A through H

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.
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.

Release	Modification
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.
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.

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

Command Default

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.

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-number*| *acl-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-number*| *acl-name*]

no default-information {**in**| **out**} [*acl-number*| *acl-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.

Release	Modification
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
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 can be redistributed without a default metric. The metric of redistributed connected routes is set to 0.

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.

Release	Modification
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.
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 a default metric to redistribute a protocol into EIGRP, unless you use the **redistribute**command.

Metric defaults have been carefully set to work for a wide variety of networks. Take great care when changing these values.

Default metrics are supported only when you are redistributing from EIGRP or static routes.

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.
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
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
```

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 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.

Release	Modification
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.
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.

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.

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.

Command	Description
router eigrp	Configures the EIGRP address-family process.

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.