

Session :
BS-IT (Morning 2023-2027)

1/18/2025

COMPUTER NETWORKING

Lab Tasks

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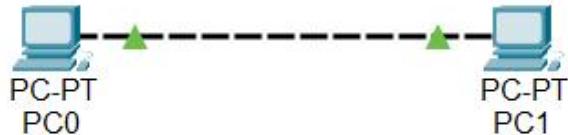
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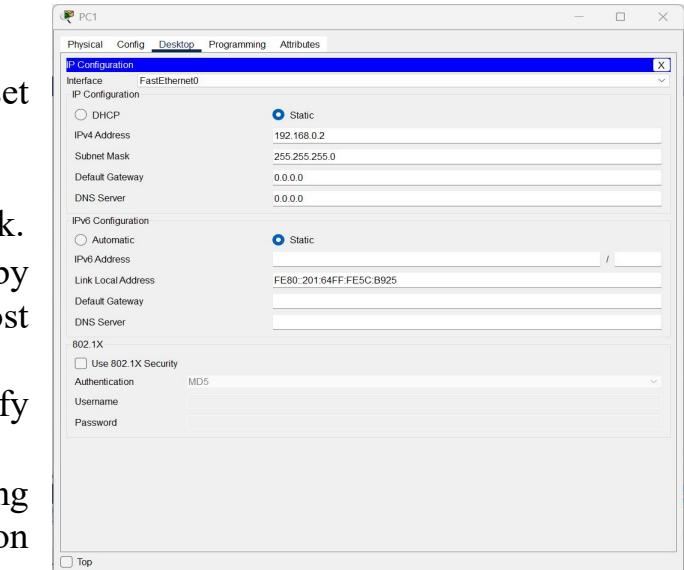
Simple Network (2PCs)

Step 1: Open the Cisco packet tracer desktop and select the devices **2 PCs**.

Step 2: Configure the PCs (hosts) with IPv4 Subnet Mask



- To assign an IP address in PC0, click on PC0.
- Then go to the desktop and then IP configuration and there you set IPv4 configuration.
- Fill IPv4 address and subnet mask.



Simulation Result:

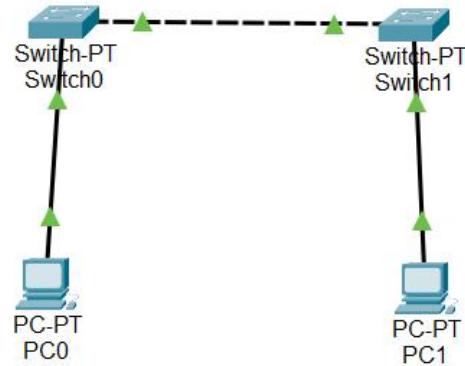
A simulation of the experiment is given below we have sent to two PDU packets one targeted from PC0 to PC2 and another is targeted from PC2 to PC1.

A screenshot of the Cisco Packet Tracer software interface showing a command prompt window. The title bar says "PC0". The tab "Command Prompt" is selected. The window displays the output of a ping command. The user typed "ping 192.168.0.2" and received a response: "Pinging 192.168.0.2 with 32 bytes of data: Reply from 192.168.0.2: bytes=32 time<1ms TTL=128...". Below this, it shows ping statistics: "Ping statistics for 192.168.0.2: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 0ms, Maximum = 0ms, Average = 0ms". The "Physical", "Config", "Desktop", "Programming", and "Attributes" tabs are also visible at the top of the window.

Simple Network (2PCs)

Step 1: Open the Cisco packet tracer desktop and select the devices **2 PCs** and

Step 2: Configure the PCs (hosts) with
IPv4 Subnet Mask;



- To assign an IP address in PC0, click on PC0.
 - Then go to the desktop and then IP configuration and there you set IPv4 configuration.
 - Fill IPv4 address and subnet mask.
- Step 3:** Verify the connection by pinging the IP address of any host in PC0.
- Use the ping command to verify the connection.
 - As we can see we are getting replies from a targeted node on both PCs.
 - Hence the connection is verified.

```
C:\>ping 192.168.0.2

Cisco Packet Tracer PC Command Line 1.0
Ping statistics for 192.168.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Simulation Result:

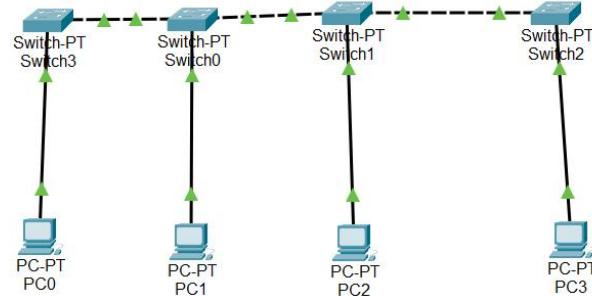
A simulation of the experiment is given below we have sent to two PDU packets one targeted from PC0 to PC1 and another is targeted from PC1 to PC0.

Simple Network (2PCs)

Step 1: Open the Cisco packet tracer desktop and select the devices 4 PCs and 4 switches.

Step 2: Configure the PCs (hosts) with IPv4 Subnet Mask;

- To assign an IP address in PC0, click on PC0.
- Then go to the desktop and then IP configuration and there you set IPv4 configuration.



- Fill IPv4 address and subnet mask.

Step 3: Verify the connection by pinging the IP address of any host in PC0.

- Use the ping command to verify the connection.
- As we can see we are getting replies from a targeted node on both PCs.
- Hence the connection is verified.

```
C:\>ping 192.168.0.2 with 32 bytes of data:  
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128  
Ping statistics for 192.168.0.2:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 0ms, Maximum = 1ms, Average = 0ms  
C:\>ping 192.168.0.4 with 32 bytes of data:  
Reply from 192.168.0.4: bytes=32 time<1ms TTL=128  
Ping statistics for 192.168.0.4:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 0ms, Maximum = 1ms, Average = 0ms  
C:\>
```

Simulation Result:

A simulation of the experiment is given below we have sent to two PDU packets one targeted from PC0 to PC2 and another is targeted from PC1 to PC4.

Network Topology

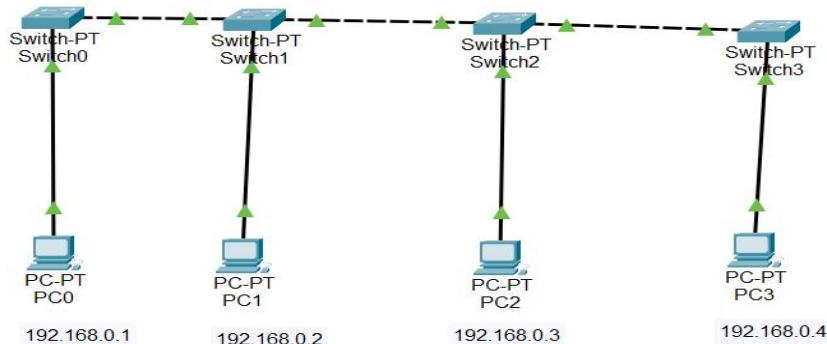
Bus Topology:

Step 1: Open the Cisco packet tracer desktop and select the devices 4 PCs and 4 switch-PT.

- IP Addressing Table

Device	IPv4 Address	Subnet Mask
pc0	192.168.0.1	255.255.255.0
pc1	192.168.0.2	255.255.255.0
pc2	192.168.0.3	255.255.255.0
pc3	192.168.0.4	255.255.255.0

- Then create a network topology as shown below :



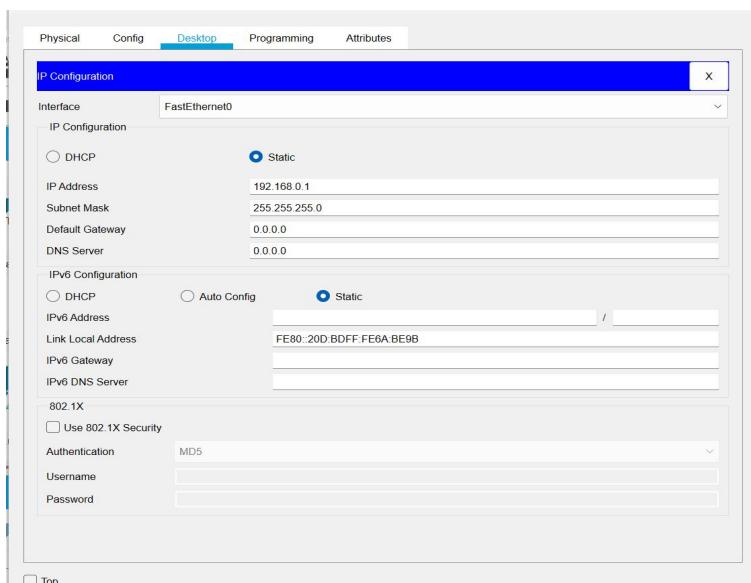
- Use an automatic connecting cable to connect the device with others.

Step 2: Configure the PCs (hosts) with IPv4 Subnet Mask according to the IP addressing table given below:

- To assign an IP address in PC0, click on PC0.
- Then go to the desktop and then IP configuration and there you set IPv4 configuration.
- Fill IPv4 address and subnet mask.

Step 3: Verify the connection by pinging the IP address of any host in PC0.

- Use the ping command to verify the connection.



- As we can see we are getting replies from a targeted node on both PCs.
- Hence the connection is verified.

Simulation Result:

A simulation of the experiment is given below we have sent to two PDU packets one targeted from PC0 to PC2 and another is targeted from PC3 to PC1.

```

Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.2

Pinging 192.168.0.2 with 32 bytes of data:
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Reply from 192.168.0.2: bytes=32 time=8ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms

C:\>ping 192.168.0.4

Pinging 192.168.0.4 with 32 bytes of data:
Reply from 192.168.0.4: bytes=32 time=2ms TTL=128

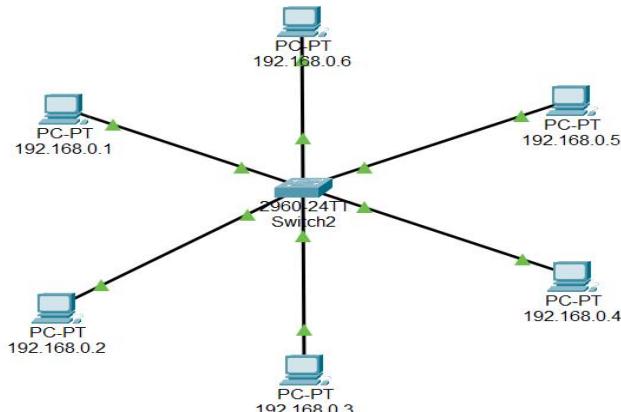
Ping statistics for 192.168.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 1ms
C:\>

```

Star Topology

Step 1: We have taken a switch and six end devices.

Step 2: link with an automatic connecting cable to connect every device with the switch as;



Step 4: Transfer message from one device to another and check the Table for Validation.

Step 5: Now to check whether the connections are correct or not try to ping any device as

Simulation Result:

A simulation of the experiment is given below;

```

Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.3

Pinging 192.168.0.3 with 32 bytes of data:
Reply from 192.168.0.3: bytes=32 time<1ms TTL=128
Reply from 192.168.0.3: bytes=32 time=1ms TTL=128
Reply from 192.168.0.3: bytes=32 time<1ms TTL=128
Reply from 192.168.0.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.0.5

Pinging 192.168.0.5 with 32 bytes of data:
Reply from 192.168.0.5: bytes=32 time<1ms TTL=128

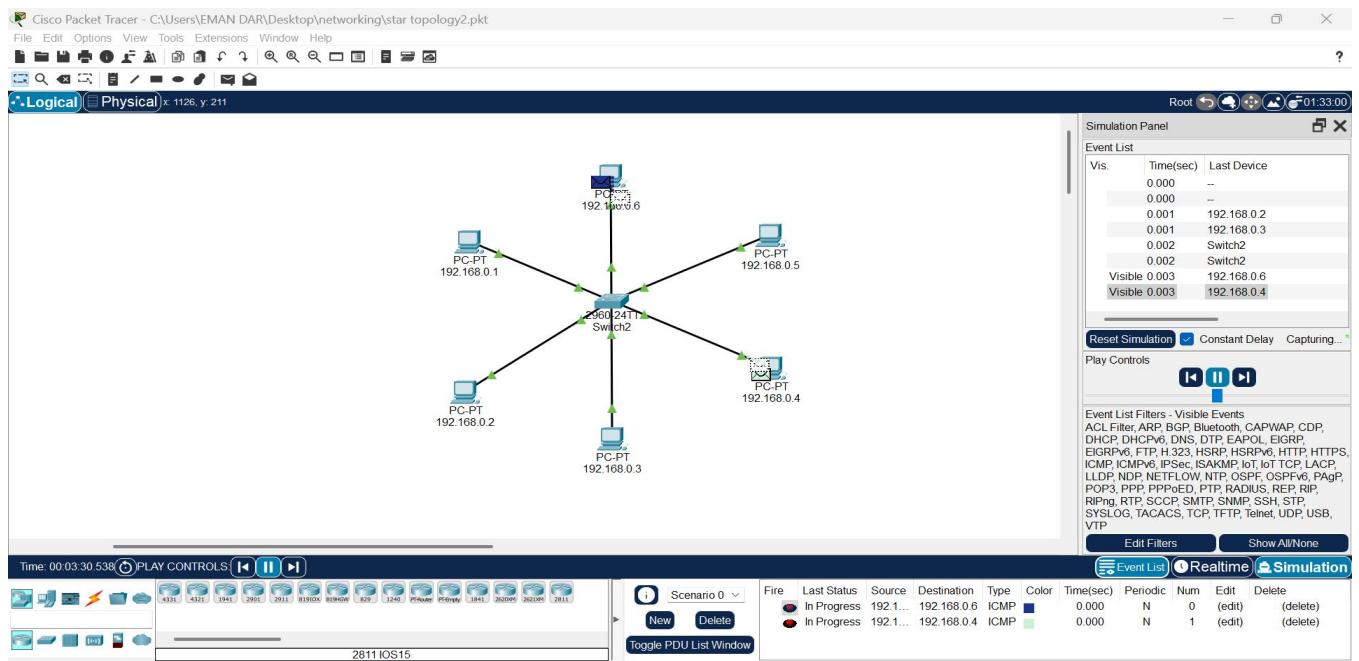
Ping statistics for 192.168.0.5:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.0.6

Pinging 192.168.0.6 with 32 bytes of data:
Reply from 192.168.0.6: bytes=32 time<1ms TTL=128
Reply from 192.168.0.6: bytes=32 time=1ms TTL=128
Reply from 192.168.0.6: bytes=32 time<1ms TTL=128
Reply from 192.168.0.6: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.6:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>

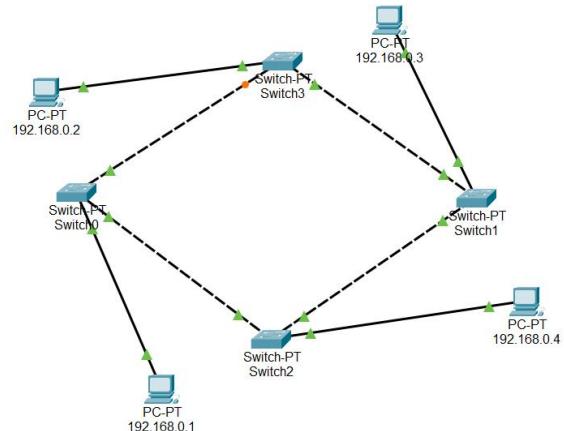
```



Ring Topology:

Step 1: First open the cisco packet tracer desktop and select the devices as 4 switch-PT and 4 PCs.

IP Addressing Table:



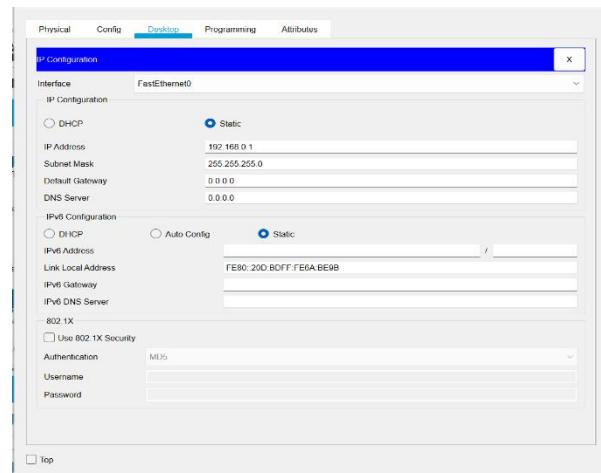
S.NO	Device	IPv4 Address	Subnet Mask
1.	pc0	192.168.0.1	255.255.255.0
2.	pc1	192.168.0.2	255.255.255.0
3.	pc2	192.168.0.3	255.255.255.0

S.NO	Device	IPv4 Address	Subnet Mask
4.	pc3	192.168.0.4	255.255.255.0

- Then create a network topology.

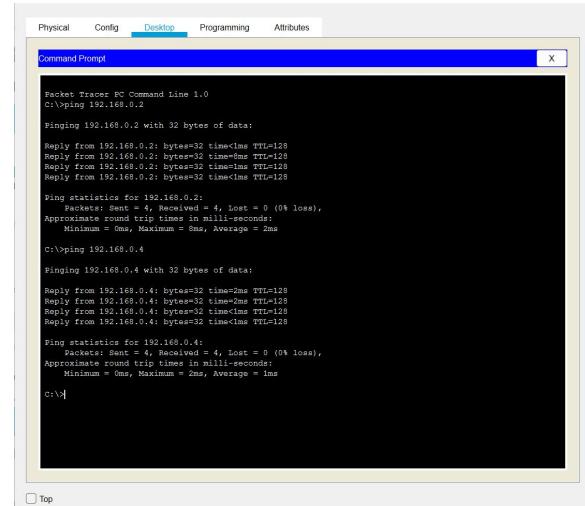
Step 2: Configure the PCs with IPv4 address and subnet mask according to the IP addressing table given above.

- To assign an IP address in PC0, click on PC0.
- Then go to the desktop and then IP configuration and there you set IPv4 configuration.
- Fill IPv4 address and subnet mask.



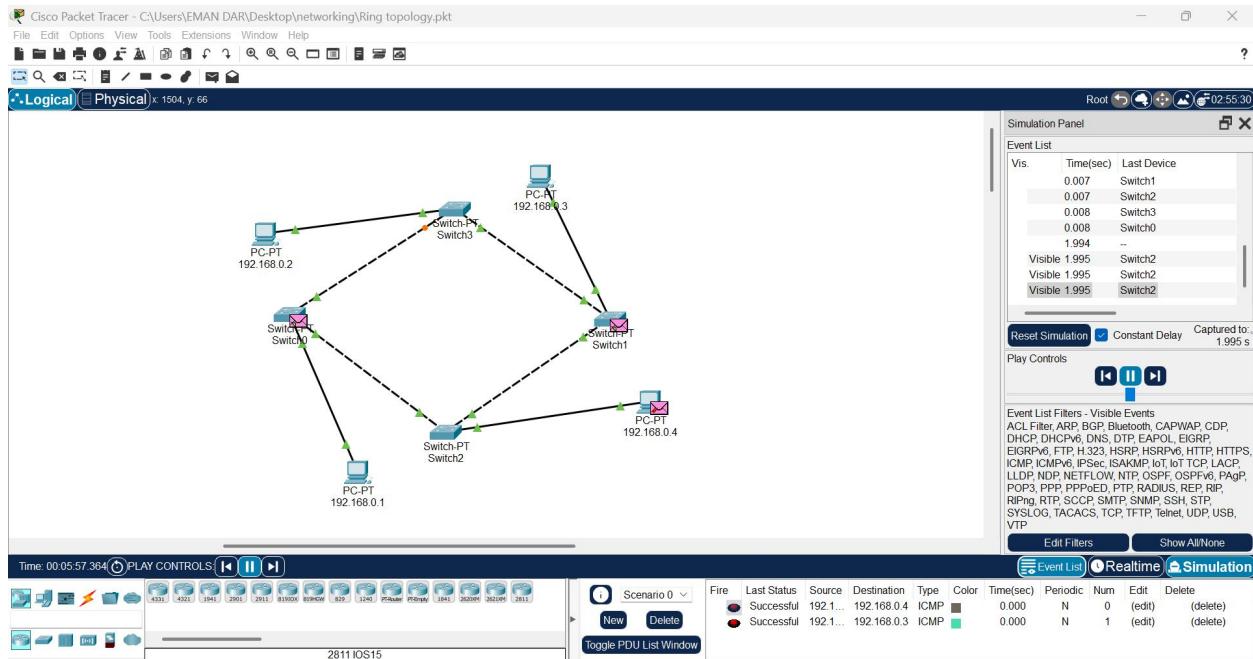
Step 3: Verify the connection by pinging the IP address of any host in PC0.

- Use the ping command to verify the connection.
- As we can see we are getting replies from a targeted node on both PCs.
- Hence the connection is verified.



• Simulation Result:

A simulation of the experiment is given below we have sent two PDU packets one targeted from PC0 to PC2 and another targeted from PC1 to PC3.



Mesh Topology

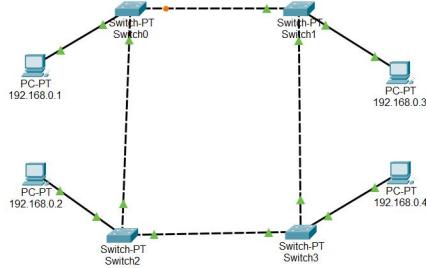
Step 1: First open the Cisco packet tracer desktop and select the devices as **4 switch-PT** and **4 PCs**.

Step 2: Configure the PCs (hosts) with IPv4 Subnet Mask according to the IP addressing table given below:

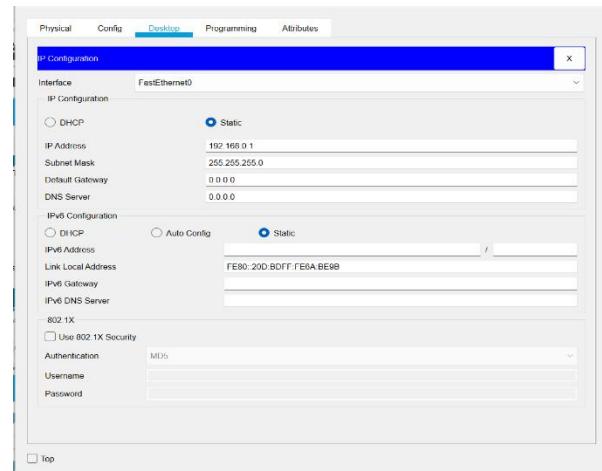
- **IP Addressing Table**

S.NO	Device	IPv4 Address	Subnet Mask
1	pc0	192.168.0.1	255.255.255.0
2	pc1	192.168.0.2	255.255.255.0
3	pc2	192.168.0.3	255.255.255.0
4	pc3	192.168.0.4	255.255.255.0

- Then create a network topology as shown below :



- Use an automatic connecting cable to connect the device with others.
- To assign an IP address in PC0, click on PC0.
- Then go to the desktop and then IP configuration and there you set IPv4 configuration. Fill IPv4 address and subnet mask.



Step 3: Verify the connection by pinging the IP address of any host in PC0.

- Use the ping command to verify the connection.
- As we can see we are getting replies from a targeted node on both PCs.
- Hence the connection is verified.

```

Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.2

Pinging 192.168.0.2 with 32 bytes of data:
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Reply from 192.168.0.2: bytes=32 time=8ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms

C:\>ping 192.168.0.4

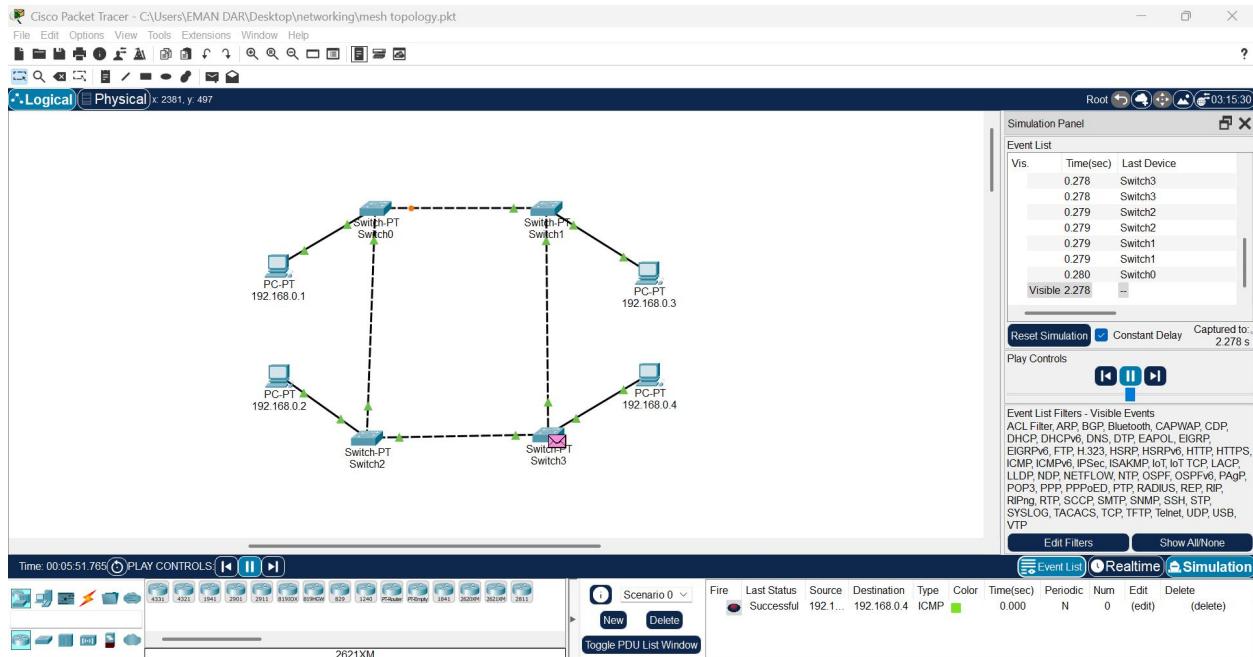
Pinging 192.168.0.4 with 32 bytes of data:
Reply from 192.168.0.4: bytes=32 time=2ms TTL=128
Reply from 192.168.0.4: bytes=32 time=2ms TTL=128
Reply from 192.168.0.4: bytes=32 time<1ms TTL=128
Reply from 192.168.0.4: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 1ms
C:\>

```

Simulation:

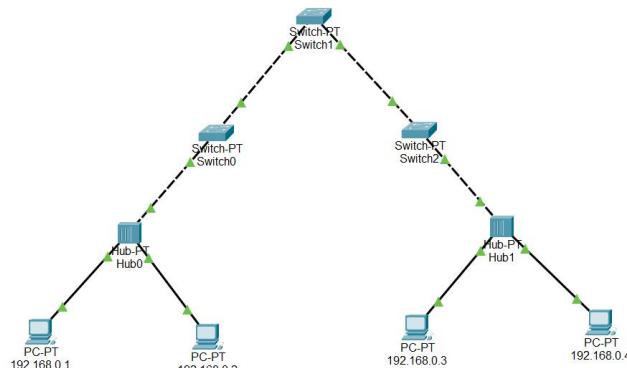
A simulation of the experiment is given below we have sent two PDU packets one targeted from PC0 to PC2 and another targeted from PC1 to PC3.



Tree Topology

Step 1: First open the cisco packet tracer desktop and select the devices as **4 switch-PT , 2 Hubs and 4 PCs**.

- Then create a network .
- Use an automatic connecting cable to connect the device with others.



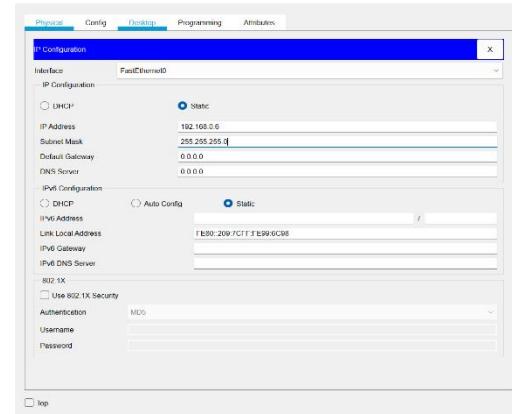
Step 2: Configure the PCs (hosts) with IPv4 Subnet Mask according to the IP addressing table given below:

IP Addressing Table:

S.NO	Device	IPv4 Address	Subnet Mask
1.	pc0	192.168.0.1	255.255.255.0
2.	pc1	192.168.0.2	255.255.255.0

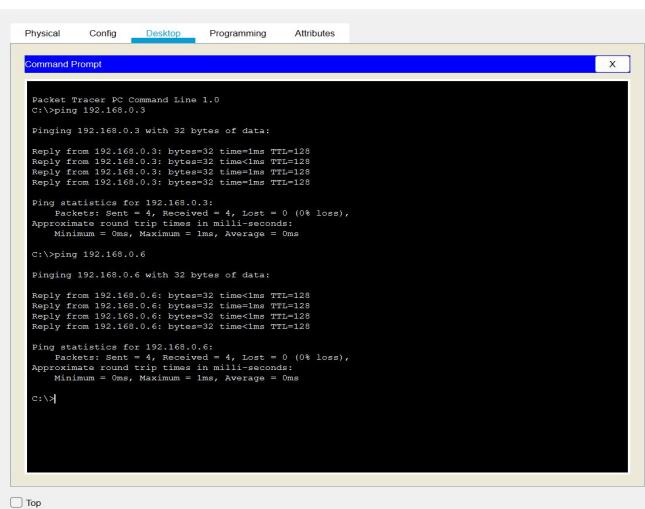
S.NO	Device	IPv4 Address	Subnet Mask
3.	pc2	192.168.0.3	255.255.255.0
4.	pc3	192.168.0.4	255.255.255.0
5.	pc4	192.168.0.5	255.255.255.0
6.	pc5	192.168.0.6	255.255.255.0

- To assign an IP address in PC0, click on PC0.
- Then go to the desktop and then IP configuration and there you set IPv4 configuration.
- Fill IPv4 address and subnet mask.



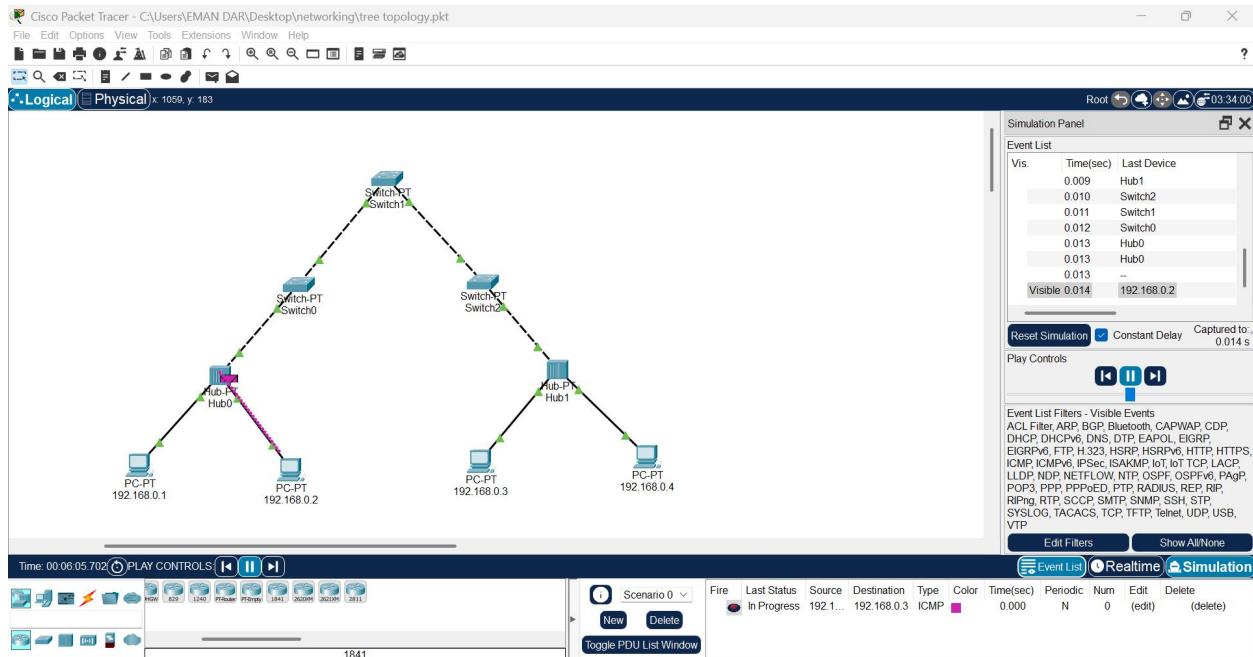
Step 3: Verify the connection by pinging the IP address of any host in PC0.

- Use the ping command to verify the connection.
- As we can see we are getting replies from a targeted node on both PCs.
- Hence the connection is verified.



Simulation:

A simulation of the experiment is given below we have sent two PDU packets one targeted from PC0 to PC2 and another targeted from PC1 to PC3.



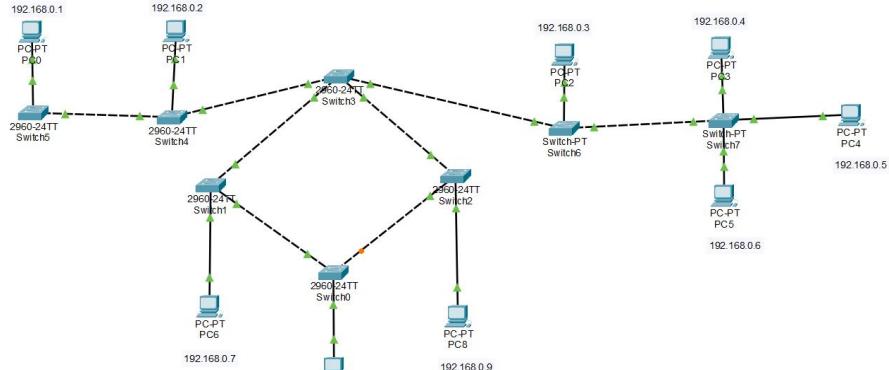
Hybrid Topology

Step 1: First open the cisco packet tracer desktop and select the devices as **8 switch-PT** and **4 PCs**.

- Then create a network topology .
- Use an automatic connecting cable to connect the device with others. As;

Step2:

Configure the PCs (hosts) with IP4 Subnet Mask according to the IP addressing table given below:



IP Addressing Table:

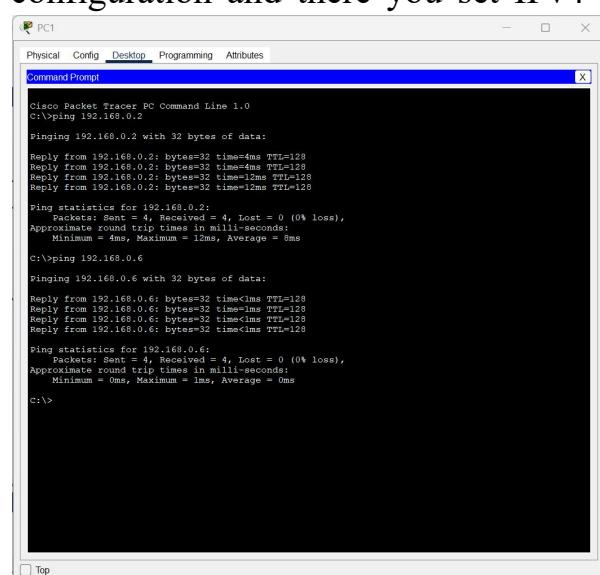
S.NO	Device	IPv4 Address	Subnet Mask
------	--------	--------------	-------------

S.NO	Device	IPv4 Address	Subnet Mask
1.	pc0	192.168.0.1	255.255.255.0
2.	pc1	192.168.0.2	255.255.255.0
3.	pc2	192.168.0.3	255.255.255.0
4.	pc3	192.168.0.4	255.255.255.0
5.	pc4	192.168.0.5	255.255.255.0
6.	pc5	192.168.0.6	255.255.255.0
7.	pc6	192.168.0.7	255.255.255.0
8.	pc7	192.168.0.8	255.255.255.0
9.	pc8	192.168.0.9	255.255.255.0

- To assign an IP address in PC0, click on PC0.
- Then go to the desktop and then IP configuration and there you set IPv4 configuration.
- Fill IPv4 address and subnet mask.

Step 3: Verify the connection by pinging the IP address of any host in PC0.

- Use the ping command to verify the connection.
- As we can see we are getting replies from a targeted node on both PCs.
- Hence the connection is verified.



