

EIGRP Commands

Note All commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 540 Series Router that is introduced from Cisco IOS XR Release 6.6.3.

This module describes the commands used to configure and monitor the Enhanced Interior Gateway Routing Protocol (EIGRP) protocol on Cisco NCS 5500 Series Routers.

For detailed information about EIGRP concepts, configuration tasks, and examples, see the Implementing BFD on Routing Command Reference for Cisco NCS 5500 Series Routers module in the *Routing Configuration Guide for Cisco NCS 5500 Series Routers*.

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address-family (EIGRP)

To enable an IPv4 address family under Enhanced Interior Gateway Routing Protocol (EIGRP), use the **address-family** command in the appropriate mode. To remove the address family from the EIGRP configuration, use the **no** form of this command.

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

Syntax Description

ipv4	Selects IPv4 address family.

Command Default

No default behavior or values

Command Modes

Router configuration

VRF configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **address-family ipv4** command to configure IPv4 address family sessions in EIGRP.

EIGRP Virtual Private Networks (VPNs) can be configured under IPv4 address family configuration modes after first entering VRF configuration mode. All commands in address family configuration mode can be configured in VRF address families except the **autonomous-system** and **maximum-prefix** commands.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to configure an IPv4 VRF address family session after defining the VRF named vrf1:

```
Routing(config)# router eigrp 1
Routing(config-eigrp)# vrf vrf1
Routing(config-eigrp-vrf)# address-family ipv4
Routing(config-eigrp-vrf-af)# default-metric 1000 100 255 1 1500
```

authentication keychain

To authenticate all EIGRP protocol traffic on one or more interfaces based on the MD5 algorithm, use the **authentication keychain** command in an appropriate configuration mode. To disable authentication, use the **no** form of this command.

authentication keychain *key-chain-name*
no authentication keychain *key-chain-name*

Syntax Description

key-chain-name	Name of the authentication keychain

Command Default

Authentication is disabled.

Command Modes

IPv4 address family interface configuration

IPv6 address family interface configuration

IPv4 VRF address family interface configuration

IPv6 VRF address family interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **address-family ipv4** command to configure IPv4 address family sessions in EIGRP and the **address-family ipv6** command to configure IPv6 address family sessions in EIGRP.

EIGRP Virtual Private Networks (VPNs) can be configured under IPv4 and IPv6 address family configuration modes after first entering VRF configuration mode.

Examples

The following example shows how to enable an EIGRP authentication keychain:

```
Router# configure eigrp 1
Router(config-eigrp)# address-family ipv4
Router(config-eigrp-af)# interface GigabitEthernet 0/2/0/0
Router(config-eigrp-if)# authentication key chain key1
```

auto-summary (EIGRP)

To allow automatic summarization of subnet routes into network-level routes for an Enhanced Interior Gateway Routing Protocol (EIGRP) process, use the **auto-summary** command in the appropriate configuration mode. To disable 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 keywords or arguments.

Command Default

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

Command Modes

IPv4 Address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Route summarization reduces the amount of routing information in the routing tables. Use the **auto-summary** command to allow the software to create summary subprefixes to the classful network boundary when crossing classful network boundaries.

EIGRP summary routes are given an administrative distance value of 5. You cannot configure this value.

Examples

The following example shows how to enable automatic summarization for EIGRP 1:

```
Router(config)# router eigrp 1
Router(config-eigrp)# vrf vpn-1
Router(config-eigrp-vrf)# address-family ipv4
Router(config-eigrp-vrf-af)# auto-summary
```

autonomous-system

To configure an Enhanced Interior Gateway Routing Protocol (EIGRP) routing process to run within a VPN routing and forwarding instance (VRF), use the **autonomous-system** command in IPv4 VRF address family configuration mode.

To configure the autonomous-system number for an address-family of Enhanced Interior Gateway Routing Protocol (EIGRP) routing process, use the **autonomous-system** command in the address family configuration mode. To remove the autonomous-system number for an address-family of EIGRP routing process, use the **no** form of this command.

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

Syntax Description

as-number	Autonomous system number of the EIGRP routing process. Range is from 1 to 65535.

Command Default

None

Command Modes

IPv4 address family configuration (For EIGRP configured using virtual-name only).

IPv4 VRF address family configuration.

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **autonomous-system** command in IPv4 VRF address family configuration mode.

The same VRF-autonomous-system combination cannot be used across multiple process instances.

Task ID

Task ID	Operations
eigrp	read, write

Examples

This example shows how to configure autonomous system 101 under VRF VPN-1:

```
Router(config)# router eigrp 1
Router(config-eigrp)# vrf vpn-1
Router(config-eigrp-vrf)# address-family ipv4
Router(config-eigrp-vrf-af)# autonomous-system 101
```

This example shows how to configure autonomous-system 1 for default/global VRF of EIGRP configured using virtual-name:

```
Router(config)# router eigrp name
Router(config-eigrp)# address-family ipv4
```

```
Router(config-eigrp-af)# autonomous-system 1
```

bandwidth-percent (EIGRP)

To configure the percentage of bandwidth that may be used by EIGRP on an interface, use the **bandwidth-percent** command in interface configuration mode. To restore the default value, use the **no** form of this command.

bandwidth-percent *percent*
no bandwidth-percent

Syntax Description

percent	Percentage of bandwidth that EIGRP may use.

Command Default

percent : 50

Command Modes

Interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

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

Examples

The following example shows how to configure EIGRP to use up to 75 percent (42 kbps) of an interface in autonomous system 209:

```
Router(config)# router eigrp 1
Router(config-eigrp)# address-family ipv4
Router(config-eigrp-af)# router-id 10.1.1.1
Router(config-eigrp-af)# interface GigabitEthernet 0/1/0/0
Router(config-eigrp-af-if)# bandwidth-percent 75
```

clear eigrp neighbors

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

clear eigrp [*as-number*] [**vrf** {**vrf***all*}] [**ipv4** | **ipv6**] **neighbors** [*ip-addresstype interface-path-id*] [**soft**]

Syntax Description

as-number	(Optional) Autonomous system number. Range is from 1 to 65535.
vrf { *vrf* | **all** }	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances.
ipv4	(Optional) Specifies the IPv4 address family.
ip-address	(Optional) Address of the neighbor.
type	Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
soft	(Optional) Specifies a soft reset.

Command Default

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

Command Modes

EXEC configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to clear all EIGRP VRF entries for neighbor Gigabit Ethernet interface 0/5/0/0:

```
Router# clear eigrp customer_1 neighbors GigabitEthernet 0/5/0/0
```

clear eigrp topology

To remove and relearn Enhanced Interior Gateway Routing Protocol (EIGRP) topology entries from the appropriate table, use the **clear eigrp topology** command in EXEC configuration mode.

clear eigrp [*as-number*] [**vrf** {**vrf***all*}] [**ipv4** | **ipv6**] **topology** [*prefix mask* *prefixl/length*]

Syntax Description

as-number	(Optional) Autonomous system number. Range is from 1 to 65535.
vrf { *vrf* | **all** }	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances.
ipv4	(Optional) Specifies the IPv4 address family.
prefix	IP prefix, which limits output to a specific route.
mask	IP address mask.
/ *length*	Prefix length, which can be indicated as a slash (/) and number. For example, /8 indicates that the first eight bits in the IP prefix are network bits. If *length* is used, the slash is required.

Command Default

No EIGRP topology entries are cleared.

Command Modes

EXEC configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Examples

The following example shows how to clear EIGRP topology entries for a specific route:

```
Router# clear eigrp topology 10.1.0.0/8
```

default-information

To control the candidate default routing information for an Enhanced Interior Gateway Routing Protocol (EIGRP), use the **defaultinformation** command in the appropriate configuration mode. To suppress EIGRP candidate default information in incoming or outgoing updates, use the **no** form of this command.

default-information allowed {**in** | **out**} [**route-policy** *name*]
no default-information allowed {**in** | **out**} [**route-policy** *name*]

Syntax Description

allowed	Specifies EIGRP to allow default routing information.
in	Specifies EIGRP to allow inbound default routing information.
out	Specifies EIGRP to allow outbound default routing information.
route-policy *name*	(Optional) Specifies a route policy.

Command Default

Default routing information is not accepted or flagged.

