**PES UNIVERSITY EC CAMPUS, BANGALORE**
**COMPUTER NETWORK LABORATORY**
**WEEK #6**

**AIM:** Designing and Simulation of Network Topology using Cisco Packet Tracer

**Objectives:**

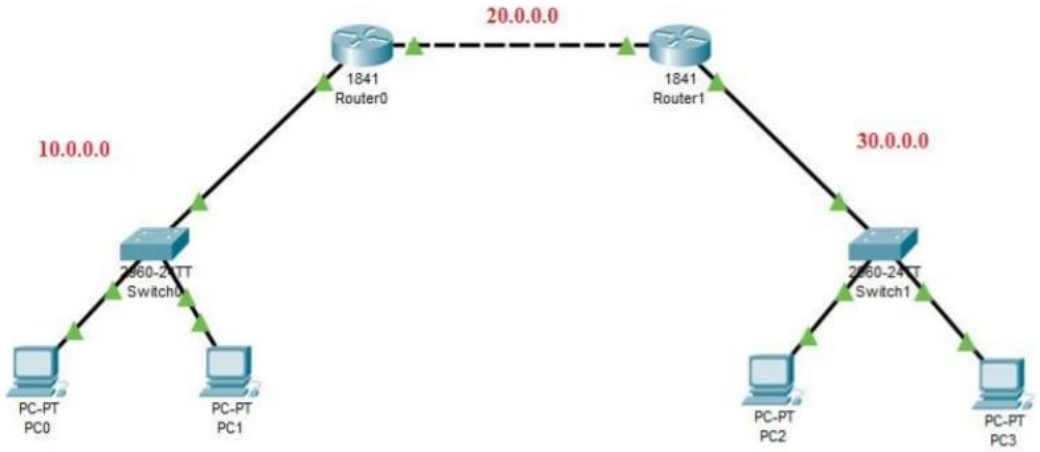
- To understand the purpose of Cisco Packet Tracer.
- To navigate, choose network and end devices and customize them.
- To interconnect devices and configure them using simple interface.
- To become familiar with building topologies in Packet Tracer.
- To simulate data interactions traveling through a network.

**Prerequisites:**

This lab assumes some understanding of the building blocks of communication networks and internet. At this point, we haven't discussed other protocols but you may use Packet Tracer in later labs to discuss those as well. Several types of devices and network connections can be used. For this experiment we will keep it simple by using end devices, switches, routers, and connections.

## TASK 1: Demo Network Topology

Replicate the given scenario, create a topology in packet tracer, as shown in following image:




**PC & Router Configuration Details:**

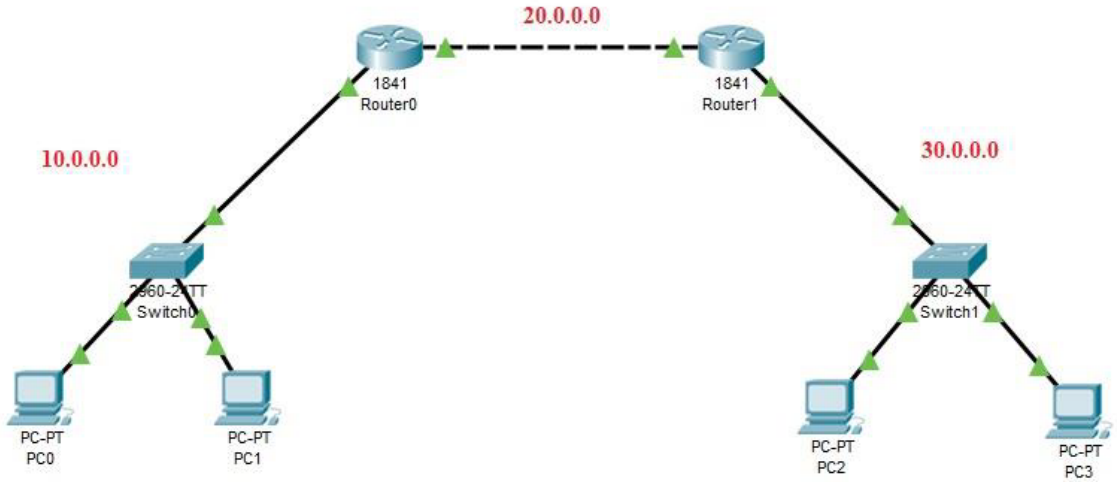
| DEVICE | IP ADDRESS | GATEWAY |
|---|---|---|
| **PC0** | 10.0.0.1 | 10.0.0.3 |
| **PC1** | 10.0.0.2 | 10.0.0.3 |
| **ROUTER 0** | FastEthernet0/0 -> 10.0.0.3<br>FastEthernet0/1 -> 20.0.0.1 | - |
| **ROUTER 1** | FastEthernet0/0 -> 20.0.0.2<br>FastEthernet0/1 -> 30.0.0.1 | - |
| **PC2** | 30.0.0.2 | 30.0.0.1 |
| **PC3** | 30.0.0.3 | 30.0.0.1 |

**Routing Table Entries:**

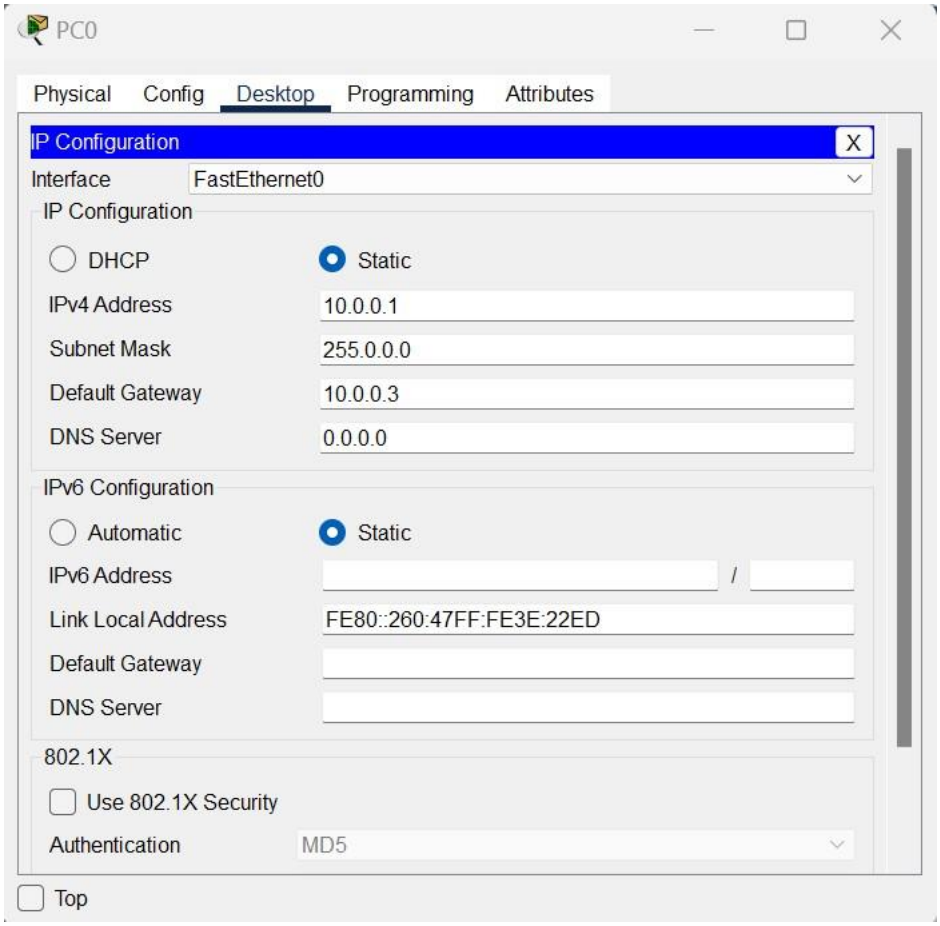
| ROUTER | NETWORK | NEXT HOP |
|---|---|---|
| **ROUTER 0** | 30.0.0.0 | 20.0.0.2 |
| **ROUTER 1** | 10.0.0.0 | 20.0.0.1 |

