

MIT WORLD PEACE UNIVERSITY

Computer Networks
Second Year B. Tech, Semester 3

CONFIGURATION OF A SIMPLE LAN

PRACTICAL REPORT

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1 Aim and Objectives

To learn how to configure a simple LAN connection using Cisco Packet Tracer.

2 Devices

2.1 Devices Used

1. 1 Generic Switch
2. 2 Switch 2960 with 24 LAN Ports
3. 6 Generic PCs
4. 4 Laptops

2.2 Device Info and IP Addresses

Subnet Mask: 255.255.255.0

Name	Type	IP
PC0	PC	192.168.10.1
PC1	PC	192.168.10.2
PC2	PC	192.168.10.3
PC3	PC	192.168.10.4
PC4	PC	192.168.10.5
PC5	PC	192.168.10.6
Laptop0	Laptop	192.168.10.7
Laptop1	Laptop	192.168.10.8
Laptop2	Laptop	192.168.10.9
Laptop3	Laptop	192.168.10.10
Switch0	2950-24 Switch	None
Switch1	2950-24 Switch	None
Switch2	Generic Switch	None

3 Cables

1. Straight LAN Cable to connect unlike Devices
2. Crossover LAN Cable to connect like Devices

4 Procedure to Configure LAN

1. All 3 switches are connected with each other using crossover cables, as they are similar.
2. 4 PCs are connected to The first Switch
3. 4 Laptops are connected to the Second switch
4. 2 More computers are connected to another Switch.

5. Check the connection by opening the command prompt, and entering the commands `ipconfig`, and pinging the other computers.

5 Commands

1. `ipconfig`:

In Windows, `ipconfig` is a console application designed to run from the Windows command prompt. This utility allows you to get the IP address information of a Windows computer. It also allows some control over your network adapters, IP addresses (DHCP-assigned specifically), even your DNS cache. `Ipconfig` replaced the older `winipcfg` utility.

2. `ping <ip addr>`:

The `ping` command is a Command Prompt command used to test the ability of the source computer to reach a specified destination computer. It's a simple way to verify that a computer can communicate with another computer or network device.

The `ping` command operates by sending Internet Control Message Protocol (ICMP) Echo Request messages to the destination computer and waiting for a response. The two major pieces of information that the `ping` command provides are how many of those responses are returned and how long it takes for them to return.

6 Platform

Operating System: Arch Linux x86-64

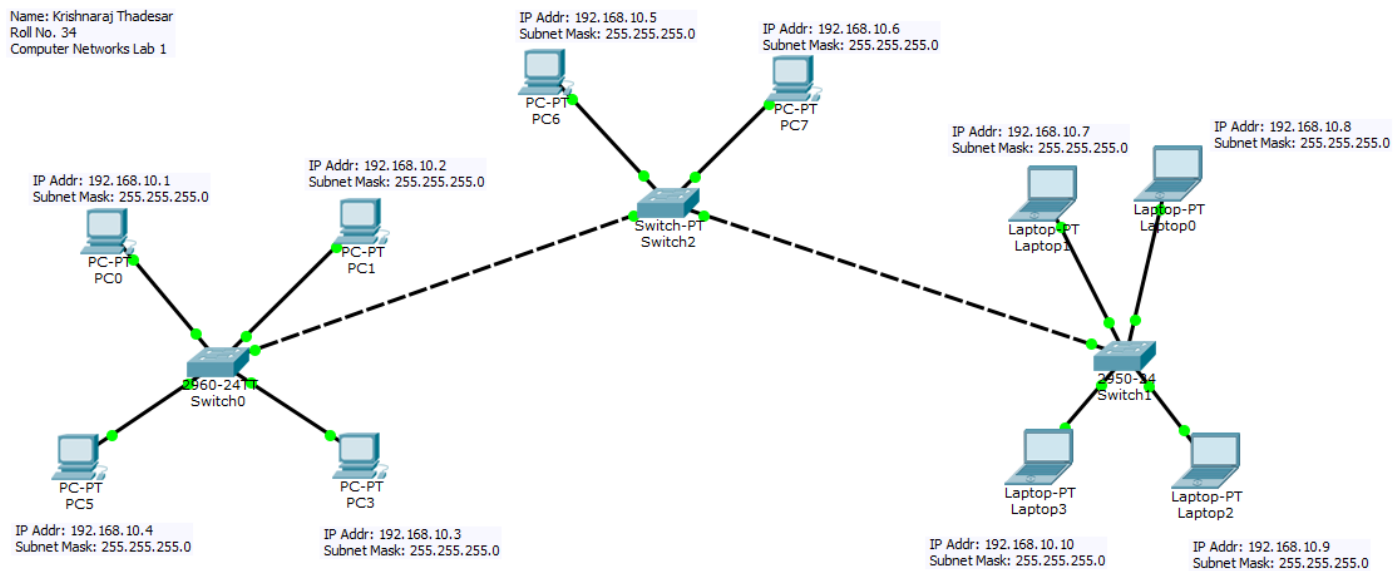
IDEs or Text Editors Used: Visual Studio Code

