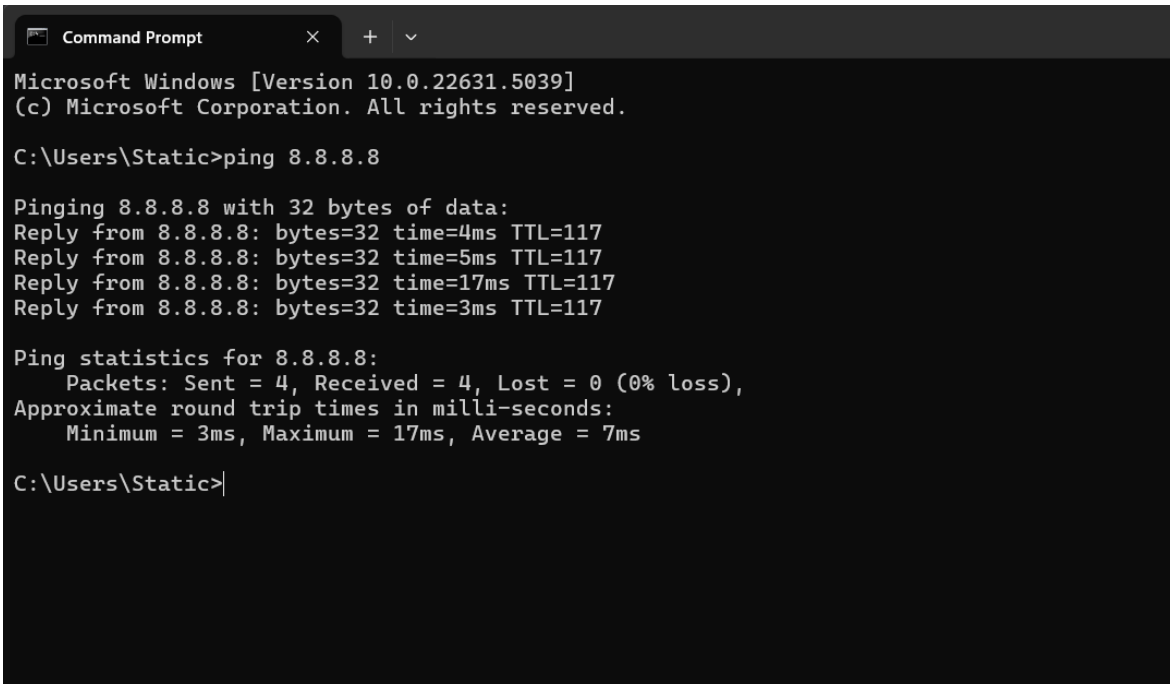
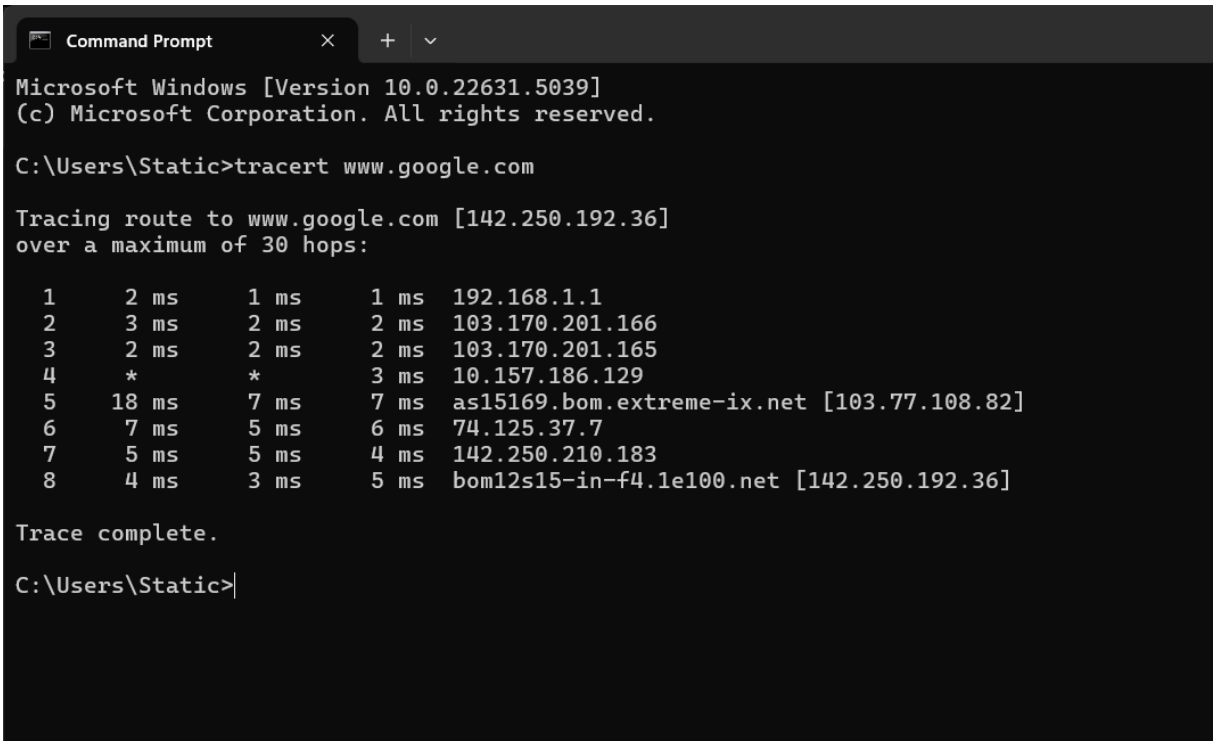
Practical No 1

Aim: Using, linux-terminal or Windows-cmd, execute following networking commands and note the output: ping, traceroute, netstat, arp, ipconfig, Getmac, hostname, NSLookUp, pathping, SystemInfo

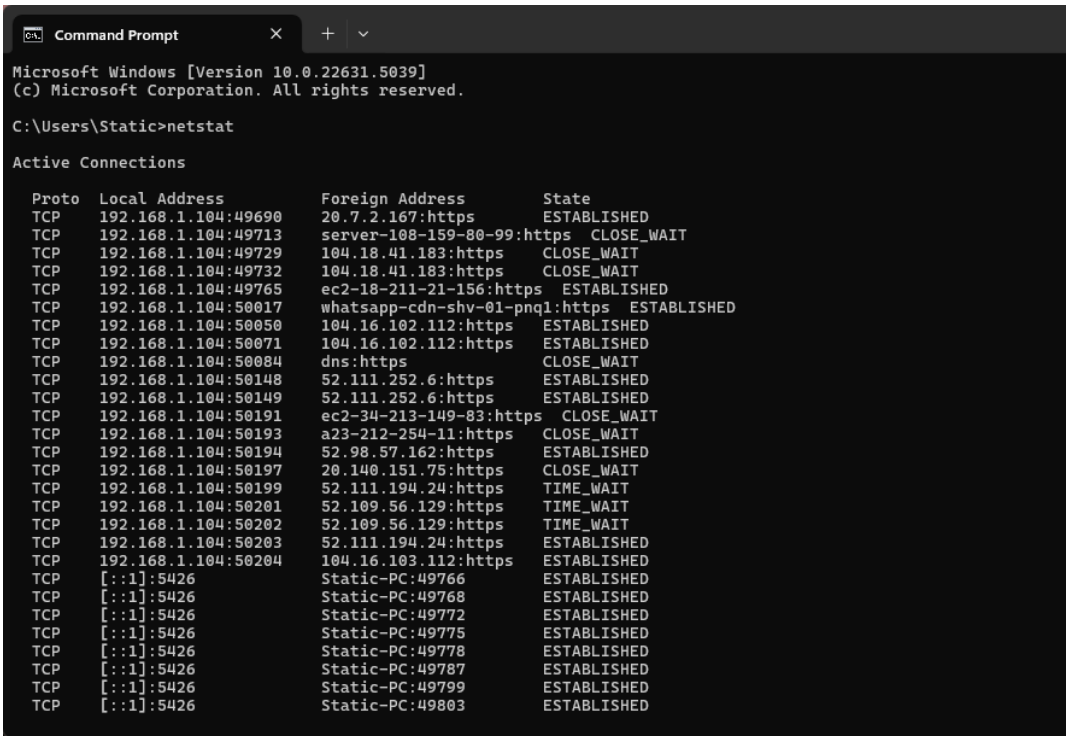
1. ping



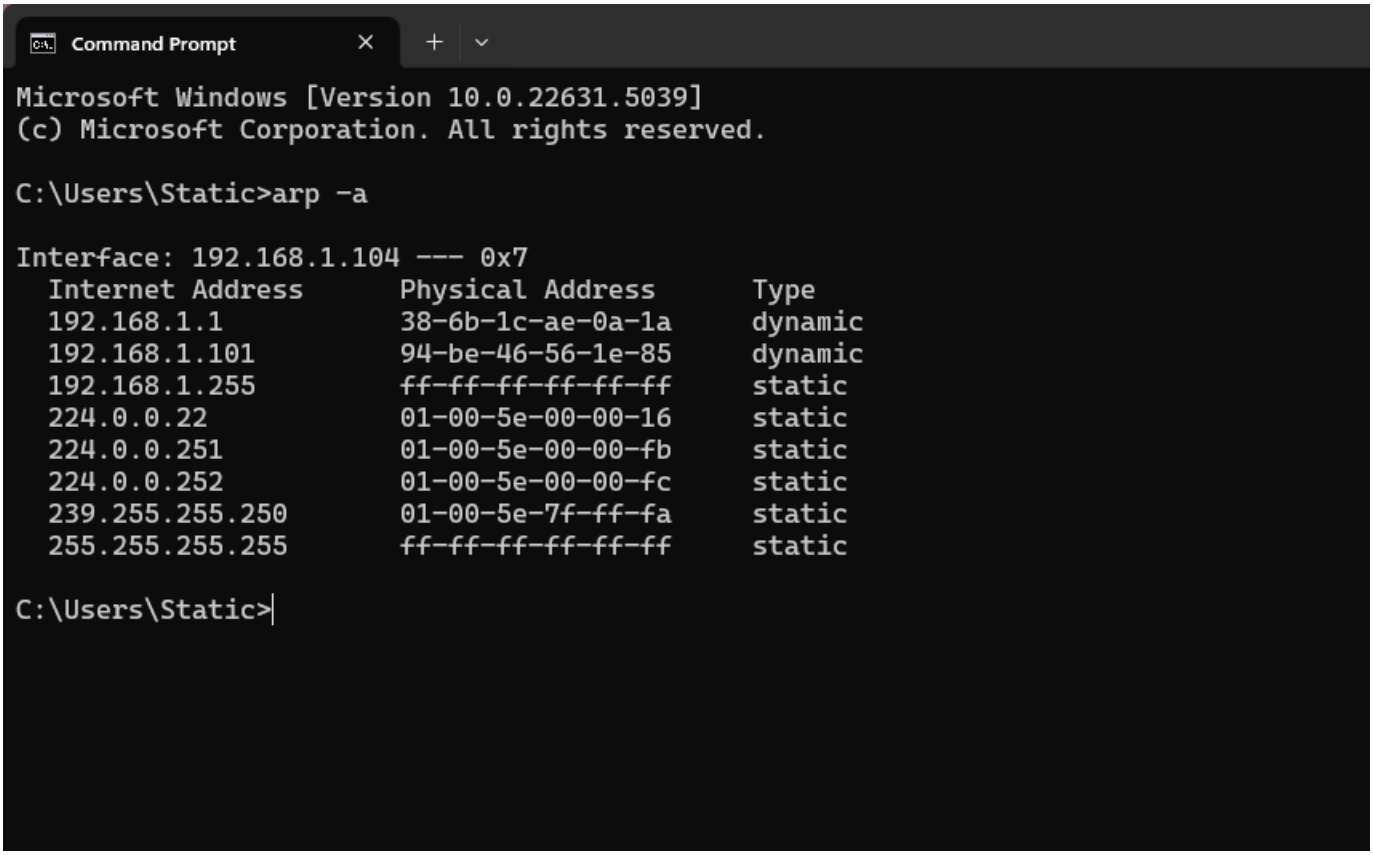
2. traceroute



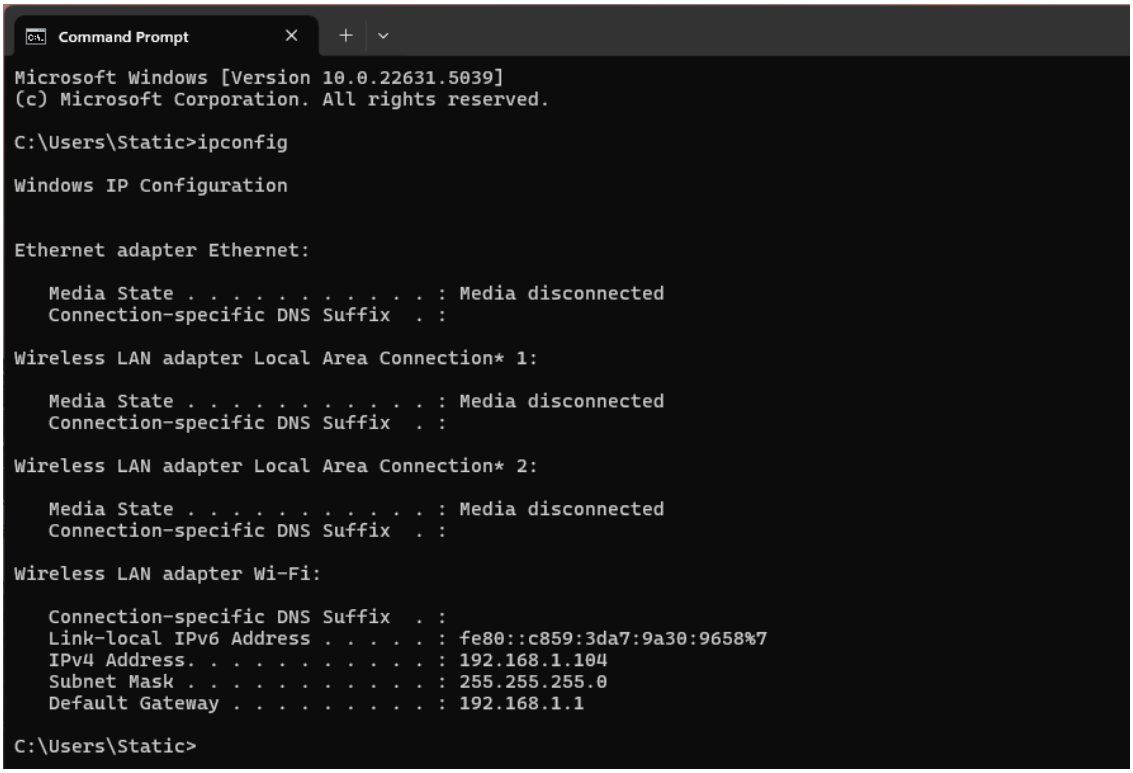
3. netstat



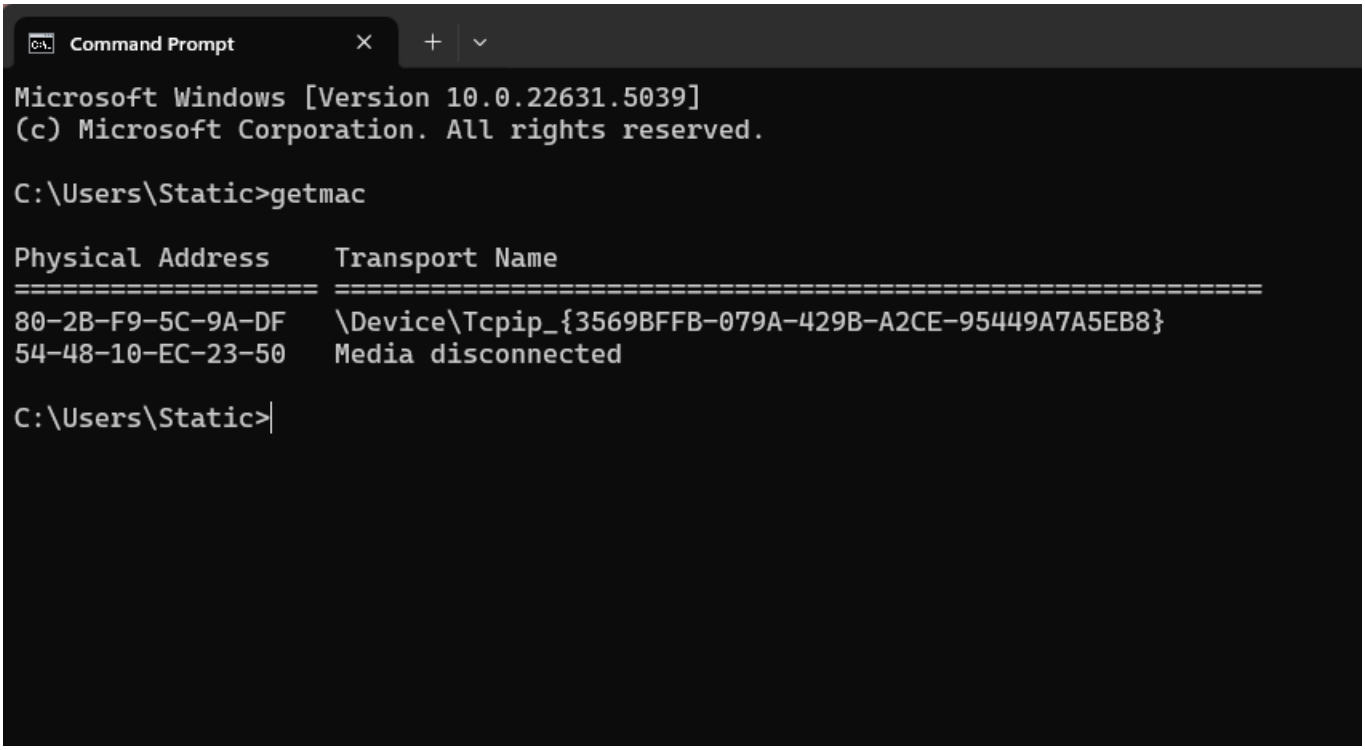
4. arp



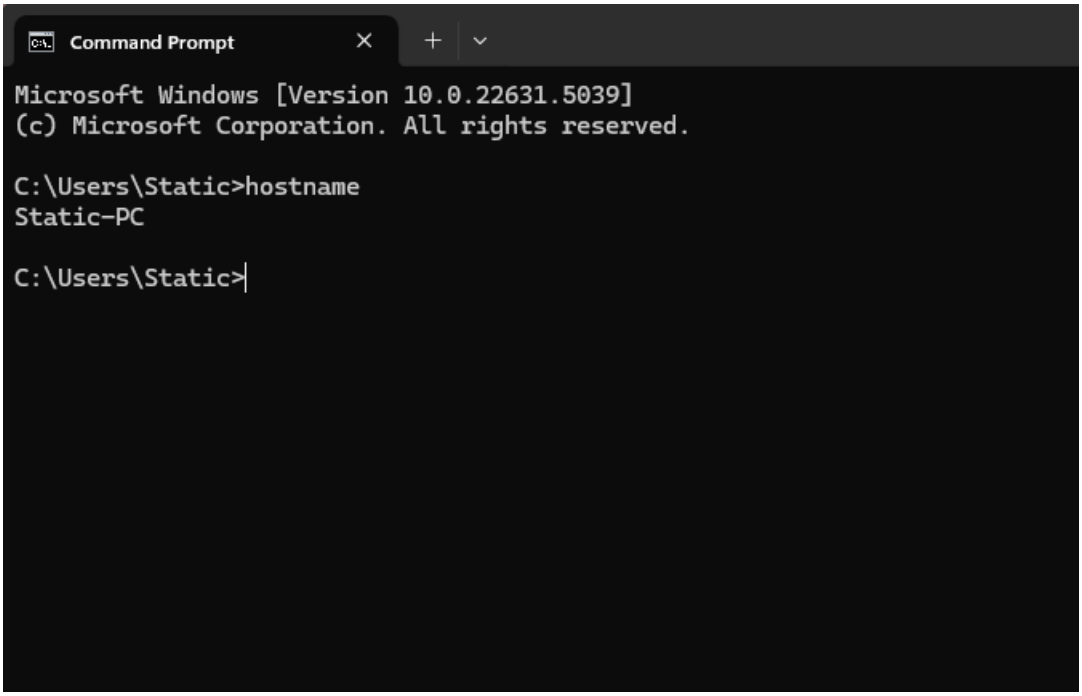
5. ipconfig



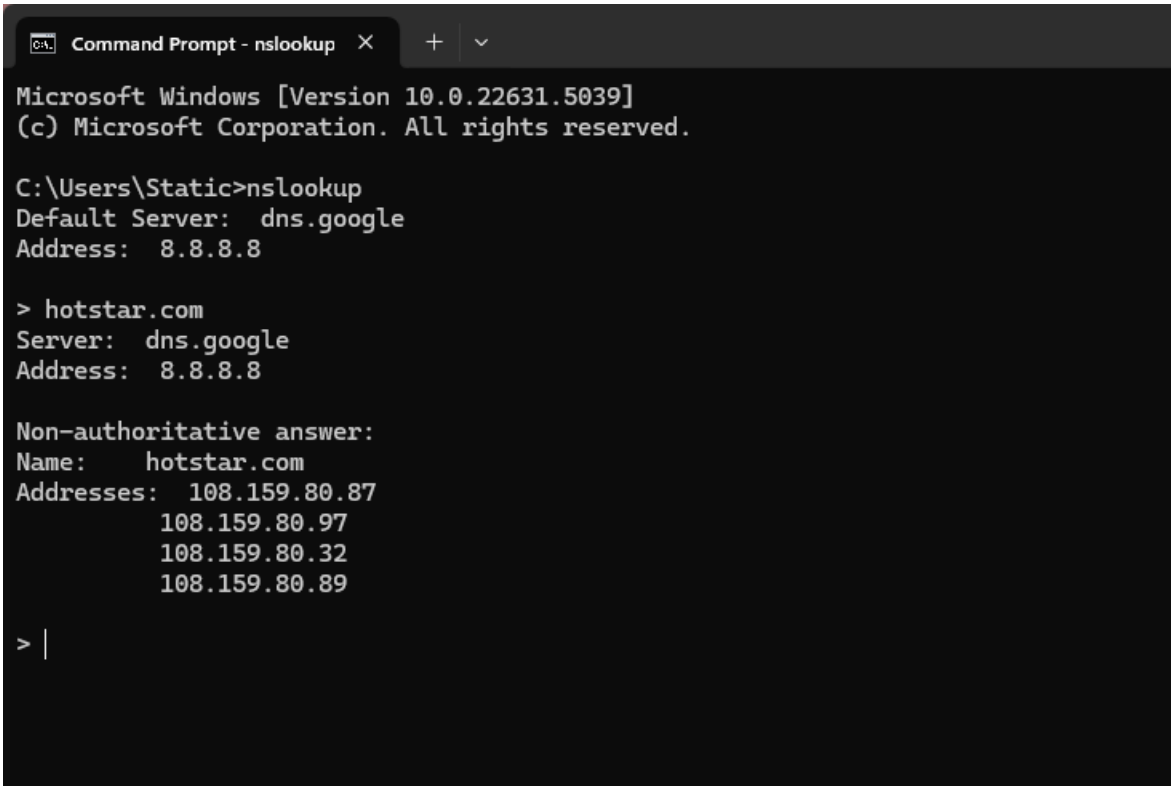
6. getmac



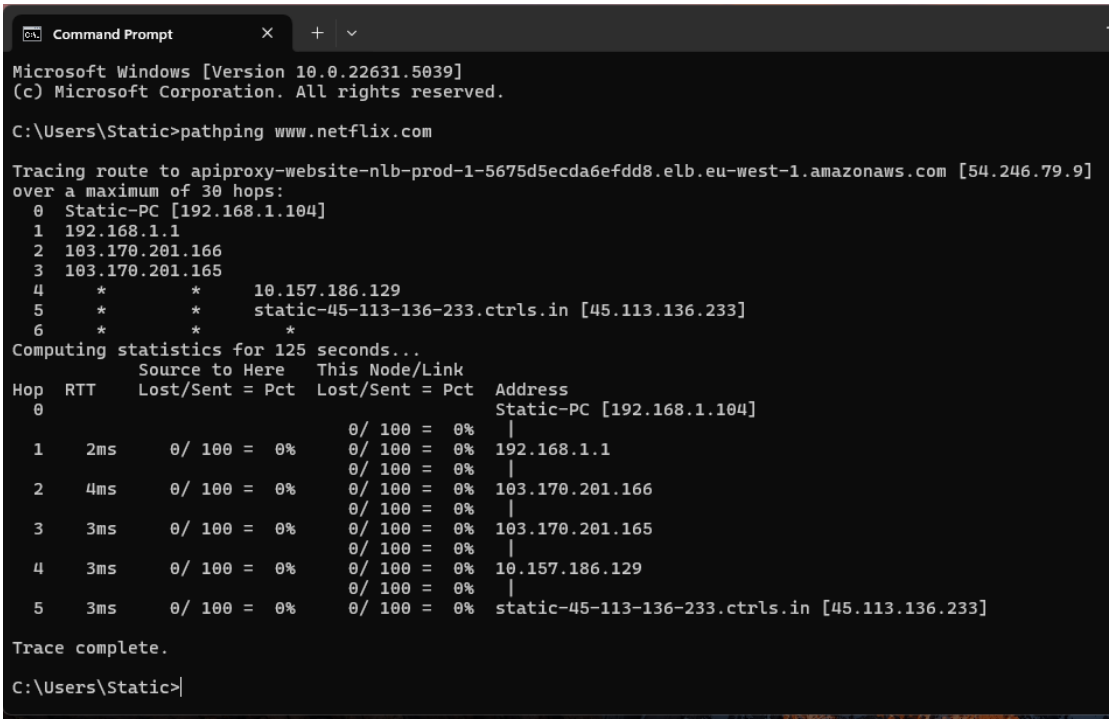
7. hostname



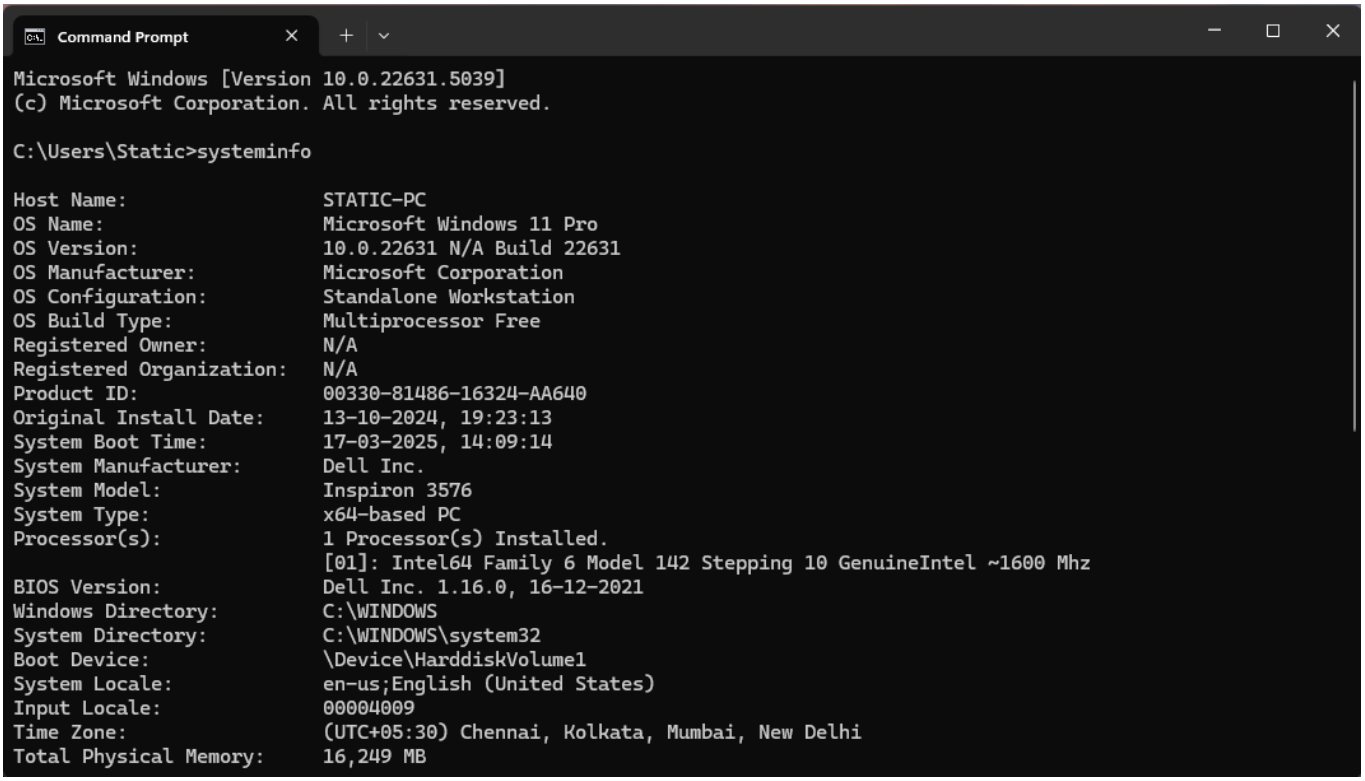
8. NSLookUp



9. Pathping



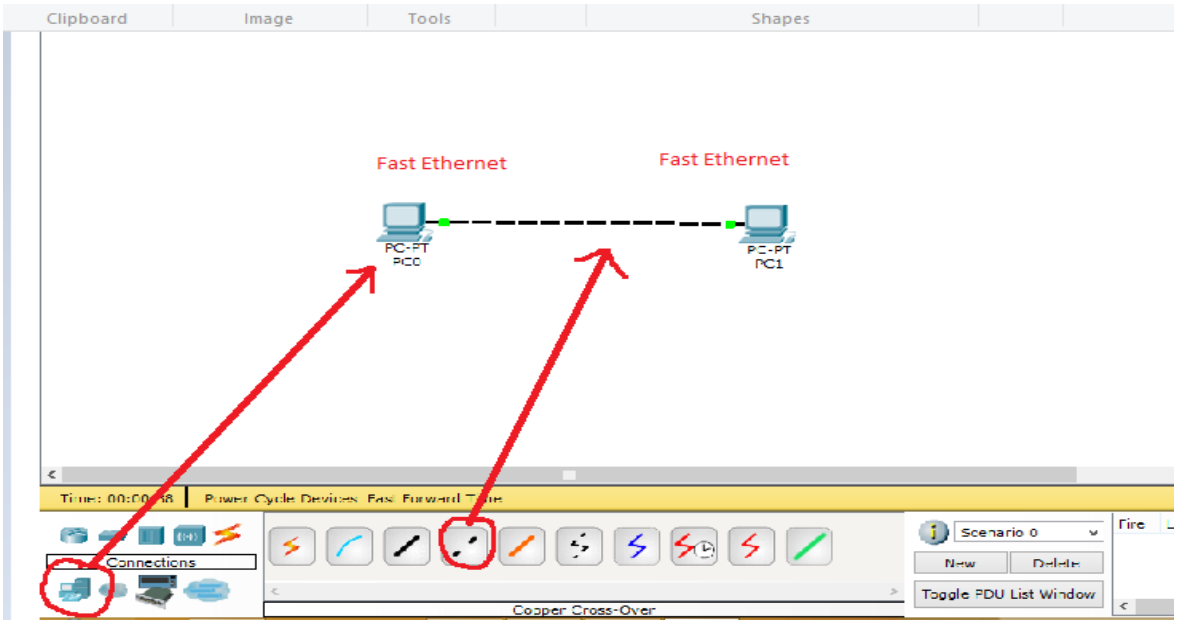
10. Systeminfo



Practical No 2

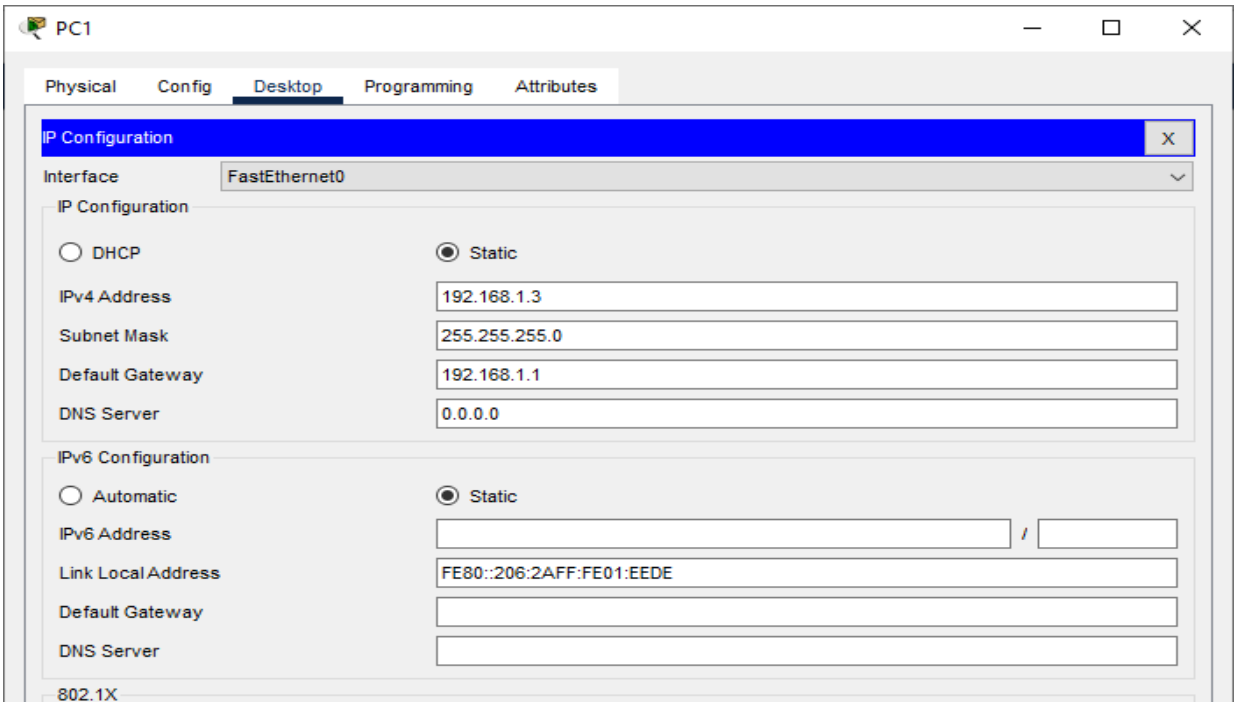
Aim: Using Packet Tracer, create a basic network of two computers using appropriate network wire through Static IP address allocation and verify connectivity

