

# 1 BFD Commands

Command	Function
<a href="#">bfd interval</a>	Configure bidirectional forwarding detection (BFD) session parameters.
<a href="#">bfd bind peer-ip</a>	Associate the interface status with the BFD sessions status.
<a href="#">bfd cpp</a>	Enable BFD protection.
<a href="#">bfd echo</a>	Enable the echo mode.
<a href="#">bfd slow-timer</a>	Configure the slow timer time in the echo mode.
<a href="#">bfd up-dampening</a>	Configure a delay for status change advertisement, after which BFD informs an associated application.
<a href="#">sbfd reflector discriminator</a>	Configure a seamless bidirectional forwarding detection (SBFD) reflector discriminator.
<a href="#">show bfd neighbors</a>	Display the information of a BFD session.
<a href="#">show sbfd reflector discriminator</a>	Display the information of an SBFD reflector discriminator.
<a href="#">show sbfd reflector initiator-mapping</a>	Display the mappings between the SBFD reflector and the initiator.

## 1.1 bfd interval

### Function

Run the **bfd interval** command to configure bidirectional forwarding detection (BFD) session parameters.

Run the **no** form of this command to remove this configuration.

Bidirectional forwarding detection (BFD) session parameters are not configured by default..

### Syntax

```
bfd interval send-interval min_rx receive-interval multiplier multiplier-value
```

```
no bfd interval
```

### Parameter Description

**interval** *send-interval*: Configures the interval of sending BFD control packets to a neighbor of a BFD session, which is also the interval of echo packets. The value ranges from 50 to 999, in milliseconds.

**min\_rx** *receive-interval*: Configures the interval for the local device of a BFD session to receive BFD control packets from a neighbor. The value ranges from 50 to 999, in milliseconds.

*multiplier-value*: Maximum number of BFD control packets from the peer end that can be discarded within the negotiation interval. The value range is from 3 to 50.

### Command Modes

Interface configuration mode

BFD template configuration mode

### Default Level

14

### Usage Guidelines

You are advised to keep the parameter configuration consistent at both ends of a BFD session. The purpose is to ensure that the application protocols associated with BFD take effect simultaneously and prevent occurrence of one-way forwarding path due to different dampening time at both ends.

Transmission bandwidth differences of different interfaces need to be taken into account during parameter configuration. If the configured minimum Tx interval and minimum Rx interval are very small, BFD may occupy excessive bandwidth and affect data transmission.

When a session negotiation is not completed on a port during command execution, the system prompts that a session negotiation is in progress and returns a configuration failure.

### Examples

The following example configures the BFD session parameters for the L3 port GigabitEthernet0/1, and sets the interval of sending BFD packets to **100** ms, the interval of receiving BFD packets to **100** ms, and the maximum number of packets that can be discarded to **3**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface gigabitethernet 0/1
```

```
Hostname(config-if-GigabitEthernet0/1)# bfd interval 100 min_rx 100 multiplier 3
```

The following example configures the BFD session parameters for the template `template1`, and sets the interval of sending BFD packets to **100** ms, the interval of receiving BFD packets to **100** ms, and the maximum number of packets that can be discarded to **3**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# bfd-template multi-hop template1
Hostname(config-bfd)# bfd interval 100 min_rx 100 multiplier 3
```

### Notifications

When the memory is insufficient during the execution of this command and the configuration fails, the following notification will be displayed:

```
no enough memory for this config.
```

When the interface line bandwidth is insufficient during the execution of this command and the configuration fails, the following notification will be displayed:

```
no enough bandwidth for this config.
```

### Common Errors

N/A

### Platform Description

N/A

### Related Commands

N/A

## 1.2 bfd bind peer-ip

### Function

Run the **bfd bind peer-ip** command to associate the interface status with the BFD sessions status.

Run the **no** form of this command to remove this configuration.

No interface status is associated with the BFD sessions status by default.

