

Assignment 01

Problem statement:

Setup a wired LAN using a layer 2 switch. It includes preparation of cable, testing cable using line tester, configuring machine's IP address, testing using ping utility and demonstrating the ping packet captured traces using wireshark packet analyzer tool.

Title: Wired LAN setup.

Definition: To set up a wired LAN using layer 2 switch and an IP switch of minimum 4 computers.

Requirements:

- a) Wireshark
- b) Cisco Packet Tracer
- c) Device used for simulation-switches cables, Laptop.

(implementation was shown using simulation by Lab teacher due to pandemic)

Description:

Computer network: a network is a set of devices (referred as nodes). A node can be any device capable of sending and receiving data generated by other nodes.

No.	Layer	minimum devices	Protocols	TCP/IP	services
1	Application	All	PC, Laptop mobile	HTTP NFS SMTP FTP	application interfaces API
2	Presentation	precious	Gateway	HTTP NFS SMTP FTP	Formatting encryption compression
3	Session	stones	Gateway	HTTP NFS SMTP FTP	application Authentication authorisation
4	Transport	too	Gateway firewall	TCP UDP	Transport addressing
5	Network	need	ROUTER Browter	IP ICMP ARP	addressing routing
6	data link	display	Bridges, modem, network I C	Ethernet, wiffl IEEE 802.2 PPP	network access
7	Picture	picture	Hub connector repeater	CAT5 RJ45	Network access Transmission

Property	Local area network LAN	Metro. political area network MAN	Wide area network WAN
① Range	covers small areas, buildings, campuses	covers cities and towns	covers geographical areas like countries, continents
② speed	High	average	low
③ delay	short	medium	long
④ maintenance	easy	slightly difficult	difficult
⑤ fault tolerance	more	less	less
⑥ congestion	less	more	most
⑦ ownership	private	private / public	not owned
⑧ cost	effective	mostly	very costly.

Type	Description	Connector	Range	Bandwidth	Cost	Applications
① Twisted pair cable	<ul style="list-style-type: none"> transmit electrical signals shielded unshielded two twisted together 	RJ45	100m	10-100 mbps	cheap	<ul style="list-style-type: none"> ① app Telephone LAN's ② advantage easy to install ③ disadv. high attenuation low bandwidth
② coaxial cable	<ul style="list-style-type: none"> transmit electric signal central core conductor of solid wire in insulating sheet 	Bayonet Nut connector (BNC)	200 m 500 m	100 mbps	slightly exp.	<ul style="list-style-type: none"> ① application TV, ethernet ② advantage can be used as broadband ③ disadvantage not comparable with twisted
③ fibre optic	<ul style="list-style-type: none"> transmit light signal made of glass/ plastic mode <ul style="list-style-type: none"> multi single sep index grade index 	SC, ST MT-RJ	2km-100 km	100mbps	exp.	<ul style="list-style-type: none"> ① application Internet dentistry ② adv secure speed ③ disadv cost

Features of wireshark:

- mainly used to monitor networks
- detects network issues (latency, suspicious activities, dropped packets)
- It can drill down into traffic and find cause of an issue.

Main Features:

- live capture and offline analysis
- Rich VoIP analysis
- read / write many different file formats
- Deep inspection of protocols
- powerful filters
- standard three-pane packet browser
- captures compressed files and decompress them.
- multiplatform.

Features of cisco packet tracer:

- tool that provide network simulation for simple and complex networks.
- workspace
 - 1. logical: shows logical network topology. It represents placing, connecting and clustering virtual network devices.
 - 2. physical: shows graphical physical dimension of physical network. Depicts the scale and placement of how routers, switches, hosts would look in a real environment.

