

NAME – SAARA ANAND

REG NO – 21BCE8156

SLOT – L23+L24

## CN LAB ASSIGNMENT 4-

### 1. Difference between LAN and VLAN-

#### LAN-

A local area network (LAN) is a network limited to a particular geographic area. A switch, or stack of switches, connects a group of computers and devices using the TCP/IP protocol's private addressing mechanism.

Private addresses are distinct from those of other machines on a local network. Routers are used to connect the LAN's edge to the wider WAN.

Data is transmitted at a high-speed rate because the number of computers linked is limited. The connections must, by definition, be high-speed, and hardware must be reasonably inexpensive (such as hubs, network adapters, and Ethernet cables).

LANs are privately owned and span a smaller geographical area (restricted to a few kilometers). It can be used in various places, including offices, homes, hospitals, and schools. The setup and management of a LAN are straightforward.

Twisted pair and coaxial cables are utilized as a LAN communication medium. Because it only traverses a limited distance, the inaccuracy and noise are kept to a minimum.

Data speeds on early LANs ranged from 4 to 16 Mbps, however the data speeds have improved significantly since then and now they are in the range of 100 to 1000 megabits per second.

In a LAN, the propagation delay is relatively short. Larger LANs can accommodate thousands of computers, whereas smaller LANs may only employ two computers.

A LAN usually has wired connections; however, wireless connectivity can also be used. A LAN's fault tolerance is higher, and the network is less congested.

## VLAN-

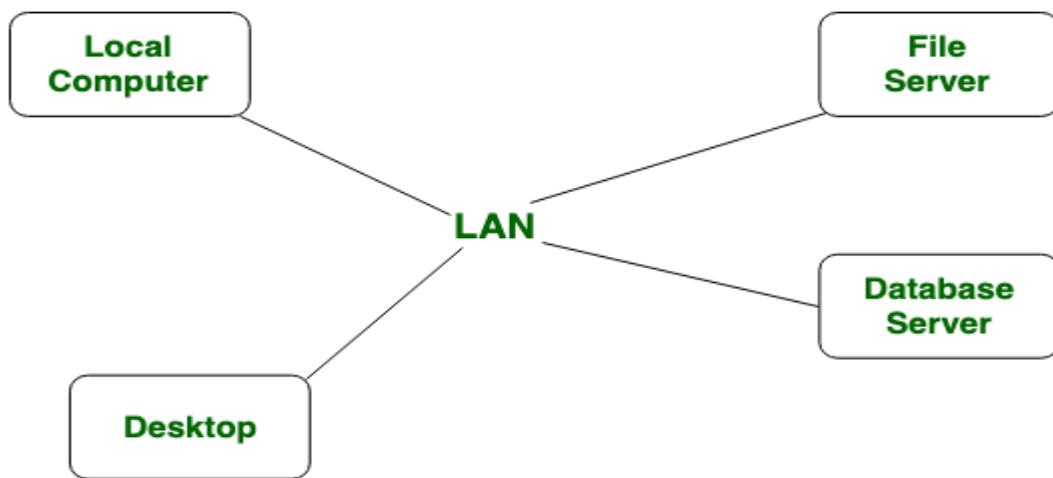
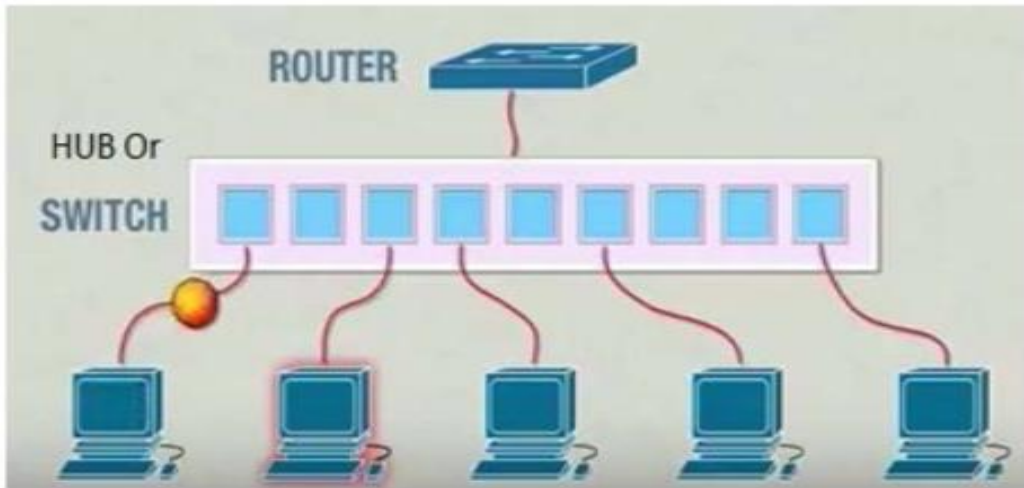
The data link layer of the OSI network model is used to create a Virtual Local Area Network (VLAN). VLANs are created with isolated partitions in workstations. An individual node address moves with the virtual division, not the physical workstation, unlike a physical local area network or LAN. A hardware setup accommodates point-to-point identification and access through a physical network.

VLANs can be implemented on higher-end switches. The goal of setting up a VLAN is to improve a network's performance or to add necessary security features.

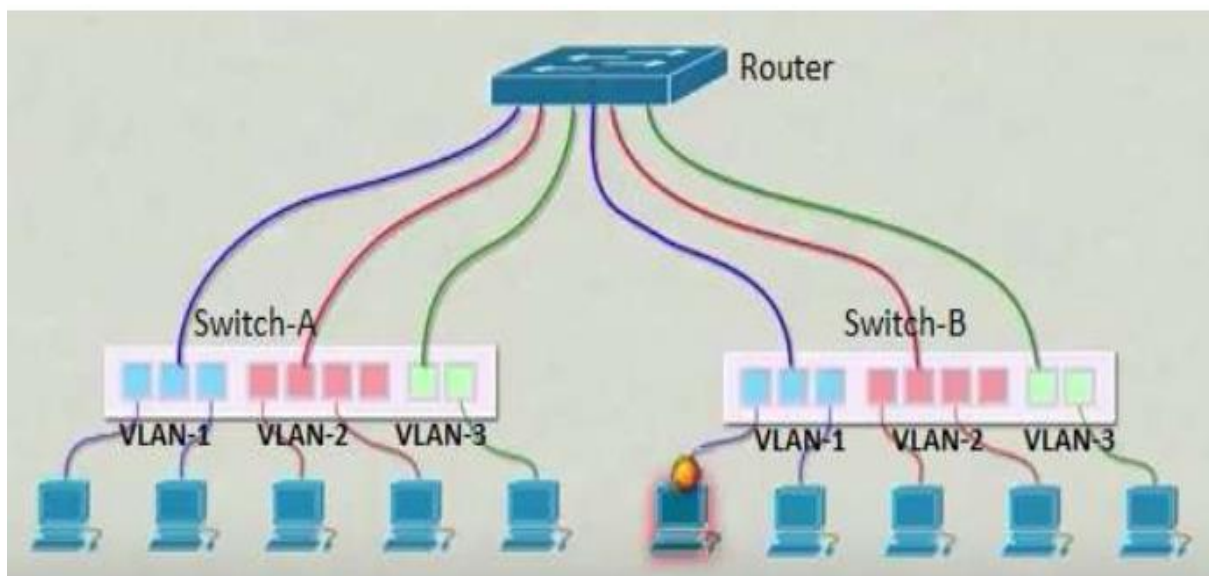
Computer networks are divided into two types: Local Area Networks (LANs) and Wide Area Networks (WANs). LANs are devices connected in the same network at a specific location such as switches, hubs, bridges, workstations, and servers. A local area network (LAN) is also a broadcast domain.

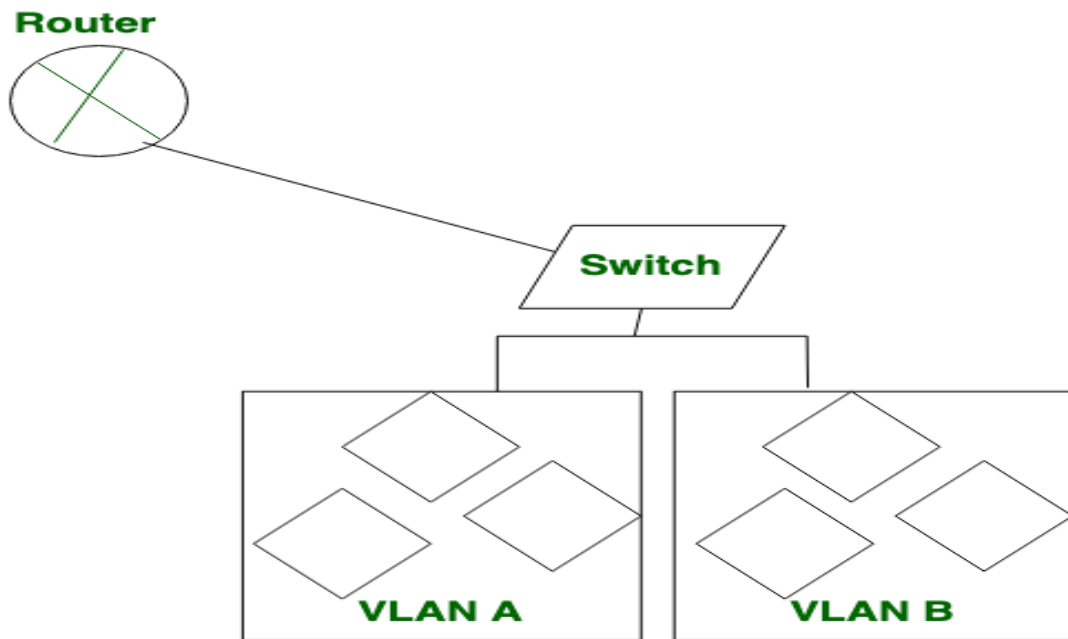
A VLAN enables several networks to function as if they were all part of the same LAN. One of the most advantageous features of a VLAN is that it reduces network latency, saving network resources, and increasing network efficiency.

