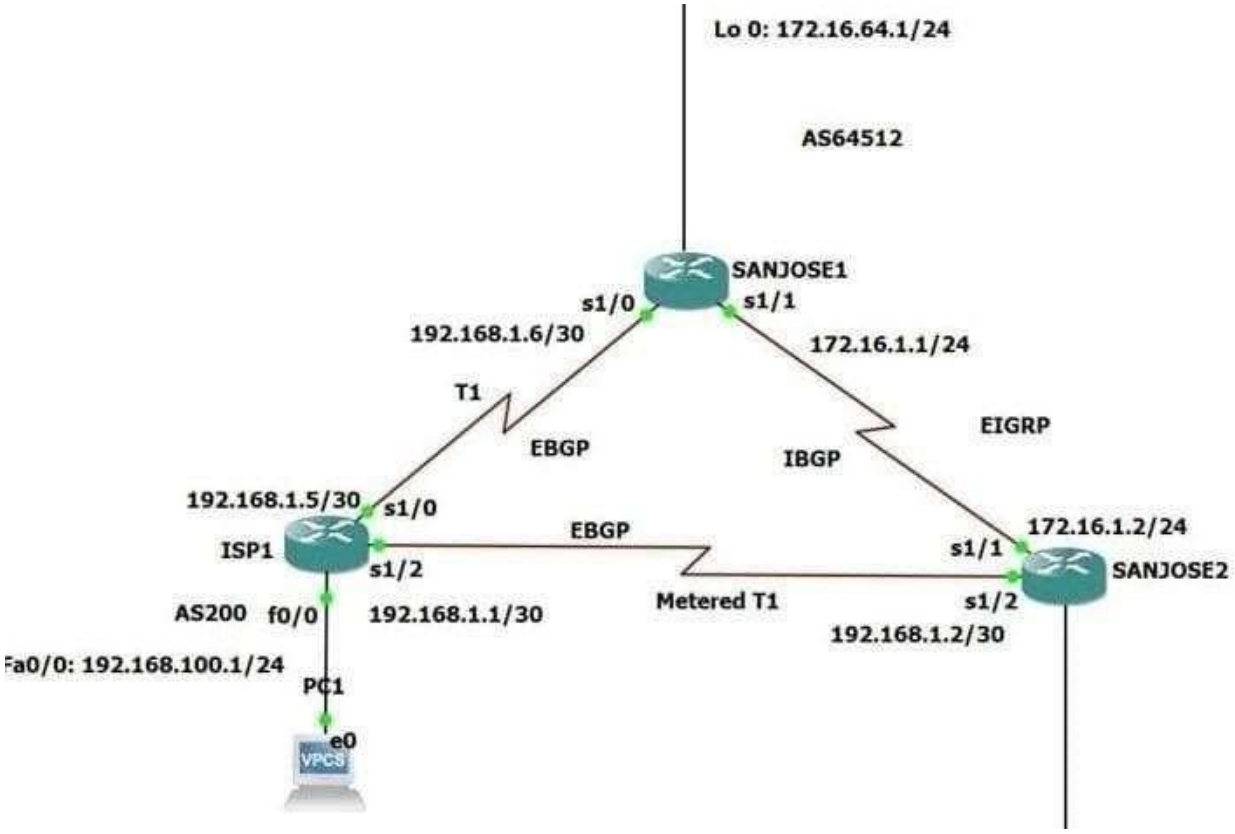
Practical No : 3

Aim: Configuring IBGP and EBGP Sessions, Local Preference and MED .



