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

Theory:

RIP is one of the dynamic routing protocols and the first distance-vector routing protocol that uses the hop count as a routing metric. A lower hop count is preferred.

Each router between the source and destination network is counted as one hop. RIP prevents routing loops by imposing a maximum number of hops on the path between source and destination.

In RIP, Every 30 seconds, each router broadcasts its entire routing table to its nearest neighbors.

Pros and Cons of RIP Protocol

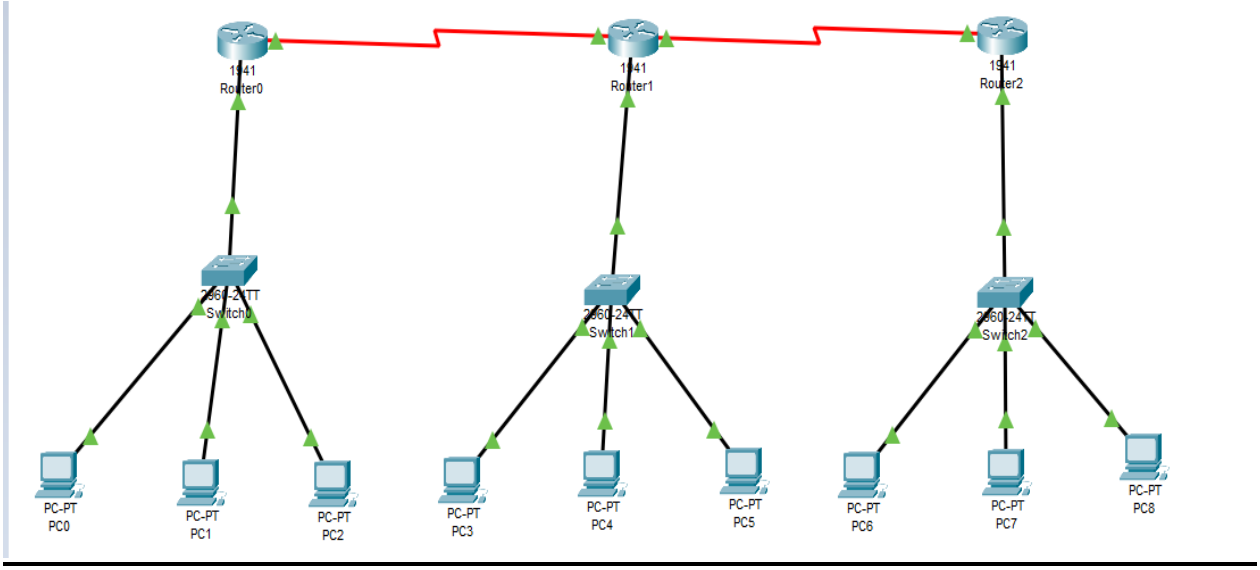
Pros:

1. The RIP protocol is ideal for small networks since it is simple to learn and configure.
2. RIP routing is guaranteed to work with nearly all routers.
3. When the network topology changes, RIP does not require an update.

Cons:

1. RIP does not support variable length subnet masks
2. RIP transmits updates every 30 seconds, which cause traffic and consumes bandwidth.
3. RIP hop counts are restricted to 15, hence any router beyond that distance is deemed infinity and becomes unreachable.
4. The rate of convergence is slow in RIP compared to other routing protocols. When a link fails, finding alternate network paths takes a long time.
5. RIP does not support multiple paths on the same route, which may result in extra routing loops.

