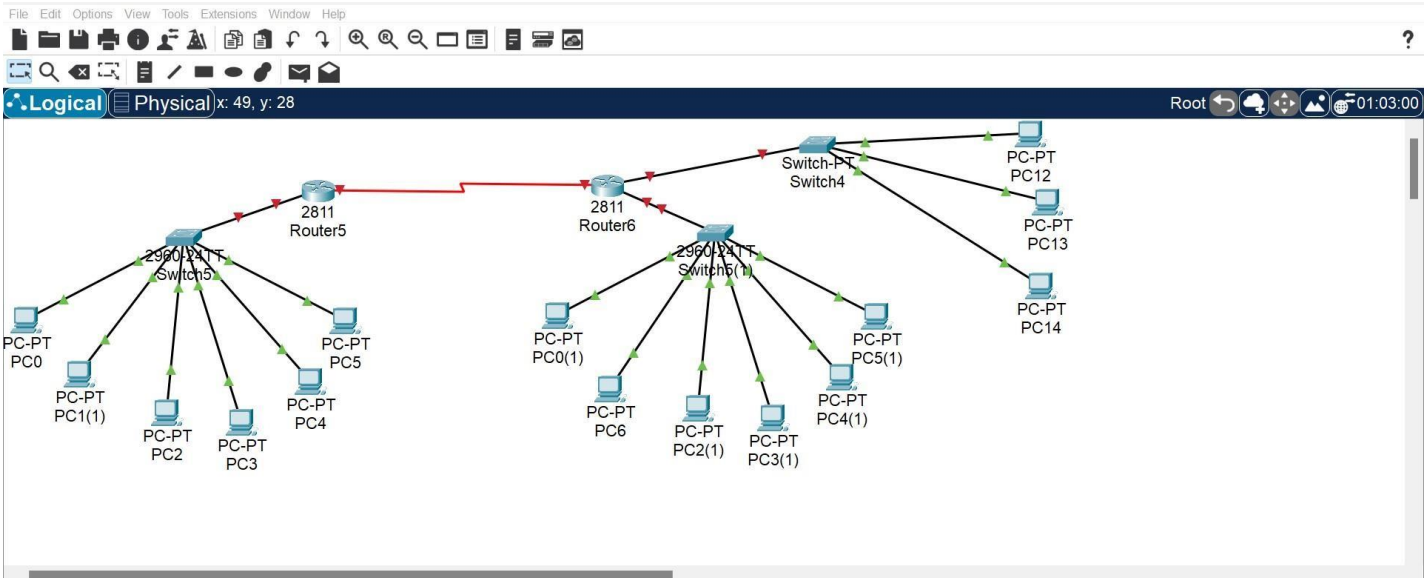
Task 6:

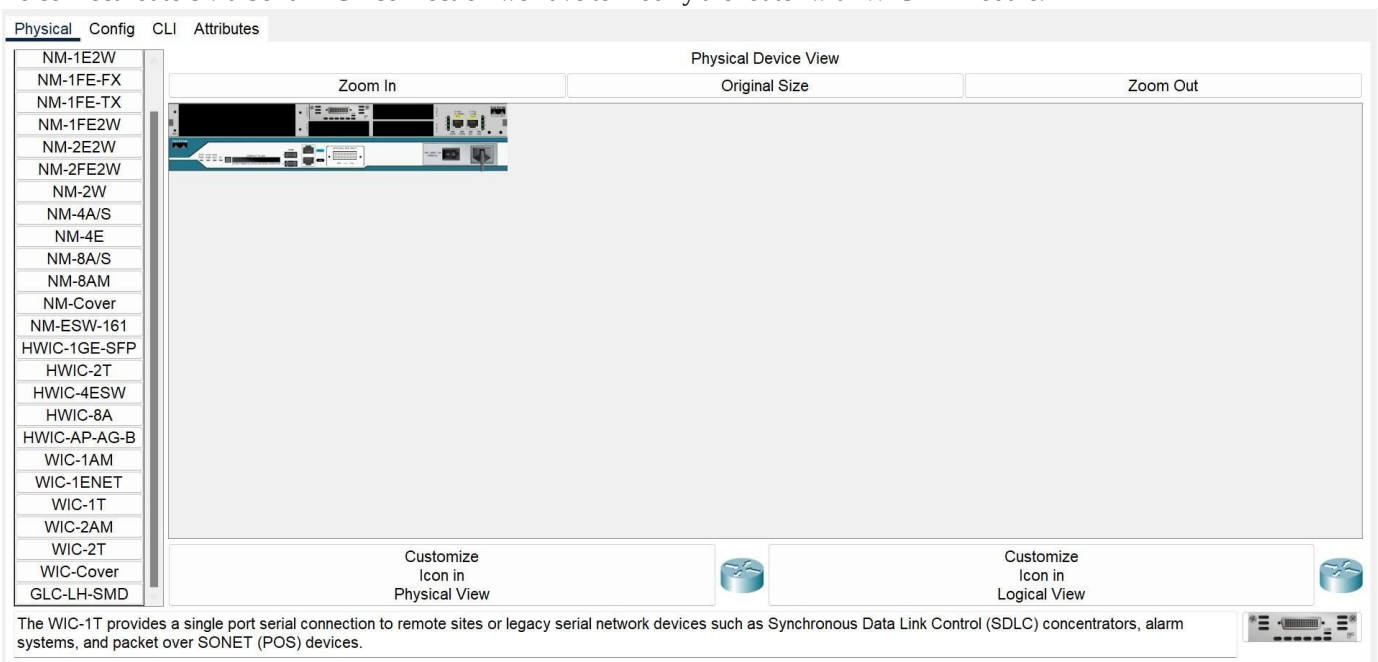
Design on packet tracer the network from document labelled Senaakmediumsubnetdoc.