Step 1: Configure all routers and test Connectivity to connected interfaces.

```
ISP1#
ISP1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ISP1(config)#int s1/0
ISP1(config-if)#ip add 192.168.1.5 255.255.255.252
ISP1(config-if)#no shut
ISP1(config-if)#int s1/2
ISP1(config-if)#ip add 192.168.1.1 255.255.255.252
ISP1(config-if)#ip add 192.168.1.1 255.255.255.252
ISP1(config-if)#no shut
ISP1(config-if)#int fa0/0
ISP1(config-if)#ip add 192.168.100.1 255.255.255.252
ISP1(config-if)#ip add 192.168.100.1 255.255.255.0
ISP1(config-if)#no shut
ISP1(config-if)#
```

```
SANJOSE1#
SANJOSE1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SANJOSE1(config)#int s1/0
SANJOSE1(config-if)#ip add 192.168.1.6 255.255.255.252
SANJOSE1(config-if)#no shut
SANJOSE1(config-if)#int s1/1
SANJOSE1(config-if)#ip add 172.16.1.1 255.255.255.0
SANJOSE1(config-if)#no shut
SANJOSE1(config-if)#int lo 0
SANJOSE1(config-if)#ip add 172.16.64.1 255.255.255.0
SANJOSE1(config-if)#no shut
SANJOSE1(config-if)#^Z
SANJOSE1#
```

```
SANJOSE2#conf t
SANJOSE2(config)#int s1/1
SANJOSE2(config-if)#ip add 172.16.1.2 255.255.255.0
SANJOSE2(config-if)#no shut
SANJOSE2(config-if)#int s1/2
SANJOSE2(config-if)#ip add 172.168.1.2  255.255.255.252
SANJOSE2(config-if)#no shut
SANJOSE2(config-if)#int lo 0
SANJOSE2(config-if)#ip add 172.16.32.1  255.255.255.0
SANJOSE2(config-if)#no shut
SANJOSE2(config-if)#^Z
SANJOSE2#
```

Step2 Configure EIGRP between the SanJose1 and SanJose2 routers with the same commands as follows:

```
SANJOSE1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SANJOSE1(config)#router eigrp 64512
SANJOSE1(config-router)#network 172.16.0.0
SANJOSE1(config-router)#exit
SANJOSE1(config)#

SANJOSE2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SANJOSE2(config)#router eigrp 64512
SANJOSE2(config-router)#network 172.16.0.0
SANJOSE2(config-router)#exit
SANJOSE2(config)#
```

Step3 Configure IBGP between the SanJose1 and SanJose2 routers. On the SanJose1 router, enter the followings :

```
SANJOSE1#
SANJOSE1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SANJOSE1(config)#router bgp 64512
SANJOSE1(config-router)#no auto-summary

SANJOSE1(config-router)#neighbor 172.16.32.1 remote-as 64512

SANJOSE1(config-router)#neighbor 172.16.32.1 update-source lo 0
SANJOSE1(config-router)#^Z
SANJOSE1#
SANJOSE1#conf  t
SANJOSE1(config)#router bgp 64512
SANJOSE1(config-router)#no synchronization
SANJOSE1(config-router)#
SANJOSE2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SANJOSE2(config)#router bgp 64512
SANJOSE2(config-router)#no synchronization
SANJOSE2(config-router)#
SANJOSE2(config-router)#
```

Step-4 Complete the Ibgp Configurations on Sanjose2 by entering the commands

```
SANJOSE2#
SANJOSE2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SANJOSE2(config)#router bgp 64512
SANJOSE2(config-router)#no synchronization
SANJOSE2(config-router)#neighbor 172.16.64.1 remote-as 64512
SANJOSE2(config-router)#neighbor 172.16.64.1 update-source lo0 SANJOSE2(config-router)#^Z
SANJOSE2
```

Step 5: Configure ISP1 to run EBGP with SanJose1 and SanJose2. Enter the following Commonds on ISP1 as shown in the following:

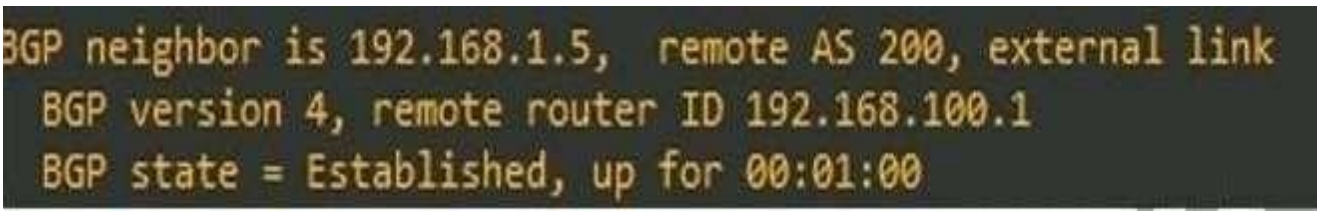
ISP1#
ISP1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ISP1(config)#router bgp 200
ISP1(config-router)#no auto-summary
ISP1(config-router)#neighbor 192.168.1.6 remote-as 64512
ISP1(config-router)#neighbor 192.168.1.2 remote-as 64512

