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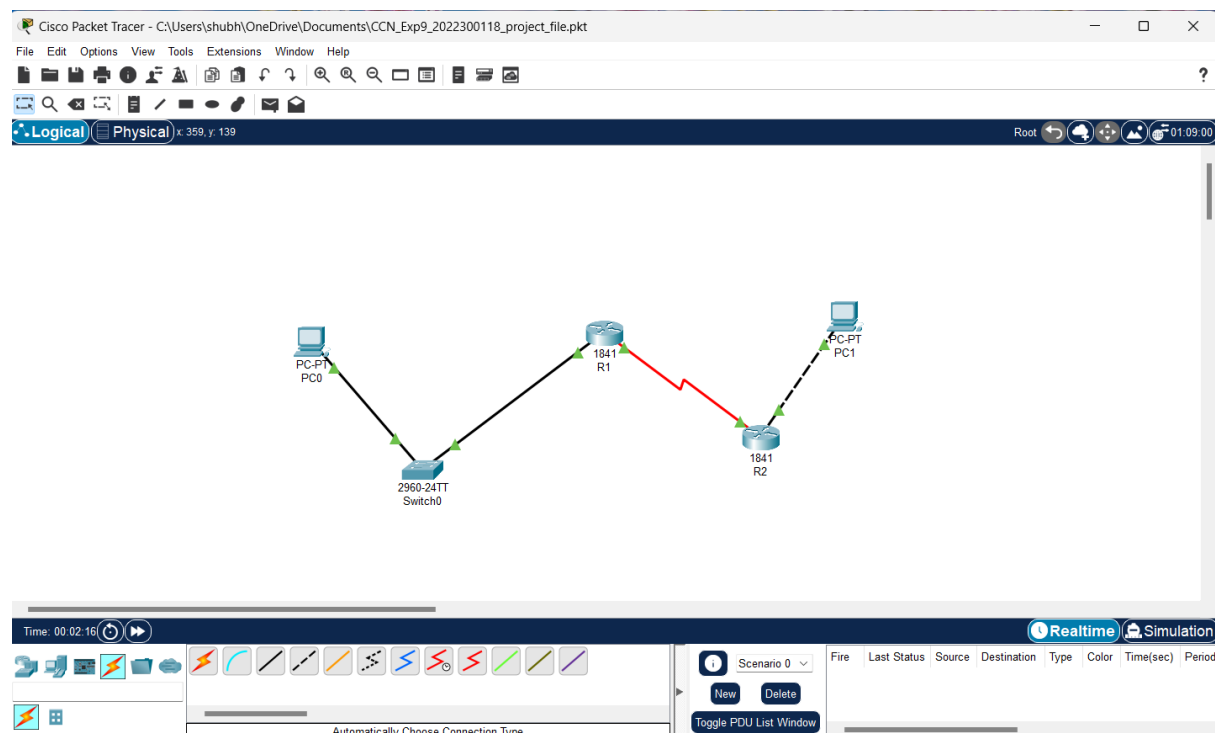
Roll no.: 2022300118

CCN Experiment 9

Cisco Packet Tracer

Aim: To use Cisco Packet Tracer

Topology diagram:



Task 1: Subnet the address space

Step 1: Examine the network requirements.

Address space : 192.168.1.0/24

The network consists of the following segments:

- The network connected to router R1 will require enough IP addresses to support 15 hosts.
- The network connected to router R2 will require enough IP addresses to support 30 hosts.
- The link between router R1 and router R2 will require IP addresses at each end of the link.

Step 2:

- a. How many subnets are needed for this network?
 - 3 Subnets are required for this network
- b. What is the subnet mask for this network in dotted decimal format?
 - 255.255.255.224 is the subnet mask
- c. What is the subnet mask for the network in slash format?
 - /27 is the subnet mask in slash format for this address.
- d. How many usable hosts are there per subnet?
 - 30 usable hosts are there per subnet