### Syntax

```
bfd bind peer-ip ipv4-address [ source-ip ipv4-address ] process-pst
```

```
no bfd bind peer-ip ipv4-address
```

### Parameter Description

**peer-ip** *ipv4-address*: Configures the peer IP address for detection. It must be set to the address of a directly connected L3 interface.

**source-ip** *ipv4-address*: Configures the source IP address for sending BFD packets. The source IP address is specified to ensure that packets are not discarded by the unicast reverse path forwarding (URPF) when BFD is used together with URPF and other functions. The default source IP address is **0**, and the source IP address is learned through BFD session negotiation.

**process-pst:** Associates the session with the BFD state of an L3 interface.

### Command Modes

Interface configuration mode

### Default Level

14

### Usage Guidelines

Configure this command on an L3 interface and make sure that the detected peer IP address is the address of the directly connected interface.

### Examples

The following example enables BFD on the L3 port GigabitEthernet 0/1, and sets the peer IP address to 192.168.0.2, and associates the interface with the BFD state of the interface.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface gigabitethernet 0/1
Hostname(config-if-GigabitEthernet0/1)# ip address 192.168.0.1 255.255.255.0
Hostname(config-if-GigabitEthernet0/1)# bfd bind peer-ip 192.168.0.2 source-ip
192.168.0.1 process-pst
```

### Notifications

When the memory is insufficient during the execution of this command and the configuration fails, the following notification will be displayed:

```
no enough memory for this config.
```

### Common Errors

N/A

### Platform Description

N/A

### Related Commands

N/A

## 1.3 bfd cpp

### Function

Run the **bfd cpp** command to enable BFD protection.

Run the **no** form of this command to disable this feature.

BFD protection is enabled by default.

### Syntax

**bfd cpp**

**no bfd cpp**

### Parameter Description

N/A

### Command Modes

Global configuration mode

### Default Level

14

### Usage Guidelines

The BFD protocol is very sensitive. If a BFD-enabled device is attacked, BFD protection can be enabled to provide protection.

If both BFD and BFD protection are enabled, the device discards the BFD packets received from the previous-hop device, which affects the establishment of a BFD session between the previous-hop device and other devices.

### Examples

The following example enables BFD protection.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# bfd cpp
```

### Notifications

N/A

### Common Errors

N/A

### Platform Description

N/A

### Related Commands

N/A

## 1.4 bfd echo

### Function

Run the **bfd echo** command to enable the echo mode.

Run the **no** form of this command to disable this feature.

The echo mode is disabled for a BFD session by default.

### Syntax

**bfd echo [ one-arm ]**

**no bfd echo****Parameter Description**

**one-arm**: Indicates a one-armed echo mode.

**Command Modes**

Interface configuration mode

**Default Level**

14

**Usage Guidelines**

By default, when BFD session parameters are configured, the system automatically enables the asynchronous mode, and disables the one-armed echo mode.

The minimum TX interval and minimum RX interval of echo packets adopt the **Interval** *send-interval* and **min\_rx** *receive-interval* parameters of a session.

Before enabling the echo mode or one-armed echo mode of BFD, run the **no ip redirects** command on the neighbors of a BFD session to disable the function of sending ICMP redirection packets, and run the **no ip deny land** command to disable the distributed denial of service (DDoS) function to prevent the land-based attack.

The echo mode takes effect only after it is enabled at both ends of a BFD session.

The one-armed echo mode takes effect when it is enabled at one end of a BFD session.

In the process that the forwarding plane of the peer device returns echo packets transmitted by the local end to the local end, the echo packets may be lost due to congestion of the peer device, causing a session detection failure. In this case, you need to configure a quality of service (QoS) policy to ensure that echo packets are processed preferentially or disable the echo function.

