Cisco IOS IP Routing: EIGRP Command Reference

First Published: 2019-12-15

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add-paths

To enable the Enhanced Interior Gateway Routing Protocol (EIGRP) to advertise multiple best paths to connected spokes in a Dynamic Multipoint VPN (DMVPN) domain, use the **add-paths** command in address family interface configuration mode. To disable this configuration, use the **no** form of this command.

add-paths *number*
no add-paths

Syntax Description

number	Number of additional paths that are advertised as best paths to connected spokes. The range is from 1 to 4.

Command Default

Only one path is advertised as the best path to spokes in a DMVPN domain.

Command Modes

Address family interface configuration (config-router-af-interface)

Command History

Release	Modification
Cisco IOS XE Release 3.8S	This command was introduced.
15.3(1)S	This command was integrated into Cisco IOS Release 15.3(1)S.
15.3(2)T	This command was integrated into Cisco IOS Release 15.3(2)T.

Usage Guidelines

You can configure the **add-paths** command on hub interfaces that connect to spokes in a DMVPN domain to enable EIGRP to advertise multiple best paths to a destination. However, before you configure this command, ensure that the **next-hop-self** command is disabled on the hub interfaces. All interfaces in an EIGRP topology are by default configured with the **next-hop-self** command. This command enables EIGRP to set the local outbound interface as the next-hop value while advertising a route to a peer, even when advertising routes out of the interface on which the routes were learned. This default EIGRP behavior may interfere with the behavior of the **add-paths** command. To change this default setting, you must use the **no next-hop-self** interface configuration command to instruct EIGRP to use the received next-hop value when advertising routes back from the interface on which the routes were learned.

Examples

The following example shows how to configure a hub device to advertise additional IPv4 and IPv6 best paths to a destination in an EIGRP-enabled DMVPN domain:

```
Device(config)# router eigrp name
Device(config-router)# address-family ipv4 autonomous-system 2
Device(config-router-af)# af-interface tunnel0
Device(config-router-af-interface)# no next-hop-self no-ecmp-mode
Device(config-router-af-interface)# add-paths 3
Device(config-router-af-interface)# end
Device# configure terminal
Device(config)# ipv6 unicast-routing
Device(config)# router eigrp name
Device(config-router)# address-family ipv6 autonomous-system 2
Device(config-router-af)# af-interface tunnel0
Device(config-router-af-interface)# no next-hop-self no-ecmp-mode
Device(config-router-af-interface)# add-paths 4
```

```
Device(config-router-af-interface)# end
```

The following sample output from the **show running-config** command displays the EIGRP additional-paths configuration on the hub device:

```
Device# show running-config | section eigrp

router eigrp name
 !
 address-family ipv4 unicast autonomous-system 2
  !
  af-interface tunnel0
   no next-hop-self no-ecmp-mode
   add-path 3
  exit-af-interface

router eigrp name
  !
 address-family ipv6 unicast autonomous-system 2
  !
  af-interface tunnel0
   no next-hop-self no-ecmp-mode
   add-path 4
  exit-af-interface
```

Related Commands

Command	Description
address-family (EIGRP)	Enters IPv4 or IPv6 VRF address family configuration mode and configures an EIGRP routing instance.
af-interface	Enters address family interface configuration mode and configures interface-specific EIGRP commands.
ipv6 unicast-routing	Enables forwarding of IPv6 datagrams.
next-hop-self	Enables EIGRP to advertise routes with the local outbound interface address as the next hop.
router eigrp	Configures an EIGRP routing process and enters router configuration mode.
show running-config	Displays contents of the current running configuration file.

address-family (EIGRP)

To enter address-family configuration mode to configure an Enhanced Interior Gateway Routing Protocol (EIGRP) routing instance, use the **address-family** (EIGRP) command in router configuration mode. To remove the address-family from the EIGRP configuration, use the **no** form of this command.

EIGRP Autonomous-System Configuration
address-family ipv4 [**unicast**] **vrf** *vrf-name* [**autonomous-system** *autonomous-system-number*]
no address-family ipv4 [**unicast**] **vrf** *vrf-name* [**autonomous-system** *autonomous-system-number*]

EIGRP Named IPv4 Configuration
address-family ipv4 [**multicast**] [**unicast**] [**vrf** *vrf-name*] **autonomous-system** *autonomous-system-number*
no address-family ipv4 [**multicast**] [**unicast**] [**vrf** *vrf-name*] **autonomous-system** *autonomous-system-number*

EIGRP Named IPv6 Configuration
address-family ipv6 [**unicast**] [**vrf** *vrf-name*] **autonomous-system** *autonomous-system-number*
no address-family ipv6 [**unicast**] [**vrf** *vrf-name*] **autonomous-system** *autonomous-system-number*

Syntax Description

ipv4	Selects the IPV4 protocol address-family.
ipv6	Selects the IPV6 protocol address-family. IPv6 is supported only in EIGRP named configurations.
multicast	(Optional) Specifies the multicast address-family. This keyword is available only in EIGRP named IPv4 configurations.
unicast	(Optional) Specifies the unicast address-family.
autonomous-system *autonomous-system- number*	(Optional) Specifies the autonomous system number. This keyword/argument pair is required for EIGRP named configurations.
vrf *vrf-name*	(Optional) Specifies the name of the VRF. This keyword/argument pair is required for EIGRP AS configurations.

Command Default

No EIGRP process is running.

Command Modes

Router configuration (config-router)

Command History

Release	Modification
12.0(22)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.

Release	Modification
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. The **autonomous-system** keyword is required for named configurations.
12.2(33)SRE	This command was modified. The **autonomous-system** keyword is required for named configurations.
12.2(33)XNE	This command was modified. The **autonomous-system** keyword is required for named configurations.
Cisco IOS XE Release 2.5	This command was modified. The **autonomous-system** keyword is required for named configurations.
12.2(33)SXI4	This command was modified. The **autonomous-system** keyword is required for named configurations.

Usage Guidelines

The **address-family** (EIGRP) command is used to configure IPv4 or IPv6 address-family sessions under EIGRP. To leave address-family configuration mode without removing the address family configuration, use the **exit-address-family** command.

EIGRP Autonomous-System Configuration

Use the **router eigrp** *number* command to configure an EIGRP autonomous-system (AS) configuration.

In this configuration, EIGRP VPNs can be configured only under IPv4 address-family configuration mode. A virtual routing and forwarding instance (VRF) and route distinguisher must be defined before the address family session can be created.

It is recommended that you configure an autonomous-system number when the address-family is configured, either by entering the **address-family** command or the **autonomous-system**command.

EIGRP Named Configuration

Use the **router eigrp** *virtual-name* command to configure an EIGRP named configuration.

In this configuration, EIGRP VPNs can be configured in IPv4 and IPv6 named configurations. A virtual routing and forwarding instance (VRF) and a route distinguisher may or may not be used to create the address-family.

If a VRF is not used in creating the address-family, the EIGRP VPN instance assumes the default route distinguisher and will communicate with the default route distinguisher of other routers in the same network.

EIGRP VPNs can be configured under EIGRP named configurations. A virtual routing and forwarding instance (VRF) and route distinguisher must be defined before the address-family session can be created.

A single EIGRP routing process can support multiple VRFs. The number of VRFs that can be configured is limited only by available system resources on the router, which is determined by the number of VRFs, running processes, and available memory. However, only a single VRF can be supported by each VPN, and redistribution between different VRFs is not supported.

MPLS VPN support between PE and CE routers is configured only on PE routers that provide VPN services over the service provider backbone. The customer site does not require any changes to equipment or configurations to support the EIGRP VPN. A metric must be configured for routes to be advertised to the CE router. The metric can be configured using the **redistribute (IP)** command or configured with the **default-metric** (EIGRP) command.

Examples

The following example configures an IPv4 address-family session for the VRF named RED in Cisco IOS releases prior to Cisco IOS Release 15.0(1)M, 12.2(33)SRE, 12.2(33)XNE and Cisco IOS XE Release 2.5:

```
Router(config)# ip vrf RED

Router(config-vrf)# rd 1:1

Router(config-vrf)# exit

Router(config)# router eigrp 1

Router(config-router)# address-family ipv4 vrf RED
Router(config-router-af)# autonomous-system 101

Router(config-router-af)# network 172.16.0.0

Router(config-router-af)# default-metric 10000 100 255 1 1500

Router(config-router-af)# exit-address-family
```

The following examples configure a single VRF named VRF-RED in Cisco IOS Release 15.0(1)M, 12.2(33)SRE, 12.2(33)XNE and Cisco IOS XE Release 2.5 and later releases:

```
Router(config)# ip vrf VRF-RED

Router(config-vrf)# rd 1:1

Router(config-vrf)# exit

Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 vrf VRF-RED autonomous-system 1
Router(config-router-af)# network 10.0.0.0 0.0.0.255
Router(config-router-af)# topology base
Router(config-router-topology)#
default-metric 10000 100 255 1 1500

Router(config-router-topology)# exit-af-topology
Router(config-router-af)# exit-address-family
```

The following example configures a non-VRF address-family in Cisco IOS Release 15.0(1)M, 12.2(33)SRE, 12.2(33)XNE and Cisco IOS XE Release 2.5, and later releases:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 3
Router(config-router-af)# network 10.0.0.0 0.0.0.255
Router(config-router-af)# topology base
Router(config-router-af-topology)#
default-metric 10000 100 255 1 1500

Router(config-router-af- topology)# exit-af-topology
Router(config-router-af)# exit-address-family
```

Related Commands

Command	Description
autonomous-system (EIGRP)	Configures the autonomous-system number for an EIGRP routing process to run within a VRF instance.
default-metric (EIGRP)	Sets metrics for EIGRP.
exit-address-family	Exits address-family configuration mode.
network (EIGRP)	Specifies a list of networks for the EIGRP routing process.
redistribute (IP)	Redistributes routes from one routing domain into another routing domain.

af-interface

To enter address-family interface configuration mode and to configure interface-specific Enhanced Interior Gateway Routing Protocol (EIGRP) commands, use the **af-interface**command in address-family configuration mode. To reset the address-family interface setting to factory values, use the **no** form of this command.

af-interface {**default** | *interface-type interface-number*}
no af-interface {**default** | *interface-type interface -number*}

Syntax Description

default	Specifies the default address-family interface configuration mode. Commands applied under this mode affect all interfaces used by this address-family instance.
interface-type interface-number	Interface type and number of the interface that the address-family submode commands will affect.

Command Default

Address-family interface configuration mode is not entered.

Command Modes

Address-family configuration (config-router-af)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

The **af-interface default** command is useful for defining user defaults to apply to EIGRP interfaces that belong to an address-family when EIGRP is configured using the named method. For example, authentication mode is disabled by default, and you can enable MD5 authentication for all EIGRP interfaces in the address-family using address-family interface configuration mode and then selectively override the new default setting using different address-family interface configuration commands.

Note Use the **af-interface default** command with caution, because some default settings can be different depending on the interface type. For example, the default hello-interval is 5 seconds for most interfaces but is 60 seconds for slow NBMA interfaces, and changing the hello-interval in address-family interface configuration mode will affect all interfaces.

Examples

The following example shows how to enter address-family interface configuration mode and to configure EIGRP interface-specific commands:

```
Router(config)# router eigrp virtual-name
```

```
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# af-interface default
Router(config-router-af-interface)# shutdown

Router(config-router-af-interface)# exit
Router(config-router-af)# af-interface Ethernet 0/0

Router (config-router-af-interface)# no shutdown

Router (config-router-af-interface)# exit-af-interface
Router(config-router-af)#
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
exit-address-family	Exits address-family configuration mode.

authentication key-chain (EIGRP)

To specify an authentication key chain for Enhanced Interior Gateway Routing Protocol (EIGRP), use the **authentication key-chain** (EIGRP) command in address-family interface configuration mode or service-family interface configuration mode. To remove the authentication key-chain, 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 key chains are specified for EIGRP.

Command Modes

Address-family interface configuration (router-config-af-interface) Service-family interface configuration (router-config-sf-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

The **key-chain** command has no effect until the **authentication mode md5**command is configured.

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

Examples

The following example configures EIGRP to apply authentication to address-family autonomous system 1 and identifies a key chain named SITE1:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 1
Router(config-router-af)# af-interface ethernet0/0
Router(config-router-af-interface)# authentication key-chain SITE1
Router(config-router-af-interface)# authentication mode md5
```

The following example configures EIGRP to apply authentication to service-family autonomous system 1 and identifies a key chain named SITE1:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 1
Router(config-router-sf)# sf-interface ethernet0/0
Router(config-router-sf-interface)# authentication key-chain SITE1
Router(config-router-sf-interface)# authentication mode md5
```

Related Commands

Command	Description
authentication mode (EIGRP)	Specifies the type of authentication used in EIGRP address-family packets for the EIGRP instance.
key chain	Defines an authentication key chain needed to enable authentication for routing protocols.
router eigrp	Configures the EIGRP address-family process.

authentication mode (EIGRP)

To specify the type of authentication used in Enhanced Interior Gateway Routing Protocol (EIGRP) address-family or service-family packets for an EIGRP instance, use the **authentication mode** command in address family interface configuration mode or service family interface configuration mode. To disable a configured authentication type, use the **no** form of this command.

authentication mode {**hmac-sha-256** {**0** | **7**} *password* | **md5**}
no authentication mode

Syntax Description

hmac-sha-256	Specifies the Hashed Message Authentication Code (HMAC)-Secure Hash Algorithm (SHA)-256 authentication.
0	Indicates that there is no password encryption. 0 is the default.
7	Indicates that there is an explicit password encryption.
password	Password string to be used with SHA authentication. The string can contain 1 to 32 characters including white spaces; however, the first character cannot be a number.
md5	Specifies message digest algorithm 5 (MD5) authentication.

Command Default

No authentication mode is provided for EIGRP packets.

Command Modes

Address family interface configuration (config-router-af-interface)

Service family interface configuration (config-router-sf-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.
15.1(2)S	This command was modified. The **hmac-sha-256** keyword and the *encryption-type* and *password* arguments were added.
Cisco IOS XE Release 3.3S	This command was modified. The **hmac-sha-256** keyword and the *encryption-type* and *password* arguments were added.
15.2(1)T	This command was modified. The **hmac-sha-256** keyword and the *encryption-type* and *password* arguments were added.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.

Usage Guidelines

You can configure authentication to prevent unapproved sources from introducing unauthorized or false service messages.

When the **authentication mode**(EIGRP)command is used in conjunction with the **authentication key-chain** command, an MD5 keyed digest is added to each EIGRP packet.

To configure basic HMAC-SHA-256 authentication, use the **authentication mode hmac-sha-256** command on each interface of each router that should use authentication.

Examples

The following example shows how to configure the interface to use MD5 authentication in address-family packets:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 1
Router(config-router-af)# af-interface ethernet0/0
Router(config-router-af-interface)# authentication key-chain TEST1
Router(config-router-af-interface)# authentication mode md5
```

The following example shows how to configure the interface to use MD5 authentication in service-family packets:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 1
Router(config-router-sf)# sf-interface ethernet0/0
Router(config-router-sf-interface)# authentication key-chain TEST1
Router(config-router-sf-interface)# authentication mode md5
```

The following example shows how to configure the interface to use basic HMAC SHA authentication with password password1 in address-family packets:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv6 autonomous-system 4453
Router(config-router-af)# af-interface ethernet 0
Router(config-router-af-interface)# authentication mode hmac-sha-256 7 password1
```

The following example shows how to configure an interface to use basic HMAC SHA authentication with password password1 in service-family packets:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 6473
Router(config-router-sf)# sf-interface ethernet 0
Router(config-router-sf-interface)# authentication mode hmac-sha-256 7 password1
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address family interface configuration mode to configure interface-specific EIGRP commands.
authentication key-chain	Specifies the type of authentication used in EIGRP address-family or service-family packets for the EIGRP instance.

Command	Description
key chain	Defines an authentication key chain needed to enable authentication for routing protocols.
router eigrp	Configures an EIGRP routing process.

autonomous-system (EIGRP)

To configure the autonomous-system number for an Enhanced Interior Gateway Routing Protocol (EIGRP) routing process to run within a VPN routing and forwarding (VRF) instance, use the **autonomous-system** command in address-family configuration mode. To remove the autonomous-system for an EIGRP routing process from within a VPN VRF instance, use the **no** form of this command.

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

Syntax Description

autonomous-system-number	Autonomous system number of the EIGRP routing process.

Command Default

The autonomous-system number is not configured.

Command Modes

Address-family configuration (config-router-af)

Command History

Release	Modification
12.0(22)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.2(27)SBC	The command was integrated into Cisco IOS Release 12.2(27)SBC.
15.0(1)M	This command was modified. This command can now be configured as a keyword of the **address-family**(EIGRP) command. This command can still be configured as a separate command in address-family configuration mode.
12.2(33)SRE	This command was modified. This command can now be configured as a keyword of the **address-family**(EIGRP) command. This command can still be configured as a separate command in address-family configuration mode.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	The command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

This standalone **autonomous-system** command is not available in EIGRP named configurations. This command is present only in EIGRP autonomous-system (AS) configurations.

When configuring an EIGRP process, you must configure an autonomous-system value. You can configure an autonomous-system value using the standalone **autonomous-system**(EIGRP) command in address-family configuration mode or by configuring the **address-family**command in router configuration mode with the *autonomous-system-number* argument, or both.

Once configured, the standalone **autonomous-system** command can optionally be removed, but only if the *autonomous-system*argument is also configured on the **address-family** command.

Once configured, the *autonomous-system-number* argument on the **address-family** command cannot be removed without also removing the address-family itself.

Examples

The following example shows how to configure an EIGRP routing process within a VRF with the autonomous system configured by the **autonomous-system** command in address-family configuration mode:

```
Router(config)# router eigrp 65200
Router(config-router)# address-family ipv4 vrf VRF2
Router(config-router-af)# autonomous-system 65500
```

The following example shows how to configure an EIGRP address family within a VRF with the autonomous system configured by the **address-family** *autonomous-system-number* command in router configuration mode:

```
Router(config)# router eigrp 65200
Router(config-router)# address-family ipv4 vrf VRF2 autonomous-system 65500
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
router eigrp	Configures the EIGRP address-family process.

auto-summary (EIGRP)

To allow automatic summarization of subnet routes into network-level routes, use the **auto-summary** command in router configuration mode or address-family topology configuration mode. Todisable this function and send subprefix routing information across classful network boundaries, use the **no** form of this command.

auto-summary
no auto-summary

Syntax Description

This command has no arguments or keywords.

Command Default

The behavior of this command is enabled by default (the software does not send subprefix routing information across classful network boundaries).

The behavior of this command is disabled by default (the software sends subprefix routing information across classful network boundaries).

Command Modes

Router configuration (config-router) Address-family topology configuration (config-router-af-topology)

Command History

Release	Modification
10.0	This command was introduced.
12.2(8)T	The command default behavior changed to disabled.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Address-family topology configuration mode was added. The default behavior was changed to disabled.
12.2(33)SRE	This command was modified. Address-family topology configuration mode was added. The default behavior was changed to disabled.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was modified. Address-family topology configuration mode was added. The default behavior was changed to disabled.

Usage Guidelines

To allow the software to create summary subprefixes to the classful network boundary when crossing classful network boundaries, use the **auto-summary** command.

Enhanced Interior Gateway Routing Protocol (EIGRP) summary routes are given an administrative distance value of 5. You cannot configure this value.

Examples

The following example enables automatic summarization for EIGRP process 109:

```
Router(config)# router eigrp 109
Router(config-router)# auto-summary
```

The following example enables automatic summarization for EIGRP autonomous-system 4473:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4473
Router(config-router-af)# topology base

Router(config-router-af-topology)# auto-summary
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
ip summary-address eigrp	Configures a summary aggregate address for a specified interface.
router eigrp	Configures the EIGRP address-family process.
topology (EIGRP)	Configures an EIGRP process to route IP traffic under the specified topology instance and enters router address-family topology configuration mode.

bandwidth-percent

To configure the percentage of bandwidth that may be used by an Enhanced Interior Gateway Routing Protocol (EIGRP) address family or service family on an interface, use the **bandwidth-percent**command in address-family interface configuration mode or service-family interface configuration mode. To restore the default value, use the **no** form of this command.

bandwidth-percent *maximum-bandwidth-percentage*
no bandwidth-percent

Syntax Description

maximum-bandwidth- percentage	Percent of configured bandwidth that EIGRP may use to send packets. Valid range is 1 to 999999. The default is 50 percent.

Command Default

EIGRP limits bandwidth usage to 50 percent of the configured interface bandwidth.

Command Modes

Address-family interface configuration (config-router-af-interface) Service-family interface configuration (config-router-sf-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

Use the **bandwidth-percent** command to configure a different percentage of bandwidth for use by EIGRP than specified for the link by using the **bandwidth interface**command. Values greater than 100 percent may be configured. This option might be useful if the link bandwidth is set artificially low for other reasons. The default bandwidth percent uses 50 percent of the configured bandwidth of the link.

Examples

The following example uses up to 75 percent (42 kbps) of a 56-kbps serial link for address-family autonomous system 4453:

```
Router(config)# router eigrp virtual-name

Router(config-router)# address-family ipv4 autonomous-system 4453

Router(config-router-af)# af-interface ethernet0/0
Router(config-router-af-interface)# bandwidth-percent 75
```

The following example uses up to 75 percent (42 kbps) of a 56-kbps serial link for service-family autonomous system 4533:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 4533
```

```
Router(config-router-sf)# sf-interface serial 0
Router(config-router-sf-interface)# bandwidth-percent 75
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
router eigrp	Configures the EIGRP address-family process.
service-family	Configures VRF metrics for an EIGRP service-family.
sf-interface	Configures interface-specific commands for an EIGRP service-family.

bfd (EIGRP)

To enable Bidirectional Forwarding Detection (BFD) on Enhanced Interior Gateway Routing Protocol (EIGRP) IPv6 interfaces, use the **bfd** command in address family interface configuration mode. To disable BFD on EIGRP IPv6 interfaces, use the **no** form of this command.

bfd

no bfd

Syntax Description

This command has no arguments or keywords.

Command Default

BFD is not enabled on EIGRP IPv6 interfaces.

Command Modes

Address family interface configuration (config-router-af-interface)

Command History

Release	Modification
Cisco IOS XE Release 3.6S	This command was introduced.
15.2(2)S	This command was integrated into Cisco IOS Release 15.2(2)S.
15.2(4)M	This command was integrated into Cisco IOS Release 15.2(4)M.
15.2(1)E	This command was integrated into Cisco IOS Release 15.2(1)E.

Usage Guidelines

Use the **bfd** command to enable BFD on a specific EIGRP IPv6 interface or all EIGRP IPv6 interfaces. To enable BFD on all EIGRP IPv6 interfaces, enter the **bfd** command under the default address family interface configuration mode. If BFD is enabled on all EIGRP IPv6 interfaces and you want to disable it on a specific interface, use the **no bfd** command on that specific interface.

Note BFD on EIGRP IPv6 interfaces is supported only in EIGRP named configurations.

Examples

The following example shows how to enable BFD on all EIGRP IPv6 interfaces.

```
Device(config)# router eigrp name
Device(config-router)# address-family ipv6 unicast autonomous-system 12
Device(config-router-af)# af-interface default
Device(config-router-af-interface)# bfd
```

The following example shows how to enable BFD on a specific EIGRP IPv6 interface:

```
Device(config)# router eigrp name
Device(config-router)# address-family ipv6 unicast autonomous-system 12
Device(config-router-af)# af-interface gigabitEthernet 0/0/1
Device(config-router-af-interface)# bfd
```

The following example shows how to enable BFD on all interfaces under address family IPv6 Virtual Routing and Forwarding (VRF) mode:

```
Device(config)# router eigrp name
Device(config-router)# address-family ipv6 vrf vrf1 autonomous-system 12
Device(config-router-af)# af-interface default
Device(config-router-af-interface)# bfd
```

The following example shows how to enable BFD on a specific interface under address family IPv6 VRF mode:

```
Device(config)# router eigrp name
Device(config-router)# address-family ipv6 vrf vrf1 autonomous-system 12
Device(config-router-af)# af-interface gigabitEthernet 0/0/1
Device(config-router-af-interface)# bfd
```

Related Commands

Command	Description
bfd	Sets the baseline BFD session parameters on an interface.

clear eigrp address-family neighbors

To delete entries from the Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor table, use the **clear eigrp address-family neighbors** command in privileged EXEC mode.

clear eigrp address-family {**ipv4** [{*autonomous-system-number* | **vrf** [*vrf-name*][*autonomous-system-number*]}] | **ipv6** [*autonomous-system-number*]} **neighbors** [*ip-address*] [*interface-type interface-number*] [**soft**]

Syntax Description

ipv4	Selects neighbors formed using the IPv4 protocol family.
ipv6	Selects neighbors formed using the IPv6 protocol family.
autonomous-system-number	(Optional) Autonomous system number of the EIGRP routing process. If no autonomous system number is specified, all autonomous systems are affected.
vrf	(Optional) Deletes entries from the neighbor table for the specified IPv4 VRF.
vrf-name	(Optional) Name of the VRF address-family to which the command is applied.
ip-address	(Optional) IPv4 or IPv6 address of the neighbor. Specifying an address removes all entries with this address from the neighbor table.
interface-type	(Optional) Interface type. Specifying this argument removes the specified interface type that all entries learned via this interface from the neighbor table.
interface-number	(Optional) Interface number. Specifying this arguments removes the specified interface number that all entries learned via this interface from the neighbor table.
soft	(Optional) Gracefully informs the peer that adjacency is being resynced. This method does not take the peer down and back up with a hard reset.

Command Default

Entries in the EIGRP neighbor table are not cleared.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

Caution This command causes peers to bounce and routes to be relearned. Use this command only with the guidance of Cisco technical support.

Specifying the *interface-type* and *interface-number* arguments clears the neighbors on the specified interface from the neighbor table.

Specifying the VRF for an IPv4 address family clears neighbors in that VRF only. If an autonomous-system number is provided along with the VRF, then only the neighbors of that autonomous-system number in the VRF are cleared.

Examples

The following example removes the neighbor whose address is 172.16.8.3:

```
Router# clear eigrp address-family ipv4 neighbors 172.16.8.3
```

The following example clears EIGRP neighbors reached through the VRF named VRF1 in autonomous system 101:

```
Router# clear eigrp address-family ipv4 vrf VRF1 101 neighbors
```

The following example clears EIGRP neighbors reached through the VRF named VRF1 in autonomous system 101 learned through Ethernet interface 0/0:

```
Router# clear eigrp address-family ipv4 vrf VRF1 101 neighbors ethernet0/0
```

Related Commands

Command	Description
clear eigrp topology	Clears an EIGRP process for a topology instance.
clear ip eigrp neighbors	Deletes entries from the EIGRP neighbor table.
show eigrp address-family neighbors	Displays neighbors discovered by EIGRP.
show ip eigrp address-family neighbors	Displays neighbors discovered by EIGRP.

clear ip eigrp neighbors

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

clear ip eigrp [{**vrf** *vrf-name* [*autonomous-system-number*]*autonomous-system-number*}] **neighbors** [{*ip-address* | *interface-type interface-number*}] [**soft**]

Syntax Description

vrf	(Optional) Deletes entries from the neighbor table for the specified IPv4 VRF.
vrf-name	(Optional) Name of the VRF address family to which the command is applied.
autonomous-system-number	(Optional) Autonomous-system (AS) number of the EIGRP routing process. If no autonomous-system number is specified, all autonomous systems are affected.
ip-address	(Optional) Address of the neighbor.
interface-type	(Optional) Interface type. Specifying this argument removes the specified interface type that all entries learned via this interface from the neighbor table.
interface-number	(Optional) Interface number. Specifying this argument removes the specified interface number that all entries learned via this interface from the neighbor table.
soft	(Optional) Gracefully informs the peer that adjacency is being resynced. This method does not take the peer down and back up with a hard reset.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
10.0	This command was introduced.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.0(1)M	This command was modified. The **vrf** keyword, *vrf-name*argument, and **soft** keyword were added. This command replaces the **clear ip eigrp vrf neighbors** command.
12.2(33)SRE	This command was modified. The **vrf** keyword, *vrf-name*argument, and **soft** keyword were added. This command replaces the **clear ip eigrp vrf neighbors** command.

Release	Modification
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

Caution This command causes peers to bounce and routes to be relearned. Use this command only with the guidance of Cisco technical support.

Specifying the *interface-type* and *interface-number* arguments clears the neighbors on the specified interface from the neighbor table.

Specifying the VRF or AS clears the neighbors in that VRF or AS.

This is a IPv4-only command in that it clears only the specified EIGRP IPv4 neighbors.

Examples

The following example removes the neighbor whose address is 172.16.8.3:

```
Router# clear ip eigrp neighbors 172.16.8.3
```

The following example clears EIGRP neighbors reached through the VRF named VRF1 in autonomous-system 101:

```
Router# clear ip eigrp vrf VRF1 101 neighbors
```

The following example clears EIGRP neighbors reached through the VRF named VRF1 in autonomous-system 101 learned through Ethernet interface 0/0:

```
Router# clear ip eigrp vrf VRF1 101 neighbor ethernet0/0
```

Related Commands

Command	Description
clear eigrp address-family neighbors	Deletes entries from the EIGRP neighbor table.
show ip eigrp interfaces	Displays information about interfaces configured for EIGRP.
show ip eigrp neighbors	Displays neighbors discovered by EIGRP.

clear ip eigrp vrf neighbors

Note Effective with Cisco IOS Release 15.0(1)M and 12.2(33)SRE, the **clear ip eigrp vrf neighbors**command is replaced by the **clear ip eigrp neighbors** command. See the **clear ip eigrp neighbors**for more information.

To clear neighbor entries of the specified Enhanced Interior Gateway Routing Protocol (EIGRP) virtual routing and forwarding instance (VRF) from the Routing Information Base (RIB), use the **clear ip eigrp vrf neighbors**command in privileged EXEC mode.

clear ip eigrp vrf *vrf-name* [*autonomous-system-number*] **neighbors** [*interface-name interface-number*]

Syntax Description

vrf-name	Name of the VRF whose EIGRP neighbors will be cleared. The ***** keyword can be used as a wildcard to specify all VRFs.
autonomous-system-number	(Optional) Autonomous system number of the VRF whose neighbors will be cleared.
interface-name interface-number	(Optional) Interface that VRF neighbors were learned through. The exact interface is specified by interface name and number using the *interface-name* and *interface-number* arguments.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(22)S	This command was introduced.
12.2(15)T	This command was integrated into 12.2(15)T.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was replaced by the **clear ip eigrp neighbors** command.
12.2(33)SRE	This command was replaced by the **clear ip eigrp neighbors** command.

Examples

The following example shows how to clear EIGRP neighbors reached through the VRF named RED in autonomous system 45000:

```
Router# clear ip eigrp vrf RED 45000 neighbors
```

The following example shows how to clear EIGRP neighbors reached through the VRF named GREEN in autonomous-system 101 learned through Ethernet interface 0/0:

```
Router# clear ip eigrp vrf GREEN 45000 neighbors ethernet 0/0
```

Related Commands

Command	Description
show ip eigrp vrf interfaces	Displays EIGRP interfaces that are defined under the specified VRF.
show ip eigrp vrf neighbors	Displays neighbors discovered by EIGRP that carry VRF information.
show ip eigrp vrf topology	Displays VRF entries in the EIGRP topology table.
show ip eigrp vrf traffic	Displays EIGRP VRF traffic statistics.
show ip route vrf	Displays routing protocol information that is associated with a VRF.

clear ipv6 eigrp

To delete entries from Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 routing tables, use the **clear ipv6 eigrp** command in privileged EXEC mode.

clear ipv6 eigrp [*as-number*] [**neighbor** [{*ipv6-address* | *interface-type interface-number*}]]

Syntax Description

as-number	(Optional) Autonomous system number.
neighbor	(Optional) Deletes neighbor router entries.
ipv6-address	(Optional) IPv6 address of a neighboring router.
interface-type	(Optional) The interface type of the neighbor router.
interface-number	(Optional) The interface number of the neighbor router.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Usage Guidelines

Use the **clear ipv6 eigrp** command without any arguments or keywords to clear all EIGRP for IPv6 routing table entries. Use the *as-number* argument to clear routing table entries on a specified process, and use the **neighbor***ipv6-address* keyword and argument, or the *interface-typeinterface-number* argument, to remove a specific neighbor from the neighbor table.

Examples

The following example removes the neighbor whose IPv6 address is 3FEE:12E1:2AC1:EA32:

```
Router# clear ipv6 eigrp neighbor 3FEE:12E1:2AC1:EA32
```

dampening-change

To set a threshold percentage to minimize or dampen the effect of frequent routing changes through an interface in an Enhanced Interior Gateway Routing Protocol (EIGRP) address family or service family, use the **dampening-change** command in address-family interface configuration mode or service-family interface configuration mode. To restore the default value, use the **no** form of this command.

dampening-change [*change-percentage*]
no dampening-change

Syntax Description

change-percentage	(Optional) The percentage a metric must change before the value is stored for future decisions on advertisements. Value range is 1 to 100. If a *change-percentage* value is not specified, the default is 50 percent of the computed metric.

Command Default

No threshold percentage is configured.

Command Modes

Address-family interface configuration (config-router-af-interface) Service-family interface configuration (config-router-sf-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

The **dampening-change** command is supported only for Mobile Ad Hoc Networking (MANET) router-to-radio links.

When a peer metric changes on an interface that is configured with the **dampening-change** command, EIGRP multiplies the dampening-change percentage with the old peer metric and compares the result (the threshold) to the difference between the old and new metrics. If the metric difference is greater than the calculated threshold, then the new metric is applied and routes learned from that peer are updated and advertised to other peers. If the metric difference is less than the threshold, the new metric is discarded.

There are exceptions that will result in an immediate update regardless of the dampening-change setting:

- An interface is down.
- A route is down.
- A change in metric which results in the router selecting a new next hop.

Peer metric changes that do not exceed a configured change percentage and that do not result in a routing change do not result in an update being sent to other adjacencies. Peer metric changes are based on the stored

last-update of the peer. Peer metric changes that exceed the threshold value are stored and used for future comparisons.

Examples

The following example configures an EIGRP address family to accept a peer metric change if the change is greater than 75 percent of the last updated value:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 5400
Router(config-router-af)# af-interface ethernet0/0
Router(config-router-af-interface)# dampening-change 75
```

The following example configures an EIGRP service family to accept a peer metric change if the change is greater than 75 percent of the last updated value:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 4533
Router(config-router-sf)# sf-interface serial 0
Router(config-router-sf-interface)# dampening-change 75
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
dampening-interval	Sets a threshold time interval to minimize or dampen the effect of frequent routing changes through an interface in an EIGRP address family or service family.
router eigrp	Configures the EIGRP address-family process.
service-family	Specifies service-family configuration mode.
sf-interface	Configures interface-specific commands under a service family.

dampening-interval

To set a threshold time interval to minimize or dampen the effect of frequent routing changes through an interface in an Enhanced Interior Gateway Routing Protocol (EIGRP) address family or service family, use the **dampening-interval** command in address-family interface configuration mode or service-family interface configuration mode. To restore to the default value, use the **no** form of this command.

dampening-interval [*interval*]
no dampening-interval [*interval*]

Syntax Description

interval	(Optional) Time interval, in seconds, that must elapse before a route change will cause an update to occur. Value range is 1 to 65535. If an *interval*value is not specified, the default is 30 seconds.

Command Default

A dampening interval is not enabled.

Command Modes

Address-family interface configuration (config-router-af-interface) Service-family interface configuration (config-router-sf-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

The **dampening-interval** command is supported only in Mobile Ad Hoc Networking (MANET) Router-to-Radio links.

When a peer metric changes on an interface that is configured with a dampening interval, EIGRP will apply the metric change only if the time difference since the last metric changed exceeds the specified interval. If the time difference is less than the specified interval, the update is discarded.

There are exceptions that result in an immediate update regardless of the dampening interval settings:

- An interface is down.
- A route is down.
- A change in metric that results in the router selecting a new next hop.

Examples

The following example configures EIGRP address-family Ethernet interface 0/0 to limit the metric change frequency to no more than one change in a 45-second interval:

```
Router(config)# router eigrp virtual-name
```

```
Router(config-router)# address-family ipv4 autonomous-system 5400
Router(config-router-af)# af-interface ethernet0/0
Router(config-router-af-interface)# dampening-interval 45
```

The following example configures EIGRP service-family Serial interface 0 to limit the metric change frequency to no more than one change in a 30 second interval:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 4533
Router(config-router-sf)# sf-interface serial0
Router(config-router-sf-interface)# dampening-interval 30
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
dampening-change	Sets a threshold percentage to minimize or dampen the effect of frequent routing changes through an interface in an EIGRP address family or service family.
router eigrp	Configures the EIGRP address-family process.
service-family	Specifies service-family configuration mode.
sf-interface	Configures interface-specific commands under a service family.
shutdown	Disables service family on the interface.

default-information

To accept exterior or default routing information into Enhanced Interior Gateway Routing Protocol (EIGRP) processes, use the **default-information** command in router configuration mode or address-family topology configuration mode. To suppress exterior or default routing information in inbound or outbound updates, use the **no**form of this command.

default-information {**allowed** {**in** | **out**} | **in** | **out**} [{*acl-numberacl-name*}]
no default-information {**allowed** {**in** | **out**} | **in** | **out**}

Cisco IOS Release 15.0(1)M, 12.2(33)SRE, 12.2(33)XNE, Cisco IOS XE Release 2.5 and Later Releases
default-information {**in** | **out**} [{*acl-numberacl-name*}]
no default-information {**in** | **out**} [{*acl-numberacl-name*}]

Syntax Description

allowed	Configures EIGRP to accept default routing information.
in	Configures EIGRP to accept exterior or default routing information.
out	Configures EIGRP to advertise external routing information.
acl-number	(Optional) Standard access list number from 1 to 99 or an expanded standard access list from 1300 to 1999.
acl-name	(Optional) Named standard access list.

Command Default

Exterior routes are always accepted and default information is passed between EIGRP processes when redistribution occurs.

Command Modes

Router configuration (config-router) Address-family topology configuration (config-router-af-topology)

Command History

Release	Modification
10.0	This command was introduced.
11.2	The *acl-number* and *acl-name* arguments were added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Address-family topology configuration mode was added. The **allowed** keyword was removed.
12.2(33)SRE	This command was modified. Address-family topology configuration mode was added. The **allowed** keyword was removed.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

The default network of 0.0.0.0 used by Routing Information Protocol (RIP) can be redistributed by EIGRP.

Examples

The following example allows exterior or default routes to be received by the EIGRP process in autonomous system 23:

```
Router(config)#
router eigrp 23
Router(config-router)# default-information in
```

The following example allows EIGRP exterior or default routes to be received by the EIGRP process in autonomous system 4473 in Cisco IOS Release 15.0(1)M, 12.2(33)SRE, 12.2(33)XNE, Cisco IOS XE Release 2.5 and later releases:

```
Router(config)# router eigrp virtual-name

Router(config-router)# address-family ipv4 autonomous-system 4473
Router(config-router-af)#
topology base

Router(config-router-af-topology)# default-information in
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
router eigrp	Configures the EIGRP address-family process.
topology (EIGRP)	Configures an EIGRP process to route IP traffic under the specified topology instance and enters router address-family topology configuration mode.

default-metric (EIGRP)

To set metrics for Enhanced Interior Gateway Routing Protocol (EIGRP), use the **default-metric** command in router configuration mode or address-family topology configuration mode. 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 *bandwidth delay reliability loading mtu*

Syntax Description

bandwidth	Minimum bandwidth of the route in kilobytes per second. It can be from 1 to 4294967295.
delay	Route delay in tens of microseconds. It can be 1 or any positive number that is a multiple of 39.1 nanoseconds.
reliability	Likelihood of successful packet transmission expressed as a number from 0 through 255. The value 255 means 100 percent reliability; 0 means no reliability.
loading	Effective bandwidth of the route expressed as a number from 1 to 255 (255 is 100 percent loading).
mtu	The smallest allowed value for the maximum transmission unit (MTU), expressed in bytes. It can be from 1 to 65535.

Command Default

Only connected routes, static routes with exit interfaces and another EIGRP instance can be redistributed without a default metric. The metric of redistributed connected routes is set to the metric of the interface. The metric of redistributed static route with exit interface is the metric of the exit interface. The metric of another EIGRP instance is copied from that instance.

Command Modes

Router configuration (config-router) Address-family topology configuration (config-router-af-topology)

Command History

Release	Modification
10.0	This command was introduced.
12.0(22)S	Address family support was added.
12.2(15)T	Address family support was added.
12.2(18)S	Address family support was added.
12.4(6)T	Support for IPv6 was added.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Release	Modification
15.0(1)M	This command was modified. Address-family topology configuration mode was added. This command must be entered in address-family topology configuration mode when EIGRP is configured with a named router configuration.
12.2(33)SRE	This command was modified. Address-family topology configuration mode was added. This command must be entered in address-family topology configuration mode when EIGRP is configured with a named router configuration.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

You must use the **default-metric** command to redistribute a protocol into EIGRP unless you specify the metrics in the **redistribute** command itself. Default metrics support all protocols being redistributed into EIGRP.