```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.2 with 32 bytes of data:
Pinging 192.168.0.2 with 32 bytes of data:
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Reply from 192.168.0.2: bytes=32 time<1ms TTL=128
Reply from 192.168.0.2: bytes=32 time=12ms TTL=128
Reply from 192.168.0.2: bytes=32 time=12ms TTL=128

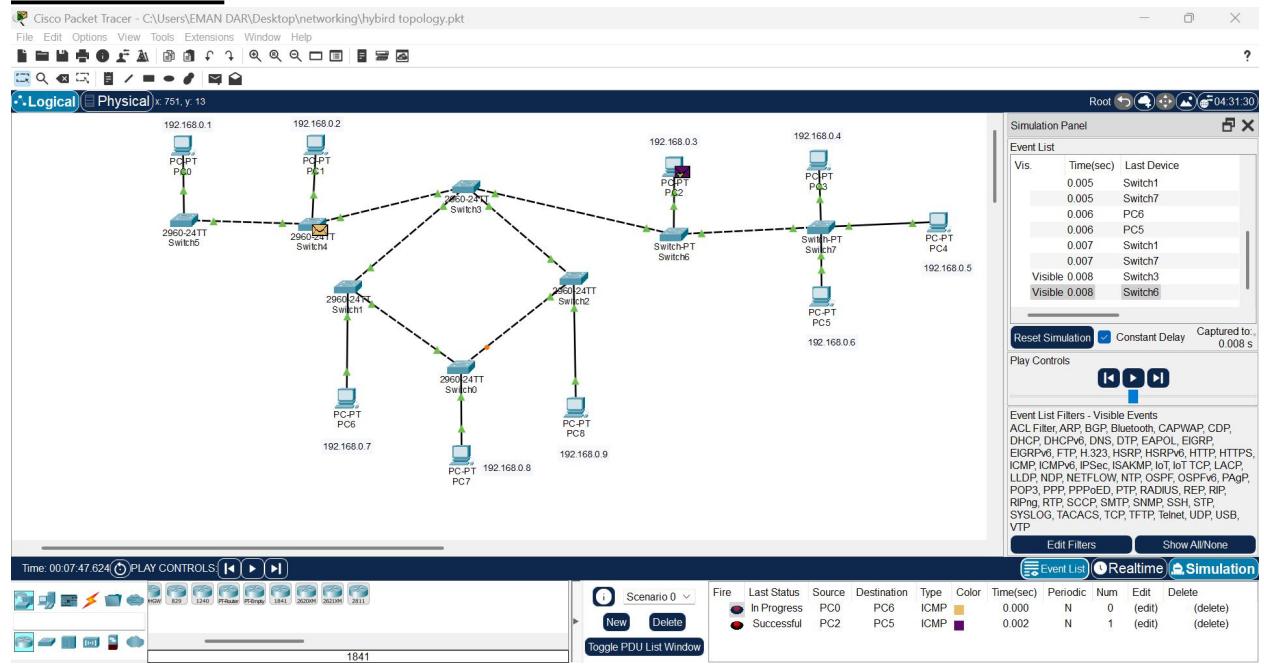
Ping statistics for 192.168.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 12ms, Average = 8ms

C:\>ping 192.168.0.6 with 32 bytes of data:
Pinging 192.168.0.6 with 32 bytes of data:
Reply from 192.168.0.6: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.6:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>

```

Simulation:

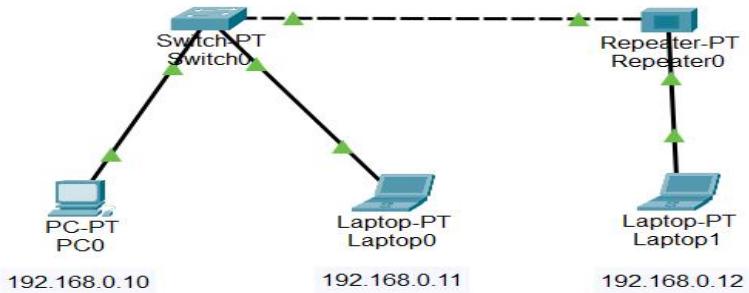


3 Devices with Repeater

Step 1: Open Cisco Packet Tracer.

Step 2: Select 1 PC named **PC0** and 2 laptops named **laptop0** and **laptop1**.

Step 3: Select an **PT-switch**, **PT-Repeater** and connect them to both laptops and PC with a **Automatic connection** wire.



Step 4: Assign IP addresses and subnet Mask according to the IP addresses to each device connected to router as;

1. To assign IP to pC0, click on **PC0**.

- Then go to the Desktop → IP configuration and there IP address and subnet mask.

Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 7: Hence connected is verified as ICMP successful.

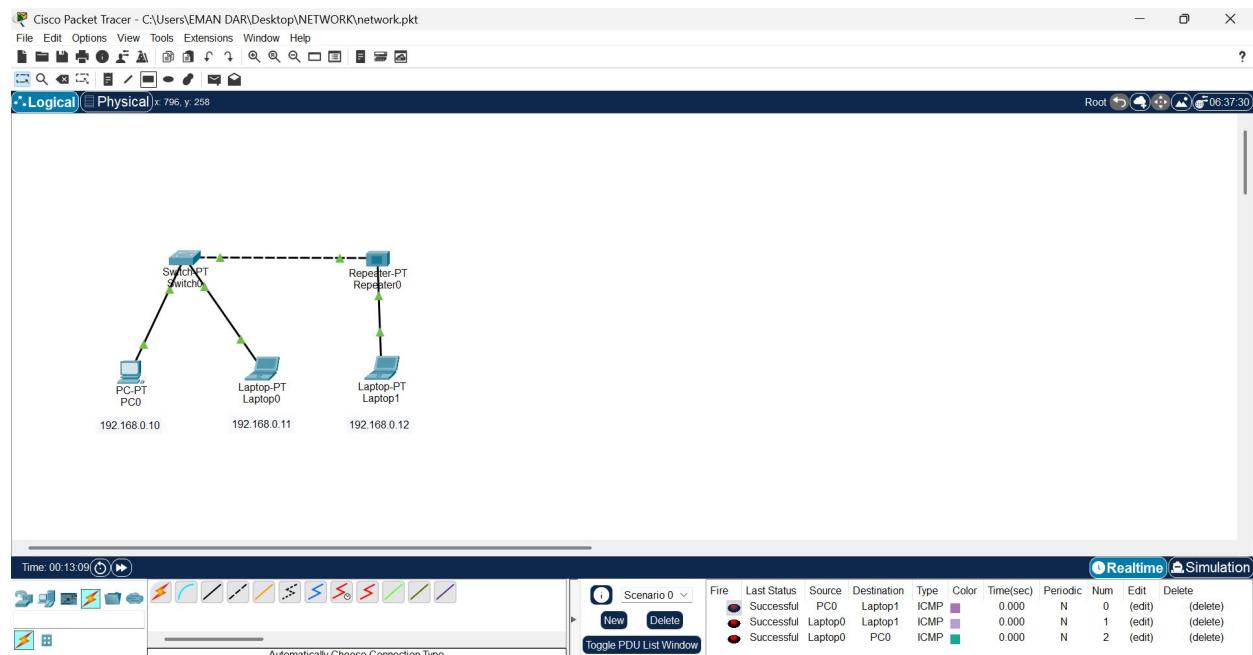
```
C:\>ping 192.168.0.11
Pinging 192.168.0.11 with 32 bytes of data:
Reply from 192.168.0.11: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.0.12
Pinging 192.168.0.12 with 32 bytes of data:
Reply from 192.168.0.12: bytes=32 time<1ms TTL=128

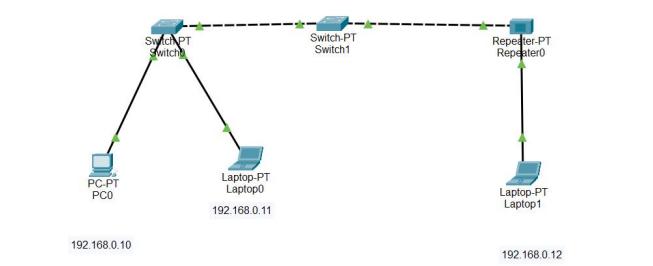
Ping statistics for 192.168.0.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```



Repeater with PC, laptops and switch

- Open Cisco Packet Tracer.
- Select 1 PC named **PC0** and 2 laptops named **laptop0** and **laptop1**.
- Select two **PT-switch**, **PT-Repeater** and connect them to both laptops and PC with a **Automatic connection wire**.



```

PC0
Physical Config Desktop Programming Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.11
Pinging 192.168.0.11 with 32 bytes of data:
Reply from 192.168.0.11: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.0.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>ping 192.168.0.12
Pinging 192.168.0.12 with 32 bytes of data:
Reply from 192.168.0.12: bytes=32 time<1ms TTL=128
Reply from 192.168.0.12: bytes=32 time<1ms TTL=128
Reply from 192.168.0.12: bytes=32 time<1ms TTL=128
Reply from 192.168.0.12: bytes=32 time<20ms TTL=128
Ping statistics for 192.168.0.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 20ms, Average = 5ms
C:\>

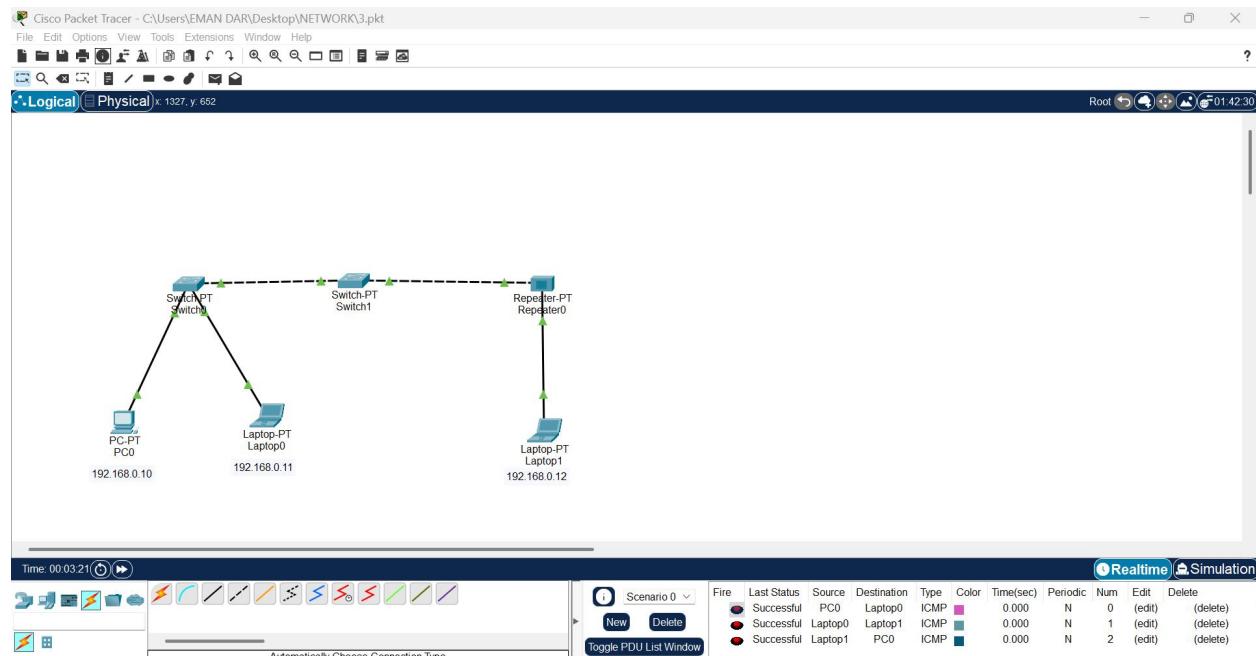
```

Step 4: Assign IP addresses and subnet Mask according to the IP addresses to each device connected to router as;

1. To assign IP to pC0, click on **PC0**.
2. Then go to the **Desktop** → **IP configuration** and there IP address and subnet mask.

Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 7: Hence connected is verified as **ICMP successful**.

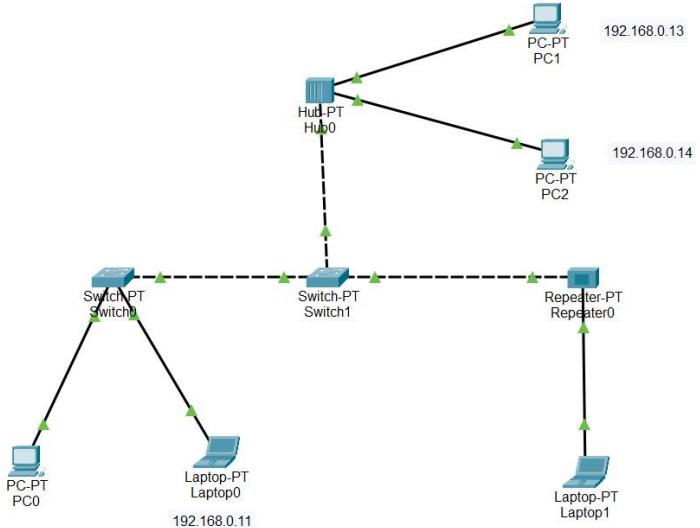


Repeater with 2 PCs, Hubs and switch

Step 1: Open Cisco Packet Tracer.

Step 2: Select 3 PCs named **PC0** and 2 laptops named **laptop0** and **laptop1**.

Step 3: Select two PT-switch, PT-Repeater and PT-Hub connect them to both laptops and PC with a **Automatic connection** wire.



Step 4: Assign IP addresses and subnet Mask according to the IP addresses to each device connected to router as;

1. To assign IP to pC0, click on **PC0**.
2. Then go to the Desktop → IP configuration and there IP address and subnet mask.

Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.0.10
Pinging 192.168.0.10 with 32 bytes of data:
Reply from 192.168.0.10: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.0.13
Pinging 192.168.0.13 with 32 bytes of data:
Reply from 192.168.0.13: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.13:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

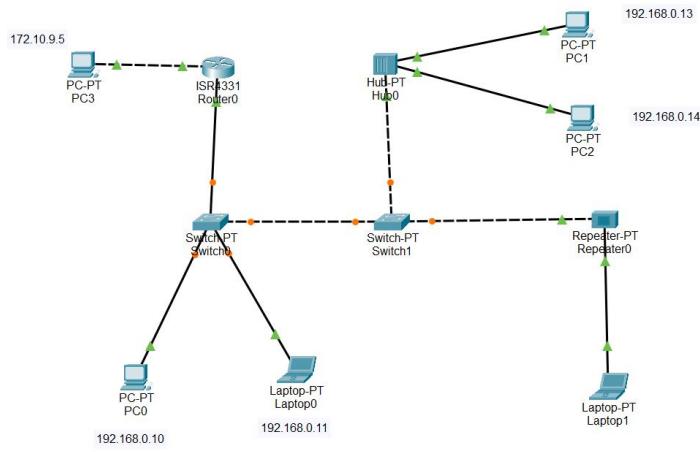
Step 7: Hence connected is verified as **ICMP successful**.

Router with Repeater, 2 PCs, Hubs and switch

Step 1: Open Cisco Packet Tracer.

Step 2: Select 4 PCs named **PC0** and 2 laptops named **laptop0** and **laptop1**.

Step 3: Select two PT-switch, PT-Repeater, ISR4331 Router and PT-Hub connect them to both laptops and PC with a Automatic connection wire.



Step 4: Assign IP addresses and subnet Mask according to the IP addresses to each device connected to router as;

1. To assign IP to pC0, click on **PC0**.
 2. Then go to the Desktop → IP configuration and there IP address and subnet mask.

Step 5: Configure router from CLI by following commands as below:

Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

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/wl/export/crypto/tool/stqrg.html>

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

cisco ISR4331/KR (IRUN processor with 1795999K/6147K bytes of memory.
Processor type is P4057010100
1 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
4194304K bytes of physical memory.
3223551K bytes of flash memory at bootflash:.

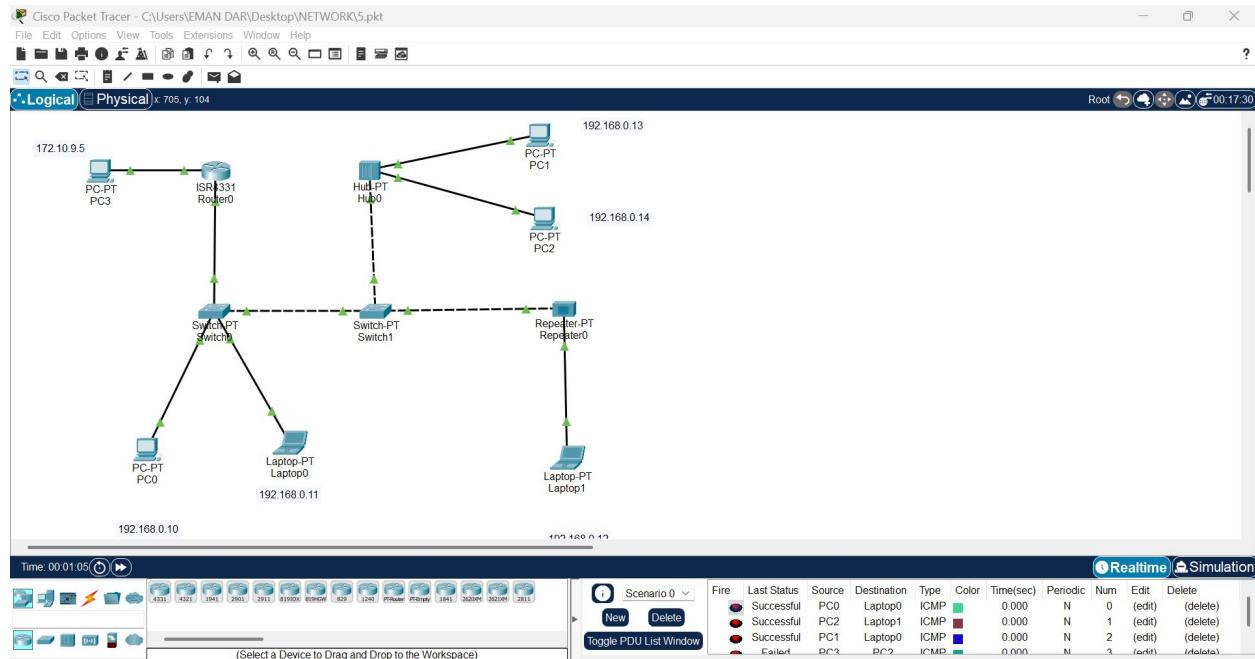
Press RETURN to get started!

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Gig0/0/0
Router(config-if)#ip address 192.168.0.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface Gig0/0/1
Router(config-if)#ip address 172.10.9.6 255.255.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config) #

Copy Paste

Step 7: Hence ICMP results are:



Server with 2 PCs and IP phone

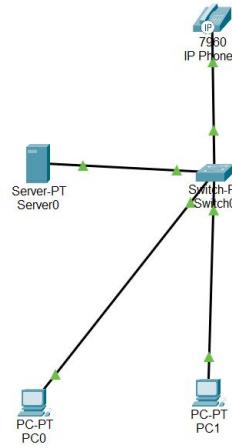
Step 1: Open Cisco Packet Tracer.

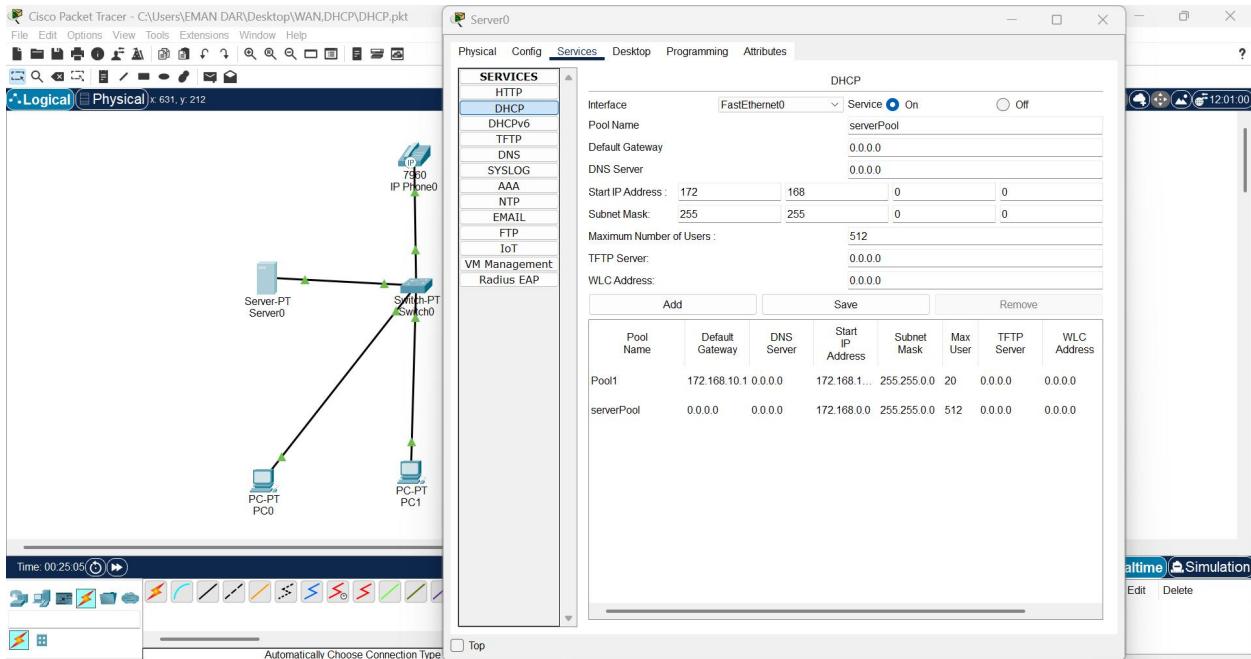
Step 2: Select 2 PCs named **PC0** and **PC1**.

Step 3: Select two **PT-switch** and **PT-Server** connect them to both PCs with an **Automatic connection wire**.

Step 4: Assign IP addresses and subnet Mask according to the IP addresses to each device connected to router as;

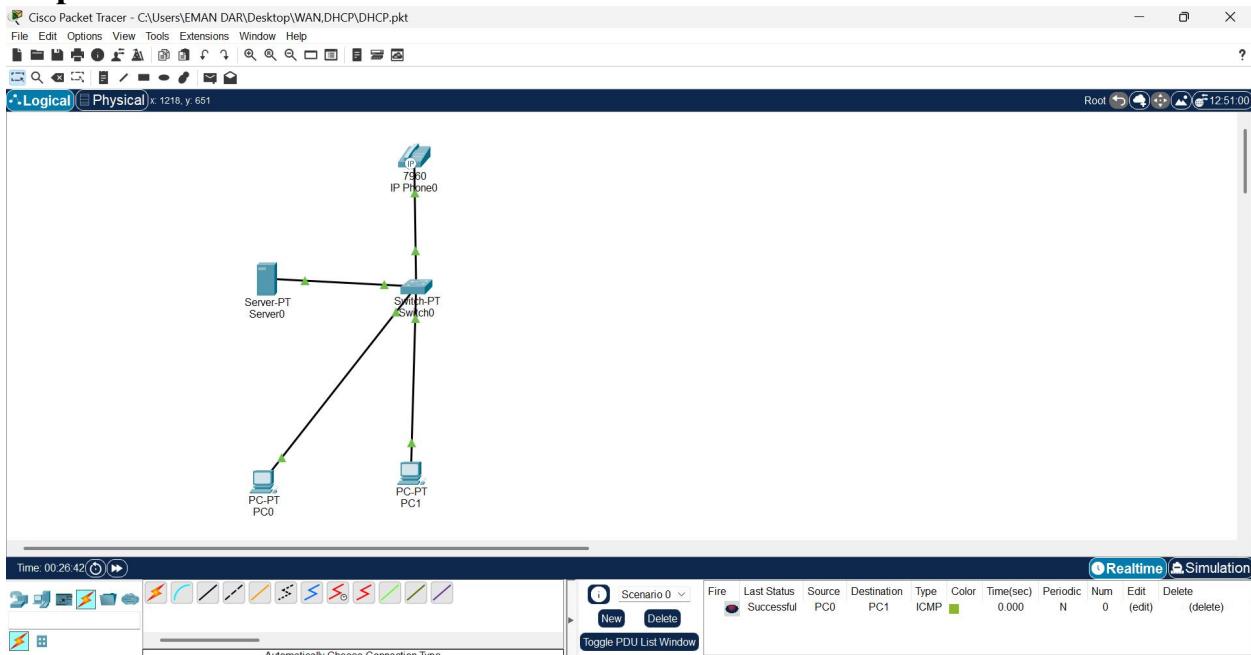
1. To assign IP to PCs click on server.
2. Then go to the Desktop → IP configuration and there starting IP address, subnet mask and default gateway.
3. Then go to **services**→**DHCP** and follow the process as below:





Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 7: Hence connected is verified as **ICMP successful**.



DHCP Server

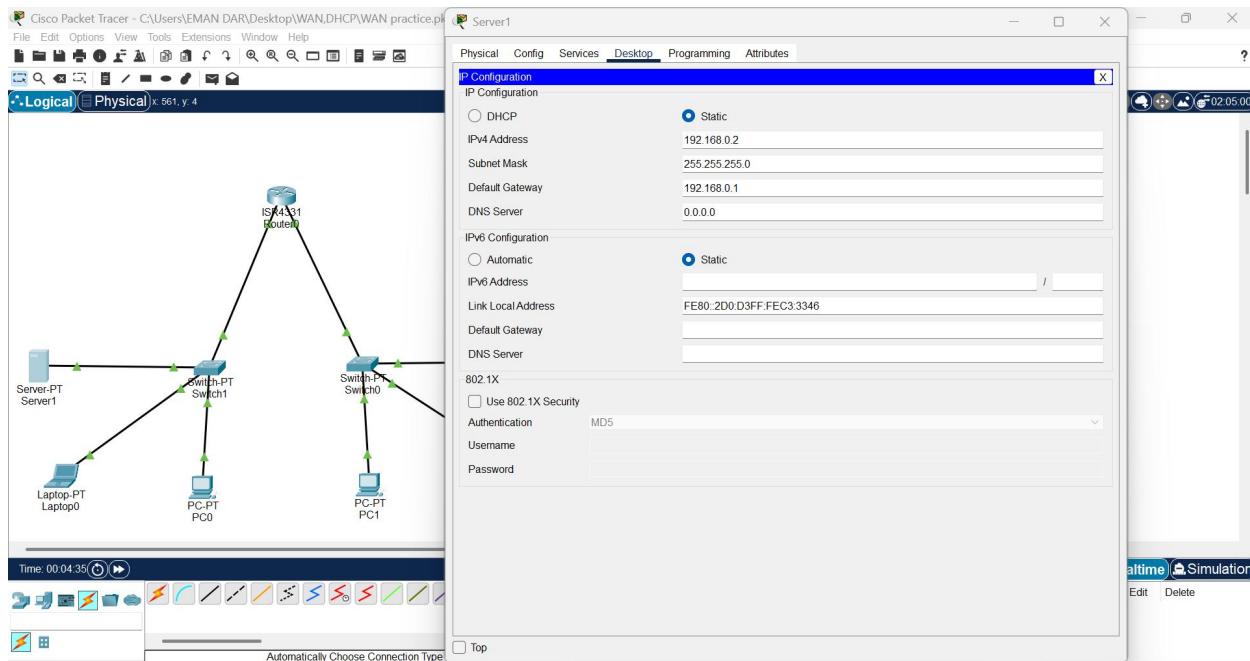
Step 1: Open Cisco Packet Tracer.

Step 2: Select 3 PCs named **PC0** and 2 laptops named **laptop0** and **laptop1**.

Step 3: Select two **PT-switch**, **PT-Repeater** and **PT-Hub** connect them to both laptops and PC with a **Automatic connection wire**.

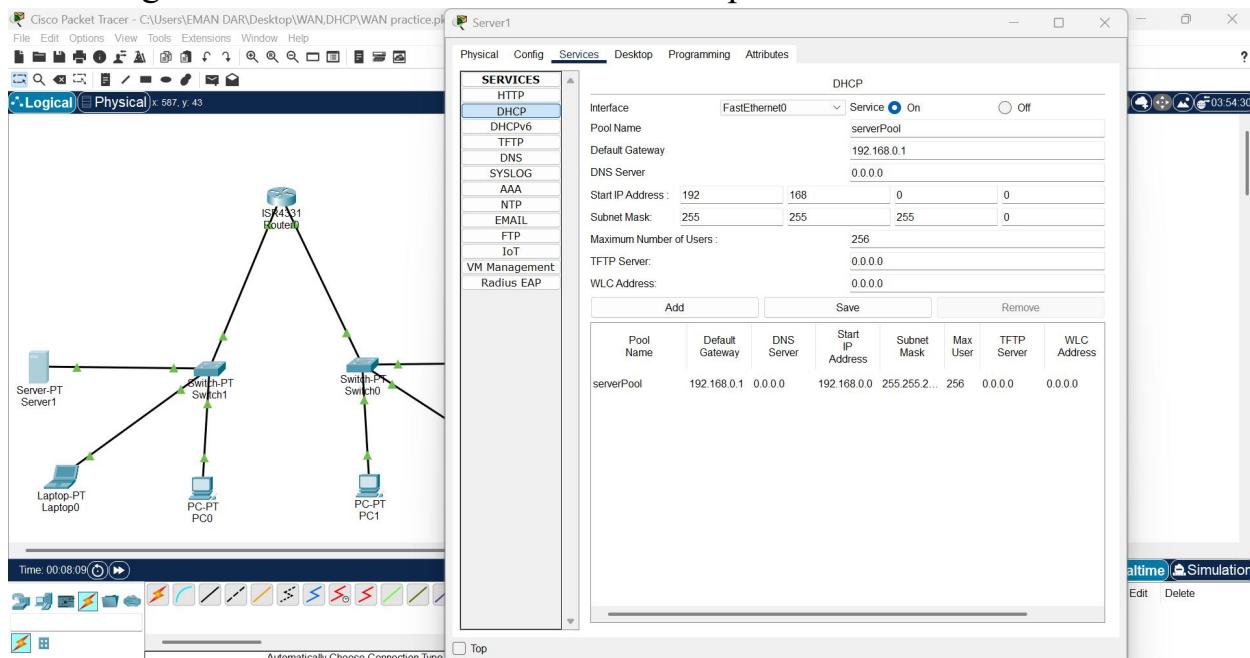
Step 4: Assign IP addresses and subnet Mask according to the IP addresses to each device connected to router as;

1. To assign IP to PCs click on server.
2. Then go to the Desktop → IP configuration and there starting IP address,



subnet mask and default gateway.

Then go to services → DHCP and follow the process as below:



Step 5: Configure router from CLI by following commands as below:

Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.4

Pinging 192.168.1.4 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

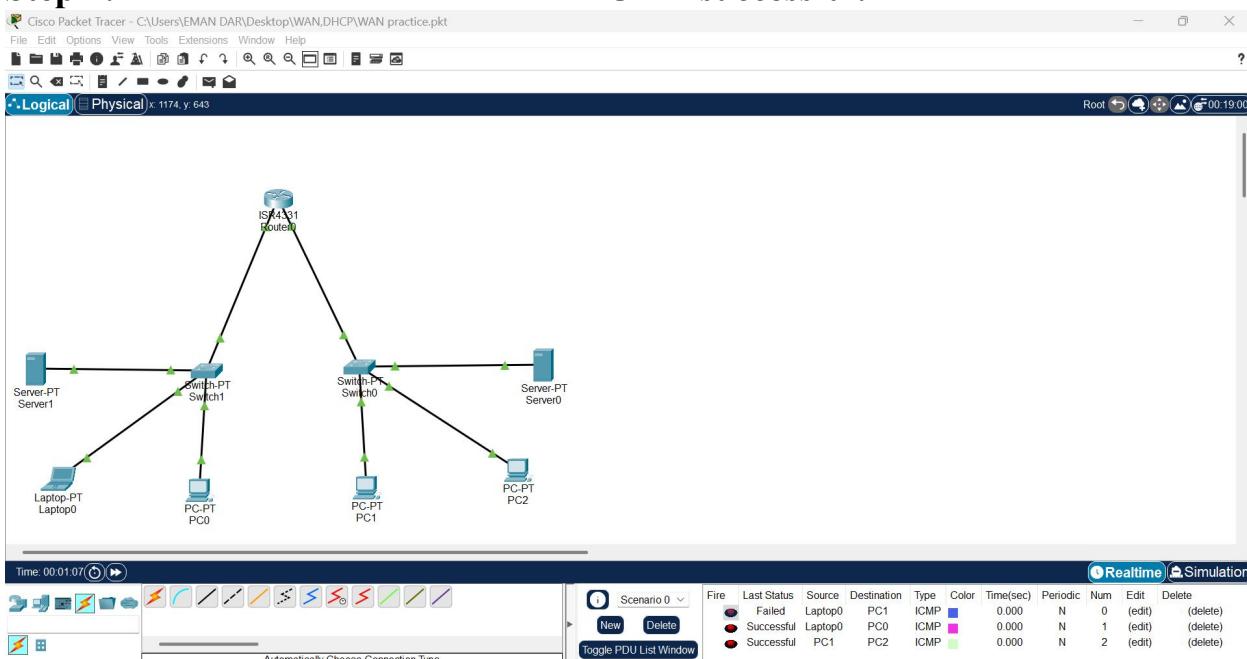
Ping statistics for 192.168.1.4:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>ping 192.168.0.4

Pinging 192.168.0.4 with 32 bytes of data:
Reply from 192.168.0.4: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>

```

Step 7: Hence connected is verified as ICMP successful.

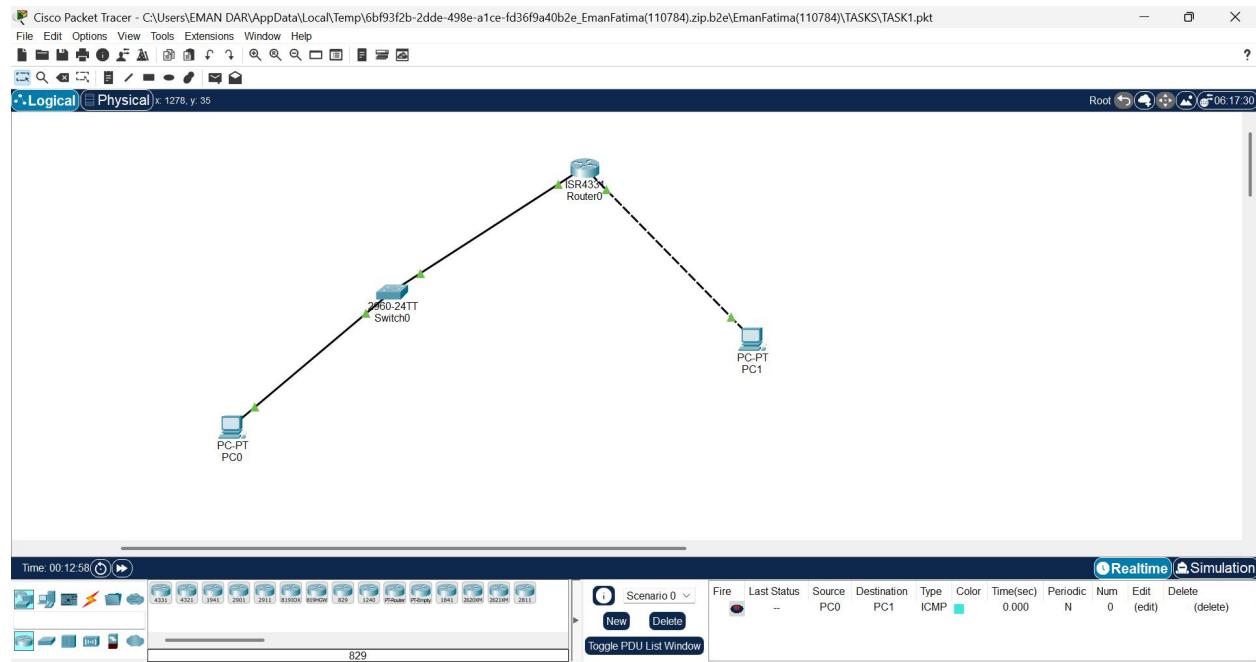


Router with 2PCs

Step 1: Open Cisco Packet Tracer.

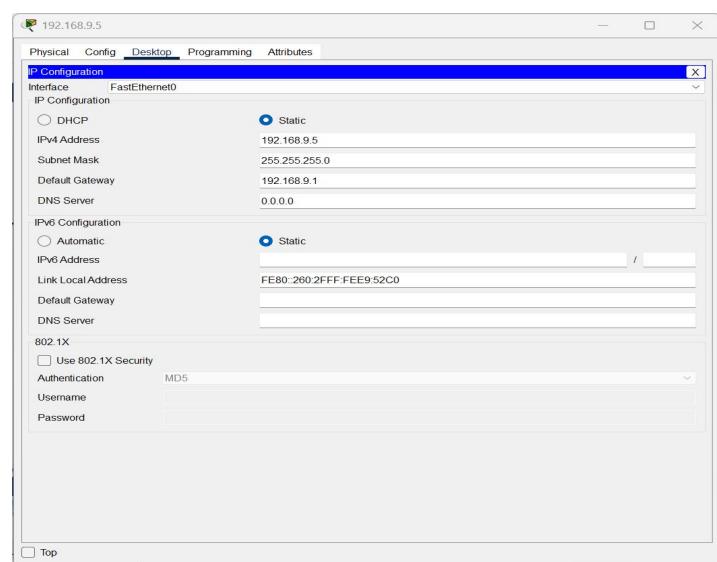
Step 2: Select 2 PCs named **PC0** and **PC1**.

Step 3: Select a **2960-24TT** switch and **ISR4331 Router** connect them to both PCs with an **Automatic connection wire**.



Step 4: Assign IP addresses and subnet Mask according to the IP addresses to each device connected to router as;

3. To assign IP to pC0, click on **PC0**.
4. Then go to the Desktop → IP configuration and there IP address and subnet mask.

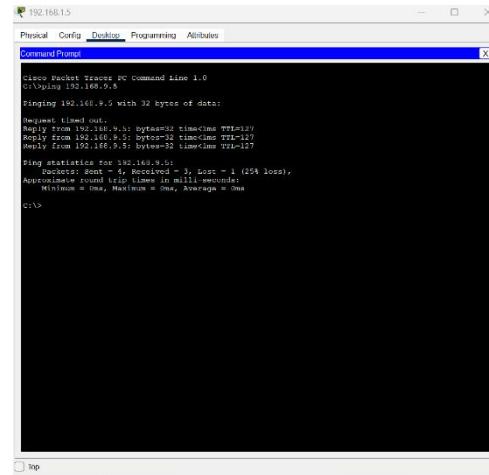


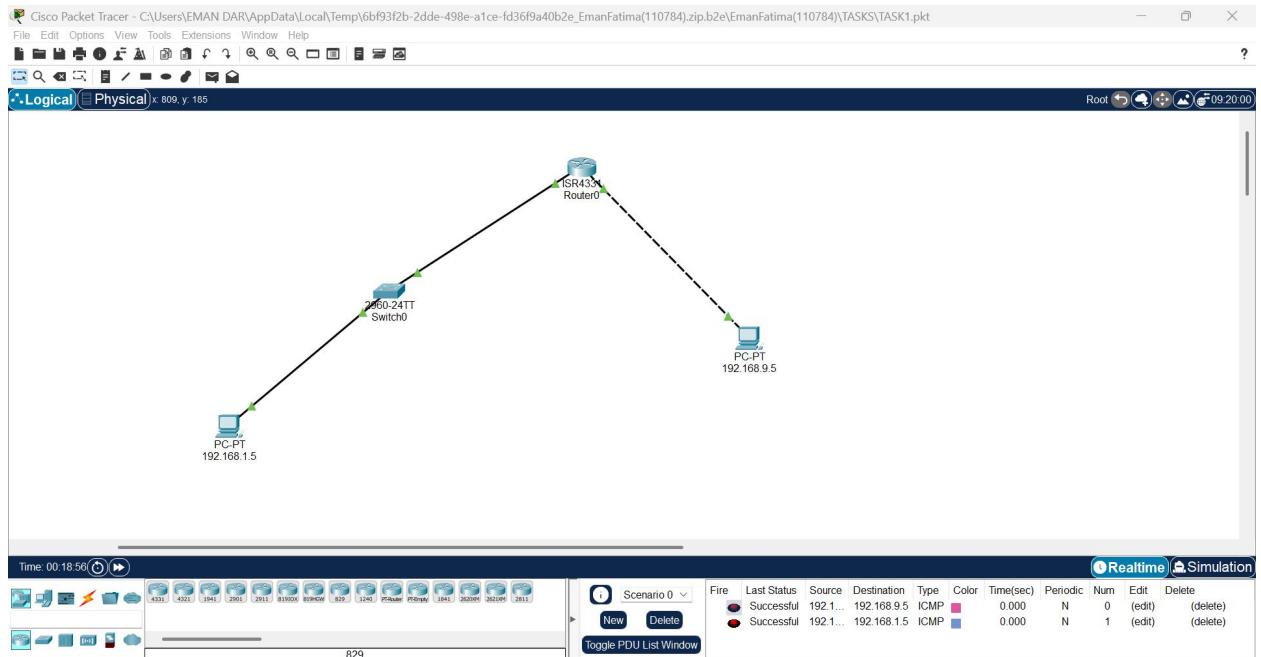
Step 5: Configure router from CLI by following commands as below:

Equivariant \mathcal{C}^* Commutants

Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 7: Hence ICMP results are:



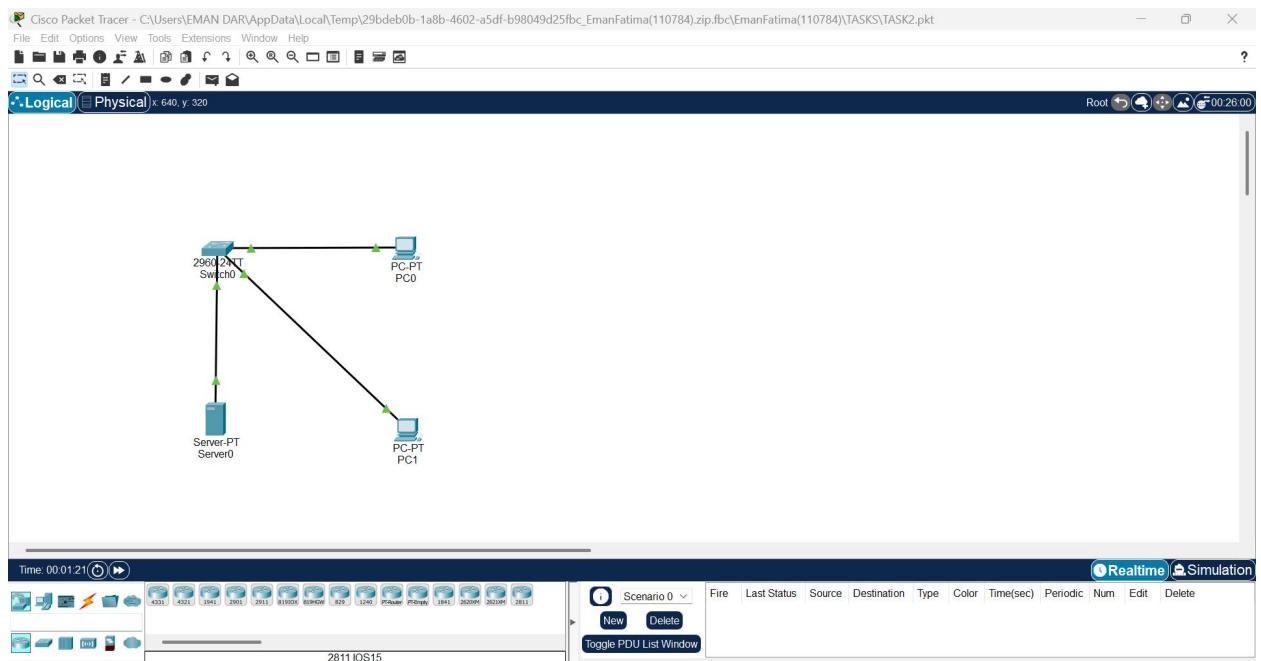


Server with 2 devices

Step 1: Open Cisco Packet Tracer.

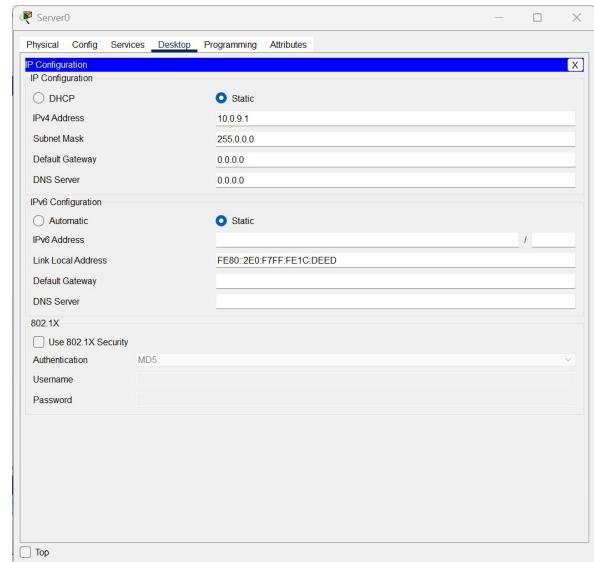
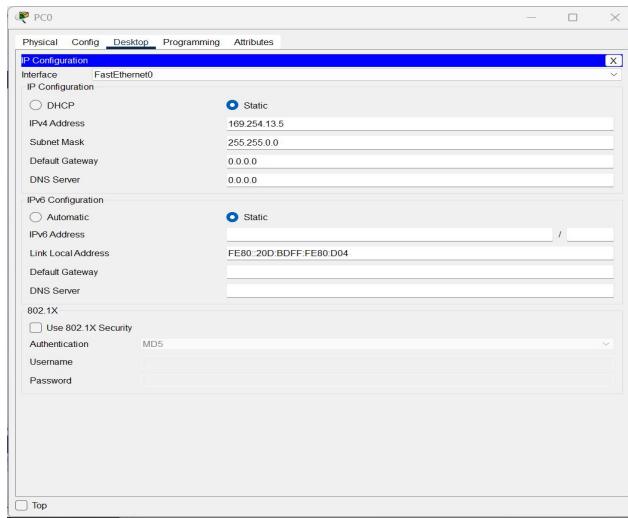
Step 2: Select 2 PCs named **PC0** and **PC1**.

Step 3: Select a **2960-24TT switch** and **Server** connect them to both PCs with an **Automatic connection wire**.

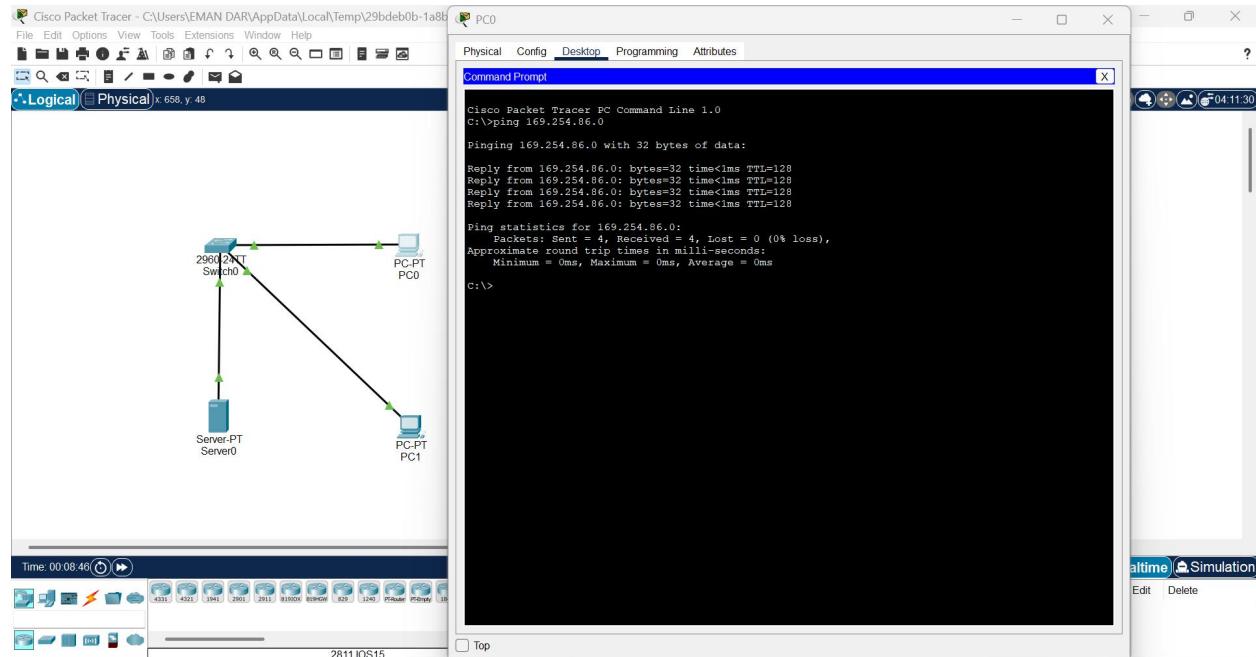


Step 4: Assign IP addresses and subnet Mask according to server as;

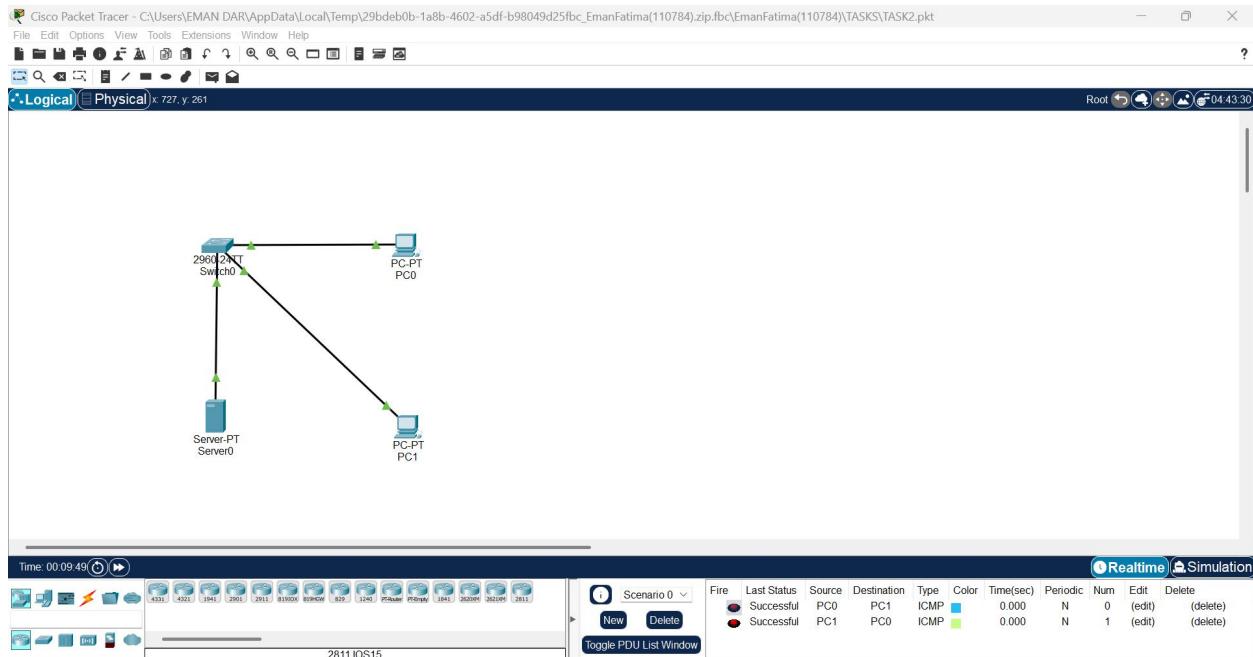
1. To assign IP to pC0, click on **PC0**.
2. Then go to the Desktop → IP configuration and there IP address.



Step 5: Ping PC0 or PC1 to check whether the connection is successful or not.



Step 6: Hence ICMP results are:



Repeater with 2 devices

Step 1: Open Cisco Packet Tracer.

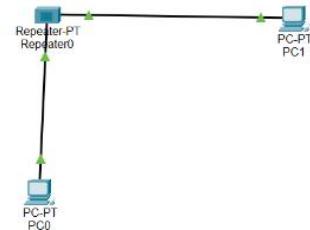
Step 2: Select 2 PCs named **PC0** and **PC1**.

Step 3: Select a **PT-Repeater** connect it to both PCs with an **Automatic connection wire**.

Step 4: Assign IP addresses and subnet Mask according to the IP addresses to each device ;

1. To assign IP to pC0, click on **PC0**.
2. Then go to the Desktop → IP configuration and there IP address and subnet mask.

Step 5: Ping PC0 or PC1 to check whether the connection is successful or not.



