

**Batch: A1**      **Roll No.: 16010123012**

**Experiment / assignment / tutorial No.: 03**

**Grade: AA / AB / BB / BC / CC / CD /DD**

**Signature of the Staff In-charge with date**

### **Experiment No.:3**

**TITLE:** Building and configuring simple topology using Network tool - CISCO PACKET TRACER.

**AIM:** To build and configure simple network topology using CISCO Packet Tracer. Packet Tracer is a network simulation program that allows students to experiment with network behaviour and ask “what if” questions. Packet Tracer provides simulation, visualization, and authoring, assessment, and collaboration capabilities and facilitates the teaching and learning of complex technology concepts.

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**Expected Outcome of Experiment:**

**CO1:** Explain the fundamentals of the data communication networks, reference models, topologies, physical media, devices, simulators and identify their use in day to day networks

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**Books/ Journals/ Websites referred:**

1. <http://www.google.com>
2. A. S. Tanenbaum, “Computer Networks”, Pearson Education, Fourth Edition
3. B. A. Forouzan, “Data Communications and Networking”, TMH, Fourth Edition
4. CISCO PACKET TRACER 8.0.1 and Higher version (free download)

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**Pre-Lab/ Prior Concepts:** Simple Network flow

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**New Concepts to be learned:** Purpose of this lab is to become familiar with building topologies in Packet Tracer.

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**Stepwise-Procedure:**

Creating a simple LAN network using packet tracer:

Step 1: Select two PCs (PC0 and PC1) from the end devices and one fast ethernet switch (2950/24 ports)  
Step 2: Connect PCs and switch via copper cable from the panel. Connection can be verified by appearance of all green dots on the links.

Step 3: For PCs to communicate click on PC0.

- Dialog box for PC0 appears

- Click on desktop applications by packet tracer.
- Go to IP configuration.
- Enter IP address to identify host i.e. PC0 (for example: 192.168.1.1)
- Subnet mask-by default already set one can change it as per his/her specification.

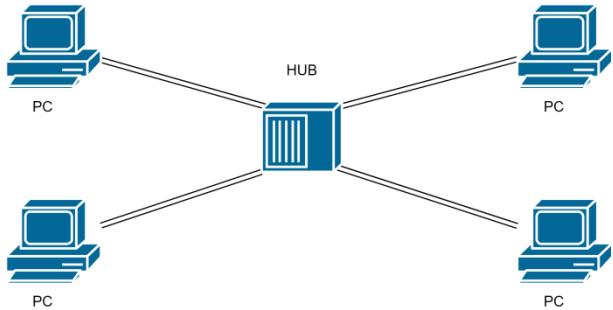
Step 4: Repeat step 3 for PC1

Step 5: Ping both the PCs and check their working status.

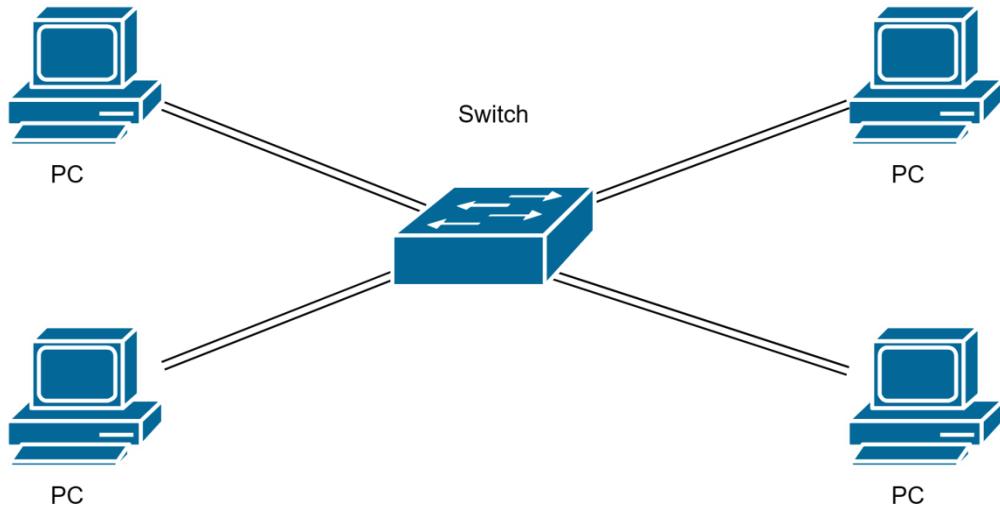
Step 6: Simple PDU (Protocol Data Unit) to simulate network traffic by sending ICMP PDU to assess the network traffic. View simulation in simulation mode

