MANIPAL
ACADEMY of HIGHER EDUCATION
DUBAI CAMPUS
(Institution of Eminence Deemed to be University)

SCHOOL OF ENGINEERING & IT

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Student Name: Rahini Sharma

Registration No: 220101051

Course Name:

Course Code:

CERTIFICATE

This is to certify that **Ms. Rahini Sharma** Reg. No: **220101051**

Section: **A** Roll No: has satisfactorily completed the LAB EXERCISES

PRESCRIBED FOR COMPUTER NETWORKS LAB (CSE 3143) of Third Year B.Tech.

Degree in Computer Science and Engineering at MAHE, Dubai Campus, in the Academic Year 2024– 2025.

Date

Signature
Faculty In Charge

Table of Contents

13	Create a network using Three (3) routers and establish the communication between two different networks (PCs); use Dynamic Routing (RIP) Protocol to establish the routing and study the routing table. Use 'tracert' command to analyze the route of communication. Create a connection between 1st and 3rd router directly and verify the functionality of RIP Hop routing using 'tracert' command.		
14	Hub Connectivity		
15	PC to Printer Connectivity		
16	Virtual LAN		

Experiment 1

Cabling Stright & Crossover

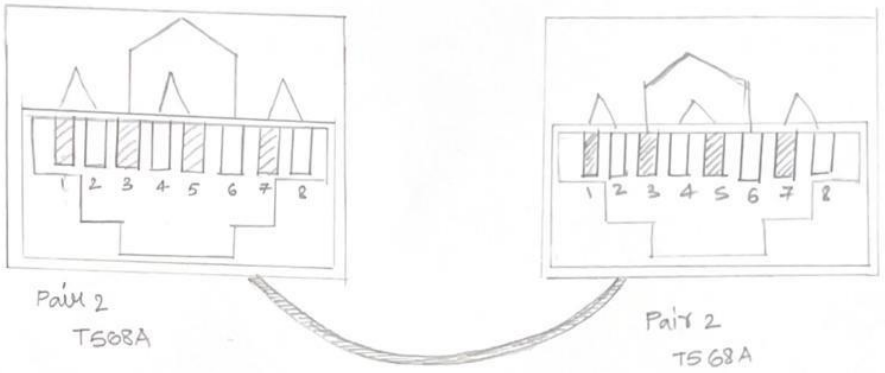
Rahini Sharma
220101051
Btech CSE, Section A Batch 2.

27.8.2024

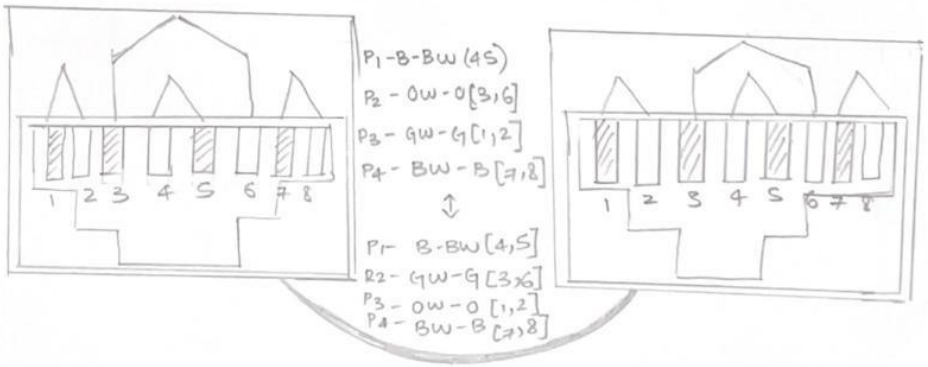
Pair 1: B-BW [4,5]
Pair 2: O-OW [6,3]
Pair 3: G-GW [2,1]
Pair 4: B-BW [7,8]

Pair 1: B-BW [4,5]
Pair 2: O-OW [6,3]
Pair 3: G-GW [2,1]
Pair 4: B-BW [7,8]

Straight through cable



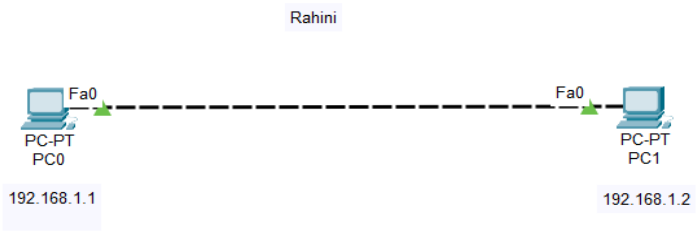
- Straight through cables have the same termination at each end - T568A or T568B
- Straight through cables are used to connect devices that operate at different layers of the network model (PC to Router, Hub to Router etc) (devices of different nature)



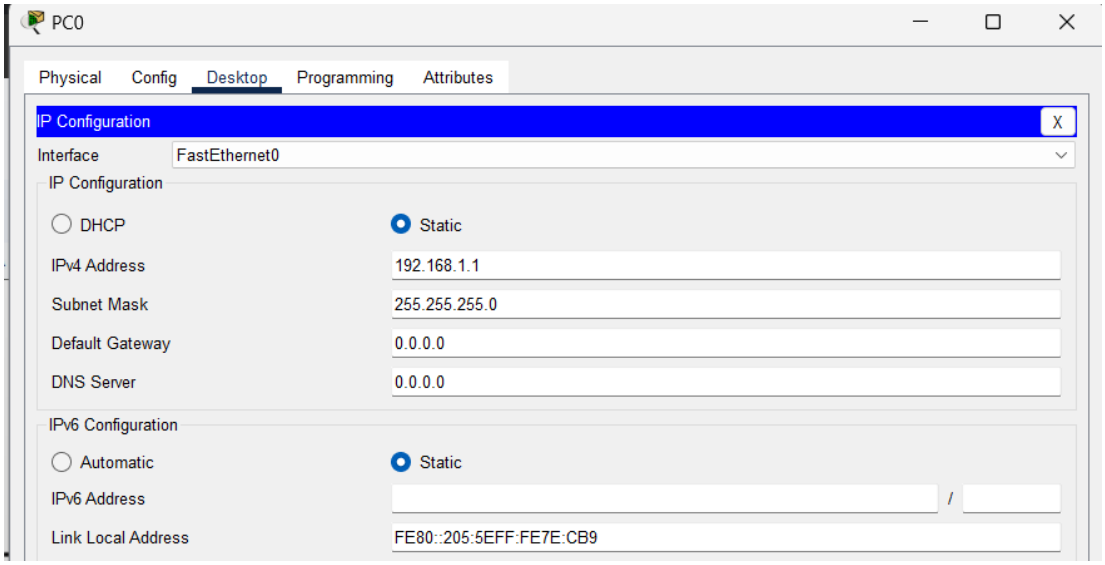
- Crossover cables have a T568A termination at one end and a T568B termination at the other end
- Crossover cables are used to link devices of same nature (PC to PC, Router to Router)

Experiment 2

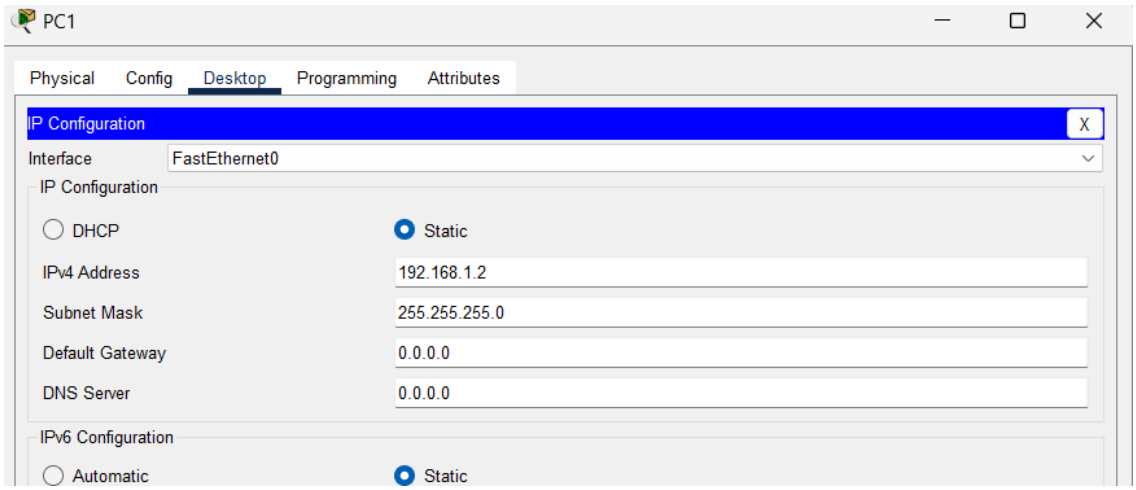
PC to PC Connectivity



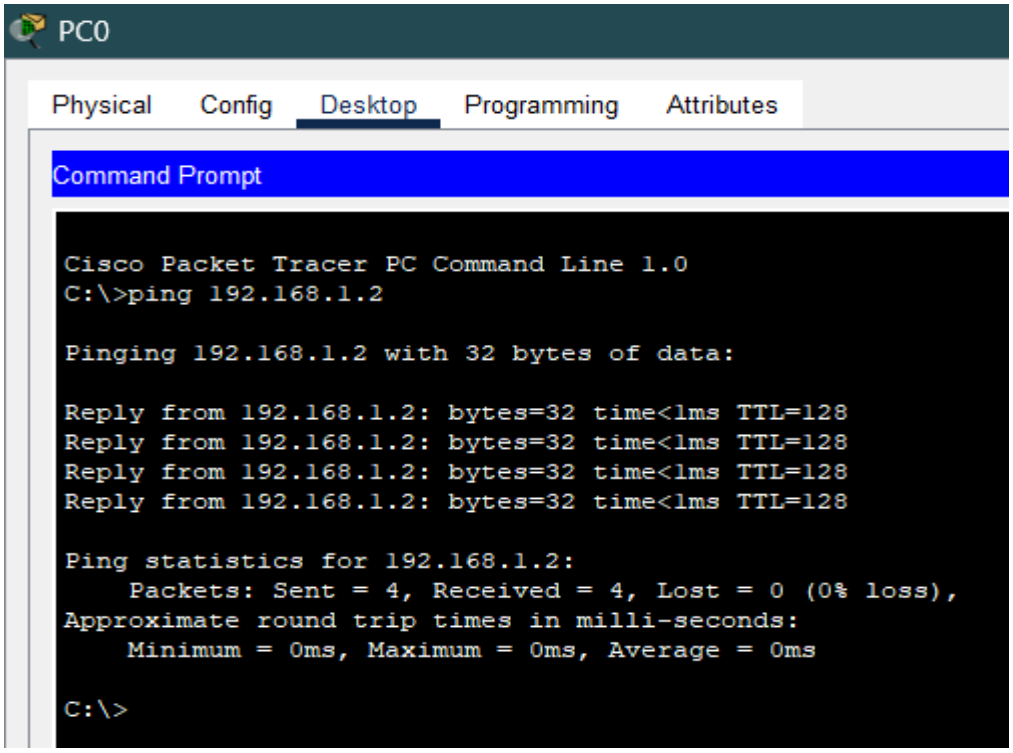
PC0 Configuration



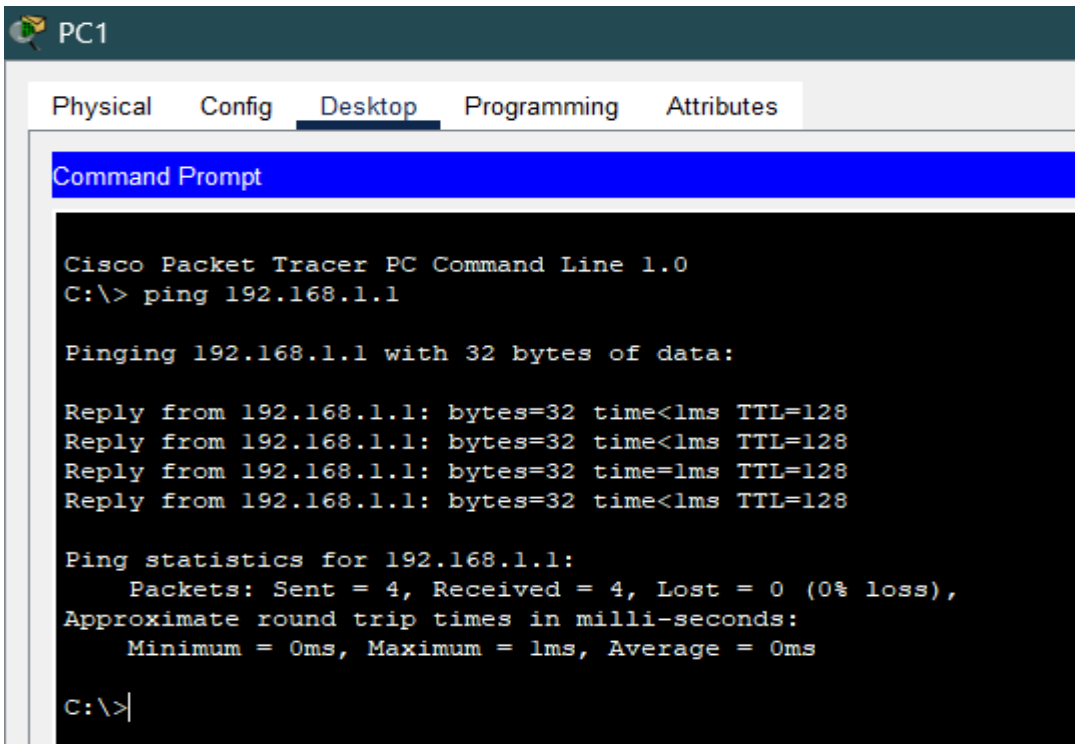
PC1 Configuration



Pinging PC0 to PC1

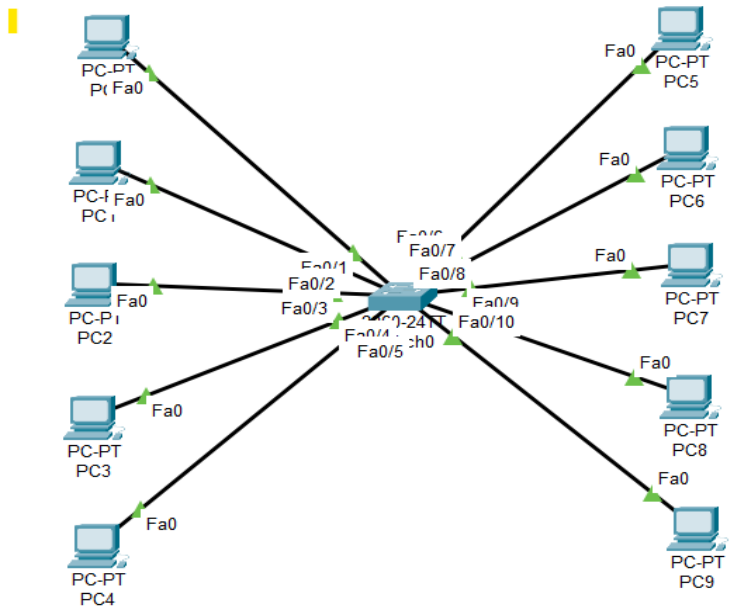


Pinging PC1 to PC0

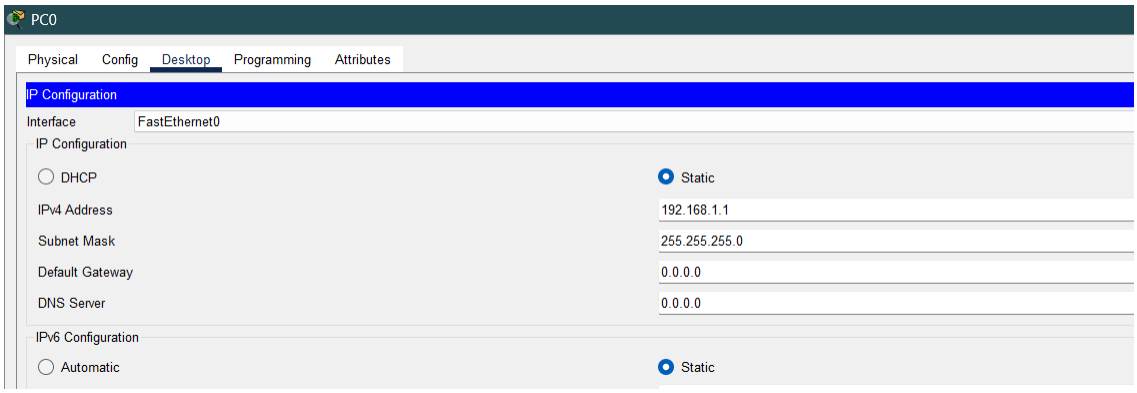


Experiment 3

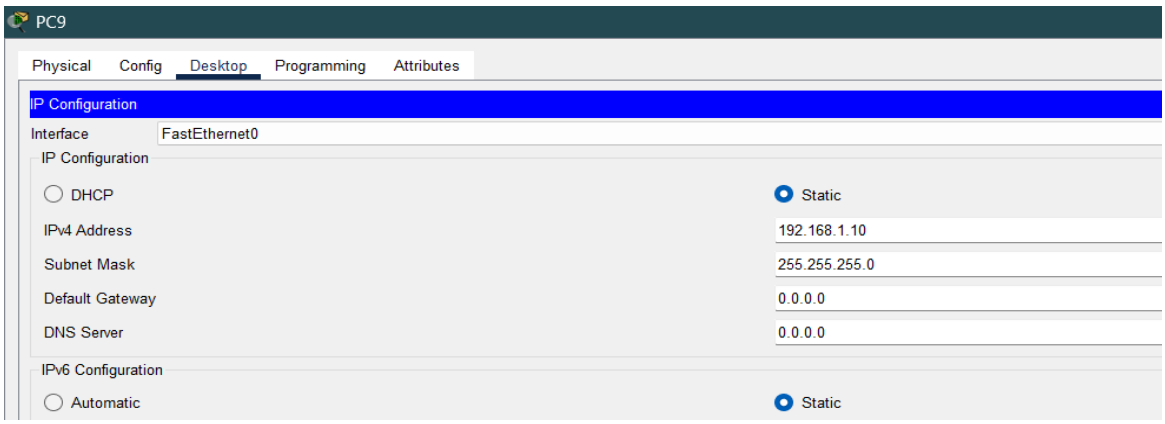
Multi PC connectivity with Switch



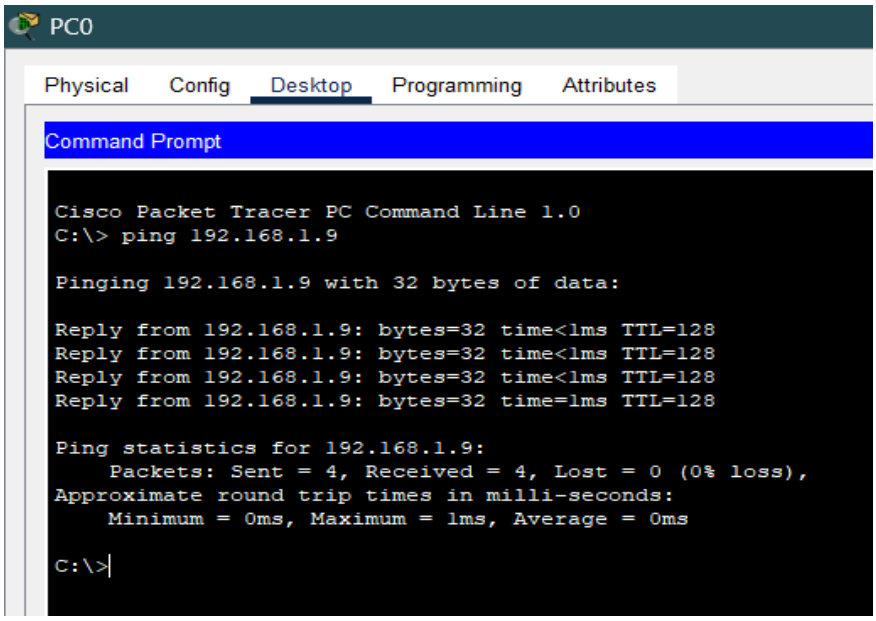
PC0 Configuration (1st)