Programs Used: Cisco Packet Tracer v6.0.1

7 Output

```
1 FastEthernet0 Connection:(default port)
2
3 Link-local IPv6 Address.....: FE80::201:C9FF:FEE6:3985
4 IP Address.....: 192.168.1.1
5 Subnet Mask.....: 255.255.255.0
6 Default Gateway.....: 0.0.0.0
7
8 PC>ping 192.168.1.2
9
10 Pinging 192.168.1.2 with 32 bytes of data:
11
12 Reply from 192.168.1.2: bytes=32 time=1ms TTL=128
13 Reply from 192.168.1.2: bytes=32 time=17ms TTL=128
14 Reply from 192.168.1.2: bytes=32 time=0ms TTL=128
15 Reply from 192.168.1.2: bytes=32 time=0ms TTL=128
16
17 Ping statistics for 192.168.1.2:
18 Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
19 Approximate round trip times in milli-seconds:
20 Minimum = 0ms, Maximum = 17ms, Average = 4ms
```

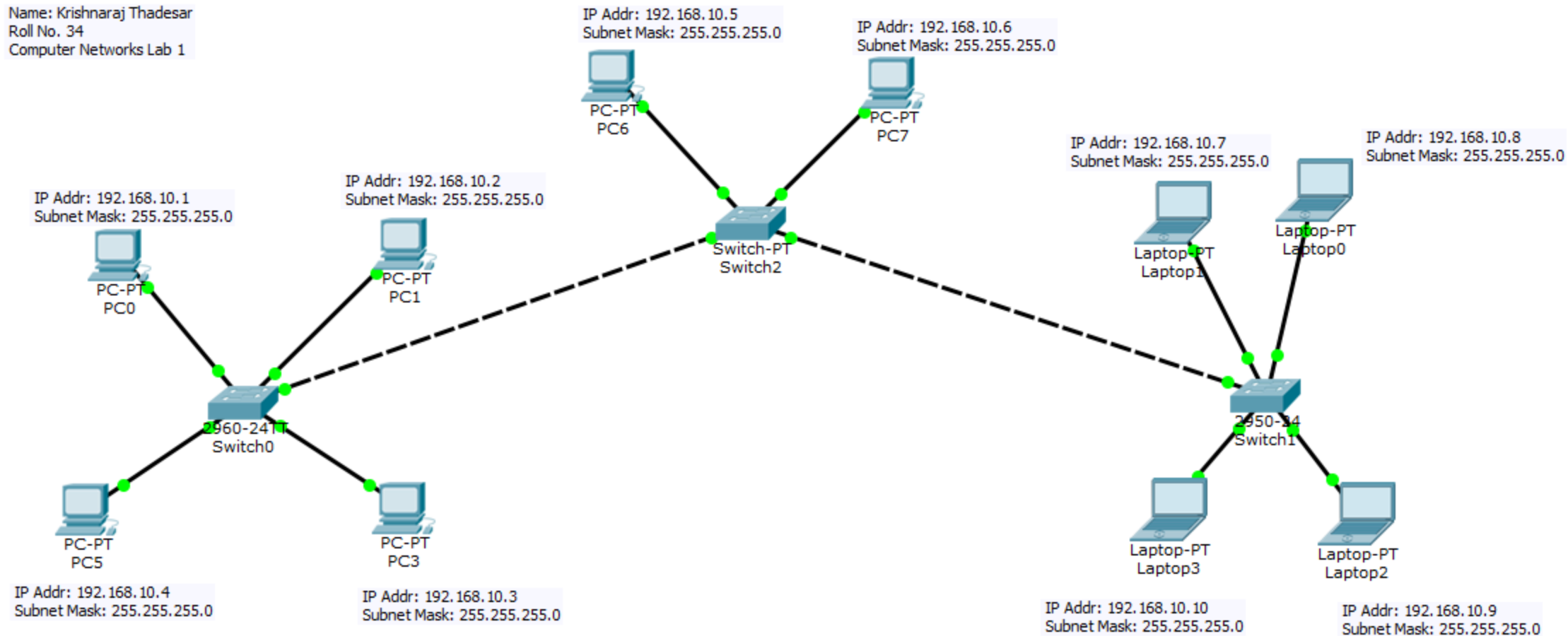
8 Connection Screenshot



9 Conclusion

A local area network was successfully created, deployed and tested on a simulator. The concept behind the Local area network was understood in detail. The various types