ISP1(config-router)#network 192.168.100.0 ISP1(config-router)#

Step6: Configure SanJose1 as an EBGP peer to ISP1 as shown in the following:

SANJOSE1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SANJOSE1(config)#ip route 172.16.0.0 255.255.0.0 null0
SANJOSE1(config)#router bgp 64512
SANJOSE1(config-router)#neighbor 192.168.1.5 remote-as 200
SANJOSE1(config-router)#
SANJOSE1(config-router)#network 172.16.0.0
SANJOSE1(config-router)#
*Jun 24 11:00:14.303: %BGP-5-ADJCHANGE: neighbor 192.168.1.5 Up
SANJOSE1(config-router)#^Z
SANJOSE1#

Use the Show ip bgp neighbors:



Step7: Configure SAnJose1 As an EBGP peer to ISP1:-

SANJOSE2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SANJOSE2(config)#ip route 172.16.0.0 255.255.0.0 null0
SANJOSE2(config)#router bgp 64512
SANJOSE2(config-router)#neighbor 192.168.1.1 remote-as 200
SANJOSE2(config-router)#
SANJOSE2(config-router)#network 172.16.0.0
SANJOSE2(config-router)#

```
SANJOSE2#show ip bgp summary
BGP router identifier 172.16.32.1, local AS number 64512
BGP table version is 3, main routing table version 3
1 network entries using 144 bytes of memory
2 path entries using 160 bytes of memory
2/1 BGP path/bestpath attribute entries using 272 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 576 total bytes of memory
BGP activity 1/0 prefixes, 2/0 paths, scan interval 60 secs

Neighbor        V           AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State/PfxRcd
172.16.64.1     4        64512      15      15        3    0    0 00:09:54        1
192.168.1.1     4          200       6       6        3    0    0 00:00:42        0
SANJOSE2#
```

Step8:
Test whether ISP1 can ping the Loopback 0 address of 172.16.64.1 from SanJosel, as well as the serial link between San Josel and San Jose2, 172.16.1.1.

```
ISP1#ping 172.16.64.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.64.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 20/31/44 ms
ISP1#ping 172.16.1.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/29/32 ms
ISP1#
```

Now ping from ISP1 to the Loopback 0 address of 172.16.32.1 from San Jose2, as well as the serial link between San Josel and SanJose2. This time try 172.16.1.2.

```
ISP1#ping 172.16.32.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.32.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
ISP1#ping 172.16.1.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.1.2, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
ISP1#sh ip bgp
BGP table version is 3, local router ID is 192.168.100.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - i
              r RIB-failure, S Stale, m multipath, b backup-path, f RT-
              x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

     Network          Next Hop            Metric LocPrf Weight Path
 *   172.16.0.0       192.168.1.2              0             0 64512 i
 *>                   192.168.1.6              0             0 64512 i
 *>  192.168.100.0    0.0.0.0                  0         32768 i
```

At this point, the be able to get to each network connected to San Jose2 from the FastEthernet address 192.168.100.1.

ISP1#ping
Protocol [ip]:
Target IP address: 172.16.64.1
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Extended commands [n]: y
Source address or interface: 192.168.100.1
Type of service [0]:
Set DF bit in IP header? [no]:
Validate reply data? [no]:
Data pattern [0xABCD]:
Loose, Strict, Record, Timestamp, Verbose [none]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.64.1, timeout is 2 seconds:
Packet sent with a source address of 192.168.100.1