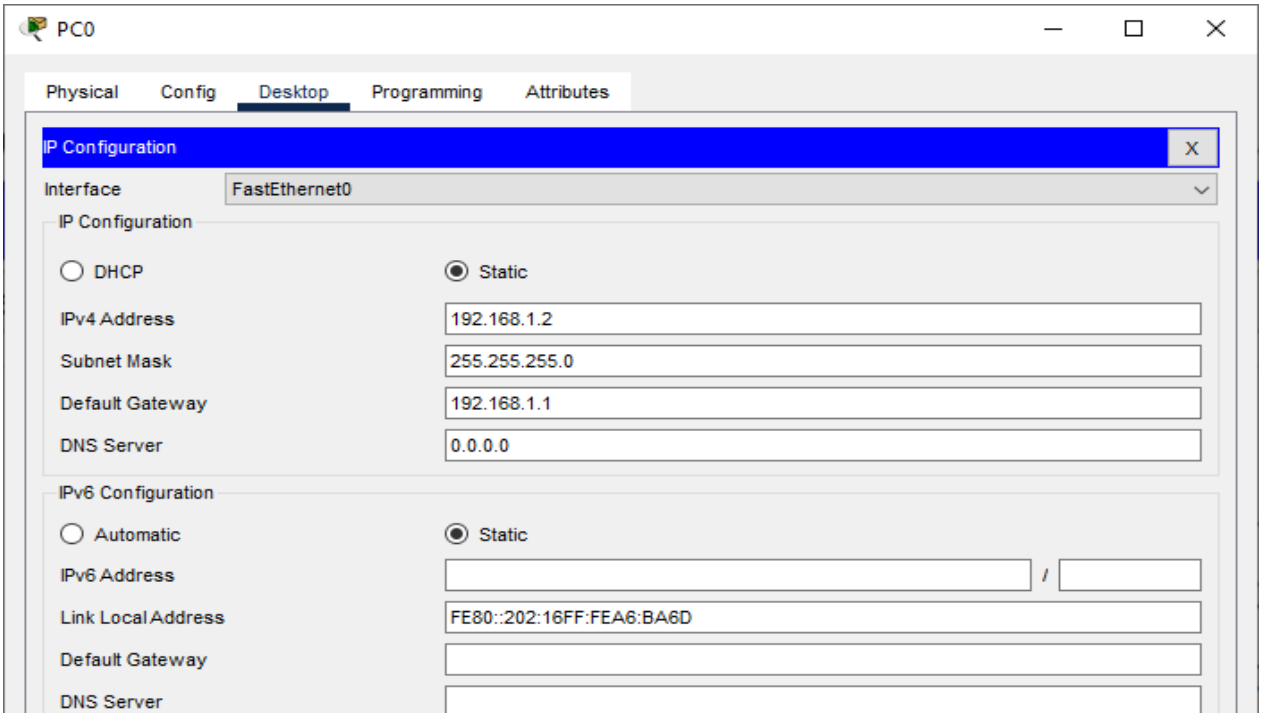
Theory:
We use the following network to verify the connectivity using Cisco packet tracer



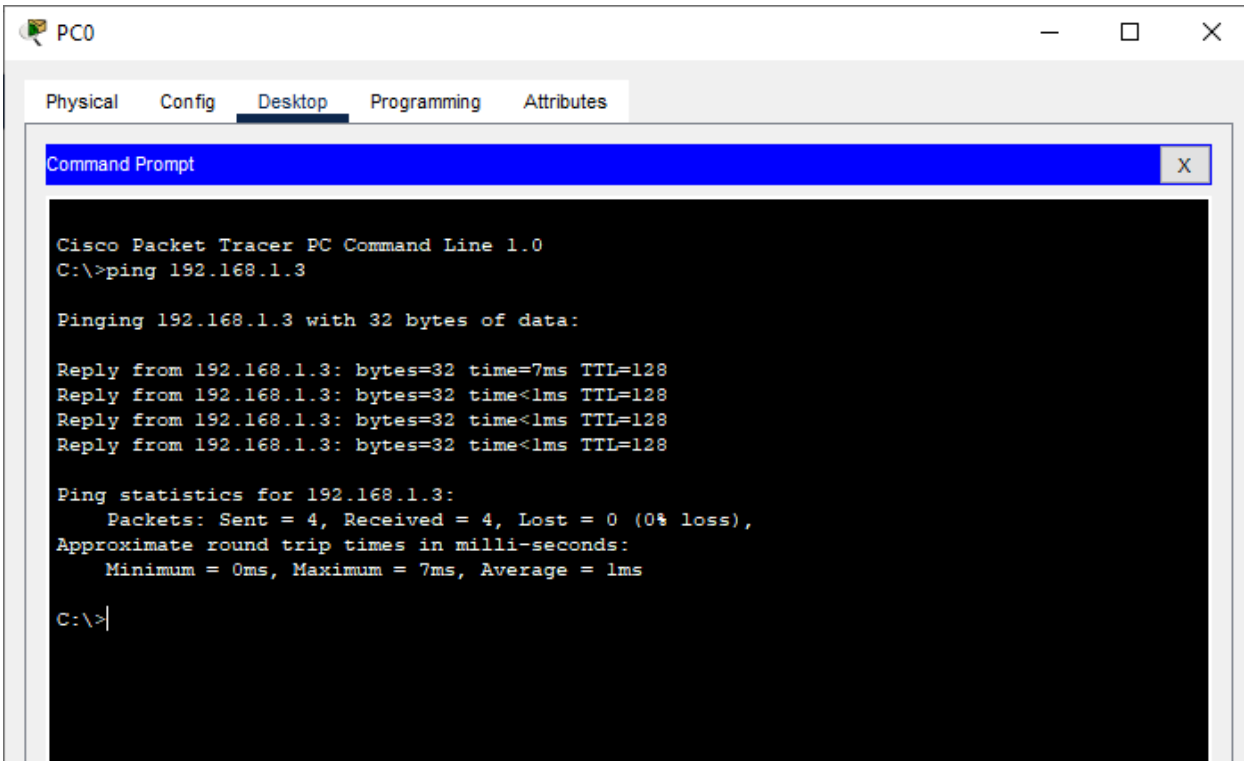
Now we set the ip address of the devices as follows

Host name	ip Address	Default Gateway
PC0	192.168.1.2	192.168.1.1
PC1	192.168.1.3	192.168.1.1


PC1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.1.3
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::206:2AFF:FE01:EEDE
Default Gateway
DNS Server
802.1X


PC0
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.1.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::202:16FF:FEA6:BA6D
Default Gateway
DNS Server

In order to check the connectivity we send a ping command from PC0 to PC1 as follows

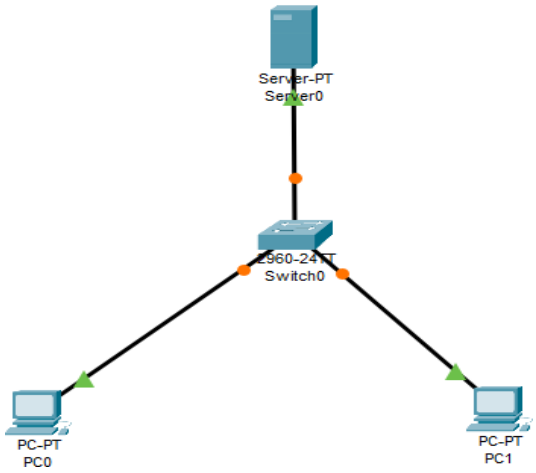


Result:
Hence the Connectivity between the PCs has been verified.

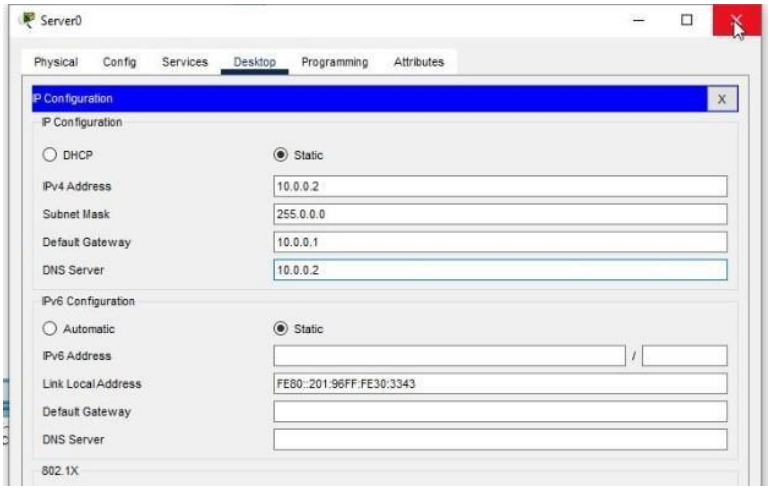
Practical No 3

Aim: Using Packet Tracer, create a basic network of one server and two computers using appropriate network wire. Use Dynamic IP address allocation and show connectivity

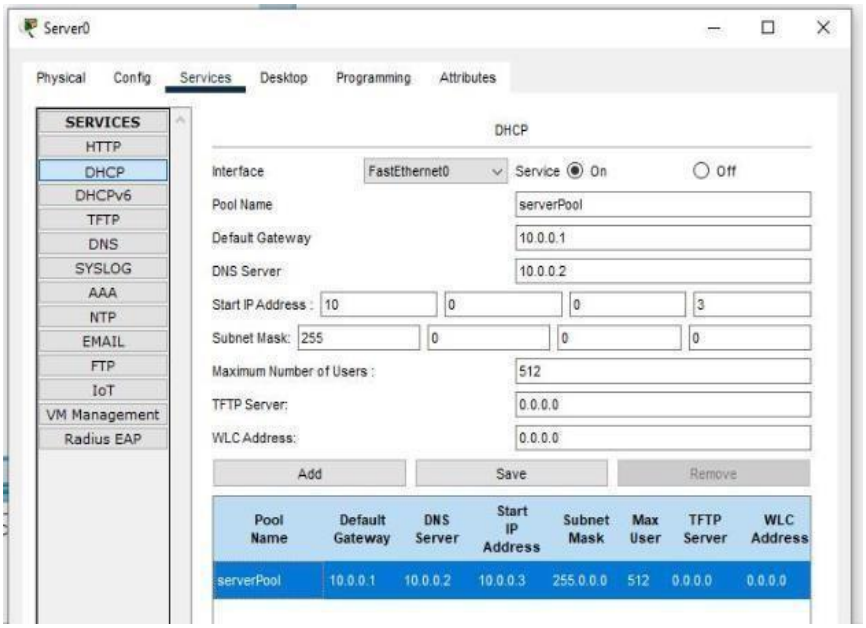
We use the following topology for the present case



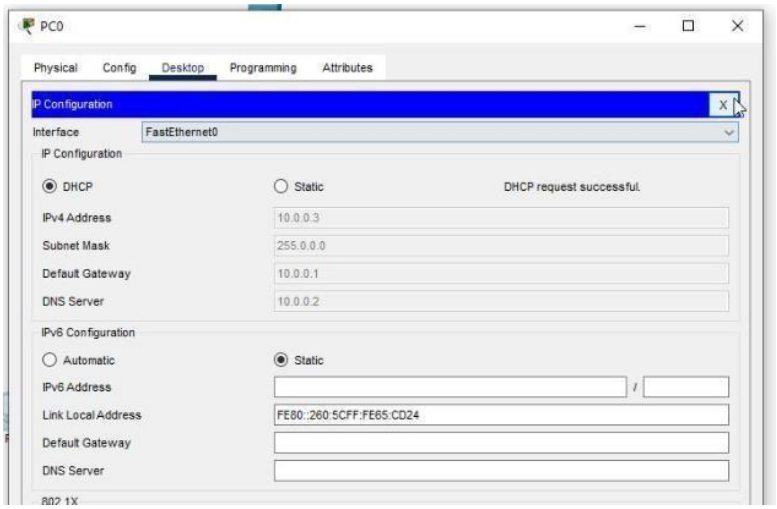
Configuring the Server:

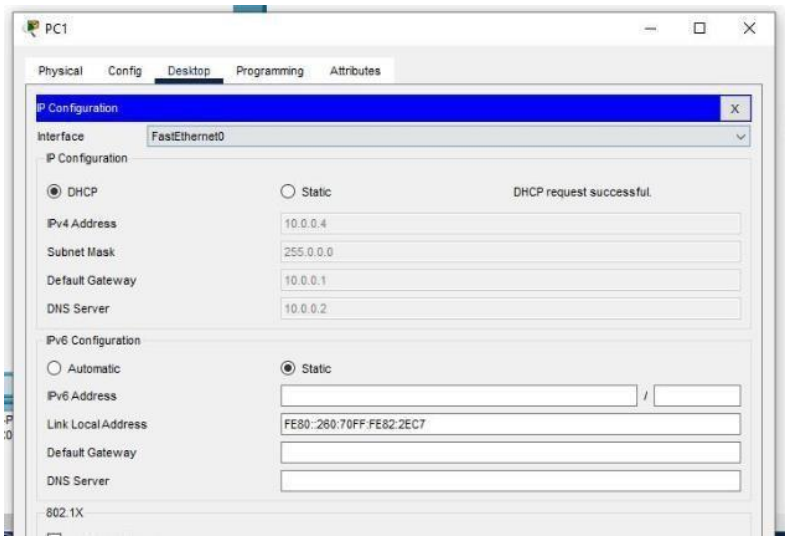


Enabling and setting the DHCP Service on the Server:

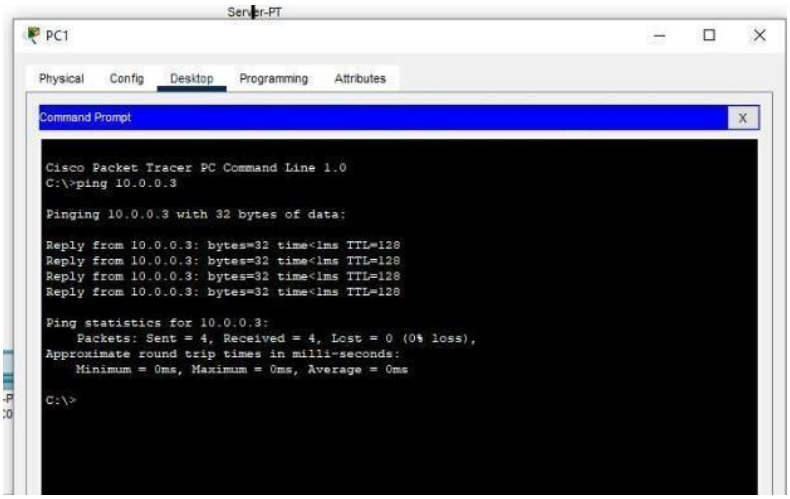


Verifying the Dynamic Addressing on both the PCs:





Checking the connectivity:

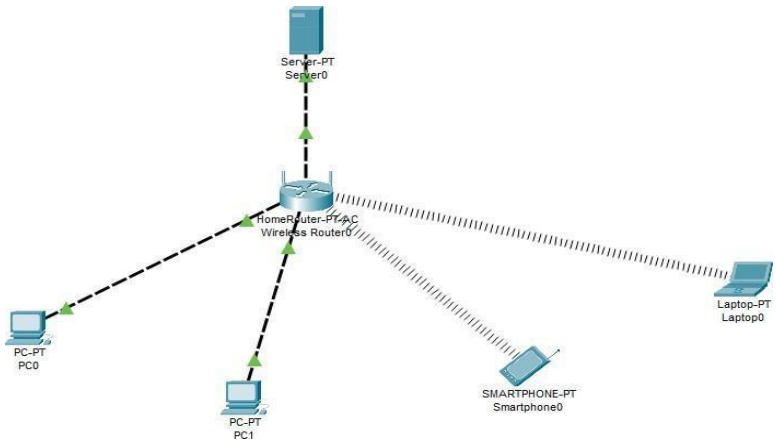


<u>Result</u>:
Hence the Connectivity between the PCs has been verified.

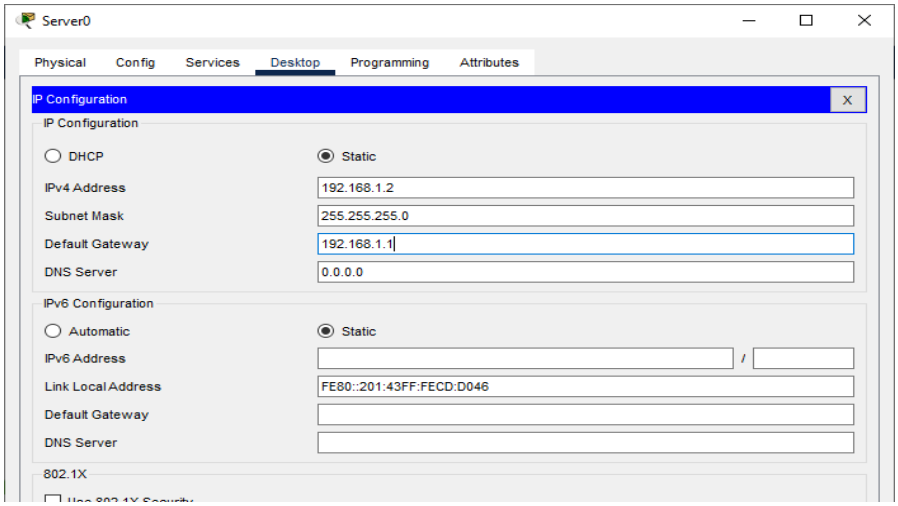
Practical No 4

Aim: Using Packet Tracer, create a basic network of one server and two computers and two mobile / movable devices using appropriate network wire. And verify the connectivity

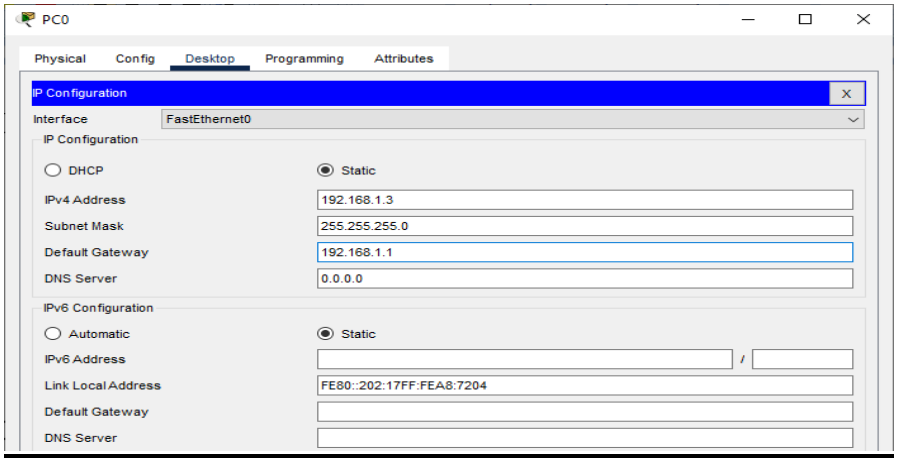
For the present case we use the following topology



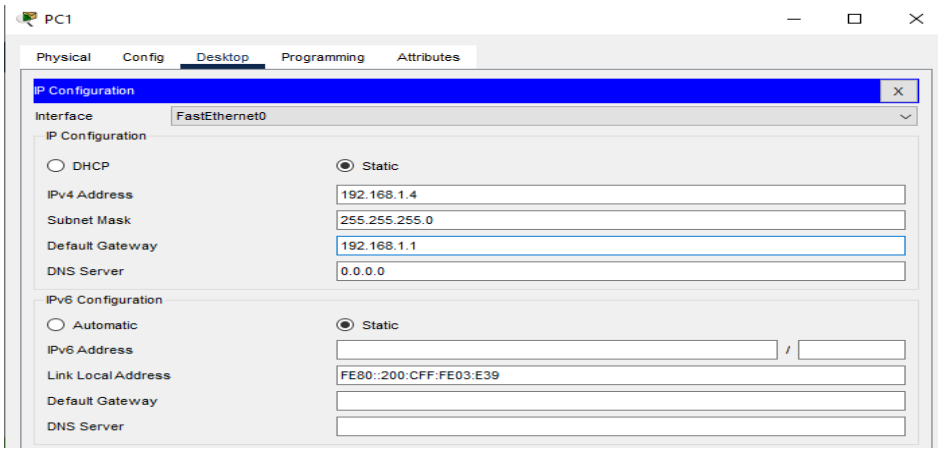
Configure the Server:



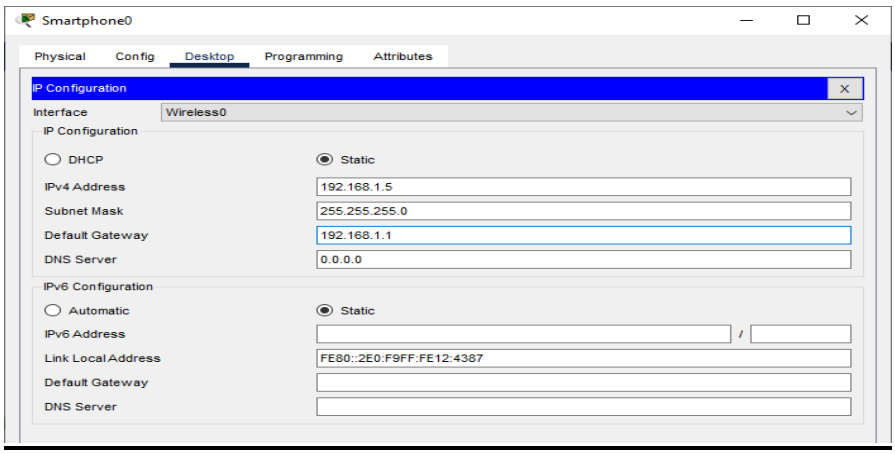
Configure PC0:



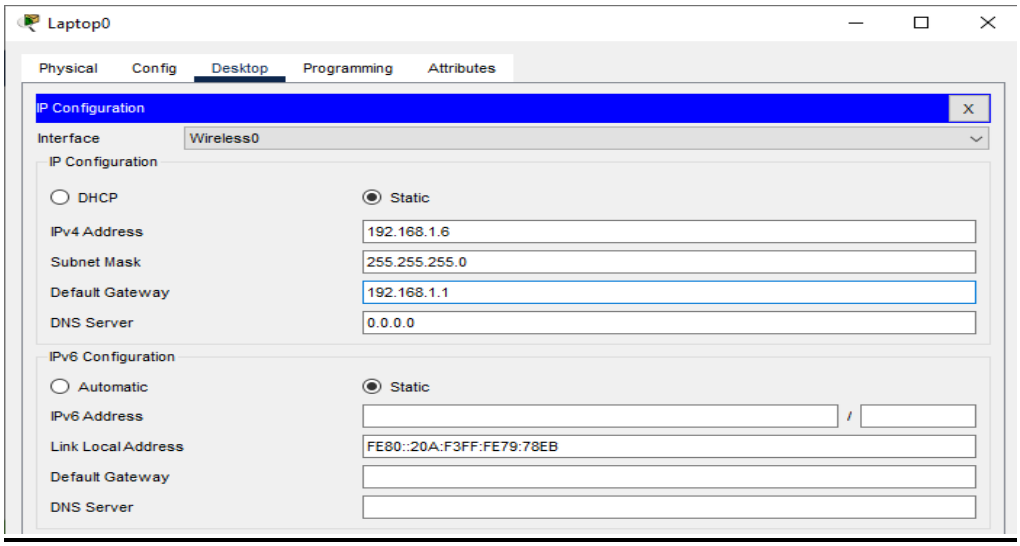
Configure PC1:



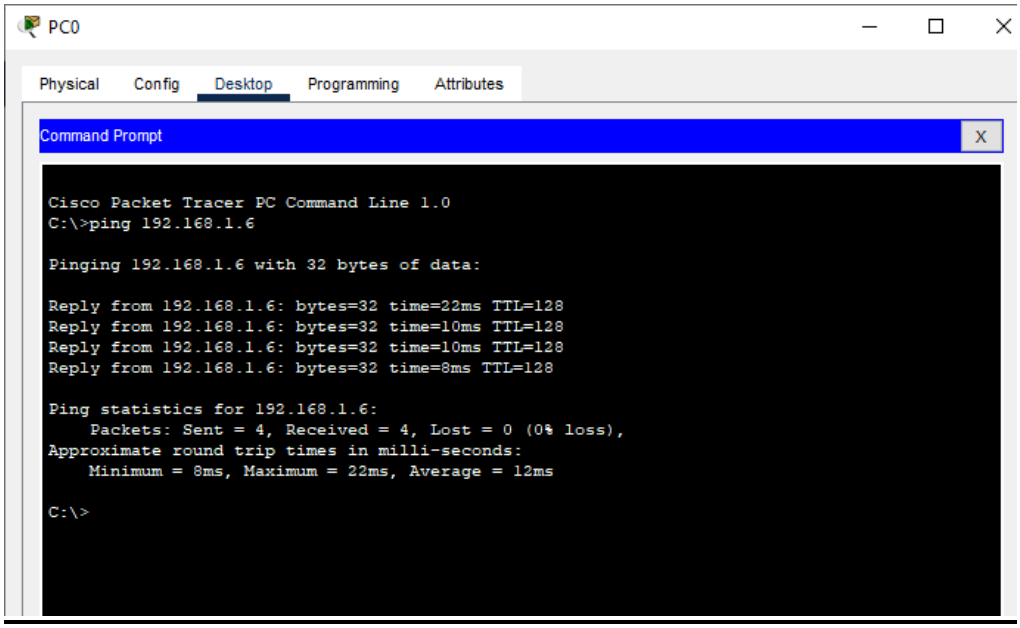
Configure Smartphone0:



Configure Laptop0:



Checking the connectivity (pinging laptop0 from PC0):



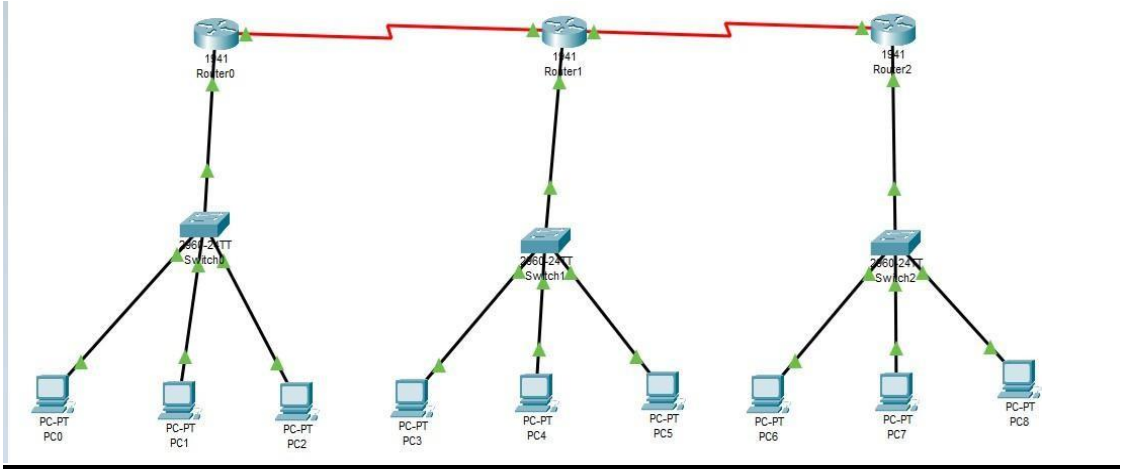
Similarly the ping message can be checked for all the devices

Result:
Hence the Connectivity of the network has been verified.

