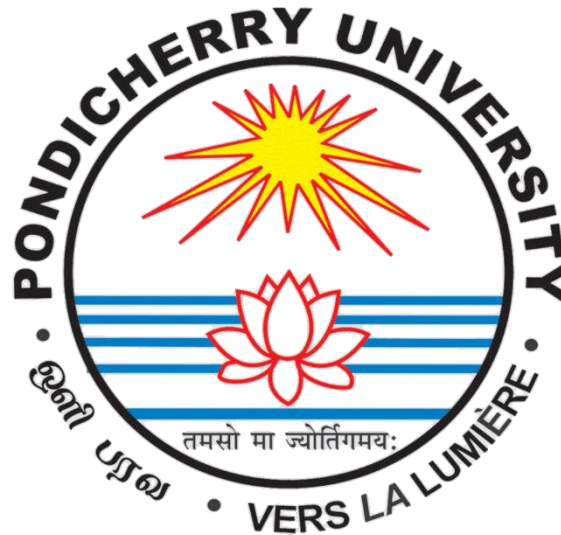


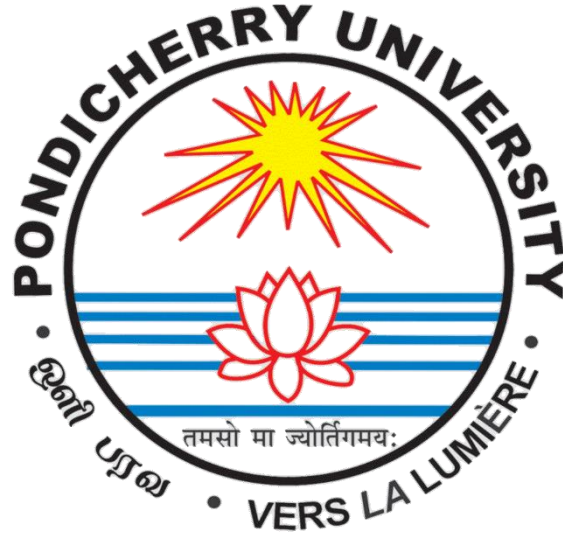
**PONDICHERRY UNIVERSITY**  
**(A Central University)**



**SCHOOL OF ENGINEERING AND TECHNOLOGY**  
**DEPARTMENT OF COMPUTER SCIENCE**  
**M.Sc. Computer Science**

NAME : G. HEMALATHA  
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SEMESTER : 3<sup>St</sup> Semester  
SUBJECT : CSSC513 – WEB TECHNOLOGY AND  
COMPUTER NETWORK LAB

**PONDICHERRY UNIVERSITY**  
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**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 **HEMALATHA G** having Reg. No. **23370026** semester-III from the month July 2024 to December 2024.

**FACULTY IN-CHARGE**

Submitted for the Practical Examination held on: \_\_\_\_\_

**INTERNAL EXAMINER**

**EXTERNAL EXAMINER**

**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 **Router FastEthernet0/0** 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 VLAN10
config# exit
```
- **VLAN 20:**