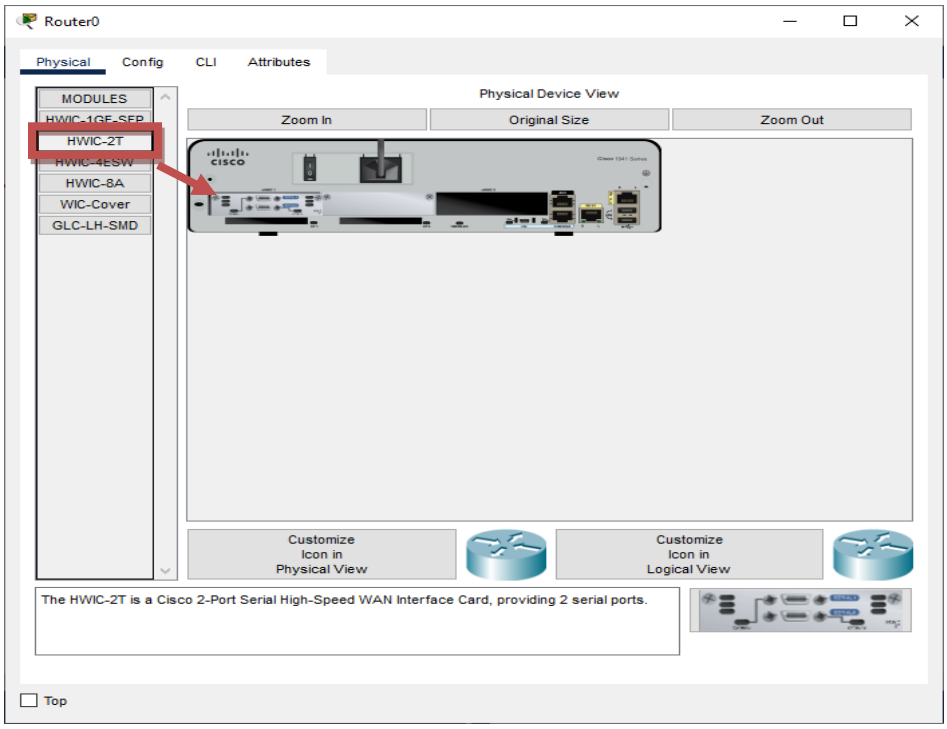
We use the following topology for the present case



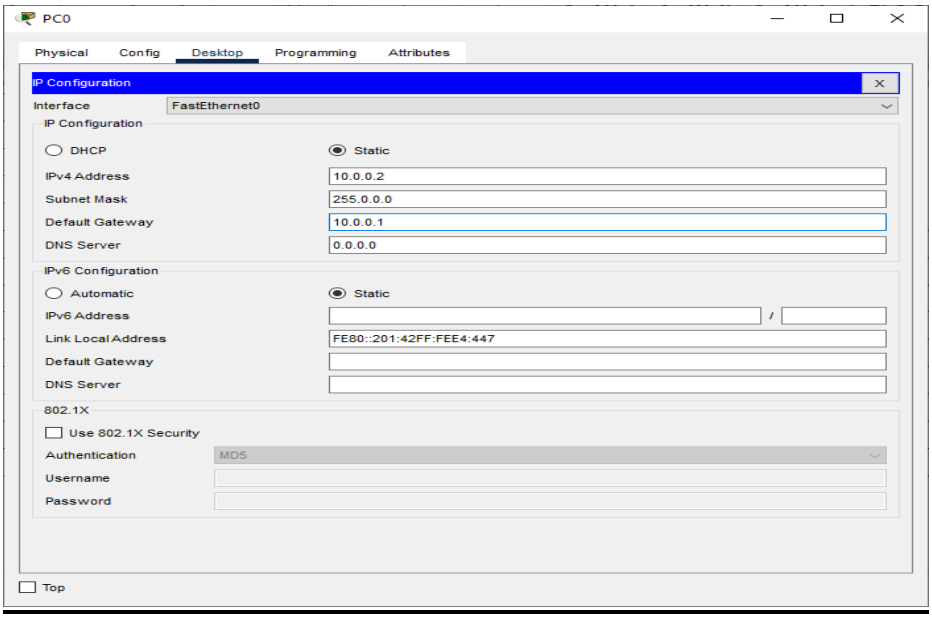
We configure the above network using the following IP addresses