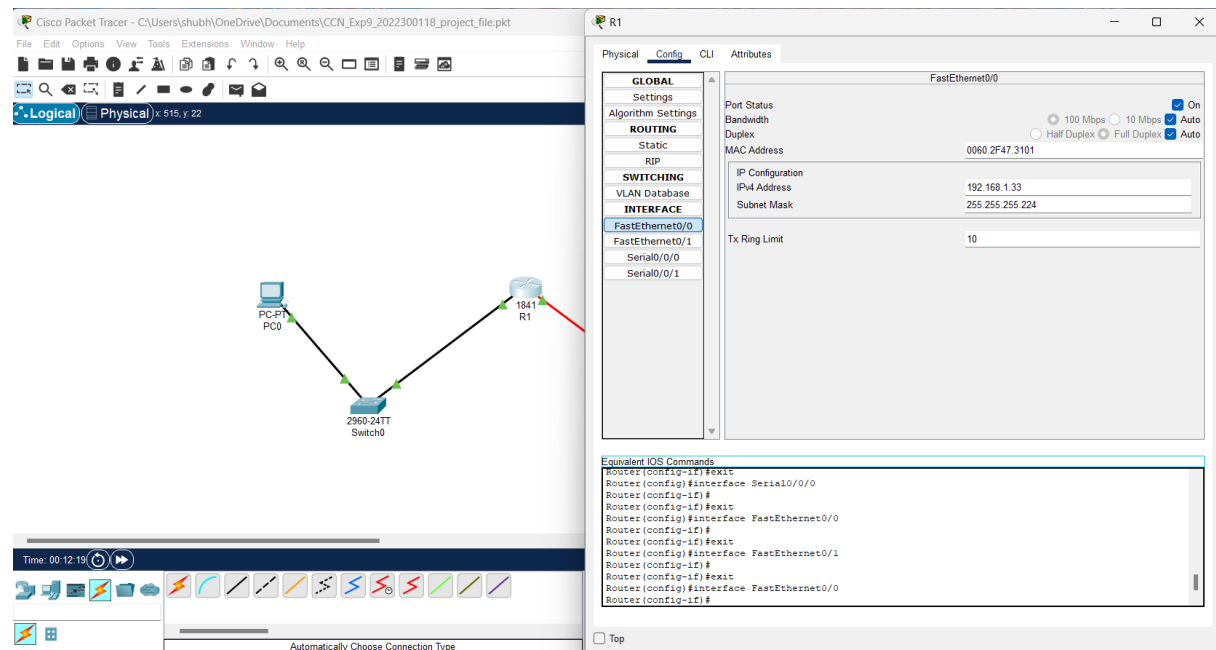
Step 3: Assign subnetwork addresses to the Topology Diagram.

- Assign subnet 1 to the network attached to R1 – 192.168.1.32/27
- Assign subnet 2 to the link between R1 and R2 – 192.168.1.64/27
- Assign subnet 3 to the network attached to R2 – 192.168.1.96/27

Task 2-3: Determine Interface Addresses and configure serial and FastEthernet interfaces of routers and PCs.

Step 1: Assign appropriate addresses to the device interfaces.

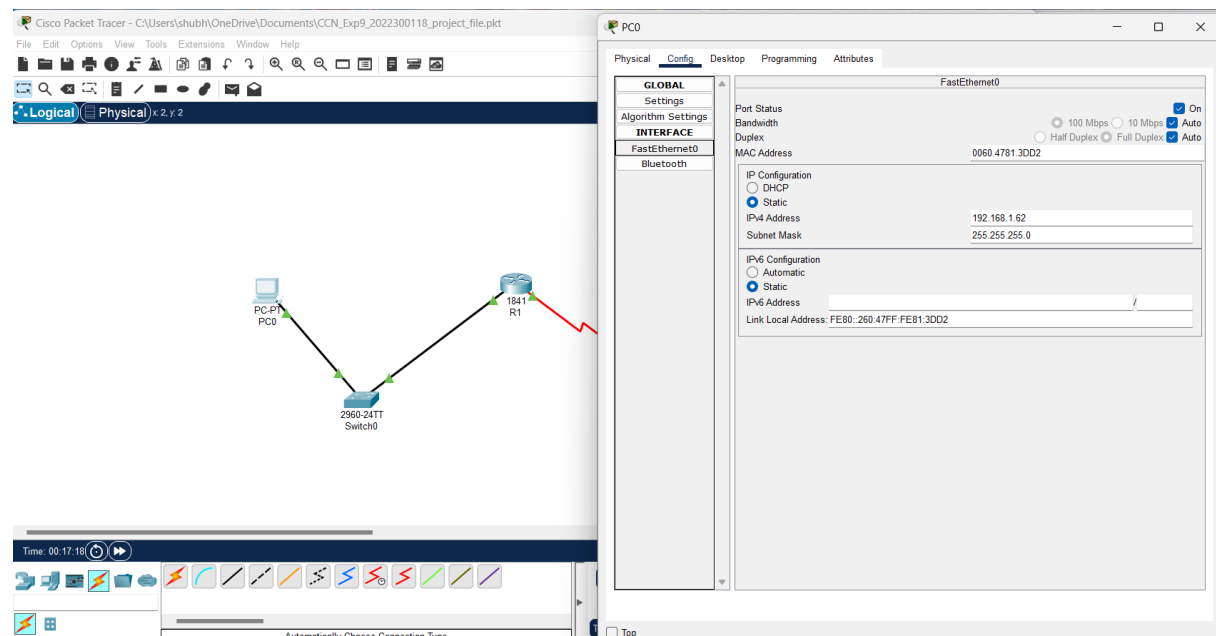
1. Assign the first valid host address in subnet 1 to the LAN interface on R1 i.e., 192.168.1.33