```
config# vlan 20
config# name VLAN20
config# 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 192.168.1.100 255.255.255.0
config# 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
```

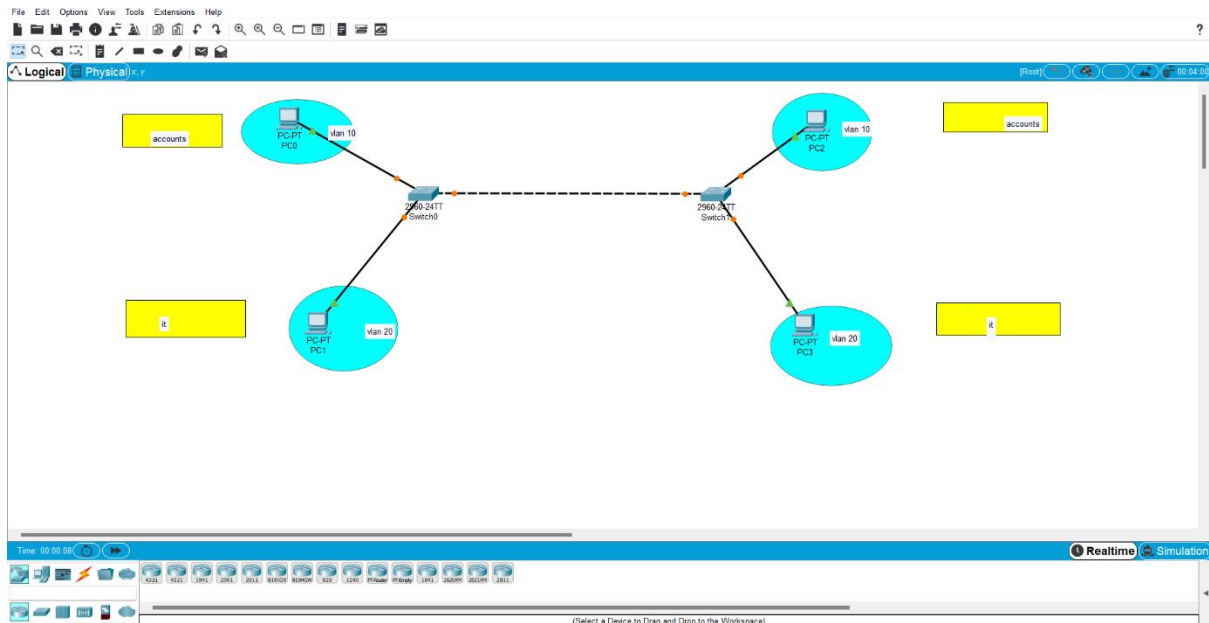
### **Step 4: Configure IP Addresses on PCs**

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

**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., **1841 Router**). 