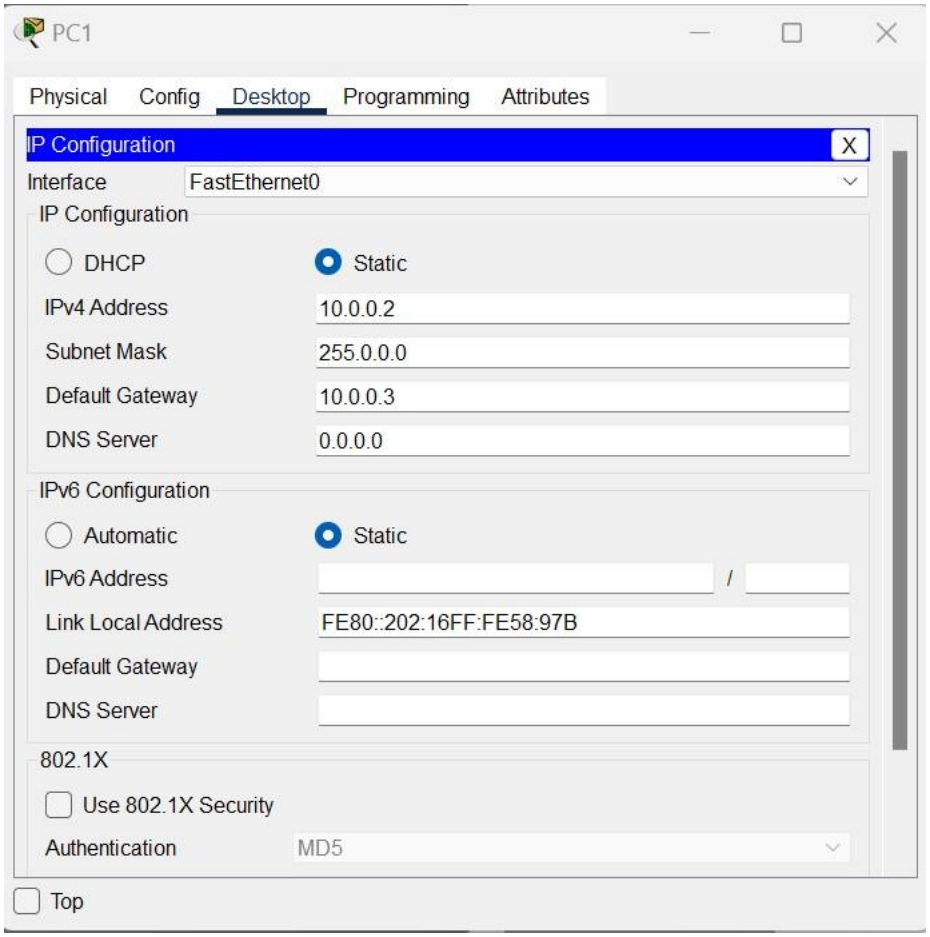
**Execution Procedure:**

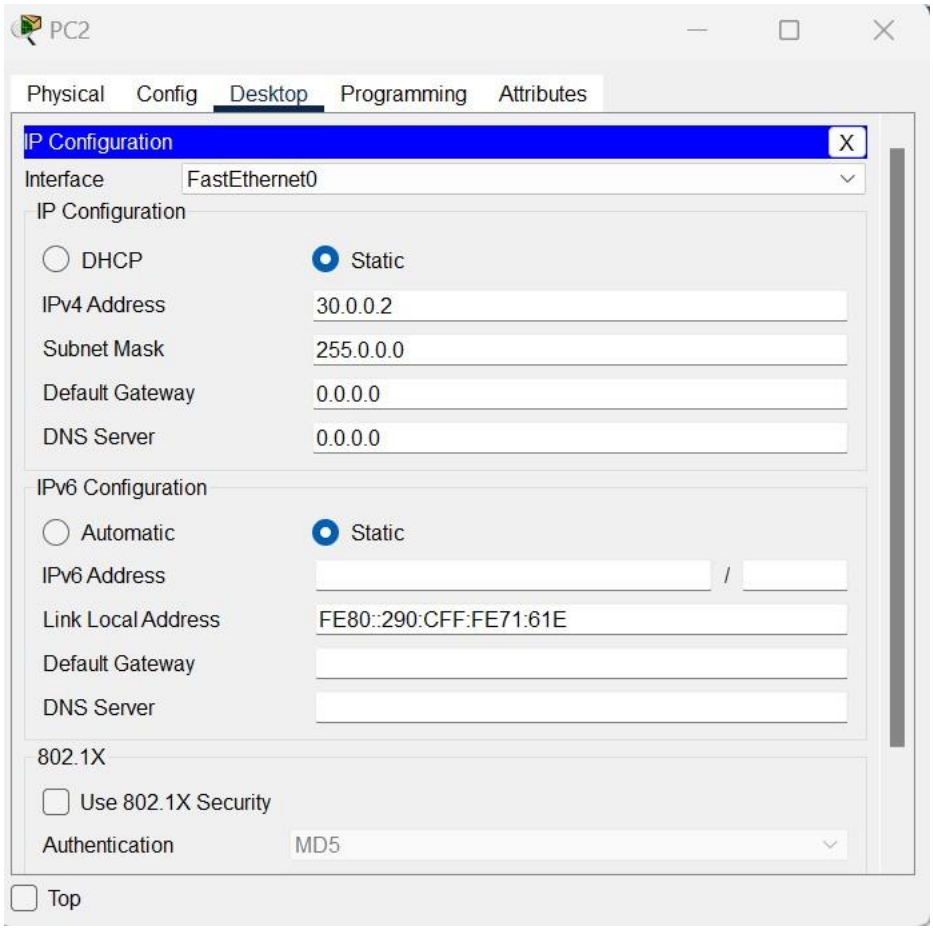
Task 1: Design a network topology with desktops, switches and routers similar to the network depicted in the above diagram.

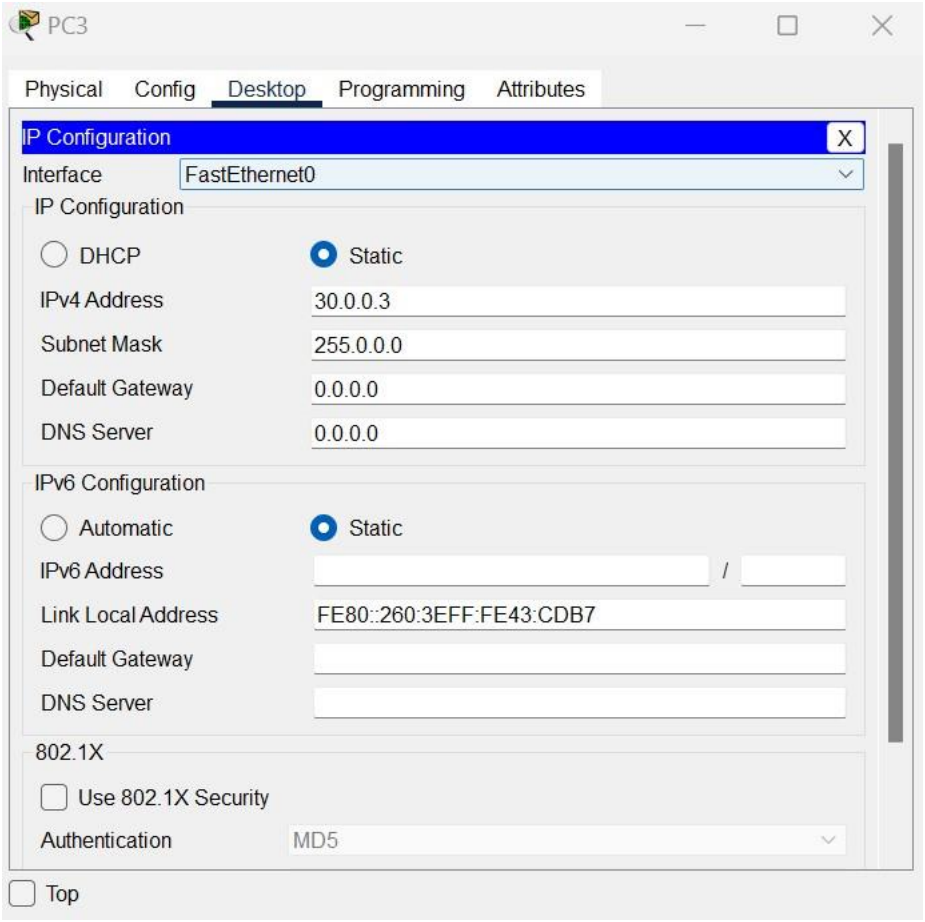



**Task 2:** Configure the PCs and routers with the details provided above.

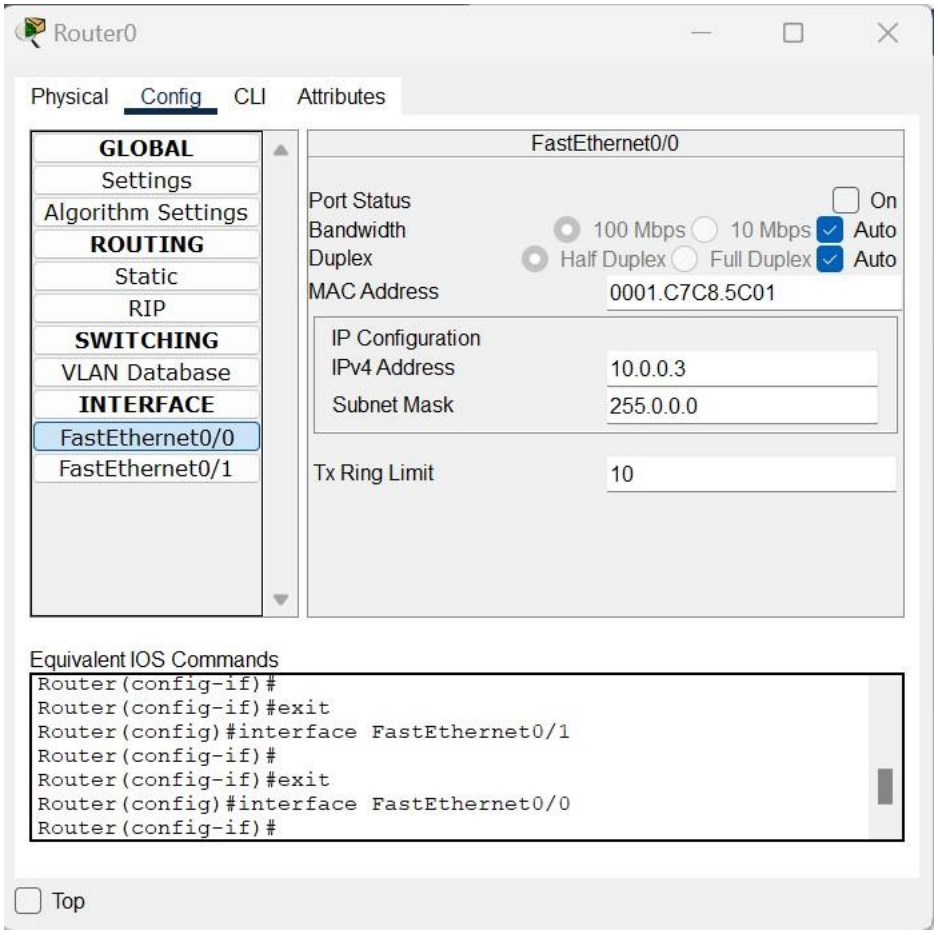

PC0
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
10.0.0.1
Subnet Mask
255.0.0.0
Default Gateway
10.0.0.3
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::260:47FF:FE3E:22ED
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Top