```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.72.68.1 with 32 bytes of data:
Reply from 192.72.68.1: bytes=32 time<1ms TTL=128

Ping statistics for 192.72.68.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 12ms, Average = 3ms
C:\>

```

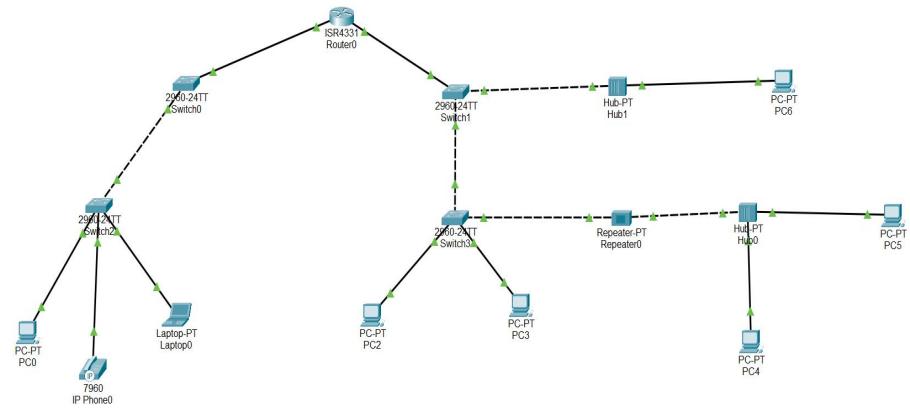
Step 7: Hence ICMP successful.

Router with multiple devices

Step 1: Open Cisco Packet Tracer.

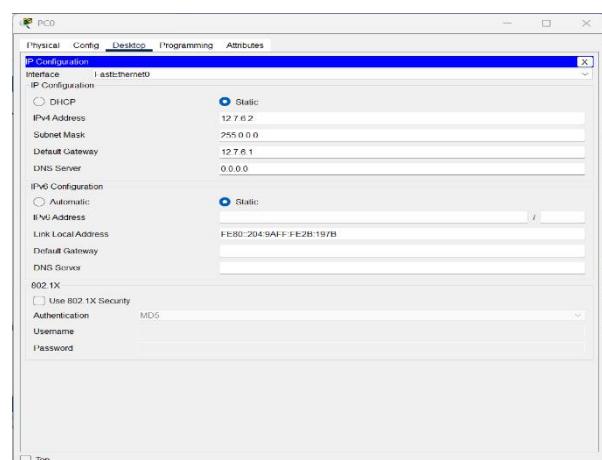
Step 2: Select 6 PCs , a laptop and an IP phone.

Step 3: Select a PT-Repeater, 2 PT-Hub , 4 2960-24TT switch and a ISR4331 Router connect it to both PCs with an Automatic connection wire.



Step 4: Assign IP addresses and subnet Mask according to the IP addresses to each device ;

1. To assign IP to pC0, click on **PC0**.
2. Then go to the Desktop → IP configuration and there IP address and subnet mask.



Step 5: Configure router from CLI by following commands as below:

Equivalent IOS Commands

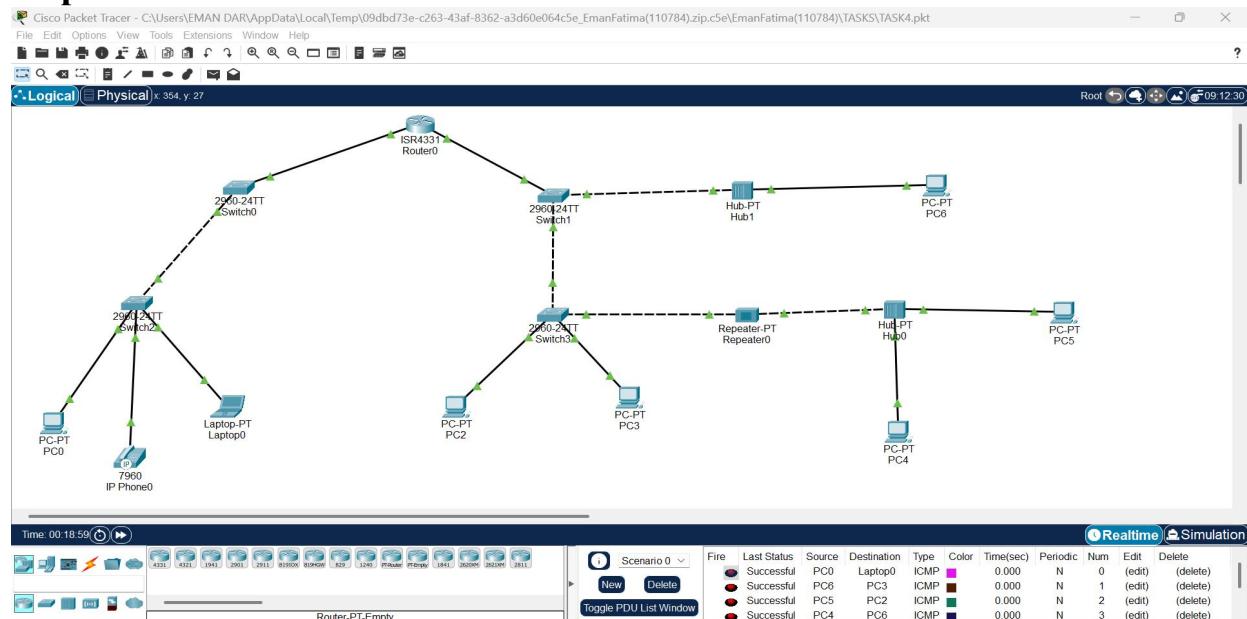
```

Router>configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#ip address 150.0.7.1 255.255.0.0
Router(config-if)#ip address 150.0.7.1 255.255.0.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#ip address 12.7.6.1 255.0.0.0
Router(config-if)#ip address 12.7.6.1 255.0.0.0
Router(config-if)#

```

Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 7: Hence ICMP successful.

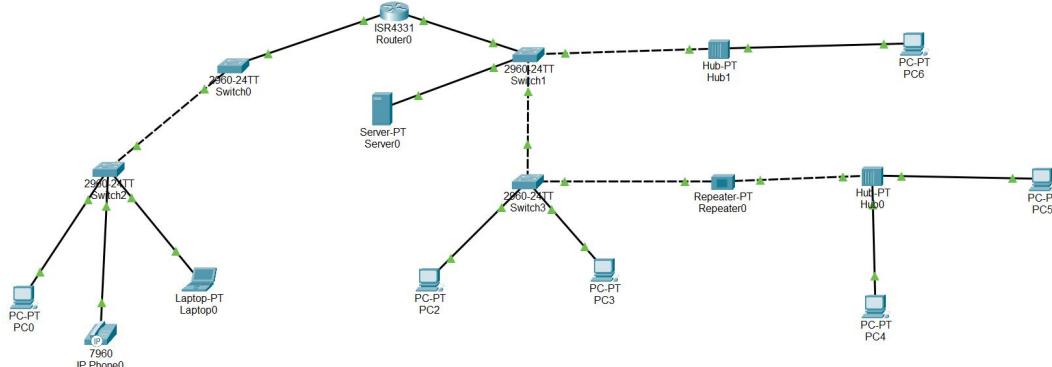


Router with multiple devices and server

Step 1: Open Cisco Packet Tracer.

Step 2: Select 6 PCs , a laptop and an IP phone.

Step 3: Select a server , a PT-Repeater, 2 PT-Hub , 4 2960-24TT switch and an



ISR4331 Router connect it to both PCs with an **Automatic connection wire**.

Step 4: Assign IP addresses and subnet Mask according to the IP addresses to each device ;

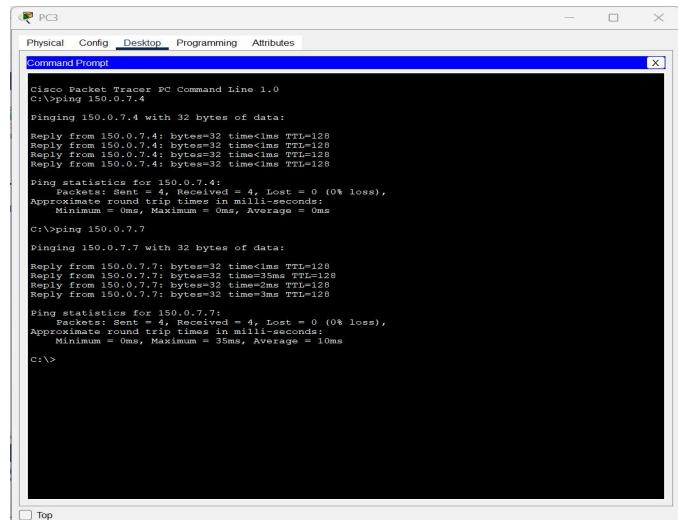
1. To assign IP to pC0, click on **PC0**.
 2. Then go to the Desktop → IP configuration and there IP address and subnet mask same as in above network.

Step 5: Configure router from CLI by following commands as below:

Equivalent IOS Commands

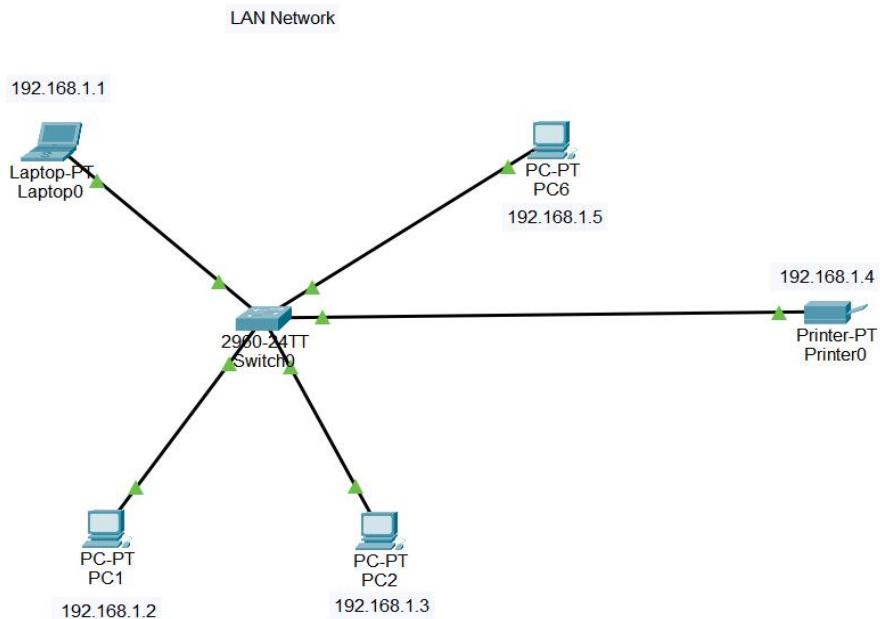
Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 7: Hence ICMP successful.



LAN

Step 1: Open the Cisco packet tracer desktop and select the devices **3 PCs , laptop, a printer and 1 PT-switch**.



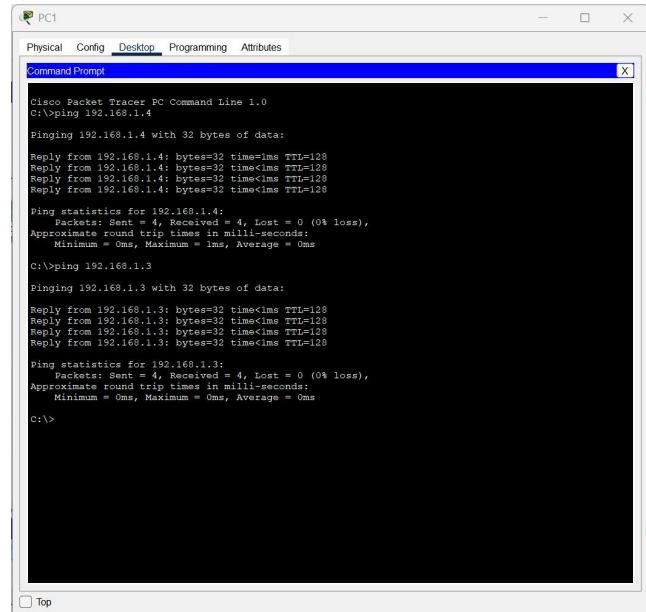
Step 2: Configure the PCs (hosts) with IPv4 Subnet Mask.

S.NO	Device	IPv4 Address	Subnet Mask
1.	Laptop	192.168.1.1	255.255.255.0
2.	pc1	192.168.1.2	255.255.255.0
3.	pc2	192.168.1.3	255.255.255.0
4.	Printer	192.168.1.4	255.255.255.0
5.	Pc6	192.168.1.5	255.255.255.0

- To assign an IP address in PC0, click on PC0.
- Then go to the desktop and then IP configuration and there you set IPv4 configuration.
- Fill IPv4 address and subnet mask.

Step 3: Verify the connection by pinging the IP address of any host in PC0.

- Use the ping command to verify the connection.
- As we can see we are getting replies from a targeted node on both PCs.
- Hence the connection is verified.



```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.4 with 32 bytes of data:
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 192.168.1.3 with 32 bytes of data:
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>

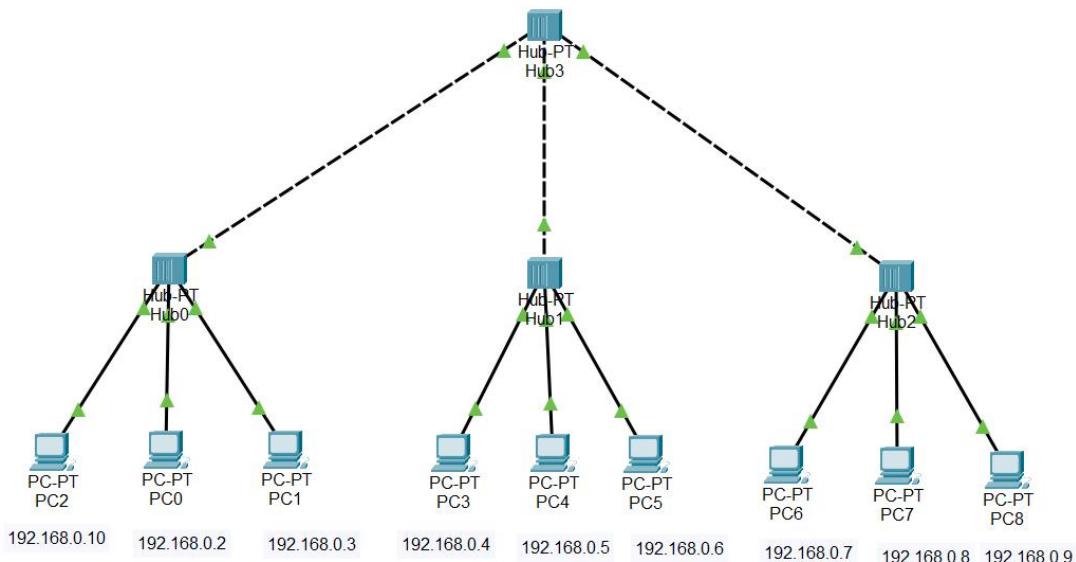
```

Simulation Result:

A simulation of the experiment is given below we have sent to two PDU packets one targeted from PC0 to PC2 and another is targeted from PC6 to printer.

CLASS LAN

Step 1: Open the Cisco packet tracer desktop and select the devices **9 PCs** and **4 PT-Hubs**.

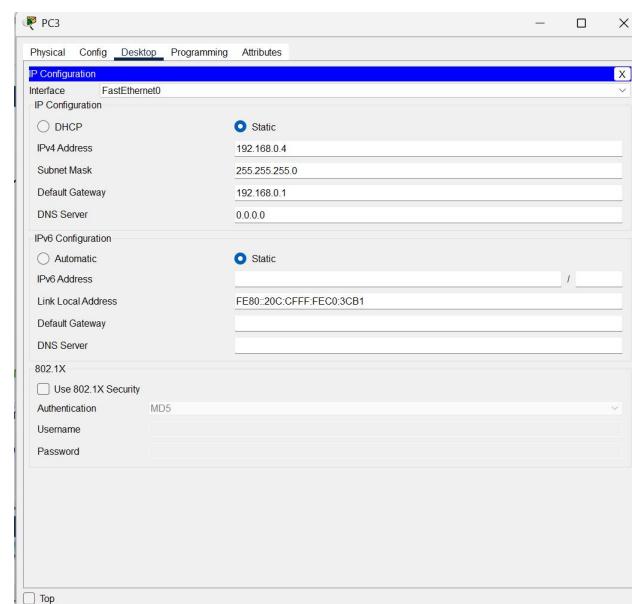


Step 2: Configure the PCs (hosts) with IPv4 Subnet Mask according to the IP addressing table given below:

S.NO	Device	IPv4 Address	Subnet Mask
------	--------	--------------	-------------

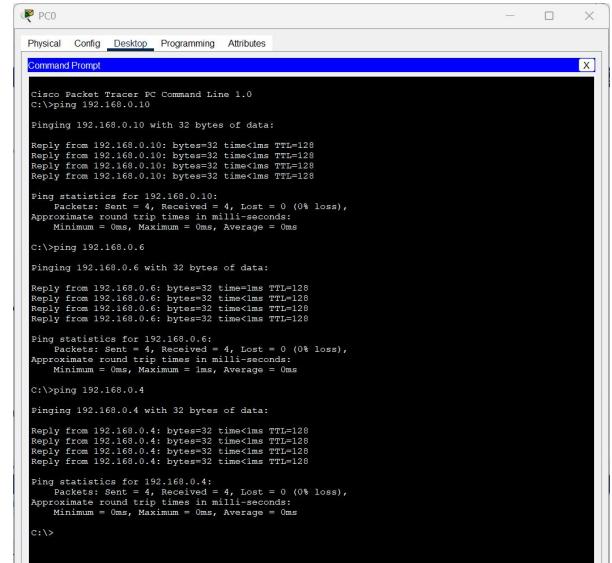
S.NO	Device	IPv4 Address	Subnet Mask
6.	pc0	192.168.0.1	255.255.255.0
7.	pc1	192.168.0.2	255.255.255.0
8.	pc2	192.168.0.3	255.255.255.0
9.	pc3	192.168.0.4	255.255.255.0
10.	pc4	192.168.0.5	255.255.255.0
11.	pc5	192.168.0.6	255.255.255.0
12.	Pc6	192.168.0.7	255.255.255.0
13.	Pc7	192.168.0.8	255.255.255.0
14.	Pc8	192.168.0.9	255.255.255.0

- To assign an IP address in PC0, click on PC0.
 - Then go to the desktop and then IP configuration and there you set IPv4 configuration.
 - Fill IPv4 address and subnet mask.
- Step 3:** Verify the connection by pinging the IP address of any host in PC0.
- Use the ping command to verify the connection.
 - As we can see we are getting replies from a targeted node on both PCs.
 - Hence the connection is verified.



Simulation Result:

A simulation of the experiment is given below we have sent to two PDU packets one targeted from PC0 to PC2 and another is targeted from PC6 to PC4.

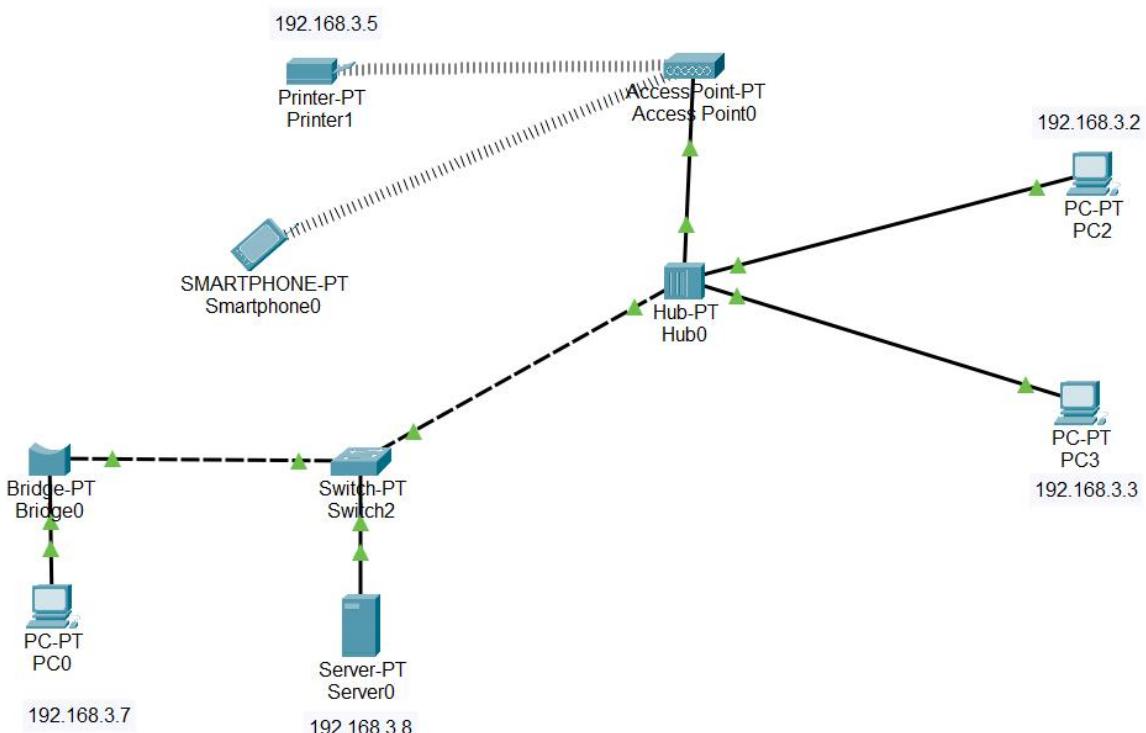


```
C:\>ping 192.168.0.10 with 32 bytes of data:  
Reply from 192.168.0.10: bytes=32 time<1ms TTL=128  
Reply from 192.168.0.10: bytes=32 time<1ms TTL=128  
Reply from 192.168.0.10: bytes=32 time<1ms TTL=128  
Ping statistics for 192.168.0.10:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 0ms, Maximum = 0ms, Average = 0ms  
C:\>ping 192.168.0.6 with 32 bytes of data:  
Reply from 192.168.0.6: bytes=32 time<1ms TTL=128  
Ping statistics for 192.168.0.6:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 0ms, Maximum = 0ms, Average = 0ms  
C:\>ping 192.168.0.4 with 32 bytes of data:  
Reply from 192.168.0.4: bytes=32 time<1ms TTL=128  
Ping statistics for 192.168.0.4:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 0ms, Maximum = 0ms, Average = 0ms  
C:\>
```

Multiple LAN

Step 1: Open the Cisco packet tracer desktop and select the devices **4 PCs, aPT-Switch, a PT-Access point , a server ,a printer, a Smartphone and a Bridge**.

Step 2: Connect all devices with an Automatic wire as;

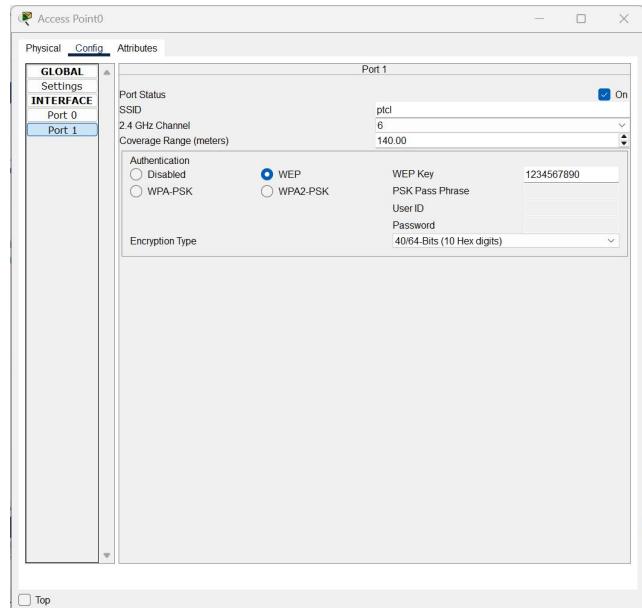


- Configure the PCs (hosts) with IPv4 Subnet Mask .

- To assign an IP address in PC0, click on PC0.
- Then go to the desktop and then IP configuration and there you set IPv4 configuration.
- Fill IPv4 address and subnet mask.

Step 3: Configure both access points with different SSID as;

- Click on access point → **port 1**.
- Give a **SSID** and set a **WEP password** (numeric digits) for other devices as;

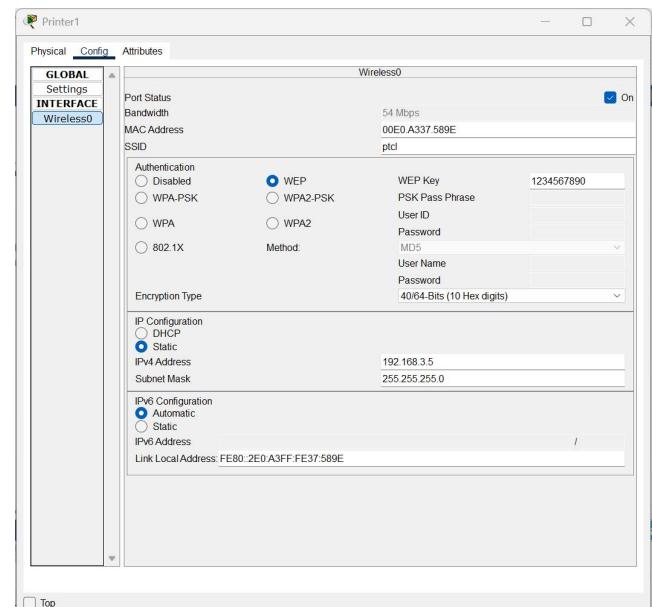


Step 4: Click on each device to assign IP address password for access point as;

- Click on PC → config → wireless0.
- Now set static IP address and give an SSID and **WEP password** as;

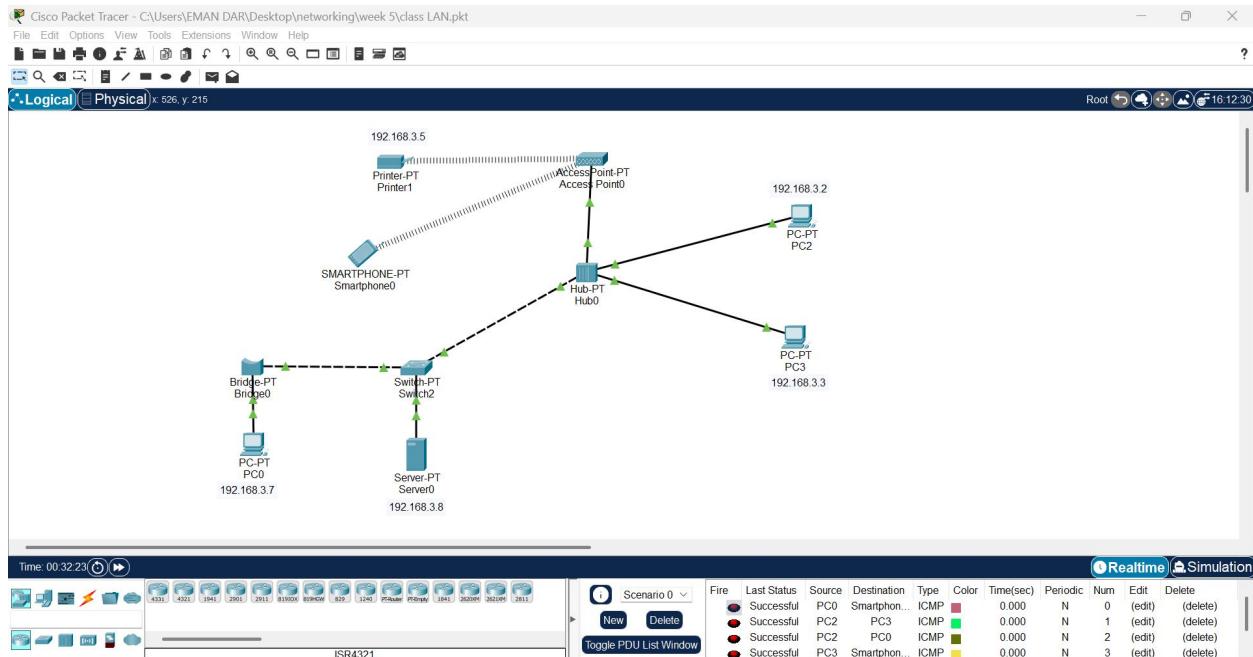
Step 5: Verify the connection by pinging the IP address of any host in PC0.

- Use the ping command to verify the connection.
- As we can see we are getting replies from a targeted node on both PCs.
- Hence the connection is verified.



Simulation Result:

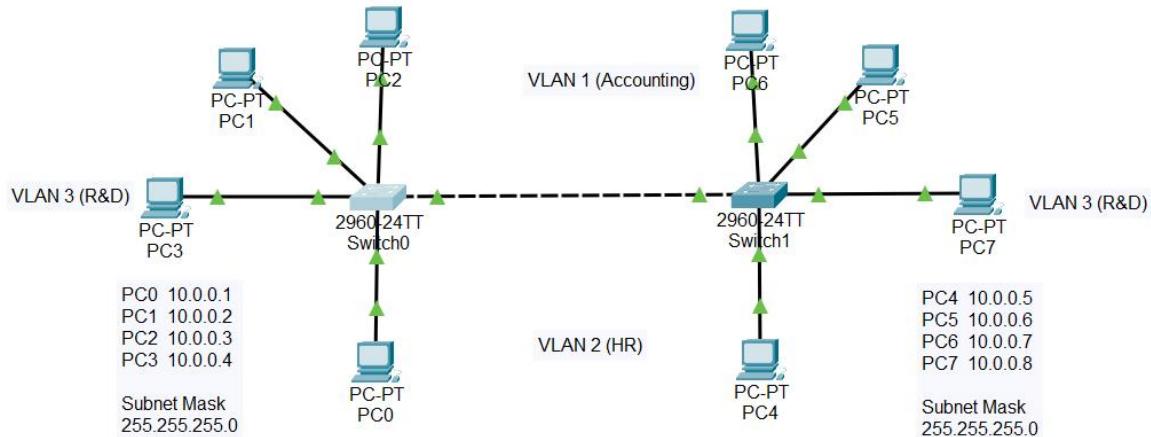
A simulation of the experiment is given below we have sent to two PDU packets one targeted from PC0 to Smartphone and another is targeted from PC2 to PC3.



V-LAN

Step 1: Open Cisco Packet Tracer.

Step 2: Select 2 PCs, a printer ,a 1941 Router and 2 Pt-Access connect both Access points with an Automatic wire.



Step 3: Assign IP address and subnet mask to each device.

Step 4: Configure the switch as;

- Switch(config)# vlan 10
- Switch(config-vlan)# name Accounting

- Switch(config)# interface fastethernet0/1
- Switch(config-if)# switchport mode access
- Switch(config-if)# switchport access vlan 10
- Switch(config)# interface fastethernet0/2
- Switch(config-if)# switchport mode trunk
- Switch(config)# interface vlan 10
- Switch(config-if)# ip address 192.168.10.1 255.255.255.0

Step 5:Ping PC0 or PC1 to check whether the connection is successful or not.

Step 6: Hence ICMP successful.

