Commands

Command	Description
show vrrs tag	Displays the VRRS tag information.
show vrrs client	Displays the VRRS client information.

show vrrs tag

To display the Virtual Router Redundancy Service (VRRS) tag information, use the **show vrrs tag** command.

show vrrs tag *tag-name*

Syntax Description

tag-name	Tag name.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to display the VRRS tag information:

```
switch# show vrrs tag tag-1
switch#
```

Related Commands

Command	Description
show vrrs client	Displays the VRRS client information.
show vrrs server	Displays the VRRS server information.

T Commands

- transmit-delay (OSPFv3 virtual link), on page 1027

table-map (EIGRP)

To configure a table map with the route map information, use the table-map command.

table-map *route-map-name* [**filter**]

Syntax Description

route-map-name	Route map name. This string can be a maximum of 63 alphanumeric characters.
filter	(Optional) Filters routes rejected by the route map and does not download them to the RIB.

Command Default

None

Command Modes

config-router mode

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 configure a table map with route map information:

```
switch# configure terminal
switch(config)# router eigrp Test1
switch(config-router)# table-map route-map1 filter
switch(config-router)#
```

Related Commands

Command	Description
router ospf	Creates a new OSPFv2 instance with the configured instance tag.

table-map (OSPF)

To configure the policy for filtering and modifying the Open Shortest Path First (OSPF) routes before sending them to the Routing Information Base (RIB), use the **table-map** command. To disable this function, use the **no** form of this command.

table-map *map-name* [**filter**]
no table-map *map-name* [**filter**]

Syntax Description

map-name	Name of table map. The range is 1 to 63 alphanumeric characters. For OSPFv2 and OSPFv3, the *map-name* argument specifies the name of a route map to be used for filtering.
filter	(Optional) Filters routes based on the configuration of the specified route map. A next-hop path is not downloaded to the RIB if it is denied in the route-map configuration.

Command Default

OSPF filters all next-hops from being downloaded in the RIB or deletes all the next-hop paths for a route if a given route is present in RIB.

Command Modes

Router configuration mode

Command History

Release	Modification
6.2(6a)	This command was modified. Support for filtering next-hop paths for an OSPF route was added.
6.2(2)	This command was modified. The **filter** keyword was added.
6.1(1)	This command was introduced.

Usage Guidelines

A table map controls whether routes are downloaded to the RIB. Use this command with the **filter** keyword to filter next-hop paths for an OSPF route based on the configuration in a route map. The route is not downloaded to the RIB if it is denied by the specified route map.

In Cisco NX-OS Release 6.2(6a) and later releases, you can filter next-hop paths for an OSPF route to prevent the path from being added to the RIB. Before Cisco NX-OS Release 6.2(6a), filtering on a specific path is ignored and the entire route is filtered from being added to the RIB.

Before using this command with the **filter** keyword, you must use the **route-map** command in global configuration mode to configure the route map that is to be specified in the **table-map** command.

Unlike a route map, a table map is not followed by **match** or **set** commands.

This command does not require a license.

Examples

The following example shows a route-map configuration for blocking the next hops that are learned through Vlan10:

```
route-map Filter-OSPF deny 10
match interface Vlan10
route-map Filter-OSPF permit 20
```

```
The following example show how to configure the table-map
 command with the filter
 keyword to use the preceding route-map configuration (Filter-OSPF) to remove the next-hop
 path that is learned through VLAN 10 and not the next-hop path that is learned through
VLAN 20:
switch(config)# router ospf p1
switch(config-router)# table-map Filter-OSPF filter
```

The following example shows how to configure the policy for filtering and modifying OSPF routes before sending them to the RIB:

```
switch(config)# router ospf p1
switch(config-router)# table-map tmap
switch(config-router)#
```

Related Commands

Command	Description
route-map	Enters route-map configuration mode for configuring a route map.
show forwarding distribution	Displays information about the FIB.

table-map (OSPFv3)

To configure the policy for filtering and modifying the Open Shortest Path First (OSPF) routes before sending them to the Routing Information Base (RIB), use the **table-map** command.To disable this function, use the **no** form of this command.

table-map *table-map-name*
no table-map *table-map-name*

Syntax Description

table-map-name	Table-map name. The maximum size is 40 characters.

Command Default

None

Command Modes

OSPFv3 router configuration mode

Command History

Release	Modification
6.1(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

In OSPFv3, you can add a table map in the address-family ipv6 unicast mode only.

Examples

This example shows how to configure a policy for filtering and modifying OSPF routes before sending them to the RIB:

```
switch(config)# router ospfv3 3
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# table-map tmap
```

Related Commands

Command	Description
show forwarding distribution	Displays information about the FIB.

template (BGP)

To create a peer template and enter a peer template configuration mode, use the **template** command. To remove a peer template, use the **no** form of this command.

template {**peer** *name* | **peer-policy** *name* | **peer-session** *name*}
no template {**peer** *name* | **peer-policy** *name* | **peer-session** *name*}

Syntax Description

peer *name*	Specifies the name of the neighbor template.
peer-policy *name*	Specifies the name of the peer-policy template.
peer-session *name*	Specifies the name of the peer-session template.

Command Default

None.

Command Modes

Neighbor address-family configurationRouter bgp configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The **template** command allows you to enable a set of predefined attributes that a neighbor inherits.

Note A Border Gateway Protocol neighbor cannot be configured to work with both peer groups and peer templates. A BGP neighbor can be configured to belong to a peer group or to inherit policies from peer templates only.

Peer templates support only general policy commands. BGP policy configuration commands that are configured only for specific address families or Network Layer Reachability Information configuration modes are configured with peer templates.

The peer template combines the peer-session and peer-policy templates to form a basic neighbor definition. It is not mandatory to use a neighbor template but you can use it to simplify the BGP configuration.

Peer-policy templates are used to group and apply the configuration of commands that are applied within specific address families and the NLRI configuration mode. Peer-policy templates are created and configured in peer policy configuration mode. BGP policy commands that are configured for specific address families or NLRI configuration modes are configured in a peer-policy template. When you enter the peer-policy template configuration mode, the following commands are available:

- **suppress-inactive**—Advertises the active routes to the peer only. See the **suppress-inactive** command for additional information.
- **exit**—Exits current configuration mode.
- **filter-list** *name* {**in** | **out**}—Creates the AS-PATH filter list on the inbound and the outbound BGP routes . To remove the entry, use the **no** form of this command.
  - **in**—Applies the access list to incoming routes.

- **out**—Applies the access list to outgoing routes.

- **inheritpeer-policy***policy-name seq-num*—Configures a peer-policy template to inherit the configuration from another peer-policy template. To remove an inherited statement from a peer-policy template, use the **no** form of this command. Range: 1 to 65535. Default: No inherit statements are configured.

The sequence number specifies the order in which the peer policy template is evaluated. Like a route-map sequence number, the lowest sequence number is evaluated first. Peer policy templates support inheritance and a peer can directly and indirectly inherit up to seven peer policy templates. Inherited peer policy templates are configured with sequence numbers like route maps. When multiple peer-policies are configured under a template, only the policy with the lowest sequence number is executed. If a BGP policy command is reapplied with a different value, it will overwrite any previous value from a lower sequence number.

Note A BGP routing process cannot be configured to be a member of a peer group and to use peer templates for group configurations. You must use one method or the other. We recommend peer templates because they provide improved performance and scalability.

- **maximum-prefix***max*—Specifies the maximum number of prefixes from this neighbor. Range: 1 to 300000. Default: This command is disabled by default. Peering sessions are disabled when the maximum number of prefixes is exceeded. See the **maximum-prefix** command for additional information.
- **next-hop-self**—Configures the router as the next hop for a BGP neighbor or peer group. To disable this feature, use the **no** form of this command. Default: Disabled.
- **next-hop-third-party**—Computes a third-party next hop if possible.
- **no**—Negates a command or sets its defaults.
- **prefix-list***name* {**in** | **out**}—Specifies the route type to apply the prefix list. To remove the entry, use the **no** form of this command.
  - **in**—Applies the prefix list to incoming routes.
  - **out**—Applies the prefix list to outgoing routes.
- **route-map***name* {**in** | **out**}—Specifies the route map name to apply the route type to the neighbor.
  - **in**—Applies the route map to incoming routes.
  - **out**—Applies the route map to outgoing routes.
- **route-reflector-client**—Configures the router as a BGP route reflector and configures the specified neighbor as its client. To indicate that the neighbor is not a client, use the **no** form of this command. Default: There is no route reflector in the autonomous system.

By default, all internal BGP (iBGP) speakers in an autonomous system must be fully meshed, and neighbors do not readvertise iBGP learned routes to neighbors, which prevents a routing information loop. When all the clients are disabled, the local router is no longer a route reflector.

If you use route reflectors, all iBGP speakers do not need not be fully meshed. In the route reflector model, an Interior BGP peer is configured to be a route reflector responsible for passing iBGP learned routes to iBGP neighbors. This scheme eliminates the need for each router to talk to every other router.

All the neighbors configured with this command will be members of the client group and the remaining iBGP peers will be members of the nonclient group for the local route reflector.

- **send-community**—Specifies that a community attribute be sent to a BGP neighbor. To remove the entry, use the **no** form of this command.

- **soft-reconfiguration**—Configures the Cisco NX-OS software to start storing updates. To not store received updates, use the **no** form of this command. Default: Disabled. Entering this command starts the storage of updates, which is required to do inbound soft reconfiguration. Outbound BGP soft reconfiguration does not require inbound soft reconfiguration to be enabled.

To use soft reconfiguration, or soft reset, without preconfiguration, both BGP peers must support the soft route refresh capability, which is advertised in the open message sent when the peers establish a TCP session. Clearing the BGP session using the **soft-reconfiguration** command has a negative effect on network operations and should only be used as a last resort.