of cables used to connect the devices were also used and explained. Commands to test computers on a network were also executed successfully. Various computers can be connected with each other and communicate seamlessly with the help of switches, Network Interface Cards, Computers and Straight as well as twisted Ethernet Cables. in a local area network.

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16/11/22

CN - Workshop

Assignment - 1

Theory:

★ LAN:

A local area network is a connection of devices in a relatively small physical location, like an office, home, or lab. A Lan could range from 1 user to thousands in an organization.

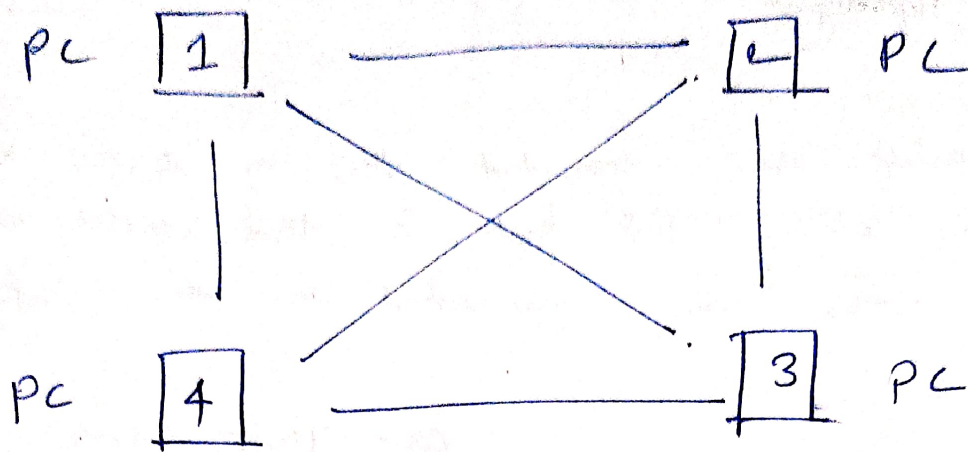
★ Advantages

- ① Hardware and software can be shared
- ② Doesn't cost a lot
- ③ Private ownership
- ④ Separate components.

★ Network Topologies

① Mesh topology

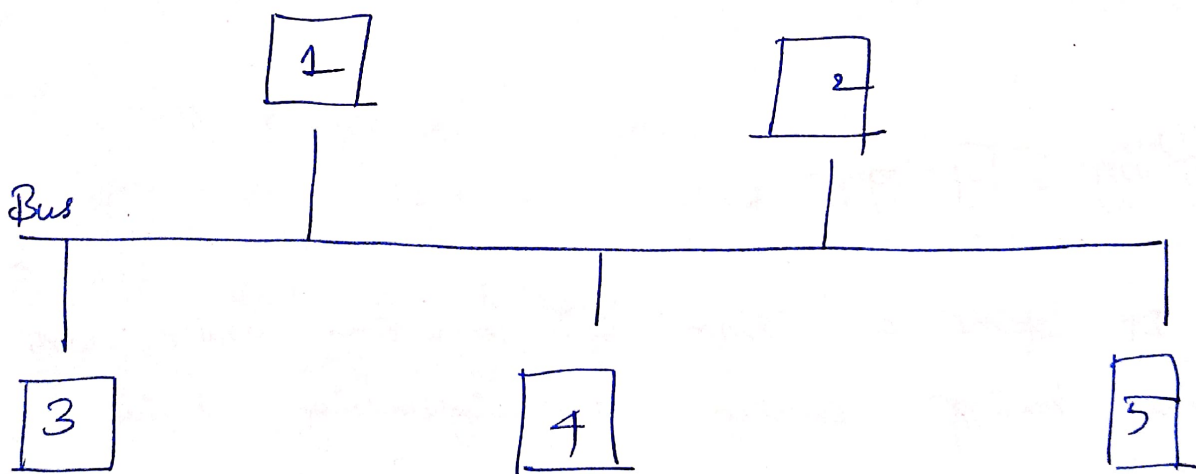
- every device connected to another via a particular channel.
- Protocols used are: ARP, DHCP.