```

Cisco Packet Tracer FC Command Line 1.0
C:>ping 10.0.0.7 with 32 bytes of data:
Reply from 10.0.0.7: bytes=32 time<1ms TTL=128

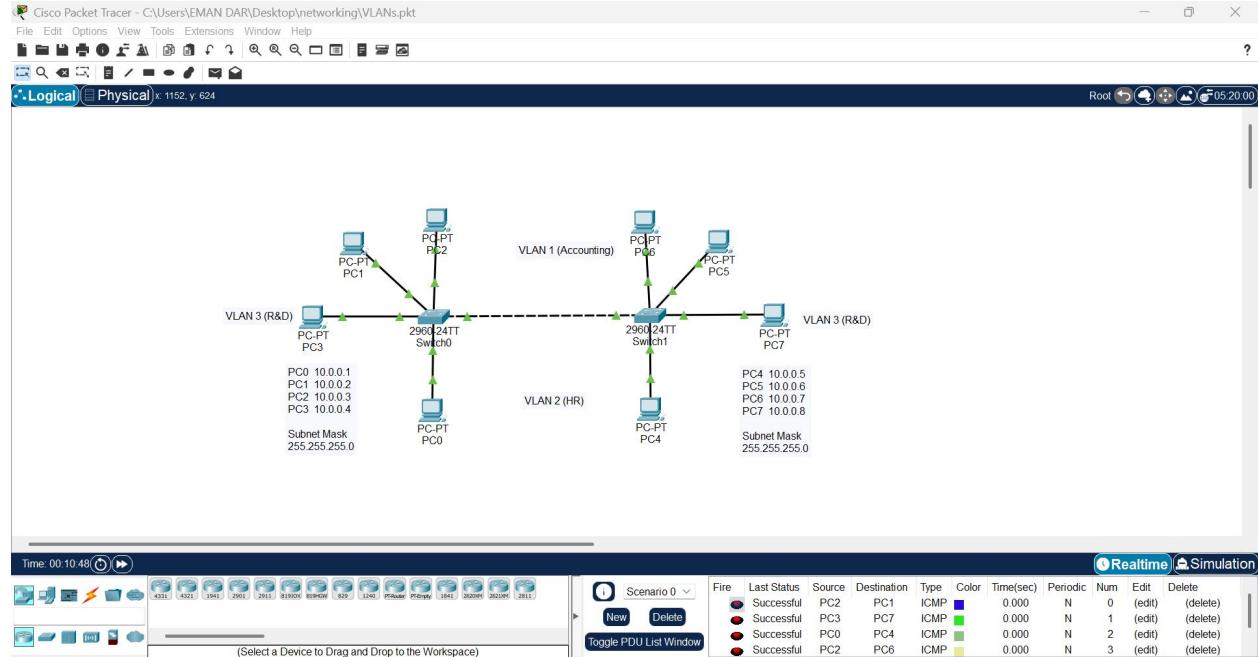
Ping statistics for 10.0.0.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:>ping 10.0.0.3 with 32 bytes of data:
Reply from 10.0.0.3: bytes=32 time=6ms TTL=128
Reply from 10.0.0.3: bytes=32 time=1ms TTL=128
Reply from 10.0.0.3: bytes=32 time=21ms TTL=128
Reply from 10.0.0.3: bytes=32 time=6ms TTL=128

Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 21ms, Average = 8ms

C:>

```

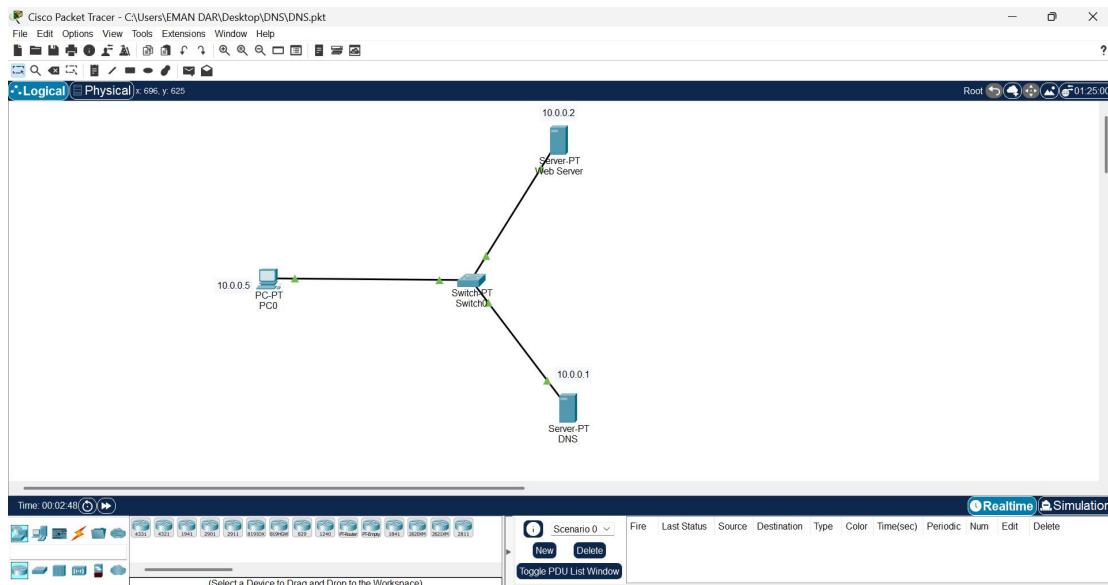


DNS, Web Server and a client

Step 01: Open cisco packet tracer and select a new file.

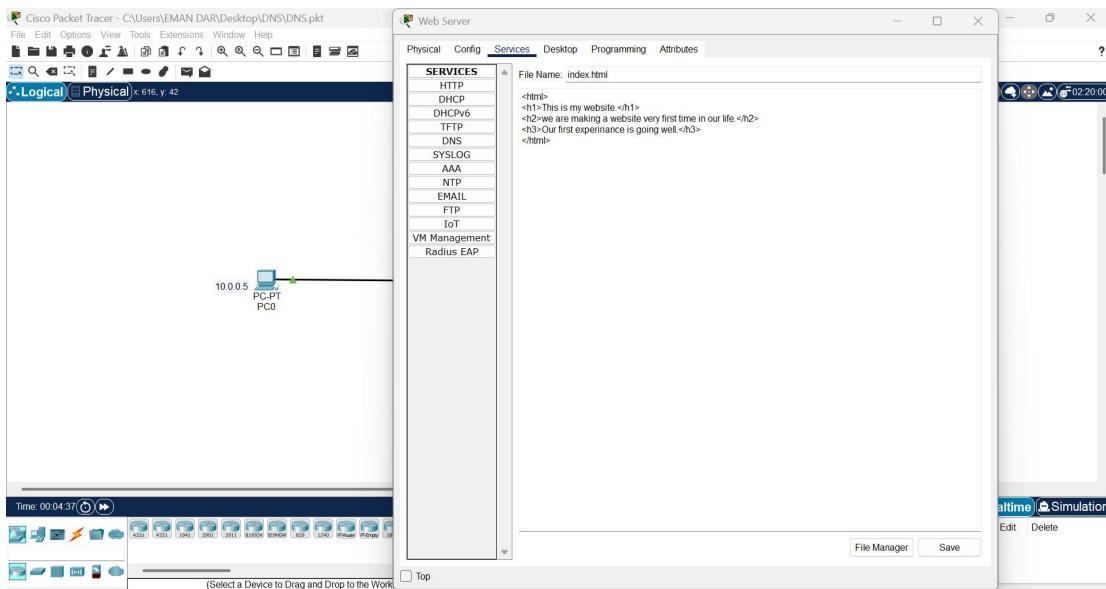
Step 02: Take two servers one DNS and other one Web server, a PT-switch and a device as PC or client.

Step 03: Connect the device with switch and then connect switch with servers , with an Automatic wire.

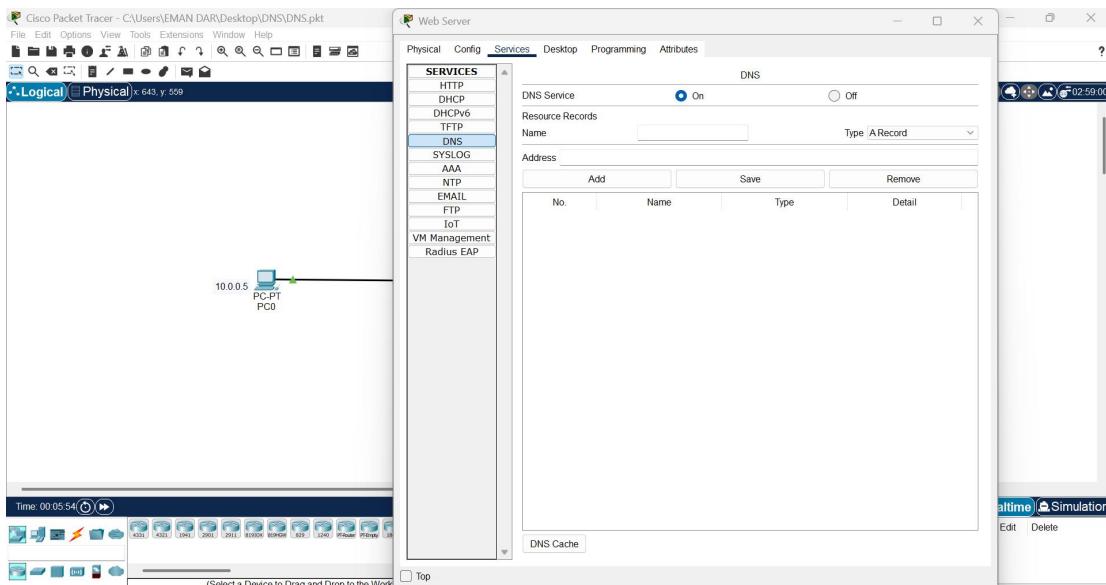


Step 04: Assign IP address to each device(PC0).

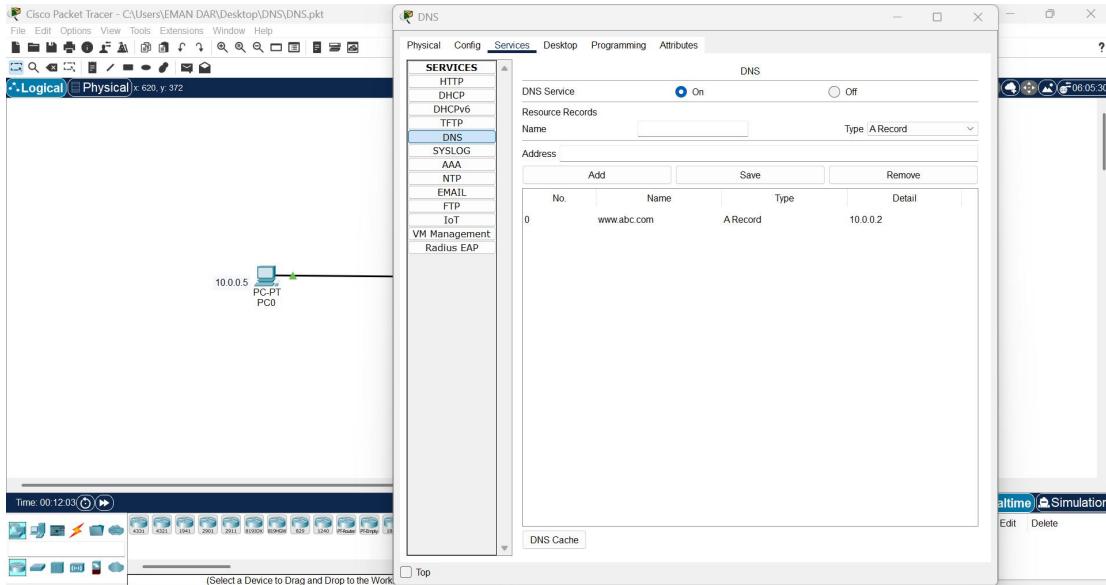
Step 05: Click on **Web Server** and assign **IP address** and subnet mask, then go to **services (index.html)** and click on edit, a html file will open , edit it as desired and save it , this may ask to overwrite the file so click on yes.



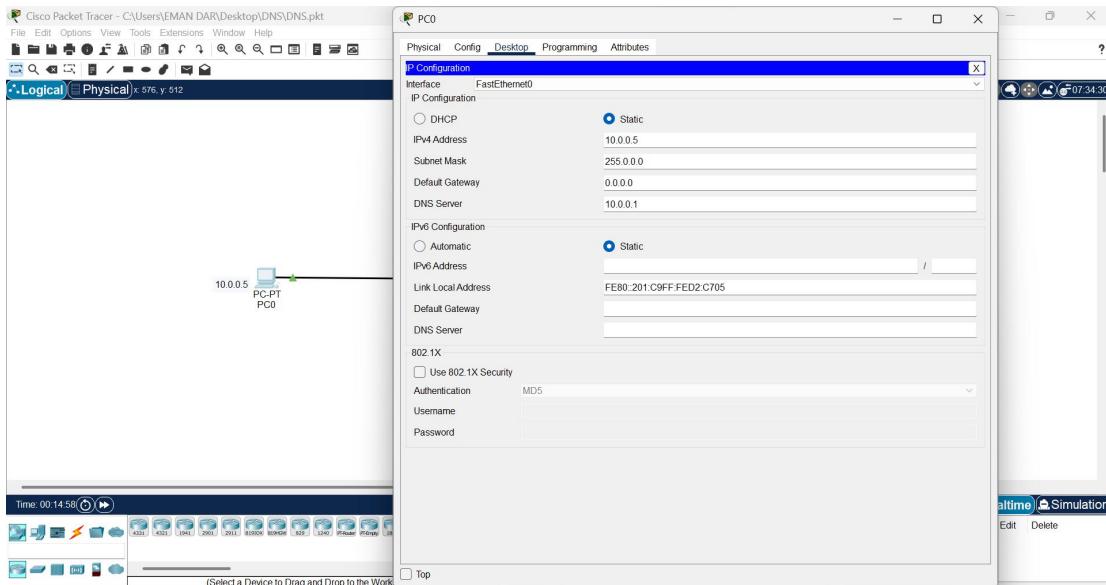
Step 06: Then click on services tab and choose DNS and turn this on (for both servers) as;



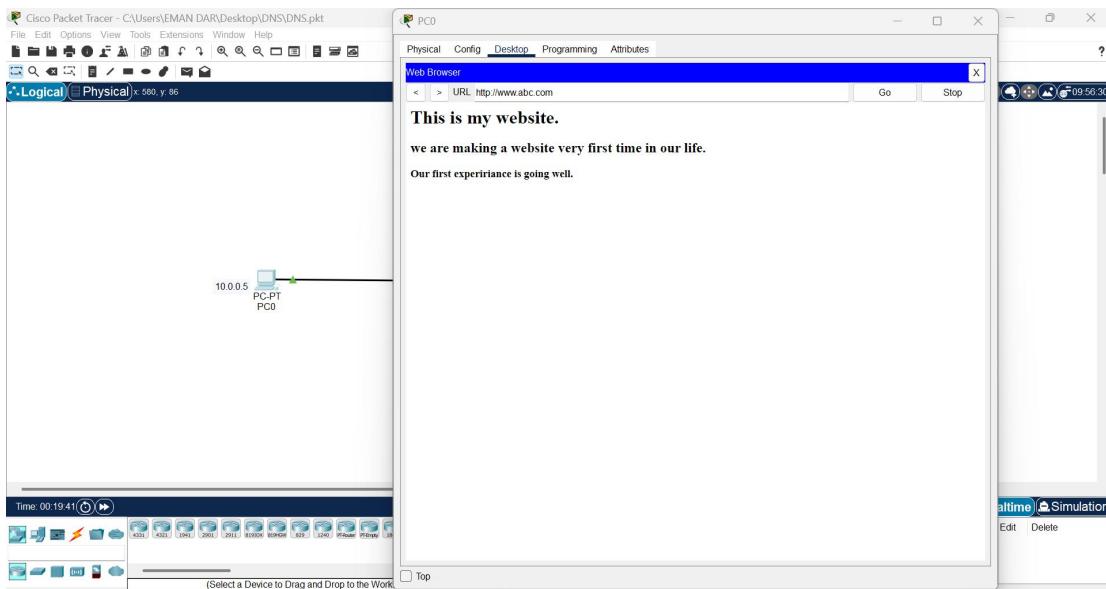
Step 07: Name the web site and give it an IP address of the web server where you make a website (Html documentation) and save it as;



Step 08: Go to PC0 click on desktop click on IP configuration and write address of DNS server over here.



Step 09: Then go to desktop again and click on web browsing this time and write the name of your very first website in URL box and click on Go the results are here as;



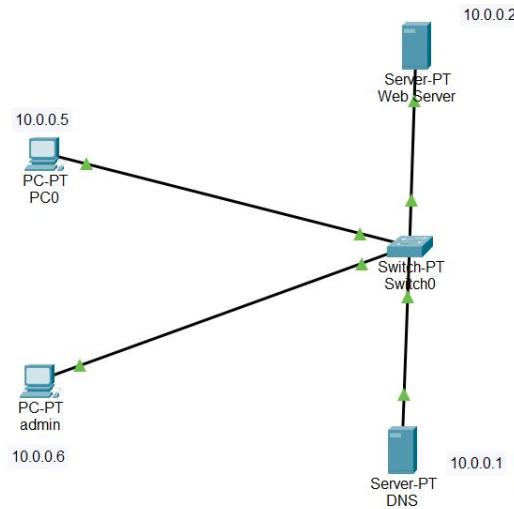
DNS, Web Server,PC0 and a client

Step 01: Open cisco packet tracer and select a new file.

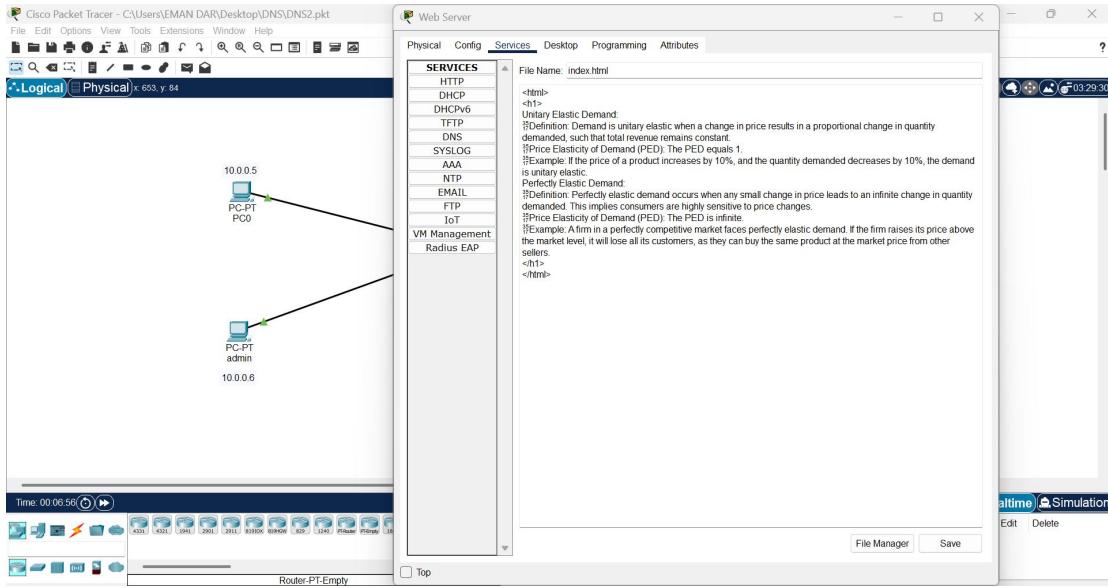
Step 02: Take two servers one DNS and other one Web server, a PT-switch and a device named PC0 and admin(PC1).

Step 03: Connect the device with switch and then connect switch with servers , with an Automatic wire.

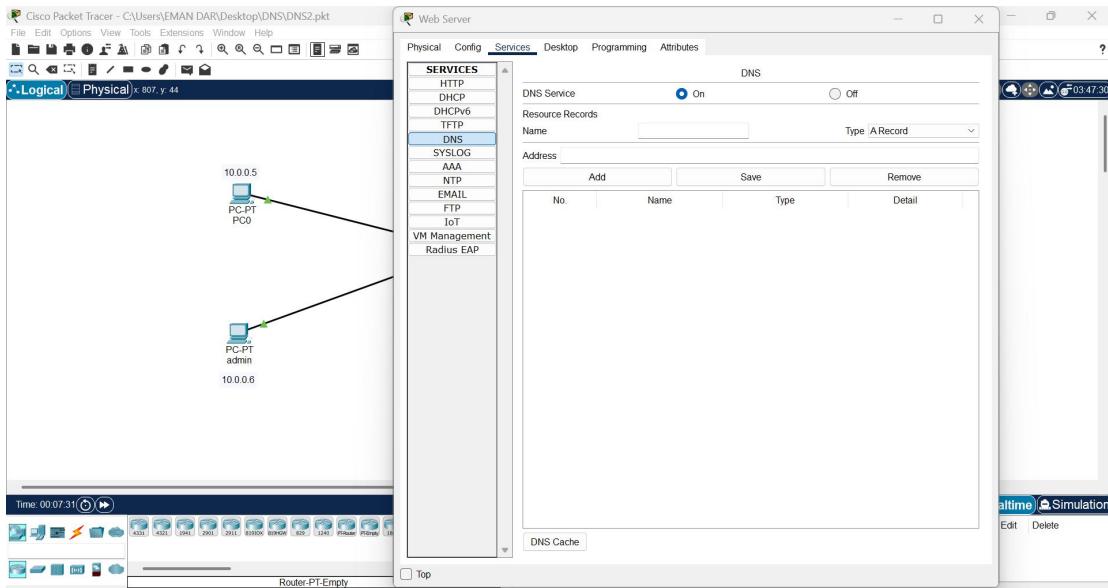
Step 04: Assign IP address to each device connected to switch as;



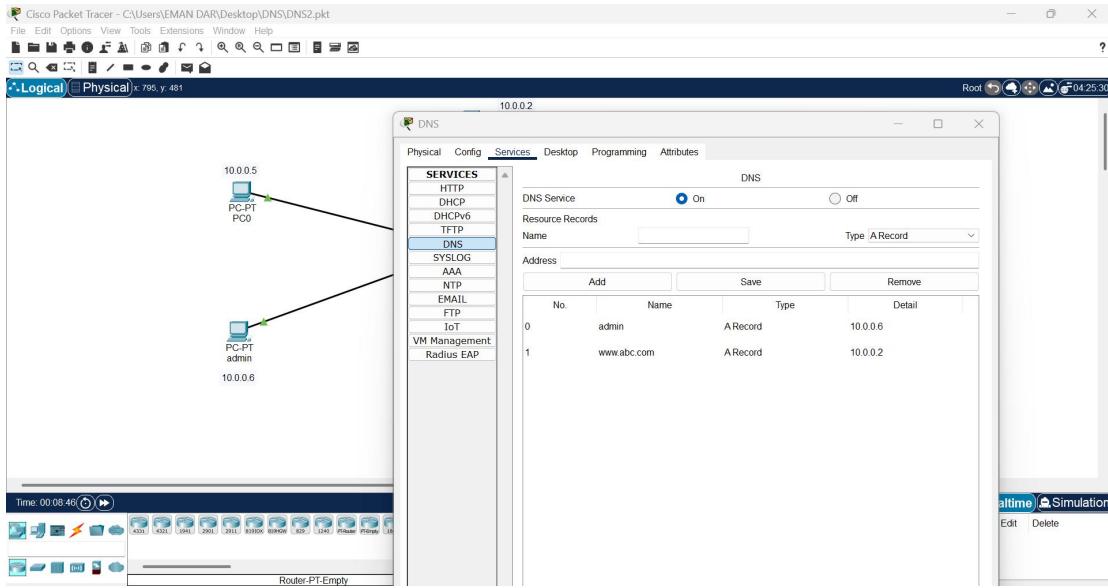
Step 05: Click on **Web Server** and assign **IP address** and subnet mask, then go to **services (index.html)** and click on edit, a html file will open , edit it as desired and save it , this may ask to overwrite the file so click on yes.



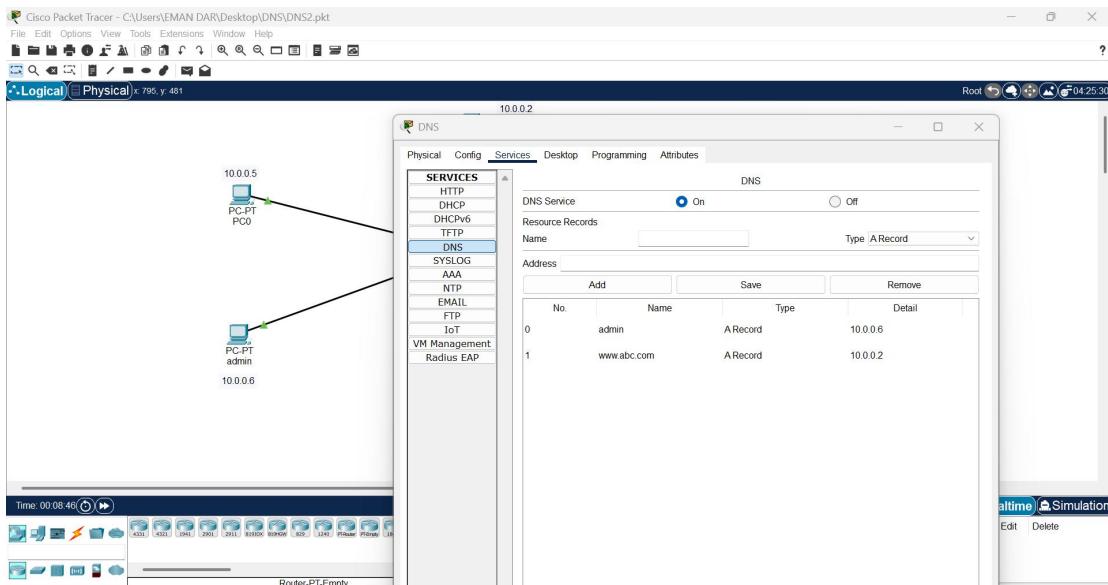
Step 06: Then click on services tab and choose DNS and turn this on (for both servers) as;



Step 07: Name the web site and give it an IP address of the web server where you make a website (Html documentation) and save it as;

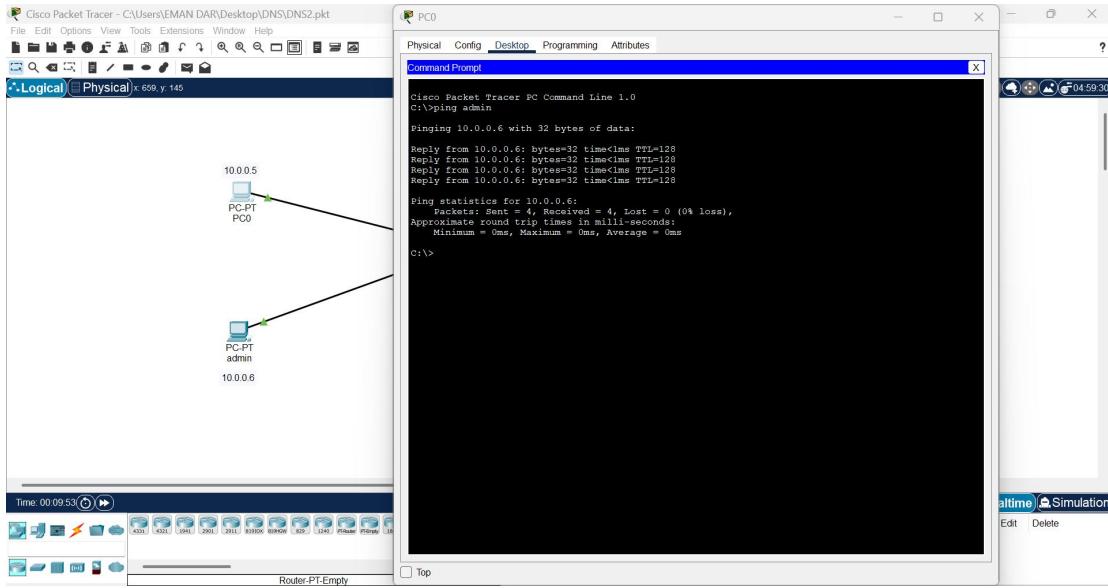


Step 08: Go to PC0 click on desktop click on IP configuration and write address of DNS server over here.



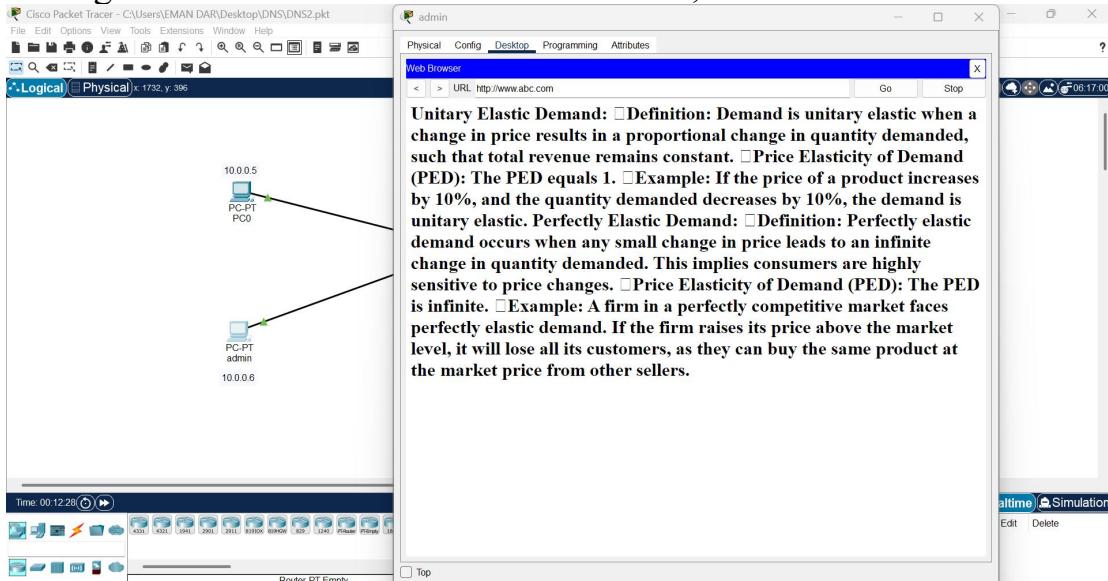
Step 9: Ping your PC as;

1. Click on PC0 go to desktop click on command prompt as;

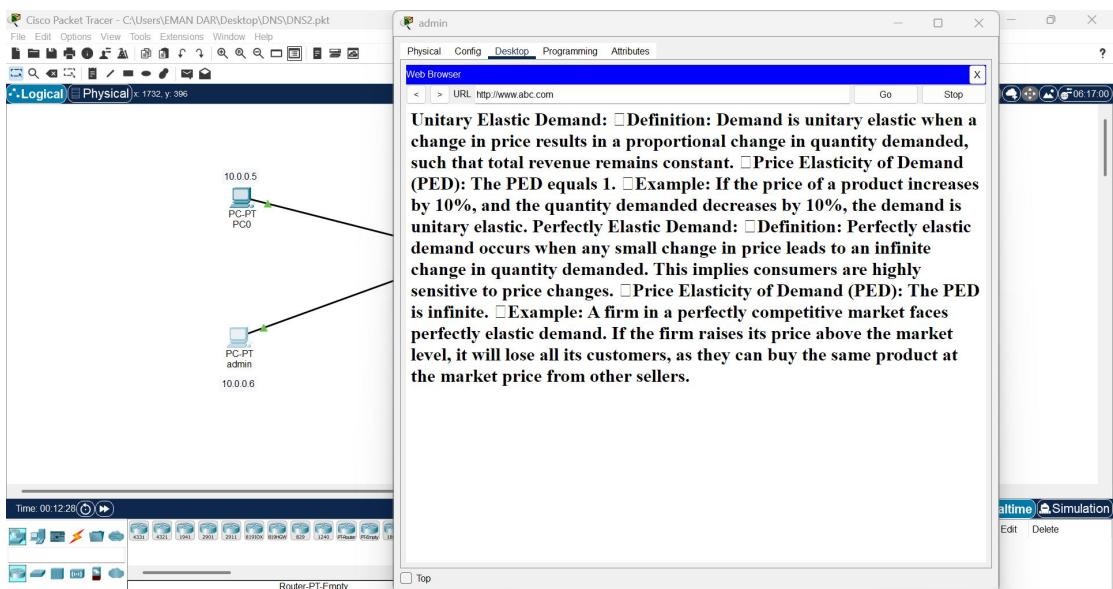


Step 10: Then go to desktop again and click on web browsing this time and write the name of your very first website in URL box and click on Go the results are here as;

1. Accesing website from the device named admin;



2. Accessing the website from the device named PC0;

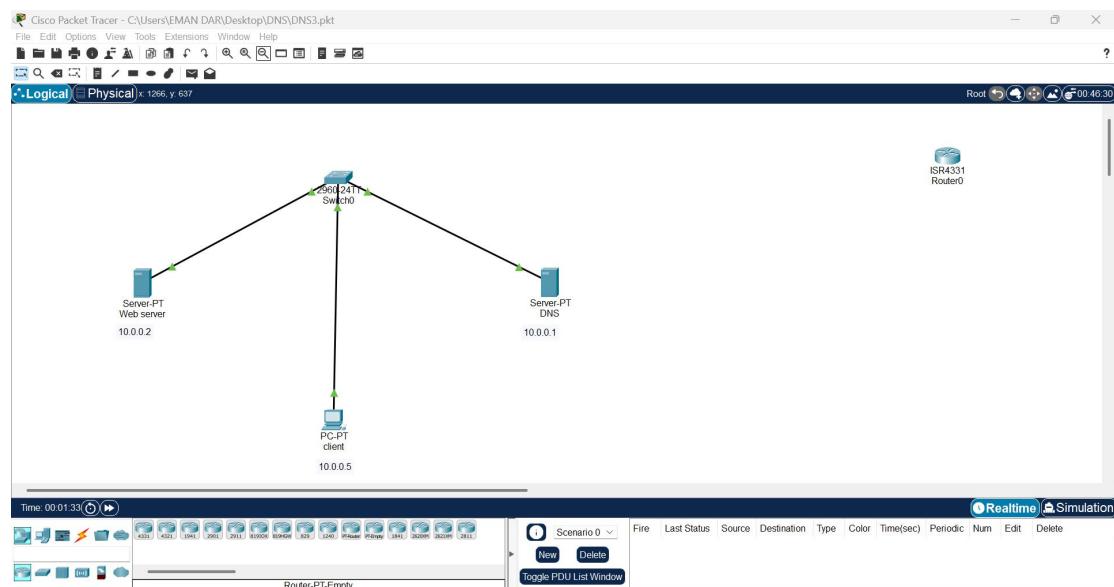


DNS, Web Server and a client

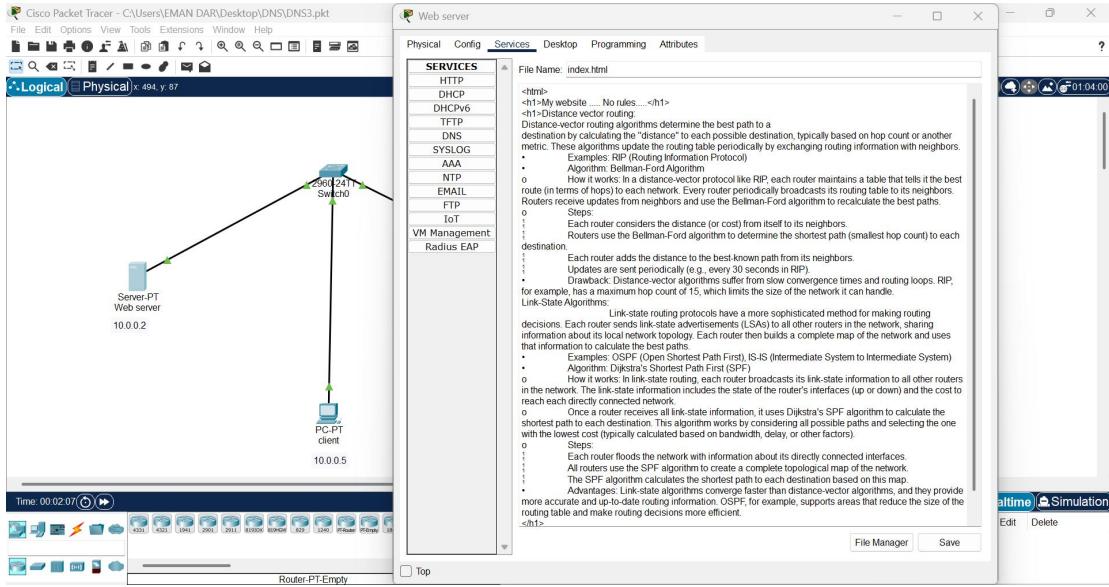
Step 01: Open cisco packet tracer and select a new file.

Step 02: Take two servers one DNS and other one Web server, a PT-switch and a device as PC or client.

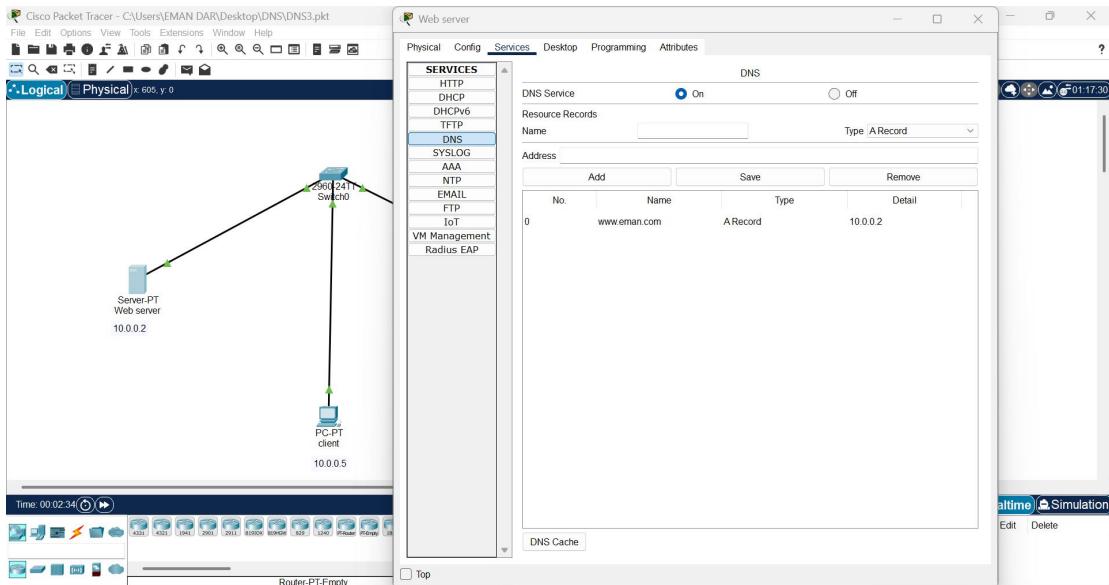
Step 03: Connect the device with switch and then connect switch with servers , with an Automatic wire.



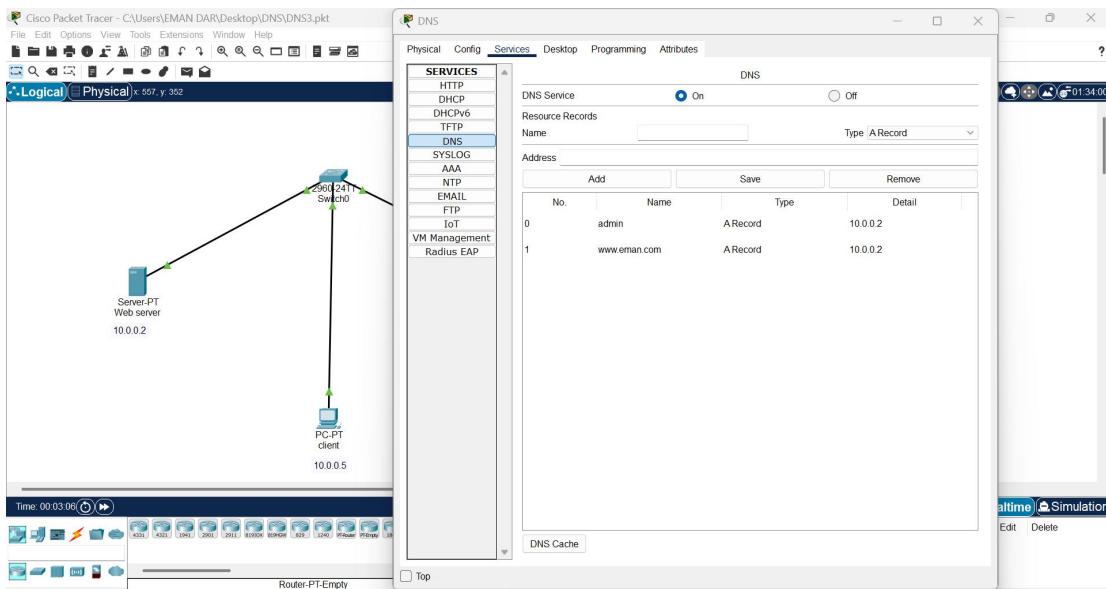
Step 04: Click on **Web Server** and assign **IP address** and subnet mask, then go to **services (index.html)** and click on edit, a html file will open , edit it as desired and save it , this may ask to overwrite the file so click on yes.



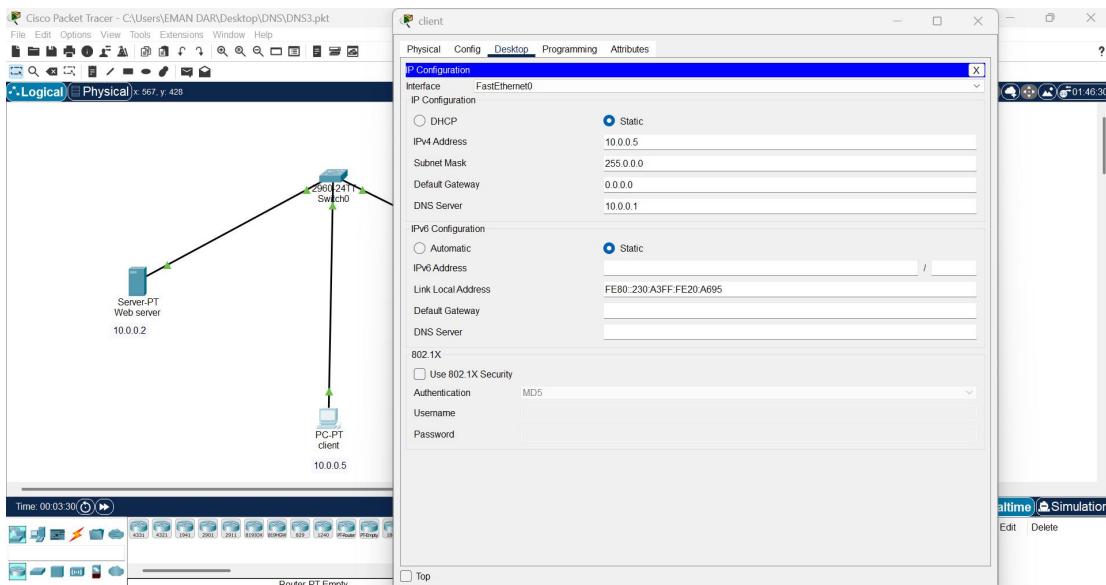
Step 05: Then click on services tab and choose DNS and turn this on as;



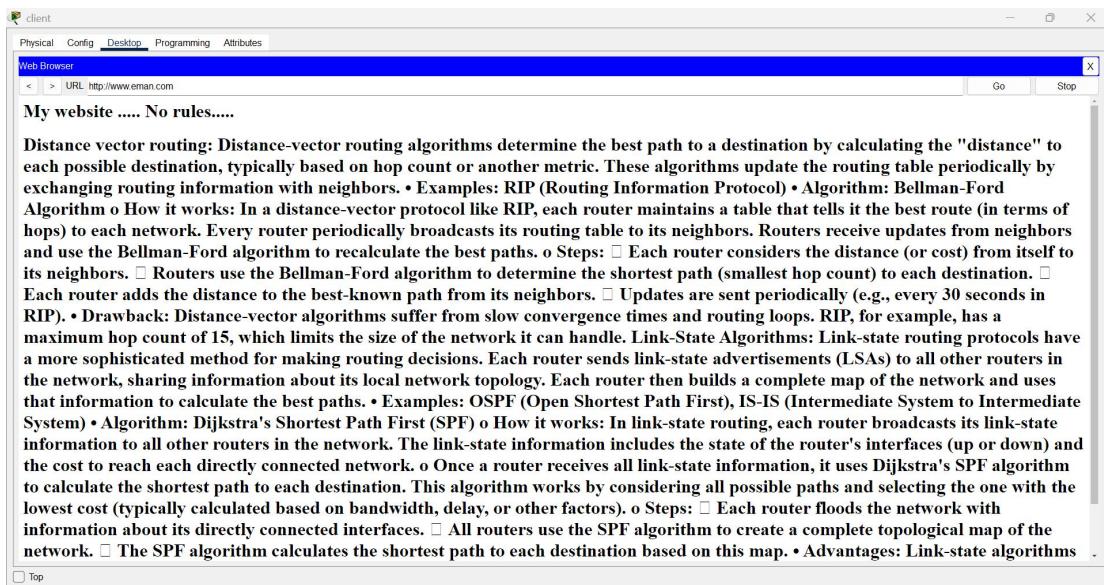
Step 06: Name the web site and give it an IP address of the web server where you make a website (Html documentation) and save it as;



Step 07: Go to PC0 click on desktop click on IP configuration and write address of DNS server over here.



Step 08: Then go to desktop again and click on web browsing this time and write the name of your very first website in URL box and click on Go the results are here as;

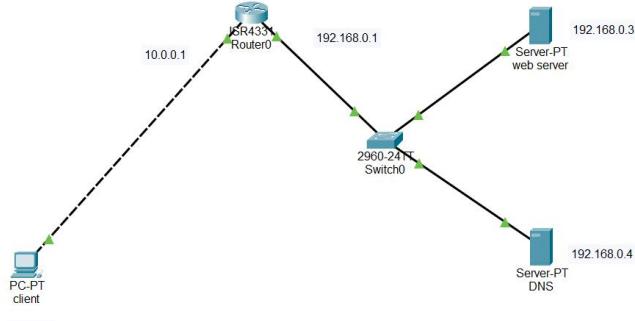


DNS, Web Server, Router and a client

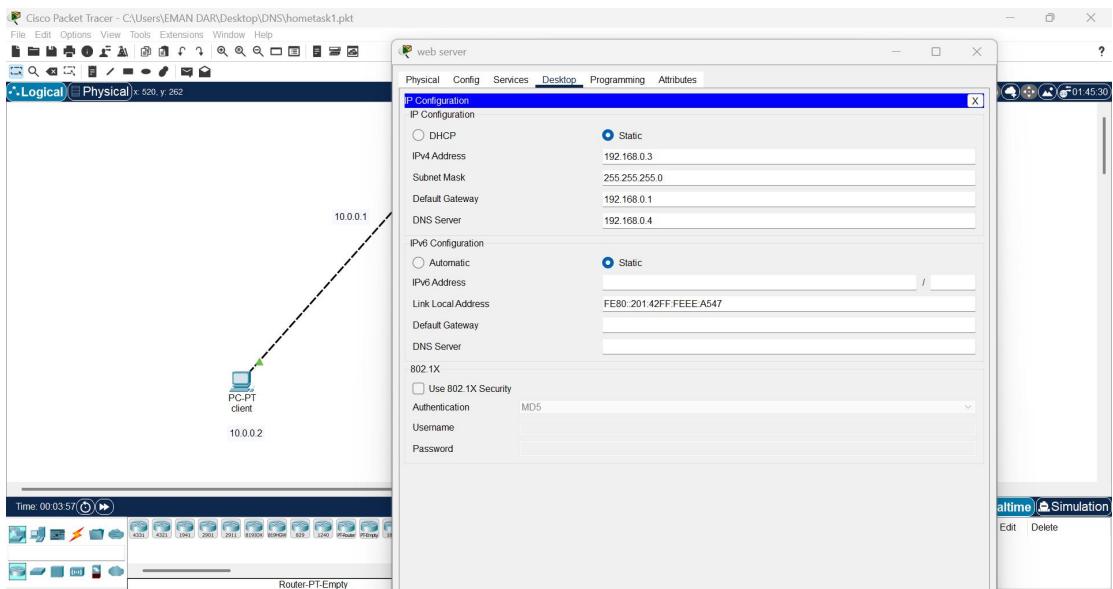
Step 01: Open cisco packet tracer and select a new file.

Step 02: Take two servers one DNS and other one Web server, a PT-switch and a device as PC or client.

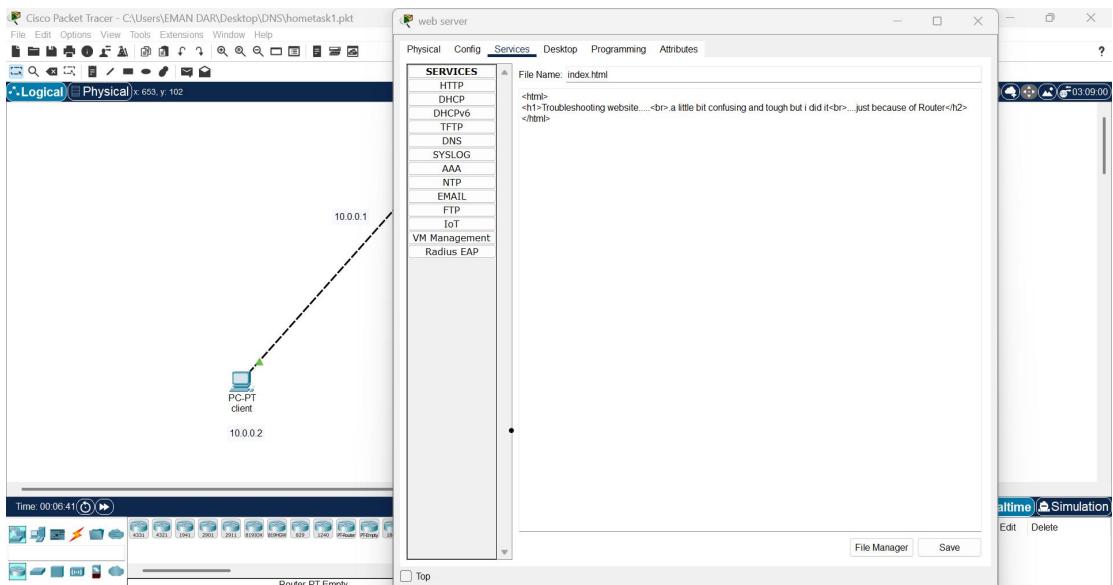
Step 03: Connect the device with switch and then connect switch with servers , with an Automatic wire.



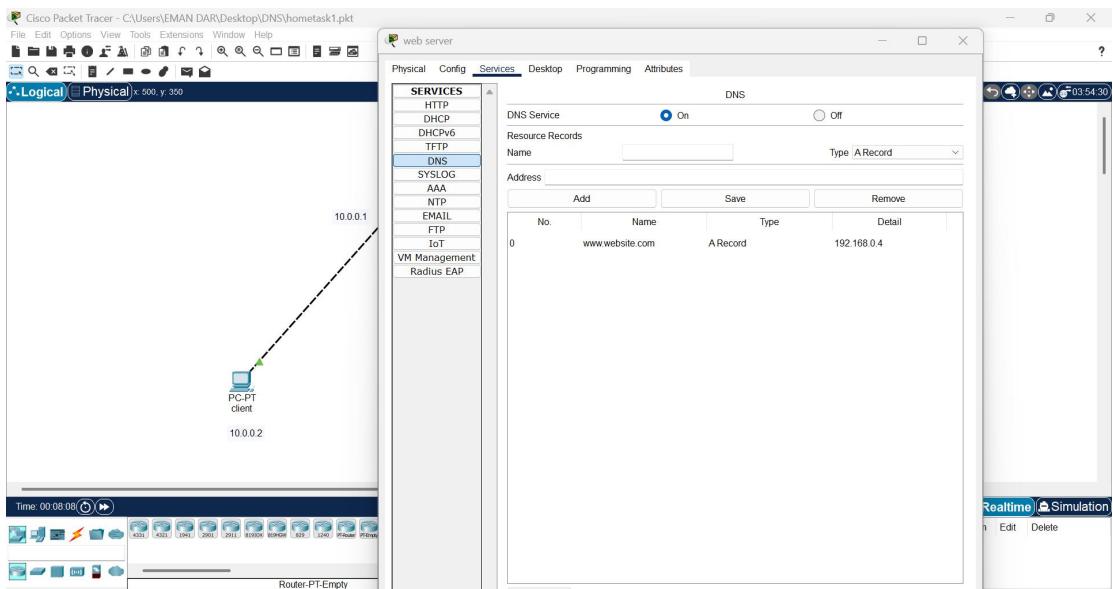
Step 04: Click on **Web Server** and assign **IP address** and subnet mask and gateway as;



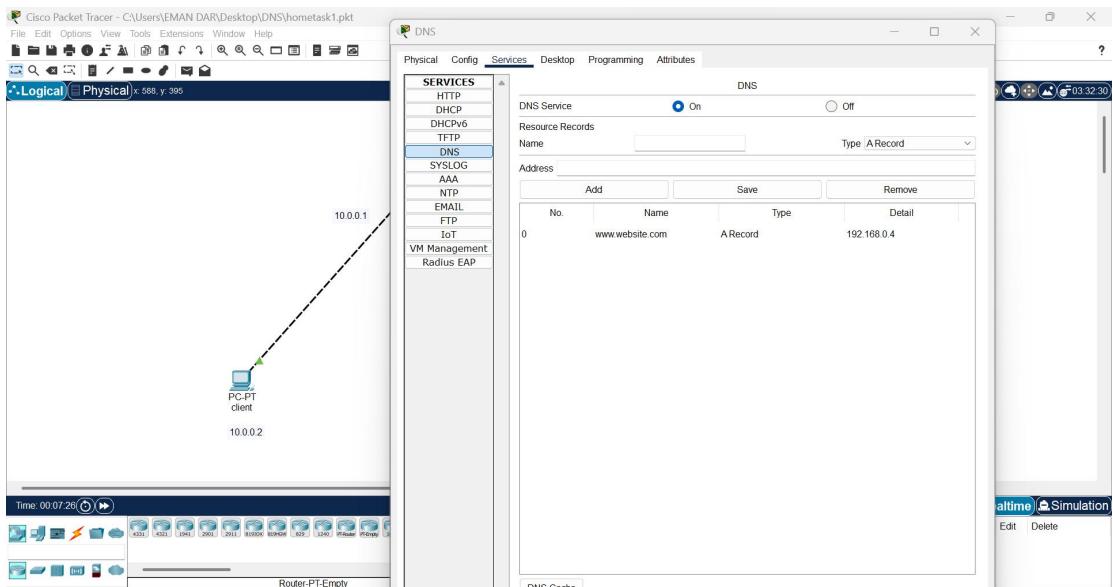
Then go to **services (index.html)** and click on edit, a html file will open , edit it as desired and save it , this may ask to overwrite the file so click on yes.



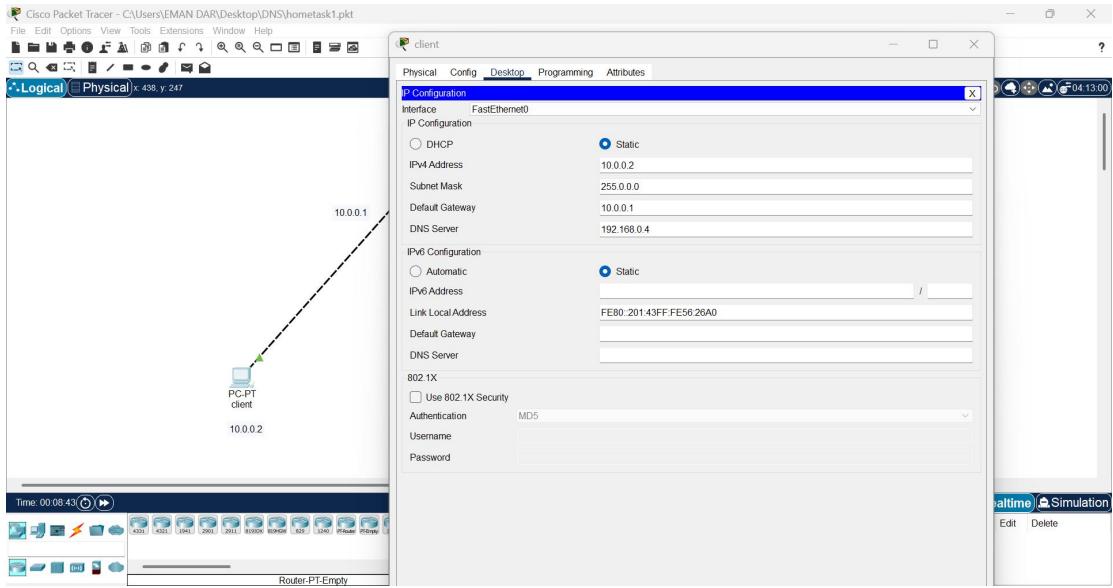
Step 05: Then click on services tab and choose DNS and turn this on as;



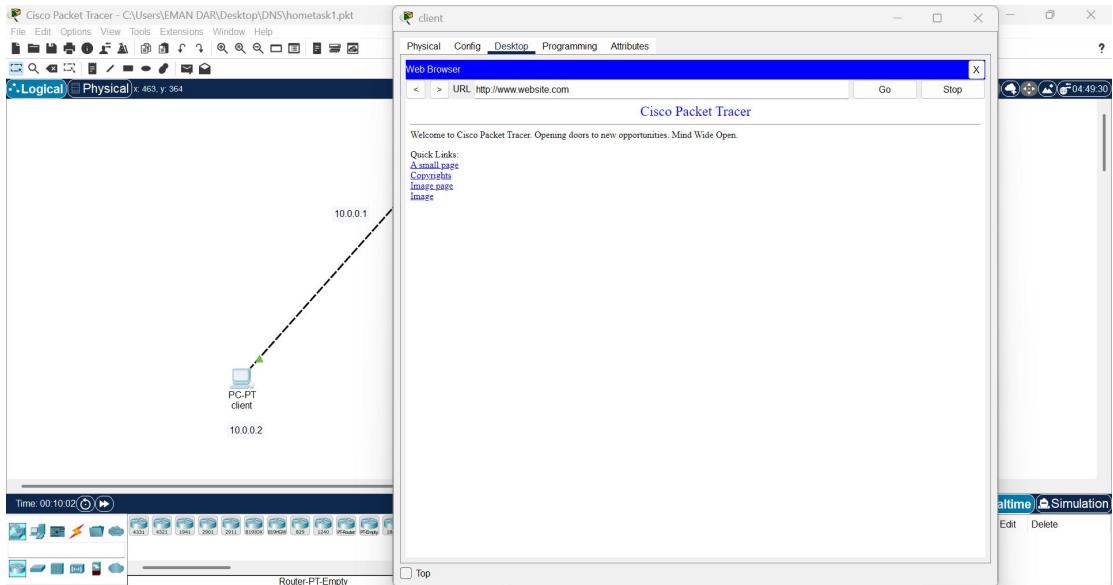
Step 06: Name the web site and give it an IP address of the web server where you make a website (Html documentation) and save it as;



Step 07: Go to PC0 click on desktop click on IP configuration and write address of DNS server over here.



Step 08: Then go to desktop again and click on web browsing this time and write the name of your very first website in URL box and click on Go the results are here as;



2 DNS, 2 Web Servers and 2 devices (client & admin)

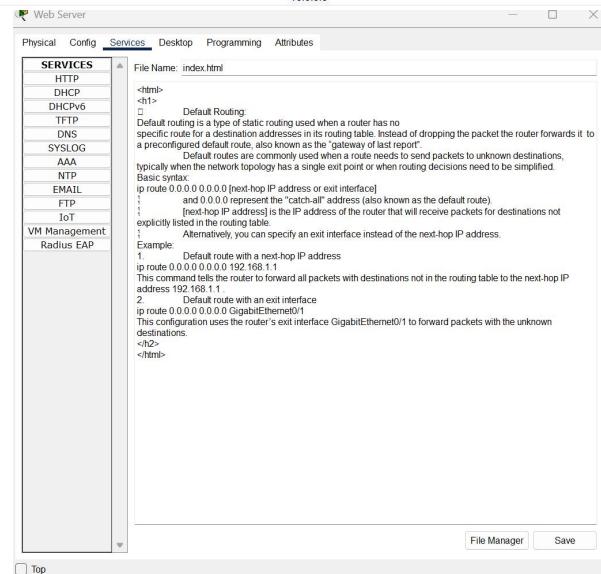
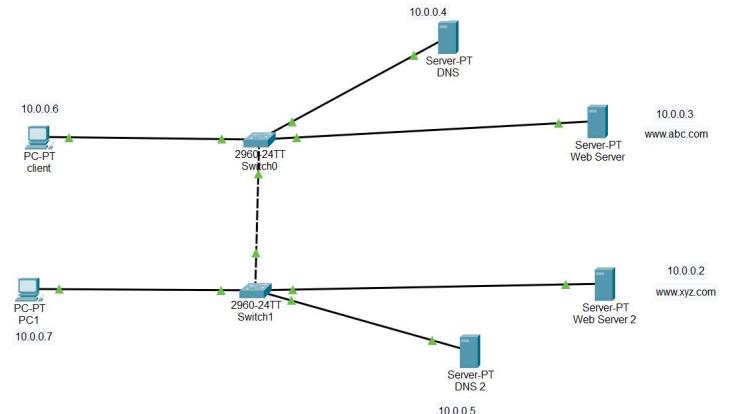
Step 01: Open cisco packet tracer and select a new file.

Step 02: Take four servers two DNS and other two Web servers, a PT-switch and a devices as admin or client.

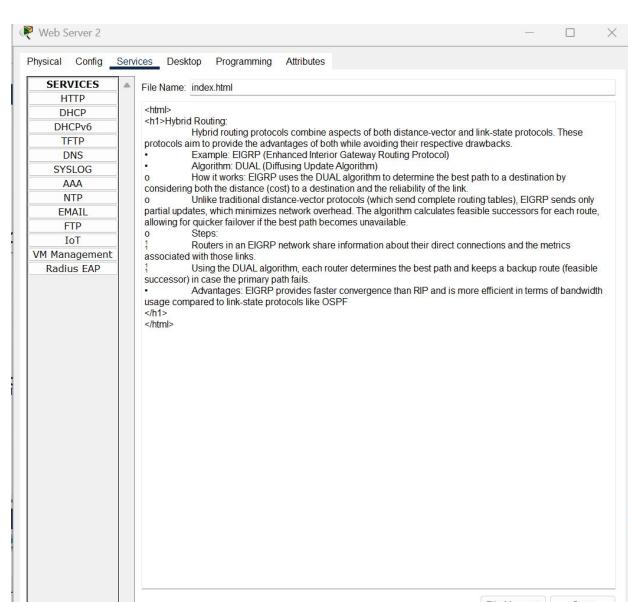
Step 03: Connect the device with switch and then connect switch with servers , with an Automatic wire.

Step 04: Click on **Web Server** and assign **IP address** and subnet mask, then go to **services (index.html)** and click on edit, a html file will open , edit it as desired and save it , this may ask to overwrite the file so click on yes.

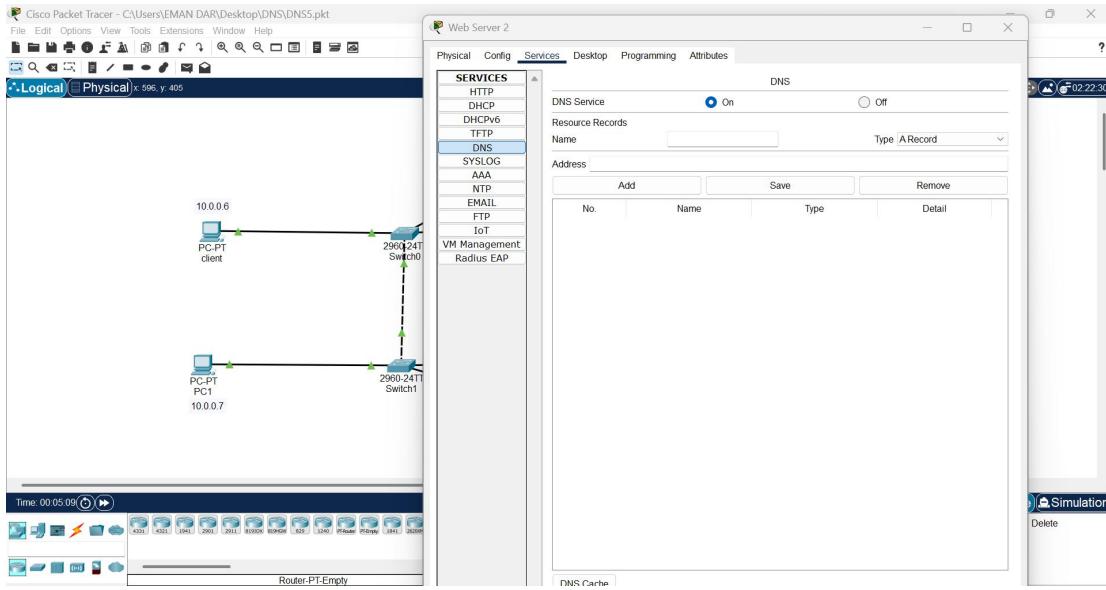
1. For web server 1



2. For web server 2

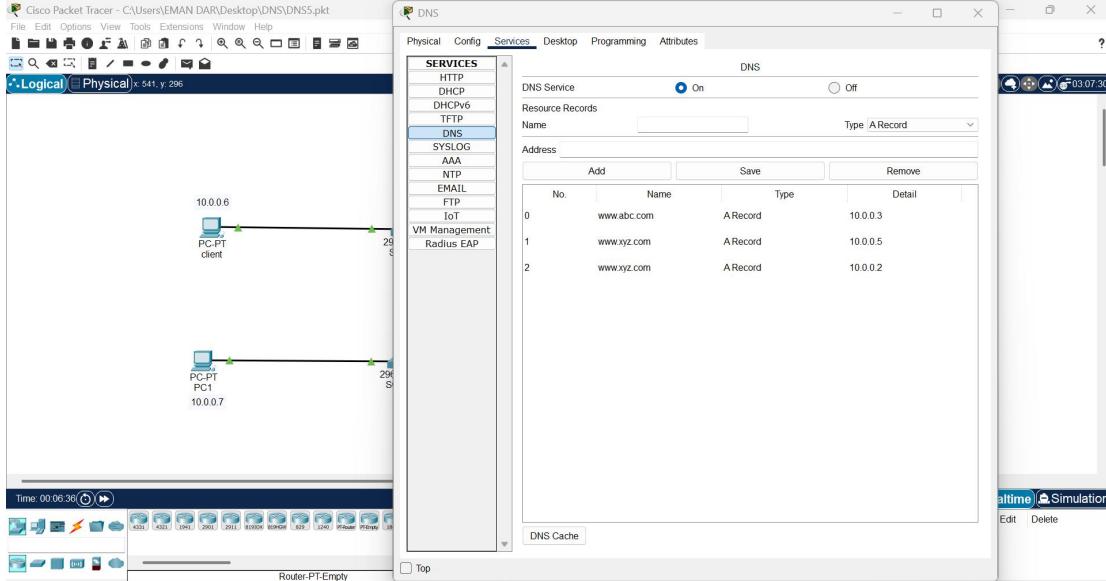


Step 05: Then click on services tab and choose DNS and turn this on (for both servers) as;

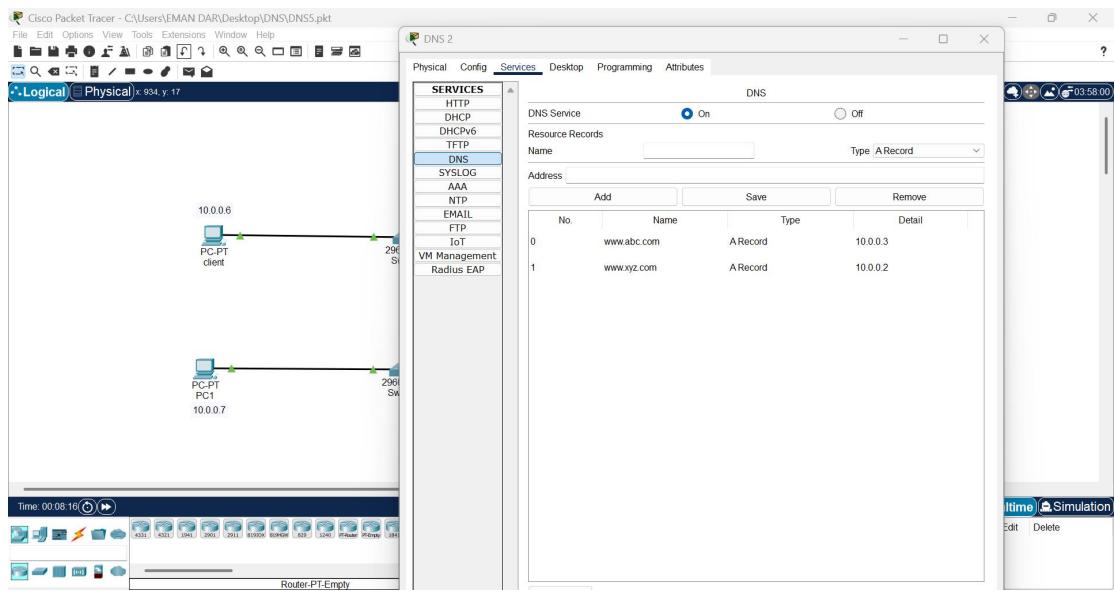


Step 06: Name the web site and give it an IP address of the web server where you make a website (Html documentation) and save it as;

1. For websites named www.abc.com and www.xyz.com on DNS server 1 as;

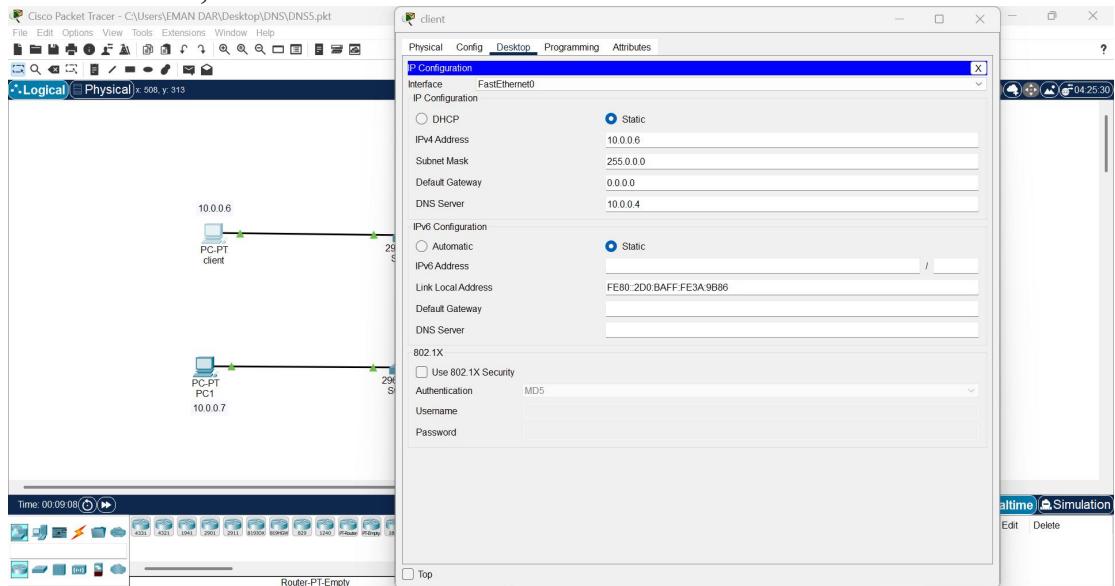


2. For websites named www.abc.com and www.xyz.com on DNS server 2 as;

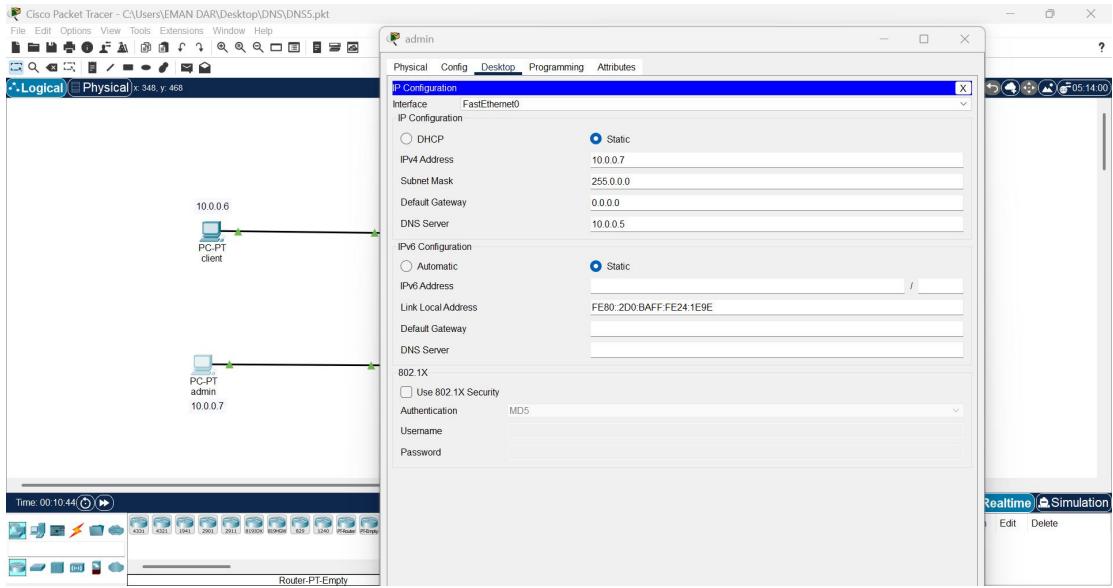


Step 07: Go to client as well as admin click on desktop click on IP configuration and write address of DNS server over here.

1. For client ;

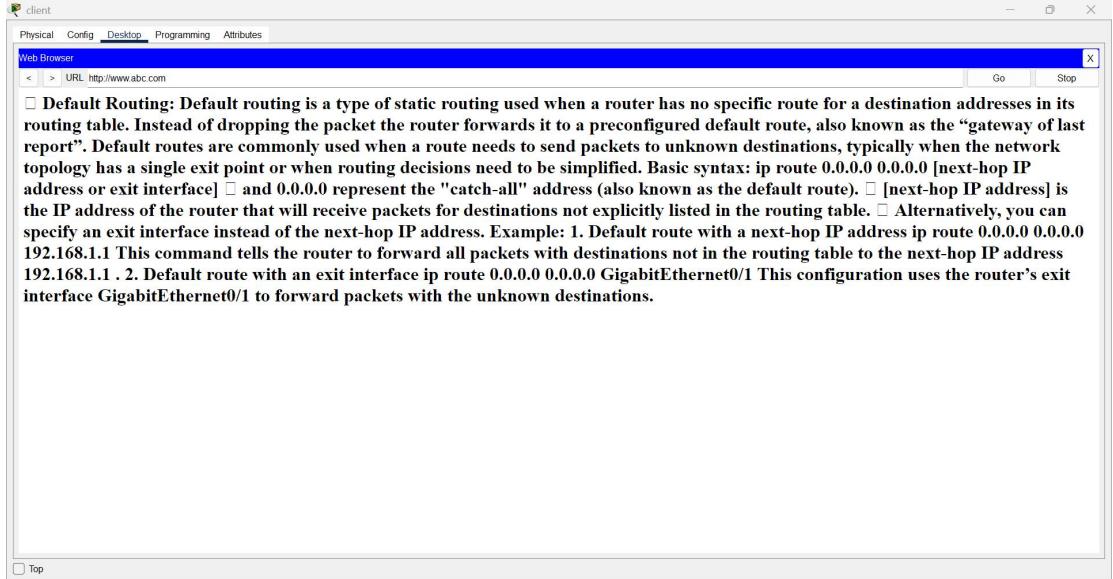


2. For device named admin;

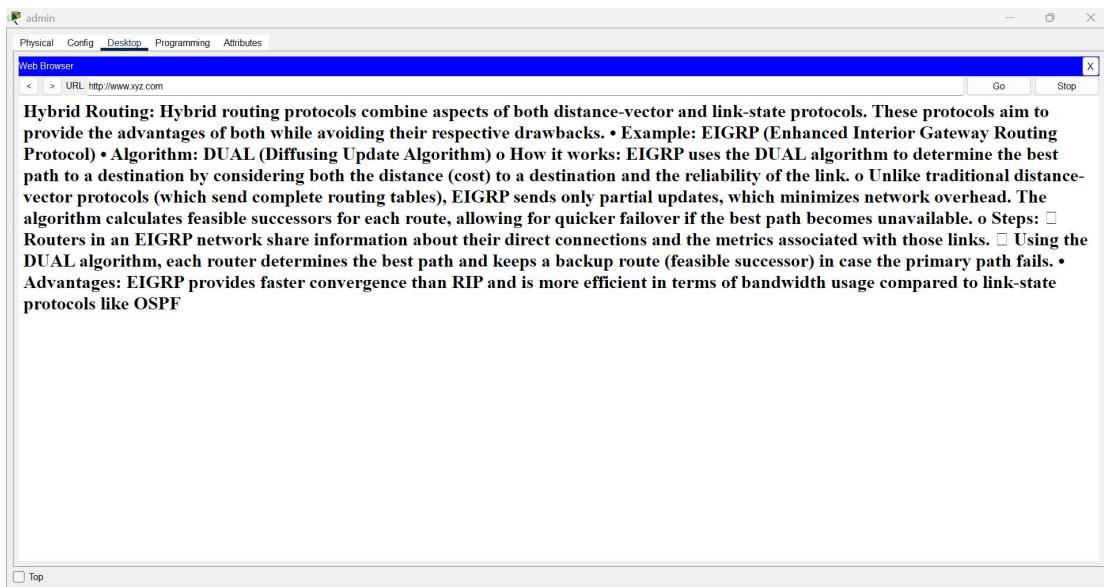


Step 08: Then go to desktop again and click on web browsing this time and write the name of your very first website in URL box and click on Go the results are here as;

1. Accessing website named www.abc.com from client device;



2. Accessing website named www.xyz.com from admin device;

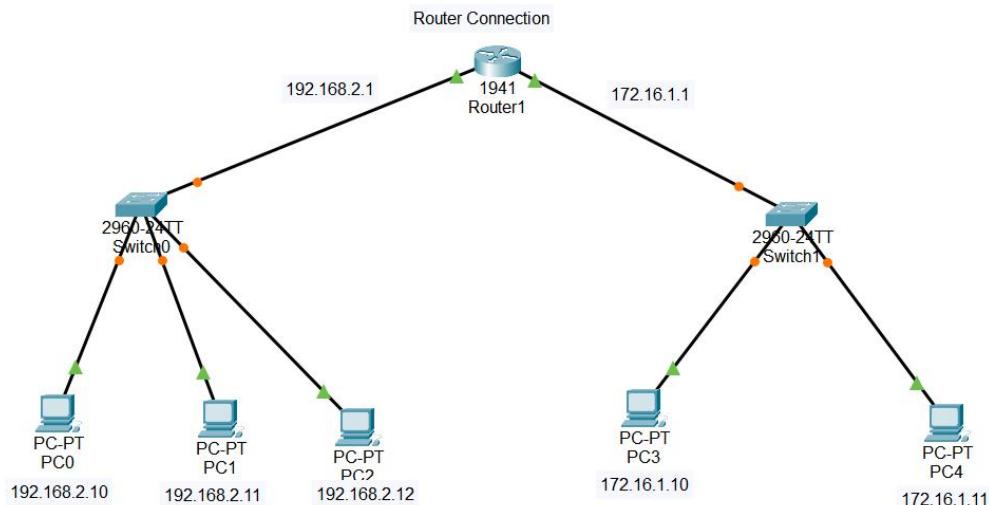


You can also access these websites from alternate devices by assigning DNS IPs to each device for the specific web server.

Router connection

Step 1: Open Cisco Packet Tracer.

Step 2: Select 5 PCs, a 1941 Router and 2 Pt-switches connect both Access points with an **Automatic wire**.



Step 3: Assign IP addresses , subnet mask and gateway to each device .

Step 4: Configure the router as;

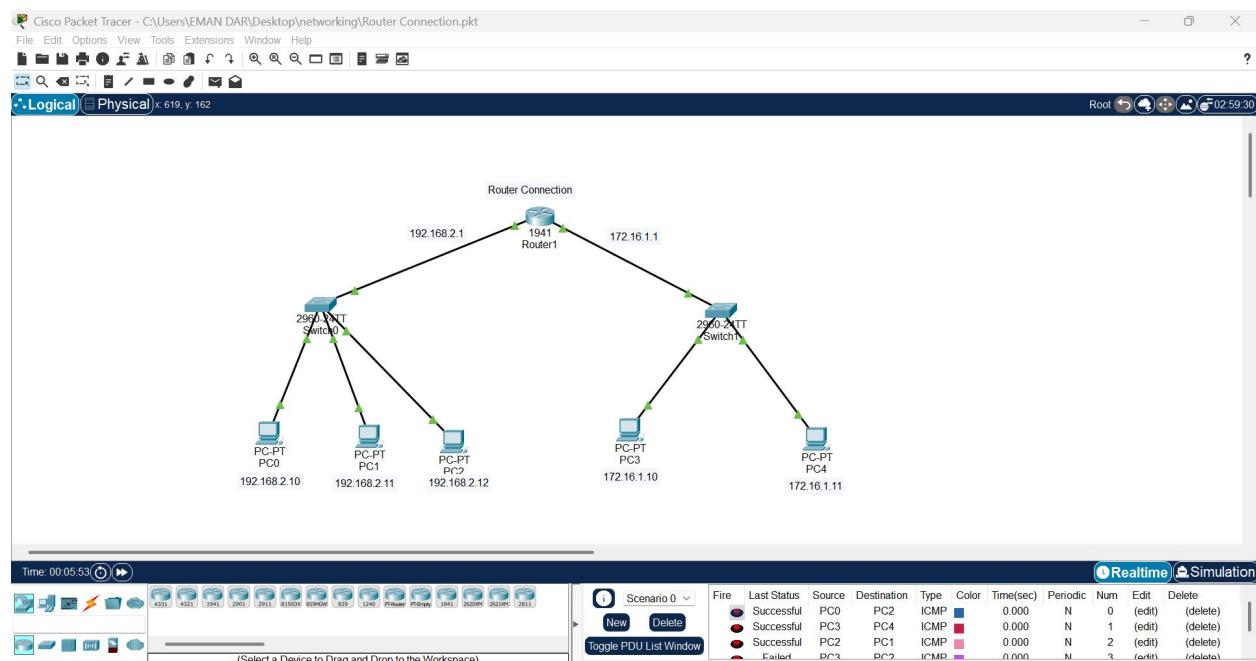
```

