



BFD—BGP Multihop Client Support for IPv4

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The BFD—BGP Multihop Client Support feature enables Border Gateway Protocol (BGP) to use multihop Bidirectional Forwarding Detection (BFD) support, which improves BGP convergence as BFD detection and failure times are faster than the Interior Gateway Protocol (IGP) convergence times in most network topologies.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see 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 for BFD—BGP Multihop Client Support for IPv4” section on page 7](#).

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Restrictions for BFD—BGP Multihop Client Support for IPv4

- Since multihop BFD operates in software, the minimum timer recommended is 200 ms x 3.

- For BGP IPv4 peering sessions only, multihop BFD support is available for BGP for address-family IPv4.
- The maximum supported multihop BFD sessions are 64 with 200ms timer.
- Currently BFD Hardware offload is not supported for multihop BFD sessions and so C-bit will not be set for multihop sessions.
- Multihop BFD for IPv6 BGP is not supported.

Information About BFD—BGP Multihop Client Support for IPv4

BFD is a detection protocol that is designed to provide fast forwarding path failure detection times for all media types, encapsulations, topologies, and routing protocols. In addition to fast forwarding path failure detection, BFD provides a consistent failure detection method for network administrators. Because the network administrator can use BFD to detect forwarding path failures at a uniform rate, rather than the variable rates for different routing protocol hello mechanisms, network profiling and planning is easier, and re-convergence time is consistent and predictable. The main benefit of implementing BFD for BGP is a significantly faster re-convergence time. For internal BGP (iBGP) sessions and external BGP (eBGP) sessions that are either single hop or multihop, BGP can use of the multihop BFD support to help improve the BGP convergence because BFD detection and failure times are faster than the IGP convergence times in most of the network topologies. BGP needs the support of multihop BFD as described in RFC5882, Generic Application of Bidirectional Forwarding Detection (BFD).

How to BFD—BGP Multihop Client Support for IPv4

Configuring BFD—BGP Multihop Client Support for IPv4

Prerequisites

The multihop BFD minimum detection time should be higher than IGP convergence times in your network to ensure that down events are not mistakenly identified during re-convergences, causing multihop BGP sessions to flap.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router bgp** *autonomous-system-number*
4. **neighbor** *ip-address* **remote-as** *autonomous-system-number*
5. **neighbor** *ip-address* **update-source** *interface-type interface-number*
6. **neighbor** *ip-address* **remote-as** *autonomous-system-number*
7. **neighbor** *ip-address* **fall-over bfd**
8. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	<p>enable</p> <p>Example: Router> enable</p>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> Enter your password if prompted.
Step 2	<p>configure terminal</p> <p>Example: Router# configure terminal</p>	<p>Enters global configuration mode.</p>
Step 3	<p>router bgp <i>autonomous-system-number</i></p> <p>Example: Device(config)# router bgp 50000</p>	<p>Configures the Border Gateway Protocol (BGP) routing process and enters router configuration mode.</p>
Step 4	<p>neighbor <i>ip-address</i> remote-as <i>autonomous-system-number</i></p> <p>Example: Device(config-router)# neighbor 10.0.0.2 remote-as 100</p>	<p>Adds an entry to the BGP or multiprotocol BGP neighbor table.</p>
Step 5	<p>neighbor <i>ip-address</i> update-source <i>interface-type interface-number</i></p> <p>Example: Device(config-router)# neighbor 10.0.0.2 update-source GigabitEthernet 0/0/0</p>	<p>Allows BGP sessions to use any operational interface for TCP connections.</p>
Step 6	<p>neighbor <i>ip-address</i> remote-as <i>autonomous-system-number</i></p> <p>Example: Device(config-router)# neighbor 10.0.0.2 remote-as 100</p>	<p>Adds an entry to the BGP or multiprotocol BGP neighbor table.</p>
Step 7	<p>neighbor <i>ip-address</i> fall-over bfd</p> <p>Example: Device(config-router)# neighbor 10.0.0.2 fall-over bfd</p>	<p>Enables BGP to monitor the peering session of a specified neighbor for adjacency changes and to deactivate the peering session.</p>
Step 8	<p>end</p> <p>Example: Device(config-router)# end</p>	<p>Exits router configuration mode and returns to privileged EXEC mode.</p>

