

PONDICHERRY UNIVERSITY

(A Central university)



SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

M.Sc. Computer Science

NAME : ASISH SUBAS A

REG. NO. : 23370008

SEMESTER : 3rd Semester

SUBJECT : CSSC 513 - WEB TECHNOLOGY AND COMPUTER NETWORKS
LAB

PONDICHERRY UNIVERSITY

(A Central university)



SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

M.Sc. Computer Science

PRACTICAL LAB RECORD

BONAFIDE CERTIFICATE

This is to certify that this is a Bonafide record of practical work done by **ASISH SUBAS A**, having Reg. No. **23370008** semester - III from the month July 2024 to December 2024.

FACULTY IN-CHARGE

SUBMITTED FOR THE PRACTICAL EXAM HELD ON:

—

INTERNAL EXAMINER

EXTERNAL EXAMINER

NETWORK TOPOLOGY

AIM: To configure a basic Network Topology using Cisco Packet Tracer.

PROCEDURE:

1. Place the devices:

- From the **Devices menu**, select **Routers** and choose the **1841 Router**. Place it in the center.
- Go to **Switches**, select two **2960 switches**, and place them on the left and right of the router.
- From **End Devices**, select **PC** and place three PCs connected to the left switch and three PCs connected to the right switch.

2. Configure Connections:

- **Router to Switches:**
 - Use the **Copper Straight-Through Cable** tool to connect:
 - **Router FastEthernet0/0** to **Switch0 FastEthernet0/1** (left switch).
 - **Router FastEthernet0/1** to **Switch1 FastEthernet0/1** (right switch).
- **Switches to PCs:**
 - For **Switch0**, connect each of its **FastEthernet ports** (e.g., **FastEthernet0/2, FastEthernet0/3, and FastEthernet0/4**) to **PC0, PC1, and PC2**.
 - For **Switch1**, connect its **FastEthernet ports** (e.g., **FastEthernet0/2, FastEthernet0/3, and FastEthernet0/4**) to **PC3, PC4, and PC5**.

3. Configure IP Addresses:

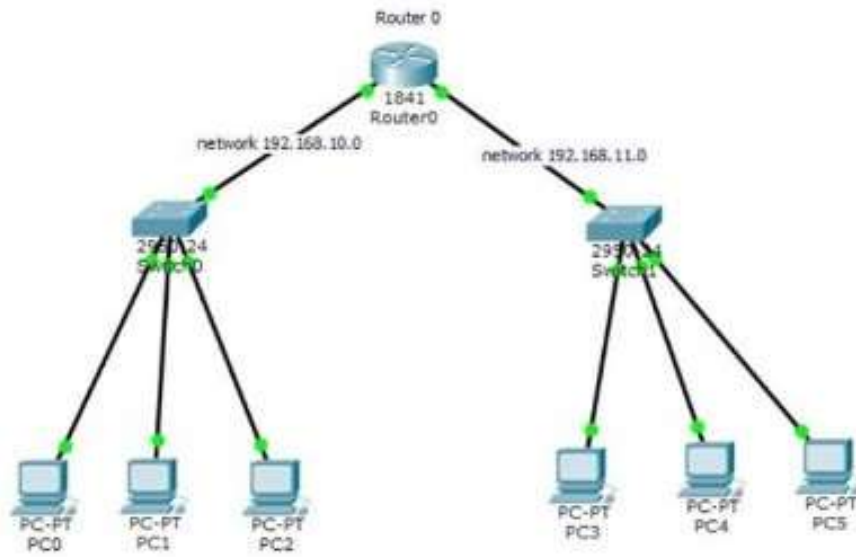
- **Router Interfaces:**
 - Click on **Router0**, go to **Config > FastEthernet0/0**, and set:
 - **IP Address:** 192.168.10.1
 - **Subnet Mask:** 255.255.255.0
 - **Turn on** the interface by clicking on **Port Status**.

- Go to **FastEthernet0/1** and set:
 - **IP Address:** 192.168.11.1
 - **Subnet Mask:** 255.255.255.0
 - **Turn on** the interface by clicking on **Port Status**.
- **PCs:**
 - For **PC0, PC1, and PC2** (connected to the left switch):
 - Set IP addresses within the 192.168.10.0 network (e.g., 192.168.10.2, 192.168.10.3, 192.168.10.4) with a **Subnet Mask** of 255.255.255.0.
 - Set the **Default Gateway** to 192.168.10.1.
 - For **PC3, PC4, and PC5** (connected to the right switch):
 - Set IP addresses within the 192.168.11.0 network (e.g., 192.168.11.2, 192.168.11.3, 192.168.11.4) with a **Subnet Mask** of 255.255.255.0.
 - Set the **Default Gateway** to 192.168.11.1.

