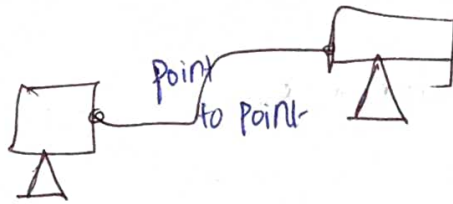


Switching

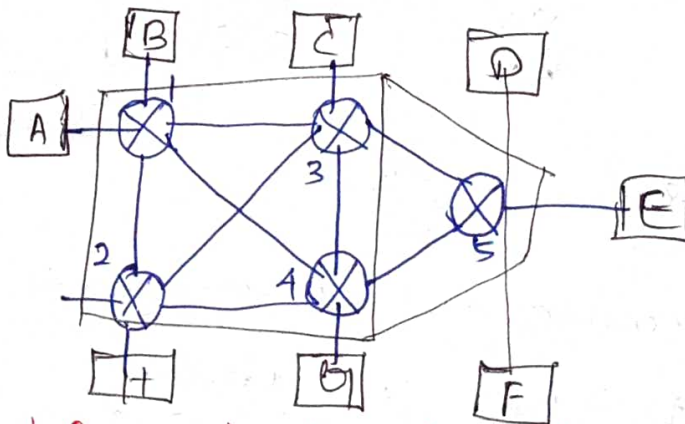
Two or more devices connected together to form a network



For large numbers of devices \Rightarrow Switching

Switches

- * A switched network consists of series of interlinked nodes [switches]
- * Switches are capable of creating temporary connections between devices connected.

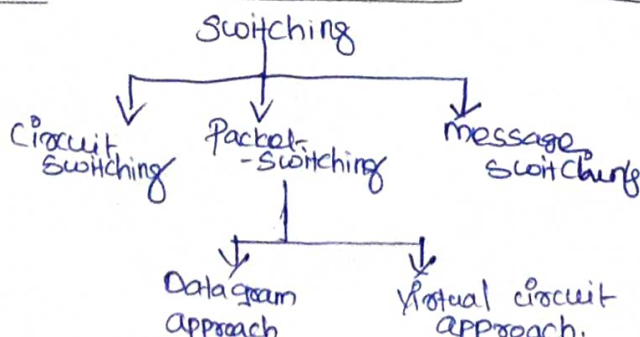


(2m) Switching



The technique of transmitting data from sender to receiver by finding out the best path in a large network.

Methods of switching (or) types (or) techniques of switching:-

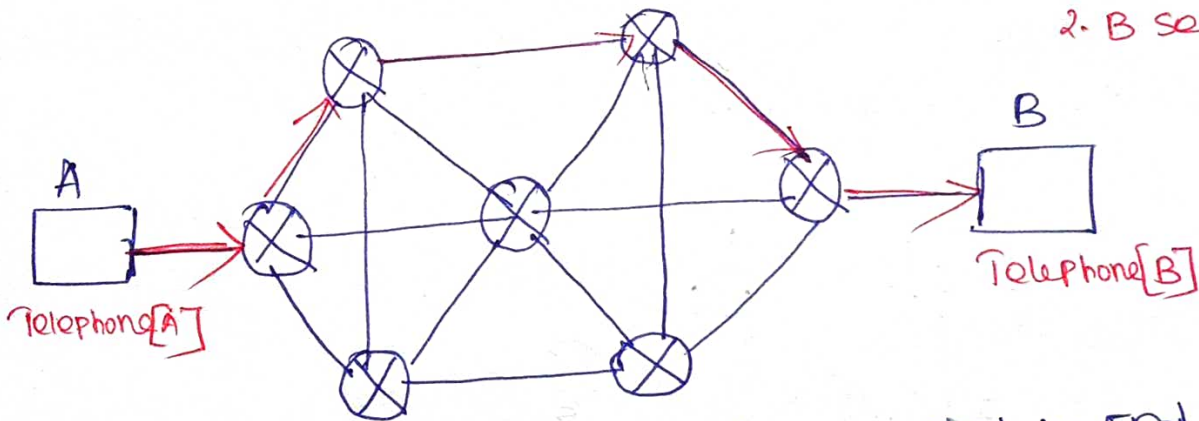


Circuit Switching:-

- * A dedicated path will be established between senders and receiver before data transmission.
- * A circuit switched network requires 3 phases for data transmission.

1. Connection establishment [Set up phase]
2. Data transfer phase
3. Connection disconnection [Tear down phase]

Example:- Telephone network



1. Connection Establishment - End to End Addressing
2. Data Transfer - No addressing
3. Connection Disconnection

Circuit Switching Takes place at the physical layer

Advantages:-

- * Since communication channel is dedicated, data transmission delay does not occur.

Disadvantages:-

- * Chance of delay during connection establishment phase
- * Low efficiency.

Packet Switching

Entire data is divided into packets & sent individually

There is no resource allocation for the packet.

