MUST

Wisdom & Virtue

MIRPUR UNIVERSITY OF SCIENCE AND TECHNOLOGY (MUST), MIRPUR

DEPARTMENT OF SOFTWARE ENGINEERING

Computer Networks

Lecture [5]: Network Types

Engr. Samiullah Khan

(Lecturer)

Topics discussed in Today's Lectures

- Network Types

NETWORK TYPES

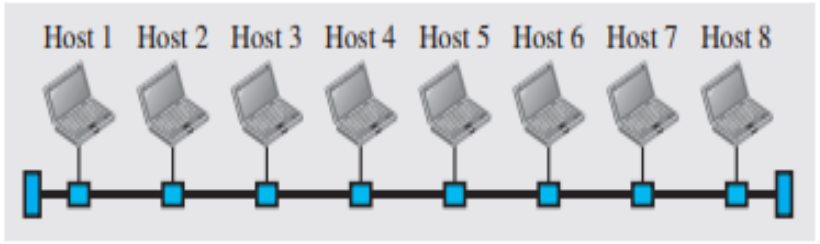
Local Area Network (LAN)

- LAN is usually privately owned and connects some hosts in a single office, building, or campus
- Depending on the needs of an organization, a LAN can be:
  - As **simple** as two PCs and a printer in someone's home office
  - Extend throughout a company and include audio and video devices
- Each host in a LAN has an identifier, an address, that uniquely defines the host in the LAN
- A packet sent by a host to another host carries both the source host's and the destination host's addresses
- In the past, all hosts in a network were connected through a common cable, which meant that a packet sent from one host to another was received by all hosts
- The intended recipient kept the packet; the others dropped the packet

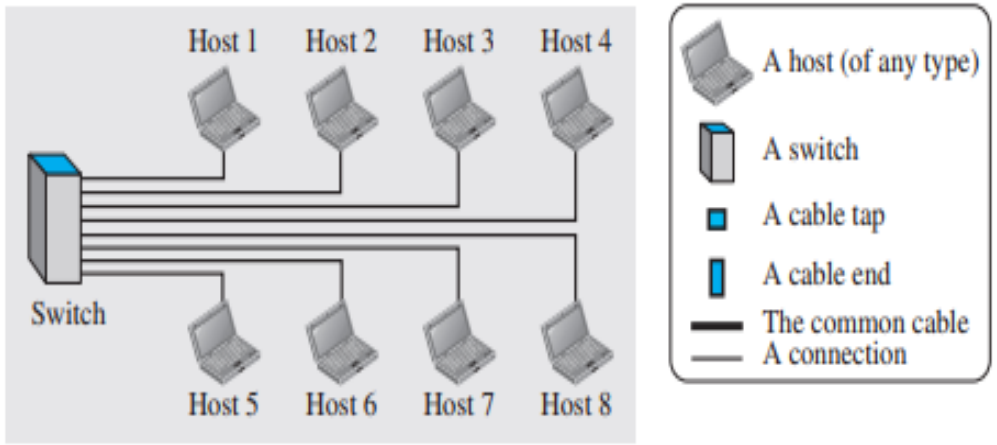
NETWORK TYPES

Local Area Network (Contd…)

- Today, most LANs use a smart connecting switch, which is able to recognize the destination address of the packet and guide the packet to its destination without sending it to all other hosts
- Switch allows more than one pair to communicate with each other at the same time if there is no common source and destination among them



a. LAN with a common cable (past)



b. LAN with a switch (today)

NETWORK TYPES

Wide Area Network (WAN)

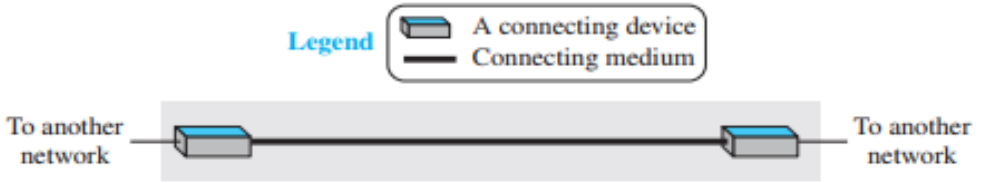
- WAN is also an interconnection of devices capable of communication
- However, there are some differences between a LAN and a WAN
  - A LAN is normally limited in size, spanning an office, a building, or a campus
  - A WAN has a wider geographical span, spanning a town, a state, a country, or even the 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, run and leased by communication companies that uses it
  - Two examples of WANs today: point-to-point WANs and switched WANs