VLANs are also used to provide segmentation and help with security, network management, and scalability. VLANs can also be used to regulate traffic flows efficiently.



**Figure of LAN**





**Figure of VLAN**

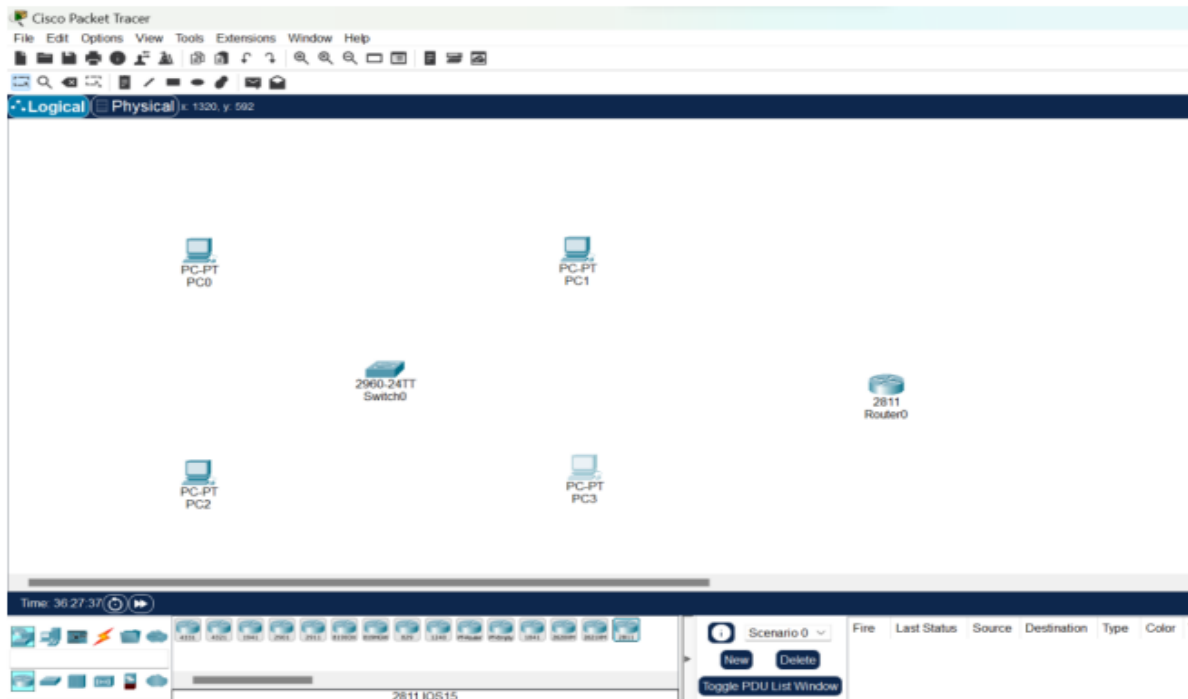
## **Conclusion**

A LAN is a network of computers or devices that share a communications line/wireless link to a server within the same geographical area.

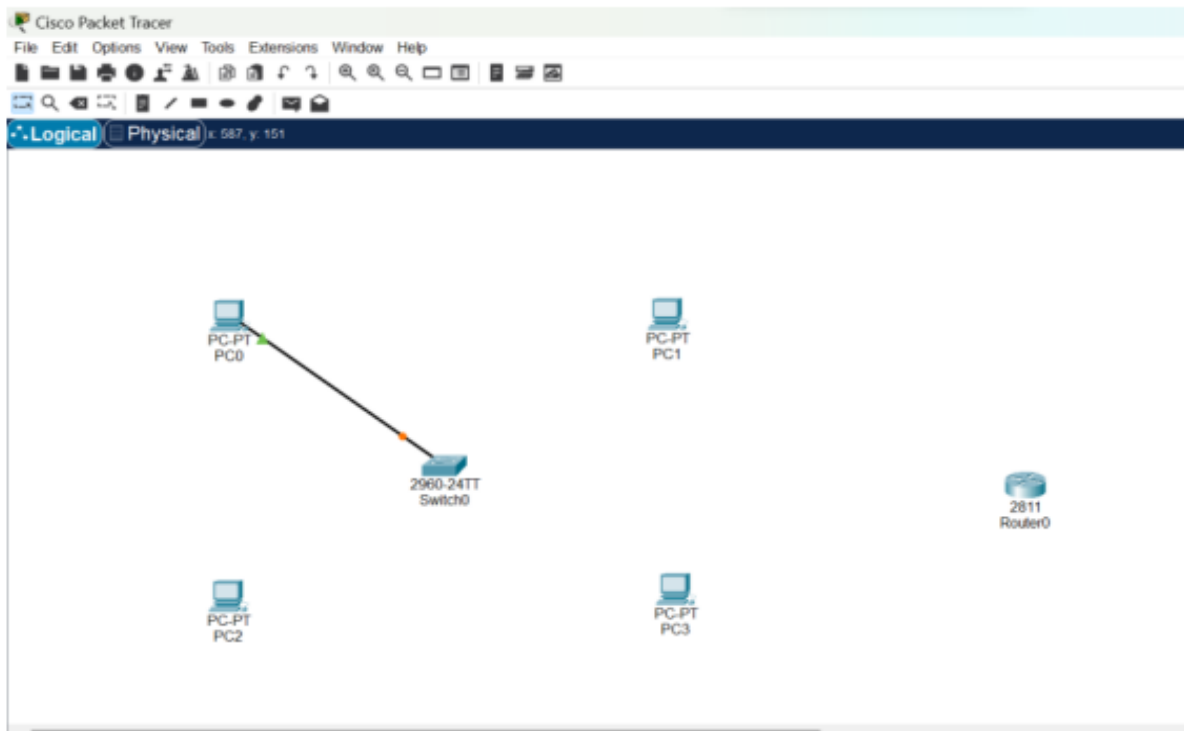
A VLAN is called a subnetwork that can group together devices on separate physical LANs. VLANs provide security on larger networks by allowing a higher degree of control over which devices have access to each other. VLANs are based on logical connections, hence they are flexible.

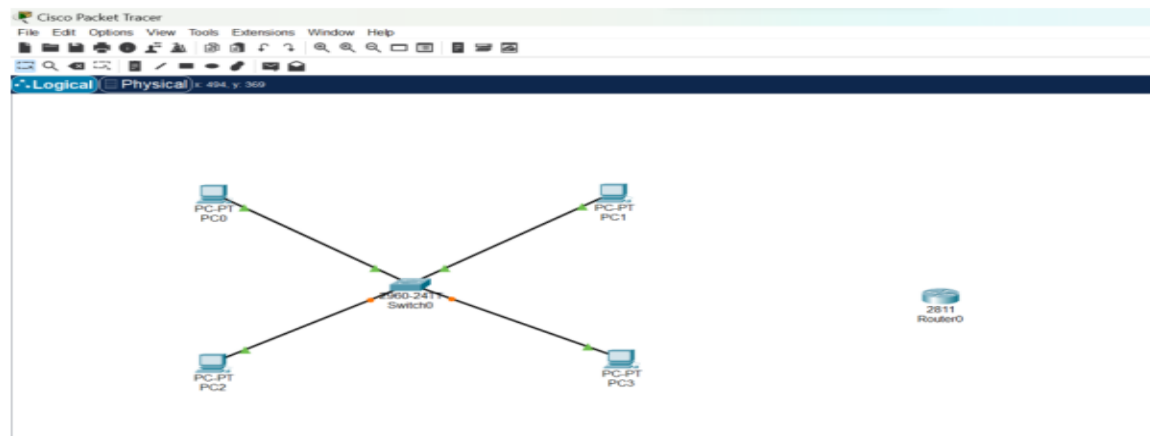
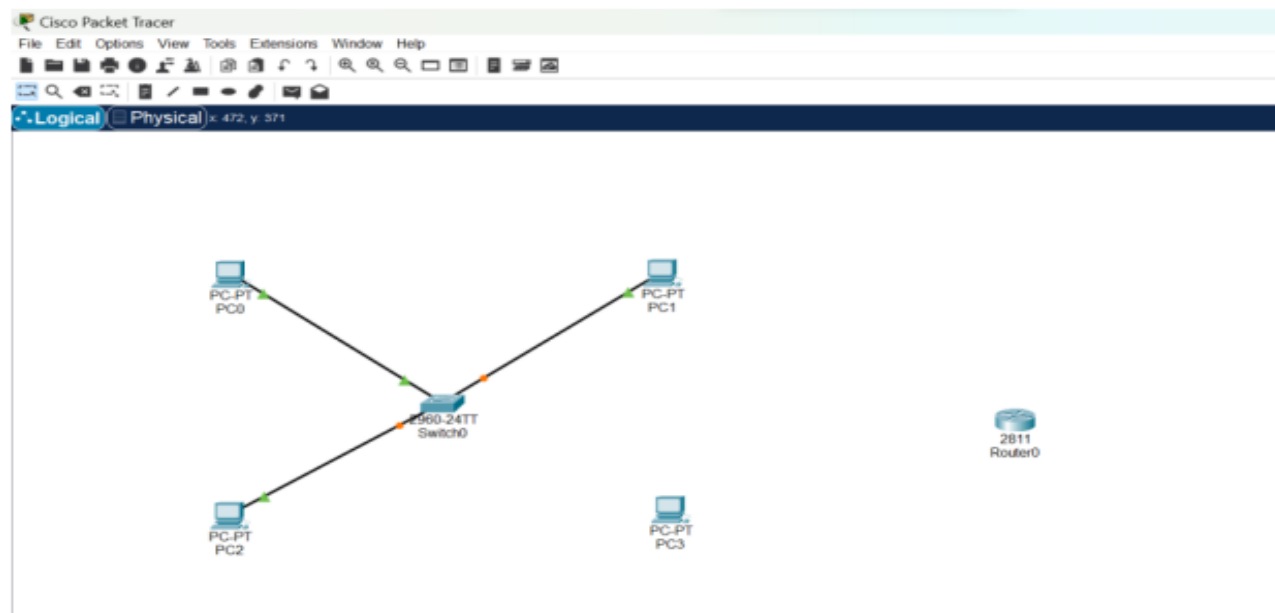
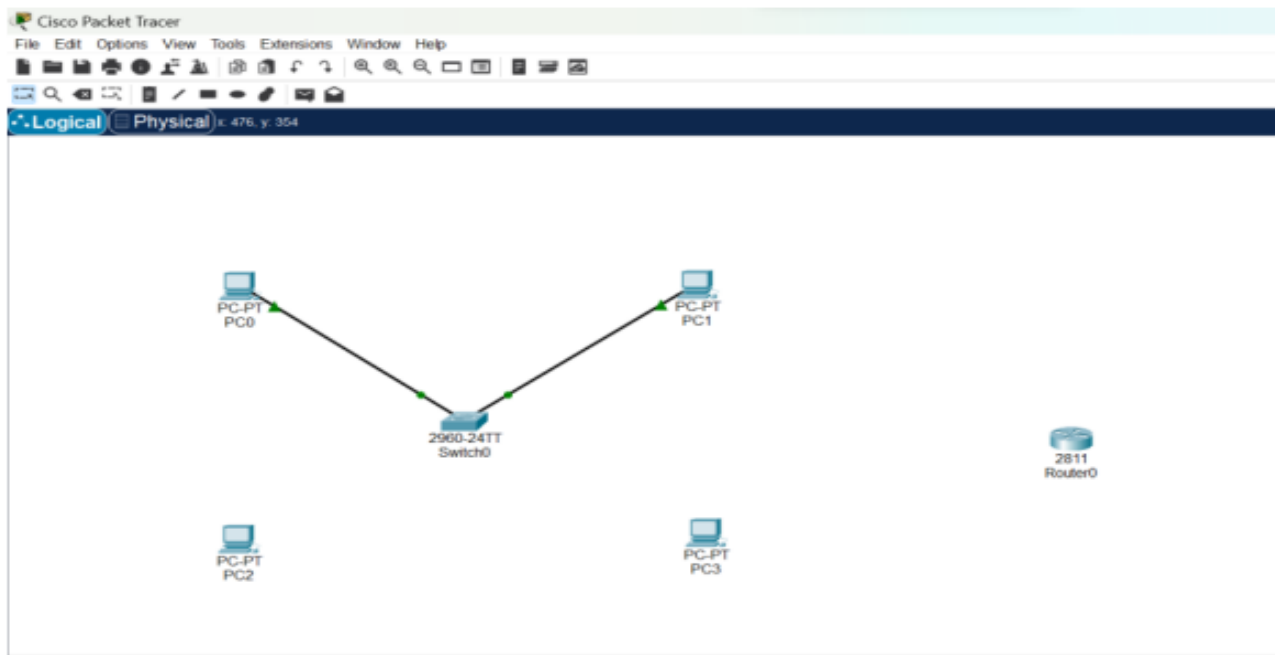
## **2. How to create and Configure a VLAN**