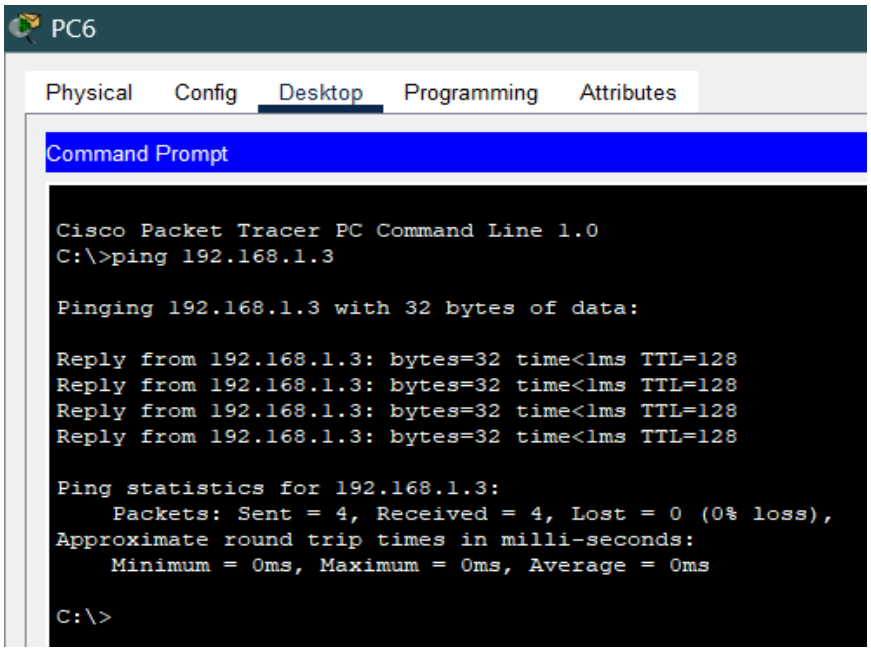
PC9 Configuration (10th)



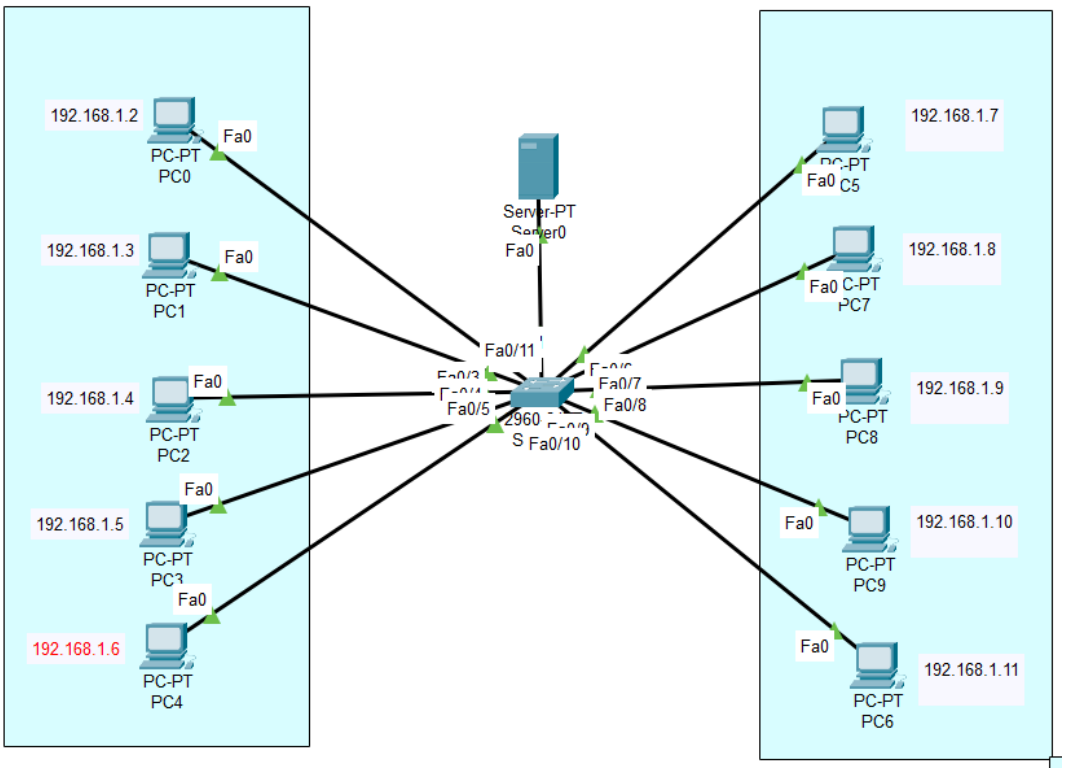
Pinging PC0 to PC8 (9th)



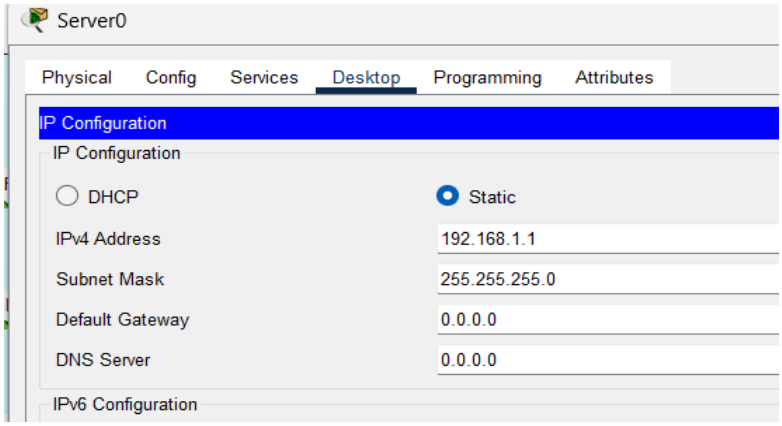
Pinging PC6 to PC2 (3rd)



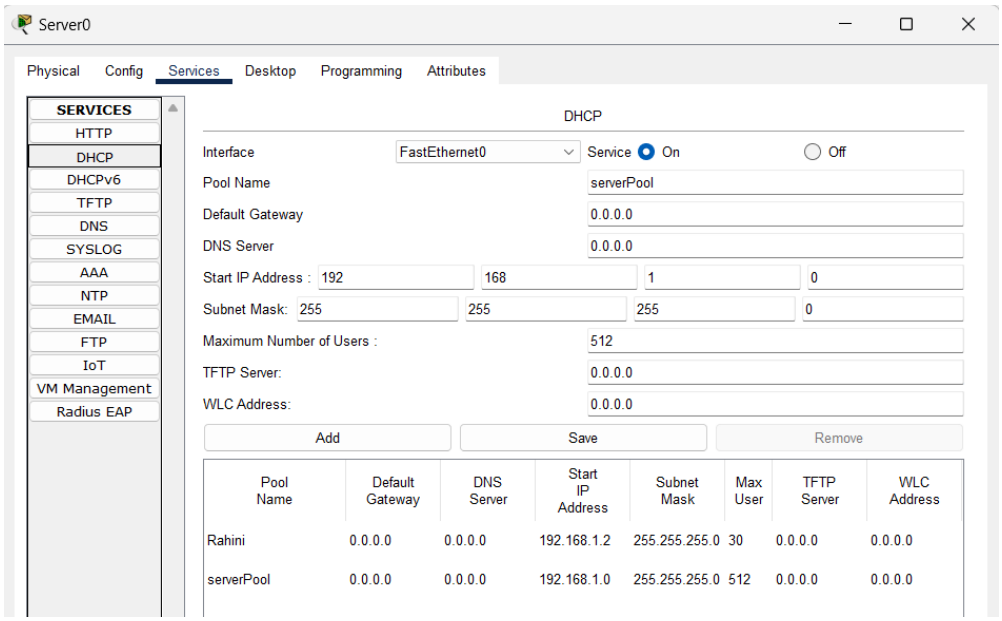
DHCP:



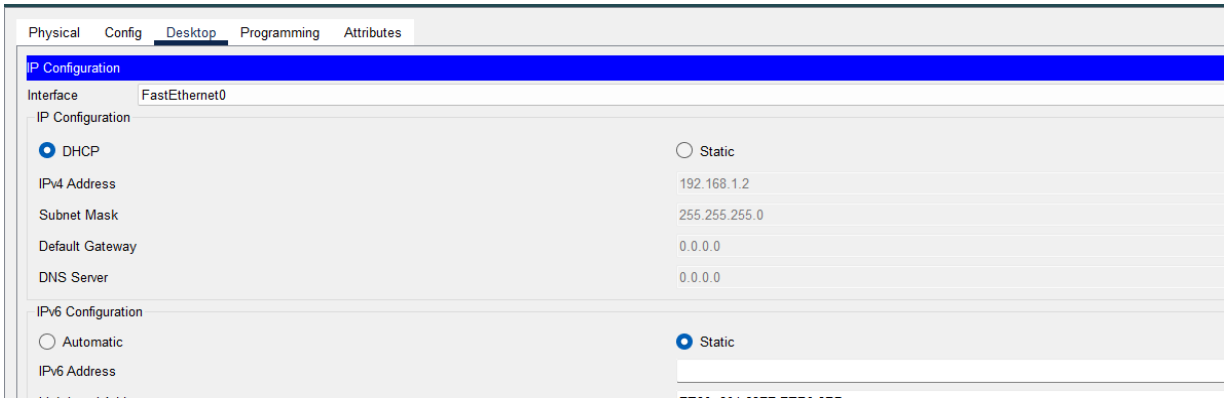
Server Configuration



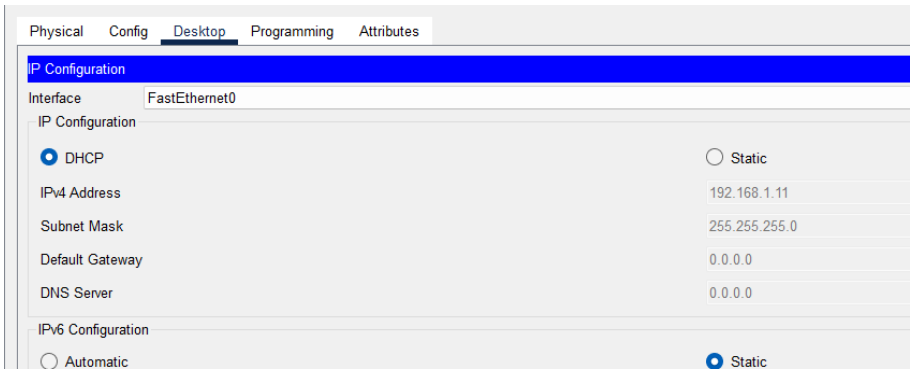
Server Services Configuration



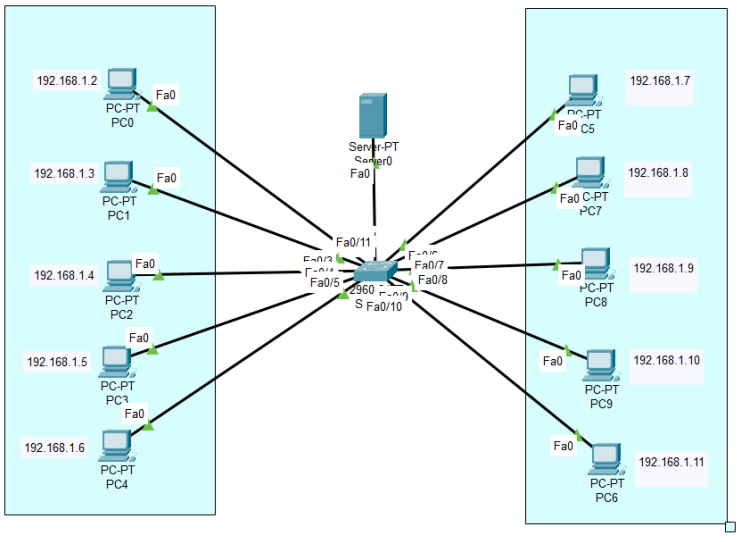
PC1 Configuration

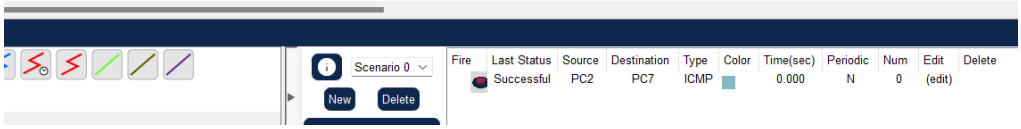


PC10 Configuration

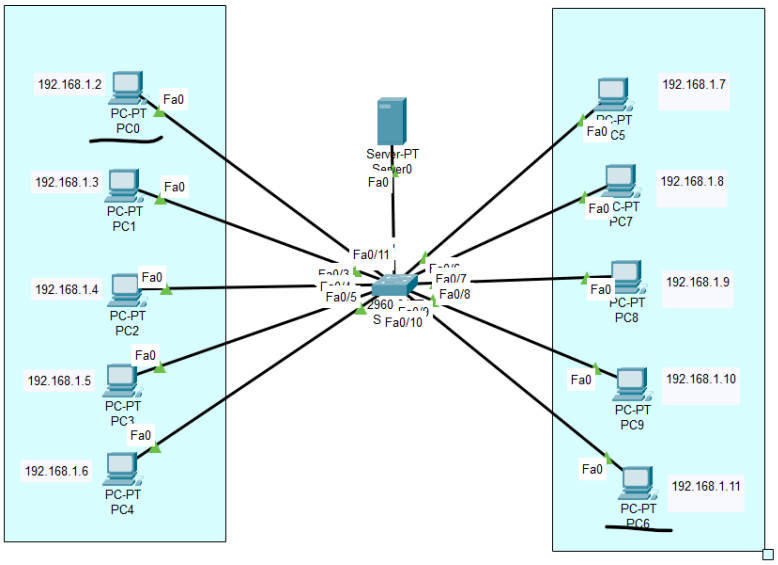


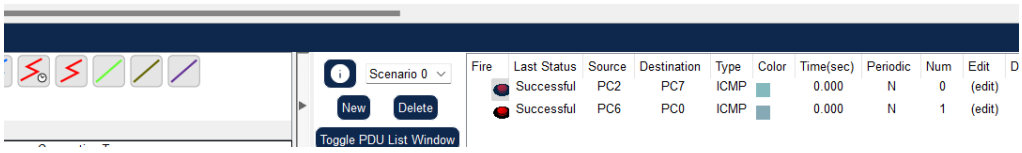
Real-Time (PC2 to PC7)



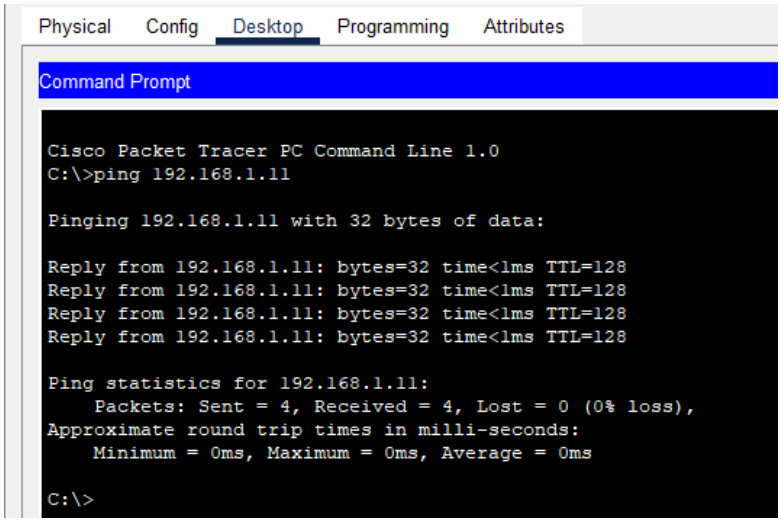


Real-Time (PC6 to PC0)

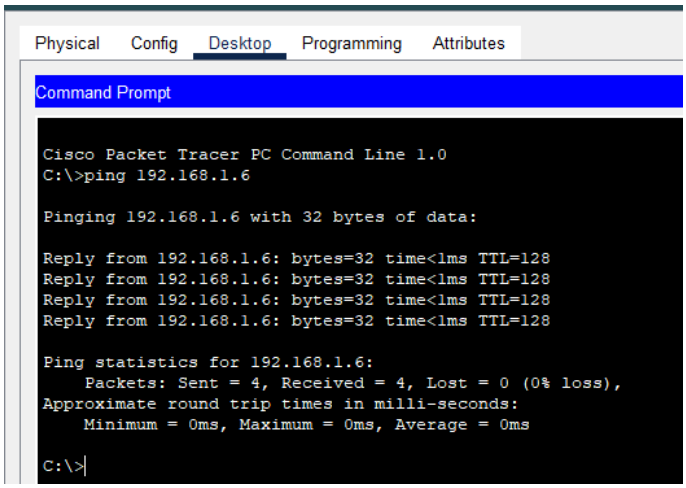




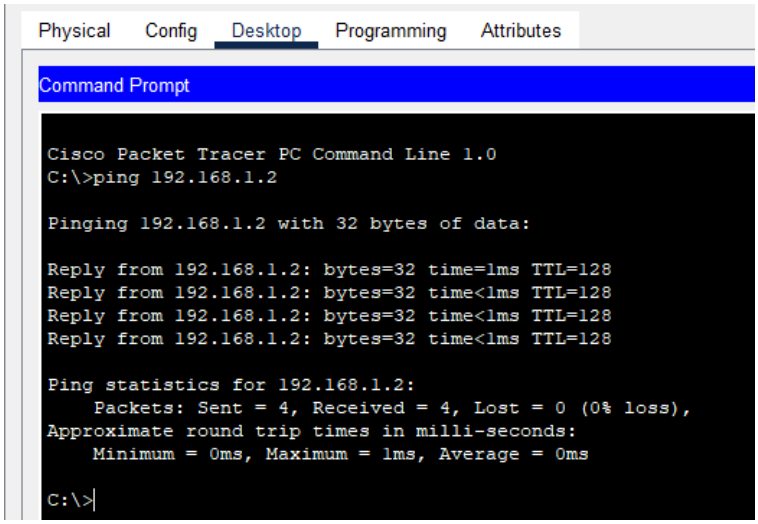
Pinging PC8 to PC6 (8th pc to 10th pc)



Pinging PC1 to PC4 (2nd pc to 5th pc)

