Assignment

Network Systems Assignment 7

Objective:

Design and configure a network in Cisco Packet Tracer with two separate LANs. The first LAN contains six PCs connected to a switch, while the second LAN contains six PCs connected to another switch. Connect these two LANs using two routers through a Serial link. Implement static routing between the routers to establish communication between the LANs.
Access the devices across the two LANs by configuring static routes on both routers. Assign IP addresses to each device manually, as per the network details provided below. Verify the connectivity by pinging devices across the two LANs.

Following are the network details:

Network 1 (Class B):
- Starting IP Address: 192.168.16.10
- Router0 (Ethernet Interface): 192.168.16.1

Network 2 (Class C):

- Starting IP Address: 172.16.1.10
- Router1 (Ethernet Interface): 172.16.1.1

Router Interconnection:

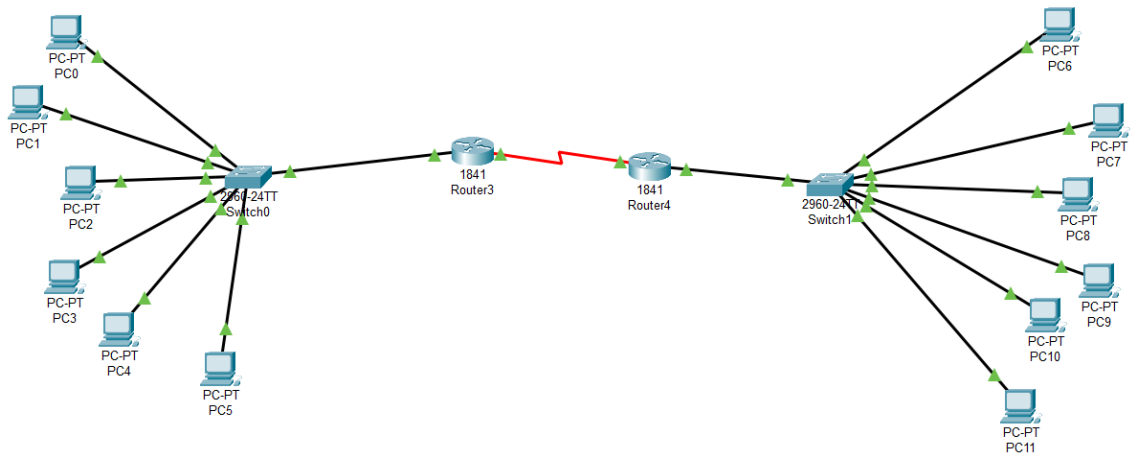
- Router0 (Serial Interface): 10.0.0.1
- Router1 (Serial Interface): 10.0.0.2

Static Routes:

- On Router0: Add a static route to reach 172.16.0.0/16 network through 10.0.0.2.
- On Router1: Add a static route to reach 192.168.16.0/24 network through 10.0.0.1.

Establish a successful connection and verify the static routing implementation. Attach all screenshots (including IP configuration, router static route configuration, successful ping outputs, and network structure) along with a description in a PDF file and submit.

Network Structure



Setting up DHCP in the PCs

Router0 → Switch 0 – LAN1

```
Router#c
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip dhcp pool LAN1
Router(dhcp-config)#network 192.168.16.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.16.1
Router(dhcp-config)#dns-server 8.8.8.8
Router(dhcp-config)#exit
Router(config)#
```

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Router1 → Switch 1 – LAN2

```
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip dhcp pool LAN2
Router(dhcp-config)#network 172.16.1.0 255.255.255.0
Router(dhcp-config)#default-router 172.16.1.1
Router(dhcp-config)#dns-server 8.8.8.8
Router(dhcp-config)#exit
Router(config)#
```

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Configure the Router's IP address

Router0

```
        --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]:
% Please answer 'yes' or 'no'.
Would you like to enter the initial configuration dialog? [yes/no]: n


Press RETURN to get started!



Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 192.168.16.1 255.255.255.0
Router(config-if)#no  shutdown

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

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

Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#ip address 10.0.0.1 255.255.255.252
Router(config-if)#clock rate 64000
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
Router(config-if)#exit
Router(config)#
```