Examples

The following example shows how the redistributed Routing Information Protocol (RIP) metrics are translated into EIGRP metrics with values as follows: bandwidth = 1000, delay = 100, reliability = 250, loading = 100, and MTU = 1500:

```
Router(config)#
router eigrp 109
Router(config-router)#
network 172.16.0.0
Router(config-router)# redistribute rip
Router(config-router)#
default-metric 1000 100 250 100 1500
```

The following example shows how the redistributed EIGRP service family 6473 metrics are translated into EIGRP metric with values as follows: bandwidth = 1000, delay = 100, reliability = 250, loading = 100, and MTU = 1500.

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# af-interface default
Router(config-router-af-interface)# no shutdown
Router(config-router-af-interface)# exit
Router(config-router-af)# topology base
Router(config-router-af-topology)# default-metric 1000 100 250 100 1500
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
ipv6 router eigrp	Configures the EIGRP IPv6 routing process.
redistribute (IP)	Redistributes routes from one routing domain into another routing domain.

Command	Description
redistribute (IPv6)	Redistributes IPv6 routes from one routing domain into another routing domain.
router eigrp	Configures the EIGRP address-family process.
topology (EIGRP)	Configures an EIGRP process to route IP traffic under the specified topology instance and enters router address-family topology configuration mode.

distance (IPv6 EIGRP)

To allow the use of two administrative distances--internal and external--that could be a better route to a node, use the **distance**command in router configuration mode. To reset these values to their defaults, use the **no** form of this command.

distance *internal-distance external-distance*
no distance

Syntax Description

internal-distance	Administrative distance for Enhanced Internal Gateway Routing Protocol (EIGRP) for IPv6 internal routes. Internal routes are those that are learned from another entity within the same autonomous system. The distance can be a value from 1 to 255.
external-distance	Administrative distance for EIGRP for IPv6 external routes. External routes are those for which the best path is learned from a neighbor external to the autonomous system. The distance can be a value from 1 to 255.

Command Default

internal-distance : 90*external-distance*: 170

Command Modes

Router configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

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.

Use the **distance**command if another protocol is known to be able to provide a better route to a node than was actually learned via external EIGRP for IPv6, or if some internal routes should be preferred by EIGRP for IPv6.

The table below lists the default administrative distances.

Table 1: Default Administrative Distances

Route Source	Default Distance
Connected interface	0
Static route	1
EIGRP summary route	5

Route Source	Default Distance
External Border Gateway Protocol (BGP)	20
Internal EIGRP	90
Open Shortest Path First (OSPF)	110
Intermediate System-to-Intermediate System (IS-IS)	115
Routing Information Protocol (RIP)	120
Exterior Gateway Protocol (EGP)	140
EIGRP external route	170
Internal BGP	200
Unknown	255

Examples

The following example sets the internal distance to 95 and the external distance to 165:

```
distance 95 165
```

distance eigrp

To allow the use of two administrative distances--internal and external--that could be a better route to a node, use the **distance eigrp** command in router configuration mode or address-family topology configuration mode. To reset these values to their defaults, use the **no** form of this command.

distance eigrp *internal-distance external-distance*
no distance eigrp

Syntax Description

internal-distance	Administrative distance for Enhanced Internal Gateway Routing Protocol (EIGRP) internal routes. Internal routes are those that are learned from another entity within the same autonomous system. The distance can be a value from 1 to 255. The default administrative distance for EIGRP internal routes is 90.
external-distance	Administrative distance for EIGRP external routes. External routes are those for which the best path is learned from a neighbor external to the autonomous system. The distance can be a value from 1 to 255. The default administrative distance for EIGRP external routes is 170.

Command Default

EIGRP uses the default internal and external administrative distances.

Command Modes

Router configuration (config-router) Address-family topology configuration (config-router-af-topology)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Address-family topology configuration mode was added. This command must be entered in address-family topology configuration mode when EIGRP is configured with a named router configuration.
12.2(33)SRE	This command was modified. Address-family topology configuration mode was added. This command must be entered in address-family topology configuration mode when EIGRP is configured with a named router configuration.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

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.

Use the **distance eigrp** command if another protocol is known to be able to provide a better route to a node than was actually learned via external EIGRP, or if some internal routes should really be preferred by EIGRP.

The table below lists the default administrative distances.

Table 2: Default Administrative Distances

Route Source	Default Distance
Connected interface	0
Static route	1
EIGRP summary route	5
External BGP	20
Internal EIGRP	90
Open Shortest Path First (OSPF)	110
Intermediate System-to-Intermediate System (IS-IS)	115
Routing Information Protocol (RIP)	120
EIGRP external route	170
Internal Border Gateway Protocol (BGP)	200
Unknown	255

To display the default administrative distance for a specified routing process, use the **show ip protocols** command.

Examples

In the following example, the **router eigrp** global configuration command sets up EIGRP routing in autonomous system number 109. The **network** router configuration commands specify EIGRP routing on networks 192.168.7.0 and 172.16.0.0. The **distance eigrp** command sets the administrative distance of all EIGRP internal routes to 80 and all EIGRP external routes to 130.

```
Router(config)# router eigrp 109
Router(config-router)# network 192.168.7.0
Router(config-router)# network 172.16.0.0
Router(config-router)# distance eigrp 80 130
```

In the following example, the **distance eigrp** command sets the administrative distance of all EIGRP address-family internal routes to 80 and all external routes to 130:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4473
Router(config-router-af)# topology base
Router(config-router-af-topology)# distance eigrp 80 130
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
router eigrp	Configures the EIGRP address-family process.
show ip protocols	Displays the parameters and current state of the active routing protocol process.
topology (EIGRP)	Configures an EIGRP process to route IP traffic under the specified topology instance and enters router address-family topology configuration mode.

distribute-list prefix-list (IPv6 EIGRP)

To apply a prefix list to Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 routing updates that are received or sent on an interface, use the **distribute-list prefix-list**command in router configuration mode. To remove the prefix list, use the **no** form of this command.

distribute-list prefix-list *list-name*
no distribute-list prefix-list *list-name*

Syntax Description

list-name	Name of a prefix list. The list defines which EIGRP for IPv6 networks are to be accepted in incoming routing updates and which networks are to be advertised in outgoing routing updates, based upon matching the network prefix to the prefixes in the list.

Command Default

Prefix lists are not applied to EIGRP for IPv6 routing updates.

Command Modes

Router configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The prefix list is applied to routing updates received or sent on all interfaces.

Examples

The following example applies prefix list list1 to routes received and sent on all interfaces:

```
Router(config)# ipv6 router eigrp 1
Router(config-router)# distribute-list prefix-list list1
```

Related Commands

Command	Description
ipv6 prefix-list	Creates an entry in an IPv6 prefix list.
show ipv6 prefix-list	Displays information about an IPv6 prefix list or prefix list entries.

eigrp default-route-tag

To set a default route tag for all internal Enhanced Interior Gateway Routing Protocol (EIGRP) routes, use the **eigrp default-route-tag** command in address family configuration mode. To remove the default route tag, use the **no** form of this command.

eigrp default-route-tag {*route-tag-plain-decimal* *route-tag-dotted-decimal*}
no eigrp default-route-tag

Syntax Description

route-tag-plain-decimal	Route tag value in plain decimals. The valid range is from 0 to 4294967295.
route-tag-dotted-decimal	Route tag value in dotted decimals. The valid range is from 0.0.0.0 to 255.255.255.255.

Command Default

Internal routes do not have a default route tag.

Command Modes

Address family configuration (config-router-af)

Command History

Release	Modification
15.2(2)S	This command was introduced.
Cisco IOS XE Release 3.6S	This command was integrated into Cisco IOS XE Release 3.6S.
15.2(4)M	This command was integrated into Cisco IOS Release 15.2(4)M.

Usage Guidelines

Use the **eigrp default-route-tag** command to set a default route tag for all internal EIGRP routes without using a route map. You can set a default tag for routes in either plain-decimal format or dotted-decimal format. Default route tags are supported only in EIGRP named mode configurations. You must enable the **route-tag notation** command on the device for **show** commands to display route tags in dotted-decimal format.

Examples

The following example shows how to configure a default route tag in dotted-decimal format:

```
Device(config)# router eigrp name
Device(config-router)# address-family ipv4 unicast autonomous-system 1
Device(config-router-af)# eigrp default-route-tag 10.10.10.10
```

The following example shows how to configure a default route tag in plain-decimal format:

```
Device(config)# router eigrp name
Device(config-router)# address-family ipv4 unicast autonomous-system 1
Device(config-router-af)# eigrp default-route-tag 2
```

Related Commands

Command	Description
match tag	Filters routes that match specific route tags.
route-tag notation	Enables the display of route tag values in dotted-decimal format.
set tag (IP)	Sets a tag value for a route.

eigrp event-log-size

To set the size of the Enhanced Interior Gateway Routing Protocol (EIGRP) event log, use the **eigrp event-log-size** command in router configuration mode or address-family topology configuration mode. To reset the size of the EIGRP event log to its default value, use the **no** form of this command.

eigrp event-log-size *size*
no eigrp event-log-size

Syntax Description

size	Size of the EIGRP event log; valid values are from 0 to half of the available memory on the system at the time of configuration. Default value is 500.

Command Default

The EIGRP event log size is 500.

Command Modes

Router configuration (config-router) Address-family topology configuration (config-router-af-topology)

Command History

Release	Modification
12.2(18)SXF	This command was introduced in Cisco IOS Release 12.2(18)SXF.
15.0(1)M	This command was modified. Address-family topology configuration mode was added.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

When the configured size (number of lines) of the event log is exceeded, the last configured number of lines is retained, and the log becomes a rolling number of events with the most recent at the top of the log.

Examples

The following example shows how to set the size of the EIGRP event log to 5000010:

```
Router# configure terminal
Router(config)# router eigrp 2
Router (config-router)# eigrp event-log-size 5000010
Router (config-router)#
```

The following example shows how to set the size of the EIGRP event log in an EIGRP named configuration to 10000:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 1
Router(config-router-af)# topology base
Router(config-router-af-topology)# eigrp event-log-size 10000
```

Related Commands

Command	Description
clear ip eigrp event	Clears the IP EIGRP event log.

eigrp interface

Note Effective with Cisco IOS Release 15.0(1)M, the **eigrp interface**command is replaced by the **dampening-change** command and the **dampening-interval** command. See the **dampening-change** and **dampening-interval**commands for more information.

To set a threshold value to minimize hysteresis in a router-to-radio configuration, use the **eigrp interface** command in interface configuration mode. To reset the hysteresis threshold to the default value, use the **no** form of this command.

eigrp *vmi-interface-number* **interface** [**dampening-change** *value*] [**dampening-interval** *value*]
no eigrp *vmi-interface-number* **interface** [**dampening-change** *value*] [**dampening-interval** *value*]

Syntax Description

vmi-interface-number	The number assigned to the VMI interface.
dampening-change *value*	(Optional) Value used to minimize the effect of frequent routing changes in router-to-radio configurations. Percent interface metric must change to cause update. Value range is 1 to 100.
dampening-interval *value*	(Optional) Specifies the time interval in seconds to check the interface metrics at which advertising of routing changes occurs. The default value is 30 seconds. Value range is 1 to 65535.

Command Default

Default for change-based dampening is 50 percent of the computed metric.

Default for interval-based dampening is 30 seconds.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.4(15)XF	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.
15.0(1)M	This command was replaced. This command was replaced by the **dampening-change**command and the **dampening-interval** command.

Usage Guidelines

This command advertises routing changes for EIGRP traffic only.

The REPLY sent to any QUERY will always contain the latest metric information. Exceptions which will result in immediate UPDATE being sent:

- A down interface
- A down route
- Any change in metric which results in the router selecting a new next hop

Change-based Dampening

The default value for the change tolerance will be 50% of the computed metric. It can be configured in the range from 0 to 100 percent. If the metric change of the interface is not greater (or less) than the current metric plus or minus the specified amount, the change will not result in a routing change, and no update will be sent to other adjacencies.

Interval-based Dampening

The default value for the update intervals is 30 seconds. It can be configured in the range from 0 to 64535 seconds. If this option is specified, changes in routes learned though this interface, or in the interface metrics, will not be advertised to adjacencies until the specified interval is met. When the timer expires, any changes detected in any routes learned through the interface, or the metric reported by the interfaces will be sent out.

Examples

Change-based Dampening Example

The following example sets the threshold to 50 percent tolerance routing updates involving VMI interfaces and peers:

```
interface vmi1
 ip address 10.2.2.1 255.255.255.0
 ipv6 address 2001:0DB1:2::1/96
 ipv6 enable
 eigrp 1 interface dampening-change 50
 physical-interface Ethernet0/0
```

Interval-based Dampening Example

The following example sets the interval to 30 seconds at which updates occur for topology changes that affect VMI interfaces and peers:

```
interface vmi1
 ip address 10.2.2.1 255.255.255.0
 ipv6 address 2001:0DB1:2::1/96
 ipv6 enable
 eigrp 1 interface dampening-interval 30
 physical-interface Ethernet0/0
```

Related Commands

Command	Description
debug vmi	Displays debugging output for virtual multipoint interfaces (VMIs)
interface vmi	Creates a virtual multipoint interface (VMI) that can be configured and applied dynamically.

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 in router configuration mode, address-family configuration mode, or service-family configuration mode. To disable the logging of changes in EIGRP neighbor adjacencies, use the **no**form of thiscommand.

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

Router configuration (config-router) Address-family configuration (config-router-af) Service-family configuration (config-router-sf)

Command History

Release	Modification
11.2	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Address-family configuration mode and service-family configuration mode were added.
12.2(33)SRE	This command was modified. Address-family configuration mode and service-family configuration mode were added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

This command enables the logging of neighbor adjacency changes to monitor the stability of the routing system and to help detect problems. Logging is enabled by default. To disable the logging of neighbor adjacency changes, use the **no** form of this command.

To enable the logging of changes for EIGRP address-family neighbor adjacencies, use the **eigrp log-neighbor-changes**command in address-family configuration mode.

To enable the logging of changes for EIGRP service-family neighbor adjacencies, use the **eigrp log-neighbor-changes**command in service-family configuration mode.

Examples

The following configuration disables logging of neighbor changes for EIGRP process 209:

```
Router(config)# router eigrp 209
Router(config-router)# no eigrp log-neighbor-changes
```

The following configuration enables logging of neighbor changes for EIGRP process 209:

```
Router(config)# router eigrp 209
Router(config-router)# eigrp log-neighbor-changes
```

The following example shows how to disable logging of neighbor changes for EIGRP address-family with autonomous-system 4453:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# no eigrp log-neighbor-changes
Router(config-router-af)# exit-address-family
```

The following configuration enables logging of neighbor changes for EIGRP service-family process 209:

```
Router(config)# router eigrp 209
Router(config-router)# service-family ipv4 autonomous-system 4453
Router(config-router-sf)# eigrp log-neighbor-changes
Router(config-router-sf)# exit-service-family
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
exit-address-family	Exits address-family configuration mode.
exit-service-family	Exits service-family configuration mode.
router eigrp	Configures the EIGRP routing process.
service-family	Specifies service-family configuration mode.

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 in router configuration mode, address-family configuration mode, or service-family configuration mode. To disable the logging of EIGRP neighbor warning messages, use the **no**form of thiscommand.

eigrp log-neighbor-warnings [*seconds*]
no eigrp log-neighbor-warnings

Syntax Description

seconds	(Optional) The time interval (in seconds) between repeated neighbor warning messages. The range is from 1 to 65535. The default is 10.

Command Default

Neighbor warning messages are logged at 10-second intervals.

Command Modes

Router configuration (config-router) Address-family configuration (config-router-af) Service-family configuration (config-router-sf)

Command History

Release	Modification
12.0(5)	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Address-family and service-family configuration modes were added.
12.2(33)SRE	This command was modified. Address-family and service-family configuration modes were added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

When neighbor warning messages occur, they are logged by default. With this command, you can disable and enable neighbor warning messages, and you can configure the interval between repeated neighbor warning messages.

To enable the logging of warning messages for an EIGRP address family, use the **eigrp log-neighbor-warnings** command in address-family configuration mode.

To enable the logging of warning messages for an EIGRP service family, use the **eigrp log-neighbor-warnings** command in service-family configuration mode.

Examples

The following command will log neighbor warning messages for EIGRP process 209 and repeat the warning messages in 5-minute (300 seconds) intervals:

```
Router(config)# router eigrp 209
Router(config-router)# eigrp log-neighbor-warnings 300
```

The following example logs neighbor warning messages for the service family with autonomous system number 4453 and repeats the warning messages in five-minute (300 second) intervals:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 4453
Router(config-router-sf)# eigrp log-neighbor-warnings 300
```

The following example logs neighbor warning messages for the address family with autonomous system number 4453 and repeats the warning messages in five-minute (300 second) intervals:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# eigrp log-neighbor-warnings 300
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
exit-address-family	Exits address-family configuration mode.
exit-service-family	Exits service-family configuration mode.
router eigrp	Configures the EIGRP routing process.
service-family	Specifies service-family configuration mode.

eigrp router-id

To set the router ID used by Enhanced Interior Gateway Routing Protocol (EIGRP) when communicating with its neighbors, use the **eigrp router-id**command in router configuration mode, address-family configuration mode, or service-family configuration mode. To remove the configured router ID, use the **no**form of thiscommand.

eigrp router-id *router-id*
no eigrp router-id [*router-id*]

Syntax Description

router-id	EIGRP router ID in IP address format.

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

Router configuration (config-router) Address-family configuration (config-router-af) Service-family configuration (config-router-sf)

Command History

Release	Modification
12.1	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Address-family configuration mode and service-family configuration mode were added.
12.2(33)SRE	This command was modified. Address-family configuration mode and service-family configuration mode were added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

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. A unique value should be configured for each router.

In EIGRP named IPv4, named IPv6, and Cisco Service Advertisement Framework (SAF) configurations, the *router-id* is also included for identifying internal routes and loop detection.

Examples

The following example configures 172.16.1.3 as a fixed router ID:

```
Router(config)# router eigrp 209
Router(config-router)# eigrp router-id 172.16.1.3
```

The following example configures 172.16.1.3 as a fixed router ID for service-family autonomous-system 4533:

```
Router(config)# router eigrp 209
Router(config-router)# service-family ipv4 autonomous-system 4453
Router(config-router-sf)# eigrp router-id 172.16.1.3
```

The following example configures 172.16.1.3 as a fixed router ID for address-family autonomous-system 4533:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# eigrp router-id 172.16.1.3
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
router eigrp	Configures the EIGRP routing process.
service-family	Specifies service-family configuration mode.

eigrp stub

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

eigrp stub [**receive-only**] [**leak-map** *name*] [**connected**] [**static**] [**summary**] [**redistributed**]
no eigrp stub

Syntax Description

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

Command Default

Stub routing is not enabled by default.

Command Modes

Address-family configuration (config-router-af)

Router configuration (config-router)

Command History

Release	Modification
12.0(7)T	This command was introduced.
12.0(15)S	This command was integrated into Cisco IOS Release 12.0(15)S.
12.2	This command was modified. The **redistributed** keyword was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Address family configuration mode was added to support EIGRP named configurations. The **leak-map** keyword and *name* argument were added.
12.2(33)SRE	This command was modified. Address family configuration mode was added to support EIGRP named configurations. The **leak-map** keyword and *name* argument were added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Release	Modification
12.2(33)SXI4	This command was modified. Address family configuration mode was added to support EIGRP named configurations. The **leak-map** keyword and *name* argument were added.

Usage Guidelines

Use the **eigrp stub** command to configure a router as a stub; this will allow the router to direct all IP traffic to a distribution router, unless stub leaking is configured on the router.

The **receive-only** keyword will restrict the router from sharing any of its routes with any other router in the EIGRP autonomous system, and the **receive-only** keyword will not permit any other option to be specified because it prevents any type of route from being advertised. The **connected**, **static**, **summary**, **leak-map**, and **redistributed** keywords can be used in any combination but cannot be used with the **receive-only** keyword. If any of these five keywords is used with the **eigrp stub** command, only route types specified by the particular keywords will be advertised. Route types specified by the remaining keywords will not be advertised.

The **connected** keyword permits the EIGRP stub routing feature to send connected routes. If the connected routes are not covered by a network statement, they may be redistributed using the **redistribute connected** command under the EIGRP process. This option is enabled by default.

The **static** keyword permits the EIGRP stub routing feature to advertise static routes. If this option is not configured, EIGRP will not send any static routes, including internal static routes that normally would be automatically redistributed. It will still be necessary to redistribute static routes with the **redistribute static** command.

The **summary** keyword permits the EIGRP stub routing feature to advertise summary routes. Summary routes can be created manually using the **summary-address** command or automatically at a major network border router using the **auto-summary** command. This option is enabled by default.

The **redistributed** keyword permits the EIGRP stub routing feature to advertise other routing protocols and autonomous systems. If this option is not configured, EIGRP will not advertise redistributed routes.

The **leak-map** keyword permits the EIGRP stub routing feature to reference a leak map that identifies routes that are allowed to be advertised on an EIGRP stub router that would normally have been suppressed.

Examples

In the following example, the **eigrp stub** command is used to configure the router as a stub that advertises connected and summary routes:

```
Router(config)# router eigrp 1
Router(config-router)# network 10.0.0.0
Router(config-router)# eigrp stub
```

In the following named configuration example, the **eigrp stub** command is used to configure the router as a stub that advertises routes learned from a directly connected client:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# network 10.0.0.0
Router(config-router-af)# eigrp stub connected
```

In the following example, the **eigrp stub** command is issued with the **connected** and **static** keywords to configure the router as a stub that advertises connected and static routes (sending summary routes will not be permitted):

```
Router(config)# router eigrp 1
```

```
Router(config-router)# network 10.0.0.0
Router(config-router)# eigrp stub connected static
```

In the following named configuration example, the **eigrp stub** command is issued with the **connected** and **static** keywords to configure the router as a stub that advertises connected and static routes (sending summary routes will not be permitted):

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# network 10.0.0.0
Router(config-router-af)# eigrp stub connected static
```

In the following example, the **eigrp stub** command is issued with the **receive-only** keyword to configure the router as a receive-only neighbor (connected, summary, and static routes will not be sent):

```
Router(config)# router eigrp 1
Router(config-router)# network 10.0.0.0 eigrp
Router(config-router)# eigrp stub receive-only
```

In the following named configuration example, the **eigrp stub** command is issued with the **receive-only** keyword to configure the router as a receive-only neighbor (connected, summary, and static routes will not be sent):

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# network 10.0.0.0
Router(config-router-af)# eigrp stub receive-only
```

In the following example, the **eigrp stub** command is issued with the **redistributed** keyword to configure the router to advertise other protocols and autonomous systems:

```
Router(config)# router eigrp 1
Router(config-router)# network 10.0.0.0 eigrp
Router(config-router)# eigrp stub redistributed
```

In the following named configuration example, the **eigrp stub** command is issued with the **redistributed** keyword to configure the router to advertise other protocols and autonomous systems:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# network 10.0.0.0
Router(config-router-af)# eigrp stub redistributed
```

In the following example, the **eigrp stub** command is issued with the **leak-map** *name* keyword-argument pair to configure the router to reference a leak map that identifies routes that would normally have been suppressed:

```
Router(config)# router eigrp
Router(config-router)# network 10.0.0.0
Router(config-router)# eigrp stub leak-map map1
```

In the following named configuration example, the **eigrp stub** command is issued with the **leak-map** *name* keyword-argument pair to configure the router to reference a leak map that identifies routes that would normally have been suppressed:

```
Router(config)# router eigrp virtual-name
```

```
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# network 10.0.0.0
Router(config-router-af)# eigrp stub leak-map map1
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address family configuration mode to configure an EIGRP routing instance.
network (EIGRP)	Specifies the network for an EIGRP routing process.
router eigrp	Configures the EIGRP address family process.
redistribute (IP)	Redistributes routes from one routing domain into another.
summary-address (EIGRP)	Configures a summary aggregate address for the specified EIGRP interface.
auto-summary (EIGRP)	Allows automatic summarization of subnet routes into network-level routes.

eigrp upgrade-cli

To enable the upgrade of Enhanced Interior Gateway Routing Protocol (EIGRP) classic mode configurations to named mode, use the **eigrp upgrade-cli** command in router configuration mode under EIGRP classic router configuration.

eigrp upgrade-cli *name*

Syntax Description

name	Name of the EIGRP virtual instance.

Command Default

Configurations will remain in classic mode.

Command Modes

Router configuration mode (config-router)

Command History

Release	Modification
Cisco IOS XE Release 3.11S	This command was introduced.
15.4(1)S	This command was integrated into Cisco IOS Release 15.4(1)S.

Usage Guidelines

This command allows you to upgrade from classic mode to named mode without causing network or neighbor flaps or requiring the EIGRP process to restart. After conversion, the running configuration on the device will show only named mode configurations; you will be unable to see any classic mode configurations. This command is available only under EIGRP classic router configuration mode. You must use the **eigrp upgrade-cli** command for every classic router configuration in order to ensure that this configuration is upgraded to named mode. Therefore, if multiple classic configurations exist, you must use this command per autonomous system number. The new configurations will be present only in the running configuration; they will not be saved to the startup configuration.

Note This command allows you to convert only classic mode configurations to named mode and not vice-versa. To revert to classic mode configurations, you can reload the router without saving the running configurations.

Example

Given below is an example of how the device configuration looks before and after conversion:

```
!Classic mode before conversion:

router eigrp 1
 !
 address-family ipv4 vrf vrf1 autonomous-system 2
  network 10.0.1.0
  exit-address-family
 network 10.0.3.0

interface Ethernet0/0
 ip address 10.0.1.1 255.255.255.0
 ip hello-interval eigrp 1 10
 end
```

```
interface Ethernet0/1
 vrf forwarding vrf1
 ip address 10.0.3.1 255.255.255.0
 ip hello-interval eigrp 2 20

ipv6 router eigrp 1

interface Ethernet0/2
 no ip address
 ipv6 address 2001:DB8::1/32
 ipv6 enable
 ipv6 eigrp 1

interface Ethernet0/3
 no ip address
 ipv6 address 2001:DB8:1::2/32
 ipv6 enable
 ipv6 eigrp 1

!After conversion to named mode:

router eigrp rtr_v4
 !
 address-family ipv4 unicast autonomous-system 1
  !
  af-interface Ethernet0/0
   hello-interval 10
   exit-af-interface
  !
  topology base
   exit-af-topology
  network 10.0.1.0
  exit-address-family
 address-family ipv4 unicast vrf vrf1 autonomous-system 2
  !
  af-interface Ethernet0/1
   hello-interval 20
   exit-af-interface
  !
  topology base
   exit-af-topology
  network 10.0.3.0
  exit-address-family

router eigrp rtr_v6
 !
 address-family ipv6 unicast autonomous-system 1
  !
  af-interface default
   shutdown
   exit-af-interface
  !
  af-interface Ethernet0/2
   no shutdown
   exit-af-interface
  !
  af-interface Ethernet0/3
   no shutdown
   exit-af-interface
  !
  topology base
  exit-af-topology
```

```
exit-address-family
```

exit-address-family

To exit from address-family configuration mode, use the **exit-address-family**command in address-family configuration mode.

exit-address-family

Syntax Description

This command has no arguments or keywords.

Command Default

The router remains in address-family configuration mode.

Command Modes

Address-family configuration (config-router-af) VRF address-family configuration (config-vrf-af)

Command History

Release	Modification
12.0(5)T	This command was introduced.
12.0(22)S	Enhanced Interior Gateway Routing Protocol (EIGRP) support was added in Cisco IOS Release 12.0(22)S.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(15)T	EIGRP support was added in Cisco IOS Release 12.2(15)T.
12.2(18)S	EIGRP support was added.
12.2(17b)SXA	This command was integrated into Cisco IOS Release 12.2(17b)SXA.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
15.4(3)S	This command was implemented on the Cisco ASR 901 Series Aggregation Services Router.

Usage Guidelines

Use the **exit-address-family** command to exit address-family configuration mode and return to router configuration mode.

This command can be abbreviated to **exit**.

Examples

The following example shows how to exit address-family configuration mode and return to router configuration mode:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453

Router(config-router-af)# exit-address-family
```

```
Router(config-router)#
```

The following example shows how to exit VRF address-family configuration mode and return to VRF configuration mode:

```
Router(config)# vrf definition vrf1
Router(config-vrf)# address-family ipv6
Router(config-vrf-af)# exit-address-family

Router(config-vrf)#
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
address-family ipv4	Enters IPv4 address family configuration mode.
address-family ipv6	Enters IPv6 address family configuration mode.
address-family nsap	Enters CLNS address family configuration mode.
address-family vpnv4	Enters VPNv4 address family configuration mode.
address-family (VRF)	Selects an address family type for a VRF table and enters VRF address-family configuration mode.
router eigrp	Configures the EIGRP address-family process.

exit-af-interface

To exit address-family interface configuration mode, use the **exit-af-interface** command in address-family interface configuration mode.

exit-af-interface

Syntax Description

This command has no arguments or keywords.

Command Default

The router remains in address-family interface configuration mode.

Command Modes

Address-family interface configuration (config-router-af-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

Use the **exit-af-interface** command to exit address-family interface configuration mode and return to address-family configuration mode.

Examples

The following example shows how to exit address-family interface configuration mode:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# af-interface default
Router(config-router-af-interface)# exit-af-interface
Router(config-router-af)#
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
router eigrp	Configures the EIGRP address-family process.

exit-af-topology

To exit address-family topology configuration mode, use the **exit-af-topology** command in address-family topology configuration mode.

exit-af-topology

Syntax Description

This command has no arguments or keywords.

Command Default

The router remains in address-family topology configuration mode.

Command Modes

Address-family topology configuration (config-router-af-topology)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

Use the **exit-af-topology** command to exit address-family topology configuration mode and return to address-family configuration mode.

Examples

The following example shows how to exit address-family topology configuration mode:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# topology base
Router(config-router-af-topology)# exit-af-topology
Router(config-router-af)#
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
router eigrp	Configures the EIGRP address-family process.
topology (EIGRP)	Configures an EIGRP process to route IP traffic under the specified topology instance and enters address-family topology configuration mode.

fast-reroute load-sharing disable (EIGRP)

To disable Fast Reroute (FRR) load sharing among Equal Cost Multipath (ECMP) loop-free alternates (LFAs) in an Enhanced Interior Gateway Routing Protocol (EIGRP) network, use the **fast-reroute load-sharing disable** command in router address family topology configuration mode. To enable FRR load sharing among ECMP LFAs, use the **no** form of this command.

fast-reroute load-sharing disable
no fast-reroute load-sharing disable

Syntax Description

This command has no arguments or keywords.

Command Default

FRR load sharing among ECMP LFAs is enabled by default.

Command Modes

Router address family topology configuration (config-router-af-topology)

Command History

Release	Modification
15.2(4)S	This command was introduced.
Cisco IOS XE Release 3.7S	This command was integrated into Cisco IOS XE Release 3.7S.

Usage Guidelines

Use this command to disable FRR load sharing among ECMP LFAs when FRR can be enabled on a single LFA by using tie-breaking rules. Tie-breaking rules are used to select the best LFA (repair path) for a primary path in an EIGRP network when many candidate LFAs are available. However, if a tie-breaking rule cannot be applied to select LFAs, use the **no** form of this command to restore the device to its default settings.

Examples

The following example shows how to disable load sharing among ECMP LFAs in an EIGRP network:

```
Device(config)# router eigrp test
Device(config-router)# address-family ipv4 autonomous-system 1
Device(config-router-af)# topology base
Device(config-router-af-topology)# fast-reroute load-sharing disable
```

Related Commands

Command	Description
debug eigrp frr	Enables debugging of EIGRP FRR events.
fast-reroute load-sharing disable	Disables FRR load sharing among prefixes in a network.
fast-reroute per-prefix	Enables FRR per prefix in a network.
fast-reroute per-prefix (EIGRP)	Enables FRR per prefix in EIGRP networks.
fast-reroute tie-break	Configures an FRR tie-breaking priority when there are multiple LFAs for a primary path in a network.

Command	Description
fast-reroute tie-break (EIGRP)	Enables EIGRP to select an LFA from among multiple candidate LFAs by configuring a tie-breaking attribute.
show ip eigrp topology	Displays entries in the EIGRP topology table.

fast-reroute per-prefix (EIGRP)

To enable Fast Reroute (FRR) per prefix in an Enhanced Interior Gateway Routing Protocol (EIGRP) network, use the **fast-reroute per-prefix** command in router address family topology configuration mode. To disable FRR per prefix in the EIGRP network, use the **no** form of this command.

fast-reroute per-prefix {**all** | **route-map** *route-map-name*}
no fast-reroute per-prefix {**all** | **route-map** *route-map-name*}

Syntax Description

all	Enables FRR for all available prefixes in the EIGRP network.
route-map	Enables FRR for prefixes that are specified by a route map.
route-map-name	Name of the route map.

Command Default

FRR is not enabled for any prefix in a network.

Command Modes

Router address family topology configuration (config-router-af-topology)

Command History

Release	Modification
15.2(4)S	This command was introduced.
Cisco IOS XE Release 3.7S	This command was integrated into Cisco IOS XE Release 3.7S.

Examples

The following example shows how to enable FRR on all available prefixes in an EIGRP network:

```
Device(config)# router eigrp test
Device(config-router)# address-family ipv4 autonomous-system 1
Device(config-router-af)# topology base
Device(config-router-af-topology)# fast-reroute per-prefix all
```

The following example shows how to enable FRR on prefixes that are specified by a route map:

```
Device(config)# router eigrp test
Device(config-router)# address-family ipv4 autonomous-system 1
Device(config-router-af)# topology base
Device(config-router-af-topology)# fast-reroute per-prefix route-map map1
```

Related Commands

Command	Description
debug eigrp frr	Enables debugging of EIGRP FRR events.
fast-reroute load-sharing disable	Disables FRR load sharing among prefixes in a network.
fast-reroute load-sharing disable (EIGRP)	Disables FRR load sharing among ECMP LFAs in an EIGRP network.

Command	Description
fast-reroute per-prefix	Enables FRR per prefix in a network.
fast-reroute tie-break	Configures an FRR tie-breaking priority when there are multiple LFAs for a primary path in a network.
fast-reroute tie-break (EIGRP)	Enables EIGRP to select an LFA from among multiple candidate LFAs by configuring a tie-breaking attribute.
show ip eigrp topology	Displays entries in the EIGRP topology table.

fast-reroute tie-break (EIGRP)

To enable Enhanced Interior Gateway Routing Protocol (EIGRP) Fast Reroute (FRR) to select a loop-free alternate (LFA) from among multiple candidate LFAs for a given primary path by configuring a tie-breaking attribute, use the **fast-reroute tie-break** command in router address family topology configuration mode. To disable EIGRP FRR from selecting LFAs based on the configured tie-breaking attribute, use the **no** form of this command. To revert the configuration to the default attributes and their associated priorities, use the **default** form of this command.

fast-reroute tie-break {**interface-disjoint** | **linecard-disjoint** | **lowest-backup-path-metric** | **srlg-disjoint**} *priority-number*
no fast-reroute tie-break {**interface-disjoint** | **linecard-disjoint** | **lowest-backup-path-metric** | **srlg-disjoint**}
default fast-reroute tie-break {**interface-disjoint** | **linecard-disjoint** | **lowest-backup-path-metric** | **srlg-disjoint**}

Syntax Description

interface-disjoint	Enables EIGRP FRR to choose an LFA that does not share the outgoing interface with the primary path. The default priority is 20.
linecard-disjoint	Enables EIGRP FRR to choose an LFA that does not share the line card with the primary path. The default priority is 40.
lowest-backup-path-metric	Enables EIGRP FRR to choose the LFA with the lowest metric to the protected destination. The default priority is 30.
srlg-disjoint	Enables EIGRP FRR to choose an LFA that does not share any Shared Risk Link Group (SRLG) with the primary path. The default priority is 10.
priority-number	Priority number assigned to the tie-breaking attribute. The range is from 1 to 255.

Command Default

The default attributes and their associated priorities are used to determine the LFA. The following are the default priority of each attribute:

- **interface-disjoint**—20
- **linecard-disjoint**—40
- **lowest-backup-path-metric**—30
- **srlg-disjoint**—10

Command Modes

Router address family topology configuration (config-router-af-topology)

Command History

Release	Modification
15.2(4)S	This command was introduced.
Cisco IOS XE Release 3.7S	This command was integrated into Cisco IOS XE Release 3.7S.

Usage Guidelines

Use this command to configure tie-breaking rules when there are multiple LFAs for a given primary path. EIGRP allows you to use four attributes to configure tie-breaking rules. Each of the following keywords specifies an attribute and allows you to configure a tie-breaking rule based on the attribute: **interface-disjoint**, **linecard-disjoint**, **lowest-backup-path-metric**, and **srlg-disjoint**. You can configure a priority value for each attribute. Tie-breaking rules are applied on the basis of the priority configured for each attribute. The lower the configured priority value the higher the priority of the tie-breaking attribute.

Note An attribute cannot be configured more than once in an address family.

The **no** form of this command disables EIGRP from selecting the best LFA based on the configured tie-breaking attributes. When the **no** form of this command is used, EIGRP will either randomly select an LFA or resort to load sharing. The **default** form of this command will revert the configuration to the default attributes and their respective priorities.

Examples

The following example shows how to configure a tie-breaking rule by using the **interface-disjoint** keyword:

```
Device(config)# router eigrp test
Device(config-router)# address-family ipv4 autonomous-system 1
Device(config-router-af)# topology base
Device(config-router-af-topology)# fast-reroute tie-break interface-disjoint 2
```

The following example shows how to configure a tie-breaking rule by using the **linecard-disjoint** keyword:

```
Device(config)# router eigrp test
Device(config-router)# address-family ipv4 autonomous-system 1
Device(config-router-af)# topology base
Device(config-router-af-topology)# fast-reroute tie-break linecard-disjoint 3
```

The following example shows how to configure a tie-breaking rule by using the **lowest-backup-path-metric** keyword:

```
Device(config)# router eigrp test
Device(config-router)# address-family ipv4 autonomous-system 1
Device(config-router-af)# topology base
Device(config-router-af-topology)# fast-reroute tie-break lowest-backup-path-metric 4
```

The following example shows how to configure a tie-breaking rule by using the **srlg-disjoint** keyword:

```
Device(config)# router eigrp test
Device(config-router)# address-family ipv4 autonomous-system 1
Device(config-router-af)# topology base
Device(config-router-af-topology)# fast-reroute tie-break srlg-disjoint 5
```

Related Commands

Command	Description
debug eigrp frr	Enables debugging of EIGRP FRR events.
fast-reroute load-sharing disable	Disables FRR load sharing among prefixes in a network.

Command	Description
fast-reroute load-sharing disable (EIGRP)	Disables load sharing among ECMP LFAs in an EIGRP network.
fast-reroute per-prefix	Enables FRR per prefix in a network.
fast-reroute per-prefix (EIGRP)	Enables FRR per prefix in EIGRP networks.
fast-reroute tie-break	Configures an FRR tie-breaking priority when there are multiple LFAs for a primary path in a network.
show ip eigrp topology	Displays entries in the EIGRP topology table.

hello-interval

To configure the hello interval for the Enhanced Interior Gateway Routing Protocol (EIGRP) address-family or service-family configurations, use the **hello-interval** command in address-family interface configuration mode or service-family interface configuration mode. To configure the default hello interval, use the **no** form of this command.

hello-interval *seconds*
no hello-interval

Syntax Description

seconds	Hello interval in seconds. The range is 1 to 65535. The default is 60 for low-speed nonbroadcast multiaccess (NBMA) networks, and 5 for all other networks.

Command Default

The EIGRP hello interval is 60 seconds for low-speed NBMA networks and 5 seconds for all other networks.

Command Modes

Address-family interface configuration (config-router-af-interface) Service-family interface configuration (config-router-sf-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

The 60-second default applies only to low-speed, NBMA media. Low speed is considered a rate of T1 or slower, as specified by the **bandwidth** command in interface configuration mode.

For the purposes of EIGRP, Frame Relay and Switched Multimegabit Data Service (SMDS) networks are considered to be NBMA if the interface has not been configured to use physical multicasting. Otherwise, Frame Relay and SMDS networks are not considered to be NBMA.

Examples

The following example configures a 10-second hello interval for address-family Ethernet interface 0/0:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453

Router(config-router-af-interface)# af-interface ethernet0/0
Router(config-router-af-interface)# hello-interval 10
```

The following example sets a 10 second hello-interval for service-family Ethernet interface 0/0:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 4533
```

```
Router(config-router-sf)# sf-interface Ethernet 0/0
Router(config-router-sf-interface)# hello-interval 10
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
hold-time	Configures the hold time for EIGRP address-family or service-family configurations.
router eigrp	Configures the EIGRP address-family process.
service-family	Specifies service-family configuration mode.
sf-interface	Configures interface-specific commands under a service family.

hold-time

To configure the hold time for Enhanced Interior Gateway Routing Protocol (EIGRP) address-family or service-family configurations, use the **hold-time** command in address-family interface configuration mode or service-family interface configuration mode. To configure the default hold time, use the **no** form of this command.

hold-time *seconds*
no hold-time

Syntax Description

seconds	Interval, in seconds, before a neighbor is considered down. Valid range is 1 to 65535 seconds (approximately 18 hours). The default is 180 seconds for low-speed nonbroadcast multiaccess (NBMA) networks and 15 seconds for all other networks.

