



Configuring EIGRP MIB

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EIGRP MIB

The EIGRP MIB feature provides complete Enhanced Interior Gateway Routing Protocol (EIGRP) support for GET requests and limited notification (also known as trap) support for neighbor authentication failure, neighbor down, and stuck-in-active (SIA) events. This MIB is accessed through remote Simple Network Management Protocol (SNMP) software clients. The EIGRP IPv6 MIB feature enables IPv6 support for the EIGRP MIB.

Prerequisites for EIGRP MIB

- An Enhanced Interior Gateway Routing Protocol (EIGRP) routing process must be enabled and a Simple Network Management Protocol (SNMP) community string must be configured on at least one device for EIGRP MIB table objects to be visible via SNMP.
- Support for EIGRP notifications (traps) is not activated until a trap destination is configured.

Restrictions for EIGRP MIB

EIGRP MIB support was not implemented for the EIGRP Prefix Limit Support feature.

Information About EIGRP MIB

EIGRP MIB Overview

The EIGRP MIB feature provides MIB support in Cisco software for Enhanced Interior Gateway Routing Protocol (EIGRP) routing processes that run over IPv4 and IPv6. The EIGRP MIB is accessed through remote Simple Network Management Protocol (SNMP) software clients. MIB table objects are accessed as read-only through GETBULK, GETINFO, GETMANY, GETONE, and GETNEXT requests. Counters for MIB table objects are cleared when the EIGRP routing process is reset or when the routing table is refreshed when you enter the **clear ip route** or **clear ip eigrp** command. Managed objects for all EIGRP routing processes are implemented as five table objects—EIGRP Interface, EIGRP Neighbor, EIGRP Topology, EIGRP Traffic Statistics, and EIGRP VPN—on a per-autonomous-system or per-VPN basis.

EIGRP Interface Table

The EIGRP Interface table contains information and statistics for all interfaces on which the Enhanced Interior Gateway Routing Protocol (EIGRP) has been configured. The objects in this table are populated on a per-interface basis. The table below describes EIGRP Interface table objects and the values populated for each object.

Table 1: EIGRP Interface Table Object Descriptions

| EIGRP Interface Table Object | Description |
|-------------------------------------|---|
| cEigrpAcksSuppressed | Total number of individual acknowledgment packets that have been suppressed and combined in an already enqueued outbound reliable packet on an interface. |
| cEigrpAuthKeyChain | The name of the authentication key chain that is configured on the interface. The key chain is a reference to the set of secret keys that need to be accessed to determine the key string that needs to be used. |
| cEigrpAuthMode | The authentication mode that is configured for traffic that uses the interface. A value of 0 is displayed when no authentication is enabled. A value of 1 is displayed when message digest algorithm 5 (MD5) authentication is enabled. |
| cEigrpCRpkts | Total number conditional receive (CR) packets sent from the interface. |
| cEigrpHelloInterval | The configured time interval (in seconds) between hello packet transmissions on the interface. |
| cEigrpPacingReliable | The configured time interval (in milliseconds) between EIGRP packet transmissions on the interface when the reliable transport is used. |
| cEigrpPacingUnreliable | The configured time interval (in milliseconds) between EIGRP packet transmissions on the interface when the unreliable transport is used. |
| cEigrpPeerCount | Total number of neighbor adjacencies formed through the interface. |
| cEigrpPendingRoutes | Total number of routing updates that are queued for transmission on the interface. |
| cEigrpMcastExcept | Total number of EIGRP multicast exception transmissions that have occurred on the interface. |
| cEigrpMeanSrtt | The computed smooth round-trip time (SRTT) for packets that were transmitted to and received from all neighbors on the interface. |
| cEigrpMFlowTimer | The configured multicast flow control timer value (in milliseconds) for the interface. |
| cEigrpOOSrcvd | Total number of out-of-sequence packets received on the interface. |
| cEigrpRetranSent | Total number of packet retransmissions sent from the interface. |
| cEigrpRMcasts | Total number of reliable (acknowledgment required) multicast packets that were transmitted on the interface. |