**Examples**

The following example enables the echo mode on the L3 port GigabitEthernet0/1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface gigabitethernet 0/1
Hostname(config-if-GigabitEthernet0/1)# bfd echo
```

The following example enables the one-armed echo mode on the L3 port GigabitEthernet0/1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface gigabitethernet 0/1
Hostname(config-if-GigabitEthernet0/1)# bfd echo one-arm
```

**Notifications**

When the memory is insufficient during the execution of this command and the configuration fails, the following notification will be displayed:

```
no enough memory for this config.
```

When the interface line bandwidth is insufficient during the execution of this command and the configuration fails, the following notification will be displayed:

```
no enough bandwidth for this config.
```

### Common Errors

N/A

### Platform Description

N/A

### Related Commands

N/A

## 1.5 bfd slow-timer

### Function

Run the **bfd slow-timer** command to configure the slow timer time in the echo mode.

Run the **no** form of this command to restore the default configuration.

The default slow timer time in the echo mode is **2000** milliseconds.

### Syntax

```
bfd slow-timer [ interval ]
```

```
no bfd slow-timer
```

### Parameter Description

*interval*: Slow timer time of BFD, in milliseconds. The value range is from 1000 to 30000.

### Command Modes

Global configuration mode

### Default Level

14

### Usage Guidelines

N/A

### Examples

The following example sets the slow timer time in the echo mode to **14000** milliseconds.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# bfd slow-timer 14000
```

### Notifications

N/A

## Common Errors

N/A

## Platform Description

N/A

## Related Commands

N/A

# 1.6 bfd up-dampening

## Function

Run the **bfd up-dampening** command to configure a delay for status change advertisement, after which BFD informs an associated application.

Run the **no** form of this command to restore the default configuration.

The default delay for status change advertisement, after which BFD informs an associated application of BFD up is **0** seconds.

## Syntax

**bfd up-dampening** *interval*

**no bfd up-dampening**

## Parameter Description

*interval*: Required delay for status change advertisement, after which BFD informs an associated application of BFD up, in milliseconds. The value range is 0 to 300000. When the parameter is set to **0**, the associated application is informed immediately when the session state is switched from down to up.

## Command Modes

Interface configuration mode

## Default Level

14

## Usage Guidelines

Enable this function only when the link is unstable.

If a BFD session does not frequently switch between the down and up states, configuring this command will delay notifying an associated application of BFD up.

## Examples

The following example sets the delay for status change advertisement, after which BFD informs an associated application of BFD up, to **60,000** milliseconds on the port GigabitEthernet 0/1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface gigabitethernet 0/1
```



```
Hostname(config-if-GigabitEthernet0/1)# bfd up-dampening 60000
```

### Notifications

When the memory is insufficient during the execution of this command and the configuration fails, the following notification will be displayed:

```
no enough memory for this config.
```

When the interface line bandwidth is insufficient during the execution of this command and the configuration fails, the following notification will be displayed:

```
no enough bandwidth for this config.
```

### Common Errors

N/A

### Platform Description

N/A

### Related Commands

N/A

## 1.7 sbfd reflector discriminator

### Function

Run the **sbfd reflector discriminator** command to configure a seamless bidirectional forwarding detection (SBFD) reflector discriminator.

Run the **no** form of this command to remove this configuration.

No SBFD reflector discriminator is configured by default.

### Syntax

```
sbfd reflector discriminator { unsigned-integer-descriptor | ipv4-address }
```

```
no sbfd reflector discriminator { unsigned-integer-descriptor | ipv4-address }
```

### Parameter Description

*unsigned-integer-descriptor*: Discriminator of the integer type. The value range is from 16777216 to 4294967295.

*ipv4-address*: IPv4 address, in dotted decimal notation.

### Command Modes

Global configuration mode

### Default Level

14

### Usage Guidelines

Like BFD sessions, SBFD sessions also distinguish different sessions through My Discriminator and Your Discriminator. Since the reflector of SBFD does not perceive the detection service and is responsible for only

looping back packets, only a reflector discriminator needs to be configured by running the **reflector discriminator** command at the reflector. This discriminator is Your Discriminator for the initiator.