4. Test Connectivity:

- Use the **Ping Tool** from **PC0** to **PC3** (or any PC on a different subnet) to verify connectivity.

DIAGRAM :



RESULT:

Thus the configuration of the basic Network Topology is successfully pings indicate proper configuration and connectivity between the subnets.

VLAN

AIM: To configure VLANs on a switch and router in Cisco Packet Tracer to enable communication between devices in different VLANs through inter-VLAN routing.

PROCEDURE:

Step 1: Set Up the Devices

- Place the **Router, Switch,** and **PCs** in the workspace.
- Connect the **Router to the Switch** using a cross-over cable from **RouterFastEthernet0/0** to **Switch FastEthernet0/20**.
- Connect each **PC to the Switch**:
 - PC1 and PC2 will be in VLAN 10 (connect to any ports like Fa0/1 and Fa0/2).
 - PC3 and PC4 will be in VLAN 20 (connect to any ports like Fa0/3 and Fa0/4).

Step 2: Configure VLANs on the Switch

1. Access the Switch CLI:

- Click on the switch, go to the **CLI** tab.

2. Enter Configuration Mode:

```
config# enable  
config# configure terminal
```

3. Create VLANs:

- **VLAN 10:**

```
config# vlan 10  
config# name  
VLAN10config# exit
```
- **VLAN 20:**

```
config# vlan 20  
config# name  
VLAN20config# exit
```

4. Assign Ports to VLANs:

- For **VLAN 10 (PC1 and PC2):**
config# interface FastEthernet0/1
config# switchport mode access
config# switchport access vlan 10
config# exit
config# interface FastEthernet0/2
config# switchport mode access
config# switchport access vlan 10
config# exit
- For **VLAN 20 (PC3 and PC4):**
config# interface FastEthernet0/3
config# switchport mode access
config# switchport access vlan 20
config# exit
config# interface FastEthernet0/4
config# switchport mode access
config# switchport access vlan 20
config# exit

5. Configure the Trunk Port:

- Set the port connected to the router as a trunk port (e.g., FastEthernet0/20).
config# interface FastEthernet0/20
config# switchport mode trunk
config# exit

Step 3: Configure the Router for Inter-VLAN Routing

1. Access the Router CLI:

- Click on the router, go to the **CLI** tab.