| EIGRP Interface Table Object | Description |
|------------------------------|---|
| cEigrpRUcasts | Total number of reliable (acknowledgment required) unicast packets that were transmitted on the interface. |
| cEigrpUMcasts | Total number of unreliable (no acknowledgment required) multicast packets that were transmitted on the interface. |
| cEigrpUUcasts | Total number of unreliable (no acknowledgment required) unicast packets that were transmitted on the interface. |
| cEigrpXmitNextSerial | The serial number of the next packet that is queued for transmission on the interface. |
| cEigrpXmitReliableQ | Total number of packets waiting in the reliable transport transmission queue (acknowledgment required). |
| cEigrpXmitUnreliableQ | Total number of packets waiting in the unreliable transport transmission queue (no acknowledgment required). |

EIGRP Neighbor Table

The EIGRP Neighbor table contains information about Enhanced Interior Gateway Routing Protocol (EIGRP) neighbors with which adjacencies have been established. EIGRP uses a “Hello” protocol to form neighbor relationships with directly connected EIGRP neighbors. The objects in this table are populated on a per-neighbor basis. The table below describes EIGRP Neighbor table objects and the values populated for each object.

Table 2: EIGRP Neighbor Table Object Descriptions

| EIGRP Neighbor Table Object | Description |
|-----------------------------|---|
| cEigrpHoldTime | The hold timer value for an adjacency with a neighbor. If this timer expires, the neighbor is declared down and removed from the neighbor table. |
| cEigrpLastSeq | The number of the last sequence of a packet transmitted to a neighbor. This table object value increases as the sequence number increases. |
| cEigrpPeerAddr | The source IP address of a neighbor that was used to establish an EIGRP adjacency with the local device. The source IP address can be an IPv4 or IPv6 address. |
| cEigrpPeerAddrType | The protocol type of the remote source IP address that was used by a neighbor to establish an EIGRP adjacency with the local device. The protocol type can be IPv4 or IPv6. |
| cEigrpPeerIfIndex | The index of the local interface through which a neighbor can be reached. |
| cEigrpPeerInterface | The name of the local interface through which a neighbor can be reached. |
| cEigrpPktsEnqueued | Total number of EIGRP packets (all types) currently queued for transmission to a neighbor. |
| cEigrpRetrans | Cumulative number of packets retransmitted to a neighbor while the neighbor is in an up state. |

| EIGRP Neighbor Table Object | Description |
|-----------------------------|---|
| cEigrpRetries | Total number of times an unacknowledged packet is sent to a neighbor. |
| cEigrpRto | The computed retransmission timeout (RTO) for a neighbor. The value for this table object is computed as an aggregate average of the time required for packet delivery. |
| cEigrpSrtt | The computed smooth round-trip time (SRTT) for packets that are transmitted to and received from a neighbor. |
| cEigrpUpTime | The period for which the EIGRP adjacency to a neighbor has been in an up state. The time period is displayed in hours:minutes:seconds. |
| cEigrpVersion | EIGRP version information reported by a remote neighbor. |

EIGRP Topology Table

The EIGRP Topology table contains information about Enhanced Interior Gateway Routing Protocol (EIGRP) routes that are received in updates and routes that are locally originated. EIGRP sends routing updates to and receives routing updates from adjacent routers with which adjacencies have been formed. The objects in this table are populated on a per-topology table entry (route) basis. The table below describes EIGRP Topology table objects and the values populated for each object.