1) Place 4 PC's, a switch and a router on the screen of Cisco Packet Tracer.

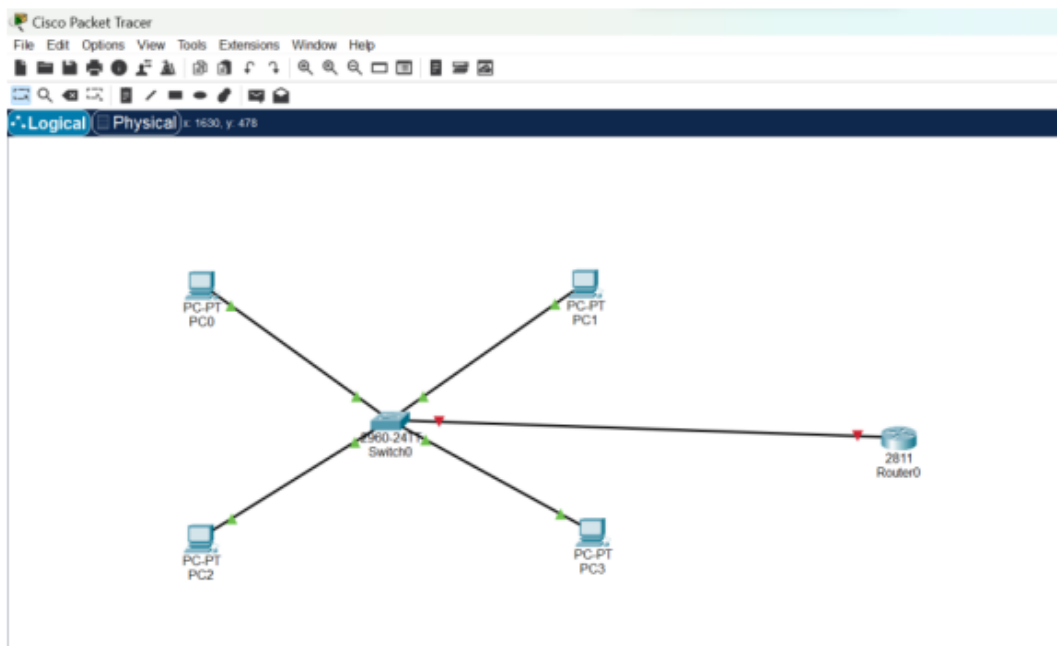


2) Connect all the PC's to the switch using a copper straight through wire.

