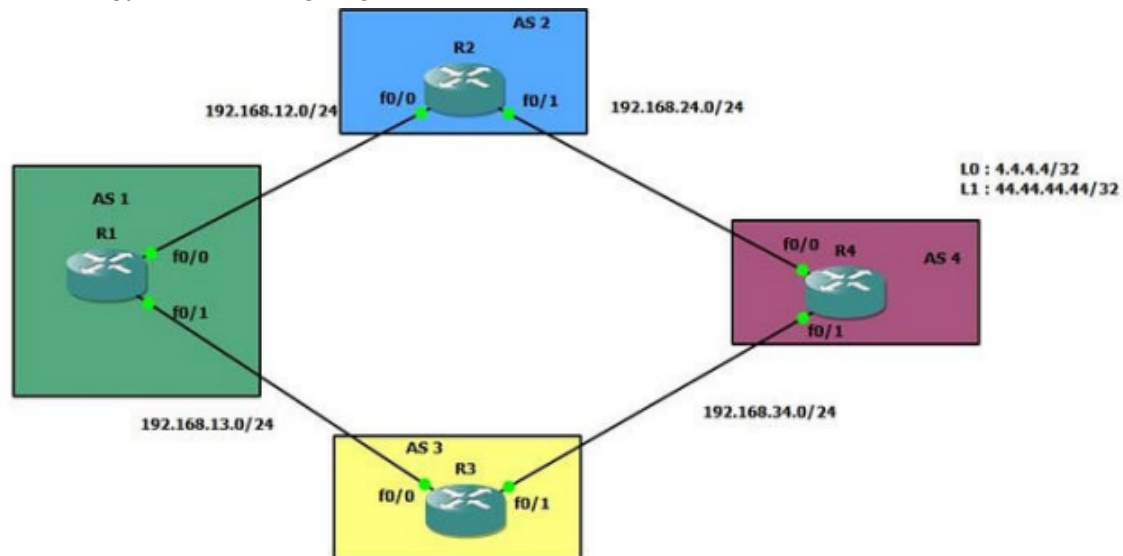


The Topology that we are going to see is shown below :



R1#configure terminal

```
R1(config)#interface fastEthernet 0/0
R1(config-if)#ip address 192.168.12.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#interface fastEthernet 0/1
R1(config-if)#ip address 192.168.13.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#interface loopback 0
R1(config-if)#ip address 1.1.1.1 255.255.255.255
R1(config-if)#end
R1#
```

```
R2(config)#int
R2(config)#interface fastEthernet 0/0
R2(config-if)#ip address 192.168.12.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#
R2(config-if)#exit
R2(config)#interface fastEthernet 0/1
R2(config-if)#ip address 192.168.24.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#interface loopback 0
R2(config-if)#ip address 2.2.2.2 255.255.255.255
R2(config-if)#end
R2#
```

```
R3(config)#interface fastEthernet 0/0
R3(config-if)#ip address 192.168.13.3 255.255.255.0
R3(config-if)#no shutdown
```

```
R3(config-if)#exit
R3(config)#interface fastEthernet 0/1
R3(config-if)#ip address 192.168.35.3 255.255.255.0
R3(config-if)#no shutdown
R3(config-if)#
R3(config)#
R3(config)#interface loopback 0
R3(config-if)#ip address 3.3.3.3 255.255.255.255
R3(config-if)#
R3(config-if)#end
R3#
```

```
R4#configure terminal
R4(config)#interface fastEthernet 0/0
R4(config-if)#ip address 192.168.24.4 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#
R4(config)#interface fastEthernet 0/1
R4(config-if)#ip address 192.168.45.4 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#
R4(config)#interface loopback 0
R4(config-if)#ip address 4.4.4.4 255.255.255.255
R4(config-if)#exit
R4(config)#
```

```
R5#configure terminal
R5(config)#interface fastEthernet 0/0
R5(config-if)#ip address 192.168.35.5 255.255.255.0
R5(config-if)#no shutdown
R5(config-if)#exit
R5(config)#interface fastEthernet 0/1
R5(config-if)#ip address 192.168.45.5 255.255.255.0
R5(config-if)#no shutdown
R5(config-if)#exit
R5(config)#interface loopback 0
R5(config-if)#ip address 5.5.5.5 255.255.255.255
R5(config-if)#exit
R5(config)#interface loopback 1
R5(config-if)#ip address 55.55.55.55 255.255.255.255
R5(config-if)#end
R5#
```

```
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
```

```
R1(config)#R1(config)#router bgp 1
R1(config-router)#neighbor 3.3.3.3 remote-as 3
R1(config-router)#neighbor 3.3.3.3 update-source loopback 0
R1(config-router)#neighbor 3.3.3.3 ebgp-multihop 2R1(config-router)#
R1(config-router)#neighbor 2.2.2.2 remote-as 1
R1(config-router)#neighbor 2.2.2.2 updatesource loopback 0
R1(config-router)#neighbor 2.2.2.2 next-hop-self R1(config-router)#
R1(config-router)#end
R1#
```

