PONDICHERRY UNIVERSITY

(A Central university)

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

M.Sc. Computer Science

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REG. NO.   :   23370033

SEMESTER   :   3rd Semester

SUBJECT   :   CSSC 513 - WEB TECHNOLOGY AND COMPUTER NETWORKS
LAB

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PRACTICAL LAB RECORD

<ins>BONAFIDE CERTIFICATE</ins>

This is to certify that this is a Bonafide record of practical work done by **MARIYA VENUS**, having Reg. No. **23370033** 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:**

      o 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:**

      o For **Switch0**, connect each of its **FastEthernet ports (e.g., FastEthernet0/2, FastEthernet0/3, and FastEthernet0/4)** to **PC0, PC1, and PC2**.

      o For **Switch1**, connect its **FastEthernet ports (e.g., FastEthernet0/2, FastEthernet0/3, and FastEthernet0/4)** to **PC3, PC4, and PC5**.

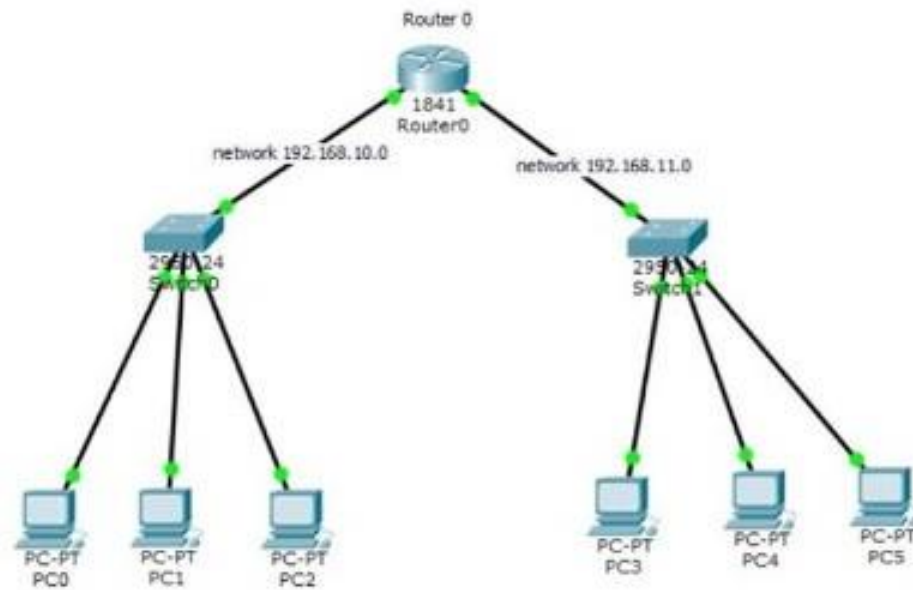3. **Configure IP Addresses:**

   · **Router Interfaces:**

      o 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**.

- o 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:**
    - o 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.
    - o 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 :

Router 0

1841
Router0

network 192.168.10.0   network 192.168.11.0

2960 24   2960 24
Switch0   Switch1

PC-PT   PC-PT   PC-PT   PC-PT   PC-PT   PC-PT
PC0   PC1   PC2   PC3   PC4   PC5

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**:

  - o PC1 and PC2 will be in VLAN 10 (connect to any ports like Fa0/1 andFa0/2).

  - o PC3 and PC4 will be in VLAN 20 (connect to any ports like Fa0/3 andFa0/4).

Step 2: Configure VLANs on the Switch

1. **Access the Switch CLI:**

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

2. **Enter Configuration Mode:**

       config# enable

       config# configure terminal

3. **Create VLANs:**

   - o **VLAN 10:**

       config# vlan 10

       config# name

       VLAN10config# exit

   - o **VLAN 20:**

       config# vlan 20

       config# name

       VLAN20config# exit

4. **Assign Ports to VLANs:**

   o 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

   o 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:**

   o 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:**

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

2. **Enter Configuration Mode:**

config# enable

config# configure terminal

3. **Configure Subinterfaces for Each VLAN:**

   o **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

   o **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:**

   o 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)**:

   o IP Address: 192.168.1.1

   o Subnet Mask: 255.255.255.0

   o Default Gateway: 192.168.1.100

· For **PC2 (VLAN 10)**:

   o IP Address: 192.168.1.2

   o Subnet Mask: 255.255.255.0

   o Default Gateway: 192.168.1.100

· For **PC3 (VLAN 20)**:

   o 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-VLANrouting (should also succeed).

