BFD Configuration

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Chapter 1   Configuring BFD

1.1   Overview

BFD (Bidirectional Forwarding Detection) is a set of all-net uniform detection mechanism used for rapid detection and monitoring of link or IP routing forwarding connectivity. To improve the performance of existing networks, communication troubles can be detected rapidly between neighboring protocols so that a standby communication channel can be quickly established.

BFD can establish sessions between two machines to monitor bidirectional forwarding paths between the two machines and serve upper-level protocols. The served upper-level protocol notifies BFD of the one with which the session is established. After the session is established through the three-handshake mechanism, no reception of BFD control packets from the peer within the detection time or the number of dropped echo packets outnumbering the allowed threshold causes trouble. This case is then reported to the upper-level protocol for corresponding processing.

1.2   BFD Configuration Tasks

1.2.1   Activating Port BFD

Port BFD is not activated by default.

After port BFD is enabled, BFD configured through dynamic protocols takes effect.

Run the following command to achieve the previous purpose:

Command	Purpose
bfd enable <cr> | [min_tx_interval <tx_value> min_rx_interval <rx_value> multiplier <m_value>]	Activates port BFD.

Before the BFD session is established, the BFD control packets are transmitted in an interval of no less than 1 second so as to narrow down traffic. After the session is established, the BFD control packets are transmitted in a negotiated interval so as to realize rapid detection. During the establishment of BFD session, the transmission interval and detection time of BFD control packets are also determined via packet exchange. In an effective BFD session, these timers can be modified through negotiation at any time without affecting the session status. The timer negotiations at different BFD session directions are conducted independently and the bidirectional timers can be different. The transmission interval for BFD control packets is the maximum value between local **min_tx_interval** and peer **min_rx_interval**, that is to say, the comparatively slow part decides the transmission frequency.

The detection time is **Detect Mult** in peer BFD control packets multiplied the negotiated transmission interval of peer BFD control packets. If you increase **min_tx_interval** of the local end, the actual transmission interval of BFD control packets on the local end cannot be modified until the packets reset by the peer's F field are received, which ensures that the detection time is lengthened on the peer before

the increase of the transmission interval of BFD control packets on the local end. Otherwise, the detection timer on the peer may time out.

If **min_rx_interval** on the local end is decreased, the local detection time cannot be modified until the packets reset by the peer's F field are received, which ensures that the transmission interval of BFD control packets on the peer has been decreased before the decrease of local detection time. However, if **min_tx_interval** is decreased, the local transmission interval of BFD control packets may decrease immediately; if **min_rx_interval** is increased, the local detection time will increase immediately.

1.2.2   Activating the Port BFD Query Mode

The port BFD query mode is not activated by default.

In query mode, we suppose that each system has an independent method to confirm its connection with other systems. Once a BFD session is established, the system stops transmitting BFD control packets unless a certain system requires explicit connectivity checkup. In a system where explicit connectivity checkup is required, the system transmits short-sequence BDF control packets and claims the session is down if it doesn't receive the response packets in the checkup period. If the response packets are received from the peer in the checkup period, it means the forwarding path is normal and the BFD control packets then stop being transmitted.

Run the following command to achieve the previous purpose:

Command	Purpose
bfd demand enable	Activates the BFD query mode.

The system supports to activate or deactivate the BFD query mode.

1.2.3   Activating Port BFD Echo

Port BFD echo is not activated by default.

After the BFD echo is activated, if the neighbor supporting BFD echo is up, the control packets are transmitted according to the interval configured by slow-timers. The connectivity detection is finished by the echo packets and the transmission interval of echo packets is the time configured by **min_echo_rx_interval**.

Run the following command to achieve the previous purpose:

Command	Purpose
bfd echo enable *<cr>|<number>*	Activates BFD echo.

The activation and shutdown of echo functionality on an already "up" neighbor has no impact on this neighbor's status, but the transmission interval of control packets is affected.

1.2.4   Enabling Port BFD Authentication

Port BFD authentication is not activated by default.

Authentication configuration takes immediate effect before BFD neighbor is up, and the two terminals of a link on which BFD detection is conducted can be up only when their BFD authentication configurations are same. But if authentication configuration is modified after BFD neighbor is up, the same configurations or different configurations on the two terminals have no any impact on the BFD neighbor's status.

Run the following command to achieve the previous purpose:

Command	Purpose
bfd authentication-mode [md5 | meticulous md5 | simple] <key id> <key>	Enables the BFD authentication function.

1.3   Displaying the BFD Statistics Information

You can run the following commands to display all kinds of BFD statistics information:

Command	Purpose
show bfd interfaces *[details]*	Displays the ports in the system on which BFD is activated.
show bfd neighbors *[details]*	Displays BFD neighbors in the system.

1.4   BFD Configuration Example

You need to set related protocols for BFD detection and activate the BFD function on the corresponding port before configuring BFD.

The following example shows how BFD provides BGP with bidirectional detection:

Establish the EBGP relationship between A and B, and check the link through BFD.

A:

interface vlan1

  ip address 1.1.1.1 255.255.255.0

  bfd enable

  no ip directed-broadcast

!

router bgp 100

  no synchronization

  bgp log-neighbor-changes

  neighbor 1.1.1.2 remote-as 200

  neighbor 1.1.1.2 fall-over bfd

!

B:

interface vlan1

  ip address 1.1.1.2 255.255.255.0

  bfd enable

  no ip directed-broadcast

!

router bgp 200

```
    no synchronization
    bgp log-neighbor-changes
    neighbor 1.1.1.1 remote-as 100
    neighbor 1.1.1.1 fall-over bfd
!
```