Command Default

The EIGRP hold time is 180 seconds for NBMA networks and 15 seconds for all other networks.

Command Modes

Address-family interface configuration (config-router-af-interface) Service-family interface configuration (config-router-sf-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

On very congested and large networks, the default hold time may not be sufficient for all routers and access servers to receive hello packets from neighbors. In this case, increase the hold time duration. The hold time should be at least three times the hello interval. If a router does not receive a hello packet within the specified hold time, services through this router are considered unavailable. Increasing the hold time will delay route convergence across the network.

Examples

The following example sets a 50-second hold time for address-family Ethernet interface 0/0:

```
Router(config)# router eigrp virtual-name

Router(config-router)# address-family ipv4 autonomous-system 4453

Router(config-router-af-interface)# af-interface ethernet0/0
Router(config-router-af-interface)# hold-time 50
```

The following example sets a 40-second hold time for service-family Ethernet interface 0/0:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 4533
```

```
Router(config-router-sf)# sf-interface Ethernet 0/0
Router(config-router-sf-interface)# hold-time 40
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
router eigrp	Configures the EIGRP routing process.
hello-interval	Configures the hello interval for EIGRP address-family or service-family configurations.
router eigrp	Configures the EIGRP address-family process.
service-family	Specifies service-family configuration mode.
sf-interface	Configures interface-specific commands under service-family.

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ip authentication key-chain eigrp

To enable authentication of Enhanced Interior Gateway Routing Protocol (EIGRP) packets, use the **ip authentication key-chain eigrp**command in interface configuration mode. To disable such authentication, use the **no** form of this command.

ip authentication key-chain eigrp *as-number key-chain*
no ip authentication key-chain eigrp *as-number key-chain*

Syntax Description

as-number	Autonomous system number to which the authentication applies.
key-chain	Name of the authentication key chain.

Command Default

No authentication is provided for EIGRP packets.

Command Modes

Interface configuration (config-if) Virtual network interface (config-if-vnet)

Command History

Release	Modification
11.2F	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 3.2S	This command was modified. Support was added for this command in virtual network interface configuration mode.

Examples

The following example applies authentication to autonomous system 2 and identifies a key chain named SPORTS:

```
ip authentication key-chain eigrp 2 SPORTS
```

Related Commands

Command	Description
accept-lifetime	Sets the time period during which the authentication key on a key chain is received as valid.
ip authentication mode eigrp	Specifies the type of authentication used in EIGRP packets.
key	Identifies an authentication key on a key chain.
key chain	Enables authentication of routing protocols.

Command	Description
key-string (authentication)	Specifies the authentication string for a key.
send-lifetime	Sets the time period during which an authentication key on a key chain is valid to be sent.

ip authentication mode eigrp

To specify the type of authentication used in Enhanced Interior Gateway Routing Protocol (EIGRP) packets, use the **ip authentication mode eigrp**command in interface configuration mode. To disable that type of authentication, use the **no** form of this command.

ip authentication mode eigrp *as-number* **md5**
no ip authentication mode eigrp *as-number* **md5**

Syntax Description

as-number	Autonomous system number.
md5	Keyed Message Digest 5 (MD5) authentication.

Command Default

No authentication is provided for EIGRP packets.

Command Modes

Interface configuration (config-if) Virtual network interface (config-if-vnet)

Command History

Release	Modification
11.2F	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 3.2S	This command was modified. Support was added for this command in virtual network interface configuration mode.

Usage Guidelines

Configure authentication to prevent unapproved sources from introducing unauthorized or false routing messages. When authentication is configured, an MD5 keyed digest is added to each EIGRP packet in the specified autonomous system.

Examples

The following example configures the interface to use MD5 authentication in EIGRP packets in autonomous system 10:

```
ip authentication mode eigrp 10 md5
```

Related Commands

Command	Description
accept-lifetime	Sets the time period during which the authentication key on a key chain is received as valid.

Command	Description
ip authentication key-chain eigrp	Enables authentication of EIGRP packets.
key	Identifies an authentication key on a key chain.
key chain	Enables authentication of routing protocols.
key-string (authentication)	Specifies the authentication string for a key.
send-lifetime	Sets the time period during which an authentication key on a key chain is valid to be sent.

ipv6 authentication mode eigrp

To specify the type of authentication used in Enhanced Interior Gateway Routing Protocol (EIGRP) packets for IPv6, use the **ipv6 authentication mode eigrp**command in interface configuration mode. To disable the type of authentication, use the **no** form of this command.

ipv6 authentication mode eigrp *as-number* **md5**
no ipv6 authentication mode eigrp *as-number* **md5**

Syntax Description

as-number	Autonomous system number.
md5	Specifies keyed message digest 5 (MD5) authentication.

Command Default

No authentication is provided for EIGRP for IPv6 packets.

Command Modes

Interface configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Usage Guidelines

Use the **ipv6 authentication mode eigrp**command to configure authentication to prevent unapproved sources from introducing unauthorized or false routing messages. When authentication is configured, an MD5 keyed digest is added to each EIGRP for IPv6 packet in the specified autonomous system.

Examples

The following example configures the interface to use MD5 authentication in EIGRP for IPv6 packets in autonomous system 1:

```
Router(config-if)# ipv6 authentication mode eigrp 1 md5
```

Related Commands

Command	Description
accept-lifetime	Sets the time period during which the authentication key on a key chain is received as valid.
ipv6 authentication key-chain eigrp	Enables authentication of EIGRP packets for IPv6.
key	Identifies an authentication key on a key chain.
key chain	Enables authentication of routing protocols.
key-string (authentication)	Specifies the authentication string for a key.

Command	Description
send-lifetime	Sets the time period during which an authentication key on a key chain is valid to be sent.

ip bandwidth-percent eigrp

To configure the percentage of bandwidth that may be used by Enhanced Interior Gateway Routing Protocol (EIGRP) on an interface, use the **ip bandwidth-percent eigrp**command in interface configuration mode. To restore the default value, use the **no** form of this command.

ip bandwidth-percent eigrp *as-number percent*
no ip bandwidth-percent eigrp *as-number percent*

Syntax Description

as-number	Autonomous system number.
percent	Percent of bandwidth that EIGRP may use.

Command Default

EIGRP may use 50 percent of available bandwidth.

Command Modes

Interface configuration (config-if) Virtual network interface (config-if-vnet)

Command History

Release	Modification
11.2	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 3.2S	This command was modified. Support was added for this command in virtual network interface configuration mode.

Usage Guidelines

EIGRP will use up to 50 percent of the bandwidth of a link, as defined by the **bandwidth** interface configuration command. This command may be used if some other fraction of the bandwidth is desired. Note that values greater than 100 percent may be configured. The configuration option may be useful if the bandwidth is set artificially low for other reasons.

Examples

The following example allows EIGRP to use up to 75 percent (42 kbps) of a 56-kbps serial link in autonomous system 209:

```
Router(config)# interface serial 0
Router(config-if)# bandwidth 56
Router(config-if)# ip bandwidth-percent eigrp 209 75
```

Related Commands

Command	Description
bandwidth (interface)	Sets a bandwidth value for an interface.

ip hello-interval eigrp

To configure the hello interval for an Enhanced Interior Gateway Routing Protocol (EIGRP) process, use the **ip hello-interval eigrp** command in interface configuration mode. To restore the default value, use the **no** form of this command.

ip hello-interval eigrp *as-number seconds*
no ip hello-interval eigrp *as-number* [*seconds*]

Syntax Description

as-number	Autonomous system number.
seconds	Hello interval (in seconds). The range is from 1 to 65535.

Command Default

The hello interval for low-speed, nonbroadcast multiaccess (NBMA) networks is 60 seconds and 5 seconds for all other networks.

Command Modes

Interface configuration (config-if) Virtual network interface (config-if-vnet)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 3.2S	This command was modified. Support was added for this command in virtual network interface configuration mode.

Usage Guidelines

The default of 60 seconds applies only to low-speed, NBMA media. Low speed is considered to be a rate of T1 or slower, as specified with the **bandwidth** interface configuration command. Note that for the purposes of EIGRP, Frame Relay and Switched Multimegabit Data Service (SMDS) networks may be considered to be NBMA. These networks are considered NBMA if the interface has not been configured to use physical multicasting; otherwise, they are considered not to be NBMA.

Examples

The following example sets the hello interval for Ethernet interface 0 to 10 seconds:

```
Router(config)# interface ethernet 0
Router(config-if)# ip hello-interval eigrp 109 10
```

Related Commands

Command	Description
bandwidth (interface)	Sets a bandwidth value for an interface.
ip hold-time eigrp	Configures the hold time for a particular EIGRP routing process designated by the autonomous system number.

ip hold-time eigrp

To configure the hold time for an Enhanced Interior Gateway Routing Protocol (EIGRP) process, use the **ip hold-time eigrp** command in interface configuration mode. To restore the default value, use the **no** form of this command.

ip hold-time eigrp *as-number seconds*
no ip hold-time eigrp *as-number seconds*

Syntax Description

as-number	Autonomous system number.
seconds	Hold time (in seconds). The range is from 1 to 65535.

Command Default

The EIGRP hold time is 180 seconds for low-speed, nonbroadcast multiaccess (NBMA) networks and 15 seconds for all other networks.

Command Modes

Interface configuration (config-if) Virtual network interface (config-if-vnet)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 3.2S	This command was modified. Support was added for this command in virtual network interface configuration mode.

Usage Guidelines

On very congested and large networks, the default hold time might not be sufficient time for all routers and access servers to receive hello packets from their neighbors. In this case, you may want to increase the hold time.

We recommend that the hold time 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.

The default of 180 seconds hold time and 60 seconds hello interval apply only to low-speed, NBMA media. Low speed is considered to be a rate of T1 or slower, as specified with the **bandwidth** interface configuration command.

Examples

The following example sets the hold time for Ethernet interface 0 to 40 seconds:

```
Router(config)# interface ethernet 0
Router(config-if)# ip hold-time eigrp 109 40
```

Related Commands

Command	Description
bandwidth (interface)	Sets a bandwidth value for an interface.
ip hello-interval eigrp	Configures the hello interval for the EIGRP routing process designated by an autonomous system number.

ip next-hop-self eigrp

To enable the Enhanced Interior Gateway Routing Protocol (EIGRP) to advertise routes with the local outbound interface address as the next hop, use the **ip next-hop-self eigrp** command in interface configuration mode or virtual network interface mode. To instruct EIGRP to use the received next hop instead of the local outbound interface address, use the **no** form of this command.

ip next-hop-self eigrp *autonomous-system-number*
no ip next-hop-self eigrp *autonomous-system-number*[{**no-ecmp-mode**}]

Syntax Description

autonomous-system-number	Autonomous system number.
no-ecmp-mode	(Optional) Evaluates all paths to a network before advertising the paths out of an interface.

Command Default

The IP next-hop-self state is enabled.

Command Modes

Interface configuration (config-if)

Virtual network interface (config-if-vnet)

Command History

Release	Modification
12.3	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 3.2S	This command was modified. This command was made available in virtual network interface configuration mode.
Cisco IOS XE Release 3.5S	This command was modified. The **no-ecmp-mode** keyword was added.
15.2(1)S	This command was modified. The **no-ecmp-mode** keyword was added.
15.2(3)T	This command was modified. The **no-ecmp-mode** keyword was added.

Usage Guidelines

EIGRP, by default, sets the next-hop value to the local outbound interface address for routes that it is advertising, even when advertising those routes back out of the same interface on which they were learned. 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. Following are some exceptions to this guideline:

- If your topology does not require spoke-to-spoke dynamic tunnels, you need not configure the **no ip next-hop-self eigrp** command.
- If your topology requires spoke-to-spoke dynamic tunnels, you must use process switching on the tunnel interface of spoke devices. Otherwise, you will need to use a different routing protocol over Dynamic Multipoint VPN (DMVPN).

The **no-ecmp-mode** option is an enhancement to the **no ip next-hop-self eigrp** command. When this option is enabled, all routes to a network in the EIGRP table are evaluated to check whether routes advertised from an interface were learned on the same interface. If a route advertised by an interface was learned on the same interface, the **no ip next-hop-self eigrp** configuration is honored and the received next hop is used to advertise this route. Disabling the IP next-hop self functionality is primarily useful in DMVPN spoke-to-spoke topologies.

Examples

The following example shows how to change the default next-hop value in IPv4 classic mode configurations by disabling the **ip next-hop-self** functionality and configuring EIGRP to use the received next-hop value to advertise routes:

```
Device(config)# interface tun 0
Device(config-if)# no ip next-hop-self eigrp 101 no-ecmp-mode
```

Related Commands

Command	Description
ipv6 next-hop self eigrp	Instructs an EIGRP device that the IPv6 next hop is the local outbound interface.
next-hop-self	Enables EIGRP to advertise routes with the local outbound interface address as the next hop.

ip split-horizon eigrp

To enable Enhanced Interior Gateway Routing Protocol (EIGRP) split horizon, use the **ip split-horizon eigrp** command in interface configuration mode. To disable split horizon, use the **no** form of this command.

ip split-horizon eigrp *as-number*
no ip split-horizon eigrp *as-number*

Syntax Description

as-number	Autonomous system number.

Command Default

The behavior of this command is enabled by default.

Command Modes

Interface configuration (config-if) Virtual network interface (config-if-vnet)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 3.2S	This command was modified. Support was added for this command in virtual network interface configuration mode.

Usage Guidelines

For networks that include links over X.25 packet-switched networks (PSNs), you can use the **neighbor** router configuration command to defeat the split horizon feature. As an alternative, you can explicitly specify the **no ip split-horizon eigrp** command in your configuration. However, if you do so, you must similarly disable split horizon for all routers and access servers in any relevant multicast groups on that network.

Note In general, we recommend that you not change the default state of split horizon unless you are certain that your application requires the change in order to properly advertise routes. Remember that if split horizon is disabled on a serial interface and that interface is attached to a packet-switched network, you must disable split horizon for all routers and access servers in any relevant multicast groups on that network.

Examples

The following example disables split horizon on a serial link connected to an X.25 network:

```
interface serial 0
 encapsulation x25
 no ip split-horizon eigrp 101
```

Related Commands

Command	Description
ip split-horizon (RIP)	Enables the split horizon mechanism.
neighbor (EIGRP)	Defines a neighboring router with which to exchange routing information.

ip summary-address eigrp

To configure address summarization for the Enhanced Interior Gateway Routing Protocol (EIGRP) on a specified interface, use the **ip summary-address eigrp** command in interface configuration or virtual network interface configuration mode. To disable the configuration, use the **no** form of this command.

ip summary-address eigrp *as-number ip-address mask* [*admin-distance*] [**leak-map** *name*]
no ip summary-address eigrp *as-number ip-address mask*

Syntax Description

as-number	Autonomous system number.
ip-address	Summary IP address to apply to an interface.
mask	Subnet mask.
admin-distance	(Optional) Administrative distance. Range: 0 to 255. **Note** Starting with Cisco IOS XE Release 3.2S, the *admin-distance* argument was removed. Use the **summary-metric** command to configure the administrative distance.
leak-map *name*	(Optional) Specifies the route-map reference that is used to configure the route leaking through the summary.

Command Default

- An administrative distance of 5 is applied to EIGRP summary routes.
- EIGRP automatically summarizes to the network level, even for a single host route.
- No summary addresses are predefined.
- The default administrative distance metric for EIGRP is 90.

Command Modes

Interface configuration (config-if)

Virtual network interface configuration (config-if-vnet)

Command History

Release	Modification
10.0	This command was introduced.
12.0(7)T	This command was modified. The *admin-distance* argument was added.
12.3(14)T	This command was modified. The **leak-map** keyword was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Release	Modification
Cisco IOS XE Release 3.2S	This command was modified. Support was added for this command in virtual network interface configuration mode. The *admin-distance* argument was removed. Use the **summary-metric** command to configure the administrative distance.
12.2(33)SXJ	This command was modified. The summary address is not advertised to the peer if the administrative distance is configured as 255.
15.0(1)SY	This command was modified. Support was added for this command in virtual network interface configuration mode.
15.1(1)SG	This command was integrated into Cisco IOS Release 15.1(1)SG.
Cisco IOS XE Release 3.3SG	This command was integrated into Cisco IOS XE Release 3.3SG.

Usage Guidelines

The **ip summary-address eigrp** command is used to configure interface-level address summarization. EIGRP summary routes are given an administrative-distance value of 5. The administrative-distance metric is used to advertise a summary without installing it in the routing table.

By default, EIGRP summarizes subnet routes to the network level. The **no auto-summary** command can be entered to configure the subnet-level summarization.

The summary address is not advertised to the peer if the administrative distance is configured as 255.

EIGRP Support for Leaking Routes

Configuring the **leak-map** keyword allows a component route that would otherwise be suppressed by the manual summary to be advertised. Any component subset of the summary can be leaked. A route map and access list must be defined to source the leaked route.

The following is the default behavior if an incomplete configuration is entered:

- If the **leak-map** keyword is configured to reference a nonexistent route map, the configuration of this keyword has no effect. The summary address is advertised but all component routes are suppressed.
- If the **leak-map** keyword is configured but the access list does not exist or the route map does not reference the access list, the summary address and all component routes are advertised.

If you are configuring a virtual-network trunk interface and you configure the **ip summary-address eigrp** command, the *admin-distance* value of the command is not inherited by the virtual networks running on the trunk interface because the administrative distance option is not supported in the **ip summary-address eigrp** command on virtual network subinterfaces.

Examples

The following example shows how to configure an administrative distance of 95 on Ethernet interface 0/0 for the 192.168.0.0/16 summary address:

```
Router(config)# router eigrp 1
Router(config-router)# no auto-summary
Router(config-router)# exit
Router(config)# interface Ethernet 0/0
Router(config-if)# ip summary-address eigrp 1 192.168.0.0 255.255.0.0 95
```

The following example shows how to configure the 10.1.1.0/24 subnet to be leaked through the 10.2.2.0 summary address:

```
Router(config)# router eigrp 1
Router(config-router)# exit
Router(config)# access-list 1 permit 10.1.1.0 0.0.0.255
Router(config)# route-map LEAK-10-1-1 permit 10
Router(config-route-map)# match ip address 1
Router(config-route-map)# exit
Router(config)# interface Serial 0/0
Router(config-if)# ip summary-address eigrp 1 10.2.2.0 255.0.0.0 leak-map LEAK-10-1-1
Router(config-if)# end
```

The following example configures GigabitEthernet interface 0/0/0 as a virtual network trunk interface:

```
Router(config)# interface gigabitethernet 0/0/0
Router(config-if)# vnet global
Router(config-if-vnet)# ip summary-address eigrp 1 10.3.3.0 255.0.0.0 33
```

Related Commands

Command	Description
auto-summary (EIGRP)	Configures automatic summarization of subnet routes to network-level routes (default behavior).
summary-metric	Configures fixed metrics for an EIGRP summary aggregate address.

ipv6 authentication key-chain eigrp

To enable authentication of Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 packets, use the **ipv6 authentication key-chain eigrp**command in interface configuration mode. To disable authentication of EIGRP for IPv6 packets, use the **no** form of this command.

ipv6 authentication key-chain eigrp *as-number key-chain*
no ipv6 authentication key-chain eigrp *as-number key-chain*

Syntax Description

as-number	Autonomous system number.
key-chain	Name of the authentication key chain.

Command Default

No authentication is provided for EIGRP for IPv6 packets.

Command Modes

Interface configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Usage Guidelines

EIGRP for IPv6 route authentication provides Message Digest 5 (MD5) authentication of routing updates from the EIGRP for IPv6 routing protocol. The MD5 keyed digest in each EIGRP for IPv6 packet prevents the introduction of unauthorized or false routing messages from unapproved sources.

Each key has its own key identifier, which is stored locally. The combination of the key identifier and the interface associated with the message uniquely identifies the authentication algorithm and MD5 authentication key in use.

You can configure multiple keys with lifetimes. Only one authentication packet is sent, regardless of how many valid keys exist. The software examines the key numbers in order from lowest to highest, and uses the first valid key it encounters.

Examples

The following example enables authentication for EIGRP for IPv6 for AS 1, using a key chain named chain1:

```
Router(config-if)# ipv6 authentication key-chain eigrp 1 chain1
```

Related Commands

Command	Description
accept-lifetime	Sets the time period during which the authentication key on a key chain is received as valid.

Command	Description
ipv6 authentication mode eigrp	Specifies the type of authentication used in EIGRP for IPv6 packets.
key	Identifies an authentication key on a key chain.
key chain	Enables authentication of routing protocols.
key-string (authentication)	Specifies the authentication string for a key.
send-lifetime	Sets the time period during which an authentication key on a key chain is valid to be sent.

ipv6 bandwidth-percent eigrp

To configure the percentage of bandwidth that may be used by Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 on an interface, use the **ipv6 bandwidth-percent eigrp**command in interface configuration mode. To restore the default value, use the **no** form of this command.

ipv6 bandwidth-percent eigrp *as-number percent*
no ipv6 bandwidth-percent eigrp *as-number percent*

Syntax Description

as-number	Autonomous system number.
percent	Percentage of bandwidth that EIGRP for IPv6 may use.

Command Default

Percentage of bandwidth used is 50 percent.

Command Modes

Interface configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Usage Guidelines

EIGRP for IPv6 uses as much as 50 percent of the bandwidth of a link, as defined by the **bandwidth** command. The ipv6 bandwidth-percent eigrp command may be used if some other fraction of the bandwidth is desired.

Note that values greater than 100 percent may be configured. The configuration option may be useful if the bandwidth is set artificially low for other reasons.

Examples

The following example allows EIGRP for IPv6 to use up to 75 percent (42 kbps) of a 56-kbps serial link in autonomous system 1:

```
interface serial 0
 bandwidth 56
 ipv6 bandwidth-percent eigrp 1 75
```

Related Commands

Command	Description
bandwidth (interface)	Sets a bandwidth value for an interface.

ipv6 eigrp

To enable Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 on a specified interface, use the **ipv6 eigrp** command in interface configuration mode. To disable EIGRP for IPv6, use the **no** form of this command.

ipv6 eigrp *as-number*
no ipv6 eigrp *as-number*

Syntax Description

as-number	Autonomous system number.

Command Default

EIGRP is not enabled on an IPv6 interface.

Command Modes

Interface configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

Use the **ipv6 eigrp** command to enable EIGRP for IPv6 on a per-interface basis.

If an autonomous system is specified, EIGRP for IPv6 is enabled only for the specified autonomous system. Otherwise, EIGRP for IPv6 is specified throughout the interface.

Examples

The following example enables EIGRP for IPv6 for AS 1 on Ethernet interface 0:

```
Router(config)# interface ethernet0
Router(config-if)# ipv6 eigrp 1
```

Related Commands

Command	Description
ipv6 enable	Enables IPv6 processing on an interface that has not been configured with an explicit IPv6 address.
ipv6 router eigrp	Configures the EIGRP routing process in IPv6.

ipv6 hello-interval eigrp

To configure the hello interval for the Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 routing process designated by an autonomous system number, use the **ipv6 hello-interval eigrp** command in interface configuration mode. To restore the default value, use the **no** form of this command.

ipv6 hello-interval eigrp *as-number seconds*
no ipv6 hello-interval eigrp *as-number seconds*

Syntax Description

as-number	Autonomous system number.
seconds	Hello interval, in seconds. The range is from 1 to 65535.

Command Default

For low-speed, nonbroadcast multiaccess (NBMA) networks, the default hello interval is 60 seconds. For all other networks, the default hello interval is 5 seconds.

Command Modes

Interface configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

The default of 60 seconds applies only to low-speed, NBMA media. Low speed is considered to be a rate of T1 or slower, as specified with the **bandwidth** interface configuration command. Note that for the purposes of EIGRP for IPv6, Frame Relay and Switched Multimegabit Data Service (SMDS) networks may be considered to be NBMA. These networks are considered NBMA if the interface has not been configured to use physical multicasting; otherwise, they are considered not to be NBMA.

Examples

The following example sets the hello interval for Ethernet interface 0 to 10 seconds on autonomous system 1:

```
interface ethernet 0
 ipv6 hello-interval eigrp 1 10
```

Related Commands

Command	Description
bandwidth (interface)	Sets a bandwidth value for an interface.
ipv6 hold-time eigrp	Configures the hold time for a particular EIGRP for IPv6 routing process designated by the autonomous system number.

ipv6 hold-time eigrp

To configure the hold time for a particular Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 routing process designated by the autonomous system number, use the **ipv6 hold-time eigrp**command in interface configuration mode. To restore the default value, use the **no** form of this command.

ipv6 hold-time eigrp *as-number seconds*
no ipv6 hold-time eigrp *as-number seconds*

Syntax Description

as-number	Autonomous system number.
seconds	Hello interval, in seconds. The range is from 1 to 65535.

Command Default

For low-speed, nonbroadcast multiaccess (NBMA) networks, the default hold-time interval is 180 seconds. For all other networks, the default hold-time interval is 15 seconds.

Command Modes

Interface configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

On very congested and large networks, the default hold time might not be sufficient time for all routers and access servers to receive hello packets from their neighbors. In this case, you may want to increase the hold time.

Cisco recommends that the hold time 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.

The default of 180 seconds hold time and 60 seconds hello interval apply only to low-speed, NBMA media. Low speed is considered to be a rate of T1 or slower, as specified with the **bandwidth** command.

Examples

The following example sets the hold time for Ethernet interface 0 to 40 seconds for AS 1:

```
interface ethernet 0
 ipv6 hold-time eigrp 1 40
```

Related Commands

Command	Description
bandwidth (interface)	Sets a bandwidth value for an interface.

Command	Description
ipv6 hello-interval eigrp	Configures the hello interval for the EIGRP for IPv6 routing process designated by an autonomous system number.

ipv6 next-hop-self eigrp

To instruct a device configured with the Enhanced Interior Gateway Routing Protocol (EIGRP) that the IPv6 next hop is the local outbound interface address, use the **ipv6 next-hop-self eigrp** command in interface configuration mode. To instruct EIGRP to use the received next hop instead of the local outbound interface, use the **no** form of this command.

ipv6 next-hop-self eigrp *as-number*
no ipv6 next-hop-self eigrp *as-number*[{**no-ecmp-mode**}]

Syntax Description

as-number	Autonomous system number.
no-ecmp-mode	(Optional) Evaluates all paths to a network before advertising the paths out of an interface.

Command Default

The IPv6 next-hop-self state is enabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
15.2(1)S	This command was integrated into Cisco IOS Release 15.2(1)S. The **no-ecmp-mode** keyword was added.
Cisco IOS XE Release 3.5S	This command was modified. The **no-ecmp-mode** keyword was added.
15.2(3)T	This command was modified. The **no-ecmp-mode** keyword was added.

Usage Guidelines

EIGRP, by default, sets the next-hop value to the local outbound interface address for routes that it is advertising, even when advertising those routes back out of the same interface on which they were learned. To change this default, use the **no ipv6 next-hop-self eigrp** command to instruct EIGRP to use the received next-hop value when advertising these routes. Some exceptions to this guideline are as follows:

- If your topology does not require spoke-to-spoke dynamic tunnels, you need not configure the **no ipv6 next-hop-self eigrp** command.
- If your topology requires spoke-to-spoke dynamic tunnels, you must use process switching on the tunnel interface on spoke devices. Otherwise, you will need to use a different routing protocol over Dynamic Multipoint VPN (DMVPN).

The **no-ecmp-mode** option is an enhancement to the **no ipv6 next-hop-self eigrp** command. When this option is enabled, all routes to a network in the EIGRP table are evaluated to check whether routes advertised from an interface were learned on the same interface. If a route advertised by an interface was learned on the same

interface, the **no ipv6 next-hop-self eigrp** configuration is honored and the received next hop is used to advertise this route. Disabling the IPv6 next-hop self functionality is primarily useful in DMVPN spoke-to-spoke topologies.

Examples

The following example shows how to change the default IPv6 next-hop value by disabling the **ipv6 next-hop-self** functionality and configuring EIGRP to use the received next-hop value to advertise routes:

```
Device(config)# interface serial 0
Device(config-if)# no ipv6 next-hop-self eigrp 1 no-ecmp-mode
```

Related Commands

Command	Description
next-hop-self	Instructs an EIGRP device that the IPv6 next hop is the local outbound interface.
ip next-hop-self eigrp	Enables EIGRP to advertise routes with the local outbound interface address as the next hop.

ipv6 router eigrp

To place the router in router configuration mode, create an Enhanced Interior Gateway Routing Protocol (EIGRP) routing process in IPv6, and configure this process, use the **ipv6**router **eigrp**command in global configurationmode. To shut down a routing process, use the **no** form of this command.

ipv6 router eigrp *as-number* [**eigrp event-log-size event-log-size**]
no ipv6 router eigrp *as-number*

Syntax Description

as-number	Autonomous system number.
eigrp event-log-size *event-log-size*	(Optional) Memory allocation value of the EIGRP event. The *event-log-size* value is the memory allocation, in bytes, calculated dynamically based on available memory. The *event-log-size* value is between 0 and the dynamically calculated number.

Command Default

This command is disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	The **eigrp event-log-size** keyword and *event-log-size* argument were added.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Usage Guidelines

Use the **ipv6 router eigrp** command in global configuration mode to place the router in router configuration mode and create a routing process. Once in router configuration mode, you can configure the EIGRP for IPv6 routing process using the **ipv6 router eigrp** command.

Examples

The following example places the router in router configuration mode and allows you to configure an EIGRP for IPv6 routing process:

```
Router(config)# ipv6 router eigrp 400
 eigrp router-id 10.13.14.15
 eigrp stub connected summary
 eigrp event-log-size 1000
 no shutdown
```

Related Commands

Command	Description
ipv6 eigrp	Enables EIGRP for IPv6 on a specified interface.
router eigrp	Configures the EIGRP process.

ipv6 split-horizon eigrp

To enable Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 split horizon, use the **ipv6**split-horizon **eigrp**command in interface configuration mode. To disable split horizon, use the **no** form of this command.

ipv6 split-horizon eigrp *as-number*
no ipv6 split-horizon eigrp *as-number*

Syntax Description

as-number	Autonomous system number.

Command Default

EIGRP for IPv6 split horizon is enabled.

Command Modes

Interface configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Usage Guidelines

For networks that include links over X.25 packet-switched networks (PSNs), you can use the **neighbor** command in router configuration mode to disable the split horizon feature. Or, you can specify the **no ipv6 split-horizon eigrp** command in your configuration. However, if you do disable the split horizon feature, you must similarly disable split horizon for all routers and access servers in any relevant multicast groups on that network.

Note In general, we recommend that you not change the default state of split horizon unless you are certain that your application requires the change in order to advertise routes properly. Remember that if split horizon is disabled on a serial interface and that interface is attached to a packet-switched network, you must disable split horizon for all routers and access servers in any relevant multicast groups on that network.

Examples

The following example disables split horizon on a serial link connected to an X.25 network:

```
interface serial 0
 encapsulation x25
 no ipv6 split-horizon eigrp 101
```

Related Commands

Command	Description
neighbor (EIGRP)	Defines a neighboring router with which to exchange routing information on a router that is running EIGRP.

ipv6 summary-address eigrp

To configure a summary aggregate address for a specified interface, use the **ipv6**summary-address **eigrp**command in interface configuration mode. To disable a configuration, use the **no** form of this command.

ipv6 summary-address eigrp *as-number ipv6-address* [*admin-distance*]
no ipv6 summary-address eigrp *as-number ipv6-address* [*admin-distance*]

Syntax Description

as-number	Autonomous system number.
ipv6-address	Summary IPv6 address to apply to an interface.
admin-distance	(Optional) Administrative distance. A value from 0 through 255. The default value is 90.

Command Default

An administrative distance of 5 is applied to Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6 summary routes. EIGRP for IPv6 automatically summarizes to the network level, even for a single host route. No summary addresses are predefined.

Command Modes

Interface configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

The **ipv6 summary-address eigrp** command is used to configure interface-level address summarization. EIGRP for IPv6 summary routes are given an administrative distance value of 5. The administrative distance metric is used to advertise a summary address without installing it in the routing table.

Examples

The following example provides a summary aggregate address for EIGRP for IPv6 for AS 1:

```
ipv6 summary-address eigrp 1 2001:0DB8:0:1::/64
```

log-neighbor-changes (EIGRP)

To enable the logging of changes in Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor adjacencies, use the **log-neighbor-changes**command in IPX-router configuration mode. To disable this function, use the **no** form of this command.

log-neighbor-changes
no log-neighbor-changes

Syntax Description

This command has no arguments or keywords.

Command Default

No adjacency changes are logged.

Command Modes

IPX-router configuration

Command History

Release	Modification
11.2	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

Enable the logging of neighbor adjacency changes in order to monitor the stability of the routing system and to help detect problems. Log messages are of the following form:

```
%DUAL-5-NBRCHANGE: IPX EIGRP
as-number
: Neighbor
address
(
interface
) is
state
:
reason
```

where the arguments have the following meanings:

as-number	Autonomous system number
address (interface)	Neighbor address
state	Up or down
reason	Reason for change

Examples

The following configuration will log neighbor changes for EIGRP process 209:

```
ipx router eigrp 209
 log-neighbor-changes
```

log-neighbor-changes (IPv6 EIGRP)

To enable the logging of changes in Enhanced Interior Gateway Routing Protocol (EIGRP) IPv6 neighbor adjacencies, use the **log-neighbor-changes** command in router configuration mode. To disable the logging of changes in EIGRP IPv6 neighbor adjacencies, use the **no** form of this command.

log-neighbor-changes
no log-neighbor-changes

Syntax Description

This command has no arguments or keywords.

Command Default

Adjacency changes are logged.

Command Modes

Router configuration

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Usage Guidelines

The log-neighbor-changes command enables the logging of neighbor adjacency changes to monitor the stability of the routing system and to help detect problems.

Logging is enabled by default. To disable the logging of neighbor adjacency changes, use the no form of this command.

Examples

The following example disables logging of neighbor changes for EIGRP process 1:

```
ipv6 router eigrp 1
 no log-neighbor-changes
```

The following configuration enables logging of neighbor changes for EIGRP process 1:

```
ipv6 router eigrp 1
 log-neighbor-changes
```

Related Commands

Command	Description
log-neighbor- warnings	Enables the logging of EIGRP neighbor warning messages.

log-neighbor-warnings

Note Effective with Cisco IOS Release 15.0(1)M, 12.2(33)SRE and Cisco IOS XE Release 2.5, the **log-neighbor-warnings** command was replaced by the **eigrp log-neighbor-warnings** command for IPv4 and IPv6 configurations. The **log-neighbor-warnings** command is still available for IPX configurations.

To enable the logging of Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor warning messages, use the **log-neighbor-warnings** command in router configuration mode. 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) The time interval (in seconds) between repeated neighbor warning messages. The range of seconds is from 1 through 65535.

Command Default

Neighbor warning messages are logged.

Command Modes

Router configuration (config-router)

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.
15.0(1)M	This command was replaced by the **eigrp log-neighbor-warnings** command for IPv4 and IPv6 configurations. The **log-neighbor-warnings** command is still available for IPX configurations.
12.2(33)SRE	This command was replaced by the **eigrp log-neighbor-warnings** command for IPv4 and IPv6 configurations. The **log-neighbor-warnings** command is still available for IPX configurations.
Cisco IOS XE Release 2.5	This command was replaced by the **eigrp log-neighbor-warnings** command for IPv4 and IPv6 configurations. The **log-neighbor-warnings** command is still available for IPX configurations.

Usage Guidelines

When neighbor warning messages occur, they are logged by default. With the **log-neighbor-warnings** command, you can disable and enable the logging of neighbor warning messages and configure the interval between repeated neighbor warning messages.

Examples

The following example shows that neighbor warning messages will be logged for EIGRP process 1 and warning messages will be repeated in 5-minute (300 seconds) intervals:

```
Router(config)# ipv6 router eigrp 1
Router(config-router)# log-neighbor-warnings 300
```

Related Commands

Command	Description
log-neighbor-changes	Enables the logging of changes in EIGRP neighbor adjacencies.

match extcommunity

To match Border Gateway Protocol (BGP) or Enhanced Interior Gateway Routing Protocol (EIGRP) extended community list attributes, use the **match extcommunity** command in route-map configuration mode. To remove the **match extcommunity**command from the configuration file and remove the BGP or EIGRP extended community list attribute entry, use the **no** form of this command.

match extcommunity *extended-community-list-name*
no match extcommunity *extended-community-list-name*

Syntax Description

extended-community-list-name	Name of an extended community list.

Command Default

BGP and EIGRP extended community list attributes are not matched.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
12.1	This command was introduced.
12.0(22)S	The maximum number of expanded extended community list numbers was changed from 199 to 500 in Cisco IOS Release 12.0(22)S.
12.2(15)T	The maximum number of expanded extended community list numbers was changed from 199 to 500 in Cisco IOS Release 12.2(15)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Support for EIGRP was added.
12.2(33)SRE	This command was modified. Support for EIGRP was added.
Cisco IOS XE Release 2.5	This command was modified. Support for EIGRP was added.
12.2(33)XNE	This command was modified. Support for EIGRP was added.

Usage Guidelines

Extended community attributes are used to configure, filter, and identify routes for virtual routing and forwarding instances (VRFs) and Multiprotocol Label Switching (MPLS) Virtual Private Networks (VPNs).

The **match extcommunity** command is used to configure match clauses that use extended community attributes in route maps. All of the standard rules of match and set clauses apply to the configuration of extended community attributes.

Examples

The following example shows that the routes that match extended community list 500 will have the weight set to 100. Any route that has extended community 1 will have the weight set to 100.

```
Router(config)# ip extcommunity-list 500 rt 100:2
Router(config-extcomm-list)# exit
Router(config)# route-map MAP_NAME permit 10
Router(config-route-map)# match extcommunity 1
Router(config-route-map)# set weight 100
```

Related Commands

Command	Description
ip extcommunity-list	Creates an extended community list for BGP and controls access to it.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another.
set extcommunity	Sets BGP extended community attributes.
set weight	Specifies the BGP weight for the routing table.
show ip extcommunity-list	Displays routes that are permitted by the extended community list.
show route-map	Displays configured route maps.

match tag list

To filter routes that match a specified route tag list, use the **match tag list** command in route-map configuration mode. To remove the route tag list entry, use the **no** form of this command.

match tag list *list-name* [{**. . .** *list-name*}]
no match tag list *list-name* [{**. . .** *list-name*}]

Syntax Description

list-name	Name of route tag lists.

Command Default

No match tag lists are defined.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
15.2(2)S	This command was introduced.
Cisco IOS XE Release 3.6S	This command was integrated into Cisco IOS XE Release 3.6S.
15.2(4)M	This command was integrated into Cisco IOS Release 15.2(4)M.

Usage Guidelines

The ellipsis (...) in the command syntax indicates that the command input can include multiple values for the *list-name* argument. Route tag lists are used to filter routes. A single list can have multiple criteria for routes. Only routes that match all criteria specified in the route tag list are filtered.

The function of the **match tag list** command is similar to the **match tag** command; the **match tag** command specifies individual tag values and not tag lists.

Note You can use either the **match tag** command or the **match tag list** command but not both together within a single route-map sequence.

Examples

The following example shows how to filter routes from the route tag list named list1 by using the **match tag list** command:

```
Device(config)# route-map map1
Device(config-route-map)# match tag list list1
```

Related Commands

Command	Description
match tag	Filters routes that match specified route tags.
route-tag list	Creates a route tag list.
route-tag notation	Enables the display of route tag values in dotted decimal format.

maximum-prefix

To limit the number of prefixes that are accepted under an address family by an Enhanced Interior Gateway Routing Protocol (EIGRP) process, use the **maximum-prefix** command in address family configuration mode or address family topology configuration mode. To disable this function, use the **no** form of this command.

maximum-prefix *maximum*
{[[*threshold*] [**dampened**] [**reset-time** *minutes*] [**restart** *minutes*] [**restart-count** *number*]] | [**warning-only**]}
no maximum-prefix

Syntax Description

maximum	Maximum number of prefixes allowed under an address family. The range for this argument is a number from 1 to 4294967295. **Note** The number of prefixes that can be configured is limited only by the available system resources on the router.
threshold	(Optional) The prefix percentage number. Valid values are 1 to 100. The default is 75. This value causes the router to generate syslog warning messages when the specified percentage of the maximum-prefix limit has been exceeded.
dampened	(Optional) Configures a decay penalty to be applied to the restart-time period each time the maximum-prefix limit is exceeded. The half-life for the decay penalty is 150 percent of the default or user-defined restart-time value in minutes. This keyword is disabled by default.
reset-time *minutes*	(Optional) Configures the router to reset the restart count to 0 after the default or user-defined reset-time period has expired. The range of values that can be applied with the *minutes* argument is from 1 to 65535 minutes. The default reset-time period is 15 minutes.
restart *minutes*	(Optional) Configures a time period in which the router will not form adjacencies or accept redistributed routes from the Routing Information Base (RIB) after the maximum-prefix limit has been exceeded. The value for the *minutes* argument is from 1 to 65535 minutes. The default restart-time period is 5 minutes.
restart-count *number*	(Optional) Configures the number of times a peering session can be automatically reestablished after the peering session has been torn down or after a redistribute route has been cleared and relearned because the maximum-prefix limit has been exceeded. The default restart-count limit is 3. **Caution** Once the restart count threshold has been crossed, you will need to enter the **clear ip route *** or **clear ip eigrp neighbor** command to reestablish normal peering and/or redistribution.
warning-only	(Optional) Configures the router to generate syslog messages only when the maximum-prefix limitis reached, instead of suspending peering session or route redistribution. This keyword is disabled by default.

