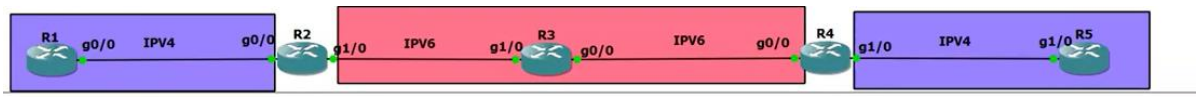
Advance Class-4

4 to 6 Tunnel



**config the Ip add on respected IPv4 and IPv6 address for the routers
**config the ##default int <int>
**config the one-one loopback of ipv4 on each routers

##OSPF config

#R1

```
R1(config)#router ospf 1
R1(config-router)#net 10.1.12.0 0.0.0.255 area 0
R1(config-router)#net 10.1.1.1 0.0.0.0 area 0
R1(config-router)#^Z
R1#
*Sep 20 20:55:53.699: %SYS-5-CONFIG_I: Configured from console by console
R1#
```

#R2

```
R2(config)#router ospf 1
R2(config-router)#net 10.1.12.0 0.0.0.255 area 0
R2(config-router)#net 10.2.2.2 0.0.0.0 area 0
R2(config-router)#do ping 10.1.12.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.1.12.1, timeout is 2 seconds:
!!!!!
```

#R4

```
R4(config)#router ospf 1
R4(config-router)#net 10.1.45.0 0.0.0.255 area 0
R4(config-router)#net 10.4.4.4 0.0.0.0 area 0
R4(config-router)#exit
R4(config)#
```

#R5

```
R5(config)#router ospf 1
R5(config-router)#net 10.1.45.0 0.0.0.255 area 0
R5(config-router)#net 10.5.5.5  0.0.0.0 area 0
R5(config-router)#exit
R5(config)#
```

```
Neighbor ID     Pri   State           Dead Time   Address         Interface
10.2.2.2          1   FULL/DR         00:00:32    10.1.12.2       GigabitEthernet0/0
R1#
```

** its having only one loopback of R2

#R2

```
R2(config)#ipv6 route 2001:172:16:34::0/64 2001:172:16:23::3
R2(config)#
```

** create a static route for the R3

#R4

```
R4(config)#
R4(config)#ipv6 route 2001:172:16:23::0/64 2001:172:16:34::3
R4(config)#
```

** same on the R4
** try to ping for the R2

we have to bypass IPv6

#R2

```
R2(config)#
R2(config)#int tunnel 24
R2(config-if)#
*Sep 20 21:00:34.895: %LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel24, changed state to down
R2(config-if)#ip add 192.168.24.2 255.255.255.0
R2(config-if)#tunnel source gig1/0
R2(config-if)#tunnel destination 2001:172:16:34::4
R2(config-if)#tunnel mode gre ipv6
R2(config-if)#
*Sep 20 21:01:25.307: %LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel24, changed state to up
R2(config-if)#
R2(config-if)#ip ospf 1 area 0
R2(config-if)#^Z
```

Tunnel will down by default we have to enable using

** by default tunnel will remain down..

** config the ospf on Interface

#R4

```
R4(config)#int tunnel 24
R4(config-if)#ip add 1
*Sep 20 21:01:48.011: %LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel24, changed state to down
R4(config-if)#ip add 192.168.24.4 255.255.255.0
R4(config-if)#ip ospf 1 area 0
R4(config-if)#tunnel source gig0/0
R4(config-if)#tunnel destination 2001:172:16:23::2
R4(config-if)#tunnel mode gre iupv6
                              ^
% Invalid input detected at '^' marker.

R4(config-if)#tunnel mode gre ipv6
R4(config-if)#
*Sep 20 21:02:37.547: %LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel24, changed state to up
R4(config-if)#^Z
R4#
*Sep 20 21:02:37.987: %OSPF-5-ADJCHG: Process 1, Nbr 10.2.2.2 on Tunnel24 from LOADING to FULL, Loading Done
*Sep 20 21:02:38.947: %SYS-5-CONFIG_I: Configured from console by console
R4#sh ip os nei

Neighbor ID     Pri   State           Dead Time   Address         Interface
10.2.2.2          0   FULL/  -        00:00:39    192.168.24.2    Tunnel24
10.5.5.5          1   FULL/DR         00:00:37    10.1.45.5       GigabitEthernet1/0
R4#sh run int tunnel 24
Building configuration...

Current configuration : 204 bytes
!
interface Tunnel24
 ip address 192.168.24.4 255.255.255.0
 ip ospf 1 area 0
 tunnel source GigabitEthernet0/0
 tunnel mode gre ipv6
 tunnel destination 2001:172:16:23::2
 tunnel path-mtu-discovery
end
```

