COMPUTER NETWROKS LAB

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Q1) Connecting PCs Using a Switch in Cisco Packet Tracer

Objective

To establish a basic network topology using Cisco Packet Tracer, connecting 3 PCs with a switch. Configure static IP addresses for the PCs and successfully ping between them.

Equipment

- 3 PC devices
- One switch

Procedure

1. **Create Network Topology:**

   - Open Cisco Packet Tracer.
   - Drag and drop two PC devices and one switch onto the workspace.
   - Connect each PC to a different port on the switch using Ethernet cables.

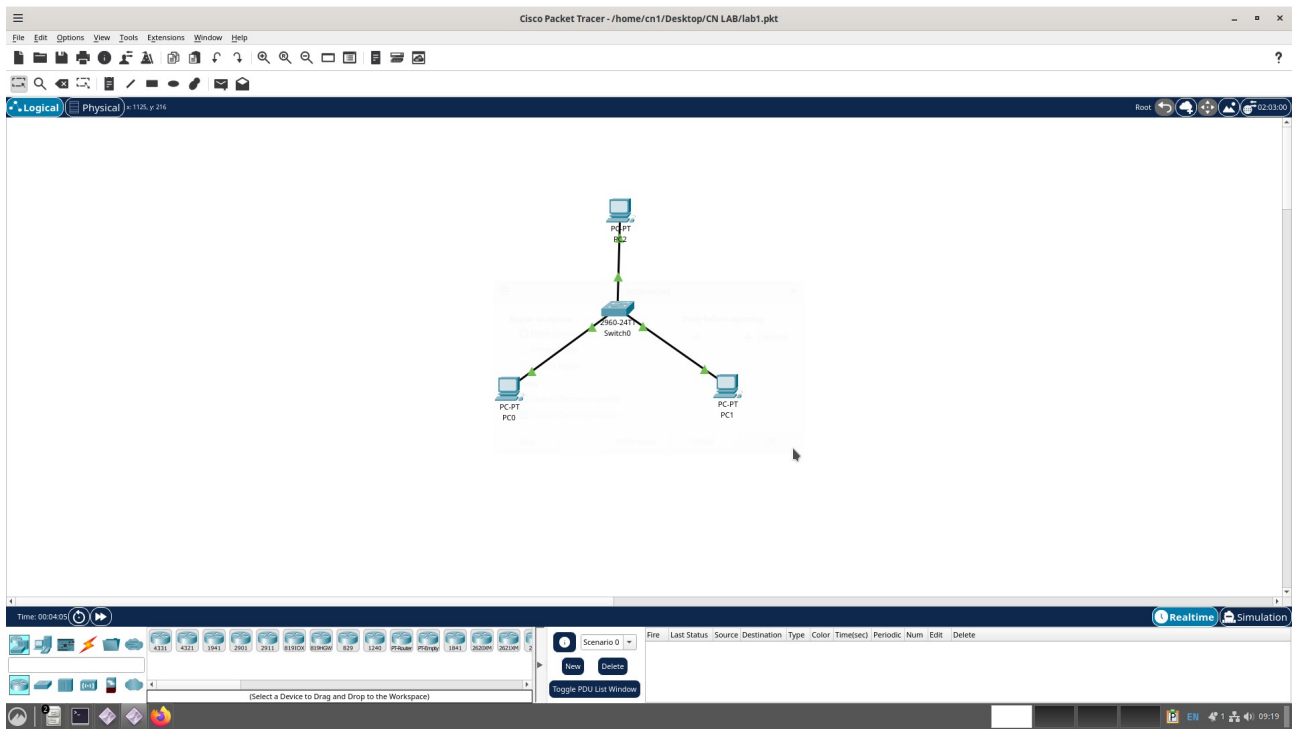2. **Configure Switch:**

   - Double-click the switch to access its configuration mode.
   - Configure the switch name (optional).
   - Exit configuration mode.

3. **Configure PC Interfaces:**

   - Double-click each PC to access its desktop.
   - Open the command prompt.
   - Configure the IP address, subnet mask, and default gateway for each PC:
     - PC1: IP address 192.168.1.1, subnet mask 255.255.255.0, default gateway 192.168.1.1
     - PC2: IP address 192.168.1.2, subnet mask 255.255.255.0, default gateway 192.168.1.1

4. **Ping Test:**

   - On PC1, open the command prompt and type `ping 192.168.1.2` to ping PC2.
   - On PC2, open the command prompt and type `ping 192.168.1.1` to ping PC1.
   - Verify successful communication by observing the ping results.