To determine whether a BGP router supports this capability, use the **show ip bgp neighbors** command. If a router supports the route refresh capability, the following message is displayed:

Received route refresh capability from peer.

If you specify a BGP peer group by using the peer-group-name argument, all the members of the peer group will inherit the characteristic configured with this command.

Similar to peer-session templates, peer-policy templates are configured once and applied to many neighbors through the direct application of a peer-policy template or through inheritance from peer-policy templates. The configuration of peer-policy templates simplifies the configuration of BGP policy commands that are applied to all neighbors within an autonomous system.

Peer-policy templates support direct and indirect inheritance from up to eight peer-policy templates. Inherited peer-policy templates are configured with sequence numbers like route maps. An inherited peer-policy template, like a route map, is evaluated starting with the inherit statement with the lowest sequence number and ending with the highest sequence number. However, there is a difference; a peer-policy template will not fall through like a route map. Every sequence is evaluated, and if a BGP policy command is reapplied with different value, it will overwrite any previous value from a lower sequence number.

Peer-policy templates support only general policy commands. BGP policy configuration commands that are configured only for specific address families or NLRI configuration modes are configured with peer-policy templates.

Note A BGP neighbor cannot be configured to work with both peer groups and peer templates. A BGP neighbor can be configured to belong only to a peer group or to inherit policies from only peer templates.

Peer-session templates are used to group and apply the configuration of general session commands to groups of neighbors that share common session configuration elements. General session commands that are common for neighbors that are configured in different address families can be configured within the same peer-session template. Peer-session templates are created and configured in peer session configuration mode. Only general session commands can be configured in a peer-session template.

When you enter the peer-session template configuration mode, the following commands are available:

- **description***description*—Configures a description to be displayed by the local or a peer router. You can enter up to 80 characters including spaces.
- **disable-connected-check**—Disables connection verification for eBGP peers no more than one hop away when the eBGP peer is configured with a loopback interface.
- **ebgp-multihop**—Accepts and attempts BGP connections to external peers that reside on networks that are not directly connected.

Note You should enter this command under the guidance of Cisco technical support staff only.

- **exit**—Exits current configuration mode.
- **inheritpeer-session***session-name*—Configures a peer-session template to inherit the configuration from another peer-session template. To remove an inherit statement from a peer-session template, use the **no** form of this command.
- **local-as**—Allows you to customize the autonomous system number for eBGP peer groupings.
- **neighbor inherit peer-session**—Configures a router to send a peer session template to a neighbor so that the neighbor can inherit the configuration.
- **neighbor translate-update**—Upgrades a router running BGP in the NLRI format to support multiprotocol BGP.
- **password**—Enables MD5 authentication on a TCP connection between two BGP peers. The following configuration tools are available:
  - **0** *password*—Specifies an unencrypted neighbor password.
  - **3** *password*—Specifies a 3DES encrypted neighbor password
  - *password*—Specifies an unencrypted (cleartext) neighbor password
- **remote-private-as**—Removes the private AS number from outbound updates.
- **show ip bgp template peer-policy**—Displays the locally configured peer policy templates.
- **show ip bgp template peer-session**—Displays the locally configured peer session templates.
- **shutdown**—Disables a neighbor or peer group.
- **timers** *keepalive-time*—Configures keepalive and hold timers in seconds. Range: 0 to 3600. Default: 60.
- **update-source** {**ethernet***modport* | **loopback***virtual-interface* | **port-channel** *number***.***sub-interface*]} —Specifies the source of the BGP session and updates. Range: *virtual-interface* is 0 to 1023; *number* is 0 to 4096; (optional); *.sub-interface* is 1 to 4093 .

General session commands can be configured once in a peer-session template and then applied to many neighbors through the direct application of a peer-session template or through indirect inheritance from a peer-session template. The configuration of peer-session templates simplify the configuration of general session commands that are commonly applied to all neighbors within an autonomous system.

Peer-session templates support direct and indirect inheritance. A peer can be configured with only one peer-session template at a time, and that peer-session template can contain only one indirectly inherited peer-session template. However, each inherited session template can also contain one indirectly inherited peer-session template. So, only one directly applied peer-session template and up to seven additional indirectly inherited peer-session templates can be applied, allowing you to apply up to a maximum of eight peer session configurations to a neighbor: the configuration from the directly inherited peer-session template and the configurations from up to seven indirectly inherited peer-session templates. Inherited peer-session templates are evaluated first, and the directly applied template will be evaluated and applied last. So, if a general session command is reapplied with a different value, the subsequent value will have priority and overwrite the previous value that was configured in the indirectly inherited template.

Peer-session templates support only general session commands. BGP policy configuration commands that are configured only for specific address families or NLRI configuration modes are configured with peer-policy templates.

This command requires the Enterprise Services license.

Examples

This example shows how to create a peer-session template named CORE1. This example inherits the configuration of the peer-session template named INTERNAL-BGP.

```
switch(config-router)# template peer-session CORE1
switch(config-router-stmp)#
```

This example shows how to create and configure a peer-policy template named CUSTOMER-A:

```
switch(config-router)# template peer-policy CUSTOMER-A
switch(config-router-ptmp)# exit
switch(config-router)# route-map SET-COMMUNITY in
switch(config-router)# filter-list 20 in
switch(config-router)# inherit peer-policy PRIMARY-IN 20
switch(config-router)# inherit peer-policy GLOBAL 10
switch(config-router)# exit-peer-policy
switch(config-router)#
```

This example shows how to configure that the maximum prefixes that will be accepted from the 192.168.1.1 neighbor is set to 1000:

```
switch(config)# router bgp 64496
switch(config-router) network 192.168.0.0
switch(config-router)# maximum-prefix 1000
```

This example shows how to configure that the maximum number of prefixes that will be accepted from the 192.168.2.2 neighbor is set to 5000. The router is also configured to display warning messages when 50 percent of the maximum-prefix limit (2500 prefixes) has been reached.

```
switch(config)# router bgp 64496
switch(config-router) network 192.168.0.0
switch(config-router)# maximum-prefix 5000 50
```

This example shows how to configure that the maximum number of prefixes that will be accepted from the 192.168.3.3 neighbor is set to 2000. The router is also configured to reestablish a disabled peering session after 30 minutes.

```
switch(config)# router bgp 64496
switch(config-router) network 192.168.0.0
switch(config-router)# neighbor 192.168.3.3 maximum-prefix 2000 restart 30
```

This example shows how to configure that the warning messages is displayed when the maximum-prefix limit (500) for the 192.168.4.4 neighbor is exceeded:

```
switch(config)# router bgp 64496
switch(config-router)# network 192.168.0.0
switch(config-router)# maximum-prefix 500 warning-only
```

This example shows how to force all updates destined for 10.108.1.1 to advertise this router as the next hop:

```
switch(config)# router bgp 64496
switch(config-router)# next-hop-self
```

This router configuration mode example shows how to configure the router belongs to autonomous system 109 and is configured to send the communities attribute to its neighbor at IP address 172.16.70.23:

```
switch(config)# router bgp 64496
switch(config-router)# send-community
```

The address family configuration mode example shows how to configure that the router belongs to autonomous system 109 send the communities attribute to its neighbor at IP address 172.16.70.23:

```
switch(config)# router bgp 64496
switch(config-router)# address-family ipv4 multicast
switch(config-router-af)# send-community
```

This example shows how to enable inbound soft reconfiguration for the neighbor 10.108.1.1. All the updates received from this neighbor will be stored unmodified, regardless of the inbound policy. When inbound soft reconfiguration is done later, the stored information is used to generate a new set of inbound updates.

```
switch(config)# router bgp 64496
switch(config-router)# soft-reconfiguration inbound
```

Related Commands

Command	Description
router bgp	Assigns an autonomous system (AS) number to a router and enters the router BGP configuration mode
address-family	Enters the address family mode for the Border Gateway Protocol (BGP).

test forwarding distribution perf

To test the forwarding distribution performance of the Forwarding Information Base (FIB), use the **test forwarding distribution perf** command.

test forwarding distribution perf

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to test the forwarding distribution performance:

```
switch# test forwarding distribution perf
```

Related Commands

Command	Description
show forwarding distribution	Displays information about the FIB.

test forwarding inconsistency

To trigger the Layer 3 inconsistency checker for the Forwarding Information Base (FIB), use the **test forwarding inconsistency** command.

test forwarding inconsistency [{**ip** | **ipv4** | **ipv6**}] [**unicast**] [**vrf** *vrf-name*] [**module** {*slot* | **all**}] [**stop**]

Syntax Description

ip	(Optional) Specifies the inconsistency check for IPv4 routes.
ipv4	(Optional) Specifies the inconsistency check for IPv4 routes.
ipv6	(Optional) Specifies the inconsistency check for IPv6 routes.
unicast	(Optional) Specifies the inconsistency check for unicast routes.
vrf	(Optional) Specifies the routes for a specific VRF.
vrf-name	(Optional) Specifies the VRF name.
module	(Optional) Specifies the inconsistency check for one or more modules.
slot	Module number. The range depends on the platform.
all	(Optional) Specifies the inconsistency check for all modules.
stop	(Optional) Stops the inconsistency check.

Command Default

None

Command Modes

Any command mode

Command History

Release	Modification
4.0(1)	This command was introduced.
4.2(1)	Added support for the **ipv6** keyword.

Usage Guidelines

This command does not require a license.