Designing the Topology and Wiring Devices:

First we layout all the network devices which include PCs, Switches, Routers.
Then we connect PCs to switches via Copper Pass through cable. Similarly Switches are connected to Routers via Copper Pass through cables. And the connection between routers is done with Serial DCE.

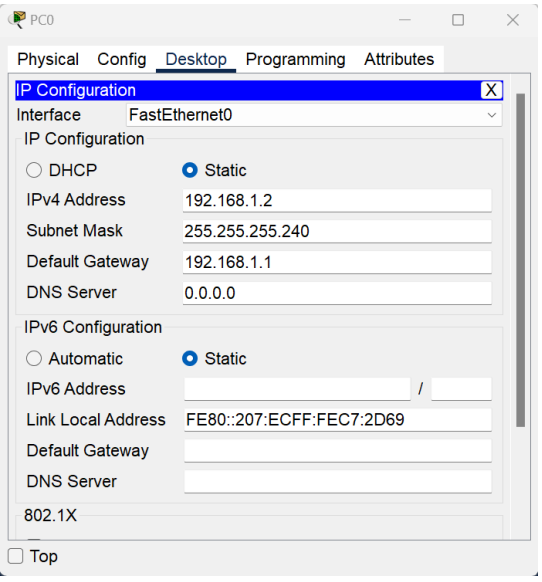


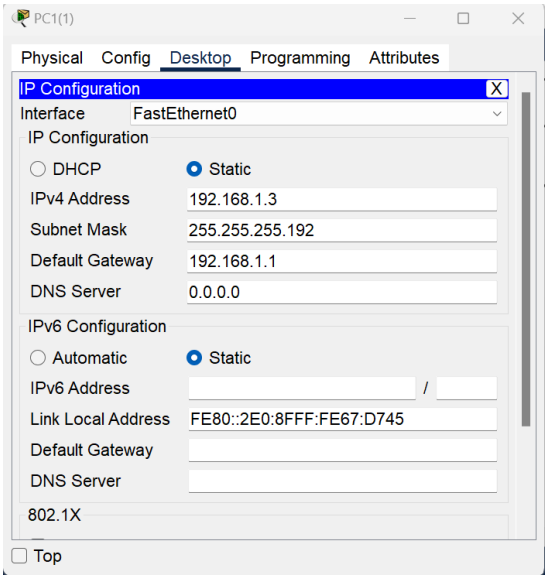
To connect routers via Serial DCE connection we have to modify the router with WIC-1T module.

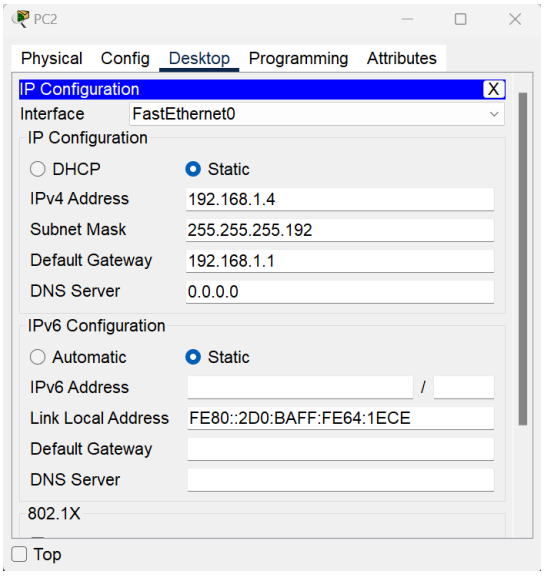


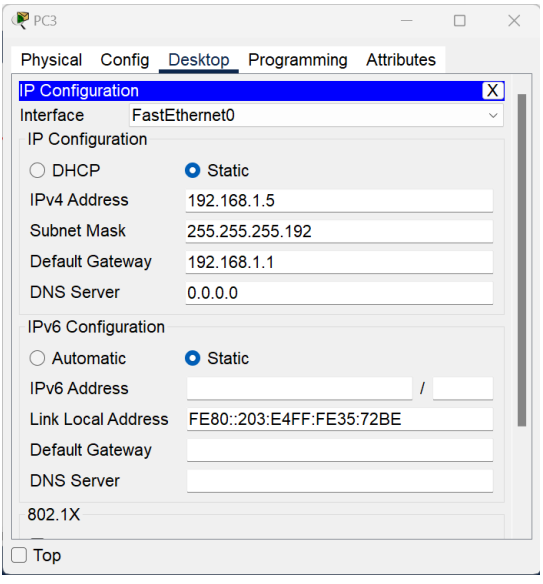
Configuring The PCs:

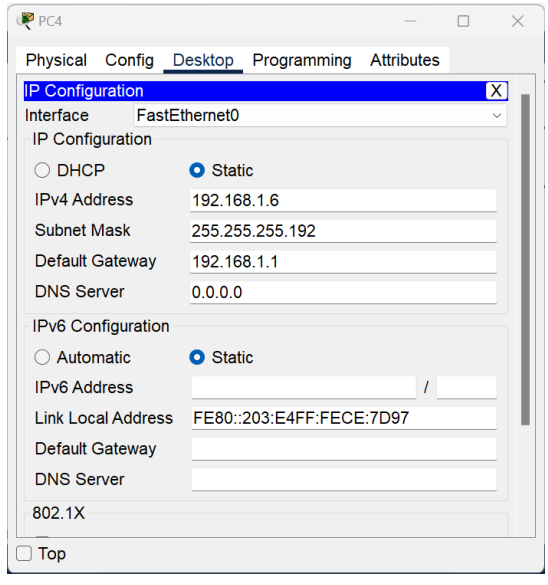
After completing connections. PCs will be configured

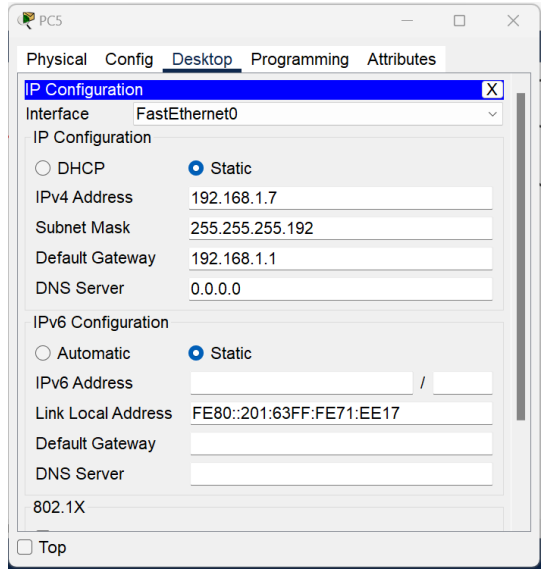


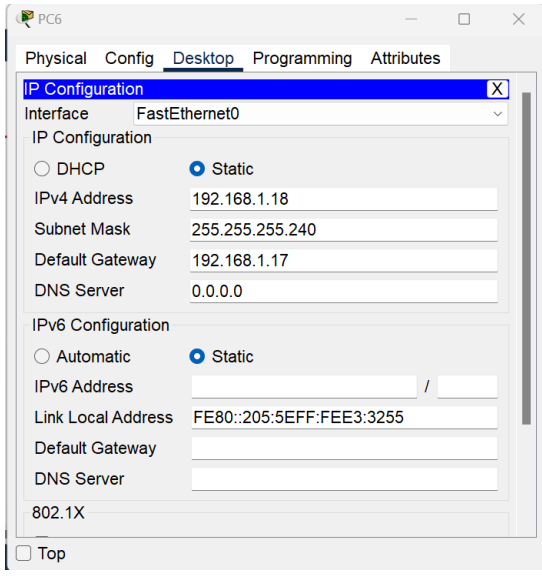


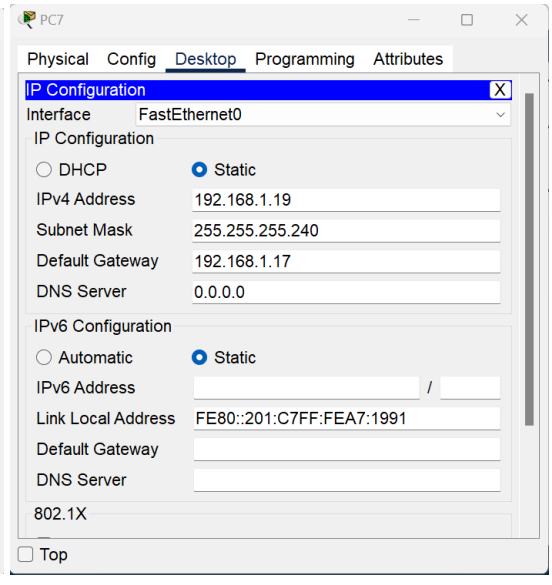


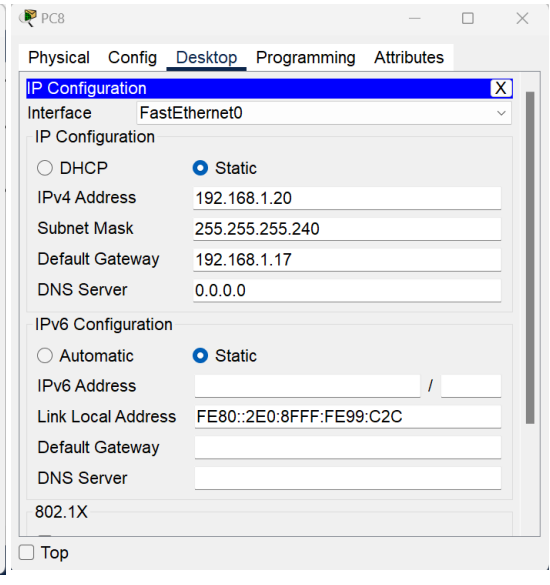


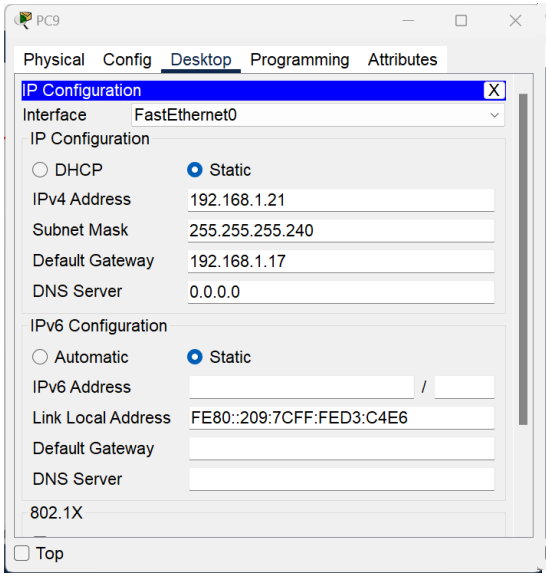


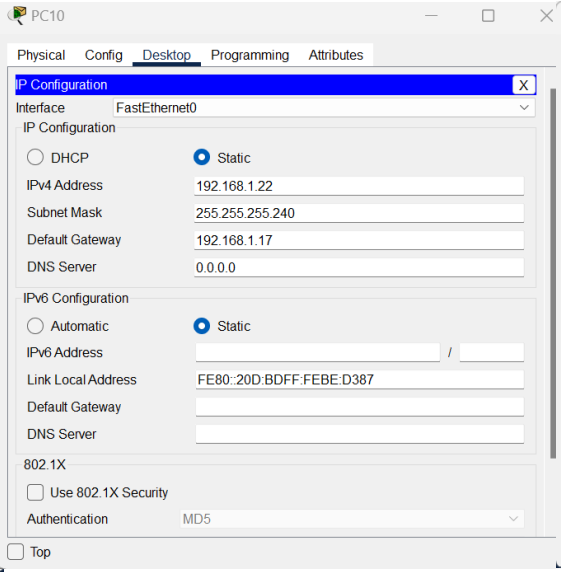


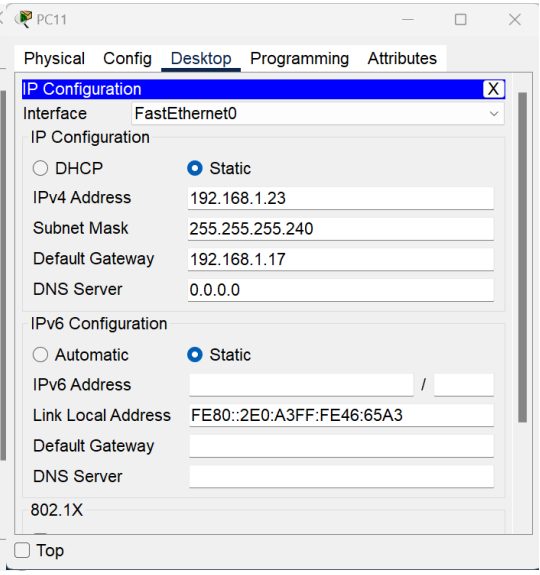


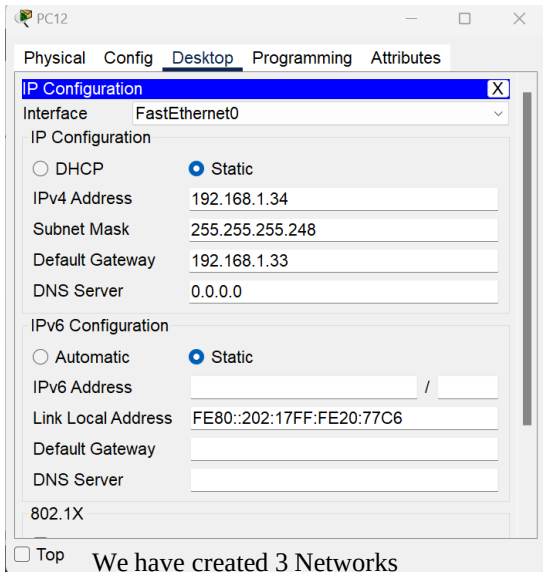


