BGP Dynamic and Multihoming

R1 R5 R6 R7
192.1.0.0/24

R1 R2 R3 R4
172.1.0.0/24
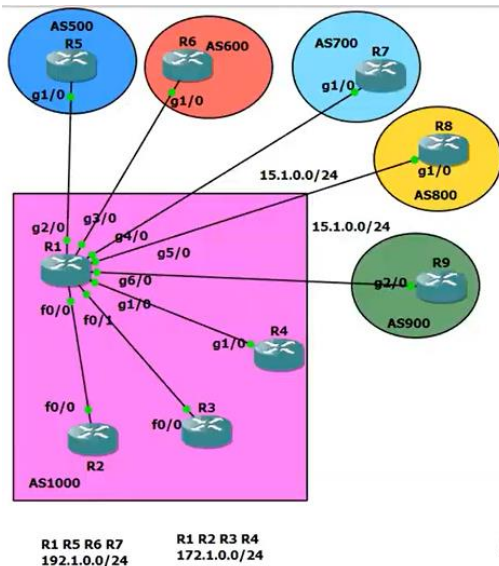
** config the basic IP via through recommended IP in networks.

#R1
[**1st = create a peer-group
     2nd = link the peer-group with listen range ip address
     3rd = config necessary things like next-hop-self, route-reflector-client, along with net and nei CMD]
it will reduce the usage of NEI command multiple times.

```
router bgp 1000
nei NH192 peer-group
nei NH172 peer-group
bgp listen range 192.1.0.0/16 peer-group NH192
bgp listen range 172.1.0.0/16 Peer-group NH172
nei NH192 remote-as 500 alternate-as 600 700
nei NH172 remote-as 1000
nei NH192 next-hop-self
nei NH172 route-reflector-client
net 192.1.15.0 mask 255.255.255.0
net 192.1.16.0 mask 255.255.255.0
net 192.1.17.0 mask 255.255.255.0
net 15.1.28.0 mask 255.255.255.0
net 15.1.29.0 mask 255.255.255.0
net 172.1.12.0 mask 255.255.255.0
net 172.1.13.0 mask 255.255.255.0
net 172.1.14.0 mask 255.255.255.0
net 10.1.1.1 mask 255.255.255.255
exit
```

** for 15.0 network
```
router bgp 1000
nei NH15 peer-group
bgp listen range 15.1.0.0/16 peer-group NH15
nei NH15 remote-as 900 alternate-as 800
```
so after config of R1 we can config BGP on other routers like R7 etc. It will directly form neighborship with the other routers.

#R1
```
Neighbor          V          AS MsgRcvd MsgSent    TblVer  InQ OutQ Up/Down  State/PfxRcd
*15.1.28.8        4         800       5      12        17    0    0 00:01:07     2
*15.1.29.9        4         900       4      12        17    0    0 00:00:24     0
*172.1.12.2       4        1000      12      16        17    0    0 00:06:22     2
*172.1.13.3       4        1000      12      19        17    0    0 00:06:20     2
*172.1.14.4       4        1000       9      18        17    0    0 00:05:32     2
*192.1.15.5       4         500      11      15        17    0    0 00:06:23     2
*192.1.16.6       4         600      11      18        17    0    0 00:06:22     2
*192.1.17.7       4         700      10      16        17    0    0 00:04:39     2
* Dynamically created based on a listen range command
Dynamically created neighbors: 8, Subnet ranges: 3

BGP peergroup NH192 listen range group members:
   192.1.0.0/16
BGP peergroup NH172 listen range group members:
   172.1.0.0/16
BGP peergroup NH15 listen range group members:
   15.1.0.0/16

Total dynamically created neighbors: 8/(100 max), Subnet ranges: 3
```
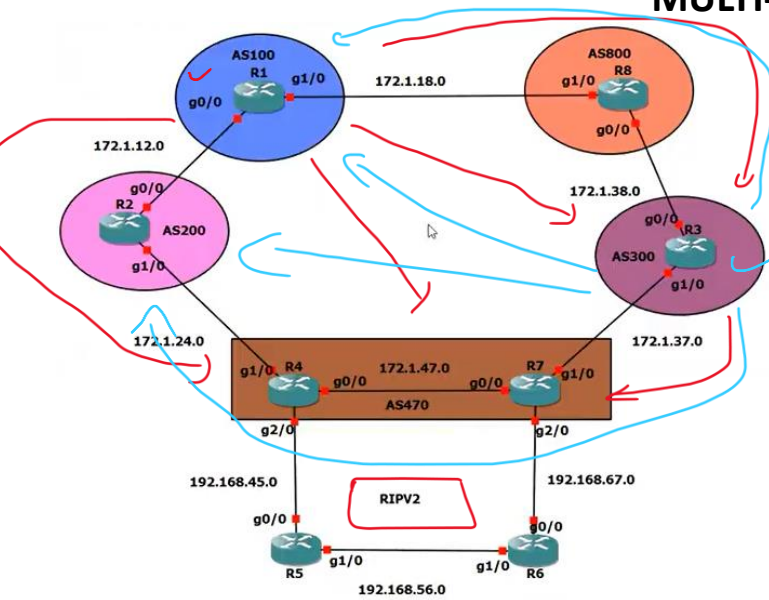## it says dynamically created neighborship with IP's.

