

# **LAB REPORT: NETWORK CONFIGURATION USING CISCO PACKET TRACER**

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**Module: ETE 4163 - Computer Networks**

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## **Introduction**

This report outlines a series of network configuration experiments performed using Cisco Packet Tracer. The goal was to develop practical skills in designing, configuring, and testing small-scale networks, including home networks, basic network devices, wireless LANs, and VLANs. The exercises reflect real-world scenarios and highlight key networking concepts and troubleshooting techniques.

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## **Lab 1: Small Home Network Configuration**

### **Objective**

To configure a basic home network with a router and two PCs, assign IP addresses, and test connectivity.

### **Materials**

- Cisco Packet Tracer software
- Devices: 1841 Router, Generic PCs
- Copper Cross-Over Cable

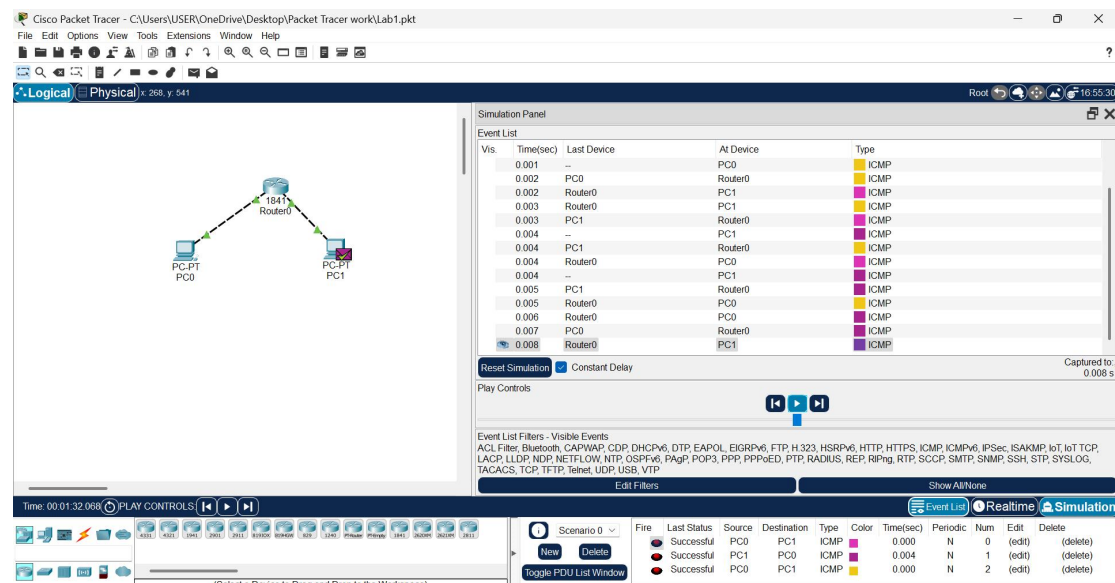
### **Network Setup**

- Connected PC1 and PC0 to the router using copper cross-over cables.
- Configured the router interfaces with IP addresses and subnet masks.
- Assigned static IP addresses and default gateways to the PCs.

## Testing Connectivity

1. Conducted ping tests between PC1 and PC0 in both **Command Prompt** and **Simulation Mode**.
2. Verified successful communication between the PCs without errors or interruptions

This is one of the images showing how PC1 successfully pinged PC2.



## Lab 2: Basic Network Devices Configuration

### Objective

To cable and configure a network topology, perform basic router configurations, activate Ethernet interfaces, and test network connectivity.