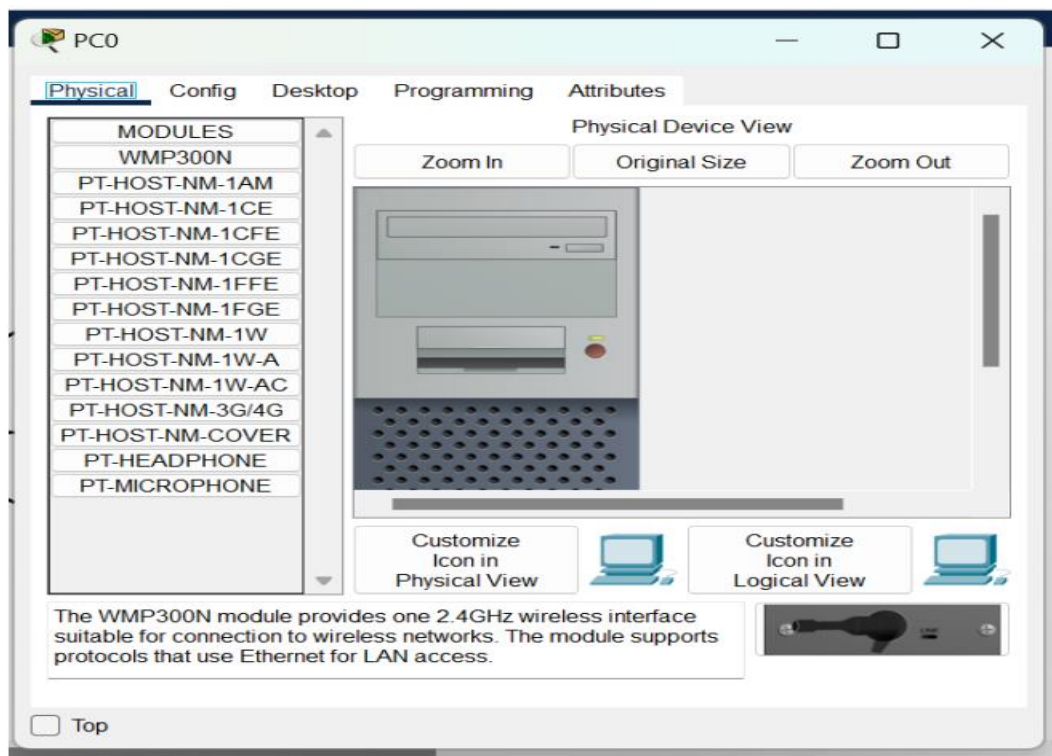


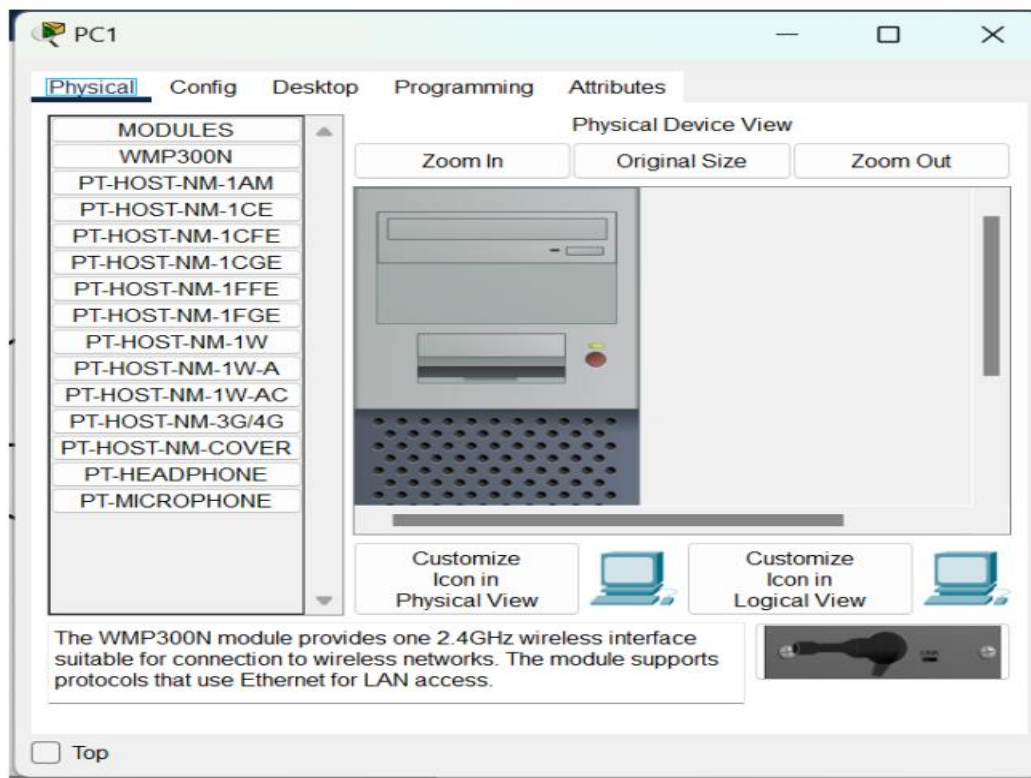
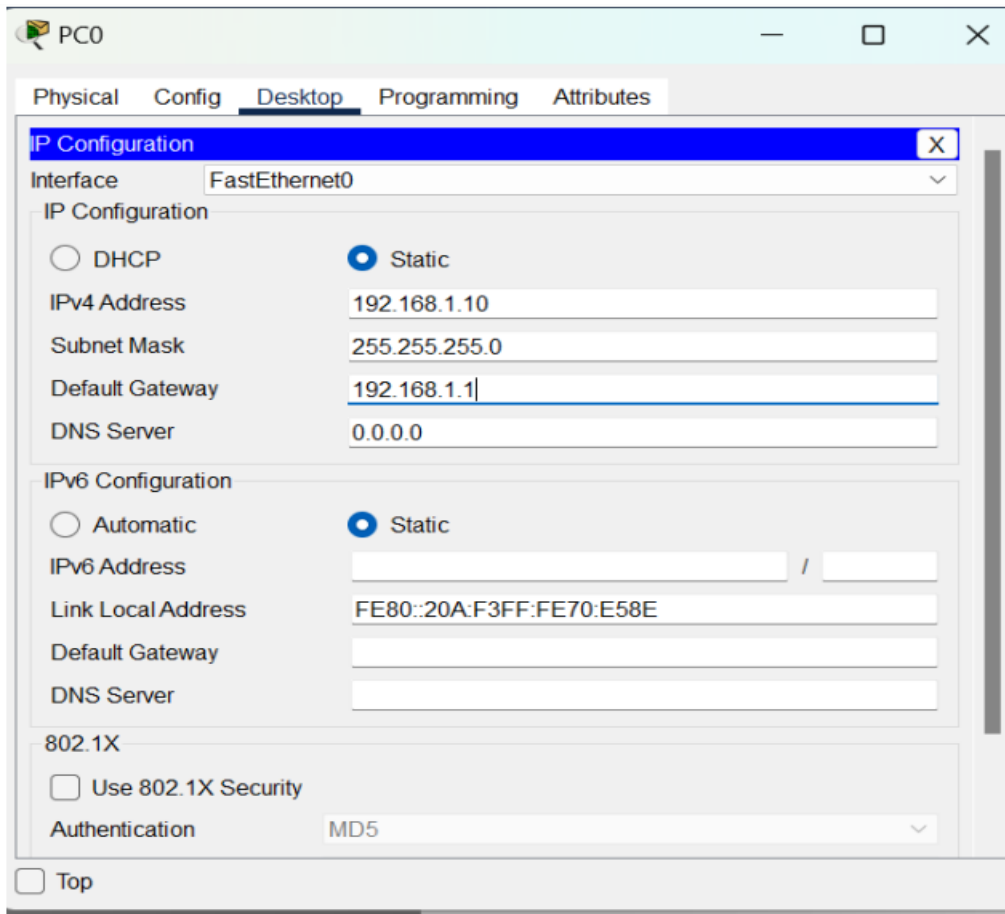


3) Connect the switch to a router.

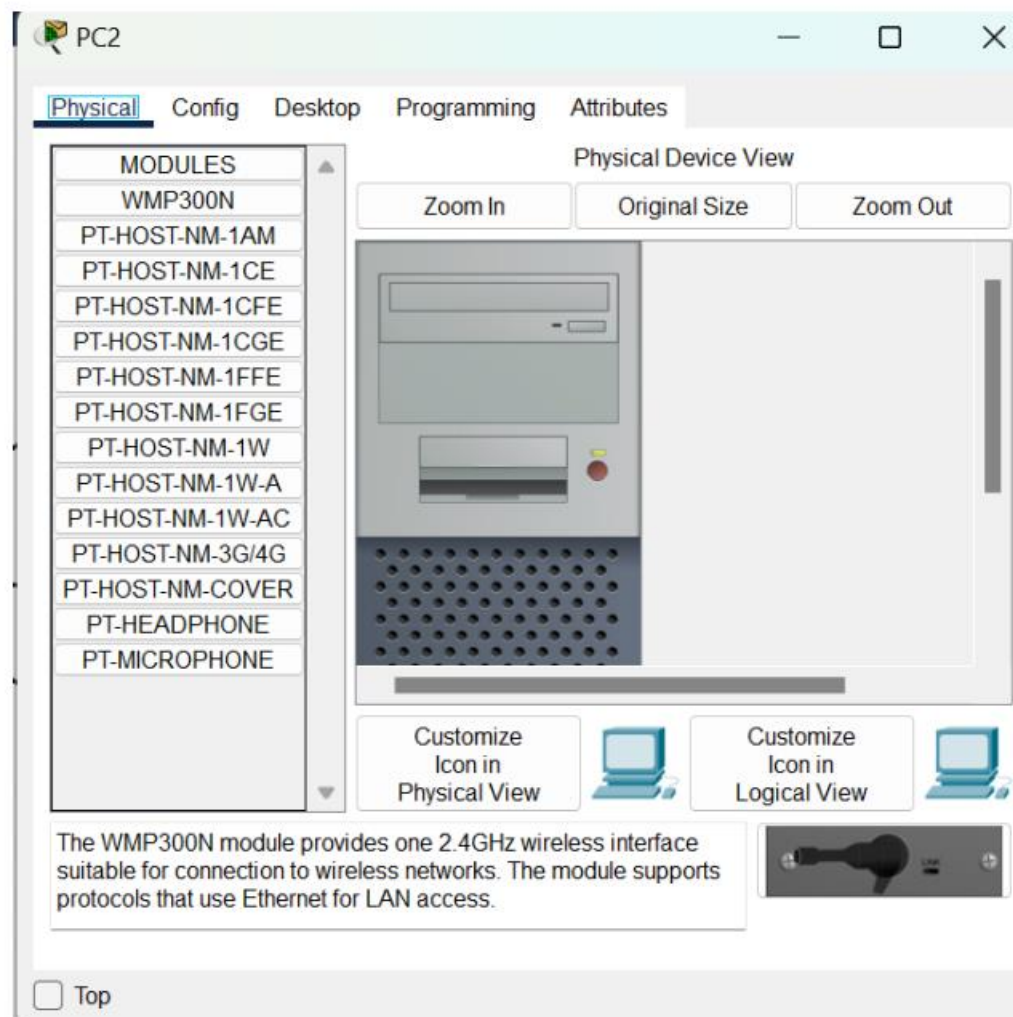
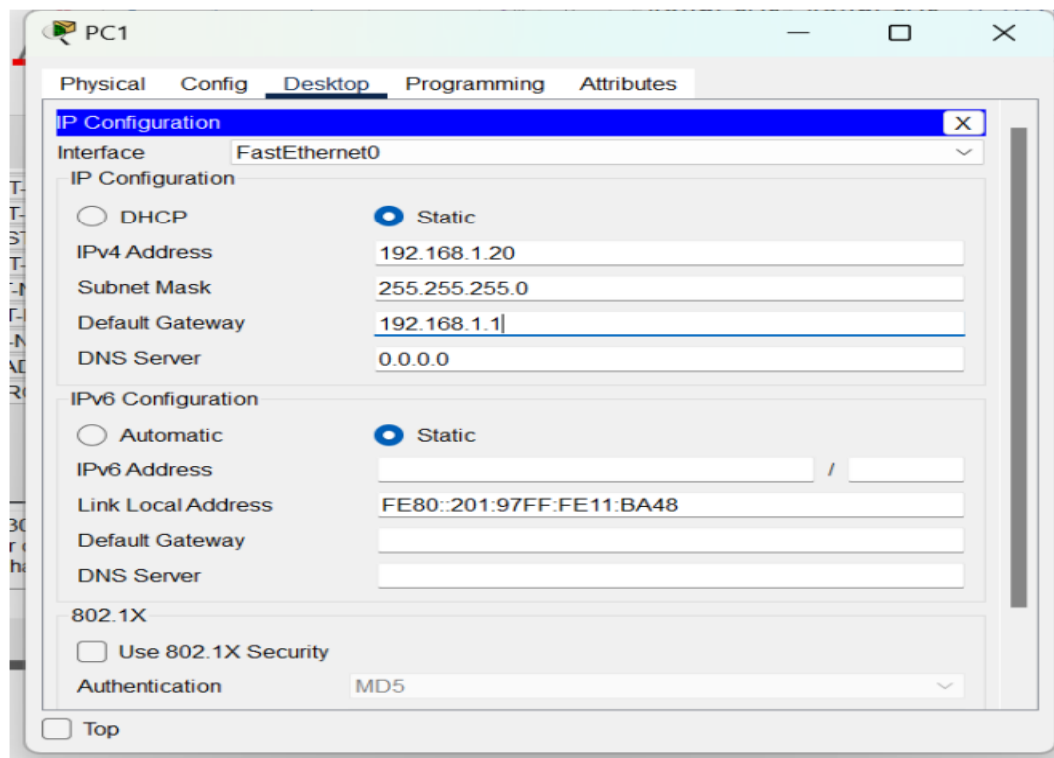


