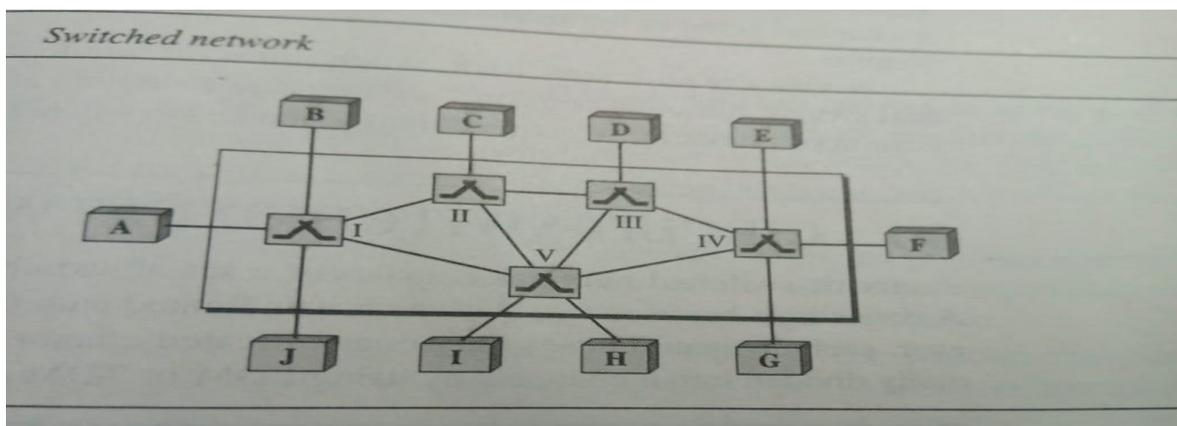


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BCA – Part III
Computer Network

Switching technique→Switches are the devices capable of creating temporary connection between two or more devices interlinked together or linked with the switch. A switched network consist of series of interlinked nodes called switches. Some of these nodes are connected to the end systems(computers, telephones etc). and others are used for routing.. A switched network may be shown as



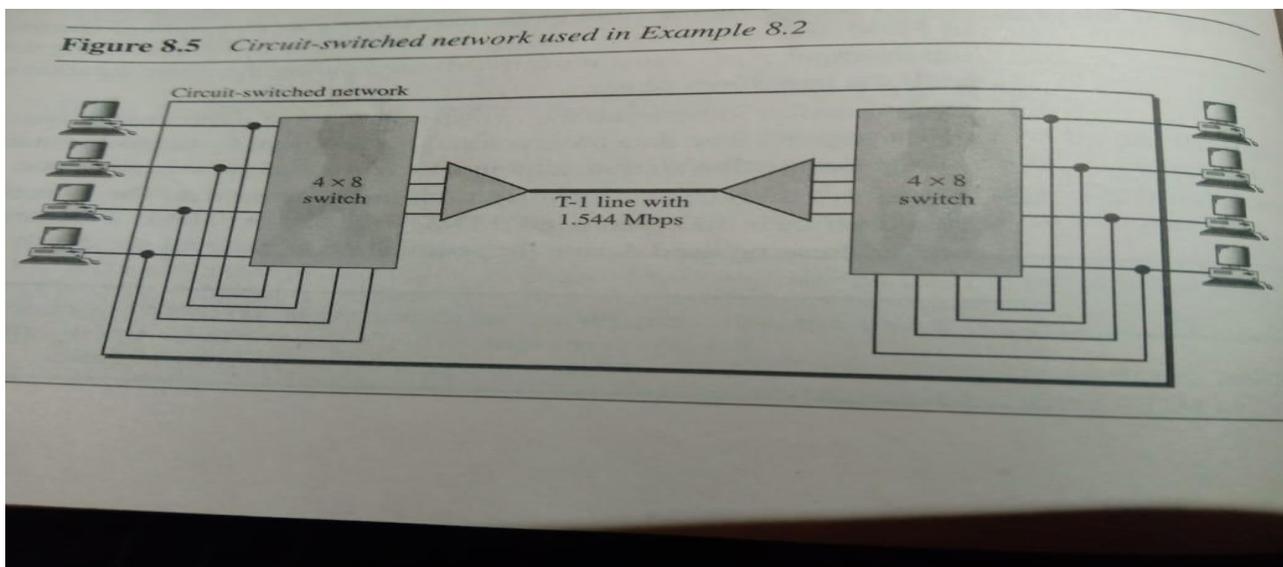
In the above figure the end system are labeled as A,B,C,E,..... and switches are labeled as I,II,III,IV, V