Enter configuration commands, one per line. End with Ctrl/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip address 172.16.1.1 255.255.0.0
Router(config-if)#ip address 172.16.1.1 255.255.0.0
Router(config-if)#
Router(config-if)#exit

```

Step 5: Ping PC0 or PC1 to check whether the connection is successful or not.

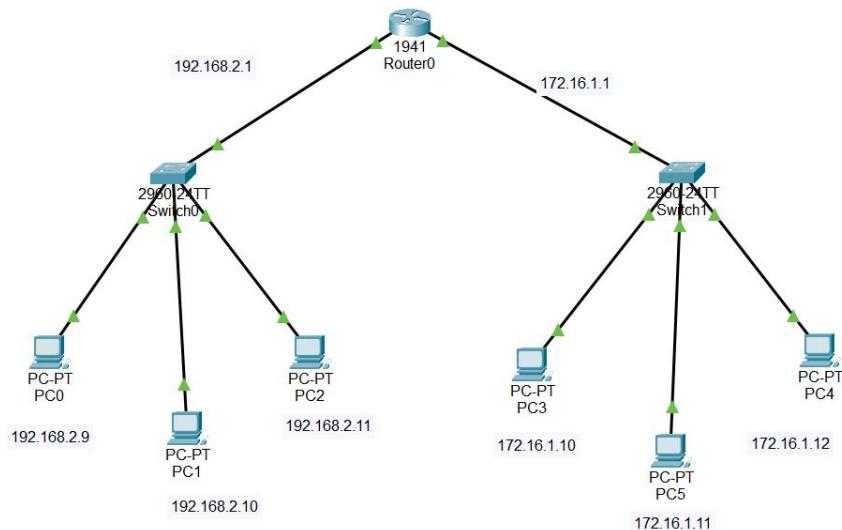
Step 7: Hence ICMP successful.



MAN

Step 1: Open Cisco Packet Tracer.

Step 2: Select 6 PCs, a 1941 Router and 2 Pt-switches connect both Access points with an Automatic wire.



Step 3: Assign IP addresses , subnet mask and gateway to each device .

Step 4: Configure the router as;