### Network Topologies:

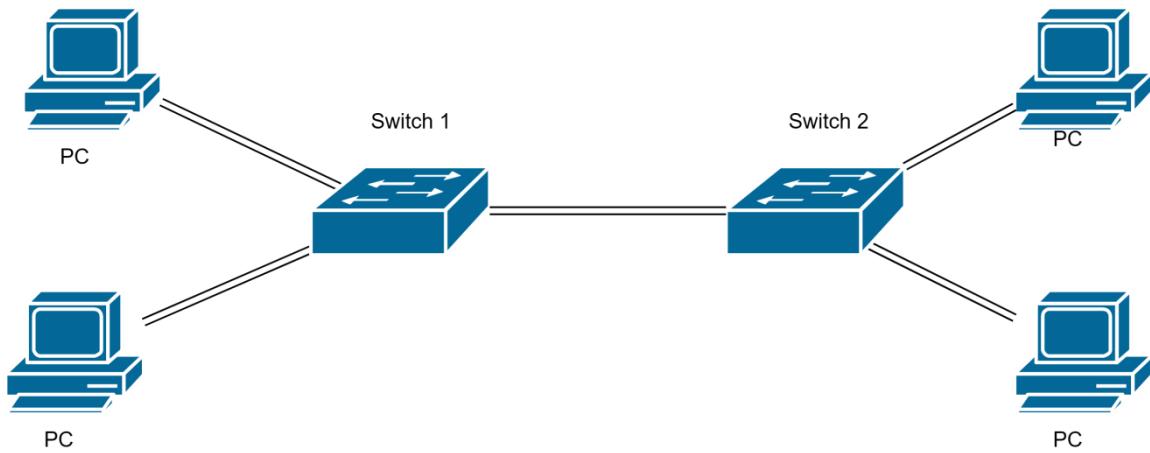
#### 1. Topology with a HUB