Results

The network topology was successfully created with two PCs connected to a switch. Static IP addresses were configured for both PCs: 192.168.1.1 for PC1 and 192.168.1.2 for PC2. Ping tests between the two PCs were successful, indicating proper network connectivity.

Conclusion

This lab demonstrated the basic steps involved in setting up a simple network using Cisco Packet Tracer. Successful ping tests confirmed the functionality of the network and the correct configuration of IP addresses.

Additional Notes

- The switch's IP address is not typically configured in this basic scenario. It is primarily used for management purposes.
- This lab can be expanded by adding more devices, creating different network topologies, and exploring advanced network concepts.

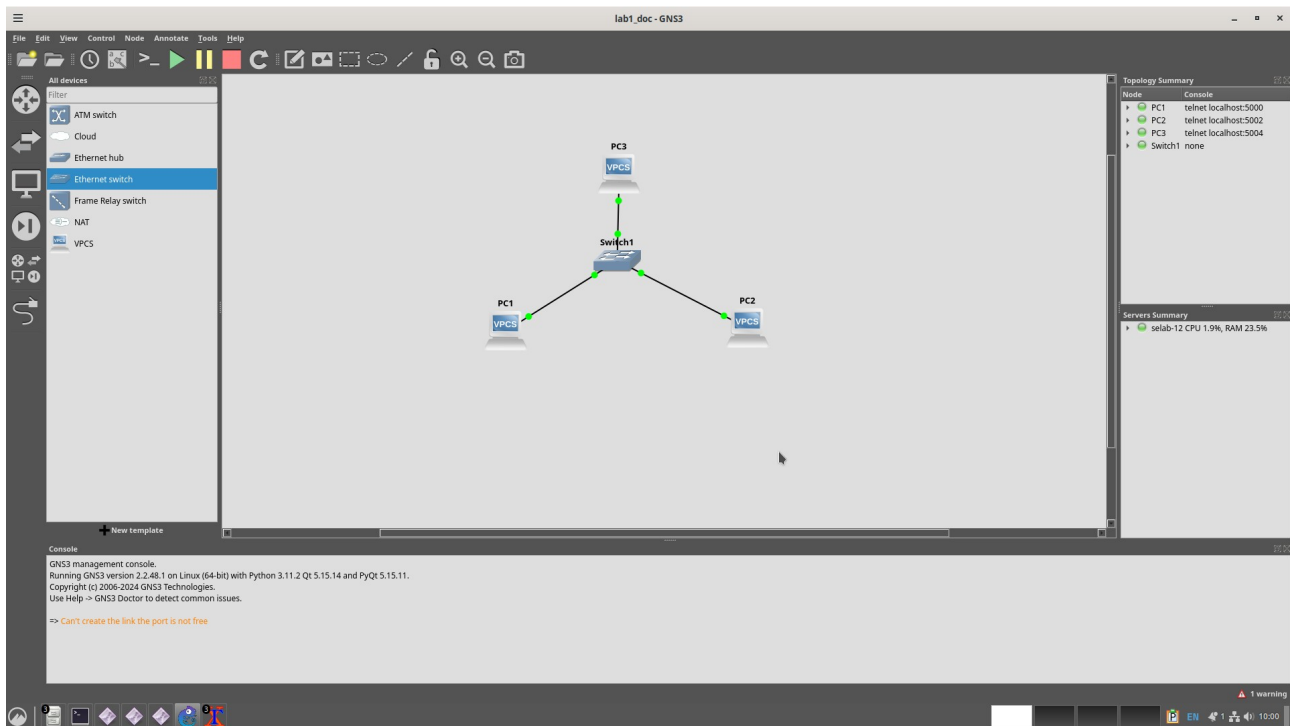# Q2: Three-PC Network with GNS3 and Wireshark Analysis

Objective

To configure a network topology with three PCs connected to a switch in GNS3, establish communication between PC1 and PC2 and capture and analyze network traffic using Wireshark.

Equipment

- GNS3 simulator
- 3 PC devices

- One switch
- Wireshark packet analyzer

Procedure

1. **Create Network Topology:**

   - Open GNS3 and create a new project.
   - Add three PC devices and one switch to the workspace.
   - Connect each PC to a different port on the switch using Ethernet links.