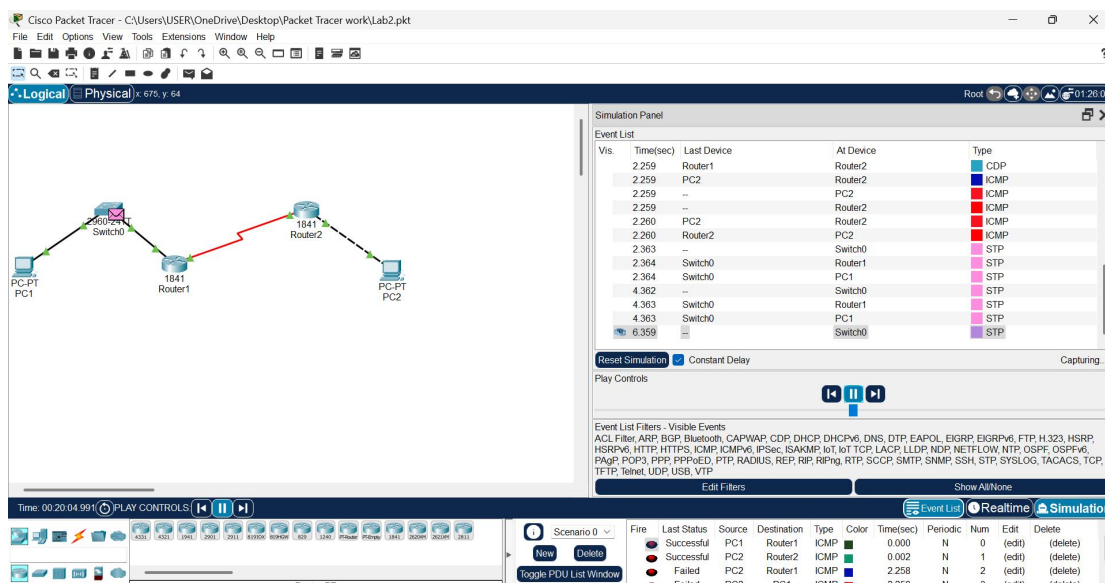
## Network Setup

- Devices: Two routers (R1, R2), switches, and PCs.
- Connected devices using appropriate cables:
  - **Straight-through cables:** PC to Switch.
  - **Serial DCE cable:** R1 to R2.
- Configured IP addresses, subnet masks, and default gateways.

## Testing Connectivity

- Verified connectivity between R1 (192.168.2.1) and R2 (192.168.2.2) using ping.
- Confirmed that PCs could communicate with their respective gateways but not across subnets due to the absence of routing protocols.
- Used commands like show ip route to validate configurations.

This is the image showing how PC1 pinged with Router1 and PC2 pinged with Router2



## **Lab 3: Configuring Wireless LANs**

### **Objective**

To set up a wireless network, configure a wireless router and client, and test connectivity.

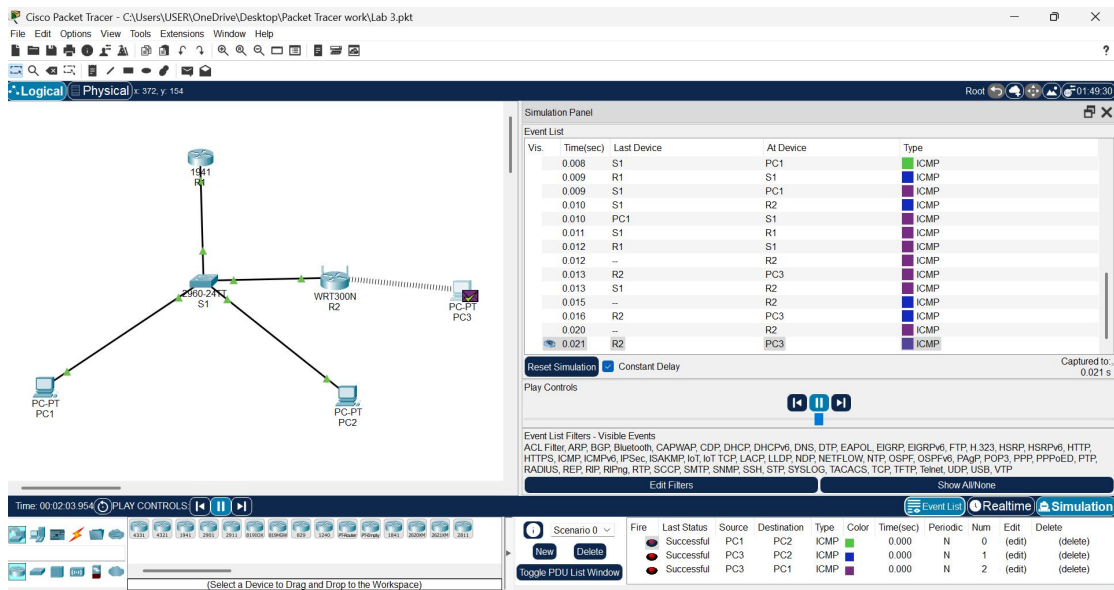
### **Network Configuration**

- **Router Configuration:**
  - Set static IP (172.17.40.1/24) and enabled DHCP.
  - Configured SSID (WRS\_LAN) with WPA2-Personal security (passphrase: cisco123).
- **Wireless Client (PC3) Configuration:**
  - Connected to WRS\_LAN using DHCP.
  - Verified signal strength and IP assignment.