- Unlimited devices
- E-learning
- interactive environment
- real time and simulation mode
- cross platform compatibility
- visualizing networks

pinging:

- i. ping tool is used to check whether particular host ip is reachable or not.
- ii. It measures time taken by packet to move from host to destination and back.
- iii. It keeps record of loss.
- iv. ping command windows

ipconfig - to know our ip

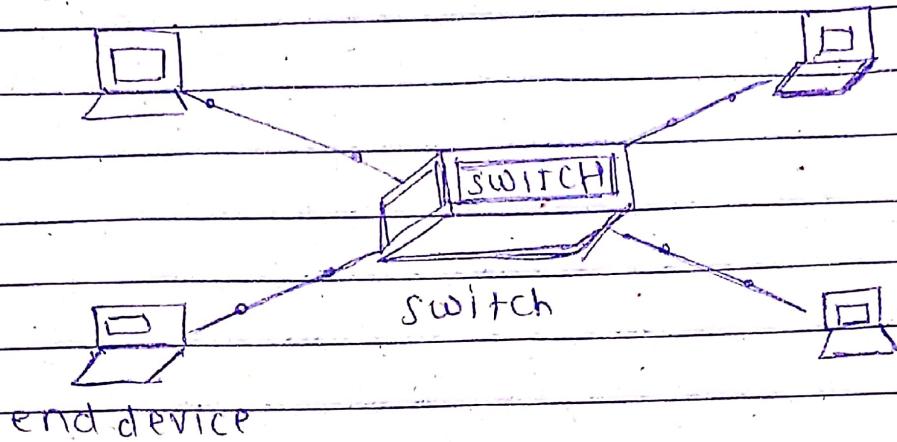
ping <dest_ip>

to ping destination ip

observation:

1. Laboratory, ma'am explained the assignment thoroughly along with implementation
2. We tried to simulate a LAN in Cisco packet tracer
3. We used switch to connect between two devices.

Diagram



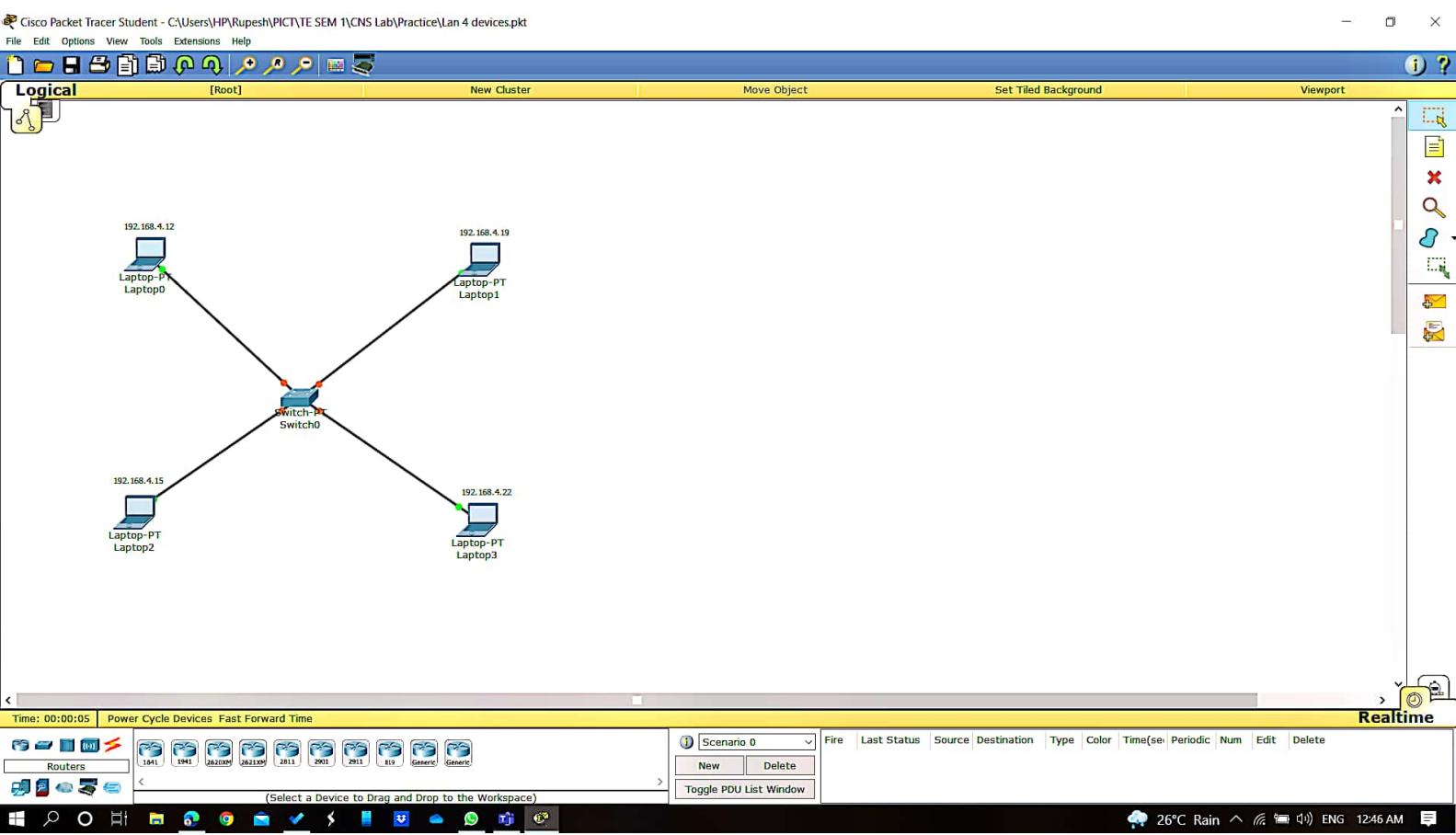
Troubleshooting:

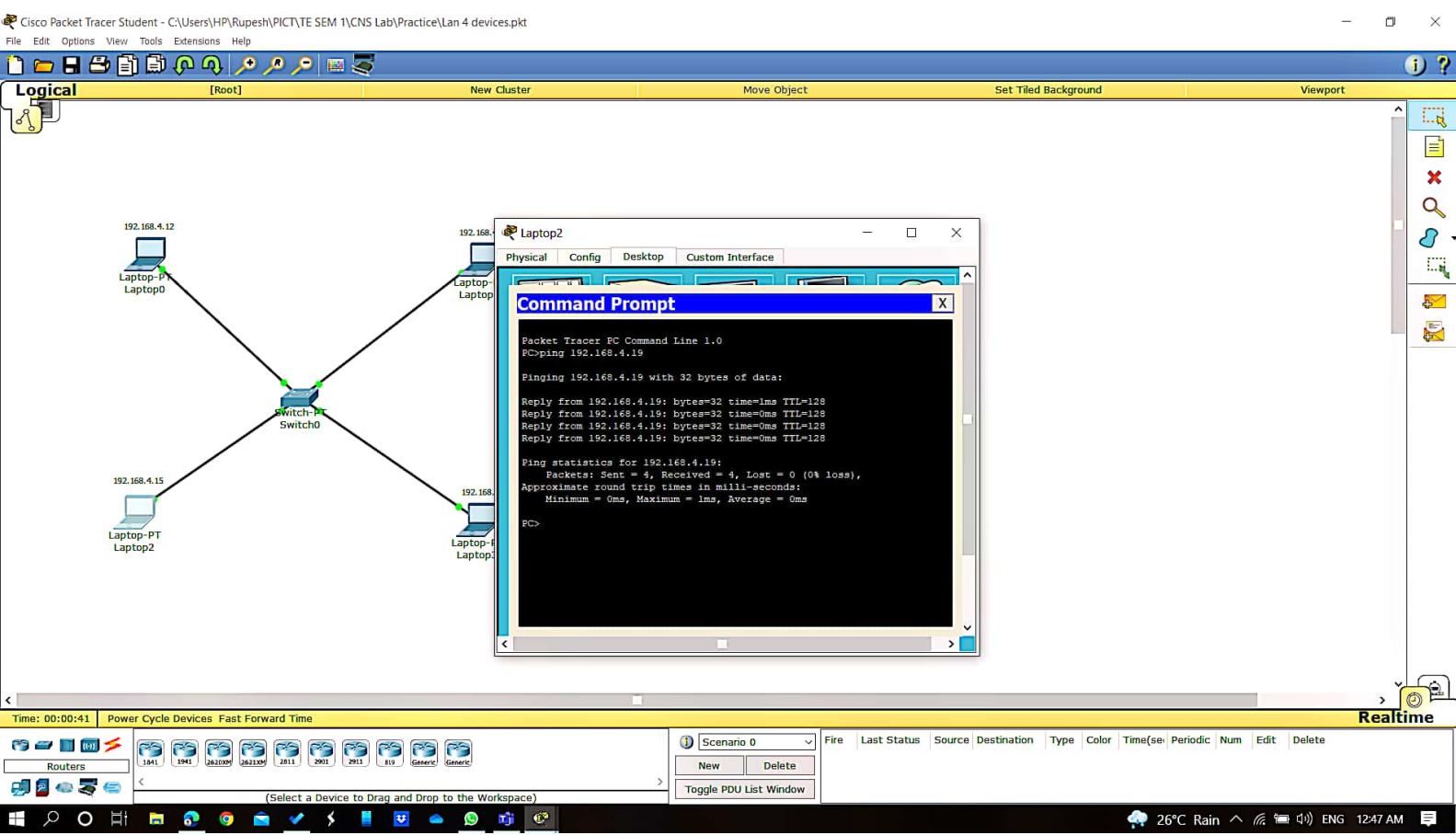
Tejas faced an issue to find and move devices. This issue was solved by coming in Realtime mode from simulation mode.