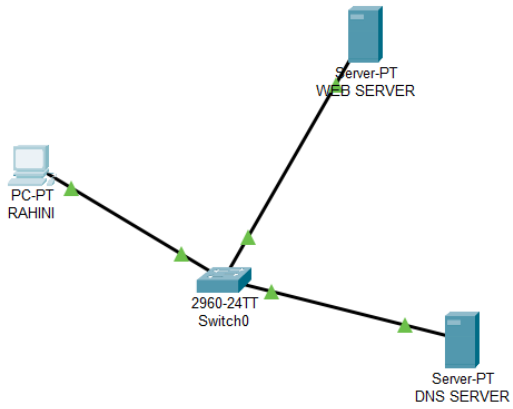


Pinging PC7 To PC1

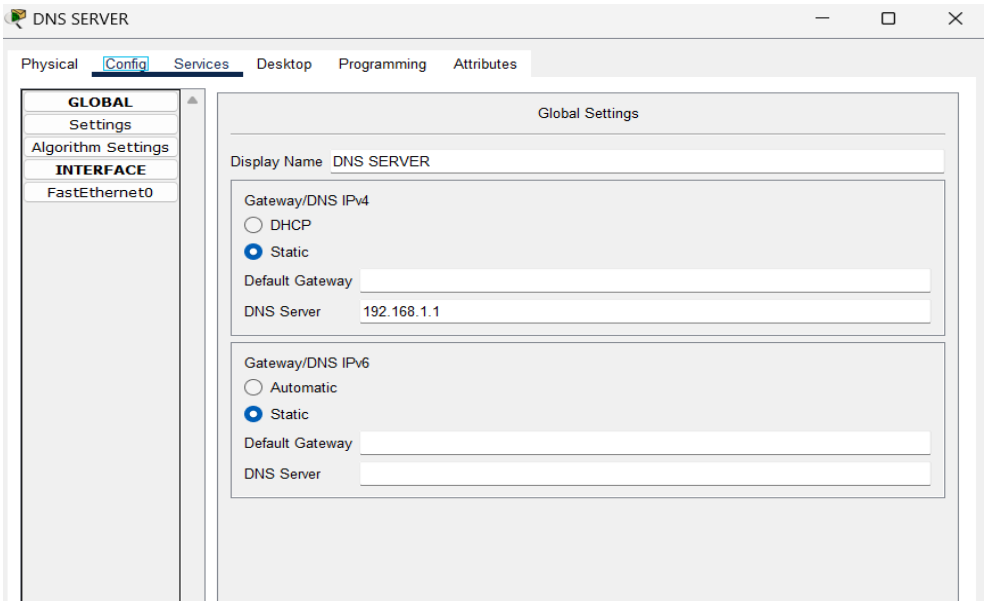


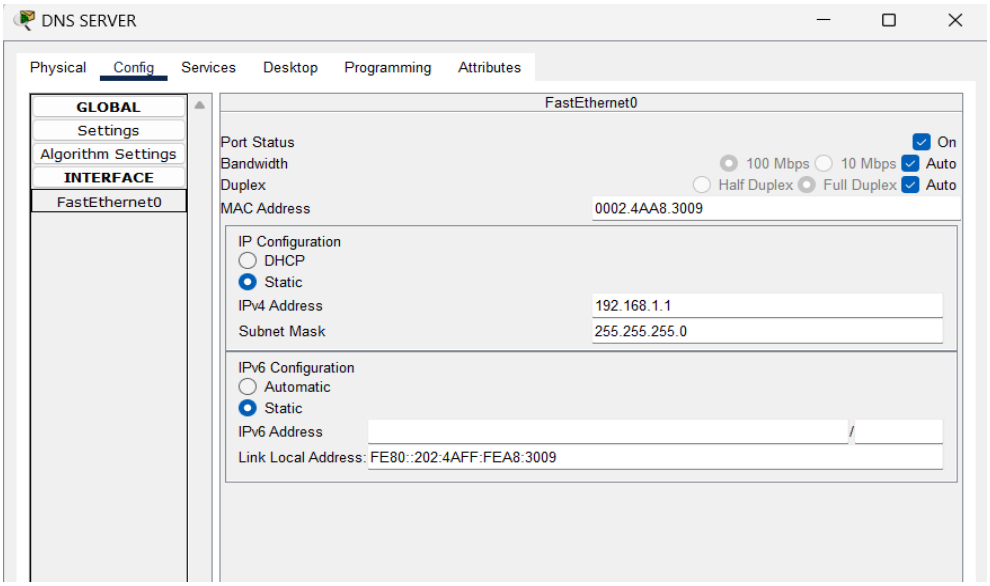
Experiment 6

Setting up a Web server and accessing it by IP address and by a DNS server

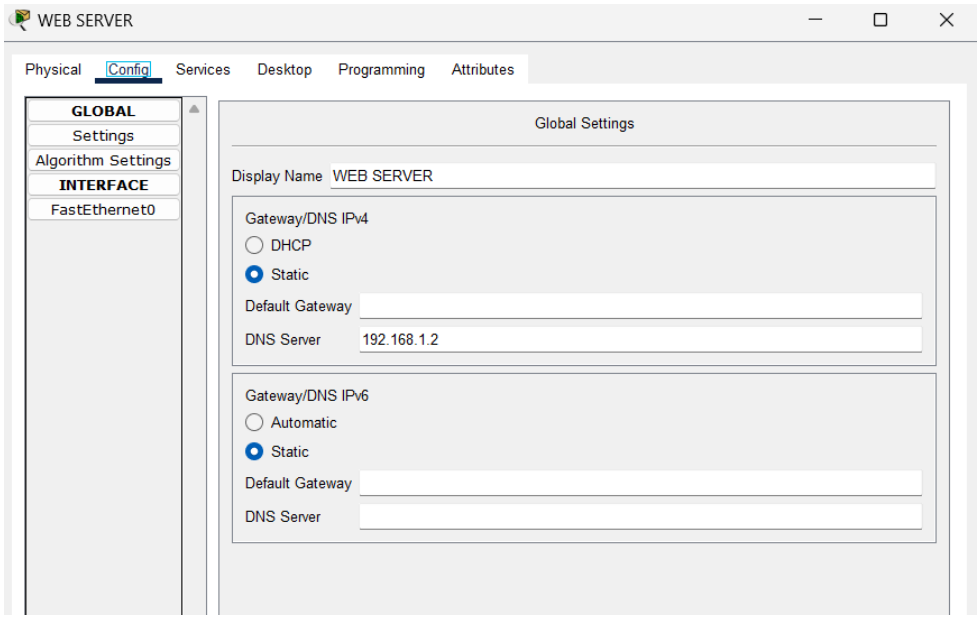


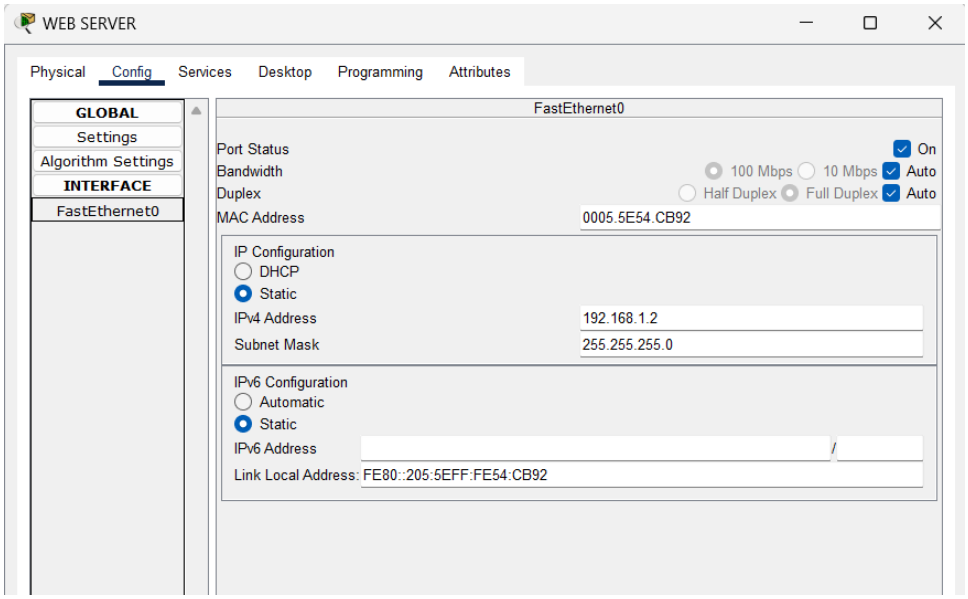
DNS Server Configuration

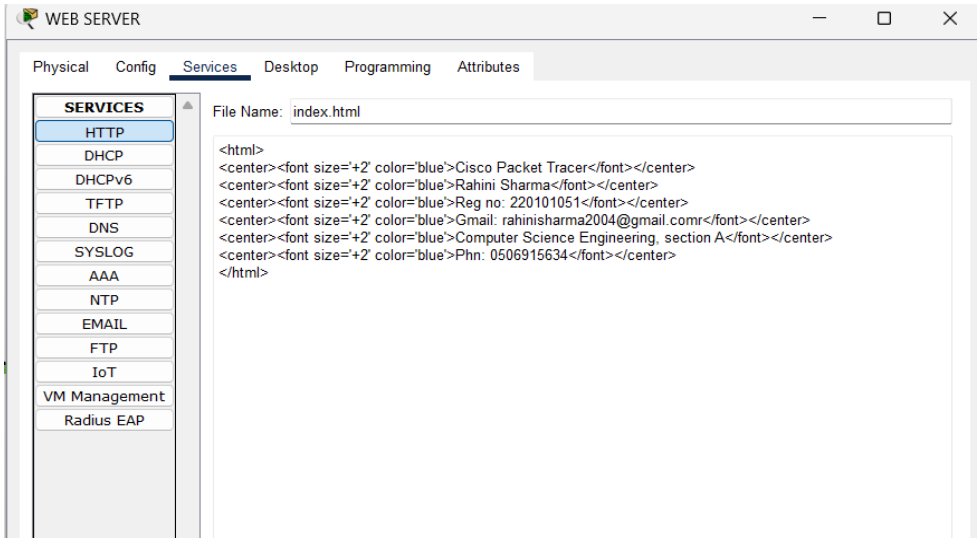




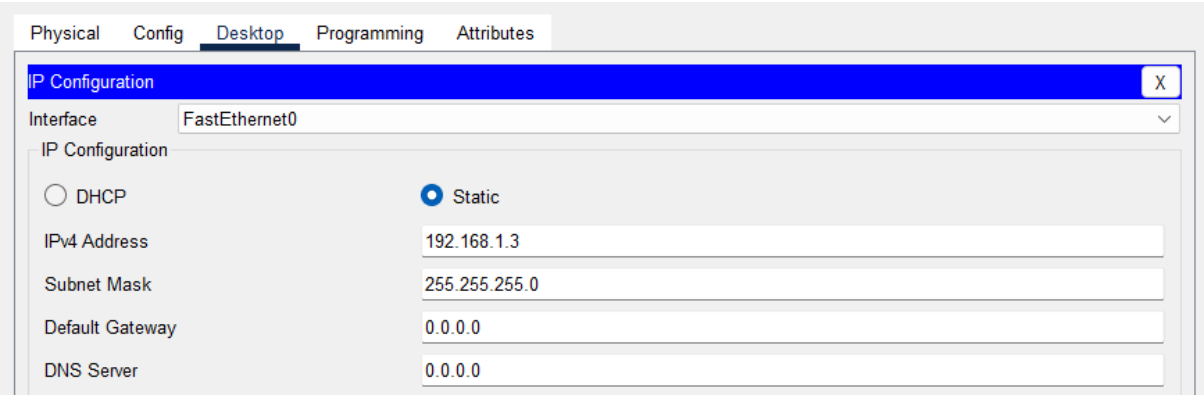
Web Server Configuration

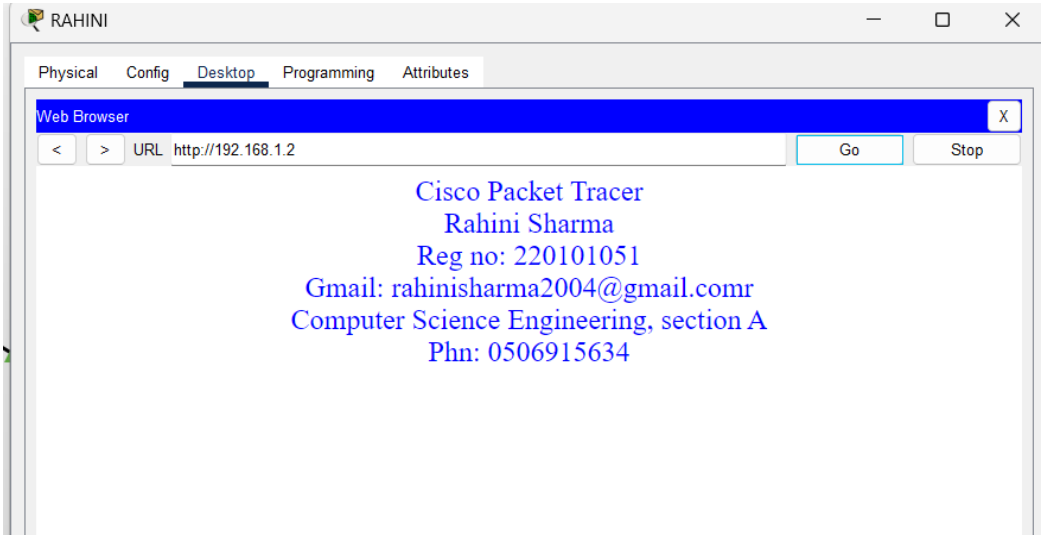






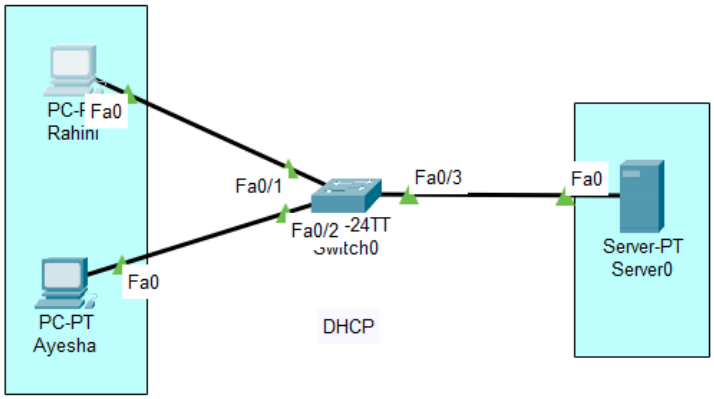
PC Configuration



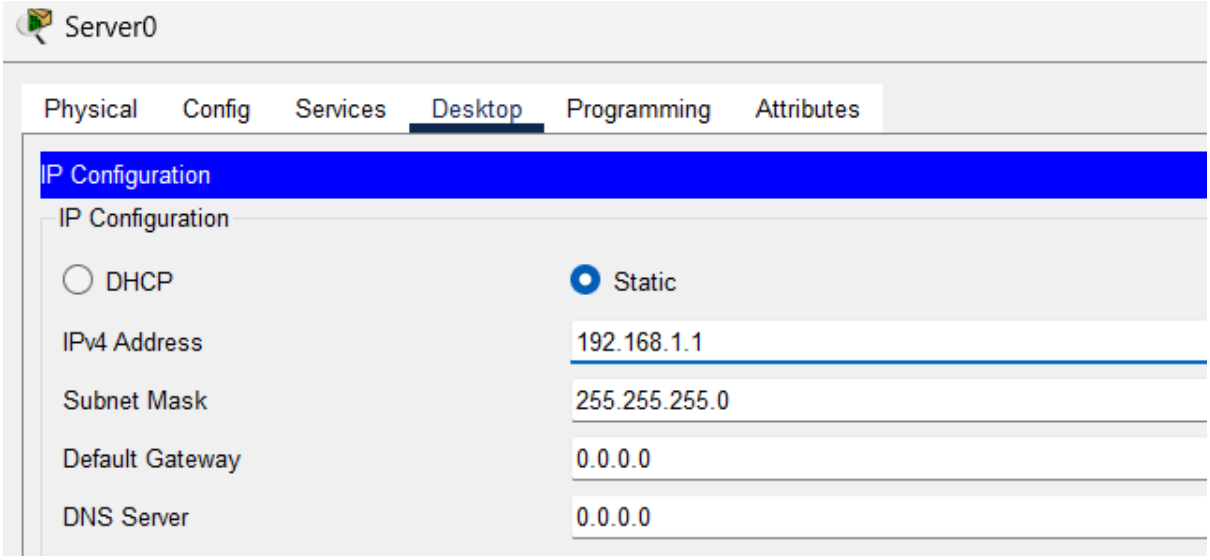


Experiment 7

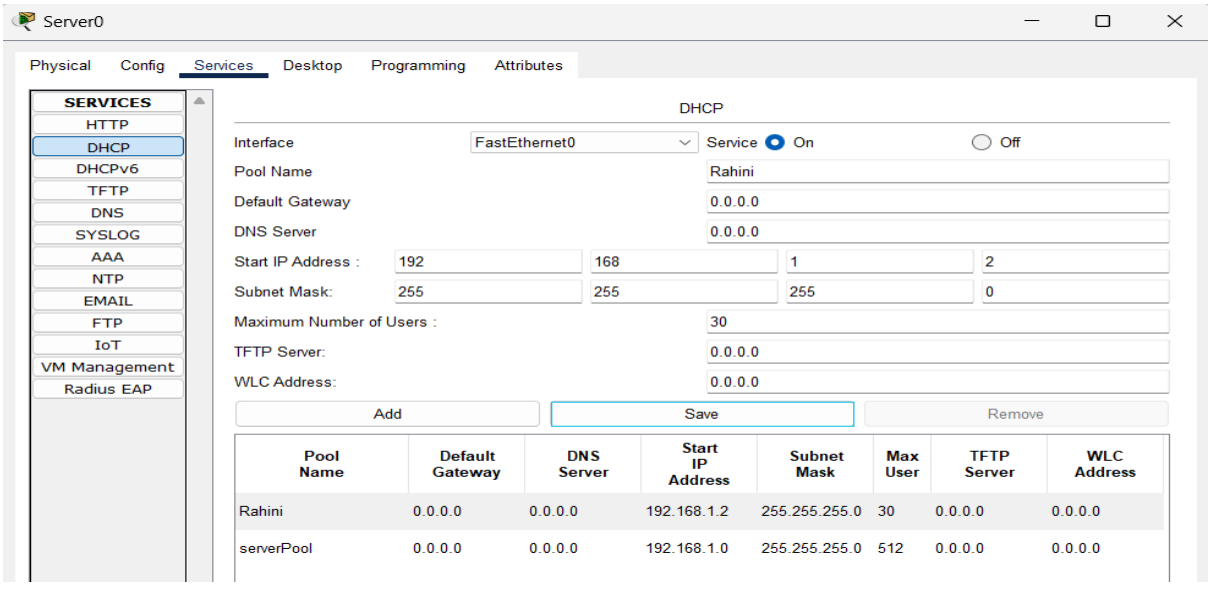
DHCP using Server



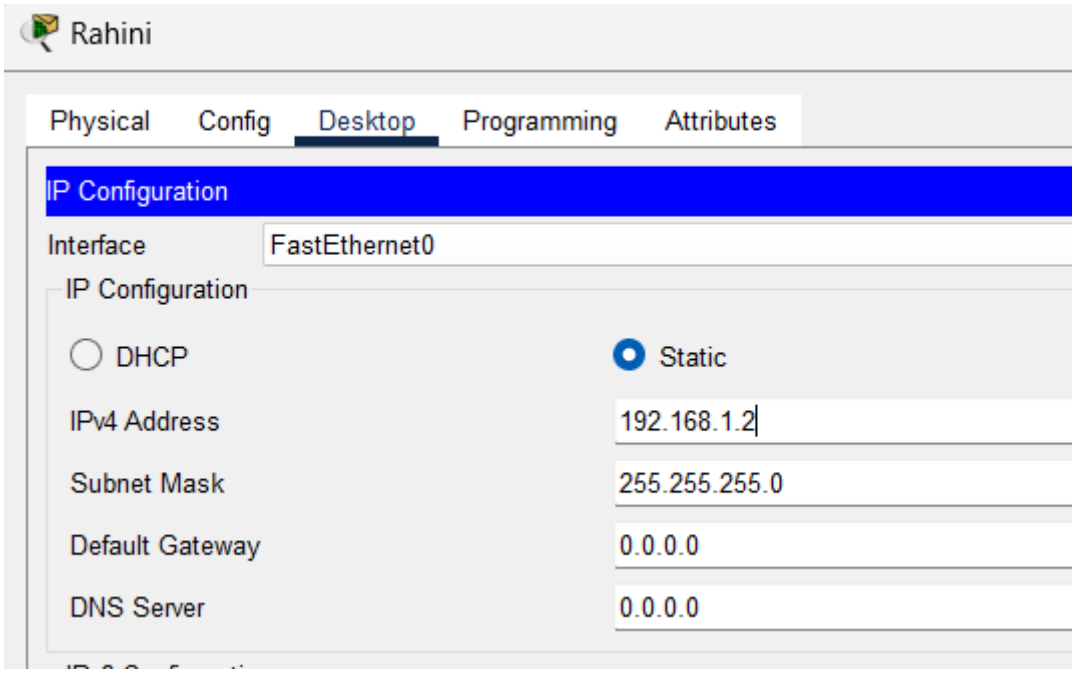
Server IP Configuration



