Namal University Mianwali

Computer Networks Laboratory Manual #1

Lab title: **Introduction to Cisco Packet Tracer**

Course Title	Computer Networks	Course Number	CS – 270
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1. Introduction:

Cisco Packet Tracer is a powerful network simulation program that allows students to experiment with network behaviour. Packet Tracer provides simulation, visualization, authoring, assessment, and collaboration capabilities to facilitate the teaching and learning of complex technology concepts. Packet Tracer supplements physical equipment in the classroom by allowing students to create a network with an almost unlimited number of devices, encouraging practice, discovery, and troubleshooting. The simulation-based learning environment helps students develop 21st century skills such as decision making, creative and critical thinking, and problem solving.

2. Key Features:

Packet Tracer Workspaces: Cisco Packet Tracer has **two** workspaces—**logical and physical**. The logical workspace allows users to build logical network topologies by placing, connecting, and clustering virtual network devices. The physical workspace provides a graphical physical dimension of the logical network, giving a sense of scale and placement in how network devices such as routers, switches, and hosts would look in a real environment. The physical view also provides geographic representations of networks, including multiple cities, buildings, and wiring closets.

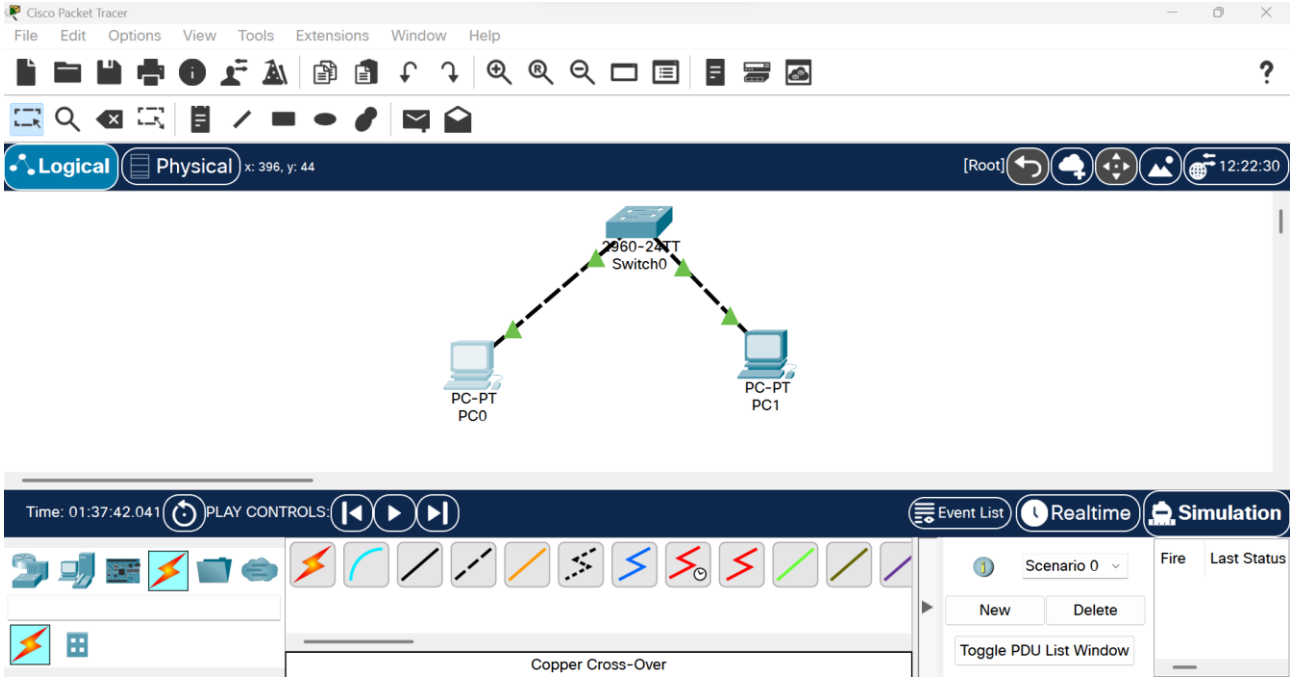


Figure 1.1 Logical View

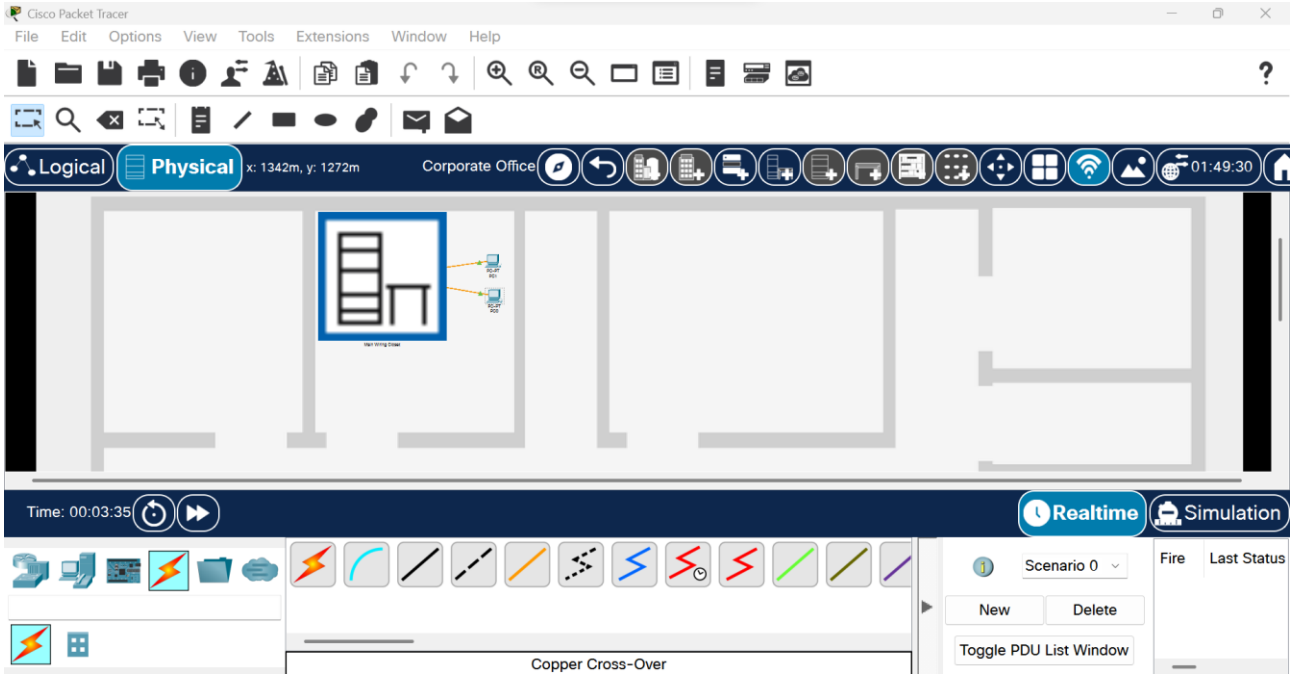


Figure 1.2 Physical View

Packet Tracer Modes: Cisco Packet Tracer provides two operating modes to visualize the behaviour of a network—real-time mode and simulation mode. In real-time mode the network behaves as real devices do, with immediate real-time response for all network activities. The real-time mode gives students a viable alternative to real equipment and allows them to gain configuration practice before working with real equipment. In simulation mode the user can see and control time intervals, the inner workings of data

