



# Configuring BFD Support for EIGRP IPv6

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## BFD Support for EIGRP IPv6

The BFD Support for EIGRP IPv6 feature provides Bidirectional Forwarding Detection (BFD) support for Enhanced Interior Gateway Routing Protocol (EIGRP) IPv6 sessions, thereby facilitating rapid fault detection and alternate-path selection in EIGRP IPv6 topologies. BFD is a detection protocol that provides a consistent failure-detection method for network administrators, and network administrators use BFD to detect forwarding path failures at a uniform rate and not at variable rates for different routing protocol ‘Hello’ mechanisms. This failure-detection methodology ensures easy network profiling and planning and consistent and predictable reconvergence time. This document provides information about BFD support for EIGRP IPv6 networks and explains how to configure BFD support in EIGRP IPv6 networks.

## Prerequisites for BFD Support for EIGRP IPv6

EIGRP IPv6 sessions have a shutdown option in router, address family, and address-family interface configuration modes. To enable BFD support on EIGRP IPv6 sessions, the routing process should be in no shut mode in the abovementioned modes.

## Restrictions for BFD Support for EIGRP IPv6

- The BFD Support for EIGRP IPv6 feature is supported only in EIGRP named mode.
- EIGRP supports only single-hop Bidirectional Forwarding Detection (BFD).
- The BFD Support for EIGRP IPv6 feature is not supported on passive interfaces.

## Information About BFD Support for EIGRP IPv6

### BFD for EIGRP IPv6

Bidirectional Forwarding Detection (BFD) is a detection protocol that provides fast-forwarding, path-failure detection for all media types, encapsulations, topologies, and routing protocols. The BFD Support for EIGRP IPv6 feature enables BFD to interact with the Enhanced Interior Gateway Routing Protocol (EIGRP) to create

BFDv6 sessions between EIGRP neighbors. In a BFD-enabled EIGRP IPv6 session, BFD constantly monitors the forwarding path (from a local device to a neighboring device) and provides consistent failure detection at a uniform rate. Because failure detection happens at a uniform rate and not at variable rates, network profiling and planning is easier, and the reconvergence time remains consistent and predictable.

BFD is implemented in EIGRP at multiple levels; it can be implemented per interface or on all interfaces. When BFD is enabled on a specific interface, all peer relationships formed through the EIGRP “Hello” mechanism on that interface are registered with the BFD process. Subsequently, BFD establishes a session with each of the peers in the EIGRP topology and notifies EIGRP through a callback mechanism of any change in the state of any peer. When a peer is lost, BFD sends a “peer down” notification to EIGRP, and EIGRP unregisters a peer from BFD. BFD does not send a “peer up” notification to EIGRP when the peer is up because BFD now has no knowledge of the state of the peer. This behavior prevents rapid neighbor bouncing and repetitive route computations. The EIGRP “Hello” mechanism will later allow peer rediscovery and reregistration with the BFD process.

## How to Configure BFD Support for EIGRP IPv6

### Configuring BFD Support on All Interfaces

#### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 unicast-routing**
4. **interface** *type number*
5. **ipv6 address** *ipv6-address/prefix-length*
6. **bfd interval** *milliseconds* **min\_rx** *milliseconds* **multiplier** *interval-multiplier*
7. **exit**
8. **router eigrp** *virtual-name*
9. **address-family ipv6 autonomous-system** *as-number*
10. **eigrp router-id** *ip-address*
11. **af-interface default**
12. **bfd**
13. **end**
14. **show eigrp address-family ipv6 neighbors detail**
15. **show bfd neighbors**

#### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b> <b>Example:</b>	Enters global configuration mode.