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Commands –

enable

configure terminal

interface FastEthernet0/0

ip address 192.168.16.1 255.255.255.0

no shutdown

exit

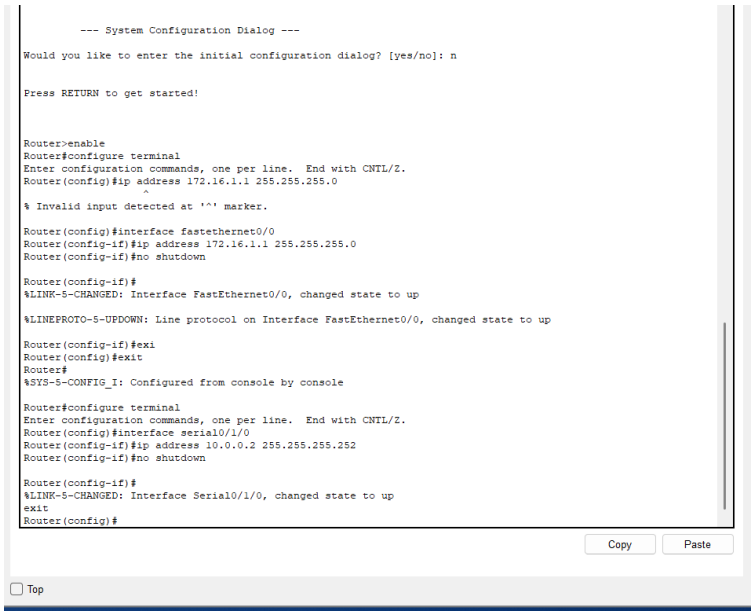
interface Serial0/1/0

ip address 10.0.0.1 255.255.255.252

no shutdown

exit

Router1



Commands –

enable

configure terminal

interface FastEthernet0/0

ip address 172.16.1.1 255.255.255.0

no shutdown

exit

interface Serial0/0/0

ip address 10.0.0.2 255.255.255.252

no shutdown

exit

Configure the static routing in routers

Router0

```
Router(config)#ip route 192.168.16.0 255.255.255.0 10.0.0.1
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

Command –

ip route 172.16.0.0 255.255.0.0 10.0.0.2

Router1

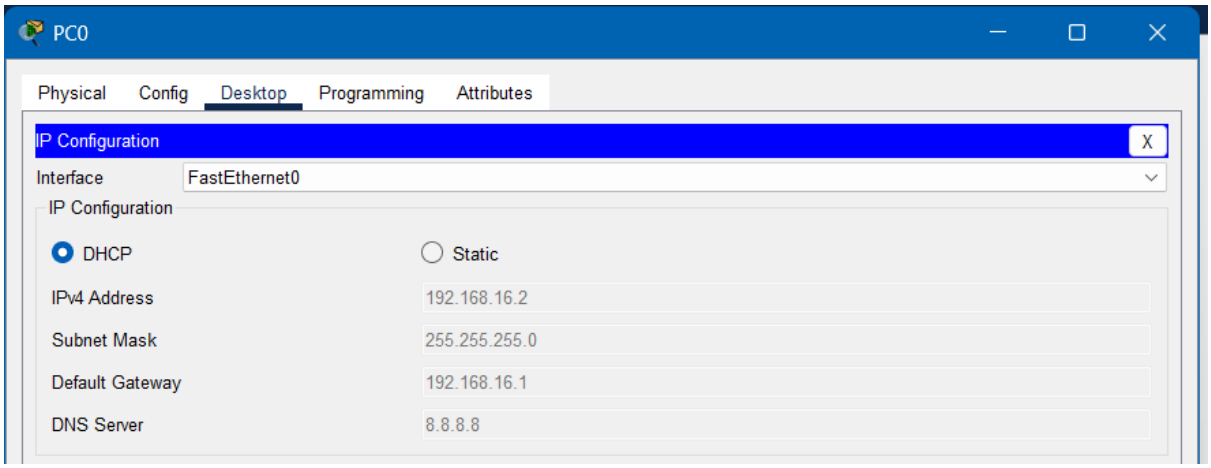
```
Router(config)#ip route 172.16.0.0 255.255.0.0 10.0.0.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

