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.

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

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

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**

DETAILED STEPS

Procedure

	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	**ipv6 unicast-routing** **Example:** `Device(config)# ipv6 unicast-routing`	Enables the forwarding of IPv6 unicast datagrams.
Step 4	**interface** *type number* **Example:** `Device(config)# interface gigabitethernet0/0/1`	Specifies the interface type and number, and enters the interface configuration mode.
Step 5	**ipv6 address** *ipv6-address/prefix-length* **Example:** `Device(config-if)# ipv6 address 2001:DB8:A:B::1/64`	Configures an IPv6 address.
Step 6	**bfd interval** *milliseconds* **min_rx** *milliseconds* **multiplier** *interval-multiplier* **Example:** `Device(config-if)# bfd interval 50 min_rx 50 multiplier 3`	Sets the baseline BFD session parameters on an interface.
Step 7	**exit** **Example:**	Exits interface configuration mode and returns to global configuration mode.

	Command or Action	Purpose
	`Device(config-if)# exit`	
Step 8	**router eigrp** *virtual-name* **Example:** `Device(config)# router eigrp name`	Specifies an EIGRP routing process and enters router configuration mode.
Step 9	**address-family ipv6 autonomous-system** *as-number* **Example:** `Device(config-router)# address-family ipv6 autonomous-system 3`	Enters address family configuration mode for IPv6 and configures an EIGRP routing instance.
Step 10	**eigrp router-id** *ip-address* **Example:** `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.
Step 11	**af-interface default** **Example:** `Device(config-router-af)# af-interface default`	Configures interface-specific commands on all interfaces that belong to an address family in EIGRP named mode configurations, and enters address-family interface configuration mode.
Step 12	**bfd** **Example:** `Device(config-router-af-interface)# bfd`	Enables BFD on all interfaces.
Step 13	**end** **Example:** `Device(config-router-af-interface)# end`	Exits address-family interface configuration mode and returns to privileged EXEC mode.
Step 14	**show eigrp address-family ipv6 neighbors** **Example:** `Device# show eigrp address-family ipv6 neighbors`	(Optional) Displays neighbors for which BFD has been enabled.

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**

DETAILED STEPS

Procedure

	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	**ipv6 unicast-routing** **Example:** `Device(config)# ipv6 unicast-routing`	Enables the forwarding of IPv6 unicast datagrams.
Step 4	**interface** *type number* **Example:** `Device(config)# interface gigabitethernet0/0/1`	Specifies the interface type and number, and enters the interface configuration mode.
Step 5	**ipv6 address** *ipv6-address /prefix-length* **Example:** `Device(config-if)# ipv6 address 2001:DB8:A:B::1/64`	Configures an IPv6 address.
Step 6	**bfd interval** *milliseconds* **min_rx** *milliseconds* **multiplier** *interval-multiplier* **Example:** `Device(config-if)# bfd interval 50 min_rx 50 multiplier 3`	Sets the baseline BFD session parameters on an interface.

	Command or Action	Purpose
Step 7	**exit** **Example:** `Device(config-if)# exit`	Exits interface configuration mode and returns to global configuration mode.
Step 8	**router eigrp** *virtual-name* **Example:** `Device(config)# router eigrp name`	Specifies an EIGRP routing process and enters router configuration mode.
Step 9	**address-family ipv6 autonomous-system** *as-number* **Example:** `Device(config-router)# address-family ipv6 autonomous-system 3`	Enters address family configuration mode for IPv6 and configures an EIGRP routing instance.
Step 10	**eigrp router-id** *ip-address* **Example:** `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.
Step 11	**af-interface** *interface-type interface-number* **Example:** `Device(config-router-af)# af-interface gigabitethernet0/0/1`	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.
Step 12	**bfd** **Example:** `Device(config-router-af-interface)# bfd`	Enables BFD on the specified interface.
Step 13	**end** **Example:** `Device(config-router-af-interface)# end`	Exits address-family interface configuration mode and returns to privileged EXEC mode.
Step 14	**show eigrp address-family ipv6 neighbors** **Example:** `Device# show eigrp address-family ipv6 neighbors`	(Optional) Displays neighbors for which BFD has been enabled.

Configuration Examples for BFD Support for EIGRP IPv6

Example: Configuring BFD Support on All Interfaces

```
Device(config)# ipv6 unicast-routing
Device(config)# interface GigabitEthernet0/0/1
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
```

Example: Configuring BFD Support on an Interface

```
Device(config)# ipv6 unicast-routing
Device(config)# GigabitEthernet0/0/1
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 GigabitEthernet0/0/1
Device(config-router-af-interface)# bfd
Device(config-router-af-interface)# end
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Master Commands List, All Releases
BFD commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples.	IP Routing: Protocol-Independent Command Reference
EIGRP commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples.	IP Routing: EIGRP Command Reference
Configuring EIGRP	“Configuring EIGRP” chapter in *IP Routing: EIGRP Configuration Guide*

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 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 https://cfnng.cisco.com/. An account on Cisco.com is not required.