Examples

This example shows how to trigger the Layer 3 inconsistency checker for all modules:

```
switch# test forwarding inconsistency module all
```

This example shows how to stop the Layer 3 inconsistency checker for all modules:

```
switch# test forwarding inconsistency module all stop
```

Related Commands

Command	Description
clear forwarding inconsistency	Clears the FIB inconsistencies.
show forwarding inconsistency	Displays information about the FIB inconsistencies.

threshold percentage

To set a threshold percentage for a tracked object in a list of objects, use the **threshold percentage** command. To disable the threshold percentage, use the **no** form of this command.

threshold percentage {**up number** [**down** *number*] | **down number** [**up** *number*]}
no threshold percentage

Syntax Description

up	Specifies the up threshold.
down	Specifies the down threshold.
number	Threshold value. The range is from 0 to 100.

Command Default

None

Command Modes

Tracking configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

When you configure a tracked list using the **track** *object-number* **list** command, there are two keywords available: **boolean** and **threshold**. If you specify the **threshold** keyword, you can specify either the **percentage** or **weight** keywords. If you specify the **percentage** keyword, the **weight** keyword is unavailable. If you specify the **weight** keyword, the **percentage** keyword is unavailable.

You should configure the up percentage first. The valid range is from 1 to 100. The down percentage depends on what you have configured for up. For example, if you configure 50 percent for up, you will see a range from 0 to 49 percent for down.

This command does not require a license.

Examples

This example shows how to configure the tracked list 11 to measure the threshold using an up percentage of 50 and a down percentage of 32:

```
switch(config)# track 11 list threshold percentage
switch(config-track)# object 1
switch(config-track)# object 2
switch(config-track)# threshold percentage up 50 down 32
```

Related Commands

Command	Description
threshold weight	Sets a threshold weight for a tracked object in a list of objects.
track list	Specifies a list of objects to be tracked and the thresholds to be used for comparison.

threshold weight

To set a threshold weight for a tracked object in a list of objects, use the **threshold weight** command. To disable the threshold weight, use the **no** form of this command.

threshold weight {**up** *number* [**down** *number*] | **down** *number* [**up** *number*]}
no threshold weight

Syntax Description

up	Specifies the up threshold.
down	(Optional) Specifies the down threshold.
number	Threshold value. The range is from 1 to 255.

Command Default

None

Command Modes

Tracking configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

When you configure a tracked list using the **track** *object-number* **list** command, there are two keywords available: **boolean** and **threshold**. If you specify the **threshold** keyword, you can specify either the **percentage** or **weight** keywords. If you specify the **percentage** keyword, then the **weight** keyword is unavailable. If you specify the **weight** keyword, then the **percentage** keyword is unavailable.

You should configure the up weight first. The valid range is from 1 to 255. The available down weight depends on what you have configured for the up weight. For example, if you configure 25 for up, you will see a range from 0 to 24 for down.

This command does not require a license.

Examples

This example shows how to configure the tracked list 12 to measure a threshold using a specified weight:

```
switch(config)# track 11 list threshold weight
switch(config-track)# object 1
switch(config-track)# object 2
switch(config-track)# threshold weight up 35 down 22
```

Related Commands

Command	Description
threshold percentage	Sets a threshold percentage for a tracked object in a list of objects.
track list	Specifies a list of objects to be tracked and the thresholds to be used for comparison.

timers active-time

To adjust the Enhanced Interior Gateway Routing Protocol (EIGRP) time limit for the active state, use the **timers active-time** command. To disable this function, use the **no** form of the command.

timers active-time [{*time-limit* | **disabled**}]
no timers active-time

Syntax Description

time-limit	(Optional) Active time limit (in minutes). The range is from 1 to 65535 minutes. The default value is 3.
disabled	(Optional) Disables the timers and permits the routing wait time to remain active indefinitely.

Command Default

Disabled

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 **timers active-time** command to control the time that the router waits (after a query is sent) before declaring the route to be in the stuck in active (SIA) state.

This command requires the Enterprise Services license.

Examples

This example shows how to configure an indefinite routing wait time on the specified EIGRP route:

```
switch(config)# router eigrp 1
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# timers active-time disabled
```

timers advertise

To set the advertisement timer in milliseconds, use the timers advertise command.

timers advertise *interval*

Syntax Description

interval	Interval duration. The range is from 100 to 40950.

Command Default

None

Command Modes

config-if-vrrpv3-group mode

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

Cisco recommends that you set this timer to a value greater than or equal to 1 second.

This command requires the Enterprise Services license.

Examples

This example shows how to set the advertisement timer in milliseconds:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# vrrpv3 5 address-family ipv4
switch(config-if-vrrpv3-group)# address 100.0.1.10 primary
switch(config-if-vrrpv3-group)# description group3
switch(config-if-vrrpv3-group)# match-address
switch(config-if-vrrpv3-group)# preempt delay minimum 30
switch(config-if-vrrpv3-group)# priority 3
switch(config-if-vrrpv3-group)# timers advertise 100
switch(config-if-vrrpv3-group)#
```

Related Commands

Command	Description
vrrpv3 address-family	Creates a VRRPv3 group and enter VRRPv3 group configuration mode.

timers basic

To adjust the Routing Information Protocol (RIP) network timers, use the **timers basic** command. To restore the default timers, use the **no** form of this command.

timers basic *update invalid holddown flush*
no timers basic

Syntax Description

update	Rate (in seconds) at which updates are sent. The default is 30 seconds.
invalid	Interval of time (in seconds) after which a route is declared invalid; it should be at least three times the value of the *update* argument. A route becomes invalid when no updates refresh the route. The route then enters into a holddown state where it is marked as inaccessible and advertised as unreachable. However, the route is still used to forward packets. The default is 180 seconds.
holddown	Interval (in seconds) during which routing information regarding better paths is suppressed; it should be at least three times the value of the *update* argument. A route enters into a holddown state when an update packet is received that indicates that the route is unreachable. The route is marked as inaccessible and advertised as unreachable. However, the route is still used to forward packets. When holddown expires, routes advertised by other sources are accepted and the route is no longer inaccessible. The default is 180 seconds.
flush	Amount of time (in seconds) that must pass before the route is removed from the routing table; the interval specified should be greater than the sum of the *invalid* argument plus the *holddown* argument. If it is less than this sum, the proper holddown interval cannot elapse, which results in a new route being accepted before the holddown interval expires. The default is 240 seconds.

Command Default

update: 30 seconds*invalid*: 180 seconds*holddown*: 180 seconds*flush*: 240 seconds

Command Modes

Router address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

You can modify the basic timing parameters for RIP. These timers must be the same for all routers and servers in the network.

Note You can view the current and default timer values by using the **show ip protocols** command.

This command does not require a license.

Examples

This example shows how to set updates to broadcast every 5 seconds. If Cisco NX-OS does not hear from a router in 15 seconds (the invalid time), it declares the route as unusable. Cisco NX-OS suppresses further information for an additional 15 seconds (the holddown time). At the end of the suppression period, Cisco NX-OS flushes the route from the routing table.

```
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# timers basic 5  15  15  30
```

Related Commands

Command	Description
address-family	Enters address-family configuration mode.

timers (GLBP)

To configure the time between hello packets sent by the Gateway Load Balancing Protocol (GLBP) gateway and the time that the virtual gateway and virtual forwarder information is considered valid, use the **timers** command. To return the timers to the default values, use the **no** form of this command.

timers [**msec**] *hellotime* [**msec**] *holdtime*
no timers

Syntax Description

msec	(Optional) Specifies that the following (*hellotime* or *holdtime)* argument value will be expressed in milliseconds.
hellotime	Hello interval. The range is from 1 to 60 seconds. The default is 3 seconds (3000 milliseconds).
holdtime	Time before the virtual gateway and virtual forwarder information contained in the hello packet is considered invalid. The range is from 2 to 180 seconds. The default is 10 seconds (10,000 milliseconds).

Command Default

hellotime : 3 seconds*holdtime* : 10 seconds

Command Modes

GLBP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

If you do not configure timers on a gateway, the gateway learns the timer values from the active virtual gateway (AVG). The timers configured on the AVG always override any other timer settings. All gateways in a GLBP group should use the same timer values. If a GLBP gateway sends a hello message, the information should be considered valid for one holdtime. Typically, the holdtime is greater than three times the value of the hello time, (*holdtime* > 3 * *hellotime*). The range of values for the holdtime force the holdtime to be greater than the hello time.

This command does not require a license.

Examples

This example shows how to configure the timers for GLBP group 10 on Ethernet interface 1/1:

```
switch(config)# interface ethernet 1/1
switch(config-if)# glbp 10
switch(config-glbp)# timers 5 18
```

Related Commands

Command	Description
glbp	Enters GLBP configuration mode and creates a GLBP group.
timers redirect	Configures the redirect and timeout values for the GLBP group.

timers lsa-arrival (OSPF)

To set the minimum interval in which the software accepts the same link-state advertisement (LSA) from Open Shortest Path First (OSPF) neighbors, use the **timers lsa-arrival** command. To return to the default, use the **no** form of this command.

timers lsa-arrival *milliseconds*
no timers lsa-arrival

Syntax Description

milliseconds	Minimum delay (in milliseconds) that must pass between acceptance of the same LSA arriving from neighbors. The range is from 10 to 600,000 milliseconds. The default is 1000 milliseconds.

Command Default

1000 milliseconds

Command Modes

Router configuration

VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **timers lsa arrival** command to configure the minimum interval for accepting the same LSA. The same LSA is an LSA instance that contains the same LSA ID number, LSA type, and advertising router ID. If an instance of the same LSA arrives sooner than the interval that is set, the software drops the LSA.

We recommend that you keep the *milliseconds* value of the **timers lsa-arrival** command less than or equal to the neighbors' *hold-interval* value of the **timers throttle lsa** command.

This command requires the Enterprise Services license.

Examples

This example shows how to set the minimum interval for accepting the same LSA at 2000 milliseconds:

```
switch(config)# router ospf 1
switch(config-router)# timers lsa-arrival 2000
```

Related Commands

Command	Description
show ip ospf timers rate-limit	Displays all of the LSAs in the rate-limit queue.
timers throttle lsa	Sets rate-limiting values for LSAs being generated.

timers lsa-arrival (OSPFv3)

To set the minimum interval in which the software accepts the same link-state advertisement (LSA) from Open Shortest Path First version 3 (OSPFv3) neighbors, use the **timers lsa-arrival** command. To return to the default, use the **no** form of this command.

timers lsa-arrival *milliseconds*
no timers lsa-arrival

Syntax Description

milliseconds	Minimum delay (in milliseconds) that must pass between acceptance of the same LSA arriving from neighbors. The range is from 10 to 600,000 milliseconds. The default is 1000 milliseconds.

Command Default

1000 milliseconds

Command Modes

Router configuration

VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **timers lsa arrival** command to configure the minimum interval for accepting the same LSA. The same LSA is an LSA instance that contains the same LSA ID number, LSA type, and advertising router ID. If an instance of the same LSA arrives sooner than the interval that is set, the software drops the LSA.

We recommend that you keep the *milliseconds* value of the **timers lsa-arrival** command less than or equal to the neighbors' *hold-interval* value of the **timers throttle lsa** command.

This command requires the Enterprise Services license.

Examples

This example shows how to set the minimum interval for accepting the same LSA at 2000 milliseconds:

```
switch(config)# router ospfv3 1
switch(config-router)# timers lsa-arrival 2000
```

Related Commands

Command	Description
show ospfv3 timers rate-limit	Displays all of the LSAs in the rate-limit queue.
timers throttle lsa	Sets rate-limiting values for LSAs being generated.

timers lsa-group-pacing (OSPF)

To change the interval at which Open Shortest Path First (OSPF) link-state advertisements (LSAs) are collected into a group and refreshed, checksummed, or aged, use the **timers lsa-group-pacing** command. To return to the default, use the **no** form of this command.

timers lsa-group-pacing *seconds*
no timers lsa-group-pacing

Syntax Description

seconds	Time (in seconds) in the interval in which LSAs are grouped and refreshed, checksummed, or aged. The range is from 1 to 1800 seconds. The default value is 10 seconds.

Command Default

The default interval for this command is 10 seconds. OSPF LSA group pacing is enabled by default.

Command Modes

Router configuration

VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **timers lsa-group-pacing** command to control the rate at which LSA updates occur and reduce the high CPU or buffer utilization that can occur when an area is flooded with a very large number of LSAs. The default settings for OSPF packet pacing timers are suitable for the majority of OSPF deployments. Do not change the packet pacing timers unless you have tried all other options to meet OSPF packet flooding requirements. You should try summarization, stub area usage, queue tuning, and buffer tuning before changing the default flooding timers. There are no guidelines for changing timer values; each OSPF deployment is unique and should be considered on a case-by-case basis.

Cisco NX-OS groups the periodic refresh of LSAs to improve the LSA packing density for the refreshes in large topologies. The group timer controls the interval used for group refreshment of LSAs; however, this timer does not change the frequency that individual LSAs are refreshed (the default refresh rate is every 30 minutes).

The duration of the LSA group pacing is inversely proportional to the number of LSAs that the router is handling. For example, if you have about 10,000 LSAs, you should decrease the pacing interval. If you have a very small database (40 to 100 LSAs), you should increase the pacing interval to 10 to 20 minutes.

This command requires the Enterprise Services license.

Examples

This example shows how to configure OSPF group packet-pacing updates between LSA groups to occur in 60-second intervals for OSPF routing process 1:

```
switch(config)# router ospf 1
switch(config-router)# timers lsa-group-pacing 60
```

Related Commands

Command	Description
show ip ospf	Displays general information about OSPF routing processes.

timers lsa-group-pacing (OSPFv3)

To change the interval at which Open Shortest Path First version 3 (OSPFv3) link-state advertisements (LSAs) are collected into a group and refreshed, checksummed, or aged, use the **timers lsa-group-pacing** command. To return to the default, use the **no** form of this command.

timers lsa-group-pacing *seconds*
no timers lsa-group-pacing

Syntax Description

seconds	Time (in seconds) in the interval in which LSAs are grouped and refreshed, checksummed, or aged. The range is from 1 to 1800 seconds. The default value is 240 seconds.

Command Default

The default interval for this command is 240 seconds. OSPFv3 LSA group pacing is enabled by default.

Command Modes

Router configuration

VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **timers lsa-group-pacing** command to control the rate at which LSA updates occur and reduce the high CPU or buffer utilization that can occur when an area is flooded with a very large number of LSAs. The default settings for OSPFv3 packet pacing timers are suitable for the majority of OSPFv3 deployments. Do not change the packet pacing timers unless you have tried all other options to meet OSPFv3 packet flooding requirements. You should try summarization, stub area usage, queue tuning, and buffer tuning before changing the default flooding timers. There are no guidelines for changing timer values; each OSPFv3 deployment is unique and should be considered on a case-by-case basis.

Cisco NX-OS groups the periodic refresh of LSAs to improve the LSA packing density for the refreshes in large topologies. The group timer controls the interval used for group refreshment of LSAs; however, this timer does not change the frequency that individual LSAs are refreshed (the default refresh rate is every 30 minutes).

The duration of the LSA group pacing is inversely proportional to the number of LSAs that the router is handling. For example, if you have about 10,000 LSAs, you should decrease the pacing interval. If you have a very small database (40 to 100 LSAs), you should increase the pacing interval to 10 to 20 minutes.

This command requires the Enterprise Services license.

Examples

This example shows how to configure OSPFv3 group packet-pacing updates between LSA groups to occur in 60-second intervals for OSPFv3 routing process 1:

```
switch(config)# router ospfv3 1
switch(config-router)# timers lsa-group-pacing 60
```

Related Commands

Command	Description
show ospfv3	Displays general information about OSPFv3 routing processes.

timers nsf converge

To adjust the time limit for nonstop forwarding (NSF) convergence for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **timers nsf converge** command. To disable this function, use the **no** form of this command.

timers nsf converge *seconds*
no timers nsf converge

Syntax Description

seconds	Time limit for convergence after an NSF switchover (in seconds). The range is from 60 to 180 seconds. The default value is 120.

Command Default

120 seconds

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 **timers nsf converge** command to control the time that the router waits for convergence after a switchover.

This command requires the Enterprise Services license.

Examples

This example shows how to configure the NSF convergence time for EIGRP:

```
switch(config)# router eigrp 1
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# timers nsf converge 100
```

timers nsf route-hold

To set the timer that determines how long an NSF-aware Enhanced Interior Gateway Routing Protocol (EIGRP) router holds routes for an inactive peer, use the **timers nsf route-hold** command. To return the route hold timer to the default value, use the **no** form of this command.

timers nsf route-hold *seconds*
no timers nsf route-hold

Syntax Description

seconds	Time, in seconds, that EIGRP holds routes for an inactive peer. The range is from 20 to 300 seconds. The default is 240.

Command Default

EIGRP NSF awareness is enabled.*seconds*: 240

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 **timers nsf route-hold** command to set the maximum period of time that the NSF-aware router holds known routes for an NSF-capable neighbor during a switchover operation or a well-known failure condition. The route hold timer is configurable so that you can tune network performance and avoid undesired effects, such as “black holing” routes (advertising invalid routes) if the switchover operation takes too much time. When this timer expires, the NSF-aware router scans the topology table and discards any stale routes, allowing EIGRP peers to find alternate routes instead of waiting during a long switchover operation.

This command requires the Enterprise Services license.

Examples

This example shows how to set the route hold timer value for an NSF-aware router to 2 minutes (120 seconds):

```
switch(config)# router eigrp 1
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# timers nsf route-hold 120
```

timers nsf signal

To set the time limit to signal a nonstop forwarding (NSF) restart for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **timers nsf signal** command. To return the route hold timer to the default, use the **no** form of this command.

timers nsf signal *seconds*
no timers nsf signal

Syntax Description

seconds	Time, in seconds, that EIGRP waits for a peer to signal an NSF restart. The range is from 10 to 30 seconds. The default is 20.

Command Default

EIGRP NSF awareness is enabled.*seconds*: 20

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 **timers nsf signal** command to set the maximum period of time that the NSF-aware router waits for an NSF-capable neighbor to signal a restart.

This command requires the Enterprise Services license.

Examples

This example shows how to set the signal timer value for an NSF-aware router to the maximum (30 seconds):

```
switch(config)# router eigrp 1
switch(config-router) address-family ipv4 unicast
switch(config-router-af)# timers nsf signal 30
```

timers prefix-peer-timeout

To configure the Border Gateway Protocol (BGP) prefix peering timeout value, use the **timers prefix-peer-timeout** command. To remove the timeout value, use the **no** form of this command.

timers prefix-peer-timeout *interval*
no timers prefix-peer-timeout

Syntax Description

interval	Timeout value for prefix peering. The range is from 0 to 1200 seconds. The default value is 30.
ipv6	Specifies the IPv6 address family.

Command Default

Timeout value is 30.

Command Modes

Router configuration

Neighbor configuration

Command History

Release	Modification
6.2(2)	This command was introduced.

Usage Guidelines

BGP supports the prefix peering timeout for both IPv4 and IPv6, which means that you do not have to add each neighbor to the configuration.

When you are defining a prefix peering, you must specify the remote AS number with the prefix. BGP accepts any peer that connects from that prefix and autonomous system if the prefix peering does not exceed the configured maximum peers allowed.

When a BGP peer that is part of a prefix peering disconnects, Cisco NX-OS holds its peer structures for a defined prefix peer timeout value. An established peer can reset and reconnect without danger of being blocked because other peers have consumed all slots for that prefix peering.

This command requires a Enterprise Services license.

Examples

This example shows how to specify the timeout interval as 100 seconds:

```
switch(config)# router bgp 65536
switch(config-router)# timers prefix-peer-timeout 100
```

Related Commands

Command	Description
address family (BGP)	Enters the address family configuration mode for BGP.
timers prefix-peer-wait	Configures the BGP prefix peering timeout value.

timers prefix-peer-wait

To configure the Border Gateway Protocol (BGP) prefix peering wait timer, use the **timers prefix-peer-wait** command. To remove the timer value, use the **no** form of this command.

timers prefix-peer-wait *interval*
no timers prefix-peer-wait

Syntax Description

interval	Prefix peer wait timer (seconds). The range is from 0 to 1200. The default value is 90.
ipv6	Specifies the IPv6 address family.

Command Default

The prefix peer wait timer interval is 90 seconds.

Command Modes

Router configuration

Neighbor configuration

Command History

Release	Modification
6.2(8)	This command was introduced.

Usage Guidelines

You can use the **timers prefix-peer-wait** command to disable the peer prefix wait time so that there is no delay before BGP prefixes are inserted into the routing information base (RIB). This command is supported on a per-VRF basis or on the default VRF.

This timer is only applicable for BGP dynamic neighbors. It is only set when BGP is restarted or is coming up for the first time for the dynamic BGP neighbors.

This prefix-peer wait timer expires:

1. When at least one prefix-peer instance comes up.
2. When the prefix-peer convergence or the bestpath timer expires (this situation is applicable when the prefix-peer wait timer is greater than the best path timer).
3. None of the BGP prefix-peer instances comes up within this time.

Use the **show bgp convergence private** command to display details of the prefix peer wait timer.

This command requires a Enterprise Services license.

Examples

This example shows how to specify the timeout interval as 30 seconds:

```
switch(config)# router bgp 65536
switch(config-router)# timers prefix-peer-wait 30
```

Command	Description
address family (BGP)	Enters the address family configuration mode for BGP.
timers prefix-peer-timeout	Configures the BGP prefix peering timeout value.

timers redirect

To configure the time interval in which the active virtual gateway (AVG) for a Gateway Load Balancing Protocol (GLBP) group continues to redirect clients to a secondary active virtual forwarder (AVF), use the **timers redirect** command. To return the redirect timers to the default values, use the **no** form of this command.

timers redirect *redirect timeout*
no timers redirect *redirect timeout*

Syntax Description

redirect	Redirect timer interval, in seconds. The range is from 0 to 3600 seconds. The default is 300 seconds (5 minutes).
timeout	Time, in seconds, before the secondary virtual forwarder becomes unavailable. The range is from 610 to 64800 seconds. The default is 14,400 seconds (4 hours).

Command Default

redirect : 300 seconds*timeout* : 14,400 seconds

Command Modes

GLBP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

A virtual forwarder that is assigned a virtual MAC address by the AVG is referred to as a primary virtual forwarder. If the virtual forwarder learned the virtual MAC address from hello messages, it is referred to as a secondary virtual forwarder.

You can use the redirect timer to set a time delay that starts when a forwarder fails on the network and the AVG assumes that the forwarder will not return. When you set a time delay, the virtual MAC address that the forwarder replies to is still in the Address Resolution Protocol (ARP) replies, but the actual forwarding task is handled by another group in the GLBP group.

The timeout interval is the time delay that begins when a forwarder fails on the network and the MAC address that the forwarder was responsible for becomes inactive on all of the routers in the GLBP group. After the timeout interval, packets sent to this virtual MAC address will be lost. You must configure a timeout interval that is long enough to allow all hosts to refresh the ARP cache entry that contained the virtual MAC address.

This command does not require a license.

Examples

This example shows how to configure the redirect and timeout values for GLBP group 1 on Ethernet interface 1/1:

```
switch(config)# i
nterface ethernet 1/1
switch(config-if)# glbp 10
switch(config-glbp)# timers redirect 600 7200
switch(config-glbp)# ip
```

Related Commands

Command	Description
glbp	Enters GLBP configuration mode and creates a GLBP group.
timers	Configures hello and hold timers for GLBP.

timers throttle lsa (OSPF)

To set rate-limiting values for Open Shortest Path First (OSPF) link-state advertisement (LSA) generation, use the **timers throttle lsa** command. To return to the default values, use the **no** form of this command.

timers throttle lsa start-time *hold-interval max-time*
no timers throttle lsa

Syntax Description

start-time	Start time (in milliseconds) that is used to calculate the subsequent rate-limiting times for LSA generation. The range is from 0 to 5000 milliseconds. The default value is 0 milliseconds.
hold-interval	Incremental time (in milliseconds) that is used to calculate the subsequent rate-limiting times for LSA generation. The range is from 50 to 30,000 milliseconds. The default value is 5000 milliseconds.
max-time	Maximum time (in milliseconds) that is used to calculate the subsequent rate-limiting times for LSA generation. The range is from 50 to 30,000 milliseconds. The default value is 5000 milliseconds.

Command Default

start-time: 0 milliseconds*hold-interval:* 5000 milliseconds*max-time:* 5000 milliseconds

Command Modes

Router configuration

VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.2(1)	Added *start-time* and *max-time* arguments.

Usage Guidelines

Use the **timers throttle lsa** command to rate limit LSA generation.

This command requires the Enterprise Services license.

Examples

This example shows how to customize OSPF LSA throttling:

```
switch(config)# router ospf 1
switch(config-router)# timers throttle lsa 50 5000 6000
```

Related Commands

Command	Description
show ip ospf	Displays information about OSPF routing processes.
timers lsa arrival	Sets the minimum interval at which the software accepts the same LSA from OSPF neighbors.

timers throttle lsa (OSPFv3)

To set rate-limiting values for Open Shortest Path First version 3 (OSPFv3) link-state advertisement (LSA) generation, use the **timers throttle lsa** command. To return to the default values, use the **no** form of this command.

timers throttle lsa start-time *hold-interval max-time*
no timers throttle lsa

Syntax Description

start-time	Start time (in milliseconds) that is used to calculate the subsequent rate-limiting times for LSA generation. The range is from 50 to 5000 milliseconds. The default value is 50 milliseconds.
hold-interval	Incremental time (in milliseconds) that is used to calculate the subsequent rate-limiting times for LSA generation. The range is from 50 to 30,000 milliseconds. The default value is 5000 milliseconds.
max-time	Maximum time (in milliseconds) that is used to calculate the subsequent rate-limiting times for LSA generation. The range is from 50 to 30,000 milliseconds. The default value is 5000 milliseconds.

Command Default

hold-interval: 5000 milliseconds

Command Modes

Router configurationVRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.
4.2(1)	Added *start-time* and *max-time* arguments.

Usage Guidelines

Use the **timers throttle lsa** command to rate limit LSA generation.

This command requires the Enterprise Services license.

Examples

This example shows how to customize OSPFv3 LSA throttling:

```
switch(config)# router ospfv3 1
switch(config-router)# timers throttle lsa 50 10000 5000
```

Related Commands

Command	Description
show ospfv3	Displays information about OSPFv3 routing processes.
timers lsa arrival	Sets the minimum interval at which the software accepts the same LSA from OSPFv3 neighbors.

timers throttle spf (OSPF)

To set the shortest-path first (SPF) best-path schedule initial delay time and the minimum hold between the SPF best-path calculation for Open Shortest Path First (OSPF), use the **timers throttle spf** command. To turn off SPF throttling, use the **no** form of this command.

timers throttle spf *spf-start spf-hold spf-default spf-max-wait*
no timers throttle spf *spf-start spf-hold spf-default spf-max-wait*

Syntax Description

spf-start	Initial SPF schedule delay in milliseconds. The range is from 1 to 6000,00 milliseconds.
spf-hold	Minimum hold time between two consecutive SPF calculations. the range is from 1 to 6000,00 milliseconds. The default is 1000 milliseconds.
spf-default	The default is 200 milliseconds.
spf-max-wait	Maximum wait time between two consecutive SPF calculations. The range is from 1 to 6000,00 milliseconds. The default is 5000 milliseconds.

Command Default

The default configuration for SPF throttling is:

```
timers throttle spf 200,1000,5000
```

Command Modes

Router configuration

VRF configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **timers throttle spf** command to set the SPF timers.

The first wait interval between SPF calculations is the amount of time in milliseconds specified by the *spf-start* argument. Each consecutive wait interval is two times the current hold level in milliseconds until the wait time reaches the maximum time in milliseconds as specified by the *spf-maximum* argument. Subsequent wait times remain at the maximum until the values are reset or an LSA is received between SPF calculations.

Examples

This example shows how to configure a router configured with the start, hold, and maximum interval values for the **timers throttle spf** command set at 5, 1000, and 90,000 milliseconds:

```
switch(config)# router ospf 1
switch(config-router)# timers throttle spf 5 1000 90000
```

timers throttle spf (OSPFv3)

To set the shortest-path first (SPF) best-path schedule initial delay time and the minimum hold between the SPF best-path calculation for Open Shortest Path First version 3 (OSPFv3), use the **timers throttle spf** command. To turn off SPF throttling, use the **no** form of this command.

timers throttle spf *spf-start spf-hold spf-default spf-max-wait*
no timers throttle spf *spf-start spf-hold spf-default spf-max-wait*

Syntax Description

spf-start	Initial SPF schedule delay in milliseconds. The range is from 1 to 600,000 milliseconds.
spf-hold	Minimum hold time between two consecutive SPF calculations. the range is from 1 to 600,000 milliseconds. The default is 1000 milliseconds.
spf-default	The default is 200 milliseconds.
spf-max-wait	Maximum wait time between two consecutive SPF calculations. The range is from 1 to 600,000 milliseconds. The default is 5000 milliseconds.

Command Default

The default configuration for SPF throttling is

timers throttle spf 200,1000,5000

Command Modes

Address-family configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **timers throttle spf** command to set the SPF timers.

The first wait interval between SPF calculations is the amount of time in milliseconds specified by the *spf-start* argument. Each consecutive wait interval is two times the current hold level in milliseconds until the wait time reaches the maximum time in milliseconds as specified by the *spf-maximum* argument. Subsequent wait times remain at the maximum until the values are reset or an LSA is received between SPF calculations.

Examples

This example shows how to configure a router configured with the start, hold, and maximum interval values for the **timers throttle spf** command set at 5, 1000, and 90,000 milliseconds:

```
switch(config)# router ospfv3 1
switch(config-router)# address-family ipv6 unicast
switch(config-router-af)# timers throttle spf 5 1000 90000
```

track interface

To configure object tracking on an interface, use the **track interface** command. To remove the object tracking for this interface, use the **no** form of this command.

track *object-id* **interface interface-type number** {{**ip** | **ipv6**} **routing** | **line-protocol**}
no track *object-id* [**force**]

Syntax Description

object-id	Tracking ID. The range can be from 1 to 500.
interface *interface-type number*	Interface to track. Use the online ? help to see a list of available interface types.
ip routing	Tracks the IP routing state of the interface.
ipv6 routing	Tracks the IPv6 routing state of the interface.
line-protocol	Tracks the line protocol state of the interface.
force	(Optional) Removes the object tracking instance.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.1(2)	Added the **ipv6** keyword.
4.0(1)	This command was introduced.

Usage Guidelines

Use the **track interface** command to track the line protocol status or IPv4 or IPv6 routing state of an interface. This command enters the object tracking command mode. Use the **vrf member** command in object tracking configuration mode to track objects in a nondefault virtual routing and forwarding (VRF) instance.

This command does not require a license.

Examples

This example shows how to track the IP routing state on interface Ethernet 1/2:

```
switch(config)# track 1 interface ethernet 1/2 ip routing
switch(config-track)#
```

Related Commands

Command	Description
show track	Displays information about object tracking.
track {**ip** | **ipv6**} **route reachability**	Tracks the state of an IPv4 or IPv6 route reachability.
vrf member	Tracks an object in a nondefault VRF.

track interface (VRRP)

To track the priority for a virtual router based on an interface, use the **track interface** command. To disable priority tracking for a virtual router, use the **no** form of this command.

track interface {**ethernet** *interface-num* | **vlan** *vlan-num* | **port-channel** *channel-group-num*} **priority** *value*
no track interface

Syntax Description

ethernet *interface-num*	Specifies the virtual router interface for which to track priority. The range is from 1 to 255.
vlan *vlan-num*	Specifies the VLAN for which to track priority.
port-channel *channel-group-num*	Specifies the port-channel group for which to track priority.
priority *value*	Interface priority for a virtual router. The range of values is from 1 to 255. If this router is the owner of the IP addresses, the value is automatically set to 255.

Command Default

Disabled

Command Modes

VRRP configuration

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

Use the **track** command to change the priority of the virtual router based on the state of another interface in the switch. When the tracked interface is down, the priority reverts to the priority value for the virtual router. When the tracked interface is up, the priority of the virtual router is restored to the interface state tracking value.

Note Interface state tracking will not be operational unless you enable preemption on the interface.

This command does not require a license.

This example shows how to enable interface state tracking for a virtual router:

```
switch# config t
switch(config)# interface ethernet 2/1
switch(config-if)# vrrp 250
switch(config-if-vrrp)# track interface ethernet 2/2 priority 2
```

Related Commands

Command	Description
feature vrrp	Enables VRRP.

Command	Description
show vrrp	Displays VRRP configuration information.
track (VRRP)	Tracks an object to modify the VRRP priority.

track ip route

To configure object tracking on an IP route, use the **track ip route** command. To remove the object tracking for this route, use the **no** form of this command.

track *object-id* **ip route** *ip-prefix/length* **reachability**
no track *object-id* [**force**]

Syntax Description

object-id	Tracking ID. The range can be from 1 to 500.
ip-prefix/length	Prefix of route to track. The IP prefix is in dotted decimal format (X.X.X.X). The length can be from 1 to 32.
reachability	Tracks the reachability state of an IP route.
force	(Optional) Removes the object tracking instance.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **track ip route** command to track IP route reachability. This command enters the object tracking command mode. Use the **vrf member** command to track objects in a nondefault VRF.

This command does not require a license.

Examples

This example shows how to track an IP route:

```
switch(config)# track 1 ip route 10.10.10.0/8 reachability
switch(config-track)#
```

Related Commands

Command	Description
show track	Displays information about object tracking.
track interface	Tracks an interface.
track ipv6 route reachability	Tracks an IPv6 route reachability.
vrf member	Tracks an object in a nondefault VRF.

track ipv6 route

To configure object tracking on an IPv6 route, use the **track ipv6 route** command. To remove the object tracking for this route, use the **no** form of this command.

track *object-id* **ipv6 route** *ipv6-prefix/length* **reachability**
no track *object-id* [**force**]

Syntax Description

object-id	Tracking ID. The range can be from 1 to 500.
ipv6-prefix/length	Prefix of route to track. The IPv6 prefix format is A:B::C:D/length. The length can be from 1 to 128.
reachability	Tracks the reachability state of an IPv6 route.
force	(Optional) Removes the object tracking instance.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.1(2)	This command was introduced.

Usage Guidelines

Use the **track ipv6 route** command to track the status of an IPv6 route. This command enters the object tracking command mode. Use the **vrf member** command to track objects in a nondefault VRF.

This command does not require a license.

Examples

This example shows how to track an IPv6 route:

```
switch(config)# track 1 ipv6 route 2001:0DB8::/8 reachability
switch(config-track)#
```

Related Commands

Command	Description
show track	Displays information about object tracking.
track ip route	Tracks an interface.
vrf member	Tracks an object in a nondefault VRF.

track list

To configure object tracking on an object list, use the **track list** command. To remove the object tracking for this object list, use the **no** form of this command.

track *object-id* **list boolean** {**and** | **or**}
track *object-id* **list threshold** {**percentage** | **weight**}
no track *object-id* [**force**]

Syntax Description

object-id	Tracking ID. The range is from 1 to 500.
boolean	Combines the tracked object states as a Boolean combination.
and	Combines the tracked object states as a Boolean AND.
or	Combines the tracked object states as a Boolean OR.
threshold	Combines the tracked object states as a percentage or weight combination.
percentage	Combines the tracked object states as a percentage of the total number of tracked objects in the list.
weight	Combines the tracked object states as a combination of their configured weights.
force	(Optional) Removes the object tracking instance.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.2(1)	This command was introduced.

Usage Guidelines

Use the **track list** command to create a list of objects to combine into one tracked state. Use the **boolean and** keywords to combine the tracked objects as an AND function (that is, all objects must be up for the track list to be up). Use the **boolean or** keywords to combine the tracked objects as an OR (that is, if any object is up, the tracked state is up).

The track list command enters the track command mode. You can configure the following commands in this mode:

- **object**—Configures one or more objects to track in the track list. You can optionally use the **not** keyword to negate the object track state. (That is, an up state becomes a down state if you use the **not** keyword) for boolean tracked lists. You can optionally use the **weight** keyword to assign a weight to an object for a threshold weight tracked list. The default weight is 10.
- **vrf**—Assigns the track list to a VRF.

This command does not require a license.

Examples

This example shows how to create a track list of two objects as a Boolean and AND:

```
switch(config)# track 1 boolean and
switch(config-track)#object 33
switch(config-track)#object 30
```

This example shows how to configure a track list with an up threshold of 70 percent and a down threshold of 30 percent:

```
switch# config t
switch(config)# track 1 list threshold percentage
switch(config-track)# threshold percentage up 70 down 30
switch(config-track)# object 10
switch(config-track)# object 20
switch(config-track)# object 30
```

This example shows how to configure a track list with an up weight threshold of 30 and a down threshold of 10:

```
switch# config t
switch(config)# track 1 list threshold weight
switch(config-track)# threshold weight up 30 down 10
switch(config-track)# object 10 weight 15
switch(config-track)# object 20 weight 15
switch(config-track)# object 30
```

In this example, the track list is up if object 10 and object 20 are up, and the track list goes to the down state if all three objects are down.

Related Commands

Command	Description
show track	Displays information about object tracking.
track ip route	Tracks an interface.

track (VRRP)

To modify the priority for a virtual router based on a tracked object, use the **track** command. To disable priority tracking for a virtual router, use the **no** form of this command.

track object-number [**decrement value**]
no track track object-number [**decrement value**]

Syntax Description

object-number	Number for a configured tracked object. The range is from 1 to 500.
decrement *value*	(Optional) Decrements the VRRP priority if the tracked object is down. The range is from 1 to 254.

Command Default

None

Command Modes

VRRP configuration

Command History

Release	Modified
4.2(1)	This command was introduced.

Usage Guidelines

Use the **track (VRRP)** command to change the priority of the virtual router based on the state of a configured tracked object. Use the track command to configure the tracked object. When the tracked object is down, the priority reverts to the priority value for the virtual router. When the tracked object is up, the priority of the virtual router is restored to the original value.

This command does not require a license.

Examples

This example shows how to enable object tracking for a virtual router:

```
switch# config t
switch(config)# track 33 ip route 192.0.2.0/24 reachability
switch(config)# interface ethernet 2/1
switch(config-if)# vrrp 250
switch(config-if-vrrp)# track 33 priority 2
```

Related Commands

Command	Description
feature vrrp	Enables VRRP.
show vrrp	Displays VRRP configuration information.
track interface (VRRP)	Tracks the state of an interface and modifies the VRRP priority if that interface state goes down.

transmit-delay (OSPF virtual link)

To set the estimated time required to end a link-state update packet on the interface, use the **transmit-delay** command. To return to the default, use the **no** form of this command.

transmit-delay *seconds*
no transmit-delay

Syntax Description

seconds	Time (in seconds) required to send a link-state update. The range is from 1 to 65535 seconds. The default is 1 second.

Command Default

1 second

Command Modes

Virtual interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **transmit-delay** command to account for the transmission and propagation delays for the virtual link.

This command requires the Enterprise Services license.

Examples

This example shows how to set the retransmit delay value to 3 seconds:

```
switch(config)# router ospf 201
switch(config-router)# area
 22 virtual-link 192.0.2.1
switch(config-router-vlink)# transmit-
delay 3
```

transmit-delay (OSPFv3 virtual link)

To set the estimated time required to end a link-state update packet on the interface, use the **transmit-delay** command. To return to the default, use the **no** form of this command.

transmit-delay *seconds*
no transmit-delay

Syntax Description

seconds	Time (in seconds) required to send a link-state update. The range is from 1 to 65535 seconds. The default is 1 second.

Command Default

1 second

Command Modes

Virtual interface configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **transmit-delay** command to account for the transmission and propagation delays for the virtual link.

This command requires the Enterprise Services license.

Examples

This example shows how to set the retransmit delay value to 3 seconds:

```
switch(config)# router ospfv3 201
switch(config-router)# area
 22 virtual-link 192.0.2.1
switch(config-router-vlink)# transmit-
delay 3
```

U Commands

unsuppress-map

To unsuppress routes that are suppressed by using the aggregate-address command, use the **unsuppress-map** command.

unsuppress-map *map-name*

Syntax Description

map-name	Map name.

Command Default

None

Command Modes

config-router-neighbor-af mode

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 unsuppress routes that are suppressed by using the aggregate-address command:

```
switch# configure terminal
switch(config)# ip prefix-list IPLIST seq 5 permit 10.1.1.0/24
switch(config)# route-map UNSUPPRESS_MAP permit 10
switch(config-route-map)# match ip address prefix-list IPLIST
switch(config-route-map)# exit
switch(config)# router bgp 100
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# aggregate-address 10.1.1.0/16 summary-only
switch(config-router-af)# exit
switch(config-router)# neighbor 10.2.3.4 remote-as 300
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# unsuppress-map UNSUPPRESS_MAP
switch(config-router-neighbor-af)#
```

Related Commands

Command	Description
address-family ipv4 unicast	Enters IPv4 unicast address family mode.

V Commands

vfhrp delay

To specify the delay period for the initialization of First Hop Redundancy Protocol (FHRP) clients, use the vfhrp delay command.

vfhrp delay [**minimum**] [**reload**] *seconds*

Syntax Description

minimum	(Optional) Configures the delay period after an interface becomes available.
reload	(Optional) Configures the delay period after the device reloads.
seconds	Seconds. The range is from 0 to 3600.

Command Default

None

Command Modes

Global configuration mode

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 delay period for the initialization of FHRP clients:

```
switch# configure terminal
switch(config)# fhrp delay minimum 90
switch(config)#
```

Related Commands

Command	Description
show fhrp	Displays First Hop Redundancy Protocol (FHRP) information.

vrf

To create a VPN routing and forwarding instance (VRF) or enter the VRF configuration mode and configure submode commands for the Intermediate System-to-Intermediate System Intradomain Routing Protocol (IS-IS), use the **vrf** command. To remove a VRF instance or disable the VRF configuration mode, use the **no** form of this command.

{ **vrf** *name* | **management** }
{ **no** **vrf** *name* | **management** }

Syntax Description

name	Name of the VRF.
management	Specifies a configurable VRF name.

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

Each VRF mode serves as a separate instance within the IS-IS process. All configuration commands available in the global configuration mode are available in the new VRF mode. For example, each VRF mode must has its own NET configured for that particular instance to be operational. All EXEC commands can be specified to be per-VRF, else with no arguments, it will be applied to the default VRF. Note that interfaces belong to a particular VRF and the appropriate interface will only be applied to the particular interface with the ip/ipv6 router isis command.

The VRF does not become active until you create an identically named VRF in global configuration mode.

When you enter the VRF configuration mode, the following commands are available:

- **address-family** —Configures an address family. See the **address-family (BGP)** command for additional information.
- **authentication key-chain** —Sets the authentication key chain string. See the **authentication key-chain** command for additional information.
- **authentication-check** —Checks the authentication. See the **authentication-check** command for additional information.
- **authentication-type** — Sets the authentication type. See the **authentication-type** command for additional information.
- **default-information** — Controls the origination of a default route. See the **default-information originate (IS-IS)** command for additional information.
- **distance** —Configures the administrative distance. See the **distance (IS-IS)** command for additional information.

- **distribute** —Distributes routes between ISIS levels. See the **distribute** command for additional information.
- **exit** —Exits from the current command mode.
- **graceful-restart** —Enables the graceful restart for IS-IS process. See the **graceful-restart (BGP)** command for additional information.
- **hostname** —Configures the dynamic hostname for IS-IS. See the **hostname dynamic** command for additional information.
- **is-type** —Configures the IS type for this IS-IS process. See the **is-type** command for additional information.
- **log-adjacency-changes** —Logs the changes in adjacency state. See the **log-adjacency-changes (IS-IS**) command for additional information.
- **lsp-gen-interval** —Configures the LSP generation interval. See the **lsp-gen-interval** command for additional information.
- **lsp-mtu** —Sets the LSP MTU. See the **lsp-mtu** command for additional information.
- **max-lsp-lifetime** —Sets the maximum LSP lifetime. See the **max-lsp-lifetime** command for additional information.
- **maximum-paths** —Sets the maximum paths per destination. See the **maximum-paths (IS-IS)** command for additional information.
- **net** —Configures the Network Entity Title for this IS-IS process. See the **net** command for additional information.
- **no** —Negates a command or set its defaults.
- **redistribute** —Redistributes the information from another routing protocol. See the **redistribute (IS-IS**) command for additional information.
- **reference-bandwidth** —Changes the reference bandwidth used for setting interface metric. See the **reference-bandwidth** command for additional information.
- **set-overload-bit** —Signals other routers not to use us for transit. See the **set-overload-bit** command for additional information.
- **shutdown** —Shuts down this IS-IS process. See the **shutdown (IS-IS)** command for additional information.
- **spf-interval** —Configures the SPF interval. See the **spf-interval** command for additional information.
- **summary-address** —Configures the IP address summaries. See the **summary-address** command for additional information.
- **wide-metric-only** —Advertises only wide metric. See the **wide-metric-only** command for additional information.

Examples

The following command shows how to enter VRF configuration mode:

```
switch(config)# router isis 100
switch(config-router)# vrf management
switch(config-router-vrf)#
```

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.

vrf context

To create a virtual routing and forwarding instance (VRF) and enter VRF configuration mode, use the **vrf** router BGP configuration command. To remove a VRF entry, use the **no** form of this command.

vrf context {*name* | **management**}
no vrf context {*name* | **management**}

Syntax Description

name	Name of the VRF. The *name* can be any case-sensitive, alphanumeric string up to 32 characters.
management	Specifies a configurable VRF name.

Command Default

This command has no default settings.

Command Modes

Neighbor address-family configuration

Router bgp configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The VRF does not become active until you create an identically named VRF in global configuration mode.

When you enter the VRF configuration mode, the following commands are available:

- **address-family**—Configures an address-family. See the **address-family (BGP)** command for additional information.
- **cluster-id** {*cluster-id* | *cluster-ip-addr*} —Configures the Route Reflector Cluster-ID (router, vrf). Range: 1 to 4294967295. You can enter the cluster identification as a 32-bit quantity or as an IP address. To remove the cluster ID, use the **no** form of this command. Together, a route reflector and its clients form a cluster. When a single route reflector is deployed in a cluster, the cluster is identified by the router ID of the route reflector.

The **cluster-id** command is used to assign a cluster ID to a route reflector when the cluster has one or more route reflectors. Multiple route reflectors are deployed in a cluster to increase redundancy and avoid a single point of failure. When multiple route reflectors are configured in a cluster, the same cluster ID is assigned to all route reflectors. This allows all route reflectors in the cluster to recognize updates from peers in the same cluster and reduces the number of updates that need to be stored in BGP routing tables.

Note All route reflectors must maintain stable sessions between all peers in the cluster. If stable sessions cannot be maintained, then overlay route reflector clusters should be used instead (route reflectors with different cluster IDs).

- **exit**—Exits from the current command mode.
- **graceful-restart**—Configure Graceful Restart functionality. See the **graceful-restart (BGP)** command for additional information.

- **graceful-restart-helper**—Configure Graceful Restart Helper mode functionality. See the **graceful-restart (BGP)** command for additional information.
- **log-neighbor-changes**—Enables logging of the BGP neighbor resets. To disable the logging of changes in BGP neighbor adjacencies, use the **no** form of this command. The **log-neighbor-changes** command enables logging of BGP neighbor status changes (up or down) and resets for troubleshooting network connectivity problems and measuring network stability. Unexpected neighbor resets might indicate high error rates or high packet loss in the network and should be investigated.

Using the **log-neighbor-changes** command to enable status change message logging does not cause a substantial performance impact, unlike, for example, enabling per BGP update debugging. If the UNIX syslog facility is enabled, messages are sent to the UNIX host running the syslog daemon so that the messages can be stored and archived. If the UNIX syslog facility is not enabled, the status change messages are retained in the internal buffer of the router, and are not stored to disk. You can set the size of this buffer, which is dependent upon the available RAM, using the **logging buffered** command.

The neighbor status change messages are not tracked if the bgp **log-neighbor-changes** command is disabled, except for the reset reason, which is always available as output of the **show ip bgp neighbors** and **show bgp ipv6 neighbors** commands.

The **eigrp log-neighbor-changes** command enables logging of Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor adjacencies, but messages for BGP neighbors are logged only if they are specifically enabled with the bgp **log-neighbor-changes** command.

Use the **show logging command** to display the log for the BGP neighbor changes.

- **neighbor**—Configures a BGP neighbor. See the **neighbor** command for additional information.
- **no**—Negates a command or set its defaults
- **router-id** *ip-addr*—Specifies the IP address to use as the router-id.
- **timers** *bestpath-timeout*—Configures the bestpath timeout in seconds. Range: 1 to 3600. Default: 300.

Examples

The following command shows how to enter VRF configuration mode:

```
switch(config)# router bgp 64496
switch(config-router)# vrf context management
switch(config-router-vrf)#
```

This example shows how to set the local router as one of the route reflectors serving the cluster. You configure the cluster ID to identify the cluster.