Command Modes

Address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to configure inbound default routes specified with route policy acme to be accepted by an EIGRP peer in autonomous system 1:

```
Router(config)# router eigrp 1
Router(config-eigrp)# vrf vrf1
Router(config-eigrp-vrf)# address-family ipv4
Router(config-eigrp-vrf-af)# default-information accept in route-policy acme
```

default-metric (EIGRP)

To set metrics for an Enhanced Interior Gateway Routing Protocol (EIGRP), use the **defaultmetric** command in the appropriate configuration mode. To remove the metric values and restore the default state, use the **no** form of this command.

default-metric *bandwidth delay reliability loading mtu*
no default-metric

Syntax Description

bandwidth	Minimum bandwidth of the route in kilobits per second. Range is 1 to 4294967295.
delay	Route delay in ten microsecond units. Range is 1 to 4294967295.
reliability	Likelihood of successful packet transmission expressed as a number between 0 and 255. The value 255 means 100-percent reliability; 0 means the link is not reliable.
loading	Effective bandwidth of the route expressed as a number from 1 to 255 (255 is 100-percent loading).
mtu	Minimum maximum transmission unit (MTU) size of the route in bytes. Range is from 1 to 65535.

Command Default

No default values

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **default-metric** command to provide default metric values while redistributing a protocol into EIGRP.

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

Task ID

Task ID	Operations
eigrp	read, write

Examples

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

```
Router(config)# router eigrp 1
Router(config-eigrp)# vrf vrf1
```

```
Router(config-eigrp-vrf)# address-family ipv4
Router(config-eigrp-vrf-af)# redistribute rip
Router(config-eigrp-vrf-af)# default-metric 1000 100 250 100 1500
```

distance (EIGRP)

To allow the use of one of two administrative distances—internal and external—that could provide a better route to a node, use the **distance** command in the appropriate 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 EIGRP internal routes. Internal routes are those that are learned from another entity within the same autonomous system (AS). The distance can be a value from 1 to 255.
external-distance	Administrative distance for EIGRP external routes. External routes are those for which the best path is learned from a source external to the AS. The distance can be a value from 1 to 255.

Command Default

internal-distance : 90

external-distance : 170

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

An administrative distance is a rating of the trustworthiness of a routing information source, such as an individual router or a group of routers. Numerically, an administrative distance is an integer from 0 to 255. In general, the higher the value, the lower the trust rating. An administrative distance of 255 means the routing information source cannot be trusted at all and should be ignored.

Use the **distance** command if another protocol is known to provide a better route to a node than was actually learned through the external Enhanced Interior Gateway Routing Protocol (EIGRP) or some internal routes should be preferred by EIGRP.

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

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to set the administrative distance of all EIGRP 1 internal routes (within vrf vpn-1) to 80 and all EIGRP external routes to 130:

```
Router(config)# router eigrp 1
Router(config-eigrp)# vrf vrf1
Router(config-eigrp-vrf)# address-family ipv4
Router(config-eigrp-vrf-af)# distance 80 130
```

hello-interval (EIGRP)

To configure the hello interval for an interface, use the **hello-interval** command in interface configuration mode. To restore the default value, use the **no** form of this command.

hello-interval *seconds*
no hello-interval

Syntax Description

seconds	Hello interval (in seconds). Range is from 1 to 65535.

Command Default

For low-speed, nonbroadcast multiaccess (NBMA) networks: 60 seconds

For all other networks: 5 seconds

Command Modes

Interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to set the hello interval to 10 seconds for the interface:

```
Router(config)# router eigrp 1
Router(config-eigrp)# address-family ipv4
Router(config-eigrp)# router-id 10.1.1.1
Router(config-eigrp-af)# interface GigabitEthernet 0/1/0/0
Router(config-eigrp-af-if)# hello-interval 10
```

hold-time (EIGRP)

To configure the hold time for an interface, use the **hold-time** command in interface configuration mode. To restore the default value, use the **no** form of this command.

hold-time *seconds*
no hold-time

Syntax Description

seconds	Hold time (in seconds). Range is from 1 to 65535.

Command Default

Three times the default hello interval time of 15 seconds.

Command Modes

Interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

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

We recommend that the hold time be at least three times the hello interval. If a router does not receive a hello packet within the specified hold time, routes through this router are considered unavailable.

Increasing the hold time delays route convergence across the network.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to set the hold time to 0 to 40 seconds for the interface:

```
Router(config)# router eigrp 1
Router(config-eigrp)# address-family ipv4
Router(config-eigrp)# router-id 10.1.1.1
Router(config-eigrp-af)# interface GigabitEthernet 0/1/0/0
Router(config-eigrp-af-if)# hold-time 40
```

interface (EIGRP)

To define the interfaces on which the Enhanced Interior Gateway Routing Protocol (EIGRP) routing protocol runs, use the **interface** command in the appropriate configuration mode. To disable EIGRP routing for interfaces, use the **no** form of this command.

interface *type interface-path-id*
no interface *type interface-path-id*

Syntax Description

type	Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

When you do not specify this command in configuration mode, EIGRP routing for interfaces is not enabled.

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **interface** command to associate a specific interface with an EIGRP process. The interface remains associated with the process even when the IPv4 address of the interface changes.

This command places the router in interface configuration mode, from which you can configure interface-specific settings. Commands configured under this mode (such as the **hello-interval** command) are automatically bound to that interface.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to enter interface configuration mode for EIGRP process 1 and set the hello interval to 10 seconds for GigabitEthernet interface 0/1/0/0:

```
Router(config)# router eigrp 1
Router(config-eigrp)# address-family ipv4
Router(config-eigrp)# router-id 10.1.1.1
```

```
Router(config-eigrp-af)# interface GigabitEthernet 0/1/0/0
Router(config-eigrp-af-if)# hello-interval 10
```

log-neighbor-changes

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

log-neighbor-changes
no log-neighbor-changes

Command Default

This command has no keywords or arguments.

Adjacency changes are not logged.

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to enable logging of neighbor changes for EIGRP 1:

```
Router(config)# router eigrp 1
Router(config-eigrp)# address-family ipv4
Router(config-eigrp-af)# log-neighbor-changes
```

log-neighbor-warnings

To enable the logging of Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor warning messages, use the **log-neighbor-warnings** command in the appropriate configuration mode. To disable the logging of EIGRP neighbor warning messages, use the **no** form of this command.

log-neighbor-warnings
no log-neighbor-warnings

Syntax Description

This command has no keywords or arguments.

Command Default

Neighbor warning messages are not logged.

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **log-neighbor-warnings** command to disable and enable neighbor warning messages. When neighbor warning messages occur, they are not logged by default.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to configure log neighbor warning messages for EIGRP process 20:

```
Router(config)# router eigrp 20
Router(config-eigrp) vrf vrf1
Router(config-eigrp-vrf)# address-family ipv4
Router(config-eigrp-vrf-af)# log-neighbor-warnings
```

maximum-paths (EIGRP)

To control the maximum number of parallel routes that the Enhanced Interior Gateway Routing Protocol (EIGRP) can support, use the **maximum-paths** command in the appropriate configuration mode. To remove the **maximum-paths** command from the configuration file and restore the system to its default condition with respect to the routing protocol, use the **no** form of this command.

maximum-paths *maximum*
no maximum-paths

Syntax Description

maximum	Maximum number of parallel routes that EIGRP can install in a routing table. Range is from 1 to 32 routes .

Command Default

maximum : 4

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **maximum-paths** command to allow the EIGRP protocol to install multiple paths into the routing table for each prefix. Multiple paths are installed for both internal and external routes, providing these routes are learned in the same autonomous system and that they are equal cost (according to the EIGRP best path algorithm).

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to allow a maximum of 10 paths to a destination:

```
Router(config)# router eigrp 1
Router(config-eigrp) vrf vrf1
Router(config-eigrp-vrf)# address-family ipv4
Router(config-eigrp-vrf-af)# maximum-paths 10
```

maximum-prefix (EIGRP)

To limit the number of prefixes that are accepted under a VRF address family by Enhanced Interior Gateway Routing Protocol (EIGRP), use the **maximum-prefix** command in IPv4 VRF address family configuration mode. To disable this function, use the **no** form of this command.