### **Testing Connectivity**

1. PC3 successfully pinged the default gateway (172.17.40.1).
2. Verified communication between wired devices (PC1, PC2) and the wireless client (PC3), confirming proper network configuration.

This is the configuration of PC1



## Lab 4: Configuring Virtual LANs (VLANs)

### Objective

To configure VLANs on switches, establish trunking, and enable inter-VLAN routing.

### Network Setup

- Two switches (S1, S2) connected via trunk ports.
- Router configured with subinterfaces for VLANs:
  - **VLAN 2 (192.168.20.0/24):** PC1, PC3.
  - **VLAN 3 (192.168.30.0/24):** PC2, PC4.

### Testing Connectivity

#### 1. Intra-VLAN Tests:

- Successful pings between devices within the same VLAN (e.g., PC1 ↔ PC3).

#### 2. Inter-VLAN Tests:

- Configured router subinterfaces enabled communication across VLANs (e.g., PC1 ↔ PC4).

### 3. Verification Commands:

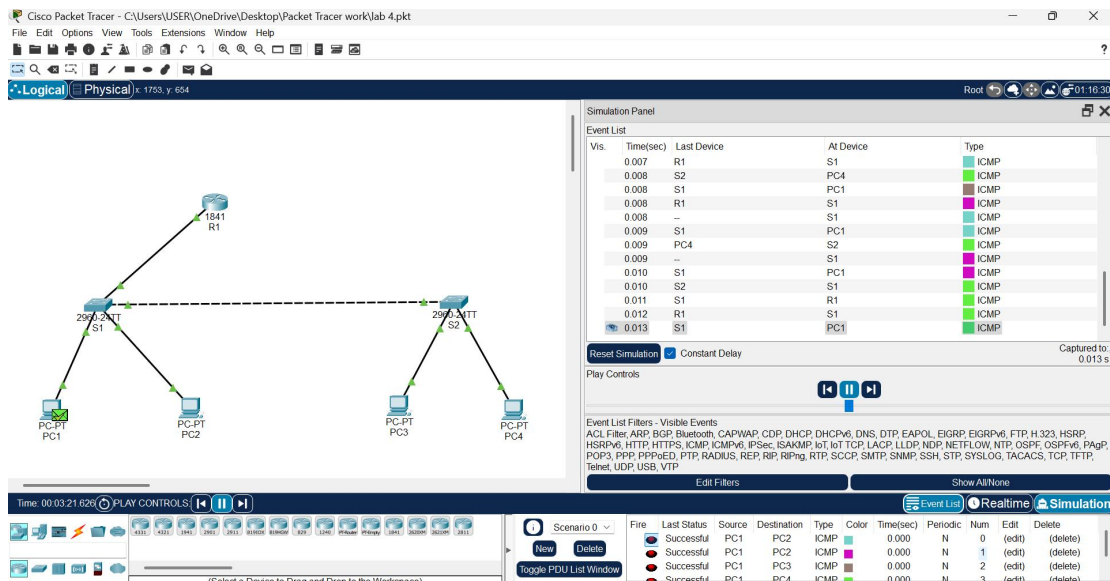
- show vlan brief
- show mac address-table

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## Conclusion

The labs successfully demonstrated the design, configuration, and testing of various networking setups:

- **Lab 1** highlighted the importance of basic IP configuration for home networks.
- **Lab 2** emphasized foundational tasks like cabling, routing, and verifying network connectivity.
- **Lab 3** illustrated the integration of wired and wireless networks with robust security measures.
- **Lab 4** showcased the use of VLANs to enhance network segmentation and the implementation of inter-VLAN routing for communication across subnets.



## Key Takeaways

- **Accurate Configuration:** Proper IP addressing and device setup are critical for seamless communication.
- **Network Optimization:** VLANs improve segmentation, reduce broadcast traffic, and enhance security.
- **Troubleshooting Skills:** Tools like ping, show ip route, and simulation modes are essential for identifying and resolving issues.