

# Troubleshoot Bidirectional Forwarding Detection in Cisco IOS XE

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## Introduction

This document describes how to troubleshoot issues with Bidirectional Forwarding Detection (BFD) in Cisco IOS® XE.

## Prerequisites

### Requirements

There are no specific requirements for this document.

### Components Used

This document is not restricted to specific software or hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

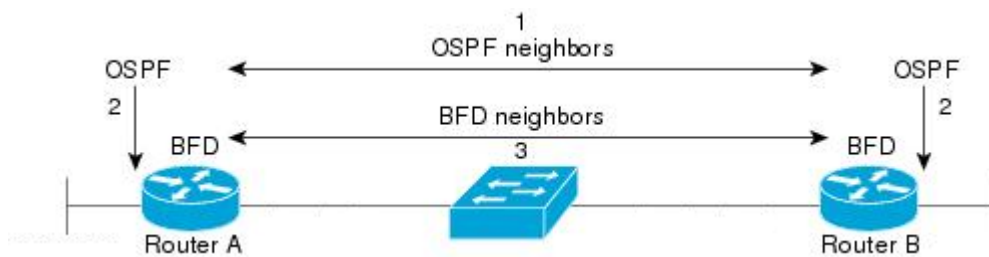
## BFD Overview

Bidirectional Forwarding Detection (BFD) is a detection protocol designed to provide fast forward path failure detection times for all media types, encapsulations, topologies, and routing protocols. In addition to fast forward path failure detection, BFD provides a consistent failure detection method for network

administrators. Because the network administrator can use BFD to detect forward path failures at a uniform rate, rather than the variable rates for different routing protocol hello mechanisms, network profiles and plans are easier, and reconvergence time is consistent and predictable.

A pair of systems transmit BFD packets periodically over each path between the two systems, and if a system stops receipt of BFD packets for long enough, some component in that particular bidirectional path to the neighbor system is assumed to have failed. Under some conditions, systems can negotiate not to send periodic BFD packets in order to reduce overhead. Reduction of number and frequency of updates can, however, impact the sensitivity of BFD.

The image shows BFD establishment in simple network with two routers configured for OSPF and BFD. When OSPF discovers a neighbor (1) it sends a request to the local BFD process to initiate a BFD neighbor session with the OSPF neighbor router (2). The BFD neighbor session with the OSPF neighbor router is established (3). The same progression is used with other routing protocols when BFD is enabled.



## BFD Modes of Operation

**BFD Echo Mode** - Echo mode is enabled by default, and runs with asynchronous BFD. It can be disabled on one side to run with asymmetry, or run on both sides of a neighborship. Echo packets are sent by the forward engine, and forwarded back along the same path. An echo packet is set with a source and destination address of the interface itself, and a destination UDP port of 3785. The neighbor reflects the echo back to the originator, which minimizes its process load of the packet, and increases the possible sensitivity of BFD. In general, echoes are not forwarded to the control plane of the neighbor, in order to reduce delays and CPU load.

**BFD Asynchronous Mode** - Asynchronous mode tracks the neighbor availability by the exchange of control packets between the two neighbors, which requires static configuration of BFD on both sides.

## Troubleshoot BFD Problems

### BFD Down

BFD down log messages are crucial to isolation of a down session. There are several different causes which can be seen:

**DETECT TIMER EXPIRED** - The router no longer receives BFD keepalive traffic and times out.

**ECHO FAILURE** - The router no longer receives its BFD echos from the other side.

**RX DOWN** - The router receives notification from its neighbor that it has gone down.

**RX ADMINDOWN** - BFD has been disabled on the neighbor device.

\*Mar 31 19:35:51.809: %BFD/SM-6-BFD\_SESS\_DOWN: BFD-SYSLOG: BFD session Id:4111 handle:3,is going Down Re

```

*Mar 31 19:35:51.811: %BGP-5-NBR_RESET: Neighbor 10.1.1.2 reset (BFD adjacency down)
*Mar 31 19:35:51.812: %BGP-5-ADJCHANGE: neighbor 10.1.1.2 Down BFD adjacency down
*Mar 31 19:35:51.813: %BGP_SESSION-5-ADJCHANGE: neighbor 10.1.1.2 IPv4 Unicast topology base removed from
*Mar 31 19:35:51.813: %BFD-6-BFD_SESS_DESTROYED: BFD-SYSLOG: bfd_session_destroyed, ld:4111 neigh proc:

```

```

*Mar 31 19:36:33.377: %BFDFSM-6-BFD_SESS_DOWN: BFD-SYSLOG: BFD session ld:4113 handle:1,is going Down Re
*Mar 31 19:36:33.380: %BFD-6-BFD_SESS_DESTROYED: BFD-SYSLOG: bfd_session_destroyed, ld:4113 neigh proc:
*Mar 31 19:36:33.381: %OSPF-5-ADJCHG: Process 1, Nbr 10.30.30.30 on GigabitEthernet3 from FULL to DOWN,

```

```

*Mar 31 19:35:59.483: %BFDFSM-6-BFD_SESS_DOWN: BFD-SYSLOG: BFD session ld:4110 handle:2,is going Down Re
*Mar 31 19:36:02.220: %BFD-6-BFD_SESS_CREATED: BFD-SYSLOG: bfd_session_created, neigh 10.1.1.2 proc:BGP,

```

After confirmation of the reason the BFD session is torn down, and the directionality of the problem, you can begin to isolate possible causes:

- One-way media failure
- Configuration changes
- BFD blocked in the path
- CPU or forward failures on one device

## BFD Neighbor Flaps

### Neighbor Flaps Due to Packet Loss

Frequent BFD flaps can often be due to a lossy link that causes BFD control packets or echos to be lost. If there are multiple different session down reasons, this would be more indicative of packet loss.

```

*Apr 4 17:18:25.931: %BFDFSM-6-BFD_SESS_DOWN: BFD-SYSLOG: BFD session ld:4097 handle:1,is going Down Re
*Apr 4 17:18:25.933: %BGP-5-NBR_RESET: Neighbor 10.1.1.2 reset (BFD adjacency down)
*Apr 4 17:18:25.934: %BGP-5-ADJCHANGE: neighbor 10.1.1.2 Down BFD adjacency down
*Apr 4 17:18:25.934: %BGP_SESSION-5-ADJCHANGE: neighbor 10.1.1.2 IPv4 Unicast topology base removed from
*Apr 4 17:18:25.934: %BFD-6-BFD_SESS_DESTROYED: BFD-SYSLOG: bfd_session_destroyed, ld:4097 neigh proc:
*Apr 4 17:18:27.828: %BFDFSM-6-BFD_SESS_UP: BFD-SYSLOG: BFD session ld:4097 handle:1 is going UP
*Apr 4 17:18:32.304: %BFD-6-BFD_SESS_CREATED: BFD-SYSLOG: bfd_session_created, neigh 10.1.1.2 proc:BGP,
*Apr 4 17:18:32.304: %BGP-5-ADJCHANGE: neighbor 10.1.1.2 Up
*Apr 4 17:18:34.005: %BFDFSM-6-BFD_SESS_UP: BFD-SYSLOG: BFD session ld:4100 handle:1 is going UP
*Apr 4 17:18:34.418: %BFDFSM-6-BFD_SESS_DOWN: BFD-SYSLOG: BFD session ld:4100 handle:1,is going Down Re
*Apr 4 17:18:34.420: %BGP-5-NBR_RESET: Neighbor 10.1.1.2 reset (BFD adjacency down)
*Apr 4 17:18:34.422: %BGP-5-ADJCHANGE: neighbor 10.1.1.2 Down BFD adjacency down
*Apr 4 17:18:34.422: %BGP_SESSION-5-ADJCHANGE: neighbor 10.1.1.2 IPv4 Unicast topology base removed from
*Apr 4 17:18:34.422: %BFD-6-BFD_SESS_DESTROYED: BFD-SYSLOG: bfd_session_destroyed, ld:4100 neigh proc:
*Apr 4 17:18:42.529: %BFD-6-BFD_SESS_CREATED: BFD-SYSLOG: bfd_session_created, neigh 10.1.1.2 proc:BGP,
*Apr 4 17:18:42.529: %BGP-5-ADJCHANGE: neighbor 10.1.1.2 Up
*Apr 4 17:18:43.173: %BFDFSM-6-BFD_SESS_UP: BFD-SYSLOG: BFD session ld:4100 handle:1 is going UP