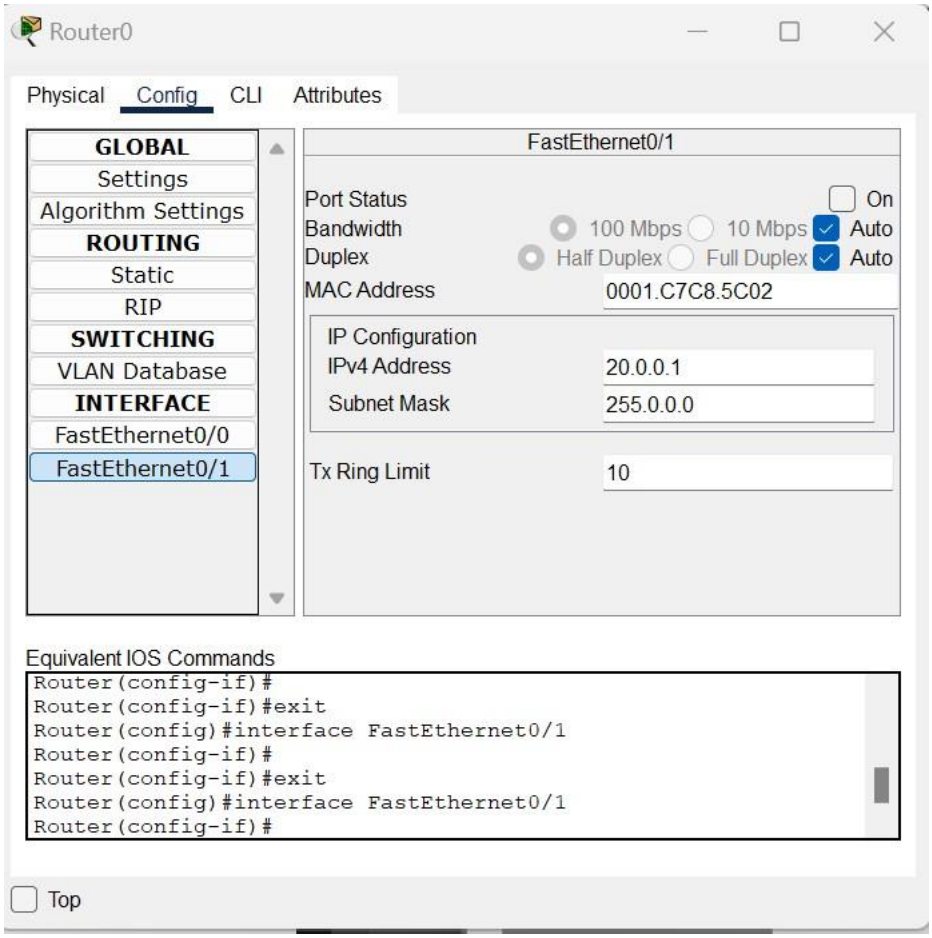

PC1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
10.0.0.2
Subnet Mask
255.0.0.0
Default Gateway
10.0.0.3
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::202:16FF:FE58:97B
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Top

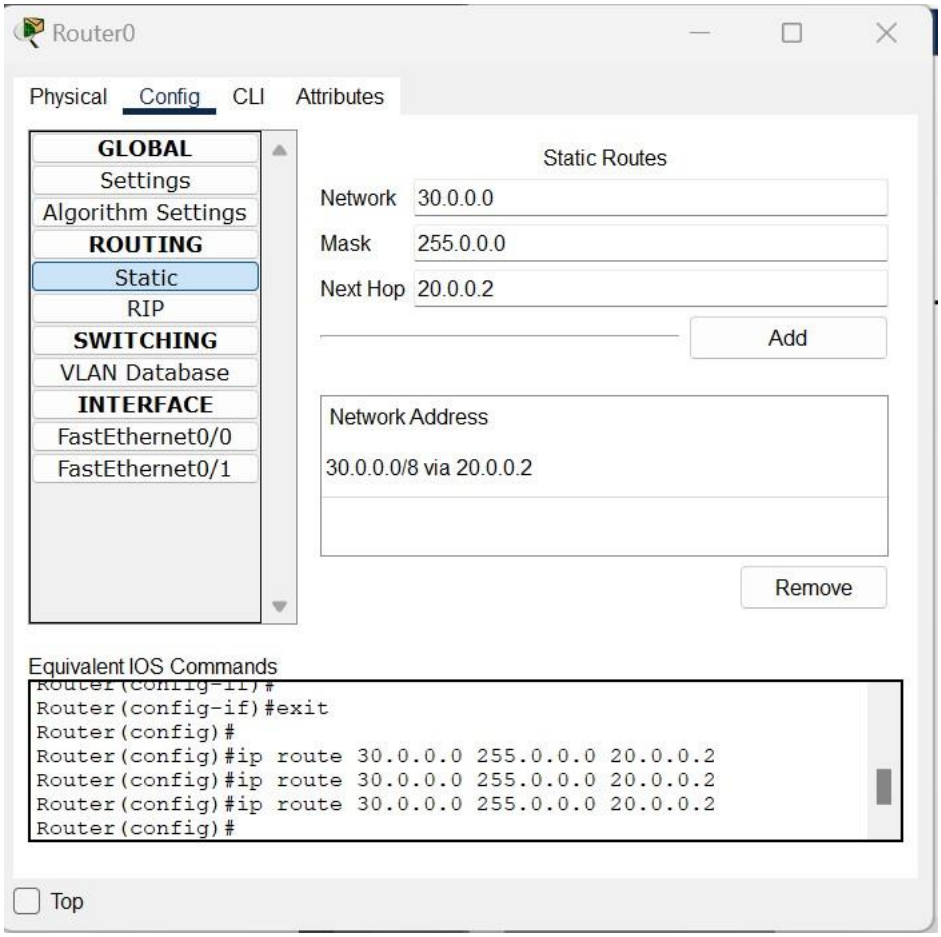

PC2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
30.0.0.2
Subnet Mask
255.0.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
/
Link Local Address
FE80::290:CFF:FE71:61E
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Top