MULTI-HOMING

#R4
```
R4(config)#router ospf 10
R4(config-router)#router-id 4.4.4.4
R4(config-router)#net 192.168.45.0 0.0.0.255 area 0
R4(config-router)#net 4.4.4.4 0.0.0.0 area 0
R4(config-router)#exit
```

#R6
```
R6(config)#router ospf 10
R6(config-router)#net 0.0.0.0 255.255.255.255 area 0
R6(config-router)#^Z
R6#
```
** config the same on the R6 and R5

#R7
```
R7(config)#router ospf 10
R7(config-router)#router-id 7.7.7.7
R7(config-router)#net 192.168.67.0 0.0.0.255 area 0
R7(config-router)#net 7.7.7.7 0.0.0.0 area 0
R7(config-router)#exit
```

BGP config
#R1
```
R1(config)#router bgp 100
R1(config-router)#nei 172.1.12.2 remote-as 200
R1(config-router)#nei 172.1.18.8 remote-as 800
R1(config-router)#net 172.1.12.0 mask 255.255.255.0
R1(config-router)#net 172.1.18.0 mask 255.255.255.0
R1(config-router)#net 10.1.1.1 mask 255.255.255.255
R1(config-router)#
```

#R2
```
R2(config)#router bgp 200
R2(config-router)#nei 172.1.12.1 remote-as 100
R2(config-router)#nei 172.1.24.2
*Sep  9 20:51:21.099: %BGP-5-ADJCHANGE: neighbor 172.1.12.1 Up
R2(config-router)#nei 172.1.24.4 remote-as 470
R2(config-router)#net 172.1.24.0 mask 255.255.255.0
R2(config-router)#net 172.1.12.0 mask 255.255.255.0
R2(config-router)#net 10.2.2.2 mask 255.255.255.255
```

same on R8,R3.

#R4
```
R4(config)#router bgp 470
R4(config-router)#nei 172.1.24.2 remote-as 200
R4(config-router)#nei
*Sep  9 20:54:48.687: %BGP-5-ADJCHANGE: neighbor 172.1.24.2 Up
R4(config-router)#nei 172.1.47.7 remote-as 470
R4(config-router)#nei 172.1.47.7 next-hop-self
R4(config-router)#net 172.1.24.0 mask 255.255.255.0
R4(config-router)#net 172.1.47.0 mask 255.255.255.0
R4(config-router)#net 44.44.44.44 mask 255.255.255.255
R4(config-router)#
```

#R7
```
R7(config)#router bgp 470
R7(config-router)#nei 172.1.37.3 remote-as 300
R7(config-router)#nei 172.1.47.4 remote-as 470
*Sep  9 20:56:25.131: %BGP-5-ADJCHANGE: neighbor 172.1.37.3 Up
R7(config-router)#nei 172.1.47.4 remote-as 470
R7(config-router)#nei 172.1.47.4 next-hop-self
R7(config-router)#
*Sep  9 20:56:33.379: %BGP-5-ADJCHANGE: neighbor 172.1.47.4 Up
R7(config-router)#net 172.1.37.0 mask 255.255.255.0
R7(config-router)#net 172.1.47.0 mask 255.255.255.0
R7(config-router)#net 77.77.77.77 mask 255.255.255.255
```

** now R1 wont get ospf routes and we want end-to-end connectivity.

[we have two options 1= default-originate and 2=redistribute <ip> internal external.