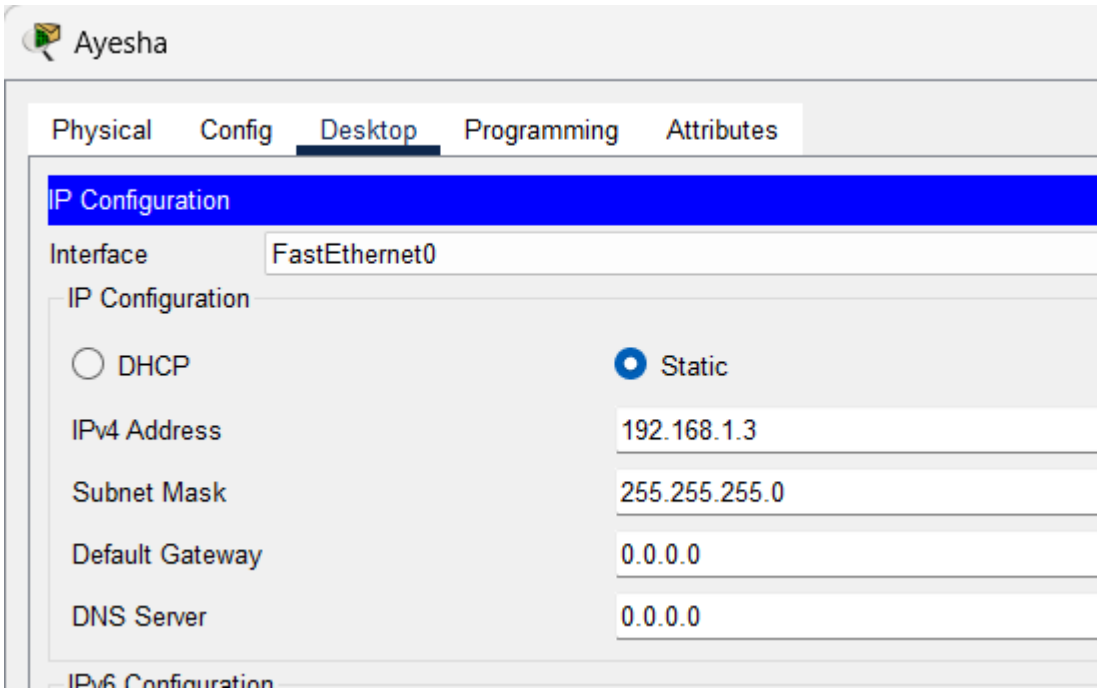
Server Services Configuration



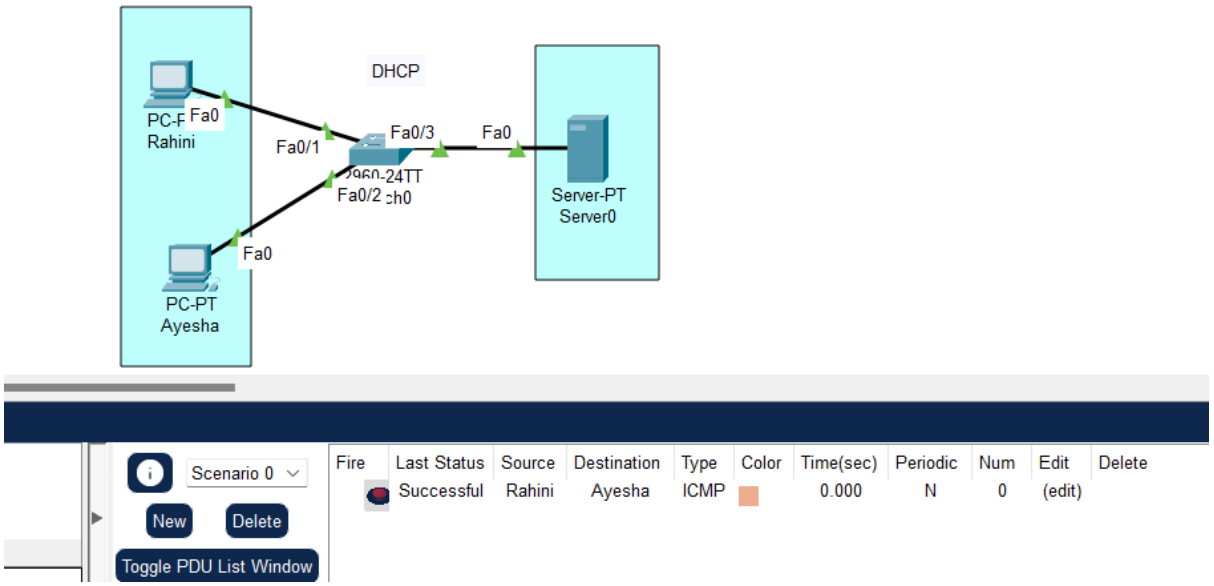
PC1 Configuration



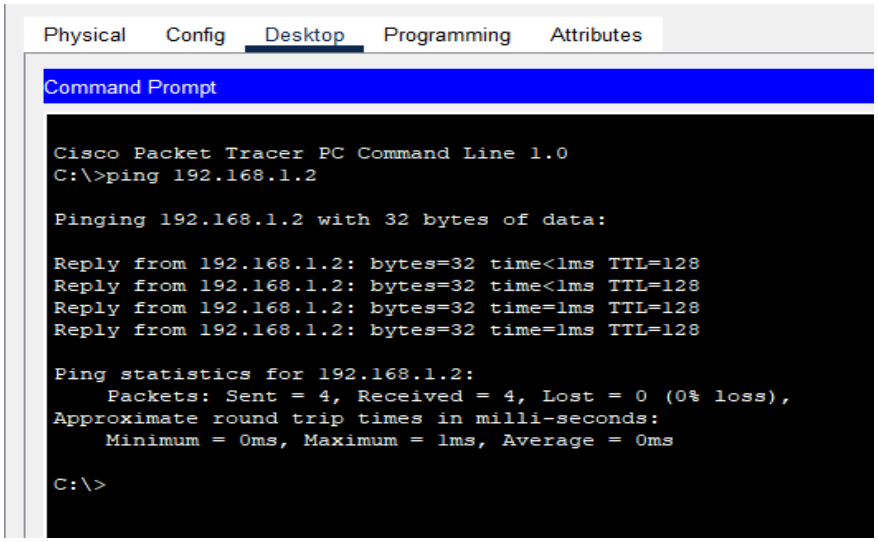
PC2 Configuration



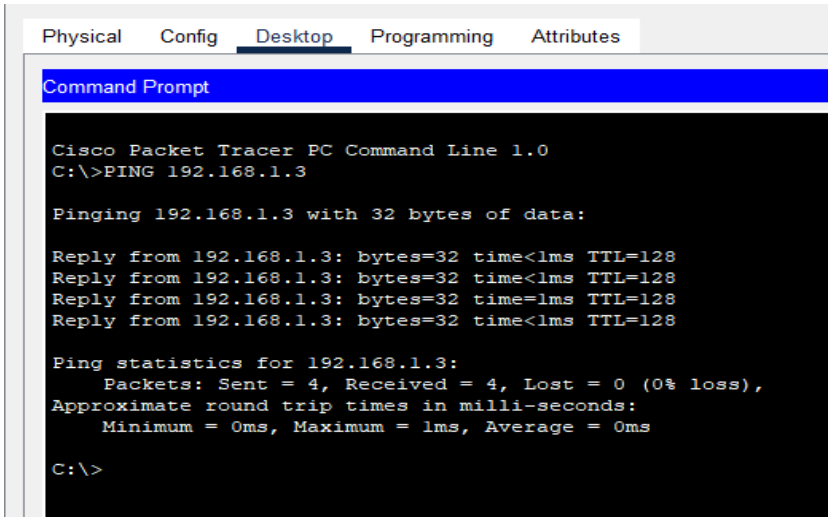
Real-Time Packet Transfer



Pinging PC2 to PC1

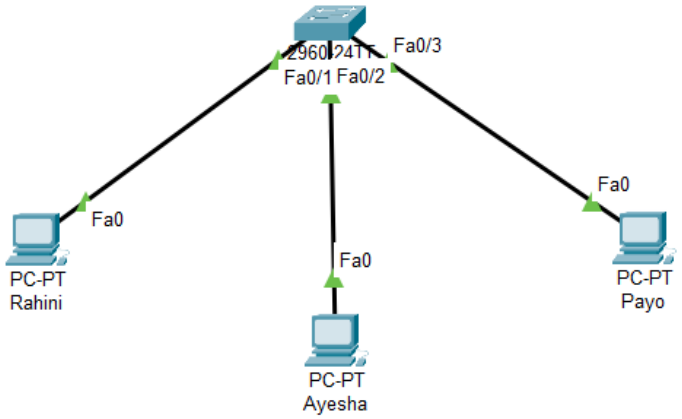


Pinging PC1 to PC2

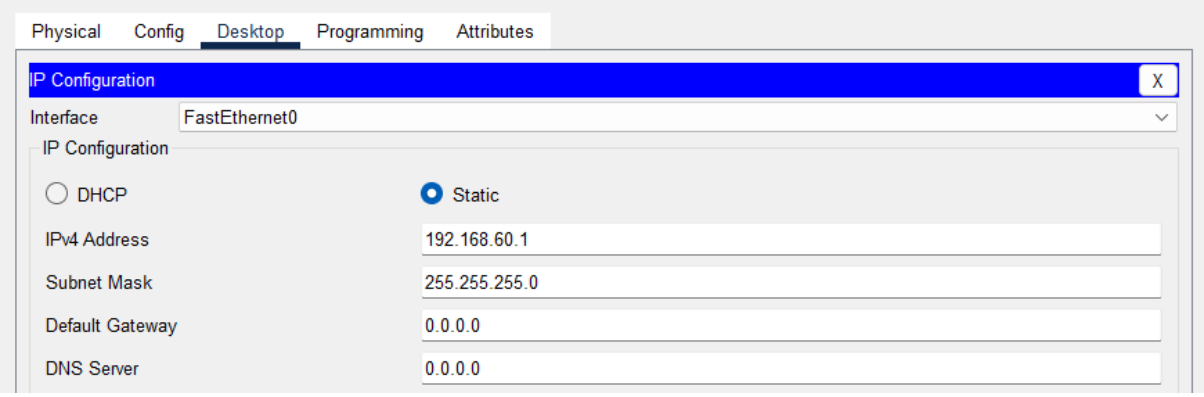


Experiment 9

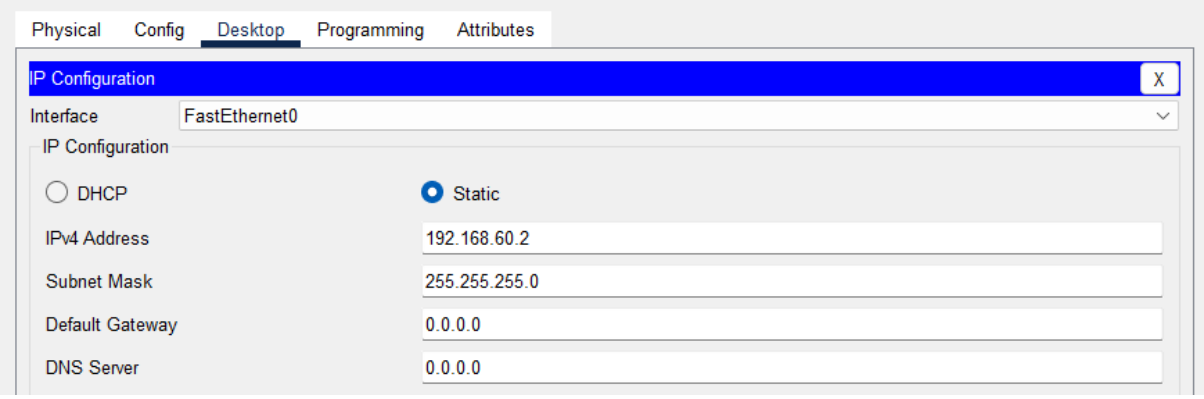
Study on Switch Learning Process using packet tracer tools



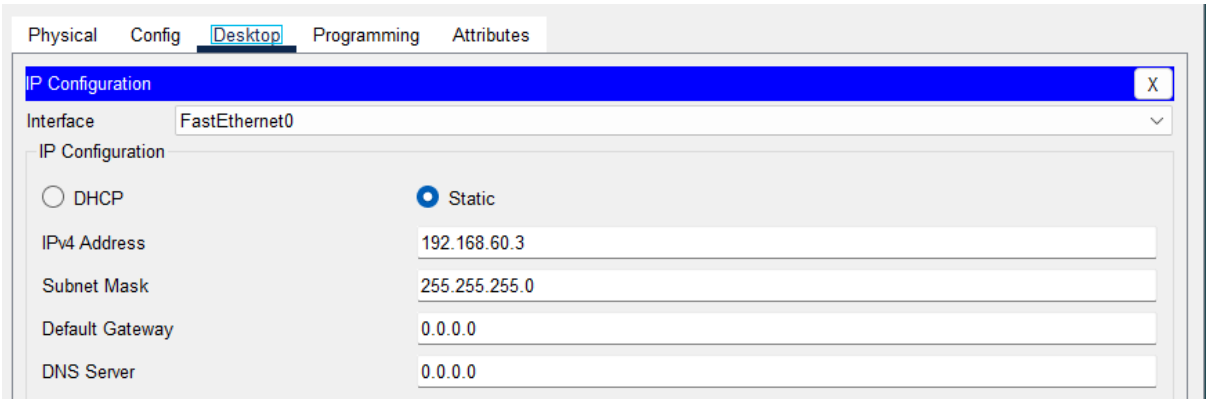
PC0 Configuration



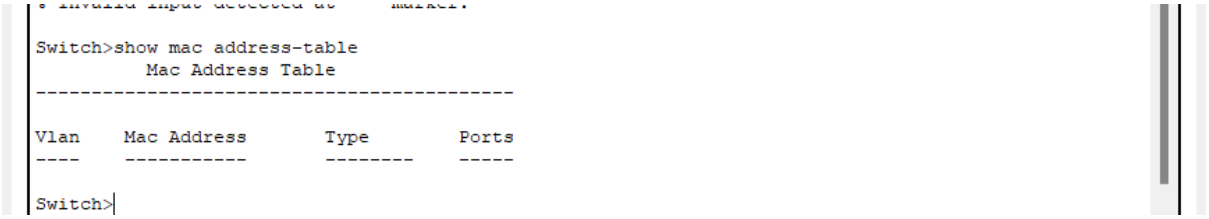
PC1 Configuration



PC2 Configuration



Before Pinging



Pinging ayesha to PC rahini

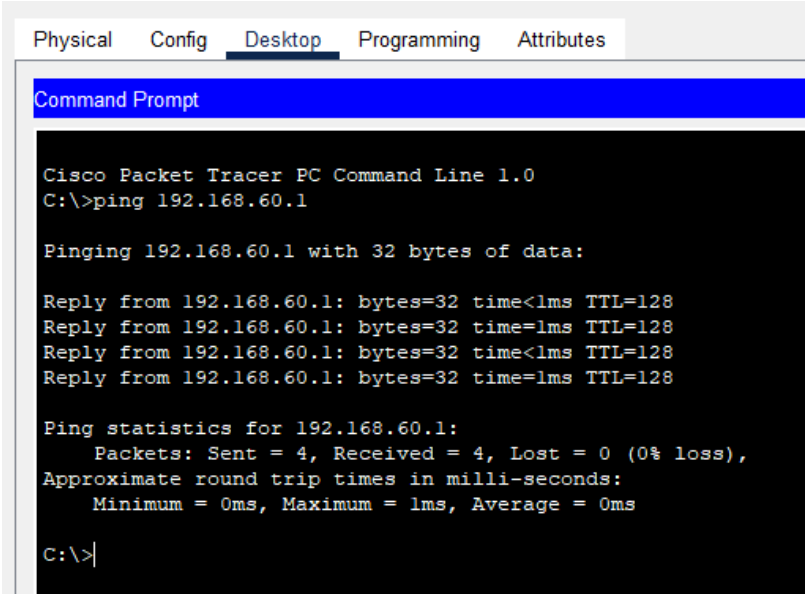
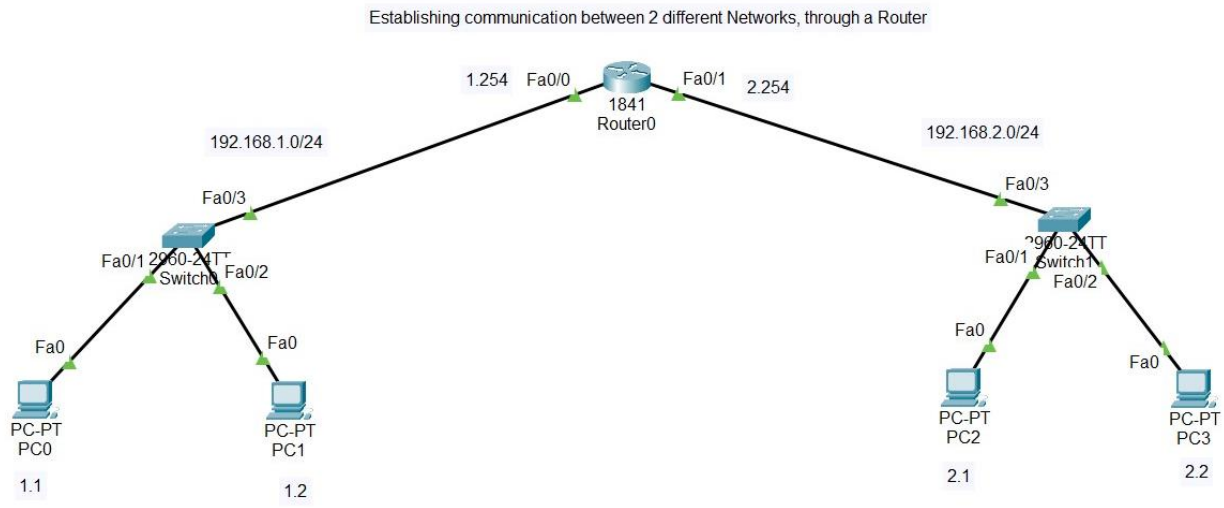