```

To isolate packet loss, it is helpful to take an embedded packet capture of the involved interface. The basic commands are:

```

monitor capture <name> interface <interface> <in|out|both>
monitor capture <name> match ipv4 protocol udp any any eq <3784|3785>

```

You can also filter with an access-list to match both BFD control and echo packets.

```
config t
ip access-list extended <ACLname>
permit udp any any eq 3784
permit udp any any eq 3785
end
monitor capture <name> interface <interface> <in|out|both>
monitor capture <name> access-list <ACLname>
```

In this example, captures on the inbound interface show BFD control packets are received consistently, but echoes are intermittent. From the 5 second to 15 second timestamps, there are no echo packets for the local system 10.1.1.1 seen returned. This would indicate there is loss from the BFD router towards its neighbor.

```
BFDrouter#show run | section access-list extended
ip access-list extended BFDcap
 10 permit udp any any eq 3784
 20 permit udp any any eq 3785
BFDrouter#mon cap BFD interface Gi1 in
BFDrouter#mon cap BFD access-list BFDcap
BFDrouter#mon cap BFD start
Started capture point : BFD
BFDrouter#mon cap BFD stop
Stopped capture point : BFD
BFDrouter#show mon cap BFD buffer brief
```

#	size	timestamp	source	destination	dscp	protocol
...						
212	54	4.694016	10.1.1.1	-> 10.1.1.1	48 CS6	UDP
213	54	4.733016	10.1.1.2	-> 10.1.1.2	48 CS6	UDP
214	54	4.735014	10.1.1.1	-> 10.1.1.1	48 CS6	UDP
215	54	4.789012	10.1.1.1	-> 10.1.1.1	48 CS6	UDP
216	54	4.808009	10.1.1.2	-> 10.1.1.2	48 CS6	UDP
217	54	4.838006	10.1.1.1	-> 10.1.1.1	48 CS6	UDP
218	66	4.857002	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
219	66	5.712021	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
220	66	6.593963	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
221	66	7.570970	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
222	66	8.568971	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
223	66	9.354977	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
224	66	10.250979	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
225	66	11.154991	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
226	66	11.950000	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
227	66	12.925007	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
228	66	13.687013	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
229	66	14.552965	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
230	66	15.537967	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
231	66	15.641965	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
232	66	15.656964	10.1.1.2	-> 10.1.1.1	48 CS6	UDP
233	54	15.683015	10.1.1.1	-> 10.1.1.1	48 CS6	UDP
234	54	15.702011	10.1.1.2	-> 10.1.1.2	48 CS6	UDP
235	54	15.731017	10.1.1.1	-> 10.1.1.1	48 CS6	UDP
236	54	15.752012	10.1.1.2	-> 10.1.1.2	48 CS6	UDP

## Neighbor Flaps Due to Parameters Set Too Low

On lower speed links, it is important to be mindful of appropriate BFD parameters. The interval and minimum receive values are set in milliseconds. If the delay between neighbors is at or near these values, normal delays caused by traffic conditions trigger BFD flaps. For example, if the normal end-to-end delay between neighbors is 100 ms and the BFD interval is set to the minimum of 50 ms with a multiplier of 3, a single missed BFD packet would trigger a neighbor down event, as the next two are still in transit.

