INTERNETWORKING ESSENTIALS CA1

BACHELOR OF TECHNOLOGY

IN

Computer Science & Engineering

By

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SECTION-K23UP

Roll no: 66

Reg.No: 12301821

TO

Mr. Singh Malhi Sir

LOVELY PROFESSIONAL UNIVERSITY

PUNJAB INDIA

Project66:

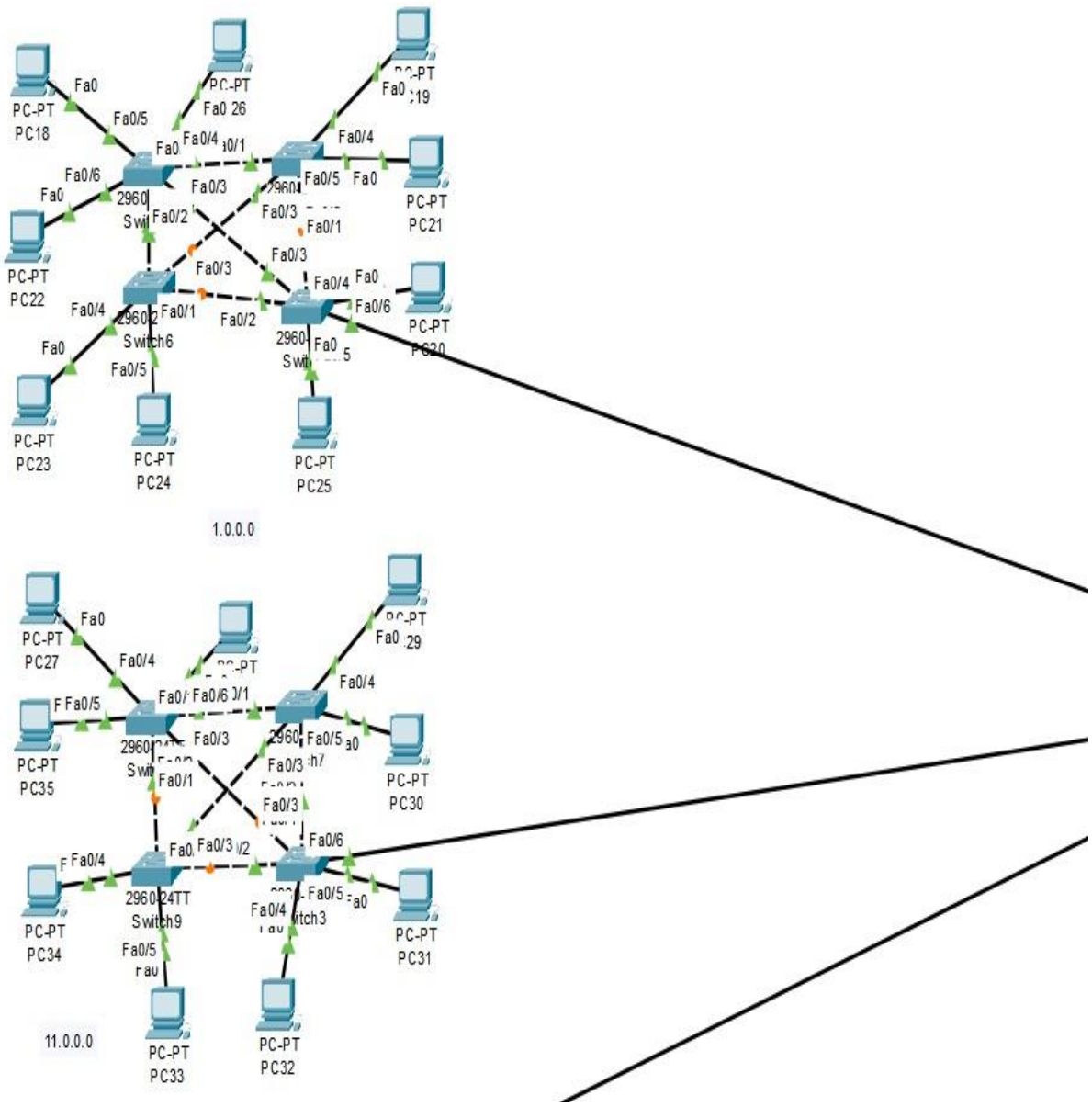
You are hired as a network engineer for Caretech Network Solutions, a mid-sized enterprise with a 6-floor office building. Each floor is equipped with 9 computers, and the organization requires a wellstructured network to ensure efficient communication and scalability.