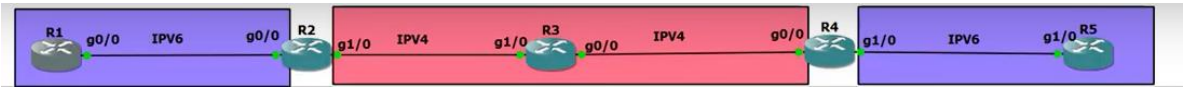
** now we have nei on R2

#R5

```
R5#traceroute 10.1.1.1 sou
R5#traceroute 10.1.1.1 source 10.5.5.5
Type escape sequence to abort.
Tracing the route to 10.1.1.1
VRF info: (vrf in name/id, vrf out name/id)
  1 10.1.45.4 48 msec 24 msec 28 msec
  2 192.168.24.2 84 msec 72 msec 100 msec
  3 10.1.12.1 144 msec 128 msec 108 msec
```

** now we have bypassed ipv6

6 to 4 Tunnel



**** config the basic ipv6 and Loopback on the R1,R2 and R4,R5 && config the ipv4 (10.1.24.2=R2 ,10.1.23.3,10.1.34.3 =R3, 10.1.34.4 =R4)**

**** config the OSPF on IPv6**

#R1

```
R1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#
R1(config)#int range gig0/0 , loop 1
R1(config-if-range)#ipv6 ospf 1 area 0
R1(config-if-range)#^Z
```

#R2

```
R2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#int range gig0/0 , loop 1
R2(config-if-range)#ipv6 ospf 1 area 0
R2(config-if-range)#exit
R2(config)#
```

R4 and R5

****config the ospf on IPv6**

#R2

```
R2(config)#
R2(config)#ip route 10.1.34.0 255.255.255.0 10.1.23.3
```

#R4

```
R4(config)#
R4(config)#
R4(config)#ip route 10.1.23.0 255.255.255.0 10.1.34.3
R4(config)#do
```

**** tunnel source and destination will ipv4 and tunnel ip will IPv6**

#R2

```
R2(config)#int tunnel 1
R2(config-if)#
*Sep 20 20:44:25.075: %LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel1, changed state to down
R2(config-if)#
R2(config-if)#tunnel source gig1/0
R2(config-if)#tunnel destination 10.1.34.4
R2(config-if)#
*Sep 20 20:44:48.259: %LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel1, changed state to up
R2(config-if)#
R2(config-if)#ipv6 add 2001:172:16:24::2/64
R2(config-if)#ipv6 ospf 1 area 0
R2(config-if)#exit
```

****config of the tunnel**

#R4

```
R4(config)#int tunnel 1
R4(config-if)#tunnel s
*Sep 20 20:45:33.531: %LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel1, changed state to down
R4(config-if)#tunnel source gig0/0
R4(config-if)#tunnel destination 10.1.23.2
R4(config-if)#
*Sep 20 20:45:47.539: %LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel1, changed state to up
R4(config-if)#
R4(config-if)#ipv6 add 2001:172:16:24::4/64
R4(config-if)#ipv6 ospf 1 area 0
R4(config-if)#exit
R4(config)#
```

now we have end-to-end reachability and we bypass IPv4 network

#R1


R1#tr
R1#traceroute ipv6 2001:10:5::5
Type escape sequence to abort.
Tracing the route to 2001:10:5::5
1 2001:172:16:12::2 140 msec 32 msec 24 msec
2 2001:172:16:24::4 84 msec 92 msec 92 msec
3 2001:172:16:45::5 156 msec 120 msec 124 msec