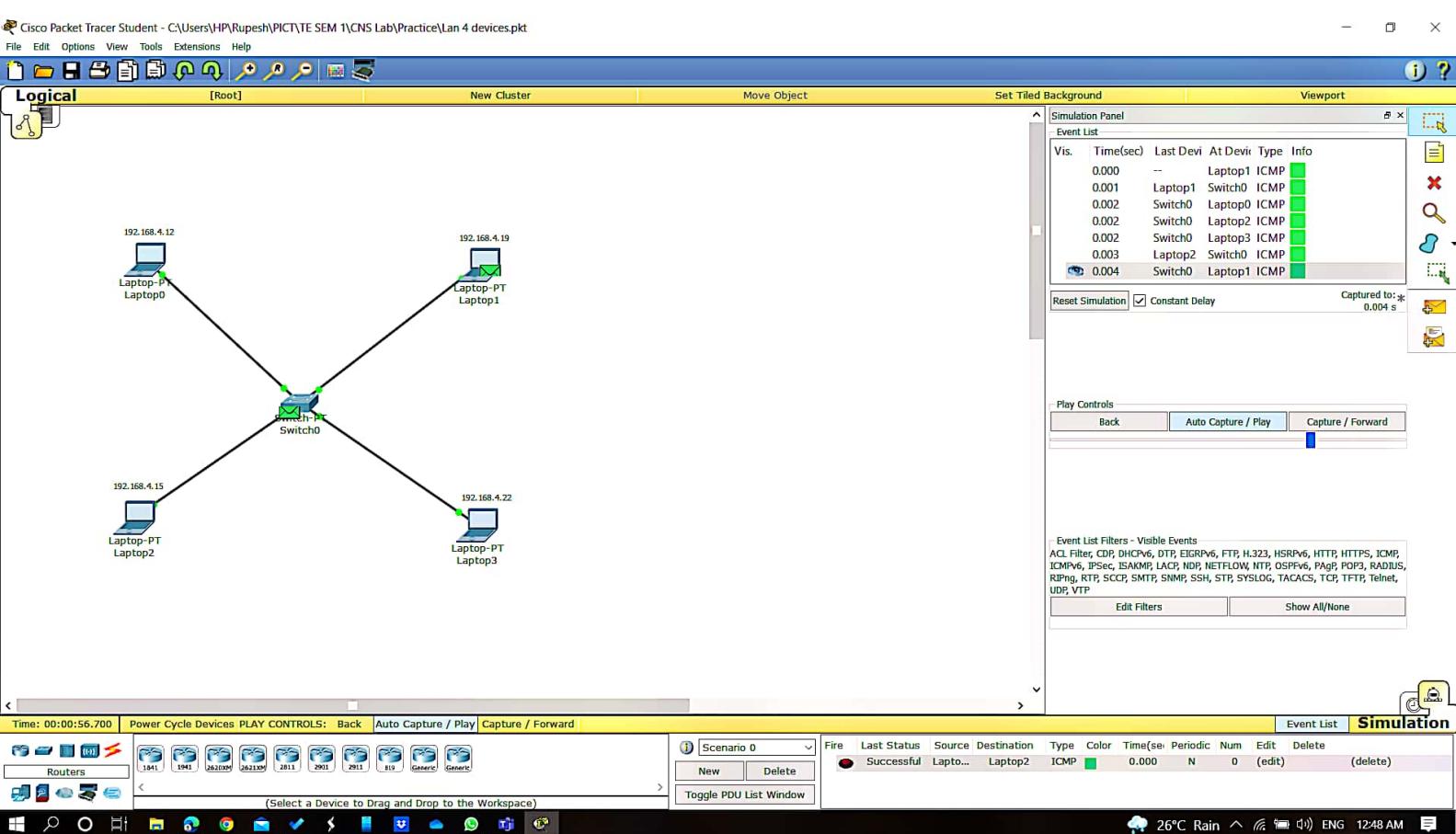
ping command failed: The issue was resolved by rechecking IP addressess and connections in network.