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

Syntax Description

maximum	Maximum number of prefixes allowed under an address family. Range is from 1 to 4294967295. The number of prefixes that can be configured is limited only by the available system resources on the router.
threshold	(Optional) Syslog warning messages are specified as a percentage of the maximum prefix limit that was exceeded. The prefix percentage number range is from 1 to 100. The default is 75 percent.
dampened	(Optional) A decay penalty is applied to the restart time period each time the maximum prefix limit is exceeded. The half-life for the decay penalty is 150 percent of the default or user-defined restart time value in minutes. This keyword is disabled by default.
reset-time *minutes*	(Optional) The restart count is reset to 0 after the default or user-defined reset time period has expired. The range of values that can be applied with the *minutes* argument is from 1 to 65535 minutes. The default reset-time period is 15 minutes.
restart *minutes*	(Optional) A time period when router adjacencies are not formed or when redistributed routes are not accepted from the RIB after the maximum prefix limit has been exceeded. The value for the *minutes* argument is from 1 to 65535 minutes. The default restart time period is 5 minutes.
restart-count *number*	(Optional) Number of times a peering session is automatically reestablished after the peering session is torn down or after the redistribute route is cleared and relearned when the maximum prefix exceeds limits. The default restart count limit is 3. **Caution** After the restart count threshold is crossed, you need to use the `clear eigrp neighbors` command to re-establish normal peering, redistribution, or both.
warning-only	(Optional) Configures the router to generate syslog messages only when the maximum prefix limit is reached, instead of terminating the peering session.

Command Default

threshold: 75 percent

dampened : False

reset-time : 15 minutes

restart : 5 minutes

restart-count : 3

warning-only : False

Command Modes

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
eigrp	read, write

Examples

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

```
Router(config)# router eigrp 1
Router(config-eigrp)# vrf vrf1
Router(config-eigrp-vrf)# address-family ipv4
Router(config-eigrp-vrf-af)# maximum-prefix 50000
```

metric (EIGRP)

To set metrics for an Enhanced Interior Gateway Routing Protocol (EIGRP) interface, use the **metric** command in interface configuration mode. To remove the metric values and restore the default state, use the **no** form of this command.

metric {**bandwidth** | **delay** | **load** | **reliability**}
no metric

Syntax Description

bandwidth	Minimum interface bandwidth of the route in kilobits per second. Range is 1 to 4294967295.
delay	Interface route delay in tens of microseconds. Delay is 1 or any positive number that is a multiple of 39.1 nanoseconds. Range is 1 to 4294967295.
load	Effective bandwidth of the route expressed as a number from 1 to 255 (255 is 100-percent loaded).
reliability	Likelihood of successful packet transmission expressed as a number between 0 and 255. The value 255 means 100-percent reliability; 0 means no reliability.

Command Default

Metric values are not set.

Command Modes

Interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **metric** command to provide metric values while redistributing a protocol into an EIGRP interface. Metric defaults have been carefully set to work for a wide variety of networks. Take great care when changing these values.

This example shows how to configure metric values for interface POS 0/1/0/1 with values as bandwidth = 100, delay = 7, reliability = 250, and load = 100.

```
Router# configure
Router(config)# router eigrp 100
Router(config-eigrp)# address-family ipv4
Router(config-eigrp-af)# interface GigabitEthernet 0/1/0/1
Router(config-eigrp-af-if)# metric bandwidth 100 delay 7 reliability 250 load 100
```

metric maximum-hops

To advertise as unreachable those Enhanced Interior Gateway Routing Protocol (EIGRP) routes with a hop count higher than is specified by the command, use the **metric maximum-hops** command in the appropriate configuration mode. To reset the value to the default, use the **no** form of this command.

metric maximum-hops *hops-number*
no metric maximum-hops

Syntax Description

hops-number	Maximum hop count. Range is from 1 to 255 hops.

Command Default

hops-number : 100

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **metric maximum-hops** command to provide a safety mechanism that breaks any potential *count-to-infinity* problems. This command causes the EIGRP routing protocol to advertise as unreachable routes with a hop count greater than the value assigned to the *hops-number* argument.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to configure a hop count to 200 for a router that has a complex WAN generating a large hop count under normal (nonlooping) operations.

```
Router(config)# router eigrp 1
Router(config-eigrp) address-family ipv4
Router(config-eigrp-af)# metric maximum-hops 200
```

metric version (EIGRP)

By default, EIGRP uses a 64-bit metric to calculate route metrics. To switch to a 32-bit metric version for route metric calculation, use the **metric version** command in the appropriate configuration mode.

metric version { **32bit** }

Syntax Description

32bit	Changes the EIGRP route metric calculation from the default 64-bit version to 32-bit version.

Command Default

By default, EIGRP uses 64-bit metric calculation.

Command Modes

IPv4 address family configuration

Command History

Release	Modification
Release 5.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **metric version** command within the EIGRP address-family configuration mode to switch the metric calculation to 32-bit.

Task ID

Task ID	Operations
eigrp	read, write

Related Commands

Command	Description
default-metric (EIGRP)	Sets default metric values for redistributed routes

metric rib-scale

To set a RIB scale for EIGRP, use the **metric rib-scale** command in an appropriate configuration mode. To remove the RIB scale and restore the default state, use the **no** form of this command.

metric rib-scale *scale-down-value*
no metric rib-scale

Syntax Description

scale-down-value	Amount to divide the EIGRP Wide Metric by to convert to a 4 Byte RIB metric. Legal ranges are 1-256. Results are expressed as whole integers only (no rounding).

Command Default

Default RIB scale is 128 in the 64 bit mode.

In 32 bit mode, rib scale is always 1.

Command Modes

IPv4 address family configuration

IPv6 address family configuration

IPv4 VRF address family configuration

IPv6 VRF address family configuration (Only supported in 64 bit mode)

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

The ability to scale the RIB metric is provided through the use of the **metric rib-scale** configuration command. When entered, the command will result in all routes in the RIB being cleared and replaced with the new metric values.

Task ID

Task ID	Operation
eigrp	read, write

This example shows how to set the metric rib-scale as 64:

```
Router#configure
Router(config)#router eigrp 1
Router(config-eigrp)#address-family ipv4
Router(config-eigrp-af)#metric rib-scale 64
```

metric weights

To allow the tuning of the Enhanced Interior Gateway Routing Protocol (EIGRP) metric calculations, use the **metric weights** command in the appropriate configuration mode. To reset the values to their defaults, use the **no** form of this command.

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

Syntax Description

tos	Type of service (ToS) which must always be 0.
k1 k2 k3 k4 k5	Constants that convert an EIGRP metric vector into a scalar quantity. The range is 0 to 4294967295.

Command Default

tos: 0

k1: 1

k2: 0

k3: 1

k4: 0

k5: 0

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **metric weights** command to alter the default behavior of EIGRP routing and metric computation and allow the tuning of the EIGRP metric calculation for a particular ToS.

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

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

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

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

Bandwidth is inverse minimum bandwidth of the path in BPS scaled by a factor of 2.56 * 1012. The range is from a 1200-bps line to 10 terabits per second.

Delay is in units of 10 microseconds. The range of delay is from 10 microseconds to 168 seconds. A delay of all 1s indicates that the network is unreachable.

The delay parameter is stored in a 32-bit field, in increments of 39.1 nanoseconds. The range of delay is from 1 (39.1 nanoseconds) to hexadecimal FFFFFFFF (decimal 4,294,967,040 nanoseconds). A delay of all 1s (that is, a delay of hexadecimal FFFFFFFF) indicates that the network is unreachable.

This table lists the default values used for several common media.

Table 1: Bandwidth Values by Media Type

Media Type	Delay	Bandwidth
Satellite	5120 (2 seconds)	5120 (500 megabits)
Ethernet	25600 (1 milliseconds [ms])	256000 (10 megabits)
1.544 Mbps	512000 (20,000 ms)	1,657,856 bits
64 kbps	512000 (20,000 ms)	40,000,000 bits
56 kbps	512000 (20,000 ms)	45,714,176 bits
10 kbps	512000 (20,000 ms)	256,000,000 bits
1 kbps	512000 (20,000 ms)	2,560,000,000 bits

Reliability is given as a fraction of 255. That is, 255 is a reliability of 100 percent or a perfectly stable link. Load is given as a fraction of 255. A load of 255 indicates a completely saturated link.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to set the metric weights to change the default values:

```
Router(config)# router eigrp 1
Router(config-eigrp) address-family ipv4
Router(config-eigrp-af)# metric weights 0 2 0 2 0 0
```

neighbor (EIGRP)

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

neighbor *ip-address interface* [**remote** [*max-hops*]]
noneighbor *ip-address interface* [**remote** [*max-hops*]]

Syntax Description

ip-address	IP address of a peer router with which routing information is exchanged.
interface	Interface through which peering is established.
remote	Specifies that the neighbor is remote.
max-hops	The maximum number of hops within which the neighbor is expected to be reachable from the configured router. The default value is 100 hops.

