

PONDICHERRY UNIVERSITY

(A Central university)



SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

M.Sc. Computer Science

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SEMESTER : 3rd Semester

SUBJECT : CSSC 513 - WEB TECHNOLOGY AND COMPUTER NETWORKS
LAB

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PRACTICAL LAB RECORD

BONAFIDE CERTIFICATE

This is to certify that this is a Bonafide record of practical work done by **ASWANTH E K**, having Reg. No. **23370009** semester - III from the month July 2024 to December 2024.

FACULTY IN-CHARGE

SUBMITTED FOR THE PRACTICAL EXAM HELD ON: —

INTERNAL EXAMINER

EXTERNAL EXAMINER

NETWORKTOPOLOGY

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:

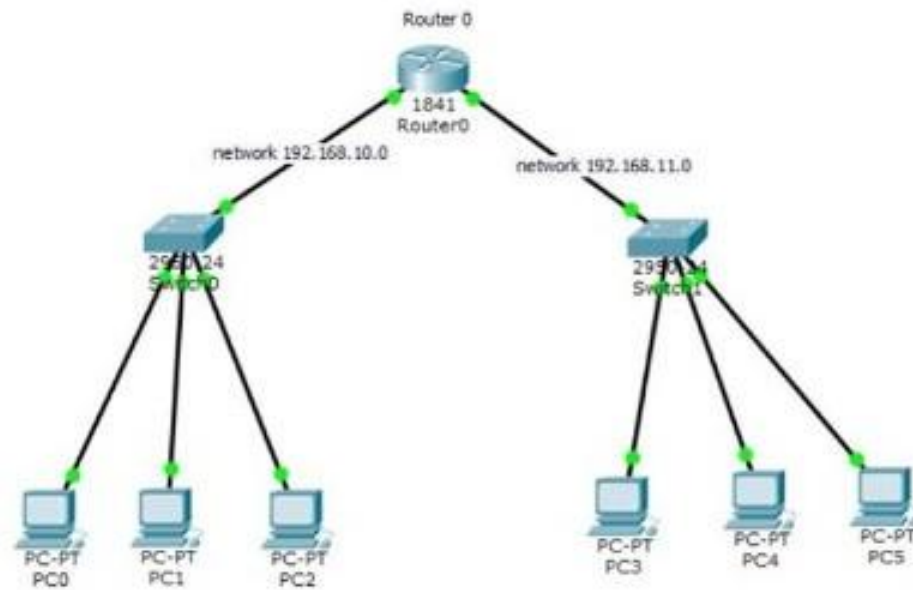
- **Router Interfaces:**
 - Click on **Router0**, go to **Config > FastEthernet0/0**, and set:
 - **IP Address:** 192.168.10.1
 - **Subnet Mask:** 255.255.255.0
 - **Turn on** the interface by clicking on **Port Status**.