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:

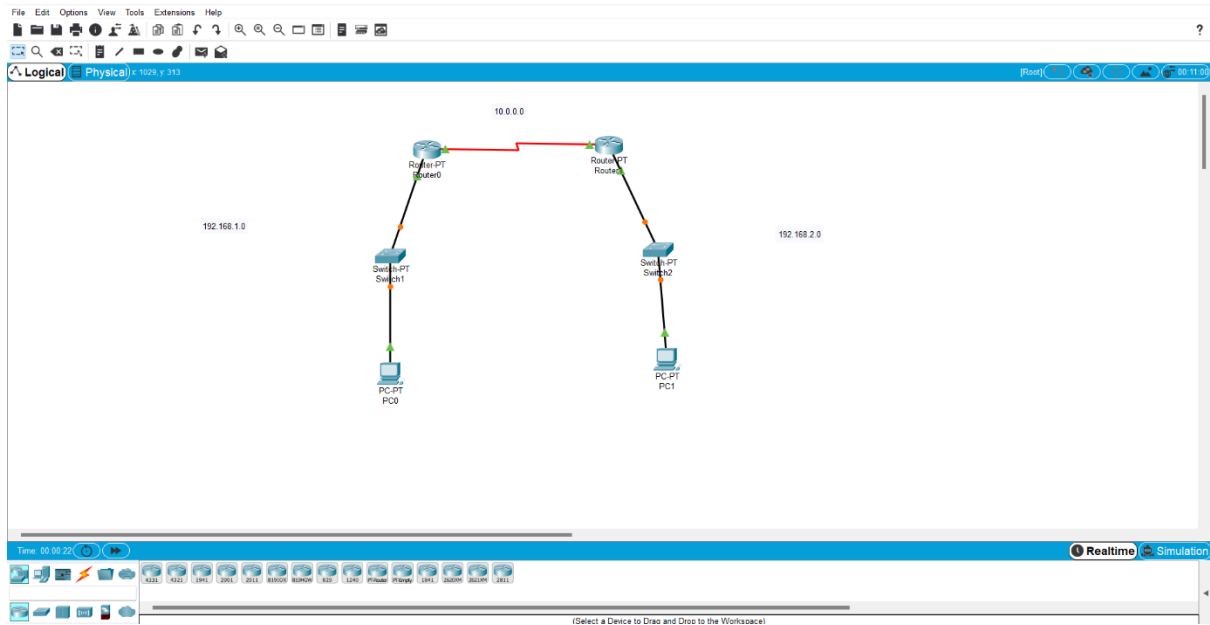
config# write memory

- 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.





## RESULT:

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

# FIREWALL CONFIGURATION

**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 **FastEthernet 0/1** 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.

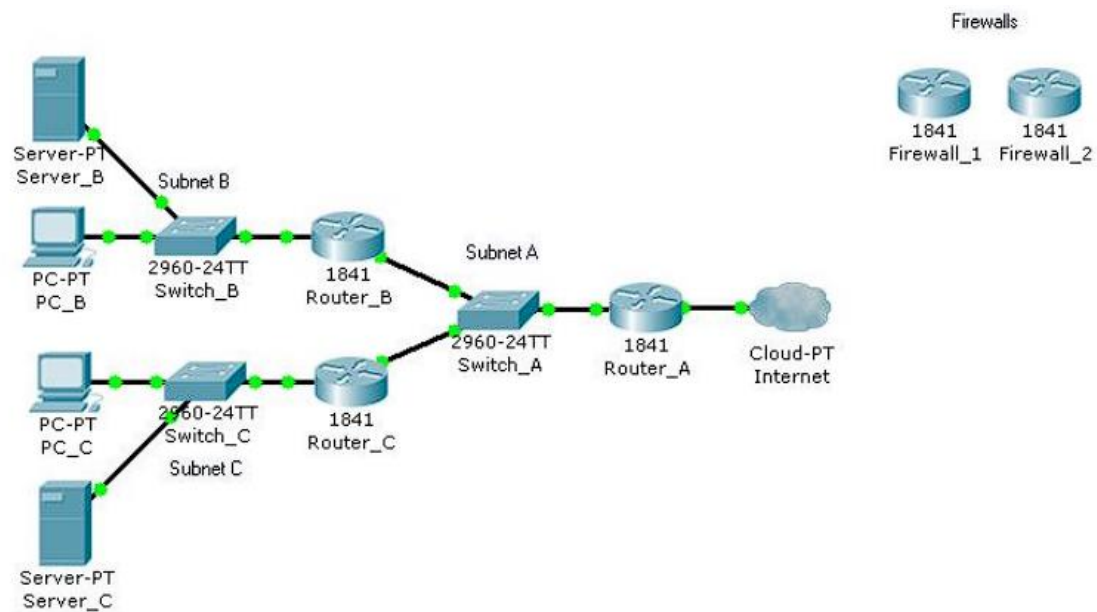
```