DIAGRAM:
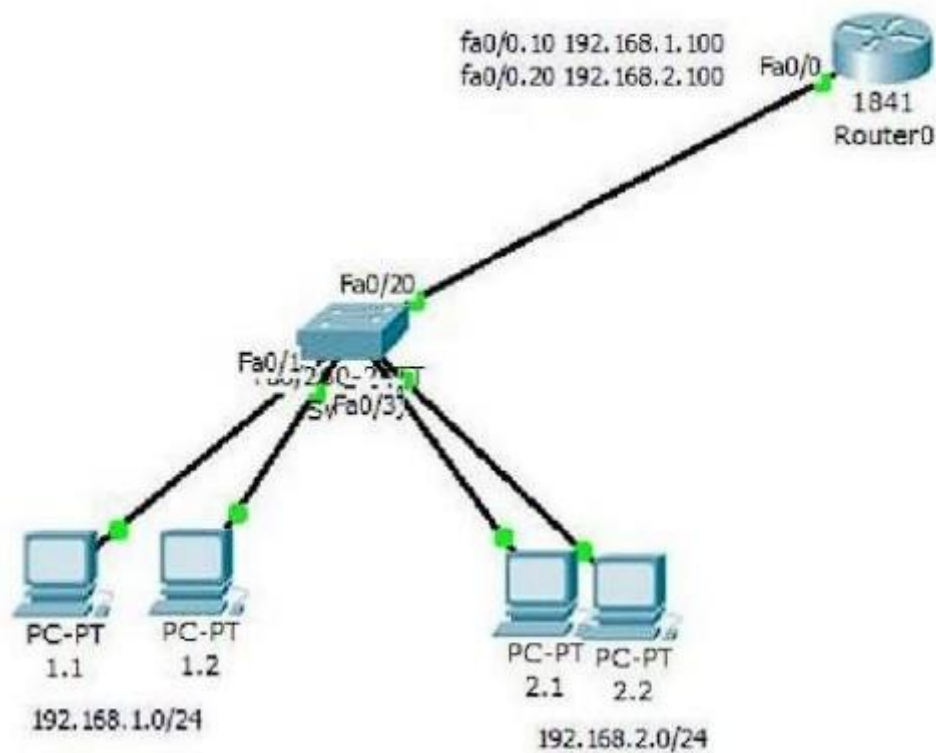
RESULT:

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 partialexample 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
```

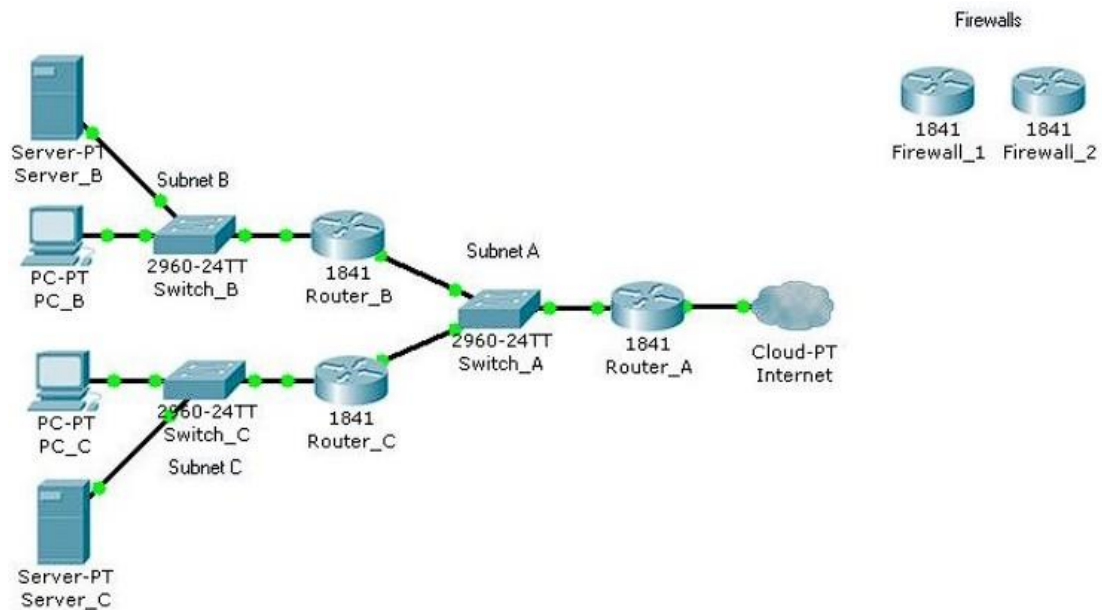Ping statistics for 209.165.200.225:

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 switchesor 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:

     o For **FastEthernet0/0**:

        config# interface FastEthernet0/0

     o Set the IP address and subnet mask:

        config# ip address 192.168.10.1 255.255.255.0

     o Turn on the interface:

config# no shutdown

o   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
   exituntil 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:
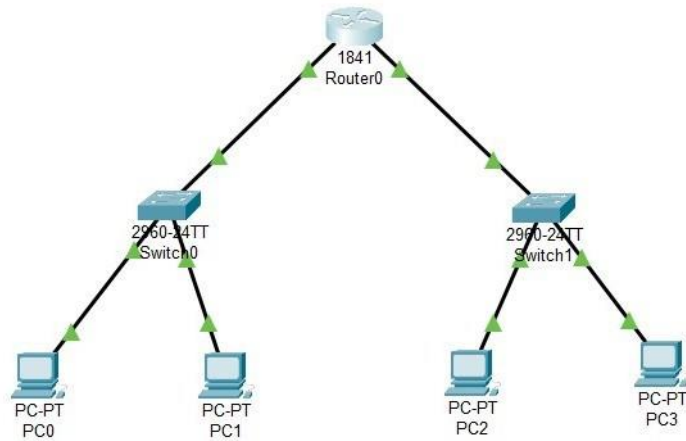
RESULT:

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