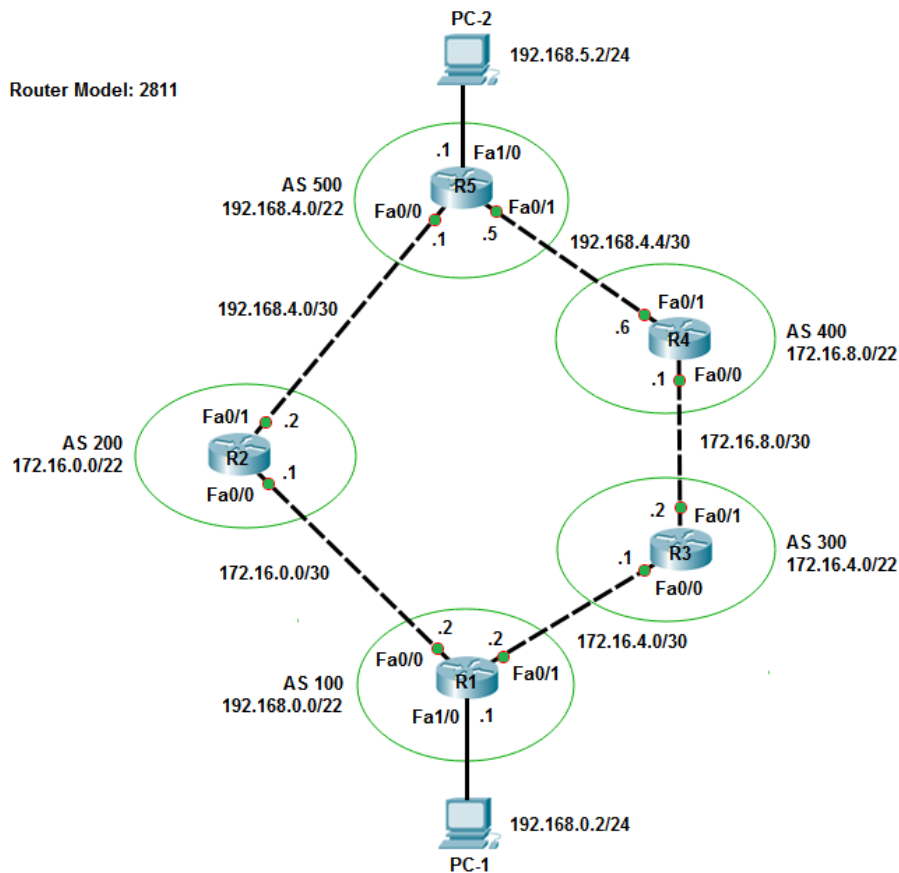


**BGP LAB**  
(For Practice)

**LAB Topology**

**BGP Routing LAB Topology**



**LAB Instruction**

- Task-1 : Configuring IP Addresses on Routers and PCs
- Task-2 : Configuring BGP peering among ASes and advertising respective Prefixes
- Task-3 : Verifying BGP peers and BGP Table
- Task-4 : Verifying Routing Table
- Task-5 : Verifying Connectivity between PC-1 and PC-2

**Configurations are given below.....**

**Task-1 : Configuring IP Addresses on Routers and PCs**

**R1**

==

```
Router>enable
Router#configure terminal

Router(config)#line console 0
Router(config-line)#logging synchronous
Router(config-line)#exec-timeout 0
Router(config-line)#exit
Router(config)#hostname R1

R1(config)#interface fastEthernet 0/0
R1(config-if)#ip address 172.16.0.2 255.255.255.252
R1(config-if)#no shutdown
R1(config-if)#description To-R2
R1(config-if)#exit
R1(config)#interface fastEthernet 0/1
R1(config-if)#ip address 172.16.4.2 255.255.255.252
R1(config-if)#no shutdown
R1(config-if)#description To-R3
R1(config-if)#exit
R1(config)#interface fastEthernet 1/0
R1(config-if)#ip address 192.168.0.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#description LAN
R1(config-if)#exit
R1(config)#exit

R1#write
```

**R2**

==

```
Router>enable
Router#configure terminal

Router(config)#line console 0
Router(config-line)#logging synchronous
Router(config-line)#exec-timeout 0
Router(config-line)#exit

Router(config)#hostname R2

R2(config)#interface fastEthernet 0/0
R2(config-if)#ip address 172.16.0.1 255.255.255.252
R2(config-if)#no shutdown
```

```
R2(config-if)#description To-R1
R2(config-if)#exit
R2(config)#interface fastEthernet 0/1
R2(config-if)#ip address 192.168.4.2 255.255.255.252
R2(config-if)#no shutdown
```

```
R2(config-if)#description To-R5
R2(config-if)#exit
R2(config)#exit
```

```
R2#write
```