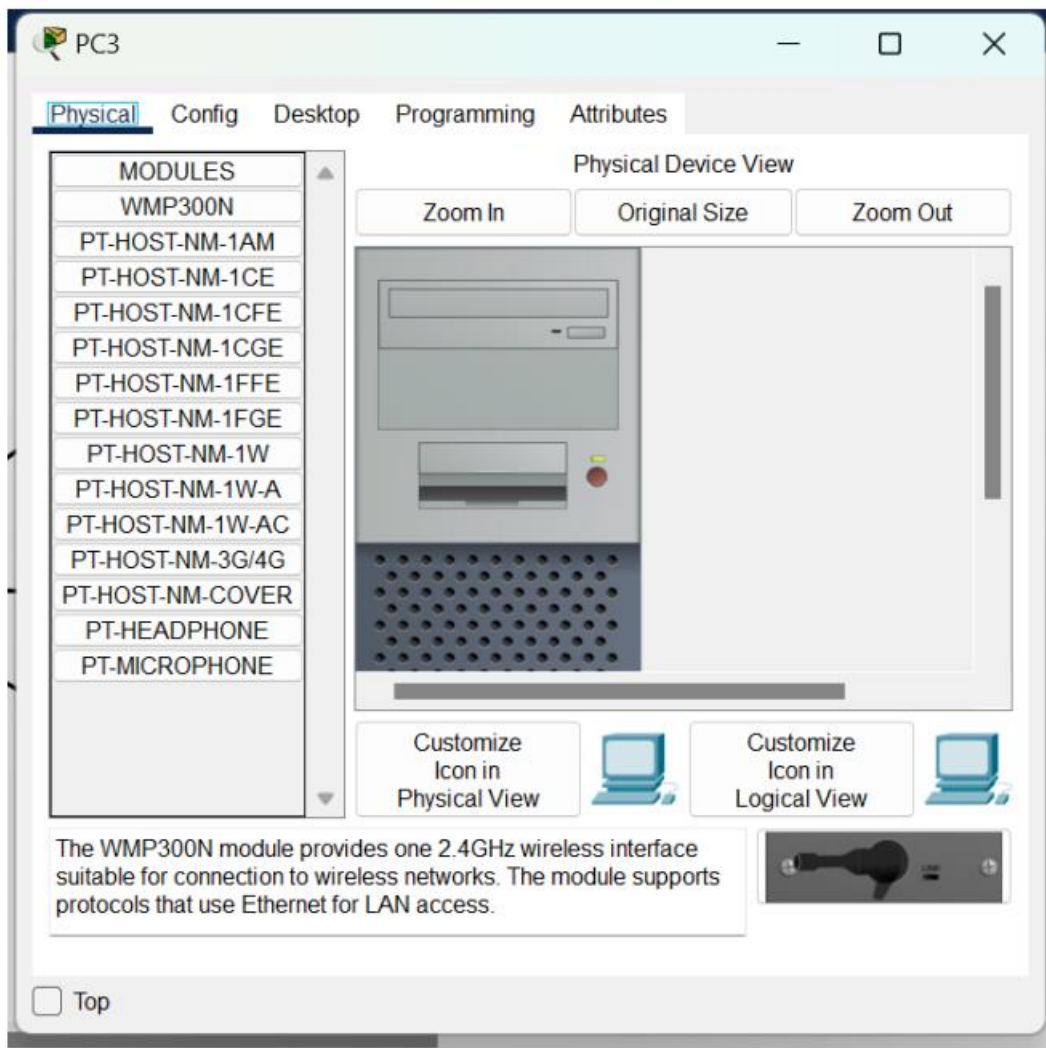
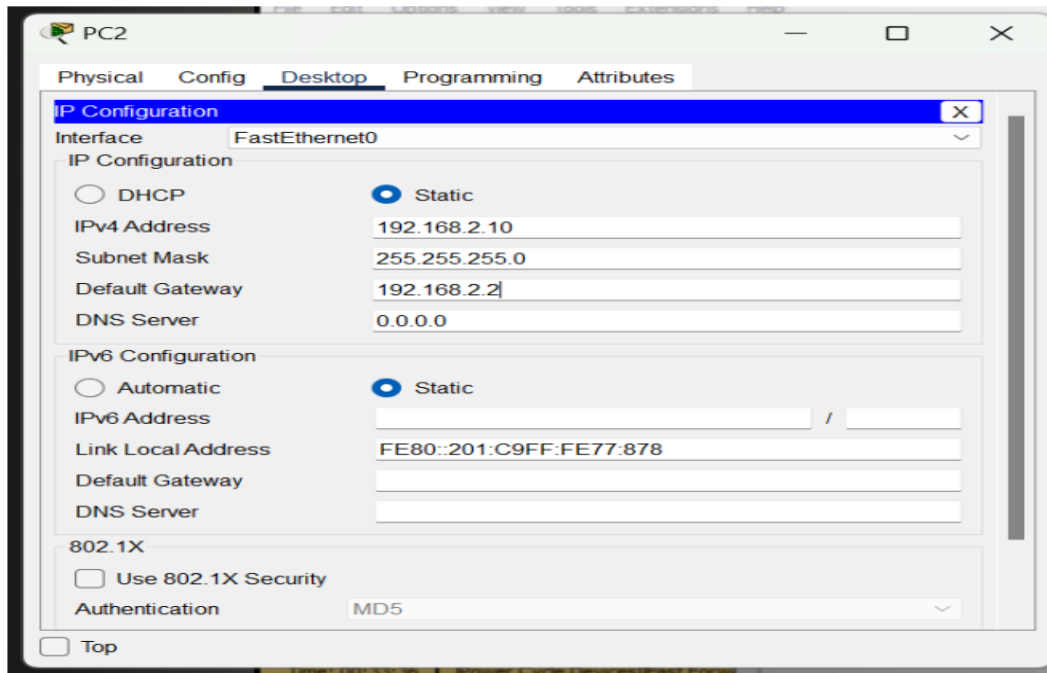
4) Configure the PC's and give them an appropriate IP Address as follows.