Command Default

No neighboring routers are defined.

Command Modes

Interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **neighbor** command to permit the point-to-point (nonbroadcast) exchange of routing information.

If a neighbor is configured on an interface using the **neighbor** command, the interface stops sending or receiving multicast hello messages. However, the interface can send or receive unicast hello messages. So each neighbor on a LAN must be configured individually .Multiple **neighbor** commands can be used to specify additional neighbors or peers.

Task ID

Task ID	Operations
eigrp	read, write

Examples

This example shows how to permit the sending of EIGRP updates to specific neighbors. One copy of the update is generated for each neighbor:

```
Router(config)# router eigrp 100
Router(config-eigrp) address-family ipv4
Router(config-eigrp-af)# interface GigabitEthernet 0/0/0/3
Router(config-eigrp-af-if)# neighbor 172.20.1.2 remote 10
```

neighbor maximum-prefix

To limit the number of prefixes that are accepted from a single Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor or all EIGRP VPN neighbors, use the **neighbor maximum-prefix** command in IPv4 VRF address family configuration mode. To disable this function, use the **no** form of this command.

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

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

Syntax Description

ip-address	(Optional) IP address of a single peer.
maximum	Maximum number of prefixes accepted. The range is from 1 to 4294967295. The number of prefixes that can be configured is limited only by the available system resources on the router.
threshold	(Optional) Syslog warning messages are specified as a percentage of the maximum prefix limit that was exceeded. The prefix percentage number range is from 1 to 100. The default is 75 percent.
dampened	(Optional) Configures a decay penalty to be applied to the restart time period each time the maximum prefix limit is exceeded. The half-life for the decay penalty is 150 percent of the default or user-defined restart time value in minutes. This keyword is disabled by default.
reset-time *minutes*	(Optional) Configures the router to reset the restart count to 0 after the default or configured reset time period has expired. The range is from 1 to 65535 minutes.
restart *minutes*	(Optional) Configures a time period in which the router does not form adjacencies or accept redistributed routes from the RIB after the maximum prefix limit has been exceeded. The range is from 1 to 65535 minutes.
restart-count *number*	(Optional) Configures the number of times a peering session can be automatically reestablished after the peering session has been torn down or a redistribute route has been cleared and relearned because the maximum prefix limit has been exceeded. **Caution** After the restart count threshold is crossed, you need to use the **clear eigrp neighbors** command to reestablish normal peering, redistribution, or both.
warning-only	(Optional) Configures the router to generate syslog messages only when the maximum prefix limit is reached, instead of terminating the peering session.

Command Default

threshold: 75 percent

dampened : disabled

warning-only : disabled

reset-time : 15 minutes

restart : 5 minutes

restart-count : 3

Command Modes

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

The **neighbor maximum-prefix**command is configured to protect an individual peering session or all peering sessions. When this feature is enabled and the maximum prefix limit is exceeded, the router tears down the peering session, clears all routes that are learned from the peer, and then places the peer in a penalty state for the default or user-defined time period. After the penalty time period expires, normal peering is reestablished.

Note In EIGRP, **neighbor** commands have been used traditionally to configure static neighbors. In the context of this feature, however, the **neighbor maximum-prefix** command can be used to configure the maximum prefix limit for both statically configured and dynamically discovered neighbors.

When configuring the **neighbor maximum-prefix** command to protect a single peering session, just the maximum prefix limit, percentage threshold, and warning only configuration options can be configured. Session dampening, restart, and reset timers are configured on a global basis.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to configure the maximum prefix limit for a single peer. The maximum limit is set to 1000 prefixes, and the warning threshold is set to 80 percent. When the maximum prefix limit is exceeded, the session with this peer is torn down, all routes learned from this peer are removed from the topology and routing tables, and this peer is placed in a penalty state for 5 minutes (default penalty value).

```
Router(config)# router eigrp 1
Router(config-eigrp)# vrf vrf1
Router(config-eigrp-vrf)# address-family ipv4
Router(config-eigrp-vrf-af)# neighbor 10.0.0.1 maximum-prefix 1000 80
```

The following example shows how to configure the maximum prefix limit for all peers. The maximum limit is set to 10,000 prefixes, the warning threshold is set to 90 percent, the restart timer is set to 4 minutes, a decay penalty is configured for the restart timer with the **dampened** keyword, and all

timers are configured to be reset to 0 every 60 minutes. When the maximum prefix limit is exceeded, all peering sessions are torn down, all routes learned from all peers are removed from the topology and routing tables, and all peers are placed in a penalty state for 4 minutes (user-defined penalty value). A dampening exponential decay penalty is also applied.

```
  Router(config)# router eigrp 1
  Router(config-eigrp)# vrf vrf1
  Router(config-eigrp-vrf)# address-family ipv4
  Router(config-eigrp-vrf-af)# neighbor maximum-prefix 10000 90 dampened reset-time 60
restart4
```

next-hop-self disable

To instruct the Enhanced Interior Gateway Routing Protocol (EIGRP) process to use the received next-hop value when advertising the routes, use the **next-hop-self disable**command in interface configuration mode. To revert to the default, use the **no** form of this command.

next-hop-self disable
no next-hop-self disable

Syntax Description

This command has no keywords or arguments.

Command Default

EIGRP always sets the IP next-hop value to be itself.

Command Modes

Interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

EIGRP, by default, sets the IP next-hop value to be itself for routes that it is advertising, even when advertising those routes on the same interface from which learned them. To change this default, you must use the **next-hop-self disable** interface configuration command to instruct EIGRP to use the received next-hop value when advertising these routes.

The **next-hop-self disable** feature is not available for redistributed routes.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to change the default IP next-hop value and instruct EIGRP to use the received next-hop value:

```
Router(config)# router eigrp 1
Router(config-eigrp) address-family ipv4
Router(config-eigrp-af)# interface GigabitEthernet 0/1/0/0
Router(config-eigrp-af-if)# next-hop-self disable
```

passive-interface (EIGRP)

To disable sending and receiving "hello" messages on an Enhanced Interior Gateway Routing Protocol (EIGRP) interface and to disable formation of neighbors on the interface, use the **passive-interface** command in interface configuration mode. To reenable sending and receiving "hello messages", use the **no** form of this command.

passive-interface
no passive-interface

Syntax Description

This command has no keywords or arguments.

Command Default

passive-interface command is disabled on an interface.

Command Modes

Interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **passive-interface** command to disable sending of "hello" massages. The particular subnet on that interface will continue to be advertised by EIGRP to neighbors on other interfaces.

Task ID

Task ID	Operations
eigrp	read, write

Examples

This example shows how to configure **passive-interface** command on GigabitEthernet interface 0/6/5/0:

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp) address-family ipv6
RP/0/RP0/CPU0:router(config-eigrp-af)# interface GigabitEthernet 0/6/5/0
RP/0/RP0/CPU0:router(config-eigrp-af-if)# passive-interface
```

redistribute (EIGRP)

To inject routes from one routing domain into the Enhanced Interior Gateway Routing Protocol (EIGRP), use the **redistribute** command in the appropriate configuration mode. To remove the **redistribute** command from the configuration file and restore the system to its default condition in which the software does not redistribute routes, use the **no** form of this command.

redistribute {**{bgp** | **connected** | **isis** | **ospf** | **rip** | **static** | **eigrp}** | [*as-numberinstance-name*]}[**route-policy** *name*]
no redistribute

Syntax Description

bgp	Distributes routes from the BGP protocol.
connected	Distributes routes that are established automatically by virtue of having enabled IP on an interface.
isis	Distributes routes from the IS-IS protocol.
ospf	Distributes routes from the OSPF protocol. This protocol is supported in the IPv4 address family.
static	Redistributes IP static routes.
as-number | *instance-name*	Represents one of the following three options: For the **bgp** keyword: Range for 2-byte Autonomous system numbers (ASNs) is 1 to 65535. Range for 4-byte Autonomous system numbers (ASNs) in asplain format is 1 to 4294967295. Range for 4-byte Autonomous system numbers (ASNs) is asdot format is 1.0 to 65535.65535. For the **isis** keyword, an IS-IS instance name from which routes are to be redistributed. The value takes the form of a string. A decimal number can be entered, but it is stored internally as a string. For the **ospf** keyword, an OSPF instance name from which routes are to be redistributed. The value takes the form of a string. A decimal number can be entered, but it is stored internally as a string.
route-policy *name*	(Optional) Specifies the identifier of a configured policy. A policy is used to filter the importation of routes from this source routing protocol to EIGRP.

Command Default

Route redistribution is disabled.

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Redistributed routing information should always be filtered by the **route- policy** *name* keyword and argument. This filtering ensures that only those routes intended by the administrator are redistributed by EIGRP.

A default metric is usually required to redistribute routes from another protocol into EIGRP. The metric is configured through the **default-metric** command or under the route policy configured with the **redistribute** command. The one exception to this requirement is when EIGRP redistributes BGP routes on a provider edge (PE) router in an MPLS-VPN scenario. If the originating protocol of the route is EIGRP with the same autonomous system (as in MPLS-VPN), the metric would be learned automatically from the extended communities of the BGP route.

Task ID

Task ID	Operations
eigrp	read, write

Examples

This example shows how to cause BGP routes to be redistributed into an EIGRP autonomous system:

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp) address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-af)# redistribute bgp 100
```

