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Course / Platform: Cisco Packet Tracer

Project Overview:

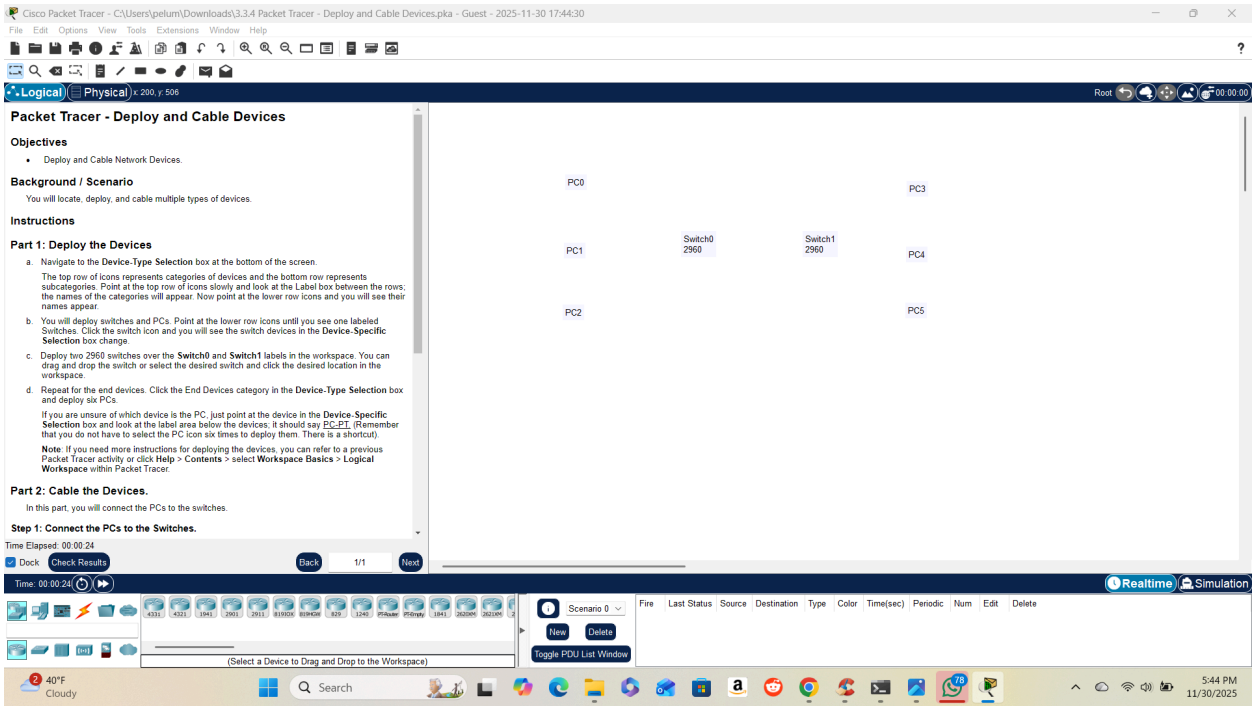
In this lab, I used Cisco Packet Tracer to deploy end devices and switches, then cabled them together to form a small switched network. The goal was to practice selecting the correct device types, placing them in the Logical workspace, and using the appropriate Ethernet cables to build a working Layer 2 topology. This mirrors real-world tasks where a technician or junior network engineer sets up access switches and connects user workstations in a small office or lab environment.

Topology and Devices

The final topology included:

- Two Cisco 2960 switches: Switch0 and Switch1
- Six PCs: PC0, PC1, PC2, PC3, PC4, and PC5

PC0–PC2 were connected to Switch0, and PC3–PC5 were connected to Switch1. The two switches were then interconnected to form a single broadcast domain, allowing all PCs to eventually communicate once IP addressing is configured.



Project Steps

1. Deploying the Devices

I started in the Logical workspace of Packet Tracer and opened the Device-Type Selection box at the bottom of the screen.

First, I deployed the switches. I selected the Switches category and chose the 2960 model. I placed one 2960 switch in the left side of the workspace and named it Switch0, then placed a second 2960 switch on the right side and named it Switch1. These represent access-layer switches that user devices plug into.

Next, I deployed the PCs. From the End Devices category, I selected the generic PC icon and placed three PCs near Switch0 and three more near Switch1. Packet Tracer automatically labeled them PC0 through PC5. At this point, the logical layout matched the instructions: three PCs on each side with a switch in the center of each group.