Table 3: EIGRP Topology Table Object Descriptions

| EIGRP Topology Table Object | Description |
|-----------------------------|---|
| cEigrpActive | Status of routes in the topology table. The value for this table object is displayed on a per-route basis. A value of 1 is displayed when a route is in active state. A value of 2 is displayed when a route is in passive state (normal). |
| cEigrpDestSuccessors | Total number of successors (a successor is a route that is the next hop to a destination network) for a topology table entry. The topology table will contain a successor for each path to a given destination. This table object value increases each time a successor is added. |
| cEigrpDistance | The computed distance to the destination network entry from the local router. |
| cEigrpFdistance | The feasible (best) distance to a destination network. This value is used to calculate a feasible successor for a topology table entry. |
| cEigrpNextHopAddress | The next-hop IP address for a route in a topology table entry. The next hop can be an IPv4 or IPv6 address. |
| cEigrpNextHopAddressType | The protocol type of the next-hop IP address for a route in a topology table entry. The protocol type can be IPv4 or IPv6. |
| cEigrpNextHopInterface | The interface through which the next-hop IP address is reached to forward traffic to the destination. |
| cEigrpReportDistance | The computed distance to the destination network in the topology entry as reported by the originator of the route. |

| EIGRP Topology Table Object | Description |
|------------------------------------|---|
| cEigrpRouteOriginAddr | The IP address of the router that originated the route in the topology table entry. This table is populated only if the topology table entry was not locally originated. The route origin address can be an IPv4 or IPv6 address. |
| cEigrpRouteOriginType | The protocol type of the IP address defined as the origin of the topology route entry. The protocol type can be IPv4 or IPv6. |
| cEigrpStuckInActive | Stuck-in-active (SIA) status of a route. The value for this table object is displayed on a per-route basis. A value of 1 is displayed when a route is in SIA state (that is, no reply has been received for queries about alternate paths). SIA queries are transmitted when a route is placed in this state. |

EIGRP Traffic Statistics Table

The EIGRP Traffic Statistics table contains counters and statistics for specific types of Enhanced Interior Gateway Routing Protocol (EIGRP) packets that are sent and the related, collective information that is generated. Objects in this table are populated on a per-autonomous-system basis. Objects in this table are populated for adjacencies formed on interfaces that have IP addresses configured under EIGRP network statements. The table below describes EIGRP Traffic Statistics table objects and the values populated for each object.

Table 4: EIGRP Traffic Statistics Table Object Descriptions

| EIGRP Traffic Statistics Table Object | Description |
|--|--|
| cEigrpAcksRcvd | Total number of acknowledgment packets that are received in response to the transmitted update packets. This table object value increases as packets are received. |
| cEigrpAcksSent | Total number of acknowledgment packets that are transmitted in response to received update packets. This table object value increases as packets are transmitted. |
| cEigrpAsRouterId | The configured or automatically selected router ID in IP address format. This table object is updated if the router ID is manually reconfigured or if the IP address that was automatically selected is removed. |
| cEigrpAsRouterIdType | The type of IP address that is used as the router ID. The value for this table object is an IPv4 address. |
| cEigrpInputQDrops | Total number of packets that are dropped from the input queue because the input queue was full. This table object value increases each time a packet is dropped. |
| cEigrpInputQHighMark | The highest number of packets that have been in the input queue. This table object value increases only when the previous highest number is exceeded. |