```
Enter configuration commands, one per line. End with Ctrl/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip address 172.16.1.1 255.255.0.0
Router(config-if)#ip address 172.16.1.1 255.255.0.0
Router(config-if)#
Router(config-if)#exit
```

Step 5: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 7: Hence ICMP successful.

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
Successful		PC5	PC4	ICMP	purple	0.000	N	1	(edit)	(delete)
Successful		PC3	PC4	ICMP	red	0.000	N	2	(edit)	(delete)
Successful		PC2	Router0	ICMP	green	0.000	N	3	(edit)	(delete)
Successful		PC3	Router0	ICMP	blue	0.000	N	4	(edit)	(delete)

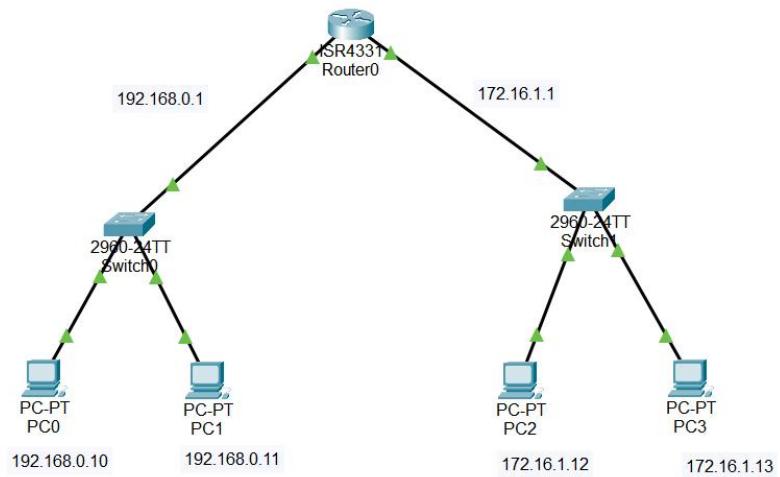
MAN(with 4 PCs)

Step 1: Open Cisco Packet Tracer.

Step 2: Select 2 PCs, a printer ,a 1941 Router and 2 Pt-Access connect both Access points with an Automatic wire.

Step 3: Assign IP addresses , subnet mask and gateway to each device .

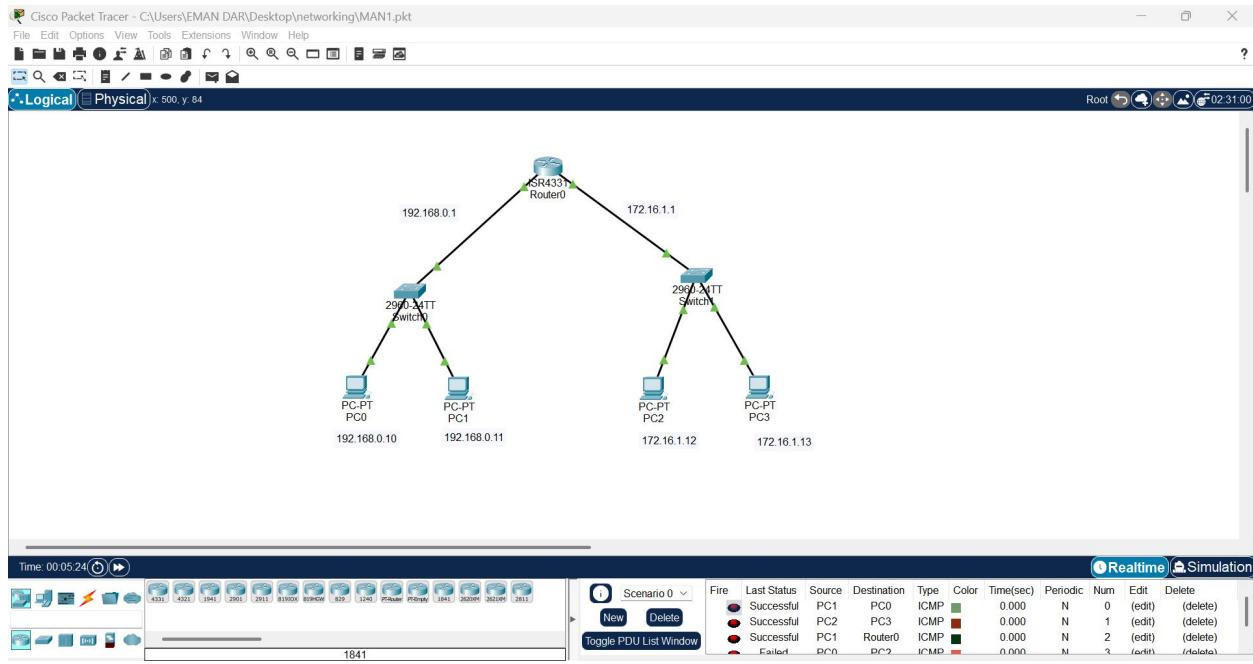
Step 4: Configure the router as;



```
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#ip address 192.168.0.1 255.255.255.0
Router(config-if)#ip address 192.168.0.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#ip address 172.16.1.1 255.255.0.0
Router(config-if)#ip address 172.16.1.1 255.255.0.0
Router(config-if)#
Router(config-if)#exit
```

Step 5: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 7: Hence ICMP successful.

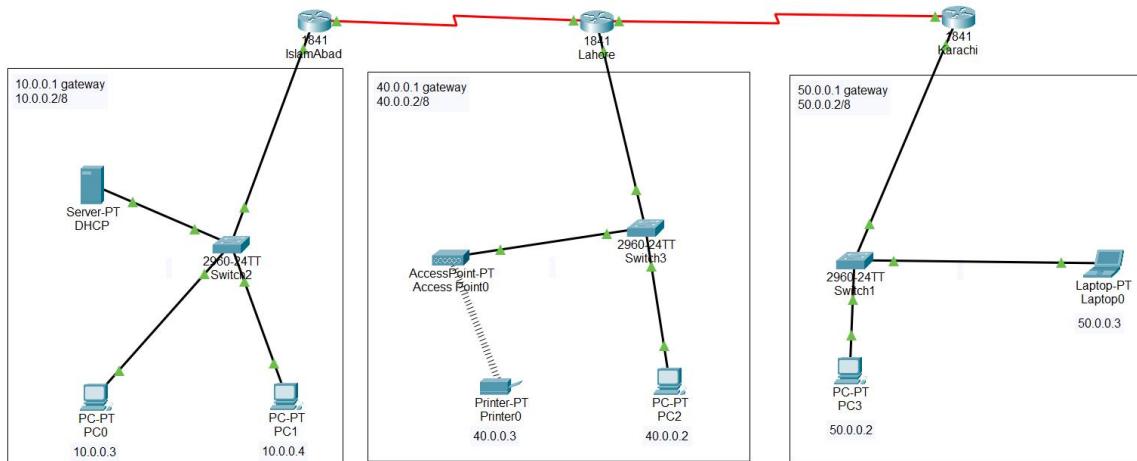


WAN (with 3 LANs simple)

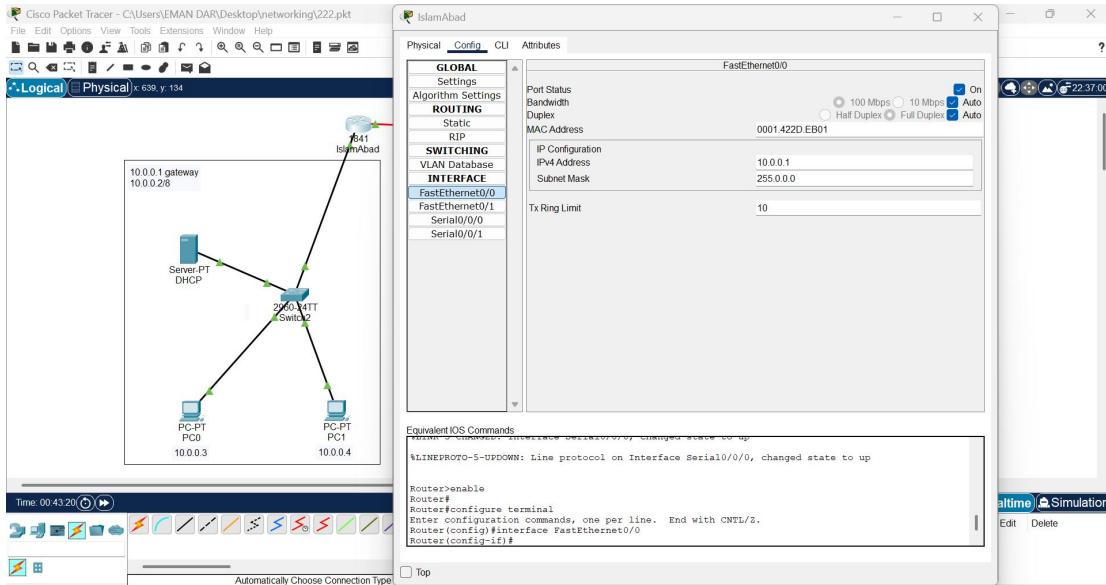
Step 01: Open a Cisco packet tracer, choose a new file and save it with the name **WAN-1**.

Step 02: Take 3 **1841-Routers**, 3 **Switches**, 4 **PCs**, a **Laptop**, a **Printer**, a **Web server** and a **PT-Access point**. As;

- ✧ Connect all devices with switches with an Automatic wire.
- ✧ Use copper straight through to connect all network switches with Routers.
- ✧ Use **Serial DTE** to connect all network Routers with each other.

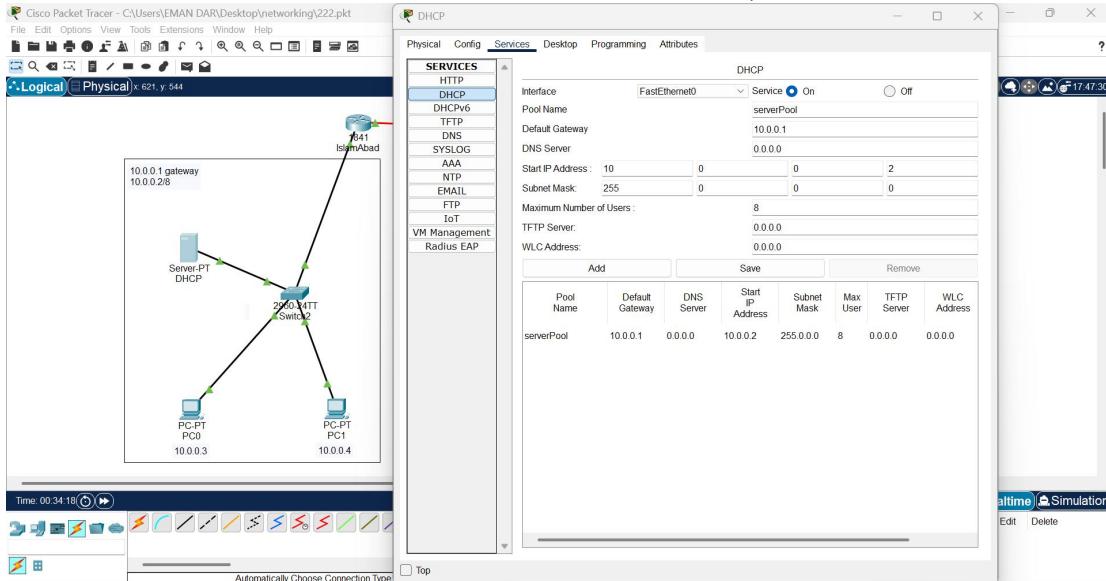


- ✧ **Configure the Routers** connected to each LAN as;



Step 03: Assign IP addresses to each device as mentioned in the above picture. Also assign gateway to each device according to its network.

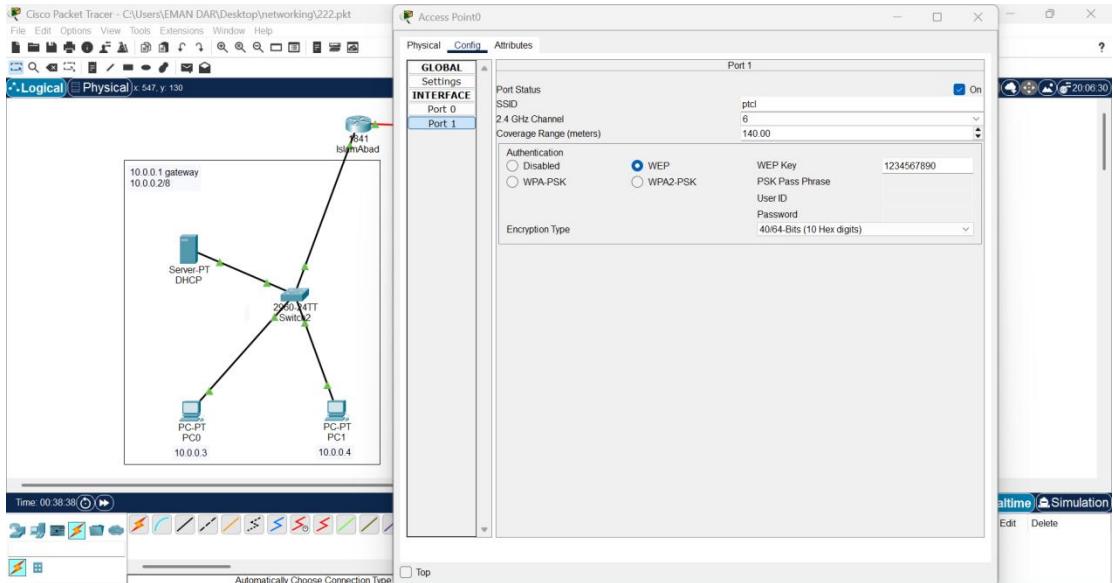
- ❖ Click on **DHCP server** and assign it an IP address and gateway then click on services and DHCP and turn on its services as;



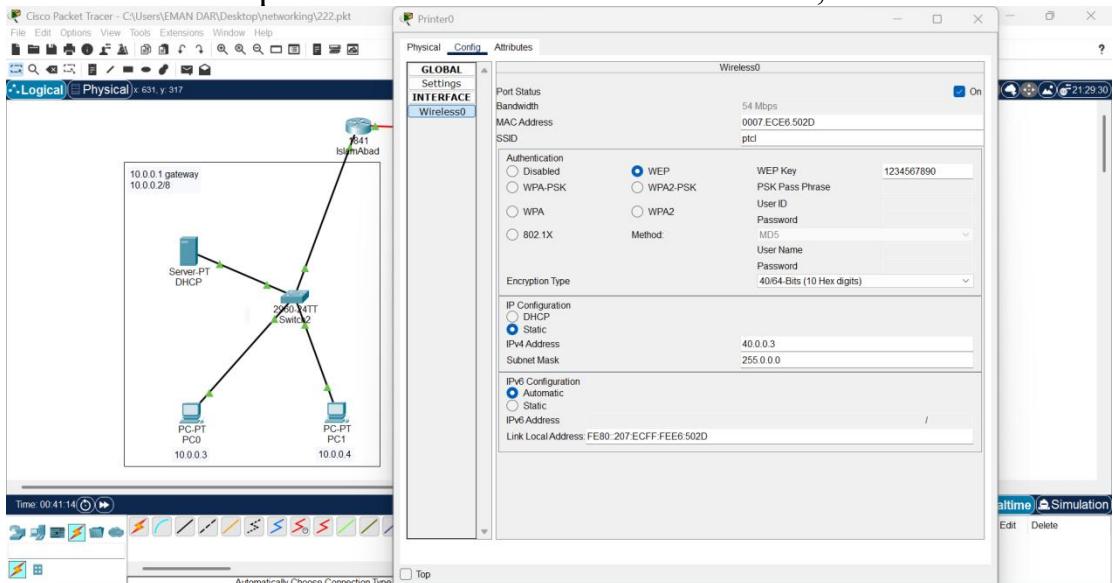
- ❖ Then go to each device in this network and click on **DHCP** which assign an automatic addresses to each device .

Step 04: Configure Access point as;

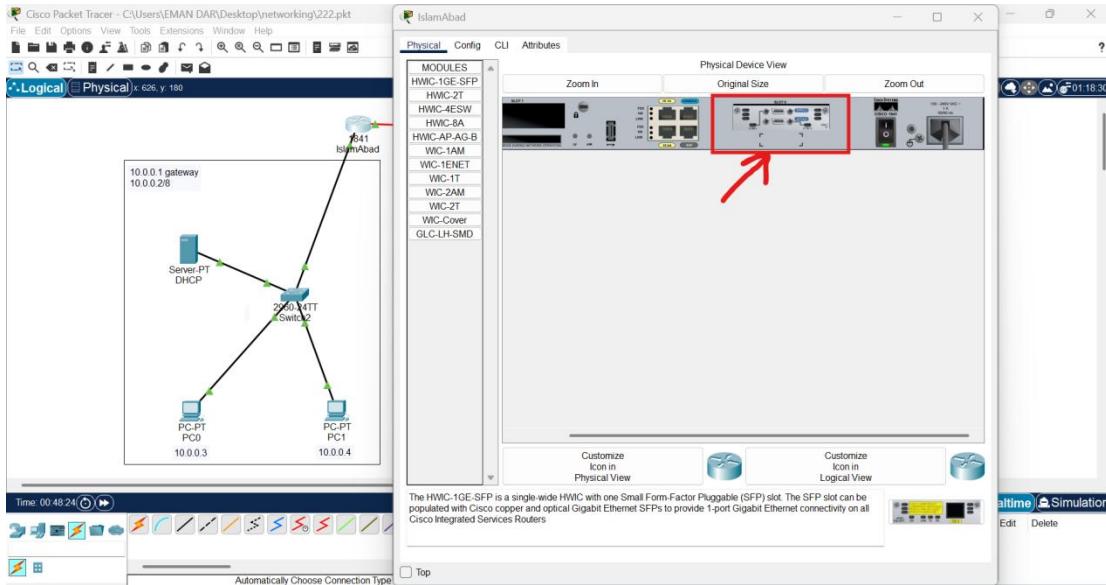
- ❖ Turn on the **port status**, Give an **SSID** to the access point, Set a **WEP password(9-digit)**.



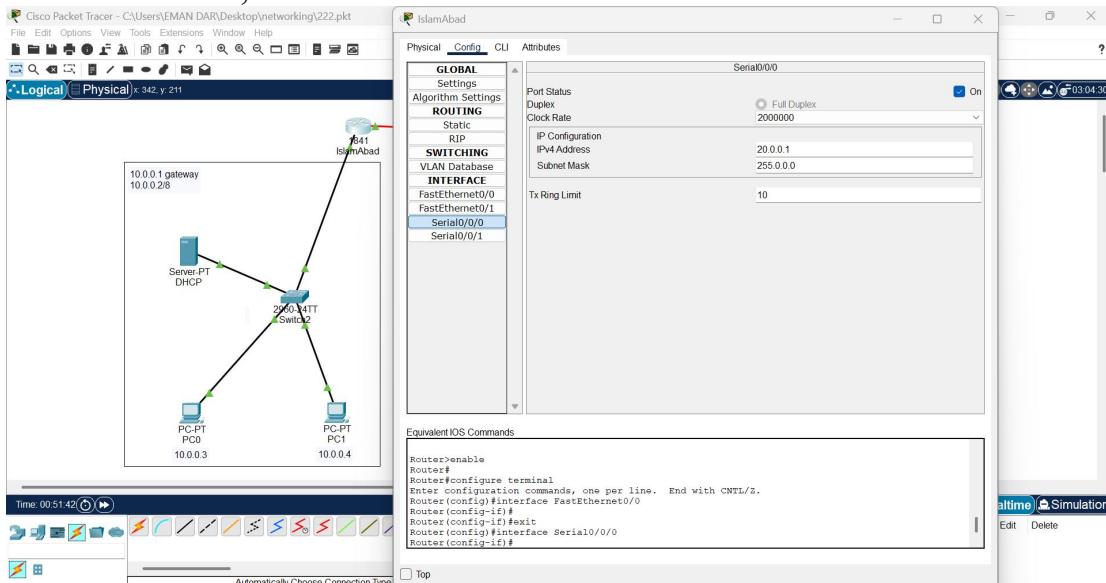
❖ Configure the printer by clicking on wireless then assign it all information about access point and also a static IP address. As;



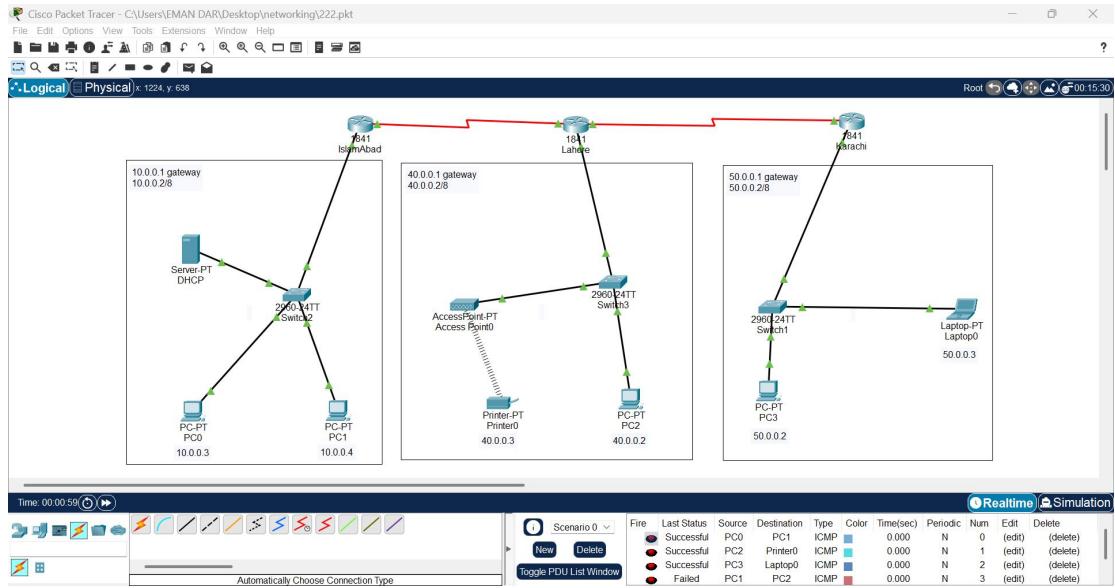
Step 05: For Serial configuration go to Router click on physical and set a HWIC-2T port to connect serial DTE.As;



- Now **configure each serial port** by assigning IP address according to their networks as;



Step 06: Hence connection is verified as **ICMP successful**.

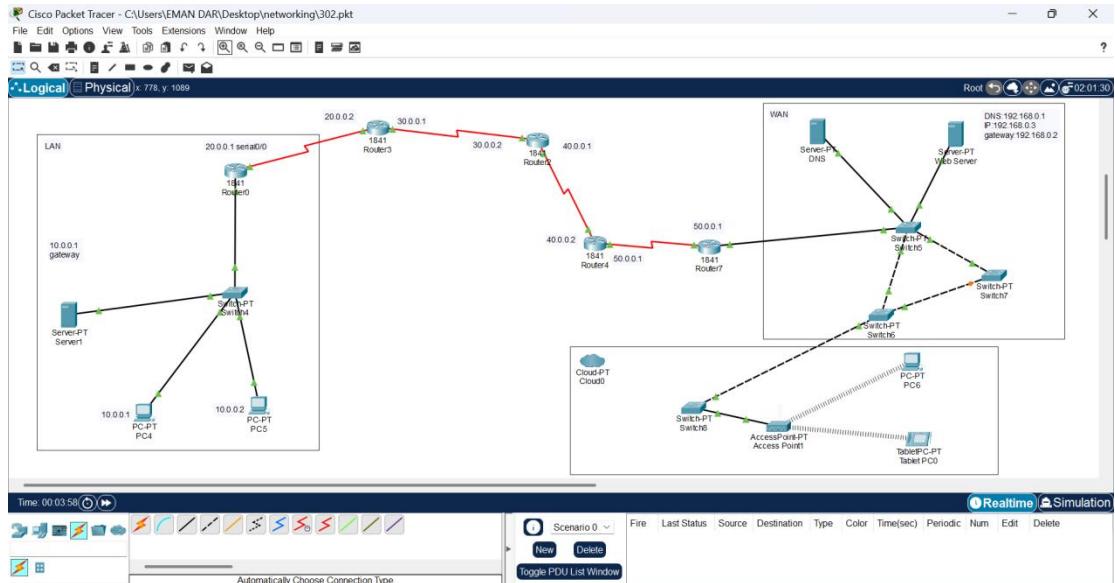


WAN (with multiple Routers)

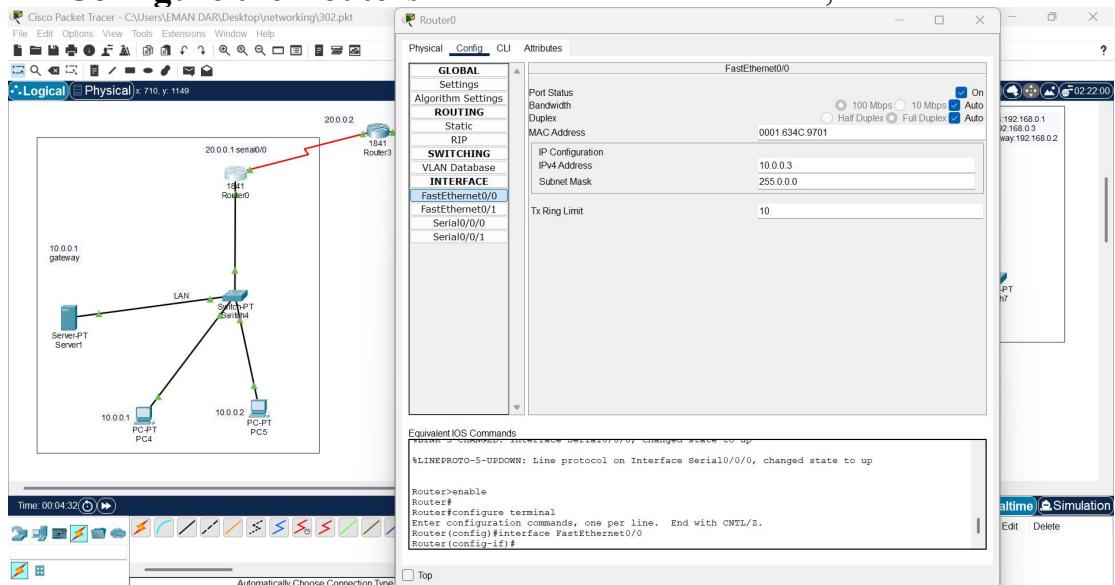
Step 01: Open a Cisco packet tracer, choose a new file and save it with the name **WAN-1**.

Step 02: Take 5 **1841-Routers**, 5 **Switches**, 3 **PCs**, a **Tablet**, a **Web server**, **server**, **DNS server** and a **PT-Access point**. As;

- ✧ Connect all devices with switches with an Automatic wire.
- ✧ Use copper straight through to connect all network switches with Routers.
- ✧ Use **Serial DTE** to connect all network Routers with each other.

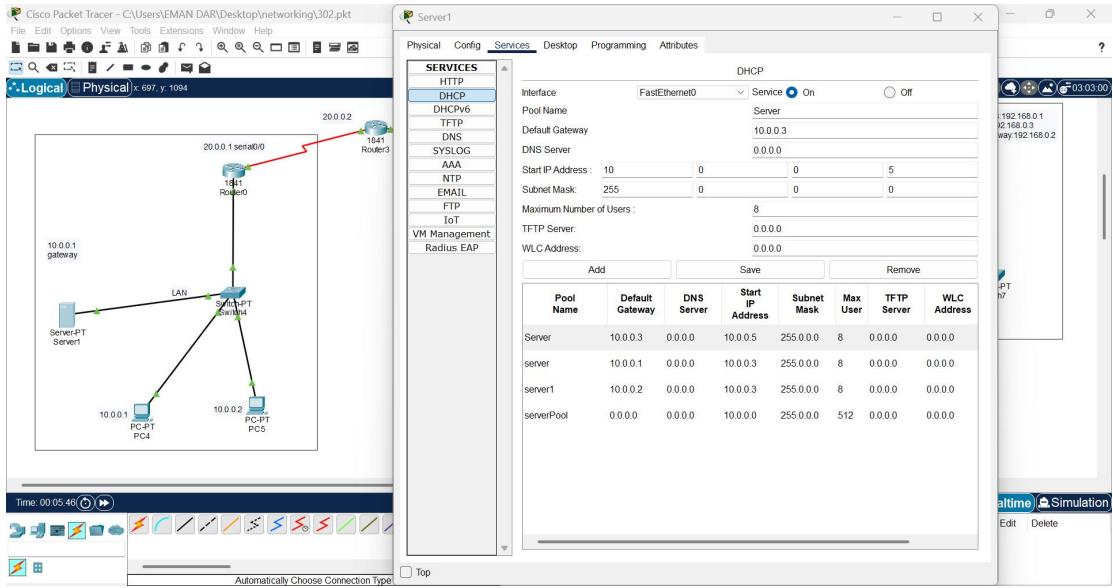


❖ Configure the Routers connected to each LAN as;



Step 03: Assign IP addresses to each device as mentioned in the above picture. Also assign gateway to each device according to its network.

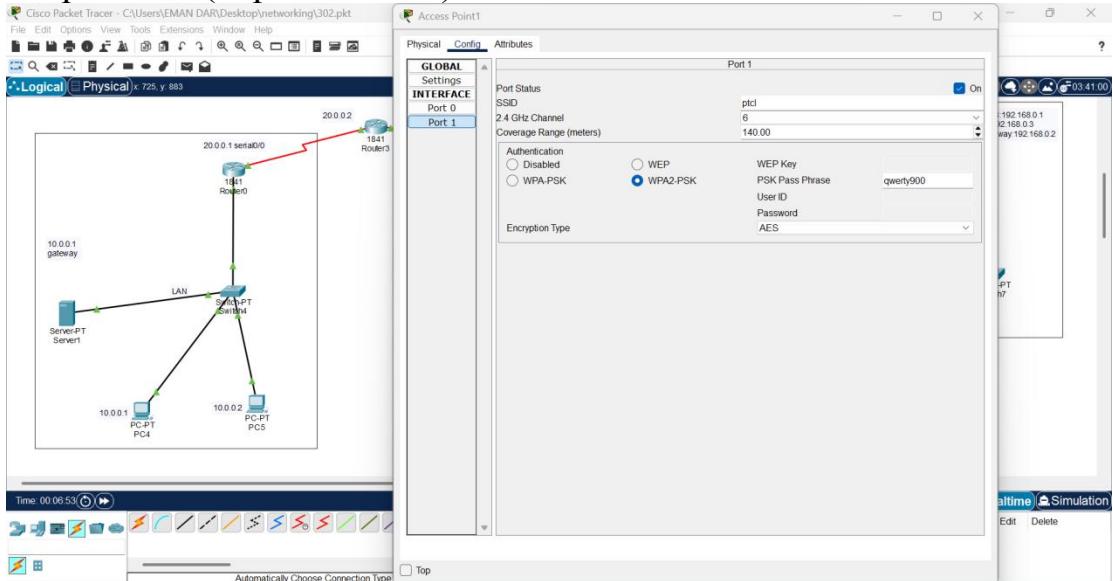
❖ Click on **DHCP server** and assign it an IP address and gateway then click on services and DHCP and turn on its services as;



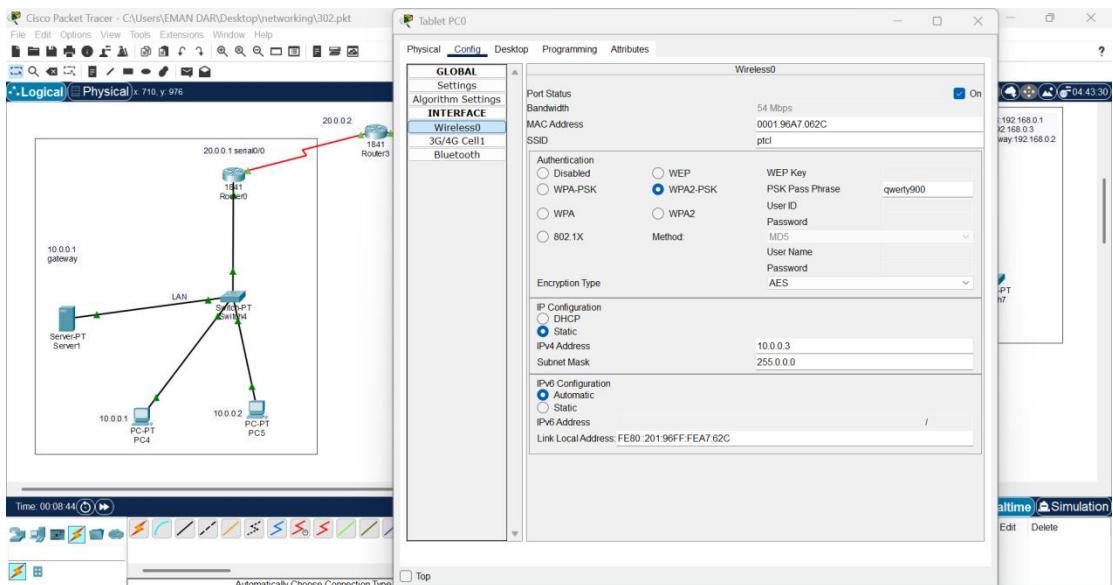
- ❖ Then go to each device in this network and click on **DHCP** which assign an automatic addresses to each device .

Step 04: Configure Access point as;

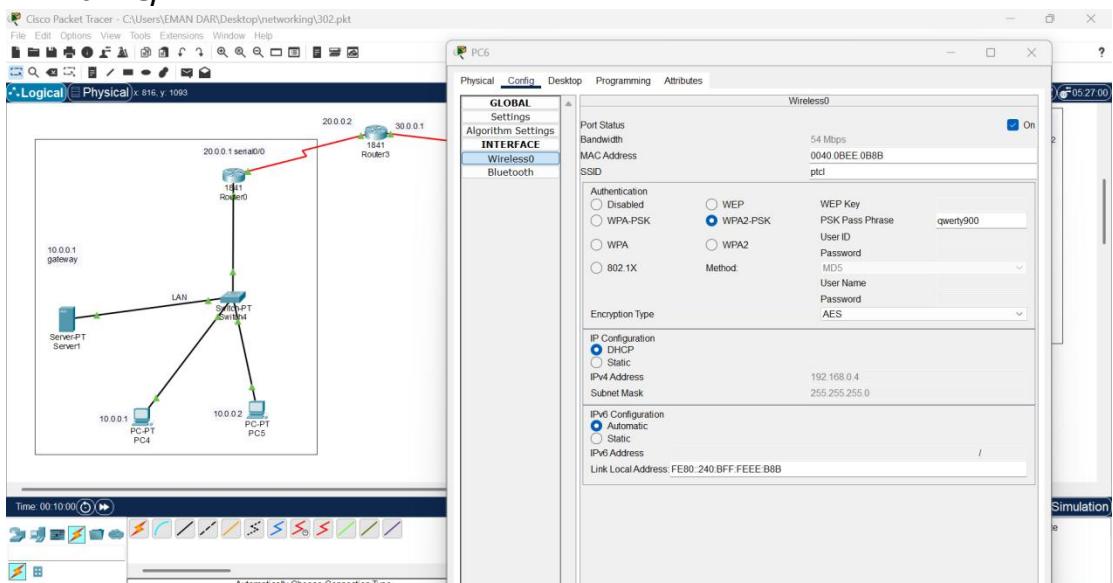
- ❖ Turn on the **port status**, Give an **SSID** to the access point, Set a **WPA2-PSK** password(Alpha-numeric).



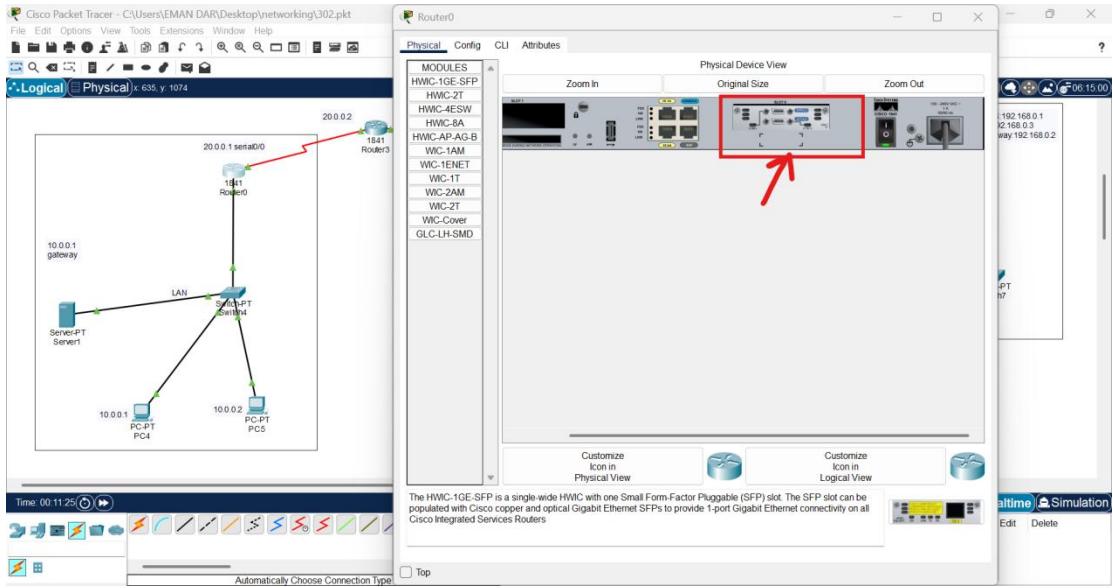
- ❖ **Configure** connected devices by clicking on wireless then assign it all information about access point and also a static IP address.
- ✓ For **Tablet**;



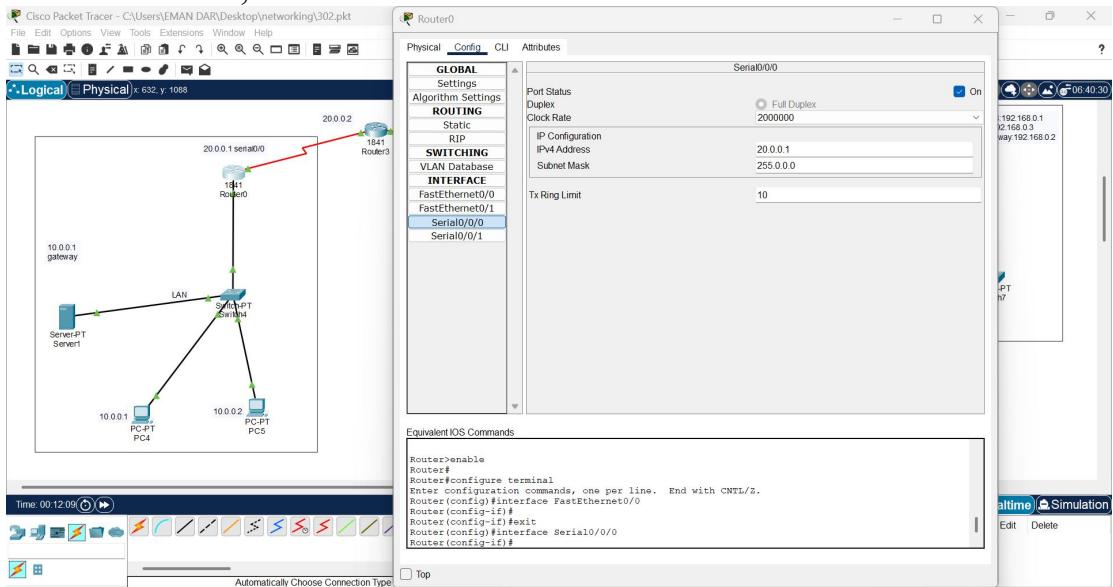
✓ For PCs;



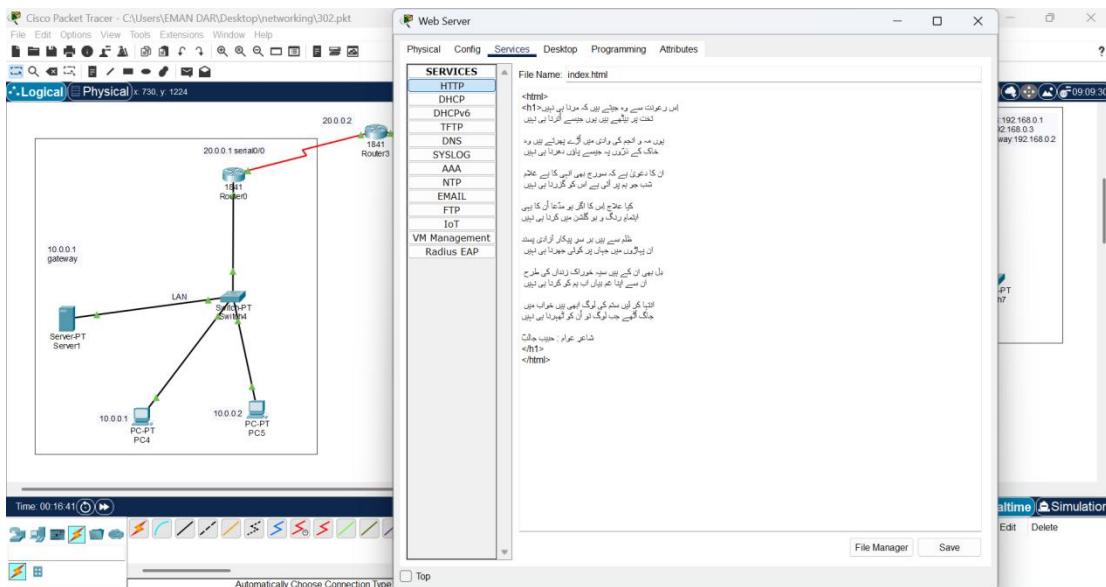
Step 05: For Serial configuration go to Router click on physical and set a HWIC-2T port to connect serial DTE.As;



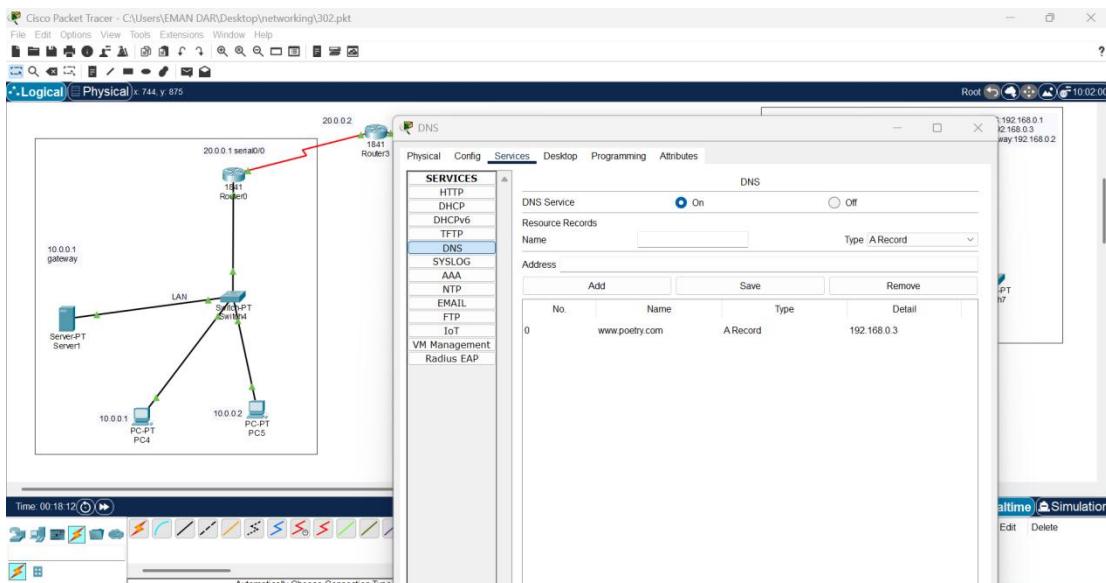
- Now **configure** each **serial port** by assigning IP address according to their networks as;



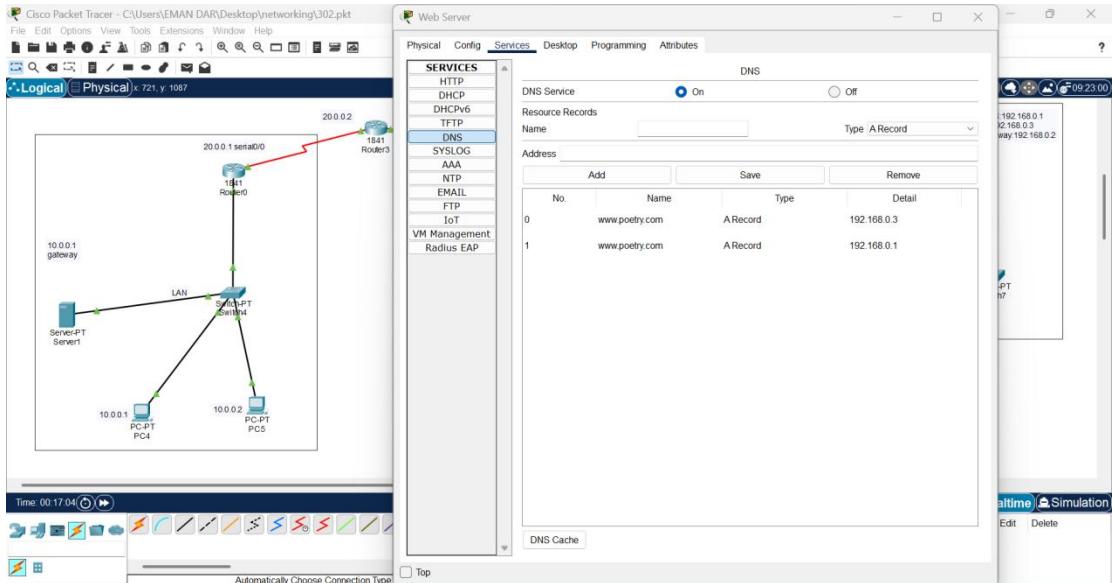
Step 06: Click on **Web Server** and assign **IP address** and sub-net mask, then go to **services (index.HTML)** and click on edit, a **HTML** file will open , edit it as desired and save it , this may ask to overwrite the file so click on yes.



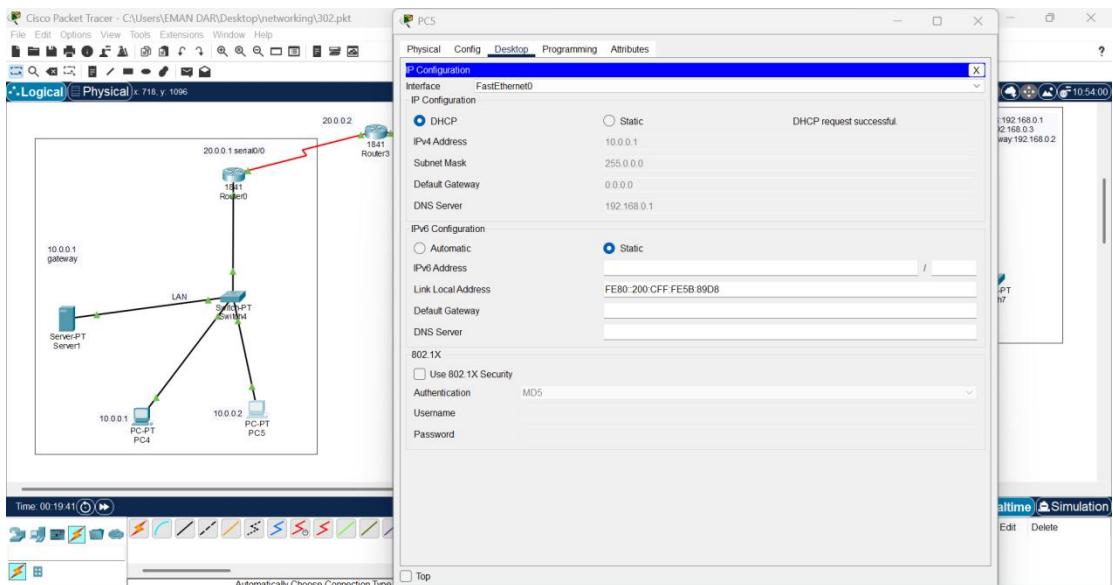
Step 07: Then click on services tab and choose DNS and turn this on (for both servers).As;



Step 08: Name the web site and give it an IP address of the web server where you make a website (HTML documentation) and save it as;

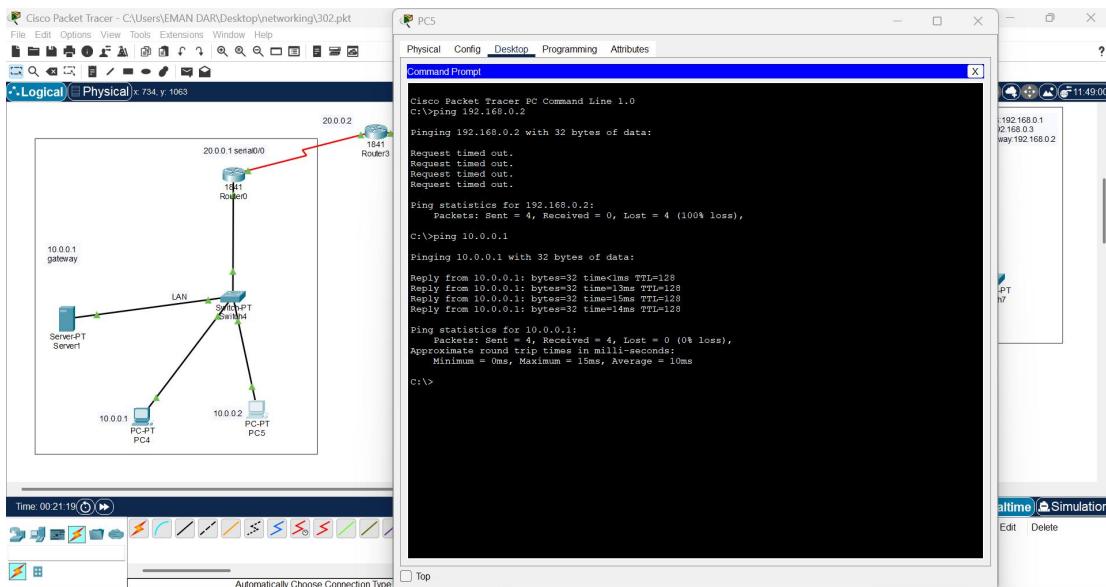


Step 09: Go to each PC click on desktop click on IP configuration and write address of DNS server over here.



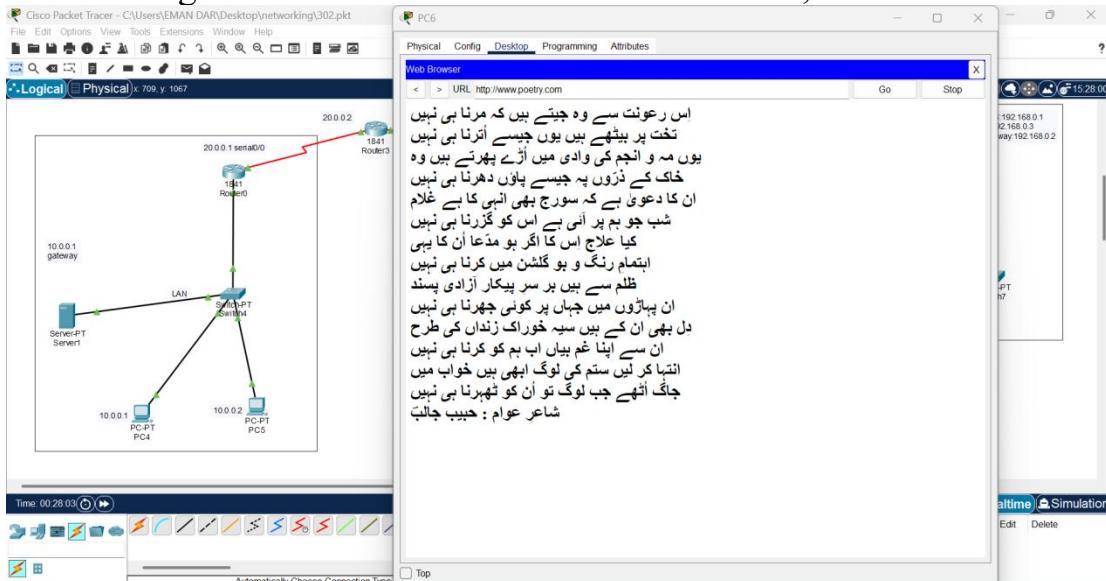
Step 10: Ping your PC as;

2. Click on PC0 go to desktop click on command prompt as;



Step 11: Then go to desktop again and click on web browsing this time and write the name of your very first website in URL box and click on Go the results are here as;

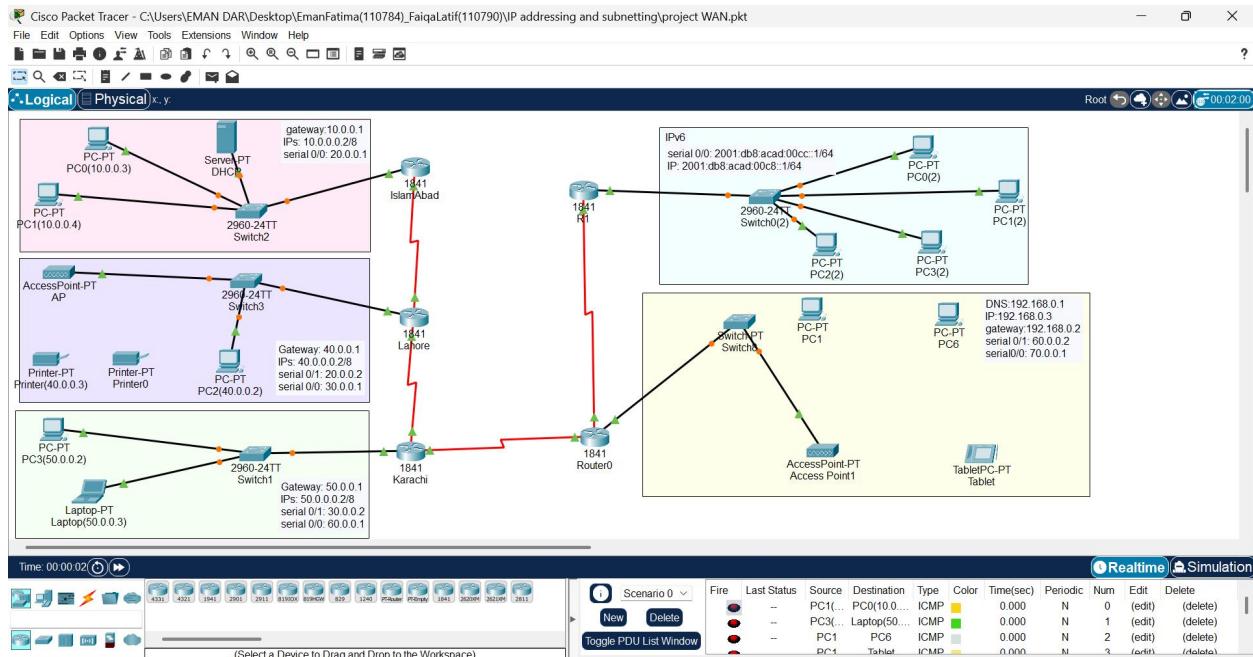
3. Accessing the website from the device named PC6;



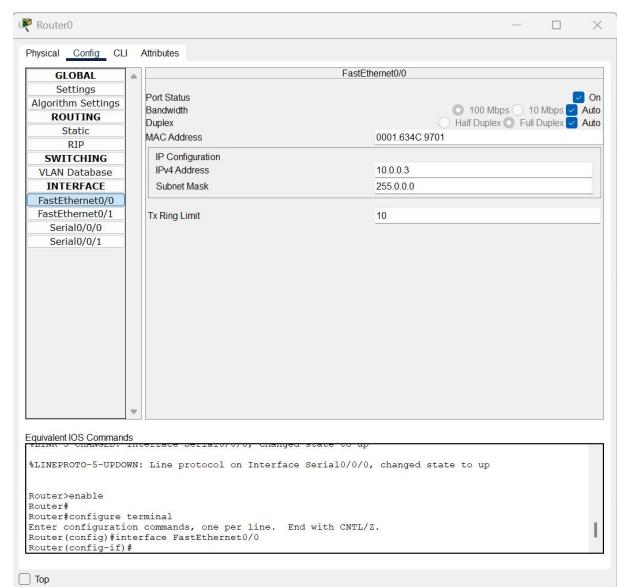
WAN (with 3 LANs simple)

Step 01: Open a Cisco packet tracer, choose a new file and save it with the name **WAN-1**.

Step 02: Take 3 1841-Routers, 3 Switches, 4 PCs, a Laptop ,a Printer , a Web server and a PT-Access point . As;



- ❖ Connect all devices with switches with an Automatic wire.
- ❖ Use copper straight through to connect all network switches with Routers.
- ❖ Use **Serial DTE** to connect all network Routers with each other.
- ❖ **Configure the Routers** connected to each LAN as;



Step 03: Assign IP addresses to each device as mentioned in the above picture. Also assign gateway to each device according to its network.

- ❖ Click on **DHCP server** and assign it an IP address and gateway then click on services and DHCP and turn on its services.
- ❖ Then go to each device in this network and click on **DHCP** which assign an automatic addresses to each device .

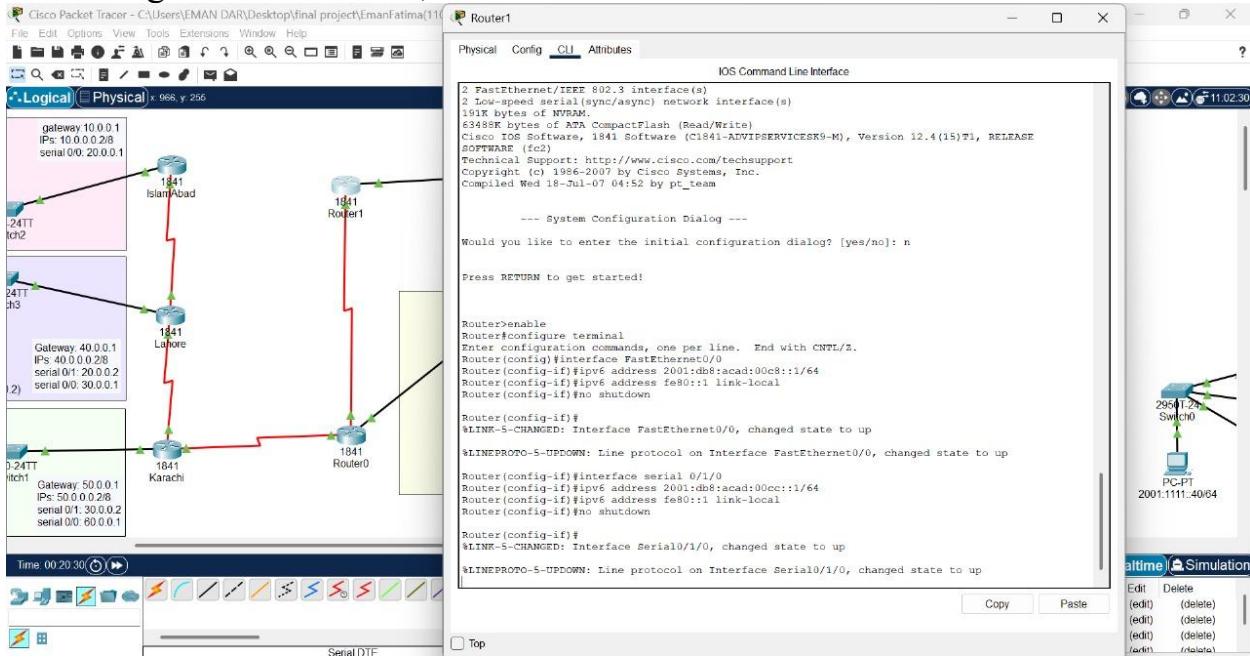
Step 04: Configure Access point as;

- ❖ Turn on the **port status**, Give an **SSID** to the access point, Set a **WEP** password(9-digit).

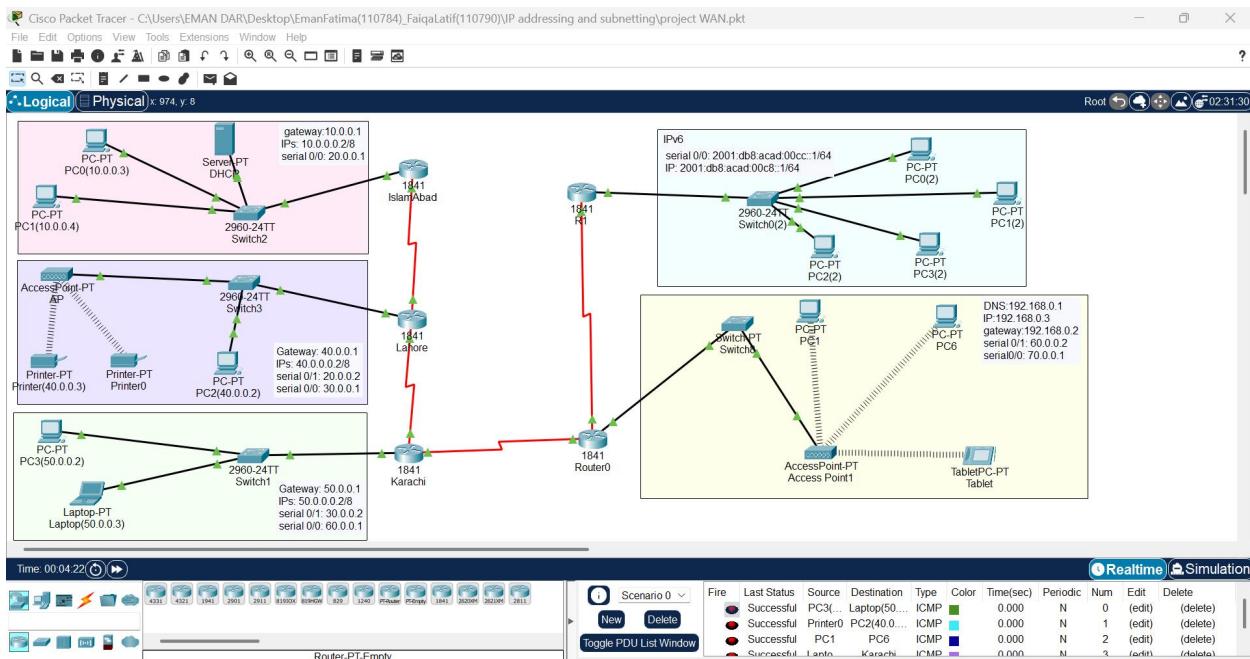
- ❖ **Configure the printer** by clicking on wireless then assign it all information about access point and also a static IP address. As;

Step 05: For Serial configuration go to Router click on physical and set a HWIC-2T port to connect serial DTE.As;

- ❖ Now **configure each serial port** by assigning IP address according to their networks .
- ❖ Configure IPv6 LAN as;



Step 06: Hence connection is verified as ICMP successful.

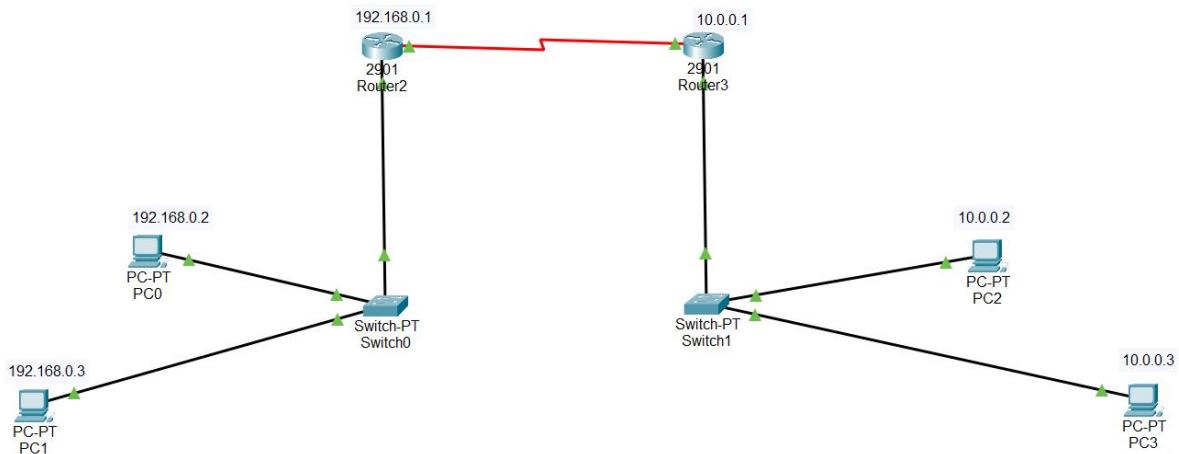


WAN (with 2 LANs)

Step 01: Open a Cisco packet tracer, choose a new file and save it with the name **WAN-1**.

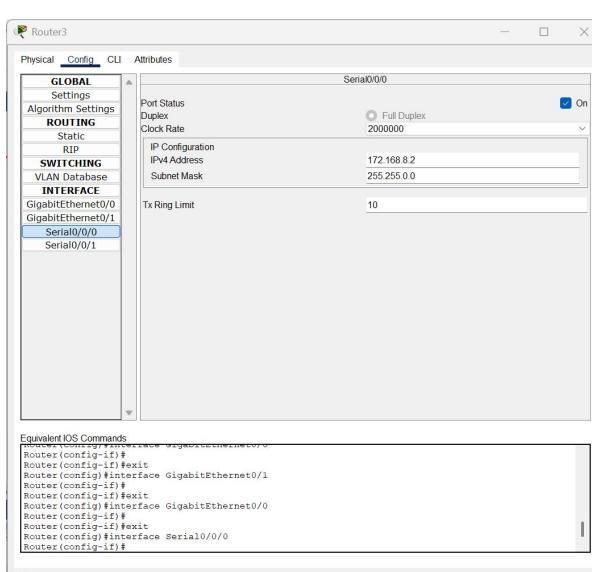
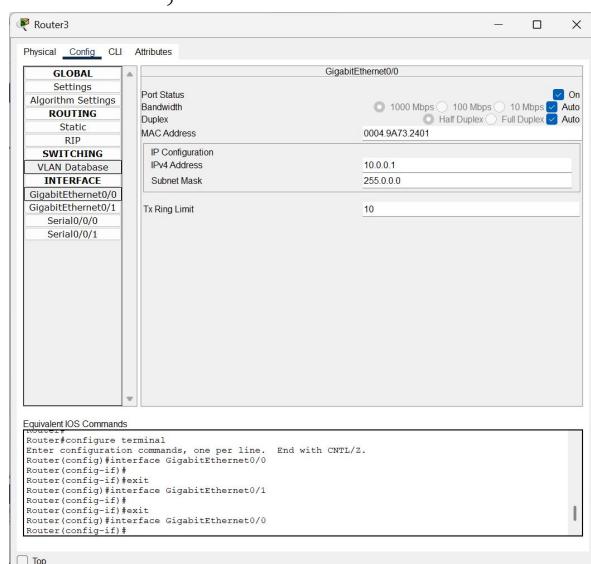
Step 02: Take 2 1841-Routers, 2 Switches, 4 PCs and a PT-Access point . As;

- ✧ Connect all devices with switches with an Automatic wire.
- ✧ Use copper straight through to connect all network switches with Routers.
- ✧ Use **Serial DTE** to connect all network Routers with each other.



- ✧ **Configure the Routers** connected to each LAN as;

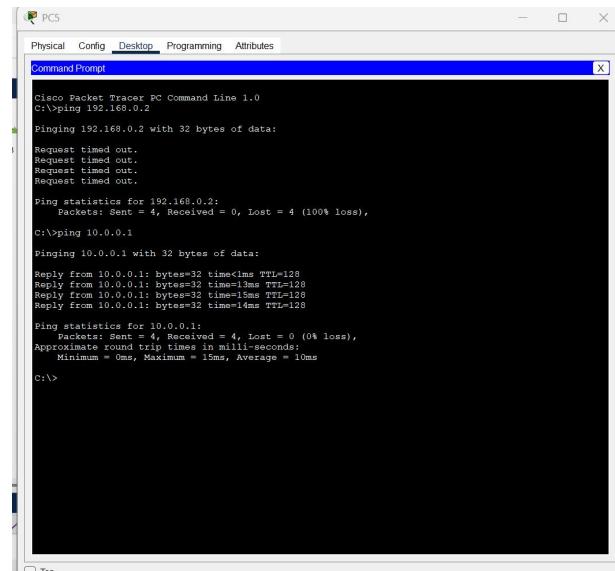
Step 03: Assign IP addresses to each device as mentioned in the above picture. Also assign gateway to each device according to its network.



Step 4: config serial DTE as;

Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 7: Hence ICMP successful.