You can validate the delay to the neighbor via a simple ping between the two neighbor IP addresses.

Additionally, the minimum supported timers vary per-platform, and must be confirmed prior to BFD configuration.

## BFD Does Not Fail Over When Strict Mode is Not Configured

It is important to note that when BFD strict-mode is not enabled, the absence of a BFD session does not prevent the associated routing protocol from establishment.

This can allow re-convergence in undesirable scenarios. In the example, BFD successfully tears down BGP, but because TCP communication remains successful, the neighbor comes back up.

```
*Mar 31 18:53:08.997: %BFDFSM-6-BFD_SESS_DOWN: BFD-SYSLOG: BFD session ld:4097 handle:1,is going Down Re
*Mar 31 18:53:08.999: %BGP-5-NBR_RESET: Neighbor 10.1.1.1 reset (BFD adjacency down)
*Mar 31 18:53:09.000: %BGP-5-ADJCHANGE: neighbor 10.1.1.1 Down BFD adjacency down
*Mar 31 18:53:09.000: %BGP_SESSION-5-ADJCHANGE: neighbor 10.1.1.1 IPv4 Unicast topology base removed fro
BGPpeer#
*Mar 31 18:53:09.000: %BFD-6-BFD_SESS_DESTROYED: BFD-SYSLOG: bfd_session_destroyed, ld:4097 neigh proc
*Mar 31 18:53:10.044: %SYS-5-CONFIG_I: Configured from console by console
BGPpeer#
*Mar 31 18:53:15.245: %BFD-6-BFD_SESS_CREATED: BFD-SYSLOG: bfd_session_created, neigh 10.1.1.1 proc:BGP
*Mar 31 18:53:15.245: %BGP-5-ADJCHANGE: neighbor 10.1.1.1 Up
BGPpeer#show bfd neighbor
```

IPv4 Sessions

NeighAddr	LD/RD	RH/RS	State	Int
10.1.1.1	4097/0	Down	Down	Gi1

Because BGP is up prior to BFD neighborship, the network re-converges. If BFD remains down, the only way for the neighbor to be brought down is when the two minute hold timer expires, which delays failover.

```
*Mar 31 18:59:01.539: %BGP-3-NOTIFICATION: sent to neighbor 10.1.1.1 4/0 (hold time expired) 0 bytes
*Mar 31 18:59:01.540: %BGP-5-NBR_RESET: Neighbor 10.1.1.1 reset (BGP Notification sent)
*Mar 31 18:59:01.541: %BGP-5-ADJCHANGE: neighbor 10.1.1.1 Down BGP Notification sent
*Mar 31 18:59:01.541: %BGP_SESSION-5-ADJCHANGE: neighbor 10.1.1.1 IPv4 Unicast topology base removed fro
*Mar 31 18:59:01.541: %BFD-6-BFD_SESS_DESTROYED: BFD-SYSLOG: bfd_session_destroyed, ld:4097 neigh proc
```

## Useful Show Commands

### Show BFD Neighbor Details

This command provides details of the configured BFD neighbors as outlined below. This includes all neighbors independent of current state.

BFDrouter#show bfd neighbor details

IPv4 Sessions

NeighAddr	LD/RD	RH/RS	State	Int
10.1.1.2	4104/4097	Up	Up	Gi1

Session state is UP and using echo function with 50 ms interval.

