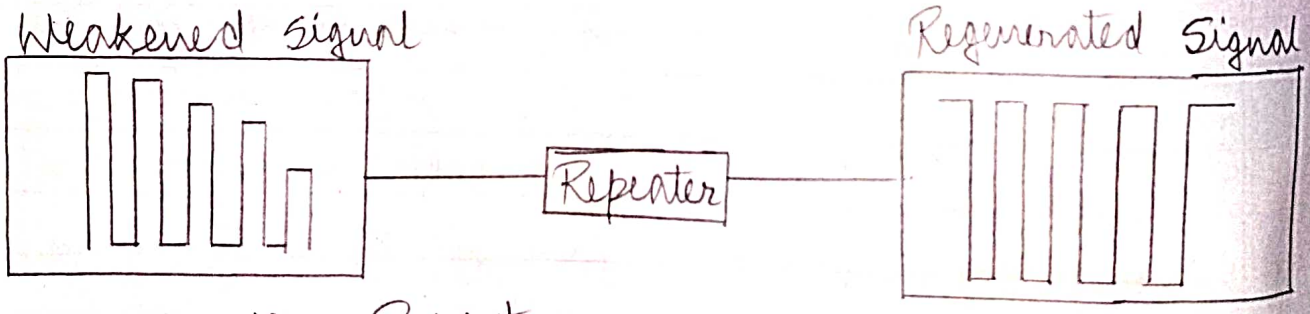

Fig: Repeaters

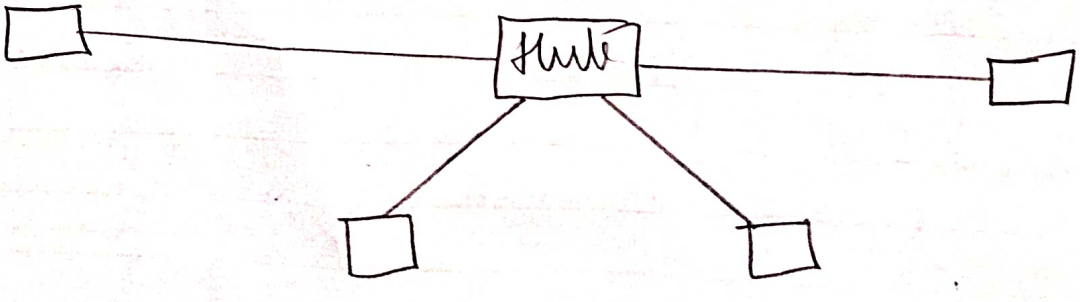

Fig: Hub

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Experiment -1

☆ Aim:
Study of different type of LAN of Network Equipments.

☆ Theory:
Types of LAN equipments:
Local Area Networking equipments discussed the different types of hardware found in a LAN environment hubs, bridges and switches how each of hardware functions specifically in an ethernet environment.
a) Repeaters (Layers/ Devices): Repeater is a type of network node that amplifies incoming signals and rebroadcasts them over a wider area or higher layer than original signal. It is used to increase network's reach, restore damaged or weak signal, or provide access to unaccessible nodes.

b) Hubs: A hub is a device that links multiple computers and devices together. Hubs can also be referred to as repeaters or concentrators and serve as centre of local area network

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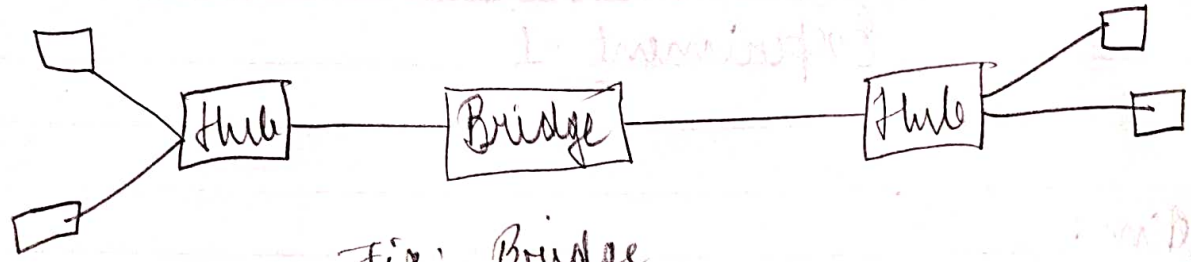