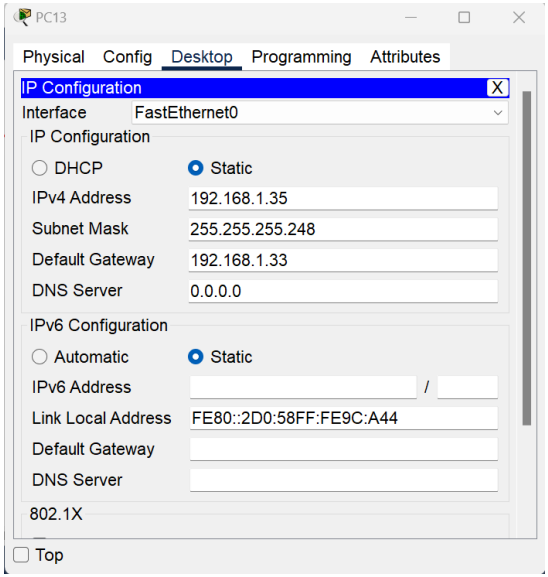


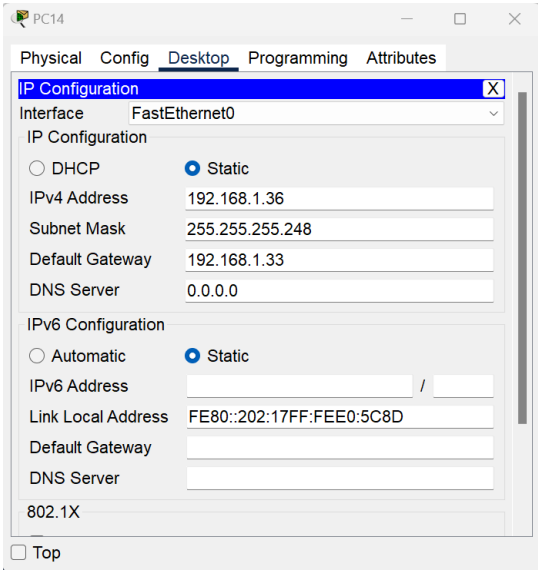












We have created 3 Networks

In Network 1 assigned IPv4 between 192.168.1.2 upto 192.168.1.7 with subnet mask 255.255.240 with default gateway192.168.1.1.

In Network 2 assigned IPv4 between 192.168.1.18 upto 192.168.1.23 with subnet mask 255.255.240 with defaultgateway 192.168.1.17.

In Network 3 assigned IPv4 between 192.168.1.33 upto 192.168.1.36 with subnet mask 255.255.248 with defaultgateway 192.168.1.33.