There are three important methods of switching

1. Circuit Switching Network
2. Packet switching network.
 - 1. Datagram Switching network
 2. Virtual switching network .
3. Message switching network

The first two switching technique is commonly used today. But third switching technique cannot work at the lower level and used in some application like email. In message switching, each switch stores message and forward it to the next switch.

1. Circuit switching network: - A Circuit switch network is made up of a set of switches connected to physical links in which each link is divided into n- channels by using FDM or TDM. A circuit switching networks may be shown as :-

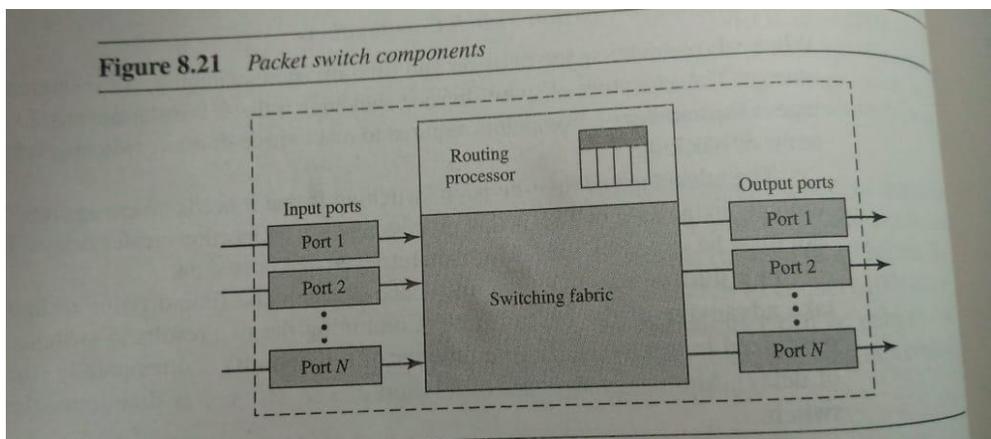


The end system (Computers or telephone) are directly connected to as switch. When end system A needs to communicate with End system M. A Needs to request a

connection to M that must be accepted by all switches as well as M itself. This process is called Setup Phase, a Circuit is reserved on each link and combinations of circuit of channels define dedicated path . after dedicated path made of connected circuit is established , data transfer can take place. After all the data have been transferred the circuit are torn down phase.

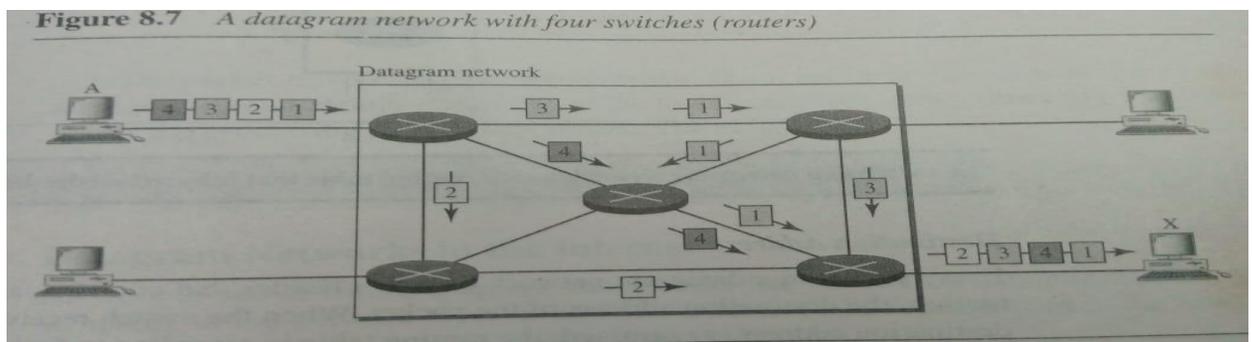
In circuit switching the resources need to be reserved during setup phase , the setup remains dedicated for the entire duration of data transfer until tourdown phase.