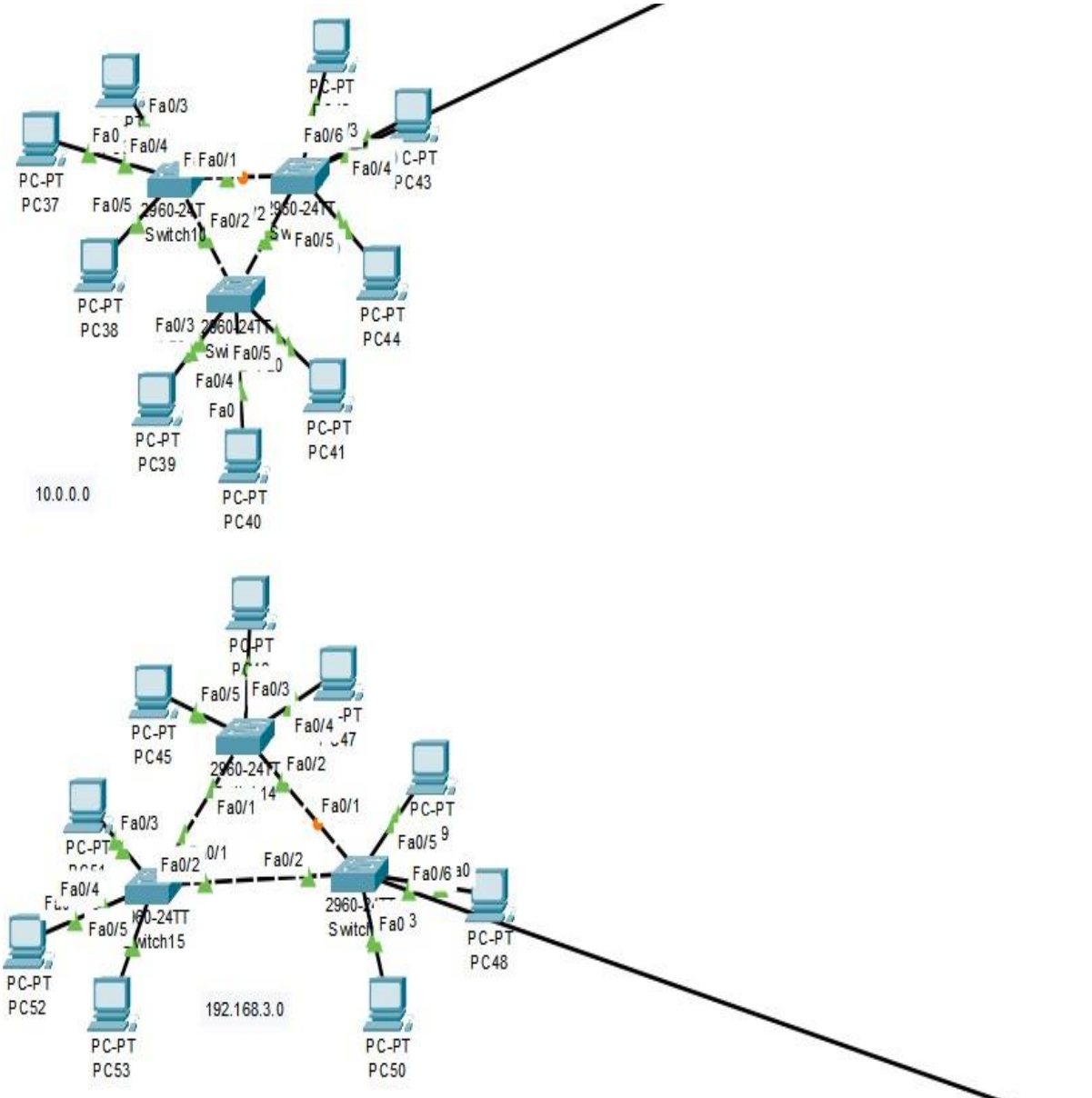
Network Design Requirements:

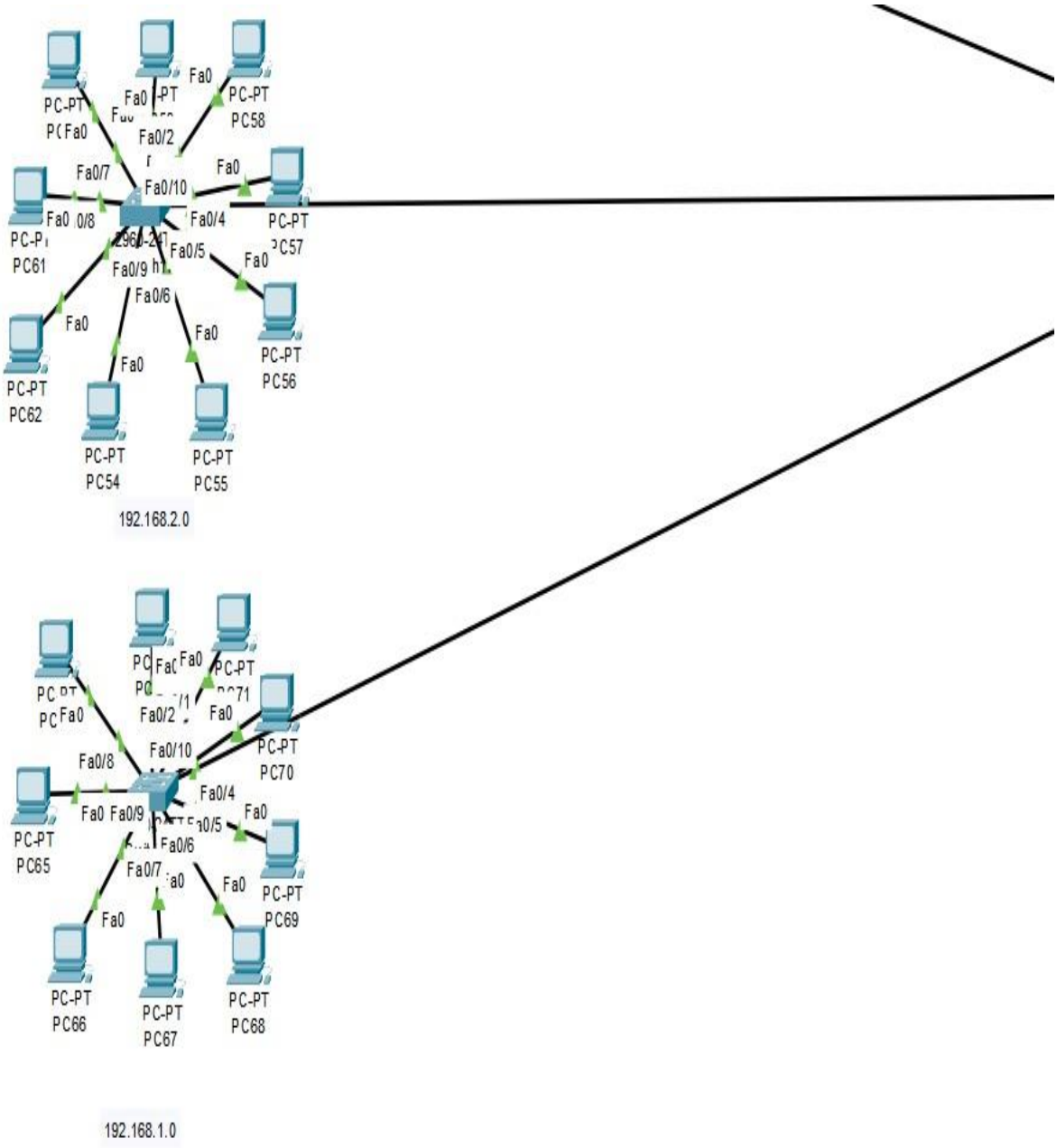
1. Topology Selection: Design a star topology for first 2 floors, ring topology for next 2 floors, and mesh topology for remaining floors, considering performance and fault tolerance.
2. IP Addressing Scheme: The company has decided to use Class C private IPv4 addresses for first three floors, Class A private IPv4 addresses for next two floors, and then Class A public IPv4 addresses for remaining floors following a classful addressing scheme. Allocate IP addresses properly for each floor, ensuring uniqueness.
3. Routing Strategy for Inter-Floor Communication & Connectivity: Recommend a routing approach that is static for interfloor communication.