| EIGRP Traffic Statistics Table Object | Description |
|--|---|
| cEigrpHeadSerial | Internal sequencing number (serial) that is applied to EIGRP topology table routes. Routes are sequenced starting with 1. A value of 0 is displayed when there are no routes in the topology table. The “Head” serial number is applied to the first route in the sequence. |
| cEigrpHellosRcvd | Total number of received hello packets. This table object value increases as packets are received. |
| cEigrpHellosSent | Total number of hello packets transmitted. This table object value increases as packets are transmitted. |
| cEigrpNbrCount | Total number of live neighbors. This table object value increases or decreases as peering sessions are established or expired. |
| cEigrpNextSerial | Serial number that is applied to the next route in the sequence. |
| cEigrpQueriesSent | Total number of alternate route query packets that are transmitted. This table object value increases as packets are transmitted. |
| cEigrpQueriesRcvd | Total number of alternate route query packets that are received. This table object value increases as packets are received. |
| cEigrpRepliesSent | Total number of reply packets that are transmitted in response to the received query packets. This table object value increases as packets are transmitted. |
| cEigrpRepliesRcvd | Total number of reply packets that are received in response to transmitted query packets. This table object value increases as packets are received. |
| cEigrpSiaQueriesSent | Total number of query packets that are sent in response to a destination that is in a stuck-in-active (SIA) state for a down peer. This table object value increases each time an SIA query packet is sent. |
| cEigrpSiaQueriesRcvd | Total number of SIA query packets that are received from neighbors searching for an alternate path to a destination. This table object value increases each time an SIA query packet is received. |
| cEigrpTopoRoutes | Total number of EIGRP-derived routes in the topology table. This table object value increases if a route is added. |
| cEigrpUpdatesRcvd | Total number of routing update packets that are received. This table object value increases as packets are received. |
| cEigrpUpdatesSent | Total number of routing update packets that are transmitted. This table object value increases as packets are transmitted. |
| cEigrpXmitDummies | Total number of temporary entries in the topology table. Dummies are internal entries and not transmitted in routing updates. |
| cEigrpXmitPendReplies | Total number of replies expected in response to locally transmitted query packets. This table object contains a value of 0 until a route is placed in an active state. |

EIGRP VPN Table

The EIGRP VPN table contains information about VPNs that are configured to run an Enhanced Interior Gateway Routing Protocol (EIGRP) process. Devices index VPN routes by using the VPN name and the EIGRP autonomous system number. The table below describes the EIGRP VPN table object and the value populated for that object.

Table 5: EIGRP VPN Table Object Description

| EIGRP VPN Table Object | Description |
|------------------------|---|
| cEigrpVpnName | The VPN routing and forwarding (VRF) name. Only VRFs that are configured to run an EIGRP routing process are populated. |

EIGRP Notifications

The EIGRP MIB provides limited notification (trap) support for neighbor authentication failure, neighbor down, and stuck-in-active (SIA) events. Use the **snmp-server enable traps eigrp** command to enable Enhanced Interior Gateway Routing Protocol (EIGRP) notifications or traps on a Cisco device. To activate support for trap events, you must configure a trap destination by using the **snmp-server host** command and define a community string by using the **snmp-server community** command. EIGRP notifications are described in the table below.

Table 6: EIGRP Notifications

| EIGRP Notifications | Description |
|--------------------------|--|
| cEigrpAuthFailureEvent | When EIGRP message digest algorithm 5 (MD5) authentication is enabled on any interface and neighbor adjacencies are formed, a notification is sent if any adjacency goes down because of an authentication failure. This notification will be sent once per down event. This notification includes the source IP address of the neighbor from which the authentication failure occurred. |
| cEigrpNbrDownEvent | This notification is sent when a neighbor goes down for any reason, such as hold time expiry, neighbor shutdown, interface shutdown, SIA events, or authentication failure. If a neighbor is down because of an authentication failure, both cEigrpAuthFailureEvent and cEigrpNbrDownEvent notifications are sent. |
| cEigrpRouteStuckInActive | During the query phase for a new route to a destination network, the route is placed in active state (during which an alternate path is actively sought) and a query packet is broadcast to the network. If no replies are received for the query, SIA query packets are broadcast. If no replies are received for the SIA queries, the neighbor adjacency is dropped, the route is declared to be in an SIA state, and this notification is sent. |

How to Enable EIGRP MIB

Enabling EIGRP MIB Notifications

Perform this task to specify a Simple Network Management Protocol (SNMP) server host, configure an SNMP community access string, and enable Enhanced Interior Gateway Routing Protocol (EIGRP) MIB notifications.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server host** *{hostname | ip-address}* [**traps** | **informs** | **version** {**1** | **2c** | **3** [**auth** | **noauth** | **priv**]}] *community-string* [**udp-port** *port*] [*notification-type*]
4. **snmp-server community** *string*
5. **snmp-server enable traps** [*notification-type*]
6. **end**
7. **show running-config**