Packet switching network :- In packet switching networks , message transferred from one system is divided into packets of fixed or variable size . the size of packet is depend on the network and governing protocol. , then transfer the message to destination. Here, there is no resource allocation for the packet i.e no reserved bandwidth on the links and there is no switching time for each packets. Resource are allocated on demands.when the switch received the packet, no matter what the source and destination, the packet wait if other packet is processed . each packets are transferred one by one. It may be shown as:



Datagram network packet switching :-

In this network each packet is treated as independently of all others. Even if packet is part of multi-packet transmission. The network treated as alone. Packets are known as datagram. Such switching is normally done at the network layer. The switches in data gram network is generally referred to routers. Such switching network is connectionless network means that the switch does not keep information about connection state. There are no setup or teardown phase here. each packet is treated the same by the switch regardless of its source and destination. it may be shown as :



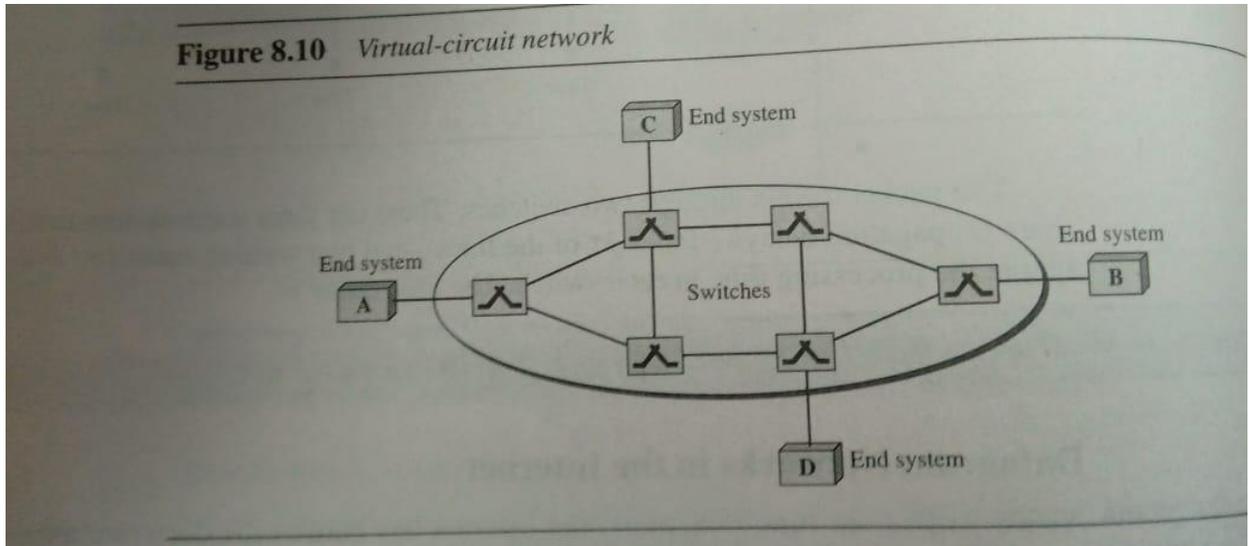
Here, datagram approach is used to deliver four packet from station A to Station X . four packets belongs to the same message but travels in different path to reach their destination. It cause the datagram of a transmission to arrive at their destination out of order with different delay between the packets. Packet may loss due to network congestion .

This switching network , manage a routing table to manage the packet transmission. Each switch have its own routing table which is dynamic in nature i.e table created and updated as per the packet available.

Virtual circuit networks (Packet switching)- this switching technology is the cross between circuit switching network and datagram network with the following characteristics :

1. It has setup, teardown and data transfer phase
 2. Resource can be allocated during setup phase as in circuit switching or on demand as datagram network.
 3. Data are packetized and each packet carries an address in the header. The address in the header are local jurisdiction, what should be the next switch and channel on which packet to be transferred .
 4. All packets follow the same path during connection or different path during connection less.
 5. It generally implemented in data link layer of osi model where as circuit switching work on physical layer and datagram on network layer.
- It may be shown as :-

Figure 8.10 *Virtual-circuit network*



Here , network has switches that allow traffic from source to destination. A source and destination may be computer, packet switch , bridge, or any other device that connects over networks.

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