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Experiment: 13

## DESIGN A SIMPLE TOPOLOGY USING CISCO PACKET TRACER

### AIM:

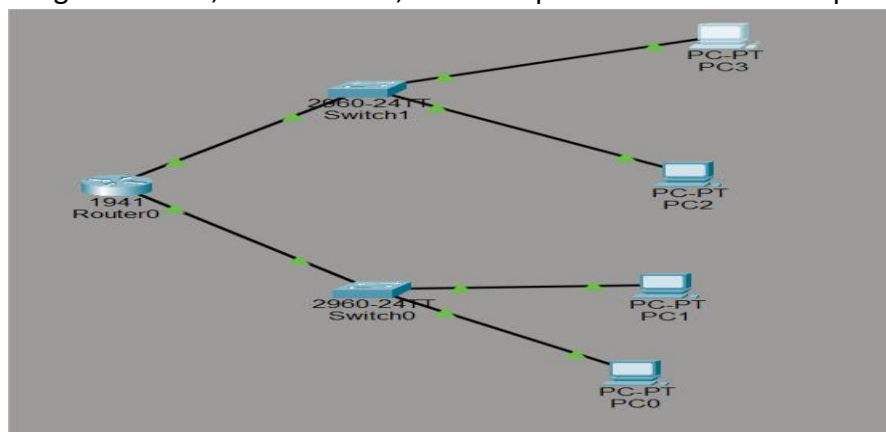
To design a simple network topology using Cisco Packet Tracer that includes one router, two switches, and multiple PCs, and to configure them for successful communication.

### INTRODUCTION:

Cisco Packet Tracer is a powerful network simulation tool that allows users to design, configure, and test computer network topologies virtually. By using routers, switches, and PCs, students and professionals can build and practice real-world networking scenarios without physical hardware. In this experiment, a simple topology with one router, two switches, and multiple PCs is designed to demonstrate basic device setup and connectivity

### ALGORITHM:

1. Open Cisco Packet Tracer and create a new project workspace.
2. Add Devices:
  - Drag one router, two switches, and multiple PCs onto the workspace.



3. Connect Devices:
  - Use straight-through cables to connect each PC to a switch.
  - Connect each switch to a separate interface on the router.
4. Assign IP Addresses:
  - Set appropriate IP addresses for each PC in their respective subnets.

PC0

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☒ DHCP ☒ Static

IPv4 Address 192.168.1.2

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☒ Automatic ☒ Static

IPv6 Address

Link Local Address FE80::200:CFF:FEA4:C962

Default Gateway

DNS Server

802.1X

☒ Use 802.1X Security

Authentication MD5

Username

Password

Top

PC1

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☒ DHCP ☒ Static

IPv4 Address 192.168.1.3

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☒ Automatic ☒ Static

IPv6 Address

Link Local Address FE80::290:21FF:FE1B:C47

Default Gateway

DNS Server

802.1X

☒ Use 802.1X Security

Authentication MD5

Username

Password

Top

PC2

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☒ DHCP ☒ Static

IPv4 Address 192.168.2.2

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☒ Automatic ☒ Static

IPv6 Address

Link Local Address FE80::290:2BFF:FE98:54B

Default Gateway

DNS Server

802.1X

☒ Use 802.1X Security

Authentication MD5

Username

Password

Top

PC3

Physical Config Desktop Programming Attributes

IP Configuration

Interface FastEthernet0

IP Configuration

☒ DHCP ☒ Static

IPv4 Address 192.168.2.3

Subnet Mask 255.255.255.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☒ Automatic ☒ Static