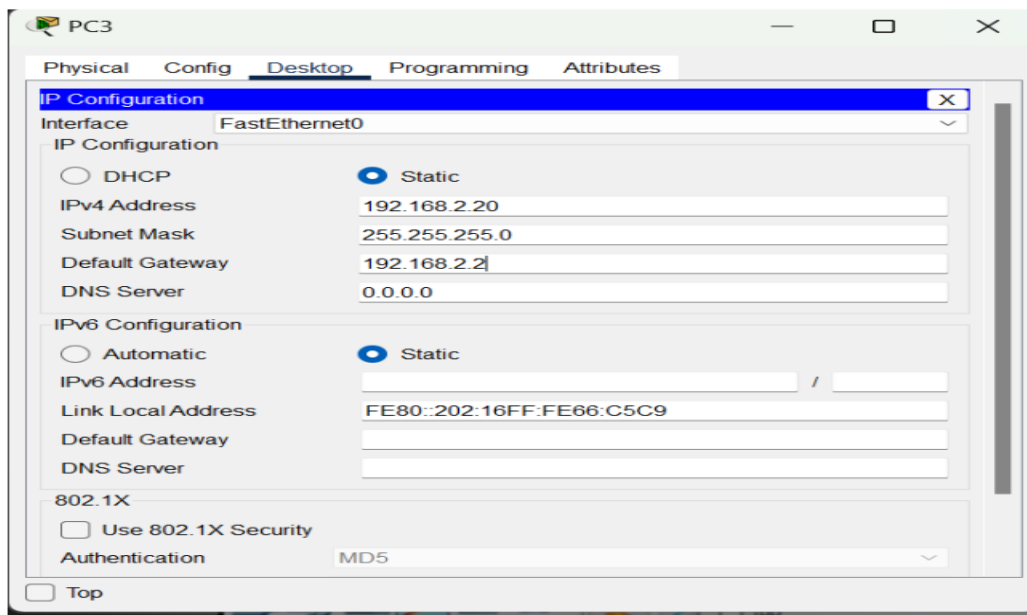




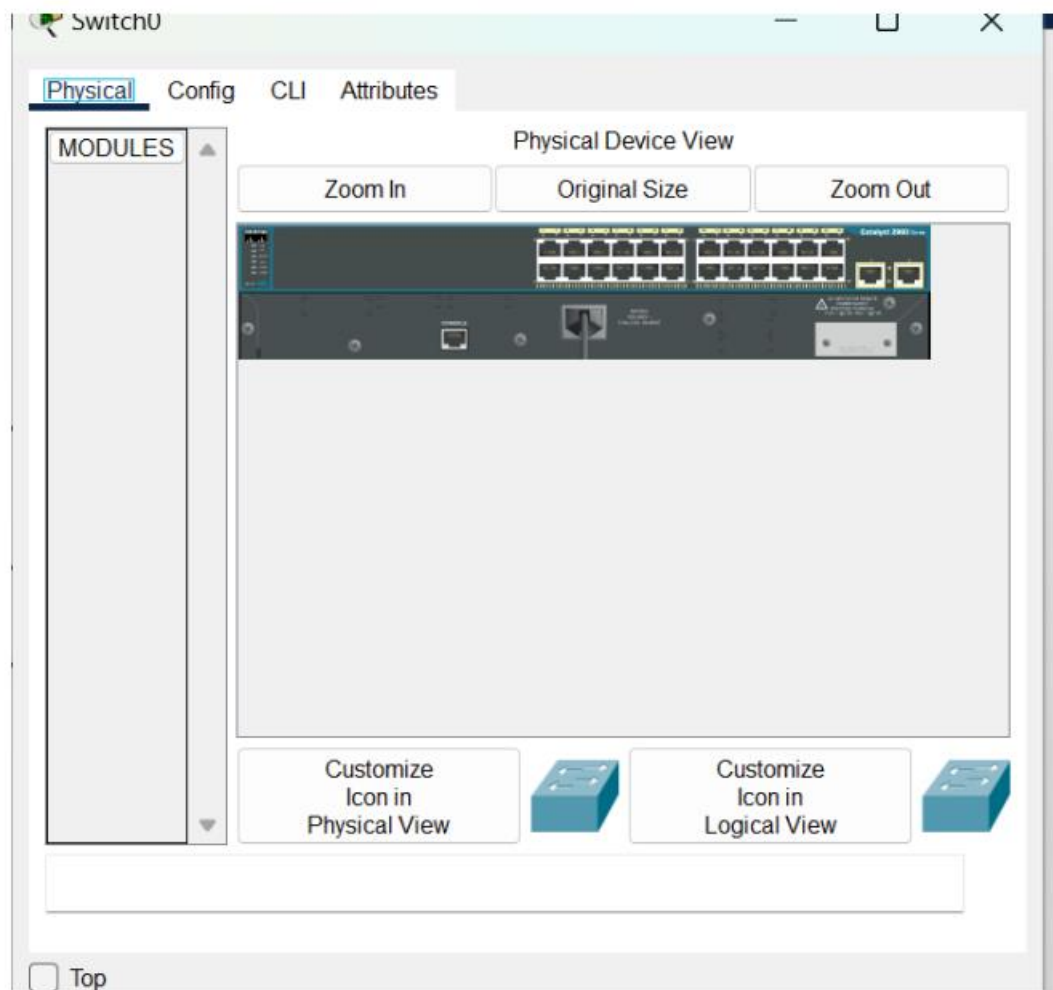


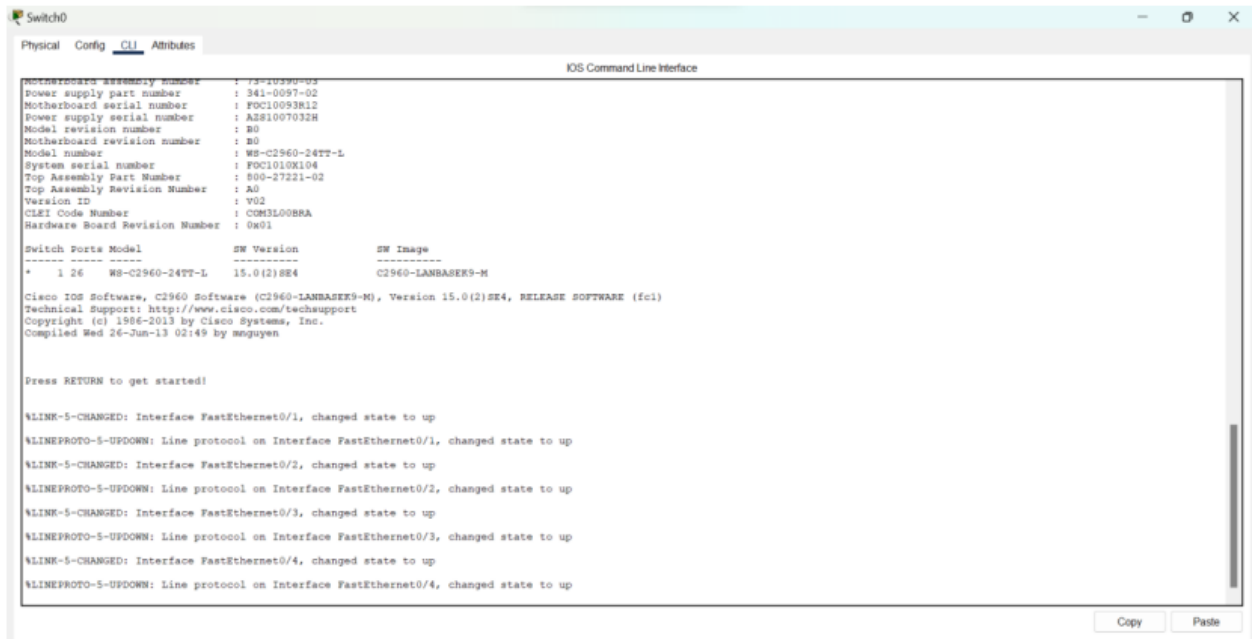




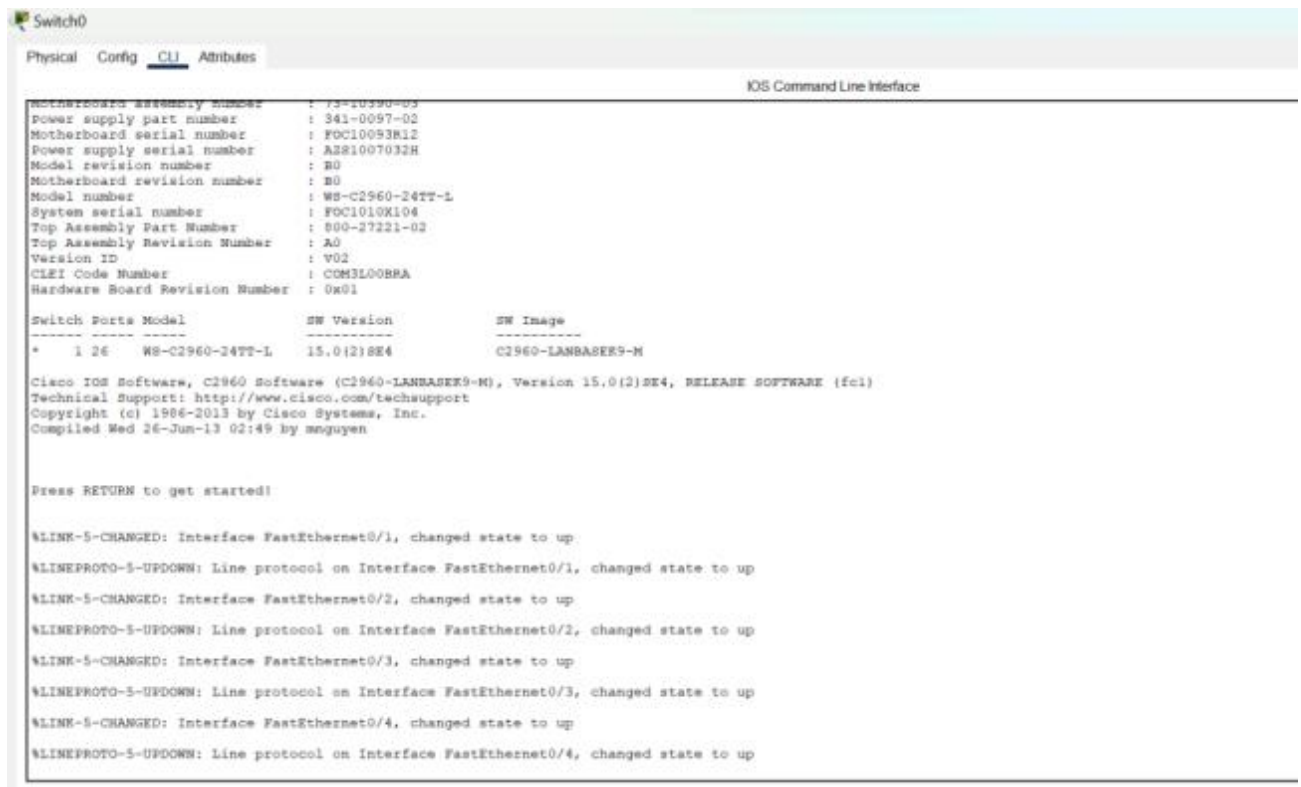


5) Configure the switch in the physical tab.





6) Type the following commands to configure the switch in the CU tab.



Switch0

Physical Config CLI Attributes

IOS Command Line Interface

Version ID : V02

CLEI Code Number : COM3L008RA

Hardware Board Revision Number : 0x01

Switch Ports Model

SW Version

SW Image

\* 1 26 WS-C2960-24TT-L

15.0(2)SE4

C2960-LANBASEK9-M

Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M), Version 15.0(2)SE4, RELEASE SOFTWARE (fc1)  
Technical Support: <http://www.cisco.com/techsupport>  
Copyright (c) 1986-2013 by Cisco Systems, Inc.  
Compiled Wed 26-Jun-13 02:49 by nguyen

Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

Switch>enable

Switch#config terminal

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#vlan 10

Switch(config-vlan)#name neelmani

Switch(config-vlan)#vlan 20

Switch(config-vlan)#name ram

Switch(config-vlan)#int fa0/1

Switch(config-if)#

Copy Paste

Switch0

Physical Config CLI Attributes

IOS Command Line Interface

Cisco IOS Software, C2960 Software (C2960-LANBASEK9-M), Version 15.0(2)SE4, RELEASE SOFTWARE (fc1)  
Technical Support: <http://www.cisco.com/techsupport>  
Copyright (c) 1986-2013 by Cisco Systems, Inc.  
Compiled Wed 26-Jun-13 02:49 by nguyen

Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

Switch>enable

Switch#config terminal

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#vlan 10

Switch(config-vlan)#name neelmani

Switch(config-vlan)#vlan 20

Switch(config-vlan)#name ram

Switch(config-vlan)#int fa0/1

Switch(config-if)#switchport mode access

Switch(config-if)#switchport access vlan 10

Switch(config-if)#int fa0/2

Switch(config-if)#switchport mode access

Switch(config-if)#switchport access vlan 10

Switch(config-if)#int fa0/3

Switch(config-if)#switchport mode access

Switch(config-if)#switchport access vlan 20

Switch(config-if)#

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```
Switch0
Physical Config CLI Attributes
IOS Command Line Interface

Compiled Wed 26-Jun-13 02:45 By angyuen

Press RETURN to get started!

