

# CCIE Service Provider Lab Workbook v4.0

(<http://labs.ine.com/workbook/toc/service-provider-v4>) »  
CCIE SP v4 Advanced Technology Labs - IGP

## IS-IS BFD

« [IS-IS Path Selection \(/workbook/view/service-provider-v4/task/is-is-path-selection-MjgzOQ%3D%3D\)](/workbook/view/service-provider-v4/task/is-is-path-selection-MjgzOQ%3D%3D) | [IS-IS Authentication \(/workbook/view/service-provider-v4/task/is-is-authentication-Mjg0MQ%3D%3D\)](/workbook/view/service-provider-v4/task/is-is-authentication-Mjg0MQ%3D%3D) »

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### Note:

This task assumes that you have already completed the [Single-Level IS-IS \(http://labs.ine.com/workbook/view/service-provider-v4/task/single-level-is-is-MjgzNw%3D%3D\)](http://labs.ine.com/workbook/view/service-provider-v4/task/single-level-is-is-MjgzNw%3D%3D) task. Refer to the **Base IPv4 Diagram** in order to complete this task.

## Task

- Configure BFD for IS-IS between R4 and R5 so that if there is a failure of the link between them they begin reconvergence in less than one second.

## Configuration [Click to collapse](#)

> Note: BFD is not supported on the current versions of XRv

```
R4:
interface GigabitEthernet1.45
  bfd interval 250 min_rx 250 multiplier 3
  isis bfd
```

```
R5:
interface GigabitEthernet1.45
  bfd interval 250 min_rx 250 multiplier 3
  isis bfd
```

## Verification

R4 and R5 are BFD adjacent via IS-IS, and are configured to detect a failure in 750ms.

R4#show bfd neighbors detail

IPv4 Sessions

NeighAddr	LD/RD	RH/RS	State	Int
20.4.5.5	4097/4097	Up	Up	Gi1.45

Session state is UP and using echo function with 250 ms interval.

Session Host: Software

OurAddr: 20.4.5.4

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(160)

Rx Count: 154, Rx Interval (ms) min/max/avg: 1/993/867 last: 626 ms ago

Tx Count: 161, Tx Interval (ms) min/max/avg: 2/1001/876 last: 224 ms ago

Elapsed time watermarks: 0 0 (last: 0)

Registered protocols: ISIS CEF

Uptime: 00:02:13

```

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.: 4097
                Min tx interval: 1000000 - Min rx interval: 1000000
                Min Echo interval: 250000
    
```

R5#show bfd neighbors detail

IPv4 Sessions

NeighAddr	LD/RD	RH/RS	State	Int
20.4.5.4	4097/4097	Up	Up	Gi1.45

Session state is UP and using echo function with 250 ms interval.

Session Host: Software

OurAddr: 20.4.5.5

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(247)

Rx Count: 246, Rx Interval (ms) min/max/avg: 2/1045/876 last: 322 ms ago

Tx Count: 249, Tx Interval (ms) min/max/avg: 1/1000/865 last: 457 ms ago

Elapsed time watermarks: 0 0 (last: 0)

Registered protocols: ISIS CEF

Uptime: 00:03:35

```

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.: 4097
    
```

```
Min tx interval: 1000000 - Min rx interval: 1000000
Min Echo interval: 250000
```

R4's interface is disabled at time index 20:27:57.415. R5 detects the failure at 20:27:58.063, within 1 second at time index 20:27:57.415.

CONTENTS

```
RP/0/0/CPU0:XR2#ping 1.1.1.1 count 100000
Sat Apr 25 20:27:55.818 UTC
Type escape sequence to abort.
Sending 100000, 100-byte ICMP Echos to 1.1.1.1.
!!!!!!!!!!!!!!!!!!!!!!!

R5#debug bfd event
BFD event debugging is on
R5(config)#
R5(config)#router isis
R5(config-router)#log-adjacency-changes all
R5(config-router)#service timestamp log datetime msec
R5(config)#end

R4#debug bfd event
R4#conf t
R4(config)#int g1.45
R4(config-subif)#shut
R4(config-subif)#
*Apr 25 20:27:57.415: BFD-DEBUG EVENT: bfd_session_destroyed, proc:ISIS, handle:1 act
*Apr 25 20:27:57.422: BFD-DEBUG EVENT: bfd_session_destroyed, proc:CEF, handle:1 act
*Apr 25 20:27:57.425: BFD-DEBUG Event: V1 FSM Id:4097 handle:1 event:Session delete state:UP (0)
R4(config-subif)#
*Apr 25 20:28:00.422: BFD-DEBUG Event: V1 FSM Id:4097 handle:1 event:DETECT TIMER EXPIRED state:ADMIN DOWN (0)
*Apr 25 20:28:00.422: BFD-DEBUG Event: decreasing credits by 12 [to 0] (0)

R5#
*Apr 25 20:27:58.063: BFD-DEBUG Event: V1 FSM Id:4097 handle:1 event:ECHO FAILURE state:UP (0)
*Apr 25 20:27:58.063: BFD-DEBUG Event: notify client(CEF) IP:20.4.5.4, Id:4097, handle:1, event:DOWN, cp independent failure (0)
*Apr 25 20:27:58.063: BFD-DEBUG Event: notify client(ISIS) IP:20.4.5.4, Id:4097, handle:1, event:DOWN, cp independent failure (0)
*Apr 25 20:27:58.063: BFD-DEBUG Event: notify client(CEF) IP:20.4.5.4, Id:4097, handle:1, event:DOWN, cp independent failure (0)
R5#
*Apr 25 20:27:58.063: %CLNS-5-ADJCHANGE: ISIS: Adjacency to R4 (GigabitEthernet1.45) Down, bfd neighbor down
R5#
*Apr 25 20:28:04.775: %CLNS-5-ADJCHANGE: ISIS: Adjacency to R4 (GigabitEthernet1.45) Down, hold time expired
R5#
*Apr 25 20:28:04.775: BFD-DEBUG EVENT: bfd_session_destroyed, proc:ISIS, handle:1 act
```

Notice that there are 6 seconds worth of dropped packets. Although the the failure was detected within 1 second, it still takes ISIS around 5 seconds to converge with default timers. Like OSPF, these timers can be tuned to achieve subsecond convergence however.