Fig: Bridge

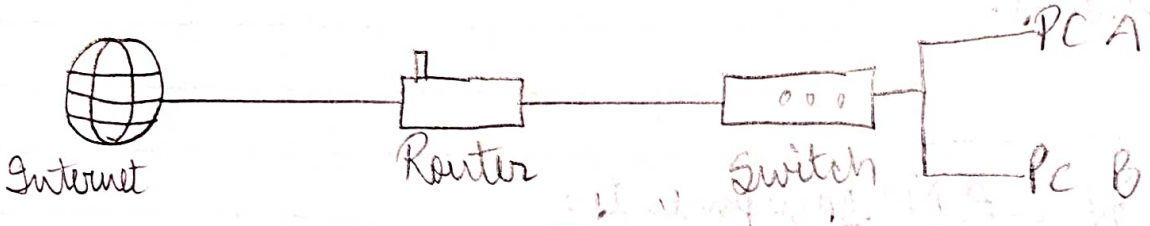

Fig: Switch and Router

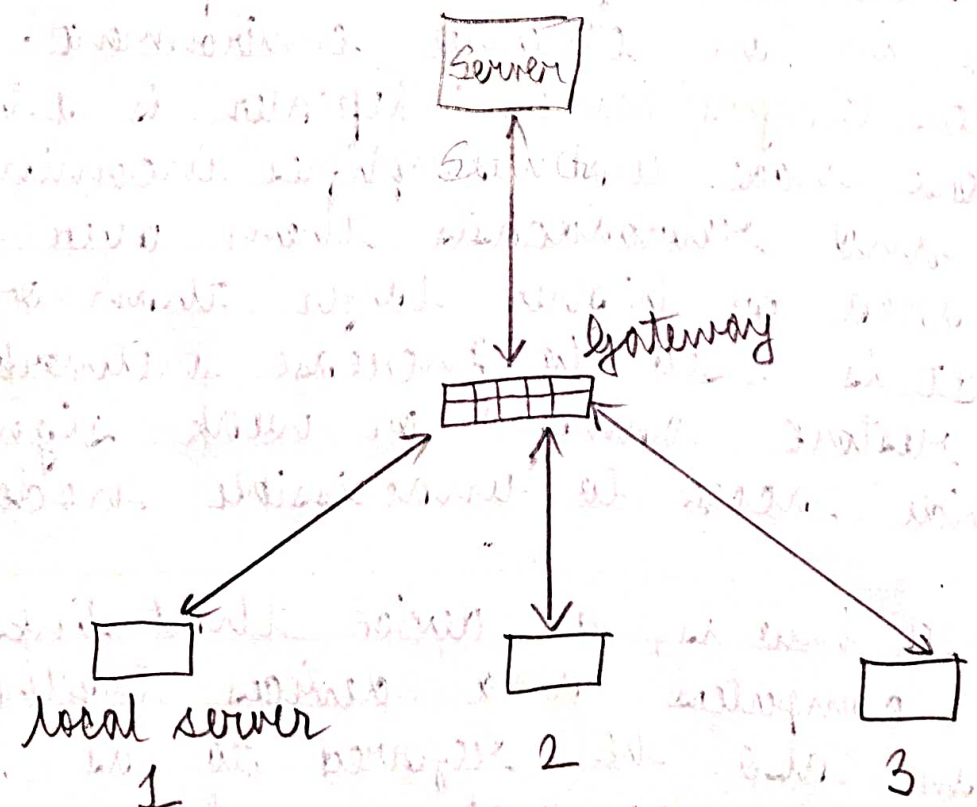

Fig: Gateway

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c) Bridge: A bridge is a network device that connects multiple subnetworks to create a single network. It provides inter connection with other computer networks that use the same protocol.

d) Switch: A network switch is equipment that allows two or more IT devices, such as computers, to communicate with another.

e) Router: A router is a device that connects two or more packet switched networks or subnetworks. It serves two primary functions managing traffic between these networks by forwarding data packets to their intended IP addresses, and allowing multiple devices to use the same internet connection.

f) Gateways: A gateway is a network node used in telecommunication that connects two networks with different transmission protocols together. Gateways serve as an entry and exit point for a network as all data must pass through or communicate with the gateway prior to being routed.

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Network equipments:

a) Network Card: Also known as network interfaces cards (NICs) are hardware devices that connect a computer with network. They are installed in the mother board. They are responsible for decomposing a physical connecting between network and computer.

b) Modems: A modem is a network device that both modulates and demodulates among carrier signals (called sine waves) for encoding and decoding digital info. for processing. Modems accomplish both of these tasks simultaneously and, for this reason, the term modem is a combination of 'modulate' and 'demodulate'.

