

EXERCISE 10

DESIGN A SIMPLE TOPOLOGY USING CISCO PACKET TRACER

AIM:

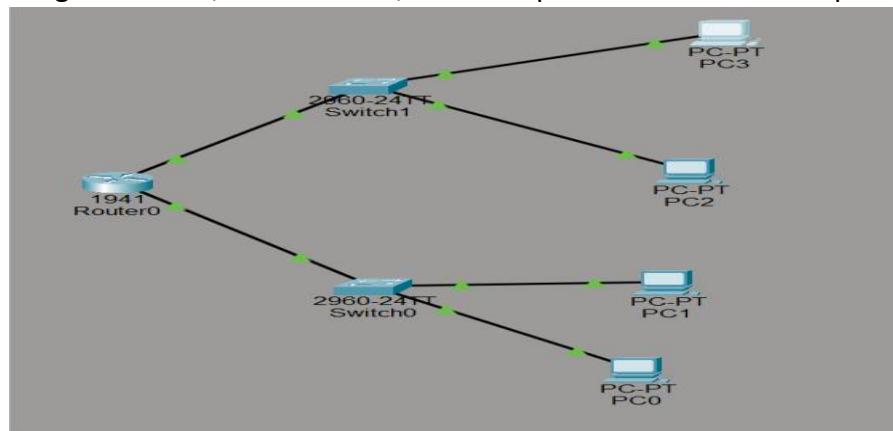
To design a simple network topology using Cisco Packet Tracer that includes one router, two switches, and multiple PCs, and to configure them for successful communication.

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 IP4 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 FE80::200:2FF:FEA4:C962
Link Local Address FE80::200:2FF: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 IP4 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 FE80::290:21FF:FE1B:C47
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 IP4 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 FE80::290:2BFF:FE98:54B
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 IP4 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 FE80::203:E4FF:FE54:1E4B
Link Local Address FE80::203:E4FF:FE54:1E4B
Default Gateway
DNS Server

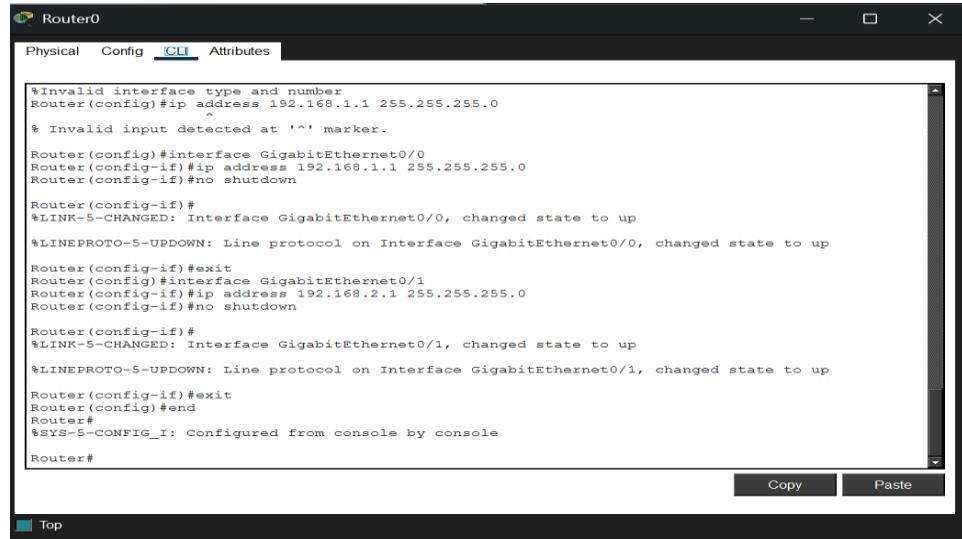
802.1X

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 CLI interface. The user has assigned IP addresses to the GigabitEthernet interfaces. The configuration commands shown are:

```
%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

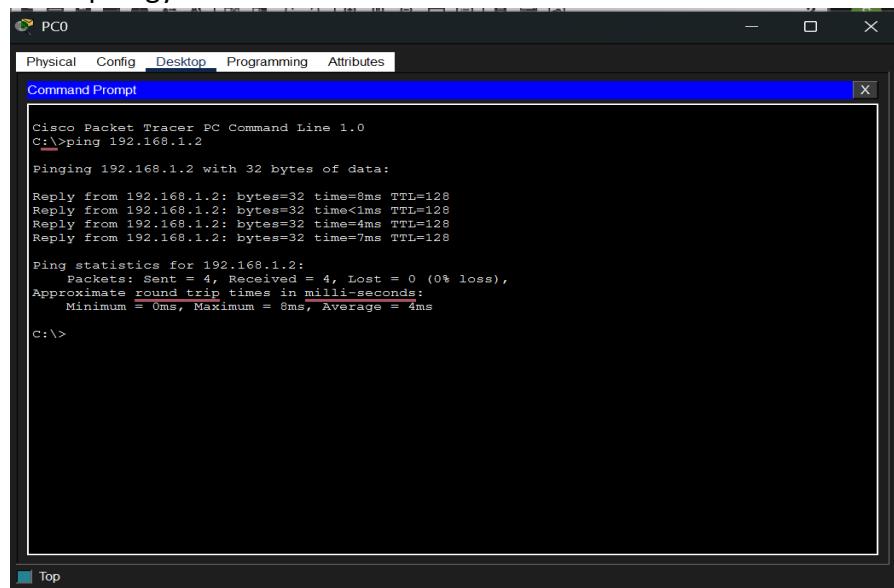
Router#
```

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 Cisco Packet Tracer Command Prompt window. A ping test is being conducted from PC0 to the IP address 192.168.1.2. The output of the ping command is displayed, showing four successful replies with low latency and TTL values.

```
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=0ms 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:\>
```

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.