### **R3**

```
==
```

```
Router>enable
Router#configure terminal
```

```
Router(config)#line console 0
Router(config-line)#logging synchronous
Router(config-line)#exec-timeout 0
Router(config-line)#exit
```

```
Router(config)#hostname R3
```

```
R3(config)#interface fastEthernet 0/0
R3(config-if)#ip address 172.16.4.1 255.255.255.252
R3(config-if)#no shutdown
R3(config-if)#description To-R1
R3(config-if)#exit
R3(config)#interface fastEthernet 0/1
R3(config-if)#ip address 172.16.8.2 255.255.255.252
R3(config-if)#no shutdown
R3(config-if)#description To-R4
R3(config-if)#exit
R3(config)#exit
```

```
R3#write
```

### **R4**

```
==
```

```
Router>enable
Router#configure terminal
```

```
Router(config)#line console 0
Router(config-line)#logging synchronous
Router(config-line)#exec-timeout 0
Router(config-line)#exit
```

```
Router(config)#hostname R4
```

```
R4(config)#interface fastEthernet 0/0
R4(config-if)#ip address 172.16.8.1 255.255.255.252
R4(config-if)#no shutdown
R4(config-if)#description To-R3
R4(config-if)#exit
R4(config)#interface fastEthernet 0/1
R4(config-if)#ip address 192.168.4.6 255.255.255.252
R4(config-if)#no shutdown
R4(config-if)#description To-R5
R4(config-if)#exit
R4(config)#exit
```

```
R4#write
```

## R5

```
==
```

```
Router>enable
```

```
Router#configure terminal
```

```
Router(config)#line console 0
Router(config-line)#logging synchronous
Router(config-line)#exec-timeout 0
Router(config-line)#exit
```

```
Router(config)#hostname R5
```

```
R5(config)#interface fastEthernet 0/0
R5(config-if)#ip address 192.168.4.1 255.255.255.252
R5(config-if)#no shutdown
R5(config-if)#description To-R2
R5(config-if)#exit
R5(config)#interface fastEthernet 0/1
R5(config-if)#ip address 192.168.4.5 255.255.255.252
R5(config-if)#no shutdown
R5(config-if)#description To-R4
R5(config-if)#exit
R5(config)#interface fastEthernet 1/0
R5(config-if)#ip address 192.168.5.1 255.255.255.0
R5(config-if)#no shutdown
R5(config-if)#description LAN
R5(config-if)#exit
R5(config)#exit
```

```
R5#write
```

## PC1

```
===
```

```
IP      : 192.168.0.2
Mask    : 255.255.255.0
GW      : 192.168.0.1
```

## PC2

===

IP : 192.168.5.2  
Mask : 255.255.255.0  
GW : 192.168.5.1

## Task-2 : Configuring BGP peering among ASes and advertising respective Prefixes

### R1

==

```
R1#conf t
R1(config)#router bgp 100
R1(config-router)#neighbor 172.16.0.1 remote-as 200
R1(config-router)#neighbor 172.16.4.1 remote-as 300
R1(config-router)#network 192.168.0.0 mask 255.255.252.0
R1(config-router)#exit

R1(config)#ip route 192.168.0.0 255.255.252.0 null 0
R1(config)#exit

R1#write
```

### R2

==

```
R2#conf t
R2(config)#router bgp 200
R2(config-router)#neighbor 192.168.4.1 remote-as 500
R2(config-router)#neighbor 172.16.0.2 remote-as 100
R2(config-router)#network 172.16.0.0 mask 255.255.252.0
R2(config-router)#exit

R2(config)#ip route 172.16.0.0 255.255.252.0 null 0
R2(config)#exit

R2#write
```

### R3

==

```
R3#conf t
R3(config)#router bgp 300
R3(config-router)#neighbor 172.16.8.1 remote-as 400
R3(config-router)#neighbor 172.16.4.2 remote-as 100
R3(config-router)#network 172.16.4.0 mask 255.255.252.0
R3(config-router)#exit

R3(config)#ip route 172.16.4.0 255.255.252.0 null 0
R3(config)#exit

R3#write
```