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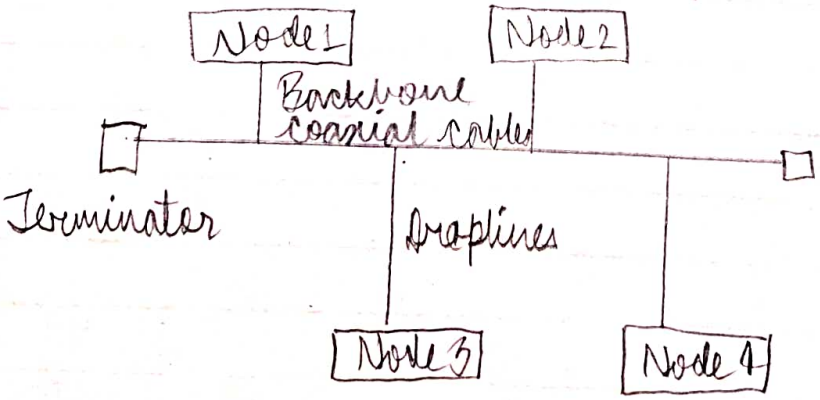

Fig: Bus Topology

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Experiment - 2.

☆ Objective:
Study and verification of standard Network Topologies (Star, Bus, Ring, Mesh etc.)

☆ Theory:
Network Topologies: LAN physical topology defines the geographical argument arrangement of networking devices. Topologies are driven fundamentally by two network connection types. A point to point connection is a direct link between two devices. For example, when we attach our computer to a printer, we have created a point-to-point link.

The major topologies of LAN are:
1. Bus topology: Bus is a network type in which every computer and network device is connected to a single cable.
It is a network bidirectional. It is a multipoint connection and a non-robust topology because if the backbone fails the topology crashes. In Bus Topology, various MAC (Media Access Control) protocols are followed by LAN ethernet connections like TDMA, Pure Aloha, CDMA etc.

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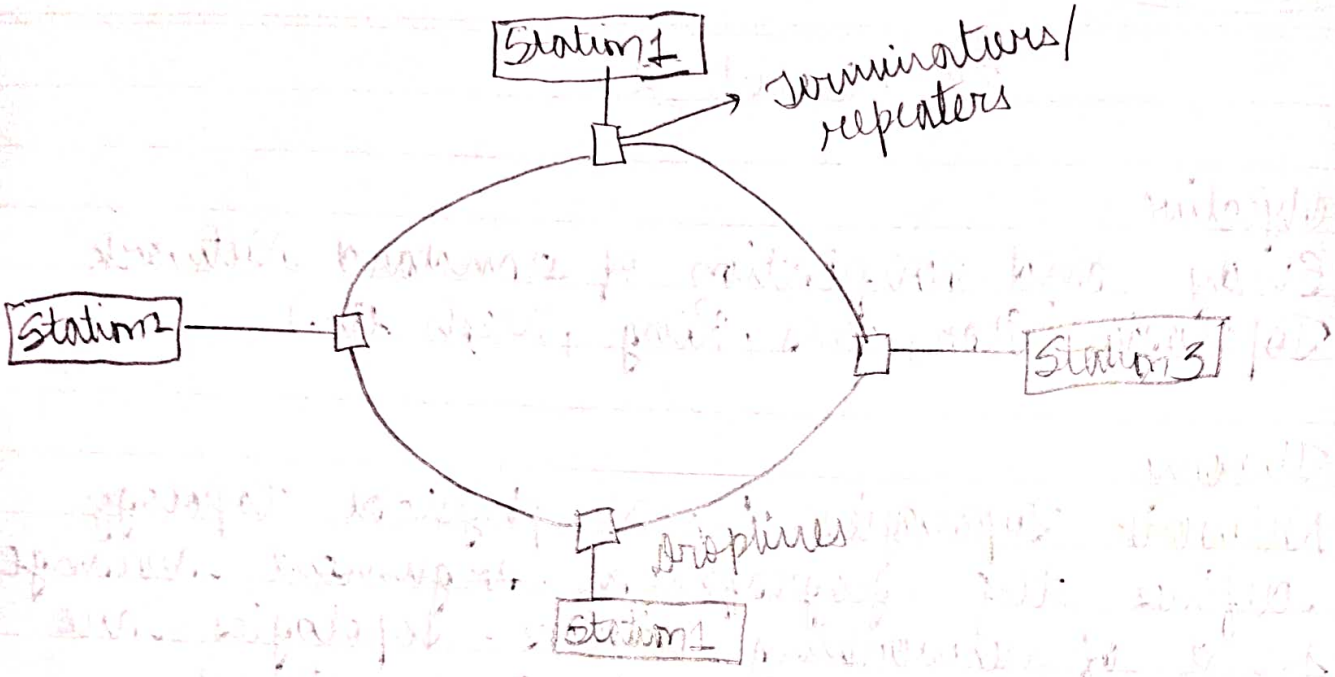

