Computer Network

Lecture-4

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Categories of Networks

Networks are classified based upon the size, the area it covers and its physical architecture. The three primary network categories are **LAN, WAN and MAN**. Each network differs in their characteristics such as distance, transmission speed, cables and cost.

Local Area Network(LAN)

- A local area network (LAN) is usually privately owned and links the devices in a single office, building, or campus.
- Depending on the needs of an organization and the type of technology used, a LAN can be as simple as two PCs and a printer in someone's home office; or it can extend throughout a company.
- Currently, LAN size is limited to a few kilometers.

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- Currently, LAN size is limited to a few kilometers.
- LANs are designed to allow resources to be shared between personal computers or workstations. The resources to be shared can include hardware (e.g., a printer), software(e.g., an application program), or data.

Local Area Network(LAN)

- The most common LAN topologies are **bus, ring,** and **star.**
- Early LANs had data rates in the 4 to 16 megabits per second (Mbps) range. Today, however, speeds are normally 100 or 1000 Mbps.
- Wireless LANs are the newest evolution in LAN technology.

Wide Area Network(WAN)

A wide area network (WAN) provides long-distance transmission of data, image, audio, and video information over large geographic areas that may comprise a country, a continent, or even the whole world.

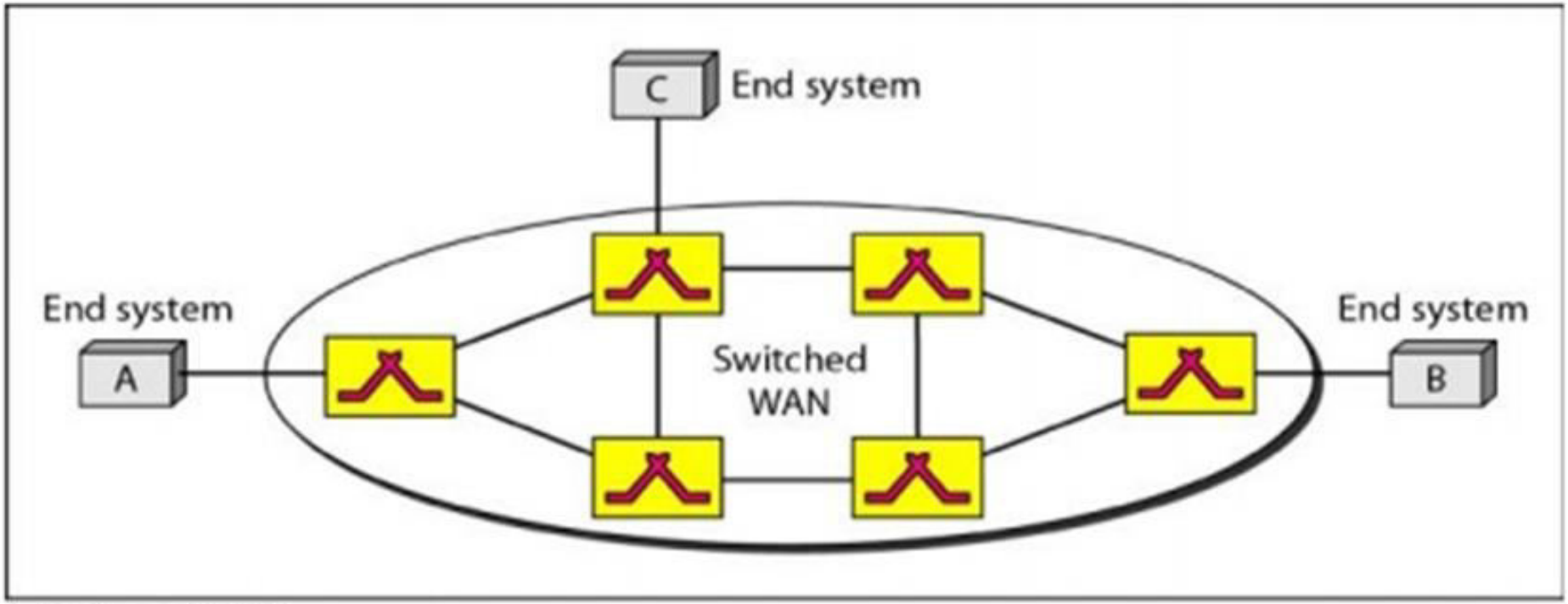
A WAN can be as complex as the backbones that connect the Internet or as simple as a dial-up line that connects a home computer to the Internet.