This example shows how to redistribute the specified IS-IS process routes into an EIGRP autonomous system within a VPN routing and forwarding instance (VRF). The IS-IS routes are redistributed using route policy 3.

```
RP/0/RP0/CPU0:router(config)# router eigrp 109
RP/0/RP0/CPU0:router(config-eigrp)# vrf vpn-1
RP/0/RP0/CPU0:router(config-eigrp-vrf)# address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-vrf-af)# redistribute isis 108 route-policy 3
```

route-policy (EIGRP)

To apply a routing policy to updates advertised to or received from an Enhanced Interior Gateway Routing Protocol (EIGRP) neighbor, use the **route-policy** command in the appropriate configuration mode. To disable applying routing policy to updates, use the **no** form of this command.

route-policy *route-policy-name* {**in** | **out**}
no route-policy *route-policy-name* {**in** | **out**}

Syntax Description

route-policy-name	Name of route policy.
in	Applies policy to inbound routes.
out	Applies policy to outbound routes.

Command Default

No policy is applied.

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **route-policy** command to specify a routing policy for an inbound or outbound route. The policy can be used to filter routes or modify route attributes.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to apply the IN-Ipv4 policy to inbound IP Version 4 (IPv4) routes:

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp) address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-af)# route-policy IN-IPv4 in
```

router-id (EIGRP)

To configure a router ID for an Enhanced Interior Gateway Routing Protocol (EIGRP) process, use the **router-id** command in the appropriate configuration mode. To cause the software to use the default method of determining the router ID, use the **no** form of this command.

router-id *router-id*
no router-id

Syntax Description

router-id	32-bit router ID value specified in four-part, dotted-decimal notation.

Command Default

If this command is not configured, EIGRP chooses an IPv4 address as the router ID from one of its interfaces.

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

It is good practice to use the **router-id** command to explicitly specify a unique 32-bit numeric value for the router ID. This action ensures that EIGRP can function regardless of the interface address configuration.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to assign the IP address of 172.20.1.1 to the EIGRP process 1:

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp) address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-af)# router-id 172.20.1.1
```

show eigrp accounting

To display prefix accounting information for Enhanced Interior Gateway Routing Protocol (EIGRP) processes, use the **show eigrp accounting** command in EXEC mode.

show eigrp [*as-number*] [**vrf** {*vrf-name* | **all**}] [**ipv4** | **ipv6**] **accounting**

Syntax Description

as-number	(Optional) Autonomous system number. This option is available when a VPN routing and forwarding (VRF) instance is not specified. Range is from 1 to 65535.
vrf { *vrf-name* | **all** }	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances.
[**ipv4**]	(Optional) Specifies the IPv4 address family.

Command Default

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Examples

The following is sample output from the **show eigrp accounting** command:

```
Router# show eigrp accounting

IP-EIGRP accounting for AS(100)/ID(10.0.2.1) Routing Table: RED
Total Prefix Count: 4  States: A-Adjacency, P-Pending, D-Down

State Address/Source   Interface        Prefix   Restart  Restart/
                                        Count     Count   Reset(s)
 P    Redistributed     ----               0          3         211
 A    10.0.1.2          Gi0/6/0/0/         2          0          84
 P    10.0.2.4          Gi00/2/0/3         0          2         114
 D    10.0.1.3          Gi0/6/0/0          0          3           0
```

Note Connected and summary routes are not listed individually in the output of this command but are counted in the total aggregate count for each process.

This table describes the significant fields shown in the display.

Table 2: show eigrp accounting Field Descriptions

Field	Description
EIGRP accounting for AS	Identifies the EIGRP instance along with the AS number, router ID and table ID.
Total Prefix Count	Shows the aggregate sum of the prefixes in an EIGRP instance topology table. The count includes prefixes learned from all neighbors or from redistribution.
States: A-Adjacency, P-Pending, D-Down	A-Adjacency: Indicates a stable adjacency with the neighbor or a normal redistribution state. P-Pending: Neighbor adjacency or redistribution is suspended or in a penalized state because the maximum prefix limit was exceeded. D-Down: Neighbor adjacency or redistribution is suspended permanently until a manual reset is performed with the **clear route** command.
Address/Source	Shows the peer IP address of the redistribution source.
Prefix Count	Displays the total number of learned prefixes by source. **Note** Routes can be learned for the same prefix from multiple sources, and the sum of all prefix counts in this column may be greater than the figure displayed in the “Prefix Count” field.
Restart Count	Number of times a route source exceeded the maximum prefix limit.
Restart Reset(s)	Displays the time, in seconds, that a route source is in a P (penalized) state. If the route source is in an A (stable or normal) state, the displayed time, in seconds, is the time period until penalization history is reset.

show eigrp interfaces

To display information about interfaces configured for Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show eigrp interfaces** command in EXEC mode.

show eigrp [*as-number*] [**vrf** {*vrf-name* | **all**}] [**ipv4** | **ipv6**] **interfaces** [*type interface-path-id*] [**detail**]

Syntax Description

as-number	(Optional) Autonomous system number. This option is available when a VPN routing and forwarding (VRF) instance is not specified. Range for 2-byte Autonomous system numbers (ASNs) is 1 to 65535. Range for 4-byte Autonomous system numbers (ASNs) in asplain format is 1 to 4294967295. Range for 4-byte Autonomous system numbers (ASNs) is asdot format is 1.0 to 65535.65535.
vrf { *vrf-name* | **all** }	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances.
[**ipv4**]	(Optional) Specifies the IPv4 address family.
type	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
detail	(Optional) Displays detailed EIGRP interface information.

Command Default

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **show eigrp interfaces** command to determine on which interfaces EIGRP is active and learn information about EIGRP related to those interfaces.

If an interface is specified, only that interface is displayed. Otherwise, all interfaces on which EIGRP is running are displayed.

If an autonomous system is specified, only the routing process for the specified autonomous system is displayed. Otherwise, all EIGRP processes are displayed.

Task ID

Task ID	Operations
EIGRP	read

Examples

The following is sample output from the **show eigrp interfaces** command:

```
RP/0/RP0/CPU0:router# show eigrp interfaces

IP EIGRP interfaces for process 1

                        Xmit Queue    Mean   Pacing Time   Multicast   Pending
Interface        Peers  Un/Reliable   SRTT   Un/Reliable   Flow Timer  Routes

Gi0/6/0/2.212      0         0/0          0      11/434          0          0

Gi0/6/0/0          1         0/0        337       0/10           0          0

 Gi0/2/0/3         1         0/0         10       1/63         103          0

Gi0/6/2/5          1         0/0        330       0/16           0          0
```

This table describes the significant fields shown in the display.

Table 3: show eigrp interfaces Field Descriptions

Field	Description
Interface	Interface over which EIGRP is configured.
Peers	Number of directly connected EIGRP neighbors.
Xmit Queue Un/Reliable	Number of packets remaining in the unreliable and reliable transmit queues.
Mean SRTT	Mean smoothed round-trip time (SRTT) internal (in milliseconds).
Pacing Time Un/Reliable	Pacing time used to determine when EIGRP packets should be sent out the interface (unreliable and reliable packets).
Multicast Flow Timer	Maximum number of seconds in which the router sends multicast EIGRP packets.
Pending Routes	Number of routes in the packets in the transmit queue waiting to be sent.