Success rate is 100 percent (5/5), round-trip min/avg/max = 20/27/36 ms

```
ISP1#ping
Protocol [ip]:
Target IP address: 172.16.1.1
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Source address or interface: 192.168.100.1
Extended commands [n]: y
Set DF bit in IP header? [no]:
Type of service [0]:
Validate reply data? [no]:
Data pattern [0xABCD]:
Loose, Strict, Record, Timestamp, Verbose[none]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds: Packet sent with a source address of
192.168.100.1 Thakkar
Success rate is 100 percent (5/5), round-trip min/avg/max = 20/29/40 ms

ISP1#ping
Protocol [ip]:
Target IP address: 172.16.32.1
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Extended commands [n]: y
Source address or interface: 192.168.100.1
Type of service [0]:
Set DF bit in IP header? [no]:
Validate reply data? [no]:
Data pattern [0xABCD]
Binita
Loose, Strict, Record, Timestamp, Verbose [none]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.32.1, timeout is 2 seconds:
Packet sent with a source address of 192.168.100.1
Success rate is 100 percent (5/5), round-trip min/avg/max = 40/45/52 ms


ISP1#ping
Protocol [ip]:
Target IP address: 172.16.1.2
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Extended commands [n]: y
Source address or interface: 192.168.100.1
Type of service [0]:
```

Set DF bit in IP header? [no]:
Validate reply data? [no]:
Data pattern [0xABCD]:
Loose, Strict, Record, Timestamp. Verbose[none]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.1.2, timeout is 2 seconds: Packet sent with a source address of 192.168.100.1
Success rate is 100 percent (5/5), round-trip min/avg/max = 40/45/48 ms
ISP1#

Complete reachability was proven between the ISP1 router and both San Josel and SanJose2.

Step9:
Before the ISP can successfully ping the internal serial interfaces of AS 64512, two issues need to be resolved. First, SanJosel does not know about the link between the ISP and SanJose2. Second, San Jose2 is unaware of the link between the ISP and San Josel. This can be resolved by an advertisement of these serial links by way of BGP router. This can also be resolved by way of EIGRP on each of the San Jose routers. The preferred method is for the ISP to advertise these links. If they are advertised and then, at a future date, a BGP link is activated to another ISP in addition to a risk of becoming a Transit AS. Binita AS 200, then there is

ISP1#conf t
ISP1 (config)#router bgp 200
ISP1 (config-router)#network 192.168.1.0 mask 255.255.255.252
ISP1(config-router)#network 192.168.1.4 mask 255.255.255.252
ISP1 (config-router)#^Z
ISP1#
*May 15 09:41:45.207: %SYS-5-CONFIG_I: Configured from console by console
ISP1#

```
ISP1#clear ip bgp *
ISP1#
*May 15 09:42:49.523: %BGP-5-ADJCHANGE: neighbor 192.168.1.2 Down User reset
*May 15 09:42:49.527: %BGP_SESSION-5-ADJCHANGE: neighbor 192.168.1.2 IPv4 Unicast topology base removed from session  User reset
*May 15 09:42:49.531: %BGP-5-ADJCHANGE: neighbor 192.168.1.6 Down User reset
*May 15 09:42:49.531: %BGP_SESSION-5-ADJCHANGE: neighbor 192.168.1.6 IPv4 Unicast topology base removed from session  User reset
*May 15 09:42:50.411: %BGP-5-ADJCHANGE: neighbor 192.168.1.6 Up
*May 15 09:42:50.411: %BGP-5-ADJCHANGE: neighbor 192.168.1.2 Up
```

```
ISP1#sh ip bgp
BGP table version is 5, local router ID is 192.168.100.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
              x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

     Network          Next Hop            Metric LocPrf Weight Path
 *>  172.16.0.0       192.168.1.2              0             0 64512 i
 *                    192.168.1.6              0             0 64512 i
 *>  192.168.1.0/30   0.0.0.0                  0         32768 i
 *>  192.168.1.4/30   0.0.0.0                  0         32768 i
 *>  192.168.100.0    0.0.0.0                  0         32768 i
ISP1#
```