```
C:\>ping 192.168.0.2

Pinging 192.168.0.2 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>ping 10.0.0.1

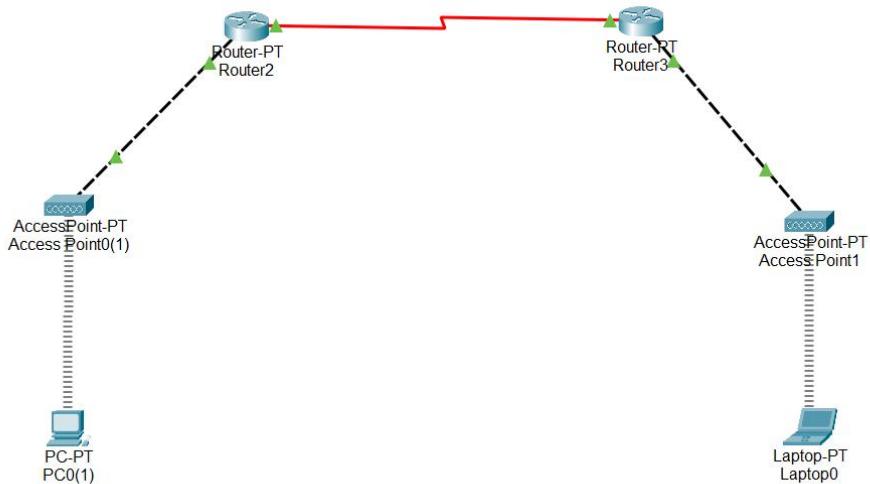
Pinging 10.0.0.1 with 32 bytes of data:
Reply from 10.0.0.1: bytes=32 time<1ms TTL=128
Reply from 10.0.0.1: bytes=32 time=1ms TTL=128
Reply from 10.0.0.1: bytes=32 time=1ms TTL=128
Reply from 10.0.0.1: bytes=32 time=1ms TTL=128

Ping statistics for 10.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 15ms, Average = 10ms
C:\>
```

w-WAN

Step 1: Open Cisco Packet Tracer.

Step 2: Select 2 PCs, a printer ,a 1941 Router and 2 Pt-Access connect both Access points with an Automatic wire.



Step 3: Assign IP address and subnet mask to each device.

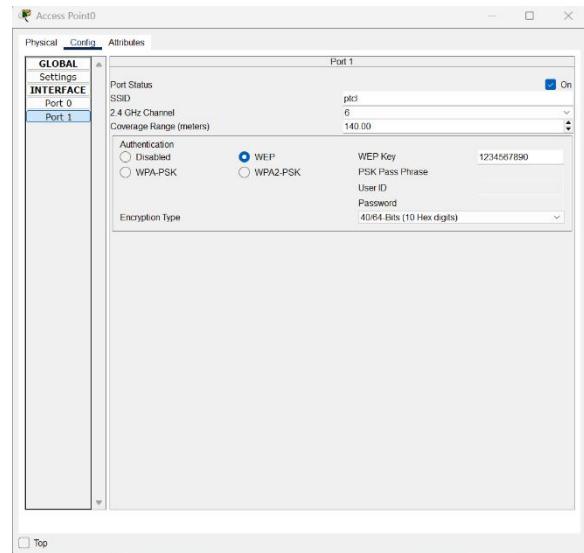
Step 4: Configure both access points with different SSID as;

- Click on access point → port 1.
- Give a **SSID** and set a **WEP password** (numeric digits) for other devices as;

Step 4: Configure the router as;

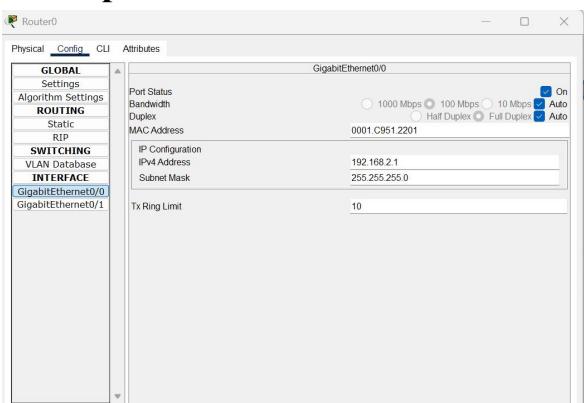
Step 5: Click on each device to assign IP address password for access point as;

- Click on PC → config → wireless0.



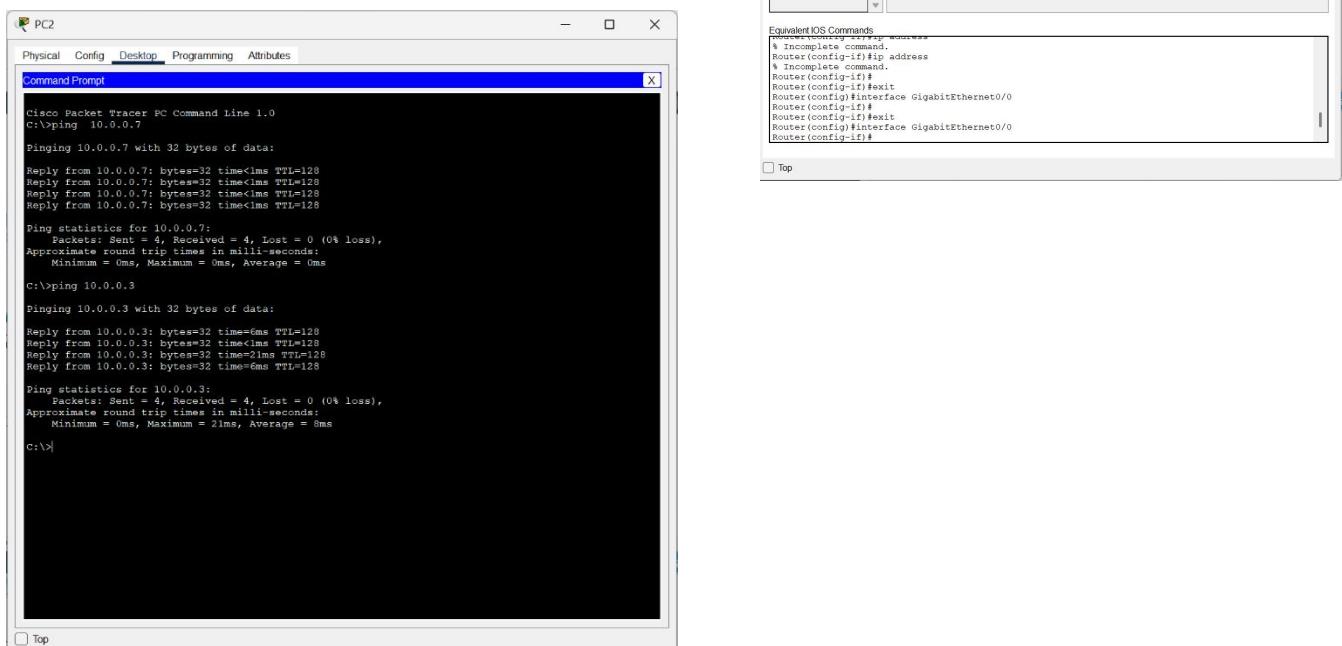
Now set static IP address and give an SSID and **WEP password**

Step 4: Configure the router as;



Step 5: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 6: Hence ICMP successful.



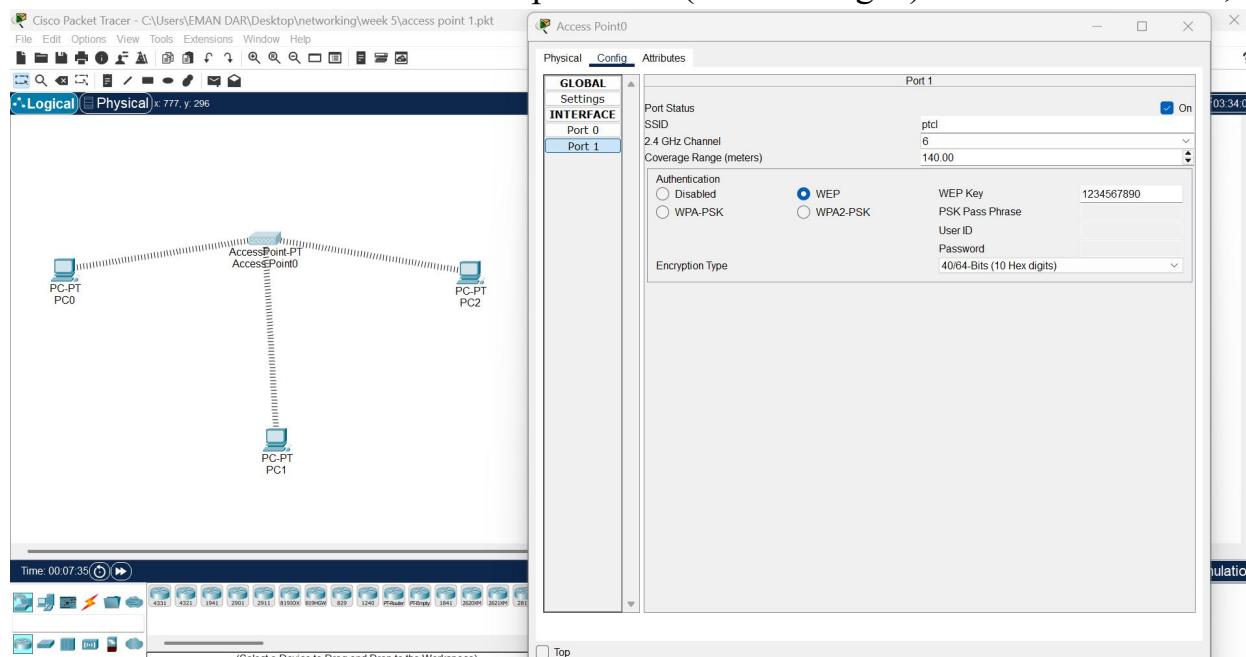
Access point

Step 1: Open Cisco Packet Tracer.

Step 2: Select 3 PCs and a Pt-Access .

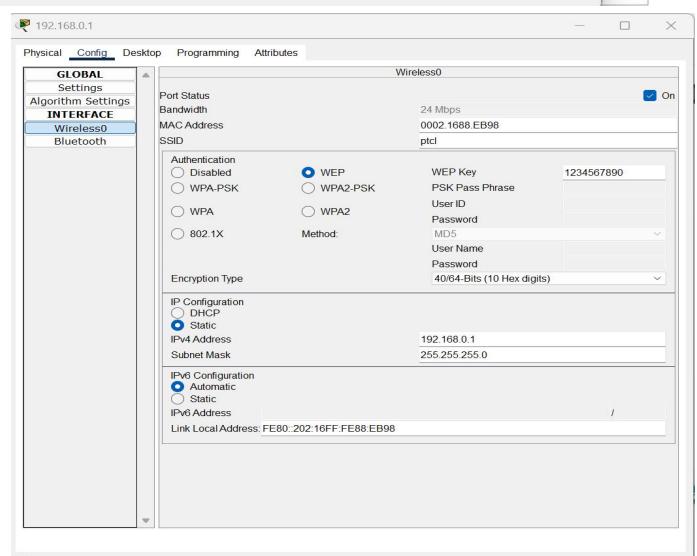
Step 3: Configure the access point as;

- Click on access point → port 1.
- Give a SSID and set a WEP password (numeric digits) for other devices as;



Step 3: Click on each device to assign IP address password for access point as;

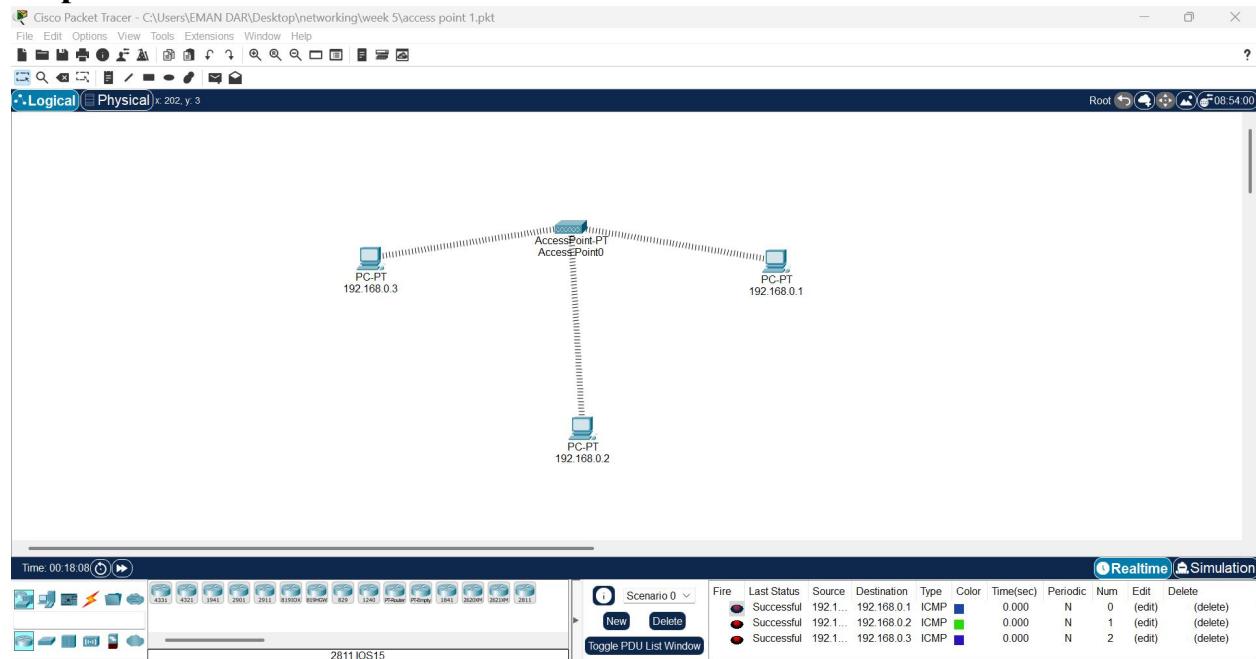
- Click on PC → config → wireless0.
- Now set static IP address and give an SSID and WEP password as;



Step 4: Ping PC0 or PC1 to check whether the connection is successful or not.