Practical No 5

Aim: Using Packet Tracer to create a network with three routers with RIPv1 and each router associated network will have minimum three PC and show the connectivity

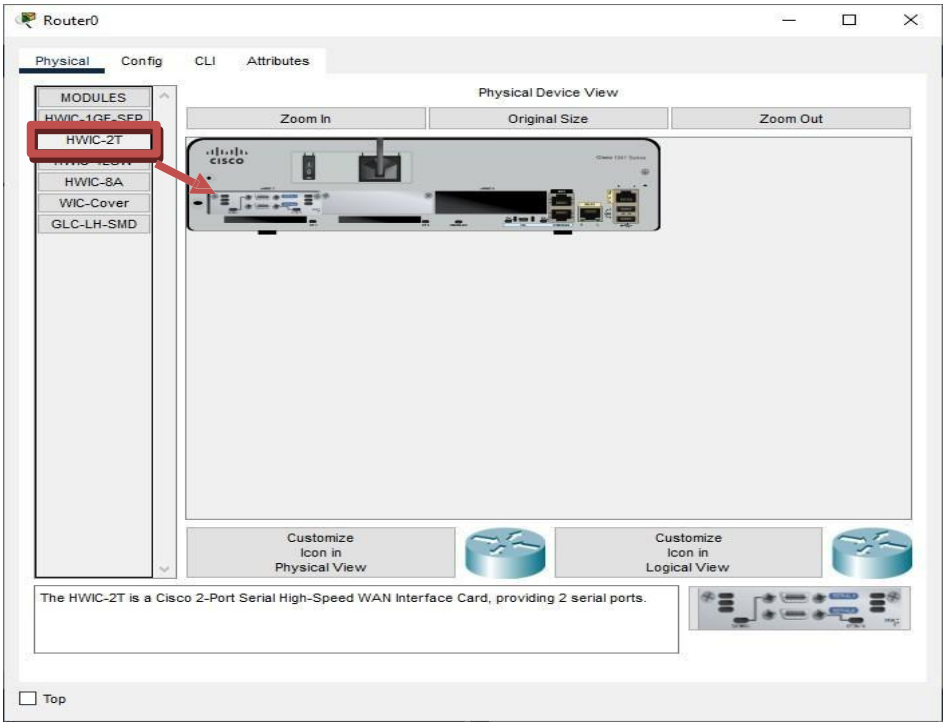
We use the following topology for the present case



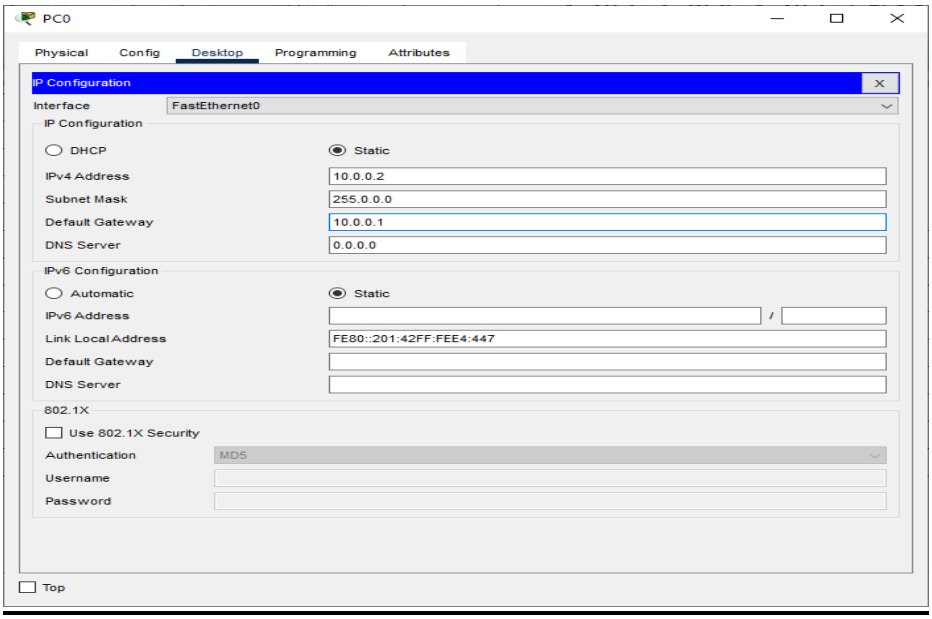
We configure the above network using the following IP addresses

Host	Interface	IP address	Network Address	Default Gateway
Router 0	G0/0	10.0.0.1	10.0.0.0	
	S0/1/0	192.168.0.1	192.168.0.0	
Router 1	G0/0	20.0.0.1	20.0.0.0	
	S0/1/0	192.168.0.2	192.168.0.0	
	S0/1/1	192.168.1.1	192.168.1.0	
Router 2	G0/0	30.0.0.1	30.0.0.0	
	S0/1/1	192.168.1.2	192.168.1.0	
PC0	FastEthernet0	10.0.0.2	10.0.0.0	10.0.0.1
PC1	FastEthernet0	10.0.0.3	10.0.0.0	10.0.0.1
PC2	FastEthernet0	10.0.0.4	10.0.0.0	10.0.0.1
PC3	FastEthernet0	20.0.0.2	20.0.0.0	20.0.0.1
PC4	FastEthernet0	20.0.0.3	20.0.0.0	20.0.0.1
PC5	FastEthernet0	20.0.0.4	20.0.0.0	20.0.0.1
PC6	FastEthernet0	30.0.0.2	30.0.0.0	30.0.0.1
PC7	FastEthernet0	30.0.0.3	30.0.0.0	30.0.0.1
PC8	FastEthernet0	30.0.0.4	30.0.0.0	30.0.0.1

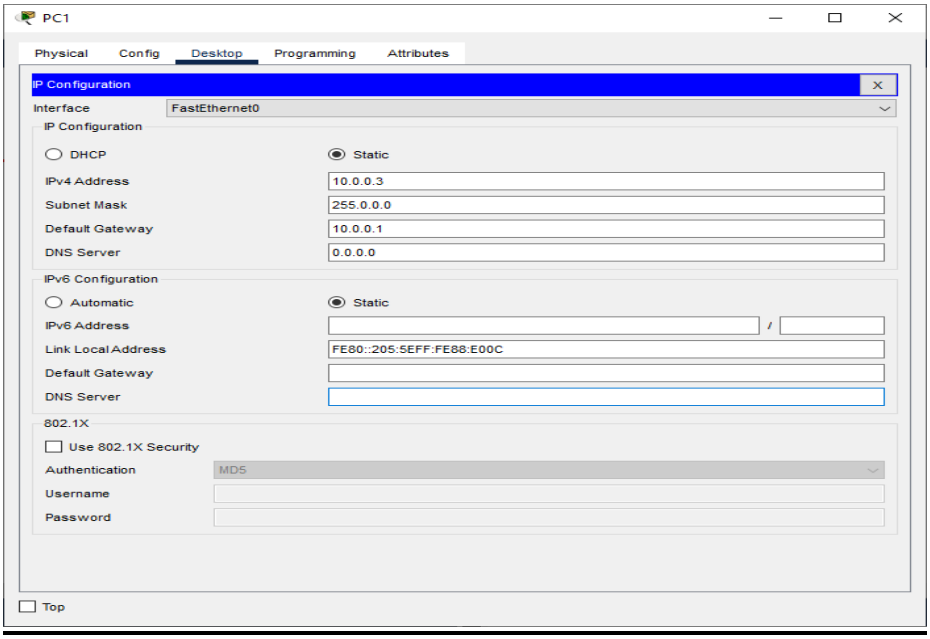
Adding Serial Interface in each Router



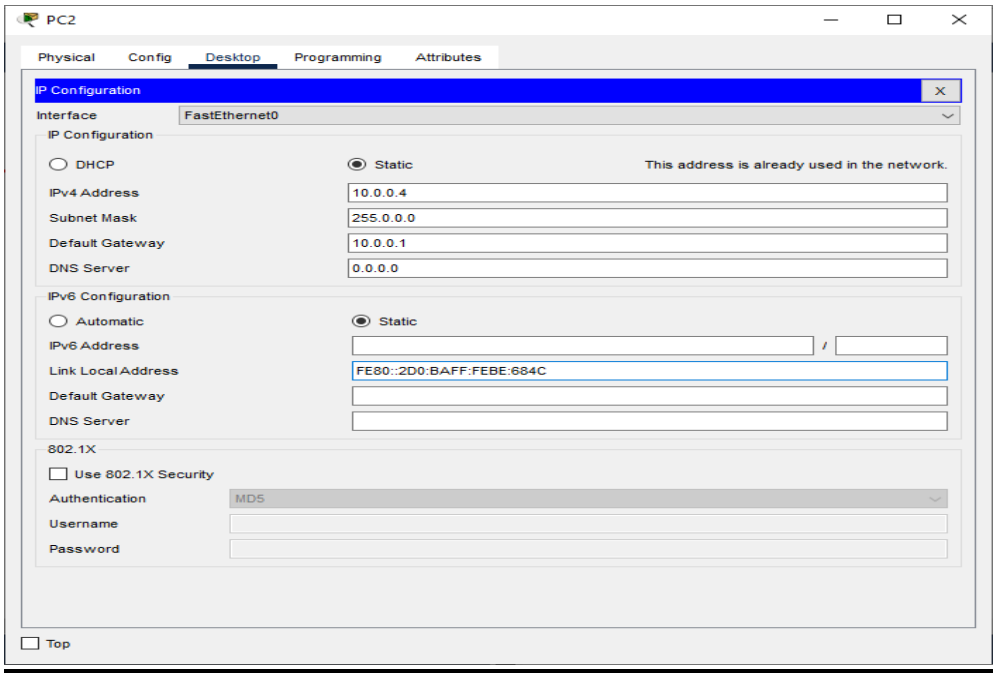
Configuring PC0:



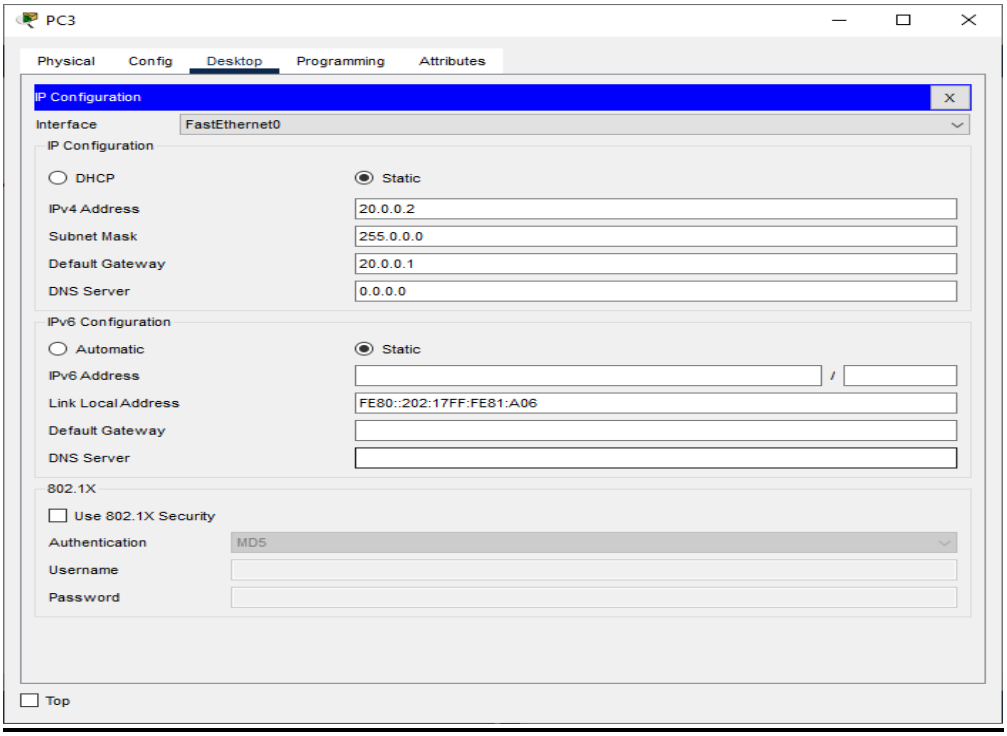
Configuring PC1:



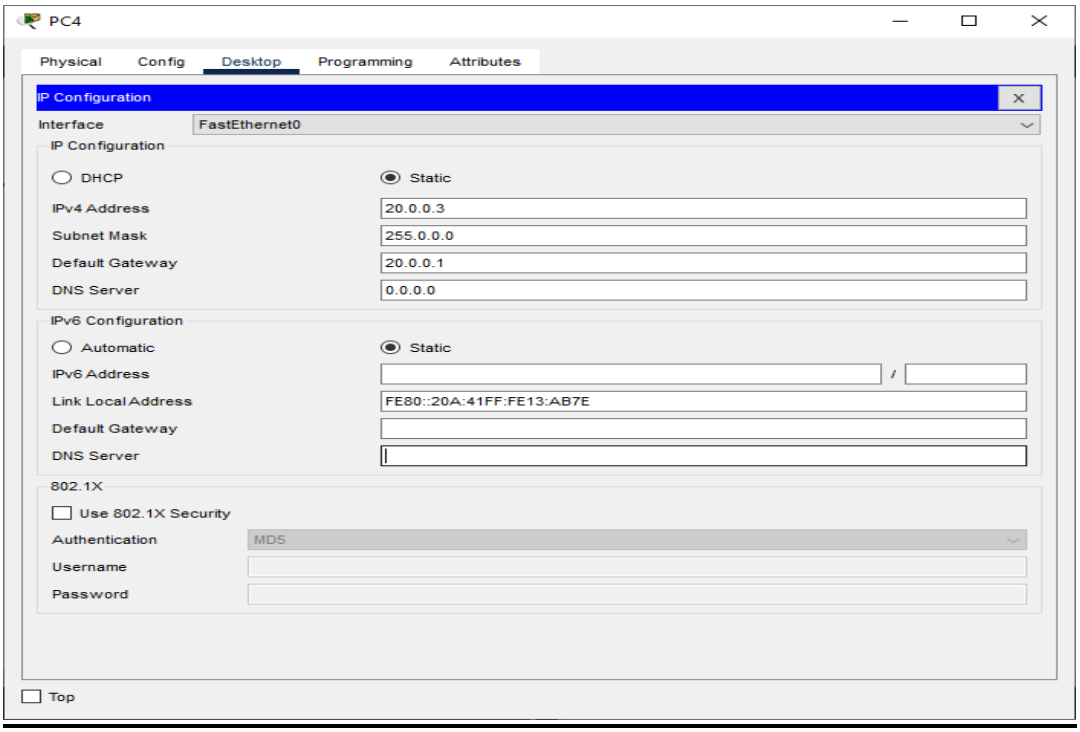
Configuring PC2:



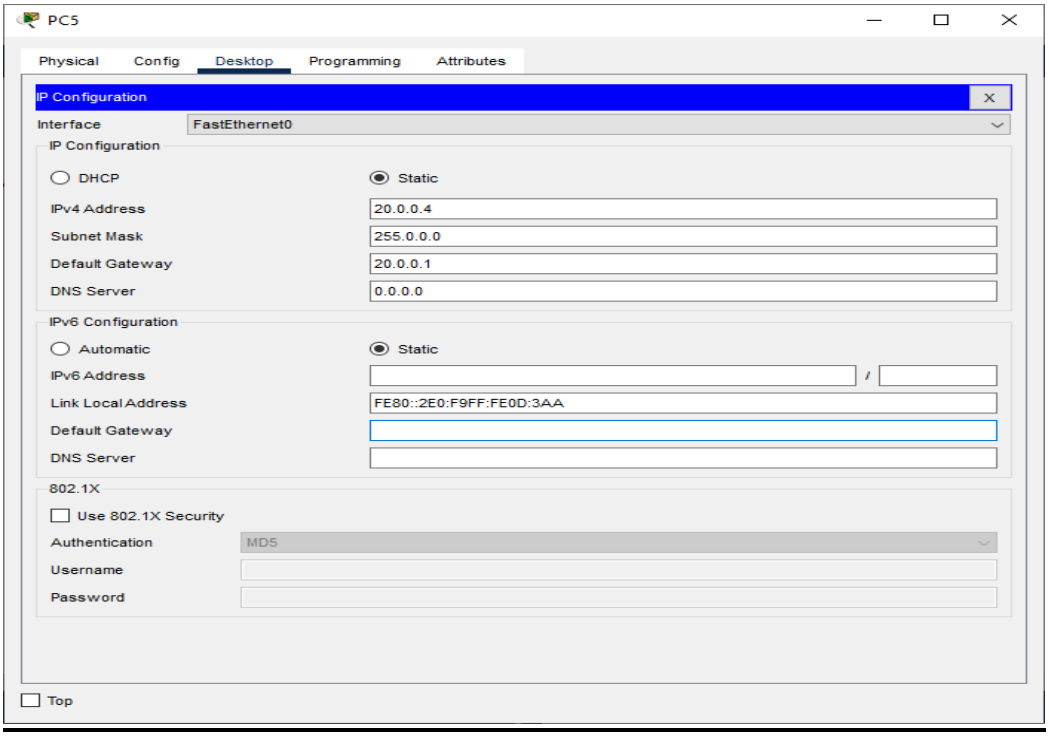
Configuring PC3:



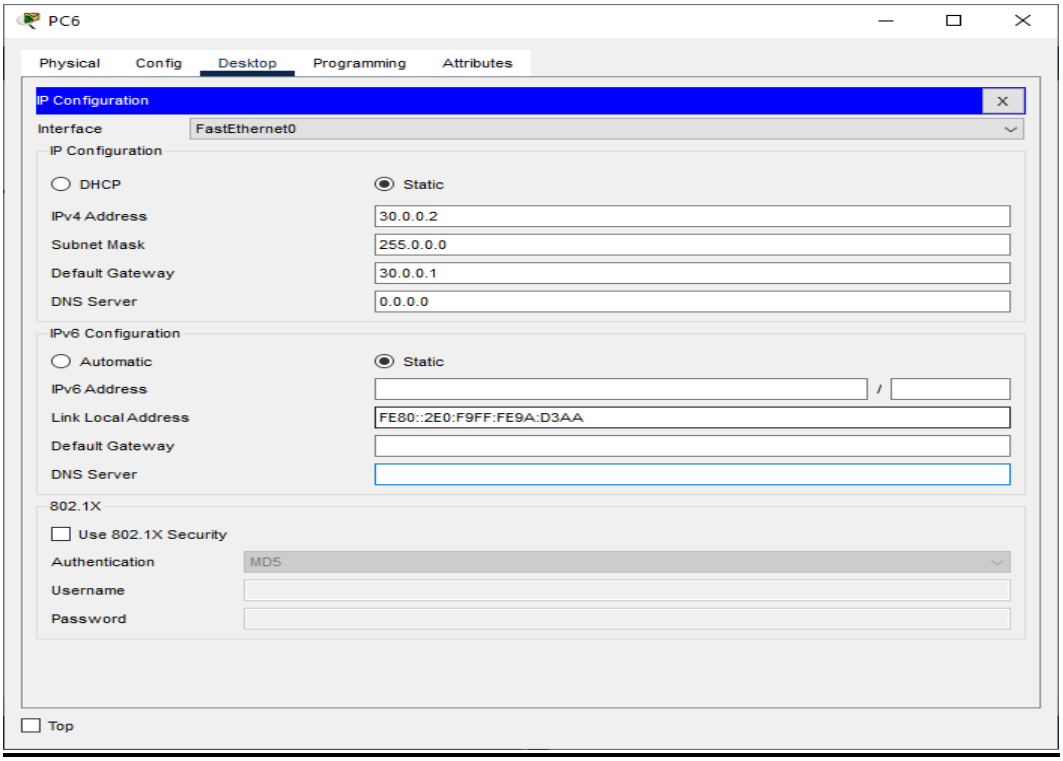
Configuring PC4:



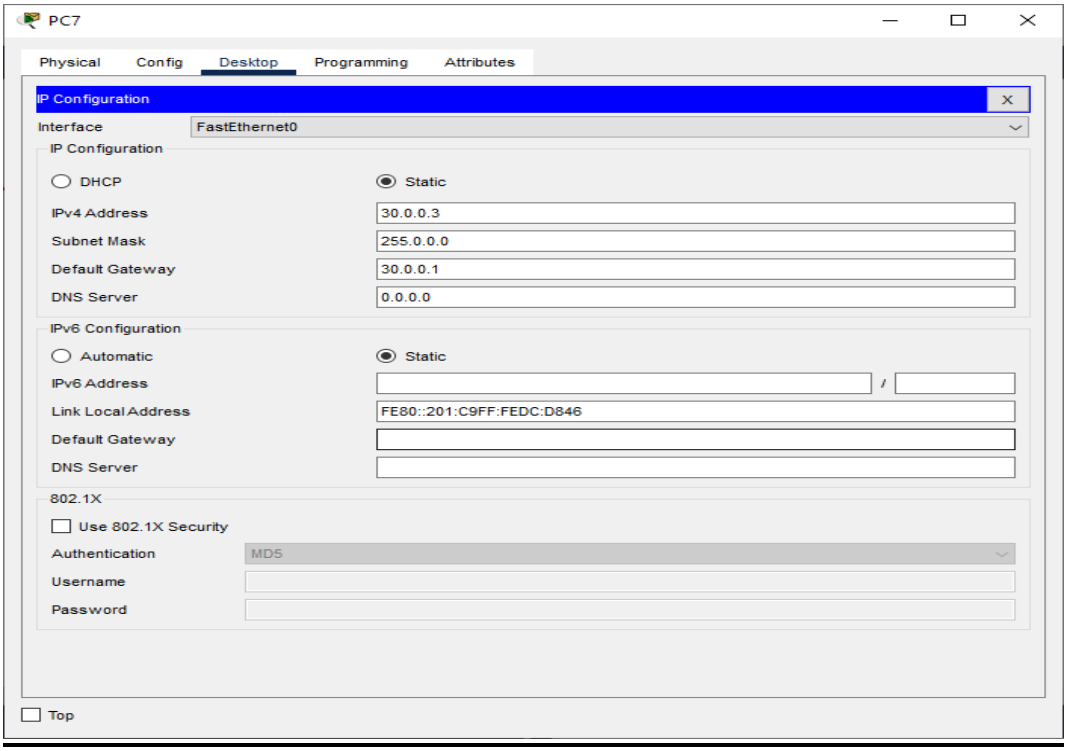
Configuring PC5:



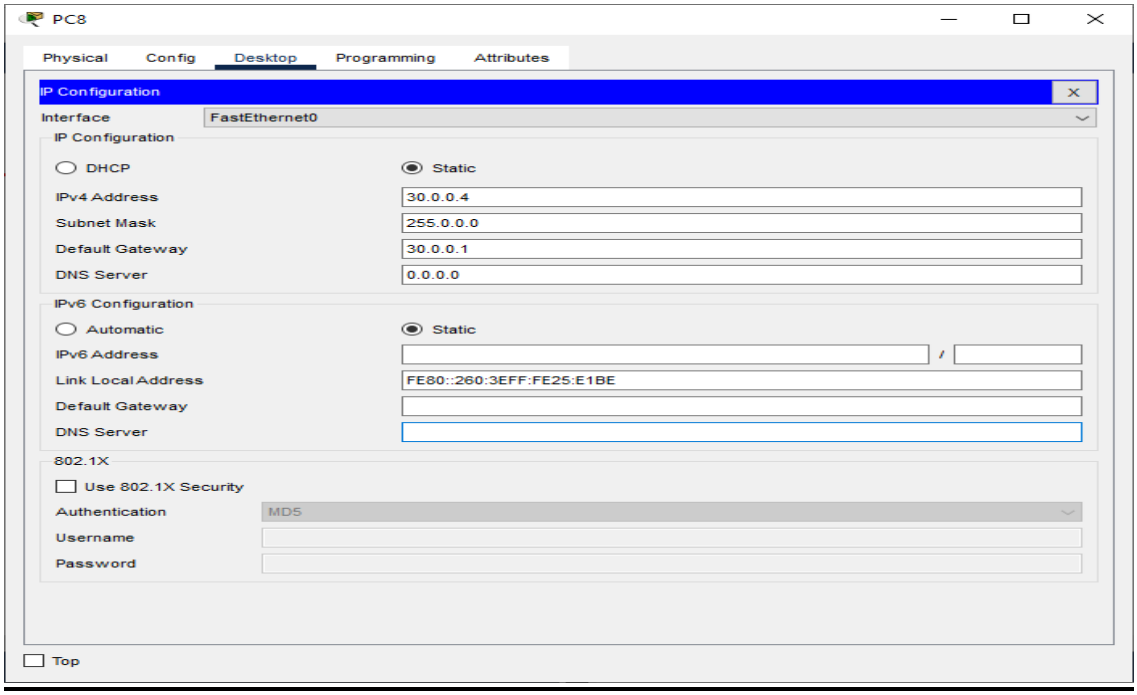
Configuring PC6:



Configuring PC7:



Configuring PC8:



Configuring Router 0 (using the CLI mode)

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#ip address 10.0.0.1
255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/1/0
Router(config-if)#ip address 192.168.0.1
255.255.255.0 Router(config-if)#no shutdown
Router(config-
if)#exit Router(config)#
Router#
```

Configuring Router 1 (using the CLI mode)