The screenshot shows the Cisco Packet Tracer interface. The main workspace displays a network diagram with PC0 connected to Switch0, which is connected to R1. The right-hand pane shows the configuration for R1's FastEthernet0/0 interface, with IP address 192.168.1.33 and subnet mask 255.255.255.224. The bottom pane shows the equivalent IOS commands.

```
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.1.33 255.255.255.224
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#end
```

2. Assign the last valid host address in subnet 1 to PC1 i.e., 192.168.1.62



The screenshot shows the Cisco Packet Tracer interface. The main workspace displays the same network diagram as the previous screenshot. The right-hand pane shows the configuration for PC0's FastEthernet0 interface, with IP address 192.168.1.62 and subnet mask 255.255.255.0. The bottom pane shows the equivalent IOS commands.

```
PC0(config)#interface FastEthernet0
PC0(config-if)#ip address 192.168.1.62 255.255.255.0
PC0(config-if)#no shutdown
PC0(config-if)#exit
PC0(config)#end
```

3. Assign the first valid host address in subnet 2 to the WAN interface on R1 i.e., 192.168.1.65

The screenshot shows the Cisco Packet Tracer interface with the configuration window for R1 open. The configuration window displays the configuration for Serial0/0/0, including the IP address 192.168.1.65 and the subnet mask 255.255.255.224. The configuration window also shows the equivalent IOS commands.

```
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config)#interface Serial0/0/1
Router(config-if)#
```

4. Assign the last valid host address in subnet 2 to the WAN interface on R2 i.e., 192.168.1.94

The screenshot shows the Cisco Packet Tracer interface with the configuration window for R2 open. The configuration window displays the configuration for Serial0/0/0, including the IP address 192.168.1.94 and the subnet mask 255.255.255.224. The configuration window also shows the equivalent IOS commands.

```
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config)#interface Serial0/0/1
Router(config-if)#
```

5. Assign the first valid host address in subnet 3 to the LAN interface of R2 i.e., 192.168.1.97

The image shows a Cisco Packet Tracer network diagram and the configuration window for router R2. The network diagram features a central 2960-24TT Switch connected to two PCs (PC1 and PC2) and two routers (R1 and R2). R1 is connected to the switch and R2. R2 is connected to the switch and R1. The configuration window for R2 shows the FastEthernet0/0 interface configured with the IP address 192.168.1.97 and subnet mask 255.255.255.224. The configuration window also shows the Equivalent IOS Commands section with the following commands:

```
Router#  
Router>configure terminal  
Router(config)#interface Serial0/0/0  
Router(config-if)#exit  
Router(config)#interface FastEthernet0/1  
Router(config-if)#  
Router(config-if)#exit  
Router(config)#interface FastEthernet0/0  
Router(config-if)#
```

6. Assign the last valid host address in subnet 3 to PC2 i.e., 192.168.1.126

The image shows a Cisco Packet Tracer network diagram and the configuration window for PC1. The network diagram is identical to the one in the previous image. The configuration window for PC1 shows the FastEthernet0 interface configured with the IP address 192.168.1.126 and subnet mask 255.255.255.224. The configuration window also shows the IPv6 Configuration section with the Link Local Address FE80::2E0:F7FF:FE9E:1E54.

Step 2: Document the addresses to be used in the table provide under the Topology Diagram.

Addressing table :

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	Fa0/0	192.168.1.33	255.255.255.224	N/A
	S0/0/0	192.168.1.65	255.255.255.224	N/A
R2	Fa0/0	192.168.1.97	255.255.255.224	N/A
	S0/0/0	192.168.1.94	255.255.255.224	N/A
PC1	NIC	192.168.1.62	255.255.255.224	192.168.1.33
PC2	NIC	192.168.1.126	255.255.255.224	192.168.1.97

Task 4: Verify the Configurations.