In a network, one initiator can be deployed to map to multiple reflectors, and multiple reflector discriminators can be configured for one reflector. All the reflector discriminators in the network must be globally unique.

## Examples

The following example sets the Sbfd reflector discriminator to 16777216.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# sbfd reflector discriminator 16777216
```

## Notifications

N/A

## Common Errors

N/A

## Platform Description

N/A

## Related Commands

- [show sbfd reflector discriminator](#)

# 1.8 show bfd neighbors

## Function

Run the **show bfd neighbors** command to display the information of a BFD session.

## Syntax

```
show bfd neighbors [ vrf vrf-name ] [ client { ap | bgp | isis | ospf | ospfv3 | rip | vrrp | static-route | pbr | vrrp-balance | bgp-lsp | ldp-lsp | static-lsp | backward-lsp-with-ip | pst | dhcp | openflow | pimdm | pimsm | pimsmv6 | srp } ] [ ipv4 ipv4-address | ipv6 ipv6-address ] [ details ] [ parm-consult [ interface-type interface-number ] ]
```

## Parameter Description

**vrf vrf-name**: Specifies the name of a virtual routing forwarding (VRF) instance, to which a neighbor belongs. The global VRF instance is displayed by default.

**client**: Displays a specified application protocol. All the application protocols are displayed by default.

**ap**: Displays the information of a BFD session associated with an L3 aggregate port (AP) member port.

**bgp**: Displays the information of a BFD session associated with Border Gateway Protocol (BGP).

**isis**: Displays the information of a BFD session associated with Intermediate System to Intermediate System (IS-IS).

**ospf**: Displays the information of a BFD session associated with Open Shortest Path First (OSPF).

**ospfv3**: Displays the information of a BFD session associated with OSPFv3.

- rip**: Displays the information of a BFD session associated with Routing Information Protocol (RIP).
- vrp**: Displays the information of a BFD session associated with Virtual Router Redundancy Protocol (VRRP).
- static-route**: Displays the information of a BFD session associated with static routing.
- pbr**: Displays the information of a BFD session associated with policy-based routing (PBR).
- vrp-balance**: Displays the information of a BFD session associated with VRRP Plus.
- bgp-lsp**: Displays the information of a BFD session associated with BGP label switched paths (LSPs).
- ldp-lsp**: Displays the information of a BFD session associated with Label Distribution Protocol (LDP) LSPs.
- backward-lsp-with-ip**: Displays the information of a BFD session associated with IP addresses of reverse LSPs.
- static-lsp**: Displays the information of a BFD session associated with static LSPs.
- pst**: Displays the information of a BFD session associated with an L3 interface.
- dhcp**: Displays the information of a BFD session associated with Dynamic Host Configuration Protocol (DHCP).
- openflow**: Displays the information of a BFD session associated with open flow.
- pimdm**: Displays the information of a BFD session associated with Protocol Independent Multicast-Dense Mode (PIM-DM).
- pimsm**: Displays the information of a BFD session associated with Protocol Independent Multicast-Sparse Mode (PIM-SM).
- pimsm**: Displays the information of a BFD session associated with PIM-SMv6.
- srp**: Displays the information of a BFD session associated with SRP.
- ipv4 *ipv4-address***: Displays the information of a specific IPv4 session. The information of all the sessions is displayed by default.
- ipv6 *ipv6-address***: Displays the session information of a specific IPv6 neighbor. The information of all the sessions is displayed by default.
- details**: Displays the details. The brief information is displayed by default.
- parm-consult**: Displays the number of BFD sessions that have completed negotiation.
- parm-consult *interface-type interface-number***: Displays the number of BFD sessions that have completed negotiation on a specified port.

## Command Modes

All modes except the user EXEC mode

## Default Level

1

## Usage Guidelines

In the information displayed by running the **show bfd neighbors** command, "OurAddr" indicates the source address of a session. When it is displayed as "-", no source address is specified. For example, the command is run on a BFD session associated with IP addresses of reverse LSPs. "Int" indicates the interface information of a session. When it is displayed as "-", no interface is specified. For example, the command is run on a

session associated with a protocol that does not carry interface information, and the system prompt logs of the session do not contain the interface information.

## Examples

The following example displays the basic information of BFD sessions.