```
Router>enable
Router#configure terminal
Router(config)#interface
gigabitEthernet 0/0 Router(config-if)#ip
address 20.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/1/0
Router(config-if)#ip address 192.168.0.2
255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/1/1
Router(config-if)#ip address 192.168.1.1
255.255.255.0
Router(config-if)#no shutdown
```

Configuring Router 2 (using the CLI mode)

Router>enable
Router#configure terminal
Router(config)#interface
gigabitEthernet 0/0
Router(config-if)#ip address 30.0.0.1
255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial 0/1/1
Router(config-if)#ip address 192.168.1.2
255.255.255.0
Router(config-if)#no shutdown

Setting the RIPv1 on Router 0

Router>enable
Router#configure
terminal
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 192.168.0.0
Router(config-router)#exit

Setting the RIPv1 on Router 1

Router>enable
Router#configure
terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 192.168.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#exit
Router(config)#

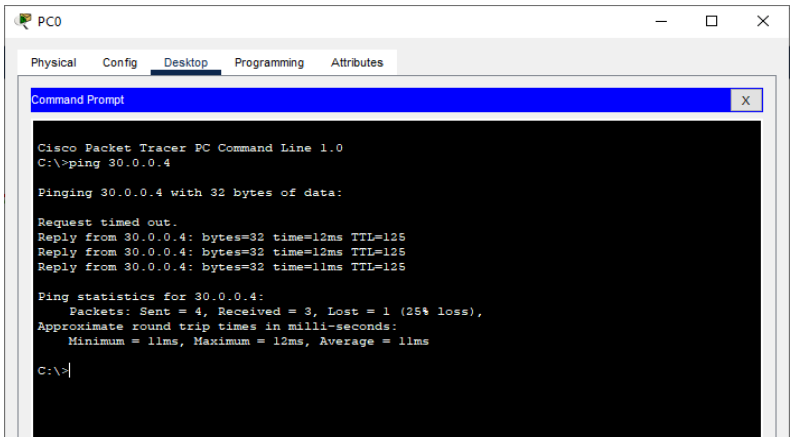
Router#

Setting the RIPv1 on Router 2

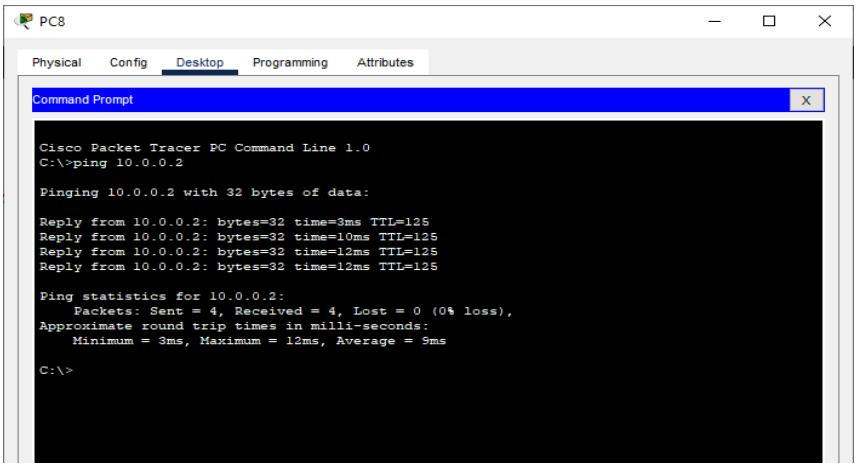
Router>enable
Router#configure
terminal
Router(config)#router rip
Router(config-router)#network 192.168.1.0
Router(config-router)#network
30.0.0.0
Router(config-router)#exit
Router(config)#

Checking the connectivity by using the ping command

Pinging PC8 (ip address 30.0.0.4) from PC0



Pinging PC0 (ip address 10.0.0.2) from PC8



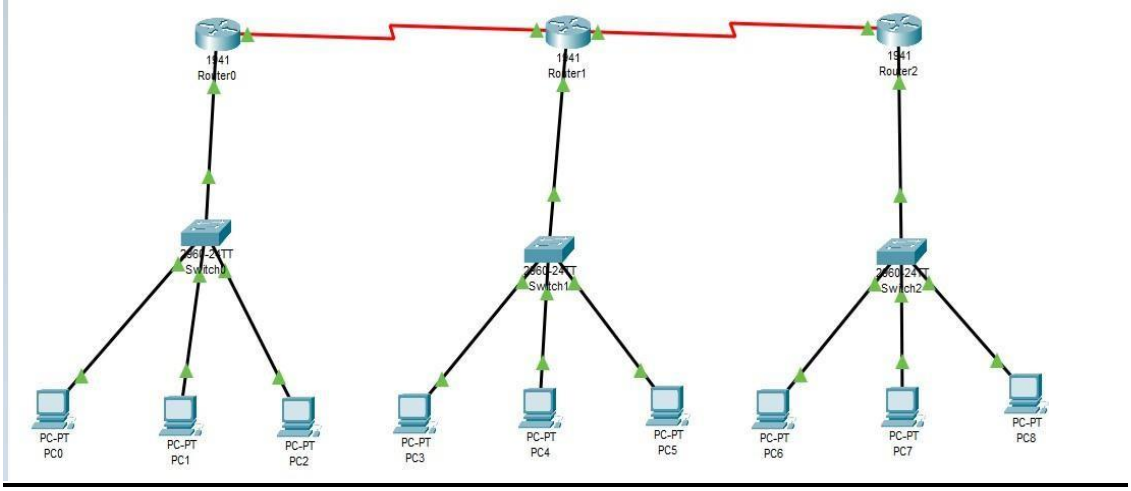
Result:

Hence the RIPv1 has been studied and verified through the given network

Practical No 6

Aim: Using Packet Tracer to create a network with three routers with RIPv2 and each router associated network will have minimum three PC and show the connectivity

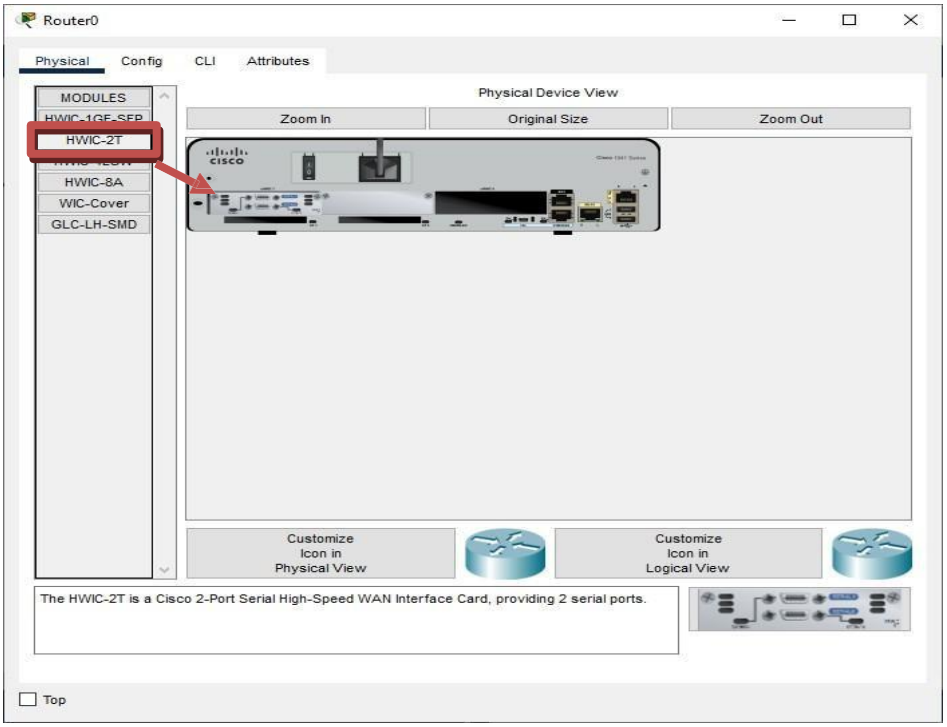
We use the following topology for the present case



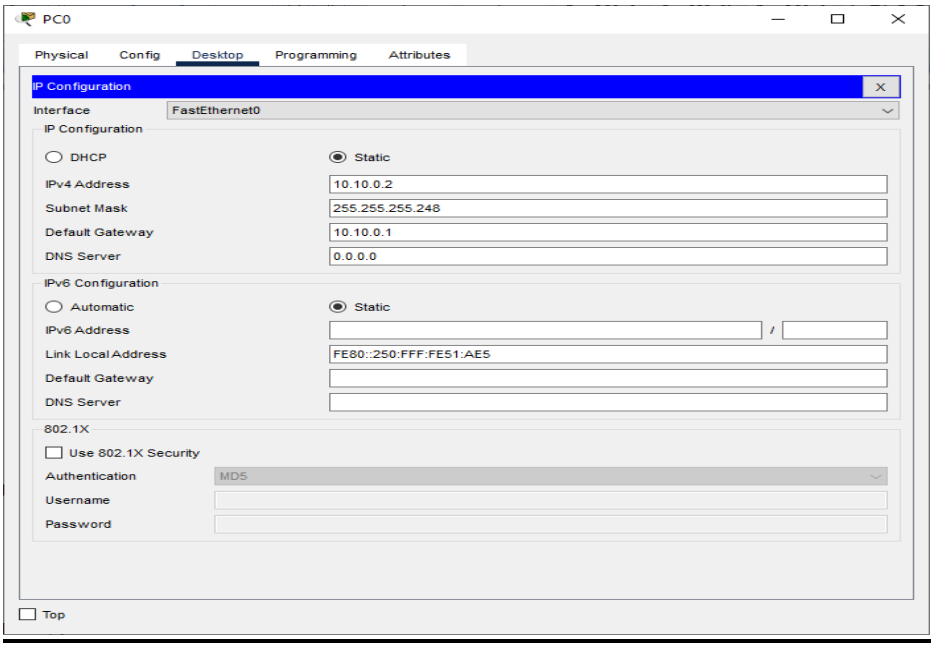
We configure the above network using the following IP addresses

Host	Interface	IP address	Subnet Mask	Network Address	Default Gateway
Router 0	G0/0	10.10.0.1	255.255.255.248	10.10.0.0	
	S0/1/0	192.168.0.1	255.255.255.252	192.168.0.0	
Router 1	G0/0	10.20.0.1	255.255.255.248	10.20.0.0	
	S0/1/0	192.168.0.2	255.255.255.252	192.168.0.0	
	S0/1/1	192.168.1.1	255.255.255.252	192.168.1.0	
Router 2	G0/0	10.30.0.1	255.255.255.248	10.30.0.0	
	S0/1/1	192.168.1.2	255.255.255.252	192.168.1.0	
PC0	FastEthernet0	10.10.0.2	255.255.255.248	10.10.0.0	10.10.0.1
PC1	FastEthernet0	10.10.0.3	255.255.255.248	10.10.0.0	10.10.0.1
PC2	FastEthernet0	10.10.0.4	255.255.255.248	10.10.0.0	10.10.0.1