Subnet masks are assigned by following calculations

- **For Network1 and Network2**

I need 7 IP address
7 = 2^x -2 => x = 4 host bits
Octet - 4 = 4 bits borrowed
Subnet mask = 255.255.255.11110000
255.255.255.240 = /28

- **For Network3**

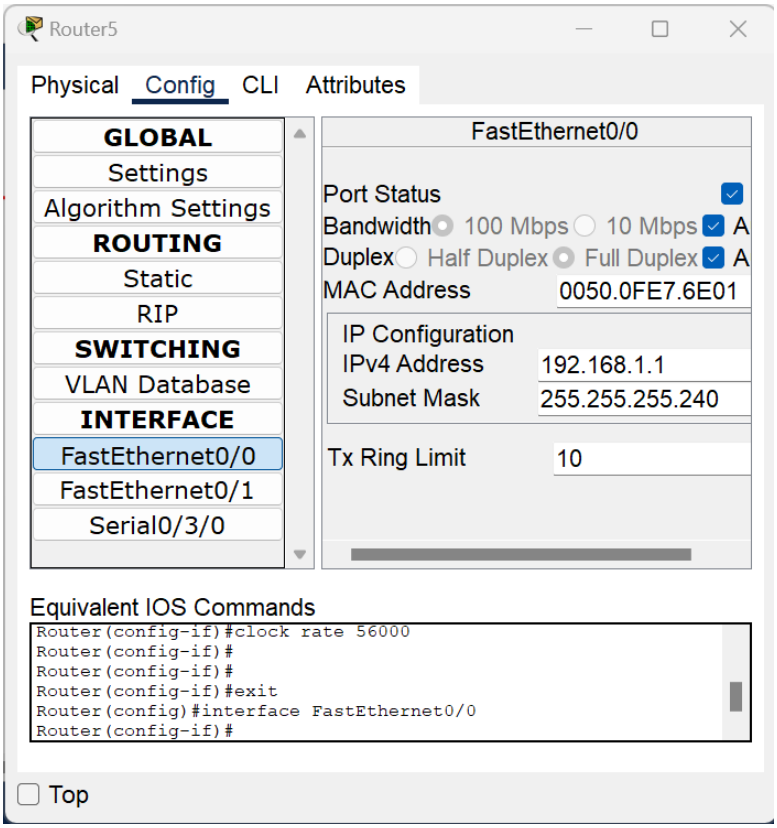
I need 4 IP address
4 = 2^x -2 => x = 3 host bits
Octet - 3 = 5 bits borrowed
Subnet mask = 255.255.255.11111000
255.255.255.248 = /29