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.

# 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**.

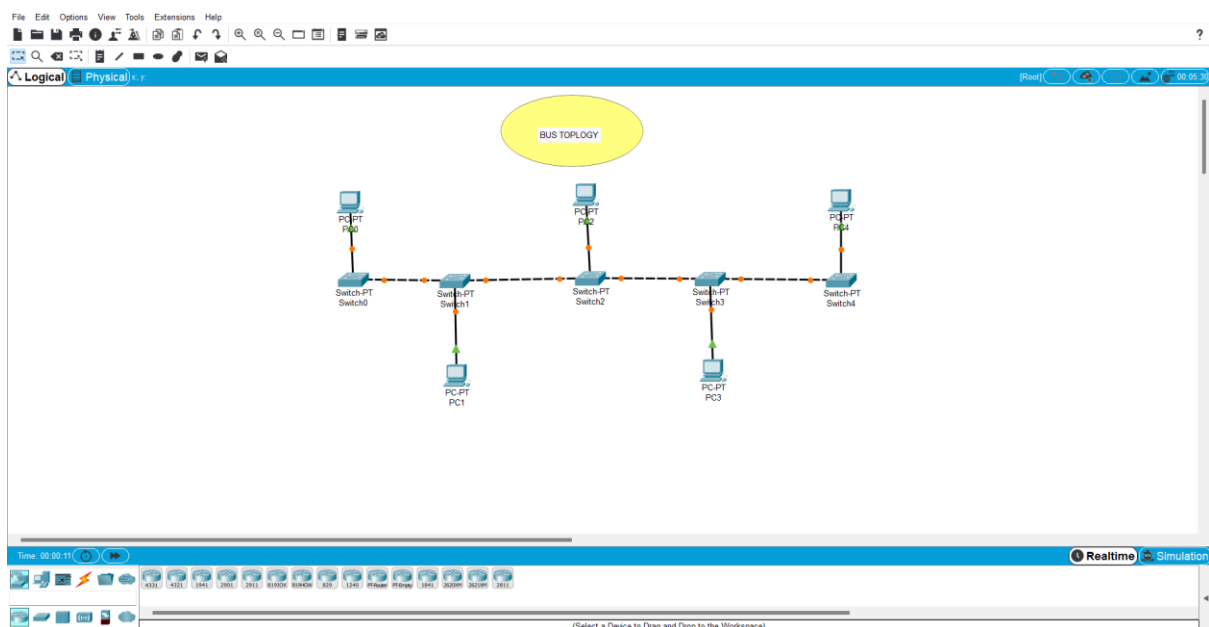
**3. Configure IP Addresses:**

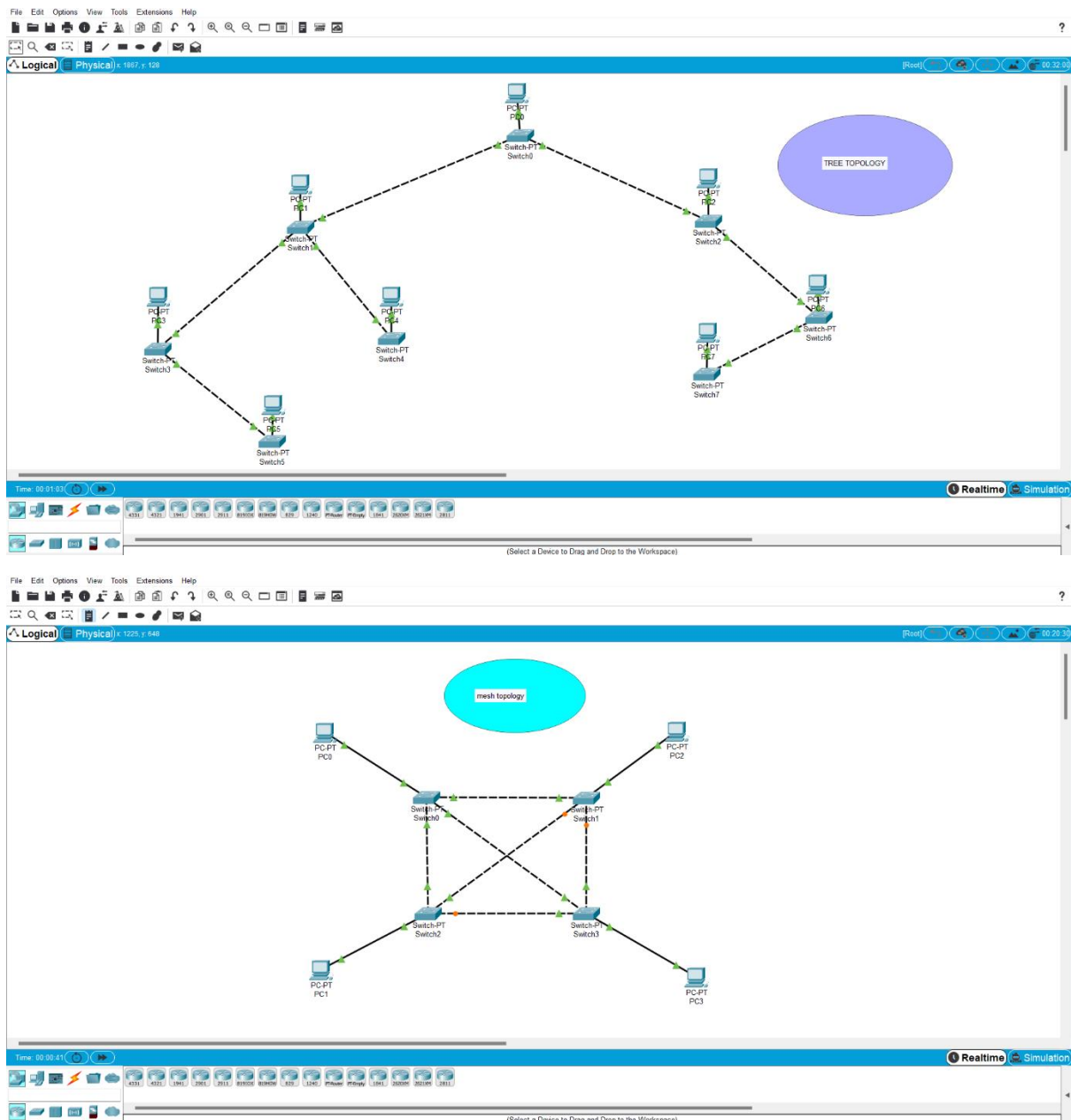
- **Router Interfaces:**
  - Click on **Router0**, go to **Config > FastEthernet0/0**, and set:
    - **IP Address:** 192.168.10.1
    - **Subnet Mask:** 255.255.255.0
    - **Turn on** the interface by clicking on **Port Status**.

- 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.





## RESULT:

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