This first phase focused on correctly identifying and placing devices before any cabling was done, similar to how a network tech would physically rack switches and place user machines in an office.

2. Cabling the PCs to the Switches

After placing the devices, I began connecting each PC to its corresponding switch using Copper Straight-Through cables.

I opened the Connections menu (the lightning bolt icon) and selected the Copper Straight-Through cable type. For each PC, I clicked its FastEthernet0 interface, then clicked the appropriate FastEthernet interface on the switch.

The connections were made as follows:

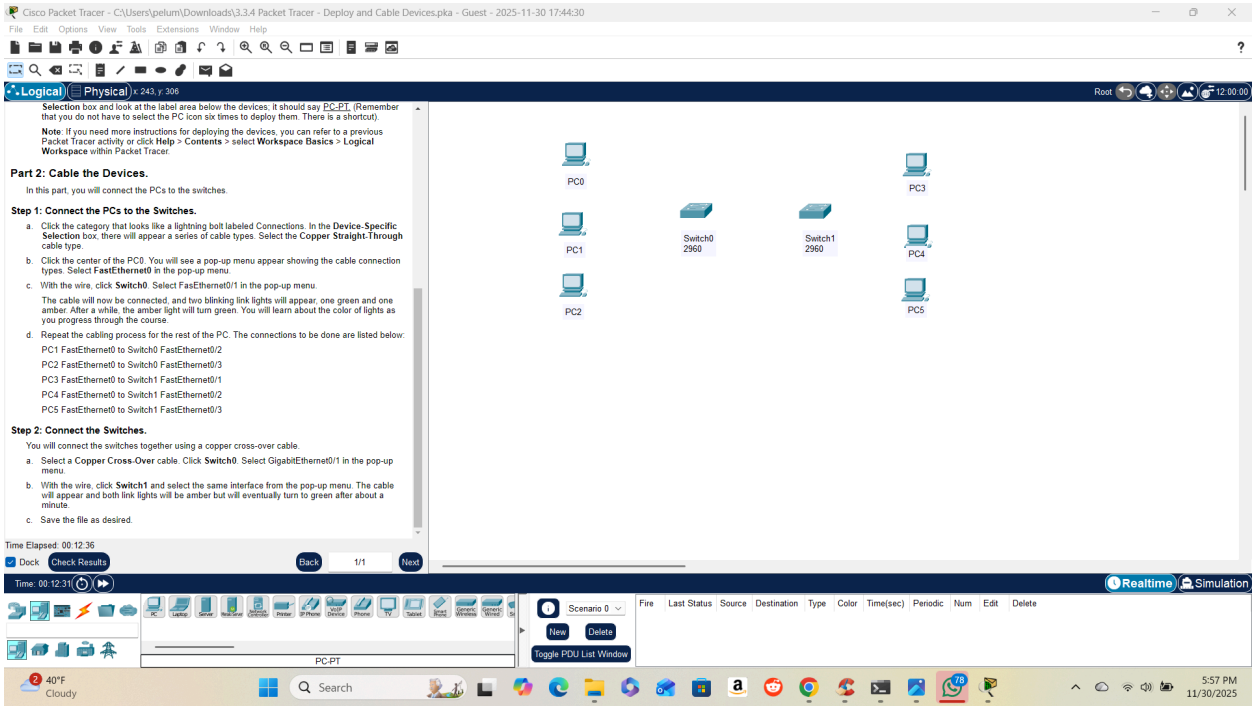
- PC0 FastEthernet0 to Switch0 FastEthernet0/2
- PC1 FastEthernet0 to Switch0 FastEthernet0/3
- PC2 FastEthernet0 to Switch0 FastEthernet0/4

On the right side of the topology:

- PC3 FastEthernet0 to Switch1 FastEthernet0/2
- PC4 FastEthernet0 to Switch1 FastEthernet0/3
- PC5 FastEthernet0 to Switch1 FastEthernet0/4

After each cable was placed, the link lights on the switch and PC ports came up amber and then turned green, indicating that the physical layer connection was working and the ports transitioned from blocking to forwarding.

This step is the Packet Tracer equivalent of running Ethernet patch cables from user PCs to wall jacks or directly to an access switch in a wiring closet.



3. Connecting the Switches Together

With all PCs connected to their local switches, I then interconnected Switch0 and Switch1 so the two sides of the network could communicate.