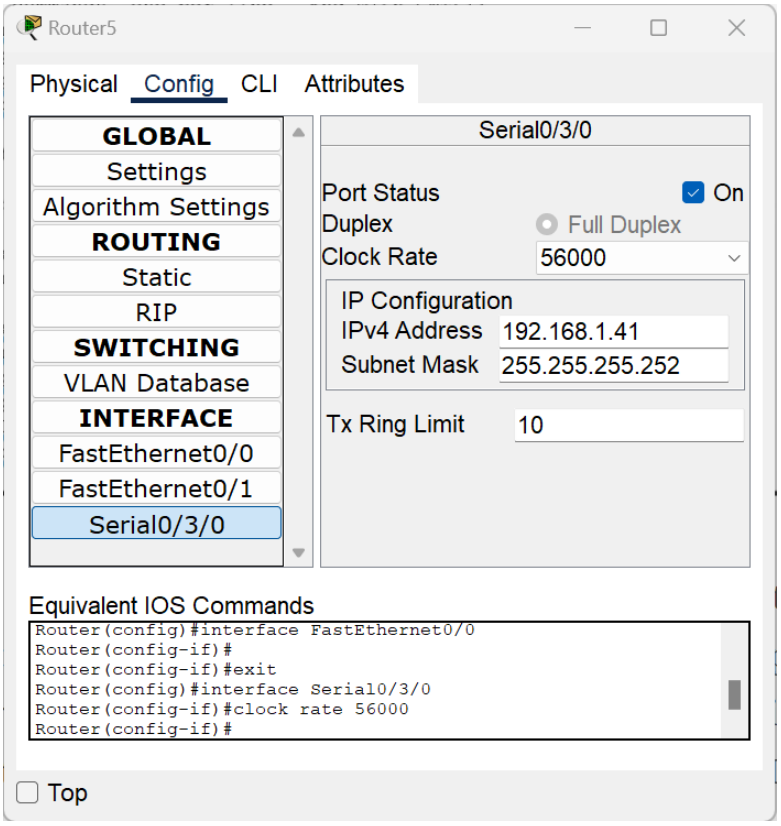
- **For Network4**

I need 2 IP address
2 = 2^x -2 => x = 2 host bits
Octet - 2 = 6 bits borrowed
Subnet mask = 255.255.255.11111100
255.255.255.252 = /30

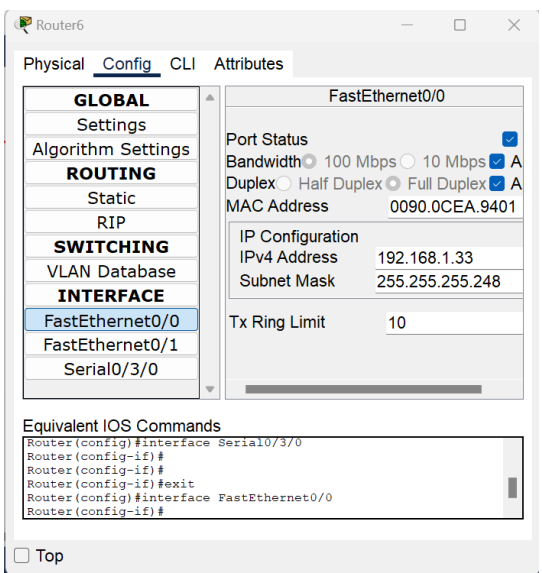
Configuring Routers:

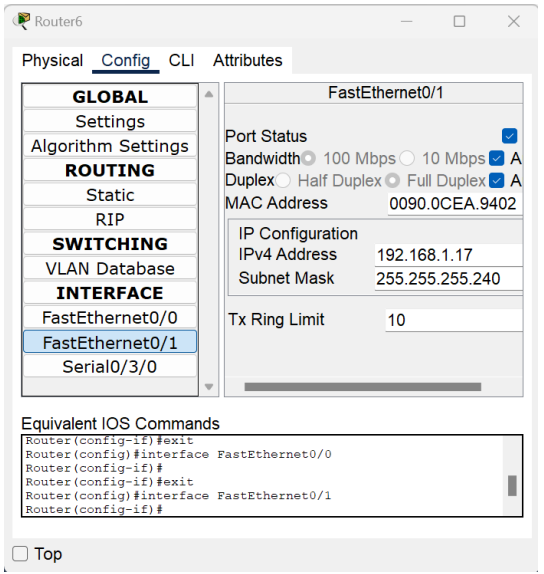
Now we will configure the routers.
In Router 1, first we configure the FastEthernet port which is connected to the switch 1. IPv4 address is 192.168.1.1which is also the default gate way for Network 1.
Serial0/3/0 port is connected to Router 2 clock rate is set at 56000 IPv4 address assigned is 192.168.41. The 2 routers will also constitute their own network called Network 4 so the subnet mask for which is 255.255.255.252.