Verifying BFD—BGP Multihop Client Support for IPv4

The following show commands can be used to verify the configuration of BFD—BGP Multihop Client Support for IPv4:

- `show bfd neighbors multihop-ipv4`

Examples

Sample output for the `show bfd neighbors multihop-ipv4` command

```
Device#show bfd neighbors multihop-ipv4 1.1.1.1
IPv4 Multihop Sessions
NeighAddr[vrf]                LD/RD          RH/RS          State
1.1.1.1                        1/1            Up              Up
```

Sample output for the `show bfd neighbors multihop-ipv4 1.1.1.1 details` command

```
Device#show bfd neighbors multihop-ipv4 1.1.1.1 details
IPv4 Multihop Sessions
NeighAddr[vrf]                LD/RD          RH/RS          State
1.1.1.1                        1/1            Up              Up
Session state is UP and not using echo function.
Session Host: Software
OurAddr: 3.3.3.3
Handle: 1
Local Diag: 0, Demand mode: 0, Poll bit: 0
MinTxInt: 50000, MinRxInt: 50000, Multiplier: 5
Received MinRxInt: 50000, Received Multiplier: 5
Holddown (hits): 238(0), Hello (hits): 50(653)
Rx Count: 659, Rx Interval (ms) min/max/avg: 1/56/47 last: 12 ms ago
Tx Count: 656, Tx Interval (ms) min/max/avg: 1/56/47 last: 44 ms ago
Elapsed time watermarks: 0 0 (last: 0)
Registered protocols: BGP
Map information:
Destination[vrf]: 1.1.1.1/32
Source[vrf]: 3.3.3.3/32
Template: 50ms
Authentication(Type/Keychain): md5/mh
last_tx_auth_seq: 5 last_rx_auth_seq 4
Uptime: 00:00:31
Last packet: Version: 1                - Diagnostic: 0
              State bit: Up             - Demand bit: 0
              Poll bit: 0               - Final bit: 0
              C bit: 0
              Multiplier: 5             - Length: 48
              My Discr.: 1              - Your Discr.: 1
              Min tx interval: 50000    - Min rx interval: 50000
              Min Echo interval: 0
```

Configuration Examples for BFD - BGP Multihop Client Support IPv4

Example: Configuring BFD—BGP Multihop Client Support for IPv4

```

bfd map ipv4 1.1.1.0/24 1.1.1.1/24 mh
bfd map ipv4 10.0.0.2/24 10.0.0.1/32 mh
bfd map ipv4 10.0.0.3/24 10.0.0.4/32 mh

! Configure BFD template
bfd-template multi-hop mh
  interval min-tx 750 min-rx 750 multiplier 3
  authentication md5 keychain qq

! Enable Interface with BFD support:
interface GigabitEthernet 0/0/0
  description Backbone interface
  ip address 10.0.0.4 255.255.255.0
  no ip redirects
! shutdown
 mpls ip

!Enable BGP BFD multihop support:

router bgp 100
neighbor 10.0.0.3 remote-as 100
neighbor 10.0.0.3 update-source GigabitEthernet 0/0/0
neighbor 10.0.0.3 fall-over bfd

neighbor 10.0.0.2 remote-as 100
neighbor 10.0.0.2 fall-over bfd

```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
BGP commands	Cisco IOS IP Routing Command Reference

Standards

Standard	Title
—	—

MIBs

MIB	MIBs Link
<ul style="list-style-type: none"> — 	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

RFCs

RFC	Title
—	—

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—BGP Multihop Client Support for IPv4

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Note

Table 7-1 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.

Table 7-1 Feature Information for <Phrase Based on Module Title>

Feature Name	Releases	Feature Information
BFD—BGP Multihop Client Support for IPv4	Cisco IOS-XE 3.13.0S	The BFD—BGP Multihop Client Support feature enables Border Gateway Protocol (BGP) to use multihop Bidirectional Forwarding Detection (BFD) support, which improves BGP convergence as BFD detection and failure times are faster than the Interior Gateway Protocol (IGP) convergence times in most of network topologies. The following commands were introduced: neighbor fall-over show ip bgp neighbors

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