2. Enter Configuration Mode:

config# enable

config# configure terminal

3. Configure Subinterfaces for Each VLAN:

- **Subinterface for VLAN 10:**

config# interface FastEthernet0/0.10

config# encapsulation dot1Q 10

config# ip address 192.168.1.100

255.255.255.0config# exit

- **Subinterface for VLAN 20:**

config# interface FastEthernet0/0.20

config# encapsulation dot1Q 20

config# ip address 192.168.2.100 255.255.255.0

config# exit

4. Enable the Main Interface:

- Make sure the main interface **FastEthernet0/0** is

up.config# interface FastEthernet0/0

config# no shutdown

config# exit

Step 4: Configure IP Addresses on PCs

- For **PC1 (VLAN 10):**

- IP Address: 192.168.1.1

- Subnet Mask: 255.255.255.0

- Default Gateway: 192.168.1.100

- For **PC2 (VLAN 10):**

- IP Address: 192.168.1.2

- Subnet Mask: 255.255.255.0

- Default Gateway: 192.168.1.100

- For **PC3 (VLAN 20):**

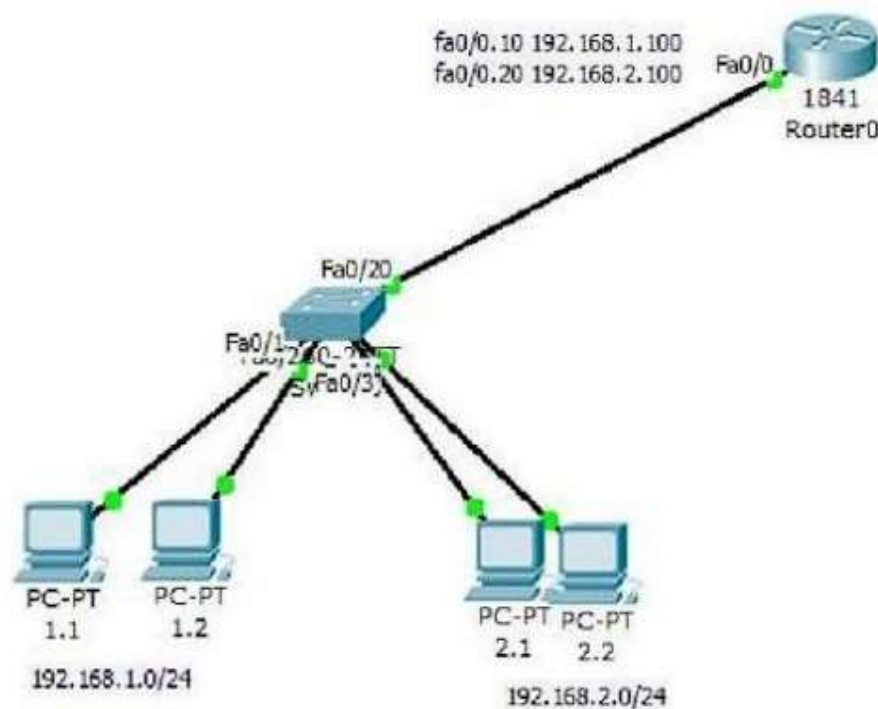
- IP Address: 192.168.2.1

- o Subnet Mask: 255.255.255.0
- o Default Gateway: 192.168.2.100
- For **PC4 (VLAN 20)**:
 - o IP Address: 192.168.2.2
 - o Subnet Mask: 255.255.255.0
 - o Default Gateway: 192.168.2.100

Step 5: Test Connectivity

- **Ping** from PC1 to PC2 within VLAN 10 (should succeed).
- **Ping** from PC3 to PC4 within VLAN 20 (should succeed).
- **Ping** between PCs in different VLANs (e.g., PC1 to PC3) to verify inter-VLAN routing (should also succeed).

DIAGRAM:



RESULT:

Thus the configuration of VLAN is successfully done and the ping from one PC to other PCs is verified.

FIREWALL

AIM: To setup an network based firewall using Cisco Packet Tracer.

PROCEDURE:

Step 1: Replace Router_A with Firewall_1

- **a.** Remove **Router_A** and replace it with **Firewall_1**.
- **b.** Connect the **FastEthernet 0/0** interface on **Firewall_1** to the **FastEthernet0/1** interface on **Switch_A**.
Connect the **FastEthernet 0/1** interface on **Firewall_1** to the **Ethernet 6** interface of the **ISP cloud**.
(Use straight-through cables for both connections.)
- **c.** Confirm that the host name of **Firewall_1** is **Firewall_1**.
- **d.** On **Firewall_1**, configure the WAN IP address and subnet mask for the **FastEthernet 0/1** interface as **209.165.200.225** and **255.255.255.224**.
- **e.** Configure the LAN IP address and subnet mask for the **FastEthernet 0/0** interface on **Firewall_1** as **192.168.1.1** and **255.255.255.0**.

Step 2: Verify the Firewall_1 Configuration

- **a.** Use the **show run** command to verify your configuration. This is a partial example of the output:

```
Firewall_1#show run

Building configuration...

hostname Firewall_1

!

interface FastEthernet0/0

    ip address 192.168.1.1 255.255.255.0

    ip nat inside

    duplex auto

    speed auto

!

interface FastEthernet0/1
```

```

ip address 209.165.200.225 255.255.255.224

ip access-group 100 in

ip nat outside

duplex auto

speed auto

!

interface

Vlan1 no ip

address

shutdown

!

ip nat inside source list 1 interface FastEthernet0/0 overload

ip classless

ip route 192.168.2.0 255.255.255.0 192.168.1.2

ip route 192.168.3.0 255.255.255.0 192.168.1.3

!

access-list 1 permit 192.168.0.0 0.0.255.255

access-list 100 deny ip any host 209.165.200.225

<output omitted>

!

end

```

- **b.** From **PC_B**, ping **209.165.200.225** to verify that the internal computer can access the Internet.

```
PC>ping 209.165.200.225
```

Pinging 209.165.200.225 with 32 bytes of data:

Reply from 209.165.200.225: bytes=32 time=107ms TTL=120

Reply from 209.165.200.225: bytes=32 time=98ms TTL=120

Reply from 209.165.200.225: bytes=32 time=104ms TTL=120

Reply from 209.165.200.225: bytes=32 time=95ms TTL=120

Ping statistics for 209.165.200.225:

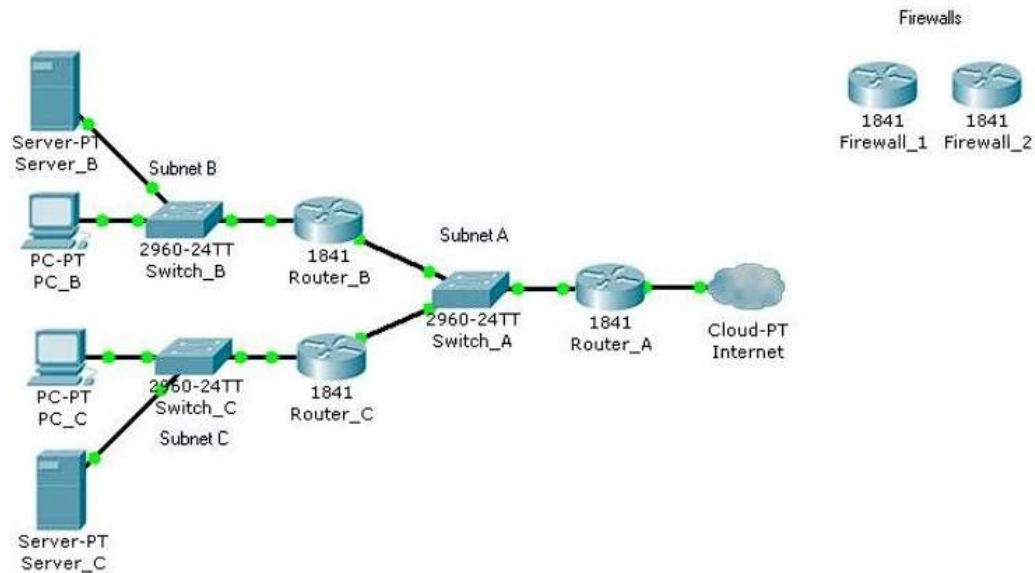
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds: Minimum

= 95ms, Maximum = 107ms, Average = 101ms

- c. From privileged EXEC mode on **Firewall_1**, save the running configuration to the startup configuration using the **copy run start** command.

DIAGRAM:



RESULT:

Hence, the firewall setup is configured within the network interface.

ROUTER CONFIGURATION

AIM: Basic configuration of Router using Cisco Packet Tracer.

PROCEDURE:

1. Place the Router:

- From the **Devices menu**, go to **Routers** and select a router model (e.g., **1841Router**). Place it on the workspace.

2. Add Network Devices (Optional):

- Add switches and PCs if you want to connect multiple devices to the router, creating different networks or subnets.

3. Connect Devices:

- Use **Copper Straight-Through Cable** to connect the router to other devices.
- Connect **Router's FastEthernet or GigabitEthernet ports** to the switches or directly to PCs, depending on the setup.

4. Enter Router Configuration Mode:

- Click on the router, then go to the **CLI (Command Line Interface)** tab.
- When prompted, type no if it asks if you want to enter the initial configuration dialog.

5. Access the Router's Global Configuration Mode:

- Type enable to enter **privileged EXEC mode**.
- Type configure terminal to enter **global configuration mode**.

6. Configure Router Interfaces:

- Enter interface configuration mode for each interface you want to configure:
 - For **FastEthernet0/0**:
`config# interface FastEthernet0/0`
 - Set the IP address and subnet mask:
`config# ip address 192.168.10.1 255.255.255.0`
 - Turn on the interface:

config# no shutdown

- Exit the interface configuration:

config# exit

- Repeat the process for **FastEthernet0/1** (or any other interface):
config# interface FastEthernet0/1
config# ip address 192.168.11.1 255.255.255.0
config# no shutdown
config# exit

7. Configure Routing (Optional, if using multiple networks):

- For **static routing**, type:
config# ip route 192.168.11.0 255.255.255.0 192.168.10.2
- This step is optional if you only need basic routing between directly connected networks.

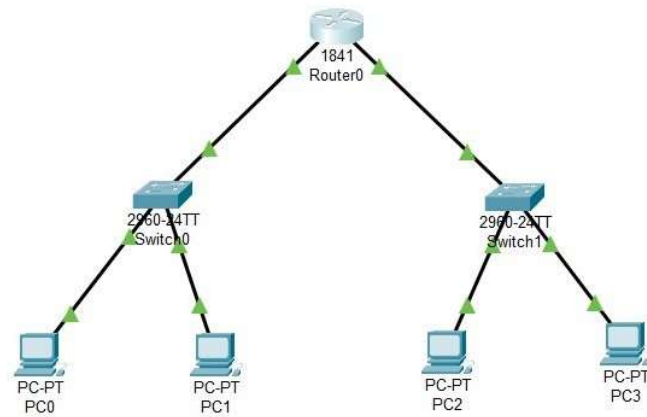
8. Save the Configuration:

- To save the configuration, exit global configuration mode by typing exit until you return to the privileged EXEC mode.
- Type:
config# write memory
- Alternatively, use copy running-config startup-config to save the configuration to non-volatile memory.

9. Test Connectivity:

- Connect PCs to the router via switches or directly.
- Assign IP addresses and default gateways to each PC in their respective network.
- Use the **Ping Tool** to test communication between devices in different networks.

DIAGRAM:



RESULT:

The basic router configuration is made using PCs, Switches and Router which connects all seamlessly.