Table after pinging the PC’s

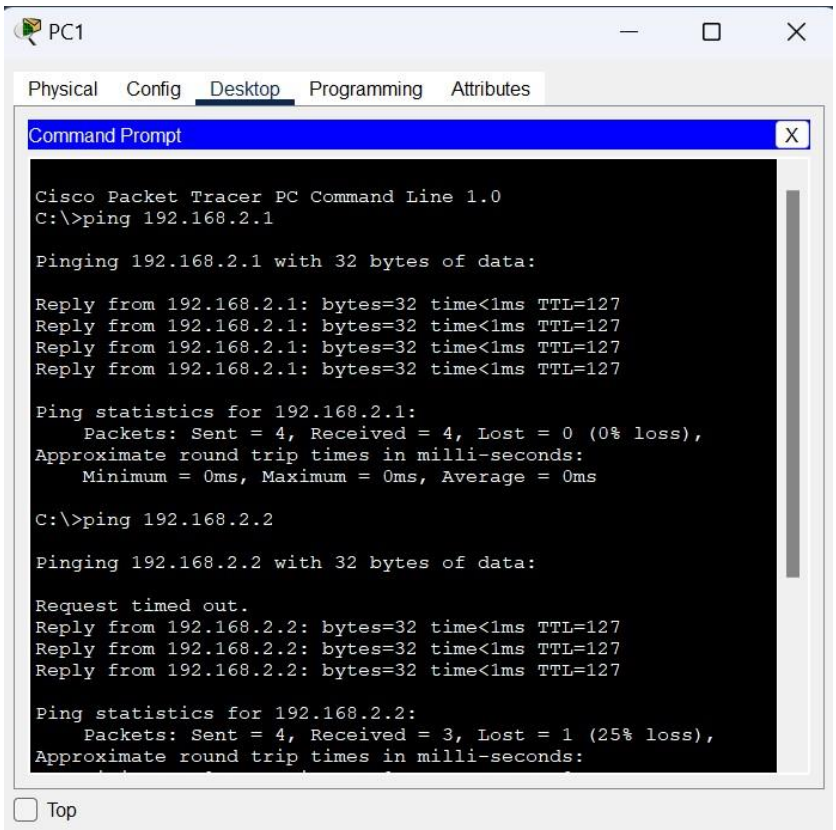
```
Switch>show mac address-table
          Mac Address Table
-------------------------------------------

Vlan    Mac Address       Type        Ports
----    -----------       --------    -----

   1    0002.4a65.0b5a    DYNAMIC     Fa0/2
   1    0002.4aa9.4321    DYNAMIC     Fa0/1
Switch>
```

Experiment 10

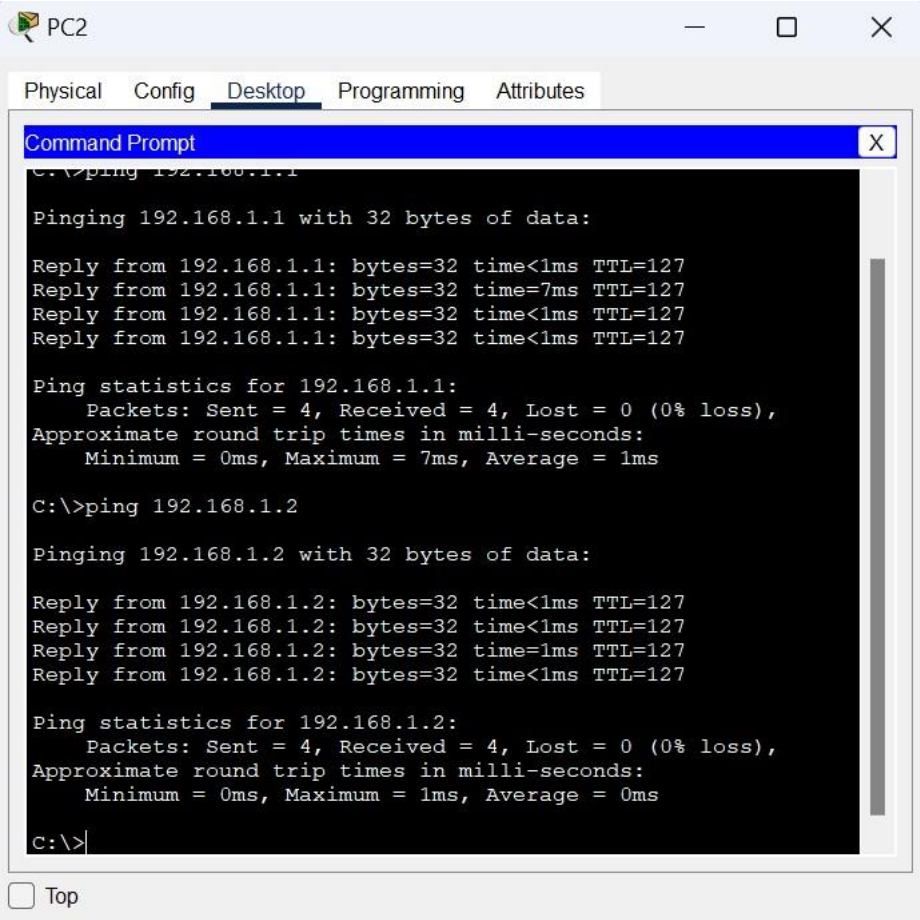
Create a network using one router and establishing the communication between two different networks



Pinging a PC of network 192.168.2.0/24 from a PC of network 192.168.1.0/24 and displaying that there is active communication as we recive a reply from the other PC

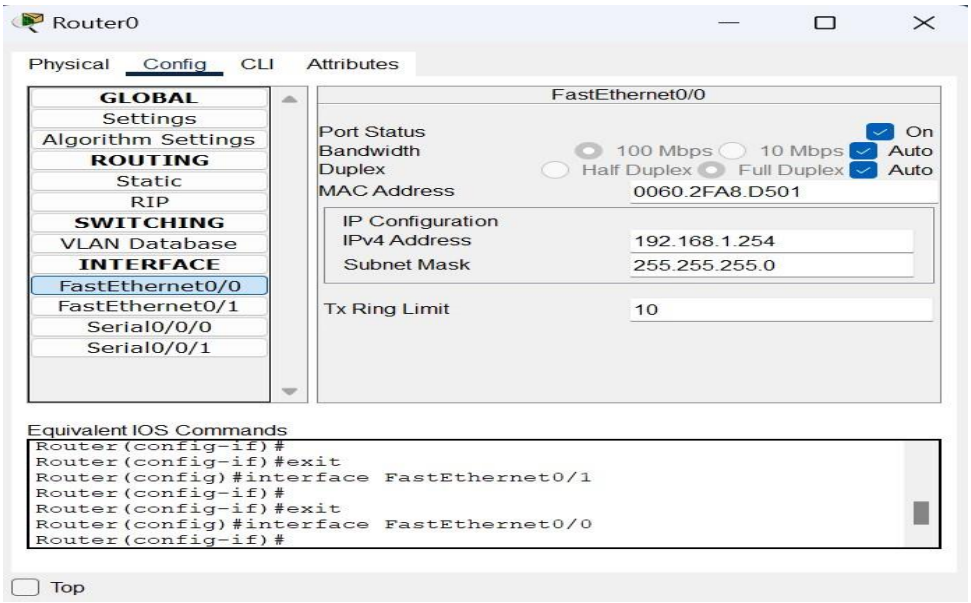


Pinging a PC of the network 192.168.1.0/24 from a PC of the network 192.168.2.0/24, and displaying that there is active communication as we are receiving a reply from the PC:

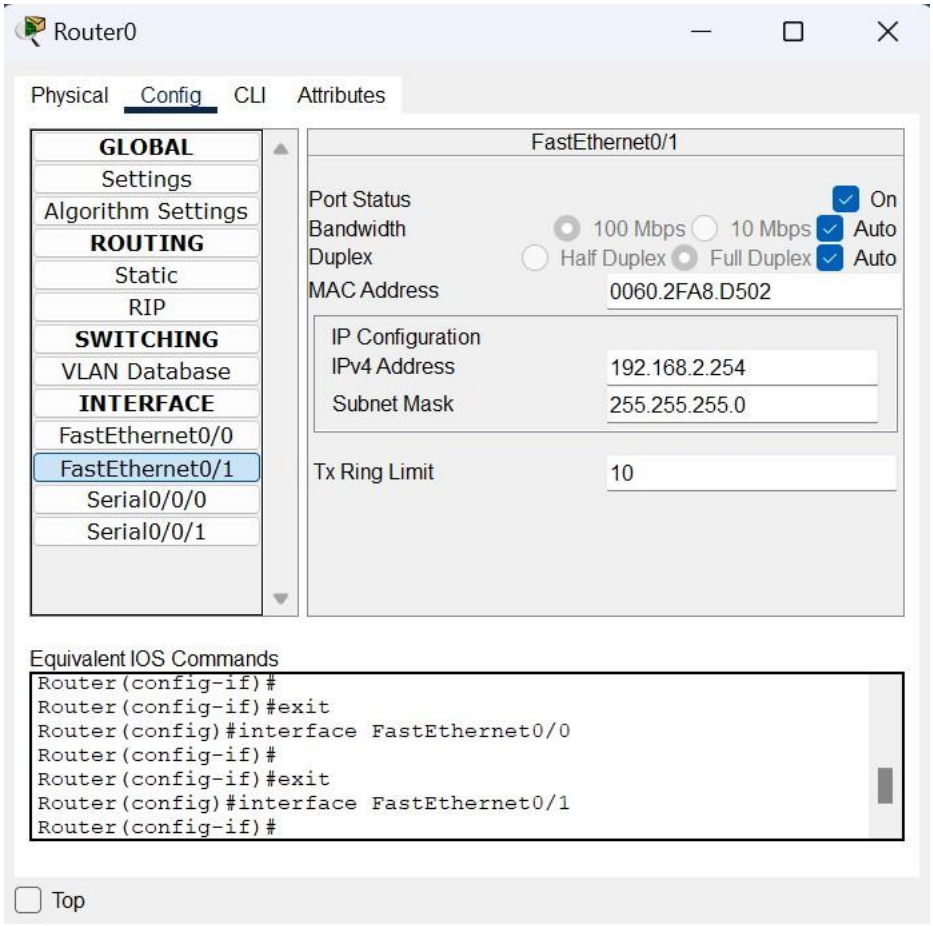


Router Information through which both the networks are interconnected:

Left side of the router, consisting of the default gateway of the 192.168.1.0/24 network

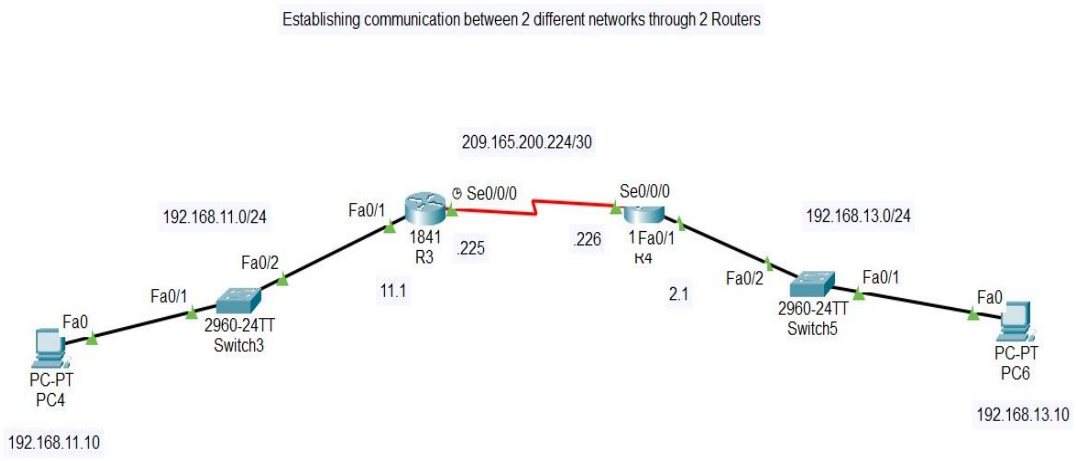


Right side of the router, consisting of the default gateway of the 192.168.2.0/24 network.



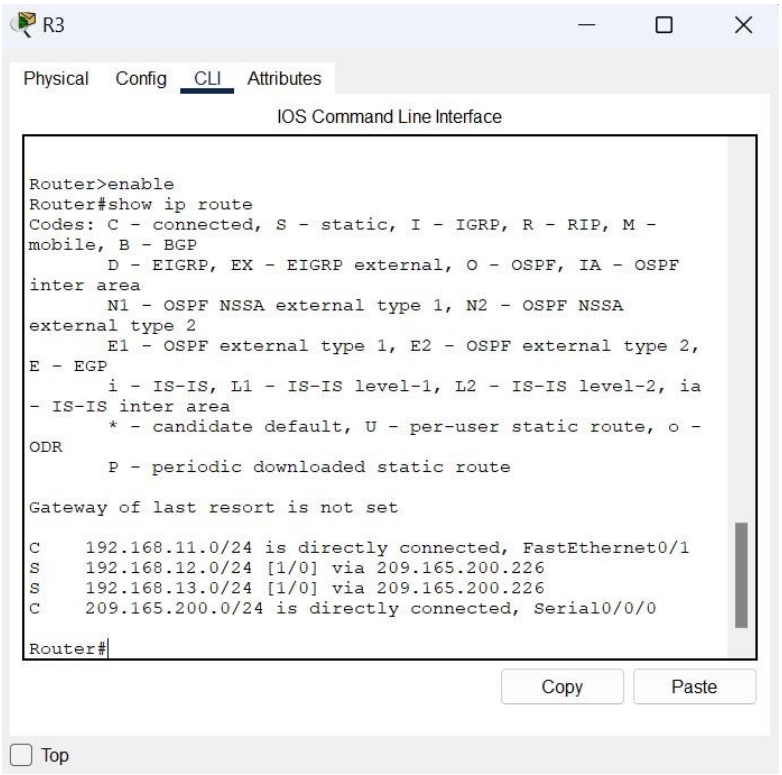
Experiment 11

Create a network using two routers and establishing the communication between two different networks

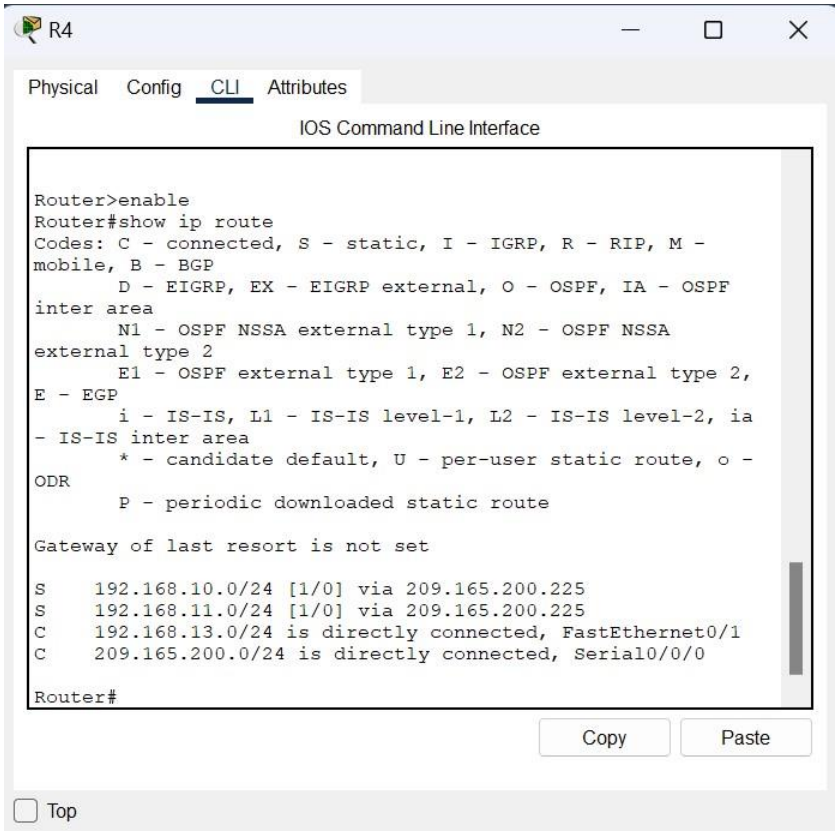


Router Information, showing all the routes that are interconnected, through the respective routers

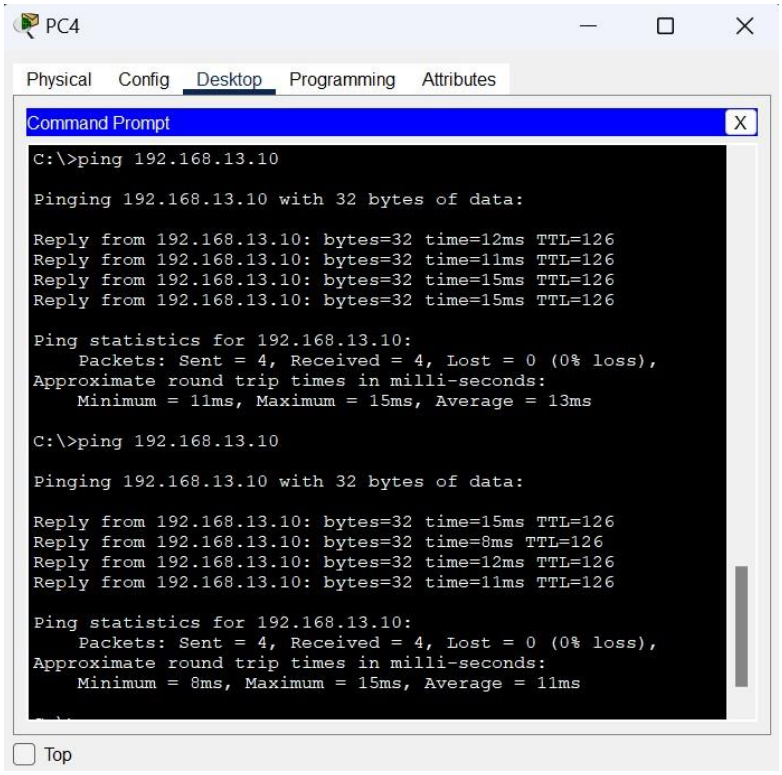
Router R3



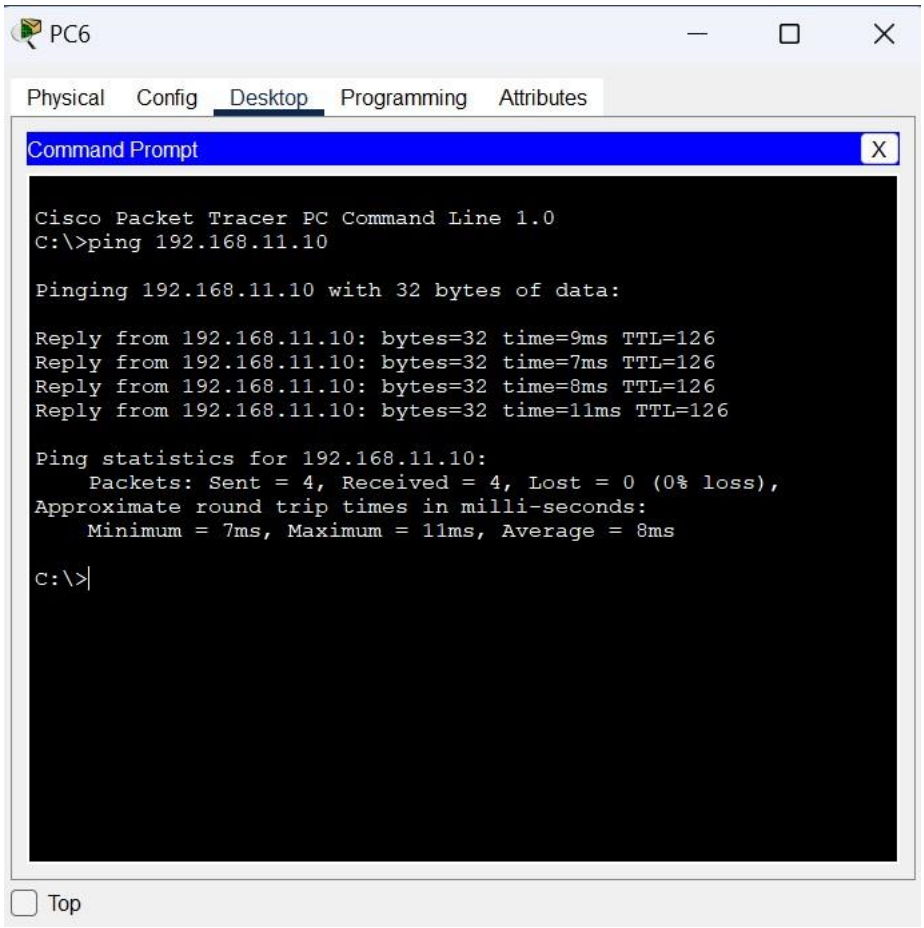
Router R4



Pinging a PC of network 192.168.13.0/24 from a PC of the network 192.168.11.0/24 and displaying that there is active communication as we are receiving a reply from the PC.