The following is sample output from the **show eigrp interfaces** command when issued with the **detail** keyword:

```
RP/0/RP0/CPU0:router# show eigrp interfaces detail

IPv4-EIGRP interfaces for AS(100)

                      Xmit Queue   Mean   Pacing Time   Multicast    Pending
Interface        Peers  Un/Reliable  SRTT   Un/Reliable   Flow Timer   Routes
Lo0                0        0/0         0     640/640          0           0
  Hello interval is 5 sec, hold time is 15 sec
  Next xmit serial <none>
  Un/reliable mcasts: 0/0  Un/reliable ucasts: 0/0
```

```
Mcast exceptions: 0  CR packets: 0  ACKs suppressed: 0
Retransmissions sent: 0  Out-of-sequence rcvd: 0
Bandwidth percent is 50
Total packets received: 0
Authentication mode: MD5  Key chain: key1
No active key found in keychain database
Valid authenticated packets received: 0
Packets dropped due to wrong keychain config: 0
Packets dropped due to missing authentication: 0
Packets dropped due to invalid authentication: 0
Effective Metric:
  Bandwidth: 10000000, Delay: 500, Reliability: 255, Load: 1, MTU: 1514
```

This table describes the significant fields shown in the display.

Table 4: show eigrp interfaces detail Field Descriptions

Field	Description
Hello interval	Hello packet transmission interval.
hold time	Hold time announced to neighbors. If neighbors do not get hello packets from the router for this period, neighbors declare that the neighbor relationship is down.
Next xmit serial	Next transmission serial number.
Un/reliable mcasts	Number of unreliable and reliable multicast packets sent on this interface.
Un/reliable ucasts	Number or unreliable and reliable unicast packets sent on this interface.
Mcast exceptions	Number of multicast exceptions (sequence TLVs).
CR packets	Number of packets sent with the conditional receive bit set.
ACKs suppresses	Number of ACK packets suppressed.
Retransmissions	Number of retransmissions sent on this interface.
Out-of-sequence rcvd	Number of packets received out of sequence.
Bandwidth percent	Configured percent of bandwidth.
Authentication	Mode of authentication.
Valid authenticated packets received	Number of valid authentication packets.
Packets dropped due to wrong keychain config	Number of packets dropped due to wrong keychain configuration.
Packets dropped due to missing authentication	Number of packets dropped due to missing authentication.

Field	Description
Packets dropped due to invalid authentication	Number of packets dropped due to invalid authentication.

show eigrp neighbors

To display information about neighbors discovered by Enhanced Interior Gateway Routing Protocol (EIGRP), use the **show eigrp neighbors** command in EXEC mode.

show eigrp *as-numbervrf* {*vrf-name* | **all**}**ipv4ipv6**

Syntax Description

as-number	(Optional) Autonomous system number. This option is available when a VPN routing and forwarding (VRF) instance is not specified. Range is from 1 to 65535.
vrf { *vrf-name* | **all** }	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances.
[**ipv4**]	(Optional) Specifies the IPv4 address family.
detail	(Optional) Displays detailed EIGRP neighbor information.
type	Interface type. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
static	(Optional) Displays static routes.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **show eigrp neighbors** command to determine when neighbors become active and inactive. This command is also useful for debugging certain types of transport problems.

Task ID

Task ID	Operations
EIGRP	read

Examples

The following is sample output from the **show eigrp neighbors** command:

```
RP/0/RP0/CPU0:router# show eigrp neighbors

IP-EIGRP Neighbors for process 77
```

```
Address                 Interface      Holdtime Uptime   Q      Seq  SRTT  RTO
                                       (secs)   (h:m:s)  Count  Num  (ms)  (ms)

172.16.81.28             Gi0/2/0/3      13       0:00:41  0      11   4     20

172.16.80.28            Gi0/6/0/0      14       0:02:01  0      10   12    24

172.16.80.31            Gi0/6/2/5      12       0:02:02  0      4    5     20

RP/0/RP0/CPU0:router#
```

This table describes the significant fields shown in the display.

Table 5: show eigrp neighbors Field Descriptions

Field	Description
process	Autonomous system number specified in the router configuration command.
Address	IP address of the EIGRP peer.
Interface	Interface on which the router is receiving hello packets from the peer.
Holdtime	Length of time (in seconds) that the Cisco IOS XR software waits to hear from the peer before declaring that the peer is down.
Uptime	Elapsed time (in hours, minutes, and seconds) since the local router first heard from this neighbor.
Q Count	Number of EIGRP packets (update, query, and reply) that the software waits to send.
Seq Num	Sequence number of the last update, query, or reply packet that was received from this neighbor.
SRTT	Smoothed round-trip time. This is the number of milliseconds required for an EIGRP packet to be sent to this neighbor and for the local router to receive an acknowledgment of that packet.
RTO	Retransmission timeout (in milliseconds). This is the amount of time the software waits before resending a packet from the retransmission queue to a neighbor.

The following is sample output from the **show eigrp neighbors** command when issued with the **detail** keyword:

```
RP/0/RP0/CPU0:router# show eigrp neighbors detail

IP-EIGRP neighbors for AS 1

H   Address                 Interface       Hold Uptime   SRTT   RTO  Q  Seq
                                            (sec)         (ms)       Cnt Num
0   11.0.0.10               Gi0/6/0/0         14 01:00:52    3   200  0  10

   Version 12.4/1.2, Retrans: 0, Retries: 0, Prefixes: 3
```

This table describes the significant fields shown in the display.

Table 6: show eigrp neighbors detail Field Descriptions

Field	Description
Version	Version of EIGRP software (major.minor) running on the node and neighbor.
Retrans	Number of retransmissions sent to this neighbor.
Retries	Number of retransmissions sent to this neighbor since the last acknowledgement (ACK).
Prefixes	Number of prefixes learned from this neighbor.

show eigrp topology

To display the Enhanced Interior Gateway Routing Protocol (EIGRP) topology table, use the **show eigrp topology** command in EXEC mode.

show eigrp [*as-number*] [**vrf** {*vrf-name* | **all**}] [**ipv4** | **ipv6**] **topology** [*ip-address mask*] {**active** | **all-links** | **detail-links** | **pending** | **summary** | **zero-successors**}

Syntax Description

as-number	(Optional) Autonomous system number. This option is available when a VPN routing and forwarding (VRF) instance is not specified. Range for 2-byte Autonomous system numbers (ASNs) is 1 to 65535. Range for 4-byte Autonomous system numbers (ASNs) in asplain format is 1 to 4294967295. Range for 4-byte Autonomous system numbers (ASNs) is asdot format is 1.0 to 65535.65535.
vrf { *vrf-name* | **all** }	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances.
[**ipv4**]	(Optional) Specifies the IPv4 address family.
ip-address	(Optional) IP address in four-part, dotted-decimal notation.
mask	(Optional) Network mask specified in either of two ways: Network mask can be a four-part, dotted decimal address. For example, 255.0.0.0 indicates that each bit equal to 1 means the corresponding address bit is a network address. Network mask can be indicated as a slash (/) and number. For example, /8 indicates that the first 8 bits of the mask are 1s, and the corresponding bits of the address are the network address.
active	(Optional) Displays only active entries in the EIGRP topology table.
all-links	(Optional) Displays all entries in the EIGRP topology table.
detail-links	(Optional) Displays detailed information for all entries in the EIGRP topology table.
pending	(Optional) Displays all entries in the EIGRP topology table that are waiting for an update from a neighbor or are waiting to reply to a neighbor.
summary	(Optional) Displays a summary of the EIGRP topology table.
zero-successors	(Optional) Displays available routes in the EIGRP topology table.

Command Modes

EXEC

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

When the **show eigrp topology** command is used without any keywords or arguments, only routes that are feasible successors are displayed.

The **show eigrp topology** command can be used to determine Diffusing Update Algorithm (DUAL) states and to debug possible DUAL problems.

Task ID

Task ID	Operations
EIGRP	read

Examples

The following is sample output from the **show eigrp topology** command. The EIGRP metrics for specified internal routes and external routes are displayed.

```
RP/0/RP0/CPU0:router# show eigrp topology 10.2.1.0/24

IP-EIGRP (AS 1): Topology entry for 10.2.1.0/24
  State is Passive, Query origin flag is 1, 1 Successor(s), FD is 281600
  Routing Descriptor Blocks:
  0.0.0.0 (GigabitEthernet0/6/0/0), from Connected, Send flag is 0x0
    Composite metric is (281600/0), Route is Internal !This is the internal route.
    Vector metric:
      Minimum bandwidth is 10000 Kbit
      Total delay is 1000 microseconds
      Reliability is 255/255
      Load is 1/255
      Minimum MTU is 1500
      Hop count is 0

RP/0/RP0/CPU0:router# show eigrp topology 10.4.80.0/20

IP-EIGRP (AS 1): Topology entry for 10.4.80.0/20
  State is Passive, Query origin flag is 1, 1 Successor(s), FD is 409600
  Routing Descriptor Blocks:
  10.2.1.1 (GigabitEthernet0/6/0/0), from 10.2.1.1, Send flag is 0x0
    Composite metric is (409600/128256), Route is External
    Vector metric:
      Minimum bandwidth is 10000 Kbit
      Total delay is 6000 microseconds
      Reliability is 255/255
      Load is 1/255
      Minimum MTU is 1500
      Hop count is 1
    External data:
      Originating router is 10.89.245.1
      AS number of route is 0
      External protocol is Connected, external metric is 0
      Administrator tag is 0 (0x00000000)
```

This table describes the significant fields shown in the display.