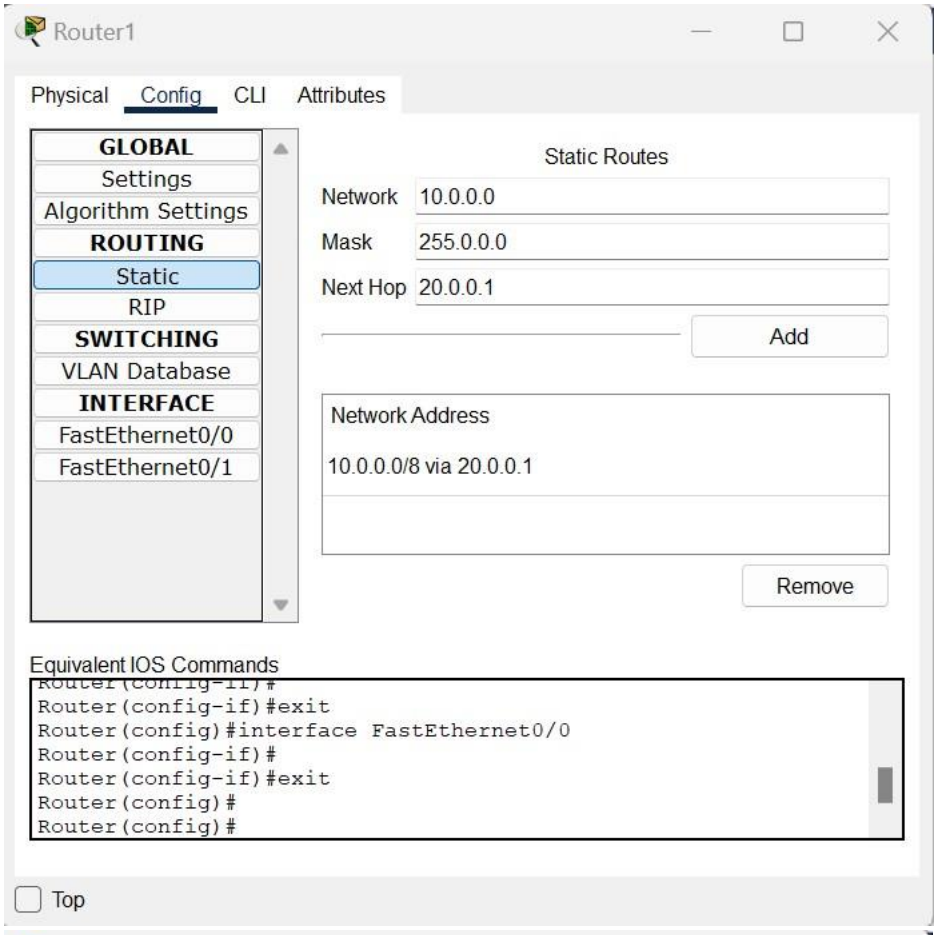


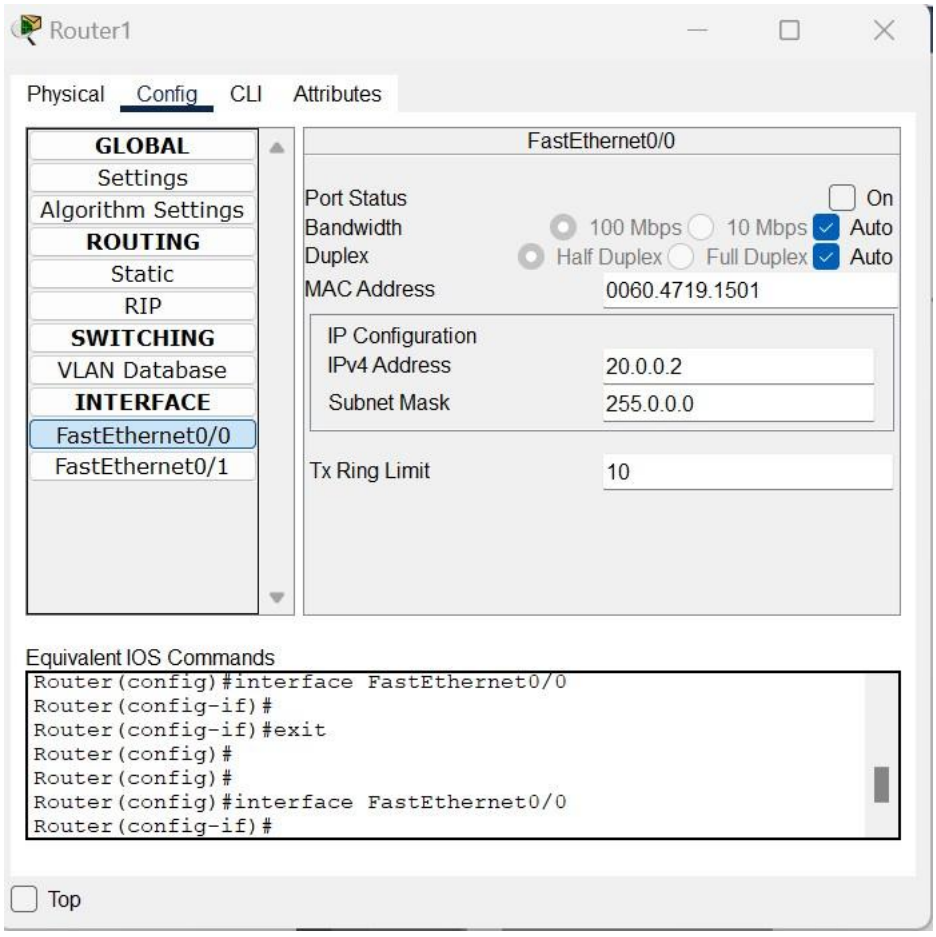

**Task 3:** Send a simple PDU from any PC on network 10.0.1.0 to any other PC on other network 10.0.3.0 and vice-versa.

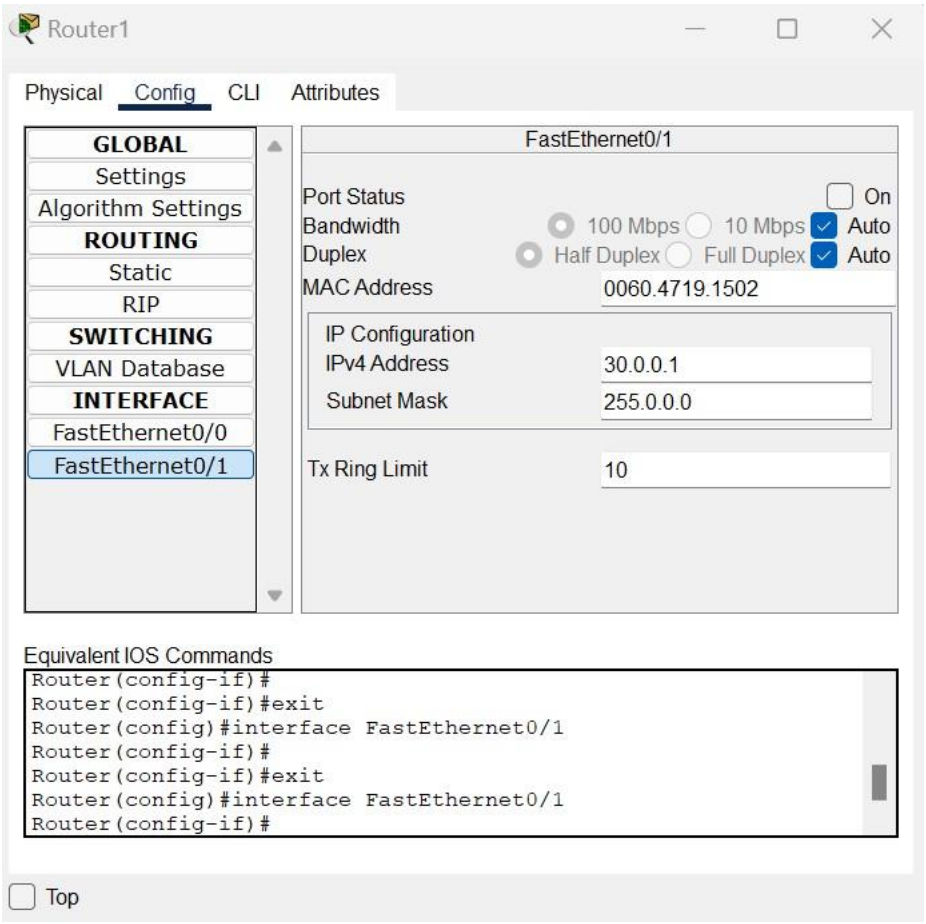

Router0
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0001.C7C8.5C01
IP Configuration
IPv4 Address
10.0.0.3
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Top


Router0
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
FastEthernet0/1
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0001.C7C8.5C02
IP Configuration
IPv4 Address
20.0.0.1
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Top

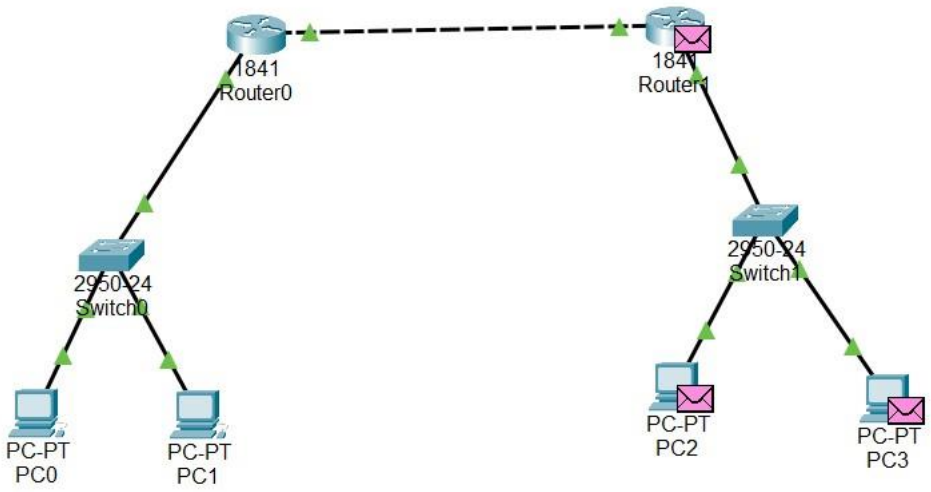

Router0
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Static Routes
Network 30.0.0.0
Mask 255.0.0.0
Next Hop 20.0.0.2
Add
Network Address
30.0.0.0/8 via 20.0.0.2
Remove
Equivalent IOS Commands
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.2
Router(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.2
Router(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.2
Router(config)#
Top


Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Static Routes
Network 10.0.0.0
Mask 255.0.0.0
Next Hop 20.0.0.1
Add
Network Address
10.0.0.0/8 via 20.0.0.1
Remove
Equivalent IOS Commands
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#
Top


Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0060.4719.1501
IP Configuration
IPv4 Address
20.0.0.2
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#
Router(config)#interface FastEthernet0/0
Router(config-if)#
Top

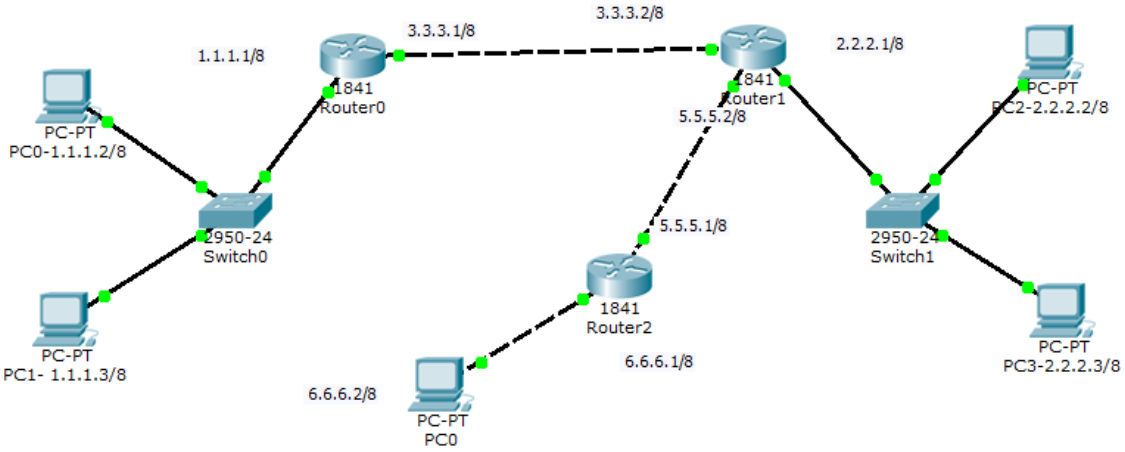



**Task 4:** Simulate the network and observe the packet flow from one network to other.



## TASK 2: Network Topology (Mandatory)

Replicate the given scenario, create a topology in packet tracer, as shown in following image:




**PC & Router Configuration Details:**

**Assuming the PC device PC0 with IP 6.6.6.2 is renamed as PC4

| DEVICE | IP ADDRESS | GATEWAY |
|---|---|---|
| **PC0** | 1.1.1.2 | 1.1.1.1 |
| **PC1** | 1.1.1.3 | 1.1.1.1 |
| **ROUTER 0** | FastEthernet0/0 -> 1.1.1.1<br>FastEthernet0/1 -> 3.3.3.3 | - |
| **ROUTER 1** | FastEthernet0/0 -> 3.3.3.2<br>FastEthernet0/1 -> 5.5.5.2<br>Ethernet0/1/0 -> 2.2.2.1 | - |
| **ROUTER 2** | FastEthernet0/0 -> 5.5.5.1<br>FastEthernet0/1 -> 6.6.6.1 | - |
| **PC4 (PC0)** | 6.6.6.2 | 6.6.6.1 |
| **PC2** | 2.2.2.2 | 2.2.2.1 |
| **PC3** | 2.2.2.3 | 2.2.2.1 |

**Routing Table Entries:**

| ROUTER | NETWORK | NEXT HOP |
|---|---|---|
| **ROUTER 0** | 1.1.1.1 | 3.3.3.1 |
| **ROUTER 1** | 2.2.2.1 | 5.5.5.2<br>3.3.3.2 |

