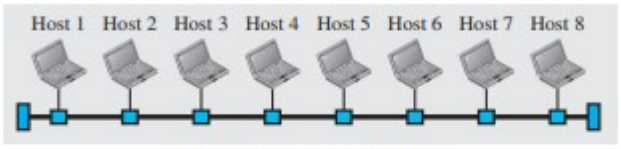
Network Types

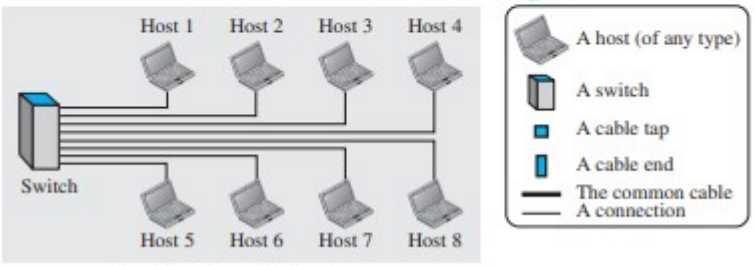
Local Area Network(LAN)

- A Local area Network (LAN) is usually privately owned and connects some hosts in a single office, building or campus.
- Depending upon the need of the organization the LAN can be simple or complex.
- Each host in the LAN has a identifier ,an address, uniquely defines the host in the LAN.
- A packet sent by a host to another host carries both source host and destination host address .
- LAN size is limited to a few kilometres.
- In past all hosts in the network connected through a common cable , which meant that a packet sent from one host to another was received by all the hosts. The indented recipient kept the packet others dropped the packet.
- Now most of the LAN use a smart connecting switch which is able to recognise the destination address and guide the packet to sent to the destination node.

Figure 1.8 *An isolated LAN in the past and today*



a. LAN with a common cable (past)



b. LAN with a switch (today)

Wide Area Network

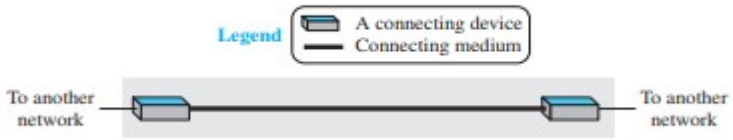
- A wide area network (WAN) is also an interconnection of devices capable of communication.
- A WAN has a wider geographical span, spanning a town, a state, a country, or even the world.

- A LAN interconnects hosts; a WAN interconnects connecting devices such as switches, routers, or modems.
- A LAN is normally privately owned by the organization that uses it; a WAN is normally created and run by communication companies and leased by an organization that uses it.

Point-to-Point WAN

A point-to-point WAN is a network that connects two communicating devices through a transmission media (cable or air).

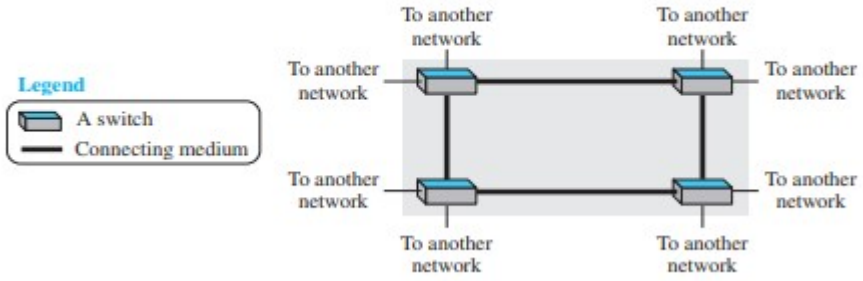
Figure 1.9 *A point-to-point WAN*



Switched WAN

- A switched WAN is a network with more than two ends.
- Switched WAN is a combination of several point-to-point WANs that are connected by switches.

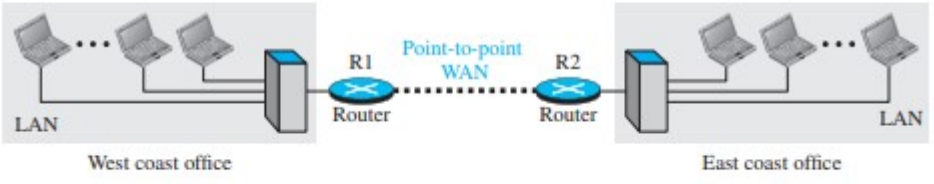
Figure 1.10 *A switched WAN*



Internetwork

When two or more networks are connected, they make an internetwork, or internet.

Figure 1.11 *An internetwork made of two LANs and one point-to-point WAN*



Switching

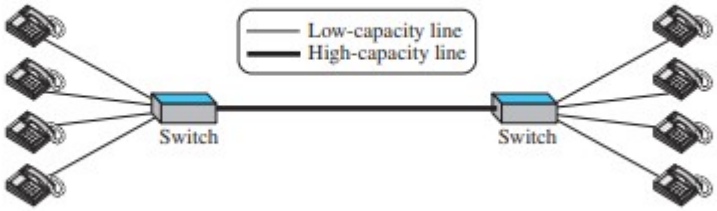
An internet is a switched network in which a switch connects at least two links together. A switch needs to forward data from a network to another network when required.

The two most common types of switched networks are circuit-switched and packet-switched networks.

Circuit-Switched Network

In a circuit-switched network, a dedicated connection, called a circuit, is always available between the two end systems; the switch can only make it active or inactive.

Figure 1.13 *A circuit-switched network*

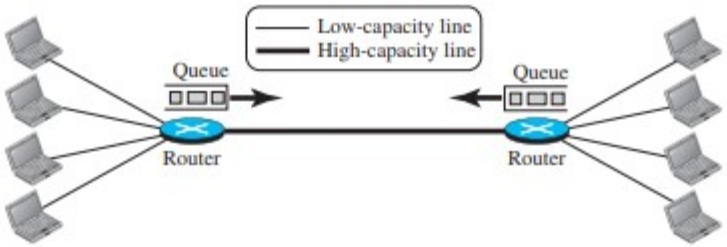


- A circuit-switched network is efficient only when it is working at its full capacity; most of the time, it is inefficient because it is working at partial capacity. (eg: site are talking with four people at the other site; the capacity of the thick line is fully used. In the second case, only one telephone set at one side is connected to a telephone set at the other side; only one-fourth of the capacity of the thick line is used).

Packet-Switched Network

- In a computer network, the communication between the two ends is done in blocks of data called packets.
- A router in a packet-switched network has a queue that can store and forward the packet.

Figure 1.14 *A packet-switched network*



- If only two computers (one at each site) need to communicate with each other, there is no waiting for the packets. However, if packets arrive at one router when the thick line is already working at its full capacity, the packets should be stored and forwarded in the order they arrived.