Table 7: show eigrp topology Field Descriptions

Field	Description
Query origin	Query origin state.
Successors	Number of feasible successors for this prefix.
FD	Feasible distance for this prefix.
10.2.1.1 (Gi0/0)	Next hop and interface from which this path was learned.
from 10.2.1.1	Information source for this path.
Send flag	Indicates if the sending of this prefix is pending to this neighbor.
Composite Metric (409600/128256)	The first number is the EIGRP metric that represents the cost to the destination. The second number is the EIGRP metric that this peer advertised.
Route is	Type of route (internal or external).
Vector Metric	Shows the metric (bandwidth, delay, reliability, load, MTU, and hop count) advertised by the neighbor.
External Data	Shows the external information (originating router ID, AS number, external protocol, metric, and tag) advertised by the neighbor.

show eigrp traffic

To display the number of Enhanced Interior Gateway Routing Protocol (EIGRP) packets sent and received, use the **show eigrp traffic** command in EXEC mode.

show eigrp [*as-number*] [**vrf** {*vrf-name* | **all**}][**ipv4** | **ipv6**] **traffic**

Syntax Description

as-number	(Optional) Autonomous system number. This option is available when a VPN routing and forwarding (VRF) instance is not specified. Range is from 1 to 65535.
vrf { *vrf-name* | **all** }	(Optional) Specifies a particular VPN routing and forwarding instance (VRF) or all VRF instances.
[**ipv4**]	(Optional) Specifies the IPv4 address family.

Command Modes

EXEC

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **show eigrp traffic** command to find the number of packets sent and received.

In addition, this command is useful in determining whether packets from one node are not reaching the neighboring node due to connectivity or configuration problems.

Task ID

Task ID	Operations
EIGRP	read

Examples

The following is sample output from the **show eigrp traffic** command:

```
RP/0/RP0/CPU0:router# show eigrp traffic

IP-EIGRP Traffic Statistics for AS 1

  Hellos sent/received: 736/797
  Updates sent/received: 6/6
  Queries sent/received: 0/1
  Replies sent/received: 1/0
  Acks sent/received: 6/6
  Input queue high water mark 0, 0 drops
  SIA-Queries sent/received: 0/0
  SIA-Replies sent/received: 0/0
```

This table describes the significant fields shown in the display.

Table 8: show eigrp traffic Field Descriptions

Field	Description
AS	Autonomous system number specified in the **router eigrp** command.
Hellos sent/received	Number of hello packets sent and received.
Updates sent/received	Number of update packets sent and received.
Queries sent/received	Number of query packets sent and received.
Replies sent/received	Number of reply packets sent and received.
Acks sent/received	Number of acknowledgment packets sent and received.
Input queue high water mark	Maximum number of packets in the input queue and number of drops.
SIA-Queries sent/received	Number of Stuck-in-Active query packets sent and received.
SIA-Replies sent/received	Number of Stuck-in-Active reply packets sent and received.

show protocols (EIGRP)

To display information about the Enhanced Interior Gateway Routing Protocol (EIGRP) process configuration, use the **show protocols** command in EXEC mode.

show protocols [**ipv4** | **afi-all**] [**all** *protocol*] [**default-context** | **vrf***vrf-name*] [**private**]

Syntax Description

ipv4	(Optional) Specifies an IPv4 address family.
afi-all	(Optional) Specifies all address families.
all	(Optional) Specifies all protocols for a given address family.
protocol	(Optional) Specifies a routing protocol. For the IPv4 address family, the options are **eigrp** , **bgp** , **isis** , **ospf** , and **rip** .
default-context	(Optional) Displays default context information. This keyword is available when the **eigrp** or **rip** protocol is specified.
vrf *vrf-name*	(Optional) Displays VPN routing and forwarding (VRF) information for the specified process. This keyword is available when the **eigrp** or **rip** protocol is specified.
private	(Optional) Displays private EIGRP data. This keyword is available when the **eigrp** is specified.

Command Modes

EXEC

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **show protocols** command to get information about the protocols running on the router and to quickly determine which protocols are active. The command is designed to summarize the important characteristics of the running protocol, and command output varies depending on the specific protocol selected.

For EIGRP, the command output lists the instance number, default AS context, router ID, default networks, distance, maximum paths, and so on.

Task ID

Task ID	Operations
EIGRP	read

Examples

The following is sample output from the **show protocols eigrp** command:

```
RP/0/RP0/CPU0:router# show protocols eigrp

Routing Protocol: EIGRP, instance 1
 Default context AS: 1, Router ID: 192.168.0.22
```

```
Address Family: IPv4
 Default networks not flagged in outgoing updates
 Default networks not accepted from incoming updates
 Distance: internal 90, external 170
 Maximum paths: 4
 EIGRP metric weight K1=1, K2=0, K3=1, K4=0, K5=0
 EIGRP maximum hopcount 100
 EIGRP maximum metric variance 1

 SIA Active timer is 180s
 Interfaces:
  GigabitEthernet0/6/0/0
```

This table describes the significant fields shown in the display.

Table 9: show protocols Field Descriptions

Field	Descriptions
instance	AS number of the instance. • Range for 2-byte Autonomous system numbers (ASNs) is 1 to 65535. • Range for 4-byte Autonomous system numbers (ASNs) in asplain format is 1 to 4294967295. • Range for 4-byte Autonomous system numbers (ASNs) is asdot format is 1.0 to 65535.65535.
AS	AS number of this context. • Range for 2-byte Autonomous system numbers (ASNs) is 1 to 65535. • Range for 4-byte Autonomous system numbers (ASNs) in asplain format is 1 to 4294967295. • Range for 4-byte Autonomous system numbers (ASNs) is asdot format is 1.0 to 65535.65535.
Address Family	Address family for which the configuration status is shown.
Default Networks Candidate	Default network acceptance and announcement behavior.
Distance	Administrative distance of EIGRP routes.
Maximum paths	Maximum paths installed in RIB for a route.
Metric Weight	Current metric weights used by EIGRP.
Maximum hopcount	Maximum hop count accepted by EIGRP.
Variance	Metric variance used to find feasible paths for a route.
Route hold time	Time duration for which routes learned from a neighbor are held without deletion while the neighbor is undergoing a graceful restart.
SIA Active time	Active time period for SIA.
Interfaces	List of interfaces configured for EIGRP.

site-of-origin (EIGRP)

To configure the Site of Origin (SoO) filtering on an Enhanced Interior Gateway Routing Protocol (EIGRP) interface, use the **site-of-origin** command in interface configuration mode. To disable SoO filtering on an interface, use the **no** form of this command.

site-of-origin {*as-number* **:** *number* | *ip-address* **:** *number*}
no site-of-origin

Syntax Description

as-number :	Autonomous system number. Range for 2-byte Autonomous system numbers (ASNs) is 1 to 65535. Range for 4-byte Autonomous system numbers (ASNs) in asplain format is 1 to 4294967295. Range for 4-byte Autonomous system numbers (ASNs) is asdot format is 1.0 to 65535.65535. The colon is used to separate the autonomous system number and network number.
number	Network number. Range is from 0 to 4294967295 when a 2-byte AS number is used. Range is from 0 to 65535 when a 4-byte AS number is used.
ip-address :	IP address in four-part, dotted-decimal notation. The colon is used to separate the IP address and network number.

Command Default

No default behavior or values

Command Modes

Interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

An EIGRP process must be capable of retrieving the SoO attribute on routes redistributed from the Border Gateway Protocol (BGP) when required to support complex topologies that include MPLS VPN links between sites with backdoor links.