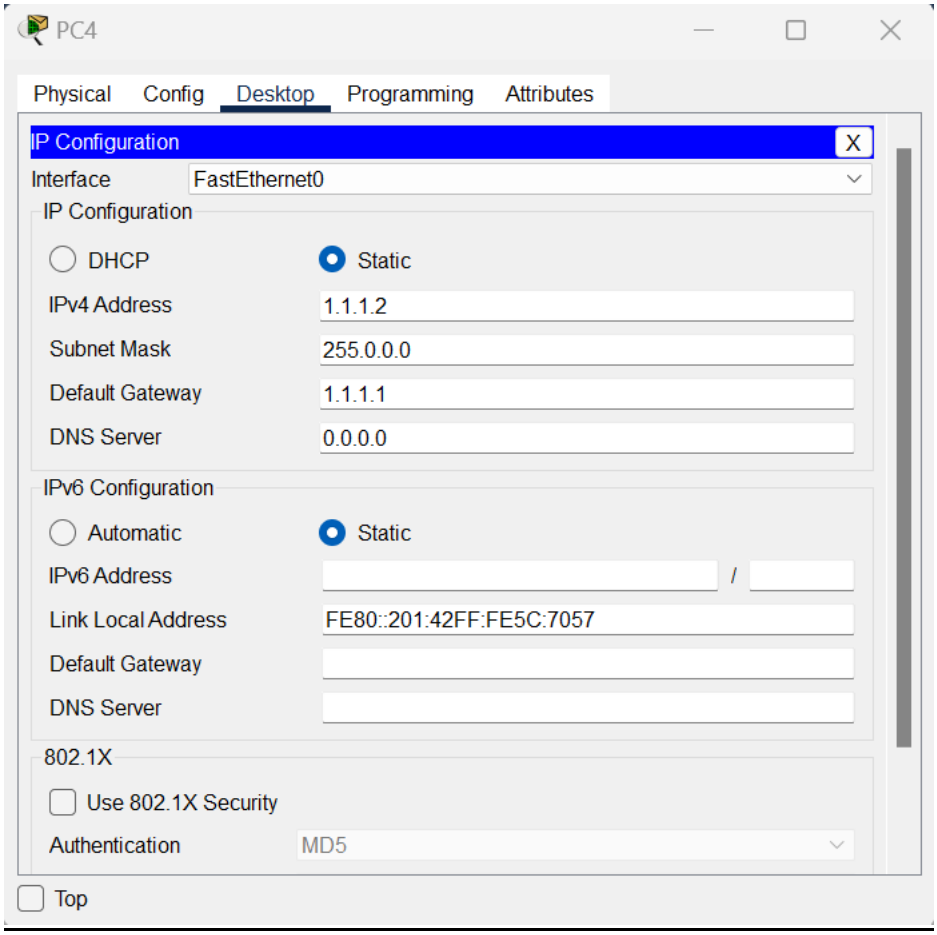
| | | |
|---|---|---|
| **ROUTER 2** | 6.6.6.6 | 5.5.5.1 |

**Execution Procedure:**

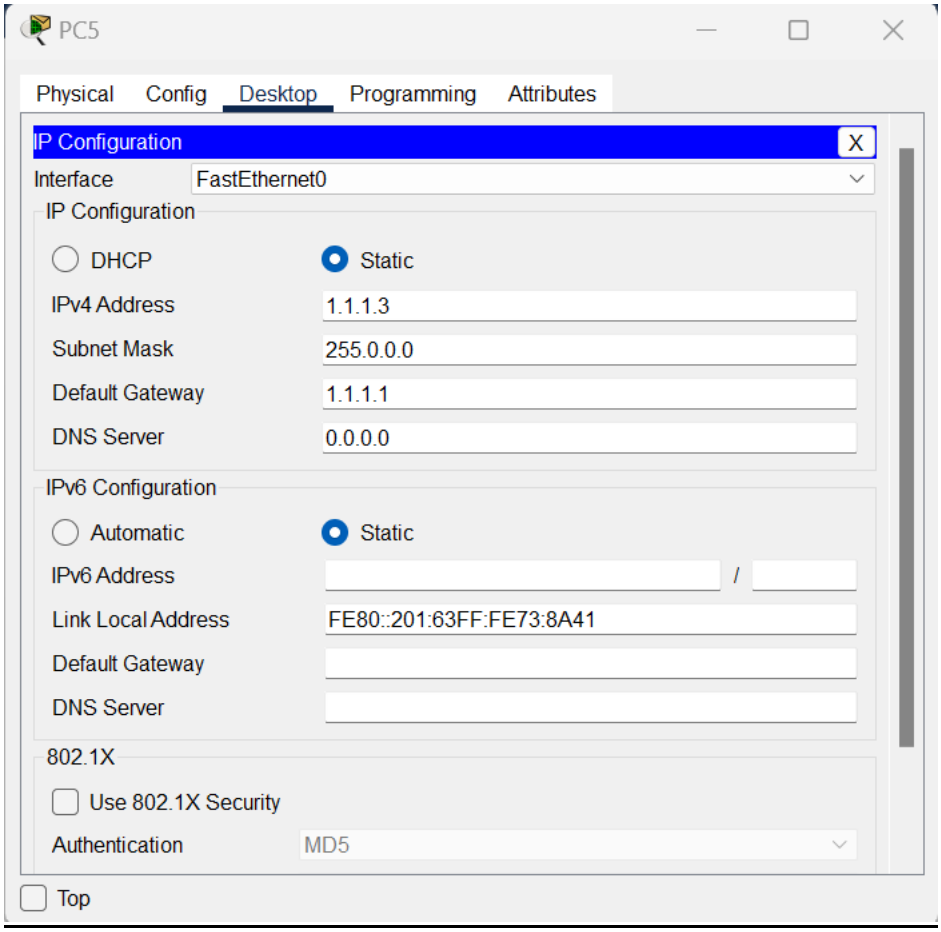
**Task 1:** Design a network topology with desktops, switches and routers similar to the network depicted in the above diagram.

**Task 2:** Configure the PCs and routers with the details provided above in the table. Take help of the screenshots given below.