```
Ping statistics for 192.168.0.1:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip time in milli-seconds:
    Minimum = 41ms, Maximum = 77ms, Average = 57ms
C:\>ping 192.168.0.2 with 32 bytes of data:
Reply from 192.168.0.2: bytes=32 time=7ms TTL=128
Reply from 192.168.0.2: bytes=32 time=4ms TTL=128
Reply from 192.168.0.2: bytes=32 time=4ms TTL=128
Reply from 192.168.0.2: bytes=32 time=4ms TTL=128
Ping statistics for 192.168.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip time in milli-seconds:
    Minimum = 44ms, Maximum = 76ms, Average = 54ms
C:\>
```

Step 5: Hence ICMP successful.



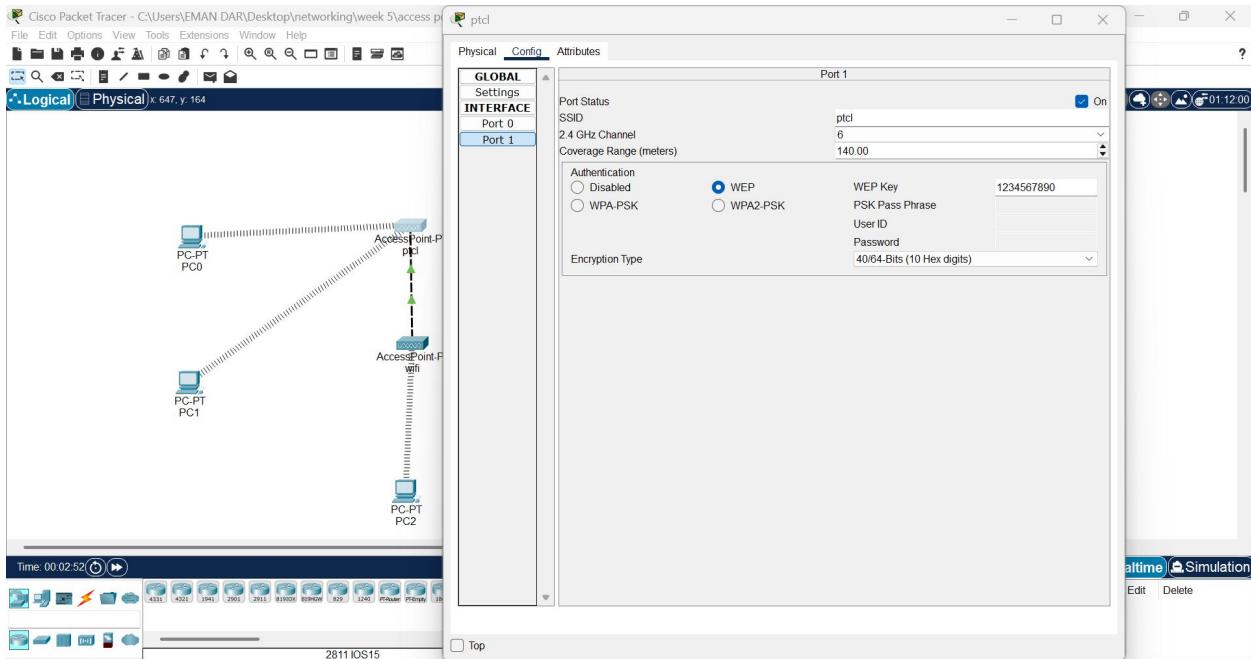
Access point (with 2 AP devices)

Step 1: Open Cisco Packet Tracer.

Step 2: Select 3 PCs, and 2 Pt-Access connect both Access points with an Automatic wire.

Step 3: Configure both access points with different SSID as;

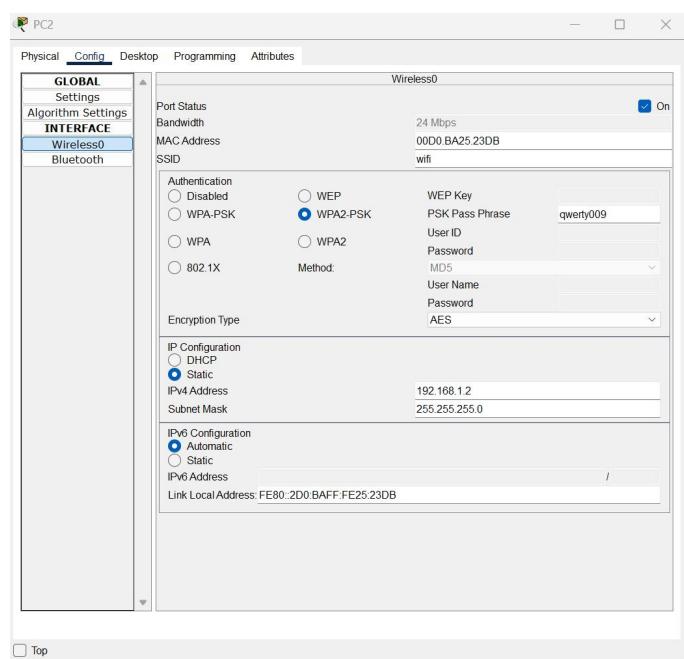
- Click on access point → port 1.
- Give a **SSID** and set a **WEP password** (numeric digits) for other devices as;

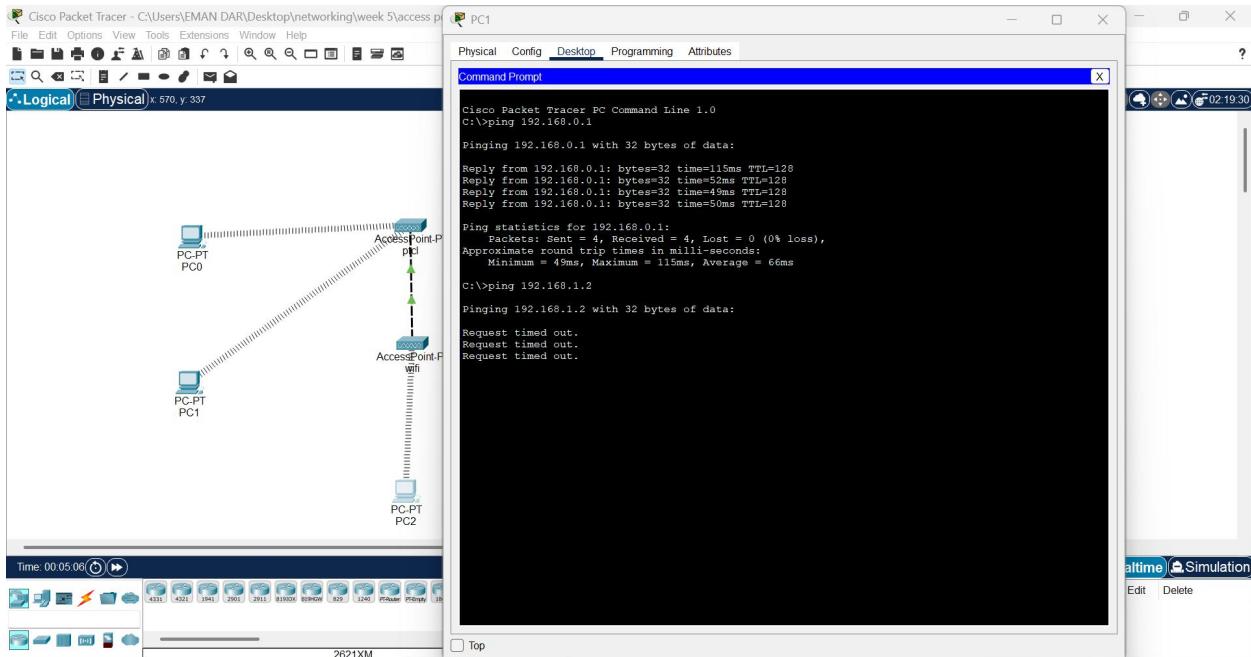


Step 3: Click on each device to assign IP address password for access point as;

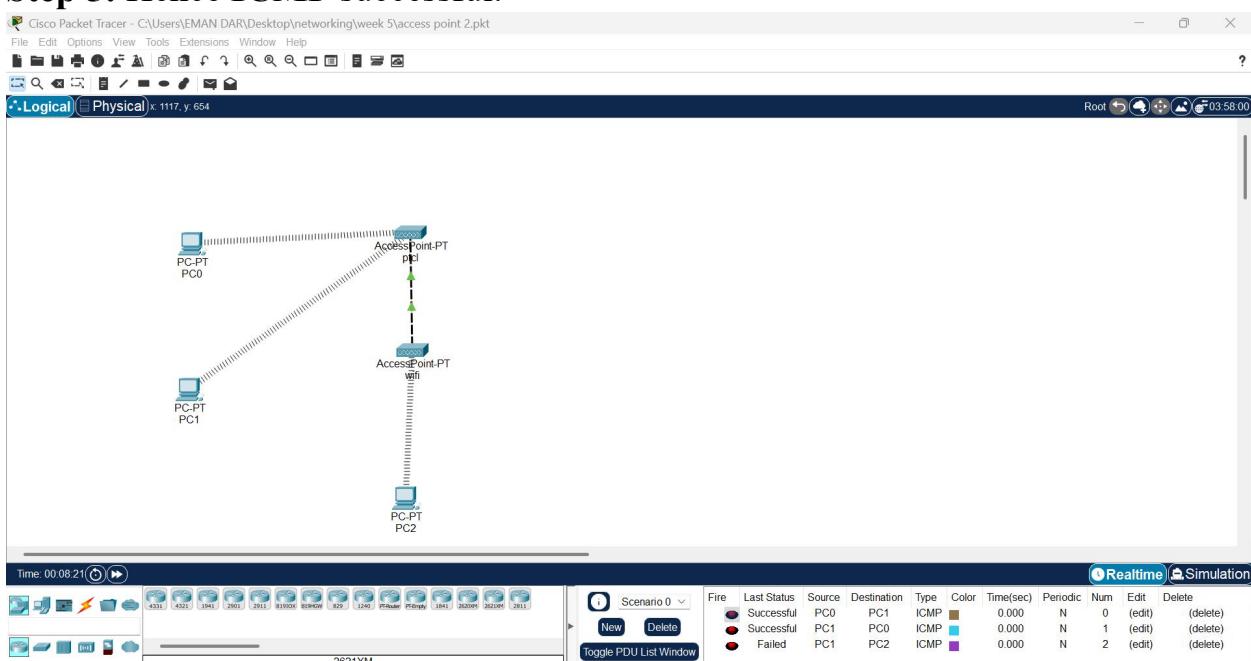
- Click on PC → config → wireless0.
- Now set static IP address and give an SSID and **WEP password** or **WPA2-PSK (Alphanumeric)** as;

Step 4: Ping PC0 or PC1 to check whether the connection is successful or not.





Step 5: Hence ICMP successful.



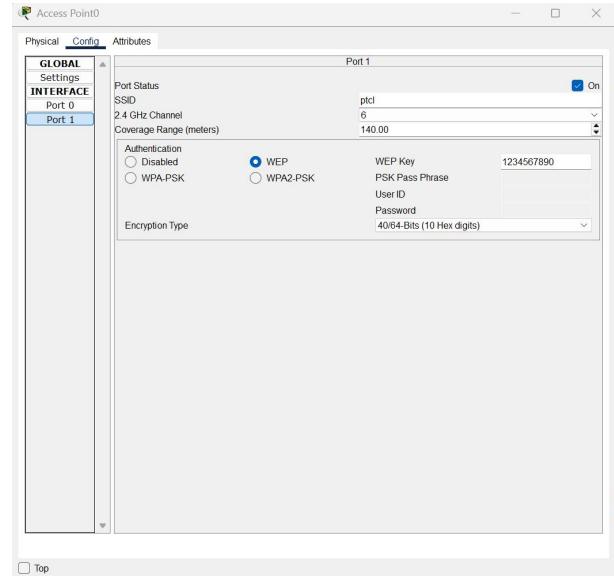
Multiplexing Access point

Step 1: Open Cisco Packet Tracer.

Step 2: Select 2 PCs, a printer ,a 1941 Router and 2 Pt-Access connect both Access points with an Automatic wire.

Step 3: Configure both access points with different SSID as;

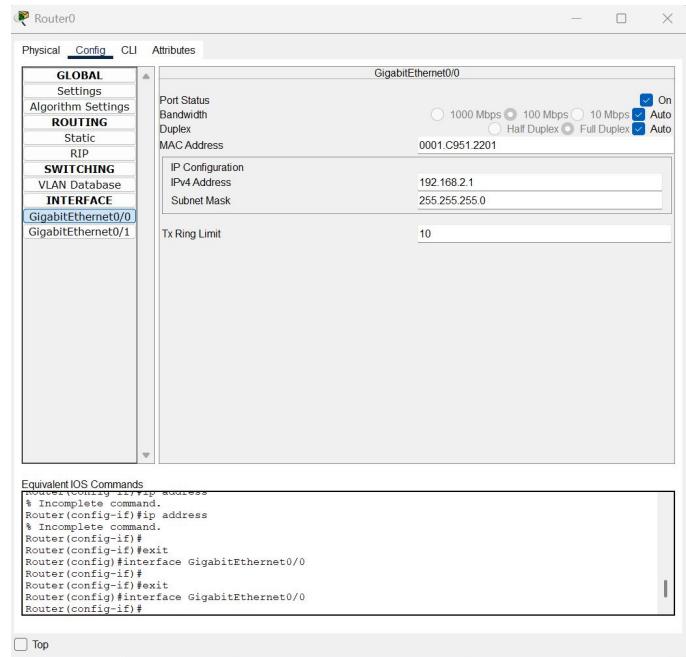
- Click on access point → port 1.
- Give a **SSID** and set a **WEP password** (numeric digits) for other devices as;

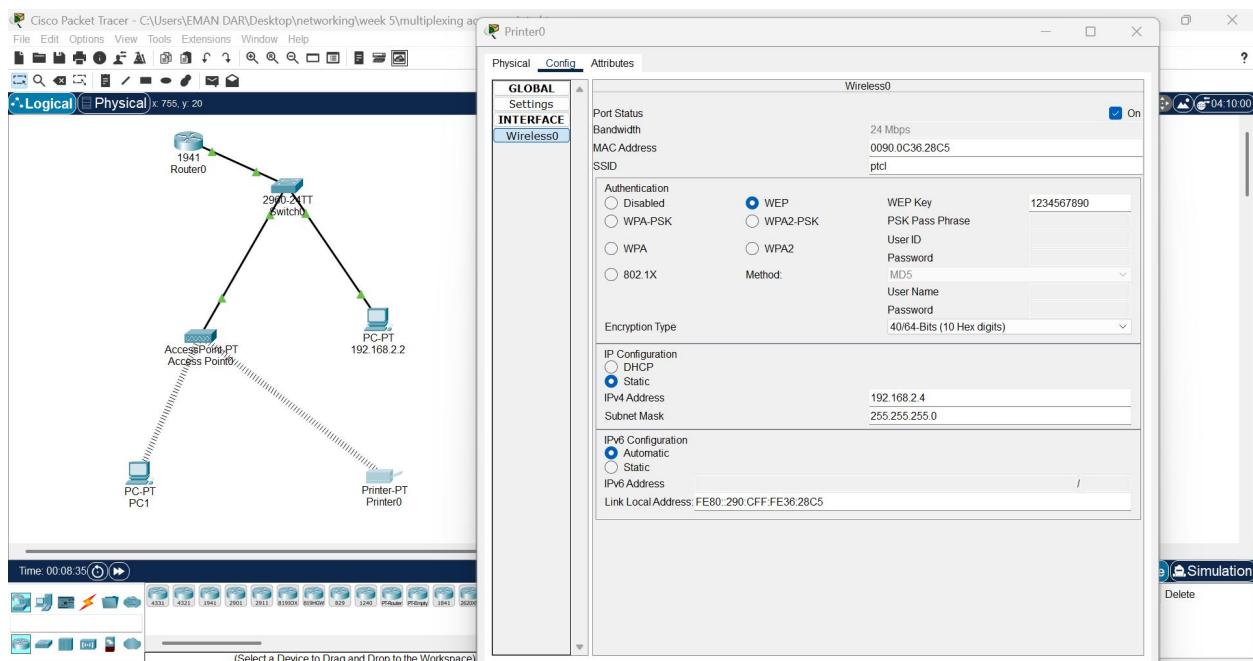


Step 4: Configure the router as;

Step 5: Click on each device to assign IP address password for access point as;

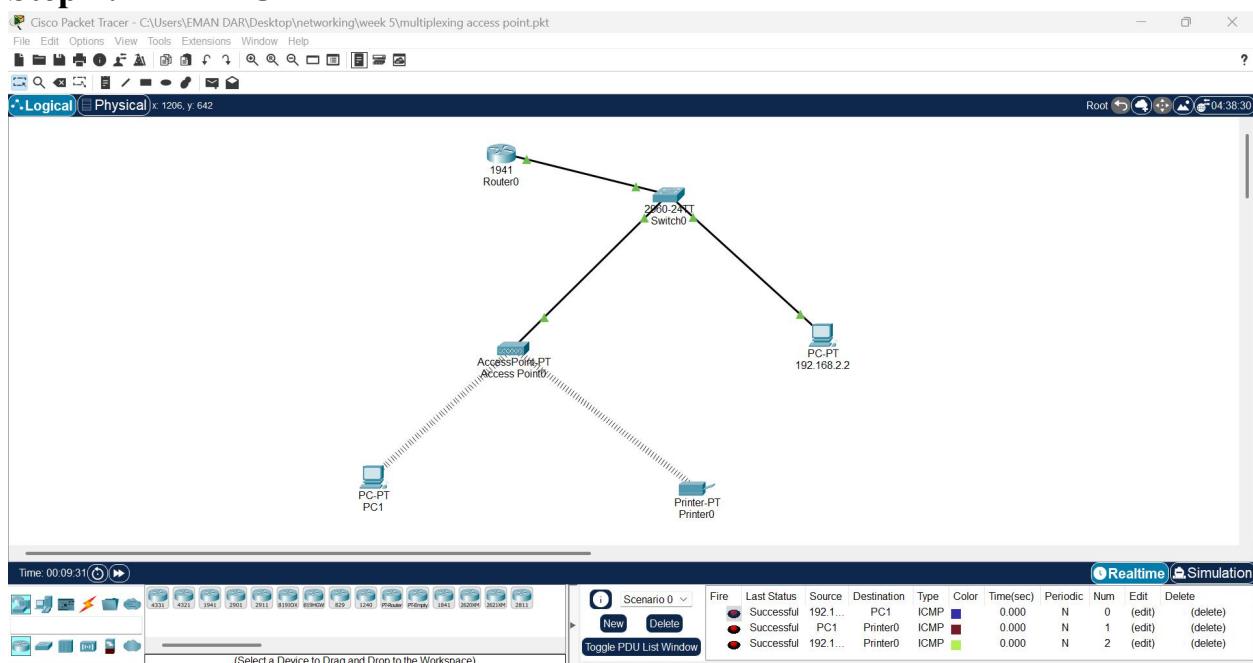
- Click on PC → config → wireless0
- Now set static IP address and give an SSID and **WEP password** as;





Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

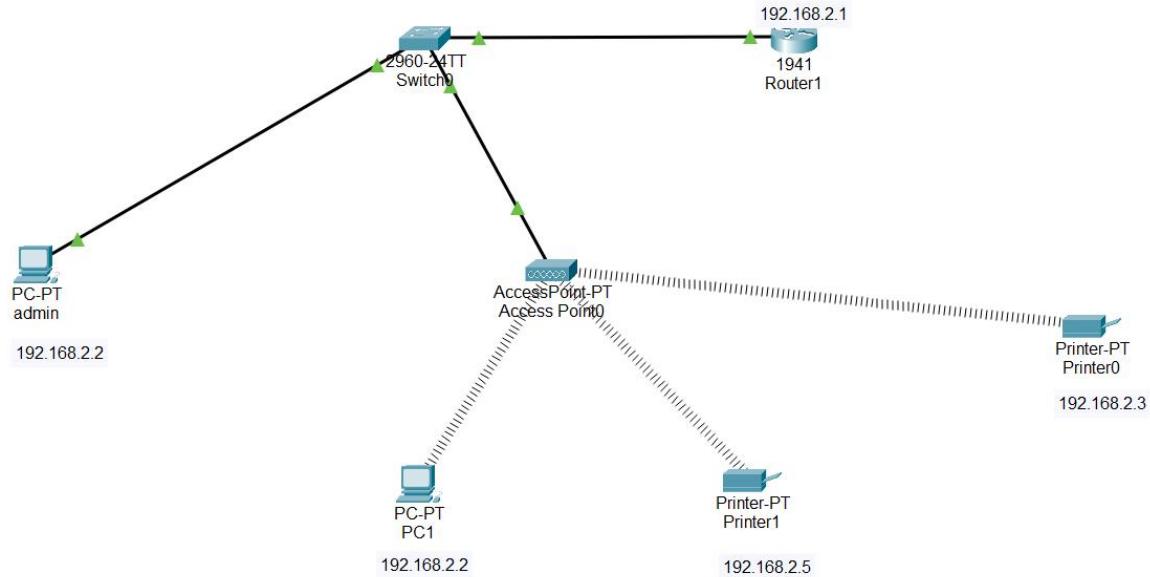
Step 7: Hence ICMP successful.



Wireless Connection

Step 1: Open Cisco Packet Tracer.

Step 2: Select 2 PCs, a printer ,a 1941 Router and 2 Pt-Access connect both Access points with an **Automatic** wire.



Step 3: Configure both access points with different SSID as;

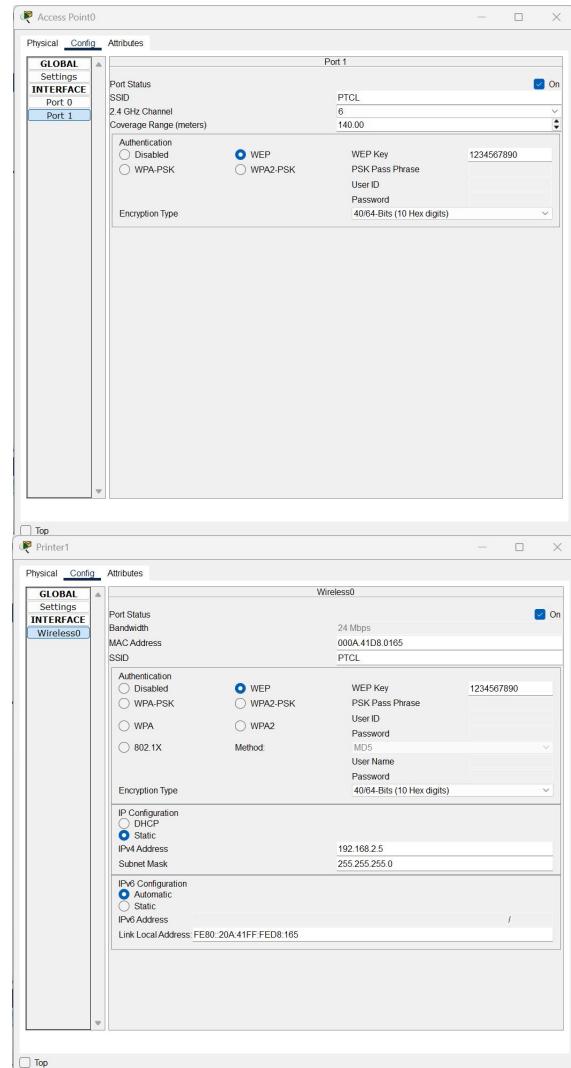
- Click on access point → port 1.
- Give a **SSID** and set a **WEP password** (numeric digits) for other devices as;

Step 4: Configure the router as;

- Switch> enable
- Switch# configure terminal
- S0(config)# interface FastEthernet0/0
- S0(config-ip)#ip addressing
192.168.1.10 255.255.255.0
- S0(config-ip)#no shutdown
- S0(config-ip)#exit

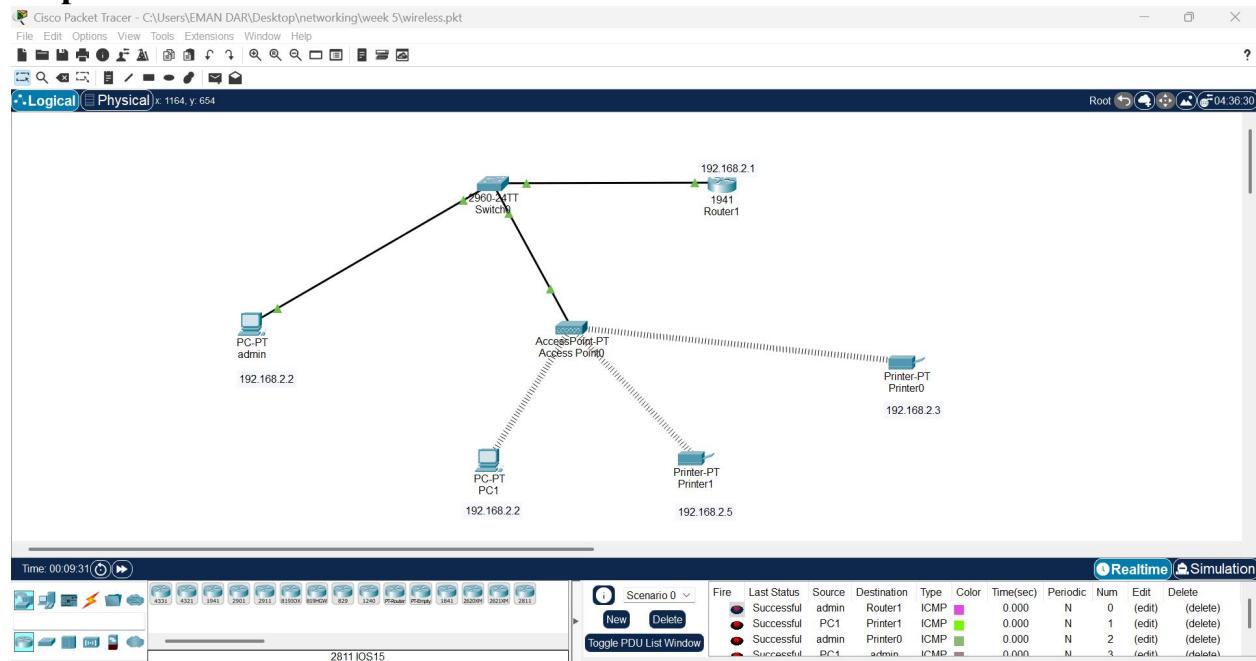
Step 5: Click on each device to assign IP address password for access point as;

- Click on PC → config → wireless0.
- Now set static IP address and give an **SSID** and **WEP password** as;



Step 6: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 7: Hence ICMP successful.



Telnet

Routers:

- **Router 0:** Manages Subnet 1 (192.168.1.0/24) and connects to Switch 0.
- **Router 1:** Acts as the central hub, connecting Subnet 2 (192.168.2.0/24) and providing links to Router 0 and Router 2.
- **Router 2:** Manages Subnet 3 (192.168.3.0/24) and connects to Switch 2.

Switches:

- **Switch 0:** Connects Router 0 to three PCs in Subnet 1.
- **Switch 1:** Connects Router 1 to three PCs in Subnet 2.
- **Switch 2:** Connects Router 2 to three PCs in Subnet 3.

PCs:

Subnet 1 (192.168.1.0/24):

- PC 1: 192.168.1.2
- PC 2: 192.168.1.3
- PC 3: 192.168.1.4

Subnet 2 (192.168.2.0/24):

- PC 4: 192.168.2.2
- PC 5: 192.168.2.3
- PC 6: 192.168.2.4

Subnet 3 (192.168.3.0/24):

- PC 7: 192.168.3.2
- PC 8: 192.168.3.3
- PC 9: 192.168.3.4

Step 2:

Router-to-Router Connections:

- Router 0 to Router 1: Serial interface (10.0.0.0/30)
- Router 1 to Router 2: Serial interface (20.0.0.0/30)

Router-to-Switch Connections:

- Router 0 to Switch 0
- Router 1 to Switch 1
- Router 2 to Switch 2

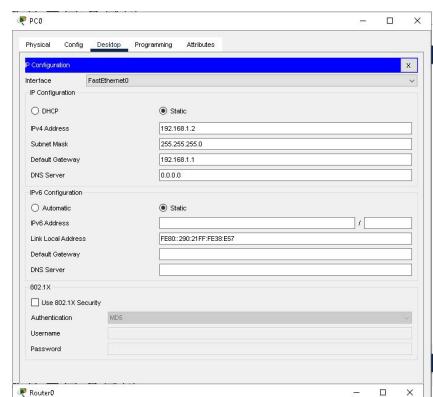
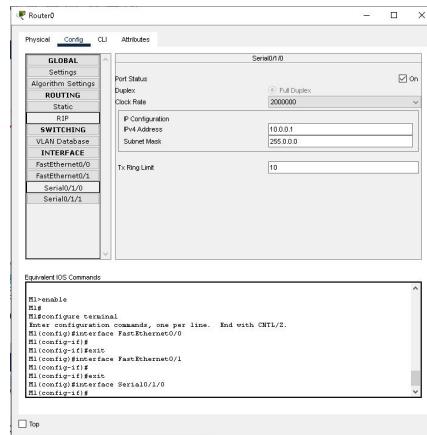
Switch-to-PC Connections:

- Each switch connects to three PCs in its respective subnet.
- **Serial Cables:** Used for connecting routers.
- **Ethernet Cables:** Used for connecting routers to switches and switches to PCs.

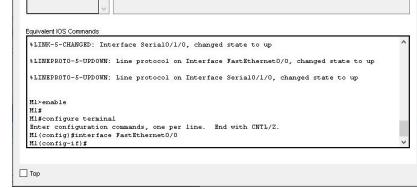
Step 3: Configure Routers

Assign IP Addresses to Router Interfaces:

- Click on the router0
- go to the config tab
- access the gigabit ethernet0/0
- turn on the services
- Put the following details:
 - IP Address: 192.168.1.1
 - Subnet mark: 255.255.255.0



Configure Serial Interfaces:

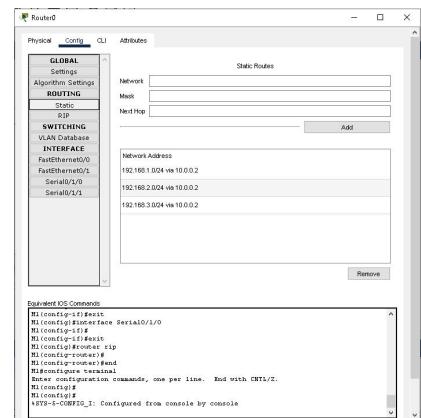


- Click on the router0
- Go to config>serial0/0/0
- Turn on the services
- Put the following details:
 - IP Address: 10.0.0.1
 - Subnet mask: 255.0.0.0

Enable Routing:

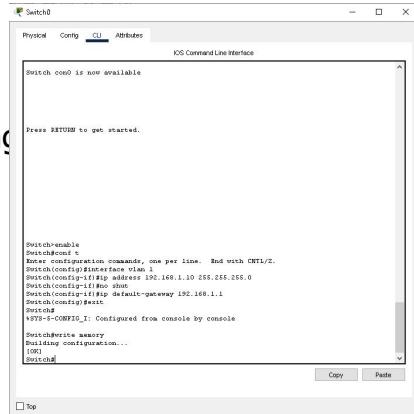
- Click on the Router0
- Go to config>static
- Put the following details:
 - Network: 192.168.1.0
 - Mask: 255.255.255.0
 - Next Hop: 10.0.0.2

(Repeat the same configuration on Router1 and Router2 according to their subnet and IP addressing and serial interface)



Step 4: Configure Switches

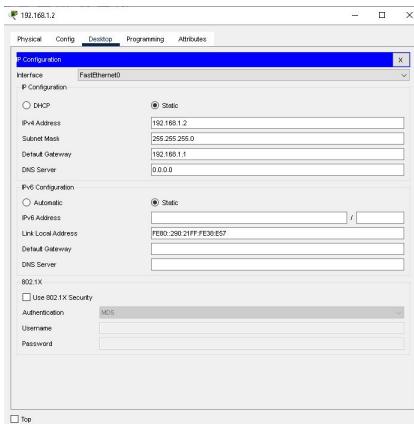
- Basic IP Configuration:
- Access the CLI of each switch and configure basic settings
- Switch> enable
- Switch# configure terminal
- Switch(config)# hostname S0
- S0(config)# interface vlan 1
- S0(config)#ip addressing 192.168.1.10 255.255.255.0
- S0(config)#no shutdown
- S0(config)#exit
- S0#write memory



Step 5: Configure PCs

Assign Static IP Addresses:

On each PC, configure the IP address, subnet mask, and



default gateway according to corresponding subnet.

- Go to desktop>IP cong.
- Put the following:
 - IP Address: 192.168.1.2
 - Subnet Mask: 255.255.255.0
 - Default Gateway: 192.168.1.1

Test Connectivity:

Use the ping command to verify that the PCs can communicate with their gateway.

Step 6: Configure Telnet on Routers

Enable Telnet Access:

- On each router, enable Telnet by setting up a VTY password.
 - Router(config)#hostname R0
 - R0(config)# line vty 0 4
 - R0(config-line)# password telnet123
 - R0(config-line)# login
 - R0(config-line)# exit
 - R0(config)#exit
 - R0(config)#exit
 - R0#write memory

```
Router0
Physical Config CLI Attributes
IOS Command Line Interface

Press RETURN to get started.

Router0>
Router0>enable
Router0#configure terminal
Enter configuration commands, one per line. End with CNTL/D.
Router0(config)#line vty 0 4
Router0(config-line)#password telnet123
Router0(config-line)#login
Router0(config-line)#exit
Router0#exit
Router0>telnet 192.168.1.1
*TELNET-1-CONNECTION: Configured from console by console
Router0#write memory
Router0#writing configuration...
Router0#exit
Router0>
```

```
CiscoPacketTracer> telnet 192.168.1.1
Trying 192.168.1.1 ... Open
CiscoPacketTracer> User Access Verification
password:
Router0>
```

Step 5: Test Network Connectivity

Ping Across Subnets:

- Test connectivity between PCs in different subnets using the ping command.

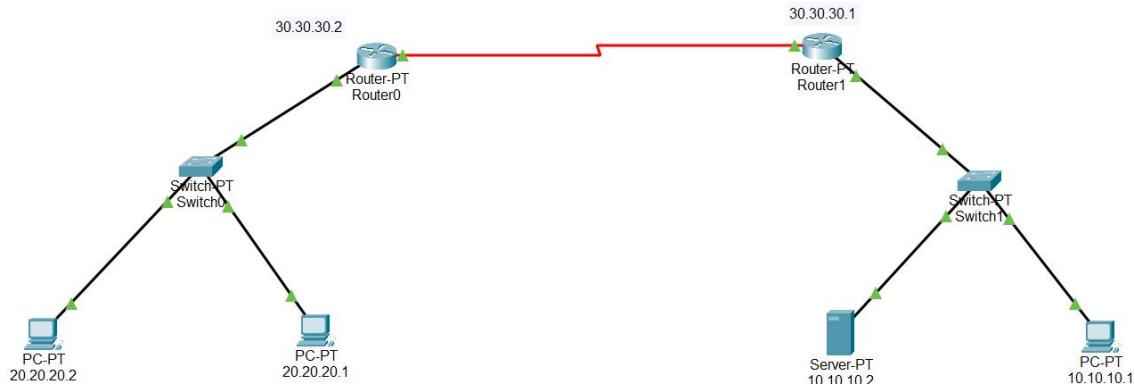
Test Telnet Access:

- From a PC, access a router using Telnet.
 - telnet 192.168.1.1
- Enter the configured Telnet password to access the router's CLI.

NAT

Step 1: Open Cisco Packet Tracer.

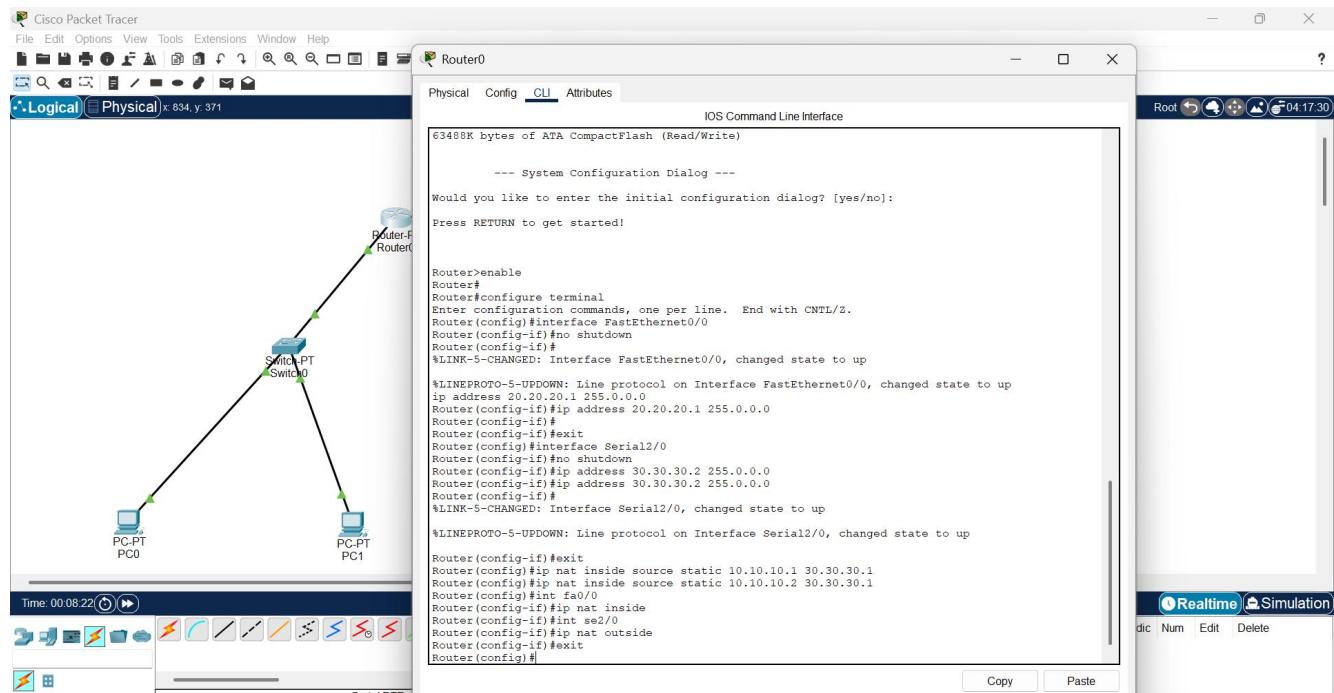
Step 2: Select 2 PCs, a printer ,a 1941 Router and 2 Pt-Access connect both Access points with an Automatic wire.



Step 3: Configure each device and assign IP address with different SSID.

Step 4: Configure the router as;

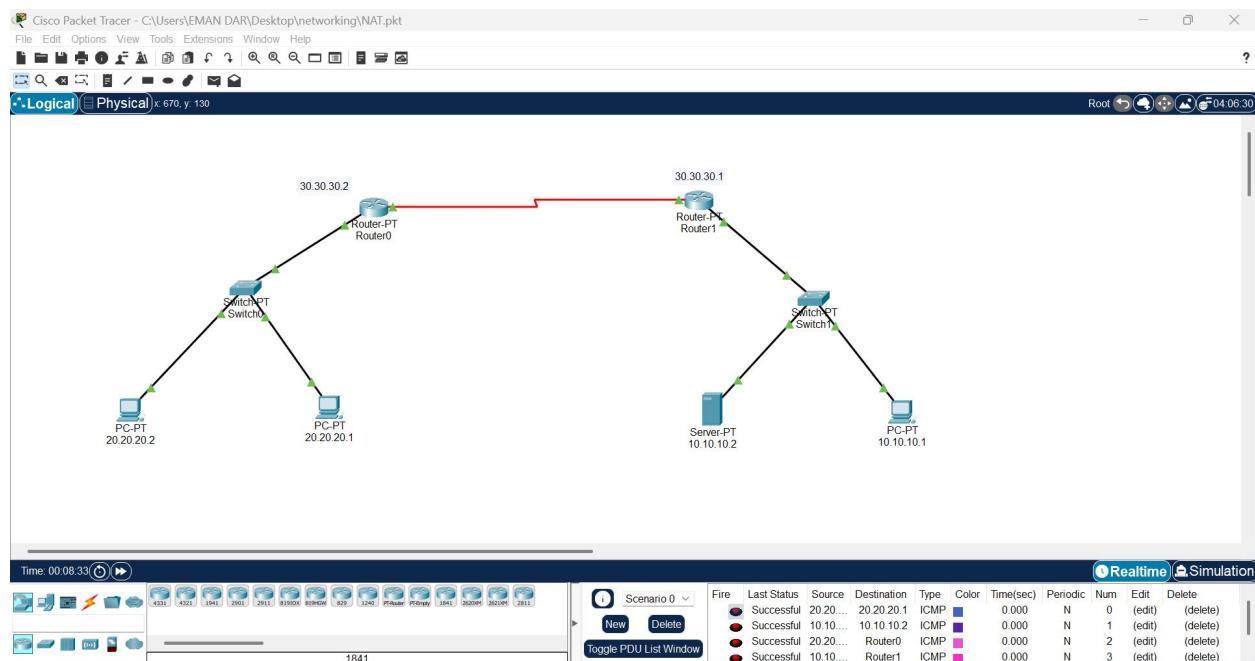
- Switch> enable
 - Switch# configure terminal
 - S0(config)# interface FastEthernet0/0
 - S0(config-ip)#ip addressing 192.168.1.10 255.255.255.0
 - S0(config-ip)#no shutdown
 - S0(config-ip)#exit



- Assign static ip address and next hop from router 1 config.

Step 5: Ping PC0 or PC1 to check whether the connection is successful or not.

Step 7: Hence ICMP successful.



The End