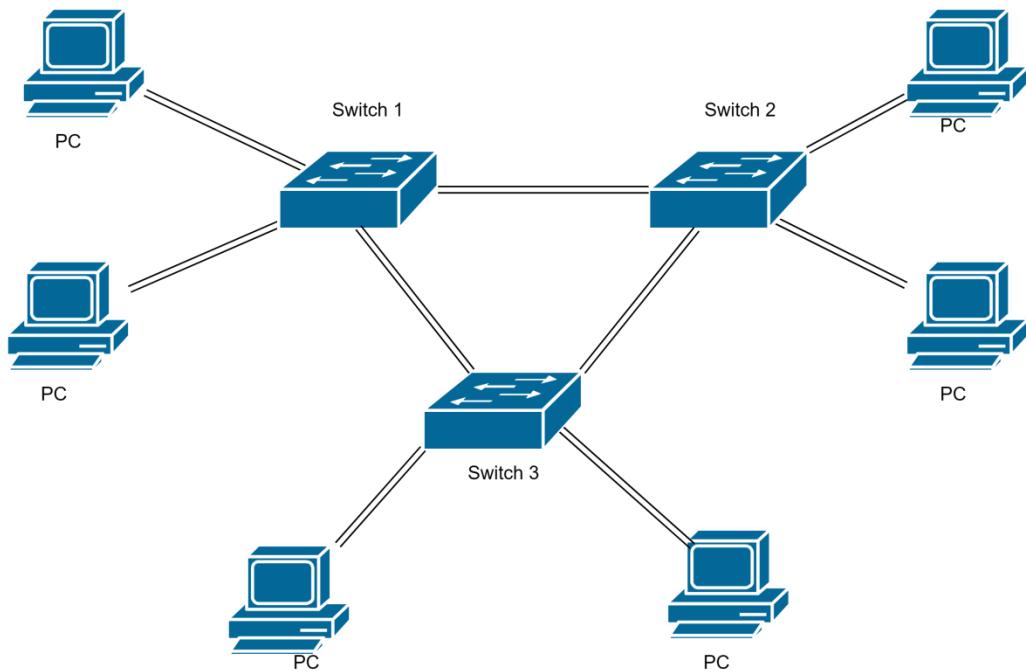
#### 2. Topology with a Switch



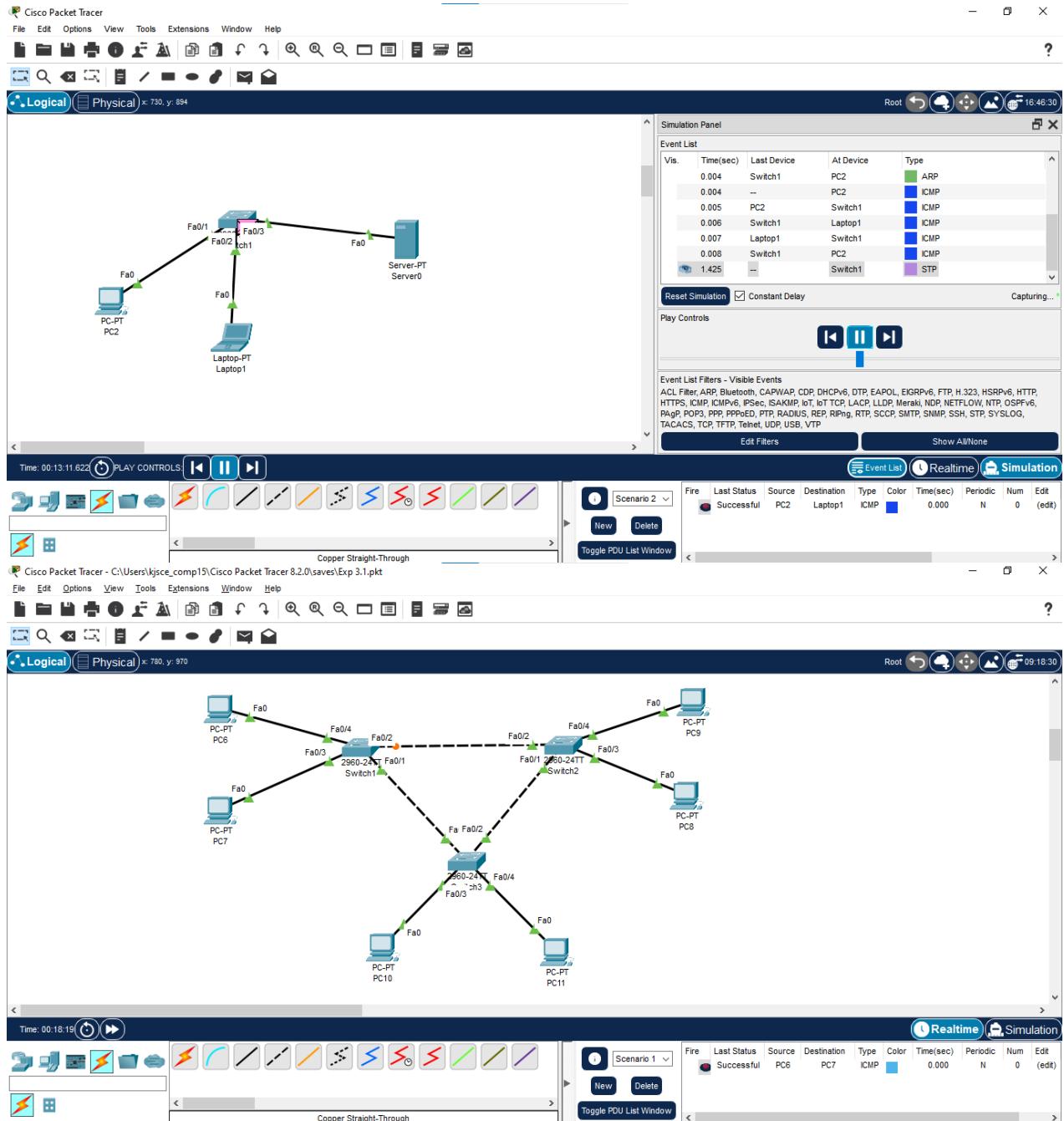
