

COMPUTER NETWORKS LAB

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ROLL NO - 14

DATE - 29/7/24

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:

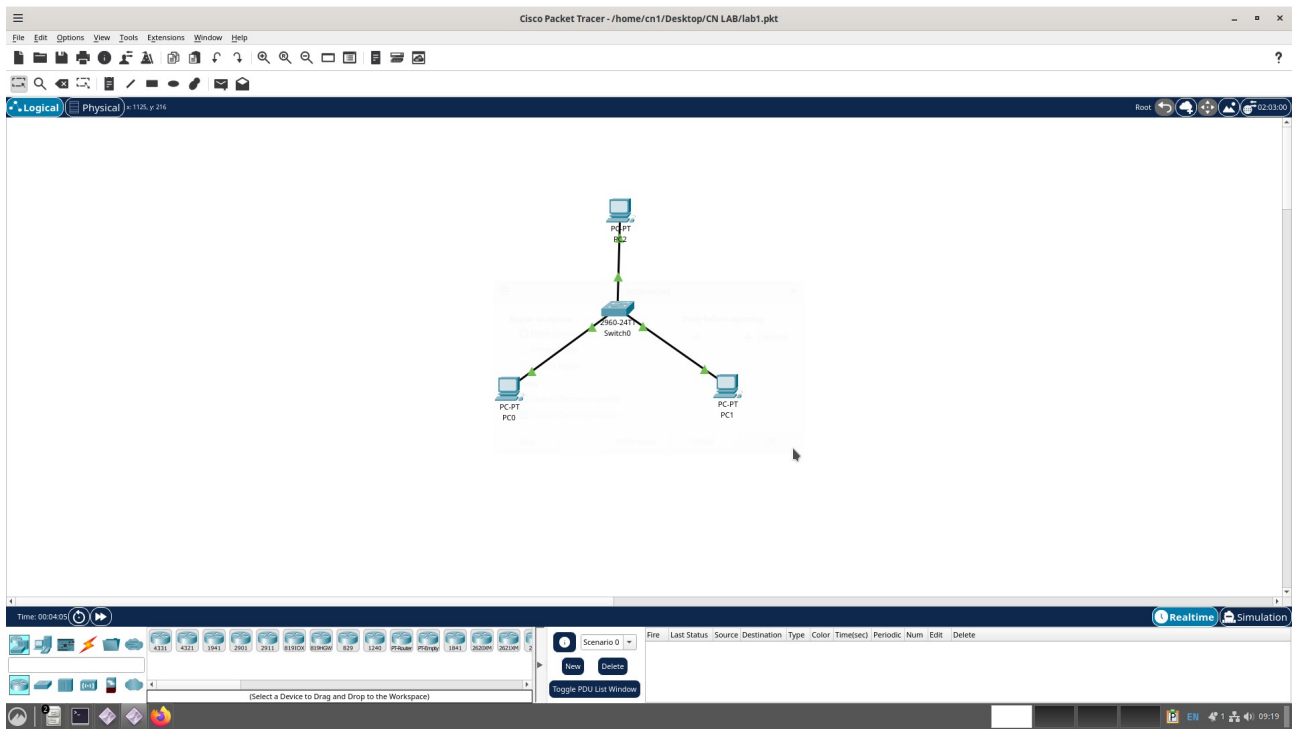
- Double-click the switch to access its configuration mode.
- Configure the switch name (optional).
- Exit configuration mode.