Wide Area Network(WAN)

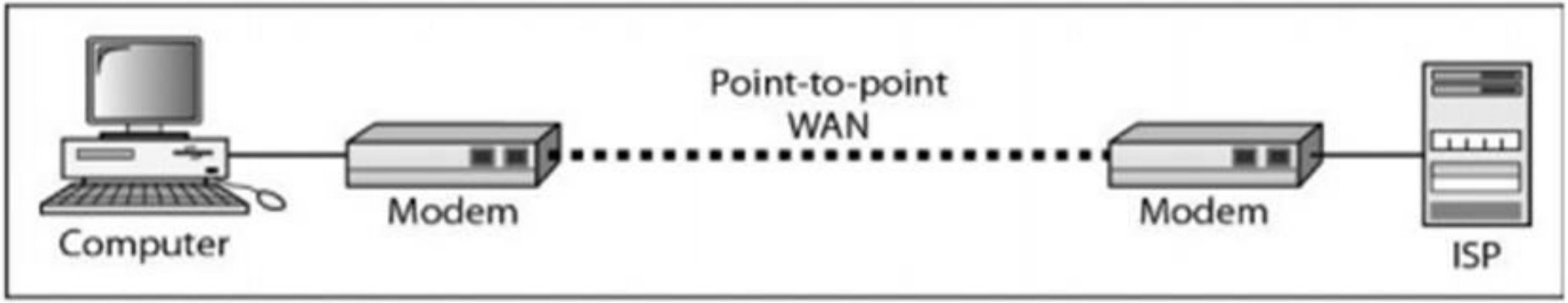
We normally refer to the first as a switched WAN and to the second as a point-to-point WAN.

- The switched WAN connects the end systems, which usually comprise a router (internetworking connecting device) that connects to another LAN or WAN.
- The point-to-point WAN is normally a line leased from a telephone or cable TV provider that connects a home computer or a small LAN to an Internet service provider (lSP). This type of WAN is often used to provide Internet access.

Wide Area Network(WAN)



a. Switched WAN



b. Point-to-point WAN

Wide Area Network(WAN)

- An early example of a switched WAN is X.25, a network designed to provide connectivity between end users.
- X.25 is being gradually replaced by a high-speed, more efficient network called Frame Relay.
- A good example of a switched WAN is the asynchronous transfer mode (ATM) network, which is a network with fixed-size data unit packets called cells.
- Another example of WANs is the wireless WAN that is becoming more and more popular.

Metropolitan Area Networks(MAN)

- A metropolitan area network (MAN) is a network with a size between a LAN and a WAN. It normally covers the area inside a town or a city. It is designed for customers who need a high-speed connectivity, normally to the Internet, and have endpoints spread over a city or part of city.
- A good example of a MAN is the part of the telephone company network that can provide a high-speed DSL line to the customer.
- Another example is the cable TV network that originally was designed for cable TV, but today can also be used for high-speed data connection to the Internet.

Interconnection of Networks: Internetwork

An internetwork can be defined as two or more computer networks (typically Local Area Networks LAN) which are connected together, using Network Routers.

It is also called internet.

Each network in an Internetwork has its own Network Address, which is different from other networks in the Internetwork. Network Address is used to identify the networks inside an Internetwork.

Internetwork allows different users at different geographical locations of an organization to share data, resources and to communicate. Modern businesses cannot even function without Internetwork. Internet, Intranet and Extranet are different types of internetwork.

Internet, Intranet and Extranet

Internet:

Internet is a worldwide, publicly accessible computer network of interconnected computer networks (internetwork) that transmit data using the standard Internet Protocol (IP). Largest Internetwork in the world is Internet.

Internet, Intranet and Extranet

Intranet:

- An intranet is a private network that is contained within an enterprise.
- Typical intranet for a business organization consists of many interlinked local area networks (LAN) and use any Wide Area Network (WAN) technology for network connectivity.
- The main purpose of an intranet is to share company information and computing resources among employees.
- Intranet is a private Internetwork, which is usually created and maintained by a private organization.
- The content available inside Intranet are intended only for the members of that organization (usually employees of a company).

Internet, Intranet and Extranet

Extranet:

- An extranet can be viewed as part of a company's intranet that is extended to users outside the company like suppliers, vendors, partners, customers, or other business associates.
- Extranet is required for normal day-to-day business activities. For example, placing purchase order to registered vendors, billing & invoices, payments related activities, joint venture related activities, product brochures for partners, discounted price lists for partners etc.