#### 3. Topology with two switches

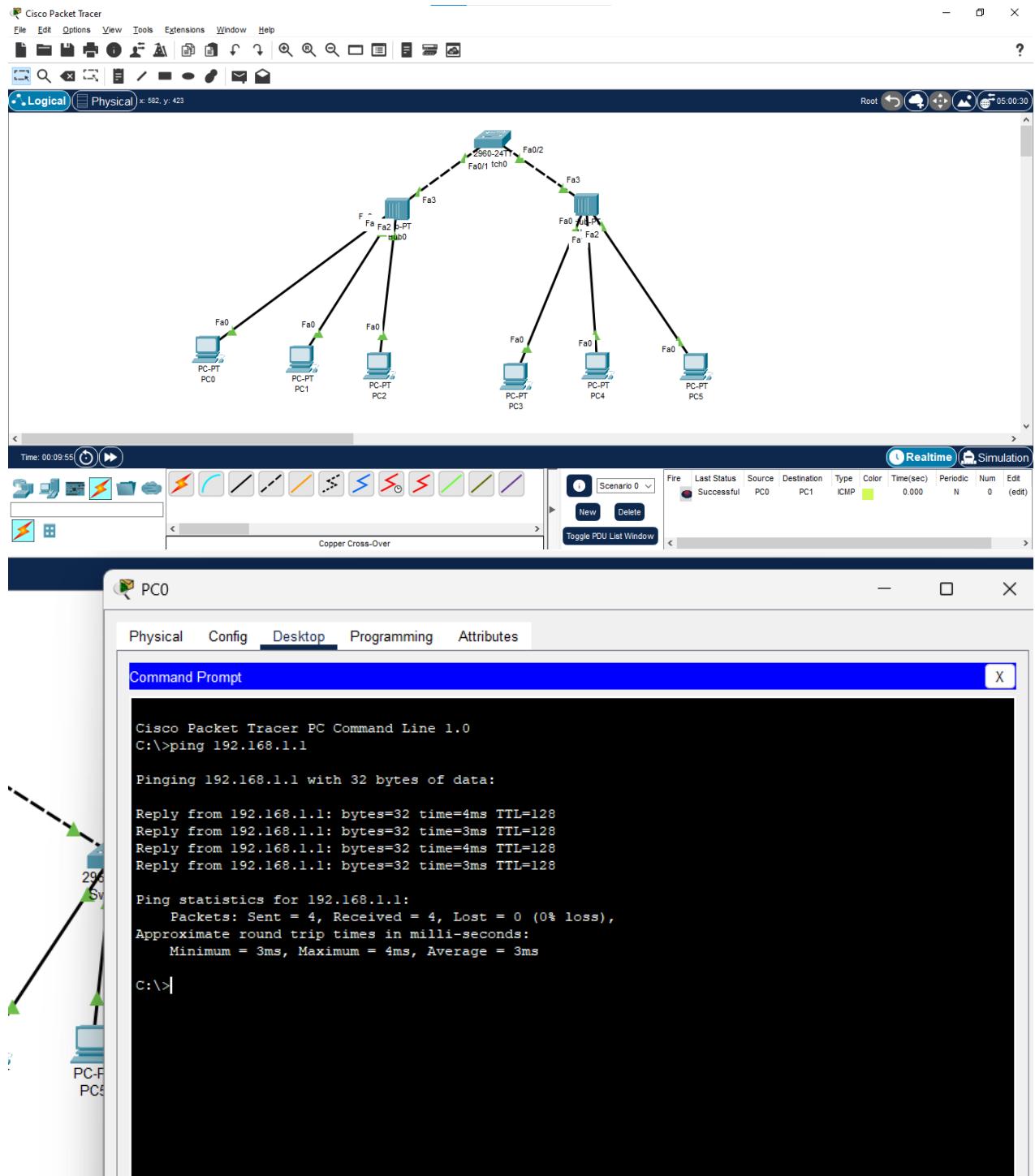