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

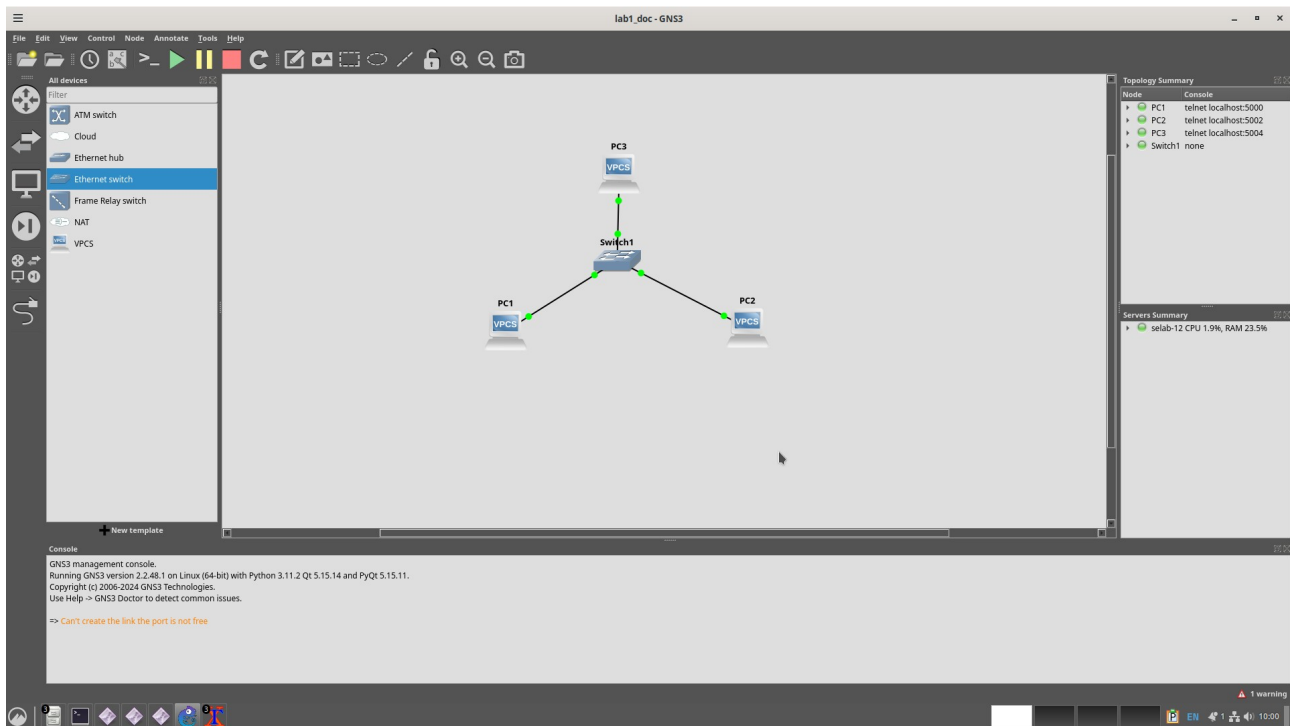
Objective

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

```
PC3
Trying 111...
Connected to localhost.
Escape character is '^]'.

Welcome to Virtual PC Simulator, version 0.8c
Dedicated to Bulny.
Build time: Oct 10 2018 17:01:10
Copyright (C) 2007-2015, Paul Peng (kirnshi@gmail.com)
All rights reserved.

VPCS is free software, distributed under the terms of the "BSD" license.
Source code and license can be found at spcs.sf.net.
For more information, please visit http://vpc.sourceforge.net.
Press '?' to get help.

Executing the startup file

PC3: ip 192.168.1.3
Checking for duplicate address...
PC1: 192.168.1.3 255.255.255.0
PC3: ping 192.168.1.1
64 bytes from 192.168.1.1: icmp_seq=1 ttl=64 time=0.626 ms
64 bytes from 192.168.1.1: icmp_seq=2 ttl=64 time=0.582 ms
64 bytes from 192.168.1.1: icmp_seq=3 ttl=64 time=0.593 ms
64 bytes from 192.168.1.1: icmp_seq=4 ttl=64 time=0.458 ms
64 bytes from 192.168.1.1: icmp_seq=5 ttl=64 time=0.522 ms
PC3: c
clear ip ip6/arp/neighbor/riid/riid
Clear ip/ip6 address, arp/neighbor table, command history.
PC3: ping 192.168.1.2
64 bytes from 192.168.1.2: icmp_seq=1 ttl=64 time=0.740 ms
64 bytes from 192.168.1.2: icmp_seq=2 ttl=64 time=0.594 ms
64 bytes from 192.168.1.2: icmp_seq=3 ttl=64 time=0.792 ms
64064 bytes from 192.168.1.2: icmp_seq=4 ttl=64 time=0.716 ms
64 bytes from 192.168.1.2: icmp_seq=5 ttl=64 time=0.734 ms
PC3: ping 192.168.1.3
192.168.1.3: icmp_seq=1 ttl=64 time=0.001 ms
192.168.1.3: icmp_seq=2 ttl=64 time=0.001 ms
192.168.1.3: icmp_seq=3 ttl=64 time=0.001 ms
192.168.1.3: icmp_seq=4 ttl=64 time=0.001 ms
192.168.1.3: icmp_seq=5 ttl=64 time=0.001 ms
PC3: █
```