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

Switch>enable
Switch#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name neelmani
Switch(config-vlan)#vlan 20
Switch(config-vlan)#name ram
Switch(config-vlan)#int fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int fa0/3
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#int fa0/4
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#
```

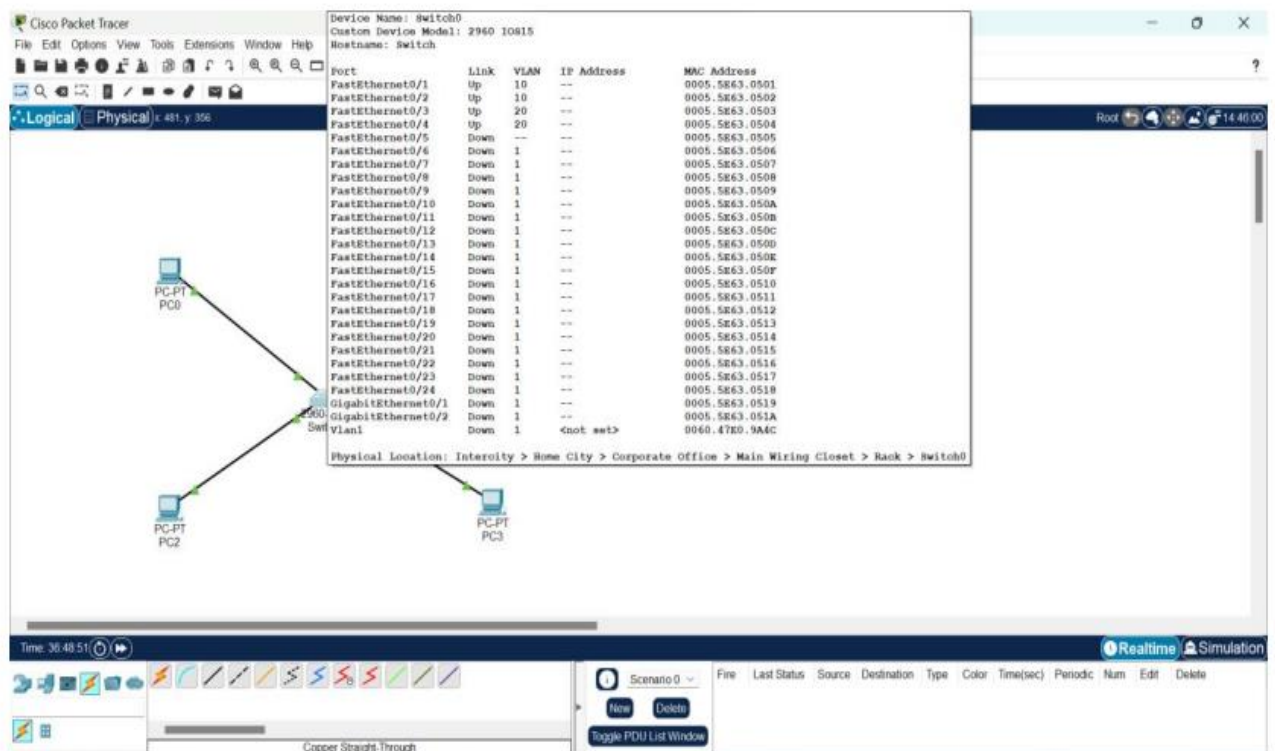
```
Switch0
Physical Config CLI Attributes
IOS Command Line Interface

Press RETURN to get started!

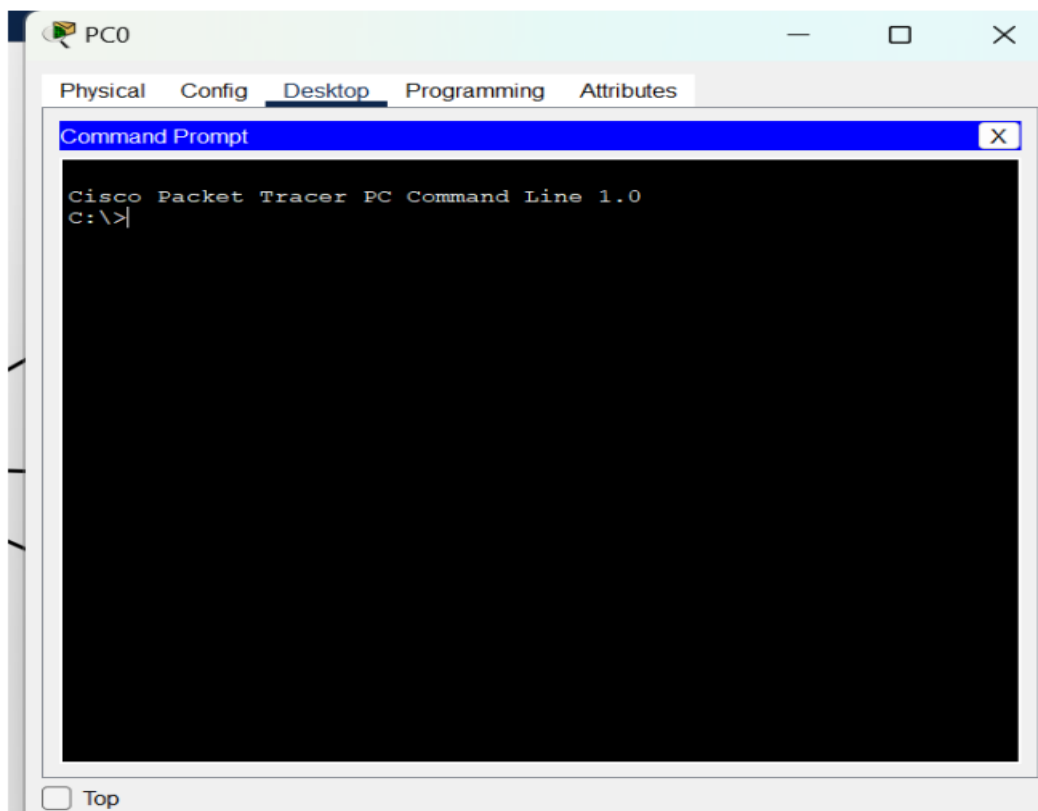
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

Switch>enable
Switch#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name neelmani
Switch(config-vlan)#vlan 20
Switch(config-vlan)#name ram
Switch(config-vlan)#int fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int fa0/3
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#int fa0/4
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#int fa0/5
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport access vlan 20
Switch(config-if)#
```

7) Make the connection using Ethernet cables.

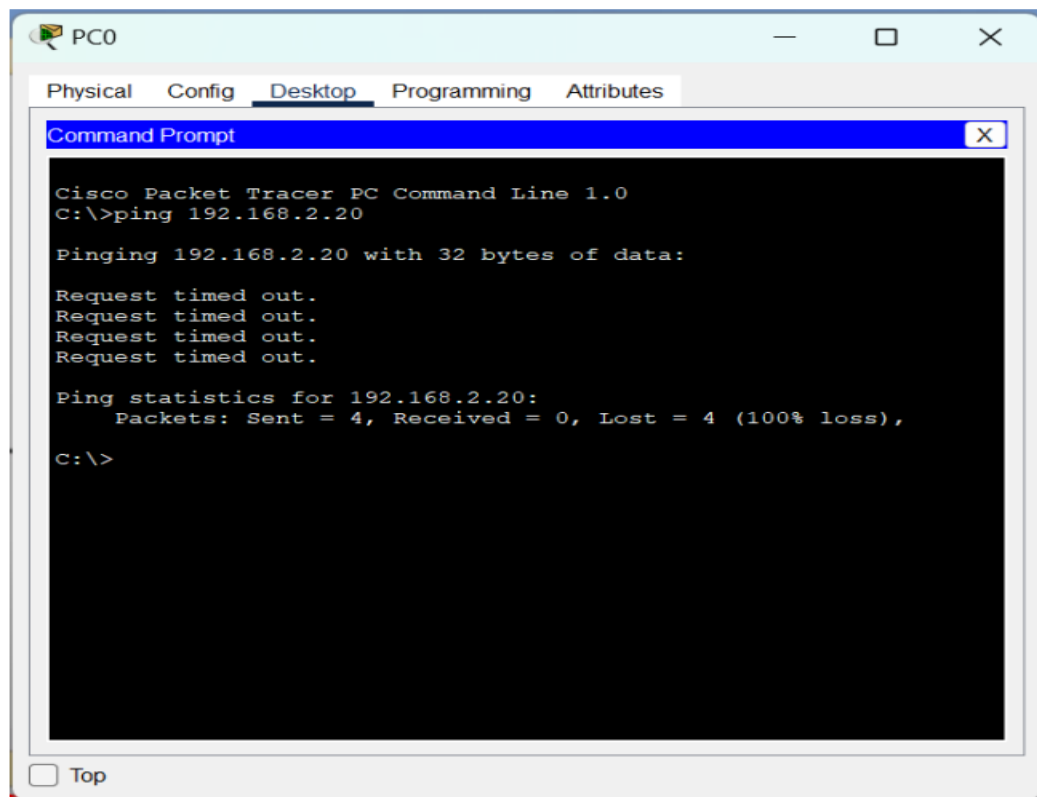


8) Open the Command Prompt in the Desktop tab of the PC.

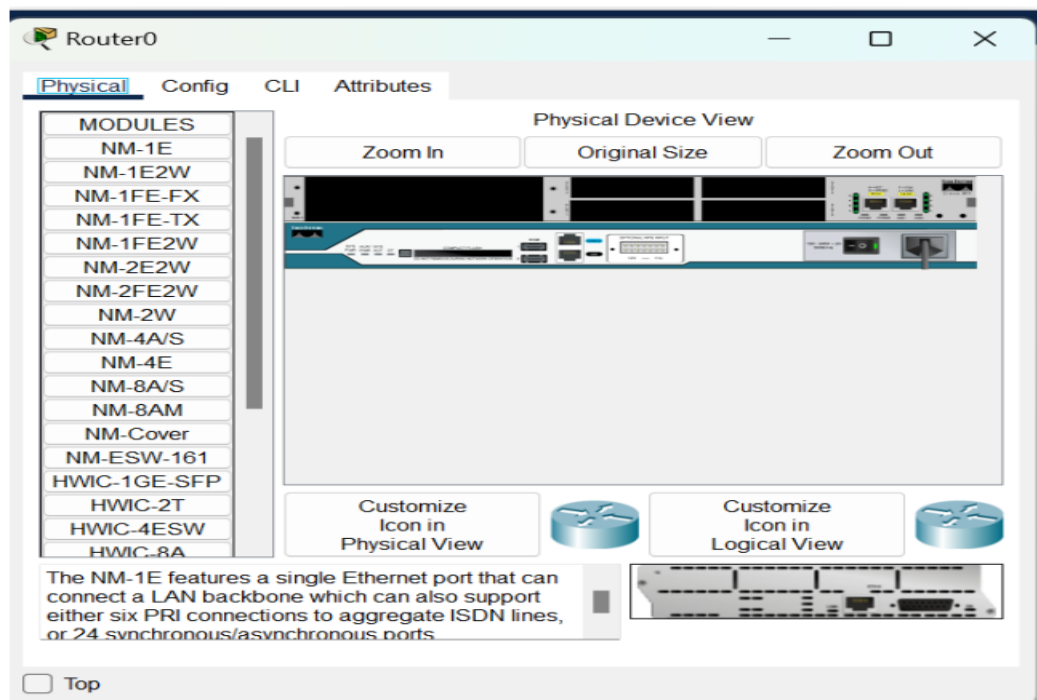




9) Use the Ping command with the IP Address.



10) Configure the router settings.





Router0

Physical Config CLI Attributes

IOS Command Line Interface

```
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Software clause at DFARS sec. 252.227-7013.