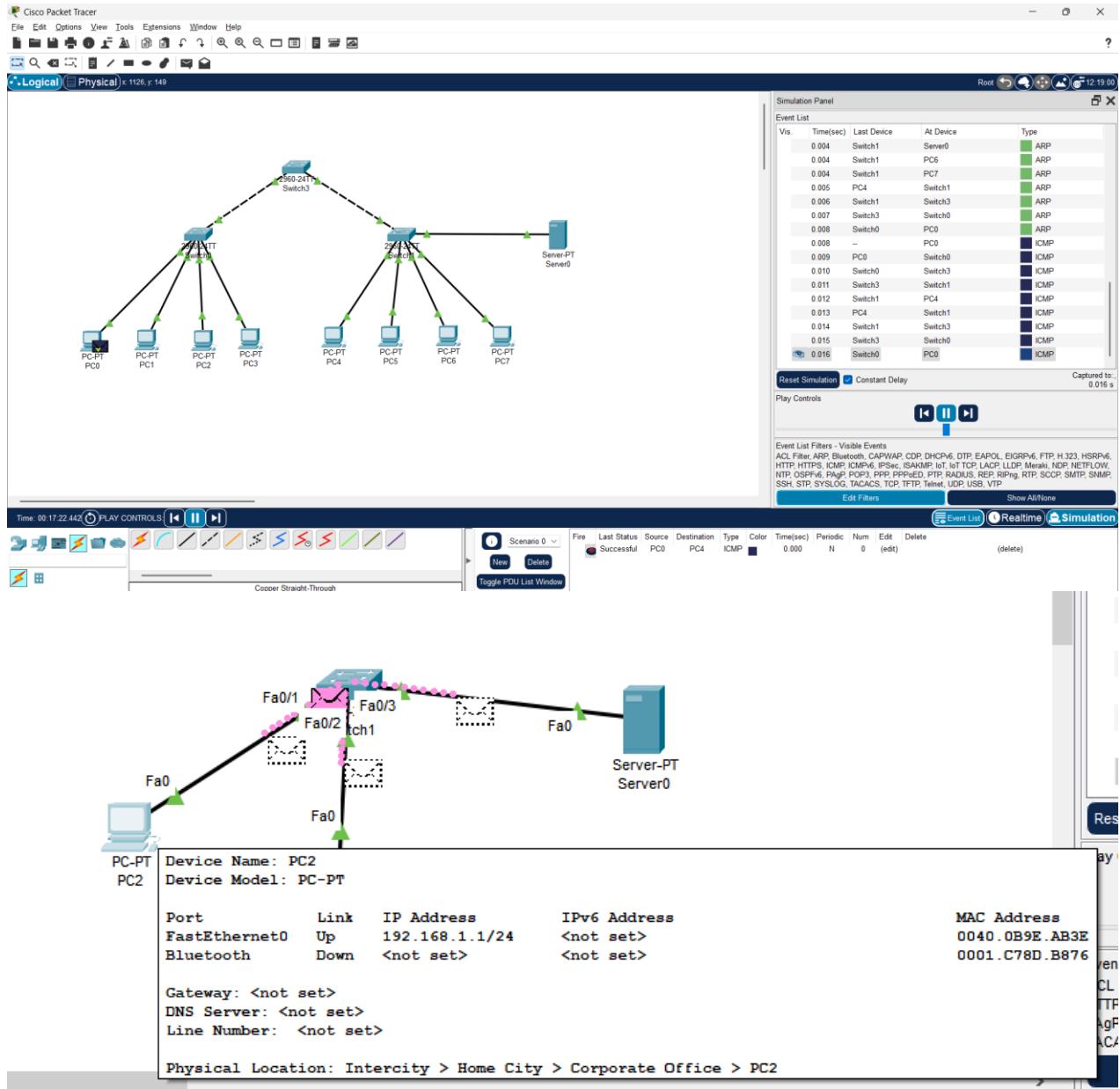
### 5. Topology with 3 switches in a loop (Concept of STP)