```
switch(config)# router bgp 64496
switch(config-router)# neighbor 192.168.70.24 route-reflector-client
switch(config-router)# cluster-id 10.0.1.2
```

vrf member

To configure object tracking on a virtual routing and forwarding (VRF) instance, use the **vrf member** command. To remove the object tracking for this route, use the **no** form of this command.

vrf member *vrf-name*
no vrf member *vrf-name*

Syntax Description

vrf-name	VRF name. The name can be any case-sensitive, alphanumeric string up to 64 characters.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

Use the **vrf member** command in object tracking configuration mode to track objects in a nondefault VRF.

This command does not require a license.

Examples

This example shows how to track an IP route in vrf Red:

```
switch(config)# track 1 ip route 10.10.10.0/8 reachability
switch(config-track)# vrf member Red
```

Related Commands

Command	Description
show track	Displays information about object tracking.
track ip route	Tracks an interface.

vrrp

To create a Virtual Router Redundancy Protocol (VRRP) group on a particular Ethernet interface and assign a number to the VRRP group and enter VRRP configuration mode, use the **vrrp** command. To remove a VRRP group, use the **no** form of this command.

vrrp *number*
no vrrp *number*

Syntax Description

number	The VRRP group number, which you can configure for a Gigabit Ethernet port, including the main interfaces and subinterfaces. The range is from 1 to 255.

Command Default

None

Command Modes

VRRP configuration

Command History

Release	Modified
4.0(1)	This command was introduced.

Usage Guidelines

You can configure VRRP only if its state is disabled. Make sure that you configure at least one IP address before you attempt to enable a virtual router.

This command does not require a license.

Examples

This example shows how to create a VRRP group:

```
switch(config-if-vrrp)# vrrp 7
```

This example shows how to create a VRRP group and configure an IPv4 address for the group:

```
switch# config terminal
switch(config)# interface ethernet 2/1
switch(config-if)# vrrp 7

switch(config-if-vrrp)# address 10.0.0.10
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.

vrrpv3 address-family

To create a Virtual Router Redundancy Protocol version 3 (VRRPv3) group and enter VRRPv3 group configuration mode, use the vrrpv3 address-family command.

vrrpv3 number address-family {**ipv4** | **ipv6**}

Syntax Description

number	VRRP number.
ipv4	(Optional) Specifies IPv4 address.
ipv6	(Optional) Specifies IPv6 address.

Command Default

None

Command Modes

Interface configuration mode

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 create a VRRPv3 group and enter VRRPv3 group configuration mode:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# vrrpv3 5 address-family ipv4
switch(config-if-vrrpv3-group)#
```

Related Commands

Command	Description
feature vrrpv3	Enables VRRPv3 and VRRS.
timers advertise interval	Sets the advertisement timer in milliseconds.

vrrs leader

To specify a leader's name to be registered with Virtual Router Redundancy Service (VRRS), use the vrrs leader command.

vrrs leader *vrrs-leader-name*

Syntax Description

vrrs-leader-name	VRRS leader name.

Command Default

None

Command Modes

config-if-vrrpv3-group mode

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 a leader's name to be registered with VRRS:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# vrrpv3 5 address-family ipv4
switch(config-if-vrrpv3-group)# address 100.0.1.10 primary
switch(config-if-vrrpv3-group)# description group3
switch(config-if-vrrpv3-group)# match-address
switch(config-if-vrrpv3-group)# preempt delay minimum 30
switch(config-if-vrrpv3-group)# priority 3
switch(config-if-vrrpv3-group)# timers advertise 100
switch(config-if-vrrpv3-group)# vrrs leaderleader1
switch(config-if-vrrpv3-group)#
```

Related Commands

Command	Description
vrrpv3 address-family	Creates a VRRPv3 group and enter VRRPv3 group configuration mode.

vrrs pathway

To define the Virtual Router Redundancy Service (VRRS) pathway for a VRRS group and enter VRRS pathway configuration mode, use the **vrrs pathway** command.

vrrs pathway *vrrs-tag*

Syntax Description

vrrs-tag	VRRS tag.

Command Default

None

Command Modes

Interface configuration mode

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 define the VRRS pathway for a VRRS group and enter VRRS pathway configuration mode:

```
switch# configure terminal
switch(config)# interface port-channel 100
switch(config-if)# ip address 209.165.200.230 255.255.255.224
switch(config-if)# vrrs pathway path1
switch(config-if-vrrs-pw)#
```

Related Commands

Command	Description
show vrrs pathway	Displays the VRRS pathway information for different pathway states.
show vrrs tag	Displays the VRRS tag information.
show vrrs client	Displays the VRRS client information.
show vrrs server	Displays the VRRS server information.

W Commands

weight

To set the default weight for routes from this neighbor, use the **weight** command. To restore the default values, use the **no** form of this command.

weight *weight*
no weight *weight*

Syntax Description

weight	Specifies the default weight. The range is from 0 to 65535.

Command Default

None.

Command Modes

neighbor address-family configuration mode

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 set the default weight for routes from this neighbor:

```
switch(config)# router bgp 100
switch(config-router)# neighbor 201.0.17.2 remote-as 101
switch(config-router-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# weight 100
switch(config-router-neighbor-af)#
```

Related Commands

Command	Description
show bgp policy statistics	Displays policy statistics for BGP.

weighting

To specify the initial weighting value of the Gateway Load Balancing Protocol (GLBP) gateway, use the **weighting** command. To restore the default values, use the **no** form of this command.

weighting *maximum* [**lower** *lower*] [**upper** *upper*]
no weighting *maximum* [**lower** *lower*] [**upper** *upper*]

Syntax Description

maximum	Maximum weighting value. The range is from 1 to 254. The default value is 100.
lower *lower*	(Optional) Specifies a lower weighting value. The range is from 1 to the specified maximum weighting value. The default value is 1.
upper *upper*	(Optional) Specifies an upper weighting value. The range is from the lower weighting to the maximum weighting value. The default value is the specified maximum weighting value.

Command Default

The default gateway weighting value is 100 and the default lower weighting value is 1.

Command Modes

GLBP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The weighting value of a virtual gateway is a measure of the forwarding capacity of the gateway. If a tracked interface on the router fails, the weighting value of the router may fall from the maximum value to below the lower threshold, causing the gateway to give up its role as a virtual forwarder. When the weighting value of the gateway rises above the upper threshold, the gateway can resume its active virtual forwarder role.

Use the **glbp weighting track** and **track** commands to track an interface. If the interface goes down, GLBP reduces the weighting for the gateway by the specified value.

This command does not require a license.

Examples

This example shows how to set the weighting of the gateway for GLBP group 10:

```
switch(config)# interface ethernet 1/1
switch(config-if)# glbp 10
switch(config-glbp)# weighting 110 lower 95 upper 105
```

Related Commands

Command	Description
glbp	Enters GLBP configuration mode and creates a GLBP group.
glbp weighting track	Specifies an object to be tracked that affects the weighting of a GLBP gateway.
track	Configures an interface to be tracked.

weighting track

To specify a tracking object where the Gateway Load Balancing Protocol (GLBP) weighting changes based on the availability of the object being tracked, use the **weighting track** command. To remove the tracking, use the **no** form of this command.

weighting track *object-number* [**decrement** *value*]
no weighting track *object-number* [**decrement** *value*]

Syntax Description

object-number	Object number that represents an item to be tracked. Use the **track** command to configure the tracked object. The range is from 1 to 500.
decrement *value*	(Optional) Specifies an amount by which the GLBP weighting for the router is decremented (or incremented) when the interface goes down (or comes back up). The range is from 1 to 255. The default is 10.

Command Default

The default decrement value is 10.

Command Modes

GLBP configuration

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

The **weighting track** command ties the weighting of the GLBP gateway to the availability of its interfaces. This command is useful for tracking interfaces that are not configured for GLBP; for instance, you can track the interface that connects the gateway to the IP network.

When a tracked interface goes down, the GLBP gateway weighting decreases by the configured decrement value. For each GLBP group, you can track a separate list of interfaces.

When the tracked interface comes back up, GLBP increments the weighting by the same amount.

When multiple tracked interfaces are down, the configured weighting decrements are cumulative.

Use the **track** command to configure each interface that you want to track.

This command does not require a license.

Examples

This example shows that Ethernet interface 1/1 tracks two interfaces represented by the numbers 1 and 2. If interface 1 goes down, the GLBP gateway weighting decreases by the default value of 10. If interface 2 goes down, the GLBP gateway weighting decreases by 5.

```
switch(config)# i
nterface fastethernet 0/0
switch(config-if)# glbp 10
switch(config-glbp)# weighting track 1
switch(config-glbp)# weighting track 2 decrement 5
```

Related Commands

Command	Description
glbp	Enters GLBP configuration mode and creates a GLBP group.
weighting	Specifies the initial weighting value of a GLBP gateway.
track	Configures an interface to be tracked.