Fig: Ring Topology

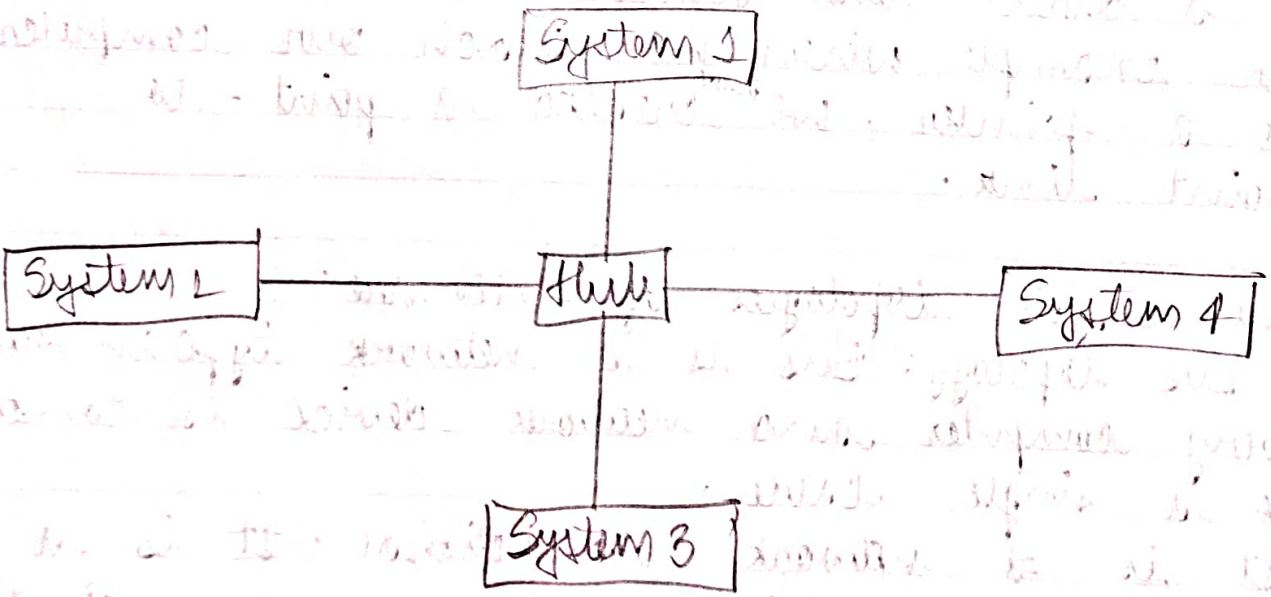

Fig: Star Topology

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2. Ring topology: In ring topology, it forms a ring connecting devices with exactly two neighboring devices. A number of repeaters are used for Ring topology with a large number nodes, because if someone wants to send some data to the last node in the ring topology with 100 nodes then the data will have to pass through 99 nodes to reach the 100th node.
The flow of data is unidirectional.

3. Star topology: In star topology, all the devices are connected to a single hub through a cable. This hub is the central node and all other nodes are connected to the central node. The hub can be nature i.e. not an intelligent hub such as broadcasting devices, at the same time the hub can be intelligent known as an active hub. Active hubs have repeaters in them.
In star topology, many popular ethernet LAN protocols are used as collision detection.