IPv6 Address

Link Local Address FE80::203:E4FF:FE54:1E4B

Default Gateway

DNS Server

802.1X

☒ Use 802.1X Security

Authentication MD5

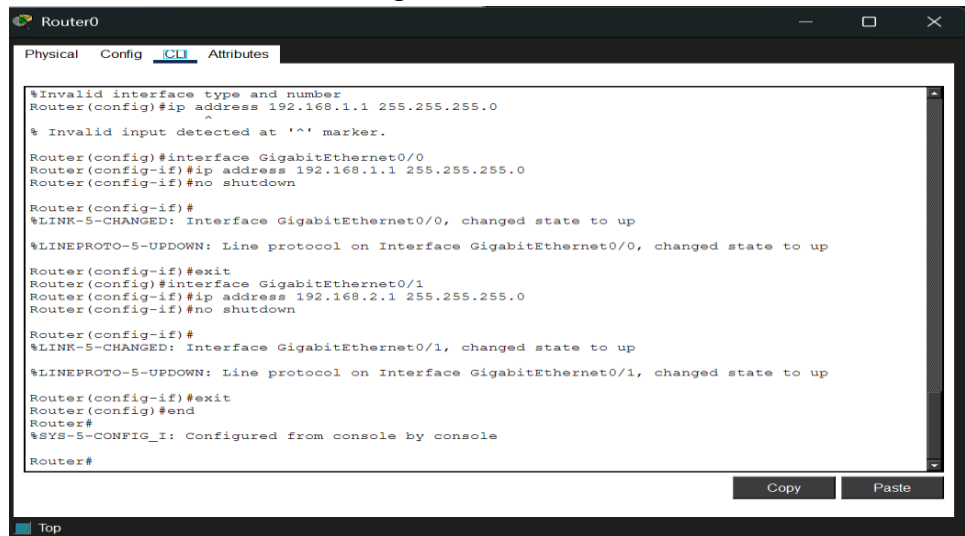
Username

Password

Top

## 5. Configure Router Interfaces:

- Access the router CLI and assign IP addresses to each connected interface.



The screenshot shows the Router0 configuration window in Cisco Packet Tracer. The 'CLI' tab is active, displaying the following commands and their outputs:

```
Router0
Physical Config CLI Attributes

%Invalid interface type and number
Router(config)#ip address 192.168.1.1 255.255.255.0
^
% Invalid input detected at '^' marker.

Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router(config-if)#exit
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
Router#
```

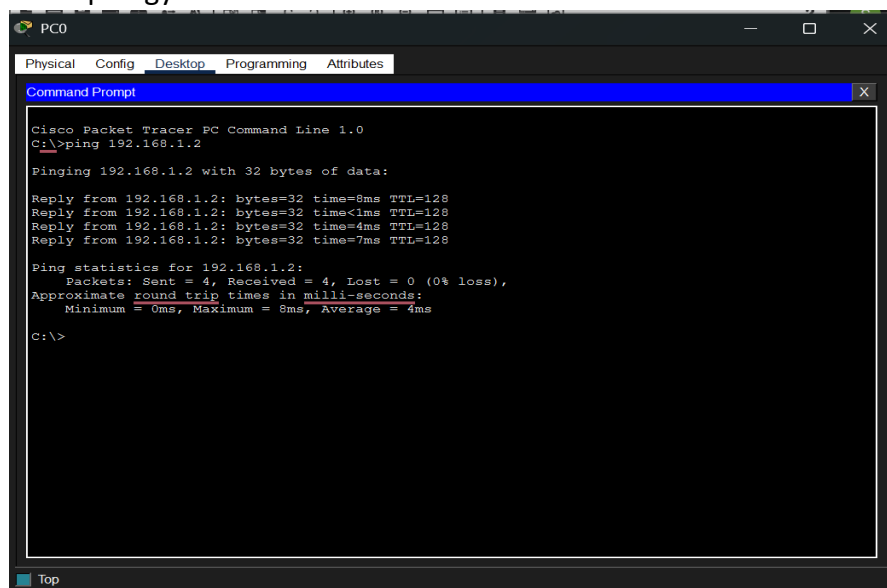
Buttons for 'Copy' and 'Paste' are visible at the bottom right of the CLI window.

## 6. Set Default Gateway:

- Configure each PC's default gateway to match the router interface IP on its subnet.

## 7. Verify Connectivity:

- Use the 'ping' command on PCs to check network communication across the topology.



The screenshot shows the PC0 configuration window in Cisco Packet Tracer. The 'Desktop' tab is active, displaying the 'Command Prompt' window. The following commands and outputs are shown:

```
PC0
Physical Config Desktop Programming Attributes

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=8ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time=4ms TTL=128
Reply from 192.168.1.2: bytes=32 time=7ms TTL=128

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 4ms

C:\>
```

A 'Top' button is visible at the bottom left of the Command Prompt window.

## RESULT:

The designed topology, consisting of one router, two switches, and multiple PCs, was successfully configured. All devices were able to communicate with each other across the network, demonstrating correct network setup and connectivity verification using Cisco Packet Tracer.