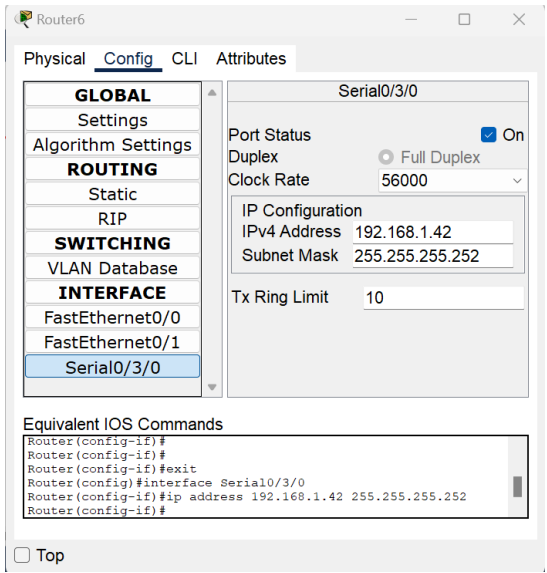




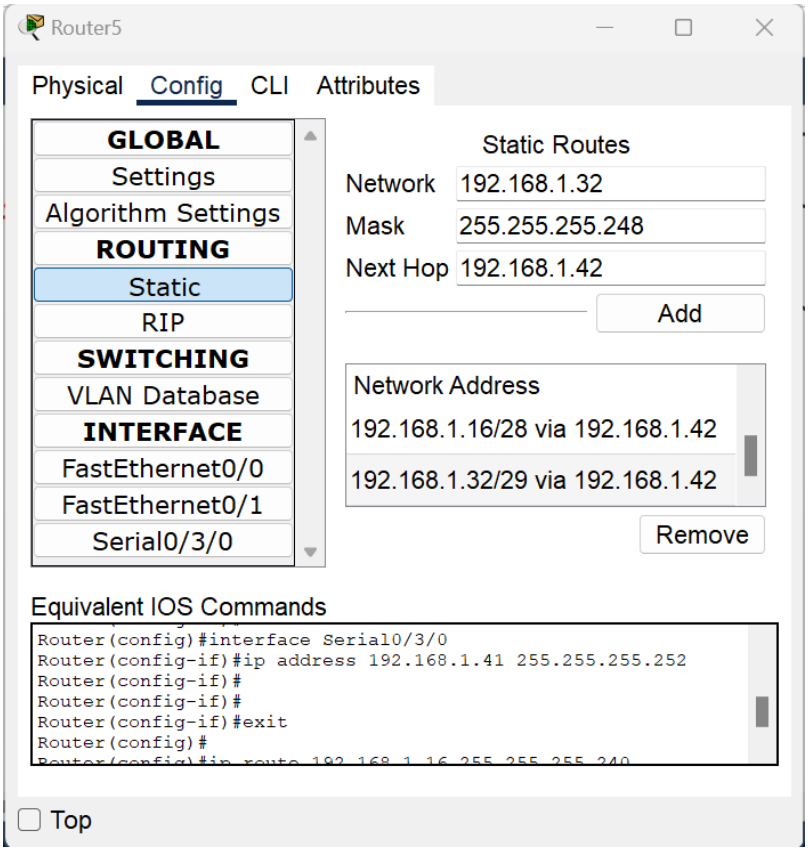
As Router 2 is connected to 2 switches so there are 2 ports connected FastEthernet0/0 for Network 3 and FastEthernet0/1 for Network 2. The default gateway of Network 3 is 192.168.1.33 which is IPv4 address for Router 2 atFastEthernet 0/0 port. Similarly, the default gateway of Network 2 is 192.168.1.17 which is IPv4 address for Router 2 at FastEthernet 0/1 port and we will turn on all the connected ports.
Now for serial port the Subnet mask is same as Router 1 and IPv4 is 192.168.1.42.