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San Jose, California 95134-1706

cisco IOS Software, 2800 Software (C2800NM-ADVIPSERVICESK9-M), Version 15.1(4)M4
Technical Support: http://www.cisco.com/techsupport
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Compiled Thurs 5-Jan-12 15:41 by pt_team
Image text-base: 0x2100F918, data-base: 0x24729040

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compliance with U.S. and local country laws. By using this product you
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A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wvl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

cisco 2811 (MPC860) processor (revision 0x200) with 60416K/5120K bytes of memory
Processor board ID JAD05190MT2 (4292891495)
2 FastEthernet interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no

Press RETURN to get started!
```

Copy Paste

☐ Top

Router0

Physical Config CLI Attributes

IOS Command Line Interface

```
A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wvl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

cisco 2811 (MPC860) processor (revision 0x200) with 60416K/5120K bytes of memory
Processor board ID JAD05190MT2 (4292891495)
2 FastEthernet interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>en
Router>conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#int fa0/0.10
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.10, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.10, changed state to up

Router(config-subif)#encapsulation dot1q 10
Router(config-subif)#ip add 192.168.1.1 255.255.255.0
Router(config-subif)#
```

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Router0

Physical Config CLI Attributes

IOS Command Line Interface

```
Processor board ID JAD0519UMTX (4252891455)
2 FastEthernet interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
245956K bytes of ATA System CompactFlash 0 (Read/Write)

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

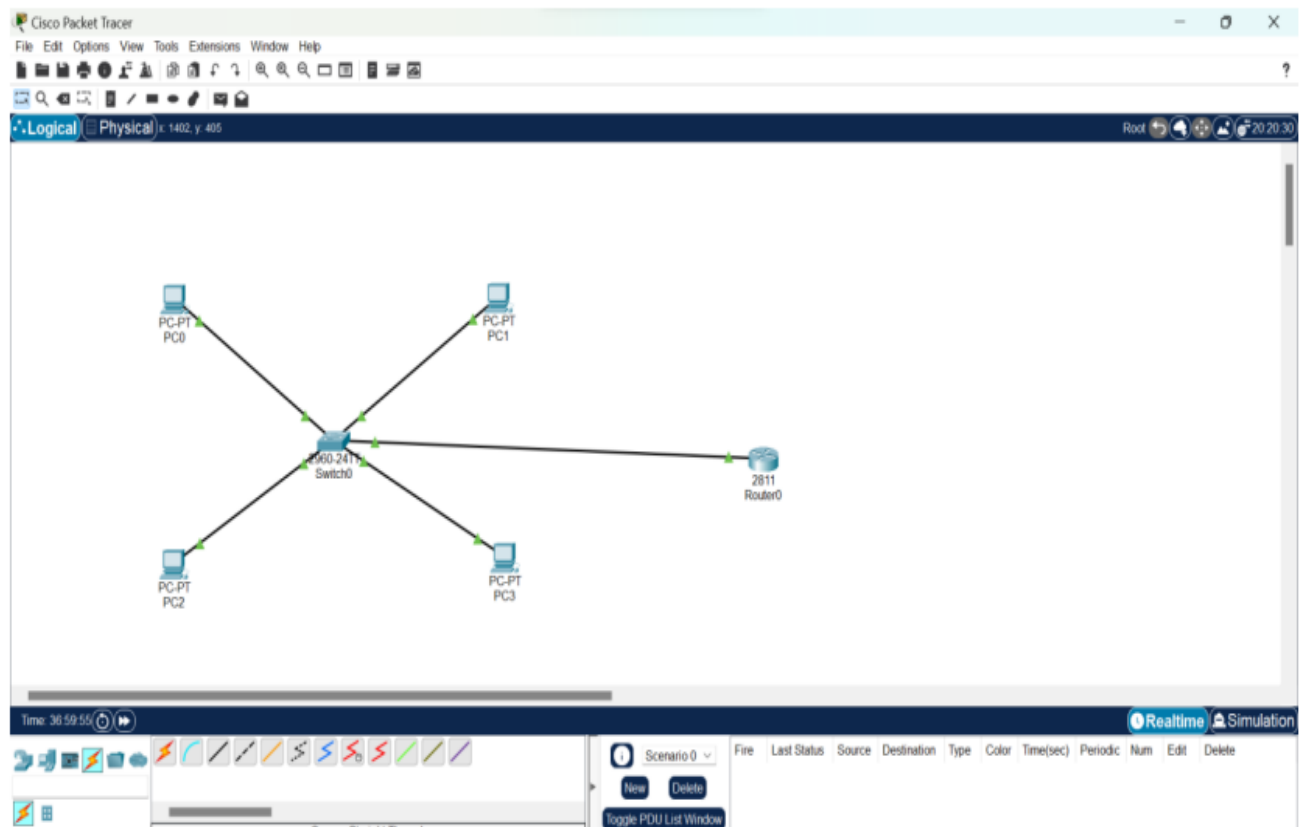
Router(config-if)#int fa0/0.10
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.10, changed state to up

Router(config-subif)#encapsulation dot1q 10
Router(config-subif)#ip add 192.168.1.1 255.255.255.0
Router(config-subif)#int fa0/0.20
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.20, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.20, changed state to up

Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip add 192.168.2.2 255.255.255.0
Router(config-subif)#
```

Copy Paste

11) Make sure all the connections are intact and put in the commands in the command prompt tab.



```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.20

Pinging 192.168.2.20 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.2.20:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 192.168.2.20

Pinging 192.168.2.20 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.20: bytes=32 time<1ms TTL=127
Reply from 192.168.2.20: bytes=32 time<1ms TTL=127
Reply from 192.168.2.20: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.2.20:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.2.20

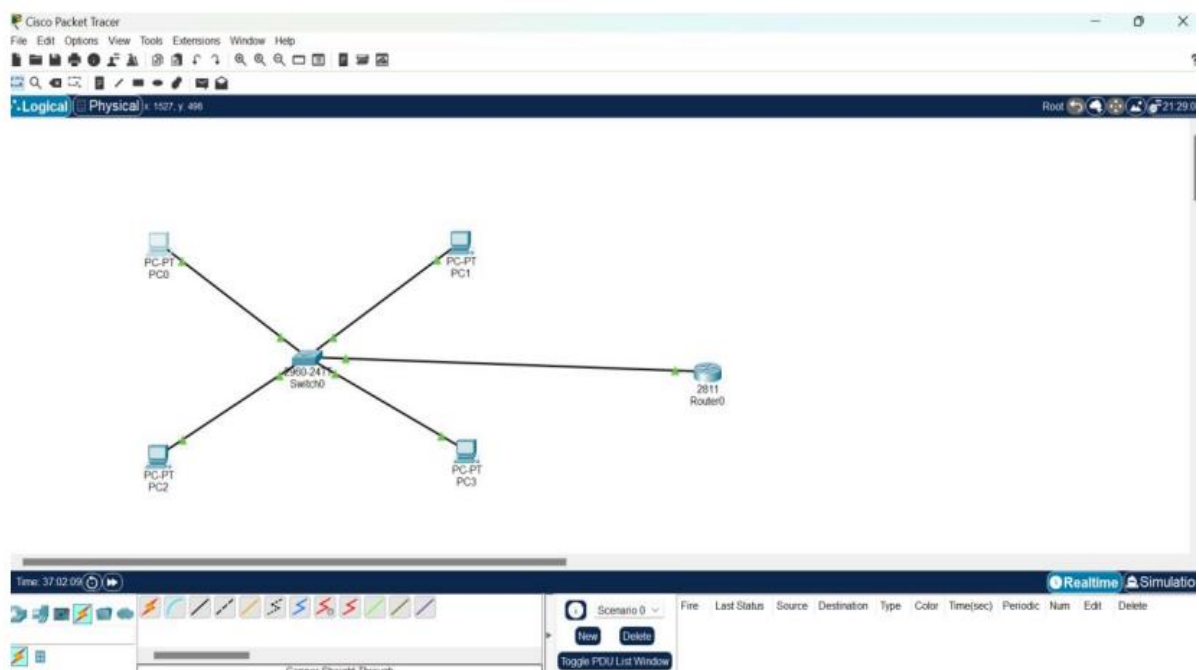
Pinging 192.168.2.20 with 32 bytes of data:

Reply from 192.168.2.20: bytes=32 time<1ms TTL=127
Reply from 192.168.2.20: bytes=32 time<1ms TTL=127
Reply from 192.168.2.20: bytes=32 time<1ms TTL=127
Reply from 192.168.2.20: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.2.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

12)The VLAN Connection is set.



-----X-----

Thank you!