R2#configure terminalEnter configuration commands, one per line. End with CNTL/Z.

```
R2(config)#
R2(config)#router bgp 1
R2(config-router)#
R2(config-router)#neighbor 1.1.1.1 remote-as 1
R2(config-router)#neighbor 1.1.1.1 updatesource loopback 0
R2(config-router)#neighbor 1.1.1.1 next-hop-self
R2(config-router)#neighbor 4.4.4.4 remote-as 4
R2(config-router)#neighbor 4.4.4.4 updatesource loopback 0
R2(config-router)#neighbor 4.4.4.4 ebgp-multihop 2
R2(config-router)#end
R2#
```

R3#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

```
R3(config)#router bgp 3
R3(config-router)#
R3(config-router)#neighbor 1.1.1.1 remote-as 1
R3(config-router)#neighbor 1.1.1.1 update-source loopback 0
R3(config-router)#neighbor 1.1.1.1 ebgp-multihop 2R3(config-router)#
R3(config-router)#neighbor 5.5.5.5 remote-as 5
R3(config-router)#neighbor 5.5.5.5 updatesource loopback 0
R3(config-router)#neighbor 5.5.5.5 ebgp-multihop 2
R3(config-router)#end
R3#
```

R4#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

```
R4(config)#router bgp 4
R4(config-router)#
R4(config-router)#neighbor 2.2.2.2 remote-as 1
R4(config-router)#neighbor 2.2.2.2 update-source loopback 0
R4(config-router)#neighbor 2.2.2.2 ebgp-multihop 2R4(config-router)#
R4(config-router)#neighbor 5.5.5.5 remote-as 5
R4(config-router)#neighbor 5.5.5.5 updatesource loopback 0
R4(config-router)#neighbor 5.5.5.5 ebgp-multihop 5
```

```
R4(configrouter)#end
R4#
```

```
R5#configure terminal
```

Enter configuration commands, one per line. End with CNTL/Z.

```
R5(config)#
R5(config)#router bgp 5
R5(config-router)#
R5(config-router)#neighbor 3.3.3.3 remote-as 3
R5(config-router)#neighbor 3.3.3.3 update-source loopback 0
R5(config-router)#neighbor 3.3.3.3 ebgp-multihop 2
R5(config-router)#
R5(config-router)#neighbor 4.4.4.4 remote-as 4
R5(config-router)#neighbor 4.4.4.4 update-source loopback 0
R5(config-router)#neighbor 4.4.4.4 ebgp-multihop 2
R5(config-router)#end
R5#
```