Answer the following questions to verify that the network is operating as expected.

1. From the host attached to R1, is it possible to ping the default gateway?

- Yes

The screenshot displays the Cisco Packet Tracer interface. On the left, the network topology is visible, showing a PC (PC0) connected to a switch (2960-24TT Switch0), which is connected to a router (R1). The router R1 is labeled with '1841'. On the right, a command prompt window is open, showing the output of a ping command. The command prompt is titled 'Cisco Packet Tracer PC Command Line 1.0' and shows the command 'C:\>ping 192.168.1.33'. The output indicates that the ping was successful, with 4 packets sent and 4 received, resulting in 0% loss. The approximate round trip times in milliseconds are shown as Minimum = 0ms, Maximum = 5ms, and Average = 1ms.

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.33

Pinging 192.168.1.33 with 32 bytes of data:

Reply from 192.168.1.33: bytes=32 time<1ms TTL=255
Reply from 192.168.1.33: bytes=32 time<1ms TTL=255
Reply from 192.168.1.33: bytes=32 time<1ms TTL=255
Reply from 192.168.1.33: bytes=32 time<1ms TTL=255

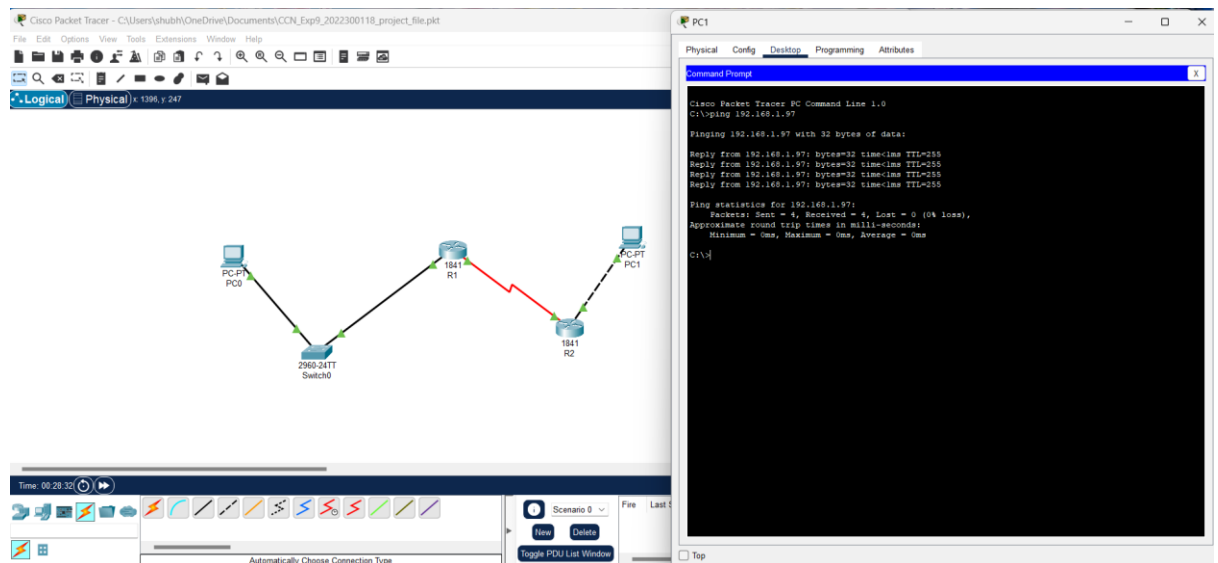
Ping statistics for 192.168.1.33:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 1ms