NETWORK TYPES

Point-to-Point WAN

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

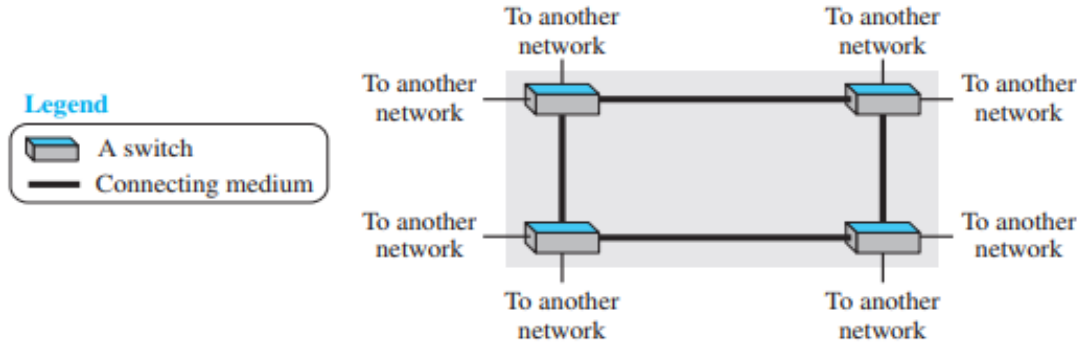
Figure 1.9 *A point-to-point WAN*



Switched WAN

- A switched WAN is a network with more than two ends
- A switched WAN, is used in the backbone* of global communication today
- Switched WAN is a combination of several point-to-point WANs that are connected by switches

Figure 1.10 *A switched WAN*



NETWORK TYPES

Internetwork

- Generally LAN or a WAN are connected to one another
- When two or more networks are connected, they make an internetwork, or internet
- **Example:** assume that an organization has 2 offices, one on east coast and other on west coast
- Each office has a LAN that allows all employees in the office to communicate with each other
- To make the communication b/w employees at different offices possible, management leases a point-to-point dedicated WAN from a service provider, such as a telephone company, and connects the two LANs
- Now the company has an internetwork, or a private internet
- Communication between offices is now possible

NETWORK TYPES

Internetwork (Contd…)

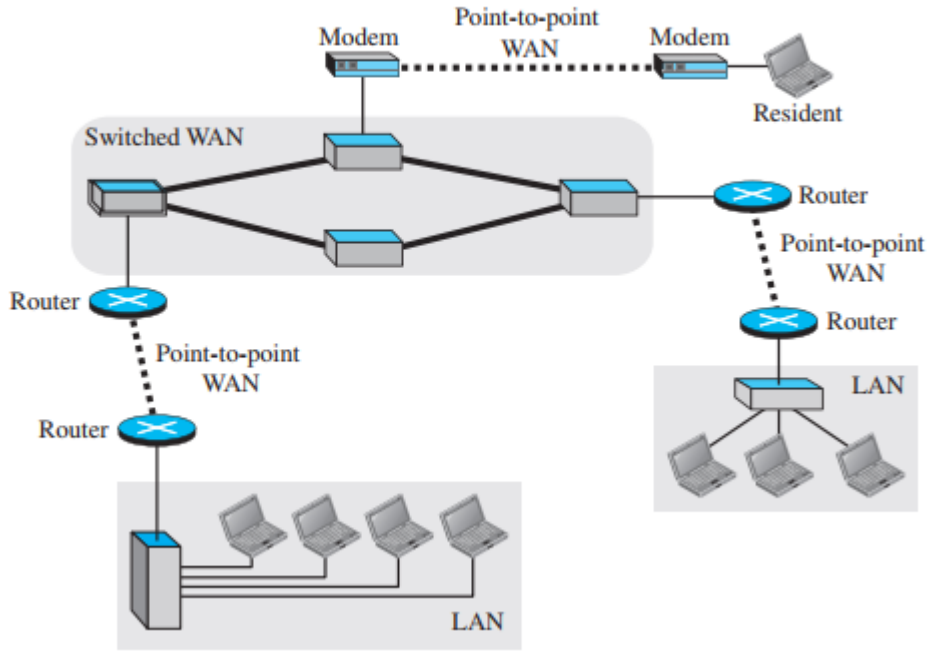
Figure 1.11 *An internetwork made of two LANs and one point-to-point WAN*

- When a host in the west coast office sends a message to another host in the same office, switch directs the message to the destination
- On the other hand, when a host on the west coast sends a message to a host on the east coast, router R1 routes the packet to router R2, and the packet reaches the destination

NETWORK TYPES

Internetwork (Contd…)

Figure 1.12 *A heterogeneous network made of four WANs and three LANs*



- Figure 1.12 shows another internet with several LANs and WANs connected
- One of the WANs is a switched WAN with four switches.

References

Chapter 1

Data Communication and Networking (5th Edition)
By Behrouz A. Forouzan

THANKS