Verify on San Josel and San Jose2 that the opposite WAN link is included in the routing table.
The output from San Jose2 is shown as follows:

```
SANJOSE2#sh ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       + - replicated route, % - next hop override

Gateway of last resort is not set

      172.16.0.0/16 is variably subnetted, 6 subnets, 3 masks
S        172.16.0.0/16 is directly connected, Null0
C        172.16.1.0/24 is directly connected, Serial1/1
L        172.16.1.2/32 is directly connected, Serial1/1
C        172.16.32.0/24 is directly connected, Loopback0
L        172.16.32.1/32 is directly connected, Loopback0
D        172.16.64.0/24 [90/2297856] via 172.16.1.1, 00:36:15, Serial1/1
      192.168.1.0/24 is variably subnetted, 3 subnets, 2 masks
C        192.168.1.0/30 is directly connected, Serial1/2
L        192.168.1.2/32 is directly connected, Serial1/2
B        192.168.1.4/30 [20/0] via 192.168.1.1, 00:01:02
B     192.168.100.0/24 [20/0] via 192.168.1.1, 00:01:02
SANJOSE2#
```

2nd last line of output

The next issue to consider is BGP policy routing between AS systems. BGP routers do not increment the next hop address to their IBGP peers. The San Jose2 router is passing a policy to SanJosel and vice versa. The policy for routing from AS 64512 to AS 200 is to forward packets to the 192.168.1.1 interface. SanJosel has a similar yet opposite policy, forwarding requests to the 192.168.1.5 interface. In the event that either WAN link fails, it is critical that the opposite router become a valid gateway. This is only achieved if the next-hop-self command is configured on SanJosel and San Jose2.

```
SANJOSE2#show ip bgp
BGP table version is 15, local router ID is 172.16.32.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
              x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

     Network          Next Hop            Metric LocPrf Weight Path
 *>  172.16.0.0       0.0.0.0                  0         32768 i
 * i                  172.16.64.1              0    100      0 i
 r i 192.168.1.0/30   192.168.1.5              0    100      0 200 i
 r>                   192.168.1.1              0             0 200 i
 * i 192.168.1.4/30   192.168.1.5              0    100      0 200 i
 *>                   192.168.1.1              0             0 200 i
 * i 192.168.100.0    192.168.1.5              0    100      0 200 i
 *>                   192.168.1.1              0             0 200 i
SANJOSE2#
```

SANJOSE1 #conf t
SANJOSE1 (config)#router bgp 64512
SANJOSE1 (config-router)#neighbor 172.16.32.1 next-hop-self Tha
SANJOSE1 (config-router)#^Z
SANJOSE2#conf t
SANJOSE2 (config)#router bgp 64512
SANJOSE2 (config-router) #neighbor 172.16.64.1 next-hop-self
SANJOSE2(config-router)#^Z

```
SANJOSE2#clear ip bgp *
SANJOSE2#
*May 15 09:49:46.755: %BGP-5-ADJCHANGE: neighbor 172.16.64.1 Down User reset
*May 15 09:49:46.759: %BGP_SESSION-5-ADJCHANGE: neighbor 172.16.64.1 IPv4 Unicast topology base removed from session  User reset
*May 15 09:49:46.763: %BGP-5-ADJCHANGE: neighbor 192.168.1.1 Down User reset
*May 15 09:49:46.767: %BGP_SESSION-5-ADJCHANGE: neighbor 192.168.1.1 IPv4 Unicast topology base removed from session  User reset
*May 15 09:49:47.375: %BGP-5-ADJCHANGE: neighbor 172.16.64.1 Up
*May 15 09:49:47.375: %BGP-5-ADJCHANGE: neighbor 192.168.1.1 Up
SANJOSE2#
```

```
SANJOSE2#show ip bgp
BGP table version is 1, local router ID is 172.16.32.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
              x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

     Network          Next Hop            Metric LocPrf Weight Path
 *   172.16.0.0       0.0.0.0                  0         32768 i
 * i                  172.16.64.1              0    100      0 i
 *   192.168.1.0/30   192.168.1.1              0             0 200 i
 * i                  172.16.64.1              0    100      0 200 i
 *   192.168.1.4/30   192.168.1.1              0             0 200 i
 * i                  172.16.64.1              0    100      0 200 i
 *   192.168.100.0    192.168.1.1              0             0 200 i
 * i                  172.16.64.1              0    100      0 200 i
SANJOSE2#
```

Step10:

At this point, everything looks good with the exception of default routes, the outbound flow of data, and inbound packet flow. Since the local preference value is shared between IBGP neighbors, configure a simple route-map that references local preference value on SanJosel and San Jose2. This policy will adjustoutbound traffic to prefer the link off the SanJosel router instead of the metered T1 off San Jose2.