For this, I used a Copper Cross-Over cable. From the Connections menu, I selected the Copper Cross-Over option, then clicked on Switch0 and chose the GigabitEthernet0/1 interface. Next, I clicked on Switch1 and selected its GigabitEthernet0/1 interface.

Once the cable was placed, both ends initially showed amber link lights, then transitioned to green as the switches brought the trunk link up. This connection forms a direct switch-to-switch link, creating a single logical network across both devices.

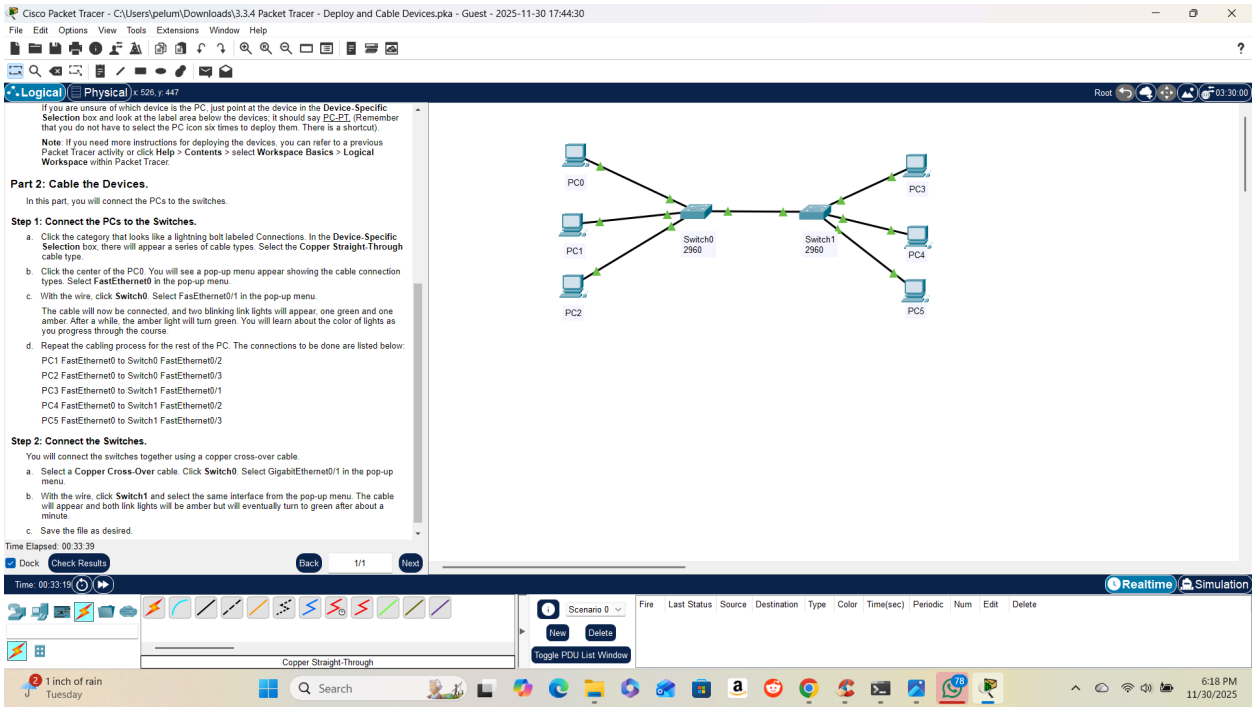
In a real environment, this would represent an uplink between two access switches, or between an access and distribution switch, allowing traffic to move between different parts of the LAN.

4. Verifying the Cabling and Topology

After all connections were made, I used the Check Results feature in Packet Tracer to verify that:

- Every PC was connected to the correct FastEthernet interface on the correct switch
- The switches were connected to each other using the proper interfaces and cable type
- All link lights were active and showing operational status

The activity reported successful completion, confirming that the topology and cabling matched the required design.



Explanation of the Cable Types Used

Copper Straight-Through Cable (PC to Switch)

A **Copper Straight-Through** cable was used to connect each PC to a switch. Traditionally, straight-through cables are used to connect different types of devices, such as:

- PC to Switch
- Switch to Router
- PC to Hub

Inside the cable, the transmit (Tx) pins on one device line up with the receive (Rx) pins on the other device. In older networks, using the wrong cable type meant the devices could not communicate because the wires would not be crossed correctly.