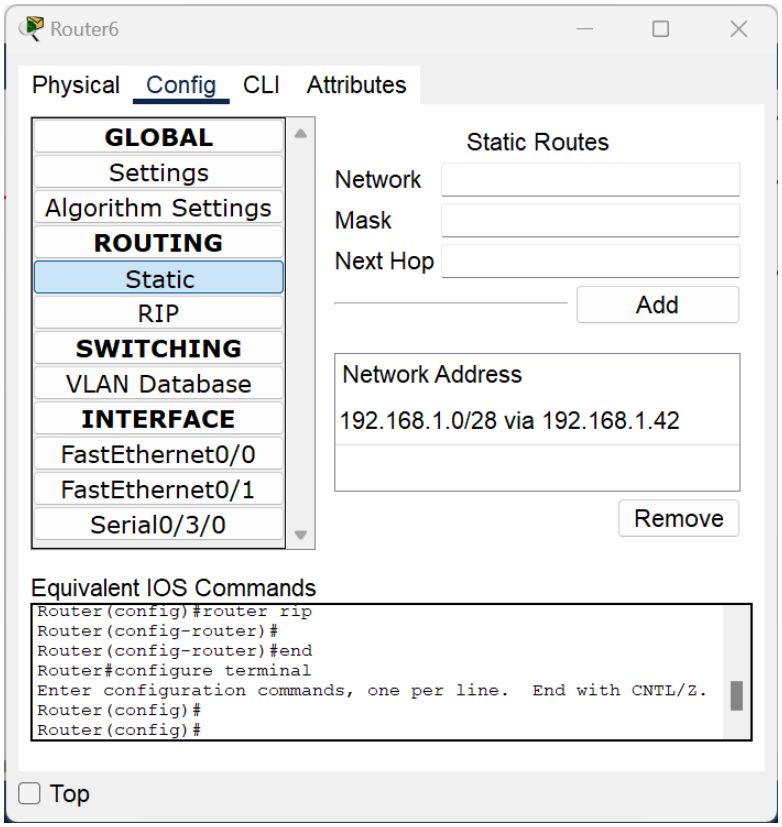




Now we establish Static Routing so the data between the routers can be sent and received as well. For Router 1 as it isreceiving data from 2 netwroks i.e. Network 2 and Network 3. So we defined both separately.

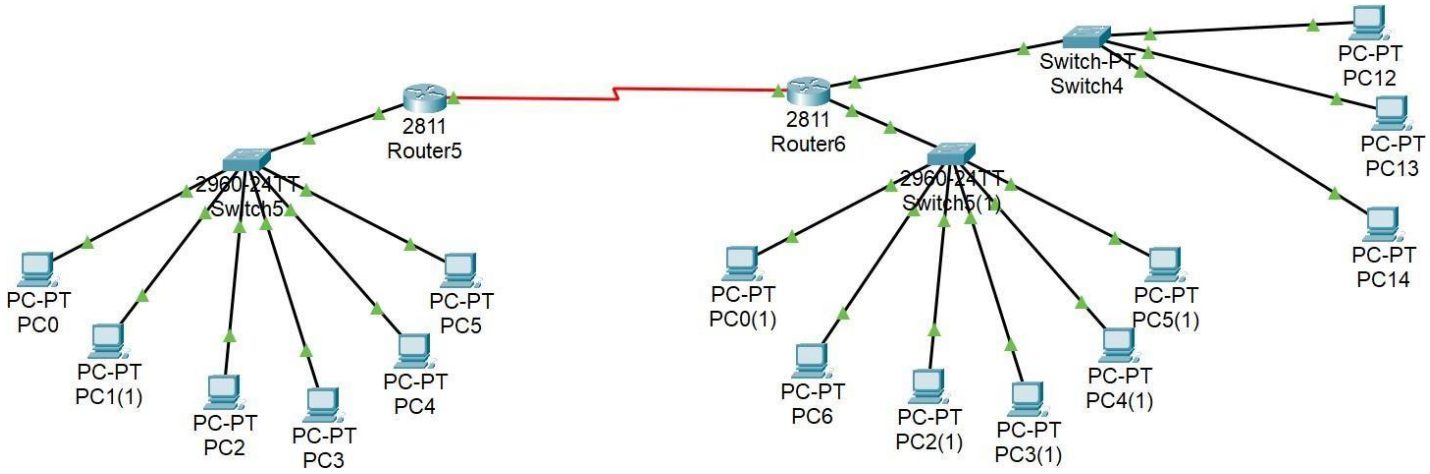


In Router 1 similar thing is done but for Network 1 only.

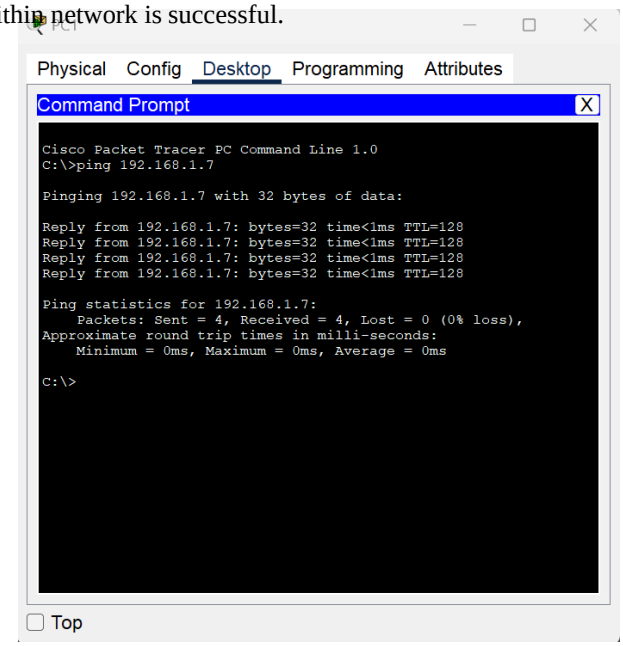


Verification

All the connections are green proving that connections are established.



PC1 pings to PC5 (IPv4 address: 192.168.1.7) successfully which is within the Network 1, which proves communicationwithin network is successful.



PC1 pings to PC12 (IPv4 address: 192.168.1.33) successfully which is in Network 3, which provescommunication withother networks is also successful.