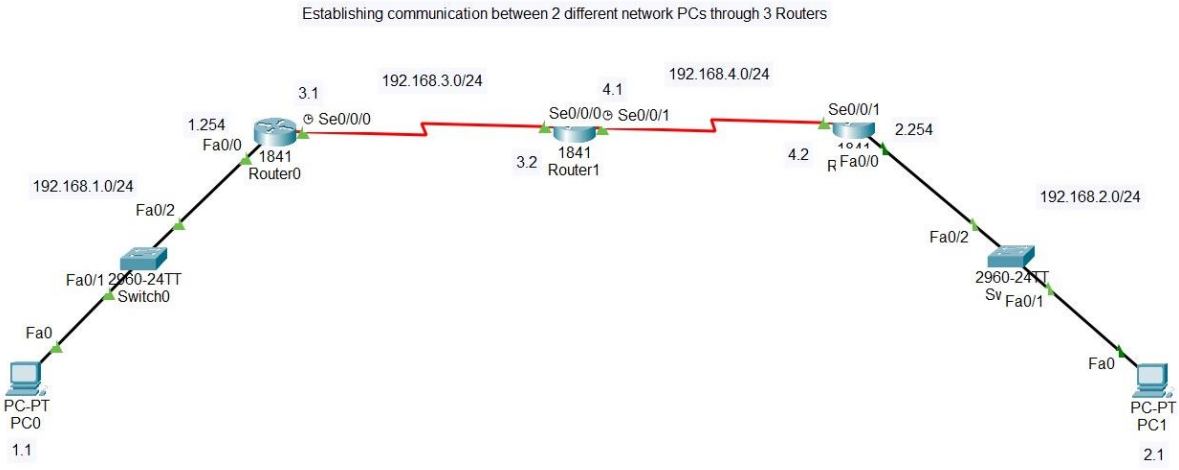


Pinging a PC of the network 192.168.11.0/24 from a PC of the network 192.168.13.0/24, and displaying that there is active communication as we are receiving a reply from the other PC.

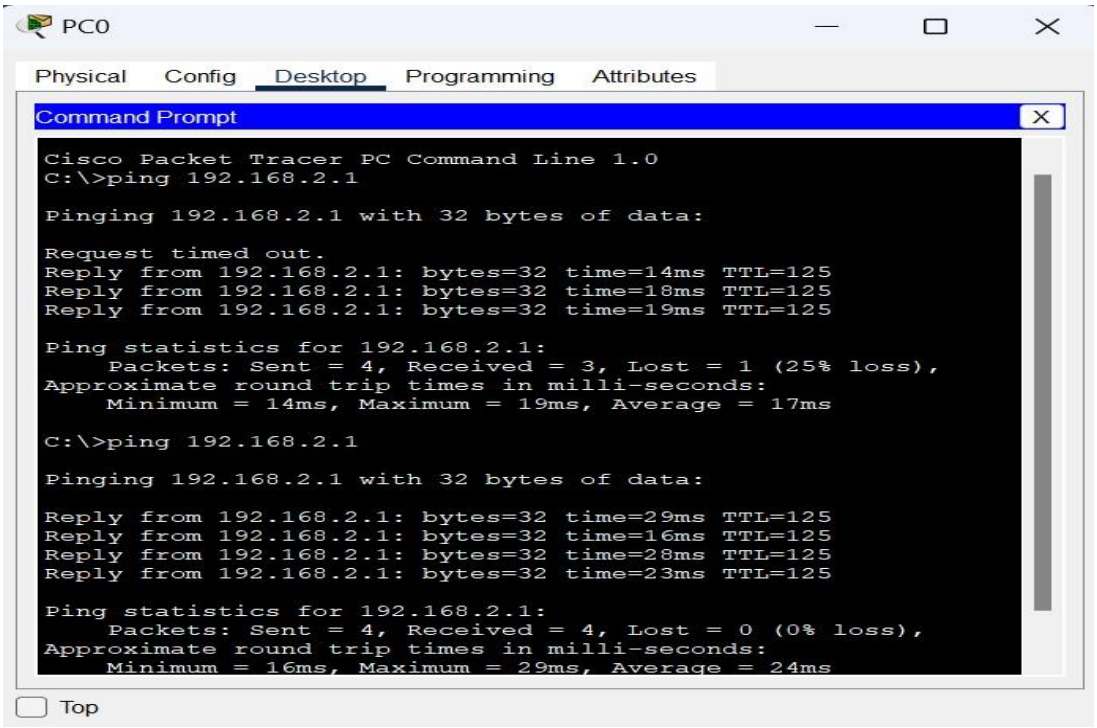


Experiment 12

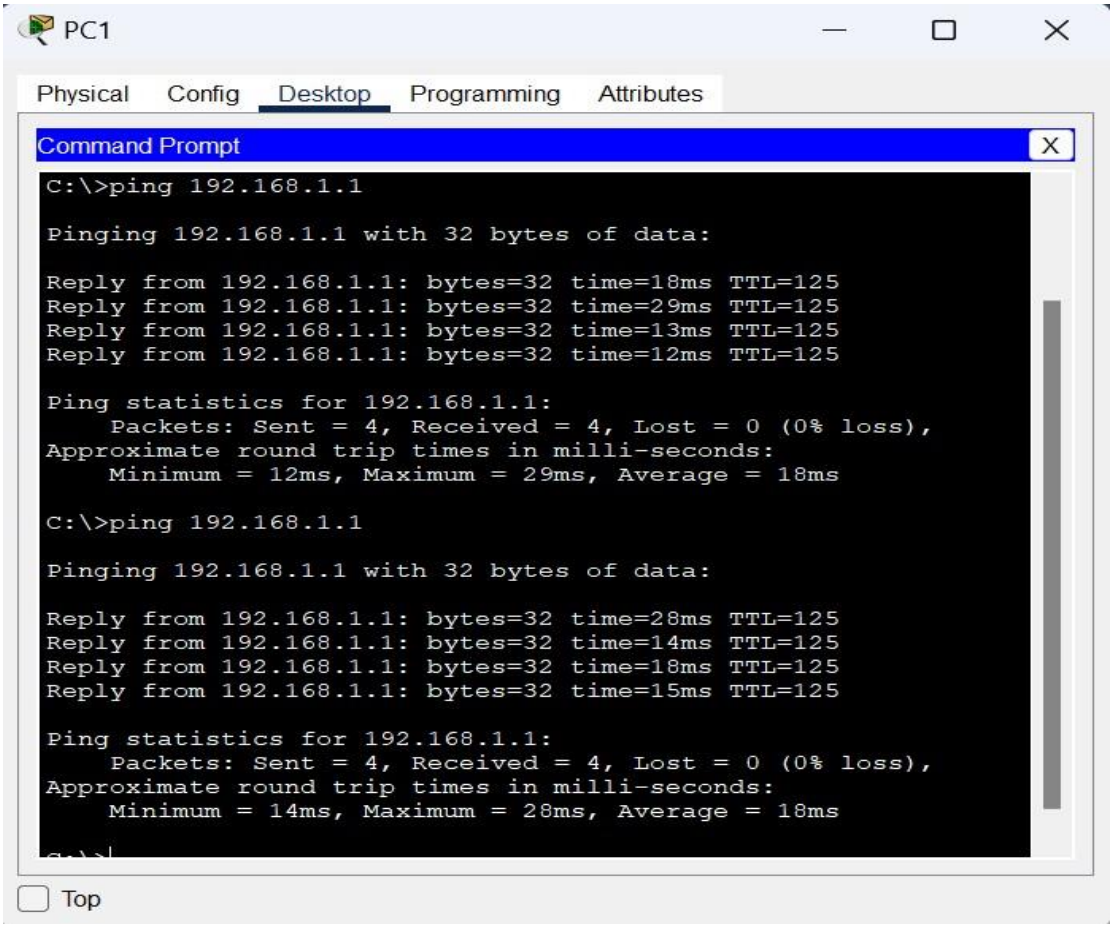
Create a network using three routers and establish the communication between two different networks (PCs); use static router to establish the routing and study the routing table. Use ‘tracert’ command to analyse the route of communication.



Pinging a PC of the network 192.168.2.0/24 from a PC of the network 192.168.1.0/24 and displaying that there is active communication as we are receiving a reply from the other PC.

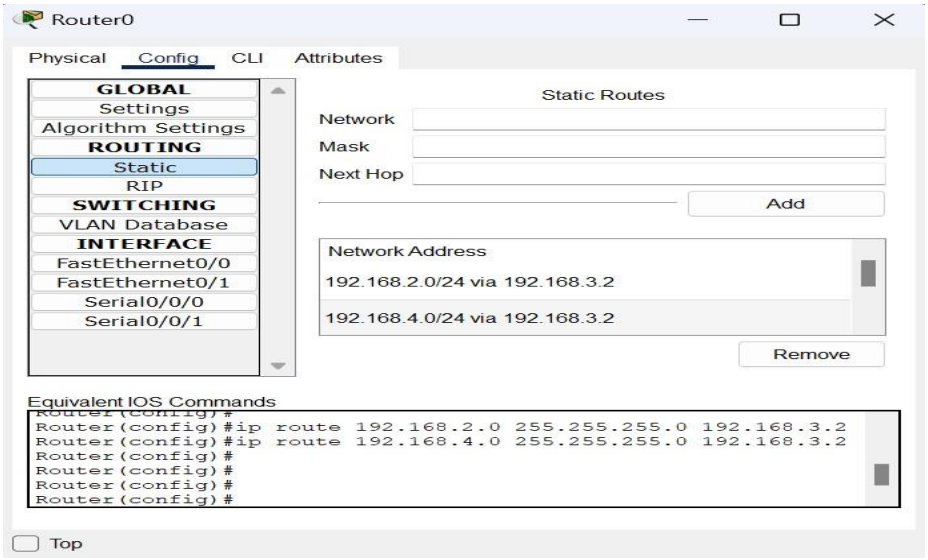


Pinging a PC of the network 192.168.1.0/24 from a PC of the network 192.168.2.0/24, and displaying that there is active communication as we are receiving a reply from the other PC.

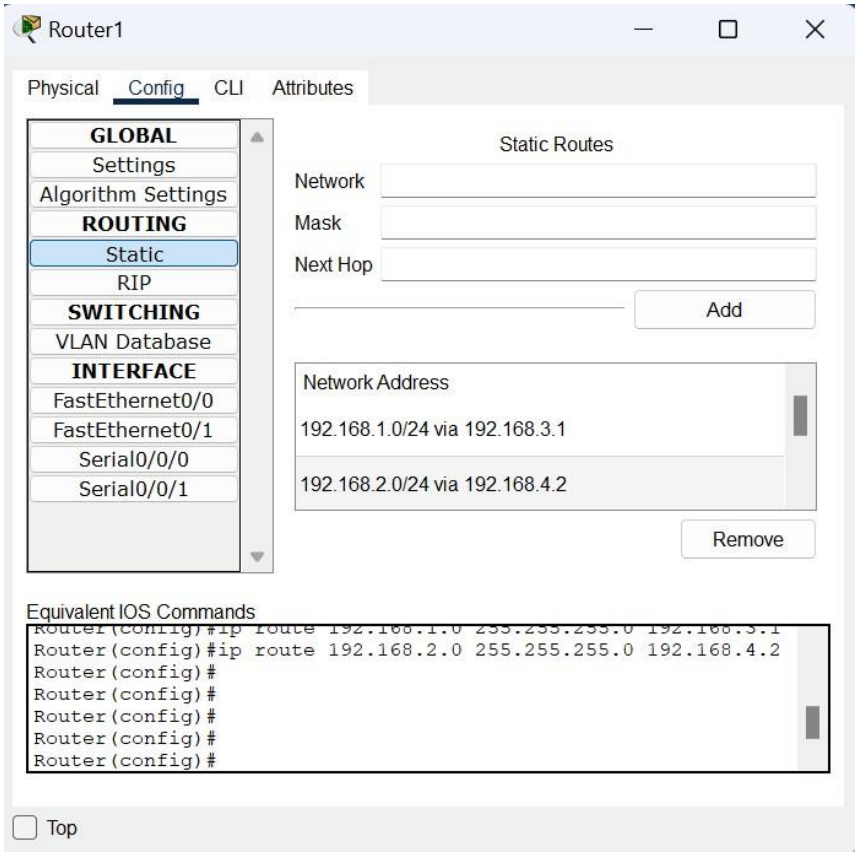


The Routing Tables of all the 3 Routers, consisting of the destination networks connected and the Next Hop address to reach to that network.

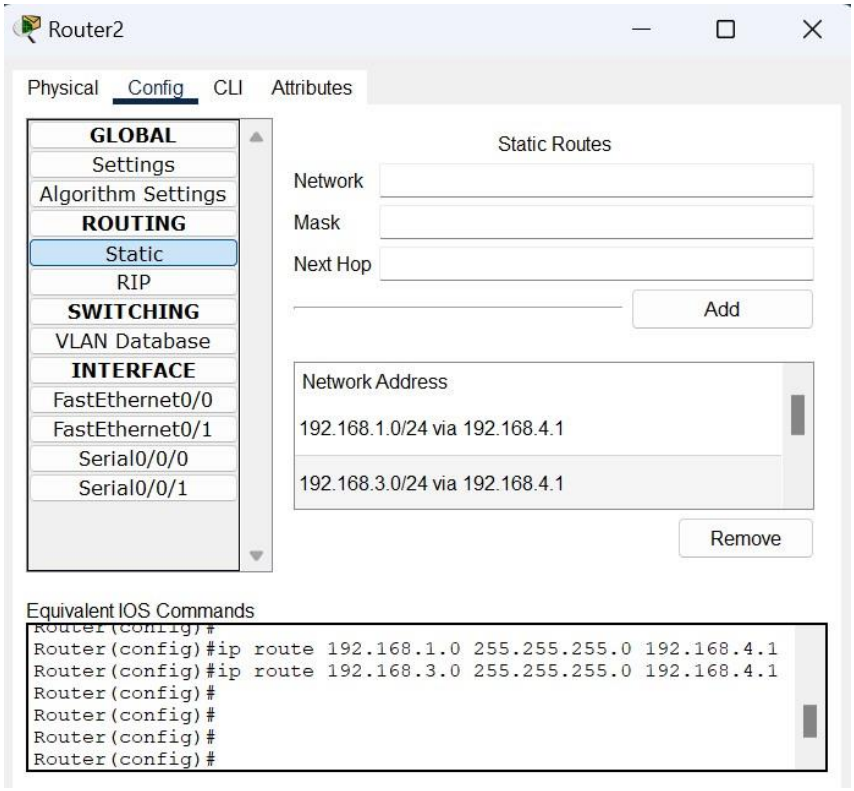
R0



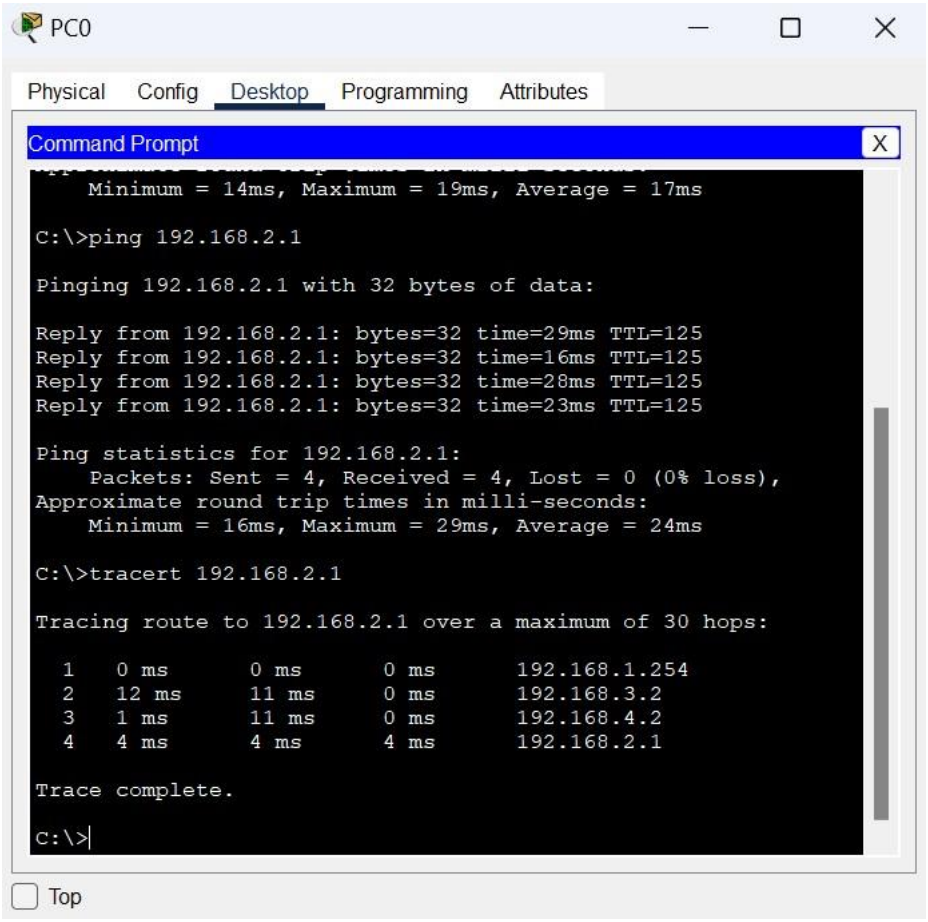
R1


Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Static Routes
Network
Mask
Next Hop
Add
Network Address
192.168.1.0/24 via 192.168.3.1
192.168.2.0/24 via 192.168.4.2
Remove
Equivalent IOS Commands
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.4.2
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Top

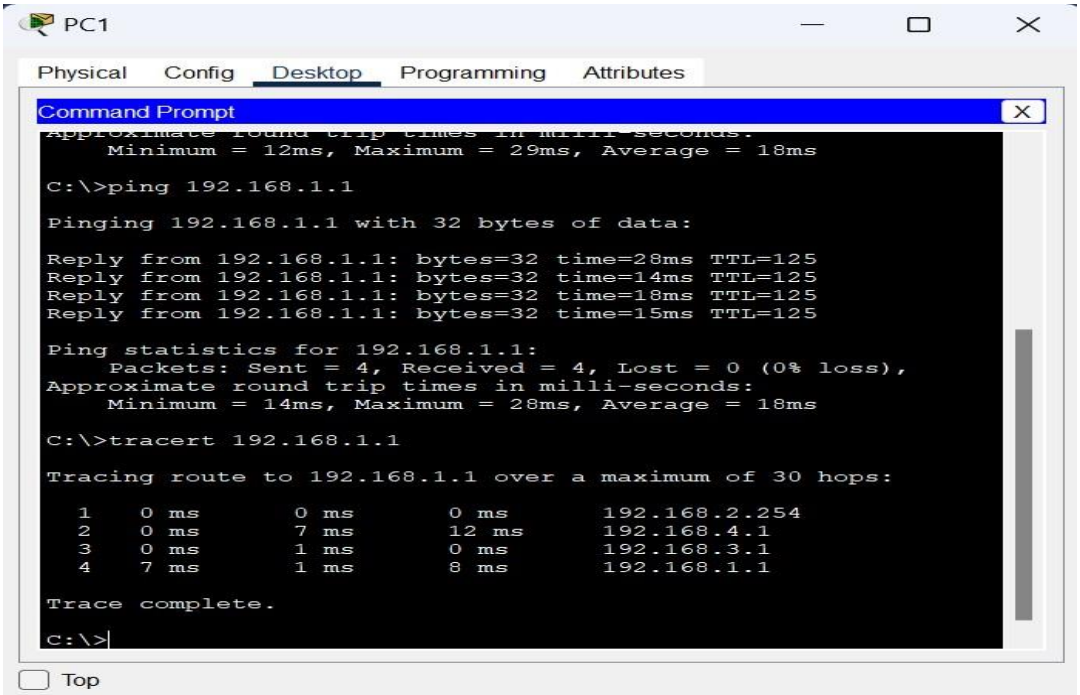
R2


Router2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Static Routes
Network
Mask
Next Hop
Add
Network Address
192.168.1.0/24 via 192.168.4.1
192.168.3.0/24 via 192.168.4.1
Remove
Equivalent IOS Commands
Router(config)#ip route 192.168.1.0 255.255.255.0 192.168.4.1
Router(config)#ip route 192.168.3.0 255.255.255.0 192.168.4.1
Router(config)#
Router(config)#
Router(config)#
Router(config)#

Using ‘tracert’ command to see information of each hop of the packet, while traveling from the Source Network to the Destination Network.

