

CCIE Service Provider Lab Workbook v4.0

(<http://labs.ine.com/workbook/toc/service-provider-v4>) »

CCIE SP v4 Advanced Technology Labs - IGP

OSPFv2 BFD

« [OSPFv2 Path Selection \(/workbook/view/service-provider-v4/task/ospfv2-path-selection-MjgyOQ%3D%3D\)](/workbook/view/service-provider-v4/task/ospfv2-path-selection-MjgyOQ%3D%3D) | [OSPFv2 Authentication \(/workbook/view/service-provider-v4/task/ospfv2-authentication-MjgzMQ%3D%3D\)](/workbook/view/service-provider-v4/task/ospfv2-authentication-MjgzMQ%3D%3D) »

Last updated: April 23, 2016

Note:

This task assumes that you have already completed the [OSPFv2](http://labs.ine.com/workbook/view/service-provider-v4/task/ospfv2-MjgyNw%3D%3D) (<http://labs.ine.com/workbook/view/service-provider-v4/task/ospfv2-MjgyNw%3D%3D>) task. Refer to the **Base IPv4 Diagram** in order to complete this task.

Task

- Configure BFD for OSPF between R2 and R4 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:

Note: BFD is not supported on the current releases of the XRv platform.

```
R2:
interface GigabitEthernet1.24
 ip ospf bfd
 bfd interval 250 min_rx 250 multiplier 3

R4:
interface GigabitEthernet1.24
 ip ospf bfd
 bfd interval 250 min_rx 250 multiplier 3
```

Verification

R2 and R4 are BFD adjacent, and will detect a failure in less than one second.

R2#show bfd neighbors detail

IPv4 Sessions

NeighAddr	LD/RD	RH/RS	State	Int
20.2.4.4	4097/4097	Up	Up	Gi1.24

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

Session Host: Software

OurAddr: 20.2.4.2

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(21)

Rx Count: 17, Rx Interval (ms) min/max/avg: 1/992/799 last: 713 ms ago

Tx Count: 22, Tx Interval (ms) min/max/avg: 1/971/825 last: 201 ms ago

Elapsed time watermarks: 0 0 (last: 0)

Registered protocols: OSPF CEF

Uptime: 00:00:13

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

R4#show bfd neighbors detail

IPv4 Sessions

NeighAddr	LD/RD	RH/RS	State	Int
20.2.4.2	4097/4097	Up	Up	Gi1.24

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

Session Host: Software

OurAddr: 20.2.4.4

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(125)

Rx Count: 124, Rx Interval (ms) min/max/avg: 1/1001/867 last: 684 ms ago

Tx Count: 127, Tx Interval (ms) min/max/avg: 1/1001/849 last: 405 ms ago

Elapsed time watermarks: 0 0 (last: 0)

Registered protocols: OSPF CEF

Uptime: 00:01:47

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
```

When R2's link goes down, R4 detects this within one second. Notice the timestamps on the logs indicating reconvergence within 1 second.

CONTENTS

```
R4#debug bfd event
BFD event debugging is on

R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface GigabitEthernet1.24
R2(config-subif)#shutdown
R2(config-subif)#end
R2#
*Apr 19 20:32:20: %OSPF-5-ADJCHG: Process 1, Nbr 4.4.4.4 on GigabitEthernet1.24 from FULL to DOWN, Neighbor Down: Interface down or detached

R4#
*Apr 19 20:32:21: BFD-DEBUG Event: V1 FSM Id:4097 handle:1 event:ECHO FAILURE state:UP (0)
*Apr 19 20:32:21: BFD-DEBUG EVENT: bfd_session_destroyed, proc:OSPF, handle:1 act
*Apr 19 20:32:21: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on GigabitEthernet1.24 from FULL to DOWN, Neighbor Down: BFD node down

R4#
*Apr 19 20:32:21: BFD-DEBUG Event: notify client(CEF) IP:20.2.4.2, Id:4097, handle:1, event:DOWN, cp independent failure (0)
*Apr 19 20:32:21: BFD-DEBUG Event: notify client(OSPF) IP:20.2.4.2, Id:4097, handle:1, event:DOWN, cp independent failure (0)
*Apr 19 20:32:21: BFD-DEBUG Event: notify client(CEF) IP:20.2.4.2, Id:4097, handle:1, event:DOWN, cp independent failure (0)
```

Traffic between R1 and XR2 now uses the link between R2 and R3.

```
R1#traceroute 20.20.20.20
Type escape sequence to abort.
Tracing the route to 20.20.20.20
VRF info: (vrf in name/id, vrf out name/id)
 1 10.1.2.2 4 msec 1 msec 1 msec
 2 20.2.3.3 1 msec 1 msec 1 msec
 3 20.3.4.4 2 msec 1 msec 4 msec
 4 20.4.5.5 10 msec 8 msec 10 msec
 5 20.5.19.19 9 msec 13 msec 13 msec
 6 10.19.20.20 13 msec * 4 msec
```

Note: previous to the failure, the traceroute output took the following path:

```
R1#traceroute 20.20.20.20
Type escape sequence to abort.
Tracing the route to 20.20.20.20
VRF info: (vrf in name/id, vrf out name/id)
 1 10.1.2.2 1 msec 2 msec 1 msec
 2 20.2.4.4 1 msec 1 msec 1 msec
 3 20.4.5.5 2 msec 1 msec 5 msec
 4 20.5.19.19 10 msec 12 msec 13 msec
 5 10.19.20.20 62 msec * 3 msec
```

Accordingly, XR2 also follows the new path via R3:

CONTENTS

```
RP/0/0/CPU0:XR2#traceroute 1.1.1.1
```

```
Sun Apr 19 20:20:36.431 UTC
```

```
Type escape sequence to abort.
```

```
Tracing the route to 1.1.1.1
```

```
 1 10.19.20.19 0 msec  0 msec  0 msec
 2 20.5.19.5 0 msec  0 msec  0 msec
 3 20.5.6.6 0 msec  0 msec  0 msec
 4 20.3.6.3 0 msec  0 msec  0 msec
 5 20.2.3.2 0 msec  0 msec  0 msec
 6 10.1.2.1 0 msec  * 0 msec
```

« OSPFv2 Path Selection (/workbook/view/service-provider-v4/task/ospfv2-path-selection-MjgyOQ%3D%3D) | OSPFv2 Authentication (/workbook/view/service-provider-v4/task/ospfv2-authentication-MjgzMQ%3D%3D) »