4 Mesh topology: In a mesh topology, every device is connected to another device via particular channel. The protocols used are AHCP, DHCP
(Ad Hoc) (Dynamic Host Configuration Protocol)

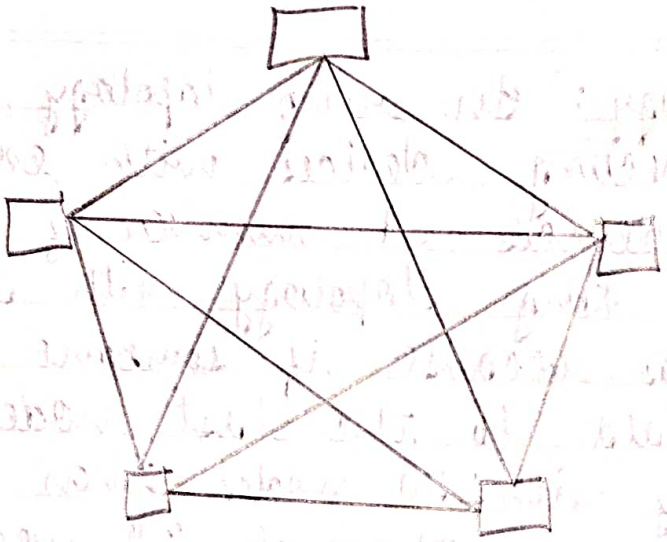

Fig: Mesh Topology

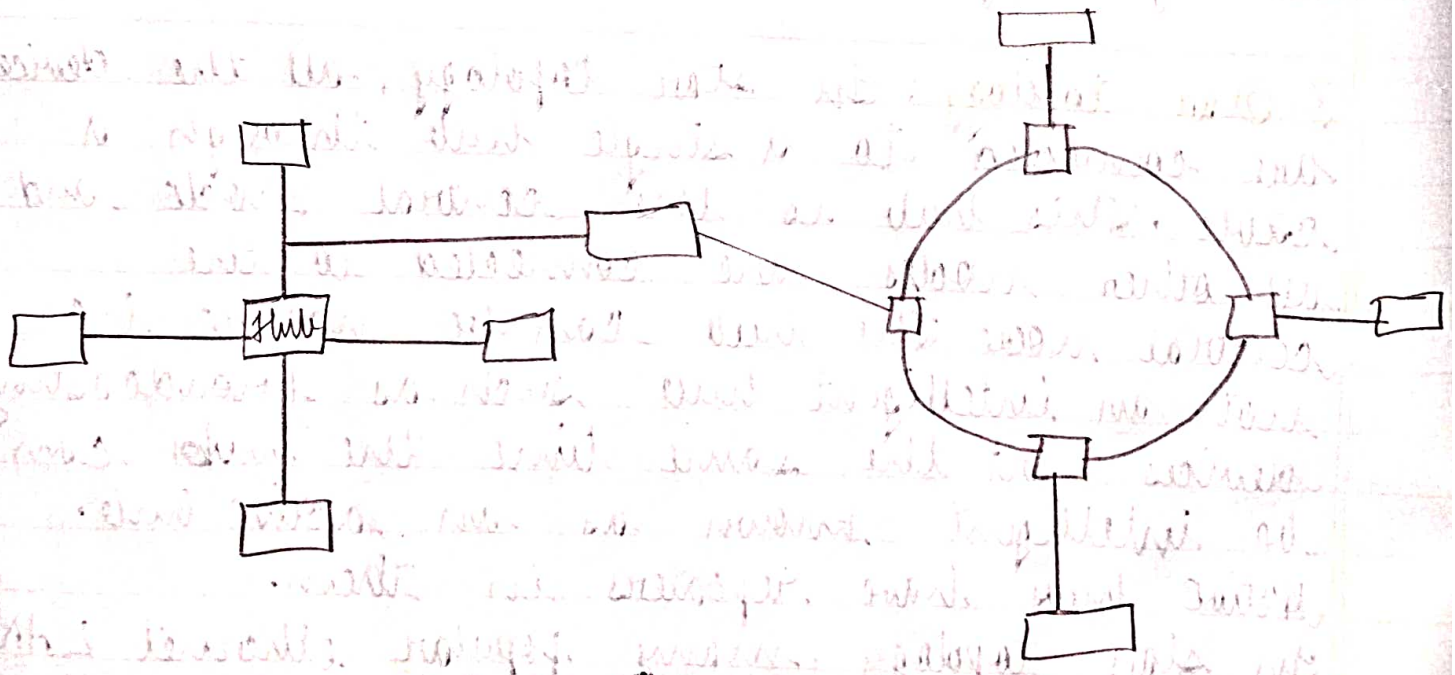

Fig: Hybrid Topology

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5. Hybrid topology: This topological technology is the combination of all the various types of topologies we have studied. Hybrid topology is used when the nodes are free to take any form. It means these can be individuals such as Ring or star topologies or can be a combination of various types of topologies seen. Each individual topology uses the protocol that has been discussed.

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