Practical 9

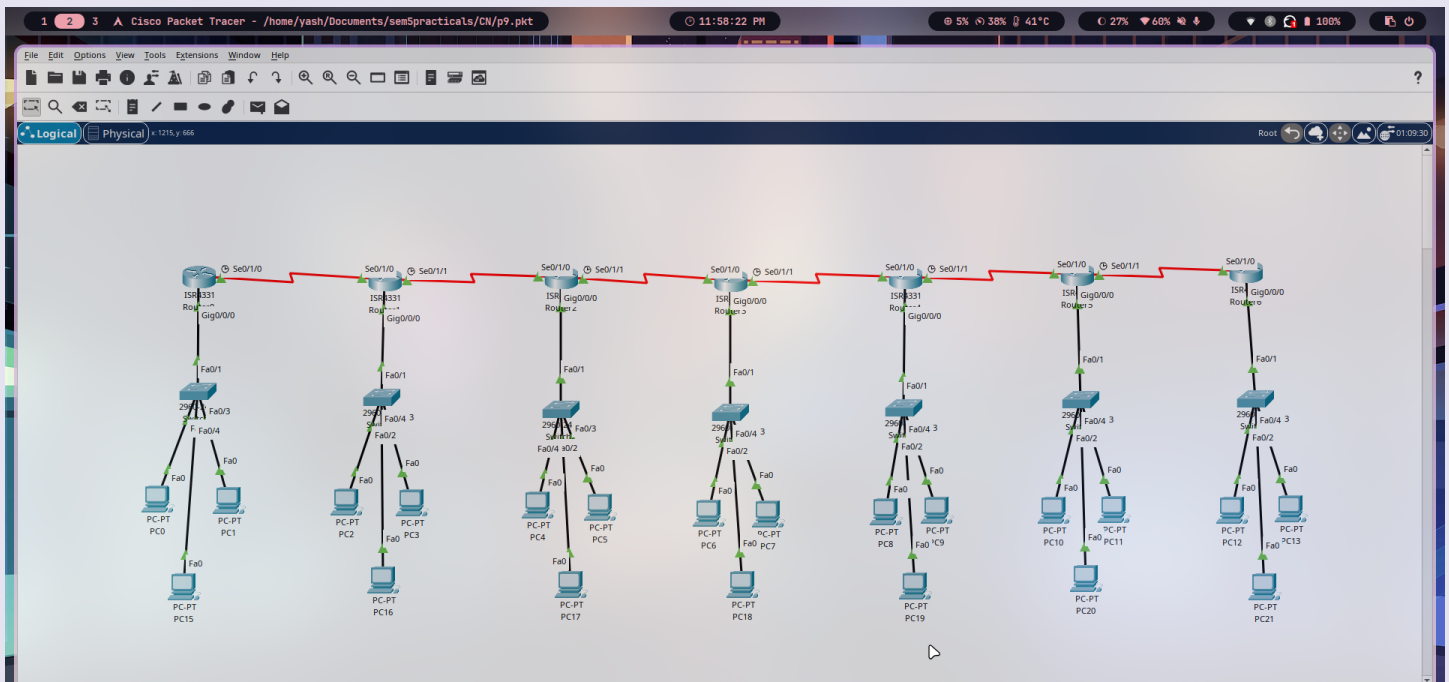**Aim** : **To design a network using Border gateway protocol (BGP).**

Scenario : Design a network containing two Autonomous Systems (AS). Each AS contains 4 routers. Establish the connection between the network of 2 AS using the BGP routing protocol.

Procedure :

1. Create the required network topology as per the given scenario

2. For minimal IP wastage, using CIDR subnetting, assign IP address to respective routers.

Requirement <= 2^n -2
Taking n=4
14 <= 14

Old Subnet Mask : 255.255.255.0
New Subnet Mask : 255.255.255.240

Subnet 1:
Network ID: 164.164.1.0/28
First IP: 164.164.1.1/28
Last IP: 164.164.1.14/28
Broadcast ID: 164.164.1.15/28

Subnet 2:
Network ID: 164.164.1.16/28
First IP: 164.164.1.17/28
Last IP: 164.164.1.30/28
Broadcast ID: 164.164.1.31/28

Subnet 3:
Network ID: 164.164.1.32/28
First IP: 164.164.1.33/28
Last IP: 164.164.1.46/28
Broadcast ID: 164.164.1.47/28

Subnet 4:
Network ID: 164.164.1.48/28
First IP: 164.164.1.49/28
Last IP: 164.164.1.62/28
Broadcast ID: 164.164.1.63/28

Subnet 5:
Network ID: 164.164.1.64/28
First IP: 164.164.1.65/28
Last IP: 164.164.1.78/28
Broadcast ID: 164.164.1.79/28

Subnet 6:
Network ID: 164.164.1.80/28
First IP: 164.164.1.81/28
Last IP: 164.164.1.94/28
Broadcast ID: 164.164.1.95/28

Subnet 7:
Network ID: 164.164.1.96/28
First IP: 164.164.1.97/28
Last IP: 164.164.1.110/28
Broadcast ID: 164.164.1.111/28