PC3	FastEthernet0	10.20.0.2	255.255.255.248	10.20.0.0	10.20.0.1
PC4	FastEthernet0	10.20.0.3	255.255.255.248	10.20.0.0	10.20.0.1
PC5	FastEthernet0	10.20.0.4	255.255.255.248	10.20.0.0	10.20.0.1
PC6	FastEthernet0	10.30.0.2	255.255.255.248	10.30.0.0	10.30.0.1
PC7	FastEthernet0	10.30.0.3	255.255.255.248	10.30.0.0	10.30.0.1
PC8	FastEthernet0	10.30.0.4	255.255.255.248	10.30.0.0	10.30.0.1

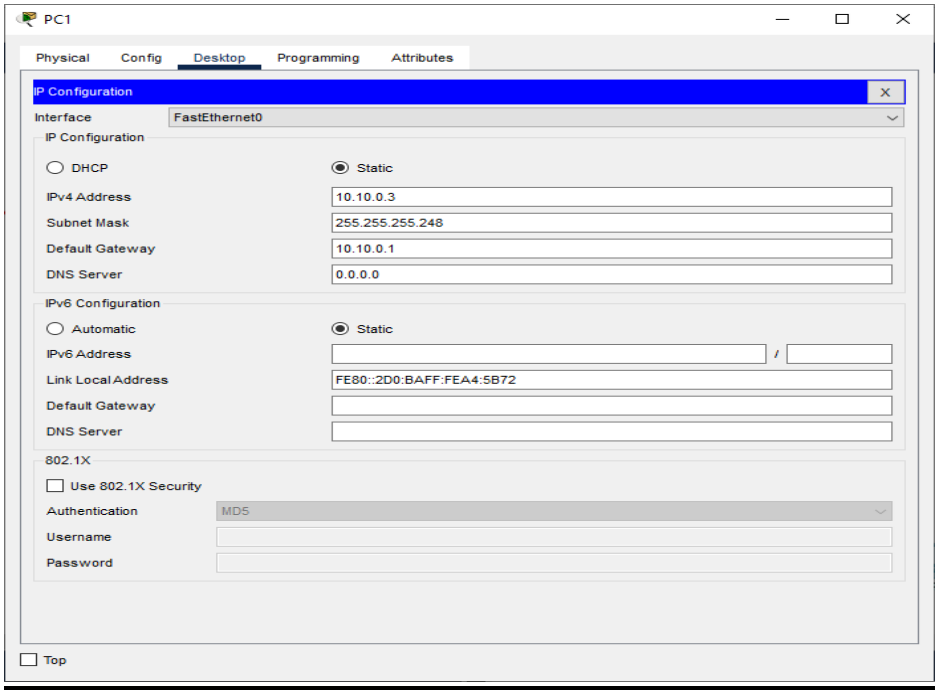
Adding Serial Interface in each Router



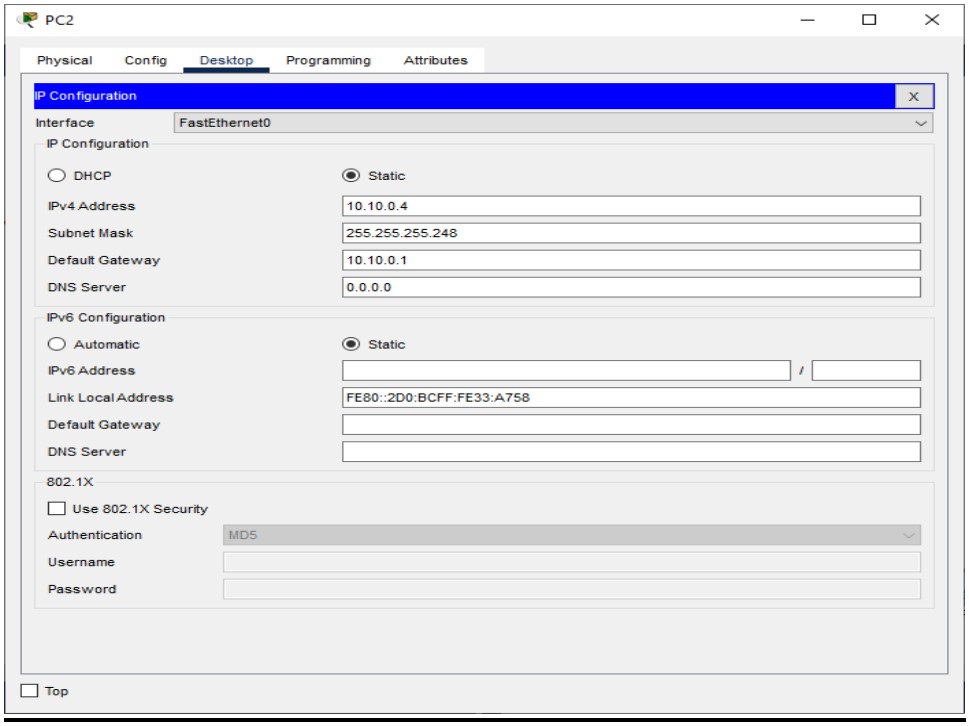
Configuring PC0:



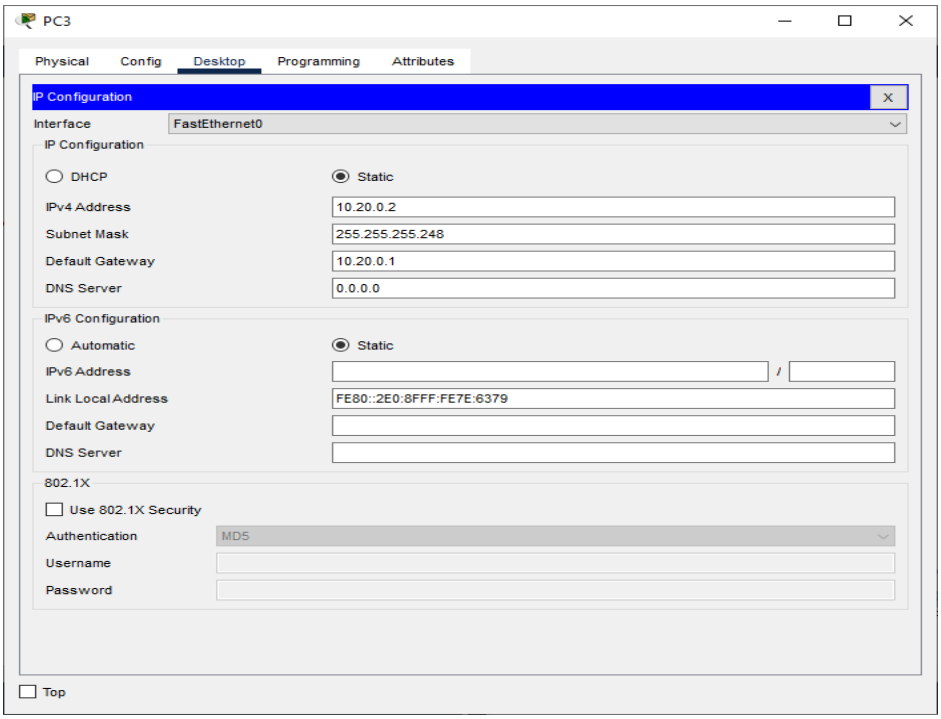
Configuring PC1:



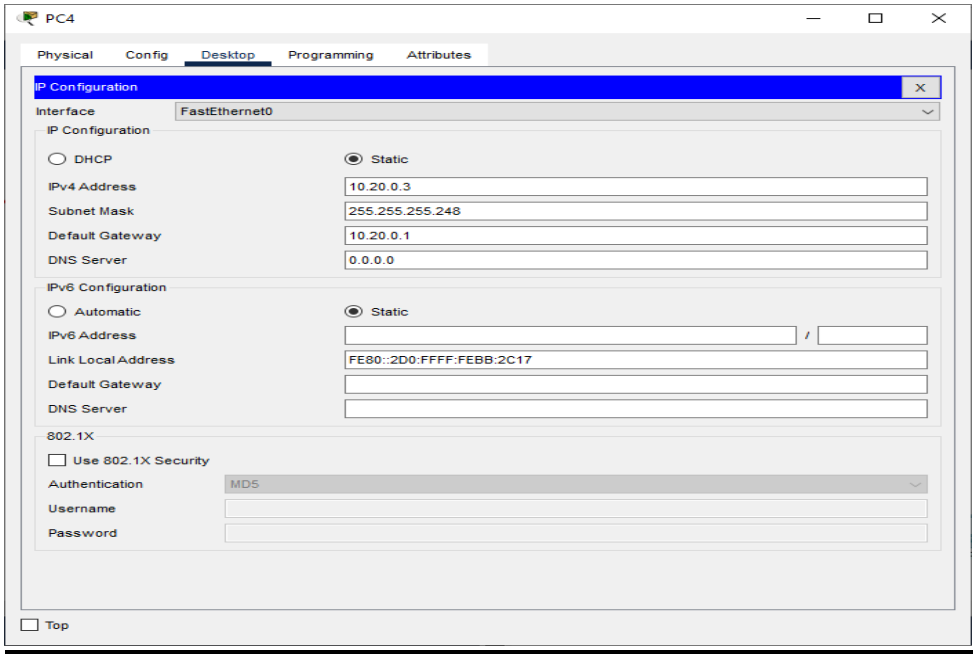
Configuring PC2:



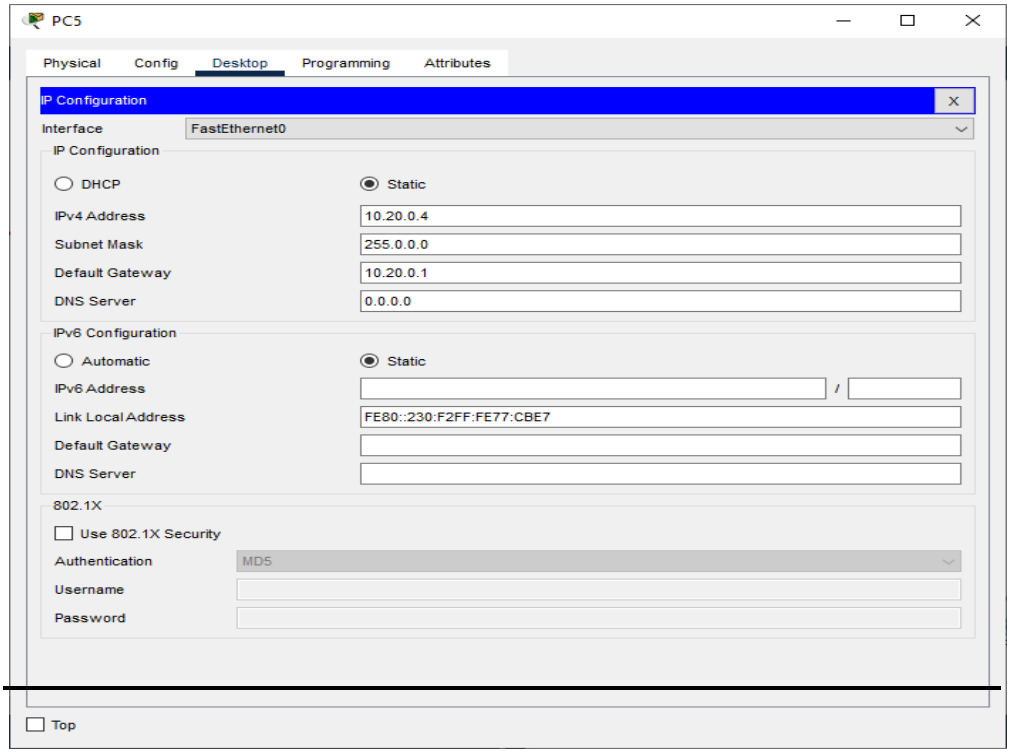
Configuring PC3:



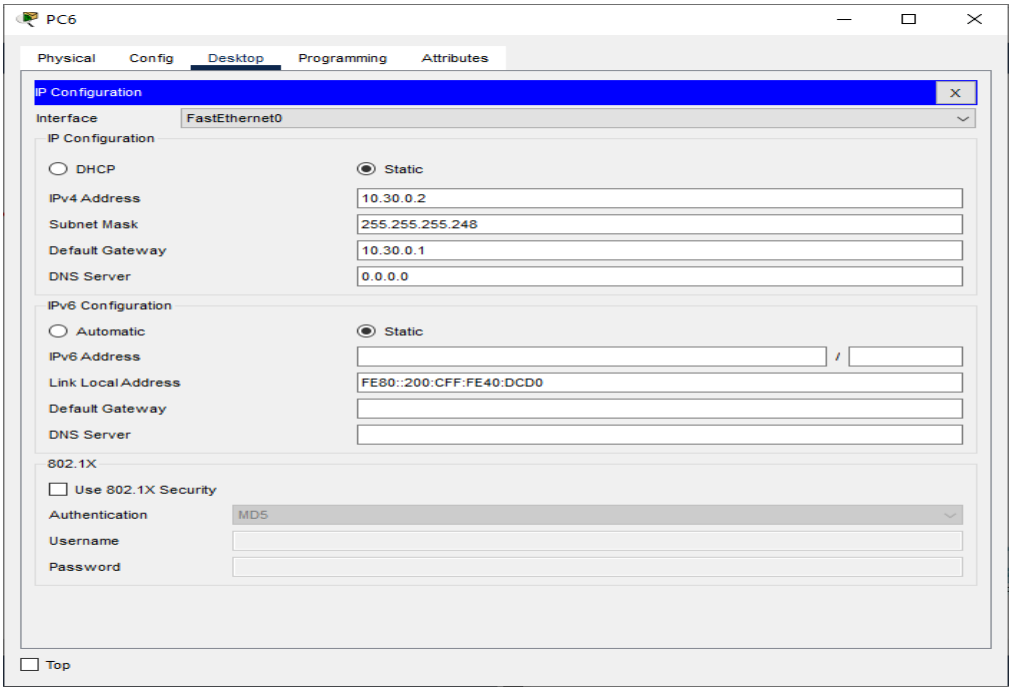
Configuring PC4:



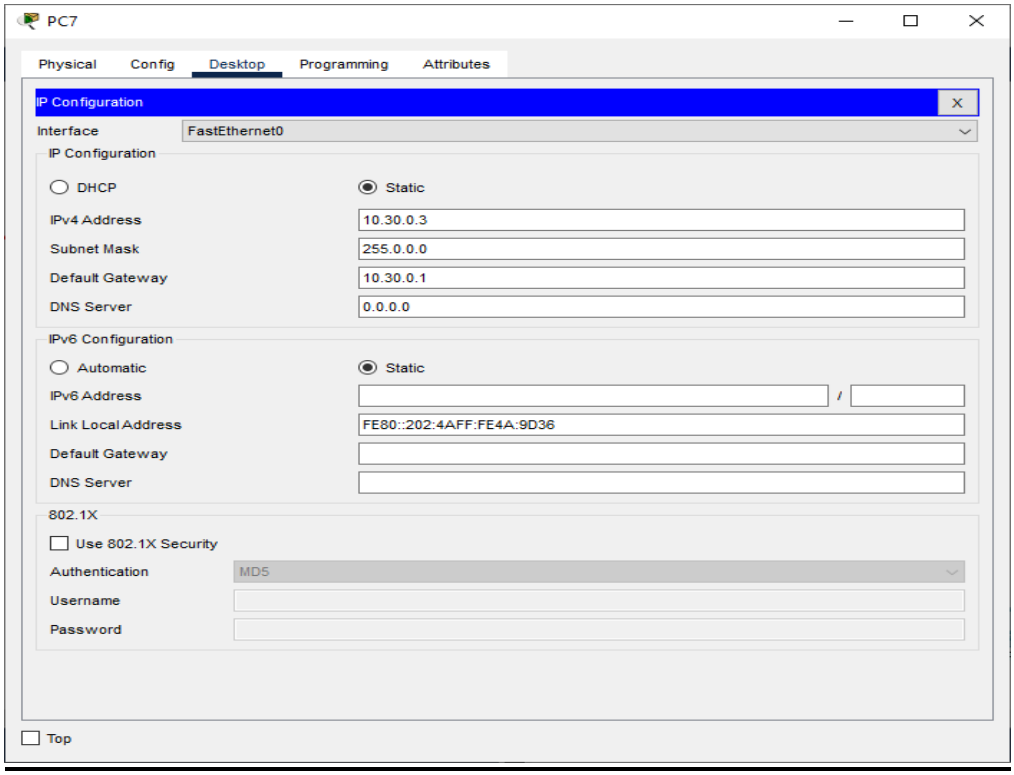
Configuring PC5:



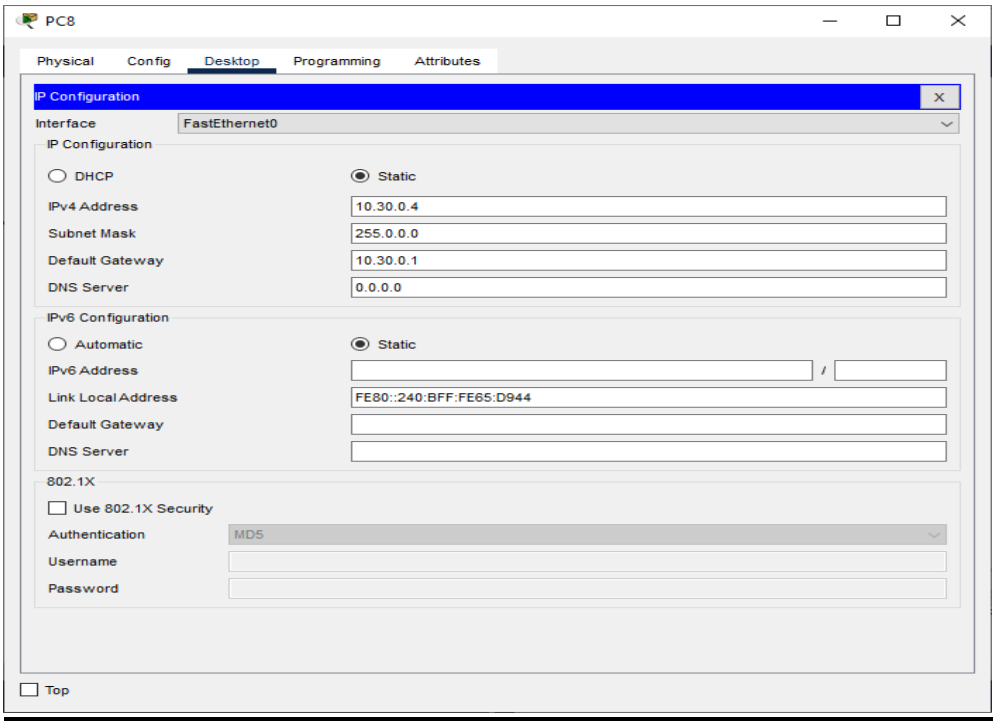
Configuring PC6:



Configuring PC7:

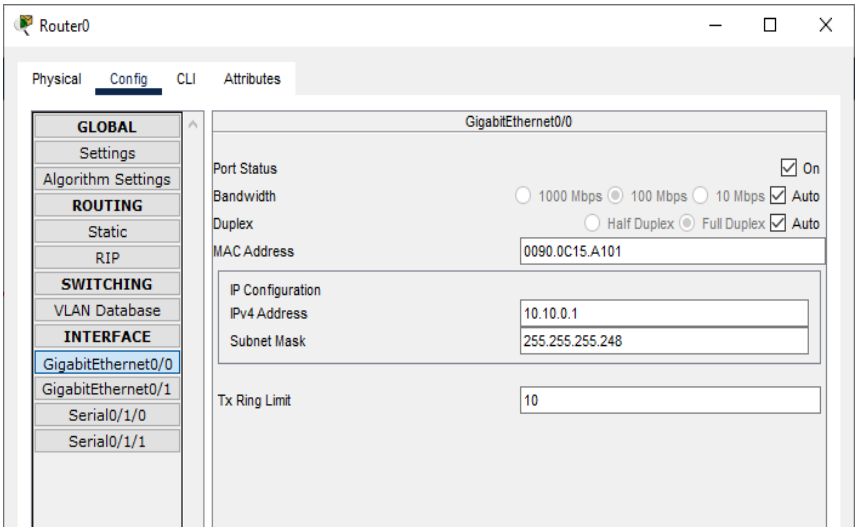


Configuring PC8:

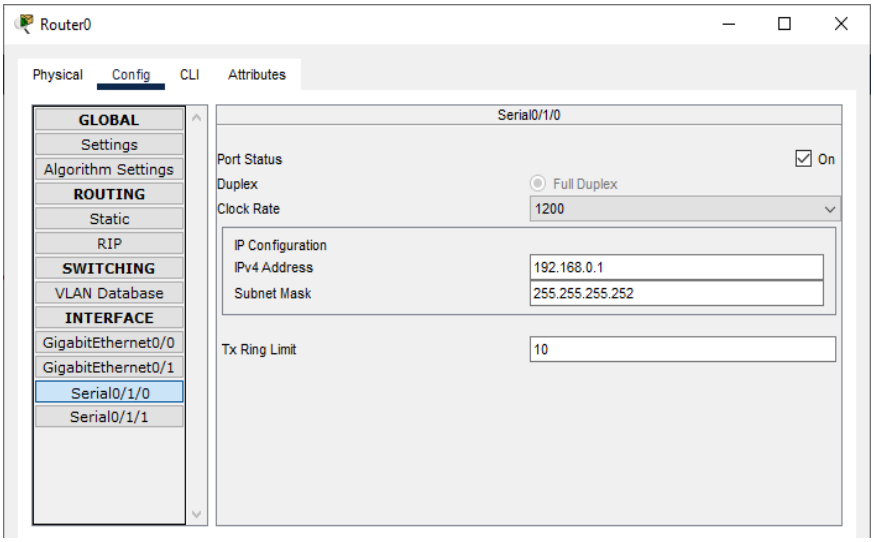


Configuring IP addresses on Router 0

i) Interface G0/0

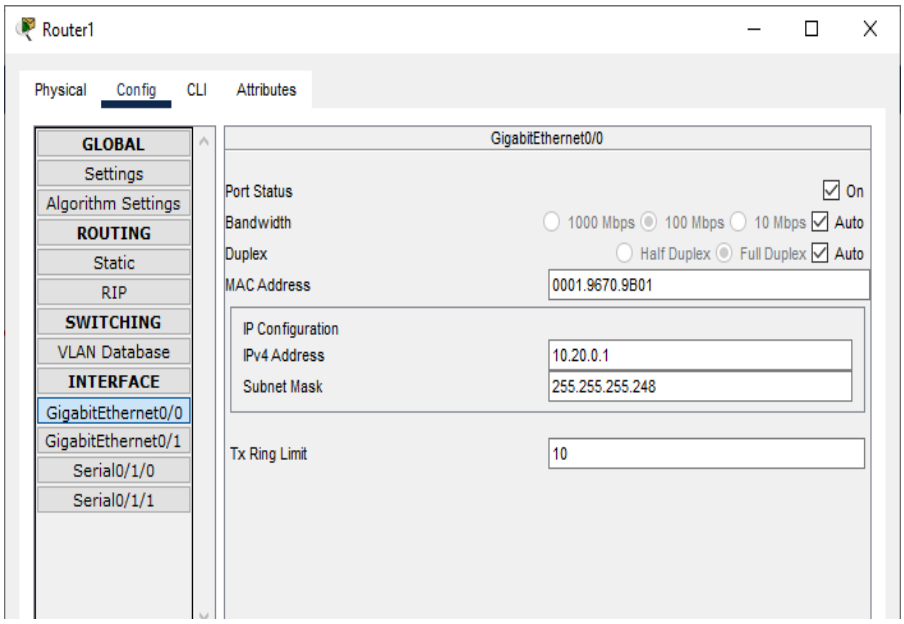


ii) Interface S0/1/0

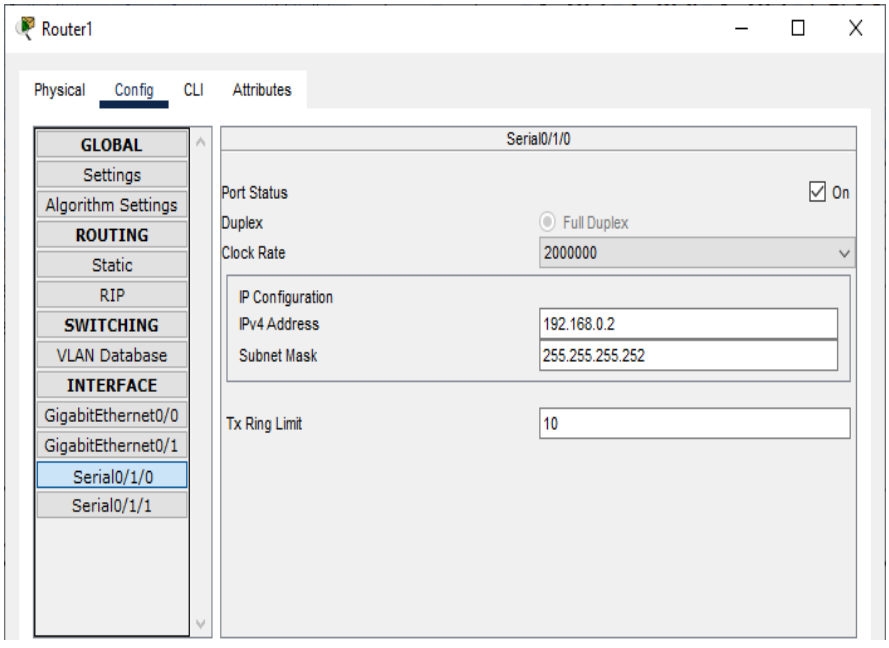


Configuring IP addresses on Router 1

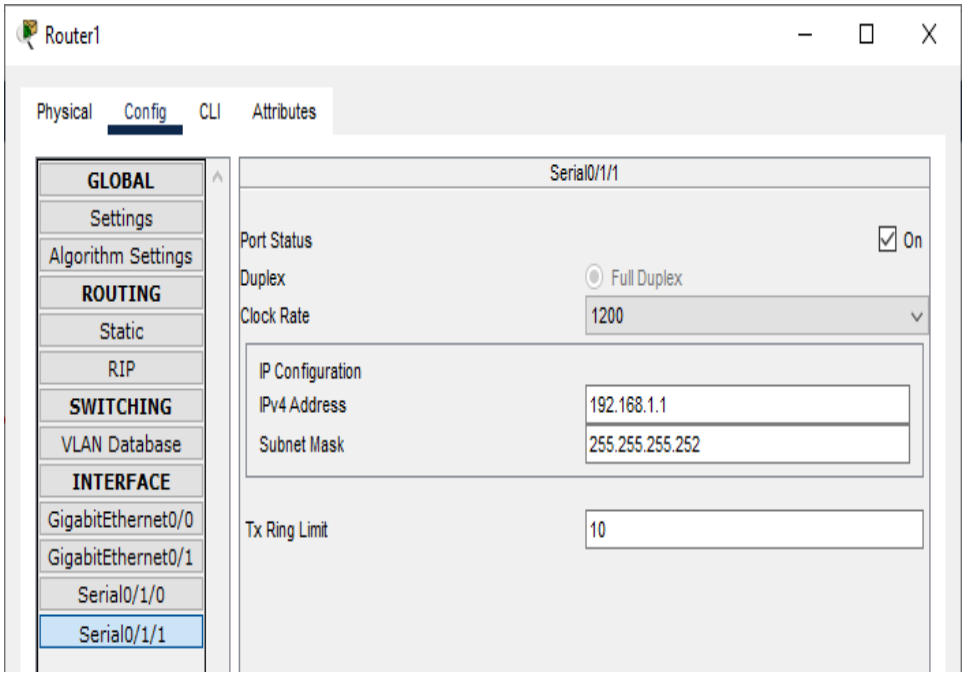
i) Interface G0/0



ii) Interface S0/1/0

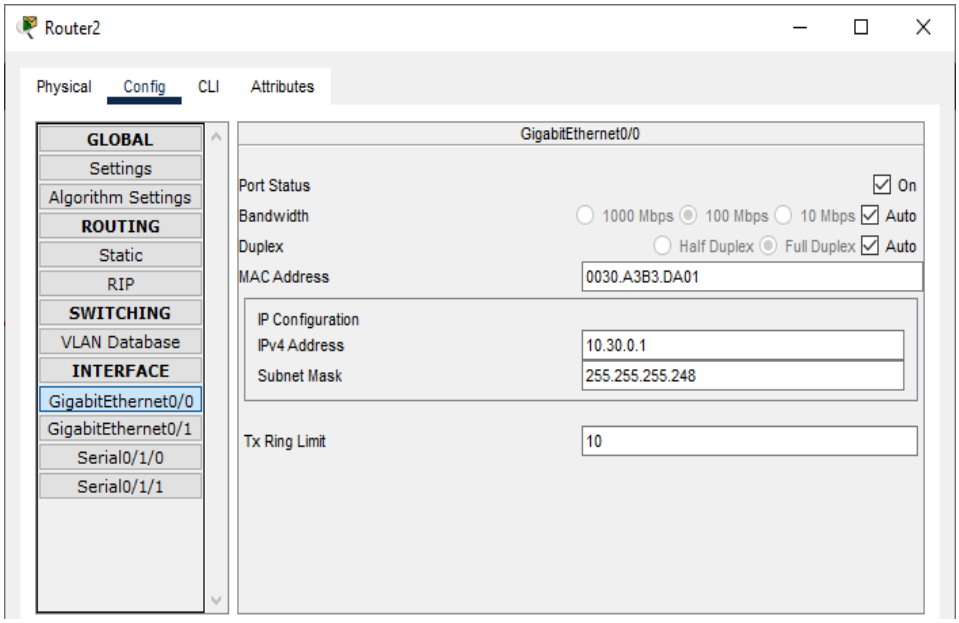


iii) Interface S0/1/1

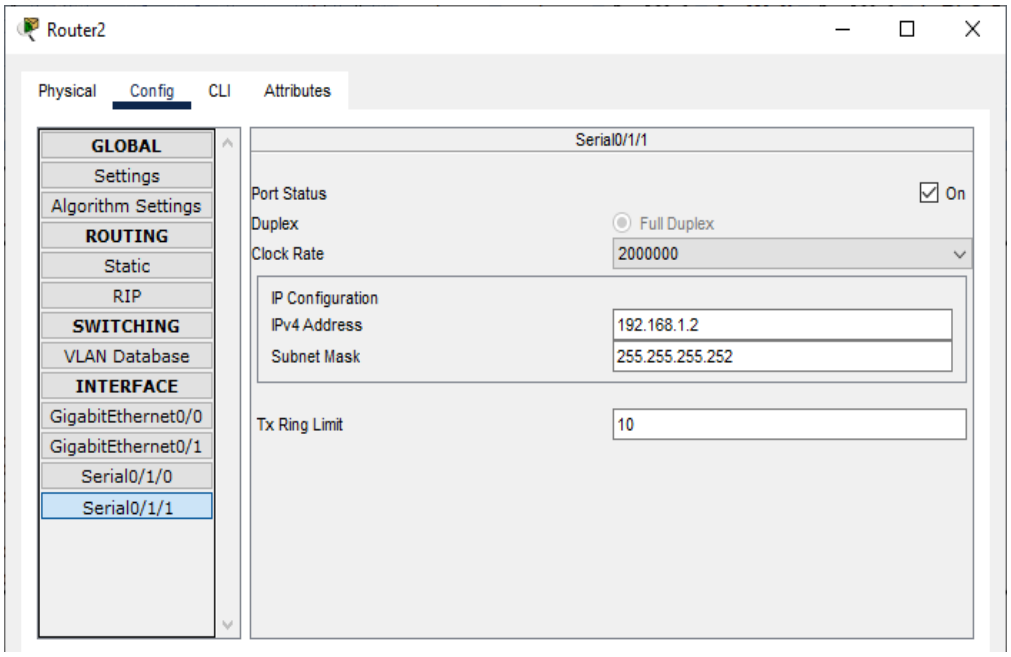


Configuring IP addresses on Router 2

i) Interface G0/0



ii) Interface S0/1/1



Configuring Router 0 for RIPv2 (using the CLI mode)

Router>enable
Router#configure terminal
Router(config)#router rip
Router(config- router)#version
2
Router(config-router)#network 10.10.0.0
Router(config-router)#network 192.168.0.0
Router(config-router)#exit
Router(config)#

Configuring Router 1 for RIPv2 (using the CLI mode)

Router>enable
Router#configure terminal
Router(config)#router rip
Router(config- router)#version
2
Router(config-router)#network 10.20.0.0

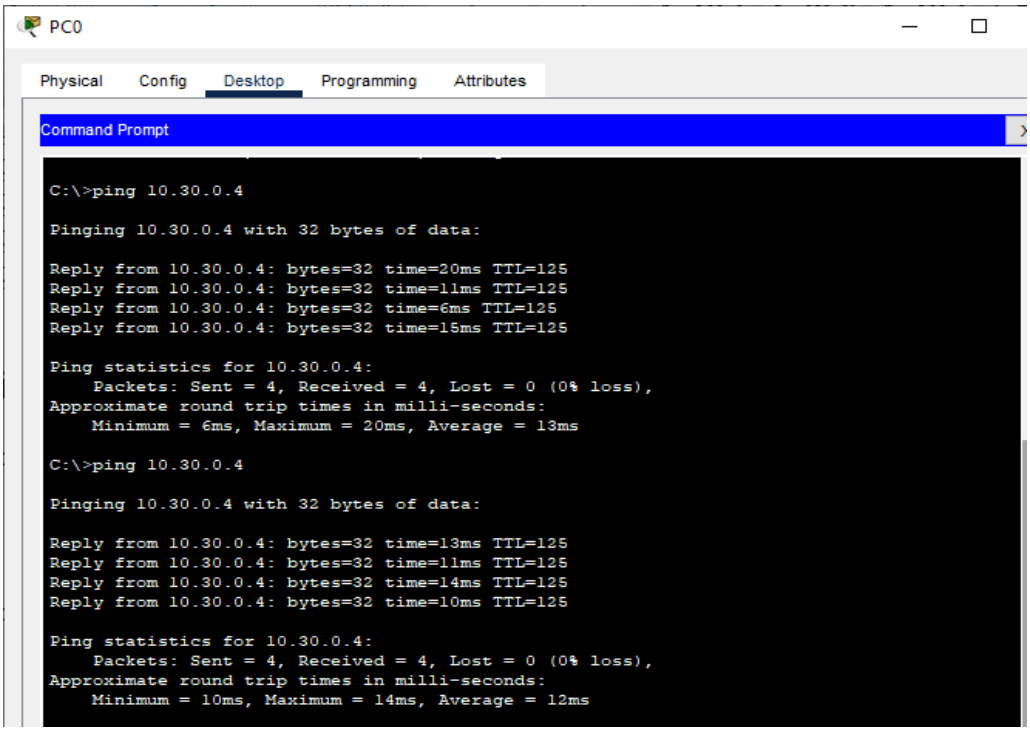
Router(config-router)#network 192.168.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#exit
Router(config)#

Configuring Router 2 for RIPv2 (using the CLI mode)

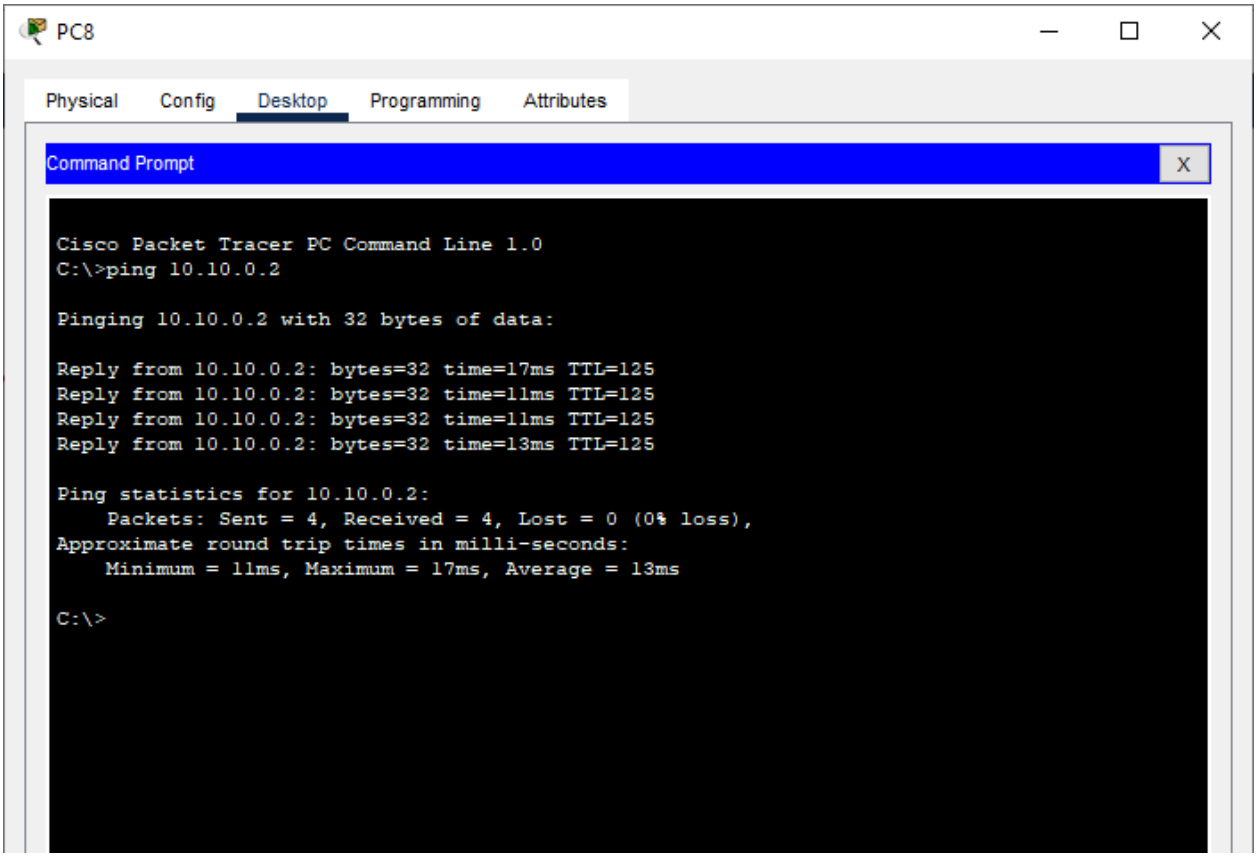
Router>enable
Router#configure terminal
Router(config)#router rip
Router(config- router)#version
2
Router(config-router)#network 10.30.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#exit
Router(config)#

Checking the connectivity by using the ping command

i) Pinging PC8 (ip address 10.30.0.4) from PC0



ii) Pinging PC0 (ip address 10.10.0.2) from PC8

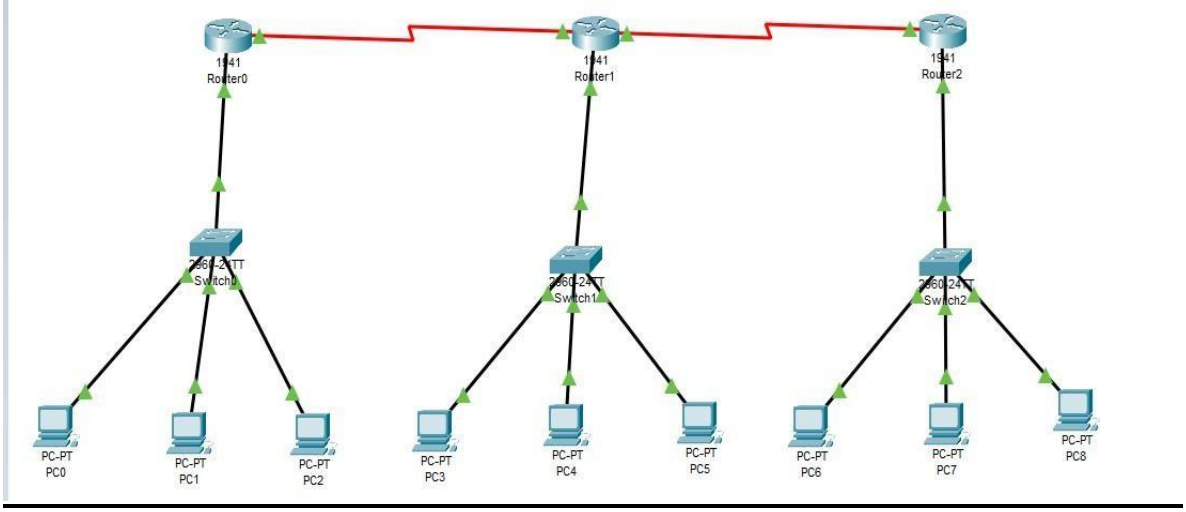


