



# Bidirectional Forwarding Detection Configuration of Deterministic Hardware Offload

This chapter provides information about configuring the Bidirectional Forwarding Detection (BFD) deterministic hardware offload feature on the router.

## Prerequisites for BFD Deterministic Hardware Offload

- This feature must be deployed only after identifying a downtime.

## Restrictions for BFD Deterministic Hardware Offload

- For existing BFD sessions (before using a new configuration command) to be made deterministic, you must recreate the sessions using the **shutdown** or **no shutdown** command, or reconfigure them.
- BFD echo with uRPF is *not* supported on the router for both hardware and software based BFD sessions.
- Echo based sessions—Maximum supported in hardware is 255.
- Non-echo based sessions—Maximum supported in hardware is 511.
- For BFD over G8032, only BFD IPv4 and IPv6 Single Hop is supported. BFD Echo Mode is not supported.

## Hardware offload BFD Echo Sessions on RSP3 Module

- Packets may get punted to CPU for hardware offload per sessions, when the BFD template is removed and added. This issue occurs on the RSP3 module with 1K BFD sessions using the same template. Some software BFD sessions might flap due to this issue.
- Hardware offloaded BFD echo packets are not punted to the ICMP queue, hence ICMP redirects are not generated.

**Table 1: Feature History**

Feature Name	Feature Release	Description
BFD over G8032 and Multi EFP BDI	Cisco IOS XE Bengaluru 17.4.1	Scale numbers for BFD and hardware offload are enhanced for BFD over G8032.

### Hardware offload BFD Echo Sessions on RSP2 Module ASR 920 Router for BFD over G8032

BFD echo packet with the same source and destination IP address are punted to the ICMP queue. This generates ICMP redirects.

**Table 2: Scale numbers for the Cisco RSP 2 module - ASR-920-24SZ-IM, Cisco ASR-920-24SZ-M and Cisco ASR-920-24TZ-M**

BFD	Hardware Offload
IP4	1023
IP6	1023

**Table 3: Scale numbers for the Cisco RSP 2 module - ASR-920-12SZ-IM and ASR-920U-12SZ-IM for BFD over G8032**

BFD	Hardware Offload
IP4	63
IP6	63

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## Information About BFD Deterministic Hardware Offload

The BFD deterministic hardware offload feature allows you to define the BFD transmission timer value. Any BFD sessions below or equal to the set value are sent to hardware. In the conventional BFD design, sessions can be hosted in hardware or software. However, sessions hosted in hardware have the advantage of running at more aggressive timers and not being impacted by CPU spikes.

Currently the determination of which session is hosted in hardware or software is done on a first come first serve basis. The sessions are hosted in hardware till the hardware limit is reached and then the sessions are either hosted in software (if supported) or rejected. In addition, after stateful switchover (SSO) or on reloading, sessions which are hosted in hardware do not necessarily remain in hardware. A similar condition applies for software sessions. The number of BFD sessions that can be supported in the hardware are also limited.

The BFD deterministic hardware offload feature allows you to select the destination of sessions to either hardware or software. This feature allows sessions hosted in hardware to remain in hardware after SSO or reload.

Using this feature you can configure a global command which defines the BFD transmission timer below or equal to the sessions are hosted in hardware.




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**Note** On reaching hardware session limit, inactive BFD session do not come up when an active session is removed.

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**Note** Starting with Cisco IOS XE Release 3.13, the global command defines the BFD transmission timer below which the sessions are hosted in hardware; those equal to or above this value are hosted in the software.

## Configuring BFD Deterministic Hardware Offload

To set the timer value below which the BFD sessions are offloaded to hardware, complete the following steps:

### Procedure

#### Step 1

enable

**Example:**

```
Router> enable
```

Enables privileged EXEC mode.

- Enter your password if prompted.

#### Step 2

configure terminal

**Example:**

```
Router# configure terminal
```

Enters global configuration mode.

#### Step 3

platform bfd-offload-timer *timervalue*

**Example:**

```
Router(config)# platform bfd-offload-timer 2000
```

Sets the timer value.

- *timervalue*—The valid range is from 200000-999000 microseconds.

**Note** There is no default value for this timer. The timer is enabled only after you specify a valid non-zero value. Starting with Cisco IOS Release 3.13, the timer value range is from 200000-999000 microseconds. For releases prior to Cisco IOS Release 3.13, the timer value range is 3300-999000 microseconds.

#### Step 4

end

**Example:**

```
Router(config)# end
```

Exits interface configuration mode and returns to privileged EXEC mode.

## Example for Configuring BFD Deterministic Hardware Offload

The following example shows how to set the timer value to 400 microseconds:

```
Router> enable
Router# configure terminal
Router(config)# platform bfd-offload-timer 400000
Router(config)# end
```

### Related Documents

Related Topic	Document Title
Bidirectional Forwarding Detection	<i>Cisco IOS Software Releases 12.2 SX Bidirectional Forwarding Detection</i>

### Standards

Standard	Title
IETF Draft	Bidirectional Forwarding Detection, January 2006 ( <a href="http://www.ietf.org/internet-drafts/draft-ietf-bfd-base-03.txt">http://www.ietf.org/internet-drafts/draft-ietf-bfd-base-03.txt</a> )
IETF Draft	BFD for IPv4 and IPv6 (Single Hop), March 2005 ( <a href="http://www.ietf.org/internet-drafts/draft-ietf-bfd-v4v6-1hop-02.txt">http://www.ietf.org/internet-drafts/draft-ietf-bfd-v4v6-1hop-02.txt</a> )