Conclusion:

We successfully built a virtual LAN and were able to ping devices. We also learnt various components of the cable.







*Wi-Fi

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

IPv6

No. Time Source Destination

1 0.000000 2409:4042:2495:a95d.. 2404:6800:4009:814:..

2 0.071315 2404:6800:4009:814:.. 2409:4042:2495:a95d..

3 0.960798 2409:4042:2495:a95d.. 2606:4700:8dea:758:..

4 1.009304 2606:4700:8dea:758:.. 2409:4042:2495:a95d..

5 1.009571 2409:4042:2495:a95d.. 2606:4700:8dea:758:..

6 1.022588 2409:4042:2495:a95d.. 2404:6800:4009:814:..

7 1.081004 2404:6800:4009:814:.. 2409:4042:2495:a95d..

8 1.134592 fe80::8040:c8ff:fe2.. 2409:4042:2495:a95d..

9 1.134819 2409:4042:2495:a95d.. fe80::8040:c8ff:fe2..

10 2.031273 2409:4042:2495:a95d.. 2404:6800:4009:814:..

11 2.105112 2404:6800:4009:814:.. 2409:4042:2495:a95d..

12 2.296493 2409:4042:2495:a95d.. 2a03:2880:f22f:1c6:..

13 2.371185 2a03:2880:f22f:1c6:.. 2409:4042:2495:a95d..

14 2.802220 2a03:2880:f22f:1c6:.. 2409:4042:2495:a95d..

15 2.844372 2409:4042:2495:a95d.. 2a03:2880:f22f:1c6:..

16 3.044991 2409:4042:2495:a95d.. 2404:6800:4009:814:..

17 3.116259 2404:6800:4009:814:.. 2409:4042:2495:a95d..

18 4.051669 2409:4042:2495:a95d.. 2404:6800:4009:814:..

19 4.131889 2404:6800:4009:814:.. 2409:4042:2495:a95d..

20 5.062321 2409:4042:2495:a95d.. 2404:6800:4009:814:..

21 5.131613 2404:6800:4009:814:.. 2409:4042:2495:a95d..

22 6.082877 2409:4042:2495:a95d.. 2404:6800:4009:814:..

23 6.140416 2404:6800:4009:814:.. 2409:4042:2495:a95d..

> Frame 7: 94 bytes on wire (752 bits), 94 bytes captured (752 bits)

> Ethernet II, Src: Chongqin_05 (82:40:c8:2d:be:07), Dst: Chongqin_05 (82:40:c8:2d:be:07)

> Internet Protocol Version 6, Src: 2404:6800:4009:814::2004, Dst: 2409:4042:2495:a95d..

> Internet Control Message Protocol v6

Type: Echo (ping) reply (129)

Code: 0

Checksum: 0x56de [correct]

[Checksum Status: Good]

Identifier: 0x0001

Sequence: 13

[Response To: 6]

[Response Time: 58.416 ms]

Data (32 bytes)

Data: 6162636465666768696a6b6c6d6e6f7071727374757677616263646566676[Length: 32]

0000 18 47 3d 05 41 07 82 40 c8 2d be 07 86 dd 68 00 .G=-A-@h-
0010 00 00 00 28 3a 74 24 04 68 00 40 09 08 14 00 00 ...(:\$-. h-@.....
0020 00 00 00 00 20 04 24 09 40 42 24 95 09 5d c1 58 \$. @B\$-]X
0030 5b 6c 35 fe 03 e6 81 00 56 de 00 01 00 0d 61 62 [15..... V-....ab
0040 63 64 65 66 67 68 69 6a 6b 6c 6d 6e 6f 70 71 72 cdefghij klmnopqr
0050 73 74 75 76 77 61 62 63 64 65 66 67 68 69 stuvwxyz defghij

Packets: 5207 · Displayed: 2922 (56.1%) · Dropped: 0 (0.0%)

Close Help