Result:
Hence the RIPv2 has been studied and verified through the given network

Practical No 7

Aim: Using Packet Tracer, create a network with three routers with OSPF and each router associated network will have minimum three PC and show Connectivity

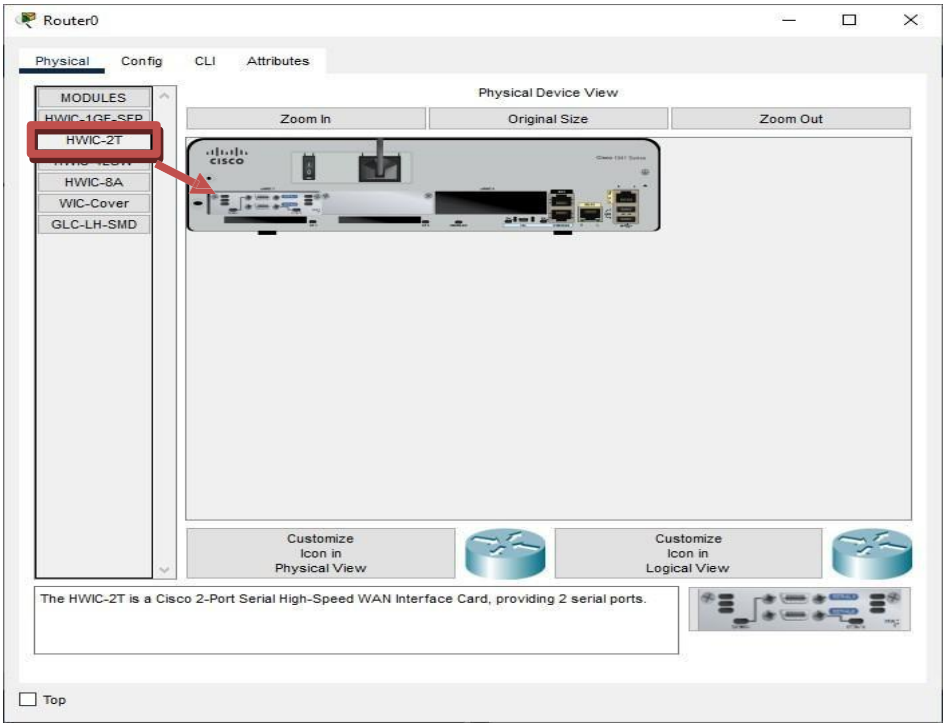
We use the following topology for the present case



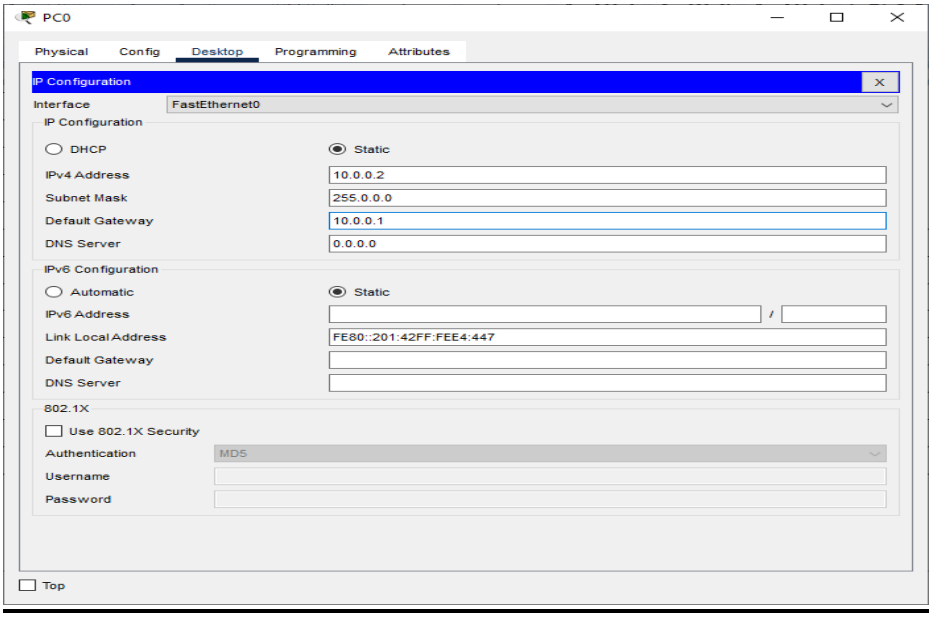
We configure the above network using the following IP addresses

Host	Interface	IP address	Default Gateway	Subnet Mask	Wildcard Mask
Router 0	G0/0	10.0.0.1		255.0.0.0	0.255.255.255
	S0/1/0	40.0.0.1			
Router 1	G0/0	20.0.0.1			
	S0/1/0	40.0.0.2			
	S0/1/1	50.0.0.1			
Router 2	G0/0	30.0.0.1			
	S0/1/1	50.0.0.2			
PC0	FastEthernet0	10.0.0.2	10.0.0.1		
PC1	FastEthernet0	10.0.0.3			
PC2	FastEthernet0	10.0.0.4			
PC3	FastEthernet0	20.0.0.2	20.0.0.1		
PC4	FastEthernet0	20.0.0.3			
PC5	FastEthernet0	20.0.0.4			
PC6	FastEthernet0	30.0.0.2	30.0.0.1		
PC7	FastEthernet0	30.0.0.3			
PC8	FastEthernet0	30.0.0.4			

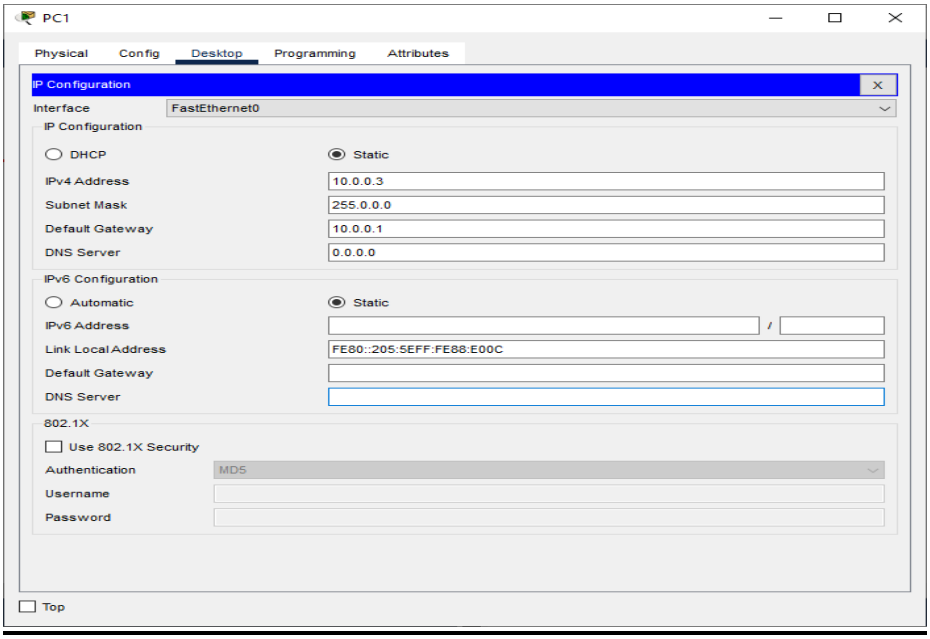
Adding Serial Interface in each Router



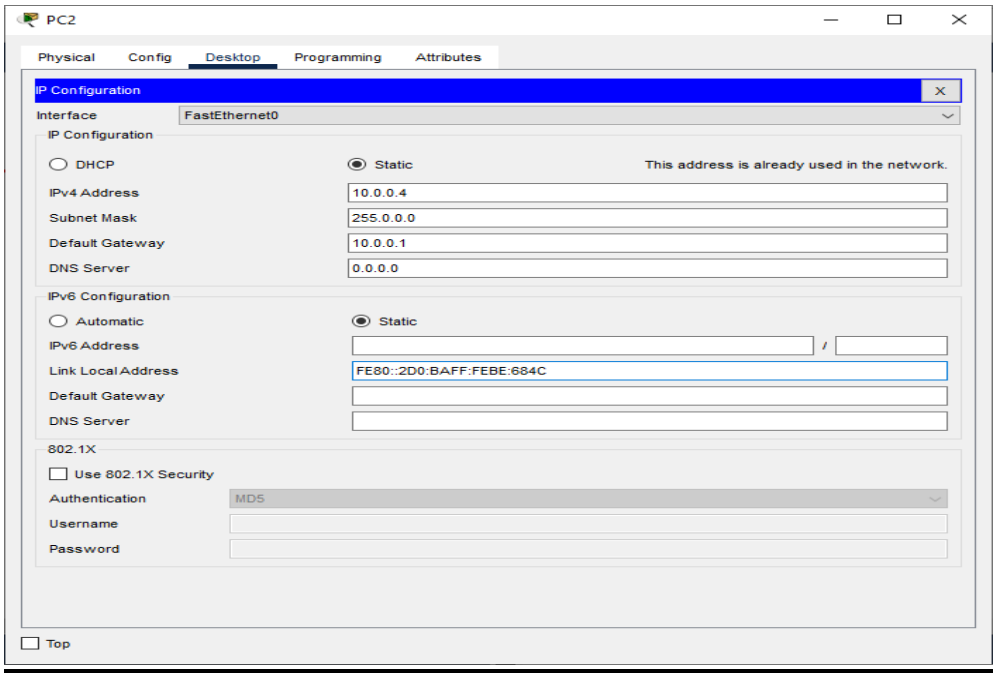
Configuring PC0:



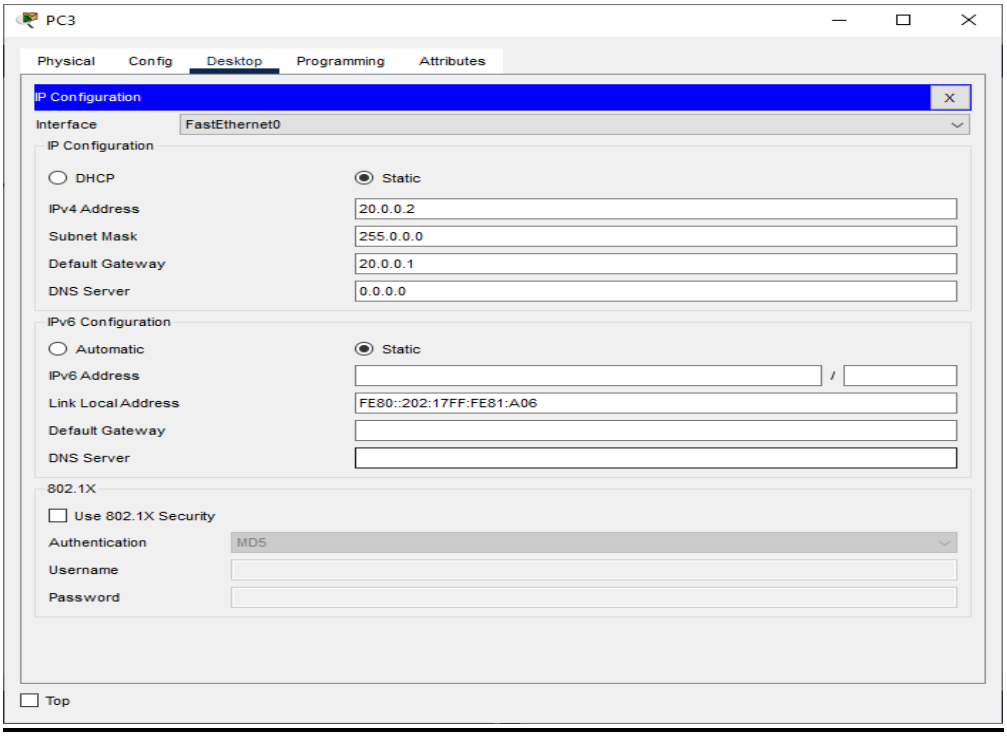
Configuring PC1:



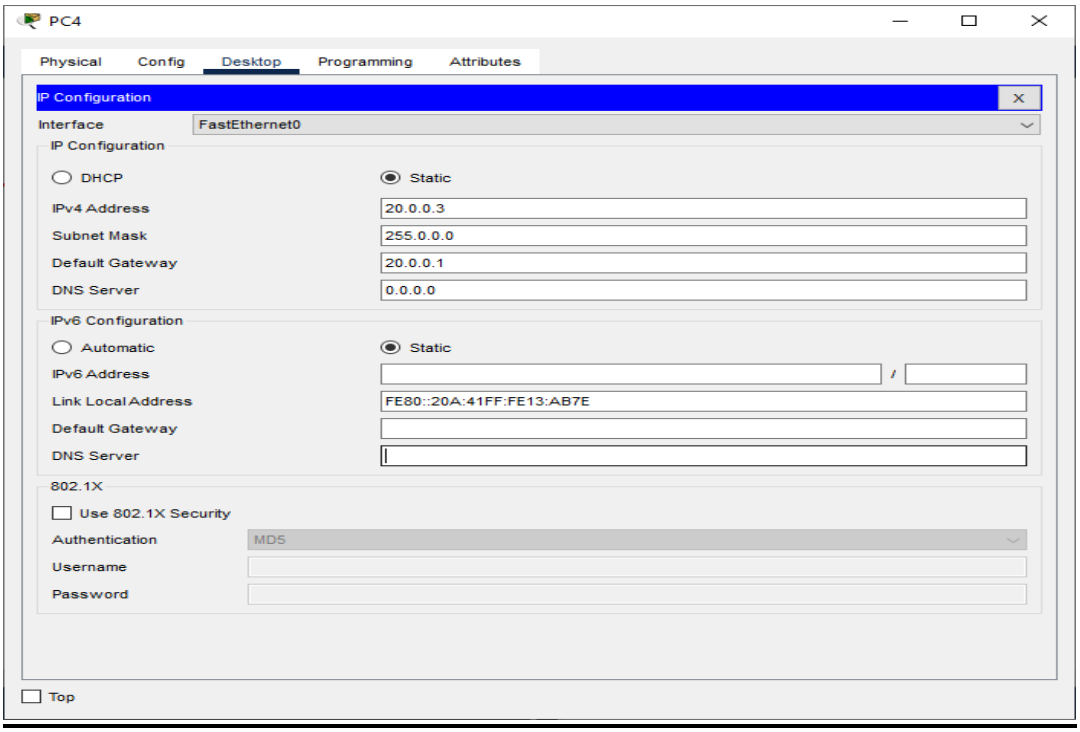
Configuring PC2:



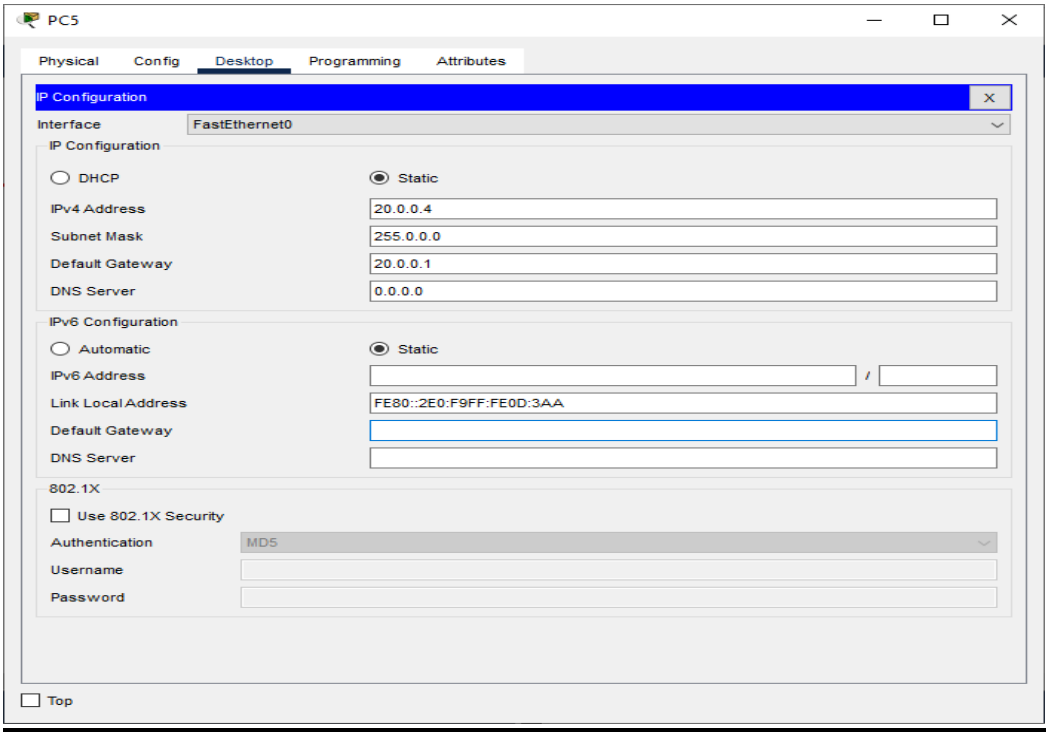
Configuring PC3:



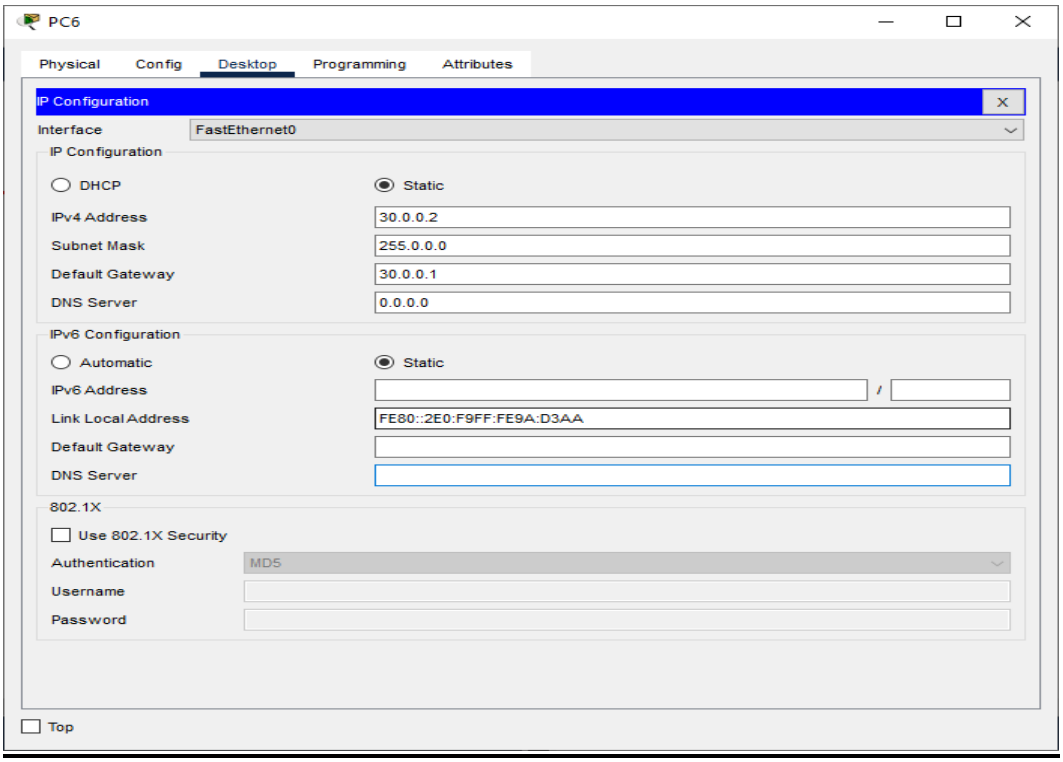
Configuring PC4:



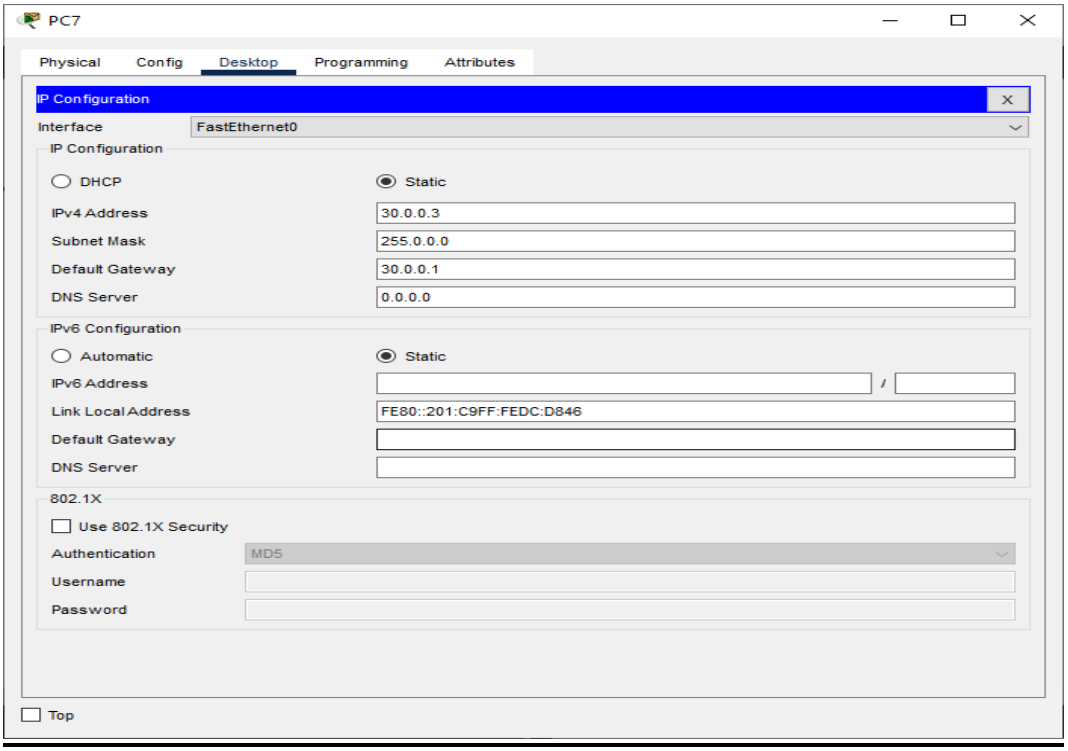
Configuring PC5:



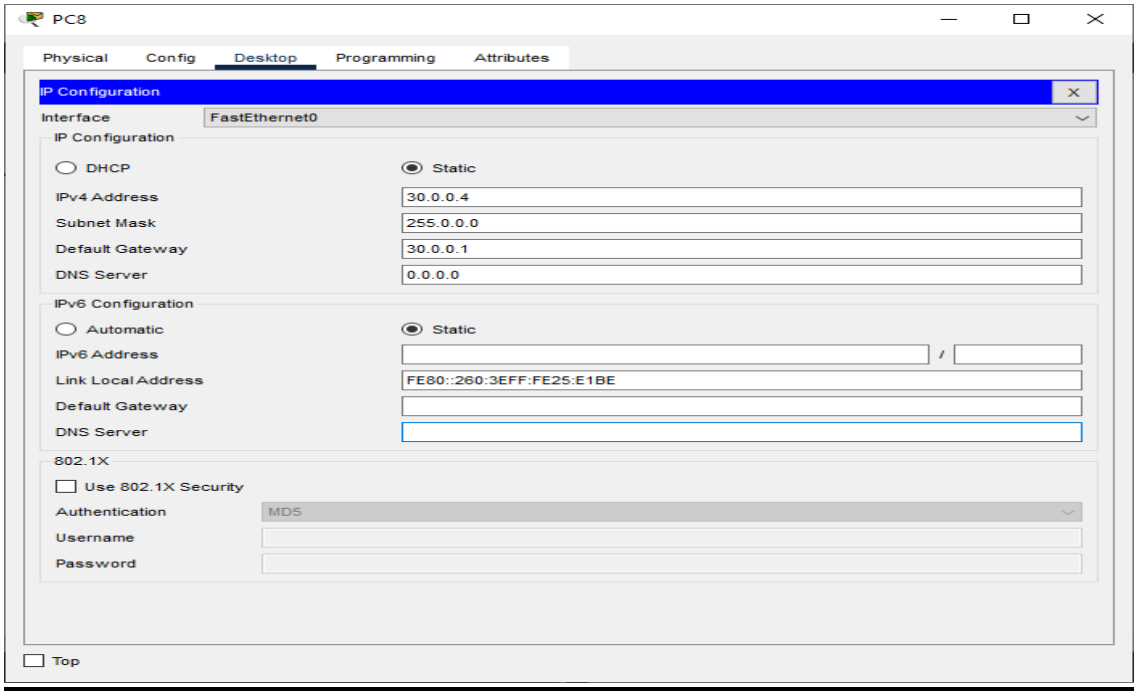
Configuring PC6:



Configuring PC7:

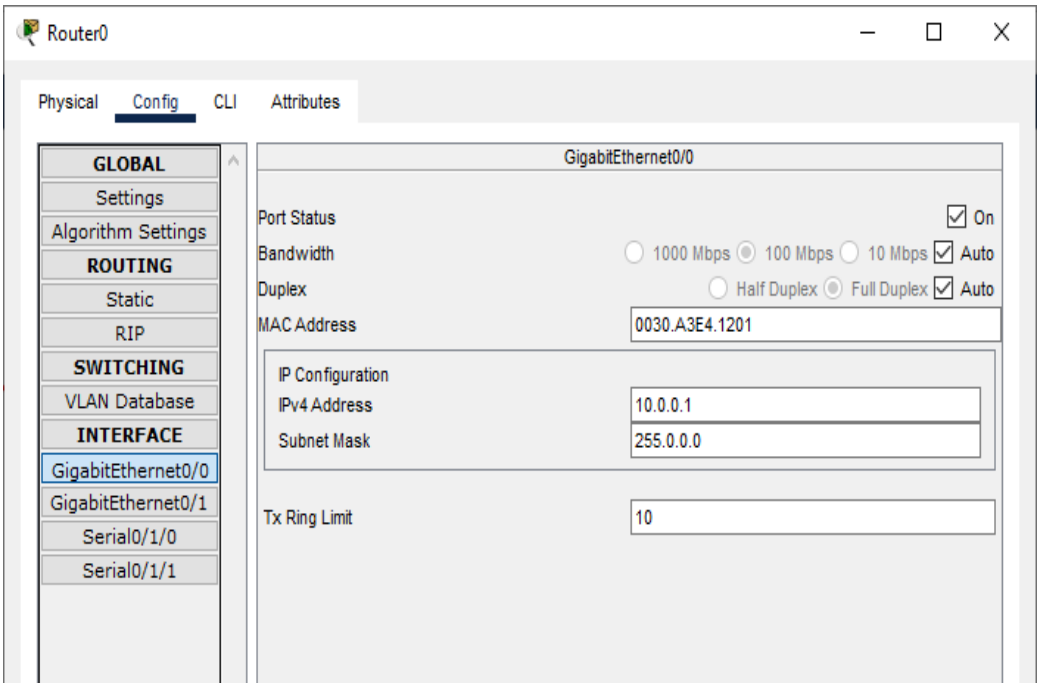


Configuring PC8:

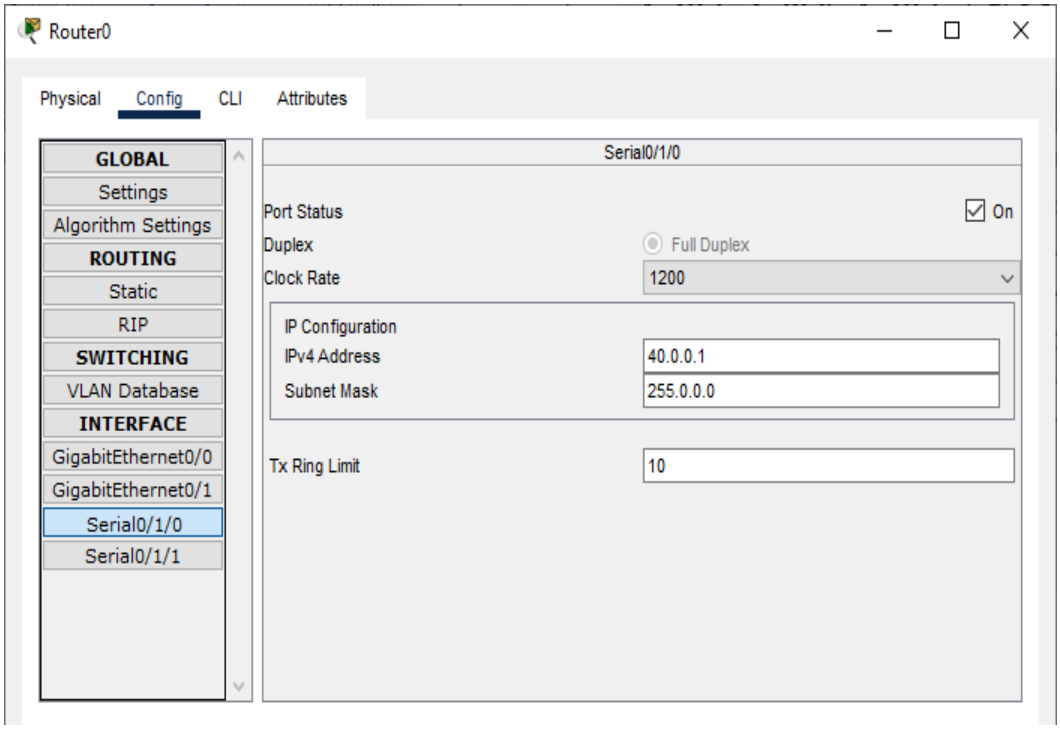


Configuring IP addresses on Router 0

i) Interface G0/0

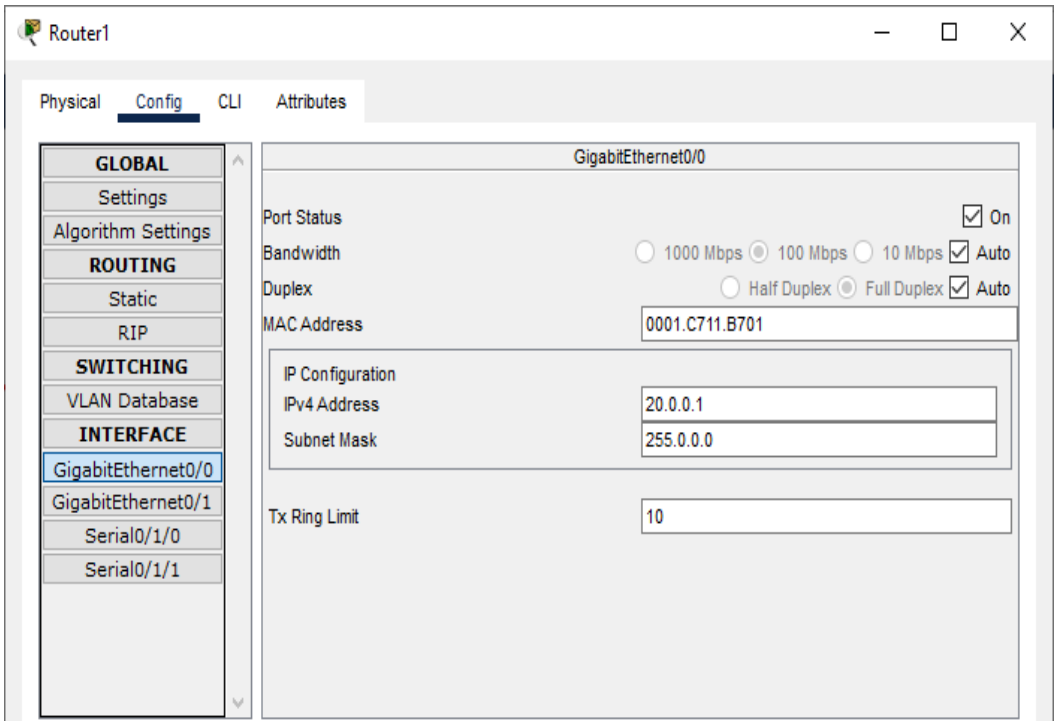


ii) Interface S0/1/0

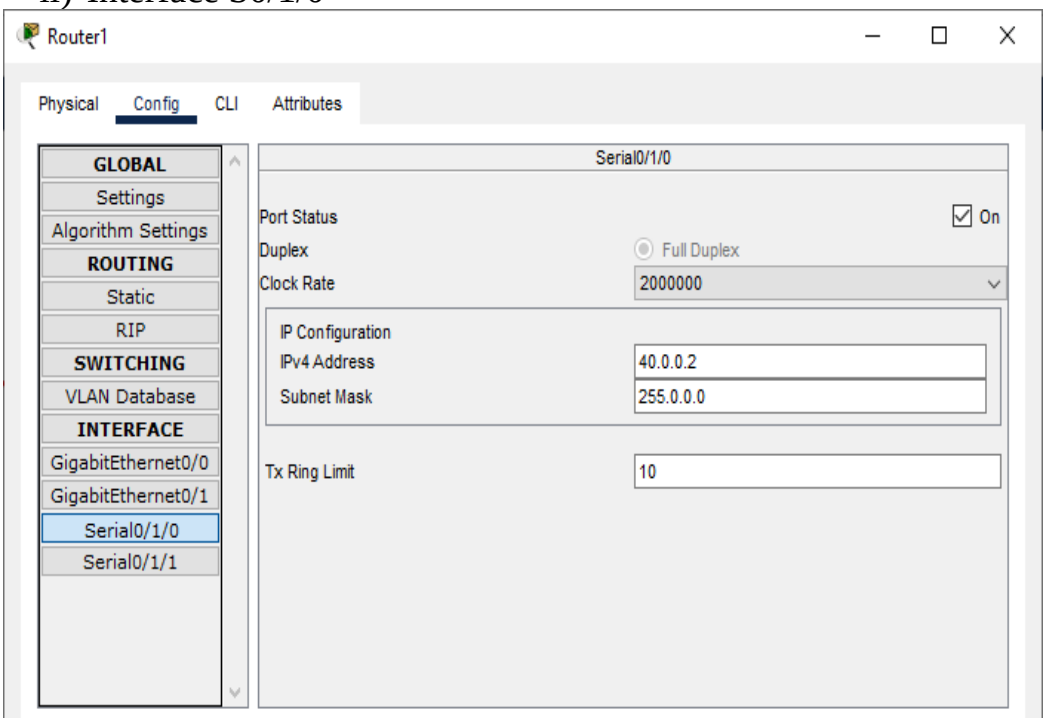


Configuring IP addresses on Router 1

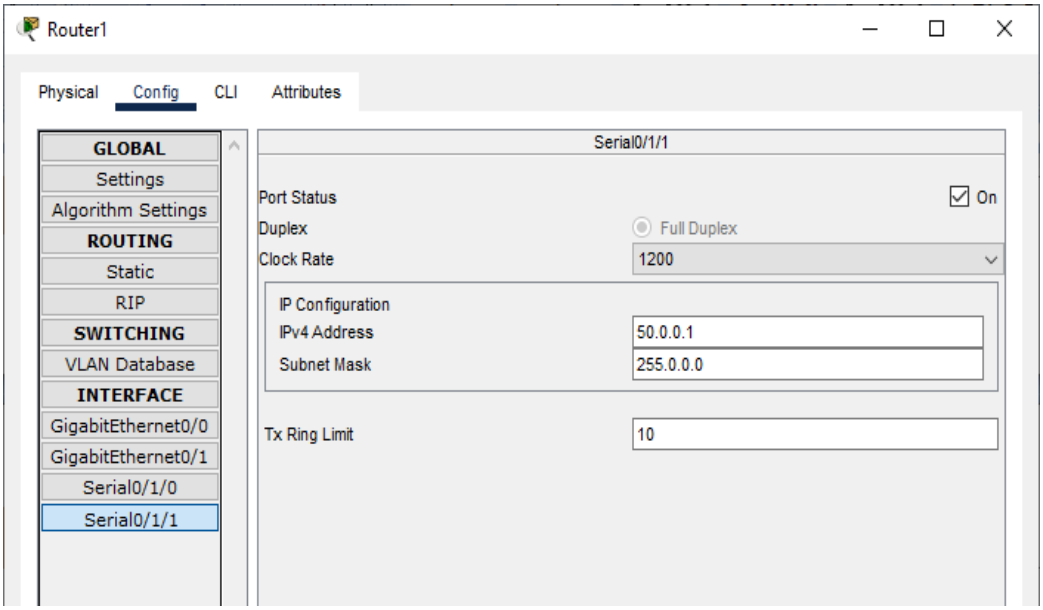
i) Interface G0/0



ii) Interface S0/1/0

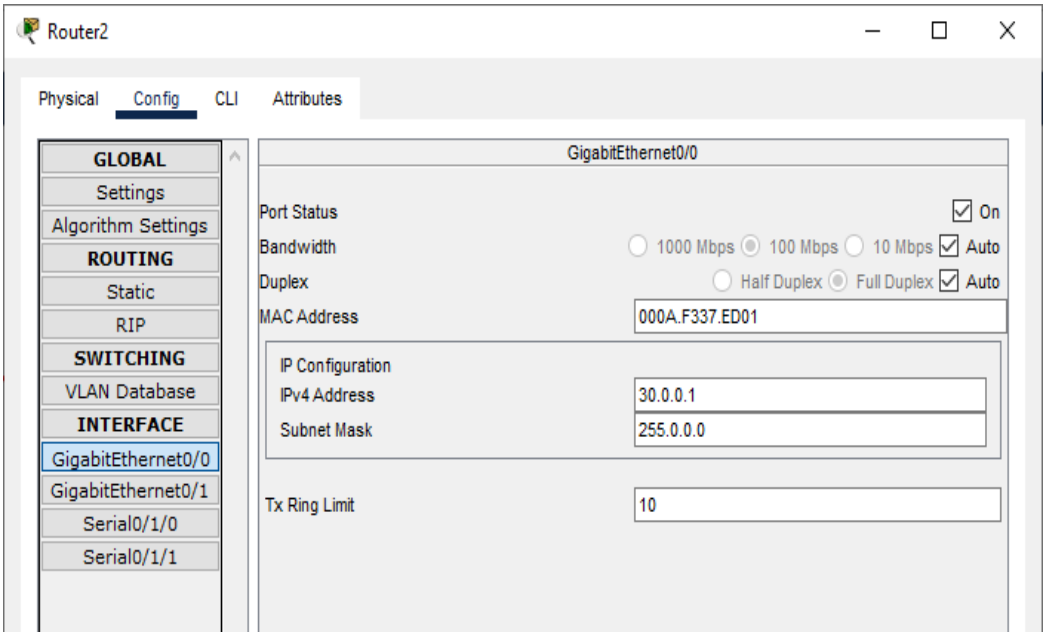


iii) Interface S0/1/1

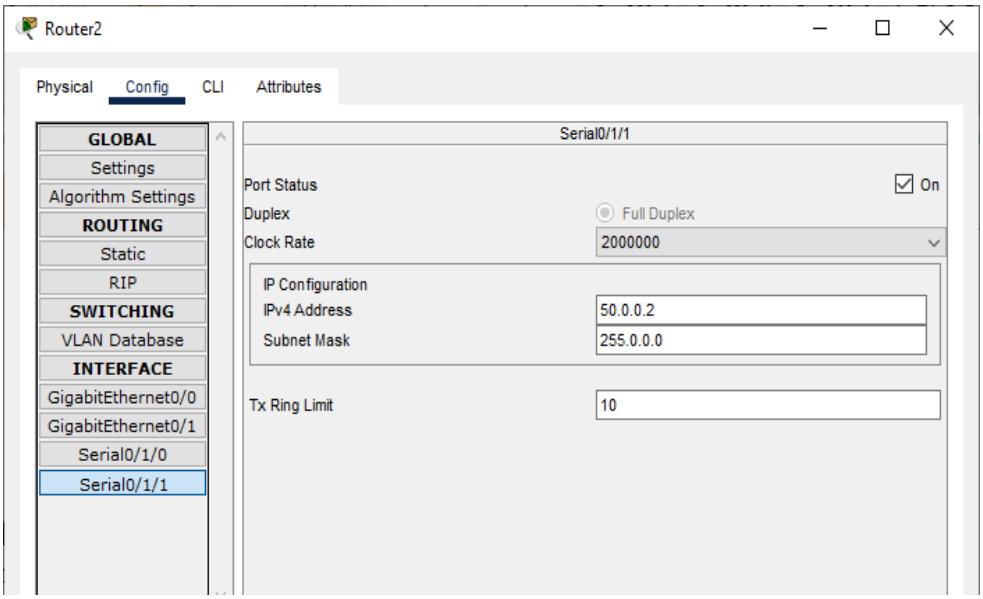


Configuring IP addresses on Router 2

i) Interface G0/0



ii) Interface S0/1/1



Configuring Router 0 for OSPF (using the CLI mode)

Router(config)#
Router(config)#router ospf 1
Router(config-router)#network 10.0.0.0 0.0.0.255 area 1
Router(config-router)#network 40.0.0.0
0.0.0.255 area 1
Router(config-router)#exit
Router(config)#

Configuring Router 1 for OSPF (using the CLI mode)

Router(config)#
Router(config)#router
ospf 1
Router(config-router)#
Router(config-router)#network 20.0.0.0 0.0 0.255 area 1
Router(config-router)#network 40.0.0.0 0.0 0.255 area 1