Command Default

The number of prefixes that are accepted under an address family by an EIGRP process is not limited.

Command Modes

Address family configuration (config-router-af) Address family topology configuration (config-router-af-topology)

Command History

Release	Modification
12.0(29)S	This command was introduced.
12.3(14)T	This command was integrated into Cisco IOS Release 12.3(14)T.
15.0(1)M	This command was modified. Address family topology configuration mode was added for EIGRP named configurations.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
Cisco IOS XE Release 2.6	This command was integrated into Cisco IOS XE Release 2.6.

Usage Guidelines

The **maximum-prefix** command is used to configure an EIGRP process to limit the number prefixes that are accepted from all sources. When the maximum-prefix limit is exceeded, sessions with remote peers are torn down, all routes learned from remote peers and through redistribution are removed from the topology and routing tables, and redistribution and peering is suspended for the default or user-defined time period.

Inherited Timer Values

Default or user-defined restart, restart-count, and reset-time values for the process-level configuration of this feature, configured with the **maximum-prefix** command, are inherited by the **redistribute maximum-prefix** and **neighbor maximum-prefix** command configurations by default. If a single peer is configured with the **neighbor maximum-prefix** command, a process-level configuration or a configuration that is applied to all neighbors will be inherited.

Examples

The following example, starting in global configuration mode, configures the maximum prefix limit for an EIGRP process, which includes routes learned through redistribution and routes learned through EIGRP peering sessions. The maximum limit is set to 50000 prefixes. When the number of prefixes learned through redistribution reaches 37,500 (75 percent of 50,000), warning messages will be displayed in the console. When the maximum prefix limit is exceeded, all peering sessions will be reset, the topology and routing tables will be cleared and redistributed routes and all peering sessions will be placed in a penalty state.

```
Router(config)# router eigrp 100
Router(config-router)# address-family ipv4 vrf VRF1
Router(config-router-af)# maximum-prefix 50000

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

The following example configures the maximum prefix limit for an EIGRP named configuration process:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# topology base
Router(config-router-af-topology)# maximum-prefix 50000
```

Related Commands

Command	Description
clear ip eigrp neighbors	Deletes entries from the EIGRP neighbor table.
clear ip eigrp vrf neighbor	Deletes neighbor entries from the VRF table.
clear ip route	Deletes routes from the IP routing table.
neighbor maximum-prefix	Limits the number of prefixes that are accepted from a single EIGRP neighbor or from all EIGRP neighbors.
redistribute maximum-prefix	Limits the number of prefixes redistributed into an EIGRP process.

metric holddown

To keep new Enhanced Interior Gateway Routing Protocol (EIGRP) routing information from being used for a certain period of time, use the **metric holddown** command in router configuration mode. To disable this feature, use the **no** form of this command.

metric holddown
no metric holddown

Syntax Description

This command has no arguments or keywords.

Command Default

The holddown state is disabled.

Command Modes

Router configuration (config-router)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The holddown state keeps new routing information from being used for a certain period of time. This function can prevent routing loops caused by slow convergence. It is sometimes advantageous to disable the holddown state to increase the ability of the network to quickly respond to topology changes; this command provides this function.

Use the **metric holddown** command if other routers or access servers within the EIGRP autonomous system are not configured with the **no metric holddown** command. If all routers are not configured the same way, you increase the possibility of routing loops.

Examples

The following example disables metric holddown:

```
Router(config)# router eigrp 15
Router(config-router)# network 172.16.0.0
Router(config-router)# network 192.168.7.0
Router(config-router)# no metric holddown
```

Related Commands

Command	Description
metric maximum-hops	Causes the IP routing software to advertise as unreachable those routes with a hop count higher than is specified by the command (EIGRP only).
metric weights (EIGRP)	Allows the tuning of the EIGRP metric calculations.

metric maximum-hops

To have the IP routing software advertise as unreachable routes with a hop count higher than is specified by the command (Enhanced Interior Gateway Routing Protocol [EIGRP] only), use the **metric maximum-hops** command in router configuration mode or address family topology configuration mode. Toreset 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 (in decimal). The default value is 100; the maximum number of hops that can be specified is 255.

Command Default

The maximum number of hops is 100.

Command Modes

Router configuration (config-router) Address family topology configuration (config-router-af-topology)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
15.0(1)M	This command was modified. The address-family topology configuration mode was added.
12.2(33)SRE	This command was modified. The address-family topology configuration mode was added.
Cisco IOS XE Release 2.5	This command was modified. The address-family topology configuration mode was added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.

Usage Guidelines

This command provides a safety mechanism that breaks any potential count-to-infinity problems. It causes the IP routing software to advertise as unreachable routes with a hop count greater than the value assigned to the *hops-number* argument.

Examples

In the following example, a router in autonomous system 71 attached to network 10.0.0.0 wants a maximum hop count of 200, doubling the default. The network administrators configured the router hop count to 200 because they have a complex WAN that can generate a large hop count under normal (nonlooping) operations.

```
Router(config)# router eigrp 71
Router(config-router)# network 172.16.0.0
Router(config-router)#
metric maximum-hops 200
```

The following example shows how to configure EIGRP autonomous-system 4453 to have a maximum hop count of 200:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# topology base
Router(config-router-af-topology)# metric maximum-hops 200
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
metric holddown	Keeps new EIGRP routing information from being used for a certain period of time.
metric weights (EIGRP)	Allows the tuning of the EIGRP metric calculations.
network (EIGRP)	Specifies the network for an EIGRP routing process.
router eigrp	Configures the EIGRP address-family process.
topology (EIGRP)	Configures an EIGRP process to route IP traffic under the specified topology instance and enters address-family topology configuration mode.

metric rib-scale

To set the Routing Information Base (RIB) scaling factor for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **metric rib-scale** command in address family configuration mode. To remove the metric value and 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	Scaling value for the RIB installation. The range is from 1 to 255. The default value is 128.

Command Default

The RIB scaling factor is set to 128.

Command Modes

Address family configuration (config-router-af)

Command History

Release	Modification
15.1(3)S	This command was introduced.
Cisco IOS XE Release 3.4S	This command was integrated into Cisco IOS XE Release 3.4S.
15.2(2)T	This command was integrated into Cisco IOS Release 15.2(2)T.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY

Usage Guidelines

Use the **metric rib-scale** command to clear all EIGRP routes and replace them with new metric values in the RIB.

Examples

The following example shows how to set the RIB-scale value to 100:

```
Router# configure terminal
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4533
Router(config-router-af)# metric rib-scale 100
```

Related Commands

Command	Description
metric weights (EIGRP)	Tunes EIGRP metric calculations.

metric weights (EIGRP)

To tune the Enhanced Interior Gateway Routing Protocol (EIGRP) metric calculations, use the **metric weights** command in router configuration mode or address family configuration mode. To reset the values to their defaults, use the **no** form of this command.

Router Configuration
metric weights *tos k1 k2 k3 k4 k5*
no metric weights

Address Family Configuration
metric weights *tos* [*k1* [*k2* [*k3* [*k4* [*k5* [*k6*]]]]]]
no metric weights

Syntax Description

tos	Type of service. This value must always be zero.
k1 k2 k3 k4 k5 k6	(Optional) Constants that convert an EIGRP metric vector into a scalar quantity. Valid values are 0 to 255. Given below are the default values: • *k1:* 1 • *k2:* 0 • *k3:* 1 • *k4:* 0 • *k5:* 0 • *k6:* 0 **Note** In address family configuration mode, if the values are not specified, default values are configured. The *k6* argument is supported only in address family configuration mode.

Command Default

EIGRP metric K values are set to their default values.

Command Modes

Router configuration (config-router)

Address family configuration (config-router-af)

Command History

Release	Modification
10.0	This command was introduced.
12.4(6)T	This command was modified. Support for IPv6 was added.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Release	Modification
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2(33)SRE	This command was modified. The address family configuration mode was added.
15.0(1)M	This command was modified. The address family configuration mode was added.
Cisco IOS XE Release 2.5	This command was modified. The address family configuration mode was added.
15.1(3)S	This command was modified. The *k6* argument was added.
Cisco IOS XE Release 3.4S	This command was modified. The *k6* argument was added.
15.2(2)T	This command was modified. The *k6* argument was added.
15.1(1)SY	This command was modified. The *k6* argument was added.

Usage Guidelines

Use this command to alter the default behavior of EIGRP routing and metric computation and to allow the tuning of the EIGRP metric calculation for a particular type of service (ToS).

If k5 equals 0, the composite EIGRP metric is computed according to the following formula:

metric = [k1 * bandwidth + (k2 * bandwidth)/(256 – load) + k3 * delay + K6 * extended metrics]

If k5 does not equal zero, an additional operation is performed:

metric = metric * [k5/(reliability + k4)]

Scaled Bandwidth= 10^7/minimum interface bandwidth (in kilobits per second) * 256

Delay is in tens of microseconds for classic mode and pico seconds for named mode. In classic mode, a delay of hexadecimal FFFFFFFF (decimal 4294967295) indicates that the network is unreachable. In named mode, a delay of hexadecimal FFFFFFFFFFFF (decimal 281474976710655) indicates that the network is unreachable.

Reliability is given as a fraction of 255. That is, 255 is 100 percent reliability or a perfectly stable link.

Load is given as a fraction of 255. A load of 255 indicates a completely saturated link.

Examples

The following example shows how to set the metric weights to slightly different values than the defaults:

```
Router(config)# router eigrp 109
Router(config-router)# network 192.168.0.0
Router(config-router)# metric weights 0 2 0 2 0 0
```

The following example shows how to configure an address-family metric weight to ToS: 0; K1: 2; K2: 0; K3: 2; K4: 0; K5: 0; K6:1:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4533
Router(config-router-af)# metric weights 0 2 0 2 0 0 1
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address family configuration mode to configure an EIGRP routing instance.
bandwidth (interface)	Sets a bandwidth value for an interface.
delay (interface)	Sets a delay value for an interface.
ipv6 router eigrp	Configures an IPv6 EIGRP routing process.
metric holddown	Keeps new EIGRP routing information from being used for a certain period of time.
metric maximum-hops	Causes IP routing software to advertise routes with a hop count higher than what is specified by the command (EIGRP only) as unreachable routes.
router eigrp	Configures an EIGRP routing process.

neighbor (EIGRP)

To define a neighboring device with which an Enhanced Interior Gateway Routing Protocol (EIGRP) device can exchange routing information, use the **neighbor** command in router configuration mode or address family configuration mode. To remove an entry, use the **no** form of this command.

neighbor {*ip-address ipv6-address*} *interface-type interface-number* [**remote** *maximum-hops* [{**lisp-encap** [{*lisp-id*}]}]]
no neighbor {*ip-addressipv6-address*} *interface-type interface-number*

Syntax Description

ip-address	IP address of a peer router with which routing information will be exchanged.
ipv6-address	IPv6 address of a peer router with which routing information will be exchanged.
interface-type	Interface or subinterface through which peering sessions are established.
interface-number	Number of the interface or subinterface.
remote	(Optional) Specifies that the neighbor is remote.
maximum-hops	(Optional) Maximum hop count. Valid range is from 2 to 100. This argument is available only when the **remote** keyword is configured.
lisp-encap	(Optional) Specifies that any data to routes from this remote neighbor is Location/ID Separation Protocol (LISP) encapsulated.
lisp-top-id	(Optional) Identity of the LISP instance. Only one LISP ID is allowed per device.

Command Default

No neighboring routers are defined.

Command Modes

Router configuration (config-router)

Address family configuration (config-router-af)

Command History

Release	Modification
10.0	This command was introduced.
12.4(6)T	This command was modified. The *ipv6-address* argument was added.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Address family configuration mode was added
12.2(33)SRE	This command was modified. Address family configuration mode was added.

Release	Modification
Cisco IOS XE Release 2.5	This command was modified. Address family configuration mode was added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 3.10	This command was modified. The **lisp-encap** keyword an *lisp-id* argument were added.
15.3(3)S	This command was integrated into Cisco IOS Release 15.3(3)S.

Usage Guidelines

Multiple neighbor statements can be used to establish peering sessions with specific EIGRP neighbors. The interface through which EIGRP exchanges routing updates must be specified in the neighbor statement. The interfaces through which two EIGRP neighbors exchange routing updates must be configured with IP addresses from the same network.

Note Configuring the **passive-interface** command suppresses all incoming and outgoing routing updates and hello messages. EIGRP neighbor adjacencies cannot be established or maintained over an interface that is configured as passive.

Examples

The following example shows how to configure EIGRP peering sessions with neighbors 192.168.1.1 and 192.168.2.2:

```
Router(config)# router eigrp 1
Router(config-router)# network 192.168.0.0
Router(config-router)# neighbor 192.168.1.1 Ethernet 0/0
Router(config-router)# neighbor 192.168.2.2 Ethernet 1/1
```

The following named configuration example shows how to configure EIGRP to send address-family updates to specific neighbors:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# neighbor 192.168.1.1 ethernet 0/0
Router(config-router-af)# neighbor 10.1.1.2 loopback 0 remote 10
```

The following example shows how to enable EIGRP to identify and reach EIGRP Route Reflectors in a network. An EIGRP Route Reflector is an EIGRP peer that forms adjacencies with customer edge routers in a network and exchange routes between them without changing the next hop or metrics of these routes.

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# neighbor 192.168.1.1 gigabitethernet 0/0/1 remote 2 lisp-encap 1
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address family configuration mode to configure an EIGRP routing instance.

Command	Description
ipv6 router eigrp	Creates and configures an EIGRP routing process in IPv6 configurations.
passive-interface	Disables sending routing updates on an interface.
router eigrp	Configures an EIGRP routing process.
network (EIGRP)	Specifies the network for an EIGRP routing process.

neighbor description

To associate a description with a neighbor, use the **neighbor description** command in router configuration mode or address family configuration mode. To remove the description, use the **no** form of this command.

neighbor {*ip-addresspeer-group-name*} **description** *text*
no neighbor {*ip-addresspeer-group-name*} **description** [*text*]

Syntax Description

ip-address	IP address of the neighbor.
peer-group-name	Name of an EIGRP peer group. This argument is not available in address-family configuration mode.
text	Text (up to 80 characters in length) that describes the neighbor.

Command Default

There is no description of the neighbor.

Command Modes

Router configuration (config-router) Address family configuration (config-router-af)

Command History

Release	Modification
11.3	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Address-family configuration mode was added.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
Cisco IOS XE Release 2.6	This command was integrated into Cisco IOS XE Release 2.6.

Examples

In the following examples, the description of the neighbor is “peer with example.com”:

```
Router(config)# router bgp 109
Router(config-router)# network 172.16.0.0
Router(config-router)# neighbor 172.16.2.3 description peer with example.com
```

In the following example, the description of the address family neighbor is “address-family-peer”:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)#
network 172.16.0.0
Router(config-router-af)#
neighbor 172.16.2.3 description address-family-peer
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address family configuration mode to configure an EIGRP routing instance.
network (EIGRP)	Specifies the network for an EIGRP routing process.
router eigrp	Configures the EIGRP address family process.

neighbor maximum-prefix (EIGRP)

To limit the number of prefixes that are accepted from a single Enhanced Interior Gateway Protocol (EIGRP) neighbor or from all EIGRP neighbors, use the **neighbor maximum-prefix** command in address family configuration mode. To disable this function, use the **no** form of this command.

Single Neighbor Configuration
neighbor *ip-address* **maximum-prefix** *maximum* [*threshold*] [**warning-only**]
no neighbor *ip-address* **maximum-prefix**

All Neighbor Configuration
neighbor maximum-prefix *maximum* [*threshold*] [{[**dampened**] [**reset-time** *minutes*] [**restart** *minutes*] [**restart-count** *number*] | **warning-only**}]
no neighbor maximum-prefix

Syntax Description

ip-address	IP address of a single peer.
maximum	Maximum number of prefixes accepted. The range for this argument is a number from 1 to 4294967295. **Note** The number of prefixes that can be configured is limited only by the available system resources on the router.
threshold	(Optional) Configures the router to generate syslog warning messages when the specified percentage of the maximum-prefix limit has been reached. The prefix percentage number that can be configured for the *threshold* argument is from 1 to 100. The default is 75 percent.
warning-only	(Optional) Configures the router to generate syslog messages only when the *maximum-prefix limit*is reached, instead of terminating the peering session. This keyword is disabled by default.
dampened	(Optional) Configures a decay penalty to be applied to the restart-time period each time the maximum-prefix limit is reached. The half-life for the decay penalty is 150 percent of the default or user-defined restart-time value in minutes. This keyword is disabled by default.
reset-time minutes	(Optional) Configures the router to reset the restart count to 0 after the default or configured reset-time period has expired. The value for the *minutes* argument is from 1 to 65535 minutes. The default reset-time period is 15 minutes.
restart minutes	(Optional) Configures a time period in which the router will not form adjacencies or accept redistributed routes from the RIB after the maximum-prefix limit has been reached. The value for the minutes argument is from 1 to 65535 minutes. The default restart-time period is 5 minutes.

restart-count *number*	(Optional) Configures the number of times a peering session can be automatically reestablished after the peering session has been torn down or after a redistribute route has been cleared and relearned because the maximum-prefix limit has been reached. The default restart-count limit is 3. **Caution** Once the restart count threshold has been crossed, you will need to enter the **clear ip route *** or **clear ip eigrp neighbor** command to reestablish normal peering and/or redistribution.

Command Default

The number of prefixes that can be configured is limited only by the available system resources on the router.

Command Modes

Address family configuration (config-router-af)

Command History

Release	Modification
12.0(29)S	This command was introduced.
12.3(14)T	This command was integrated into Cisco IOS Release 12.3(14)T.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
Cisco IOS XE Release 2.6	This command was integrated into Cisco IOS XE Release 2.6.

Usage Guidelines

The **neighbor maximum-prefix** command can be configured to protect an individual peering session or to protect all peering sessions. When this feature is enabled and the maximum-prefix limit has been reached, the router will tear down the peering session, clear all routes that were learned from the peer, and then place the peer in a penalty state for the default or user-defined time period. After the penalty time period expires, normal peering will be reestablished.

Note In EIGRP, **neighbor** commands have been traditionally used to configure static neighbors. In the context of the EIGRP Prefix Limiting feature, however, the **neighbor maximum-prefix** command can be used to configure the maximum-prefix limit for both statically configured neighbors and dynamically discovered neighbors.

When you configure the **neighbor maximum-prefix** command to protect a single peering session, only the maximum-prefix limit, the percentage threshold, and the warning-only configuration options can be configured. Session dampening, restart, and reset timers are configured on a global basis.

Inherited Timer Values

Default or user-defined restart, restart-count, and reset-time values for the process-level configuration of this feature, configured with the **maximum-prefix** command, are inherited by the **redistribute maximum-prefix** and **neighbor maximum-prefix** command configurations by default. If a single peer is configured with the **neighbor maximum-prefix** command, a process-level configuration or a configuration that is applied to all neighbors will be inherited.

Examples

Configuring the Maximum Prefix Limit for a Single Peer

The following example, starting in global configuration mode, configures the maximum prefix limit for a single peer. The maximum limit is set to 1000 prefixes, and the warning threshold is set to 80 percent. When the maximum prefix limit is reached for the configured neighbor, adjacency with this neighbor will be brought down and all routes learned from it will be cleared. The neighbor will be placed in a penalty state for 4 minutes (user-defined penalty value). This function will not affect the relationship with any other neighbor.

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# neighbor 10.0.0.1 maximum-prefix 1000 80

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

Configuring the Maximum Prefix Limit for All Peers

The following example, starting in global configuration mode, configures the maximum prefix limit for all peers. The maximum limit is set to 10,000 prefixes, the warning threshold is set to 90 percent, the restart timer is set to 4 minutes, a decay penalty is configured for the restart timer with the dampened keyword, and all timers are configured to be reset to 0 every 60 minutes. When the maximum prefix limit is reached for any neighbor, adjacency with this neighbor will be brought down and all routes learned from it will be cleared. This function will not affect the relationship with any other neighbor. The offending peer will be placed in a penalty state for 4 minutes (user-defined penalty value). A dampening exponential decay penalty will also be applied.

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 virtual-name autonomous-system 4453
Router(config-router-af)# neighbor maximum-prefix 10000 90 dampened reset-time 60 restart
4
Router(config-router-af)# end
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address family configuration mode to configure an EIGRP routing instance.
clear ip eigrp neighbors	Deletes entries from the EIGRP neighbor table.
clear ip eigrp vrf neighbor	Deletes neighbor entries from the VRF table.
clear ip route	Deletes routes from the IP routing table.
neighbor maximum-prefix	Limits the number of prefixes that are accepted from a single EIGRP neighbor or from all EIGRP neighbors.
redistribute maximum-prefix (EIGRP)	Limits the number of prefixes redistributed into an EIGRP process.

network (EIGRP)

To specify the network for an Enhanced Interior Gateway Routing Protocol (EIGRP) routing process, use the **network** command in router configuration mode or address-family configuration mode. To remove an entry, use the **no** form of this command.

network *ip-address* [*wildcard-mask*]
no network *ip-address* [*wildcard-mask*]

Syntax Description

ip-address	IP address of the directly connected network.
wildcard-mask	(Optional) EIGRP wildcard bits. Wildcard mask indicates a subnetwork, bitwise complement of the subnet mask.

Command Default

No networks are specified.

Command Modes

Router configuration (config-router) Address-family configuration (config-router-af)

Command History

Release	Modification
10.0	This command was introduced.
12.0(4)T	The *network-mask* argument was added.
12.0(22)S	Address-family support for EIGRP was added.
12.2(15)T	Address-family support for EIGRP was added.
12.2(18)S	Address-family support for EIGRP was added.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.

Usage Guidelines

When the **network** command is configured for an EIGRP routing process, the router matches one or more local interfaces. The **network** command matches only local interfaces that are configured with addresses that are within the same subnet as the address that has been configured with the **network**command. The router then establishes neighbors through the matched interfaces. There is no limit to the number of network statements **(network** commands) that can be configured on a router.

Use a wildcard mask as a shortcut to group networks together. A wildcard mask matches everything in the network part of an IP address with a zero. Wildcard masks target a specific host/IP address, entire network, subnet, or even a range of IP addresses.

When entered in address-family configuration mode, this command applies only to named EIGRP IPv4 configurations. Named IPv6 and Service Advertisement Framework (SAF) configurations do not support this command in address-family configuration mode.

Examples

The following example configures EIGRP autonomous system 1 and establishes neighbors through network 172.16.0.0 and 192.168.0.0:

```
Router(config)# router eigrp 1

Router(config-router)# network 172.16.0.0
Router(config-router)# network 192.168.0.0
Router(config-router)# network 192.168.0.0 0.0.255.255
```

The following example configures EIGRP address-family autonomous system 4453 and establishes neighbors through network 172.16.0.0 and 192.168.0.0:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# network 172.16.0.0
Router(config-router-af)# network 192.168.0.0
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
router eigrp	Configures the EIGRP address-family process.

next-hop-self

To enable the Enhanced Interior Gateway Routing Protocol (EIGRP) to advertise routes with the local outbound interface address as the next hop, use the **next-hop-self** command in address family interface configuration mode. To instruct an EIGRP device to use the received next hop instead of the local outbound interface address, use the **no** form of this command.

next-hop-self
no next-hop-self[{**no-ecmp-mode**}]

Syntax Description

no-ecmp-mode	(Optional) Evaluates all paths to a network before advertising the paths out of an interface.

Command Default

The next-hop-self state is enabled by default, which allows EIGRP to use a local address in the next-hop field of its routing advertisements.

Command Modes

Address family interface (config-router-af-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
Cisco IOS XE Release 3.5S	This command was modified. The **no-ecmp-mode** keyword was added.
15.2(1)S	This command was integrated into Cisco IOS Release 15.2(1)S. The **no-ecmp-mode** keyword was added.
15.2(3)T	This command was modified. The **no-ecmp-mode** keyword was added.

Usage Guidelines

The **next-hop-self** command is an interface-based command. EIGRP, by default, sets the next-hop value to the local outbound interface address for routes that it is advertising, even when advertising those routes back out of the same interface on which they were learned. To change this default, you must use the **no next-hop-self** command to instruct EIGRP to use the received next-hop value when advertising these routes.

The **no-ecmp-mode** option is an enhancement to the **no next-hop-self** command. When this option is enabled, all paths to a network in the EIGRP table are evaluated to check whether routes advertised from an interface were learned on the same interface. If the route advertised by an interface was learned on the same interface, the **no next-hop-self** configuration is honored and the received next hop is used to advertise this route. Disabling the next-hop self functionality is primarily useful in Dynamic Multipoint VPN (DMVPN) spoke-to-spoke topologies.

Before configuring the **no next-hop-self** command, you must disable the split-horizon functionality. Split horizon is a protocol-independent parameter that blocks route information from being advertised by a device out of any interface from which that information originated. Use the **no split-horizon** command to disable split horizon.

Examples

The following example shows how to change the default next-hop value in IPv4 address family interface configurations by disabling the next-hop self functionality and configuring EIGRP to use the received next-hop value to advertise routes:

```
Device(config)# router eigrp virtual-name
Device(config-router)# address-family ipv4 autonomous-system 33
Device(config-router-af)# af-interface ethernet0/0
Device(config-router-af-interface)# no next-hop-self no-ecmp-mode
```

The following example shows how to change the default next-hop value in IPv6 address family interface configurations:

```
Device(config)# router eigrp virtual-name
Device(config-router)# address-family ipv6 autonomous-system 33
Device(config-router-af)# af-interface ethernet0/0
Device(config-router-af-interface)# no next-hop-self no-ecmp-mode
```

Related Commands

Command	Description
address-family	Configures an EIGRP routing instance in address family configuration mode.
router eigrp	Configures an EIGRP routing process.
split-horizon (EIGRP)	Enables EIGRP split horizon.

nsf (EIGRP)

To enable Cisco nonstop forwarding (NSF) operations for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **nsf** command in router configuration or address family configuration mode. To disable EIGRP NSF and to remove the EIGRP NSF configuration from the running-configuration file, use the **no** form of this command.

nsf
no nsf

Syntax Description

This command has no arguments or keywords.

Command Default

EIGRP NSF is disabled.

Command Modes

Router configuration (config-router)

Address family configuration (config-router-af)

Command History

Release	Modification
12.2(18)S	This command was introduced.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.0(1)M	This command was modified. Support for Address family configuration mode was added.
12.2(33)SRE	This command was modified. Support for Address family configuration mode was added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
Cisco IOS XE Release 3.6S	This command was modified. Support for IPv6 and IPv6 VPN Routing and Forwarding (VRF) was added.
15.2(2)S	This command was modified. Support for IPv6 and IPv6 VRF was added.

Usage Guidelines

The **nsf** command is used to enable or disable EIGRP NSF support on an NSF-capable router. NSF is supported only on platforms that support High Availability.

Examples

The following example shows how to disable NSF:

```
Device# configure terminal
Device(config)# router eigrp 101
```

```
Device(config-router)# no nsf
Device(config-router)# end
```

The following example shows how to enable EIGRP IPv6 NSF:

```
Device# configure terminal
Device(config)# router eigrp virtual-name-1
Device(config-router)# address-family ipv6 autonomous-system 10
Device(config-router-af)# nsf
Device(config-router-af)# end
```

Related Commands

Command	Description
debug eigrp address-family ipv6 notifications	Displays information about EIGRP address family IPv6 event notifications.
debug eigrp nsf	Displays notifications and information about NSF events for an EIGRP routing process.
debug ip eigrp notifications	Displays information and notifications for an EIGRP routing process.
show ip protocols	Displays the parameters and the current state of the active routing protocol process.
show ipv6 protocols	Displays the parameters and the current state of the active IPv6 routing protocol process.
timers graceful-restart purge-time	Sets the graceful-restart purge-time timer to determine how long an NSF-aware router that is running EIGRP must hold routes for an inactive peer.
timers nsf converge	Sets the maximum time that the restarting router must wait for the end-of-table notification from an NSF-capable or NSF-aware peer.
timers nsf signal	Sets the maximum time for the initial restart period.

offset-list (EIGRP)

To add an offset to incoming and outgoing metrics to routes learned via Enhanced Interior Gateway Routing Protocol (EIGRP), use the **offset-list** command in router configuration mode or address family topology configuration mode. To remove an offset list, use the **no** form of this command.

offset-list {*access-list-numberaccess-list-name*} {**in** | **out**} *offset* [*interface-type interface-number*]
no offset-list {*access-list-numberaccess-list-name*} {**in** | **out**} *offset* [*interface-type interface-number*]

Syntax Description

access-list-number | *access-list-name*	Standard access list number or name to be applied. Access list number 0 indicates all networks (networks, prefixes, or routes). If the *offset* value is 0, no action is taken.
in	Applies the access list to incoming metrics.
out	Applies the access list to outgoing metrics.
offset	Positive offset to be applied to metrics for networks matching the access list. If the offset is 0, no action is taken.
interface-type	(Optional) Interface type to which the offset list is applied.
interface-number	(Optional) Interface number to which the offset list is applied.

Command Default

No offset values are added to incoming or outgoing metrics to routes learned via EIGRP.

Command Modes

Router configuration (config-router) Address family topology configuration (config-router-af-topology)

Command History

Release	Modification
10.0	This command was introduced.
10.3	The *interface-type* and *interface-number* arguments were added.
11.2	The *access-list-name* argument was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. The address family configuration mode was added.
12.2(33)SRE	This command was modified. The address family configuration mode was added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was modified. The address family configuration mode was added.

Usage Guidelines

The offset value is added to the routing metric. An offset list with an interface type and interface number is considered extended and takes precedence over an offset list that is not extended. Therefore, if an entry passes the extended offset list and the normal offset list, the offset of the extended offset list is added to the metric.

Examples

In the following example, the router applies an offset of 10 to the delay component of the router only to access list 21:

```
Router(config-router)# offset-list 21 out 10
```

In the following example, the router applies an offset of 10 to routes learned from Ethernet interface 0:

```
Router(config-router)# offset-list 21 in 10 ethernet 0
```

In the following example, the router applies an offset of 10 to routes learned from Ethernet interface 0 in an EIGRP named configuration:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 1
Router(config-router-af)# topology base
Router(config-router-af-topology)# offset-list 21 in 10 ethernet0
```

passive-interface (EIGRP)

To suppress Enhanced Interior Gateway Routing Protocol (EIGRP) hello packets and routing updates on interfaces while still including the interface addresses in the topology database, use the **passive-interface** command in router configuration mode, address-family configuration mode, or address-family interface configuration mode. To reenable outgoing hello packets and routing updates, use the **no** form of this command.

passive-interface [**default**] [*interface-type interface-number*]
no passive-interface [**default**] [*interface-type interface-number*]

Syntax Description

default	(Optional) Configures all interfaces as passive.
interface-type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-number	(Optional) Interface or subinterface number. For more information about the numbering syntax for your networking device, use the question mark (?) online help function.

Command Default

Hello packets and routing updates are sent and received on the interface.

Command Modes

Router configuration (config-router) Address-family configuration (config-router-af) Address-family interface configuration (config-router-af-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
15.3(2)S	This command was implemented on the Cisco ASR 901 Series Aggregation Services Routers.

Usage Guidelines

Use the **passive-interface**(EIGRP) command to select interfaces that will not form EIGRP neighbor adjacencies yet include the interface addresses in the EIGRP topology database. When the **passive-interface** (EIGRP) command is configured, networks defined on the interface are added to the EIGRP topology database while routing updates and hello packets over the passive interfaces are suppressed.

The **default** keyword sets all interfaces to passive. Individual interfaces can be specified to override the default passive-interface state by using the **no passive-interface**command. The **default** keyword is useful when there are more passive interfaces than active interfaces. If the **default** keyword is not specified, the interfaces are considered nonpassive.

Examples

The following example shows how to place the router in the router configuration mode and set all EIGRP interfaces to the passive state and then set Ethernet interface 0/0 to a nonpassive state:

```
Router(config)# router eigrp 109
Router(config-router)# passive-interface default
Router(config-router)# no
 passive-interface ethernet0/0
```

The following example shows how to place the router in the address-family configuration mode and set all EIGRP interfaces in VRF RED to the passive state and then set Ethernet interface 0/0 to a nonpassive state:

```
Router(config)# router eigrp 109
Router(config-router)# address-family ipv4 vrf RED
Router(config-router-af)# passive-interface default
Router(config-router-af)# no passive-interface ethernet0/0
```

The following EIGRP named address-family interface configuration example sets all interfaces in an address family to passive and then sets Ethernet 0/0 to a nonpassive state:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# af-interface default
Router(config-router-af-interface)# passive-interface
Router(config-router-af-interface)# exit
Router(config-router-af)# af-interface ethernet0/0
Router(config-router-af-interface)# no passive-interface
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
network (EIGRP)	Specifies the network for an EIGRP routing process.
router eigrp	Configures the EIGRP address-family process.

populate bgp-extn-comm

To enable sending Enhanced Interior Gateway Routing Protocol characteristics as extended communities to neighboring devices through the Border Gateway Protocol (BGP), use the **populate bgp-extn-comm** command in address family configuration mode. To disable this configuration, use the **no** form of this command.

populate bgp-extn-comm
no populate bgp-extn-comm

This command has no arguments or keywords.

Command Default

This command is enabled by default.

Command Modes

Address family configuration (config-router-af)

Command History

Release	Modification
Cisco IOS XE Release 3.10S	This command was introduced.
Cisco IOS XE Release 3.11S	The **no** form of this command was introduced.
15.3(3)S	This command was integrated into Cisco IOS Release 15.3(3)S.

Usage Guidelines

The **no** form of the command should be configured at that point in the network where routes are redistributed between BGP and EIGRP inside a virtual routing and forwarding (VRF) instance, typically in a provider edge/customer edge (PE/CE) scenario. You can use the **populate bgp-extn-comm** command and the **no** form of the command only under VRF address families.

Example

The following example shows how to disable this command to ensure that you do not send EIGRP characteristics as extended communities to neighboring devices:

```
Device> enable
Device# configure terminal
Device(config)# router eigrp test
Device(config-router)# address-family ipv4 vrf vrf1 autonomous-system 1
Device(config-router-af)# no populate bgp-extn-comm
Device(config-router-af)# end
```

redistribute eigrp

To redistribute IPv4 routes from Enhanced Interior Gateway Routing Protocol (EIGRP), use the **redistribute eigrp** command in router configuration mode. To disable the configuration, use the **no** form of this command.

redistribute eigrp *system-number* [**metric** *bandwidth-metric delay-metric reliability-metric effective-bandwidth-metric mtu-bytes*] [**route-map** *pointer-name*]
no redistribute eigrp *system-number* [**metric** *bandwidth-metric delay-metric reliability-metric effective-bandwidth-metric mtu-bytes*] [**route-map** *pointer-name*]

Syntax Description

system-number	Autonomous system number. The range is from 1 to 65535.
metric	(Optional) Specifies the metric for redistributed routes.
bandwidth-metric	(Optional) Maximum bandwidth of the route, in kilobits per second (kb/s). The range is from 1 to 4294967295.
delay-metric	(Optional) EIGRP route delay metric, in microseconds. The range is from 1 to 4294967295.
reliability-metric	(Optional) EIGRP reliability metric. The range is from 0 to 255. • An EIGRP metric of 255 signifies 100 percent reliability.
effective-bandwidth- metric	(Optional) Effective bandwidth of the route. The range is from 1 to 255. • Effective bandwidth of 255 denotes 100 percent load.
mtu-bytes	(Optional) The smallest allowed value for the maximum transmission unit (MTU), in bytes. The range is from 1 to 65535.
route-map	(Optional) Specifies the route map reference.
pointer-name	(Optional) Pointer to route-map entries.

Command Default

Route redistribution is disabled.

Command Modes

Router configuration (config-router)

Command History

Release	Modification
12.2(8)T	This command was introduced in a release earlier than Cisco IOS Release 12.2(8)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXI	This command was integrated into Cisco IOS Release 12.2(33)SXI.
Cisco IOS XE Release 2.1	This command was implemented on the Cisco ASR 1000 Series Aggregation Services Routers.

Usage Guidelines

Use the **redistribute eigrp** command to redistribute the routes learned through the EIGRP routing instances to other routing protocols. Forward redistribution of the EIGRP routes is allowed before creating the EIGRP routing instance. The EIGRP redistribution takes place as soon as the routing instance is created.

The metric value specified in the **redistribute**command supersedes the metric value specified using the **default-metric**command.

Note In Cisco IOS Release 12.0(33)S, the **redistribution eigrp**command is not allowed if the EIGRP router is not defined. The command terminates by displaying the following error message: %Configure eigrp router mode before redistributing

An EIGRP routing process is configured when you issue the **router eigrp** command and then specify a network for the process using the **network** sub-command. Suppose that you have not configured an EIGRP routing process, and that you have configured redistribution of routes from such an EIGRP process into BGP, OSPF, or RIP. If you use the **no redistribute eigrp** command to change or disable a parameter in the **redistribute eigrp** command, the **no redistribute eigrp** command removes the entire **redistribute eigrp** command instead of changing or disabling a specific parameter.

Examples

The following example shows how to configure a router to redistribute EIGRP routes into an EIGRP process:

```
Router# configure terminal

Router(config)# router eigrp virtual-name
Router(config-router)# redistribute eigrp 6473 metric 1 2 3 4 5
```

The following example shows the behavior of the **redistribution eigrp**command when the EIGRP router is not defined in Cisco IOS Release 12.0(33)S:

```
Router# configure terminal
Router(config)# router ospf 100 vrf vrf1
Router(config-router)# redistribute eigrp 99
%Configure eigrp router mode before redistributing
```

Related Commands

Command	Description
default-metric	Sets metrics for EIGRP.

redistribute maximum-prefix (EIGRP)

To limit the number of prefixes redistributed into an Enhanced Interior Gateway Routing Protocol (EIGRP) process, use the **redistribute maximum-prefix**command in address family configuration mode or address-family topology configuration mode. To disable this function, use the **no** form of this command.

redistribute maximum-prefix *maximum* [*threshold*] [{[**dampened**] [**reset-time** *minutes*] [**restart** *minutes*] [**restart-count** *number*] | [**warning-only**]}]
no redistribute maximum-prefix

Syntax Description

maximum	Maximum number of prefixes that are redistributed into EIGRP under an address family. The range for this argument is a number from 1 to 4294967295. **Note** The number of prefixes that can be configured is limited only by the available system resources on the router.
threshold	(Optional) The prefix percentage number. Valid values are 1 to 100. The default is 75. This value causes the router to generate syslog warning messages when the specified percentage of the maximum-prefix limit has been exceeded.
dampened	(Optional) Configures a decay penalty to be applied to the restart-time period each time the maximum-prefix limit is exceeded. The half-life for the decay penalty is 150 percent of the default or user-defined restart-time value in minutes. This keyword is disabled by default.
reset-time *minutes*	(Optional) Configures the router to reset the restart count to 0 after the default or configured reset-time period has expired. The value for the minutes argument is from 1 to 65535 minutes. The default reset-time period is 15 minutes.
restart *minutes*	(Optional) Configures a time period in which the router will not form adjacencies or accept redistributed routes from the Routing Information Base (RIB) after the maximum-prefix limit has been exceeded. The value for the *minutes* argument is from 1 to 65535 minutes. The default restart-time period is 5 minutes.
restart-count *number*	(Optional) Configures the number of times a peering session can be automatically be reestablished after the peering session has been torn down or after a redistribute route has been cleared and relearned because the maximum-prefix limit has been exceeded. The default restart-count limit is 3. **Caution** Once the restart count threshold has been crossed, you will need to enter the **clear ip route *** or **clear ip eigrp neighbor**command to reestablish normal peering and/or redistribution.
warning-only	(Optional) Configures the router to generate syslog messages only when the maximum-prefix limit is reached, instead of suspending redistribution. This keyword is disabled by default.

Command Default

The number of prefixes redistributed into an EIGRP process is not limited.

Command Modes

Address family configuration (config-router-af) Address family topology configuration (config-router-af-topology)

Command History

Release	Modification
12.0(29)S	This command was introduced.
12.3(14)T	This command was integrated into Cisco IOS Release 12.3(14)T.
15.0(1)M	This command was modified. Address family topology configuration mode was added.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
Cisco IOS XE Release 2.6	This command was integrated into Cisco IOS XE Release 2.6.

Usage Guidelines

The **redistribute maximum-prefix** command is used to configure limit prefixes learned through redistribution. When the maximum-prefix limit is exceeded, all routes learned from the RIB will be discarded and redistribution will be suspended for the default or user-defined time period. The maximum-prefix limit that can be configured for redistributed prefixes is limited only by the available system resources on the router.