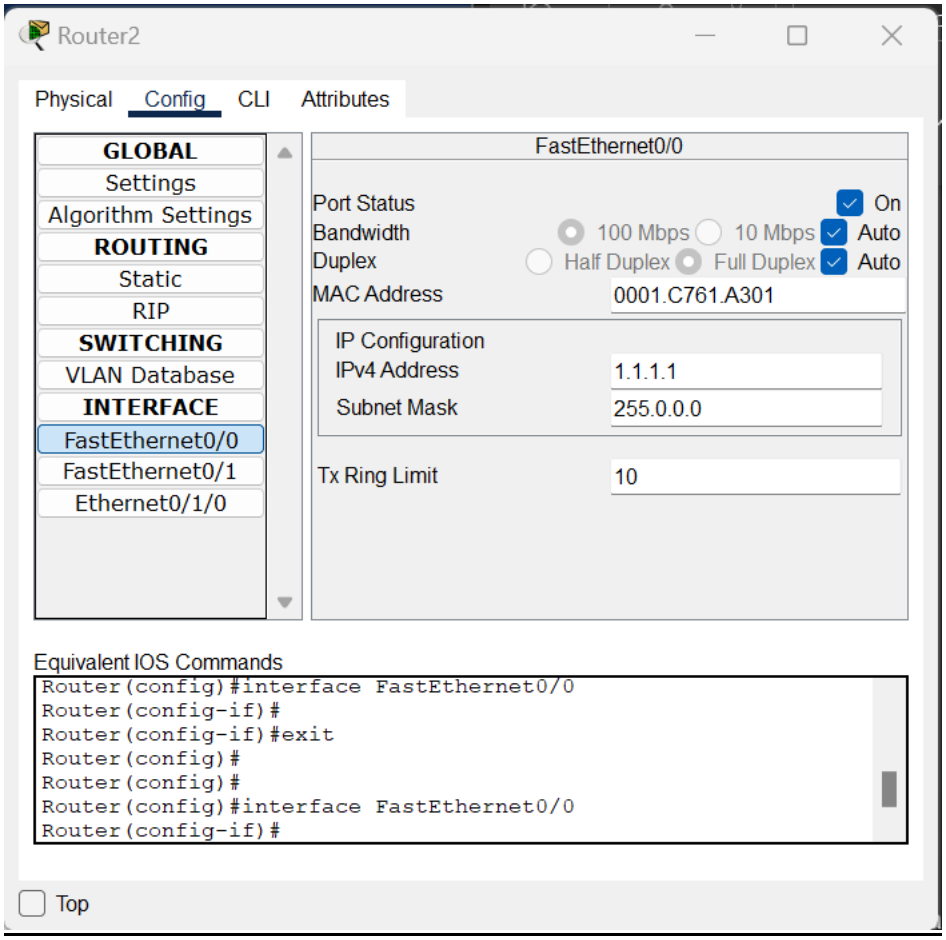
IP address and gateway of PC0




IP address and gateway of PC1

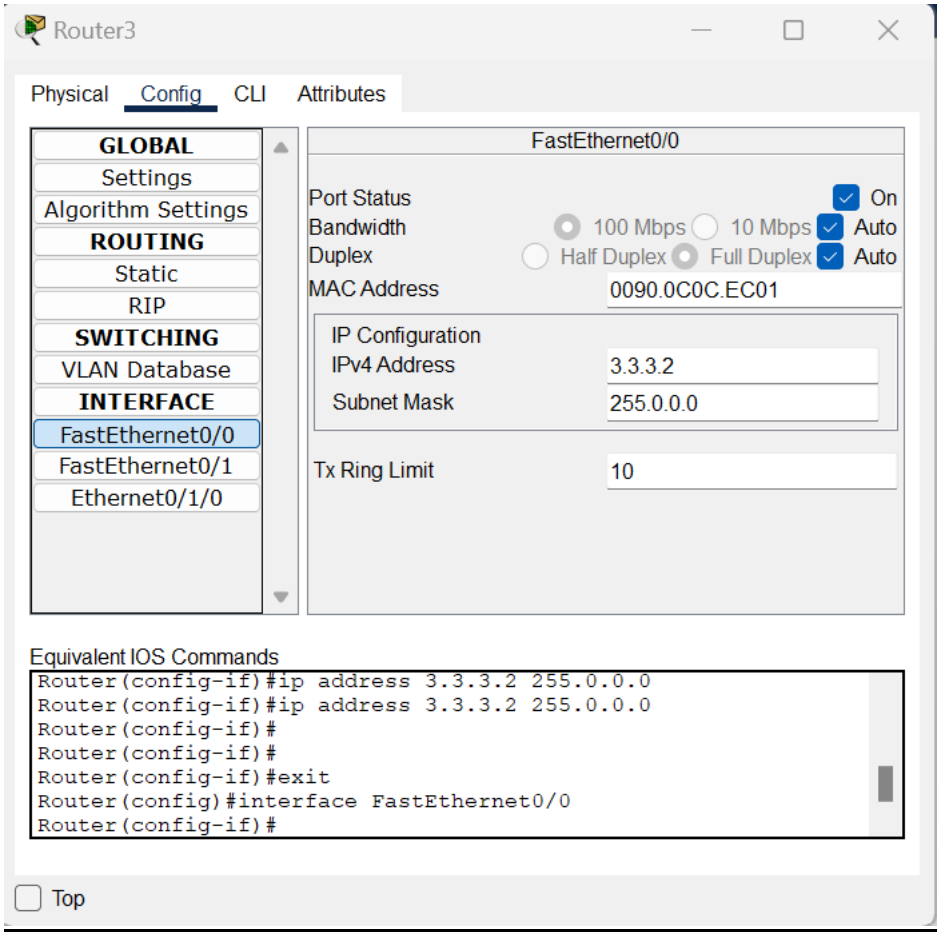



Router 0 Interfaces

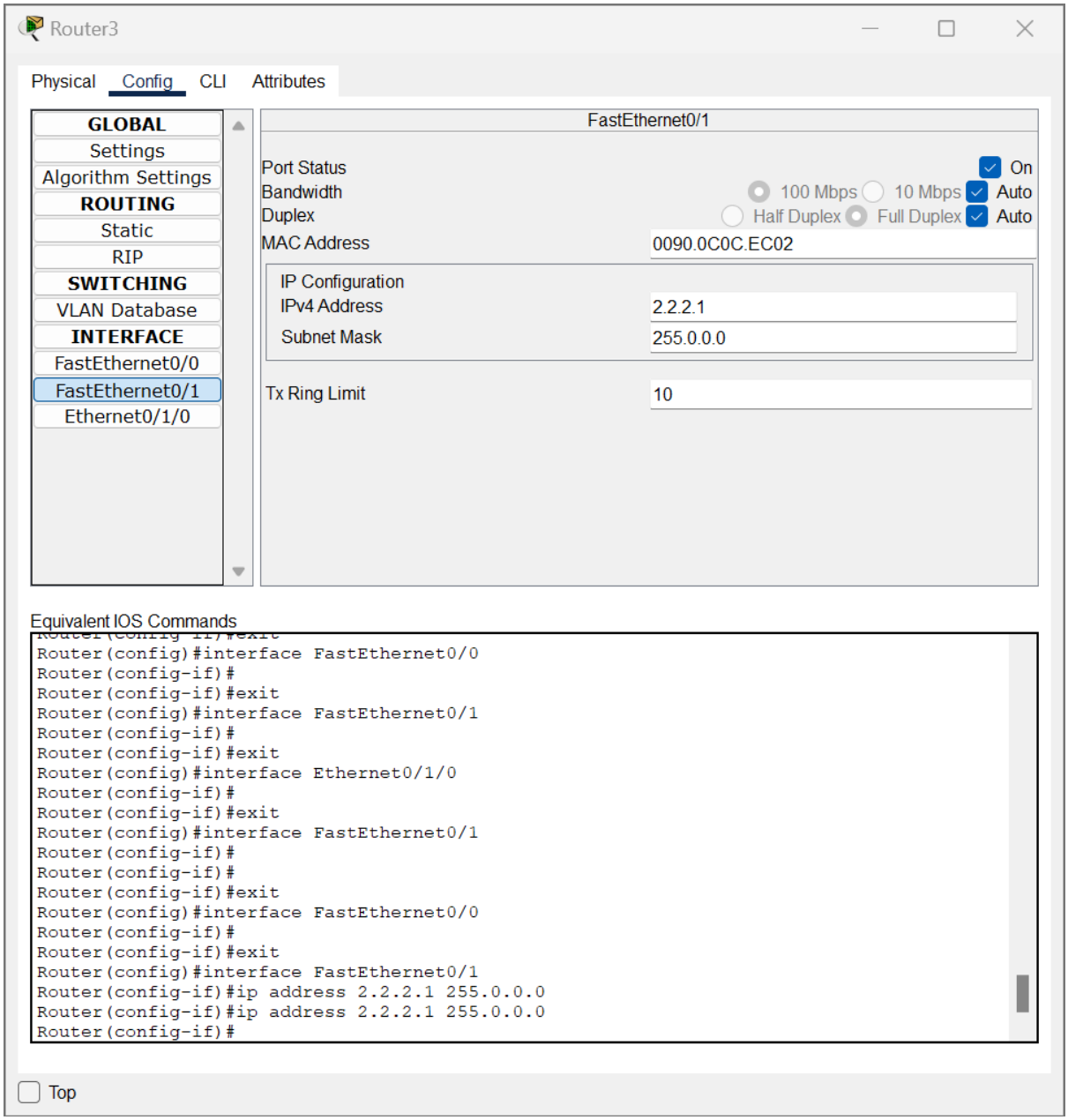


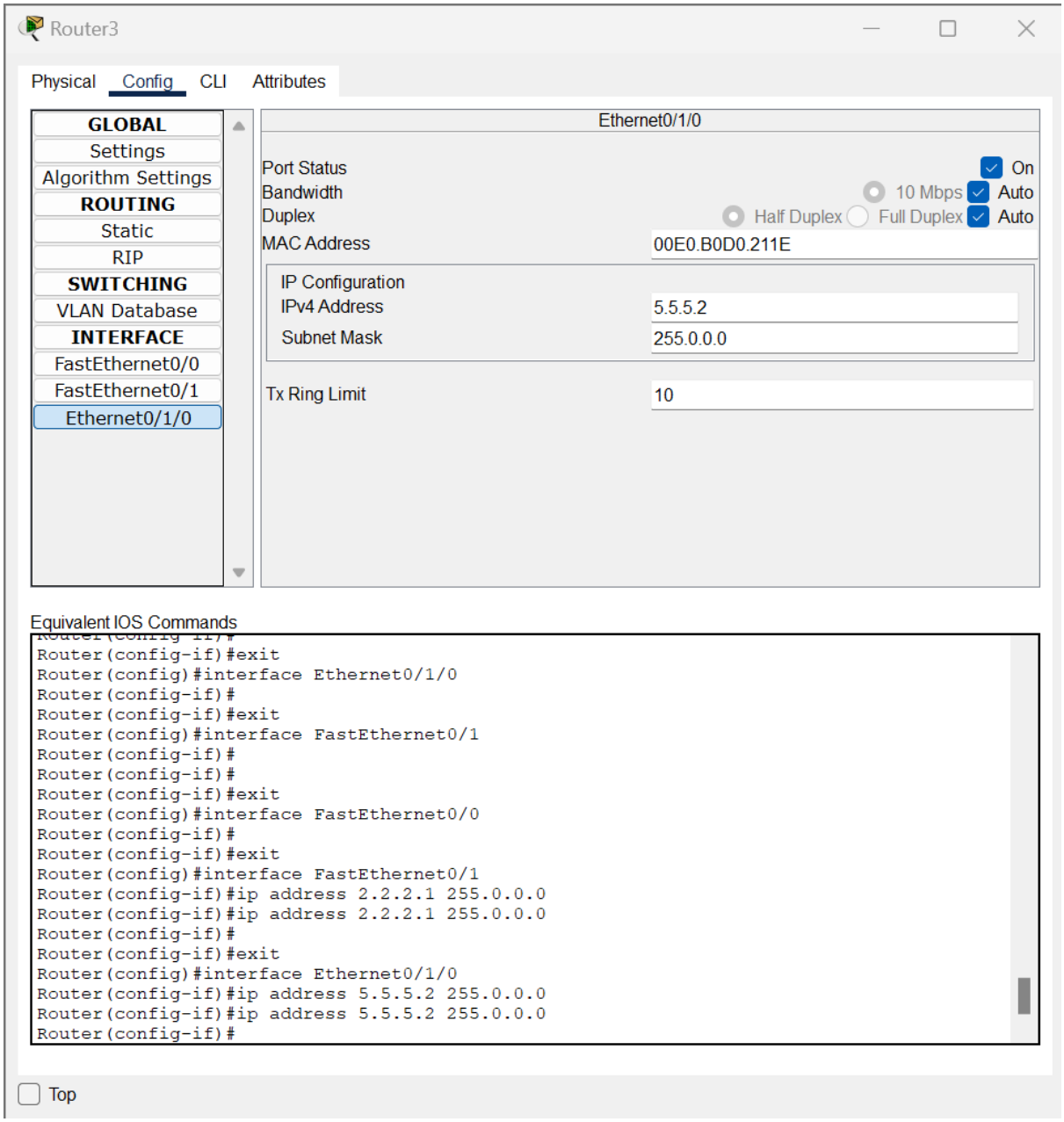

Configure the IP address of both interfaces FastEthernet0/0 and FastEthernet0/1. Don’t forget to toggle the on switch on the to right.