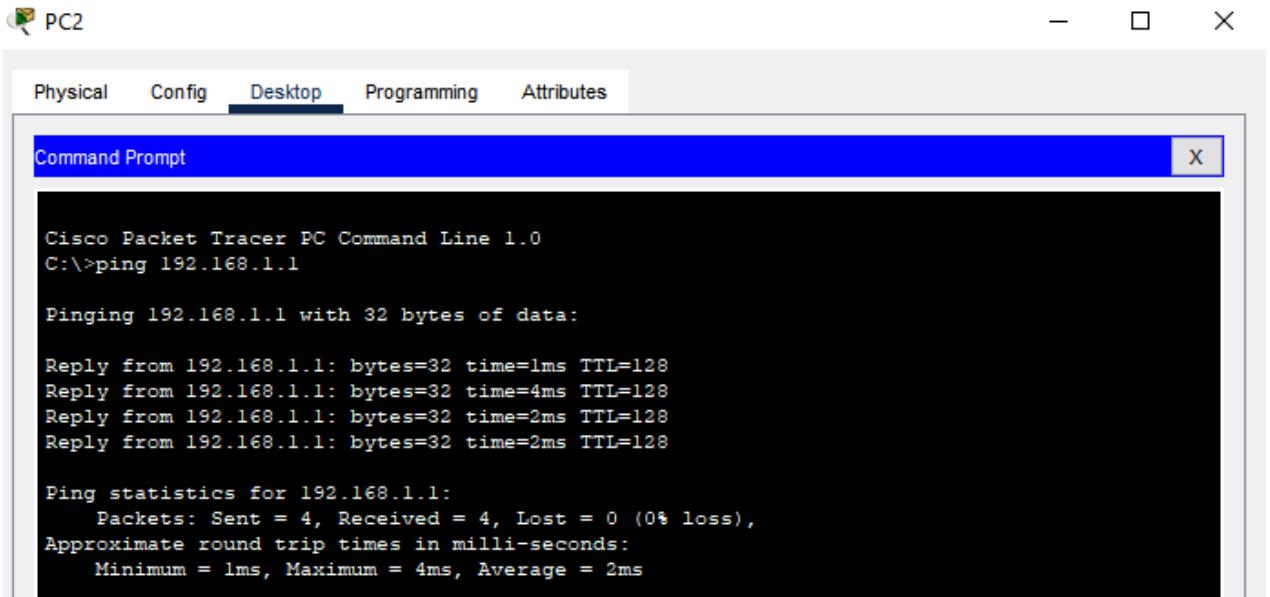


### IMPLEMENTATION:









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Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=1ms TTL=128
Reply from 192.168.1.1: bytes=32 time=4ms TTL=128
Reply from 192.168.1.1: bytes=32 time=2ms TTL=128
Reply from 192.168.1.1: bytes=32 time=2ms TTL=128

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 4ms, Average = 2ms
  
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**CONCLUSION:** I have successfully completed the experiment on building and configuring a simple network topology using Cisco Packet Tracer. Through this experiment, I learned how to create LAN connections using PCs, switches, and hubs, assign IP addresses, and test connectivity.

### **Post Lab Questions**

#### **1. List features of CISCO packet tracer.**

- Network Simulation: Allows designing, configuring, and testing network topologies without physical hardware.
- Device Variety: Supports routers, switches, PCs, servers, IoT devices, and wireless equipment.
- Realistic Configuration: Provides CLI (Command Line Interface) for device configuration similar to real Cisco devices.
- Visualization & Animation: Shows packet flow in real-time for better understanding of network operations.
- Multi-User Functionality: Supports collaborative learning by allowing multiple users to work on the same topology.
- Assessment Tools: Includes built-in tutorials, labs, and grading features for learning and evaluation.
- Cross-Platform Support: Runs on Windows, Linux, macOS, and supports mobile versions.

**2. Explain difference between working of a Hub and a Switch in a given topology.**

A hub operates at the Physical Layer (Layer 1) and broadcasts incoming data to all connected devices, regardless of the destination. This causes unnecessary traffic, collisions, and inefficient bandwidth usage. A switch, on the other hand, operates at the Data Link Layer (Layer 2) and forwards data only to the specific device identified by its MAC address. This reduces collisions, increases efficiency, and provides dedicated bandwidth to each port.

**3. Differentiate between Active and Passive Hub**

Active Hub amplifies and regenerates the signal before forwarding it to connected devices, thus extending network distance and improving performance. It requires a power supply, whereas Passive Hub merely acts as a connection point and distributes the signal as it is, without amplification. It does not require a power supply and is less expensive but less efficient over long distances.

**4. What is the difference between L2 and L3 switch?**

L2 Switch operates at the Data Link Layer, uses MAC addresses to forward frames, and is used primarily within a LAN to connect devices efficiently, whereas L3 Switch operates at the Network Layer, uses IP addresses to route packets between different networks (inter-VLAN routing), combining the functions of a switch and a router.

Date: 24/07/2025

Signature of faculty in-charge