Computer Networks

Lab Assignment Documentation

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III CSE AIML-A

Lab 1: Introduction to Packet Tracer, Peer-to-Peer Communication, Study of Cables and its Colour codes

Procedure:

1. Open Packet Tracer:

• Launch Cisco Packet Tracer on your computer.

• Familiarize yourself with the interface, including the workspace, device selection, and tools.

2. Create a Simple Network:

• Drag two computers (PC-PT) onto the workspace.

• Drag a switch (Switch-PT) onto the workspace.

• Connect each computer to the switch using straight-through Ethernet cables.
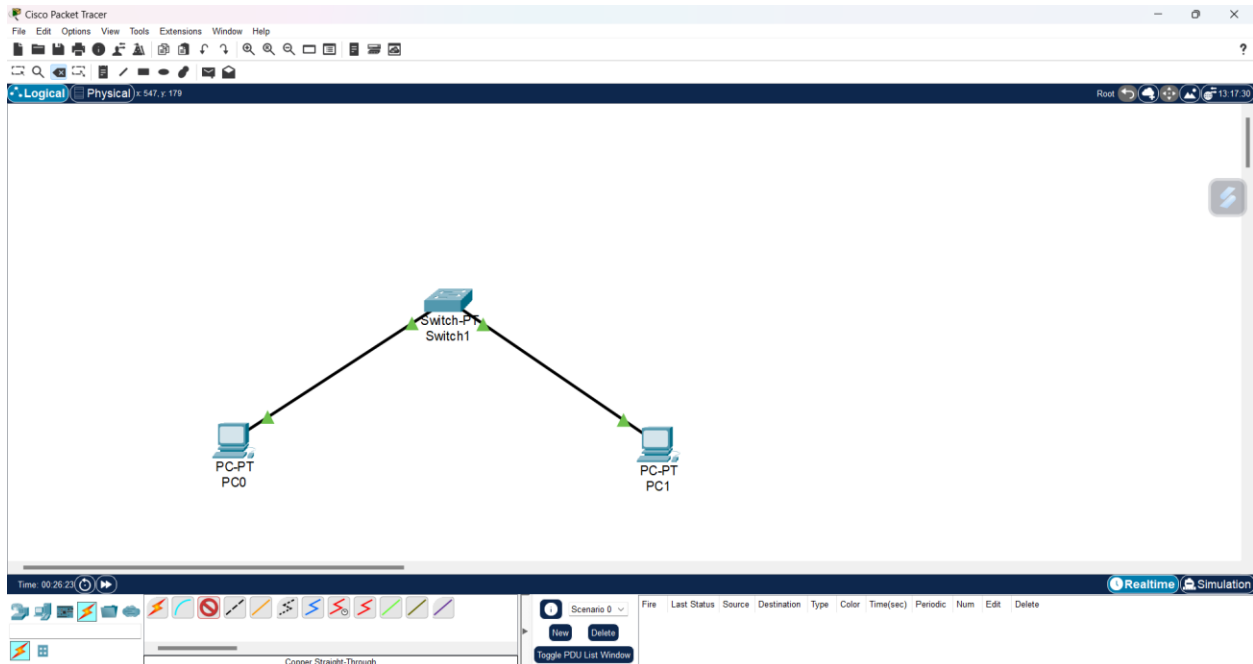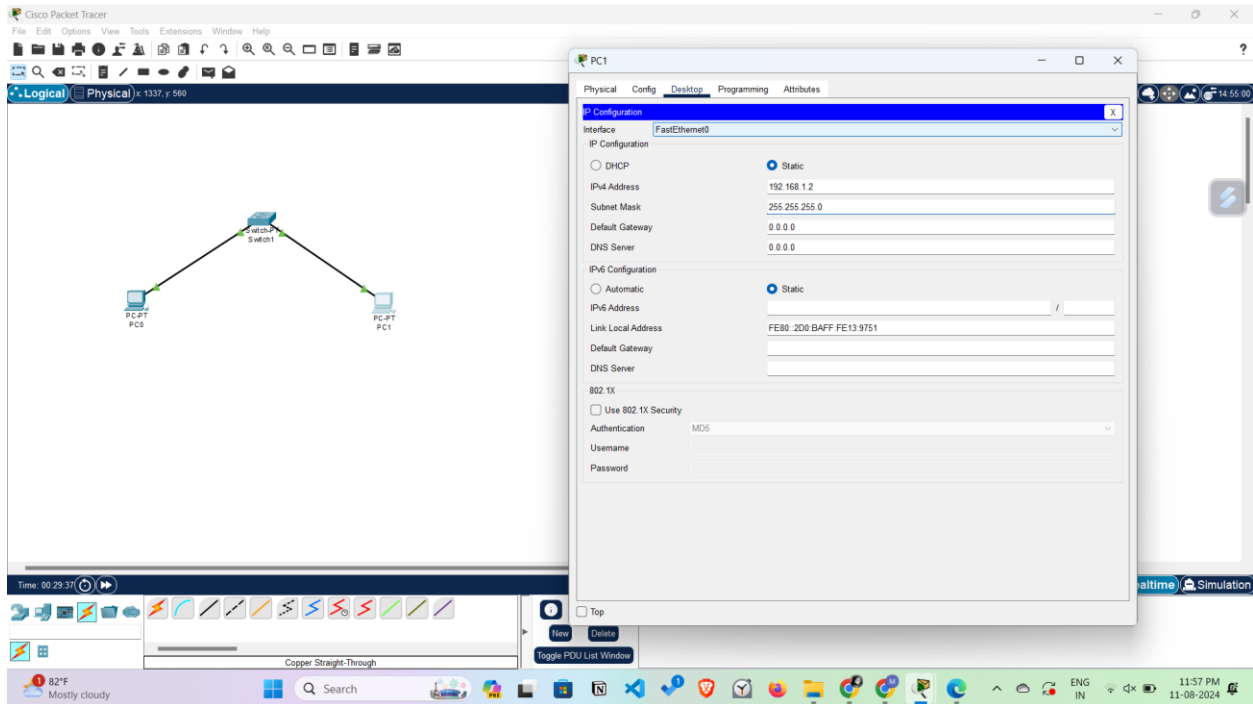
3. Configure IP Addresses:

• Click on the first computer, go to the Desktop tab, and select IP Configuration.

• Assign an IP address (e.g., 192.168.1.1) and a subnet mask (e.g., 255.255.255.0).

• Click on the second computer, go to the Desktop tab, and select IP Configuration.

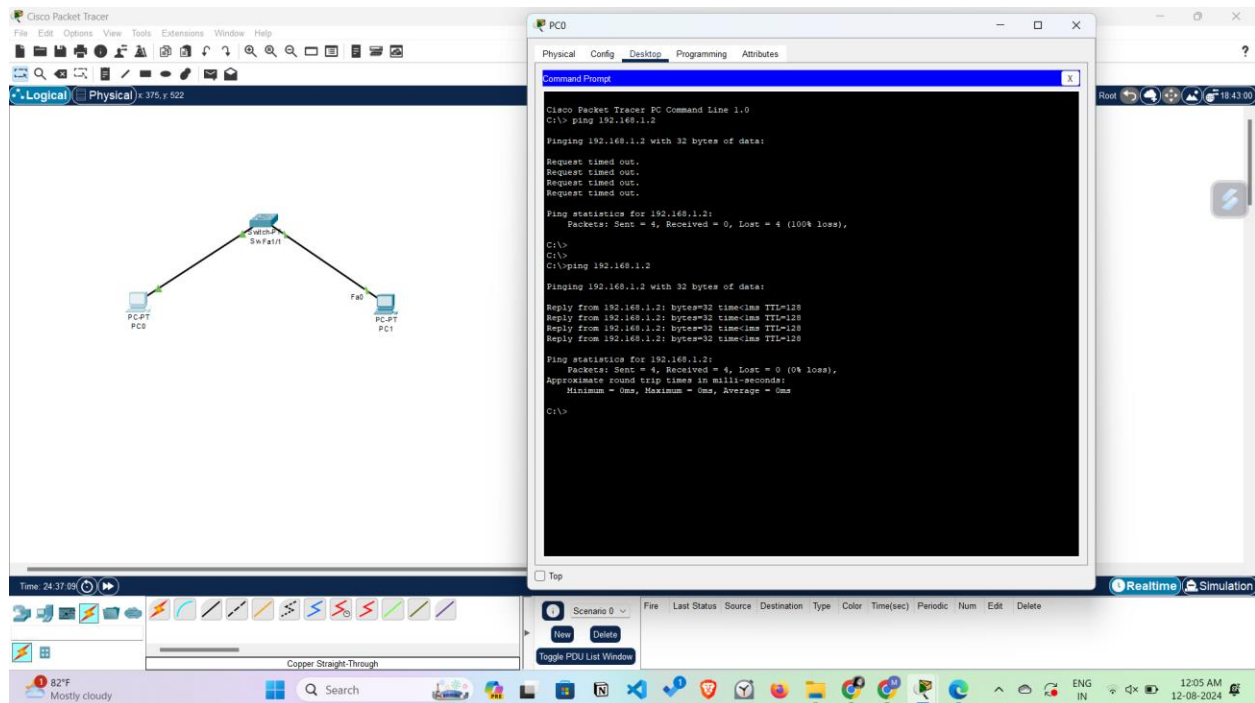• Assign an IP address (e.g., 192.168.1.2) and a subnet mask (e.g., 255.255.255.0).
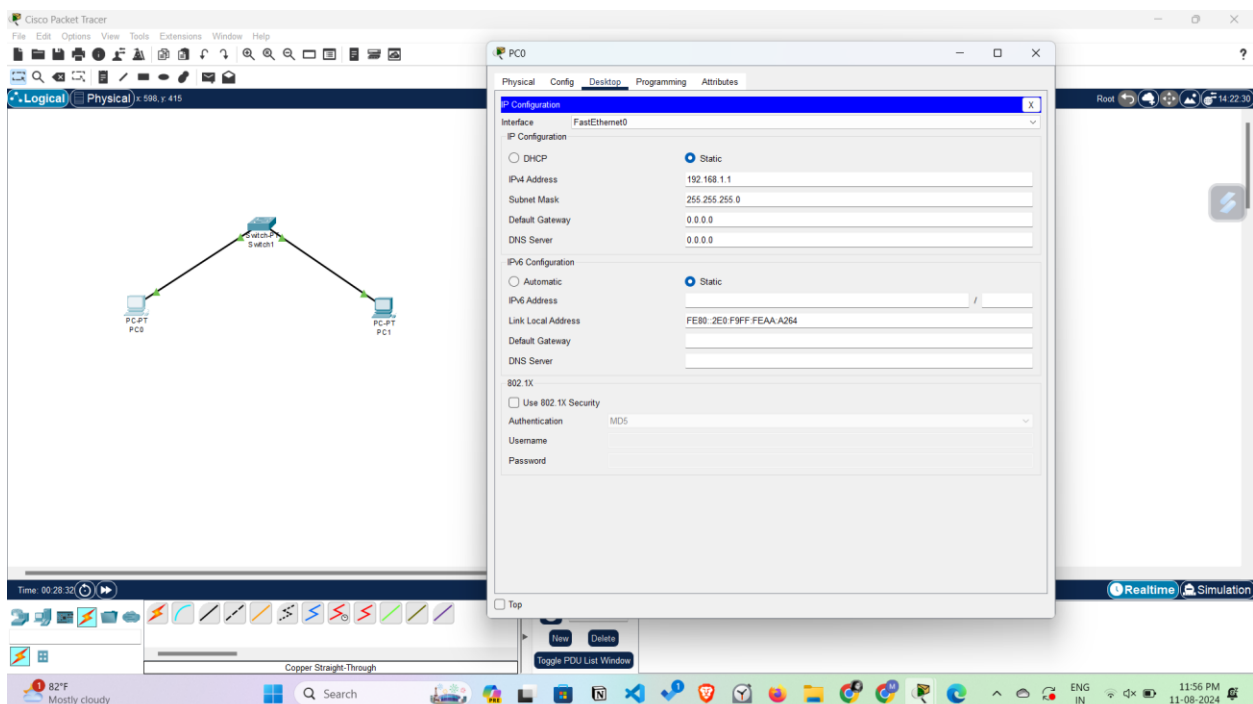
For PC 1