In this lab, the straight-through cable represents a standard Ethernet patch cable you would use to plug a user computer into an access switch.

Copper Cross-Over Cable (Switch to Switch)

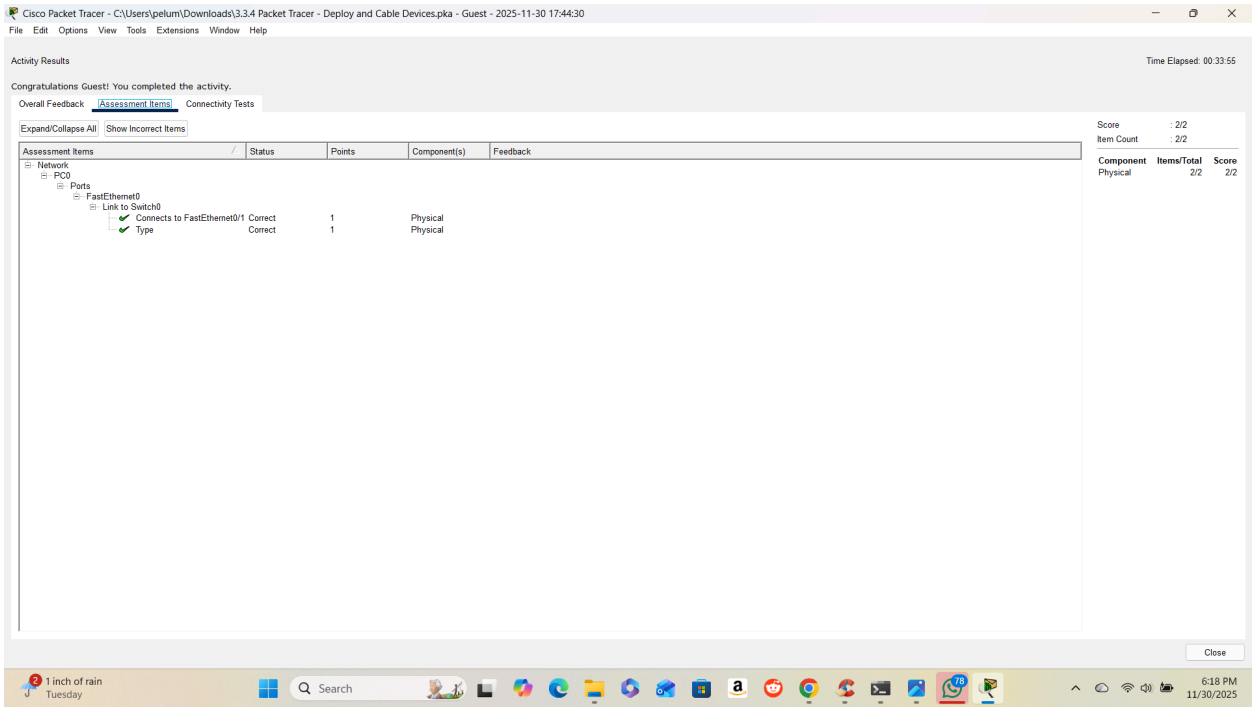
A Copper Cross-Over cable was used to connect Switch0 to Switch1. Historically, cross-over cables are required when connecting similar devices directly together, such as:

- Switch to Switch
- Router to Router
- PC to PC

In a cross-over cable, the transmit and receive pairs are swapped internally, so the Tx pins on one side feed into the Rx pins on the other side without needing an intermediate device.

Many modern switches support auto-MDI/MDI-X, which can automatically detect and adjust for straight-through or cross-over cabling. However, Packet Tracer follows the traditional rule set for teaching purposes, so using a cross-over cable between switches reinforces the concept that like devices usually require a cross-over for direct connections.

In this lab, the cross-over link between GigabitEthernet0/1 on both switches simulates a proper uplink between switches, ensuring frames can travel between both sides of the network.



Skills Demonstrated

During this activity I practiced:

- Selecting appropriate end devices and switches in Cisco Packet Tracer
- Organizing a clear logical layout for a small switched network
- Choosing the correct cable type based on the relationship between devices (unlike vs like devices)
- Connecting PCs to access-layer switches using FastEthernet interfaces
- Interconnecting switches with a cross-over uplink using GigabitEthernet ports
- Interpreting port link lights (amber to green) as indicators of port status and connectivity
- Verifying topology correctness using Packet Tracer's built-in assessment tools