SANJOSE1#conf t
SANJOSE1 (config)#route-map PRIMARY_T1_IN permit 10
SANJOSE1 (config-route-map) #set local-preference 150
SANJOSE1 (config-route-map)#
SANJOSE1 (config)#router bgp 64512
SANJOSE1 (config-router)#neighbor 192.168.1.5 route-map PRIMARY_T1_IN i
SANJOSE1 (config-router)#^Z
SANJOSE2#conf t
SANJOSE2 (config)#route-map SECONDARY_T1_IN permit 10
SANJOSE2 (config-route-map) #set local-preference 125
SANJOSE2 (config-route-map) #router bgp 64512
SANJOSE2 (config-router)#neighbor 192.168.1.1 route-map SECONDARY_T1_IN in
SANJOSE2 (config-router)#^Z
Use clear ip bgp *

```
SANJOSE1#clear ip bgp *
SANJOSE1#
*May 15 09:55:02.459: %BGP-5-ADJCHANGE: neighbor 172.16.32.1 Down User reset
*May 15 09:55:02.463: %BGP_SESSION-5-ADJCHANGE: neighbor 172.16.32.1 IPv4 Unicast topology base removed from session  User reset
*May 15 09:55:02.467: %BGP-5-ADJCHANGE: neighbor 192.168.1.5 Down User reset
*May 15 09:55:02.467: %BGP_SESSION-5-ADJCHANGE: neighbor 192.168.1.5 IPv4 Unicast topology base removed from session  User reset
*May 15 09:55:02.587: %BGP-5-ADJCHANGE: neighbor 172.16.32.1 Up
*May 15 09:55:02.615: %BGP-5-ADJCHANGE: neighbor 192.168.1.5 Up
SANJOSE1#
```

```
SANJOSE1#sh ip bgp
BGP table version is 1, local router ID is 172.16.64.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
              x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

     Network          Next Hop            Metric LocPrf Weight Path
 *   172.16.0.0       0.0.0.0                  0         32768 i
 * i                  172.16.32.1              0    100      0 i
 *   192.168.1.0/30   192.168.1.5              0    150      0 200 i
 * i                  172.16.32.1              0    100      0 200 i
 *   192.168.1.4/30   192.168.1.5              0    150      0 200 i
 * i                  172.16.32.1              0    100      0 200 i
 *   192.168.100.0    192.168.1.5              0    150      0 200 i
 * i                  172.16.32.1              0    100      0 200 i
SANJOSE1#
```

```
SANJOSE2#clear ip bgp *
SANJOSE2#
*May 15 09:57:34.999: %BGP-5-ADJCHANGE: neighbor 172.16.64.1 Down User reset
*May 15 09:57:34.999: %BGP_SESSION-5-ADJCHANGE: neighbor 172.16.64.1 IPv4 Unicast topology base removed from session  User reset
*May 15 09:57:35.007: %BGP-5-ADJCHANGE: neighbor 192.168.1.1 Down User reset
*May 15 09:57:35.007: %BGP_SESSION-5-ADJCHANGE: neighbor 192.168.1.1 IPv4 Unicast topology base removed from session  User reset
*May 15 09:57:35.399: %BGP-5-ADJCHANGE: neighbor 172.16.64.1 Up
*May 15 09:57:35.399: %BGP-5-ADJCHANGE: neighbor 192.168.1.1 Up
SANJOSE2#sh ip bgp
BGP table version is 1, local router ID is 172.16.32.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
              x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

     Network          Next Hop            Metric LocPrf Weight Path
 * i 172.16.0.0       172.16.64.1              0    100      0 i
 *   192.168.1.0/30   192.168.1.1              0    125      0 200 i
 * i                  172.16.64.1              0    150      0 200 i
 *   192.168.1.4/30   192.168.1.1              0    125      0 200 i
 * i                  172.16.64.1              0    150      0 200 i
 *   192.168.100.0    192.168.1.1              0    125      0 200 i
 * i                  172.16.64.1              0    150      0 200 i
SANJOSE2#
```

Step11:

How will traffic return from network 192.168.100.0/24? Through San Josel or SanJose2?