Types :- 2 types

1. Datagram switching:-

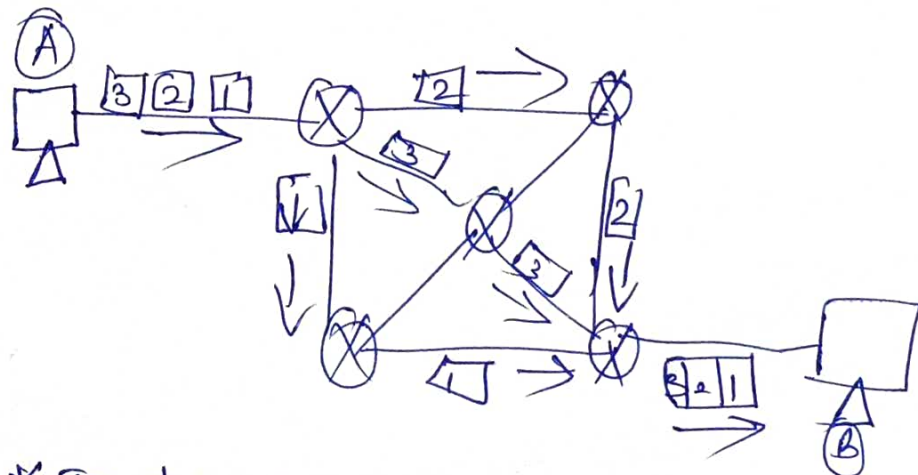
* In datagram network, each packet is treated independently

* These packets are referred to datagrams

* Datagram switching is done at network layer

* These switching devices are routers

(X) * Each datagram contains a header with source address, destination address & sequence numbers.



* In datagram network there is no fixed path

* It is also called as "connectionless network"

Advantages:-

Efficiency is better than switched network.

Virtual Circuit Switching

→ This switching is done in the data link layer

→ Also known as Connection-oriented switching

→ Before sending the frames, a ~~Virtual~~ Virtual Connection is made and path is defined.

→ All the frames travel in the same path.

→ In addition to source & destination address, every frame contains a virtual circuit identifier or label (x)

→ VCI define virtual path that the frames should follow.

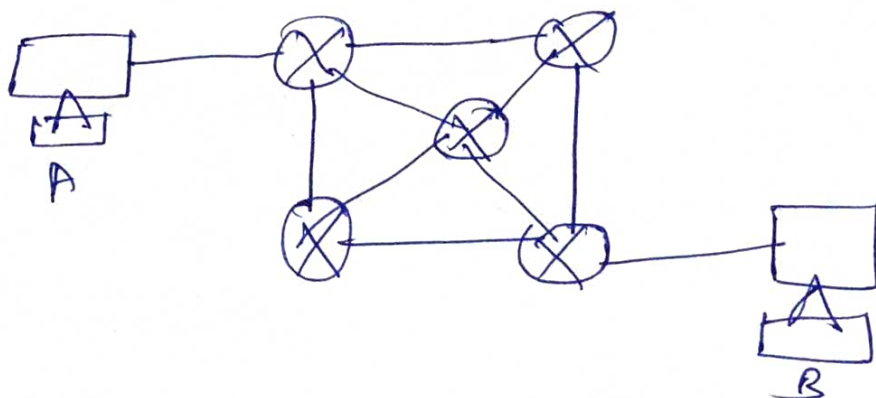
→ Each frame is forwarded based on VCI.

Three Phases:-

1. Set-up Phase

2. Data transfer Phase

3. Tear down Phase.



1. Setup Phase:-

→ Virtual path is created

→ Two steps:- 1. Setup request

2. Acknowledgement.

→ Forwarding table is created in each switch with :- VCI.

| Incoming | | outgoing | |
|----------|-------|----------|-------|
| Port | Label | Port | Label |
| 1 | 14 | 3 | 66 |

2. Data Transfer Phase:-

* Data transmission takes place.

3. Termination Phase:-

→ After transmitting all data, device A sends a teardown frame to device B.

→ Device B sends a teardown confirmation frame to device A.

→ All switches delete the entries from the table.

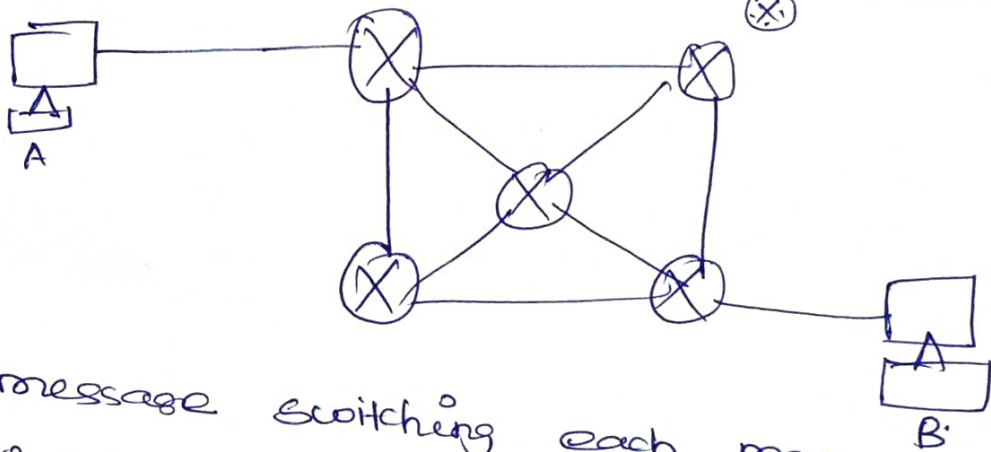
Message Switching:-

→ In message switching, there is no need of establishing a dedicated path between senders & Receiver.

→ It uses store and forward mechanism

→ The message is transferred as a complete unit & routed by the intermediate nodes at which it is stored & forwarded.

→ It is taken place at application layer



→ In message switching each message is treated as an independent unit.

→ Each & every node stores the entire message & forwards to the next node.

→ It is also called as "store & forward network"

→ The device should have sufficient storage capacity to store the incoming messages.