



Lecture – 05

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Outline

- ❑ What is networking?
- ❑ Terminology of Computer Networking
- ❑ Advantages of Networking
- ❑ Types of Network



What is networking?

- ▶ **Networking:**

A computer networking is a process of connecting two more than two computers with the purpose to share data, provide technical support, and to communicate.



Terminology of Computer Networking

- ▶ **WAN**

It stands for Wide Area Network and covers a wide area such as a city.

- ▶ **LAN**

It stands for Local Area Network and covers a small area such as a small office or home. It physically connects all the computers located in the premises.

- ▶ **Internet**

It is a computer network system that connects the computers of the world. It is normally connecting through WAN and LAN.



Terminology of Computer Networking(Cont.)

➤ World Wide Web (WWW)

It is the service that is used on Internet to view and search contents.

▶ Social networking websites

It refers to the websites that facilitate users with a common platform where they can share their message (in text, audio, or even video form), images, videos, etc. For example, Facebook, Google+, Twitter, LinkedIn, MySpace, etc.



Terminology of Computer Networking(Cont.)

- ▶ **Download**

It is a process that saves data from Internet onto a personal computer.

- ▶ **Upload**

It is a process that transfers the saved data from a personal computer to Internet server.



Advantages of Networking

- ▶ **Facility of Technical Support**

Because of having computer networking, a person sitting in the United States of America provides technical support to a person sitting in a remote part of India.

- ▶ **Easy Sharing of Data**

With the help of networking, it is very simple to share all formats of digital data from one computer system to another (irrespective of their geographic location).

- ▶ **Easy Sharing of Hardware Resource**

With the help of networking, it has now become very simple to share the expensive resources including storage space, processor, fax, etc.



Advantages of networking (Cont.)

- ▶ **Easy Sharing Software**

Through the networking system, it is easy to share and install the software from one computer system to another computer system.

- ▶ **Easy to Decentralize Data Processing**

Through the networking system, it is very simple to decentralize the data processing system. It ultimately helps to control, secure, and manage the important data.

- ▶ **Easy to Communicate**

With the help of networking, the communication system has now become highly efficient, frugal, and fast. The different modes of communication are text chatting, video chatting, emails, etc.

Disadvantages of Computer Networking



- ▶ It lacks independence.
- ▶ It poses security difficulties.
- ▶ It lacks robustness.
- ▶ It allows for more presence of computer viruses and malware.
- ▶ Its light policing usage promotes negative acts.
- ▶ It requires an efficient handler.
- ▶ It requires an expensive set-up.
- ▶ Cost of network.



Types of Network

1. Local Area Network (LAN)
2. Metropolitan Area Network (MAN)
3. Wide Area Network (WAN)





Local Area Network (LAN)

- ▶ Local Area Network or simply LAN is the technique of interconnecting a few computers located in a given premise. It is normally used for a single business office or a residential apartment.
- ▶ The major purpose of such interconnectivity is to establish a communication system in order to make the work easier.
- ▶ However, in such connectivity, some other devices can also be attached such as laser printers, fax machine, etc.

Characteristics/features LAN:



- ▶ Coverage area is generally a few kilometers.
- ▶ Using different dedicated transmission medium you can achieve the transmission rate of 1 Mb/s to 100 Mb sec or higher (e.g. 155 Mbps, 655Mbps and 1000Mbps etc.).
- ▶ In LAN you can the multiple devices to share a transmission medium.
- ▶ You can use the different topology mainly bus and ring in LAN.
- ▶ The communication quality is better in LAN, the transmission error rate are low as compare to WAN.
- ▶ LAN supports a variety of communications transmission medium such as a Ethernet cable (thin cable, thick cable, and twisted pair), fiber and wireless transmission.
- ▶ A LAN usually has low cost, installation, expansion and maintenance and LAN installation is relatively simple, good scalability.

Components of LAN:



Network Adapter

A computer needs a network adapter to connect to a network. It converts computer data into electronic signals.

Network Medium

Network medium usually refers to the cable that links computers on a network. Wire, fiber, and air are the three media.”

Cable connectors

In wired networks the most common form of connector is the RJ45. Every computer with networking capabilities has an RJ45 port. This is sometimes called a “network port” or an “Ethernet port.” The RJ45 plug looks like a slightly larger telephone plug and connects the Unshielded Twisted Pair or the Shielded Twisted Pair cable.

Components of LAN: – Cont.



Power Supply

Both wired and wireless networks need a power supply. A wireless network uses the current to generate radio waves. A cable network sends data interpreted as an electronic pulse.

Hub/Switch/Router

A **hub** is a networking device that connects multiple computer or other network device together and it broadcast the receive data.

A **Switch** receive a packet data, it determines what computer or device the packet is intended for and sends it to that computer only. It does not broadcast the packet to all Computer as a hub.

Router is a networking device that is used to connect a network to another network.



Network Software

Software is a communicating computer packages data into segments and puts that data into a structure called a `packet". The source and destination addresses of the packet are written into the header of the packet. The receiving needs to interpret these back into meaningful data and deliver it to appropriate application.



Metropolitan Area Network (MAN)

- ▶ Metropolitan Area Network or simply MAN is a system of network that normally covers a large metropolitan area (city part).
- ▶ It provides high speed Internet services throughout the area covered within the network.



Wide Area Network (WAN)

- ▶ Wide Area Network or simply WAN is a system of network that covers a large geographical area across the world.
- ▶ The services of WAN are provided by public (government) agencies as well as private agencies. The network also provides the facility to access databases located remotely.
- ▶ The WAN system is highly beneficial for MNCs and other big corporate companies (offering online services).



OSI Model

The OSI Model (Open Systems Interconnection Model) is a conceptual framework used to describe the functions of a networking system. The OSI model characterizes computing functions into a universal set of rules and requirements in order to support interoperability between different products and software.





OSI Model – Cont.

In the OSI reference model, the communications between computing systems are split into **seven** different layers:

- ▶ Physical
- ▶ Data Link
- ▶ Network
- ▶ Transport
- ▶ Session
- ▶ Presentation and
- ▶ Application Layer



Any Questions?



Thank you