Session Host: Software

OurAddr: 10.1.1.1

Handle: 3

Local Diag: 0, Demand mode: 0, Poll bit: 0

MinTxInt: 1000000, MinRxInt: 1000000, Multiplier: 3

Received MinRxInt: 1000000, Received Multiplier: 3

Holddown (hits): 0(0), Hello (hits): 1000(36)

Rx Count: 38, Rx Interval (ms) min/max/avg: 2/1001/827 last: 493 ms ago

Tx Count: 39, Tx Interval (ms) min/max/avg: 4/988/809 last: 402 ms ago

Echo Rx Count: 534, Echo Rx Interval (ms) min/max/avg: 23/68/45 last: 26 ms ago

Echo Tx Count: 534, Echo Tx Interval (ms) min/max/avg: 39/63/45 last: 27 ms ago

Elapsed time watermarks: 0 0 (last: 0)

Registered protocols: BGP CEF

Uptime: 00:00:24

Last packet: Version: 1 - Diagnostic: 0  
State bit: Up - Demand bit: 0  
Poll bit: 0 - Final bit: 0  
C bit: 0  
Multiplier: 3 - Length: 24  
My Discr.: 4097 - Your Discr.: 4104  
Min tx interval: 1000000 - Min rx interval: 1000000  
Min Echo interval: 50000

IPv4 Sessions

NeighAddr	LD/RD	RH/RS	State	Int
10.2.2.2	4102/4097	Up	Up	Gi2

Session state is UP and using echo function with 50 ms interval.

Session Host: Software

OurAddr: 10.2.2.1

Handle: 2

Local Diag: 0, Demand mode: 0, Poll bit: 0

MinTxInt: 1000000, MinRxInt: 1000000, Multiplier: 3

Received MinRxInt: 1000000, Received Multiplier: 3

Holddown (hits): 0(0), Hello (hits): 1000(2637)

Rx Count: 2639, Rx Interval (ms) min/max/avg: 3/1012/879 last: 10 ms ago

Tx Count: 2639, Tx Interval (ms) min/max/avg: 2/1006/879 last: 683 ms ago

Echo Rx Count: 51504, Echo Rx Interval (ms) min/max/avg: 1/98/45 last: 32 ms ago

Echo Tx Count: 51504, Echo Tx Interval (ms) min/max/avg: 39/98/45 last: 34 ms ago

Elapsed time watermarks: 0 0 (last: 0)

Registered protocols: EIGRP CEF

Uptime: 00:38:37

Last packet: Version: 1 - Diagnostic: 0  
State bit: Up - Demand bit: 0  
Poll bit: 0 - Final bit: 0  
C bit: 0  
Multiplier: 3 - Length: 24  
My Discr.: 4097 - Your Discr.: 4102  
Min tx interval: 1000000 - Min rx interval: 1000000  
Min Echo interval: 50000

IPv4 Sessions

```

NeighAddr          LD/RD          RH/RS          State          Int
10.3.3.2           4100/4097       Up             Up             Gi3
Session state is UP and using echo function with 50 ms interval.
Session Host: Software
OurAddr: 10.3.3.1
Handle: 1
Local Diag: 0, Demand mode: 0, Poll bit: 0
MinTxInt: 1000000, MinRxInt: 1000000, Multiplier: 3
Received MinRxInt: 1000000, Received Multiplier: 3
Holddown (hits): 0(0), Hello (hits): 1000(10120)
Rx Count: 10137, Rx Interval (ms) min/max/avg: 1/2761/878 last: 816 ms ago
Tx Count: 10136, Tx Interval (ms) min/max/avg: 1/2645/877 last: 904 ms ago
Echo Rx Count: 197745, Echo Rx Interval (ms) min/max/avg: 1/4126/45 last: 15 ms ago
Echo Tx Count: 197745, Echo Tx Interval (ms) min/max/avg: 39/4227/45 last: 16 ms ago
Elapsed time watermarks: 0 0 (last: 0)
Registered protocols: CEF OSPF
Uptime: 00:38:39
Last packet: Version: 1                - Diagnostic: 0
              State bit: Up            - Demand bit: 0
              Poll bit: 0              - Final bit: 0
              C bit: 0
              Multiplier: 3            - Length: 24
              My Discr.: 4097          - Your Discr.: 4100
              Min tx interval: 1000000 - Min rx interval: 1000000
              Min Echo interval: 50000