transfer, and the propagation of data across a network. This helps students understand the fundamental concepts behind network operations. A solid understanding of network fundamentals can help accelerate learning about related concepts.

Modular Devices: Graphical representations visually simulate hardware and offer the ability to insert interface cards into modular routers and switches, which then become part of the simulation.

2. Objective:

In this lab the students shall learn about Cisco Packet Tracer and its features. The students will learn different modes, workspaces and modular devices of Cisco Packet Tracer. After completing this lab, the students should be able to:

i. Describe the Packet Tracer and its uses.
ii. Use different devices on Packet Tracer with their interconnections.
iii. Assign IP addresses to devices.
iv. Use ping command to verify the connectivity between different devices.

3. Software/Tool:

The simulation is carried out in Cisco's Packet Tracer, whereas, notes are taken in a word processor such as Libreoffice or MS office.

Packet Tracer v8.0+ should have been installed in the previous Lab activity, if not done, please ask for Lab Engineer for assistance.

4. How to attempt this Lab Activity:

This laboratory session and subsequent sessions are divided in to activities with associated tasks. Each task requires its own setup, configuration and learned observations. You are to attempt the lab activities to the best of your knowledge, seeking guidance where hurdles arise.

Every task, needs to be performed within the Lab Time, and demonstrate the understanding to Lab Engineer/Demonstrator; to get grade points

Without further ado, lets dive into the lab activities.

