

FSOS

BFD Configuration

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1. BFD

1.1 BFD Function Overview

BFD is a simple "Hello" protocol, which in many respects resembles the neighbor detection part of the well-known routing protocols. A pair of systems periodically sends test packets over the channels on which they establish sessions, if a system does not receive the test packet from the opposite side within a sufficient period of time, it considers that a fault occurs in some part of the bi-directional channel to the adjacent system. In some cases, in order to reduce the load, the transmission and reception rates between the systems need to be negotiated.

BFD needs to set up peer-to-peer sessions at both ends of the channel before detection. After the session is established, the BFD control packets are sent to each other at the negotiated rate to implement fault detection.

The session establishment process is a three-way handshake process. After this process, the sessions at both ends become Up, and the corresponding parameters are negotiated at the same time. The later state change is based on the detection result of the defect, and the corresponding processing is done.

The BFD protocol describes the mechanism of bidirectional detection. It can be divided into two modes: asynchronous mode and query mode. There is also an auxiliary function: echo function, which can be used in combination with these two modes. The essential difference between asynchronous mode and query mode is that the position of detection is different. In asynchronous mode, the local side sends BFD control packets at a certain transmission interval and needs to detect the BFD control packets sent from the local system at the remote side. In query mode, BFD control packets sent from the local side are detected at the local system.

In asynchronous mode, the system periodically sends BFD control packets to each other. If a system does not receive the BFD control packet from the opposite side within the detection time, it declares the session to be Down.

In query mode, it is assumed that each system has a separate method to confirm that it is connected to other systems. So that once a BFD session is established, the system stops sending BFD control packets unless a system needs to explicitly verify connectivity. In case the connectivity needs to be verified explicitly, the system sends a short series of BFD control packets. If no response packet is received within the detection interval, the session is declared Down. If the response packet is received from the opposite side, the protocol remains silent again.

The local system sends a series of BFD echo packets, and the remote system loops them back through its forwarding channel. If the local system does not receive several echo packets in succession, the session is declared Down. Echo function can be used with the above two detection modes, you can use the echo function instead of the BFD control packet detection task, this reduces the transmission period of the control packet(in asynchronous mode) or completely disables the BFD control packet (in query mode).

 📖 Note:

Currently, BFD is used for OSPF and stacking. This document is only used for OSPF.

1.2 BFD Configuration

1.2.1 Enable/disable BFD

Enable/disable BFD

Operation	Command	Remarks
Enter the global configuration mode	configure terminal	-
Enable the BFD function	bfd enable	required
Disable the BFD function	bfd disable	required

1.2.2 Apply to OSPF

Apply to OSPF

Operation	Command	Remarks
Enter the global configuration mode	configure terminal	-
Enter interface configuration mode	interface vlan-interface <i>if-num</i>	required
Configure Bfd to apply to OSPF	ip ospf bfd	required
Disable Bfd to apply to OSPF	no ip ospf bfd	required

1.2.3 Configure the Session Mode

BFD session establishment is divided into active and passive two modes. If a device is in active mode, BFD control packets are actively sent regardless of whether a BFD control packet is received from the opposite side when the session is established. If a device is in passive mode, BFD control packets will not be actively sent when the session is established, and will not be sent until the BFD control packet from the opposite side is received. At least one of the two ends of the BFD session needs to be in active mode. Active mode is used by default.

Configure the Session Mode

Operation	Command	Remarks
Enter the global configuration mode	configure terminal	-
Enter interface configuration mode	interface vlan-interface <i>if-num</i>	required

Configure the session mode	bfd session init-mode { active passive }	optional
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1.2.4 Configure the Query Mode

Configure the Query Mode

Operation	Command	Remarks
Enter the global configuration mode	configure terminal	-
Enter interface configuration mode	interface vlan-interface <i>if-num</i>	required
Enable the query mode	bfd demand on	optional
Disable the query mode	bfd demand off	optional

1.2.5 Configure Time Parameters

Configure Time Parameters

Operation	Command	Remarks
Enter the global configuration mode	configure terminal	-
Enter interface configuration mode	interface vlan-interface <i>if-num</i>	required
Configure the minimum receiving interval	[no] bfd min-receive-interval <i>value</i>	optional
Configure the minimum transmission interval	[no] bfd min-transmit-interval <i>value</i>	optional
Configure the detection time	[no] bfd detect-multiplier <i>value</i>	optional

1.2.6 Information Display and Maintenance

Information Display and Maintenance

Operation	Command	Remarks
View session information	show bfd session [verbose]	optional
Display information about interface configuration	show bfd interface [verbose]	optional

1.3 BFD Configuration Example

1. Network requirements

SW1 and SW2 are connected through interface vlan 1 and run OSPF protocol. In order to immediately detect the reachability of ospf neighbors, the bfd function is enabled.(Ospf

configuration is not listed here, please refer to the OSPF user manual part. In addition to bfd run the necessary configuration, all other use the default configuration.)



sketch map of BFD

2.Configuration steps

SW1 CONFIGURATION

Enable the global bfd function and enable ospf bfd on interface 1;

```
SW1(config)#bfd enable
```

```
SW1(config-if-vlanInterface-1)#ip ospf bfd
```

Display the bfd information of the interface

```
SW1(config-if-vlanInterface-1)#s bfd interface
```

Global bfd state: enable

Interface: Vlan-interface1, Session Num: 1

Min Trans Inter: 400ms, Min Recv Inter: 400ms

DetectMult: 5, Min Echo Recv Inter: 0ms

Auth mode: NULL

Interface protocol: OSPF

#SW2 CONFIGURATION:

```
SW2(config)#bfd enable
```

```
SW2(config-if-vlanInterface-1)#ip ospf bfd
```

3.Result validation

Create a bfd session and display the following information:

```
SW1(config)#show bfd session
```

Total Session Num: 1

Init Mode: Active

Session Working Under Asynch Mode

LD	SourceAddr	DestAddr	State	Holdtime	Interface
0x06bb1f14	192.168.4.24	192.168.4.52	UP	1620ms	Vlan1