Subnet 8:
Network ID: 164.164.1.112/28
First IP: 164.164.1.113/28
Last IP: 164.164.1.126/28
Broadcast ID: 164.164.1.127/28

Subnet 9:
Network ID: 164.164.1.128/28
First IP: 164.164.1.129/28
Last IP: 164.164.1.142/28
Broadcast ID: 164.164.1.143/28

Subnet 10:
Network ID: 164.164.1.144/28
First IP: 164.164.1.145/28
Last IP: 164.164.1.158/28
Broadcast ID: 164.164.1.159/28

Subnet 11:
Network ID: 164.164.1.160/28
First IP: 164.164.1.161/28
Last IP: 164.164.1.174/28
Broadcast ID: 164.164.1.175/28

3. Define BGP routing in each routers via CLI commands and define left, right both neighbors of the router :

For Router6, example :

router bgp 7
network 164.164.1.96 mask 255.255.255.240
network 164.164.1.192 mask 255.255.255.240
neighbor 164.164.1.193 remote-as 6
exit

4. Test the connection if the successful communication is done.
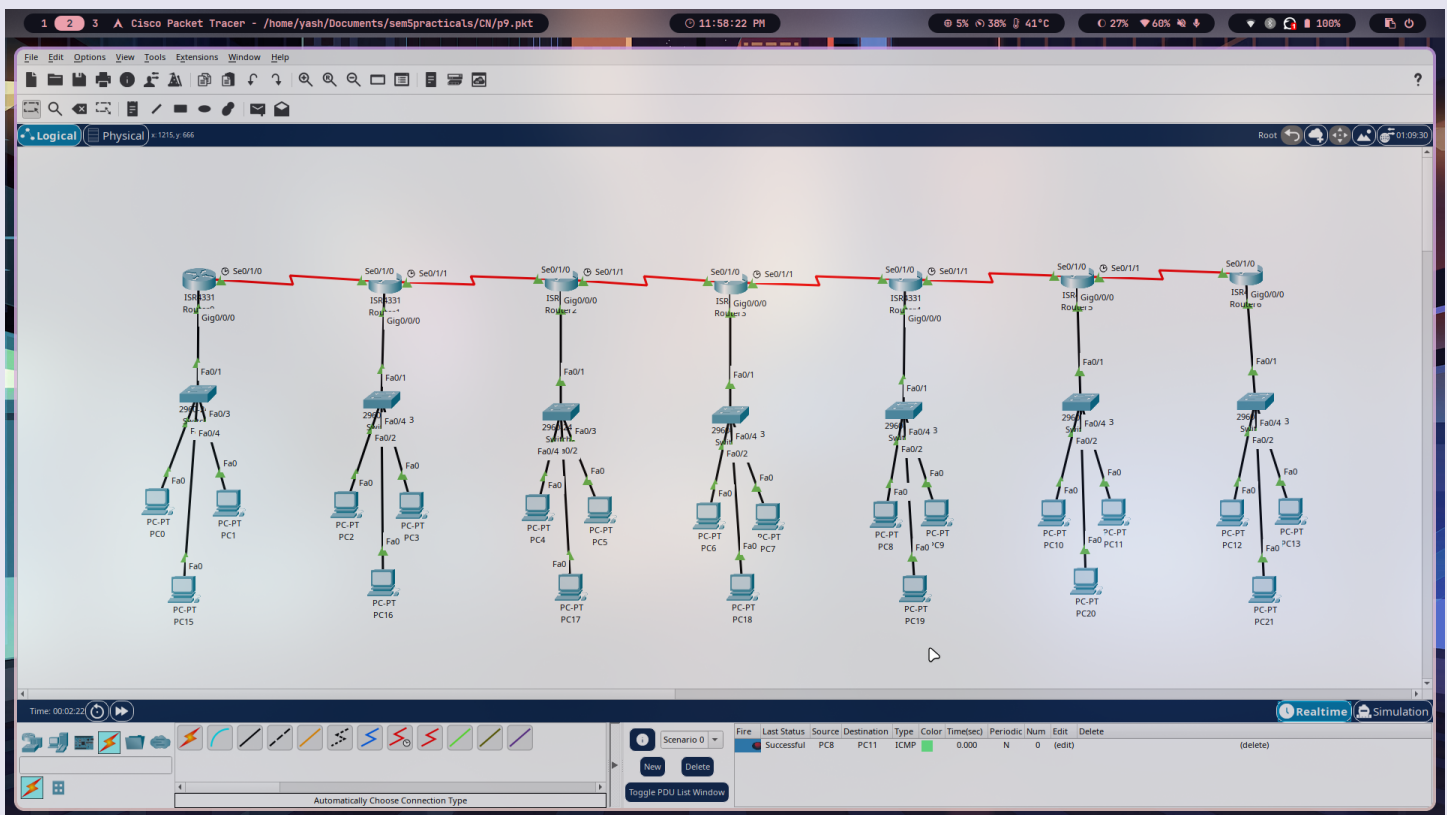
Conclusion : In this experiment, the BGP routing protocol is implemented and understood, where BGP is more preferred over OSPF because unlike OSPF which is specifically for internal AS, while BGP for inter AS or exterior communication among Autonomous systems.