Inherited Timer Values

Default or user-defined restart, restart-count, and reset-time values for the process-level configuration of this feature, configured with the **maximum-prefix** command, are inherited by the redistribute **maximum-prefix** (EIGRP) and **neighbor maximum-prefix** (EIGRP) command configurations by default. If a single peer is configured with the **neighbor maximum-prefix**(EIGRP) command, a process-level configuration or a configuration that is applied to all neighbors will be inherited.

Examples

The following example, starting in global configuration mode, configures the maximum prefix limit for routes learned through redistribution. The maximum limit is set to 5000 prefixes and the warning threshold is set to 95 percent. When the number of prefixes learned through redistribution reaches 4750 (95 percent of 5000), warning messages will be displayed in the console. Because the **warning-only** keyword was configured, the topology and routing tables will not be cleared and route redistribution will not be placed in a penalty state.

```
Router(config)# router eigrp 100
Router(config-router)# address-family ipv4 vrf RED
Router(config-router-af)# redistribute maximum-prefix 5000 95 warning-only
Router(config-router-af)# end
```

The following example shows this configuration in address-family topology configuration mode:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 vrf RED autonomous-system 4453
Router(config-router-af)# network 172.16.0.0
Router(config-router-af)# topology base
Router(config-router-af-topology)# redistribute maximum-prefix 5000 95 warning-only
Router(config-router-af-topology)# exit-af-topology
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
clear ip eigrp neighbors	Deletes entries from the EIGRP neighbor table.
clear ip eigrp vrf neighbor	Deletes neighbor entries from the VRF table.
clear ip route	Deletes routes from the IP routing table.
network (EIGRP)	Specifies the network for an EIGRP routing process.
redistribute maximum-prefix (EIGRP)	Limits the number of prefixes redistributed into an EIGRP process.
topology (EIGRP)	Configures an EIGRP process to route IP traffic under the specified topology instance and enters address-family topology configuration mode.

remote-neighbors source (EIGRP)

To configure an Enhanced Interior Gateway Routing Protocol (EIGRP) process that enables remote neighbors to accept inbound connections from any remote IP address, use the **remote-neighbors source** command in address family configuration mode. To remove the configuration, use the **no** form of this command.

remote-neighbors source *interface-type interface-number* {**multicast-group** *group-address* | **unicast-listen lisp-encap** [{*lisp-top-id*}]}[{**allow-list** *access-list-name*}][{**max-neighbor** *max-remote-peers*}]
remote-neighbors source *interface-type interface-number* {**multicast-group** | **unicast-listen lisp-encap** [{*lisp-top-id* | [{**allow-list** *access-list-name*}][{**max-neighbor** *max-remote-peers*}]}]}
=

Syntax Description

interface-type interface-number	Interface to be used as the source for packets that are sent to remote neighbors.
multicast-group	Uses IP multicast to discover remote neighbors and form remote neighbor relationships.
group-address	Multicast address that EIGRP will use to discover remote neighbors and exchange information. Only devices using the same group address will discover one another as neighbors.
unicast-listen	Accepts connections initiated by remote neighbors and forms remote neighbor relationships without having to manually configure the remote neighbor IP address.
lisp-encap	Specifies that the data for this neighbor route will be Location/ID Separation Protocol (LISP) encapsulated.
lisp-top-id	(Optional) Identity of the LISP instance. Only one LISP ID is allowed per device.
allow-list	(Optional) Uses an Access Control List (ACL) to specify the remote IP addresses from which EIGRP neighbor connections may be accepted. If you do not use the **allow-list** keyword, then all IP addresses (permit any) will be accepted.
access-list-name	(Optional) Name of the ACL to be used with the **allow-list** keyword.
max-neighbors	(Optional) Uses the maximum number of remote neighbors. If you do not use this keyword, the maximum number of remote neighbors is limited only by the available memory and bandwidth.
max-remote-peers	(Optional) Maximum number of remote neighbors that a member of the multicast group may accept. The range is from 1 to 65535.

Command Default

No remote neighbors are specified.

Command Modes

Address family configuration mode (config-router-af)

Command History

Release	Modification
Cisco IOS XE Release 3.10S	This command was introduced.

Release	Modification
15.3(3)S	This command integrated into Cisco IOS Release 15.3(3)S.

Usage Guidelines

You can use this command to configure EIGRP peers to receive unicast or multicast peering updates.

Example

The following example shows how to configure a customer edge router to receive unicast peering updates.

```
Device> enable
Device# configure terminal
Device(config)# router eigrp test
Device(config-router)# address family ipv4 unicast autonomous-system 100
Device(config-router-af)# remote-neighbors source gigabitEthernet 0/0/1 unicast-listen
lisp-encap 2
```

Related Commands

Command	Description
address-family (EIGRP)	Configures an EIGRP routing instance within an address family.
router EIGRP	Configures an EIGRP routing process.

router eigrp

To configure the Enhanced Interior Gateway Routing Protocol (EIGRP) routing process, use the **router eigrp** command in global configuration mode. To remove an EIGRP routing process, use the **no** form of this command.

router eigrp {*autonomous-system-numbervirtual-instance-name*}
no router eigrp {*autonomous-system-numbervirtual-instance-name*}

Syntax Description

autonomous-system-number	Autonomous system number that identifies the services to the other EIGRP address-family routers. It is also used to tag routing information. Valid range is 1 to 65535.
virtual-instance-name	EIGRP virtual instance name. This name must be unique among all address-family router processes on a single router, but need not be unique among routers.

Command Default

No EIGRP processes are configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. The *virtual-instance-name* argument was added.
12.2(33)SRE	This command was modified. The *virtual-instance-name* argument was added.
12.2(33)XNE	This command was modified. The *virtual-instance-name* argument was added.
Cisco IOS XE Release 2.5	This command was modified. The *virtual-instance-name* argument was added.

Usage Guidelines

Configuring the **router eigrp** command with the *autonomous-system-number*argument creates an EIGRP configuration referred to as autonomous system (AS) configuration. An EIGRP AS configuration creates an EIGRP routing instance that can be used for tagging routing information.

Configuring the **router eigrp** command with the *virtual-instance-name* argument creates an EIGRP configuration referred to as EIGRP named configuration. An EIGRP named configuration does not create an EIGRP routing instance by itself. An EIGRP named configuration is a base configuration that is required to define address-family configurations under it that are used for routing.

Examples

The following example configures EIGRP process 109:

```
Router(config)# router eigrp 109
```

The following example configures an EIGRP address-family routing process and assigns it the name "virtual-name":

```
Router(config)#
router eigrp virtual-name
```

Related Commands

Command	Description
network (EIGRP)	Specifies a list of networks for the EIGRP process.

route-tag list

To create a route tag list, use the **route-tag list** command in global configuration mode. To remove the route tag list, use the **no** form of this command.

route-tag list *list-name* {**deny** | **permit** | **sequence** *number* {**deny** | **permit**}} *tag-value-dotted-decimal mask*
no route-tag list *list-name* [**sequence** *number* {**deny** | **permit**} *tag-value-dotted-decimal mask*]

Syntax Description

list-name	Name of the route tag list.
deny	Specifies packets that have to be rejected.
permit	Specifies packets that have to be forwarded.
sequence	Specifies the sequence number of an entry.
number	Sequence number. The valid range is from 1 to 4294967294.
tag-value-dotted-decimal	Route tag value in dotted-decimal format.
mask	Wildcard mask.

Command Default

No route tag list is configured.

Command Modes

Global configuration (config)

Command History

Release	Modification
15.2(2)S	This command was introduced.
Cisco IOS XE Release 3.6S	This command was integrated into Cisco IOS XE Release 3.6S.
15.2(4)M	This command was integrated into Cisco IOS Release 15.2(4)M.

Usage Guidelines

Use the **route-tag list** command to create route tag lists that will be used by route maps to match routes based on the criteria specified in the lists.

Examples

The following example shows how to configure a route tag list:

```
Device(config)# route-tag list list1 permit 1.1.1.1 0.0.0.1
Device(config)# route-tag list list1 sequence 5 permit 10.10.10.0 0.0.0.0
```

Related Commands

Command	Description
match tag list	Filters routes that match a specific route tag list.
route-tag notation	Enables the display of route tag values in dotted-decimal format.

route-tag notation

To enable the display of route tag values in dotted-decimal format, use the **route-tag notation** command in global configuration mode. To disable this functionality, use the **no** form of this command.

route-tag notation dotted-decimal
no route-tag notation dotted-decimal

Syntax Description

dotted-decimal	Enables the display of route tag values in dotted-decimal format.

Command Default

Tag values are displayed as plain decimals.

Command Modes

Global configuration (config)

Command History

Release	Modification
15.2(2)S	This command was introduced.
Cisco IOS XE Release 3.6S	This command was integrated into Cisco IOS XE Release 3.6S.
15.2(4)M	This command was integrated into Cisco IOS Release 15.2(4)M.

Usage Guidelines

Configure the **route-tag notation** command to display route tag values in dotted-decimal format. When you configure this command, route tags are displayed as dotted decimals, irrespective of whether or not the route tags were configured as dotted decimals.

Examples

The following example shows how to configure the **route-tag notation** command:

```
Device(config)# route-tag notation dotted-decimal
```

Related Commands

Command	Description
eigrp default-route-tag	Sets a default route tag for all internal EIGRP routes.
match tag	Filters routes that match specified route tags.
set tag (IP)	Sets a tag value for routes.
show ip route	Displays contents of the IPv4 routing table.
show ipv6 route	Displays contents of the IPv6 routing table.

Command	Description
show route-map	Displays information about static and dynamic route maps.
show route-tag list	Displays information about route tag lists configured on the device.

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set metric (EIGRP)

To set the metric value for Enhanced Interior Gateway Routing Protocol (EIGRP) in a route map, use the **set metric** route-map configuration command. To return to the default metric value, use the **no** form of this command.

set metric *bandwidth delay reliability loading mtu*
no set metric *bandwidth delay reliability loading mtu*

Syntax Description

bandwidth	Metric value or EIGRP bandwidth of the route in kbps. The range is from 0 to 4294967295.
delay	Route delay (in tens of microseconds). It can be in the range from 0 to 4294967295.
reliability	Likelihood of successful packet transmission expressed as a number from 0 to 255. The value 255 means 100 percent reliability; 0 means no reliability.
loading	Effective bandwidth of the route expressed as a number from 0 to 255 (255 is 100 percent loading).
mtu	Minimum maximum transmission unit (MTU) size of the route, in bytes. It can be in the range from 0 to 4294967295.

Command Default

No metric will be set in the route map.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.

Usage Guidelines

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

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 for a router are met. When all match criteria are met, all set actions are performed.

Examples

The following example sets the bandwidth to 10,000, the delay to 10, the reliability to 255, the loading to 1, and the MTU to 1500:

```
Router(config-route-map)# set metric 10000 10 255 1 1500
```

set tag (IP)

To set a tag value for a route in a route map, use the **set tag** command in route-map configuration mode. To delete the entry, use the **no** form of this command.

set tag {*tag-valuetag-value-dotted-decimal*}
no set tag {*tag-valuetag-value-dotted-decimal*}

Syntax Description

tag-value	Route tag value in plain decimals. The range is from 0 to 4294967295.
tag-value-dotted-decimal	Route tag value in dotted decimals. The range is from 0.0.0.0 to 255.255.255.255.

Command Default

Routes are not tagged.

Command Modes

Route-map configuration (config-route-map)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
Cisco IOS XE Release 2.1	This command was implemented on Cisco ASR 1000 Series Aggregation Services Routers.
15.2(2)S	This command was modified. This command was integrated into Cisco IOS Release 15.2(2)S and the *tag-value-dotted-decimal* argument was added to support tag values in dotted-decimal format.
Cisco IOS XE Release 3.6S	This command was modified. The *tag-value-dotted-decimal* argument was added to support tag values in dotted-decimal format.

Usage Guidelines

Use the **set tag** command to set an administrative tag for a route within a route map. Route tags are 32-bit values attached to routes. You can set tag values as plain decimals or dotted decimals. Route tags are used by route maps to filter routes. The tag value has no impact on routing decisions. It is used to mark or flag routes to prevent routing loops when routes are redistributed between routing protocols.

Examples

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

```
Device(config)# route-map tag
Device(config-route-map)# set tag 5
```

The following example shows how to set the tag value in the dotted-decimal format:

```
Device(config)# route-map tag
Device(config-route-map)# set tag 10.10.10.10
```

Related Commands

Command	Description
match tag	Filters routes that match specific route tags.
route-map (IP)	Defines conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set automatic-tag	Automatically computes the tag value.

show eigrp address-family accounting

To display prefix accounting information for Enhanced Interior Gateway Routing Protocol (EIGRP) processes, use the **show eigrp address-family accounting** command in user EXEC or privileged EXEC mode.

show eigrp address-family {**ipv4** | **ipv6**} [**vrf** *vrf-name*] [*autonomous-system-number*] [**multicast**] **accounting**

Syntax Description

ipv4	Selects the IPv4 protocol address family.
ipv6	Selects the IPv6 protocol address family.
vrf *vrf-name*	(Optional) Displays information about the specified VRF. This keyword/argument pair is available only for IPv4 configurations.
autonomous-system- number	(Optional) Autonomous system number.
multicast	(Optional) Displays information about multicast instances.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command Default

Prefix accounting information for all EIGRP processes is displayed.

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

This command can be used to display information about EIGRP named configurations and EIGRP autonomous-system (AS) configurations.

This command displays the same information as the **show ip eigrp accounting** command. Cisco recommends using the **show eigrp address-family accounting** command.

Examples

The following example shows how to display EIGRP prefix accounting information for autonomous-system 22:

```
Router# show eigrp address-family ipv4 22 accounting

EIGRP-IPv4 VR(saf) Accounting for AS(22)/ID(10.0.0.1)
Total Prefix Count: 3  States: A-Adjacency, P-Pending, D-Down
State Address/Source    Interface       Prefix   Restart  Restart/
                                        Count     Count   Reset(s)
 A    10.0.0.2          Et0/0             2         0        0
 P    10.0.2.4          Se2/0             0         2        114
 D    10.0.1.3          Et0/0             0         3        0
```

The table below describes the significant fields shown in the display.

Table 3: show eigrp address-family accounting Field Descriptions

Field	Description
IP-EIGRP accounting for AS...	Identifies the EIGRP instance, AS number, router ID, and table ID.
Total Prefix Count	Number of distinct prefixes that are present in this autonomous system.
State	State of the given neighbor: Adjacency, Pending, or Down.
Address/Source	IP address of the neighbor.
Interface	Interface on which the neighbor is connected.
Prefix Count	Number of prefixes that are advertised by this neighbor.
Restart Count	Number of times this neighbor has been restarted due to exceeding prefix limits.
Restart/Reset(s)	Time remaining until the neighbor will be restarted (if in Pending state) or until the restart count will be cleared (if in Adjacency state.)

Related Commands

Command	Description
show eigrp address-family events	Displays information about EIGRP events.
show eigrp address-family interfaces	Displays information about interfaces configured for EIGRP.
show eigrp address-family neighbors	Displays the neighbors discovered by EIGRP.
show eigrp address-family sia-event	Displays information about EIGRP SIA events.
show eigrp address-family sia-statistics	Displays information about EIGRP SIA statistics.
show eigrp address-family timers	Displays information about EIGRP timers and expiration times.
show eigrp address-family topology	Displays entries in the EIGRP topology table.
show eigrp address-family traffic	Displays the number of EIGRP packets sent and received.

show eigrp address-family events

To display information about Enhanced Interior Gateway Routing Protocol (EIGRP) address-family events, use the **show eigrp address-family events**command in user EXEC or privileged EXEC mode.

show eigrp address-family {**ipv4** | **ipv6**} [**vrf** *vrf-name*] [*autonomous-system-number*] [**multicast**] **events** [*starting-event-number ending-event-number*] [**errmsg** [*starting-event-number ending-event-number*]] [**sia** [*starting-event-number ending-event-number*]] [**type**]

Syntax Description

ipv4	Selects the IPv4 protocol address family.
ipv6	Selects the IPv6 protocol address family.
vrf *vrf-name*	(Optional) Displays information about the specified VRF.
autonomous-system- number	(Optional) Autonomous system number.
multicast	(Optional) Displays information about multicast instances.
starting-event-number	(Optional) Number of first event to display.
ending-event-number	(Optional) Number of last event to display.
errmsg	(Optional) Displays error message events.
sia	(Optional) Displays Stuck in Active (SIA) events.
type	(Optional) Displays the types of events being logged.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command Default

All EIGRP address-family events are displayed.

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

The event log is used by Cisco technical support to display a history of EIGRP internal events that are specific to a particular address family.

To display information about EIGRP service-family events, use the **show eigrp service-family events** command.

This command can be used to display information about EIGRP named configurations and EIGRP autonomous-system (AS) configurations.

This command displays the same information as the **show ip eigrp events** command. Cisco recommends using the **show eigrp address-family events** command.

Examples

The following example shows how to display EIGRP address-family events for autonomous-system 3:

```
Router# show eigrp address-family ipv4 3 events
Event information for AS 3:
1 15:37:47.015 Change queue emptied, entries: 1
2 15:37:47.015 Metric set: 10.0.0.0/24 307200
3 15:37:47.015 Update reason, delay: new if 4294967295
4 15:37:47.015 Update sent, RD: 10.0.0.0/24 4294967295
5 15:37:47.015 Update reason, delay: metric chg 4294967295
6 15:37:47.015 Update sent, RD: 10.0.0.0/24 4294967295
7 15:37:47.015 Route installed: 10.0.0.0/24 1.1.1.2
8 15:37:47.015 Route installing: 10.0.0.0/24 10.0.1.2
```

Related Commands

Command	Description
show eigrp address-family accounting	Displays prefix accounting information for EIGRP processes.
show eigrp address-family interfaces	Displays information about interfaces configured for EIGRP.
show eigrp address-family neighbors	Displays the neighbors discovered by EIGRP.
show eigrp address-family sia-event	Displays information about EIGRP SIA events.
show eigrp address-family sia-statistics	Displays information about EIGRP SIA statistics.
show eigrp address-family timers	Displays information about EIGRP timers and expiration times.
show eigrp address-family topology	Displays entries in the EIGRP topology table.
show eigrp address-family traffic	Displays the number of EIGRP packets sent and received.
show eigrp service-family events	Displays information about EIGRP service-family events.

show eigrp address-family interfaces

To display information about interfaces that are configured for Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show eigrp address-family interfaces** command in user EXEC or privileged EXEC mode.

show eigrp address-family {**ipv4** | **ipv6**} [**vrf** *vrf-name*] [*autonomous-system-number*] [**multicast**] **interfaces** [**detail**] [*interface-type interface-number*]

Syntax Description

ipv4	Selects the IPv4 protocol address family.
ipv6	Selects the IPv6 protocol address family.
vrf *vrf-name*	(Optional) Displays information about the specified VPN routing and forwarding (VRF).
autonomous-system- number	(Optional) Autonomous system number.
multicast	(Optional) Displays information about multicast instances.
detail	(Optional) Displays detailed information about EIGRP interfaces.
interface-type interface-number	(Optional) Interface type and number to display. If not specified, all enabled interfaces are displayed.

Command Default

Information about all interfaces enabled with EIGRP is displayed.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS Release XE 2.5	This command was integrated into Cisco IOS XE Release 2.5.
15.2(2)S	This command was modified. The output of the command was enhanced to display information about the state of Bidirectional Forwarding Detection (BFD) on an interface.
15.2(1)E	This command was integrated into Cisco IOS Release 15.2(1)E.

Usage Guidelines

Use the **show eigrp address-family interfaces** command to determine the interfaces on which EIGRP is active and to learn EIGRP information about those interfaces.

If an autonomous system is specified, only the routing process for the specified autonomous system is displayed. Otherwise, all EIGRP processes are displayed.

This command can be used to display information about EIGRP named configurations and EIGRP autonomous system (AS) configurations.

This command displays the same information as the **show ip eigrp interfaces** command. Cisco recommends using the **show eigrp address-family interfaces** command.

Examples

The following sample output from the **show eigrp address-family ipv4 4453 interfaces** command displays information about EIGRP interfaces for autonomous system 4453:

```
Device# show eigrp address-family ipv4 4453 interfaces

EIGRP-IPv4 VR(Virtual-name) Address-family Neighbors for AS(4453)
             Xmit   Queue        Mean  Pacing Time     Multicast    Pending
Interface    Peers  Un/Reliable  SRTT  Un/Reliable     Flow Timer   Services
Se0           1        0/0        28      0/15          127           0
Se1           1        0/0        44      0/15          211           0
```

The following sample output from the show eigrp address-family ipv4 2 interfaces detail Loopback1 command shows how to display detailed information about Loopback interface 1 in autonomous system 2:

```
Device# show eigrp address-family ipv4 2 interfaces detail Loopback1

EIGRP-IPv4 VR(saf2) Address-family Neighbors for AS(2)
             Xmit    Queue       Mean  Pacing Time     Multicast    Pending
Interface    Peers  Un/Reliable  SRTT  Un/Reliable     Flow Timer   Services
Lo1          166       0/0        48      0/1            258           0
 Hello-interval is 5, Hold-time is 15
 Split-horizon is enabled
 Next xmit serial <none>
 Un/reliable mcasts: 0/0 Un/reliable ucasts: 10148/67233
 Mcast exceptions: 0 CR packets: 0 ACKs suppressed: 8719
 Retransmissions sent: 2696 Out-of-sequence rcvd: 594
 Interface has all stub peers
 Topology-ids on interface - 0
 Authentication mode is not set
```

The following sample output from the **show eigrp address-family ipv6 interfaces detail** command shows how to display information about the state of BFD on an interface:

```
Device# show eigrp address-family ipv6 interfaces detail

              Xmit  Queue        Mean  Pacing Time  Multicast   Pending
Interface    Peers  Un/Reliable  SRTT  Un/Reliable  Flow Timer  Routes
Lo1            0     0/0        0/10     0             0         0
 Hello-interval is 5 sec
 Next xmit serial <none>
 BFD is enabled
```

The table below describes the significant fields shown in the sample displays.

Table 4: show eigrp address-family interfaces Field Descriptions

Field	Description
Interface	Interface over which EIGRP is configured.
Peers	Number of EIGRP neighbors connected on this interface.

Field	Description
Xmit Queue Un/Reliable	Number of packets remaining in the unreliable and reliable transmit queues.
Mean SRTT	Mean smooth round-trip time interval (SRTT), in milliseconds.
Pacing Time Un/Reliable	Pacing time used to determine when reliable and unreliable EIGRP packets should be sent out of the interface.
Multicast Flow Timer	Maximum time (in seconds) for which the device sends multicast EIGRP packets.
Pending Services	Number of services in the packets in the transmit queue waiting to be sent.
Pending Routes	Number of available routes in the packets in the transmit queue waiting to be sent.
CR packets	Packets marked for conditional receive.

Related Commands

Command	Description
show eigrp address-family accounting	Displays prefix accounting information for EIGRP processes.
show eigrp address-family events	Displays information about EIGRP events.
show eigrp address-family neighbors	Displays the neighbors discovered by EIGRP.
show eigrp address-family sia-event	Displays information about EIGRP SIA events.
show eigrp address-family sia-statistics	Displays information about EIGRP SIA statistics.
show eigrp address-family timers	Displays information about EIGRP timers and expiration times.
show eigrp address-family topology	Displays entries in the EIGRP topology table.
show eigrp address-family traffic	Displays the number of EIGRP packets sent and received.

show eigrp address-family neighbors

To display neighbors that are discovered by the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show eigrp address-family neighbors** command in user EXEC or privileged EXEC mode.

show eigrp address-family {**ipv4** | **ipv6**} [**vrf** *vrf-name*] [*autonomous-system-number*] [**multicast**] **neighbors** [**static**] [**detail**] [*interface-type interface-number*]

Syntax Description

ipv4	Selects the IPv4 protocol address family.
ipv6	Selects the IPv6 protocol address family.
vrf *vrf-name*	(Optional) Displays information about the specified VPN routing and forwarding (VRF).
autonomous-system- number	(Optional) Autonomous system number.
multicast	(Optional) Displays information about multicast instances.
static	(Optional) Displays static neighbors.
detail	(Optional) Displays detailed EIGRP neighbor information.
interface-type interface-number	(Optional) Interface type and number. If an interface is not specified, all enabled interfaces are displayed.

Command Default

Information about all neighbors discovered by EIGRP is displayed.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
15.2(2)S	This command was modified. The output of the command was enhanced to display information for the Bidirectional Forwarding Detection (BFD) sessions.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.
15.2(1)E	This command was integrated into Cisco IOS Release 15.2(1)E.

Usage Guidelines

Use the **show eigrp address-family neighbors** command to determine when neighbors become active and inactive. The command is also useful for debugging certain types of transport problems.

This command can be used to display information about EIGRP named configurations and EIGRP autonomous system configurations.

This command displays the same information as the **show ip eigrp neighbors** command. We recommend that you use the **show eigrp address-family neighbors** command.

Examples

The following sample output from the **show eigrp address-family ipv4 4453 neighbors** command shows how to display neighbors that are discovered by EIGRP:

```
Device# show eigrp address-family ipv4 4453 neighbors

EIGRP-IPv4 VR(Virtual-name) Address-family Neighbors for AS(4453)
Address Interface Hold Uptime SRTT RTO Q Seq
                                   (sec)          (ms)   (ms)   Cnt   Num
172.16.81.28            Ethernet1     13   0:00:41  0      11   4     20
172.16.80.28            Ethernet0     14   0:02:01  0      10   12    24
172.16.80.31            Ethernet0     12   0:02:02  0      4    5     20
```

The following sample output from the **show eigrp address-family ipv4 neighbors detail** command shows how to display detailed information about neighbors that are discovered by EIGRP, including whether a neighbor has been restarted:

```
Device# show eigrp address-family ipv4 neighbors detail

EIGRP-IPv4 VR(test) Address-family Neighbors for AS(3)
H Address Interface Hold Uptime SRTT RTO Q Seq
                                   (sec)          (ms)   (ms)   Cnt   Num
172.16.81.28            Ethernet1     13   0:00:41  0      11   4     20
172.16.80.28            Ethernet0     14   0:02:01  0      10   12    24
172.16.80.31            Ethernet0     12   0:02:02  0      4    5     20


EIGRP-IPv4 VR(test) Address-Family Neighbors for AS(3)
H Address Interface Hold Uptime SRTT RTO Q Seq
                   (sec)       (ms) Cnt   Num
172.16.81.28 Et1/1 11 01:11:08 10 200 0 8
Time since Restart 00:00:05
Version 5.0/3.0, Retrans: 2, Retries: 0, Prefixes: 2
Topology-ids from peer - 0
```

The following sample output from the **show eigrp address-family ipv6 neighbors detail** command shows how to display detailed information about the neighbors that are discovered by EIGRP with BFD enabled on an interface:

```
Device# show eigrp address-family ipv6 neighbors detail

EIGRP-IPv6 Neighbors for AS(1)
H Address           Interface Hold Uptime SRTT RTO Q Seq
                              (sec)       (ms) Cnt   Num
0 Link-Local address: Et1/0 13 00:00:24 1592 5000 0  3
FE80::A8BB:CCFF:FE00:C901
Version 6.0/3.0, Retrans: 1, Retries: 0, Prefixes: 32
Topology-ids from peer - 0

BFD Sessions
NeighAddr Interface
FE80: :A8BB:CCFF:FE00:C901 Ethernet1/0
```

The table below describes the significant fields shown in the sample displays:

Table 5: show eigrp address-family neighbors Field Descriptions

Field	Description
AS(4453)	Autonomous system number specified in the configuration command, for example 4453.
Address	IP address of the peer.
Interface	Interface on which the device is receiving hello packets from the peer.
Hold	Duration (seconds) for which the device will wait to hear from the peer before declaring it down. If the default hold time is specified, the hold time value will be less than 15. If a nondefault hold time is specified, the hold time value is displayed.
Uptime	Elapsed time (in seconds) since the local device first heard from this neighbor.
SRTT	Smooth round-trip time (SRTT). Duration (milliseconds) for which an EIGRP packet requires to be sent to its neighbor and for the local device to receive an acknowledgment of that packet.
RTO	Retransmission timeout (RTO). Duration (milliseconds) for which EIGRP waits before retransmitting a packet from the retransmission queue to a neighbor.
Q Cnt	Number of packets (update, query, and reply) that the software is waiting to send.
Seq Num	Sequence number of the last update, query, or reply packet that was received from this neighbor.
Time since Restart	Time elapsed since a neighbor has been restarted.

Related Commands

Command	Description
show eigrp address-family accounting	Displays prefix accounting information for EIGRP processes.
show eigrp address-family events	Displays information about EIGRP events.
show eigrp address-family interfaces	Displays information about interfaces configured for EIGRP.
show eigrp address-family sia-event	Displays information about EIGRP SIA events.
show eigrp address-family sia-statistics	Displays information about EIGRP SIA statistics.
show eigrp address-family timers	Displays information about EIGRP timers and expiration times.
show eigrp address-family topology	Displays entries in the EIGRP topology table.
show eigrp address-family traffic	Displays the number of EIGRP packets sent and received.

show eigrp address-family timers

To display information about Enhanced Interior Gateway Routing Protocol (EIGRP) timers and expiration times, use the **show eigrp address-family timers** command in user EXEC or privileged EXEC mode.

show eigrp address-family {**ipv4** | **ipv6**} [**vrf** *vrf-name*] [*autonomous-system-number*] [**multicast**] **timers**

Syntax Description

ipv4	Selects the IPv4 protocol address family.
ipv6	Selects the IPv6 protocol address family.
vrf *vrf-name*	(Optional) Displays information about the specified VRF.
autonomous-system- number	(Optional) Autonomous system number.
multicast	(Optional) Displays information about multicast instances.

Command Default

Information about all EIGRP timers is displayed.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

This command is useful for debugging and troubleshooting by Cisco technical support, but it is not intended for normal EIGRP administration tasks. This command should not be used without guidance from Cisco technical support.

This command can be used to display information about EIGRP named configurations and EIGRP autonomous-system (AS) configurations.

This command displays the same information as the **show ip eigrp timers**command. Cisco recommends using the **show eigrp address-family timers**command.

Examples

The following example shows how to display information about EIGRP timers:

```
Router# show eigrp address-family ipv4 4453 timers
EIGRP-IPv4 VR(Virtual-name) Address-family Timers for AS(4453)
Hello Process
Expiration Type
| 1.022 (parent)
| 1.022 Hello (Et0/0)
Update Process
```

```
Expiration Type
| 14.984 (parent)
| 14.984 (parent)
| 14.984 Peer holding
SIA Process
Expiration Type for Topo(base)
| 0.000 (parent)
```

Related Commands

Command	Description
show eigrp address-family accounting	Displays prefix accounting information for EIGRP processes.
show eigrp address-family events	Displays information about EIGRP events.
show eigrp address-family interfaces	Displays information about interfaces configured for EIGRP.
show eigrp address-family neighbors	Displays the neighbors discovered by EIGRP.
show eigrp address-family sia-event	Displays information about EIGRP SIA events.
show eigrp address-family sia-statistics	Displays information about EIGRP SIA statistics.
show eigrp address-family topology	Displays entries in the EIGRP topology table.
show eigrp address-family traffic	Displays the number of EIGRP packets sent and received.

show eigrp address-family topology

To display Enhanced Interior Gateway Routing Protocol (EIGRP) address-family topology table entries, use the **show eigrp address-family topology** command in user EXEC or privileged EXEC mode.

show eigrp address-family
{**ipv4** [{**multicast** | **vrf** *vrf-name*}] | **ipv6** [{**vrf** *vrf-name*}]} [{*autonomous-system-number*}]
topology [{*topology-name* [{**accounting** | **events** [{[{**errmsg** | **sia**}] [{**reverse**}] [{*starting-event-number ending-event-number*}] | **type**}]}] | *ip-address* [{*mask*}]*ip-prefix* | **active** | **all-links** | **detail-links** | **pending** | **route-type** {**connected** | **external** | **internal** | **local** | **redistributed** | **summary** | **vpn**} | **summary** | **zero-successors**}]

Syntax Description

ipv4	Displays information about IPv4 address-family topologies.
multicast	(Optional) Displays information about IPv4 multicast instances.
vrf *vrf-name*	(Optional) Displays information about the specified virtual routing and forwarding (VRF) instance.
ipv6	Displays information about IPv6 address-family topologies.
autonomous-system-number	(Optional) Autonomous system number. The valid range is from 1 to 65535.
topology	(Optional) Displays information about EIGRP topology tables.
topology-name	(Optional) Name of the EIGRP topology table.
accounting	(Optional) Displays information about prefix accounting.
events	(Optional) Displays events log.
errmsg	(Optional) Displays error message events.
sia	(Optional) Displays stuck-in-active (SIA) events.
reverse	(Optional) Changes the order in which the event log is displayed.
starting-event-number	(Optional) Number of the first event that is displayed.
ending-event-number	(Optional) Number of the last event that is displayed.
type	(Optional) Displays the types of events that are being logged.
ip-address	(Optional) IP address. When the IP address is specified with a mask, a detailed description of the entry is provided.
mask	(Optional) Network mask.
ip-prefix	(Optional) IP prefix in the format <network>/<length>; for example, 192.168.0.0/16.
active	(Optional) Displays only active entries in the EIGRP topology table.

all-links	(Optional) Displays all entries in the EIGRP topology table (including nonfeasible-successor sources).
detail-links	(Optional) Displays detailed information about all entries in the topology table.
pending	(Optional) Displays all entries in the EIGRP topology table that are either waiting for an update from a neighbor or waiting to reply to a neighbor.
route-type	(Optional) Displays information about services of the specified route type.
connected	(Optional) Displays information about all connected routes.
external	(Optional) Displays information about all external routes.
internal	(Optional) Displays information about all internal routes.
local	(Optional) Displays information about all locally originated routes.
redistributed	(Optional) Displays information about all redistributed routes.
summary	(Optional) Displays information about all summary routes.
vpn	(Optional) Displays information about all VPN-sourced IPv4 routes.
summary	(Optional) Displays summary information about the EIGRP topology table.
zero-successors	(Optional) Displays available routes that have zero successors.

Command Default

If this command is used without any arguments or keywords, only routes that are feasible successors are displayed. This command displays the same information as the **show ip eigrp topology** command. We recommend using the **show eigrp address-family topology** command.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SRE	This command was introduced.
15.0(1)M	This command was integrated into Cisco IOS Release 15.0(1)M.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
15.1(3)S	This command was modified. This command was integrated into Cisco IOS Release 15.1(3)S, and the output of the command was enhanced to display the Routing Information Base (RIB) value.
Cisco IOS XE Release 3.4S	This command was modified. The output of the command was enhanced to display the RIB value.
15.2(2)S	This command was modified. The output of the command was enhanced to display route tag values in dotted-decimal format.

Release	Modification
Cisco IOS XE Release 3.6S	This command was modified. The output of the command was enhanced to display route tag values in dotted-decimal format.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY.

Usage Guidelines

This command can be used to display information about EIGRP named and EIGRP autonomous system configurations.

Examples

The following sample output from the **show eigrp address-family ipv4** *autonomous-system-number* **topology** command displays entries of an IPv4 topology table:

```
Device# show eigrp address-family ipv4 4453 topology

EIGRP-IPv4 Topology Table for AS(4453)/ID(192.168.10.1)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - Reply status
P 172.16.90.0 255.255.255.0, 2 successors, FD is 720896 RIB is 5632
          via 172.16.80.28 (46251776/46226176), Ethernet0
          via 172.16.81.28 (46251776/46226176), Ethernet1
          via 172.16.80.31 (46277376/46251776), Serial0
```

The following sample output from the **show eigrp address-family ipv4** *autonomous-system-number* **topology** *ip-address* command displays EIGRP metrics for specified internal and external services:

```
Device# show eigrp address-family ipv4 4453 topology 10.10.10.0/24

EIGRP-IPv4 VR(virtual-name) Topology Entry for AS(4453)/ID(10.0.0.1) for 10.10.10.0/24
  State is Passive, Query origin flag is 1, 1 Successor(s), FD is 128256, RIB is 6543
  Descriptor Blocks:
  0.0.0.0 (Null0), from Connected, Send flag is 0x0
      Composite metric is (128256/0), service is Internal
      Vector metric:
        Minimum bandwidth is 10000000 Kbit
        Total delay is 5000 picoseconds
        Reliability is 255/255
        Load is ½55
        Minimum MTU is 1514
        Hop count is 0
        Originating router is 10.0.0.1
```

The table below describes the significant fields shown in the displays.

Table 6: show eigrp address-family topology Field Descriptions

Field	Description
Codes	State of this topology table entry. Passive and Active refer to the EIGRP state with respect to the destination; Update, Query, and Reply refer to the type of packet that is being sent.
P - Passive	Indicates that no EIGRP computations are being performed for this destination.
A - Active	Indicates that EIGRP computations are being performed for this destination.

Field	Description
U - Update	Indicates that an update packet was sent to this destination.
Q - Query	Indicates that a query packet was sent to this destination.
R - Reply	Indicates that a reply packet was sent to this destination.
r - Reply status	The flag that is set after the software has sent a query and is waiting for a reply.
successors	Number of successors. This number corresponds to the number of next hops in the IP routing table. If "successors" is capitalized, the route or the next hop is in a transition state.
FD	Feasible distance. The feasible distance is the best metric to reach the destination or the best metric that was known when the route became active. This metric value is used in the feasibility condition check. If the reported distance of the device is less than the feasible distance, the feasibility condition is met and the route is considered a feasible successor. After the software determines that it has a feasible successor, the software need not send a query for that destination.
RIB	RIB metric.
replies	(Not shown in the output.) Number of replies that are still outstanding (have not been received) with respect to this destination. This information appears only when the destination is in active state.
state	(Not shown in the output) The exact EIGRP state of this destination. It can be the number 0, 1, 2, or 3. This information appears only when the destination is in active state.
via	IP address of the peer that advertised this destination. The first of these entries is the current successor. Subsequent entries in the list are feasible successors.
(46251776/46226176)	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.
Ethernet0	The interface from which this information was learned.

Related Commands

Command	Description
show eigrp address-family accounting	Displays prefix accounting information for EIGRP address-family processes.
show eigrp address-family events	Displays information about EIGRP address-family events.
show eigrp address-family interfaces	Displays information about EIGRP address-family interfaces.
show eigrp address-family neighbors	Displays information on EIGRP address-family neighbors.
show eigrp address-family timers	Displays information about EIGRP address-family timers and expiration times.

Command	Description
show eigrp address-family traffic	Displays information about EIGRP packets that are sent and received.

show eigrp address-family traffic

To display the number of Enhanced Interior Gateway Routing Protocol (EIGRP) packets that are sent and received, use the **show eigrp address-family traffic**command in user EXEC or privileged EXEC mode.

show eigrp address-family {**ipv4** | **ipv6**} [**vrf** *vrf-name*] [*autonomous-system-number*] [**multicast**] **traffic**

Syntax Description

ipv4	Selects the IPv4 protocol address family.
ipv6	Selects the IPv6 protocol address family.
vrf *vrf-name*	(Optional) Displays information about the specified VRF.
autonomous-system- number	(Optional) Autonomous system number.
multicast	(Optional) Displays information about multicast instances.

Command Default

The number of all EIGRP packets sent and received is displayed.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

This command can be used to display information about EIGRP named configurations and EIGRP autonomous-system (AS) configurations.

This command displays the same information as the **show ip eigrp traffic** command. Cisco recommends using the **show eigrp address-family traffic** command.

Examples

The following example shows how to display the number of EIGRP packets sent and received for autonomous system number 4453:

```
Router# show eigrp address-family ipv4 4453 traffic
EIGRP-IPv4 VR(virtual-name) Address-family Traffic Statistics for AS(4453)
  Hellos sent/received: 122/122
  Updates sent/received: 3/1
  Queries sent/received: 0/0
  Replies sent/received: 0/0
  Acks sent/received: 0/3
  SIA-Queries sent/received: 0/0
  SIA-Replies sent/received: 0/0
  Hello Process ID: 128
```

```
PDM Process ID: 191
Socket Queue: 0/2000/1/0 (current/max/highest/drops)
Input Queue: 0/2000/1/0 (current/max/highest/drops
```

The table below describes the significant fields shown in the display.

Table 7: show eigrp address-family traffic Field Descriptions

Field	Description
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 acknowledgement packets sent and received.
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.
Hello Process ID	Cisco IOS hello process identifier.
PDM Process ID	Protocol-dependent module IOS process identifier.
Socket Queue	IP to EIGRP Hello Process socket queue counters.
Input Queue	EIGRP Hello Process to EIGRP PDM socket queue counters.