	Command or Action	Purpose
	Device# configure terminal	
<b>Step 3</b>	<b>ipv6 unicast-routing</b> <b>Example:</b> Device(config)# ipv6 unicast-routing	Enables the forwarding of IPv6 unicast datagrams.
<b>Step 4</b>	<b>interface type number</b> <b>Example:</b> Device(config)# interface ethernet0/0	Specifies the interface type and number, and enters the interface configuration mode.
<b>Step 5</b>	<b>ipv6 address ipv6-address/prefix-length</b> <b>Example:</b> Device(config-if)# ipv6 address 2001:DB8:A:B::1/64	Configures an IPv6 address.
<b>Step 6</b>	<b>bfd interval milliseconds min_rx milliseconds multiplier interval-multiplier</b> <b>Example:</b> Device(config-if)# bfd interval 50 min_rx 50 multiplier 3	Sets the baseline BFD session parameters on an interface.
<b>Step 7</b>	<b>exit</b> <b>Example:</b> Device(config-if)# exit	Exits interface configuration mode and returns to global configuration mode.
<b>Step 8</b>	<b>router eigrp virtual-name</b> <b>Example:</b> Device(config)# router eigrp name	Specifies an EIGRP routing process and enters router configuration mode.
<b>Step 9</b>	<b>address-family ipv6 autonomous-system as-number</b> <b>Example:</b> Device(config-router)# address-family ipv6 autonomous-system 3	Enters address family configuration mode for IPv6 and configures an EIGRP routing instance.
<b>Step 10</b>	<b>eigrp router-id ip-address</b> <b>Example:</b> Device(config-router-af)# eigrp router-id 172.16.1.3	Sets the device ID used by EIGRP for this address family when EIGRP peers communicate with their neighbors.
<b>Step 11</b>	<b>af-interface default</b> <b>Example:</b>	Configures interface-specific commands on all interfaces that belong to an address family in EIGRP named mode

	Command or Action	Purpose
	<code>Device(config-router-af)# af-interface default</code>	configurations, and enters address-family interface configuration mode.
<b>Step 12</b>	<b>bfd</b> <b>Example:</b> <code>Device(config-router-af-interface)# bfd</code>	Enables BFD on all interfaces.
<b>Step 13</b>	<b>end</b> <b>Example:</b> <code>Device(config-router-af-interface)# end</code>	Exits address-family interface configuration mode and returns to privileged EXEC mode.
<b>Step 14</b>	<b>show eigrp address-family ipv6 neighbors detail</b> <b>Example:</b> <code>Device# show eigrp address-family ipv6 neighbors detail</code>	(Optional) Displays detailed information about the neighbors that are discovered by EIGRP with BFD enabled on an interface.
<b>Step 15</b>	<b>show bfd neighbors</b> <b>Example:</b> <code>Device# show bfd neighbors</code>	(Optional) Displays BFD information to neighbors.

## Configuring BFD Support on an Interface

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 unicast-routing**
4. **interface** *type number*
5. **ipv6 address** *ipv6-address /prefix-length*
6. **bfd interval** *milliseconds* **min\_rx** *milliseconds* **multiplier** *interval-multiplier*
7. **exit**
8. **router eigrp** *virtual-name*
9. **address-family ipv6 autonomous-system** *as-number*
10. **eigrp router-id** *ip-address*
11. **af-interface** *interface-type interface-number*
12. **bfd**
13. **end**
14. **show eigrp address-family ipv6 neighbors**
15. **show bfd neighbors**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
Step 3	<b>ipv6 unicast-routing</b> <b>Example:</b> Device(config)# ipv6 unicast-routing	Enables the forwarding of IPv6 unicast datagrams.
Step 4	<b>interface type number</b> <b>Example:</b> Device(config)# interface ethernet0/0	Specifies the interface type and number, and enters the interface configuration mode.
Step 5	<b>ipv6 address ipv6-address /prefix-length</b> <b>Example:</b> Device(config-if)# ipv6 address 2001:DB8:A:B::1/64	Configures an IPv6 address.
Step 6	<b>bfd interval milliseconds min_rx milliseconds multiplier interval-multiplier</b> <b>Example:</b> Device(config-if)# bfd interval 50 min_rx 50 multiplier 3	Sets the baseline BFD session parameters on an interface.
Step 7	<b>exit</b> <b>Example:</b> Device(config-if)# exit	Exits interface configuration mode and returns to global configuration mode.
Step 8	<b>router eigrp virtual-name</b> <b>Example:</b> Device(config)# router eigrp name	Specifies an EIGRP routing process and enters router configuration mode.
Step 9	<b>address-family ipv6 autonomous-system as-number</b> <b>Example:</b>	Enters address family configuration mode for IPv6 and configures an EIGRP routing instance.