For PC2

4. Test Peer-to-Peer Communication:

• On the first computer, open the Command Prompt from the Desktop tab.

• Use the ping command to test connectivity to the second computer (e.g., ping 192.168.1.2).

• Observe the response to ensure the computers can communicate.

5. Study Cables and Colour Codes:

■ Examine different types of network cables provided (Ethernet, crossover).

Network Cables Overview

1. Ethernet Cables

Definition: Ethernet cables, also known as LAN (Local Area Network) cables, are used to connect devices within a network, such as computers, routers, and switches.

  Types:

    Cat5: Supports speeds up to 100 Mbps.

    Cat5e: Enhanced version of Cat5, supports up to 1 Gbps.

    Cat6: Supports up to 10 Gbps for shorter distances (up to 55 meters).

    Cat6a: Augmented version of Cat6, supports 10 Gbps for distances up to 100 meters.

    Cat7: Supports up to 10 Gbps, with better shielding for less interference.

    Cat8: Latest version, supports up to 40 Gbps, typically used in data centers.

  Wiring Standards:

T568A and T568B: The two standards for wiring the cables, affecting the pin arrangement but not the functionality.

 2. Crossover Cables

  Definition: Crossover cables are a type of Ethernet cable used to connect two similar devices directly, such as two computers or two switches, without the need for a router or hub.

  Wiring: In a crossover cable, the wiring in the cable crosses over to enable direct communication between devices. Specifically, the transmit (Tx) and receive (Rx) wires are crossed.

   One end follows the T568A standard, and the other end follows the T568B standard.

 Use Cases:

   - Direct device-to-device connections.

   - Useful in scenarios where network devices do not support Auto MDI-X (automatic crossover detection).

 Color Codes:

The color codes in Ethernet cables correspond to the wiring standards (T568A and T568B):


T568A Color Code:

- Pin 1: White/Green

- Pin 2: Green

- Pin 3: White/Orange

- Pin 4: Blue

- Pin 5: White/Blue

- Pin 6: Orange

- Pin 7: White/Brown

- Pin 8: Brown


T568B Color Code:

- Pin 1: White/Orange

- Pin 2: Orange

- Pin 3: White/Green

- Pin 4: Blue

- Pin 5: White/Blue

- Pin 6: Green

- Pin 7: White/Brown

- Pin 8: Brown

Key Differences

Ethernet vs. Crossover Cables:

Ethernet cables are used for most network connections, while crossover cables are specifically for direct device-to-device links.

Crossover cables differ in wiring, which allows for direct communication without additional networking devices.