A **packet-switched network** is a digital communications network that groups all transmitted data, irrespective of content, type, or structure into suitably sized blocks, called *packets*.

The network over which packets are transmitted is a shared network which routes each packet independently from all others and allocates transmission resources as needed.

The principal goals of packet switching are to optimize utilization of available link capacity, minimize response times and increase the robustness of communication.

When traversing network adapters, switches and other network nodes, packets are buffered and queued, resulting in variable delay and throughput, depending on the traffic load in the network.

All the packets are reassembled at the receiving end in correct order. If any packet is missing or corrupted, then the message will be sent to resend the message. If the correct order of the packets is reached, then the acknowledgment message will be sent.

**Two major packet switching modes exist;** (1) connectionless packet switching, also known as Datagram switching, and (2) connection oriented packet switching, also known as virtual circuit switching.
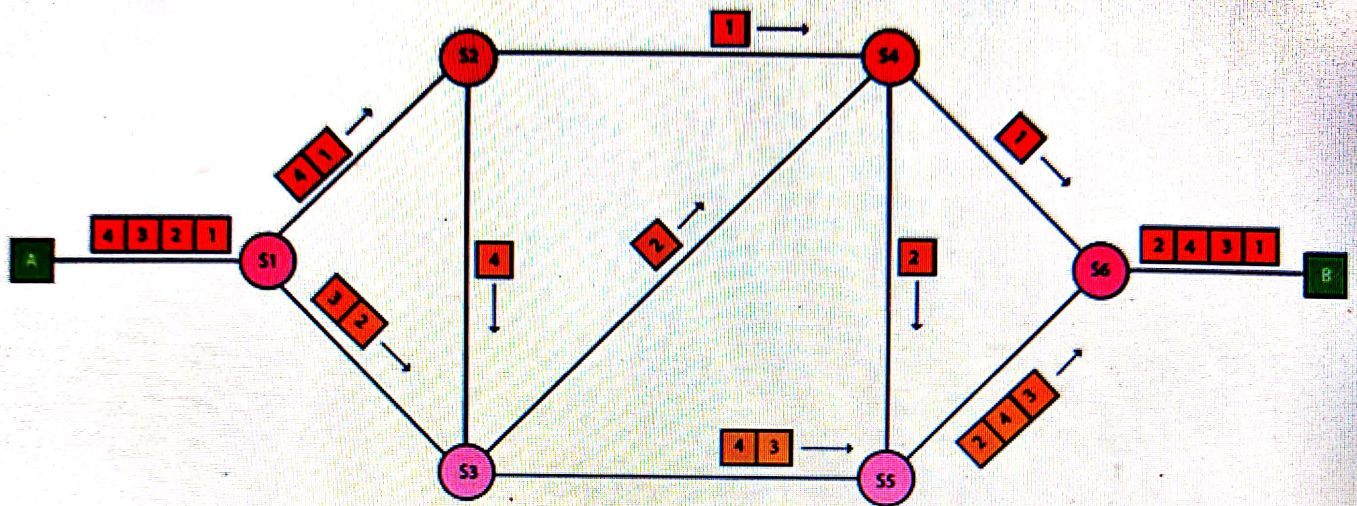
## Datagram Packet switching:

- It is a packet switching technology in which packet is known as a datagram, is considered as an independent entity.

- Each packet contains the information about the destination and switch uses this information to forward the packet to the correct destination.

- Due to independence of packets, they are free to choose their own path and due to this reason it may reorder, damage or dropped.

- The packets are reassembled at the receiving end in correct order.
- In Datagram Packet Switching technique, the path is not fixed.
- Intermediate nodes take the routing decisions to forward the packets.
- Datagram Packet Switching is also known as connectionless switching.

## Virtual Circuit Switching

- Virtual Circuit Switching is also known as connection-oriented switching.
- In the case of Virtual circuit switching, a preplanned route is established before the messages are sent.
- Call request and call accept packets are used to establish the connection between sender and receiver.
- In this case, the path is fixed for the duration of a logical connection.

## Advantages Of Packet Switching:

- **Cost-effective:** In packet switching technique, switching devices do not require massive secondary storage to store the packets, so cost is minimized to some extent. Therefore, we can say that the packet switching technique is a cost-effective technique.

- **Reliable:** If any node is busy, then the packets can be rerouted. This ensures that the Packet Switching technique provides reliable communication.

- **Efficient:** Packet Switching is an efficient technique. It does not require any established path prior to the transmission, and many users can use the same communication channel simultaneously, hence makes use of available bandwidth very efficiently.

## Disadvantages Of Packet Switching:

- Packet Switching technique cannot be implemented in those applications that require low delay and high-quality services.

- The protocols used in a packet switching technique are very complex and requires high implementation cost.

- If the network is overloaded or corrupted, then it requires retransmission of lost packets. It can also lead to the loss of critical information if errors are nor recovered.