#R4

```
R4(config)#router bgp 470
R4(config-router)#nei 172.1.24.2 def
R4(config-router)#nei 172.1.24.2 default-originate
R4(config-router)#do clear ip bgp 172.1.24.2 soft
```

```
    Network          Next Hop          Metric LocPrf Weight Path
*>  0.0.0.0          172.1.18.1                       0 100 200 470 i
*>  10.1.1.1/32      172.1.18.1          0            0 100 i
*   10.2.2.2/32      172.1.38.3                       0 300 470 200 i
*>                   172.1.18.1                       0 100 200 i
*>  10.3.3.3/32      172.1.38.3          0            0 300 i
*>  10.8.8.8/32      0.0.0.0             0        32768 i
*>  44.44.44.44/32   172.1.38.3                       0 300 470 i
*                    172.1.18.1                       0 100 200 470 i
*   77.77.77.77/32   172.1.18.1                       0 100 200 470 i
*>                   172.1.38.3                       0 300 470 i
*>  172.1.12.0/24    172.1.18.1          0            0 100 i
*>  172.1.18.0/24    0.0.0.0             0        32768 i
*                    172.1.18.1          0            0 100 i
*   172.1.24.0/24    172.1.38.3                       0 300 470 i
    Network          Next Hop          Metric LocPrf Weight Path
*>                   172.1.18.1                       0 100 200 i
*>  172.1.37.0/24    172.1.38.3          0            0 300 i
*   172.1.38.0/24    172.1.38.3          0            0 300 i
*>                   0.0.0.0             0        32768 i
*>  172.1.47.0/24    172.1.38.3                       0 300 470 i
*                    172.1.18.1                       0 100 200 470 i
R8#
```
**** we get default route from R1.**

#R7

```
R7(config)#router bgp 470
R7(config-router)#redistribute ospf 10 mat
R7(config-router)#redistribute ospf 10 match in
R7(config-router)#redistribute ospf 10 match internal e
R7(config-router)#redistribute ospf 10 match internal external
R7(config-router)#exit
```

###Testing
#R4

```
R4(config)#router bgp 470
R4(config-router)#no nei 172.1.24.2 default-originate
R4(config-router)#do clear ip bgp * soft
R4(config-router)#do clear ip bgp * soft
R4(config-router)#do clear ip bgp * soft
R4(config-router)#
```
**** remove the default-route from R4**

#R7

```
R7(config)#router bgp 470
R7(config-router)#no redistribute ospf 10 match internal external
R7(config-router)#do clear ip bgp * soft
R7(config-router)#do clear ip bgp * soft
```

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#R4

```
R4(config)#router bgp 470
R4(config-router)#net 192.168.45.0 mask 255.255.255.0
R4(config-router)#net 192.168.56.0 mask 255.255.255.0
R4(config-router)#net 192.168.67.0 mask 255.255.255.0
R4(config-router)#net 10.5.5.5 mask 255.255.255.255
R4(config-router)#net 10.6.6.6 mask 255.255.255.255
R4(config-router)#net 7.7.7.7 mask 255.255.255.255
R4(config-router)#net 4.4.4.4 mask 255.255.255.255
R4(config-router)#do sh ip rou rip
```
**** we have advertised all the routes in the BGP command (we can config other routing-protocol info in the BGP)**

#R1 (** on router R1 we have all routes)

```
*>  10.1.1.1/32       0.0.0.0              0           32768 i
*>  10.2.2.2/32       172.1.12.2           0               0 200 i
*   10.3.3.3/32       172.1.12.2                           0 200 470 300 i
*>                    172.1.18.8                           0 800 300 i
*   10.5.5.5/32       172.1.18.8                           0 800 300 470 i
*>                    172.1.12.2                           0 200 470 i
*   10.6.6.6/32       172.1.18.8                           0 800 300 470 i
*>                    172.1.12.2                           0 200 470 i
*>  10.8.8.8/32       172.1.18.8           0               0 800 i
*   44.44.44.44/32    172.1.18.8                           0 800 300 470 i
    Network           Next Hop         Metric LocPrf Weight Path
*>                    172.1.12.2                           0 200 470 i
*>  ¬7.77.77.77/32    172.1.12.2                           0 200 470 i
*                     172.1.18.8                           0 800 300 470 i
*   172.1.12.0/24     172.1.12.2           0               0 200 i
*>                    0.0.0.0              0           32768 i
*   172.1.18.0/24     172.1.18.8           0               0 800 i
*>                    0.0.0.0              0           32768 i
*>  172.1.24.0/24     172.1.12.2           0               0 200 i
*   172.1.37.0/24     172.1.12.2                           0 200 470 i
*>                    172.1.18.8                           0 800 300 i
*>  172.1.38.0/24     172.1.18.8           0               0 800 i
*   172.1.47.0/24     172.1.18.8                           0 800 300 470 i
*>                    172.1.12.2                           0 200 470 i
*   192.168.45.0      172.1.18.8                           0 800 300 470 i
*>                    172.1.12.2                           0 200 470 i
*   192.168.56.0      172.1.18.8                           0 800 300 470 i
*>                    172.1.12.2                           0 200 470 i
*   192.168.67.0      172.1.18.8                           0 800 300 470 i
*>                    172.1.12.2                           0 200 470 i
R1#
```