Router 1 Interfaces

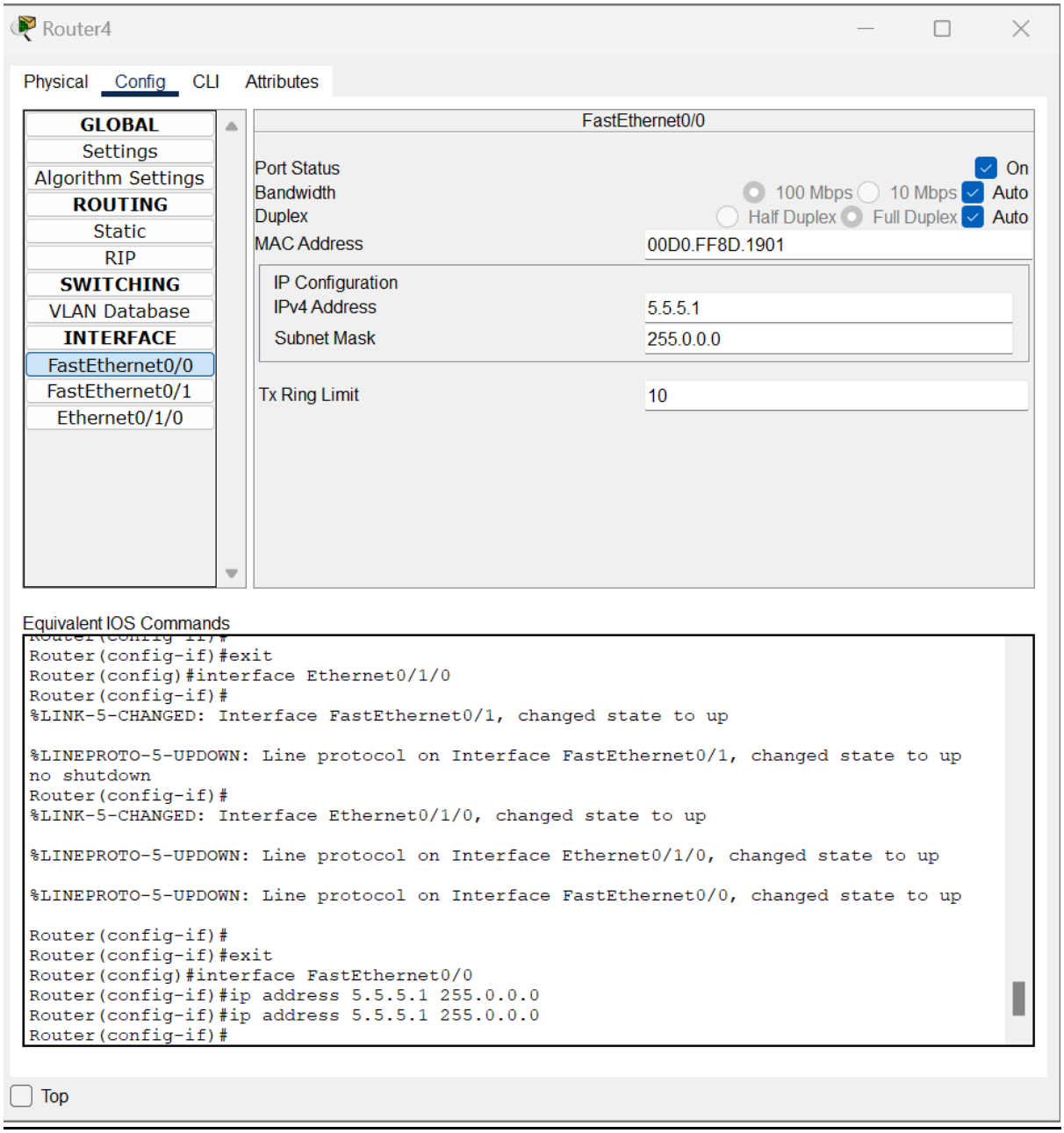


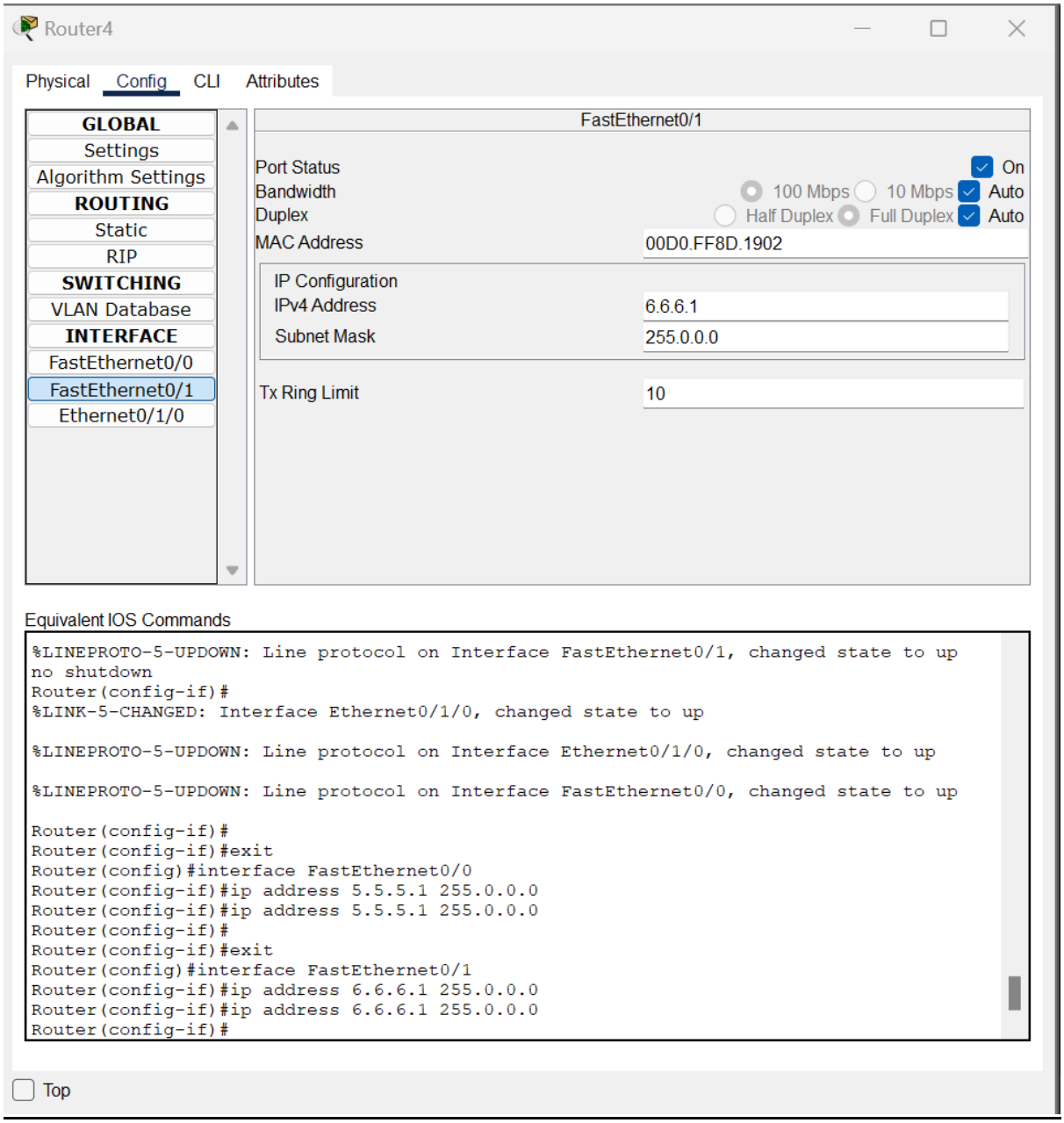

Similarly fill FastEthernet0/1 and Ethernet0/1/0 like this


Router3
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Ethernet0/1/0
FastEthernet0/1
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0090.0C0C.EC02
IP Configuration
IPv4 Address
2.2.2.1
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Ethernet0/1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#ip address 2.2.2.1 255.0.0.0
Router(config-if)#ip address 2.2.2.1 255.0.0.0
Router(config-if)#
Top