```

### Key Fields:

Session Host	This field specifies if the session is hosted in software or offloaded to hardware. Hardware offload is available on some platforms to prevent BFD instability due to CPU congestion.
MinTxInt/MinRxInt/Multiplier	The local values for minimum transmit and receive intervals and multiplier
Received MinRxInt/Received Multiplier	The peer values for minimum receive interval and multiplier
Rx/Tx Count	Counters of the sent and received BFD packets
Echo Rx/Tx Count	Counters for sent and received BFD Echoes
Registered Protocols	Routing protocol used by the BFD session
Uptime	Session uptime
LD/RD	Local Discriminator and Remote Discriminator for the session
RH/RS	Remote Heard and Remote State

### Show BFD Summary

The **show bfd summary** command provides multiple quick outputs of the active client protocols, IP protocol sessions, or hardware vs software hosted BFD sessions. This information is useful when the output of the full details is long and unwieldy.

```
BFDrouter#show bfd summary client
```

Client	Session	Up	Down
BGP	1	1	0
EIGRP	1	1	0
OSPF	1	1	0
CEF	3	3	0
Total	3	3	0

```
BFDrouter#show bfd summary session
```

Protocol	Session	Up	Down
IPV4	3	3	0
Total	3	3	0

```
BFDrouter#show bfd summary host
```

Host	Session	Up	Down
Software	3	3	0
Hardware	0	0	0
Total	3	3	0

## Show BFD Drops

This command shows BFD packets dropped on the local device and the reason. If local drops are incremented, this can cause sessions to flap.

```
BFDrouter#show bfd drops
```

```
BFD Drop Statistics
```

	IPV4	IPV6	IPV4-M	IPV6-M	MPLS_PW	MPLS_TP_LSP	MPLS_TE_GAL_LSP	MPLS_TE_SR_L
Invalid TTL	0	0	0	0	0	0	0	0
BFD Not Configured	0	0	0	0	0	0	0	0
No BFD Adjacency	12	0	0	0	0	0	0	0
Invalid Header Bits	0	0	0	0	0	0	0	0
Invalid Discriminator	3	0	0	0	0	0	0	0
Session AdminDown	2222	0	0	0	0	0	0	0
Authen invalid BFD ver	0	0	0	0	0	0	0	0
Authen invalid len	0	0	0	0	0	0	0	0
Authen invalid seq	0	0	0	0	0	0	0	0
Authen failed	0	0	0	0	0	0	0	0
Dampenend Down	0	0	0	0	0	0	0	0
SBFD Srcip Invalid	0	0	0	0	0	0	0	0
Invalid SBFD_SPORT	0	0	0	0	0	0	0	0
Source Port not valid	0	0	0	0	0	0	0	0

## Show BFD Neighbors History

This command shows recent BFD logs for each neighbor, along with its present state.

```
BFDrouter# show bfd neighbors history
```



IPv4 Sessions

NeighAddr	LD/RD	RH/RS	State	Int
10.1.1.2	4101/4097	Down	Init	Gi1

History information:

```
[Apr 4 15:56:21.346] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:20.527] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:19.552] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:18.776] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:17.823] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:16.816] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:15.886] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:14.920] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:14.023] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:13.060] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:12.183] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:11.389] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:10.600] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:09.603] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:08.750] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:07.808] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:06.825] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
[Apr 4 15:56:05.877] Event: V1 FSM ld:4101 handle:3 event:RX DOWN state:INIT
```

IPv4 Sessions

NeighAddr	LD/RD	RH/RS	State	Int
[Apr 4 15:56:04.917]	Event: V1 FSM ld:4101 handle:3	event:RX	DOWN	state:INIT
[Apr 4 15:56:03.920]	Event: V1 FSM ld:4101 handle:3	event:RX	DOWN	state:INIT