Router(config-router)#network 50.0.0.0

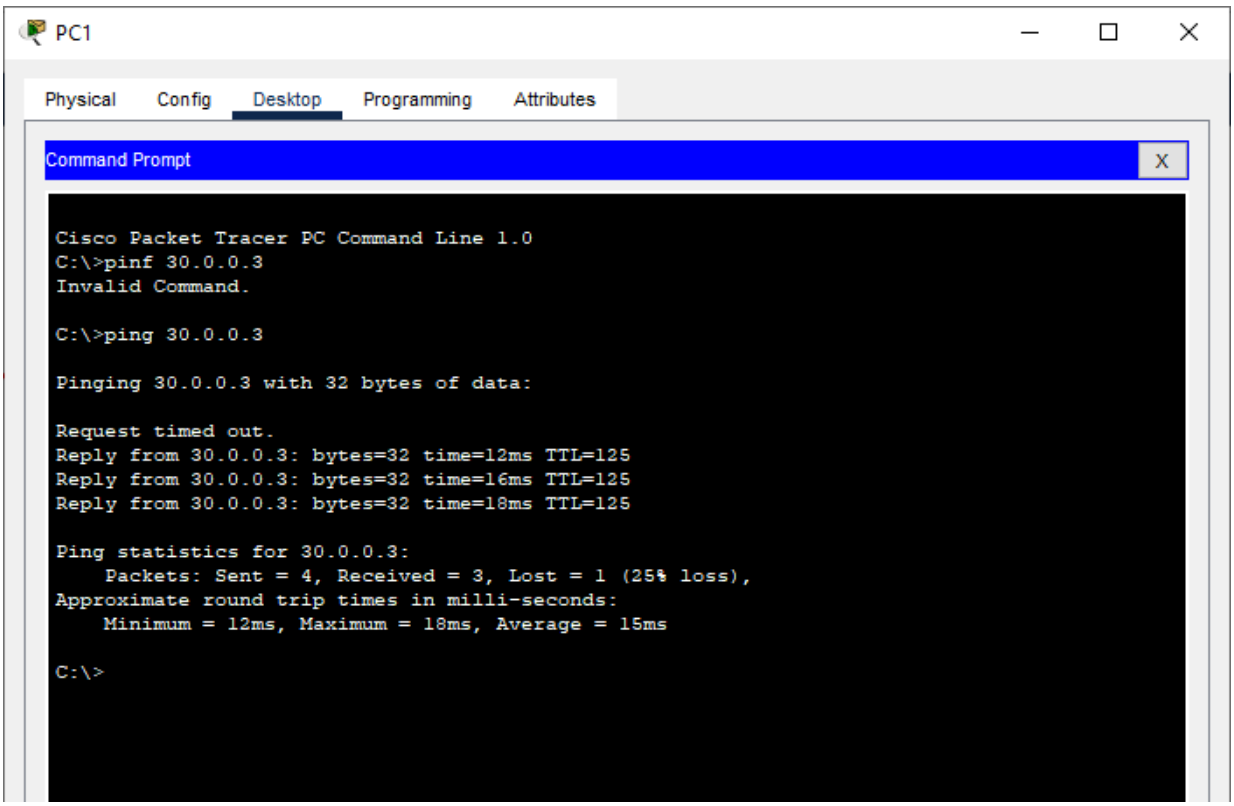
0.0.0.255 area 1
Router(config-router)#exit
Router(config)#

Configuring Router 2 for OSPF (using the CLI mode)

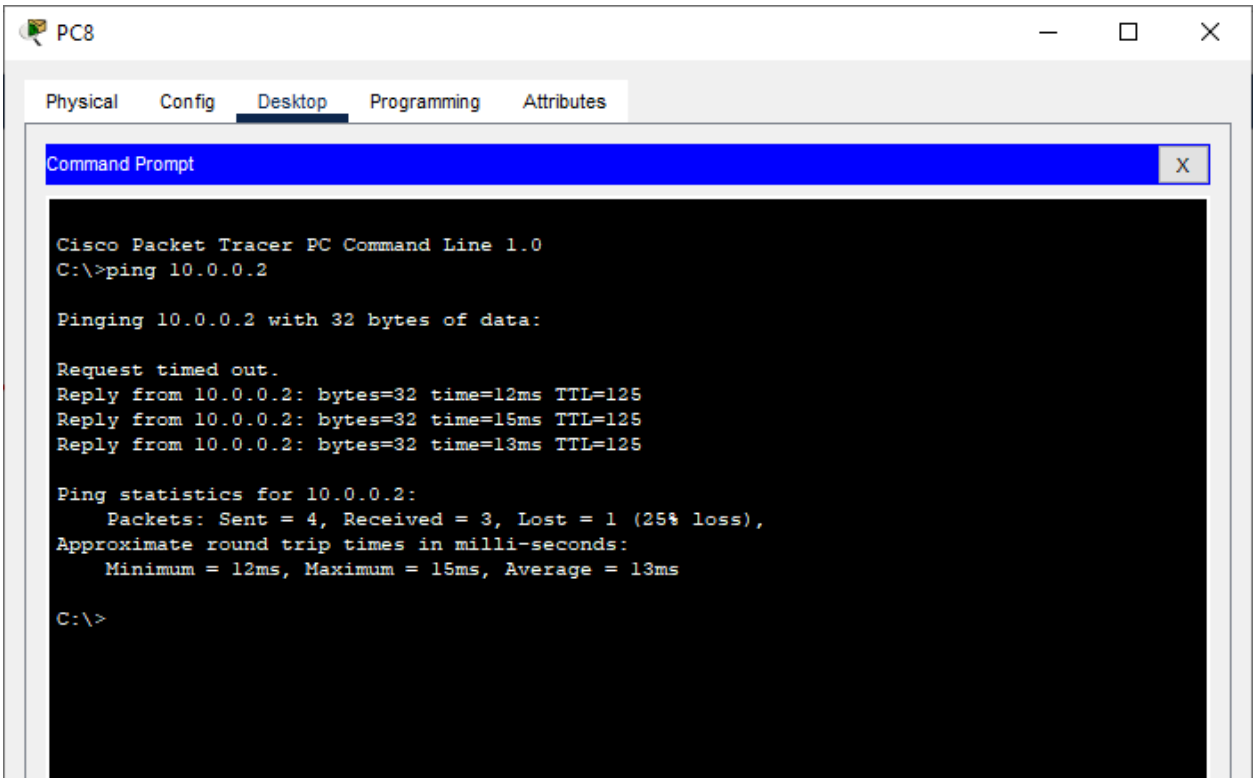
Router(config)#
Router(config)#router
ospf 1
Router(config-router)#
Router(config-router)#network 30.0.0.0 0.0.0.255 area 1
Router(config-router)#network 50.0.0.0
0.0.0.255 area 1
Router(config-router)# exit
Router(config)#

Checking the connectivity by using the ping command

i) Pinging PC8 (ip address 10.30 0.4) from PC1



ii) Pinging PC0 (ip address 10.10.0.2) from PC8

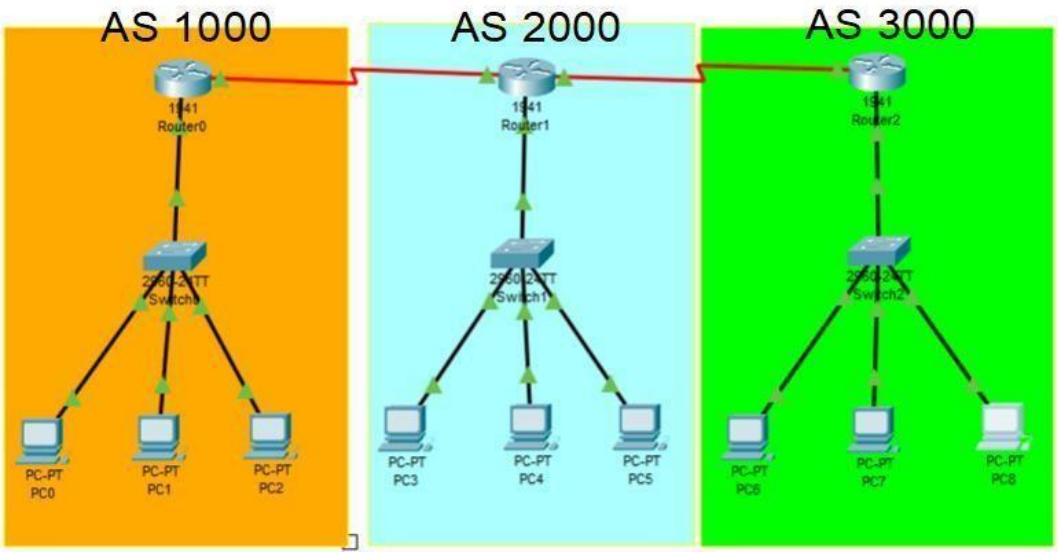


Result:
Hence the OSPF has been studied and verified through the given network

Practical No 8

Aim: Using Packet Tracer, create a network with three routers with BGP and each router associated network will have minimum three PC and show Connectivity

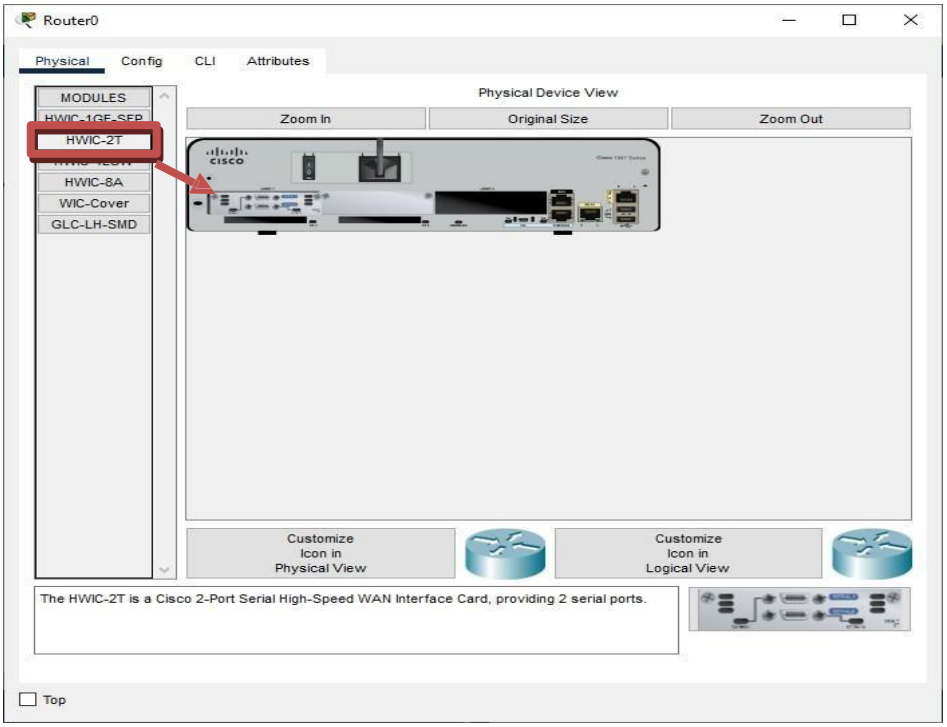
We use the following topology for the present case



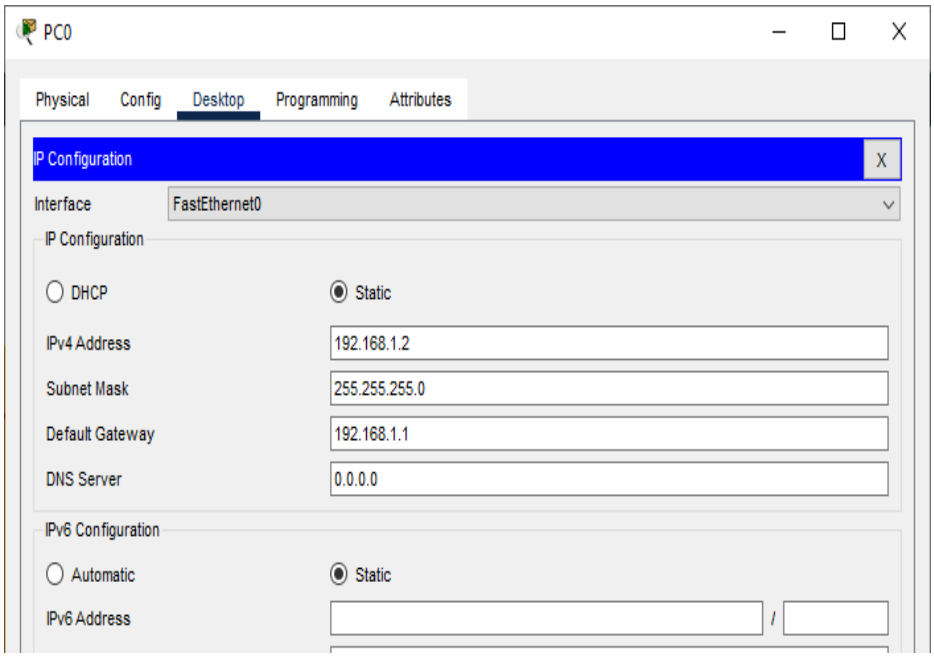
We configure the above network using the following IP addresses

Host	Interface	IP address	Network Address	Default Gateway
Router 0 AS 1000	G0/0	192.168.1.1	192.168.1.0	
	S0/1/0	10.0.0.1	10.0.0.0	
Router 1 AS 2000	G0/0	192.168.2.1	192.168.2.0	
	S0/1/0	10.0.0.2	10.0.0.0	
	S0/1/1	20.0.0.1	20.0.0.0	
Router 2 AS 3000	G0/0	192.168.3.1	192.168.3.0	
	S0/1/1	20.0.0.2	20.0.0.0	
PC0	FastEthernet0	192.168.1.2	192.168.1.0	192.168.1.1
PC1	FastEthernet0	192.168.1.3		
PC2	FastEthernet0	192.168.1.4		
PC3	FastEthernet0	192.168.2.2	192.168.2.0	192.168.2.1
PC4	FastEthernet0	192.168.2.3		
PC5	FastEthernet0	192.168.2.4		
PC6	FastEthernet0	192.168.3.2	192.168.3.0	192.168.3.1
PC7	FastEthernet0	192.168.3.3		
PC8	FastEthernet0	192.168.3.4		

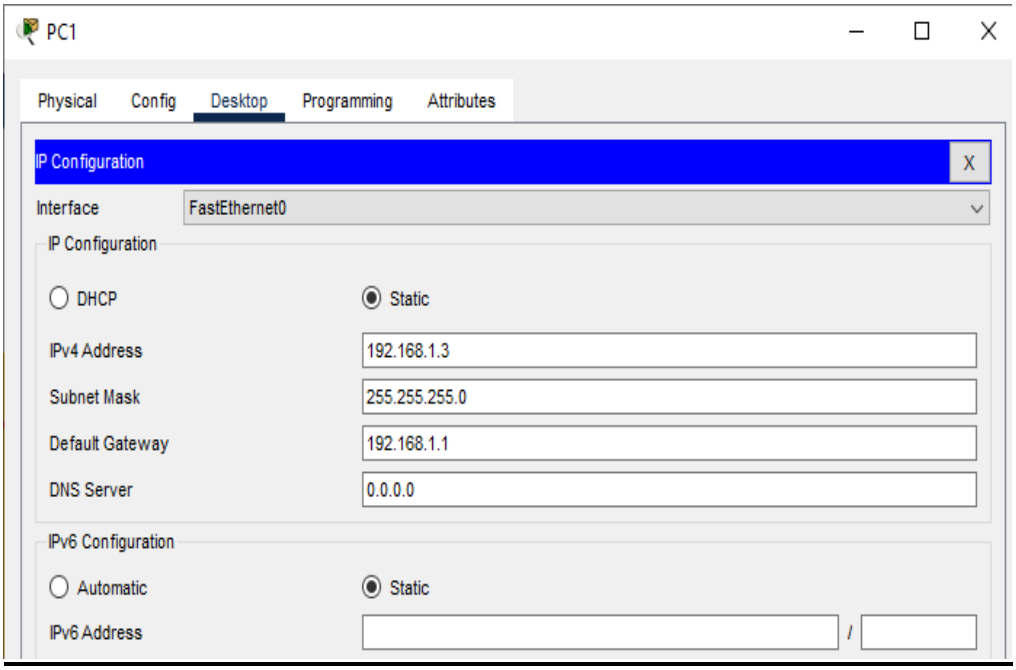
Adding Serial Interface in each Router



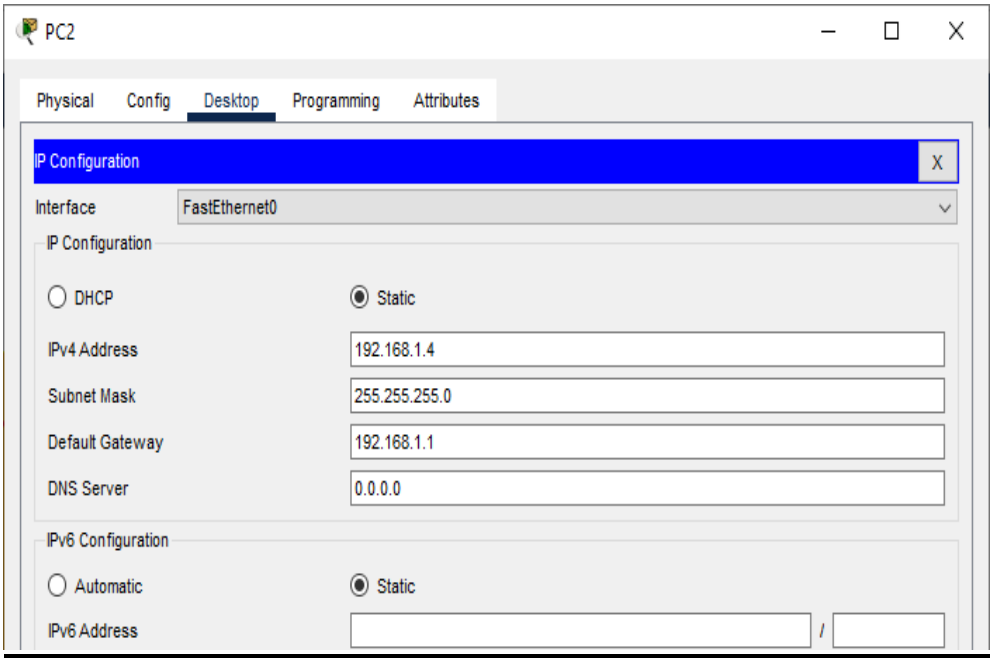
Configuring PC0:



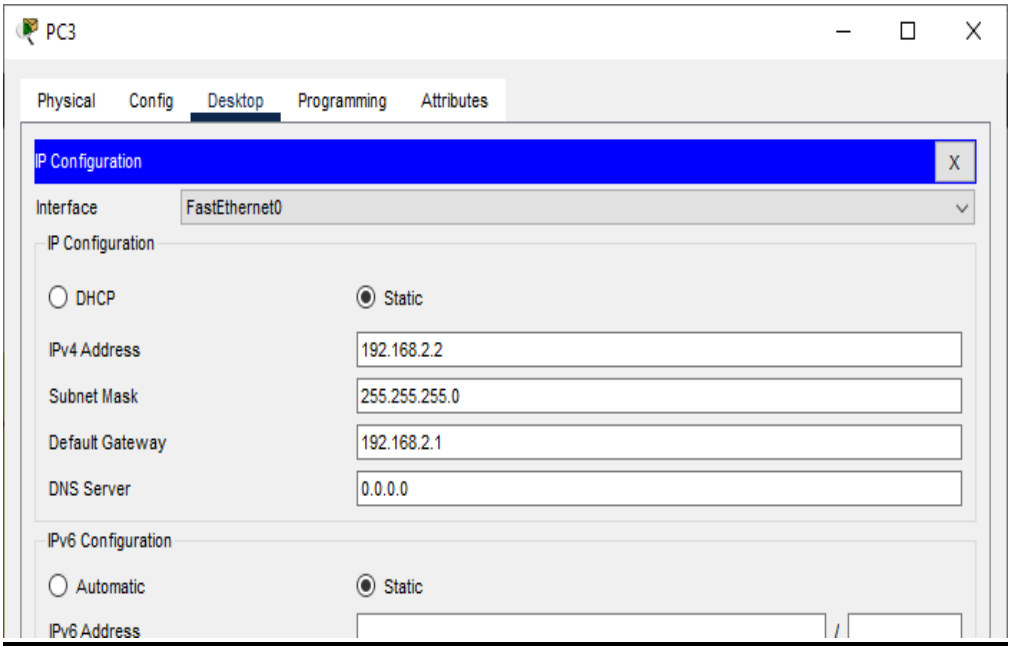
Configuring PC1:



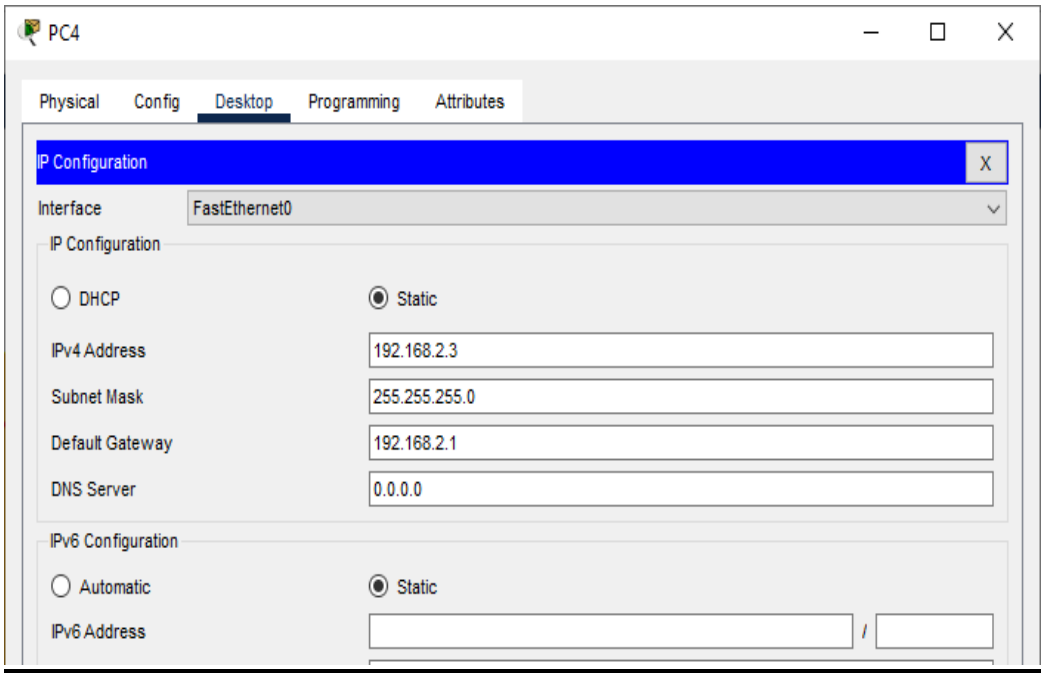
Configuring PC2:



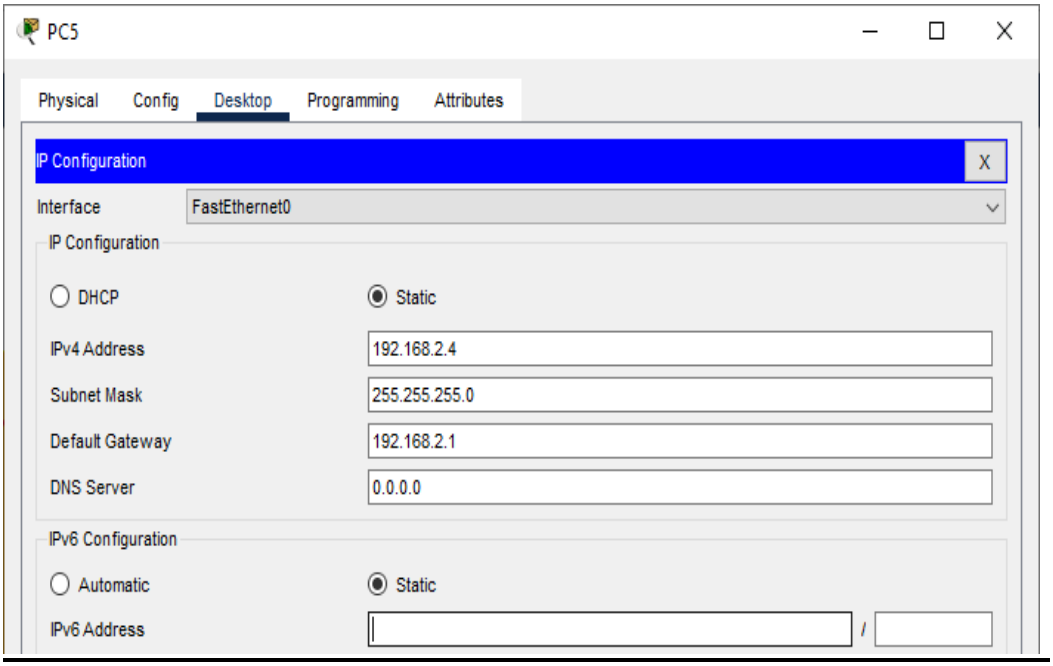
Configuring PC3:



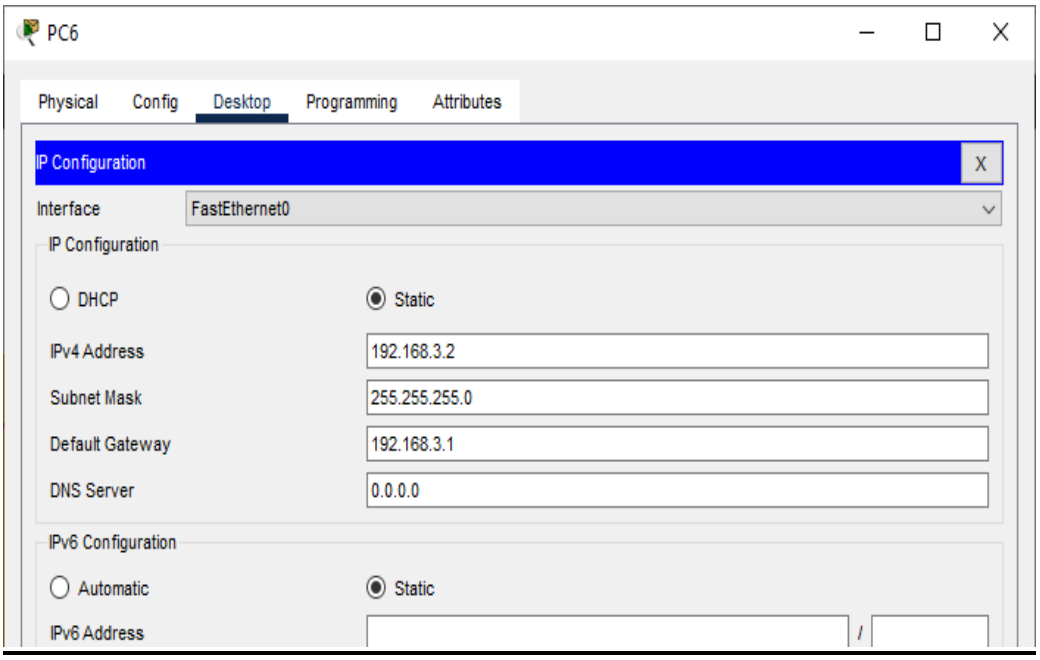
Configuring PC4:



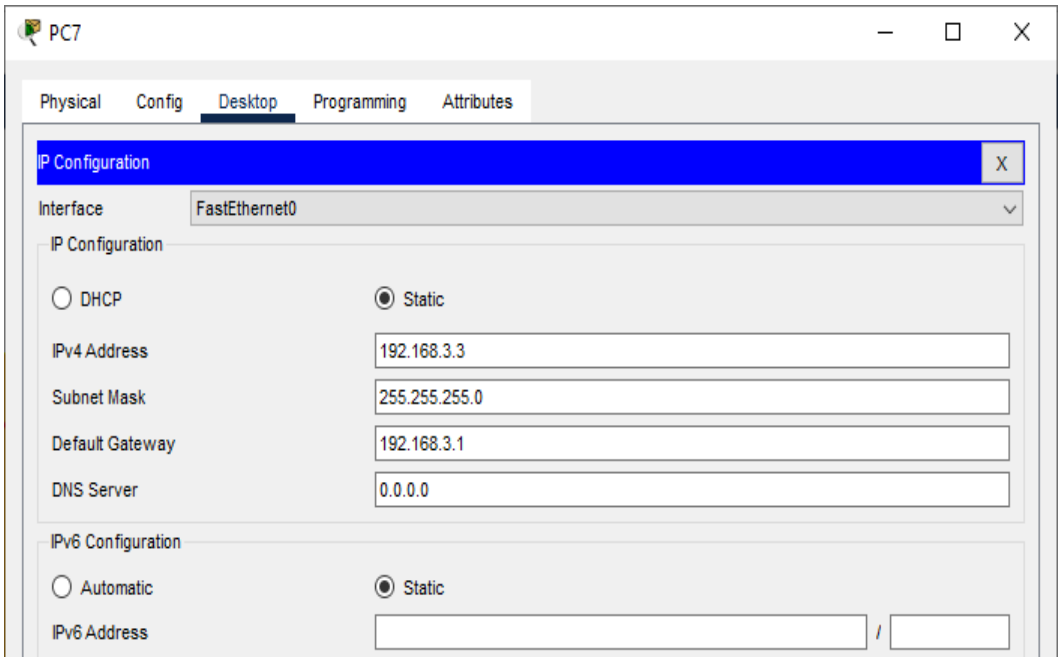
Configuring PC5:



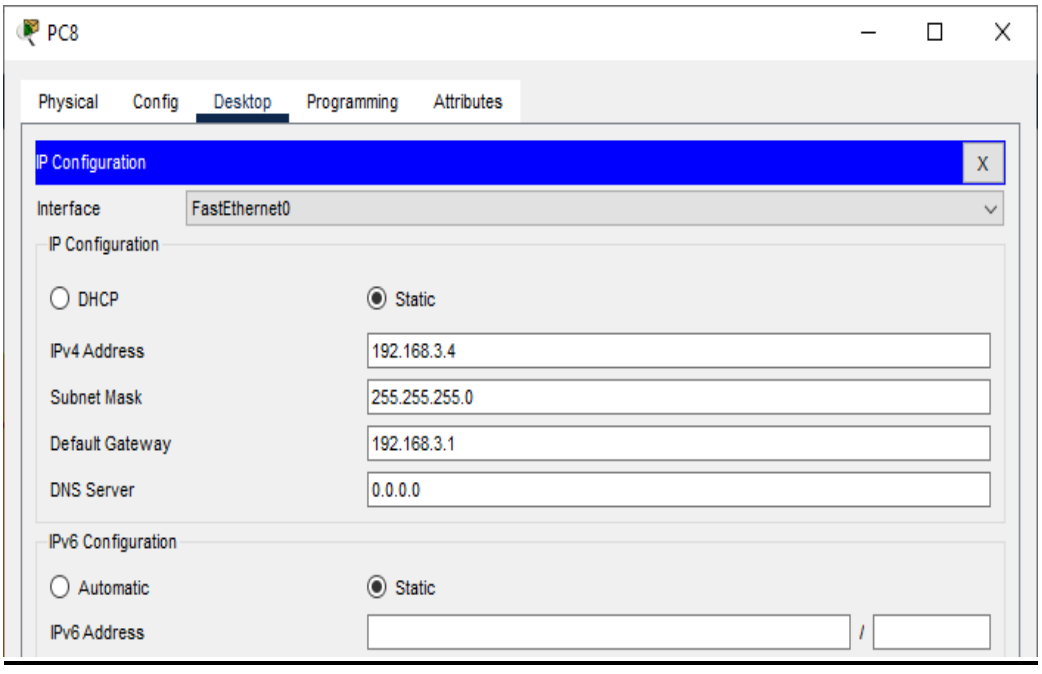
Configuring PC6:



Configuring PC7:

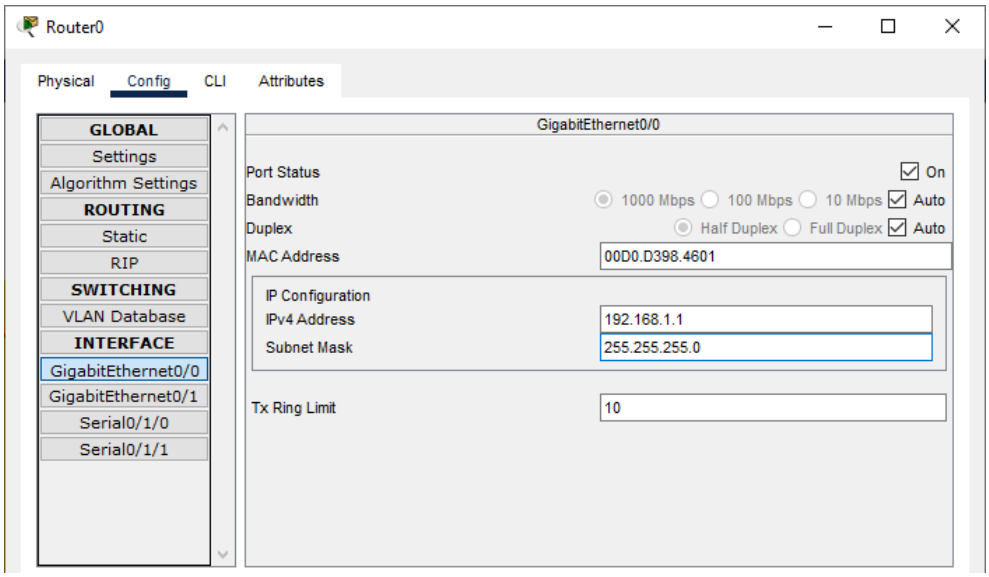


Configuring PC8:

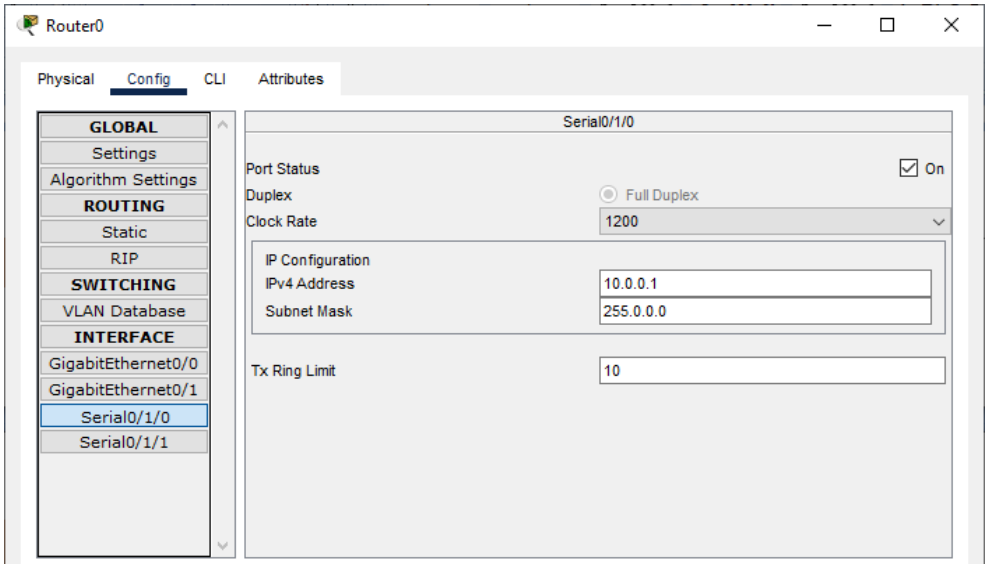


Configuring IP addresses on Router 0

i) Interface G0/0

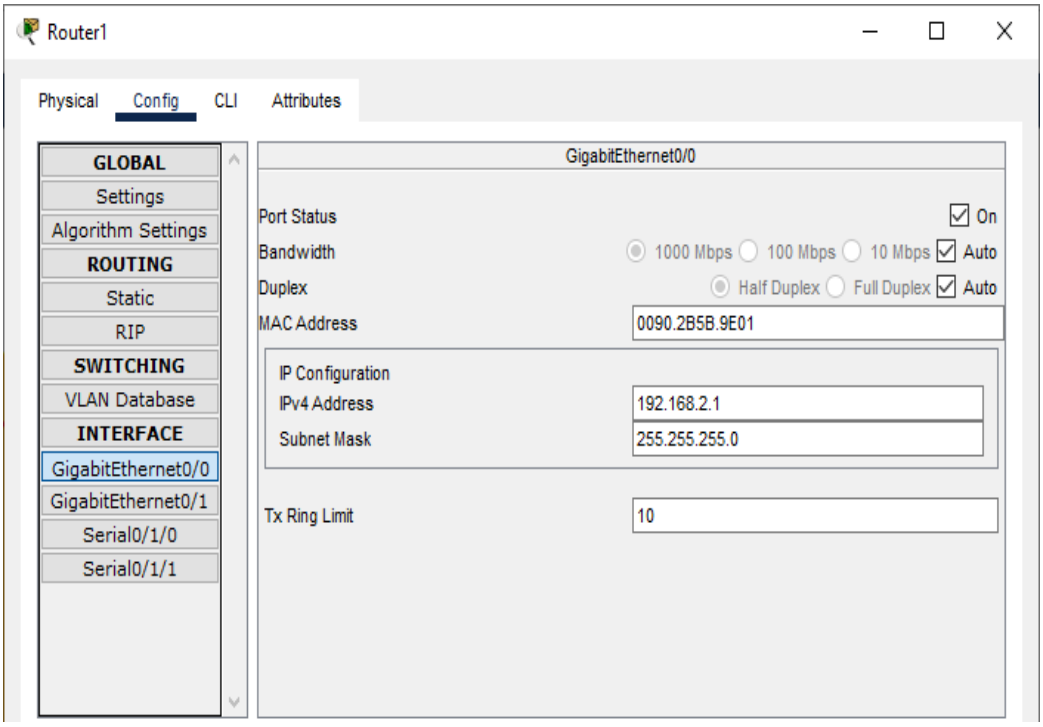


ii) Interface S0/1/0

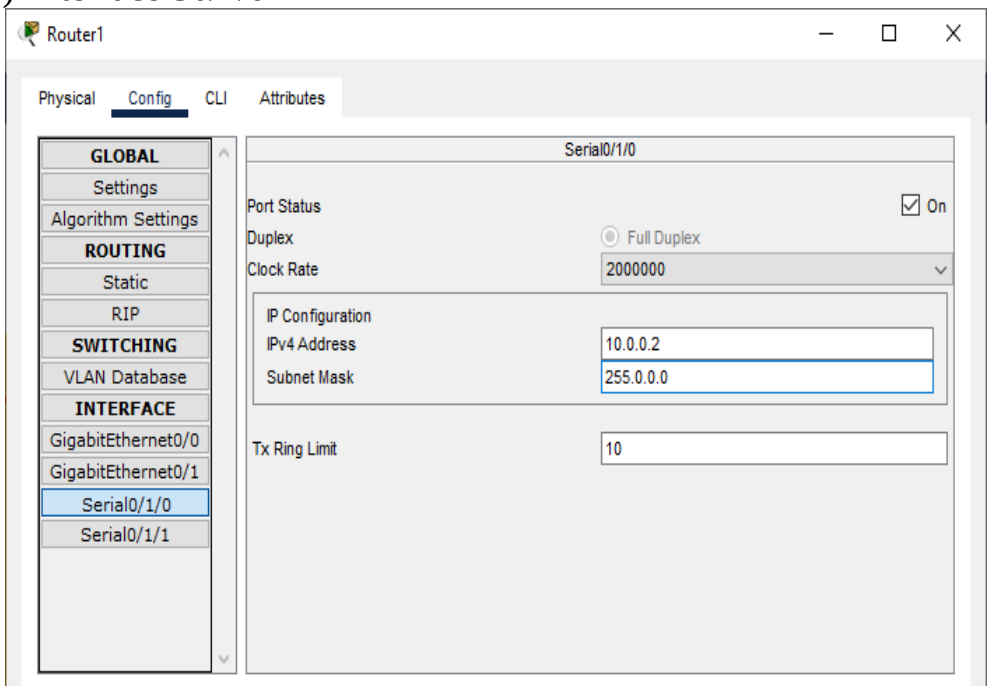


Configuring IP addresses on Router 1

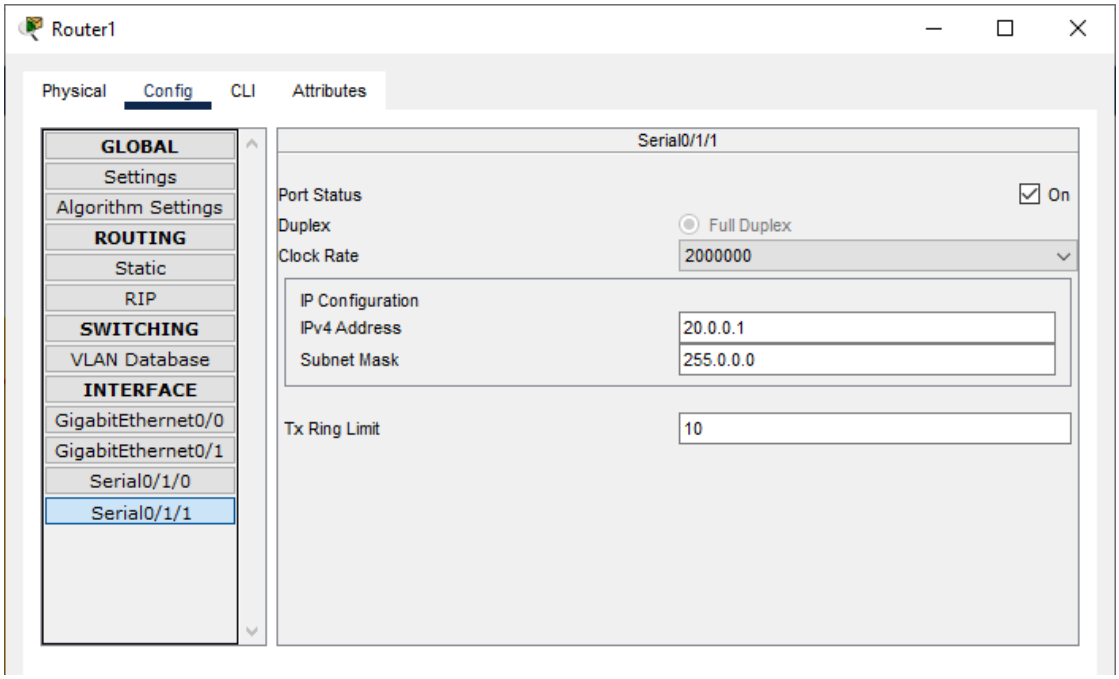
