

Lab-1 Report: Introduction to Packet Tracer, Peer-to-Peer Communication, and Study of Network Cables

Aim:

The primary aim of this lab is to familiarize students with Cisco Packet Tracer, set up a peer-to-peer communication network, and study different types of network cables along with their color codes.

Objectives:

1. Understand the basics of using Cisco Packet Tracer.
2. Set up and test a basic peer-to-peer (P2P) network configuration.
3. Research and document the different types of network cables and their color codes.
4. Document the entire process, save the network configuration, and submit the results.

Brief Overview of the Lab Objectives:

1. Familiarization with Cisco Packet Tracer:
 - Introduce students to Cisco Packet Tracer, a network simulation tool for designing and configuring network topologies.
 - Explore the interface and available tools to build confidence for future networking tasks.
2. Peer-to-Peer Communication Setup:
 - Set up a basic P2P network by connecting two PCs directly using a copper straight-through cable.
 - Understand the fundamentals of direct device communication and IP address configuration.
3. Study of Network Cables and Color Codes:

- Research different types of network cables, including copper straight-through, copper crossover, and fiber optic cables.
 - Learn the purpose and usage of each cable type, along with their color codes.
4. Documentation and Submission:
- Document the network setup process, observations, and findings in a detailed report.
 - Save the network configuration in a Packet Tracer project file and submit the work through a GitHub repository.

Steps Taken to Set Up the Network:

1. Creating a New Network in Cisco Packet Tracer:
 - Open Cisco Packet Tracer.
 - Create a new project by selecting “File” > “New” to start a blank workspace.
2. Adding Two PCs to the Workspace:
 - Add PC0: Drag and drop the first PC (PC0) onto the workspace from the “End Devices” category.
 - Add PC1: Similarly, drag and drop a second PC (PC1) onto the workspace.
3. Connecting the PCs Using a Copper Straight-Through Cable:
 - Select the “Copper Straight-Through” cable from the “Connections” category.
 - Connect PC0 to PC1 by selecting the Fast Ethernet 0 port on each PC.
4. Assigning IP Addresses to the PCs:
 - Configure PC0: Set IP address to 192.168.1.1 and Subnet Mask to 255.255.255.0.
 - Configure PC1: Set IP address to 192.168.1.2 and Subnet Mask to 255.255.255.0.
5. Testing the Connection with a Ping Command:
 - Ping from PC0 to PC1: Use the Command Prompt on PC0 to ping 192.168.1.2 and verify successful replies.

Detailed Information on Network Cables and Their Color Codes:

1. Copper Straight-Through Cable:

- Description: Used to connect different types of devices, such as a PC to a switch or a switch to a router.
- Color Codes (TIA/EIA-568A):
 - Pin1: White/Green
 - Pin2: Green
 - Pin3: White/Orange
 - Pin4: Blue
 - Pin5: White/Blue
 - Pin6: Orange
 - Pin7: White/Brown
 - Pin8: Brown

2. Copper Crossover Cable:

- Description: Connects similar devices directly, such as PC to PC or switch to switch.
- Color Codes:
 - One End (TIA/EIA-568A):
 - Pin1: White/Green
 - Pin2: Green
 - Pin3: White/Orange
 - Pin6: Orange
 - Other End (TIA/EIA-568B):
 - Pin1: White/Orange
 - Pin2: Orange
 - Pin3: White/Green
 - Pin6: Green

3. Fiber Optic Cable:

- Description: Transmits data as light pulses through glass or plastic fibers, ideal for high-speed and long-distance communication.
- Types:

- Single-Mode Fiber (SMF): For long-distance communication.
- Multi-Mode Fiber (MMF): For shorter distances.
- Purpose: Used for high-speed data transmission over long distances and in environments with electromagnetic interference.