Issue s hip bgp on ISP1.

SANJOSE2#ping

Protocol [ip]:

Target IP address: 192.168.100.1

Repeat count [5]: 2

Datagram size [100]:

Timeout in seconds [2]:

Extended commands [n]: y
Source
Type of service [0]:
Set DF bit in IP header? [no]:
Validate reply data? [no]:
Data pattern [0xABCD]:

Loose. Strict, Record, Timestamp, Verbose[none]: record
Number of hops [9]:

Loose, Strict, Record, Timestamp, Verbose [RV]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 2, 100-byte ICMP Echos to 192.168.100.1, timeout is 2 seconds:
Packet sent with a source address of 172.16.32.1
Packet has IP options: Total option bytes= 39, padded length=40
Record route: <*>
(0.0.0.0)
(0.0.0.0)
(0.0.0.0)
(0.0.0.0)
(0.0.0.0)
(0.0.0.0)
(0.0.0.0)
(0.0.0.0)
(0.0.0.0)
Reply to request 0 (52 ms). Received packet has options
Total option bytes= 40, padded length=40
Record route:
(172.16.1.2)
(192.168.1.6)
(192.168.1.5)
(192.168.1.5)
(172.16.1.1)
(172.16.1.2) <*>
(0.0.0.0)
(0.0.0.0)
(0.0.0.0)
End of list

Reply to request 1 (52 ms). Received packet has options
Total option bytes= 40. padded length
Record route:

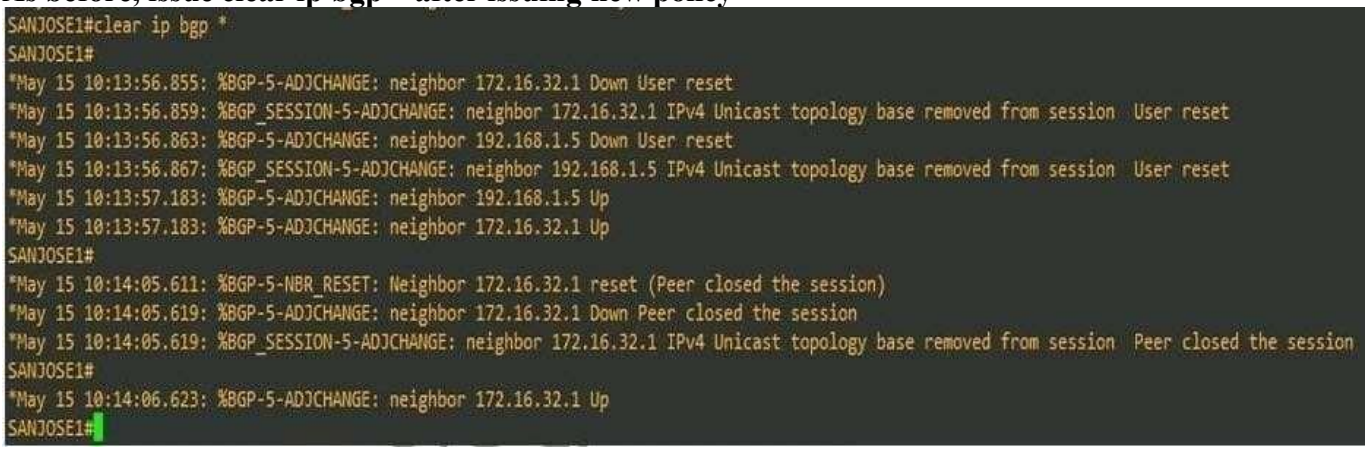
(172.16.1.2)
(192.168.1.6)
(192.168.1.5)