## R4

==

```
R4#conf t
R4(config)#router bgp 400
R4(config-router)#neighbor 192.168.4.5 remote-as 500
R4(config-router)#neighbor 172.16.8.2 remote-as 300
R4(config-router)#network 172.16.8.0 mask 255.255.252.0
R4(config-router)#exit
```

```
R4(config)#ip route 172.16.8.0 255.255.252.0 null 0
R4(config)#exit
```

R4#write

## R5

==

```
R5#conf t
R5(config)#router bgp 500
R5(config-router)#neighbor 192.168.4.2 remote-as 200
R5(config-router)#neighbor 192.168.4.6 remote-as 400
R5(config-router)#network 192.168.4.0 mask 255.255.252.0
R5(config-router)#exit
```

```
R5(config)#ip route 192.168.4.0 255.255.252.0 null 0
R5(config)#exit
```

R5#write

### Task-3 : Verifying BGP Peers and BGP Table

R1# show ip bgp summary

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
172.16.0.1	4	200	22	17	10	0	0	00:15:53	4
172.16.4.1	4	300	21	16	10	0	0	00:14:01	4

R1#show ip bgp

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/22	172.16.0.1	0	0	0	200 i
*	172.16.4.1	0	0	0	300 400 500 200 i
*> 172.16.4.0/22	172.16.4.1	0	0	0	300 i
*	172.16.0.1	0	0	0	200 500 400 300 i
*> 172.16.8.0/22	172.16.4.1	0	0	0	300 400 i
*	172.16.0.1	0	0	0	200 500 400 i
*> 192.168.0.0/22	0.0.0.0	0	0	32768	i
*> 192.168.4.0/22	172.16.0.1	0	0	0	200 500 i
*	172.16.4.1	0	0	0	300 400 500 i

**R5#show ip bgp summary**

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
192.168.4.2	4	200	19	13	10	0	0	00:11:45	4
192.168.4.6	4	400	19	13	10	0	0	00:11:28	4

**R5#show ip bgp**

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 172.16.0.0/22	192.168.4.2	0	0	0	200 i
*	192.168.4.6	0	0	0	400 300 100 200 i
* 172.16.4.0/22	192.168.4.2	0	0	0	200 100 300 i
*>	192.168.4.6	0	0	0	400 300 i
* 172.16.8.0/22	192.168.4.2	0	0	0	200 100 300 400 i
*>	192.168.4.6	0	0	0	400 i
*> 192.168.0.0/22	192.168.4.2	0	0	0	200 100 i
*	192.168.4.6	0	0	0	400 300 100 i
*> 192.168.4.0/22	0.0.0.0	0	0	32768	i

#### Task-4 : Verifying Routing Table

**R1#show ip route bgp**

```
B 172.16.0.0/22 [20/0] via 172.16.0.1, 00:37:45
B 172.16.4.0/22 [20/0] via 172.16.4.1, 00:37:45
B 172.16.8.0/22 [20/0] via 172.16.4.1, 00:37:45
B 192.168.4.0/22 [20/0] via 172.16.0.1, 00:37:45
```

**R5#show ip route bgp**

```
B 172.16.0.0 [20/0] via 192.168.4.2, 00:45:49
B 172.16.4.0 [20/0] via 192.168.4.6, 00:45:49
B 172.16.8.0 [20/0] via 192.168.4.6, 00:45:49
B 192.168.0.0/22 [20/0] via 192.168.4.2, 00:45:49
```

#### Task-5 : Verifying Connectivity between PC-1 and PC-2

**PC-1**

====

C:\>ping 192.168.5.2

Pinging 192.168.5.2 with 32 bytes of data:

Reply from 192.168.5.2: bytes=32 time=13ms TTL=124

Reply from 192.168.5.2: bytes=32 time=13ms TTL=124

Reply from 192.168.5.2: bytes=32 time=11ms TTL=124

Reply from 192.168.5.2: bytes=32 time=12ms TTL=124

Ping statistics for 192.168.5.2:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 11ms, Maximum = 13ms, Average = 12ms

**C:\>tracert 192.168.5.2**

Tracing route to 192.168.2.2 over a maximum of 30 hops:

C:\>tracert 192.168.5.2

Tracing route to 192.168.5.2 over a maximum of 30 hops:

1 1 ms 0 ms 0 ms 192.168.0.1  
2 0 ms 0 ms 0 ms 172.16.0.1  
3 1 ms 0 ms 10 ms 192.168.4.1  
4 11 ms 13 ms 12 ms 192.168.5.2  
Trace complete.

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