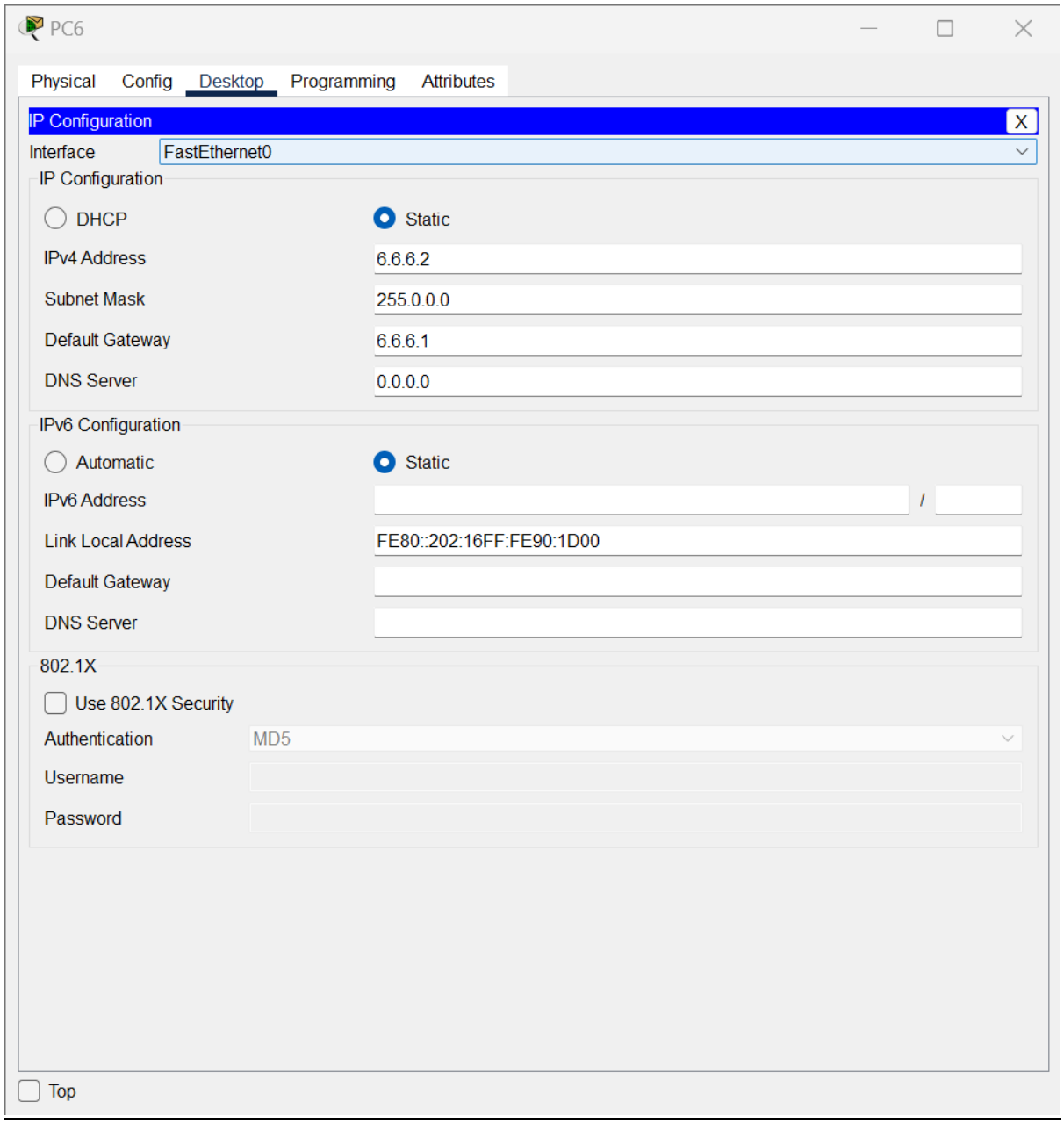



Router 2 Interfaces

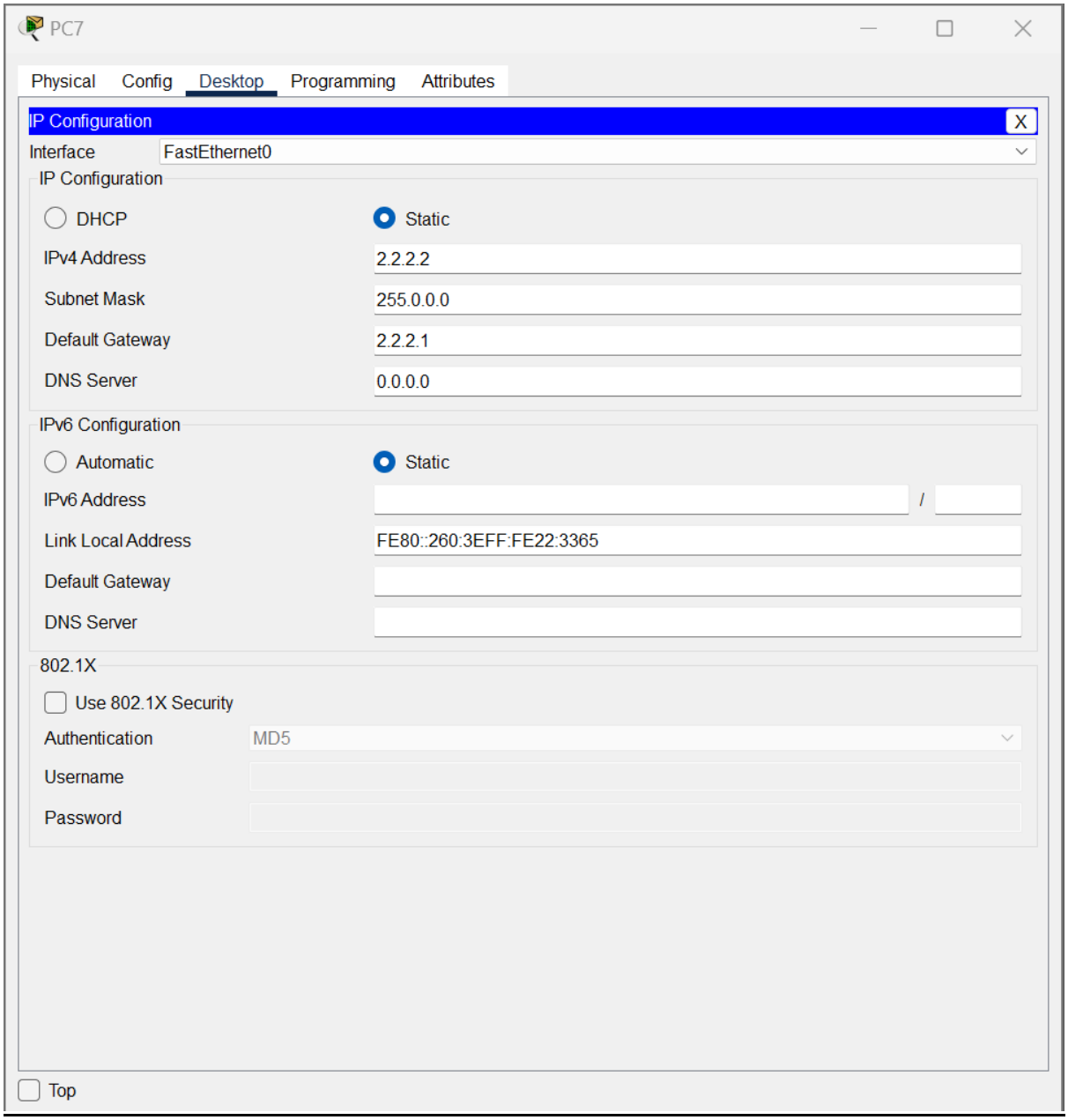

Router4
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Ethernet0/1/0
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
00D0.FF8D.1901
IP Configuration
IPv4 Address
5.5.5.1
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config-if)#exit
Router(config)#interface Ethernet0/1/0
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Ethernet0/1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 5.5.5.1 255.0.0.0
Router(config-if)#ip address 5.5.5.1 255.0.0.0
Router(config-if)#
Top



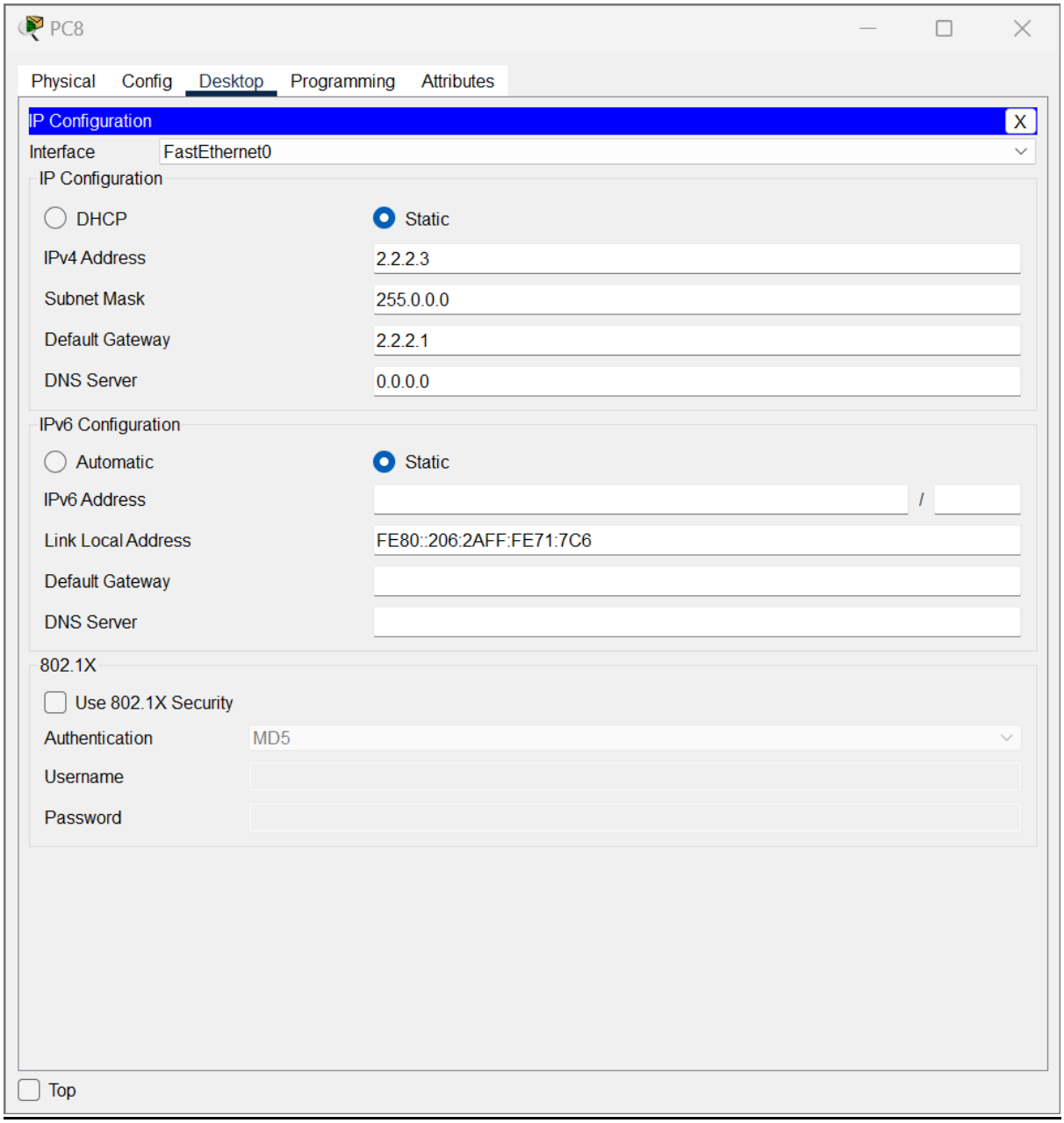

IP address and gateway of PC4 (PC0)




IP address and gateway of PC2

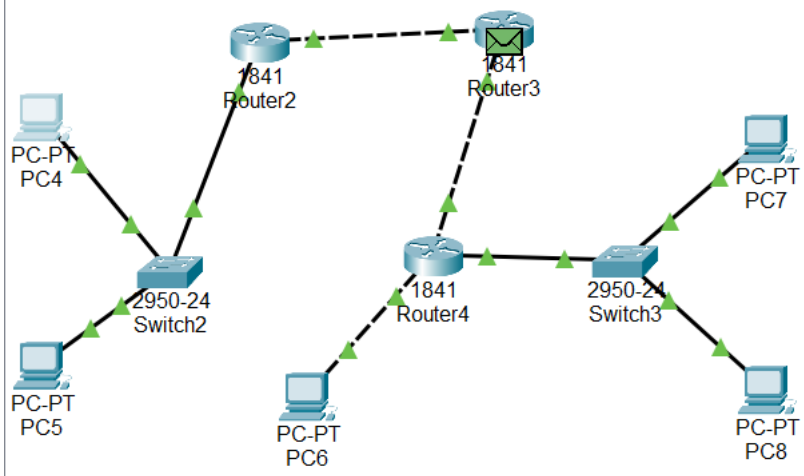


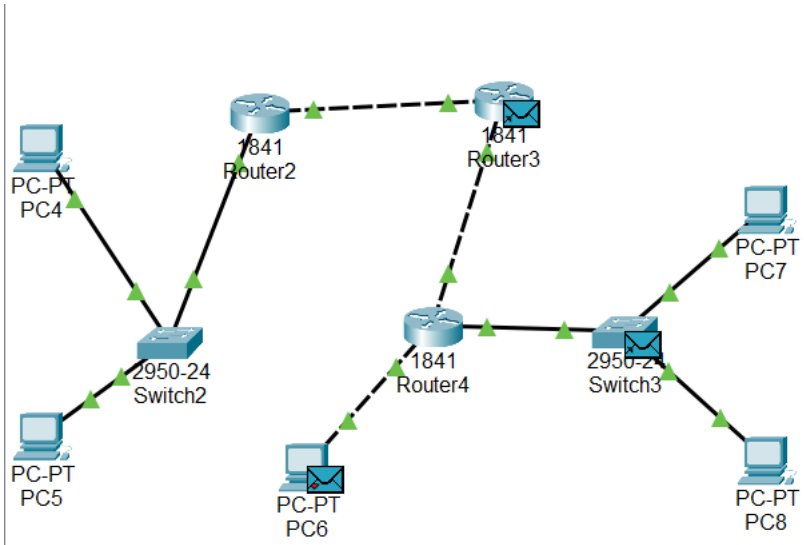

IP address and gateway of PC3




**Task 3:** Send a simple PDU from any PC on network 10.0.1.0 to any other PC on other network 10.0.3.0 and vice-versa.

**Task 4:** Simulate the network and observe the packet flow from one network to other.




Name: Atharva Menkudle
Sem:4th
Sec :B
SRN: PES2UG21CS104