Use the **site-of-origin** command to set an SoO BGP extended community attribute that is used to identify routes that have originated from a site so that the readvertisement of that prefix back to the source site can be prevented. The SoO extended community uniquely identifies the site from which a provider edge (PE) router has learned a route.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to configure SoO filtering on an EIGRP interface:

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp) vrf customer1
RP/0/RP0/CPU0:router(config-eigrp-vrf) address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-vrf-af)# interface GigabitEthernet 0/1/0/0
RP/0/RP0/CPU0:router(config-eigrp--vrf-af-if)# site-of-origin 10.0.0.1:20
```

split-horizon disable (EIGRP)

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

split-horizon disable
no split-horizon disable

Syntax Description

This command has no keywords or arguments.

Command Default

Split horizon is enabled for an EIGRP process.

Command Modes

Interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Examples

The following example shows how to disable split horizon an a GigabitEthernet link:

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp) address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-af)# interface GigabitEthernet 0/1/0/0
RP/0/RP0/CPU0:router(config-eigrp-af-if)# split-horizon disable
```

stub (EIGRP)

To configure a router as a stub for Enhanced Interior Gateway Routing Protocol (EIGRP), use the **stub** command in the appropriate configuration mode. To disable this function, use the **no** form of this command.

stub [**receive-only** | [**connected**] [**redistributed**] [**static**] [**summary**]]
no stub [**receive-only** | [**connected**] [**redistributed**] [**static**] [**summary**]]

Syntax Description

receive-only	(Optional) Sets the router as a receive-only neighbor.
connected	(Optional) Advertises connected routes.
redistributed	(Optional) Advertises redistributed routes from other protocols and autonomous systems.
static	(Optional) Advertises static routes.
summary	(Optional) Advertises summary routes.

Command Default

Stub routing is disabled.

When stub routing is specified, connected and summary routes are advertised by default.

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

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

The **stub** command can be modified with several options, and these options can be used in any combination except for the **receive-only** keyword.

The **receive-only** keyword restricts the router from sharing any of its routes with any other router in that EIGRP autonomous system and does not permit any other option to be specified because it prevents any type of route from being sent. The four other optional keywords (**connected** , **static** , **summary** , and **redistributed**) can be used in any combination but cannot be used with the **receive-only** keyword. If any of these four keywords is used with the **stub** command, only the route types specified by the particular keyword or keywords are sent. Route types specified by the nonused keyword or keywords are not sent.

The **connected** keyword permits EIGRP stub routing to send connected routes. If all the connected routes are not covered by EIGRP interfaces, it may be necessary to redistribute connected routes with the **redistribute connected** command under the EIGRP process. This option is enabled by default.

The **static** keyword permits EIGRP stub routing to send static routes. Without the configuration of this option, EIGRP does not send any static routes. You may still need to redistribute static routes with the **redistribute static** command.

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

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

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to configure, as a stub, the router that advertises connected and summary routes:

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp) address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-af)# stub
```

The following example shows how to configure the router as a receive-only neighbor (connected, summary, and static routes are not sent):

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp) address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-af)# stub receive-only
```

summary-address (EIGRP)

To configure a summary aggregate address for the specified Enhanced Interior Gateway Routing Protocol (EIGRP) interface, use the **summary-address** command in interface configuration mode. To disable a configuration, use the **no** form of this command.

summary-address *ip-address* {*/lengthmask*} [*admin-distance*]
no summary-address *ip-address* {*/lengthmask*}

Syntax Description

ip-address	The IP address argument specifies the summary IP address to apply to an interface in four-part, dotted-decimal notation.
/ length	Prefix length, which can be indicated as a slash (/) and number. For example, /8 indicates that the first eight bits in the IP prefix are network bits. If *length* is used, the slash is required.
mask	IP address mask.
admin-distance	(Optional) Administrative distance. A value from 1 to 255.

Command Default

An administrative distance of 5 is applied to EIGRP summary routes.

No summary addresses are predefined.

Command Modes

Interface configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
eigrp	read, write

Examples

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

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp) address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-af)# interface GigabitEthernet 0/1/0/0
```

```
RP/0/RP0/CPU0:router(config-eigrp-af-if)# summary-address 192.168.0.0/16 95
```

timers active-time

To adjust the Enhanced Interior Gateway Routing Protocol (EIGRP) routing wait time, use the **timers active-time** command in the appropriate configuration mode. To disable this function, use the **timers active-time no** form of the command.

timers active-time [*time-limit* | **disabled**]
no timers active-time

Syntax Description

time-limit	Active time limit (in minutes). Range is from 1 to 4294967295 minutes.
disabled	Disables the timers and permits the routing wait time to remain active indefinitely.

Command Default

Disabled

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **timers active-time** command to control the time the router waits (after query is sent) before declaring the route to be in the stuck in active (SIA) state.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to configure an indefinite routing wait time on the specified EIGRP route:

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp) address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-af)# timers active-time disabled
```

variance

To control load balancing in an Enhanced Interior Gateway Routing Protocol (EIGRP)-based internetwork, use the **variance** command in the appropriate configuration mode. To reset the variance to the default value, use the **no** form of this command.

variance *multiplier*
no variance

Syntax Description

multiplier	Metric value used for load balancing. Range is from 1 to 128.

Command Default

multiplier : 1 (equal-cost load balancing)

Command Modes

IPv4 address family configuration

IPv4 VRF address family configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **variance** command to set a variance on the EIGRP router so that the router can determine the feasibility of a potential route. A route is feasible if the next router in the path is closer to the destination than the current router and the metric for the entire path is within the variance. Only paths that are feasible can be used for load balancing and included in the routing table.

If the following two conditions are met, the route is considered feasible and can be added to the routing table:

1. The local best metric must be greater than the metric learned from the next router.
2. The multiplier times the local best metric for the destination must be greater than or equal to the metric through the next router.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to set a variance of 4:

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp) address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-af)# variance 4
```

vrf (EIGRP)

To define a VPN routing and forwarding (VRF) instance and enter VRF configuration mode, use the **vrf** command in router configuration mode. To remove a VRF instance, use the **no** form of this command.

vrf *vrf-name*
no vrf *vrf-name*

Syntax Description

vrf-name	VPN routing and forwarding instance.

Command Default

No VRFs are defined.

Command Modes

Router configuration

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

Use the **vrf** command to configure a VRF instance. A VRF instance is a collection of VPN routing and forwarding tables maintained at the provider edge (PE) router.

From VRF configuration mode, you must enter address family configuration mode and then issue commands, such as the **auto-summary** command.

A single EIGRP routing process can support multiple VRFs. The number of VRFs that can be configured is limited 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. Redistribution between different VRFs is not supported.

MPLS VPN support between PE and customer edge (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. Typically, a metric must be configured for routes to be advertised to the CE router. The metric can be configured under the route-policy for the **redistribute** protocol command or configured with the **default-metric** command.

You must remove IPv4/IPv6 addresses from an interface prior to assigning, removing, or changing a VRF on an IP interface. If this is not done in advance, any attempt to change the VRF on an IP interface is rejected.

Task ID

Task ID	Operations
eigrp	read, write

Examples

The following example shows how to enter IPv4 VRF address family configuration mode and identify EIGRP commands that can be issued from that mode.

```
RP/0/RP0/CPU0:router(config)# router eigrp 1
RP/0/RP0/CPU0:router(config-eigrp)# vrf vpn-1
```

```
RP/0/RP0/CPU0:router(config-eigrp-vrf)# address-family ipv4
RP/0/RP0/CPU0:router(config-eigrp-vrf-af)# ?

  auto-summary           Auto summarisation
  autonomous-system      Set the autonomous system of VRF
  commit                 Commit the configuration changes to running
  default-information    Handling of default route
  default-metric         Set metric of redistributed routes
  describe               Describe a command without taking real actions
  distance               Set distance for EIGRP routes
  do                     Run an exec command
  exit                   Exit from this submode
  interface              EIGRP interface configuration submode
  log-neighbor-changes   Enable/Disable EIGRP neighbor logging
  log-neighbor-warnings  Enable/Disable EIGRP neighbor warnings
  maximum-paths          Maximum paths
  maximum-prefix         Maximum number of IP prefixes acceptable in aggregate
  metric                 Modify EIGRP routing metrics and parameters
  neighbor               Neighbor prefix limits configuration
  no                     Negate a command or set its defaults
  redistribute           Redistribute another protocol
  route-policy           Configure inbound/outbound policies
  router-id              Set router ID
  show                   Show contents of configuration
  stub                   EIGRP stub
  timers                 Configure EIGRP timers
  variance               Control load balancing variance
```