Configuring Static routes for reachability of Loopback IP for making BGP neighbors Up,  
Because we are making BGP neighbors with the help of Loopback Ip.

```
R1(config)#ip route 3.3.3.3 255.255.255.255 fastEthernet 0/1
R1(config)#
R1(config)#ip route 2.2.2.2 255.255.255.255 fastEthernet 0/0
R1(config)#*Mar 1 01:03:46.671: %BGP-5-ADJCHANGE: neighbor 2.2.2.2 Up
R1(config)#*Mar 1 01:04:21.423: %BGP-5-ADJCHANGE: neighbor 3.3.3.3 Up
R2(config)#ip route 4.4.4.4 255.255.255.255 fastEthernet 0/1
R2(config)#
R2(config)#ip route 1.1.1.1 255.255.255.255 fastEthernet 0/0
R2(config)#*Mar 1 01:03:46.895: %BGP-5-ADJCHANGE: neighbor 1.1.1.1 Up
R2(config)#*Mar 1 01:04:34.423: %BGP-5-ADJCHANGE: neighbor 4.4.4.4 Up
R2(config)#
R3(config)#ip route 1.1.1.1 255.255.255.255 fastEthernet 0/0
R3(config)#
R3(config)#ip route 5.5.5.5 255.255.255.255 fastEthernet 0/1
R3(config)#*Mar 1 01:05:01.511: %BGP-5-ADJCHANGE: neighbor 1.1.1.1 Up
R3(config)#
R3(config)#*Mar 1 01:05:50.019: %BGP-5-ADJCHANGE: neighbor 5.5.5.5 Up
R4(config)#ip route 2.2.2.2 255.255.255.255 fastEthernet 0/0
R4(config)#
R4(config)#ip route 5.5.5.5 255.255.255.255 fastEthernet 0/1
R4#*Mar 1 01:05:14.279: %BGP-5-ADJCHANGE: neighbor 2.2.2.2 Up
R4#*Mar 1 01:05:50.339: %BGP-5-ADJCHANGE: neighbor 5.5.5.5 Up
R4#
```

```
R5(config)#ip route 4.4.4.4 255.255.255.255 fastEthernet 0/1
R5(config)#
```

```
R5(config)#ip route 3.3.3.3 255.255.255.255 fastEthernet 0/0
R5#*Mar 1 00:52:49.575: %BGP-5-ADJCHANGE: neighbor 3.3.3.3 Up*Mar 1 00:52:49.915:
%BGP-5- ADJCHANGE: neighbor 4.4.4.4 Up
```

R5#

All BGP routers form their Neighborhood.

R1#show ip bgp

```
summary | begin NeighborNeighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down
State/PfxRcd2.2.2.2 4 1 24 24 1 0 0 00:20:13 03.3.3.3 4 3 23 23 1 0 0 00:19:38 0 We are
redistributing Connected interfaces into BGP in all routes.
```

R1#configure terminal

R1(config)#router bgp 1

R1(config-router)#redistribute co

R1(config-router)#redistribute connectedR2(config)#router bgp 1

R2(configrouter)#redistribute connected

R3(config)#router bgp 3

R3(configrouter)#redistribute connected

R3(config-router)#

R4(config)#router bgp 4

R4(configrouter)#redistribute connected

R5(config)#router bgp 5

R5(configrouter)#redistribute connected

R5(config-router)#end After redistributing Connected routes.

R1#show ip bgp

```
summary | begin NeighborNeighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down
2.2.2.2 4 1 237 240 243 0 0 01:06:02 3.3.3.3 4 3 75 84 241 0 0 01:05:27 4/5 You can see
that we can able to receive 7 prefixes via BGP through the 2.2.2.2 and 3.3.3.3 Neighbors.
```

R1#

BGP routing table entry for 5.5.5.5/32, version 3Paths: (2 available, best #2, table Default-IP-Routing-Table) Advertised to update-groups: 2 from 2.2.2.2 (2.2.2.2) Origin incomplete, metric 0, , valid, internal 3 5 from 3.3.3.3 (3.3.3.3) Origin incomplete, , valid, external,