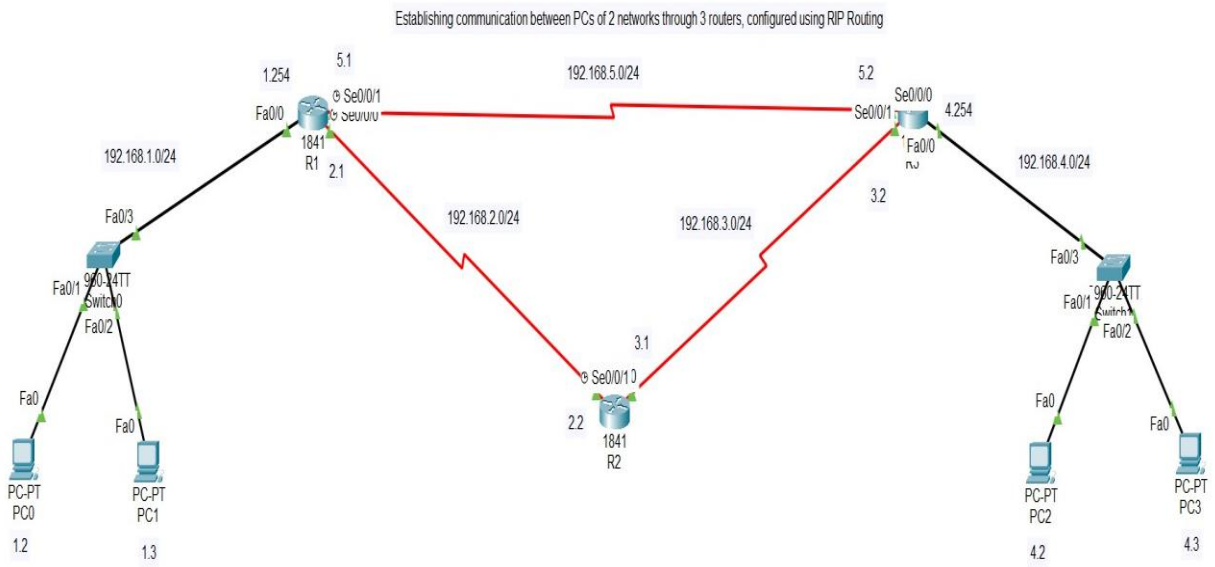


Using ‘tracert’ command to see information of each hop of the packet, while traveling from the Source Network to the Destination Network.



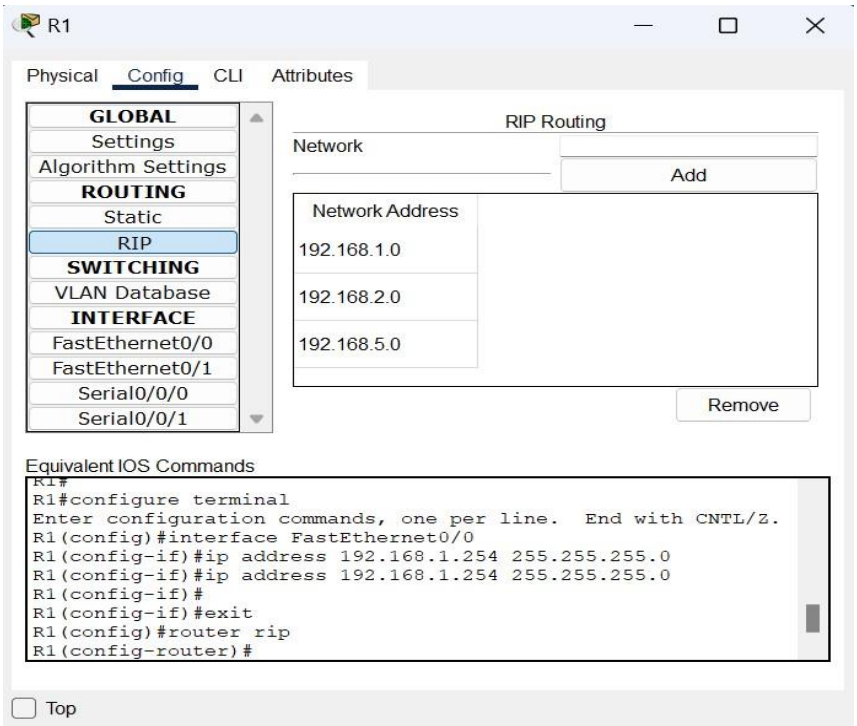
Experiment 13

Create a network using Three (3) routers and establish the communication between two different networks (PCs); use Dynamic Routing (RIP) Protocol to establish the routing and study the routing table.

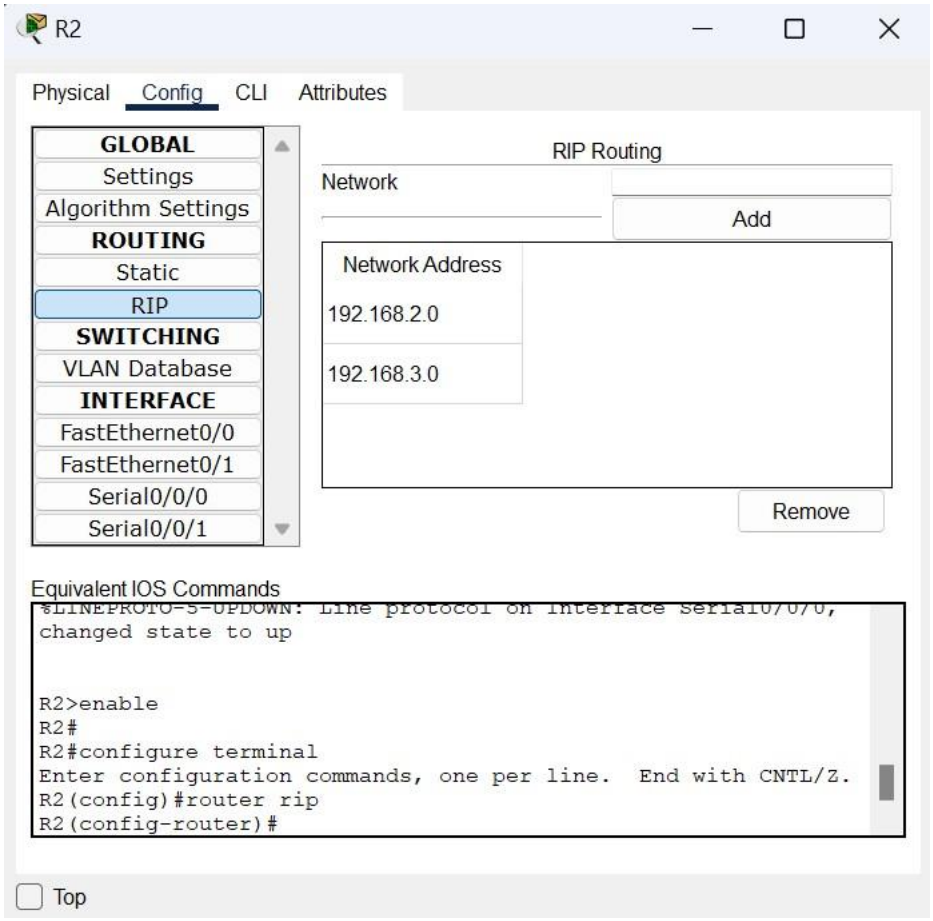


Routing Table of each Router, configured using IP Protocol

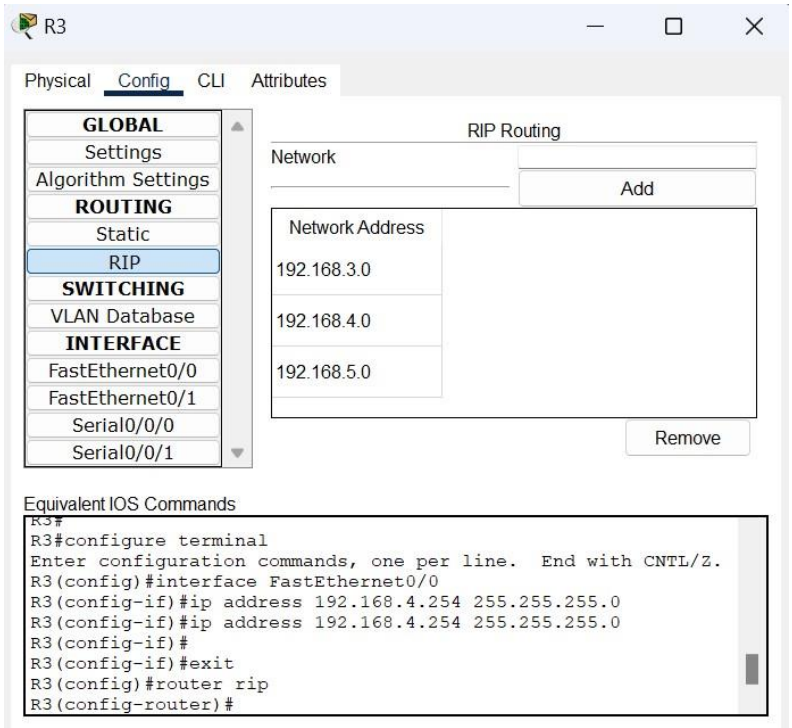
Router R1



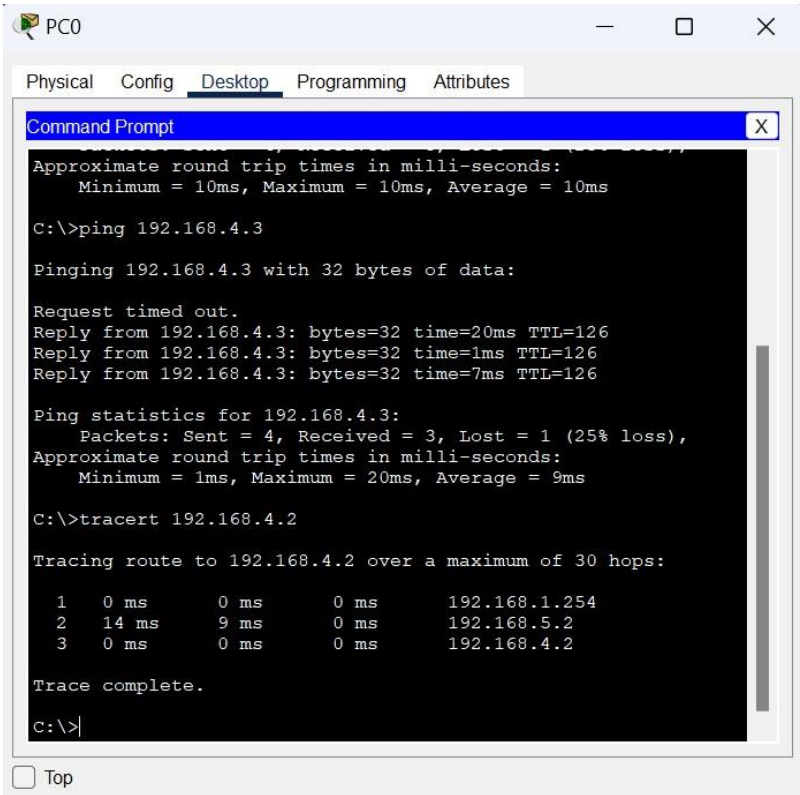
Router R2



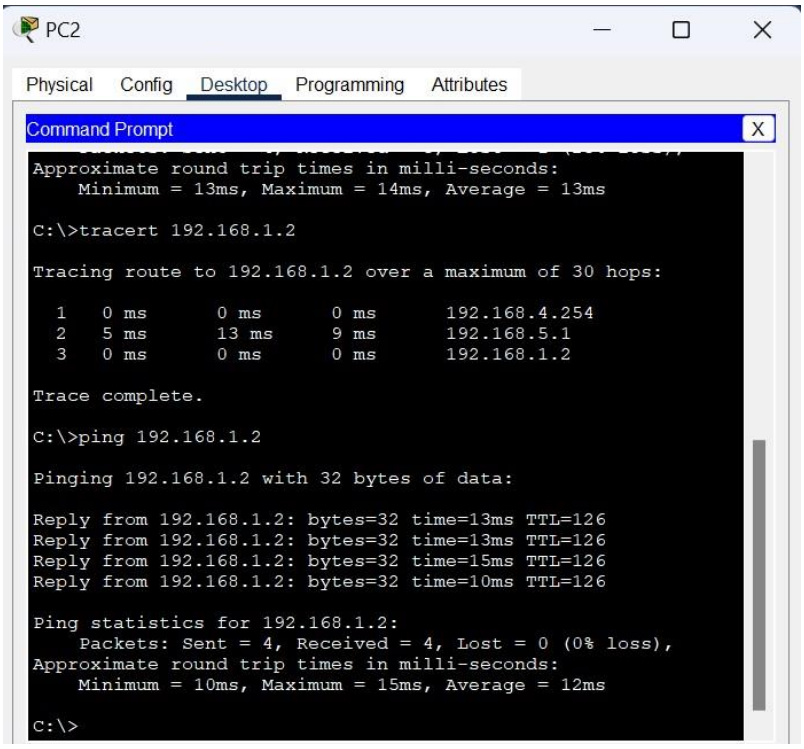
Router R3



Using ‘tracert’ command to see information of each hop of the packet, while traveling from the Source Network to the Destination Network:

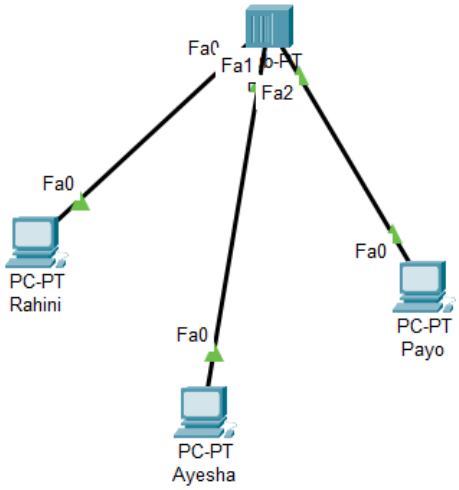


Using ‘tracert’ command to see information of each hop of the packet, while traveling from the Source Network to the Destination Network:

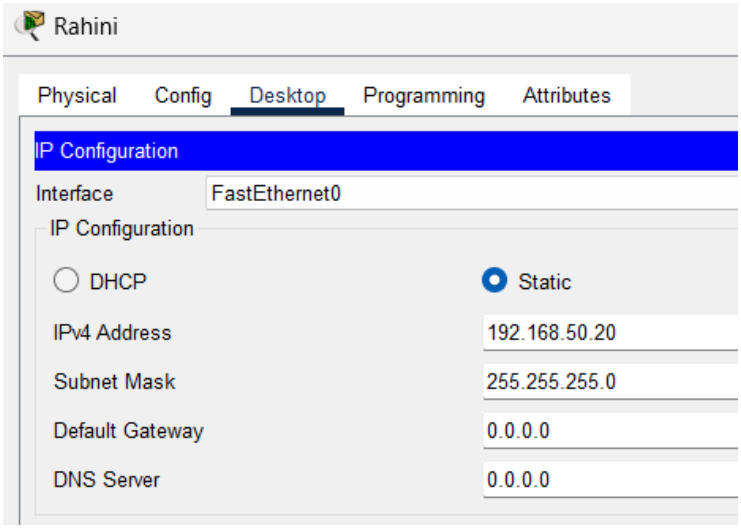


Experiment 14

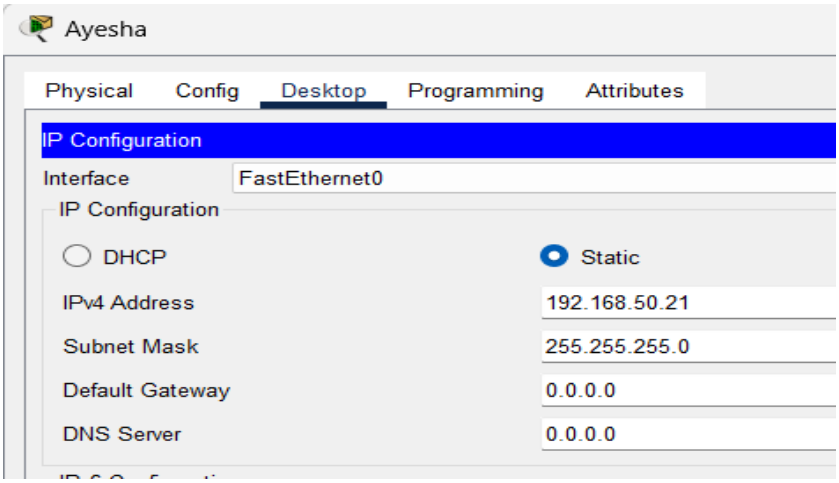
Hub Connectivity



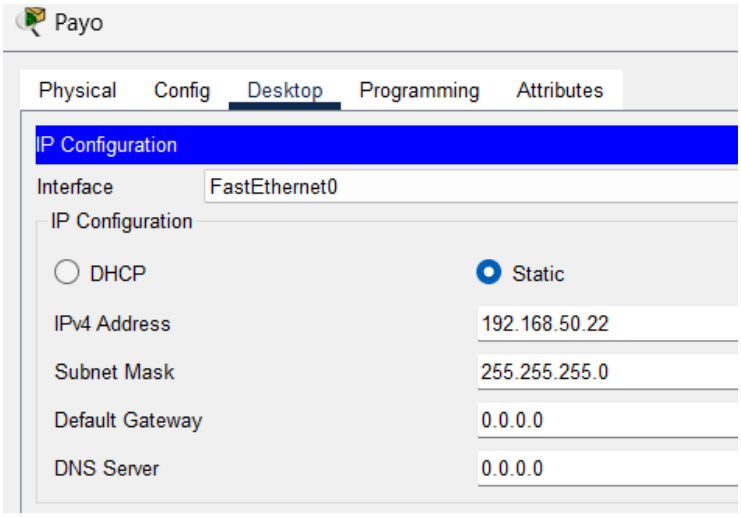
PC0 Configuration



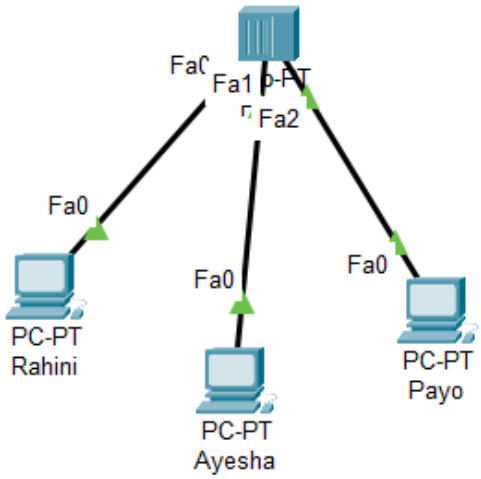
PC1 Configuration



PC2 Configuration



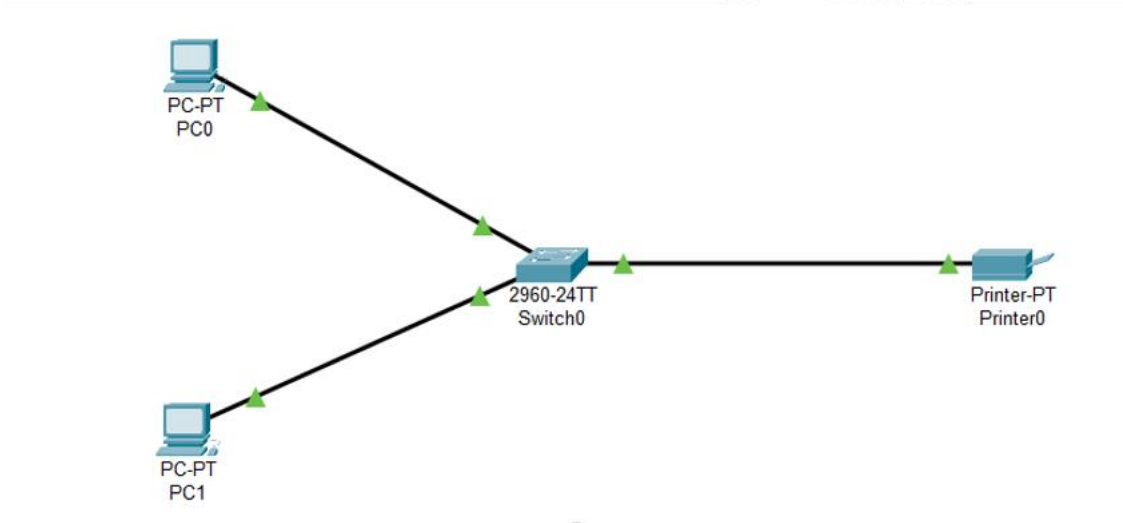
Simulation



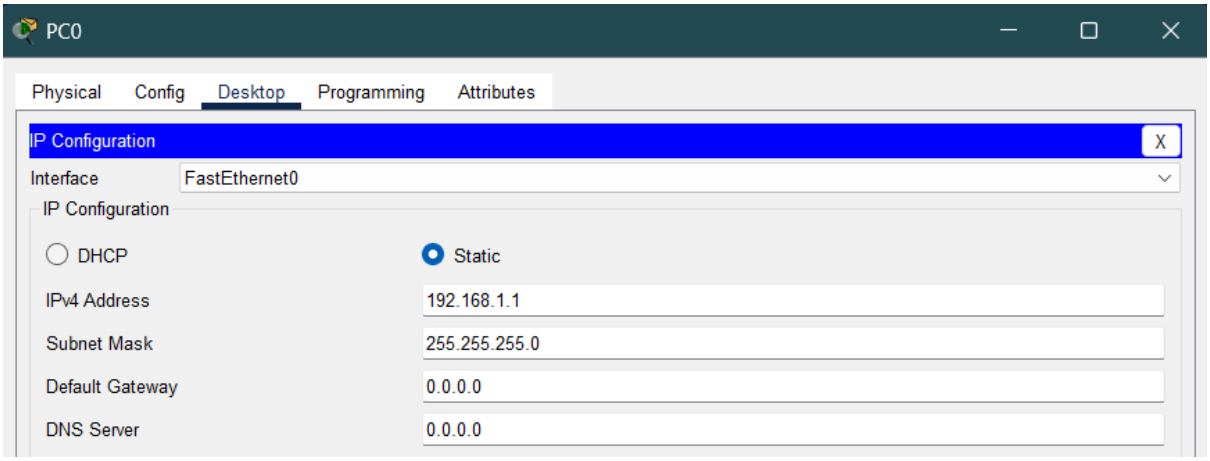
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	--	Ayesha	Payo	ICMP		0.000	N	0	(edit)	
	Successful	Rahini	Payo	ICMP		0.000	N	1	(edit)	

Experiment 15

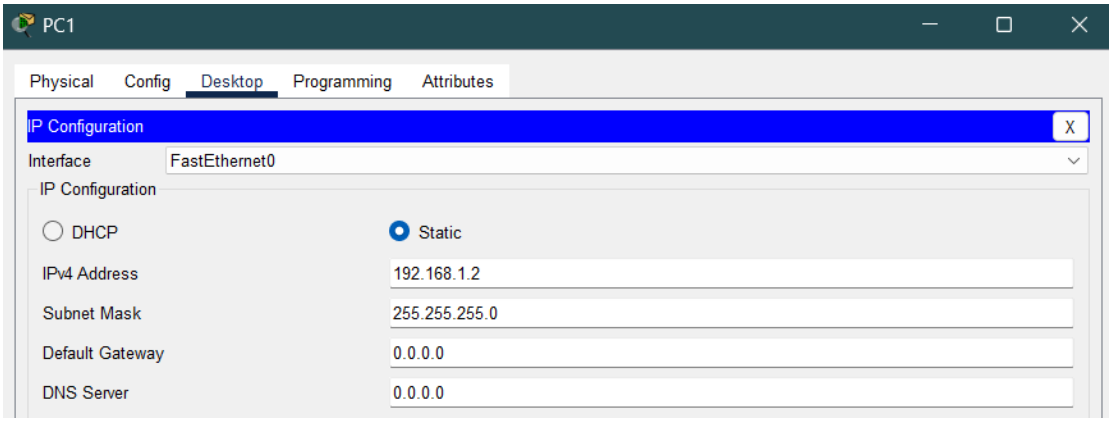
PC to Printer Connectivity



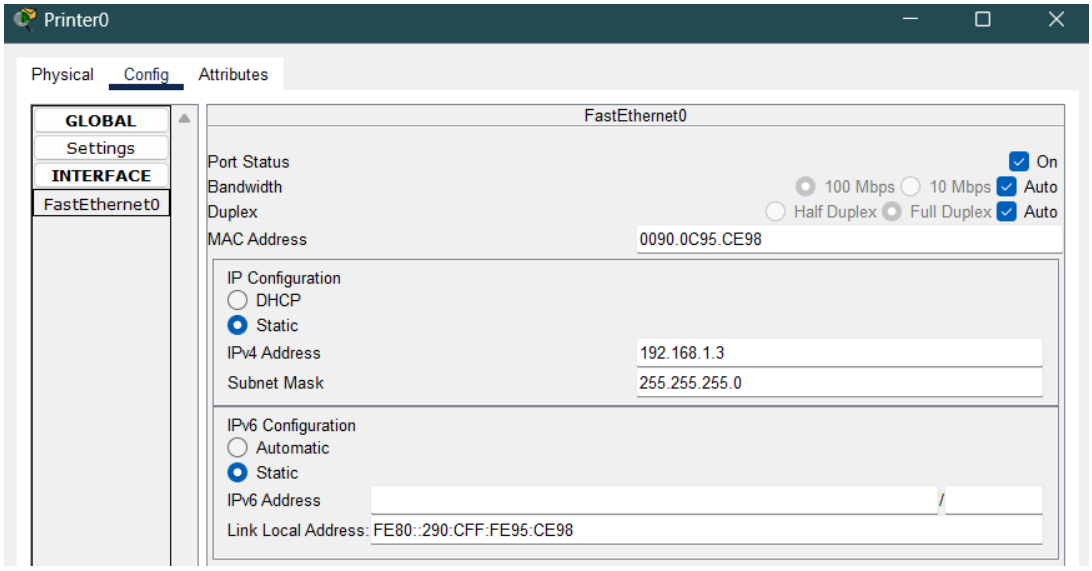
PC0 Configuration



PC1 Configuration



Printer Configuration

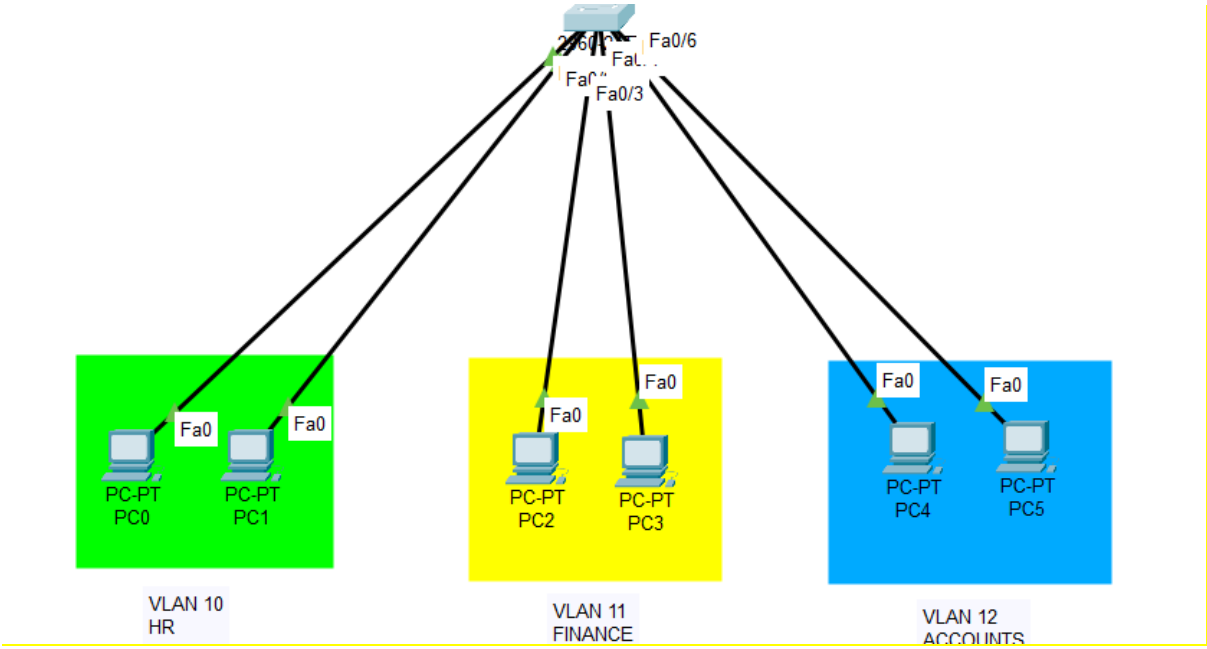


Simulation

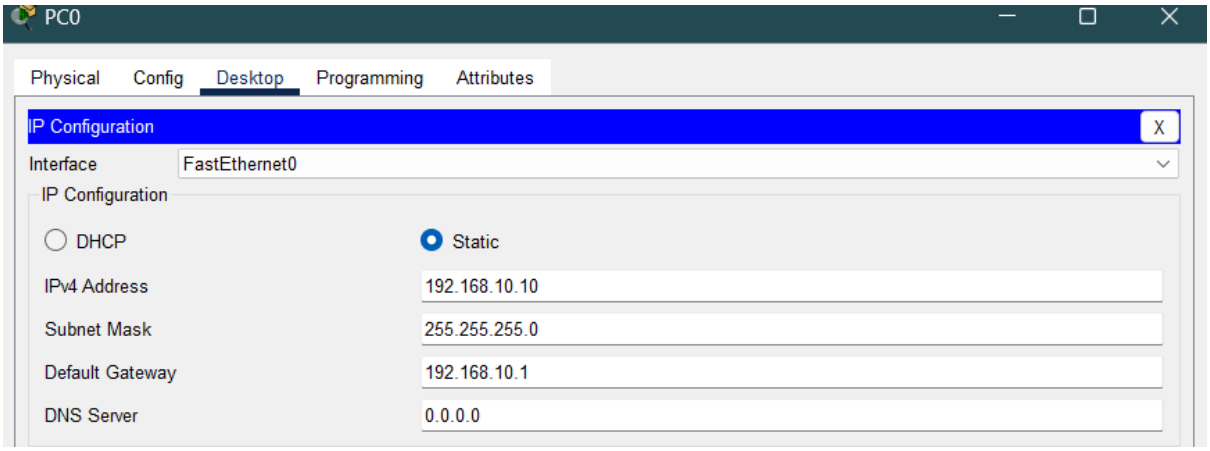
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	Printer0	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC1	Printer0	ICMP		0.000	N	1	(edit)	(delete)

Experiment 16

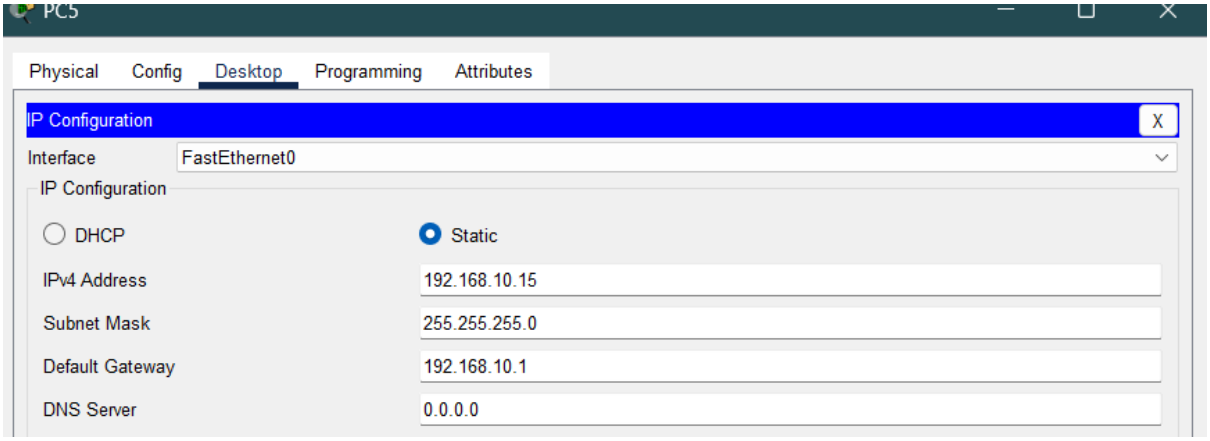
Virtual LAN



PC0 Configuration



PC5 Configuration



Changing membership of Interfaces

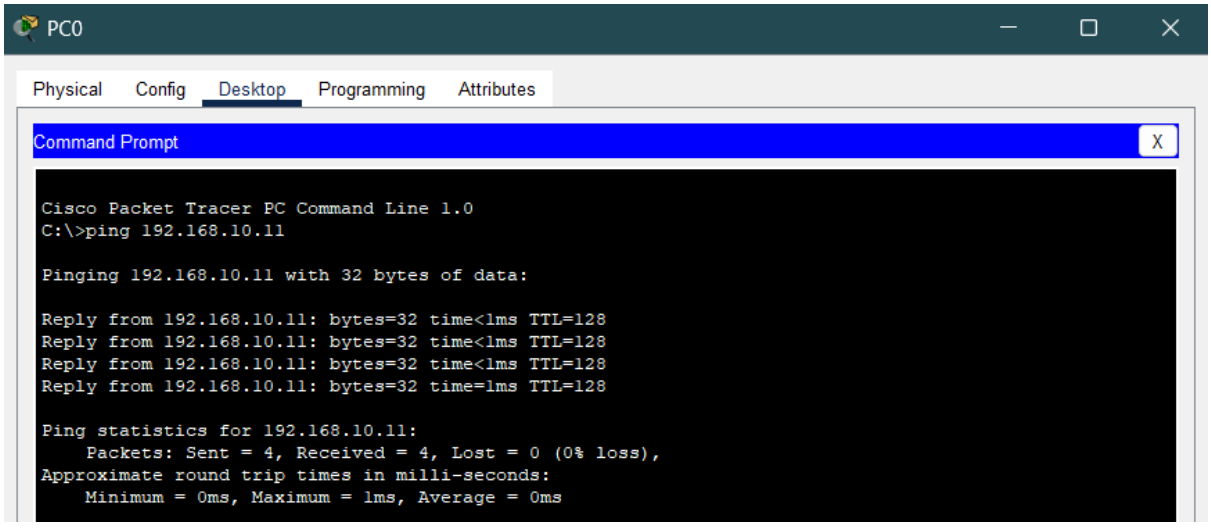
```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name hr
Switch(config-vlan)#exit
Switch(config)#vlan 11
Switch(config-vlan)#name finance
Switch(config-vlan)#exit
Switch(config)#vlan 12
Switch(config-vlan)#accounts
                    ^
% Invalid input detected at '^' marker.

Switch(config-vlan)#name accounts
Switch(config-vlan)#exit
Switch(config)#interface fastethernet 0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface fastethernet 0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface fastethernet 0/3
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 11
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface fastethernet 0/4
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 11
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface fastethernet 0/5
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 12
Switch(config-if)#exit
Switch(config)#
Switch(config)#interface fastethernet 0/6
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 12
Switch(config-if)#exit
```

Verification

```
Switch#
Switch#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/7, Fa0/8, Fa0/9, Fa0/10
                                                 Fa0/11, Fa0/12, Fa0/13, Fa0/14
                                                 Fa0/15, Fa0/16, Fa0/17, Fa0/18
                                                 Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                                 Fa0/23, Fa0/24, Gig0/1, Gig0/2
10   hr                                active    Fa0/1, Fa0/2
11   finance                           active    Fa0/3, Fa0/4
12   accounts                          active    Fa0/5, Fa0/6
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
10   enet  100010     1500  -      -      -        -    -        0      0
11   enet  100011     1500  -      -      -        -    -        0      0
12   enet  100012     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------

Remote SPAN VLANs
------------------------------------------------------------------------------

Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------
```

```
Switch#show interface status
Port      Name               Status       Vlan       Duplex  Speed Type
Fa0/1                        connected    10         auto    auto  10/100BaseTX
Fa0/2                        connected    10         auto    auto  10/100BaseTX
Fa0/3                        connected    11         auto    auto  10/100BaseTX
Fa0/4                        connected    11         auto    auto  10/100BaseTX
Fa0/5                        connected    12         auto    auto  10/100BaseTX
Fa0/6                        connected    12         auto    auto  10/100BaseTX
Fa0/7                        notconnect   1          auto    auto  10/100BaseTX
Fa0/8                        notconnect   1          auto    auto  10/100BaseTX
Fa0/9                        notconnect   1          auto    auto  10/100BaseTX
Fa0/10                       notconnect   1          auto    auto  10/100BaseTX
Fa0/11                       notconnect   1          auto    auto  10/100BaseTX
Fa0/12                       notconnect   1          auto    auto  10/100BaseTX
Fa0/13                       notconnect   1          auto    auto  10/100BaseTX
Fa0/14                       notconnect   1          auto    auto  10/100BaseTX
Fa0/15                       notconnect   1          auto    auto  10/100BaseTX
Fa0/16                       notconnect   1          auto    auto  10/100BaseTX
Fa0/17                       notconnect   1          auto    auto  10/100BaseTX
Fa0/18                       notconnect   1          auto    auto  10/100BaseTX
Fa0/19                       notconnect   1          auto    auto  10/100BaseTX
Fa0/20                       notconnect   1          auto    auto  10/100BaseTX
Fa0/21                       notconnect   1          auto    auto  10/100BaseTX
 --More--
```

Pinging PC0 to PC1 (Same VLAN)



Pinging PC1 to PC2 (Different VLAN)