	Command or Action	Purpose
	Device(config-router)# address-family ipv6 autonomous-system 3	
<b>Step 10</b>	<b>eigrp router-id <i>ip-address</i></b> <b>Example:</b> Device(config-router-af)# eigrp router-id 172.16.1.3	Sets the device ID used by EIGRP for this address family when EIGRP peers communicate with their neighbors.
<b>Step 11</b>	<b>af-interface <i>interface-type interface-number</i></b> <b>Example:</b> Device(config-router-af)# af-interface ethernet0/0	Configures interface-specific commands on an interface that belongs to an address family in an EIGRP named mode configuration, and enters address-family interface configuration mode.
<b>Step 12</b>	<b>bfd</b> <b>Example:</b> Device(config-router-af-interface)# bfd	Enables BFD on the specified interface.
<b>Step 13</b>	<b>end</b> <b>Example:</b> Device(config-router-af-interface)# end	Exits address-family interface configuration mode and returns to privileged EXEC mode.
<b>Step 14</b>	<b>show eigrp address-family ipv6 neighbors</b> <b>Example:</b> Device# show eigrp address-family ipv6 neighbors	(Optional) Displays neighbors for which BFD has been enabled.
<b>Step 15</b>	<b>show bfd neighbors</b> <b>Example:</b> Device# show bfd neighbors	(Optional) Displays BFD information to neighbors.

## Configuration Examples for BFD Support for EIGRP IPv6

### Example: Configuring BFD Support on All Interfaces

```
Device(config)# ipv6 unicast-routing
Device(config)# interface Ethernet0/0
Device(config-if)# ipv6 address 2001:0DB8:1::12/64
Device(config-if)# bfd interval 50 min_rx 50 multiplier 3
Device(config-if)# exit
Device(config)# router eigrp name
Device(config-router)# address-family ipv6 unicast autonomous-system 1
Device(config-router-af)# eigrp router-id 172.16.0.1
Device(config-router-af)# af-interface default
Device(config-router-af-interface)# bfd
Device(config-router-af-interface)# end
```

The following example displays the output for the **show eigrp address-family ipv6 neighbors detail** command.

```

Device# sh eigrp address-family ipv6 neighbors detail
EIGRP-IPv6 VR(test) Address-Family Neighbors for AS(5)
H   Address                               Interface                               Hold Uptime   SRTT   RTO   Q   Seq
                               (sec)                               (ms)                               Cnt Num
0   Link-local address:                   Et0/0                               14 00:02:04   1   4500  0   4
    FE80::10:2
    Version 23.0/2.0, Retrans: 2, Retries: 0, Prefixes: 1
    Topology-ids from peer - 0
    Topologies advertised to peer:   base

Max Nbrs: 0, Current Nbrs: 0

BFD sessions
NeighAddr           Interface
FE80::10:2          Ethernet0/0

```

The following example displays the output for the **show bfd neighbor** command.

```

Device# sh bfd neighbors

IPv6 Sessions
NeighAddr           LD/RD           RH/RS           State           Int
FE80::10:2          2/0             Down            Down            Et0/0

```

## Example: Configuring BFD Support on an Interface

```

Device(config)# ipv6 unicast-routing
Device(config)# Ethernet0/0
Device(config-if)# ipv6 address 2001:DB8:A:B::1/64
Device(config-if)# bfd interval 50 min_rx 50 multiplier 3
Device(config-if)# exit
Device(config)# router eigrp name
Device(config-router)# address-family ipv6 autonomous-system 3
Device(config-router-af)# af-interface Ethernet0/0
Device(config-router-af-interface)# bfd
Device(config-router-af-interface)# end

```

## Additional References

### Related Documents

Related Topic	Document Title
BFD commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples.	<a href="#">IP Routing: Protocol-Independent Command Reference</a>
EIGRP commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples.	<a href="#">IP Routing: EIGRP Command Reference</a>
Configuring EIGRP	“Configuring EIGRP” chapter in <i>IP Routing: EIGRP Configuration Guide</i>

**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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

**Feature Information for BFD Support for EIGRP IPv6**

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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

**Table 1: Feature Information for BFD Support for EIGRP IPv6**

Feature Name	Releases	Feature Information
BFD Support for EIGRP IPv6	Cisco IOS XE Gibraltar 16.11.x	The feature was introduced.