(192.168.1.5)
(172.16.1.1)
(172.16.1.2) <*>
(0.0.0.0)
(0.0.0.0)
(0.0.0.0)
End of list
Success rate is 100 percent (2/2), round-trip min/avg/max = 52/52/52 ms

SANJOSE2#

The next step is to create a new policy to force ISP to return all traffic via SanJosel. Create a second route-map utilizing MED (metric) which is shared between EBGP neighbors.
SANJOSE1#conf t
SANJOSE1 (config)#route-map PRIMARY_T1_MED_OUT permit 10
SANJOSE1 (config-route-map) #set Metric 50
SANJOSE1 (config-route-map)#exit
SANJOSE1 (config)#router bgp 64512
SANJOSE1 (config-router)#neighbor 192.168.1.5 route-map PRIMARY_T1_MED_OUT out
SANJOSE1 (config-router)#
SANJOSE2#conf t
SANJOSE2 (config)#route-map SECONDARY_T1_MED_OUT permit 10
SANJOSE2 (config-route-map) #set Metric 75
SANJOSE2 (config-route-map)#exit
SANJOSE2 (config)#router bgp 64512
SANJOSE2(config-router)#$2.168.1.1 route-map SECONDARY_T1_MED_OUT out
SANJOSE2(config-router)#

As before, issue clear ip bgp * after issuing new policy



```
SANJOSE1#sh ip bgp
BGP table version is 5, local router ID is 172.16.64.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
              x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

     Network          Next Hop            Metric LocPrf Weight Path
 * i 172.16.0.0       172.16.32.1              0    100      0 i
 *>                   0.0.0.0                  0         32768 i
 *>  192.168.1.0/30   192.168.1.5              0    150      0 200 i
 r>  192.168.1.4/30   192.168.1.5              0    150      0 200 i
 *>  192.168.100.0    192.168.1.5              0    150      0 200 i
SANJOSE1#
```

Reissue extended ping command with record command
SANJOSE2#ping
Protocol [ip]:

Issue sh ip bgp on ISP to check the updated MED value used,

```
ISP1#sh ip bgp
BGP table version is 13, local router ID is 192.168.100.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
              x best-external, a additional-path, c RIB-compressed,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found

     Network          Next Hop            Metric LocPrf Weight Path
 *   172.16.0.0       192.168.1.2             75             0 64512 i
 *>                   192.168.1.6             50             0 64512 i
 *>  192.168.1.0/30   0.0.0.0                  0         32768 i
 *>  192.168.1.4/30   0.0.0.0                  0         32768 i
 *>  192.168.100.0    0.0.0.0                  0         32768 i
ISP1#
```

Step 12:
Establish a default route that uses a policy statement that will adjust to changes in the network. Configure both San Josel and Sanjose2 to use 192.168.100.0/24 as the default network.

```
SANJOSE1#sh ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, * - candidate default, U - per-user static route
       o - ODR, P - periodic downloaded static route, H - NHRP, l - LISP
       + - replicated route, % - next hop override

Gateway of last resort is not set

      172.16.0.0/16 is variably subnetted, 6 subnets, 3 masks
S        172.16.0.0/16 is directly connected, Null0
C        172.16.1.0/24 is directly connected, Serial1/1
L        172.16.1.1/32 is directly connected, Serial1/1
D        172.16.32.0/24 [90/2297856] via 172.16.1.2, 01:01:22, Serial1/1
C        172.16.64.0/24 is directly connected, Loopback0
L        172.16.64.1/32 is directly connected, Loopback0
      192.168.1.0/24 is variably subnetted, 3 subnets, 2 masks
B        192.168.1.0/30 [20/0] via 192.168.1.5, 00:07:14
C        192.168.1.4/30 is directly connected, Serial1/0
L        192.168.1.6/32 is directly connected, Serial1/0
B     192.168.100.0/24 [20/0] via 192.168.1.5, 00:07:14
SANJOSE1#
```

SANJOSEI#conft
SANJOSEI (config)#ip default-network 192.168.100.0

SANJOSE2#conf t
SANJOSE2 (config)#ip default-network 192.168.100.0 SANJOSE2 (config)