R1#

R1#

BGP routing table entry for 55.55.55.55/32, version 5Paths: (2 available, best #2, table Default-IP-RoutingTable) Advertised to update-groups: 2 from 2.2.2.2 (2.2.2.2) Origin incomplete, metric 0, , valid, internal 3 5 from 3.3.3.3 (3.3.3.3) Origin incomplete, , valid, external,

R1#

From the above output we can see that we can see that best-path is via 3.3.3.3(AS 3) to reach the destination 5.5.5.5 of 55.55.55.55. By default we have a local preference of 100 for all the routes.

R2#

BGP routing table entry for 5.5.5.5/32, version 3Paths: (2 available, best #2, table Default-IP-Routing-Table) Advertised to update-groups: 1 from 1.1.1.1 (1.1.1.1) Origin incomplete, metric 0, localpref 100, valid, internal from 4.4.4.4 (4.4.4.4) Origin incomplete, localpref 100, valid, external,

R2#

R2#

R2#

BGP routing table entry for 55.55.55.55/32, version 4Paths: (2 available, best #2, table Default-IP-Routing-Table) Advertised to update-groups: 1 from 1.1.1.1 (1.1.1.1) Origin incomplete, metric 0, , valid, internal from 4.4.4.4 (4.4.4.4) Origin incomplete, , valid, external, From the above output of R2, we can see that we can see that best-path is via 4.4.4.4(AS 4) to reach the destination 5.5.5.5 and 55.55.55.55. Configuring Local-Preference using Route-Map on R1.

R1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R1(config)#

R1(config)#route-map permit 10

R1(config-route-map)#

R1(configroute-map)#set local-preference

R1(config-route-map)#match ip address

R1(configroute-map)#exit

R1(config)# Now we have created route-map with the name LOCAL-PREFERENCE, we have match it with the access-list 1 (Match ip address is nothing but matching the Access-list), and if it matches that Access-list 1 , it will set the weight to 7500.

R1(config)#access-list 1 permit 5.5.5.5 0.0.0.0

BGP Configuration to apply route-map to neighbor:

R1(config)#router bgp 1

R1(config-router)#

R1(config-router)#end

R1#

R1#clear ip bgp \*

soft Just clear the BGP sessions by using the above command. Don't forget to use the soft command, or else it will the BGP TCP sessions and BGP will be re-established. You can now see the below output after clearing the BGP Sessions: 5/5

R1#BGP routing table entry for 5.5.5.5/32, version 470Paths: (1 available, best #1, table Default-IP-Routing-Table)Flag: 0x800 Advertised to update-groups: 2 3 5 from 3.3.3.3 (3.3.3.3) Origin incomplete, , valid, external,

R1#

R1#

BGP routing table entry for 55.55.55.55/32, version 471Paths: (1 available, best #1, table Default-IP-Routing-Table)Flag: 0x820 Advertised to update-groups: 1 4 5 from 2.2.2.2 (2.2.2.2) Origin incomplete, metric 0, , valid, internal, We observe that local preference value is changed for the network 5.5.5.5, but the local preference is same (100) for the network 55.55.55.55 Also note that for the network 55.55.55.55 best-path changed to 2.2.2.2. Because the networks that matches the Access-list 1 will be forwarded to 3.3.3.3 (AS 3). Other routes will be moves on to the other path.

R2#

BGP routing table entry for 5.5.5.5/32, version 460Paths: (2 available, best #1, table Default-IP-Routing-Table) Advertised to update-groups: 2 3 5 from 1.1.1.1 (1.1.1.1) Origin incomplete, metric 0, , valid, internal, R2#BGP routing table entry for 55.55.55.55/32, version 4Paths: (1 available, best #1, table Default-IP-Routing-Table) Advertised to update-groups: 1 4 5 from 4.4.4.4 (4.4.4.4) Origin incomplete, , valid, external, R2#