i) Interface G0/0



ii) Interface S0/1/0

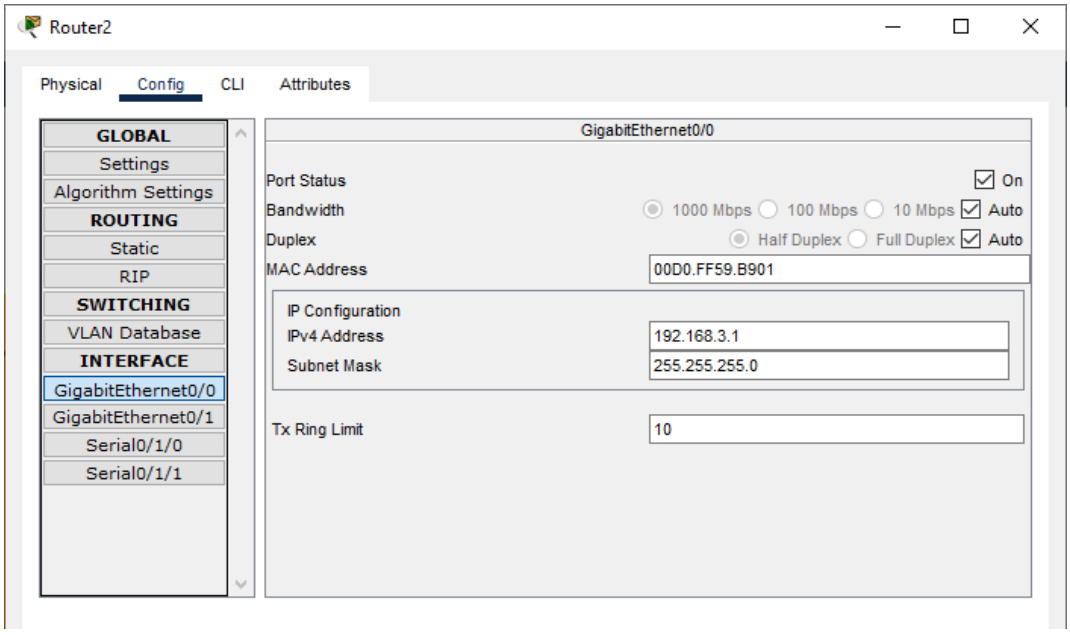


iii) Interface S0/1/1

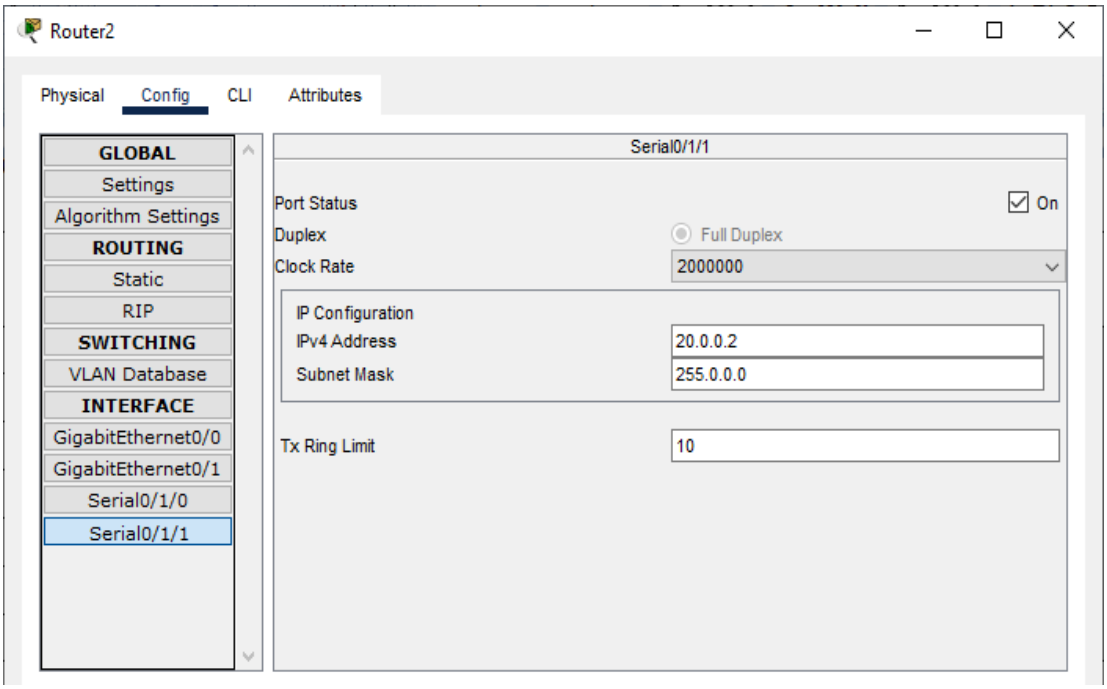


Configuring IP addresses on Router 2

i) Interface G0/0



ii) Interface S0/1/1



Configuring Router 0 for BGP (using the CLI mode)

Router>enable
Router#configure terminal
Router(config)#
Router(config)#router bgp
1000
Router(config-router)#
Router(config-router)#network 10.0.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#neighbor 10.0.0.2 remote-as 2000

Configuring Router 1 for BGP (using the CLI mode)

Router>enable
Router#configure terminal
Router(config)#
Router(config)#router bgp
2000
Router(config-router)#network 10.0.0.0

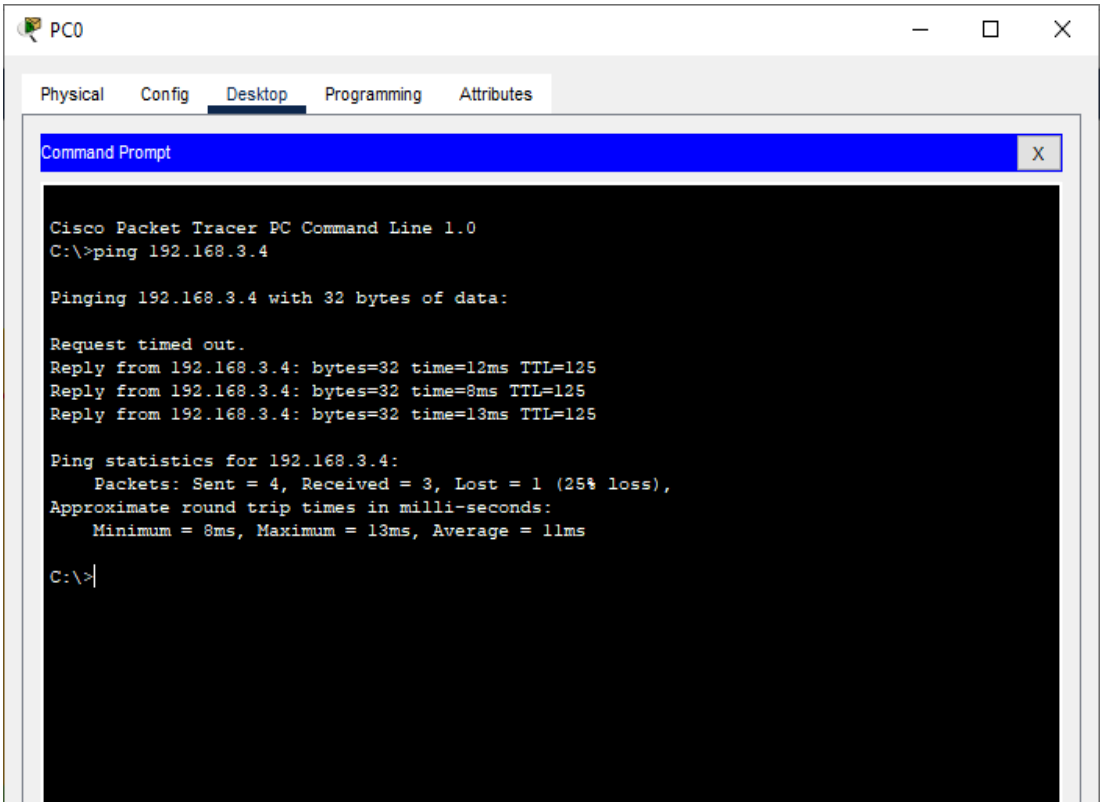
Router(config-router)#network 20.0.0.0
Router(config-router)#network 192.168.2.0
Router(config-router)#neighbor 10.0.0.1 remote-as 1000
Router(config-router)#neighbor 20.0.0.2 remote-as 3000

Configuring Router 2 for BGP (using the CLI mode)

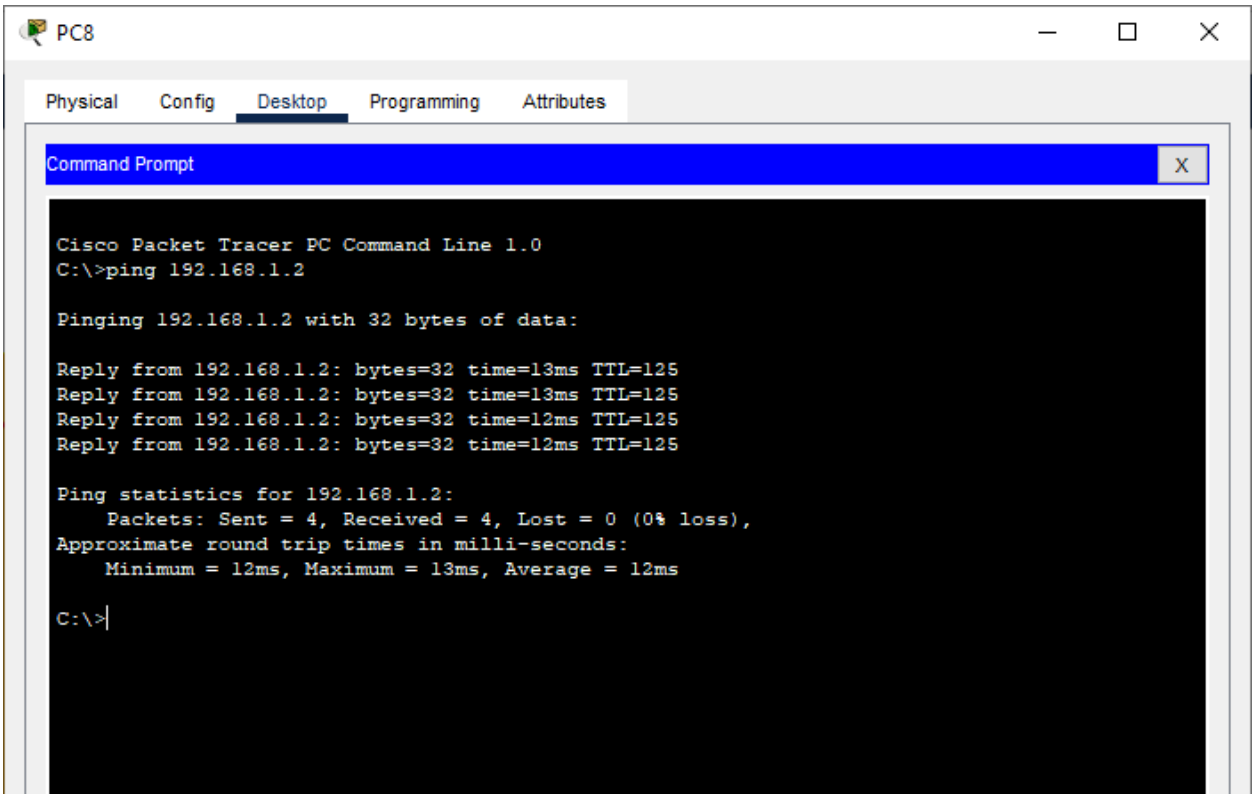
Router>enable
Router#configure terminal
Router(config)#
Router(config)#router bgp
3000
Router(config-router)#
Router(config-router)#network 20.0.0.0
Router(config-router)#network 192.168.3.0
Router(config-router)#neighbor 20.0.0.1 remote-as 2000

Checking the connectivity by using the ping command

i) Pinging PC8 (ip address 192.168.3.4) from PC1



ii) Pinging PC0 (ip address 192.168.1.2) from PC8



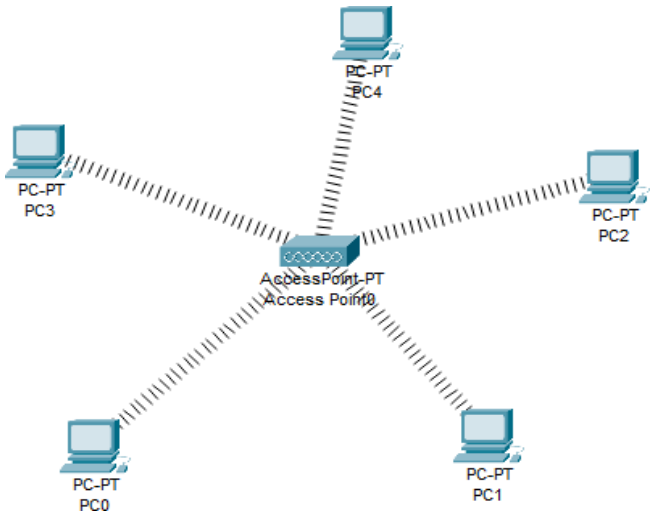
Result:

Hence the BGP has been studied and verified through the given network

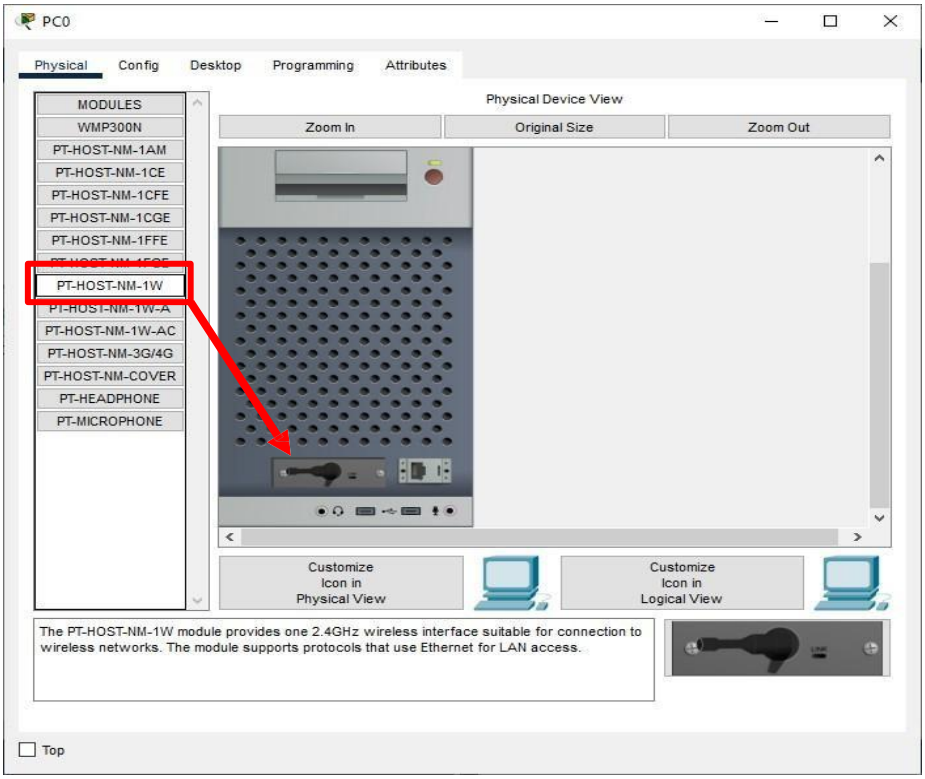
Practical No 9

Aim: Using Packet Tracer, create a wireless network of multiple PCs using appropriate access point.

We use the following topology for the present case (5PCs and an Access Point)

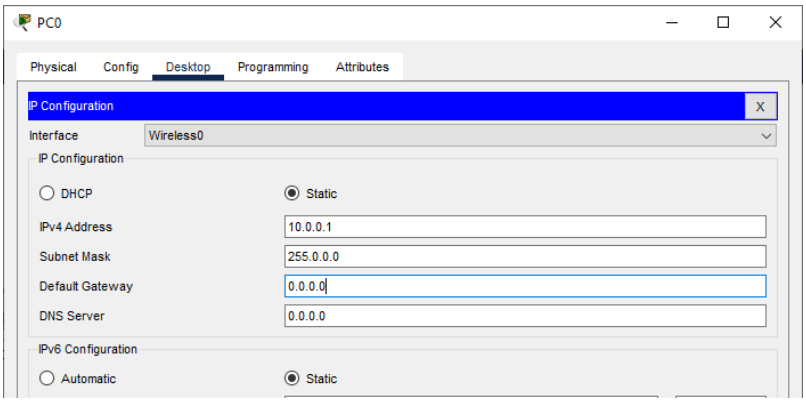


Add a Wireless interface to each PC as follows

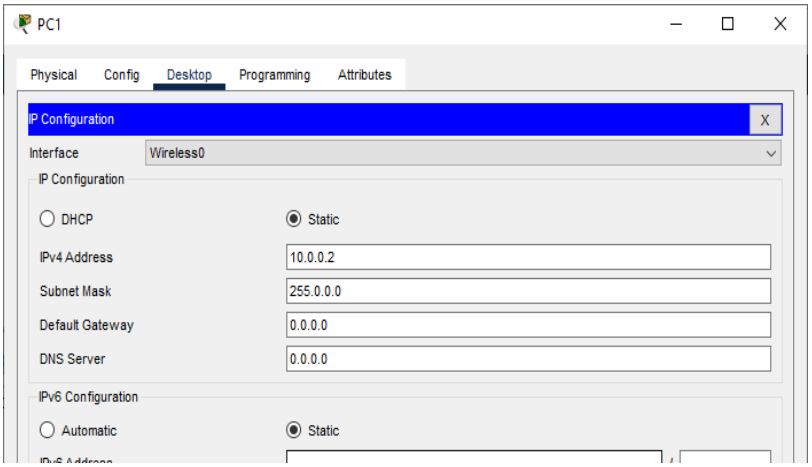


Assigning IP Address to each PC (select Static)

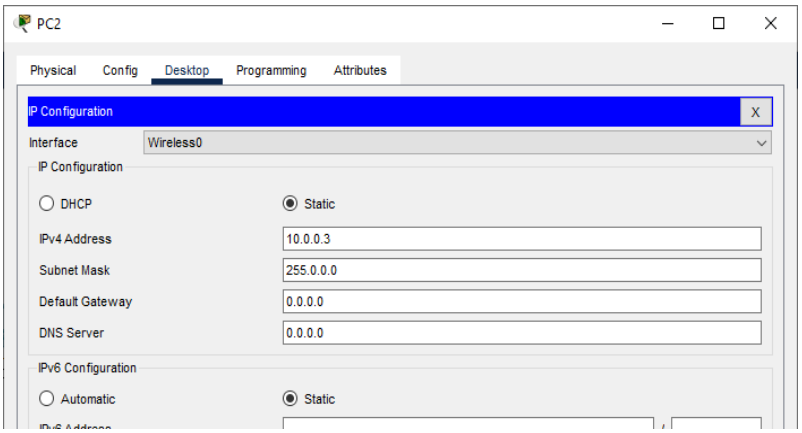
1) PC0 :



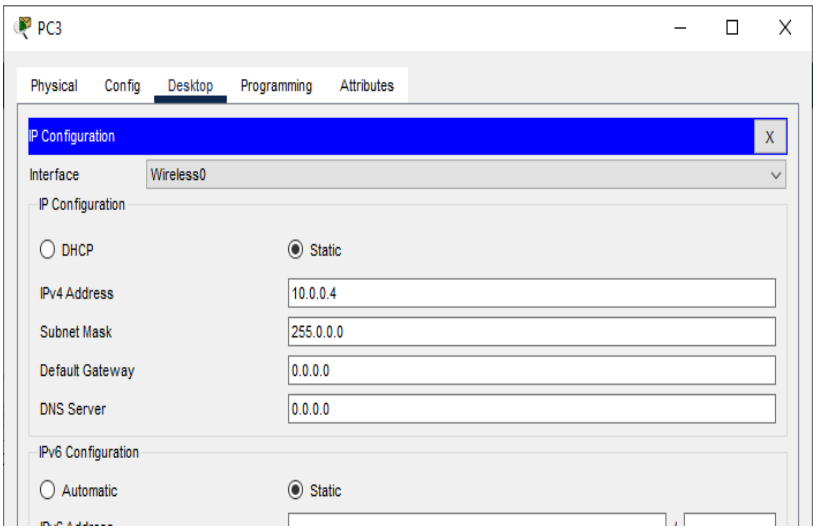
2) PC1 :



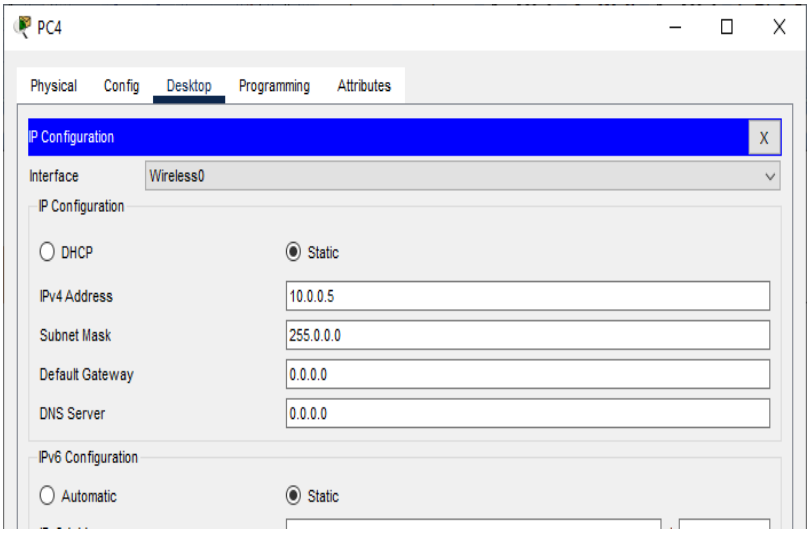
3) PC2 :



4) PC3 :



5) PC4 :

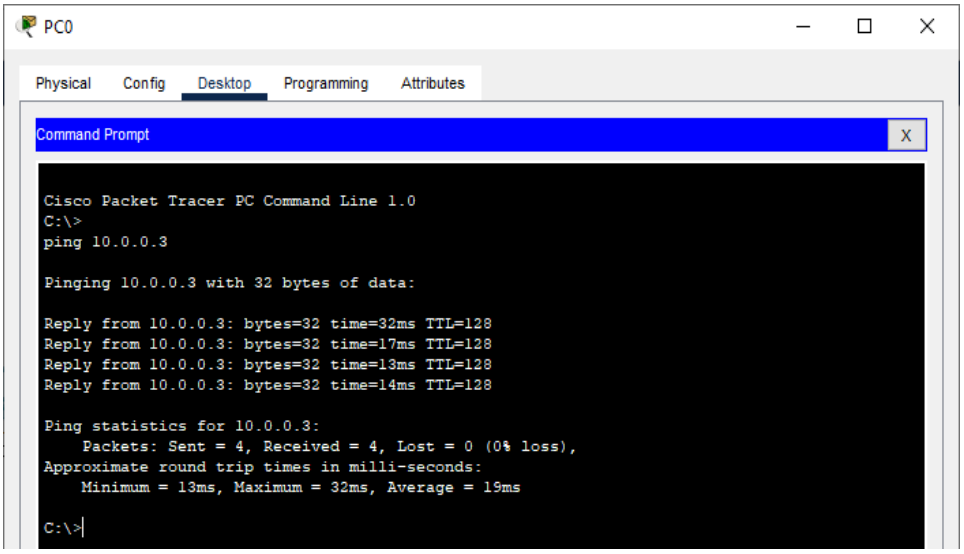


The IP addresses assigned are

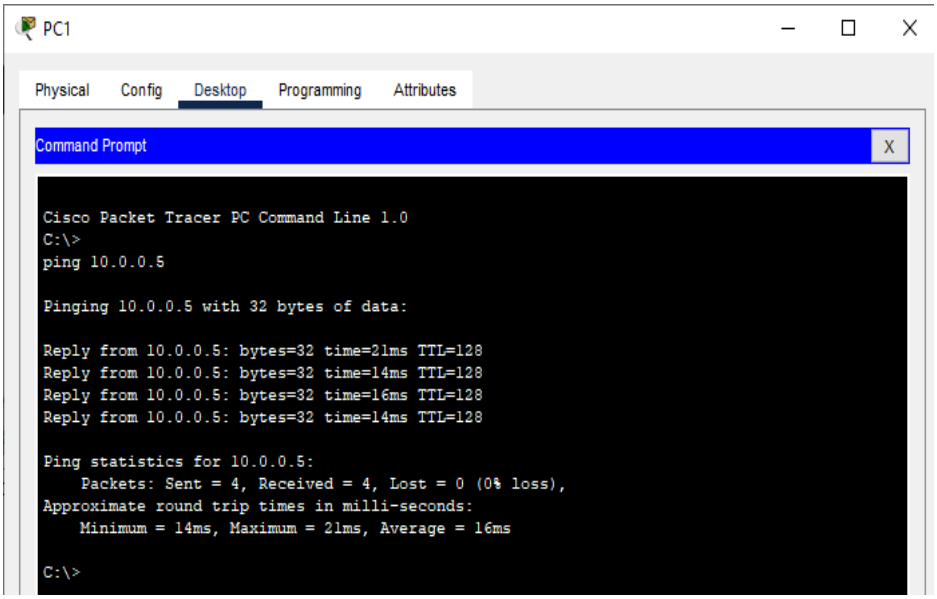
Host	**IP address**
PC0	10.0.0.1
PC1	10.0.0.2
PC2	10.0.0.3
PC3	10.0.0.4
PC4	10.0.0.5

We verify the connectivity by sending ping message from any PC to any other

PC Pinging PC2 (10.0.0.3) from PC0 (10.0.0.1)



Pinging PC4 (10.0.0.5) from PC1 (10.0.0.2)



Result:

Hence a wireless network of multiple pc's using access point is created.