```

Hostname> enable
Hostname# show bfd neighbors
IPV4 sessions: 1, UP: 1
IPV6 sessions: 0, UP: 0
OurAddr      NeighAddr      LD/RD      RH/RS      Holddown(mult)  State  Int
192.168.24.2 192.168.24.1 8192/8192  Up         0(3 )           Up
GigabitEthernet 0/1

```

The following example displays the details of BFD sessions.

```

Hostname> enable
Hostname# sh bfd neighbors details
IPV4 sessions: 1, UP: 1
IPV6 sessions: 0, UP: 0
OurAddr      NeighAddr      LD/RD      RH/RS      Holddown(mult)  State  Int
192.168.24.2 192.168.24.1 8192/8192  Up         0(3 )           Up
GigabitEthernet 0/1
Session state is Up and using echo function with 50 ms interval.
Local Diag: 0, Demand mode: 0, Poll bit: 0
MinTxInt: 3000000, MinRxInt: 3000000, Multiplier: 3
Received MinRxInt 3000000, Multiplier: 3
Holddown (hits): 9000(0), Hello (hits): 3000(36)
Rx Count: 127, Rx Interval (ms) min/max/avg: 40/999/999
Tx Count: 135, Tx Interval (ms) min/max/avg: 1000/1000/999
Registered protocols: VRRP
Uptime: 0:01:19
Last packet:
Version      : 1 - Diagnostic : 0
State bit    : Up - Demand bit : 0
Poll bit     : 0 - Final bit : 0
Multiplier  : 3 - Length : 24
My Discr     : 8192 - Your Discr : 8192
Min tx interval : 3000000 - Min rx interval: 3000000
Min Echo interval: 50000

```

The following example displays the information about a BFD session associated with the L3 AP application.

```

Hostname> enable
Hostname# show bfd neighbors client ap
IPV4 sessions: 1, UP: 0
IPV6 sessions: 0, UP: 0
OurAddr      NeighAddr      LD/RD      RH/RS      Holddown(mult)  State  Int
192.168.23.1 192.168.23.2 8192/0     Admin      0(3 )           Down
GigabitEthernet 0/2 (AP 1)

```

The following example displays the number of BFD sessions that have completed negotiation.