Related Commands

Command	Description
show eigrp address-family accounting	Displays prefix accounting information for EIGRP processes.
show eigrp address-family events	Displays information about EIGRP events.
show eigrp address-family interfaces	Displays information about interfaces configured for EIGRP.
show eigrp address-family neighbors	Displays the neighbors discovered by EIGRP.
show eigrp address-family sia-event	Displays information about EIGRP SIA events.
show eigrp address-family sia-statistics	Displays information about EIGRP SIA statistics.
show eigrp address-family timers	Displays information about EIGRP timers and expiration times.
show eigrp address-family topology	Displays entries in the EIGRP topology table.

show eigrp plugins

To display general information including the versions of the Enhanced Interior Gateway Routing Protocol (EIGRP) protocol features that are currently running, use the **show eigrp plugins** command in user EXEC or privileged EXEC mode.

show eigrp [**vrf** *vrf-name*] [*as-number*]
plugins [*plugin-name*][**detailed**]

Syntax Description

vrf *vrf-name*	(Obsolete) (Optional) Specifies a particular VPN routing and forwarding (VRF) instance name.
as-number	(Obsolete) (Optional) Autonomous system number.
plugin-name	(Optional) Name of an EIGRP plugin to display.
detailed	(Optional) Displays detailed information about EIGRP features.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.4(15)T	This command was introduced.
12.2(33)SXI	This command was integrated into Cisco IOS Release 12.2(33)SXI.
15.0(1)M	This command was modified. The **vrf** keyword and the *vrf-name* and the *as-number* arguments were removed.
12.2(33)SRE	This command was modified. The **vrf** keyword and the *vrf-name* and *as-number* arguments were removed.
Cisco IOS XE Release 2.5	This command was modified. The **vrf** keyword and the *vrf-name* and *as-number* arguments were removed.
15.1(3)S	This command was modified. The output of the command was modified to display information about wide metric.
Cisco IOS XE Release 3.4S	This command was modified. The output of the command was modified to display information about wide metric.

Usage Guidelines

Use the **show eigrp plugins** command in user EXEC or privileged EXEC mode to determine if a particular EIGRP feature is available in your Cisco IOS image. This command displays a summary of information about EIGRP service families and address families.

This command is useful when contacting Cisco technical support.

Examples

The following example shows how to display EIGRP plugin information:

```
Router# show eigrp plugins
EIGRP feature plugins:::
    eigrp-release      :   8.00.00 : Portable EIGRP Release
                       :   6.01.03 : Source Component Release(snakenavel)
                                     + HMAC-SHA-256 Authentication
    parser             :   2.02.00 : EIGRP Parser Support
    igrp2              :   2.00.00 : Reliable Transport/Dual Database
                                     + Wide Metrics
    bfd                :   1.01.00 : BFD Platform Support
    client-simulator   :   1.00.01 : Service Distribution Simulator
    mtr                :   1.00.01 : Multi-Topology Routing(MTR)
    eigrp-pfr          :   1.00.01 : Performance Routing Support
                                     + IPv4 PFR
    vNets              :   1.00.00 : vNets Platform Support
                                     + IPv4 vNets
    ipv4-af            :   2.01.01 : Routing Protocol Support
    ipv4-sf            :   1.02.00 : Service Distribution Support
                                     + Dynamic Remote Neighbors
    external-client    :   1.02.00 : Service Distribution Client Support
    vNets-parse        :   1.00.00 : EIGRP vNets Parse Support
    ipx-af             :   2.00.01 : Routing Protocol Support
    ipv6-af            :   2.01.01 : Routing Protocol Support
                                     + IPv6 VRF
    ipv6-sf            :   2.01.00 : Service Distribution Support
                                     + Dynamic Remote Neighbors
                                     + IPv6 VRF
    snmp-agent         :   1.01.01 : SNMP/SNMPv2 Agent Support
```

The table below describes the significant fields shown in the display.

Table 8: show eigrp plugins Field Descriptions

Field	Description
eigrp release	Portable EIGRP release version.
igrp2	Reliable transport and dual database version.
bfd	EIGRP-BFD feature version.
mtr	EIGRP multitopology routing (MTR) version.
eigrp-pfr	EIGRP performance routing feature version.
ipv4-af	EIGRP IPv4 routing protocol feature version.
ipv4-sf	EIGRP IPv4 service distribution feature version.
external-client	EIGRP service distribution client support feature version.
ipv6-af	EIGRP IPv6 routing protocol feature version.
ipv6-sf	EIGRP IPv6 service distribution feature version.
snmp-agent	EIGRP SNMP and SNMPv2 agent support version.

Related Commands

Command	Description
clear eigrp service-family	Clears entries from the EIGRP neighbor table.
show eigrp service-family external-client	Displays information about the EIGRP service-family external clients.
show eigrp service-family ipv4 topology	Displays information from the EIGRP IPv4 service-family topology table.
show eigrp service-family ipv6 topology	Displays information from the EIGRP IPv6 service-family topology table.
show eigrp tech-support	Generates a report of all EIGRP-related information.

show eigrp protocols

To display general information about Enhanced Interior Gateway Routing Protocol (EIGRP) protocols that are currently running, use the **show eigrp protocols** command in user EXEC or privileged EXEC mode.

show eigrp protocols [**vrf** *vrf-name*]

Syntax Description

vrf *vrf-name*	(Optional) Displays information about the specified VPN Routing and Forwarding (VRF) instance.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.
15.1(3)S	This command was modified. The command output was modified to display the relevant wide metric information.
Cisco IOS XE Release 3.4S	This command was modified. The command output was modified to display the relevant wide metric information.
15.1(1)SY	This command was modified to display the relevant wide metric information.

Usage Guidelines

Use the **show eigrp protocols** command in user EXEC or privileged EXEC mode to see a summary information on EIGRP IPv4 service families or address families.

Examples

The following example shows how to display general EIGRP information:

```
Device# show eigrp protocols

EIGRP-IPv4 VR(foo) Address-Family Protocol for AS(1)
  Metric weight K1=1, K2=0, K3=1, K4=0, K5=0 K6=0
  Metric rib-scale 128
  Metric version 64bit
  NSF-aware route hold timer is 240
  Router-ID: 1.1.1.2
  Topology : 0 (base)
    Active Timer: 3 min
    Distance: internal 90 external 170
    Maximum path: 4
    Maximum hopcount 100
    Maximum metric variance 1
```

```
    Total Prefix Count: 2
    Total Redist Count: 0
```

The following example shows how to display general EIGRP information for VRF1:

```
Device# show eigrp protocols vrf vrf1

EIGRP-IPv4 Protocol for AS(5) VRF(vrf1)
Metric weight K1=1, K2=0, K3=1, K4=0, K5=0 K=6
Metric rib-scale 128
Metric version 64bit
NSF-aware route hold timer is 240
Router-ID: 1.1.1.1
Topology : 0 (base)
Active Timer: 3 min
Distance: internal 90 external 170
Maximum path: 4
Maximum hopcount 100
Maximum metric variance 1
Total Prefix Count: 0
Total Redist Count: 0
```

The table below describes the significant fields shown in the display.

Table 9: show eigrp protocols Field Descriptions

Field	Description
EIGRP-IPv4 Protocol for AS(1)	EIGRP instance and autonomous system number.
Metric weight	EIGRP metric calculations.
NSF-aware route hold timer	Route-hold timer value for an NSF-aware router.
Router-ID	Router ID.
Topology	Number of entries in the EIGRP topology table.
Active Timer	EIGRP routing active time limit.
Distance	Internal and external administrative distance.
Maximum path	Maximum number of parallel routes that EIGRP can support.
Maximum hopcount	Maximum hop count (in decimal).
Maximum metric variance	Metric variance used to find feasible paths for a route.
Total Prefix Count	Aggregate sum of the prefixes in an EIGRP instance topology table. It includes prefixes learned from all neighbors or from redistribution.
Total Redist Count	Number of prefixes redistributed into an EIGRP process.

Related Commands

Command	Description
clear eigrp service-family	Clears entries from the EIGRP neighbor table.
show eigrp service-family external-client	Displays information about the EIGRP service-family external clients.
show eigrp service-family ipv4 topology	Displays information from the EIGRP IPv4 service-family topology table.
show eigrp service-family ipv6 topology	Displays information from the EIGRP IPv6 service-family topology table.
show tech-support	Generates a report of all EIGRP-related information.

show eigrp tech-support

To generate a report of the Enhanced Interior Gateway Routing Protocol (EIGRP) internal state information, use the **show eigrp tech-support** command in privileged EXEC mode.

show eigrp tech-support [**detailed**]

Syntax Description

detailed	(Optional) Displays detailed output.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SRE	This command was introduced.
15.0(1)M	This command was integrated into Cisco IOS Release 15.0(1)M.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.
15.1(3)S	This command was modified. The command output was modified to display relevant wide metric information.
Cisco IOS XE Release 3.4S	This command was modified. The command output was modified to display relevant wide metric information.
15.1(1)SY	This command was modified. The command output was modified to display relevant wide metric information.

Usage Guidelines

Use the **show eigrp tech-support** command in privileged EXEC mode to display various internal EIGRP states.

Note This command is useful for debugging and troubleshooting by Cisco technical support, but it is not intended for normal EIGRP administration tasks. This command should not be used without guidance from Cisco technical support.

Examples

The following is sample output from the **show eigrp tech-support detailed** command:

```
Device# show eigrp tech-support detailed

EIGRP feature plugins:::
    eigrp-release      :   8.00.00 : Portable EIGRP Release
                       :   3.00.21 : Source Component Release(dev8)
                                     + HMAC-SHA-256 Authentication
    parser             :   2.02.00 : EIGRP Parser Support
    igrp2              :   2.00.00 : Reliable Transport/Dual Database
                                     + Wide Metrics
```

```
    eigrp-nsf          :   2.00.00 : Platform Support
    bfd                :   1.01.00 : BFD Platform Support
    mtr                :   1.00.01 : Multi-Topology Routing(MTR)
    eigrp-pfr          :   1.00.01 : Performance Routing Support
                                     + IPv4 PFR
    EVN/vNets          :   1.00.00 : Easy Virtual Network (EVN/vNets)
                                     + IPv4 EVN/vNets
    ipv4-af            :   2.01.01 : Routing Protocol Support
    ipv4-sf            :   1.02.00 : Service Distribution Support
                                     + Dynamic Remote Neighbors
    ipv6-af            :   2.01.01 : Routing Protocol Support
                                     + IPv6 VRF
    ipv6-sf            :   2.01.00 : Service Distribution Support
                                     + Dynamic Remote Neighbors
                                     + IPv6 VRF
    vNets-parse        :   1.00.00 : EIGRP vNets Parse Support
    snmp-agent         :   1.01.01 : SNMP/SNMPv2 Agent Support
EIGRP Internal Process States

 procinfoQ:
   1: 0x1FC6EB4C vrid:0 afi:1 as:46    tableid:0 vrfid:0 tid:0 name:virtual-name
       topo_ddbQ(1) 0x1FCC478C tableid:0 name:base
       topo_ddbQ.count: 1
   procinfoQ.count: 1

     deadQ:

      ddbQ:
       1: 0x1FCC478C name:base
      ddbQ.count: 1
 ------------------------------------------------------------

EIGRP Memory Usage:

  EIGRP Memory                 In-use Asked-For/Allocated Count  Size  Cfg/Max
  ------------------------------------------------------------------------------
  EIGRP IP pdb            :      8216      8216/8268          1  8216   --/--
  EIGRP-Core: DDB         :      2440      2440/2492          1  2440   --/--
  EIGRP-Core: Dual Events :     30000     30000/30052         1 30000   --/--
  EIGRP-Core: IIDB        :       928       928/980           1   928   --/--
  EIGRP-Core: IIDB Scratc :        24        24/76            1    24   --/--
  EIGRP-Core: Peer Handle :        76        76/180           2    38   --/--
  EIGRP-Core: Peer Sub-To :        32        32/84            1    32   --/--
  EIGRP-Core: Topology II :       104       104/156           1   104   --/--
  EIGRP-IPv4: Proto Priva :        24        24/76            1    24   --/--
  EIGRP-IPv4: Protocol In :      3464      3464/3516          1  3464   --/--
  EIGRP-IPv4: VR-Router   :        32        32/84            1    32   --/--
  EIGRP-Parser: dBase Hdr :      1740      1740/2052          6   290   --/--
  EIGRP-v4: Work Entry    :        --      4260/4728         --    60   50/71
  EIGRP: Anchor entries   :        --      7404/10052        --    12  500/617
  EIGRP: Dummy thread ent :        --      8892/10052        --    36  200/247
  EIGRP: ExtData          :        --      1320/1708         --    24   50/55
  EIGRP: Input packet hea :        --      2304/3052         --    16  100/144
  EIGRP: Large packet buf :        --     57512/65588        --  8216  100/7
  EIGRP: List Large       :        --      1332/1552         --   148    5/9
  EIGRP: List Medium      :        --      1296/1604         --    72   10/18
  EIGRP: Max packet buffe :        --     49224/65588        -- 16408    5/3
  EIGRP: Medium packet bu :        --     64856/65588        --   536  100/121
  EIGRP: Packet descripto :        --      4260/4728         --    60   50/71
  EIGRP: Queue elements   :        --     11788/13640        --    28  200/421
  EIGRP: Small Pool       :        32       624/956          2    16   32/39
  EIGRP: Small packet buf :        --      4444/5052         --    44  100/101
  EIGRP: cmd handles      :        56        56/160           2    28   --/--
  EIGRP: mgd_timer        :      1600      1600/2640         20    80   --/--
```

```
  Total                   :     48768    268252/304704       42    --   --/--

  Total allocated: 0.290 Mb, 297 Kb, 304704 bytes
-------------------------------------------------------------

EIGRP-IPv4 VR(virtual-name) Address-Family Protocol for AS(46)
 {vrid:0 afi:1 as:46 mode:3 tableid:0 vrfid:0 tid:0 name:virtual-name }

          PIDs: Hello: (no process)  PDM: (no process)
     Router-ID: 10.4.9.87
       Threads: procinfo: 0x1FC72E58   ddb: 0x1FC73050
         workQ:
         iidbQ:
 passive_iidbQ:
         peerQ:
 unicast_peerQ:
      suspendQ:
      networkQ:
 RedistStructs: src:(0)default  distflag:0x4  ipdb->pdb->mask:0x4
                count: 1
      summaryQ:
  Socket Queue: %EIGRP(ERROR): invalid socket
   Input Queue: 0/2000/0/0 (current/max/highest/drops)
       GRS/NSF: enabled    hold-timer: 240
  Active Timer: 3 min
      Distance: internal 90 external 170
      Max Path: 4
  Max Hopcount: 100
      Variance: 1
     Rib-scale: 1
    Metric Ver: 32bit
 ---------------------------------------------------------------------
```

Related Commands

Command	Description
show eigrp plugins	Displays general information including the versions of the EIGRP protocol features currently running.

show ip eigrp accounting

To display prefix accounting information for Enhanced Interior Gateway Routing Protocol (EIGRP) processes, use the **show ip eigrp accounting**command in privileged EXEC mode.

show ip eigrp [**vrf** {*vrf-name* | *****}] [*autonomous-system-number*] **accounting**

Syntax Description

vrf *vrf-name*	(Optional) Displays information about the specified VRF.
vrf *	(Optional) Displays information about all VRFs.
autonomous-system-number	(Optional) Autonomous system number.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(29)S	This command was introduced.
12.3(14)T	This command was integrated into Cisco IOS Release 12.3(14)T.
15.0(1)M	This command was modified. The **vrf**, *vrf-name*, and ***** keywords and arguments were added. This command replaces the **show ip eigrp vrf accounting** command.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

This command can be used to display information about EIGRP named configurations and EIGRP autonomous-system (AS) configurations.

This command displays the same information as the **show eigrp address-family accounting** command. Cisco recommends using the **show eigrp address-family accounting** command.

Examples

The following is sample output from the **show ip eigrp accounting**command:

```
Router# show ip eigrp vrf RED accounting

EIGRP-IPv4 Accounting for AS(100)/ID(10.0.2.1) 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    10.0.1.2          Et0/0              2           0          84
 P    10.0.2.4          Se2/0              0           2         114
 D    10.0.1.3          Et0/0              0           3           0
```

Note Connected and summary routes are not listed individually in the output of this command but are counted in the total aggregate count per process.

The following is sample output of the **show ip eigrp accounting** command. The EIGRP process and redistribution is in adjacency state:

```
RTR-203#show ip eigrp accounting
EIGRP-IPv4 VR(test) Accounting for AS(100)/ID(2.2.2.2)
Total Prefix Count: 15  States: A-Adjacency, P-Pending, D-Down
State Address/Source          Interface                  Prefix   Restart  Restart/
                                                         Count     Count   Reset(s)

 A    Process                 ----                         15        0        0
 A    Redistributed           ----                          5        0        0
 A    10.0.0.1                Et0/0                         8        0        0
 A    20.0.0.3                Et0/1                         0        0        0
```

Examples

The table below describes the significant fields shown in the display.

Table 10: show ip eigrp accounting Field Descriptions

Field	Description
EIGRP IPv4 Accounting for AS...	Identifies the EIGRP instance along with the AS number, router ID, and table ID.
Total Prefix Count	Shows the aggregate sum of the prefixes in an EIGRP instance topology table. It includes prefixes learned from all neighbors and redistribution sources.
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 has been exceeded. D-Down: Neighbor adjacency or redistribution is suspended permanently until a manually reset is performed with the **clear ip eigrp neighbor** command.
Address/Source	Shows either the neighbor IP address or the redistribution source.
Interface	Shows the interface on which neighbor information is received.
Prefix Count	Displays the 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 a route source has exceeded the maximum-prefix limit.

Field	Description
Restart Reset(s)	Displays the 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.

Related Commands

Command	Description
show eigrp address-family accounting	Displays prefix accounting information for EIGRP processes.

show ip eigrp events

To display the Enhanced Interior Gateway Routing Protocol (EIGRP) event log, use the **show ip eigrp events** command in user EXEC or privileged EXEC mode.

show ip eigrp [{**vrf** *vrf-name*}] **events** [{[{**errmsg** | **sia**}] [{**reverse**}] [{*starting-event-number ending-event-number*}] | **type**}]

Syntax Description

vrf *vrf-name*	(Optional) Displays information about the specified VPN routing and forwarding (VRF).
errmsg	(Optional) Displays error message events.
sia	(Optional) Displays stuck in active (SIA) events.
reverse	(Optional)Displays the oldest event first and the most recent event last.
starting-event-number	(Optional) Number of the first event to display.
ending-event-number	(Optional) Number of the last event to display.
type	(Optional) Displays the types of events being logged.

Command Default

All events in the EIGRP event log are displayed.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
15.1(2)S	This command was modified. The **reverse** keyword was added.

Usage Guidelines

The EIGRP event log is used by Cisco technical support to display a history of EIGRP internal events.

This command can be used to display information about EIGRP named configurations and EIGRP autonomous-system configurations.

This command displays the same information as the **show eigrp address-family events** command. Cisco recommends using the **show eigrp address-family events** command.

The output of the **show ip eigrp events** command displays the most recent event first and the oldest event last. To display the output in the reverse order (the oldest event first and the recent event last), use the **reverse** keyword.

Examples

The following is sample output from the **show ip eigrp events** command. The output fields are self-explanatory.

```
Router# show ip eigrp events

1    02:37:58.171 NSF stale rt scan, peer: 10.0.0.0
2    02:37:58.167 Metric set: 10.0.0.1/24 284700416
3    02:37:58.167 FC sat rdbmet/succmet: 284700416 0
4    02:37:58.167 FC sat nh/ndbmet: 10.0.0.2 284700416
5    02:37:58.167 Find FS: 10.0.0.0/24 284700416
6    02:37:58.167 Rcv update met/succmet: 284956416 284700416
7    02:37:58.167 Rcv update dest/nh: 10.0.0.0/24 10.0.0.1
8    02:37:58.167 Peer nsf restarted: 10.0.0.1 Tunnel0
9    02:36:38.383 Metric set: 10.0.0.0/24 284700416
10   02:36:38.383 RDB delete: 10.0.0.0/24 10.0.0.1
11   02:36:38.383 FC sat rdbmet/succmet: 284700416 0
12   02:36:38.383 FC sat nh/ndbmet: 0.0.0.0 284700416
```

Related Commands

Command	Description
eigrp event-log size	Specifies the size of the EIGRP event log.
show eigrp address-family events	Displays the EIGRP event log.

show ip eigrp interfaces

To display information about interfaces that are configured for the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show ip eigrp interfaces** command in user EXEC or privileged EXEC mode.

show ip eigrp [**vrf** *vrf-name*] [*autonomous-system-number*] **interfaces** [*type number*] [{**detail**}]

Syntax Description

vrf *vrf-name*	(Optional) Displays information about the specified virtual routing and forwarding (VRF) instance.
autonomous-system-number	(Optional) Autonomous system number whose output needs to be filtered.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.
number	(Optional) Interface or subinterface number. For more information about the numbering syntax for your networking device, use the question mark (?) online help function.
detail	(Optional) Displays detailed information about EIGRP interfaces for a specific EIGRP process.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
11.2	This command was introduced.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE. Support for the Bidirectional Forwarding Detection (BFD) feature was added. The **detail** keyword was added.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S. Support for the BFD feature was added. Support for the Cisco 12000 series Internet router was added.
12.4(4)T	This command was modified. Support for the BFD feature was added. The **detail** keyword was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRE	This command was modified. The **vrf** *vrf-name* keyword-argument pair was added. This command replaces the **show ip eigrp vrf interfaces** command.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
15.0(1)M	This command was modified. The **vrf** *vrf-name* keyword-argument pair was added. This command replaces the **show ip eigrp vrf interfaces** command.

Release	Modification
15.1(1)S	This command was modified. The PeerQ Un/Reliable, Packetized sent/expedited, and Hello's sent/expedited fields were included in the command output.
Cisco IOS XE Release 3.5S	This command was modified. Information about the Equal Cost Multipath (ECMP) mode was included in the command output.
15.2(1)S	This command was modified. Information about the ECMP mode was included in the command output.
15.2(3)T	This command was modified. Information about the ECMP mode was included in the command output.

Usage Guidelines

Use the **show ip eigrp interfaces** command to display active EIGRP interfaces and EIGRP-specific interface settings and statistics. The optional *type number* argument and the **detail** keyword can be entered in any order.

If an interface is specified, only information about that interface is displayed. Otherwise, information about all interfaces on which EIGRP is running is displayed.

If an autonomous system is specified, only the routing process for the specified autonomous system is displayed. Otherwise, all EIGRP processes are displayed.

This command can be used to display information about EIGRP named and EIGRP autonomous system configurations.

This command displays the same information as the **show eigrp address-family interfaces** command. Cisco recommends using the **show eigrp address-family interfaces** command.

Examples

The following is sample output from the **show ip eigrp interfaces** command:

```
Device# show ip eigrp interfaces

EIGRP-IPv4 Interfaces for AS(60)
                    Xmit Queue    Mean   Pacing Time   Multicast   Pending
Interface   Peers   Un/Reliable   SRTT   Un/Reliable   Flow Timer  Routes
Di0           0         0/0          0      11/434          0          0
Et0           1         0/0        337       0/10          0          0
SE0:1.16      1         0/0         10       1/63        103          0
Tu0           1         0/0        330       0/16          0          0
```

The following sample output from the **show ip eigrp interfaces detail** command displays detailed information about all active EIGRP interfaces:

```
Device# show ip eigrp interfaces detail

EIGRP-IPv4 Interfaces for AS(1)
                        Xmit Queue   PeerQ        Mean   Pacing Time   Multicast   Pending

Interface        Peers  Un/Reliable  Un/Reliable  SRTT   Un/Reliable   Flow Timer   Routes
Et0/0              1        0/0       0/0         525       0/2         3264           0
Hello-interval is 5, Hold-time is 15
  Split-horizon is enabled
  Next xmit serial <none>
  Packetized sent/expedited: 3/0
  Hello's sent/expedited: 6/2
  Un/reliable mcasts: 0/6  Un/reliable ucasts: 7/4
```

```
  Mcast exceptions: 1  CR packets: 1  ACKs suppressed: 0
  Retransmissions sent: 1  Out-of-sequence rcvd: 0
  Topology-ids on interface - 0
  Authentication mode is not set
```

The following sample output from the **show ip eigrp interfaces detail** command displays detailed information about a specific interface on which the **no ip next-hop self** command is configured along with the **no-ecmp-mode** option:

```
Device# show ip eigrp interfaces detail tunnel 0

EIGRP-IPv4 Interfaces for AS(1)
                        Xmit Queue   PeerQ        Mean   Pacing Time   Multicast   Pending

Interface        Peers  Un/Reliable  Un/Reliable  SRTT   Un/Reliable   Flow Timer   Routes
Tu0/0              2        0/0       0/0           2       0/0         50           0
Hello-interval is 5, Hold-time is 15
  Split-horizon is disabled
  Next xmit serial <none>
  Packetized sent/expedited: 24/3
  Hello's sent/expedited: 28083/9
  Un/reliable mcasts: 0/19  Un/reliable ucasts: 18/64
  Mcast exceptions: 5  CR packets: 5  ACKs suppressed: 0
  Retransmissions sent: 52  Out-of-sequence rcvd: 2
  Next-hop-self disabled, next-hop info forwarded, ECMP mode Enabled
  Topology-ids on interface - 0
  Authentication mode is not set
```

The table below describes the significant fields shown in the displays.

Table 11: show ip eigrp interfaces Field Descriptions

Field	Description
Interface	Interface on which EIGRP is configured.
Peers	Number of directly connected EIGRP neighbors.
PeerQ Un/Reliable	Number of unreliable and reliable packets queued for transmission to specific peers on the interface.
Xmit Queue Un/Reliable	Number of packets remaining in the Unreliable and Reliable transmit queues.
Mean SRTT	Mean smooth round-trip time (SRTT) interval (in seconds).
Pacing Time Un/Reliable	Pacing time (in seconds) used to determine when EIGRP packets (unreliable and reliable) should be sent out of the interface .
Multicast Flow Timer	Maximum number of seconds for which the device will send multicast EIGRP packets.
Pending Routes	Number of routes in the transmit queue waiting to be sent.
Packetized sent/expedited	Number of EIGRP routes that have been prepared for sending packets to neighbors on an interface, and the number of times multiple routes were stored in a single packet.
Hello’s sent/expedited	Number of EIGRP hello packets that have been sent on an interface and packets that were expedited.

Related Commands

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

show ip eigrp neighbors

To display neighbors discovered by the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show ip eigrp neighbors** command in privileged EXEC mode.

show ip eigrp [**vrf** *vrf-name*] [*autonomous-system-number*] **neighbors** [{**static** | **detail**}] [*interface-type interface-number*]

Syntax Description

vrf *vrf-name*	(Optional) Displays information about the specified VPN Routing and Forwarding (VRF) instance.
autonomous-system-number	(Optional) Autonomous-system-number-specific output is displayed.
static	(Optional) Displays static neighbors.
detail	(Optional) Displays detailed neighbor information.
interface-type interface-number	(Optional) Interface-specific output is displayed.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
10.3	This command was introduced.
12.0(7)T	This command was modified. The **static** keyword was added.
12.2(15)T	This command was modified. Support for Nonstop Forwarding (NSF) restart operations was integrated into the output.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRE	This command was modified. The **vrf** *vrf-name* keyword-argument pair was added. This command replaces the **show ip eigrp vrf neighbors** command.
15.0(1)M	This command was modified. The **vrf** *vrf-name* keyword-argument pair was added. This command replaces the **show ip eigrp vrf neighbors** command.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
15.1(3)S	This command was integrated into Cisco IOS Release 15.1(3)S. The command output was modified to display relevant wide metric information.
Cisco IOS XE Release 3.4S	This command was modified. The command output was modified to display relevant wide metric information.
15.1(1)SY	This command was modified. The command output was modified to display relevant wide metric information.
Cisco IOS XE Release 3.10S	This command was modified. The command output was modified to display information about Location/ID Separation Protocol (LISP) encapsulated routes.

Release	Modification
15.3(3)S	This command was modified. The command output was modified to display information about LISP encapsulated routes.

Usage Guidelines

The **show ip eigrp neighbors** command can be used to display information about EIGRP named and EIGRP autonomous-system configurations. Use the **show ip eigrp neighbors** command to display dynamic and static neighbor states. You can use this command for also debugging certain types of transport problems.

This command displays the same information as the **show eigrp address-family neighbors** command. Cisco recommends that you use the **show eigrp address-family neighbors** command.

Examples

The following is sample output from the **show ip eigrp neighbors** command:

```
Router# show ip eigrp neighbors

H   Address                 Interface       Hold Uptime   SRTT   RTO  Q  Seq
                                            (sec)         (ms)       Cnt Num
0   10.1.1.2                 Et0/0            13 00:00:03 1996  5000  0  5
2   10.1.1.9                 Et0/0            14 00:02:24 206   5000  0  5
1   10.1.2.3                 Et0/1            11 00:20:39 2202  5000  0  5
```

The table below describes the significant fields shown in the display.

Table 12: show ip eigrp neighbors Field Descriptions

Field	Description
Address	IP address of the EIGRP peer.
Interface	Interface on which the router is receiving hello packets from the peer.
Hold	Time in seconds for which EIGRP waits to hear from the peer before declaring it down.
Uptime	Elapsed time (in hours:minutes: seconds) since the local router first heard from this neighbor.
SRTT	Smooth round-trip time. This is 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 is the amount of time the software waits before resending a packet from the retransmission queue to a neighbor.
Q Cnt	Number of EIGRP packets (update, query, and reply) that the software is waiting to send.
Seq Num	Sequence number of the last update, query, or reply packet that was received from this neighbor.

The following is sample output from the **show ip eigrp neighbors detail**command:

```
Router# show ip eigrp neighbors detail

EIGRP-IPv4 VR(foo) Address-Family Neighbors for AS(1)
H   Address                 Interface       Hold Uptime   SRTT   RTO  Q  Seq
                                            (sec)         (ms)       Cnt Num
0   192.168.10.1                Gi2/0            12 00:00:21 1600  5000  0  3
   Static neighbor (Lisp Encap)
```

```
Version 8.0/2.0, Retrans: 0, Retries: 0, Prefixes: 1
Topology-ids from peer - 0
```

The table below describes the significant fields shown in the display.

Table 13: show ip eigrp neighbors detail Field Descriptions

Field	Description
H	This column lists the order in which a peering session was established with the specified neighbor. The order is specified with sequential numbering starting with 0.
Address	IP address of the EIGRP peer.
Interface	Interface on which the router is receiving hello packets from the peer.
Hold	Time in seconds for which EIGRP waits to hear from the peer before declaring it down.
Lisp Encap	Indicates that routes from this neighbor are LISP encapsulated.
Uptime	Elapsed time (in hours:minutes: seconds) since the local router first heard from this neighbor.
SRTT	Smooth round-trip time. This is 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 is the amount of time the software waits before resending a packet from the retransmission queue to a neighbor.
Q Cnt	Number of EIGRP packets (update, query, and reply) that the software is waiting to send.
Seq Num	Sequence number of the last update, query, or reply packet that was received from this neighbor.
Version	The software version that the specified peer is running.
Retrans	Number of times that a packet has been retransmitted.
Retries	Number of times an attempt was made to retransmit a packet.

Related Commands

Command	Description
show eigrp address-family neighbors	Displays neighbors discovered by EIGRP.

show ip eigrp topology

To display Enhanced Interior Gateway Routing Protocol (EIGRP) topology table entries, use the **show ip eigrp topology** command in user EXEC or privileged EXEC mode.

show ip eigrp topology[{**vrf** *vrf-nameautonomous-system-number* | *network* [{*mask*}]*prefix* | **active** | **all-links** | **detail-links** | **frr** | **name** | **pending** | **summary** | **zero-successors**}]

Syntax Description

vrf *vrf-name*	(Optional) Displays information about the specified virtual routing and forwarding (VRF) instance.
autonomous-system-number	(Optional) Autonomous system number.
network	(Optional) Network address.
mask	(Optional) Network mask.
prefix	(Optional) Network prefix in the format <network>/<length>; for example, 192.168.0.0/16.
active	(Optional) Displays all topology entries that are in the active state.
all-links	(Optional) Displays all entries in the EIGRP topology table (including nonfeasible-successor sources).
detail-links	(Optional) Displays all topology entries with additional details.
frr	(Optional) Displays information about Fast Reroute (FRR) loop-free alternates (LFAs).
name	(Optional) Displays the IPv4 topology table name. This name is the topology identifier and shows topology-related information for Multitopology Routing (MTR).
pending	(Optional) Displays all entries in the EIGRP topology table that are either waiting for an update from a neighbor or waiting to reply to a neighbor.
summary	(Optional) Displays a summary of the EIGRP topology table.
zero-successors	(Optional) Displays available routes that have zero successors.

Command Default

If this command is used without any of the optional keywords, only topology entries with feasible successors are displayed and only feasible paths are shown.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
10.0	This command was introduced.

Release	Modification
12.3(8)T	This command was modified. The output of this command was enhanced to display internal and external EIGRP routes.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SRB	This command was modified. The **name** keyword was added to support MTR.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.0(1)M	This command was modified. The **vrf** *vrf-name* keyword-argument pair was added.
12.2(33)SRE	This command was modified. The **vrf** *vrf-name* keyword-argument pair was added. The **name** keyword was removed.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
15.1(3)S	This command was integrated into Cisco IOS Release 15.1(3)S. The output of the command was enhanced to display information about wide metrics.
Cisco IOS XE Release 3.4S	This command was modified. The output of the command was enhanced to display information about wide metrics.
Cisco IOS XE Release 3.5S	This command was modified. Information about the Equal Cost Multipath (ECMP) mode was included in the command output.
15.2(1)S	This command was modified. Information about the ECMP mode was included in the command output.
15.2(2)S	This command was modified. The output of the command was enhanced to display route tag values in dotted-decimal format.
Cisco IOS XE Release 3.6S	This command was modified. The output of the command was enhanced to display route tag values in dotted-decimal format.
15.2(3)T	This command was modified. Information about the ECMP mode was included in the command output.
15.2(4)S	This command was modified. The **frr** keyword was added.

Release	Modification
Cisco IOS XE Release 3.7S	This command was modified. The **frr** keyword was added.
15.1(1)SY	This command was integrated into Cisco IOS Release 15.1(1)SY. The output of the command was enhanced to display information about wide metrics.

Usage Guidelines

Use the **show ip eigrp topology** command to display topology entries, feasible and nonfeasible paths, metrics, and states. This command can be used without any arguments or keywords to display only topology entries with feasible successors and feasible paths. The **all-links** keyword displays all paths, whether feasible or not, and the **detail-links** keyword displays additional details about these paths.

Use this command to display information about EIGRP named and EIGRP autonomous system configurations. This command displays the same information as the **show eigrp address-family topology** command. We recommend using the **show eigrp address-family topology** command.

Examples

The following is sample output from the **show ip eigrp topology** command:

```
Device# show ip eigrp topology

EIGRP-IPv4 Topology Table for AS(1)/ID(10.0.0.1)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - Reply status, s - sia status
P 10.0.0.0/8, 1 successors, FD is 409600
        via 192.0.2.1 (409600/128256), Ethernet0/0
P 172.16.1.0/24, 1 successors, FD is 409600
        via 192.0.2.1 (409600/128256), Ethernet0/0
P 10.0.0.0/8, 1 successors, FD is 281600
        via Summary (281600/0), Null0
P 10.0.1.0/24, 1 successors, FD is 281600
        via Connected, Ethernet0/0
```

The following sample output from the **show ip eigrp topology** *prefix* command displays detailed information about a single prefix. The prefix shown is an EIGRP internal route.

```
Device# show ip eigrp topology 10.0.0.0/8

EIGRP-IPv4 VR(vr1) Topology Entry for AS(1)/ID(10.1.1.2) for 10.0.0.0/8
  State is Passive, Query origin flag is 1, 1 Successor(s), FD is 82329600, RIB is 643200
  Descriptor Blocks:
  10.1.1.1 (Ethernet2/0), from 10.1.1.1, Send flag is 0x0
      Composite metric is (82329600/163840), route is Internal
      Vector metric:
        Minimum bandwidth is 16000 Kbit
        Total delay is 631250000 picoseconds
        Reliability is 255/255
        Load is ½55
        Minimum MTU is 1500
        Hop count is 1
        Originating router is 10.1.1.1
```

The following sample output from the **show ip eigrp topology** *prefix* command displays detailed information about a single prefix. The prefix shown is an EIGRP external route.

```
Device# show ip eigrp topology 172.16.1.0/24

EIGRP-IPv4 Topology Entry for AS(1)/ID(10.0.0.1) for 172.16.1.0/24
State is Passive, Query origin flag is 1, 1 Successor(s), FD is 409600, RIB is 643200
  Descriptor Blocks:
  172.16.1.0/24 (Ethernet0/0), from 10.0.1.2, Send flag is 0x0
      Composite metric is (409600/128256), route is External
      Vector metric:
        Minimum bandwidth is 10000 Kbit
        Total delay is 6000 picoseconds
        Reliability is 255/255
        Load is ½55
        Minimum MTU is 1500
        Hop count is 1
        Originating router is 172.16.1.0/24
        External data:
        AS number of route is 0
        External protocol is Connected, external metric is 0
        Administrator tag is 0 (0x00000000)
```

The following sample output from the **show ip eigrp topology** *prefix* command displays Equal Cost Multipath (ECMP) mode information when the **no ip next-hop-self** command is configured without the **no-ecmp-mode** keyword in an EIGRP topology. The ECMP mode provides information about the path that is being advertised. If there is more than one successor, the top most path will be advertised as the default path over all interfaces, and “ECMP Mode: Advertise by default” will be displayed in the output. If any path other than the default path is advertised, “ECMP Mode: Advertise out <Interface name>” will be displayed.

The topology table displays entries of routes for a particular prefix. The routes are sorted based on metric, next-hop, and infosource. In a Dynamic Multipoint VPN (DMVPN) scenario, routes with same metric and next-hop are sorted based on infosource. The top route in the ECMP is always advertised.

```
Device# show ip eigrp topology 192.168.10.0/24

EIGRP-IPv4 Topology Entry for AS(1)/ID(10.10.100.100) for 192.168.10.0/24
State is Passive, Query origin flag is 1, 2 Successor(s), FD is 284160
  Descriptor Blocks:
  10.100.1.0 (Tunnel0), from 10.100.0.1, Send flag is 0x0
      Composite metric is (284160/281600), route is Internal
      Vector metric:
        Minimum bandwidth is 10000 Kbit
        Total delay is 1100 microseconds
        Reliability is 255/255
        Load is ½55
        Minimum MTU is 1400
        Hop count is 1
        Originating router is 10.10.1.1
        ECMP Mode: Advertise by default
        10.100.0.2 (Tunnel1), from 10.100.0.2, Send flag is 0X0
        Composite metric is (284160/281600), route is Internal
        Vector metric:
        Minimum bandwidth is 10000 Kbit
        Total delay is 1100 microseconds
        Reliability is 255/255
        Load is ½55
        Minimum MTU is 1400
        Hop count is 1
        Originating router is 10.10.2.2
        ECMP Mode: Advertise out Tunnel1
```

The following sample output from the **show ip eigrp topology all-links** command displays all paths, even those that are not feasible:

```
Device# show ip eigrp topology all-links

EIGRP-IPv4 Topology Table for AS(1)/ID(10.0.0.1)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status
P 172.16.1.0/24, 1 successors, FD is 409600, serno 14
        via 10.10.1.2 (409600/128256), Ethernet0/0
        via 10.1.4.3 (2586111744/2585599744), Serial3/0, serno 18
```

The following sample output from the **show ip eigrp topology detail-links** command displays additional details about routes:

```
Device# show ip eigrp topology detail-links

EIGRP-IPv4 Topology Table for AS(1)/ID(10.0.0.1)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status
P 10.0.0.0/8, 1 successors, FD is 409600, serno 6
        via 10.10.1.2 (409600/128256), Ethernet0/0
P 172.16.1.0/24, 1 successors, FD is 409600, serno 14
        via 10.10.1.2 (409600/128256), Ethernet0/0
P 10.0.0.0/8, 1 successors, FD is 281600, serno 3
        via Summary (281600/0), Null0
P 10.1.1.0/24, 1 successors, FD is 281600, serno 1
        via Connected, Ethernet0/0
```

The following sample output from the **show ip eigrp topology frr** command displays details about the LFAs in the EIGRP topology:

```
Device# show ip eigrp topology frr

EIGRP-IPv4 VR(test) Topology Table for AS(1)/ID(10.1.1.1)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

P 192.168.2.0/24, 1 successors, FD is 131153920
        via 10.1.1.2 (131153920/163840), Ethernet0/0
        via 10.3.3.3 (137625600/6635520), Ethernet0/1, [LFA]
P 192.168.1.0/24, 1 successors, FD is 131153920
        via 10.1.1.2 (131153920/163840), Ethernet0/0
        via 10.4.4.4 (137625600/6635520), Ethernet0/2, [LFA]
        via 10.3.3.3 (137625600/6635520), Ethernet0/1
P 192.168.4.0/32, 1 successors, FD is 131727360
        via 10.4.4.4 (131727360/7208960), Ethernet0/2
P 192.168.3.0/24, 1 successors, FD is 131072000
        via Connected, Ethernet0/1
P 192.168.5.0/24, 1 successors, FD is 131072000
        via Connected, Ethernet0/0
P 10.10.10.0/24, 1 successors, FD is 262144000
        via 10.1.1.2 (262144000/196608000), Ethernet0/0
        via 10.4.4.4 (131727360/7208960), Ethernet0/2, [LFA]
```

The following is a sample output from the **show ip eigrp topology** command when the EIGRP process is in pending state:

```
Device# show ip eigrp topology
EIGRP-IPv4 VR(test) Topology Table for AS(100)/ID(2.2.2.2)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
```

```
       r - reply Status, s - sia Status

   EIGRP Process is in Pending state. Restart in 296 sec.
P 10.0.0.0/24, 1 successors, FD is 131072000
        via Connected, Ethernet0/0
P 20.0.0.0/24, 1 successors, FD is 131072000
        via Connected, Ethernet0/1
```

The following is a sample output from the **show ip eigrp topology** command when the EIGRP process is in down state:

```
Device# show ip eigrp topology
EIGRP-IPv4 VR(test) Topology Table for AS(100)/ID(2.2.2.2)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

   EIGRP Process is in DOWN state. Manual restart required.

P 10.0.0.0/24, 1 successors, FD is 131072000
        via Connected, Ethernet0/0
P 20.0.0.0/24, 1 successors, FD is 131072000
        via Connected, Ethernet0/1
```

The following is a sample output from the **show ip eigrp topology** command when the EIGRP redistribution is in pending state:

```
Device# show ip eigrp topology
EIGRP-IPv4 VR(test) Topology Table for AS(100)/ID(2.2.2.2)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

   Redistribution is in Pending state. Restart in 44 sec.


P 15.15.15.0/24, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 14.14.14.0/24, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 10.0.0.0/24, 1 successors, FD is 131072000
        via Connected, Ethernet0/0
P 16.16.16.16/32, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 12.12.12.0/24, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 2.2.2.2/32, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 13.13.13.0/24, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 11.11.11.0/24, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
```

The following is a sample output from the **show ip eigrp topology** command when the EIGRP redistribution is in down state:

```
Device# show ip eigrp topology
EIGRP-IPv4 VR(test) Topology Table for AS(100)/ID(2.2.2.2)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status

   Redistribution is in DOWN state. Manual restart required.


P 15.15.15.0/24, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 14.14.14.0/24, 1 successors, FD is 131153920
```

```
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 10.0.0.0/24, 1 successors, FD is 131072000
        via Connected, Ethernet0/0
P 16.16.16.16/32, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 12.12.12.0/24, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 2.2.2.2/32, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 13.13.13.0/24, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
P 11.11.11.0/24, 1 successors, FD is 131153920
        via 10.0.0.1 (131153920/163840), Ethernet0/0
```

The table below describes the significant fields shown in the displays.