2. **Configure PC Interfaces:**

   - Assign static IP addresses to each PC:
     - PC1: IP address 192.168.1.1, subnet mask 255.255.255.0
     - PC2: IP address 192.168.1.2, subnet mask 255.255.255.0
     - PC3: IP address 192.168.1.3, subnet mask 255.255.255.0
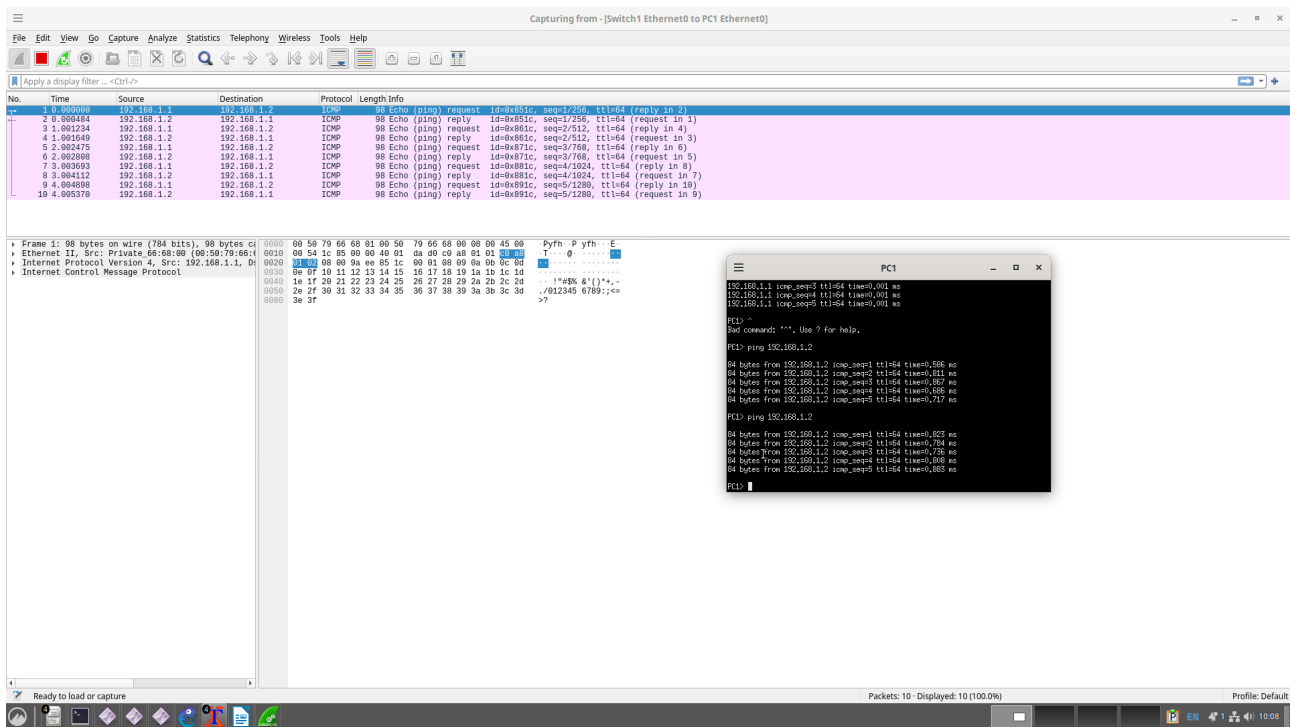
3. **Start GNS3 Simulation:**

   - Start the GNS3 simulation.

4. **Ping Test:**

   - Open a console window on PC3.
   - Ping PC1 by typing `ping 192.168.1.1`.
   - Observe the ping results.

5. **Wireshark Capture:**

   - Start Wireshark on your host machine.
   - Choose the appropriate network interface to capture packets.
   - Start the capture.
   - On PC1, initiate a ping to PC2 again.
   - Stop the Wireshark capture.

Results

- The network topology was successfully created and simulated in GNS3.
- PC1 was able to successfully ping PC2.
- Wireshark captured the network traffic, including ARP requests, ICMP echo requests and replies, and Ethernet frames.

Conclusion

This lab demonstrated the process of setting up a basic network topology in GNS3, establishing communication between devices, and analyzing network traffic using Wireshark. The experiment provided insights into the underlying network protocols and packet formats involved in a simple ping operation.