A through H

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.

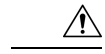
Command Modes

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.