Command –

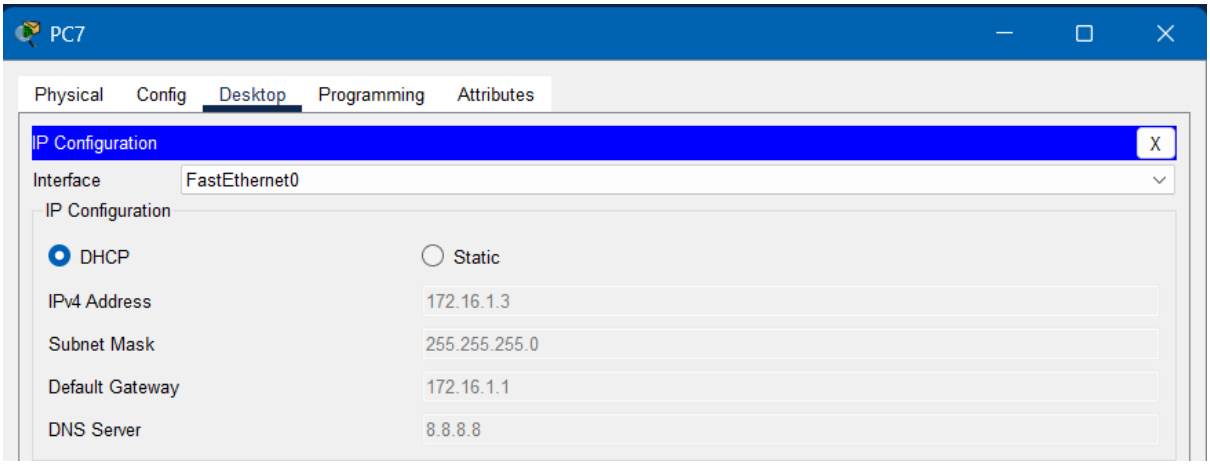
ip route 192.168.16.0 255.255.255.0 10.0.0.1

- Here the Routers are set to route manually with static routing.

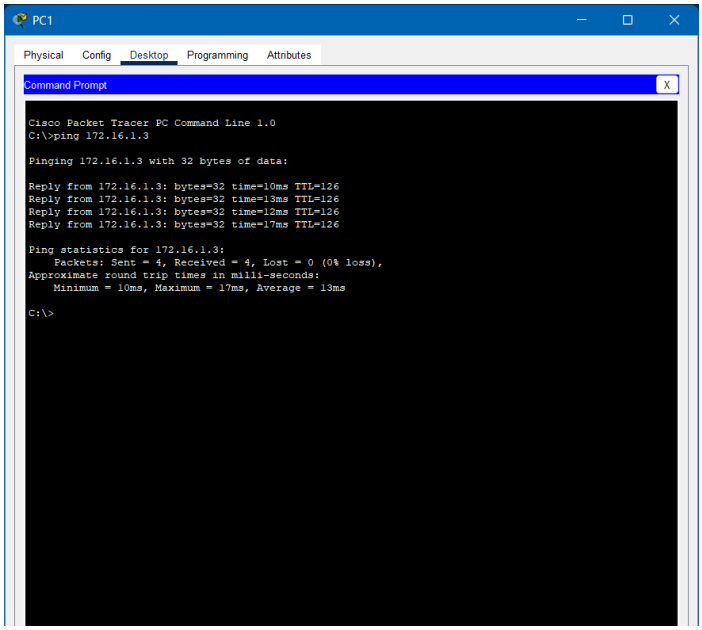
IP configuration of PC (LAN1)



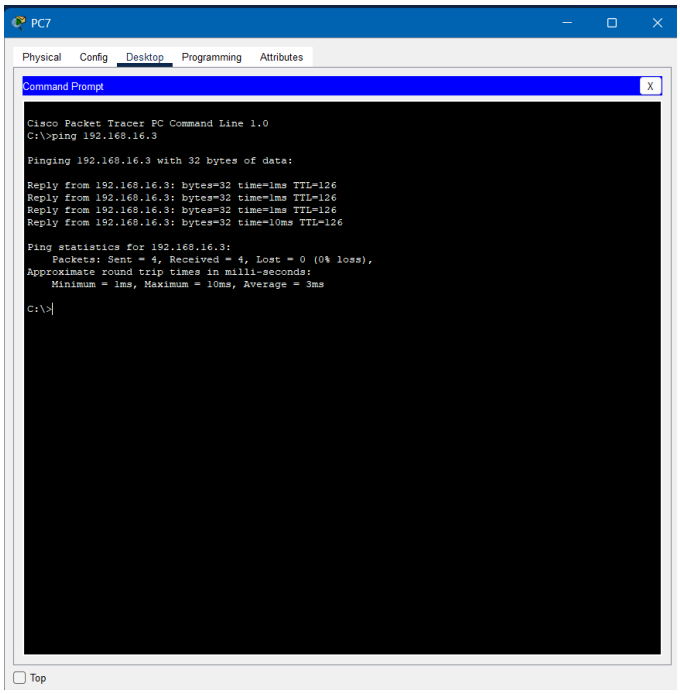
IP configuration of PC (LAN2)



Pinging from PC (LAN1) → PC (LAN2)



Pinging from PC (LAN2) → PC (LAN1)



- **Static routing is a method of configuring routes in a network manually.**
- **Static routing is simple, predictable, and consumes less bandwidth and CPU resources compared to dynamic routing.**

Submitted By Neeraj Jayesh

SOCSE 241037