- 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):**

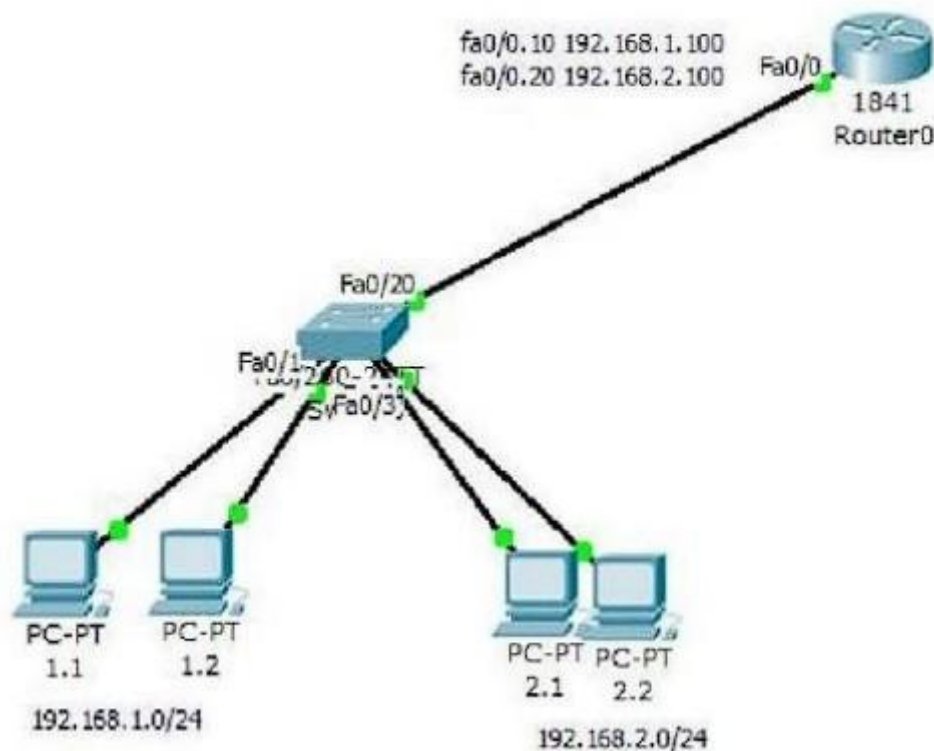
- IP Address: 192.168.2.1

- 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:

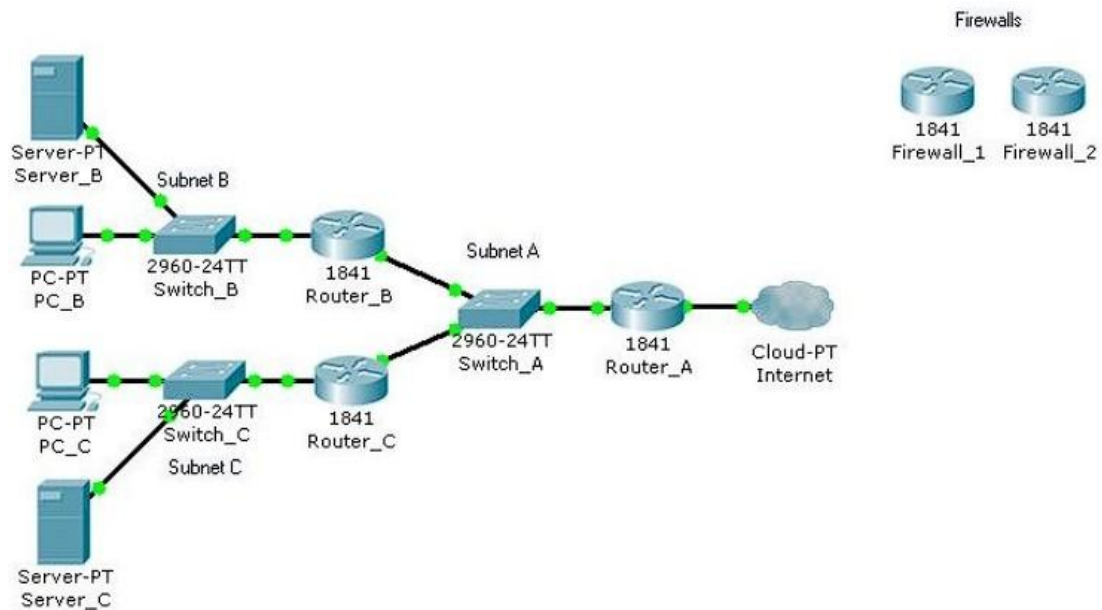
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

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:

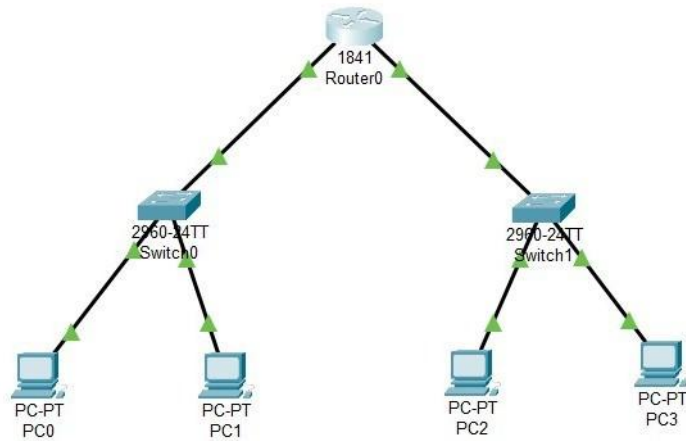
config# write memory

- 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.