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

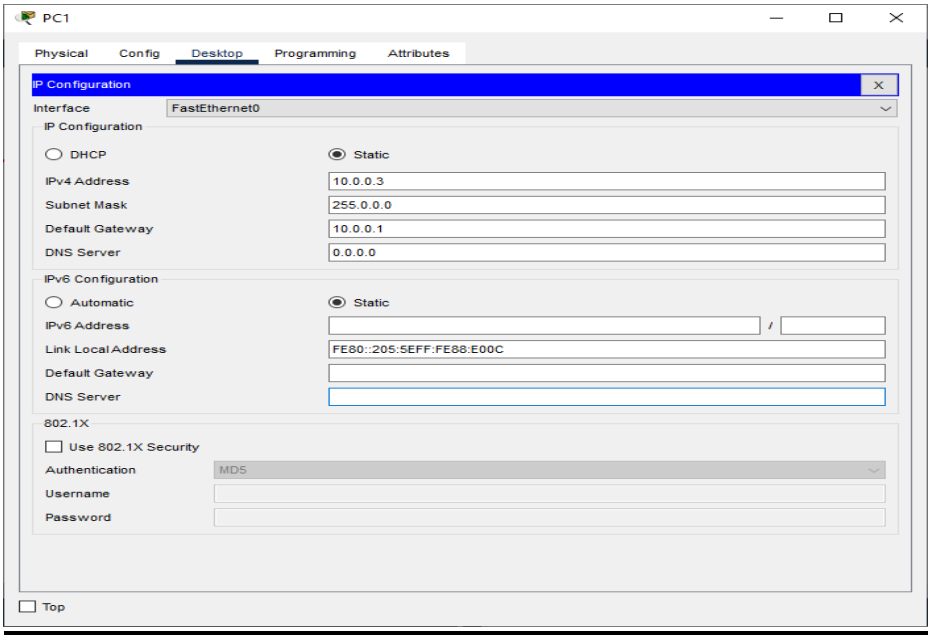
Adding Serial Interface in each Router



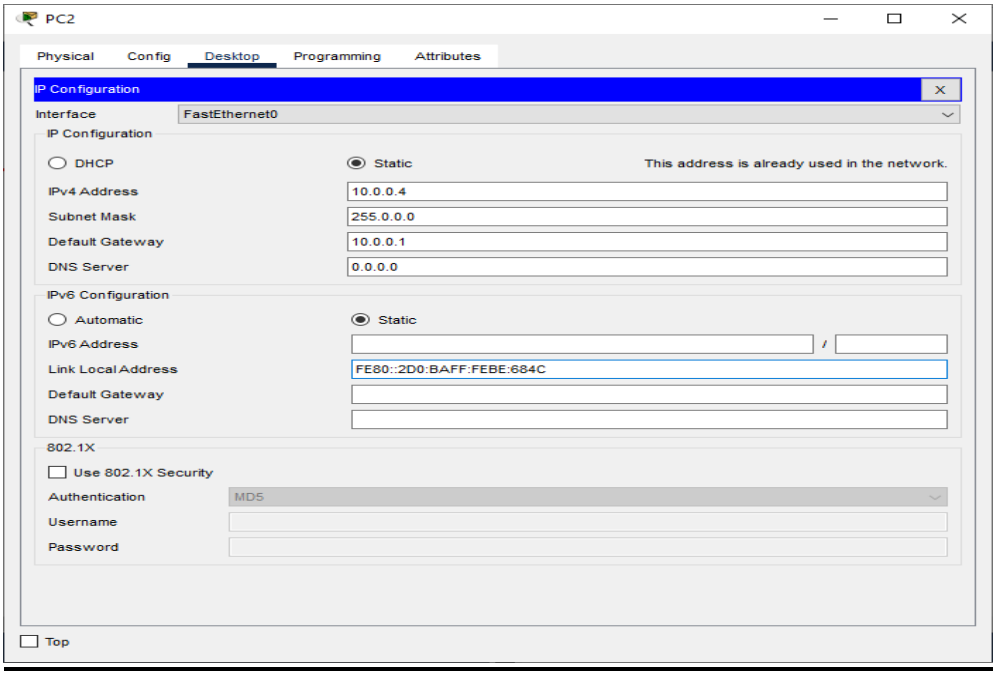
Configuring PC0:



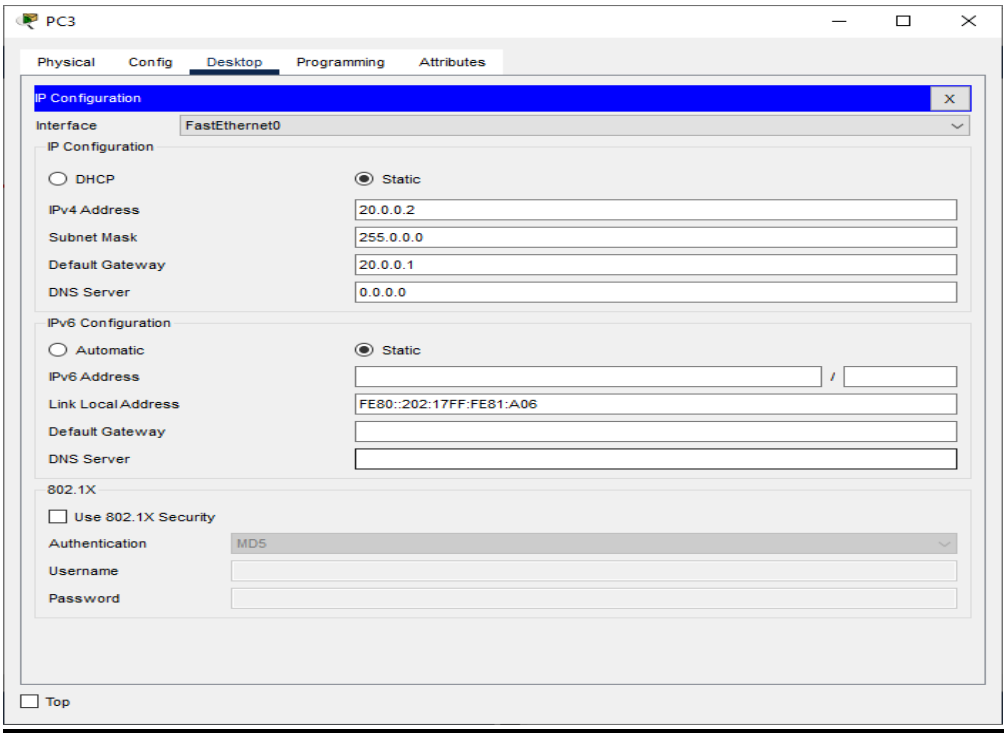
Configuring PC1:



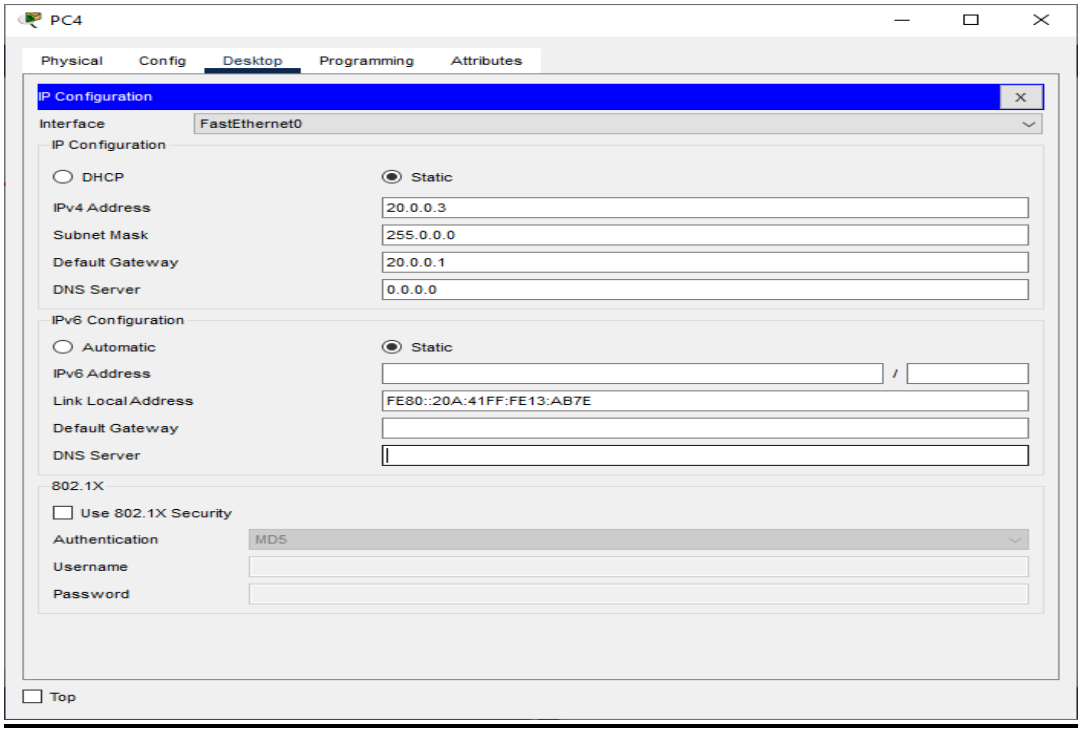
Configuring PC2:



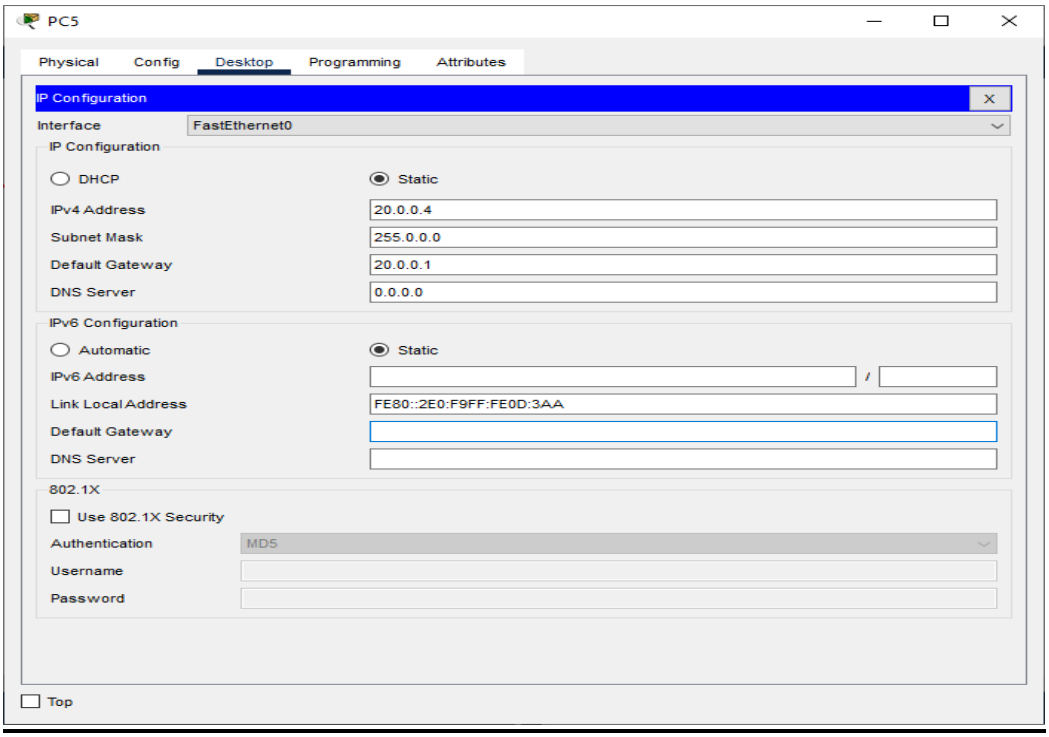
Configuring PC3:



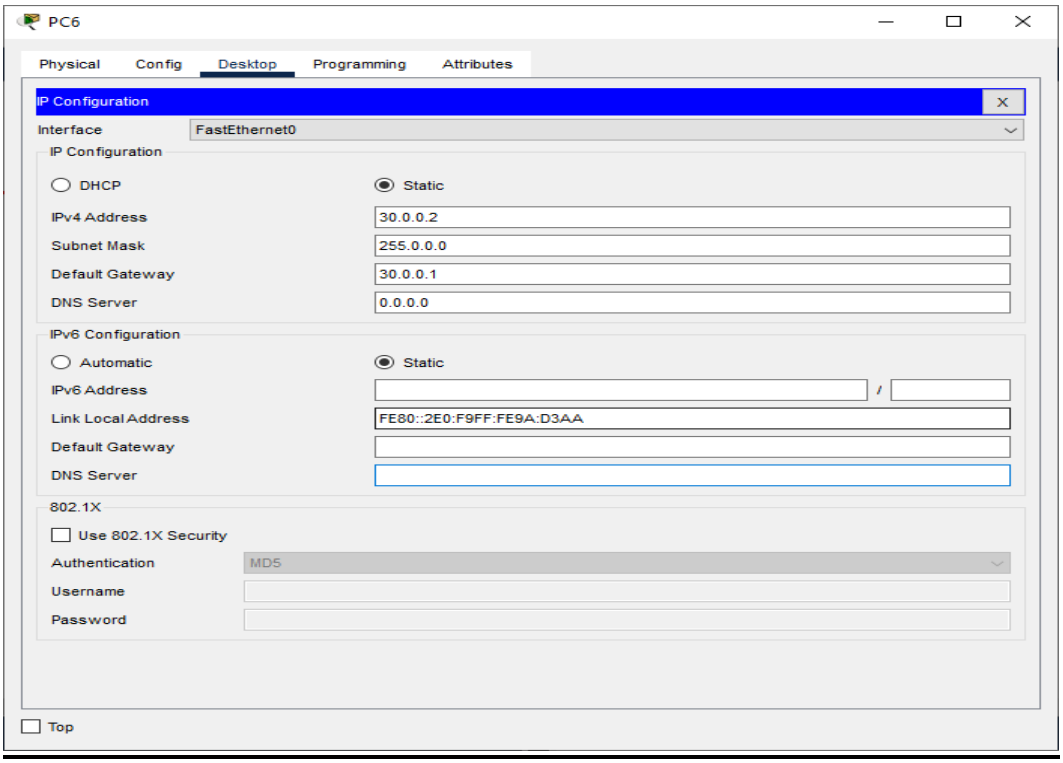
Configuring PC4:



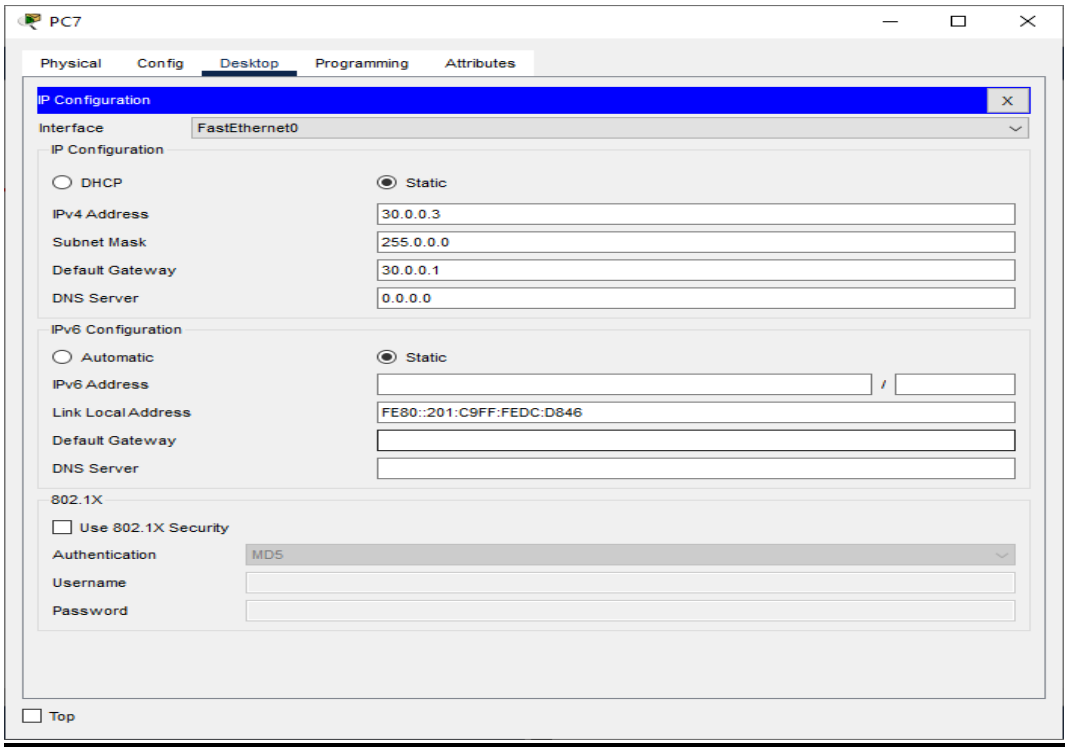
Configuring PC5:



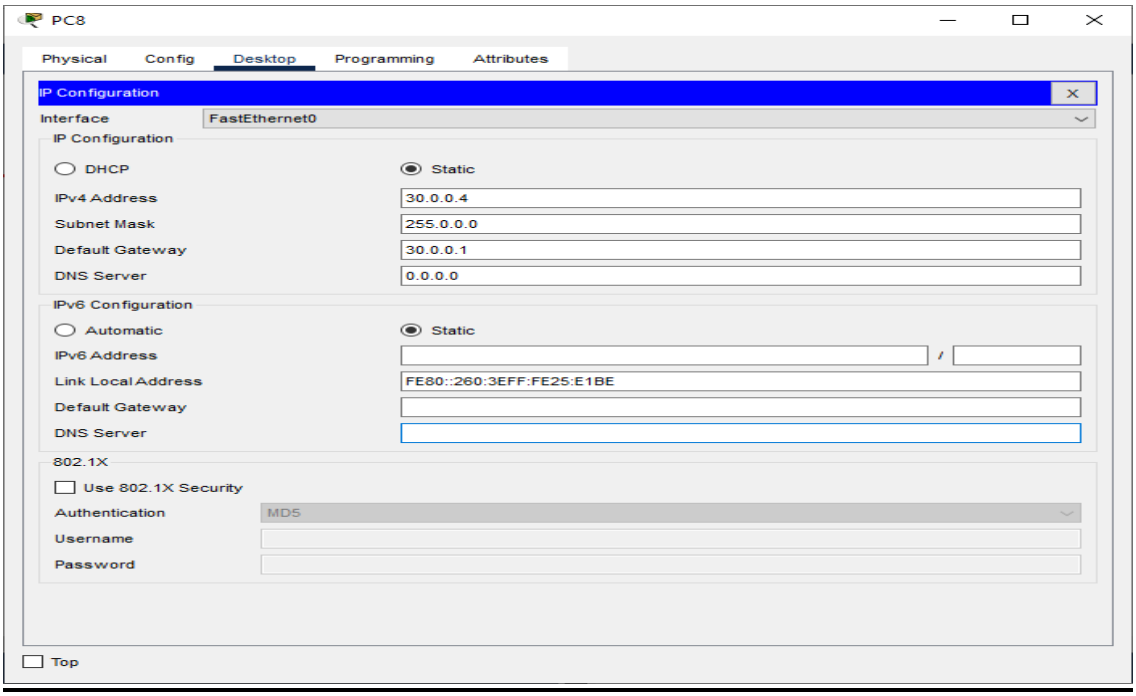
Configuring PC6:



Configuring PC7:



Configuring PC8:



Configuring Router 0 (using the CLI mode)

```
Router>en
Router>enable
Router#
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

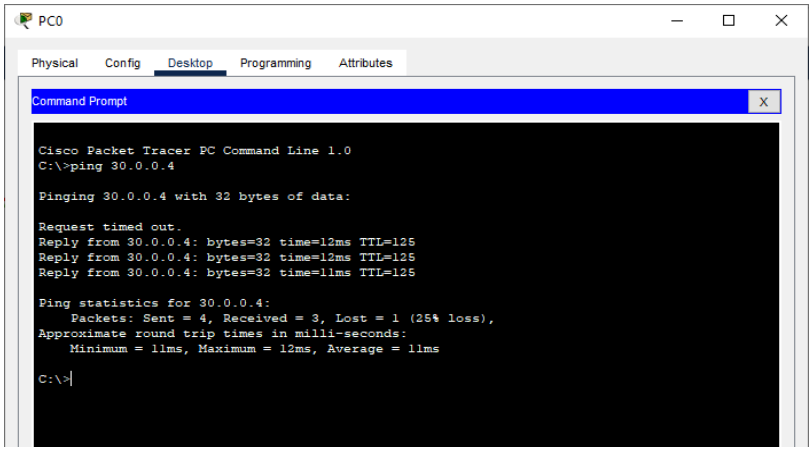
```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 192.168.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#network 192.168.1.0
Router(config-router)#exit
Router(config)#
Router#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

Setting the RIPv1 on Router 2

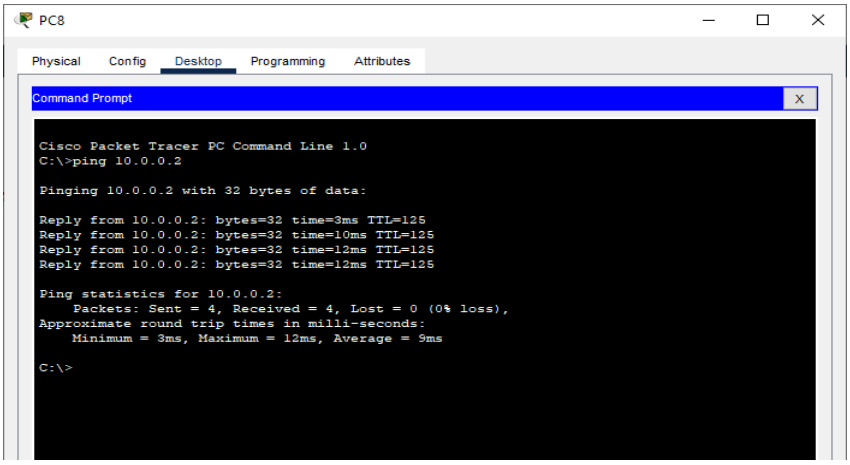
```
Router>enable
Router#configure terminal
Router(config)#router rip
Router(config-router)#network 192.168.1.0
Router(config-router)#network 30.0.0.0
Router(config-router)#exit
Router(config)#
```

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

Link for the video demonstration of the practical:

https://youtu.be/DLMpobkrDGw