DETAILED STEPS

| | Command or Action | Purpose |
|---------------|--|---|
| Step 1 | enable Example: Device> enable | Enables privileged EXEC mode. • Enter your password if prompted. |
| Step 2 | configure terminal Example: Device# configure terminal | Enters global configuration mode. |
| Step 3 | snmp-server host <i>{hostname ip-address}</i> [traps informs version { 1 2c 3 [auth noauth priv]}] <i>community-string</i> [udp-port <i>port</i>] [<i>notification-type</i>] Example: Device(config)# snmp-server host 10.0.0.1 traps version 2c NETMANAGER | Specifies the destination server host or destination address for SNMP notifications. |
| Step 4 | snmp-server community <i>string</i> Example: Device(config)# snmp-server community EIGRP1NET1A | Configures a community access string to permit SNMP access to the local router by the remote SNMP software client. Note Cisco software supports both IPv4 and IPv6. |
| Step 5 | snmp-server enable traps [<i>notification-type</i>] Example: | Enables SNMP support for EIGRP notifications. |

| | Command or Action | Purpose |
|---------------|---|--|
| | Device(config)# snmp-server enable traps eigrp | <ul style="list-style-type: none"> Notifications can be configured for only neighbor authentication failure, neighbor down, and stuck-in-active (SIA) events. |
| Step 6 | end Example: Device(config)# end | Exits global configuration mode and returns to privileged EXEC mode. |
| Step 7 | show running-config Example: Device# show running-config include snmp | Displays contents of the current running configuration file. <ul style="list-style-type: none"> Use the output modifier “ ” to display and verify the SNMP configuration. |

Configuration Examples for EIGRP MIB

Example: Enabling EIGRP MIB Notifications

The following example shows how to specify a Simple Network Management Protocol (SNMP) server host, configure an SNMP community string, and enable support for Enhanced Interior Gateway Routing Protocol (EIGRP) notifications:

```
Device(config)# snmp-server host 10.0.0.2 traps version 2c NETMANAGER eigrp
Device(config)# snmp-server community EIGRP1NET1A
Device(config)# snmp-server enable traps eigrp
```

The following sample output from the **show running-config** command displays the EIGRP MIB configuration:

```
Device# show running-config | include snmp

snmp-server community EIGRP1NET1A
snmp-server enable traps eigrp
snmp-server host 10.0.0.2 version 2c NETMANAGER eigrp
```

Additional References for EIGRP MIB

Related Documents

| Related Topic | Document Title |
|---------------------------------|--|
| Cisco IOS commands | Cisco IOS Master Command List, All Releases |
| EIGRP commands | EIGRP Command Reference |
| Basic EIGRP configuration tasks | “Configuring EIGRP” module in the <i>EIGRP Configuration Guide</i> |
| SNMP commands | SNMP Support Command Reference |

| Related Topic | Document Title |
|--------------------------|--|
| SNMP configuration tasks | “Configuring SNMP Support” module in the <i>SNMP Configuration Guide</i> |

Standards and RFCs

| Standard/RFC | Title |
|--------------|---|
| RFC 1213 | Management Information Base for Network Management of TCP/IP-based Internet: MIB-II |

MIBs

| MIB | MIBs Link |
|--------------------|---|
| CISCO-EIGRP-MIB.my | To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs |

Technical Assistance

| Description | Link |
|---|---|
| The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password. | http://www.cisco.com/cisco/web/support/index.html |

Feature Information for EIGRP MIB

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 7: Feature Information for EIGRP MIB

| Feature Name | Releases | Feature Information |
|---------------------|---------------------------|--|
| EIGRP MIB | Cisco IOS XE Fuji 16.8.1a | <p>The EIGRP MIB feature provides complete Enhanced Interior Gateway Routing Protocol (EIGRP) support for GET requests and limited notification (trap) support for neighbor authentication failure, neighbor down, and stuck-in-active (SIA) events. This MIB is accessed through remote Simple Network Management Protocol (SNMP) software clients.</p> <p>This feature was introduced.</p> |