C:\>

```

2. From the host attached to R2, is it possible to ping the default gateway?

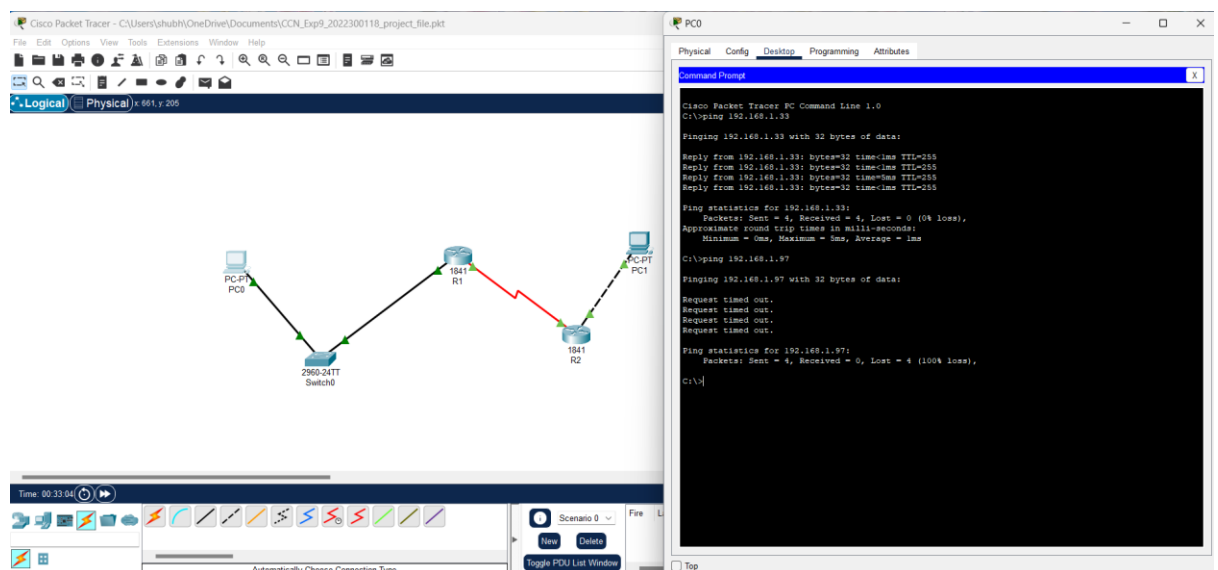
- Yes

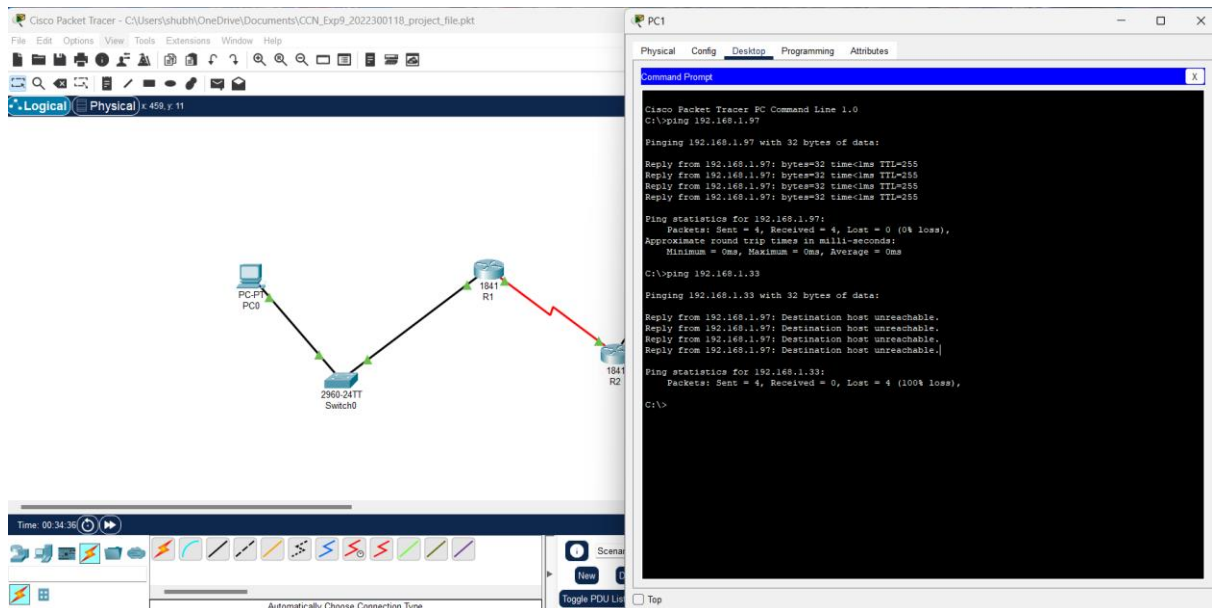


Task 5: Reflection

1. Are there any devices on the network that cannot ping each other?

- Yes





We cannot ping the other default gateway from PC0 or PC1

2. What is missing from the network that is preventing communication between these devices?
 - It is because the 2 devices belong to two different LANs, and the routing table does not have paths between them.

Conclusion:

Cisco Packet Tracer is an excellent tool for simulating and testing network configurations. It allows network engineers to experiment with various network topologies, protocols, and configurations without the need for expensive physical hardware.

Through this experiment, we learnt how to create a network topology, configure various devices, and test the connectivity between them, and also how to use network troubleshooting commands like ping using the console feature in the software.