Mesh Topology

(2) Bus Topology

- Every network is connected to a single cable
- Transmits data from one end to another in a single direction

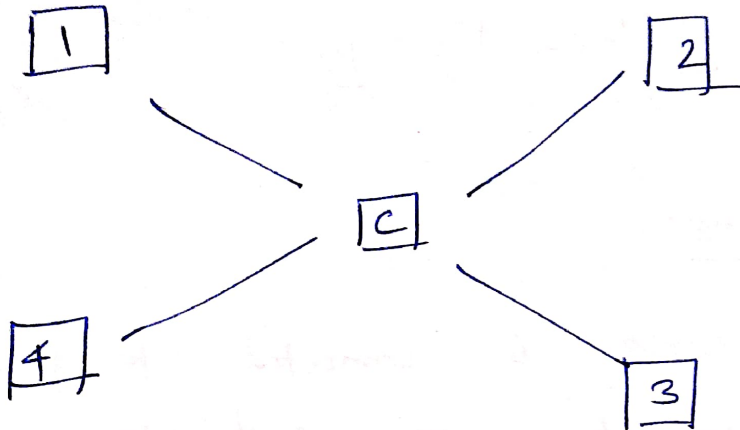


Bus Topology

③ Star Topology

→ All devices are connected to a single hub through a cable. This hub is the central node and other nodes are connected to the central node.

eg. Client Server Model

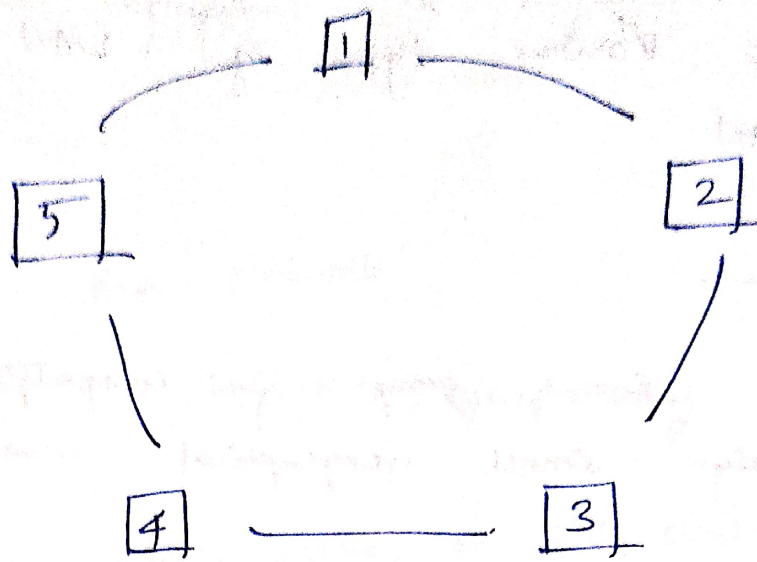


Star Topology

④ Ring Topology

→ It forms a ring of connecting devices with each one having exactly 2 neighbouring devices.

→ Number of repeaters are used for large ring topologies, if someone wants to send a message to diagonally opposite node.



Ring Topology

★ Frequently Asked Questions

Q.1. Explains use of ping with example.

- 'ping example.com' prints on line of output for every response received.
- It sends a datagram every second to specified IP address.
- Calculates round trip time and packet loss statistics, displays a brief summary on conclusion.
- Terminates upon program timeout or receipt of signal.

eg. `$ ping google.com.` or pinging a PC in LAN.

Q.2 Compare various types of LAN, MAN and WAN.

④ LAN —

- Connects small group of computers in a relatively small geographical area.
- Stands for Local Area Network
- Used in hospitals, universities, offices, homes etc.
- Cost is less, equipment requirement is minimum.
- Easy to manage and debug.
- Difficult to upscale.

② MAN. —

- Metropolitan area Network
- Comparatively wider network and covers towns, cities etc.
- Can be both private and public.
- Costs more than LAN
- Used by organizations with more than 4 offices, spread out geographically.

→ more equipment is required.

③ VAN —

→ Wide Area Network.

→ spans to the largest geographically distant places.

→ spans across states, countries and continents.

→ Can be both public and private.