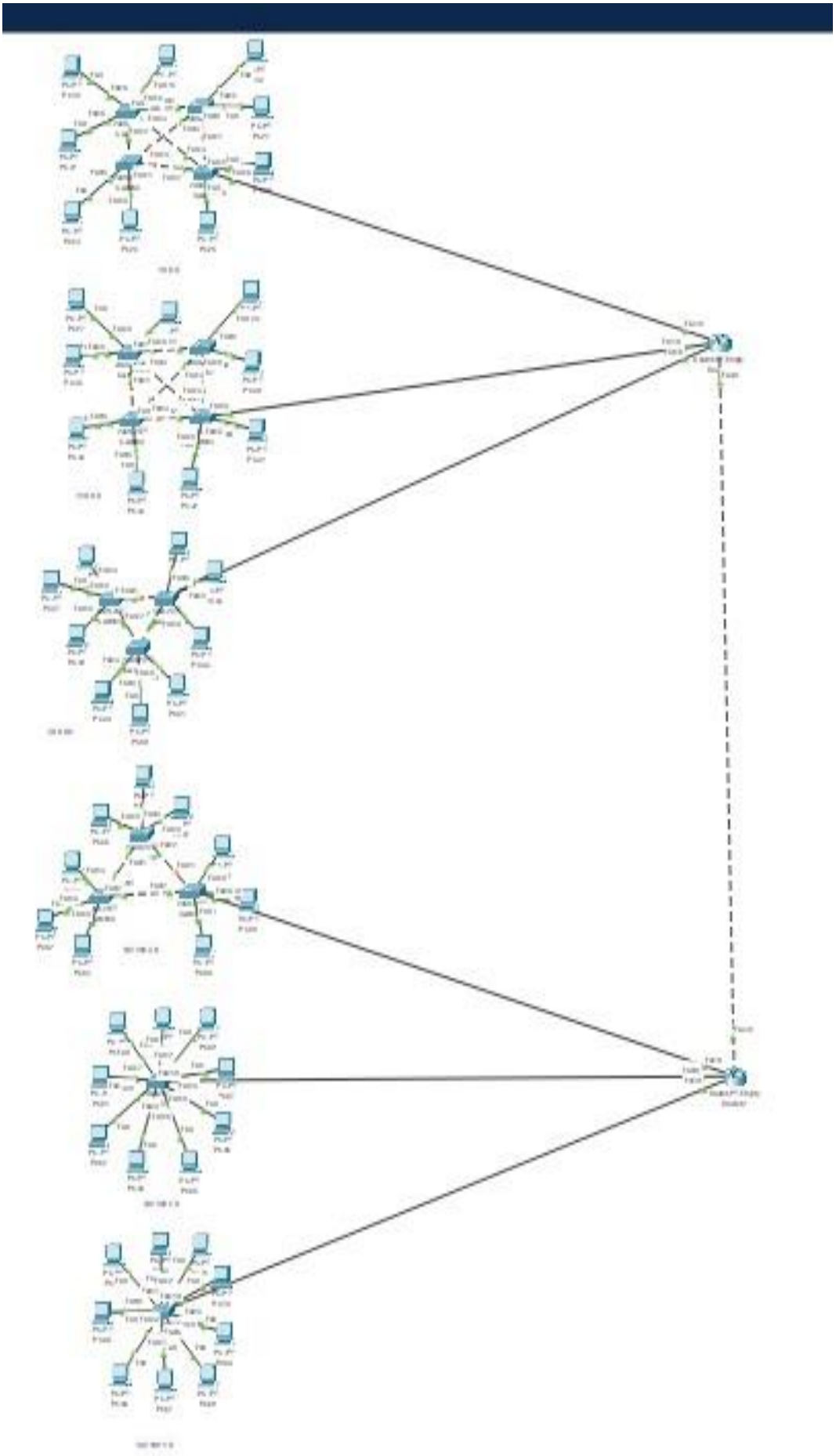
- **Design how the floors will be connected for seamless interdepartment communication.**
- **Suggest the appropriate network devices (e.g., switches, routers, access points) and their placement.**
- **If using dynamic routing, suggest an appropriate routing protocol (e.g., RIP, OSPF, or EIGRP) with justification.**
- **If using static routing, define the static routes for efficient data flow.**
- **Specify the number of default gateways along with IP addresses.**

1.Physical Connection:



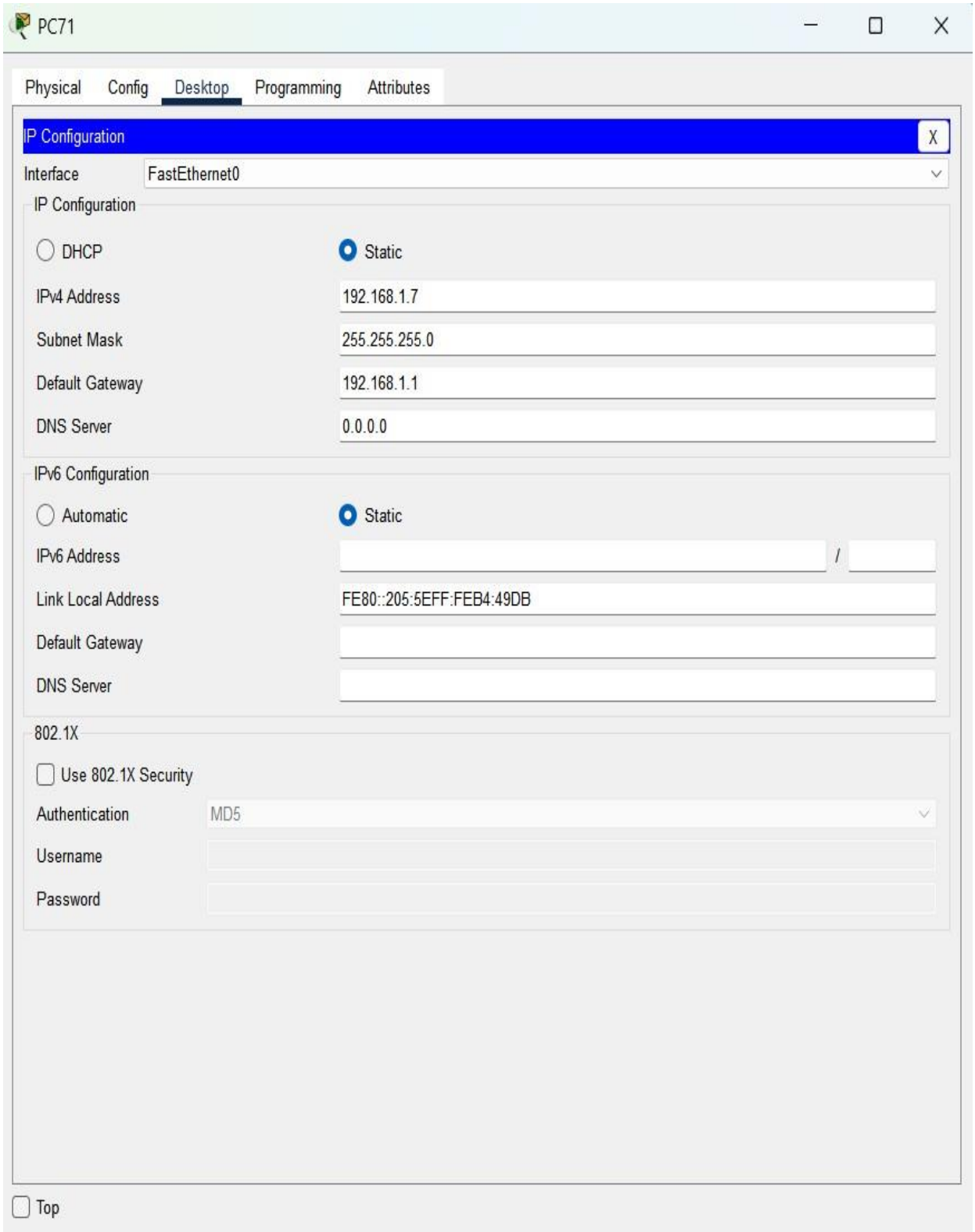

PC-PT
PC37
PC-PT
PC38
PC-PT
PC39
PC-PT
PC40
PC-PT
PC41
PC-PT
PC44
PC-PT
PC43
Fa0/3
Fa0/4
Fa0/5
Fa0/2
Fa0/1
Fa0/6
Fa0/4
Fa0/5
Fa0/3
Fa0/5
Fa0/4
Fa0
10.0.0.0
PC-PT
PC45
PC-PT
PC52
PC-PT
PC53
PC-PT
PC50
PC-PT
PC48
Fa0/5
Fa0/3
Fa0/4
Fa0/2
Fa0/1
Fa0/1
Fa0/3
Fa0/2
Fa0/2
Fa0/4
Fa0/5
Fa0/5
Fa0/6
192.168.3.0


PC-PT
PC58
PC-PT
PC57
PC-PT
PC56
PC-PT
PC55
PC-PT
PC54
PC-PT
PC62
PC-PT
PC61
Fa0
Fa0/2
Fa0/4
Fa0/5
Fa0/6
Fa0/7
Fa0/8
Fa0/9
Fa0/10
192.168.2.0
PC-PT
PC71
PC-PT
PC70
PC-PT
PC69
PC-PT
PC68
PC-PT
PC67
PC-PT
PC66
PC-PT
PC65
192.168.1.0