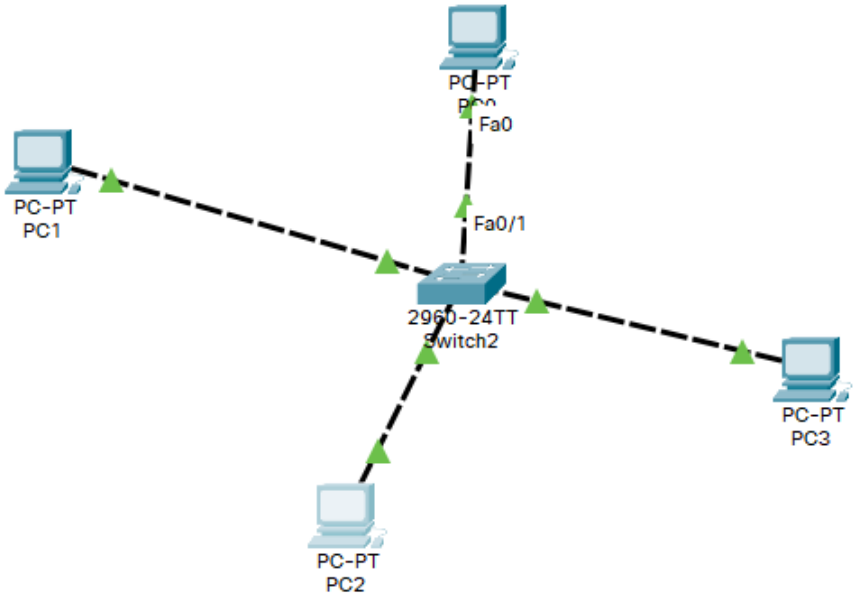
5. Activities

Activity:

Create a new network with following configuration.

(1) Build a logical topology of 4 hosts (PCs) connected via a switch.

- Logical topology with one switch and four pc's



(2) Check the network configuration of one PC using **ipconfig** command in the command line.
Observation: Take screen shot of the output and paste is here.

- Screenshot use ipconfig command in command line.

```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::20C:CFFF:FE30:665D
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: ::
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0
```

(3) Assign each host the IP address according to the Table

Label	IP Address
PC0	192.168.1.1
PC1	192.168.1.2
PC2	192.168.1.3
PC3	192.168.1.4

(4) Test your logical connection between each host using the ping command.

Observation: Take screen shot of your final network and paste it here.

- PC0 with PC0

```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=6ms TTL=128
Reply from 192.168.1.1: bytes=32 time<1ms TTL=128
Reply from 192.168.1.1: bytes=32 time=2ms TTL=128
Reply from 192.168.1.1: bytes=32 time=4ms TTL=128

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 6ms, Average = 3ms
```

- PC0 with PC1

```
C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time=1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

- PC0 with PC4

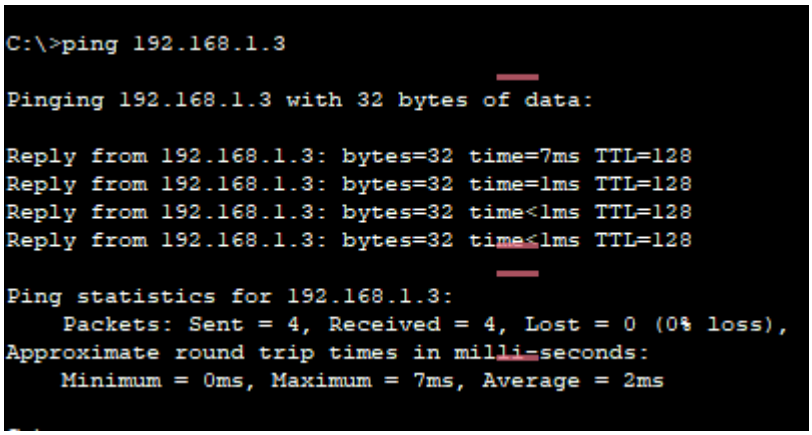
```
C:\>ping 192.168.1.4

Pinging 192.168.1.4 with 32 bytes of data:

Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time=1ms TTL=128
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time=1ms TTL=128

Ping statistics for 192.168.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

- PC0 with PC4

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

(5) Write down the output of ping between PC0 and PC3. Also verify logical

Observation:



PC0 is connected to PC3 with a switch. By ping command find the connection. Ping command tells me the link lies between PC0 and PC3. Ping command tell us about the connectivity between pc or servers.

(6) Activity ends here.