```

Hostname> enable
Hostname# show bfd neighbors parm-consult
IPV4 sessions: 1, UP: 1  consult-Finish: 1
IPV6 sessions: 0, UP: 0  consult-Finish: 0
OurAddr      NeighAddr      LD/RD      RH/RS      Holddown(mult) State  Int
192.168.23.1 192.168.23.2  8192/8192  UP         0(3  )      UP
GigabitEthernet 0/2 (AP 1)

```

**Table 1-1 Output Fields of the show bfd neighbors Command**

Field	Description
IPV4 sessions	Total number of IPv4 BFD sessions and number of up sessions.
IPV6 sessions	Total number of IPv6 BFD sessions and number of up sessions.
OurAddr	Local IP address of a session.
NeighAddr	Neighbor IP address of the session.
LD/RD	Local and remote discriminators of the session.
RH/RS	Current state of the session's peer end.
Holddown(mult)	Time when the local end of the session fails to receive hello packets and number of session detection timeout times.
State	Current state of the session.
Int	ID of the interface where the session is.
Session state is UP and using echo function with 50 ms interval	Whether the session is in the echo mode and the time interval of sending echo packets (the information is displayed only in the echo mode).
Local Diag	Diagnostic information of the session.
Demand mode	Whether the session query mode is activated.
Poll bit	Whether the configuration of the session is modified.
MinTxInt	Minimum Tx interval configured at the local end of the session.
MinRxInt	Minimum Rx interval configured at the local end of the session.
Multiplier	Number of detection timeout times configured at the local end of the session.
Received MinRxInt	Minimum Tx interval configured at the remote end of the session.
Received Multiplier	Number of detection timeout times configured at the remote end of the session.
Holddown (hits)	Session detection time and the number of detected timeout times.

Field	Description
Hello (hits)	Minimum interval of receiving hello packets after session negotiation.
Rx Count	Number of BFD packets received by the local end of the session.
Rx Interval (ms) min/max/avg	Minimum interval, maximum interval, and average interval of receiving packets at the local end of the session.
Tx Count	Number of BFD packets sent at the local end of the session.
Tx Interval (ms) min/max/avg	Minimum interval, maximum interval, and average interval of transmitting packets at the local end of the session.
Registered protocols	Type of the application protocol registered to the session.
Uptime	Up time of the session.
Last packet	Information of the last BFD packet received at the local end of the session.
consult-Finish	Statistics of the sessions that have completed negotiation.

**Notifications**

N/A

**Platform Description**

N/A

**Related Commands**

N/A

**1.9 show sbfd reflector discriminator****Function**

Run the **show sbfd reflector discriminator** command to display the information of an Sbfd reflector discriminator.

**Syntax**

```
show sbfd reflector discriminator
```

**Parameter Description**

N/A

**Command Modes**

All modes except the user EXEC mode

**Default Level**

1

**Usage Guidelines**

To display the reflector information of Sbfd, run the **show sbfd reflector discriminator** command.

**Examples**

The following example displays the information of an Sbfd reflector discriminator.

```

Hostname> enable
Hostname# show sbfd reflector discriminator
Reflec-Discr(INT)      Reflec-Discr(IP)      State      CreateType
16777216              1.0.0.0               Active     Integer
Total Discriminator Num : 1

```

**Table 1-1 Output Fields of the show sbfd reflector discriminator Command**

Field	Description
Reflec-Discr(INT)	Sbfd reflector discriminator of the integer type.
Reflec-Discr(IP)	IP address of the Sbfd reflector.
State	Status of the Sbfd reflector.
CreateType	Character type of the Sbfd reflector.
Total Discriminator Num	Number of Sbfd reflector discriminators.

**Notifications**

N/A

**Platform Description**

N/A

**Related Commands**

N/A

**1.10 show sbfd reflector initiator-mapping****Function**

Run the **show sbfd reflector initiator-mapping** command to display the mappings between the Sbfd reflector and the initiator.

**Syntax**

```
show sbfd reflector initiator-mapping
```

**Parameter Description**

N/A

**Command Modes**

All modes except the user EXEC mode

**Default Level**

1

**Usage Guidelines**

To display the information of the initiator associated with a reflector, run the **show sbfd reflector initiator-mapping** command.

**Examples**

The following example displays the mappings between the Sbfd reflector and the initiator.

```

Hostname> enable
Hostname# show sbfd reflector initiator-mapping
Reflec-Discr          Initia-Discr          Int
16777216              10000                 Gi1/0/5
16777216              10001                 Gi1/0/5
16777216              10002                 Gi1/0/5
16777216              10003                 Gi1/0/6
16777216              10004                 Gi1/0/6
16777216              10005                 Gi1/0/6
Total Initiator-mapping Num : 6

```

**Table 1-1 Output Fields of the show sbfd reflector initiator-mapping Command**

Field	Description
Reflec-Discr	SBFD reflector discriminator of the integer type.
Initia -Discr	SBFD initiator discriminator of the integer type.
Int	Outbound interface of SBFD reflector response packets.
Total Initiator-mapping Num	Total number of mappings between the SBFD reflector and the initiator.

**Notifications**

N/A

**Platform Description**

N/A

**Related Commands**

N/A