3. Start GNS3 Simulation:

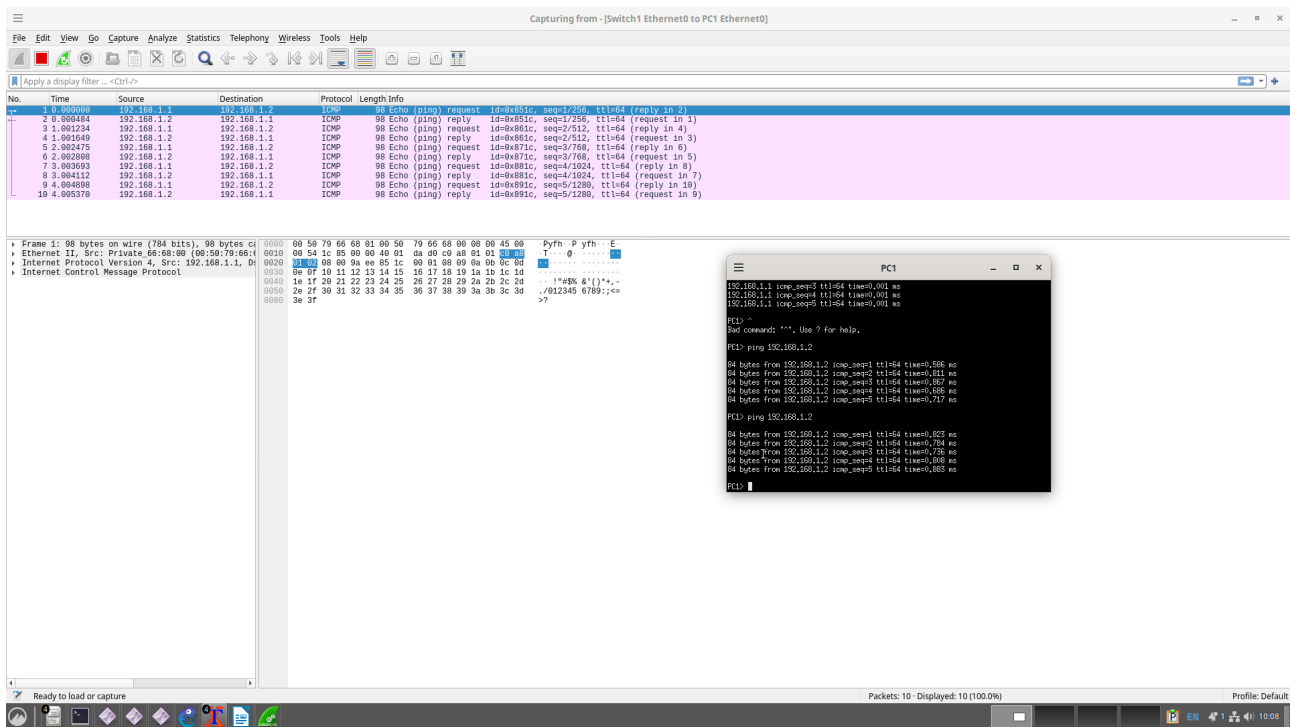
- Start the GNS3 simulation.

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.