

Packet-switched Network:

- In a packet-switched network, the message is divided into packets of fixed or variable size. The size of the packet is determined by the network and the governing protocol.
- In packet switching, there is no resource allocation for a packet. This means that there is no reserved bandwidth on the links, and there is no scheduled processing time for each packet. Resources are allocated on demand which is done on a first come, first served basis.
- When a switch receives a packet, no matter what is the source or destination, the packet must wait if there are other packets being processed.
- Each packet is treated independently of all others. Even if a packet is part of a multipacket transmission, the network treats it as though it existed alone.
- Packets in this approach are referred to as **datagrams**.
- **Datagram switching** is normally done at the network layer.
- Figure shows how the datagram approach is used to deliver four packets from station A to station X. All four packets (or datagrams) belong to the same message, but may travel different paths to reach their destination. The switches in a datagram network are referred to as routers.

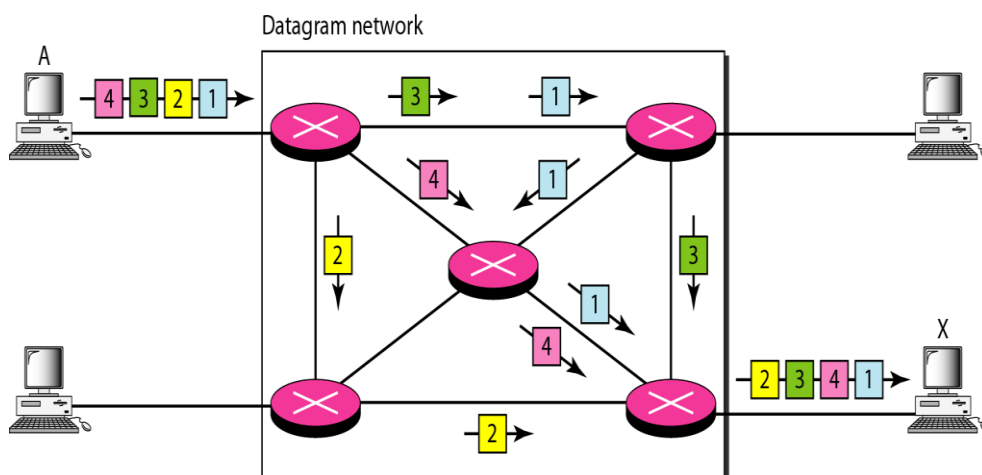


Fig.: A datagram network with five switches (routers)

- The datagram networks are sometimes referred to as **connectionless networks**. The term *connectionless* here means that the switch (packet switch) does not keep information about the connection state. There are no setup or teardown phases. Each packet is treated the same by a switch regardless of its source or destination.

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Performance:

- **Better Efficiency:** The efficiency of a datagram network is better than that of a circuit-switched network; resources are allocated only when there are packets to be transferred. If a source sends a packet and there is a delay of a few minutes before another packet can be sent, the resources can be reallocated during these minutes for other packets from other sources.
- **More Delay:** There may be more delay in a datagram network because each packet may experience a wait at a switch before it is forwarded. Since not all packets in a message necessarily travel through the same switches, the delay is not uniform for the packets of a message.

Example:

Switching in the Internet is done by using the datagram approach to packet switching at the network layer.

Exercises:

1. **What are the two approaches to packet-switching? Compare and contrast a circuit-switched network and a packet-switched network.**
2. **Why do setup and teardown phases not involve in datagram network. Explain the performance of datagram approach to packet switching network on the basis of efficiency and delay.**