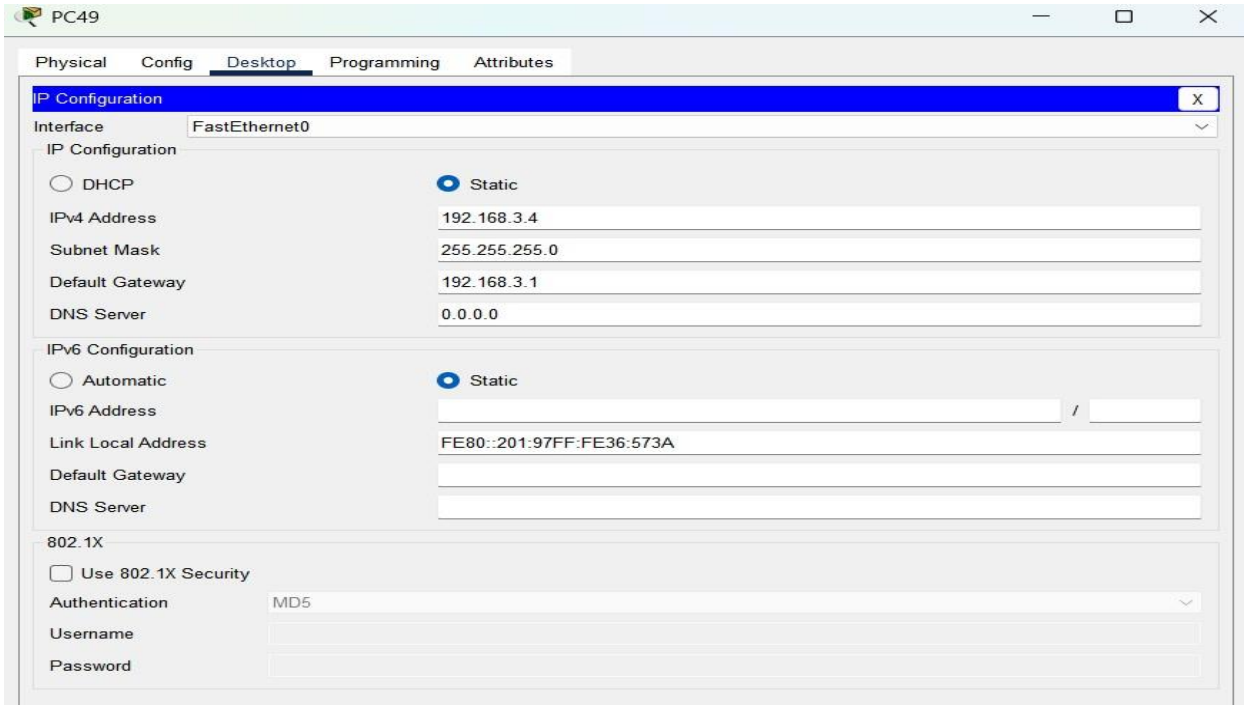


1. Allocation of IP Address:

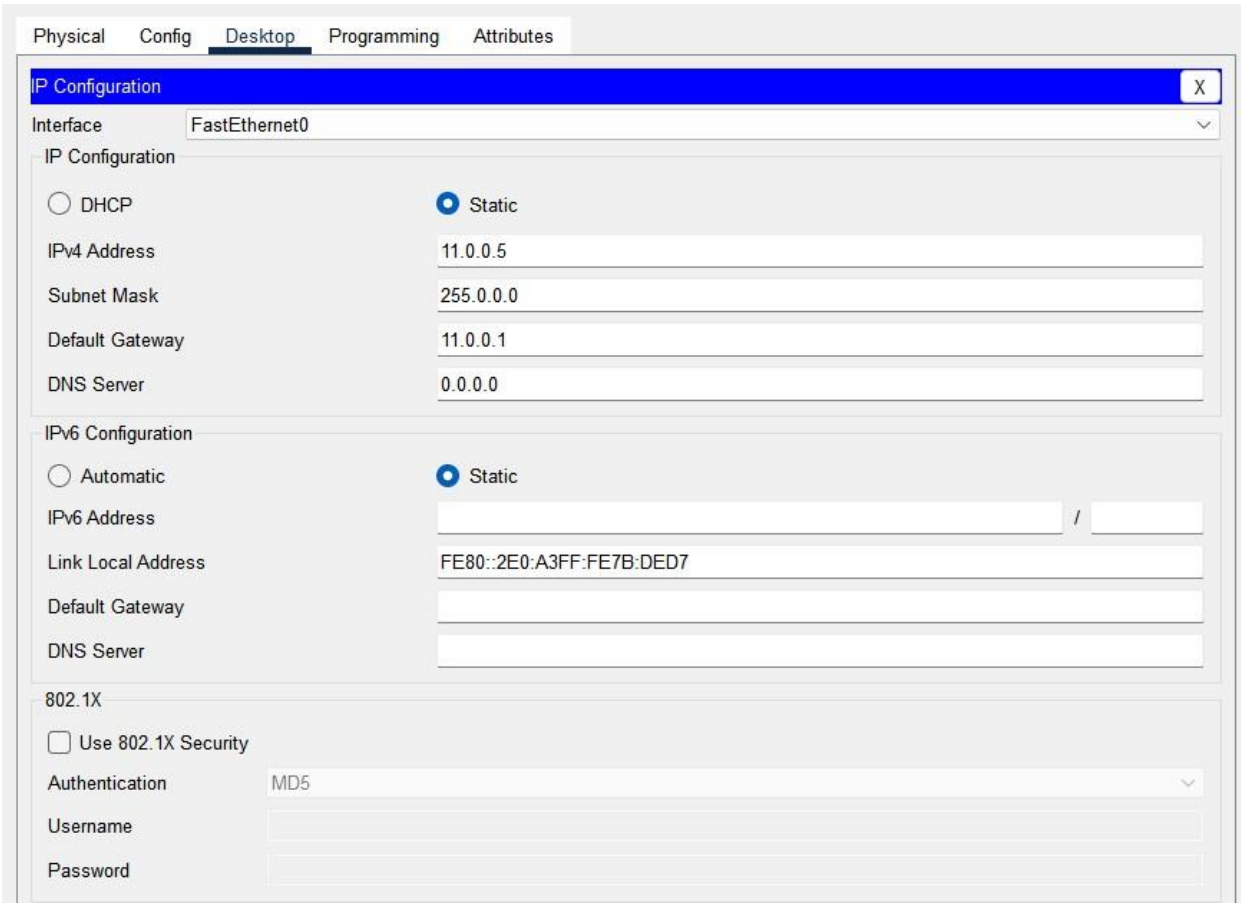
1st Floor:



3rd Floor:

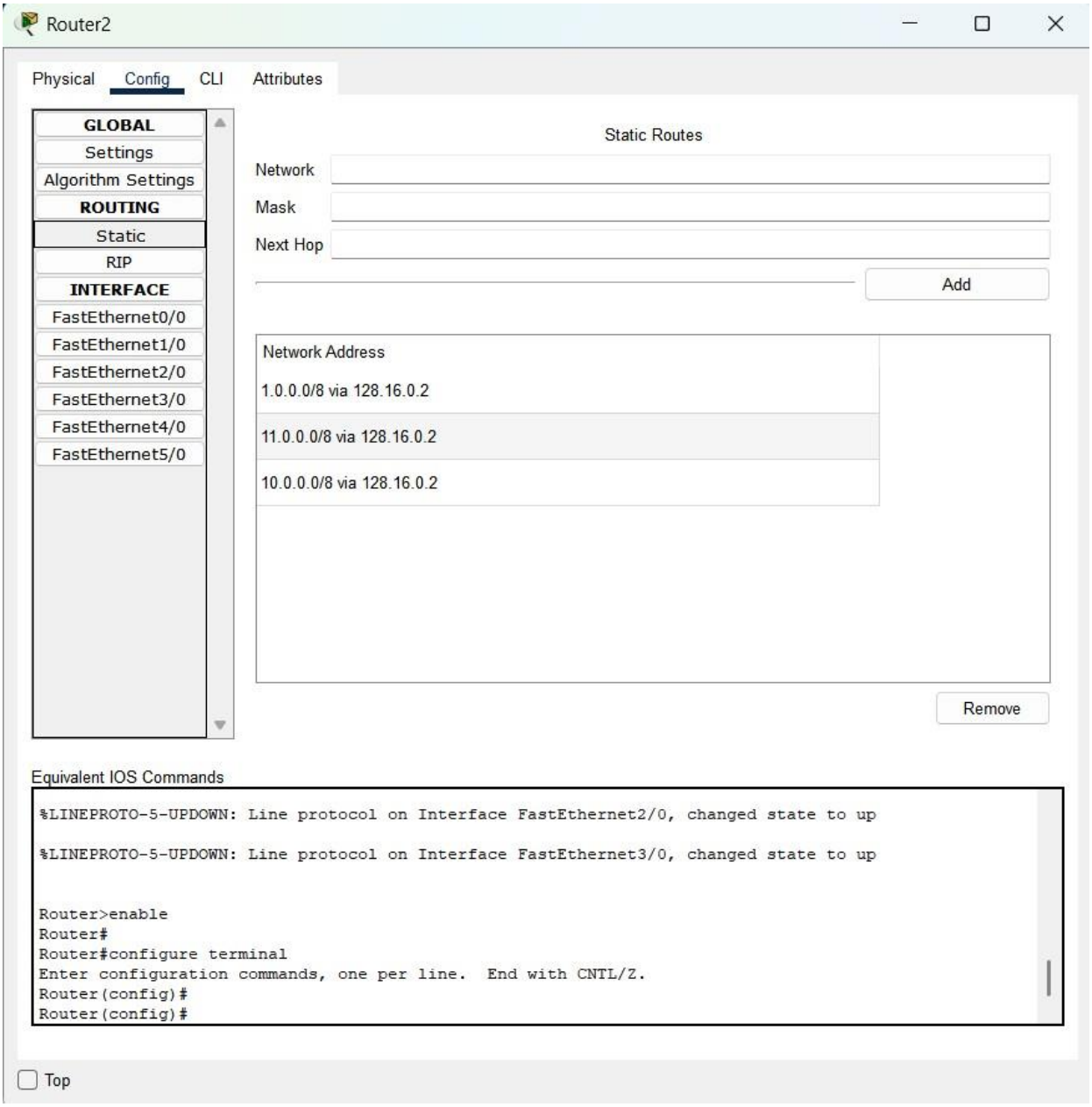


5th Floor:

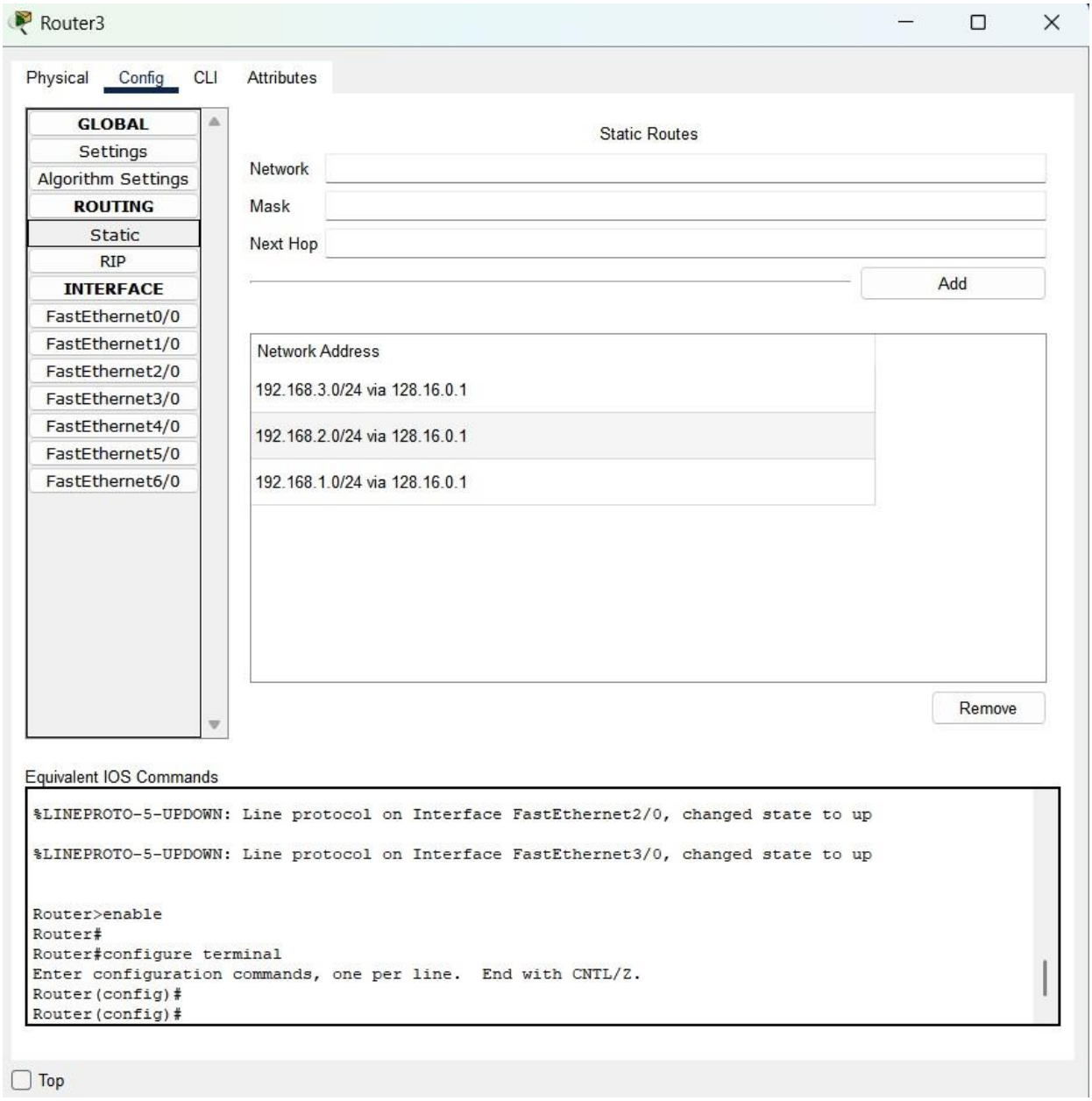


2. Static Routing:

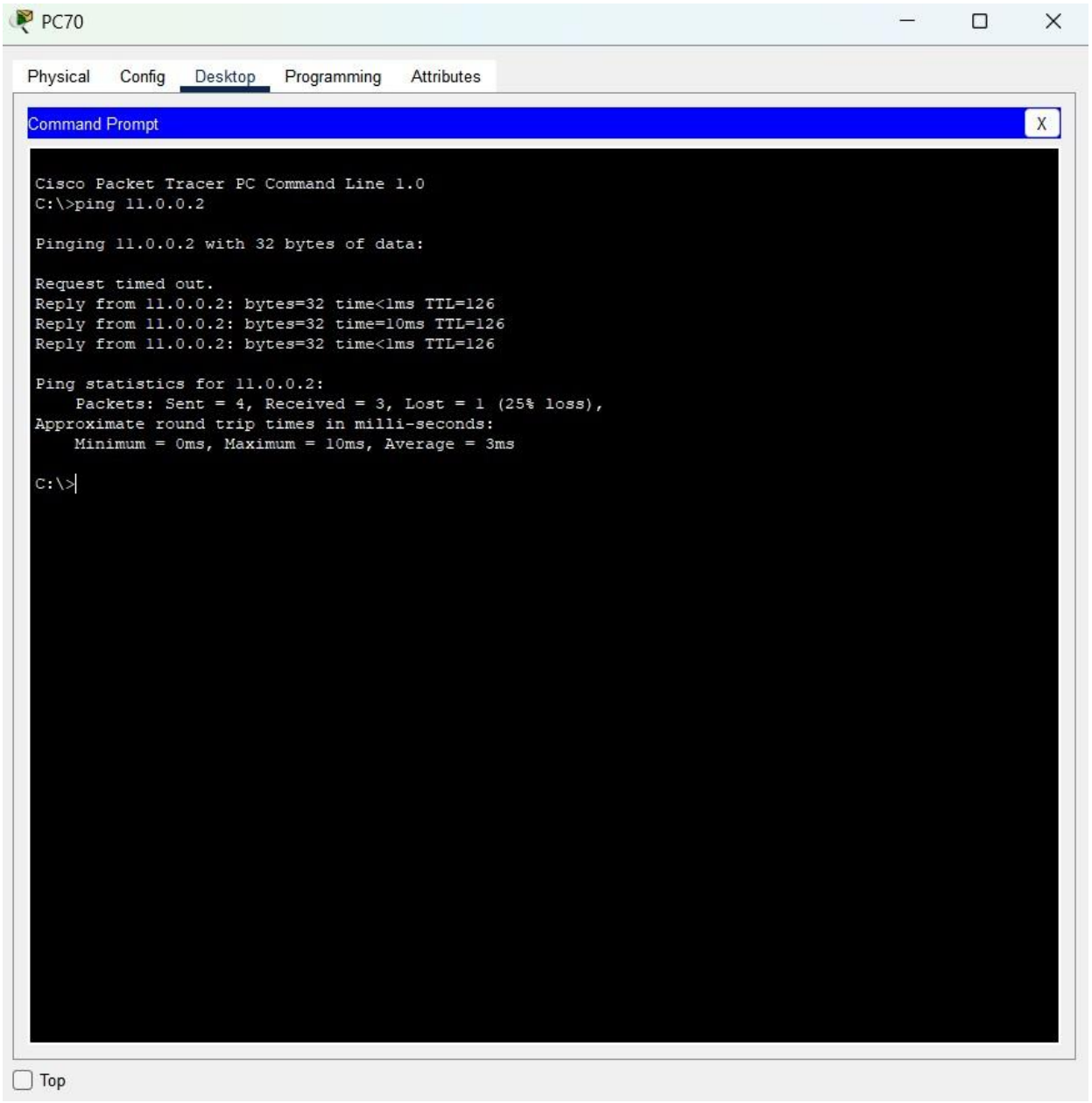
1st Router:

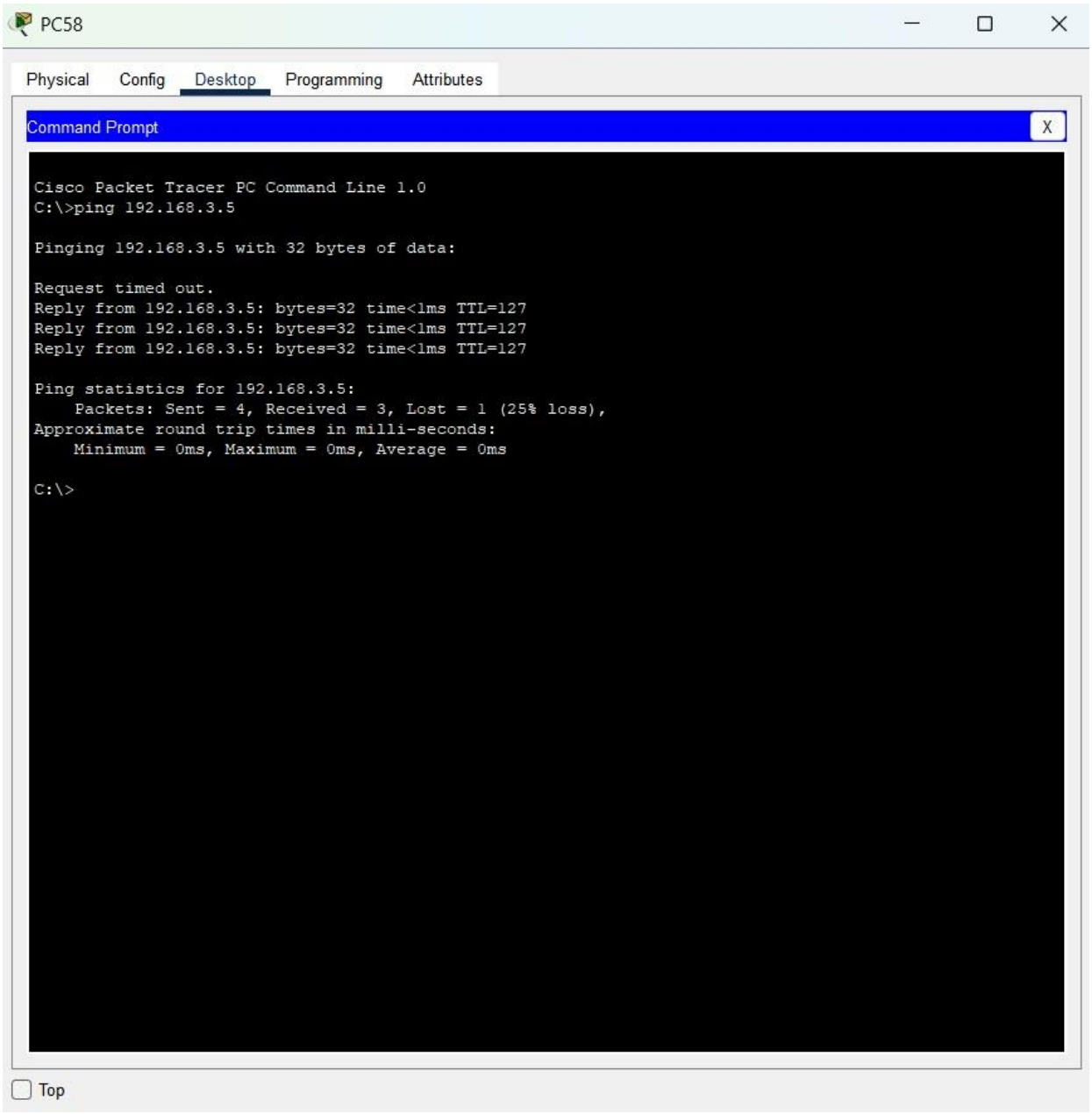

Router2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
INTERFACE
FastEthernet0/0
FastEthernet1/0
FastEthernet2/0
FastEthernet3/0
FastEthernet4/0
FastEthernet5/0
Static Routes
Network
Mask
Next Hop
Add
Network Address
1.0.0.0/8 via 128.16.0.2
11.0.0.0/8 via 128.16.0.2
10.0.0.0/8 via 128.16.0.2
Remove
Equivalent IOS Commands
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0, changed state to up
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#
Top

2nd Router:



3.Communication between all computers:


PC70
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 11.0.0.2
Pinging 11.0.0.2 with 32 bytes of data:
Request timed out.
Reply from 11.0.0.2: bytes=32 time<1ms TTL=126
Reply from 11.0.0.2: bytes=32 time=10ms TTL=126
Reply from 11.0.0.2: bytes=32 time<1ms TTL=126
Ping statistics for 11.0.0.2:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 10ms, Average = 3ms
C:\>
Top


PC58
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.3.5
Pinging 192.168.3.5 with 32 bytes of data:
Request timed out.
Reply from 192.168.3.5: bytes=32 time<1ms TTL=127
Reply from 192.168.3.5: bytes=32 time<1ms TTL=127
Reply from 192.168.3.5: bytes=32 time<1ms TTL=127
Ping statistics for 192.168.3.5:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
Top