10.2.2.2	104/4097	Up	Up	Gi2
----------	----------	----	----	-----

History information:

```
[Apr 4 15:10:41.820] Event: V1 FSM ld:104 handle:1 event:RX UP state:UP
[Apr 4 15:10:41.803] Event: V1 FSM ld:104 handle:1 event:RX UP state:UP
[Apr 4 15:10:41.784] Event: V1 FSM ld:104 handle:1 event:RX UP state:UP
[Apr 4 15:10:41.770] Event: notify client(CEF) IP:10.2.2.2, ld:104, handle:1, event:UP,
[Apr 4 15:10:41.770] Event: notify client(EIGRP) IP:10.2.2.2, ld:104, handle:1, event:UP,
[Apr 4 15:10:41.770] Event: notify client(CEF) IP:10.2.2.2, ld:104, handle:1, event:UP,
[Apr 4 15:10:41.770] Event: resetting timestamps ld:104 handle:1
[Apr 4 15:10:41.768] Event: V1 FSM ld:104 handle:1 event:RX INIT state:DOWN
[Apr 4 15:10:41.751] Event: V1 FSM ld:104 handle:1 event:Session create state:DOWN
[Apr 4 15:10:41.751]
bfd_session_created, proc:EIGRP, idb:GigabitEthernet2 handle:1 act
```

10.3.3.2	4198/4097	Up	Up	Gi3
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History information:

IPv4 Sessions

NeighAddr	LD/RD	RH/RS	State	Int
[Apr 4 15:26:01.779]	Event: notify client(CEF) IP:10.3.3.2, ld:4198, handle:2,	event:UP,		
[Apr 4 15:26:01.779]	Event: notify client(OSPF) IP:10.3.3.2, ld:4198, handle:2,	event:UP,		
[Apr 4 15:26:01.778]	Event: V1 FSM ld:4198 handle:2 event:RX	UP	state:UP	
[Apr 4 15:26:01.777]	Event: notify client(OSPF) IP:10.3.3.2, ld:4198, handle:2,	event:UP,		
[Apr 4 15:26:01.777]	Event: V1 FSM ld:4198 handle:2 event:RX	INIT	state:DOWN	
[Apr 4 15:26:01.776]	Event: V1 FSM ld:4198 handle:2 event:Session create	state:ADMIN	DOWN	
[Apr 4 15:25:59.309]	Event:			
	bfd_session_destroyed, proc:CEF, handle:2 act			
[Apr 4 15:25:59.309]	Event: V1 FSM ld:4198 handle:2 event:Session delete	state:UP		
[Apr 4 15:25:59.308]	Event:			
	bfd_session_destroyed, proc:OSPF, handle:2 act			
[Apr 4 15:22:48.912]	Event: V1 FSM ld:4198 handle:2 event:RX	UP	state:UP	
[Apr 4 15:22:48.911]	Event: notify client(CEF) IP:10.3.3.2, ld:4198, handle:2,	event:UP,		
[Apr 4 15:22:48.911]	Event: notify client(OSPF) IP:10.3.3.2, ld:4198, handle:2,	event:UP,		
[Apr 4 15:22:48.911]	Event: notify client(CEF) IP:10.3.3.2, ld:4198, handle:2,	event:UP,		

IPv4 Sessions

NeighAddr	LD/RD	RH/RS	State	Int
[Apr 4 15:22:48.911]	Event: V1 FSM ld:4198 handle:2	event:RX	INIT	state:DOWN
[Apr 4 15:22:48.910]	Event: V1 FSM ld:4198 handle:2	event:Session create		state:DOWN
[Apr 4 15:22:48.909]	bfd_session_created, proc:OSPF, idb:GigabitEthernet3 handle:2 act			

## Related Information

[Cisco IOS BFD Reference](#)

[BFD Configuration Guide, Cisco IOS XE 17.x](#)

[IETF RFC 5880 for BFD](#)