Table 14: show ip eigrp topology Field Descriptions

Field	Description
Codes	State of this topology table entry. Passive and Active refer to the EIGRP state with respect to the destination. Update, Query, and Reply refer to the type of packet that is being sent. • P - Passive—Indicates that no EIGRP computations are being performed for this route. • A - Active—Indicates that EIGRP computations are being performed for this route. • U - Update—Indicates that a pending update packet is waiting to be sent for this route. • Q - Query—Indicates that a pending query packet is waiting to be sent for this route. • R - Reply—Indicates that a pending reply packet is waiting to be sent for this route. • r - Reply status—Indicates that EIGRP has sent a query for the route and is waiting for a reply from the specified path. • s - sia status—Indicates that the EIGRP query packet is in stuck-in-active (SIA) status.
successors	Number of successors. This number corresponds to the number of next hops in the IP routing table. If “successors” is capitalized, then the route or the next hop is in a transition state.
serno	Serial number.

Field	Description
FD	Feasible distance. The feasible distance is the best metric to reach the destination or the best metric that was known when the route became active. This value is used in the feasibility condition check. If the reported distance of the device is less than the feasible distance, the feasibility condition is met and that route becomes a feasible successor. After the software determines that it has a feasible successor, the software need not send a query for that destination.
via	Next-hop address that advertises the passive route.

Related Commands

Command	Description
show eigrp address-family topology	Displays entries in the EIGRP address-family topology table.

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 in privileged EXEC mode.

show ip eigrp [**vrf** {*vrf-name* | *****}] [*autonomous-system-number*] **traffic**

Syntax Description

vrf *vrf-name*	(Optional) Displays information about the specified VRF.
vrf *	(Optional) Displays information about all VRFs.
autonomous-system-number	(Optional) Autonomous system number.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. The **vrf**, *vrf-name*, and ***** keywords and arguments were added. This command replaces the **show ip eigrp vrf traffic** command.
12.2(33)SRE	This command was modified. The **vrf**, *vrf-name*, and ***** keywords and arguments were added. This command replaces the **show ip eigrp vrf traffic** command.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

This command can be used to display information about EIGRP named configurations and EIGRP autonomous-system (AS) configurations.

This command displays the same information as the **show eigrp address-family traffic** command. Cisco recommends using the **show eigrp address-family traffic** command.

Examples

The following is sample output from the **show ip eigrp traffic** command:

```
Router# show ip eigrp traffic
EIGRP-IPv4 Traffic Statistics for AS(60)
Hellos sent/received: 21429/2809
Updates sent/received: 22/17
Queries sent/received: 0/0
Replies sent/received: 0/0
Acks sent/received: 16/13
SIA-Queries sent/received: 0/0
```

```
SIA-Replies sent/received: 0/0
Hello Process ID: 204
PDM Process ID: 203
Socket Queue: 0/2000/2/0 (current/max/highest/drops)
Input Queue: 0/2000/2/0 (current/max/highest/drops)
```

The table below describes the significant fields shown in the display.

Table 15: show ip eigrp traffic Field Descriptions

Field	Description
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 acknowledgement packets sent and received.
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.
Hello Process ID	Hello process identifier.
PDM Process ID	Protocol-dependent module IOS process identifier.
Socket Queue	The IP to EIGRP Hello Process socket queue counters.
Input queue	The EIGRP Hello Process to EIGRP PDM socket queue counters.

Related Commands

Command	Description
show eigrp address-family traffic	Displays the number of EIGRP packets sent and received.

show ip eigrp vrf accounting

Note Effective with Cisco IOS Release 15.0(1)M, this command was replaced by the **show ip eigrp accounting** command. See the **show ip eigrp accounting** command for more information.

To display prefix accounting information for an Enhanced Interior Gateway Routing Protocol (EIGRP) VPN routing and forwarding instance (VRF), use the **show ip eigrp vrf accounting**command in privileged EXEC mode.

show ip eigrp vrf {*vrf-name* | *****} **accounting** [*autonomous-system-number*]

Syntax Description

vrf-name	Specifies the VRF name.
*	Displays all VRFs.
autonomous-system-number	(Optional) Specifies the autonomous system number.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(29)S	This command was introduced.
12.3(14)T	This command was integrated into Cisco IOS Release 12.3(14)T.
15.0(1)M	This command was replaced by the **show ip eigrp accounting** command.

Usage Guidelines

This command can be used to display information about EIGRP named configurations and EIGRP autonomous-system (AS) configurations.

This command displays the same information as the **show eigrp address-family accounting** command. Cisco recommends using the **show eigrp address-family accounting**command.

Examples

The following is sample output from the **show ip eigrp vrf accounting**command:

```
Router# show ip eigrp vrf RED accounting
IP-EIGRP accounting for AS(100)/ID(10.0.2.1) Routing Table: 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    10.0.1.2          Et0/0              2           0          84
 P    10.0.2.4          Se2/0              0           2         114
 D    10.0.1.3          Et0/0              0           3           0
```

Note Connected and summary routes are not listed individually in the output of this command but are counted in the total aggregate count per process.

The table below describes the significant fields shown in the display.

Table 16: show ip eigrp vrf accounting Field Descriptions

Field	Description
IP-EIGRP accounting for AS...	Identifies the EIGRP instance along with the AS number, Router ID and Table ID.
Total Prefix Count	Shows to the aggregate sum of the prefixes in an EIGRP instance topology table. It includes prefixes learnt from all neighbors or from redistribution.
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 in suspended or in a penalized state because the maximum prefix limit has been exceeded. D-Down: Neighbor adjacency or redistribution is suspended permanently until a manually reset is performed with the **clear ip route** command.
Address/Source	Shows the peer IP address of the redistribution source.
Prefix Count	Displays the 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 a route source has exceeded the maximum-prefix limit.
Restart/Reset(s)	Displays the 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.

Related Commands

Command	Description
show eigrp address-family accounting	Displays prefix accounting information for EIGRP processes.

show ip eigrp vrf interfaces

Note Effective with Cisco IOS Release 15.0(1)M, this command was replaced by the **show ip eigrp interfaces**command. See the **show ip eigrp interfaces** command for more information.

To display information about interfaces that carry VPN routing and forwarding (VRF) information and that are configured for Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show ip eigrp vrf interfaces** command in privileged EXEC mode.

show ip eigrp vrf {*vrf-name* | *****} **interfaces** [*autonomous-system-number*] [*interface-type*] [**detail** *interface-type*] [**static** *interface-type*]

Syntax Description

vrf-name	Specifies the VRF name.
*****	Displays all VRFs.
autonomous-system-number	(Optional) Specifies the autonomous system number.
interface-type	(Optional) Specifies the VRF interface for which to display EIGRP information.
detail *interface-type*	(Optional) Displays detailed VRF peer information. The interface can be specified after this keyword is entered.
static *interface-type*	(Optional) Displays VRF information for static neighbors. The interface can be specified after this keyword is entered. The interface-type argument allows you to display information about static neighbors for VRFs that are configured on specific interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(22)S	This command was introduced.
12.2(15)T	This command was integrated into 12.2(15)T.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
15.0(1)M	This command was replaced by the **show ip eigrp interfaces** command.

Usage Guidelines

Use the **show ip eigrp vrf interfaces** command to display EIGRP interfaces that are defined under the specified VRF. If an interface is specified with the *interface-type* argument, only the specified interface is displayed. Otherwise, all interfaces on which EIGRP is running as part of the specified VRF are displayed.

This command can be used to display information about EIGRP named configurations and EIGRP autonomous-system (AS) configurations.

This command displays the same information as the **show eigrp address-family interfaces** command. Cisco recommends using the **show eigrp address-family interfaces** command.

Examples

The following is sample output from the **show ip eigrp vrf interfaces**command:

```
Router# show ip eigrp vrf VRF-PINK interfaces
IP-EIGRP interfaces for process 1
                        Xmit Queue   Mean   Pacing Time   Multicast    Pending
Interface        Peers  Un/Reliable  SRTT   Un/Reliable   Flow Timer   Routes
Et3/0              1        0/0       131       0/10         528         0
```

The table below describes the significant fields shown in the display.

Table 17: show ip eigrp vrf interfaces Field Descriptions

Field	Description
IP-EIGRP interfaces for process...	Displays the autonomous system number for the specified VRF.
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 smooth round-trip time (SRTT) interval (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 will send multicast EIGRP packets.
Pending Routes	Number of routes in the packets in the transmit queue waiting to be sent.

Related Commands

Command	Description
show eigrp address-family interfaces	Displays information about interfaces configured for EIGRP.
clear ip eigrp vrf neighbors	Clears neighbor entries of the specified VRF from the RIB.
show ip eigrp vrf neighbors	Displays neighbors discovered by EIGRP that carry VRF information.
show ip eigrp vrf topology	Displays VRF entries in the EIGRP topology table.
show ip eigrp vrf traffic	Displays EIGRP VRF traffic statistics.

show ip eigrp vrf neighbors

Note Effective with Cisco IOS Release 15.0(1)M, this command was replaced by the **show ip eigrp neighbors**command. See the **show ip eigrp neighbors** command for more information.

To display Enhanced Interior Gateway Routing Protocol (EIGRP) neighbors that are on interfaces that are part of the specified Virtual Private Network (VPN) routing and forwarding instance (VRF), use the **show ip eigrp vrf neighbors** command privileged EXEC mode.

show ip eigrp vrf {*vrf-name* | *****} **neighbors** [*autonomous-system-number*] [*interface-type*] [**detail** *interface-type*] [**static** *interface-type*]

Syntax Description

vrf-name	Specifies the VRF name.
*****	Displays all VRFs.
autonomous-system-number	(Optional) Autonomous system number.
interface-type	(Optional) Interface to display neighbor information under the specified VRF.
detail *interface-type*	(Optional) Displays detailed VRF peer information. The interface can be specified after this keyword is entered.
static *interface-type*	(Optional) Displays VRF information for static neighbors. The interface can be specified after this keyword is entered. The *interface-type* argument allows you to display information about static neighbors for VRFs that are configured on specific interfaces.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(22)S	This command was introduced.
12.2(15)T	This command was integrated into 12.2(15)T.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
15.0(1)M	This command was replaced by the **show ip eigrp neighbors** command.

Usage Guidelines

Use the **show ip eigrp vrf neighbors** command to determine when VRF neighbors become active and inactive. This command is also useful for debugging certain types of transport problems.

This command can be used to display information about EIGRP named configurations and EIGRP autonomous-system (AS) configurations.

This command displays the same information as the **show eigrp address-family neighbors** command. Cisco recommends using the **show eigrp address-family neighbors** command.

Examples

The following is sample output from the **show ip eigrp vrf neighbors** command:

```
Router# show ip eigrp vrf VRF-GREEN neighbors
IP-EIGRP neighbors for process 1
H   Address                 Interface       Hold Uptime   SRTT   RTO  Q
Seq Type
                                            (sec)         (ms)       Cnt
Num
0   10.10.10.2              Et3/0             10 1d16h     131   786  0  3
```

The table below describes the significant fields shown in the display.

Table 18: show ip eigrp vrf neighbors Field Descriptions

Field	Description
IP-EIGRP neighbors for process...	Displays the autonomous-system number for the specified EIGRP VRF.
Address	IP address of the EIGRP peer.
Interface	Interface on which the router is receiving hello packets from the peer.
Hold Uptime	Length of time (in seconds) that the Cisco IOS software will wait to hear from the peer before declaring it down, and the length in time (in seconds) since the local router first heard from this neighbor.
SRTT	Smooth round-trip time. This is 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 is the amount of time the software waits before resending a packet from the retransmission queue to a neighbor.
Q	Number of EIGRP packets (update, query, and reply) that the software is waiting to send.

Related Commands

Command	Description
show eigrp address-family neighbors	Displays neighbors discovered by EIGRP.

show ip eigrp vrf topology

To display VPN routing and forwarding (VRF) entries in the Enhanced Interior Gateway Routing Protocol (EIGRP) topology table, use the **show ip eigrp vrf topology** command in user EXEC or privileged EXEC mode.

show ip eigrp vrf {*vrf-name* | *****} **topology** [*as-number*] [*ip-address* [*mask*]] [{**active** | **all-links** | **pending** | **summary** | **zero-successors**}]

Syntax Description

vrf-name	Name of the VRF.
*****	Displays all VRFs.
as-number	(Optional) Autonomous system number.
ip-address	(Optional) IP address. When the IP address is specified with a mask, a detailed description of the entry is provided.
mask	(Optional) Subnet mask.
active	(Optional) Displays only active entries in the EIGRP topology table.
all-links	(Optional) Displays all entries in the EIGRP topology table (including nonfeasible-successor sources).
pending	(Optional) Displays all entries in the EIGRP topology table that are either waiting for an update from a neighbor or waiting to reply to a neighbor.
summary	(Optional) Displays a summary of the EIGRP topology table.
zero-successors	(Optional) Displays available routes that have zero successors.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.0(22)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
15.2(2)S	This command was modified. The output of the command was enhanced to display route tag values in dotted-decimal format.
Cisco IOS XE Release 3.6S	This command was modified. This command was integrated into Cisco IOS XE Release 3.6S. The output of the command was enhanced to display route tag values in dotted-decimal format.

Usage Guidelines

The **show ip eigrp vrf topology** command can be used to determine Diffusing Update Algorithm (DUAL) states and to debug possible DUAL problems.

This command can be used to display information about EIGRP named and EIGRP autonomous system configurations.

This **show ip eigrp vrf topology** command displays the same information as the **show eigrp address-family topology** command. We recommend using the **show eigrp address-family topology** command.

Examples

The following is sample output from the **show ip eigrp vrf** *vrf-name* **topology** command:

```
Device# show ip eigrp vrf VRF1 topology

IP-EIGRP Topology Table for AS(1)/ID(192.168.10.1) Routing Table:VRF1
Codes:P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status
P 10.17.17.0/24, 1 successors, FD is 409600
         via 10.10.10.2 (409600/128256), Ethernet3/0
P 172.16.19.0/24, 1 successors, FD is 409600
         via 10.10.10.2 (409600/128256), Ethernet3/0
P 192.168.10.0/24, 1 successors, FD is 281600
         via Connected, Ethernet3/0
P 10.10.10.0/24, 1 successors, FD is 281600
         via Redistributed (281600/0)
```

The table below describes the significant fields shown in the display.

Table 19: show ip eigrp vrf vrf-name topology Field Descriptions

Field	Description
Codes	State of this topology table entry. Passive and Active refer to the EIGRP state with respect to the destination; Update, Query, and Reply refer to the type of packet that is being sent.
P—Passive	No EIGRP computations are being performed for this destination.
A—Active	EIGRP computations are being performed for this destination.
U—Update	An update packet was sent to this destination.
Q—Query	A query packet was sent to this destination.
R—Reply	A reply packet was sent to this destination.
r—reply Status	The flag that is set after the software has sent a query and is waiting for a reply.
s—sia Status	The flag that is set if a route is in stuck-in-active state.
successors	Number of successors. This number corresponds to the number of next hops in the IP routing table. If "successors" is capitalized, then the route or the next hop is in a transition state.

Field	Description
FD	Feasible distance. The feasible distance is the best metric to reach the destination or the best metric that was known when the route became active. This value is used in the feasibility condition check. If the reported distance of the device is less than the feasible distance, the feasibility condition is met and that route becomes a feasible successor. After the software determines that it has a feasible successor, the software need not send a query for that destination.
replies	(Not shown in the output) Number of replies that are still outstanding (have not been received) with respect to this destination. This information appears only when the destination is in active state.
state	(Not shown in the output) The exact EIGRP state of this destination. It can be the number 0, 1, 2, or 3. This information appears only when the destination is in active state.
via	IP address of the peer that advertised this destination. The first of these entries is the current successor. Subsequent entries on the list are feasible successors.
(409600/128256)	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.
Ethernet3/0	The interface from which this information was learned.

Related Commands

Command	Description
show eigrp address-family topology	Displays entries in the EIGRP address-family topology table.

show ip eigrp vrf traffic

Note Effective with Cisco IOS Release 15.0(1)M, the **show ip eigrp vrf traffic** command is replaced by the **show ip eigrp traffic** command. See the **show ip eigrp traffic** command for more information.

To display sent and received statistics for Enhanced Interior Gateway Routing Protocol (EIGRP) Virtual Private Networking (VPN) routing and forwarding instance (VRF) packets, use the **show ip eigrp vrf traffic**command in privileged EXEC mode.

show ip eigrp vrf {*vrf-name* | *****} **traffic** [*as-number*]

Syntax Description

vrf-name	VRF name.
*	Displays all VRFs.
as-number	(Optional) Autonomous system number.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(22)S	This command was introduced.
12.2(15)T	This command was integrated into 12.2(15)T.
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.2(27)SBC	This command was integrated into Cisco IOS Release 12.2(27)SBC.
15.0(1)M	This command was replaced by the **show ip eigrp traffic** command.

Usage Guidelines

This command can be used to display information about EIGRP named configurations and EIGRP autonomous-system (AS) configurations.

This command displays the same information as the **show eigrp address-family traffic** command. Cisco recommends using the **show eigrp address-family traffic** command.

Examples

The following is sample output from the **show ip eigrp vrf traffic** command:

```
Router# show ip eigrp vrf VRF-RED traffic
IP-EIGRP Traffic Statistics for AS 101
  Hellos sent/received: 600/585
  Updates sent/received: 23/22
  Queries sent/received: 7/0
  Replies sent/received: 0/6
  Acks sent/received: 55/42
  Input queue high water mark 0, 0 drops
```

The table below describes the significant fields shown in the display.

Table 20: show ip eigrp vrf traffic Field Descriptions

Field	Description
IP-EIGRP Traffic Statistics for AS...	Displays the autonomous system number for the specified EIGRP VRF .
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..., ... drops	Number of received packets that are approaching the maximum receive threshold and number of dropped packets.

Related Commands

Command	Description
show eigrp address-family traffic	Displays the number of EIGRP packets sent and received.

show ip route tag

To display route tag entries for IPv4 routes, use the **show ip route tag** command in user EXEC or privileged EXEC mode.

show ip route tag {*tag-value* | *tag-value-dotted-decimal* [{*mask*}]}

Syntax Description

tag-value	Route tag value in plain decimals. The range is from 1 to 4294967295.
tag-value-dotted-decimal	Route tag value in dotted decimals. The range is from 0.0.0.0 to 255.255.255.255.
mask	(Optional) Route tag wildcard mask.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.2(2)S	This command was introduced.
Cisco IOS XE Release 3.6S	This command was integrated into Cisco IOS XE Release 3.6S.
15.2(4)M	This command was integrated into Cisco IOS Release 15.2(4)M.

Usage Guidelines

Route tags are 32-bit values attached to routes. They are used to filter routes. You can display route tag values as either plain decimals or dotted decimals.

Examples

The following sample output from the **show ip route tag** command displays detailed information about route tag entries. The route tag entries in this output are displayed in dotted-decimal format.

```
Device# show ip route tag 1.1.1.1

Routing entry for 192.168.10.0/24
  Known via "eigrp 2", distance 170, metric 1536000
  Tag 1.1.1.1, type external
  Redistributing via eigrp 2
  Last update from 10.0.0.1 on Ethernet0/1, 00:00:20 ago
  Routing Descriptor Blocks:
  * 10.0.0.1, from 10.0.0.1, 00:00:20 ago, via Ethernet0/1
      Route metric is 1536000, traffic share count is 1
      Total delay is 2000 microseconds, minimum bandwidth is 10000 Kbit
      Reliability 100/255, minimum MTU 1500 bytes
      Loading 100/255, Hops 1
      Route tag 1.1.1.1
```

The following sample output from the **show ip route tag** command displays detailed information about route tag entries with the wild card mask. The route tag entries in this output are displayed in dotted-decimal format.

```
Device# show ip route tag 10.10.10.0 0.0.0.7

Routing entry for 10.1.10.4/30
  Known via "eigrp 7", distance 170, metric 2560512256
  Tag 10.10.10.3, type external
  Redistributing via eigrp 7, ospf 10
  Last update from 172.16.2.9 on Serial2/1, 00:02:28 ago
  Routing Descriptor Blocks:
  * 172.16.2.9, from 172.16.2.9, 00:02:28 ago, via Serial2/1
     Route metric is 2560512256, traffic share count is 1
     Total delay is 20010 microseconds, minimum bandwidth is 1 Kbit
     Reliability 1/255, minimum MTU 1 bytes
     Loading 1/255, Hops 1
     Route tag 10.10.10.3
Routing entry for 192.168.1.0/24
  Known via "eigrp 7", distance 170, metric 2560512256
  Tag 10.10.10.2, type external
  Redistributing via eigrp 7, ospf 10
  Advertised by ospf 10 metric 100 route-map to_ospf
  Last update from 172.16.2.9 on Serial2/1, 00:01:59 ago
  Routing Descriptor Blocks:
  * 172.16.2.9, from 172.16.2.9, 00:01:59 ago, via Serial2/1
     Route metric is 2560512256, traffic share count is 1
     Total delay is 20010 microseconds, minimum bandwidth is 1 Kbit
     Reliability 1/255, minimum MTU 1 bytes
     Loading 1/255, Hops 1
     Route tag 10.10.10.2
Routing entry for 192.168.2.0/24
  Known via "eigrp 7", distance 170, metric 2560512256
  Tag 10.10.10.2, type external
  Redistributing via eigrp 7, ospf 10
  Advertised by ospf 10 metric 100 route-map to_ospf
  Last update from 172.16.2.9 on Serial2/1, 00:01:59 ago
  Routing Descriptor Blocks:
  * 172.16.2.9, from 172.16.2.9, 00:01:59 ago, via Serial2/1
     Route metric is 2560512256, traffic share count is 1
     Total delay is 20010 microseconds, minimum bandwidth is 1 Kbit
     Reliability 1/255, minimum MTU 1 bytes
     Loading 1/255, Hops 1
     Route tag 10.10.10.2
```

The table below describes the significant fields shown in the displays.

Table 21: show ip route tag Field Descriptions

Field	Description
Known via	Indicates how the route was derived.
Redistributing via	Indicates the redistribution protocol.
Last update from	Indicates the interface on which the last update arrived.
Routing Descriptor Blocks	Displays the next-hop IP address followed by the information source.
Route metric	Displays the best metric for this routing descriptor block.
Total Delay	Displays the total delay of the route.
Reliability	Indicates the reliability of the link.

Field	Description
Loading	Displays the total load on the link.
Route tag	Displays the tag of the prefix or network.

Related Commands

Command	Description
show ipv6 route tags	Displays route tag entries for IPv6 routes.

show ipv6 eigrp events

To display Enhanced Interior Gateway Routing Protocol (EIGRP) events logged for IPv6, use the **show ipv6 eigrp events** command in user EXEC or privileged EXEC mode.

show ipv6 eigrp events [{[{**errmsg** | **sia**}] [*event-num-start* *event-num-end*] | **type**}]

Syntax Description

errmsg	(Optional) Displays error messages being logged.
sia	(Optional) Displays Stuck In Active (SIA) messages.
event-num-start	(Optional) Starting number of the event range. The range is from 1 to 4294967295.
event-num-end	(Optional) Ending number of the event range. The range is from 1 to 4294967295.
type	(Optional) Displays event types being logged.

Command Default

If no event range is specified, information for all IPv6 EIGRP events is displayed.

Command Modes

User EXEC (>)
Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced in a release earlier than Cisco IOS Release 15.0(1) on the Cisco 3845 series routers.

Usage Guidelines

The **show ipv6 eigrp events**command is used to analyze a network failure by the Cisco support team and is not intended for general use. This command provides internal state information about EIGRP and how it processes route notifications and changes.

Examples

The following is sample output from the **show ipv6 eigrp events** command. The fields are self-explanatory.

```
Router# show ipv6 eigrp events
Event information for AS 65535:
1    00:56:41.719 State change: Successor Origin Local origin
2    00:56:41.719 Metric set: 2555:5555::/32 4294967295
3    00:56:41.719 Poison squashed: 2555:5555::/32 lost if
4    00:56:41.719 Poison squashed: 2555:5555::/32 rt gone
5    00:56:41.719 Route installing: 2555:5555::/32 FE80::ABCD:4:EF00:1
6    00:56:41.719 RDB delete: 2555:5555::/32 FE80::ABCD:4:EF00:2
7    00:56:41.719 Send reply: 2555:5555::/32 FE80::ABCD:4:EF00:1
8    00:56:41.719 Find FS: 2555:5555::/32 4294967295
9    00:56:41.719 Free reply status: 2555:5555::/32
10   00:56:41.719 Clr handle num/bits: 0 0x0
11   00:56:41.719 Clr handle dest/cnt: 2555:5555::/32 0
12   00:56:41.719 Rcv reply met/succ met: 4294967295 4294967295
13   00:56:41.719 Rcv reply dest/nh: 2555:5555::/32 FE80::ABCD:4:EF00:2
14   00:56:41.687 Send reply: 2555:5555::/32 FE80::ABCD:4:EF00:2
15   00:56:41.687 Rcv query met/succ met: 4294967295 4294967295
```

```
16   00:56:41.687 Rcv query dest/nh: 2555:5555::/32 FE80::ABCD:4:EF00:2
17   00:56:41.687 State change: Local origin Successor Origin
18   00:56:41.687 Metric set: 2555:5555::/32 4294967295
19   00:56:41.687 Active net/peers: 2555:5555::/32 65536
20   00:56:41.687 FC not sat Dmin/met: 4294967295 2588160
21   00:56:41.687 Find FS: 2555:5555::/32 2588160
22   00:56:41.687 Rcv query met/succ met: 4294967295 4294967295
23   00:56:41.687 Rcv query dest/nh: 2555:5555::/32 FE80::ABCD:4:EF00:1
24   00:56:41.659 Change queue emptied, entries: 1
25   00:56:41.659 Metric set: 2555:5555::/32 2588160
```

Related Commands

Command	Description
clear ipv6 eigrp	Deletes entries from EIGRP for IPv6 routing tables.
debug ipv6 eigrp	Displays information about EIGRP for IPv6 protocol.
ipv6 eigrp	Enables EIGRP for IPv6 on a specified interface.

show ipv6 eigrp interfaces

To display information about interfaces configured for the Enhanced Interior Gateway Routing Protocol (EIGRP) in IPv6 topologies, use the **show ipv6 eigrp interfaces** command in user EXEC or privileged EXEC mode.

show ipv6 eigrp [*as-number*] **interfaces** [*type number*] [**detail**]

Syntax Description

as-number	(Optional) Autonomous system number.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.
number	(Optional) Interface number. For more information about the numbering syntax for your networking device, use the question mark (?) online help function.
detail	(Optional) Displays detailed interface information.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was implemented on Cisco ASR 1000 Series Aggregation Services Routers.
15.2(1)S	This command was integrated into Cisco IOS Release 15.2(1)S. Information about the Equal Cost Multipath (ECMP) mode was included in the command output.
Cisco IOS XE Release 3.5S	This command was modified. Information about the ECMP mode was included in the command output.
15.2(3)T	This command was modified. Information about the ECMP mode was included in the command output.

Usage Guidelines

Use the **show ipv6 eigrp interfaces** command to determine the interfaces on which EIGRP is active and to get information about EIGRP processes related to those interfaces. The optional *type number* argument and the **detail** keyword can be entered in any order.

If an interface is specified, only that interface is displayed. Otherwise, all interfaces on which EIGRP is running are displayed.

If an autonomous system is specified, only the routing process for the specified autonomous system is displayed. Otherwise, all EIGRP processes are displayed.

Examples

The following is sample output from the **show ipv6 eigrp interfaces** command:

```
Device# show ipv6 eigrp 1 interfaces

IPv6-EIGRP interfaces for process 1
                     Xmit Queue    Mean    Pacing Time    Multicast     Pending
Interface    Peers   Un/Reliable   SRTT    Un/Reliable    Flow Timer    Routes
Et0/0         0         0/0           0        0/10            0          0
```

The following is sample output from the **show ipv6 eigrp interfaces detail** command:

```
Device# show ipv6 eigrp interfaces detail

IPv6-EIGRP interfaces for process 1
                     Xmit Queue    Mean    Pacing Time    Multicast    Pending
Interface    Peers   Un/Reliable   SRTT    Un/Reliable    Flow Timer    Routes
Et0/0          0        0/0           0        0/10            0          0
Hello interval is 5 sec
Next xmit serial <none>
Un/reliable mcasts: 0/0 Un/reliable ucasts: 0/0
Mcast exceptions: 0 CR packets: 0 ACKs suppressed: 0
Retransmissions sent: 0 Out-of-sequence rcvd: 0
Authentication mode is not set
```

The following sample output from the **show ipv6 eigrp interface detail** command displays detailed information about a specific interface on which the **no ipv6 next-hop self** command is configured with the **no-ecmp-mode** option:

```
Device# show ipv6 eigrp interfaces detail tunnel 0

EIGRP-IPv6 Interfaces for AS(1)
                       Xmit Queue   PeerQ        Mean   Pacing Time   Multicast   Pending

Interface        Peers  Un/Reliable  Un/Reliable  SRTT   Un/Reliable   Flow Timer   Routes
Tu0/0              2        0/0       0/0          29       0/0         136           0
Hello-interval is 5, Hold-time is 15
  Split-horizon is disabled
  Next xmit serial <none>
  Packetized sent/expedited: 48/1
  Hello's sent/expedited: 13119/49
  Un/reliable mcasts: 0/20  Un/reliable ucasts: 31/398
  Mcast exceptions: 5  CR packets: 5  ACKs suppressed: 1
  Retransmissions sent: 355  Out-of-sequence rcvd: 6
  Next-hop-self disabled, next-hop info forwarded, ECMP mode Enabled
  Topology-ids on interface - 0
  Authentication mode is not set
```

The table below describes the significant fields shown in the displays.

Table 22: show ipv6 eigrp interfaces Field Descriptions

Field	Description
Interface	Interface over which EIGRP is configured.
Peers	Number of directly connected EIGRP neighbors.

Field	Description
Xmit Queue Un/Reliable	Number of packets remaining in the Unreliable and Reliable transmit queues.
Mean SRTT	Mean smooth round-trip time (SRTT) interval (in seconds).
Pacing Time Un/Reliable	Pacing time (in seconds) used to determine when EIGRP packets (unreliable and reliable) should be sent out of the interface.
Multicast Flow Timer	Maximum number of seconds in which the device will send multicast EIGRP packets.
Pending Routes	Number of routes in the transmit queue waiting to be sent.
Hello interval is 5 sec	Length (in seconds) of the hello interval.

show ipv6 eigrp neighbors

To display the neighbors discovered by Enhanced Interior Gateway Routing Protocol (EIGRP) for IPv6, use the **show ipv6 eigrp neighbors** command in user EXEC or privileged EXEC mode.

show ipv6 eigrp neighbors [{*interface-typeas-number* | **static** | **detail**}]

Syntax Description

interface-type	(Optional) Interface type.
as-number	(Optional) Autonomous system number.
static	(Optional) Displays static routes.
detail	(Optional) Displays detailed neighbor information.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
Cisco IOS XE Release 2.1	This command was introduced on Cisco ASR 1000 Series Routers.

Usage Guidelines

Use the **show ipv6 eigrp neighbors** command to determine when neighbors become active and inactive. It is also useful for debugging certain types of transport problems.

Examples

The following is sample output from the **show ipv6 eigrp neighbors**command:

```
Router# show ipv6 eigrp neighbors
IPv6-EIGRP neighbors for process 1
H Address                 Interface      Hold      Uptime    SRTT    RTO   Q    Seq
                                         (sec)               (ms)          Cnt  Num
0 Link-local address:         Et0/0         14        00:00:13   11     200   0     2
FE80::A8BB:CCFF:FE00:200
```

The table below describes the significant fields shown in the display.

Table 23: show ipv6 eigrp neighbors Field Descriptions

Field	Description
process 1	Autonomous system number.
Address FE80::A8BB:CCFF:FE00:200	IPv6 address of the EIGRP peer.

Field	Description
Interface	Interface on which the router is receiving hello packets from the peer.
Hold	Length of time (in seconds) that the Cisco IOS software will wait to hear from the peer before declaring it down. If the peer is using the default hold time, this number will be less than 15. If the peer configures a nondefault hold time, the nondefault hold time will be displayed.
Uptime	Elapsed time (in hours:minutes:seconds) since the local router first heard from this neighbor.
SRTT (ms)	Smoothed round-trip time (SRTT). 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 is the amount of time the software waits before resending a packet from the retransmission queue to a neighbor.
Q count	Number of EIGRP packets (update, query, and reply) that the software is waiting to send.
Seq Num	Sequence number of the last update, query, or reply packet that was received from this neighbor.

The following is sample output from the **show ipv6 eigrp neighbors**command with the **detail** keyword:

```
Router# show ipv6 eigrp neighbors detail
IPv6-EIGRP neighbors for process 1
H  Address                 Interface      Hold      Uptime    SRTT    RTO   Q    Seq
                                         (sec)               (ms)          Cnt  Num
0  Link-local address:        Et0/0        11        00:00:30   11     200   0    2
FE80::A8BB:CCFF:FE00:200
Version 12.4/1.2, Retrans: 0, Retries: 0
```

The table below describes the significant fields shown in the display.

Table 24: show ipv6 eigrp neighbors detail Field Descriptions

Field	Description
H	This column lists the order in which a peering session was established with the specified neighbor. The order is specified with sequential numbering starting with 0.
Version	The software version that the specified peer is running.
Retrans	The number of times that a packet has been retransmitted.
Retries	The number of times an attempt was made to retransmit a packet.

The following is sample output from the **show ipv6 eigrp neighbors**command with the **static**keyword:

```
Router# show ipv6 eigrp neighbors static
```

```
IPv6-EIGRP neighbors for process 1
Static Address Interface
Link-local address: Ethernet0/0
FE80::A8BB:CCFF:FE00:200
```

show ipv6 eigrp topology

To display Enhanced Interior Gateway Routing Protocol (EIGRP) IPv6 topology table entries, use the **show ipv6 eigrp topology** command in user EXEC or privileged EXEC mode.

show ipv6 eigrp topology [{*as-number ipv6-address*}] [{**active** | **all-links** | **pending** | **summary** | **zero-successors**}]

Syntax Description

as-number	(Optional) Autonomous system number.
ipv6-address	(Optional) IPv6 address.
active	(Optional) Displays only active entries in the EIGRP topology table.
all-links	(Optional) Displays all entries in the EIGRP topology table (including nonfeasible-successor sources).
pending	(Optional) Displays all entries in the EIGRP topology table that are either waiting for an update from a neighbor or waiting to reply to a neighbor.
summary	(Optional) Displays a summary of the EIGRP topology table.
zero-successors	(Optional) Displays the available routes that have zero successors.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.2(1)S	This command was integrated into Cisco IOS Release 15.2(1)S. Information about the Equal Cost Multipath (ECMP) mode was included in the command output.
Cisco IOS XE Release 3.5S	This command was integrated into Cisco IOS XE Release 3.5S.
15.2(2)S	This command was modified. The output of the command was enhanced to display route tag values in dotted-decimal format.
Cisco IOS XE Release 3.6S	This command was modified. The output of the command was enhanced to display route tag values in dotted-decimal format.
15.2(3)T	This command was modified. Information about the Equal Cost Multipath (ECMP) mode was included in the command output.

Usage Guidelines

If this command is used without any keywords or arguments, only routes that are feasible successors are displayed. The **show ipv6 eigrp topology** command can be used to determine Diffusing Update Algorithm (DUAL) states and to debug possible DUAL problems.

Examples

The following is sample output from the **show ipv6 eigrp topology** command. The fields in the display are self-explanatory.

```
Device# show ipv6 eigrp topology

IPv6-EIGRP Topology Table for AS(1)/ID(2001:0DB8:10::/64)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
r - reply Status, s - sia Status
P 2001:0DB8:3::/64, 1 successors, FD is 281600
via Connected, Ethernet1/0
```

The following sample output from the **show ipv6 eigrp topology** *prefix* command displays ECMP mode information when the **no ipv6 next-hop-self** command is configured without the **no-ecmp-mode** option in the EIGRP topology. The ECMP mode provides information about the path that is being advertised. If there is more than one successor, the top most path will be advertised as the default path over all interfaces, and the message “ECMP Mode: Advertise by default” will be displayed in the output. If any path other than the default path is advertised, the message “ECMP Mode: Advertise out <Interface name>” will be displayed. The fields in the display are self-explanatory.

```
Device# show ipv6 eigrp topology 2001:DB8:10::1/128

EIGRP-IPv6 Topology Entry for AS(1)/ID(192.0.2.100) for 2001:DB8:10::1/128
  State is Passive, Query origin flag is 1, 2 Successor(s), FD is 284160
  Descriptor Blocks:
  FE80::A8BB:CCFF:FE01:2E01 (Tunnel0), from FE80::A8BB:CCFF:FE01:2E01, Send flag is 0x0
      Composite metric is (284160/281600), route is Internal
      Vector metric:
        Minimum bandwidth is 10000 Kbit
        Total delay is 1100 microseconds
        Reliability is 255/255
        Load is 1/55
        Minimum MTU is 1400
        Hop count is 1
        Originating router is 10.10.1.1
      ECMP Mode: Advertise by default
FE80::A8BB:CCFF:FE01:3E01 (Tunnel1), from FE80::A8BB:CCFF:FE01:3E01, Send flag is 0x0
      Composite metric is (284160/281600), route is Internal
      Vector metric:
        Minimum bandwidth is 10000 Kbit
        Total delay is 1100 microseconds
        Reliability is 255/255
        Load is 1/55
        Minimum MTU is 1400
        Hop count is 1
        Originating router is 10.10.2.2
      ECMP Mode: Advertise out Tunnel1
```

Related Commands

Command	Description
show eigrp address-family topology	Displays entries in the EIGRP topology table.

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 in user EXEC or privileged EXEC mode.

show ipv6 eigrp traffic [*as-number*]

Syntax Description

as-number	(Optional) Autonomous system number.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.

Usage Guidelines

Use the **show ipv6 eigrp traffic**command to provide information on packets received and sent.

Examples

The following is sample output from the **show ipv6 eigrp traffic** command:

```
Router# show ipv6 eigrp traffic
IPv6-EIGRP Traffic Statistics for process 9
 Hellos sent/received: 218/205
 Updates sent/received: 7/23
 Queries sent/received: 2/0
 Replies sent/received: 0/2
 Acks sent/received: 21/14
```

The table below describes the significant fields shown in the display.

Table 25: show ipv6 eigrp traffic Field Descriptions

Field	Description
process 9	Autonomous system number specified in the **ipv6 router eigrp**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.

