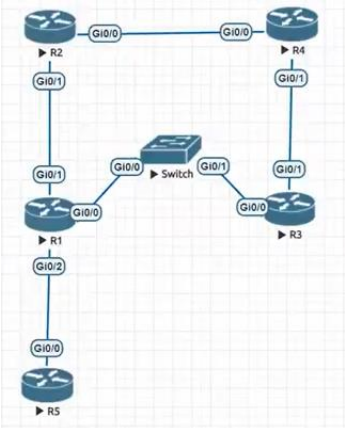

** it has to path to reach R5 if primary link fails then ospf recollects the path and 2nd path becomes primary path.

Fig: 1.0 Test

```
SW1(config)#int gig0/0
SW1(config-if)#shut
SW1(config-if)#
*Aug 31 14:46:33.761: %LINK-5-CHANGED: Interface GigabitEthernet0/0, changed sta
te to administratively down
*Aug 31 14:46:34.760: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEth
ernet0/0, changed state to down
SW1(config-if)#
```

```
Type escape sequence to abort.
Sending 400, 100-byte ICMP Echos to 10.5.5.5, timeout is 2 seconds:
Packet sent with a source address of 10.3.3.3
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!.!.!.!.!.!.!.!.!.!.!.!.!.!.!.!
*Aug 31 14:47:06.687: %OSPF-5-ADJCHG: Process 10, Nbr 10.1.1.1 on GigabitEthernet0/0 fr
om FULL to DOWN, Neighbor Down: Dead timer expired....!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Success rate is 95 percent (380/400), round-trip min/avg/max = 4/6/15 ms
```

CMD=ping 10.5.5.5 source 10.3.3.3 repeat 400

** due to shutdown int on switch sometimes icmp will drop and after it will change the path and the reach 10.5.5.5 (20 echo's has been dropped)

BFD

##config BFD (R1 and R3)

```
*Aug 31 14:41:49.271: %OSPF-5-ADJCHG: Process 10, Nbr 10.5.5.5 on GigabitEthernet0/2 fr
om LOADING to FULL, Loading Done
R1(config)#
*Aug 31 14:47:07.764: %OSPF-5-ADJCHG: Process 10, Nbr 10.3.3.3 on GigabitEthernet0/0 fr
om FULL to DOWN, Neighbor Down: Dead timer expired
R1(config)#
*Aug 31 14:48:51.605: %OSPF-5-ADJCHG: Process 10, Nbr 10.3.3.3 on GigabitEthernet0/0 fr
om LOADING to FULL, Loading Done
R1(config)#
R1(config)#router ospf 10
R1(config-router)#bfd all
R1(config-router)#bfd all-interfaces
R1(config-router)#exit
R1(config)#
```

```
R3
R3#traceroute 10.5.5.5
Type escape sequence to abort.
Tracing the route to 10.5.5.5
VRF info: (vrf in name/id, vrf out name/id)
  1 172.16.13.1 3 msec 3 msec 9 msec
  2 172.16.15.5 5 msec *  4 msec
R3#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#
R3(config)#router ospf 10
R3(config-router)#bfd all-interfaces
R3(config-router)#exit
R3(config)#
```

config bfd interval on R3 and R1 Both

```
R3(config-router)#exit
R3(config)#int gig0/0
R3(config-if)#bfd interval 50 min_rx 50 multiplier 3
R3(config-if)#
*Aug 31 14:51:32.082: %BFD-6-BFD_IF_CONFIGURE: BFD-SYSLOG: bfd config apply, idb:Gigabi
tEthernet0/0
*Aug 31 14:51:32.318: %BFD-6-BFD_SESS_CREATED: BFD-SYSLOG: bfd session created, neigh 1
```

CMD:

 # show bfd neighbor

 # show bfd summary

Once again Fig 1.0

Switch

 # int g0/0

 # shut

R3

 # ping 10.5.5.5 source 10.3.3.3

**** this time only 2 echo's has dropped due to BFD Config**

```
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!
*Aug 31 14:52:32.227: %BFDFSM-6-BFD_SESS_DOWN: BFD-SYSLOG: BFD session ld:1 handle:1,is
 going Down Reason: ECHO FAILURE
*Aug 31 14:52:32.229: %BFD-6-BFD_SESS_DESTROYED: BFD-SYSLOG: bfd_session_destroyed,  ld
:1 neigh proc:OSPF, handle:1 act
*Aug 31 14:52:32.230: %OSPF-5-ADJCHG: Process 10, Nbr 10.1.1.1 on GigabitEthernet0/0 fr
om FULL to DOWN, Neighbor Down: BFD node down...!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Success rate is 99 percent (447/450), round-trip min/avg/max = 3/6/14 ms
```

##remove BFD from all interfaces

Fast-Hello

##config on all routers

```
R1(config)#int range gig0/0 -2
R1(config-if-range)#ip ospf dea
R1(config-if-range)#ip ospf dead-interval m
R1(config-if-range)#ip ospf dead-interval minimal h
R1(config-if-range)#ip ospf dead-interval minimal hello-multiplier ?
  <3-20>  Number of Hellos sent within 1 second

R1(config-if-range)#ip ospf dead-interval minimal hello-multiplier 3
R1(config-if-range)#
```

```
 Flush timer for old DR LSA due in 00:00:29
 Timer intervals configured, Hello 333 msec, Dead 1, Wait 1, Retransmit 5
   oob-resync timeout 40
```

after applying every where fast-hello once again test Fig 1.0 (on sw1 and R3)

**** the 4 echo's will dropped here**

H-MAC Authentication

on R5 and R3

```
R1(config)#key chain 150
R1(config-keychain)#key 50
R1(config-keychain-key)#key-string cisco
R1(config-keychain-key)#cryptographic-algorithm hmac-sha-384exit
                                                               ^
```

**** password in plain-text**

```
R5(config)#int gig0/0
R5(config-if)#ip ospf authentication ?
  key-chain       Use a key-chain for cryptographic authentication keys
  message-digest  Use message-digest authentication
  null            Use no authentication
  <cr>

R5(config-if)#ip ospf authentication ke
R5(config-if)#ip ospf authentication key-chain 150
R5(config-if)#
*Aug 31 15:07:27.819: %OSPF-5-ADJCHG: Process 10, Nbr 10.1.1.1 on GigabitEthernet0/0 fro
m FULL to DOWN, Neighbor Down: Dead timer expired
R5(config-if)#
```

**** service password-encryption**

check the ospf neighborship on making some of the parameters making miss-match and check on which is stucked on neighborship