Related Commands

Command	Description
ipv6 router eigrp	Configures the EIGRP for IPv6 routing process.

show ipv6 route tag

To display route tag entries for IPv6 routes, use the **show ipv6 route tag** command in user EXEC or privileged EXEC mode.

show ipv6 route tag {*tag-value* | *tag-value-dotted-decimal* [{*mask*}]}

Syntax Description

tag-value	Route tag value in plain decimals. The range is from 1 to 4294967295.
tag-value-dotted-decimal	Route tag value in dotted decimals. The range is from 0.0.0.0 to 255.255.255.255.
mask	(Optional) Route tag wildcard mask.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.2(2)S	This command was introduced.
Cisco IOS XE Release 3.6S	This command was integrated into Cisco IOS XE Release 3.6S.
15.2(4)M	This command was integrated into Cisco IOS Release 15.2(4)M.

Usage Guidelines

Route tags are 32-bit values attached to routes. They are used to filter routes. You can display route tag entries as either plain decimals or dotted decimals.

Examples

The following sample output from the **show ipv6 route tag** command displays detailed information about route tag entries in the routing table. Route tag values in this output are displayed in dotted-decimal format.

```
Device# show ipv6 route tag 0.0.10.10

IPv6 Routing Table - default - 4 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
       B - BGP, R - RIP, H - NHRP, I1 - ISIS L1
       I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary, D - EIGRP
       EX - EIGRP external, ND - ND Default, NDp - ND Prefix, DCE -
Destination
       NDr - Redirect, l - LISP
       O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
        ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
R 2001:DB8::/96 [120/2]
 Tag 0.0.10.10
  via FE80::A8BB:CCFF:FE00:A00, Ethernet0/0
```

The following sample output from the **show ipv6 route tag** command displays detailed information about route tag entries with the wild card mask. Route tag values in this output are displayed in dotted-decimal format.

```
Device# show ipv6 route tag 0.0.0.10 0.0.0.7

IPv6 Routing Table - default - 4 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
       B - BGP, R - RIP, H - NHRP, I1 - ISIS L1
       I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary, D - EIGRP
       EX - EIGRP external, ND - ND Default, NDp - ND Prefix, DCE - Destination
       NDr - Redirect, l - LISP
       O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
R   2001:DB8::/32 [0/0]
  Tag 0.0.0.10
     via FE80::A8BB:CCFF:FE00:A00, Ethernet0/0
```

The table below describes the significant fields in the displays.

Table 26: show ipv6 route tag Field Descriptions

Field	Description
Codes	Indicates the protocol that derived the route. It can be one of the following values: • B—BGP derived • C—Connected • D—Enhanced Interior Gateway Routing Protocol (EIGRP) • EX—EIGRP external • H—NHRP • i—IS-IS derived • L—Local • O—Open Shortest Path First (OSPF) derived • P—Periodic downloaded static route • R—Routing Information Protocol (RIP) derived • S—Static • U—Per-user static route
2001:DB8::/96 [120/2]	Indicates the address of the remote network.
Tag	Identifies the tag associated with the remote network.
via FE80::A8BB:CCFF:FE00:A00	Specifies the IPv6 address of the next router to the remote network.
Ethernet0/0	Specifies the interface through which the specified network can be reached.

Related Commands

Command	Description
show ip route tag	Displays route tag entries for IPv4 routes.

show route-tag list

To display information about route tag lists configured on the router, use the **show route-tag list** command in user EXEC or privileged EXEC mode.

show route-tag list[{*list-name*}]

Syntax Description

list-name	Name of a specific route tag list.

Command Default

If this command is used without the *list-name* argument, information about all route tag lists configured on the router are displayed.

Command Modes

User EXEC (>)

Privileged EXEC (#)

Command History

Release	Modification
15.2(2)S	This command was introduced.
Cisco IOS XE Release 3.6S	This command was integrated into Cisco IOS XE Release 3.6S.
15.2(4)M	This command was integrated into Cisco IOS Release 15.2(4)M.

Usage Guidelines

Use the *list-name* argument to display information about a specific route tag list. Route tags are 32-bit values attached to routes. They are used to filter routes. You can display route tag values as either plain decimals or dotted decimals. To enable **show** commands to display route tag values in dotted-decimal format, configure the **route-tag notation** command in global configuration mode.

Examples

The following sample output from the **show route-tag list** command displays route tag information in dotted-decimal format. The fields in the display are self-explanatory.

```
Device# show route-tag list

route-tag-list List1 :
    permit 5 1.1.1.1 1.1.1.1
    permit 10 2.2.2.2 2.2.2.2
    permit 12 3.3.3.3 3.3.3.3
    permit 15 4.4.4.4 4.4.4.4
    permit 18 6.6.6.6 6.6.6.6
route-tag-list List2 :
    permit 5 1.1.1.1 1.1.1.1
    permit 10 2.2.2.2 2.2.2.2
    permit 12 3.3.3.3 3.3.3.3
    permit 15 4.4.4.4 4.4.4.4
    permit 18 6.6.6.6 6.6.6.6
```

Related Commands

Command	Description
route-tag list	Configures a route tag list.
route-tag notation	Enables the display of route tag values in dotted-decimal format.

shutdown (address-family)

To disable the Enhanced Interior Gateway Routing Protocol (EIGRP) address-family protocol for a specific routing instance without removing any existing address-family configuration parameters, use the **shutdown** command in the appropriate configuration mode. To reenable the EIGRP address-family protocol, use the **no** form of this command.

shutdown
no shutdown

Syntax Description

This command has no arguments or keywords.

Command Default

The EIGRP address-family protocol for routing instances is not disabled.

Command Modes

Router configuration (config-router) Address-family configuration (config-router-af) Address-family interface configuration (config-router-af-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

When you configure the **shutdown** (address-family) command, the EIGRP address-family protocol continues to run on the router and you can continue to use the current address-family configuration. The address-family will not form any adjacencies on any interface and the address-family topology database is cleared.

Configure the **shutdown** command in address-family configuration mode to shut down all topologies under that address family. Configure this command in router configuration mode to shut down all address and service families and their topologies.

Examples

The following example shows how to disable the address-family protocol in router configuration mode:

```
Router(config)# router eigrp virtual-name
Router(config-router)# shutdown
```

The following example shows how to disable the address-family protocol in address-family configuration mode:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# shutdown
```

The following example shows how to disable the address-family protocol in address-family interface configuration mode:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# af-interface default
Router(config-router-af-interface)# shutdown
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
router eigrp	Configures the EIGRP address-family process.

split-horizon (EIGRP)

To enable Enhanced Interior Gateway Routing Protocol (EIGRP) split-horizon, use the **split-horizon** command in address-family interface configuration mode or service-family interface configuration mode. To disable EIGRP split-horizon, use the **no** form of this command.

split-horizon
no split-horizon

Syntax Description

This command has no arguments or keywords.

Command Default

EIGRP split-horizon is enabled by default. However, for ATM interfaces and subinterfaces **split-horizon** is disabled by default.

Command Modes

Address-family interface configuration (config-router-af-interface) Service-family interface configuration (config-router-sf-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.

Usage Guidelines

The split-horizon rule prohibits a router from advertising a route through an interface that the router itself uses to reach the destination. The following are general rules for EIGRP split-horizon:

- Split-horizon behavior is turned on by default.
- When you change the EIGRP split-horizon setting on an interface, all adjacencies with EIGRP neighbors reachable over that interface are reset.
- Split-horizon should typically be disabled only on non-broadcast multi-access interfaces.
- The EIGRP split-horizon behavior is not controlled or influenced by the **ip split-horizon** command.

To configure split-horizon for an EIGRP address family, use the **split-horizon**command in address-family interface configuration mode.

To configure split-horizon for an EIGRP service family, use the **split-horizon**command in service-family interface configuration mode.

Examples

The following example disables EIGRP split-horizon for serial interface 3/0 in address-family 5400:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 5400
```

```
Router(config-router-af)# af-interface serial3/0
Router(config-router-af-interface)# no split-horizon
```

The following example disables EIGRP split-horizon for serial interface 3/0 in service-family 5400:

```
Router(config)# router eigrp virtual-name
Router(config-router)# service-family ipv4 autonomous-system 5400
Router(config-router-sf)# sf-interface serial3/0
Router(config-router-sf-interface)# no split-horizon
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
router eigrp	Configures the EIGRP address-family process.
service-family ipv4	Configures commands under service-family configuration mode.
sf-interface	Configures interface-specific commands under service-family configuration mode.

stub

Note Effective with Cisco IOS Release 15.0(1)M and 12.2(33)SRE, the **stub** command was replaced by the **eigrp stub**command. See the **eigrp stub** command for more information.

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

stub [{**receive-only** | **connected** | **static** | **summary** | **redistributed**}]
no stub [{**receive-only** | **connected** | **static** | **summary** | **redistributed**}]

Syntax Description

receive-only	(Optional) Sets the router as a receive-only neighbor.
connected	(Optional) Advertises connected routes.
static	(Optional) Advertises static routes.
summary	(Optional) Advertises summary routes.
redistributed	(Optional) Advertises redistributed routes from other protocols and autonomous systems.

Command Default

Stub routing is not enabled.

Command Modes

Router configuration (config-router)

Command History

Release	Modification
12.4(6)T	This command was introduced.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.0(1)M	This command was replaced by the **eigrp stub**command.
12.2(33)SRE	This command was replaced by the **eigrp stub**command.

Usage Guidelines

Use the **stub** command to configure a router as a stub where the router directs all IPv6 traffic to a distribution router.

The **stub** command can be modified with keywords, and more than one keyword can be used in the same syntax. These options can be used in any combination, except for the **receive-only** keyword. The **receive-only** keyword will restrict the router from sharing any of its routes with any other router in that EIGRP autonomous system, and the **receive-only** keyword will not permit any other option to be specified because it prevents any type of route from being sent. The **connected**, **static**, **summary**, and **redistributed** keywords can be used in any combination but cannot be used with the **receive-only** keyword.

If any of these four keywords is used with the **stub** command, only the route types specified by the particular keywords will be sent. Route types specified by the nonused keywords will not be sent.

The **connected** keyword permits the EIGRP stub routing feature to send connected routes. If the connected routes are not covered by a network statement, it may be necessary to redistribute connected routes with the **redistribute connected** command under the EIGRP process. This option is enabled by default.

The **static** keyword permits the EIGRP stub routing feature to send static routes. Without the configuration of this option, EIGRP will not send any static routes, including internal static routes that normally would be automatically redistributed. It will still be necessary to redistribute static routes with the **redistribute static**command.

The **summary** keyword permits the EIGRP stub routing feature to send summary routes. Summary routes can be created manually with the **ipv6 summary address eigrp** command or automatically at a major network border router with the **auto-summary** command enabled. This option is enabled by default.

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.

Note Multiaccess interfaces such as ATM, Ethernet, Frame Relay, ISDN PRI, and X.25 are supported by the EIGRP stub routing feature only when all routers on that interface, except the hub, are configured as stub routers.

Examples

In the following example, the **stub** command is used to configure the router as a stub that advertises connected and summary routes:

```
ipv6 router eigrp 1
 network 3FEE:12E1:2AC1:EA32::/64
 stub
```

In the following example, the **stub** command is issued with the **connected** and **static** keywords to configure the router as a stub that advertises connected and static routes (sending summary routes will not be permitted):

```
ipv6 router eigrp 1
 network 3FEE:12E1:2AC1:EA32::/64
 stub connected static
```

In the following example, the **stub** command is issued with the **receive-only** keyword to configure the router as a receive-only neighbor (connected, summary, and static routes will not be sent):

```
ipv6 router eigrp 1
 network 3FEE:12E1:2AC1:EA32::/64 eigrp
 stub receive-only
```

In the following example, the **stub** command is issued with the **redistributed** keyword to configure the router to advertise other protocols and autonomous systems:

```
ipv6 router eigrp 1
 network 3FEE:12E1:2AC1:EA32::/64 eigrp
 stub redistributed
```

Related Commands

Command	Description
auto-summary (EIGRP)	Allows automatic summarization of subnet routes into network-level routes.
ipv6 summary-address eigrp	Configures a summary aggregate address for a specified interface.
redistribute (IPv6)	Redistributes IPv6 routes from one routing domain into another routing domain.

summary-address (EIGRP)

To configure a summary address for Enhanced Interior Gateway Routing Protocol (EIGRP), use the **summary-address**(EIGRP) command in address-family interface configuration mode. To remove an EIGRP summary address, use the **no** form of this command.

summary-address *ip-address mask* [*administrative-distance* [**leak-map** *leak-map-name*]]
no summary-address *ip-address mask* [*administrative-distance* [**leak-map** *leak-map-name*]]

Syntax Description

ip-address	Summary address designated for a range of addresses.
mask	IP subnet mask used for the summary route.
administrative-distance	(Optional) Administrative distance. Valid range is 1 to 255. Default is 5.
leak-map	(Optional) Allows dynamic addresses based on a leak map.
leak-map-name	(Optional) The name of a leak-map.

Command Default

All routes are advertised individually.

Command Modes

Address-family interface configuration (config-router-af-interface)

Command History

Release	Modification
15.0(1)M	This command was introduced.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

The **summary-address** (EIGRP) command is used to configure interface-level address summarization. EIGRP summary routes are given an administrative distance value of 5. The administrative distance metric is used to advertise a summary address without installing it in the routing table.

By default, EIGRP summarizes subnet routes to the network level. The **no auto-summary** command can be entered to configure subnet-level summarization.

EIGRP Support for Leaking Routes

Configuring the **leak-map** keyword allows you to advertise a component route that would otherwise be suppressed by the manual summary. Any component subset of the summary routes or addresses can be leaked. A route map and access list must be defined to source the leaked route.

The following is default behavior if an incomplete configuration is entered:

- If the **leak-map** keyword is configured to reference a nonexistent route map, the configuration of this keyword has no effect. The summary address is advertised, but all component routes are suppressed.

- If the **leak-map** keyword is configured but the access list does not exist or the route map does not reference the access list, the summary address and all component routes are sent.

Examples

The following example shows how to configure an EIGRP summary address:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# af-interface ethernet0/0
Router(config-router-af-interface)# summary-address 192.168.0.0 255.255.0.0 95
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address-family interface configuration mode to configure interface-specific EIGRP commands.
auto-summary (EIGRP)	Allow automatic summarization of subnet routes into network-level routes.
router eigrp	Configures the EIGRP address-family process.

summary-metric

To configure a fixed metric for an Enhanced Interior Gateway Routing Protocol (EIGRP) summary aggregate address, use the **summary-metric** command in address family topology configuration mode. To remove a configured metric, use the **no** form of this command.

summary-metric *network-address subnet-mask* {*bandwidth delay reliability load mtu* [**distance** *administrative-distance*] | **distance** *administrative-distance*}
no summary-metric *network-address subnet-mask*

Syntax Description

network-address	IP summary aggregate address to apply to an interface.
subnet-mask	Subnet mask.
bandwidth	Minimum bandwidth of the router, in kilobits per second. Valid values are 0 or any positive integer.
delay	Route delay, in tens of microseconds. Valid values are 0 or any positive number that is a multiplier of 39.1 nanoseconds.
reliability	Likelihood of a successful packet transmission that is expressed as a number between 0 and 255, where 255 is 100 percent reliability and 0 is no reliability.
load	Effective load of the route that is expressed as a number from 0 to 255, where 255 is 100 percent load.
mtu	Maximum transmission unit (MTU) size of the route, in bytes. Valid values are 0 or any positive integer.
distance *administrative-distance*	Specifies the administrative distance. Valid range is 1 to 255.

Command Default

EIGRP summary aggregate addresses do not have a fixed metric.

Command Modes

Address family topology configuration (config-router-af-topology)

Command History

Release	Modification
12.2(33)SRE	This command was introduced.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
15.0(1)M	This command was integrated into Cisco IOS Release 15.0(1)M.
Cisco IOS XE Release 3.2S	This command was modified. The **distance** keyword and *administrative-distance* argument were added.
12.2(33)SXJ	This command was modified. The summary address is not advertised to the peer if the administrative distance is configured as 255.
15.1(1)SG	This command was integrated into Cisco IOS Release 15.1(1)SG.

Release	Modification
Cisco IOS XE Release 3.2SG	This command was integrated into Cisco IOS XE Release 3.3SG.

Usage Guidelines

When EIGRP creates a summary route, it includes a metric with the route in order to advertise it. EIGRP searches for components of the summary to be suppressed and represented by the summary. EIGRP finds the component with the best metric and copies the metric from the component into the summary. Components of the summary may change often, which means that every time the best component metric changes, the summary needs to be readvertised to all its peers. Even if the best component metric is not the one that changed, EIGRP still has to search every topology entry to make sure the summary is not affected. This can add a significant processing overhead.

Use the **summary-metric** command to mitigate this metric churn and processing overhead. Rather than searching for the best component metric, EIGRP uses the values configured using the **summary-metric** command.

The summary address is not advertised to the peer if the administrative distance is configured as 255.

The administrative distance or a set of values with or without the administrative distance is required after the subnet mask. That is, you can configure bandwidth, delay, reliability, load, and MTU with or without the administrative distance, or you can configure only the administrative distance.

Examples

The following example shows how to configure an EIGRP summary address and sets the bandwidth to 10000, the delay to 10, the reliability to 255, the load to 1, and the MTU to 1500 for the summary address 192.168.0.0/16:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# af-interface ethernet0/0
Router(config-router-af-interface)# summary-address 192.168.0.0 255.255.0.0
Router(config-router-af-interface)# exit
Router(config-router-af)# topology base
Router(config-router-af-topology)# summary-metric 192.168.0.0/16 10000 10 255 1 1500
```

In the following example, only the administrative distance is specified for summary address 192.168.0.1/24:

```
router eigrp 1
 summary-metric 192.168.0.1/24 distance 20
 ! <-- Specify admin distance only for 192.168.0.0/24
```

In the following example, for summary address 192.168.1.0/24 a metric is specified, but not the administrative distance:

```
 summary-metric 192.168.1.0/24 10000 10 255 1 1500
 ! <-- Specify metric only for 192.168.1.0/24
```

In the following example, for summary address 192.168.2.0/24 both the metrics and distance are specified:

```
 summary-metric 192.168.2.0/24 1 1 1 1 1  distance 20
 ! <-- metric and distance for 192.168.2.0/24
```

In the following example, for summary address 192.168.0.1/24 in VRF vrf1 a different distance is specified:

```
address-family ipv4 vrf vrf1 autonomous-system 2
summary-metric 192.168.0.1/24 distance 55
! <-- different distance for 192.168.0.1/24 in vrf vrf1
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address family configuration mode to configure an EIGRP routing instance.
af-interface	Enters address family interface configuration mode to configure interface-specific EIGRP commands.
ip summary-address	Configures a summary aggregate address for a specified interface.
router eigrp	Configures the EIGRP address-family routing process.
summary-address (EIGRP)	Configures a summary address for EIGRP.
topology (EIGRP)	Configures an EIGRP process to route IP traffic under the specified topology instance and enters address-family topology configuration mode.

timers active-time

To adjust Enhanced Interior Gateway Routing Protocol (EIGRP) routing wait time, use the **timers active-time** command in router configuration mode or address-family topology configuration mode. 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) EIGRP active-time limit (in minutes). Valid range is 1 to 65535.
disabled	(Optional) Disables the timers and permits the routing wait time to remain active indefinitely.

Command Default

This command is disabled by default.

Command Modes

Router configuration (config-router) Address-family topology configuration (config-router-af-topology)

Command History

Release	Modification
10.0	This command was introduced.
12.4(6)T	Support for IPv6 was added.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Address-family topology configuration mode was added. You must enter this command in address-family topology configuration mode for EIGRP named configurations.
12.2(33)SRE	This command was modified. Address-family topology configuration mode was added. You must enter this command in address-family topology configuration mode for EIGRP named configurations.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

In EIGRP, there are timers that control the time that the router waits (after sending a query) before declaring the route to be in the stuck in active (SIA) state.

Examples

In the following example, the routing wait time is 200 minutes on the specified route:

```
Router(config)# router eigrp 5
Router(config-router)# timers active-time 200
```

In the following example, the routing wait time is 200 minutes on the specified address-family route:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# network 10.0.0.0
Router(config-router-af)# topology base
Router(config-router-af-topology)# timers active-time 200
```

In the following example, the routing wait time is indefinite if a route becomes active:

```
Router(config)# router eigrp 5
Router(config-router)# timers active-time disabled
```

In the following example, the routing wait time is indefinite on the specified address-family route:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# network 10.0.0.0
Router(config-router-af)# topology base
Router(config-router-af-topology)# timers active-time disabled
```

In the following example, the routing wait time is 100 minutes on the specified route:

```
Router(config)# ipv6 router eigrp 1
Router(config-router)# timers active-time 100
```

In the following example, the routing wait time is 100 minutes on the specified address-family route:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv6 autonomous-system 4453
Router(config-router-af)# topology base
Router(config-router-af-topology)# timers active-time disabled
```

Related Commands

Command	Description
address-family (EIGRP)	Enters address-family configuration mode to configure an EIGRP routing instance.
ipv6 router eigrp	Configures the EIGRP IPv6 routing process.
network (EIGRP)	Specifies the network for an EIGRP routing process.
router eigrp	Configures the EIGRP address-family process.
show ip eigrp topology	Displays the EIGRP topology table.
show ipv6 eigrp topology	Displays the IPv6 EIGRP topology table.
topology (EIGRP)	Configures an EIGRP process to route IP traffic under the specified topology instance and enters address-family topology configuration mode.

timers graceful-restart purge-time

To set the graceful-restart purge-time timer to determine how long a nonstop forwarding (NSF)-aware router that is running the Enhanced Interior Gateway Routing Protocol (EIGRP) must hold routes for an inactive peer, use the **timers graceful-restart purge-time** command in router configuration, address family configuration, or service-family configuration mode. To return the graceful-restart purge-time timer to the default value, use the **no** form of this command.

timers graceful-restart purge-time *seconds*
no timers graceful-restart purge-time

Syntax Description

seconds	Time, in seconds, for which EIGRP must hold routes for an inactive peer. The range is from 20 to 300. The default is 240.

Command Default

The default graceful-restart purge-time timer is 240 seconds.

Command Modes

Router configuration (config-router)

Address family configuration (config-router-af)

Service-family configuration (config-router-sf)

Command History

Release	Modification
15.0(1)M	This command was introduced. This command replaces the **timers nsf route-hold** command.
12.2(33)SRE	This command was integrated into Cisco IOS Release 12.2(33)SRE.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
12.2(33)SXI4	This command was integrated into Cisco IOS Release 12.2(33)SXI4.
Cisco IOS XE Release 3.6S	This command was modified. Support for IPv6 and IPv6 VPN Routing and Forwarding (VRF) was added.
15.2(2)S	This command was modified. Support for IPv6 and IPv6 VRF was added.
15.2(1)E	This command was integrated into Cisco IOS Release 15.2(1)E.

Usage Guidelines

The graceful-restart purge-time timer sets the maximum period of time for which the NSF-aware router must hold known routes for an NSF-capable neighbor during a switchover operation or a well-known failure condition. The graceful-restart purge-time timer is configurable so that you can tune network performance and avoid undesired effects, such as null 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.

Note The **timers nsf signal** command is supported only on platforms that support High Availability.

Examples

The following example shows how to set the graceful-restart purge-time timer to 60 seconds for an NSF-aware IPv4 address family:

```
Device(config)# router eigrp virtual-name
Device(config-router)# address-family ipv4 autonomous-system 1
Device(config-router-af)# timers graceful-restart purge-time 60
```

The following example shows how to set the graceful-restart purge-time timer to 300 seconds for an NSF-aware-service family configuration:

```
Device(config)# router eigrp virtual-name
Device(config-router)# service-family ipv4 autonomous-system 4533
Device(config-router-sf)# timers graceful-restart purge-time 300
```

The following example shows how to set the graceful-restart purge-time timer to 200 seconds for an NSF-aware IPv6 address family configuration:

```
Device(config)# router eigrp e1
Device(config-router)# address-family ipv6 autonomous-system 4
Device(config-router-af)# timers graceful-restart purge-time 300
```

Related Commands

Command	Description
debug eigrp address-family ipv6 notifications	Displays information about EIGRP address family IPv6 event notifications.
debug eigrp nsf	Displays notifications and information about NSF events for an EIGRP routing process.
debug ip eigrp notifications	Displays EIGRP events and notifications in the console of the router.
nsf (EIGRP)	Enables EIGRP NSF or EIGRP IPv6 NSF on an NSF-capable router.
show eigrp neighbors	Displays the neighbors discovered by EIGRP.
show ip protocols	Displays the parameters and the current state of the active routing protocol process.
show ipv6 protocols	Displays the parameters and the current state of the active IPv6 routing protocol process.
timers nsf converge	Sets the maximum time that the restarting router must wait for the end-of-table notification from an NSF-capable or NSF-aware peer.
timers nsf signal	Sets the maximum time for the initial restart period.

timers nsf converge

To adjust the maximum time that a restarting router must wait for the end-of-table (EOT) notification from a nonstop forwarding (NSF)-capable or NSF-aware peer, use the **timers nsf converge** command in router configuration or address family configuration mode. To return the signal timer to the default value, use the **no** form of this command.

timers nsf converge *seconds*
no timers nsf converge

Syntax Description

seconds	Time, in seconds, for which a restarting router must wait for an EOT notification. The range is from 60 to 180. The default is 120.

Command Default

The default converge timer is 120 seconds.

Command Modes

Router configuration (config-router)

Address family configuration (config-router-af)

Command History

Release	Modification
12.2(18)S	This command was introduced.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.0(1)M	This command was modified. Support for Address family configuration mode was added.
12.2(33)SRE	This command was modified. Support for Address family configuration mode was added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
Cisco IOS XE Release 3.6S	This command was modified. Support for IPv6 and IPv6 VPN Routing and Forwarding (VRF) was added.
15.2(2)S	This command was modified. Support for IPv6 and IPv6 VRF was added.

Usage Guidelines

The **timers nsf converge** command is entered only on an NSF-capable router to wait for the last EOT update if all startup updates have not been received within the signal timer period. If an EIGRP process discovers no neighbor, or if it has received all startup updates from its neighbor within the signal timer period, the converge timer will not be started.

Note The **timers nsf converge** command is supported only on platforms that support High Availability.

Examples

The following example shows how to adjust the converge timer to 60 seconds on an NSF-capable router:

```
Device(config)# router eigrp virtual-name
Device(config-router)# address-family ipv4 autonomous-system 1
Device(config-router-af)# timers nsf converge 60
```

The following example shows how to adjust the converge timer for EIGRP IPv6 NSF:

```
Device(config)# router eigrp e1
Device(config-router)# address-family ipv6 autonomous-system 1
Device(config-router-af)# timers nsf converge 60
```

Related Commands

Command	Description
debug eigrp address-family ipv6 notifications	Displays information about EIGRP address family IPv6 event notifications.
debug eigrp nsf	Displays notifications and information about NSF events for an EIGRP routing process.
debug ip eigrp notifications	Displays information and notifications for an EIGRP routing process.
nsf (EIGRP)	Enables EIGRP NSF or EIGRP IPv6 NSF on an NSF-capable router.
show eigrp neighbors	Displays the neighbors discovered by EIGRP.
show ip protocols	Displays the parameters and the current state of the active routing protocol process.
show ipv6 protocols	Displays the parameters and the current state of the active IPv6 routing protocol process.
timers graceful-restart purge-time	Sets the graceful-restart purge-time timer to determine how long an NSF-aware router that is running EIGRP must hold routes for an inactive peer.
timers nsf signal	Sets the maximum time for the initial restart period.

timers nsf route-hold

Note Effective with Cisco IOS Release 15.0(1)M and 12.2(33)SRE, the **timers nsf route-hold** command was replaced by the **timers graceful-restart purge-time**command. See the **timers graceful-restart purge-time**command for more information.

To set the route-hold timer to determine how long a nonstop forwarding (NSF)-aware router that is running Enhanced Interior Gateway Routing Protocol (EIGRP) will hold routes for an inactive peer, use the timers nsf route-hold command in router configuration mode. 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, for which EIGRP will hold routes for an inactive peer. Valid range is 20 to 300 seconds. The default is 240 seconds.

Command Default

EIGRP NSF awareness is enabled by default. The default value for the route-hold timer is 240 seconds.

Command Modes

Router configuration (config-router)

Command History

Release	Modification
12.2(15)T	This command was introduced.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.0(1)M	This command was replaced by the **timers graceful-restart purge-time**command.
12.2(33)SRE	This command was replaced by the **timers graceful-restart purge-time**command.

Usage Guidelines

The route-hold timer sets the maximum period of time that the NSF-aware router will hold 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 null 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.

Examples

The following configuration example sets the route-hold timer value for an NSF-aware router. In the example, the route-hold timer is set to 2 minutes:

```
Router(config-router)# timers nsf route-hold 120
```

Related Commands

Command	Description
debug eigrp nsf	Displays EIGRP NSF-specific events in the console of a router.
debug ip eigrp notifications	Displays EIGRP events and notifications in the console of the router.
show ip eigrp neighbors	Displays the neighbors discovered by IP EIGRP.
show ip protocols	Displays the parameters and current state of the active routing protocol process.

timers nsf signal

To adjust the maximum time for the initial signal timer restart period, use the **timers nsf signal** command in router configuration or address family configuration mode. To return the signal timer to the default value, use the **no** form of this command.

timers nsf signal *seconds*
no timers nsf signal

Syntax Description

seconds	Time, in seconds, for which the Enhanced Interior Gateway Routing Protocol (EIGRP) must hold routes for an inactive peer. The range is from 10 to 30. The default is 20.

Command Default

The default signal timer is 20 seconds.

Command Modes

Router configuration (config-router)

Address family configuration (config-router-af)

Command History

Release	Modification
12.2(15)T	This command was introduced.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXH	This command was integrated into Cisco IOS Release 12.2(33)SXH.
15.0(1)M	This command was modified. Support for Address family configuration mode was added.
12.2(33)SRE	This command was modified. Support for Address family configuration mode was added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.
Cisco IOS XE Release 3.6S	This command was modified. Support for IPv6 and IPv6 VPN Routing and Forwarding (VRF) was added.
15.2(2)S	This command was modified. Support for IPv6 and IPv6 VRF was added.

Usage Guidelines

The **timers nsf signal** command is entered only on a nonstop forwarding (NSF)-capable router. The EIGRP process starts a signal timer when it is notified of a switchover event. Hello packets with the RS bit set are sent during this period.

The converge timer is used to wait for the last end-of-table (EOT) update if all startup updates have not been received within the signal timer period. If an EIGRP process discovers no neighbor, or if it has received all startup updates from its neighbor within the signal timer period, the converge timer will not be started.

Note The **timers nsf signal** command is supported only on platforms that support High Availability.

Examples

The following example shows how to adjust the signal timer to 30 seconds on an NSF-capable router:

```
Device(config)# router eigrp virtual-name-1
Device(config-router)# address-family ipv4 autonomous-system 1
Device(config-router-af)# timers nsf signal 30
```

The following example shows how to adjust the signal timer to 30 seconds for EIGRP IPv6 NSF:

```
Device(config)# router eigrp e1
Device(config-router)# address-family ipv6 autonomous-system 1
Device(config-router-af)# timers nsf signal 30
```

Related Commands

Command	Description
debug eigrp address-family ipv6 notifications	Displays information about EIGRP address family IPv6 event notifications.
debug eigrp nsf	Displays notifications and information about NSF events for an EIGRP routing process.
debug ip eigrp notifications	Displays information and notifications for an EIGRP routing process.
nsf (EIGRP)	Enables EIGRP NSF or EIGRP IPv6 NSF on an NSF-capable router.
show eigrp neighbors	Displays the neighbors discovered by EIGRP.
show ip protocols	Displays the parameters and the current state of the active routing protocol process.
show ipv6 protocols	Displays the parameters and the current state of the active IPv6 routing protocol process.
timers graceful-restart purge-time	Sets the graceful-restart purge-time timer to determine how long an NSF-aware router that is running EIGRP must hold routes for an inactive peer.
timers nsf converge	Sets the maximum time that the restarting router must wait for the end-of-table notification from an NSF-capable or NSF-aware peer.

topology (EIGRP)

To configure an Enhanced Interior Gateway Routing Protocol (EIGRP) process to route IP traffic under the specified topology instance and to enter address-family topology configuration mode, use the **topology** command in address-family configuration mode. To disassociate the EIGRP routing process from the topology instance, use the **no** form of this command.

topology {**base** | *topology-name* **tid** *number*}
no topology *topology-name*

Syntax Description

base	Specifies the base topology.
topology-name	Topology name. The *topology-name* argument is case-sensitive.
tid *number*	Specifies the topology ID number. The range is 1 to 65535.

Command Default

EIGRP routing processes are not configured to route IP traffic under a topology instance.

Command Modes

Address-family configuration (config-router-af)

Command History

Release	Modification
12.2(33)SRB	This command was introduced.
15.0(1)M	This command was integrated into Cisco IOS Release 15.0(1)M.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

The **topology** command is used in a Multitopology Routing (MTR) configuration to enable an EIGRP process under the specified topology. The **topology** command is entered under address-family configuration mode. Command configurations are applied only to the topology instance. The topology must be defined globally with the **global-address-family** command in global address-family configuration mode before the topology can be configured under the EIGRP process.

The **tid** keyword associates an ID with the topology instance. Each topology must be configured with a unique topology ID. The topology ID is used to identify and group Network Layer Reachability Information (NLRI) for each topology in EIGRP updates.

The topology ID must be consistent across devices so that EIGRP can correctly associate topologies.

Examples

The following example configures EIGRP process 1 to route traffic for the 192.168.0.0/16 network under the VOICE topology instance:

```
Device(config)# router eigrp 1
Device(config-router)# address-family ipv4 unicast autonomous-system 3
Device(config-router-af)# topology VOICE tid 100
Device(config-router-af-topology)# no auto-summary
Device(config-router-af-topology)# network 192.168.0.0 0.0.255.255
```

```
Device(config-router-af-topology)# end
```

Related Commands

Command	Description
clear ip eigrp	Resets EIGRP process and neighbor session information.
global-address-family ipv4	Enters global address family configuration mode to configure MTR.
topology (interface)	Configures an MTR topology instance on an interface.

traffic-share balanced

To c ontrol how traffic is distributed among routes when multiple routes for the same destination network have different costs, use the **traffic-share balanced**command in router configuration mode or address-family topology configuration mode. To disable this function, use the **no** form of the command.

traffic-share balanced
no traffic-share balanced

Syntax Description

This command has no arguments or keywords.

Command Default

Traffic is distributed proportionately to the ratios of the metrics.

Command Modes

Router configuration (config-router) Address-family topology configuration (config-router-af-topology)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)M	This command was modified. Address-family topology configuration mode was added.
12.2(33)SRE	This command was modified. Address-family topology configuration mode was added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

This command applies only to Enhanced Interior Gateway Routing Protocol (EIGRP). With the default setting, routes that have higher metrics represent less-preferable routes and get less traffic.

Examples

In the following example, traffic is balanced across multiple routes:

```
Router(config)# router eigrp 5
Router(config-router)# traffic-share balanced
Router(config-router)# variance 1
```

In the following EIGRP named configuration example, traffic is balanced across multiple routes:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# network 10.0.0.0
Router(config-router-af)# topology base
```

```
Router(config-router-af-topology)# traffic-share balanced
Router(config-router-af-topology)# variance 1
```

Related Commands

Command	Description
variance (EIGRP)	Controls load balancing in an EIGRP network.

variance (EIGRP)

To control load balancing in an internetwork based on the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **variance** command in router configuration mode or address-family topology configuration mode. To reset the variance to the default value, use the **no** form of this command.

variance *multiplier*
no variance

Syntax Description

multiplier	Metric value used for load balancing. It can be a value from 1 to 128. The default is 1, which means equal-cost load balancing.

Command Default

EIGRP uses equal-cost load balancing.

Command Modes

Router configuration (config-router) Address-family topology configuration (config-router-af-topology)

Command History

Release	Modification
10.0	This command was introduced.
12.4(6)T	Support for IPv6 was added.
12.2(33)SRB	This command was integrated into Cisco IOS Release 12.2(33)SRB.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
15.0(1)	This command was modified. Address-family topology configuration mode was added.
12.2(33)SRE	This command was modified. Address-family topology configuration mode was added.
12.2(33)XNE	This command was integrated into Cisco IOS Release 12.2(33)XNE.
Cisco IOS XE Release 2.5	This command was integrated into Cisco IOS XE Release 2.5.

Usage Guidelines

Setting a variance value enables EIGRP to install multiple loop-free routes with unequal cost in a local routing table. A route learned through EIGRP must meet two criteria to be installed in the local routing table:

- The route must be loop- free. This condition is satisfied when the reported distance is less than the total distance or when the route is a feasible successor.
- The metric of the route must be lower than the metric of the best route (the successor) multiplied by the variance configured on the router.

Thus, if the variance is set to 1, only routes with the same metric as the successor are installed in the local routing table. If the variance is set to 2, any EIGRP-learned route with a metric less than 2 times the successor metric will be installed in the local routing table.

Note EIGRP does not load-share between multiple routes; it only installs the routes in the local routing table. Then, the local routing table enables switching hardware or software to load-share between the multiple paths.

Examples

The following example sets a variance value of 4:

```
Router(config)# router eigrp 109
Router(config-router)# variance 4
```

The following example sets a variance value of 4 in address-family topology configuration mode:

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 4453
Router(config-router-af)# network 10.0.0.0
Router(config-router-af)# topology base
Router(config-router-af-topology)# variance 4
```

vnet

To override interface configurations on a per-virtual routing and forwarding (VRF) basis, use the **vnet** command in the appropriate configuration mode. To remove VRF-specific configurations, use the **no** form of this command.

vnet {**global** | **name** *vrf-name*}
no vnet {**global** | **name** *vrf-name*}

Syntax Description

global	Allows the parent interface and subinterfaces to have different configurations. This is helpful when you have untagged packets arriving on the parent interface; **vnet global** configurations are applied to such packets. **Note** Every router has a predefined virtual Network (vNET) known as "vNET global," which refers to the global routing context, corresponds to the default Routing Information Base (RIB), is the default routing table, and carries untagged traffic. By default, interfaces belong to vNET global.
name *vrf-name*	Specifies a VRF that is included in the list of VRFs assigned to the interface by the **vnet trunk** command.

Command Default

Only vNET global exists.

Command Modes

Interface configuration (config-if)

Virtual network interface configuration (config-if-vnet)

Address family interface configuration (config-router-af-interface)

Command History

Release	Modification
Cisco IOS XE Release 3.2S	This command was introduced.
Cisco IOS XE Release 3.5S	This command was modified. The command was made available in address family interface configuration mode in EIGRP-named mode configurations.
15.2(1)S	This command was integrated into Cisco IOS Release 15.2(1)S. and modified. The command was made available in address family interface configuration mode in EIGRP-named mode configurations.
15.0(1)SY	This command was integrated into Cisco IOS Release 15.0(1)SY.
15.1(1)SG	This command was integrated into Cisco IOS Release 15.1(1)SG.
Cisco IOS XE Release 3.3SG	This command was integrated into Cisco IOS XE Release 15.1(1)SG.
15.3(2)T	This command was integrated into Cisco IOS Release 15.3(2)T.

Usage Guidelines

This command can be used in interface configuration mode to configure vNET commands on the interface only if the interface is configured as a trunk interface. Any commands entered after the **vnet** command will be disabled on any interface that does not have the **vnet trunk** command configured.

VRF subinterfaces inherit certain configurations from the parent interface. An example is the **ip ospf cost** command.

Use the **vnet** command if you want to configure a VRF-specific command that is different from a command configured on the parent interface. Use this command to enter virtual network interface mode and then configure commands that will apply to a specified VRF.

Examples

The following example using the **vnet** command shows how to define a VRF instance named vrf1 on Gigabit Ethernet interface 1/1/1. The system then enters virtual network interface mode and the user configures the Open Shortest Path First (OSPF) value to 30 that overrides the value inherited by the VRFs on the trunk interface, which had an OSPF cost of 20.

```
Router(config)# interface gigabitethernet 1/1/1
Router(config-if) vnet trunk
Router(config-if) ip address 10.1.2.1 255.255.255.0
Router(config-if) ! Set OSPF cost for all vNETs on this interface to 20.
Router(config-if) ip ospf cost 20
Router(config-if) vnet name vrf1
Router(config-if) ! Set OSPF cost for vrf1 to 30.
Router(config-if-vnet) ip ospf cost 30
Router(config-if-vnet) exit-if-vnet
```

The following example using the **vnet** command shows how to define vrf1 on Gigabit Ethernet interface 1/1/1. The system then enters virtual network interface mode and the user configures the OSPF cost value to 40, which applies to **vnet global** only.

```
Router(config)# interface gigabitethernet1/1/1
Router(config-if) vnet trunk
Router(config-if) ip address 10.1.2.1 255.255.255.0
Router(config-if) vnet global
Router(config-if-vnet) ! Set OSPF cost for global to 40.
Router(config-if-vnet) ip ospf cost 40
Router(config-if-vnet) exit-if-vnet
```

Related Commands

Command	Description
vnet trunk	Configures an interface to be a trunk interface.
ip ospf cost	Specifies the cost of sending a packet on an interface .