



MUST

Wisdom & Virtue

MIRPUR UNIVERSITY OF SCIENCE AND TECHNOLOGY (MUST), MIRPUR
DEPARTMENT OF SOFTWARE ENGINEERING



Computer Networks

Lecture [2b] : Modes of Network and Network Criteria

Engr. Samiullah Khan
(Lecturer)



Topics discussed in Today's Lectures

- Need of Computer Network
- Network Criteria



NETWORKS

Definition

- A **network** is a set of devices (often referred to as **nodes**) connected by communication **links**.

Node

- Also known as **host** or **end system**
- A node can be a computer, printer, or any other connecting device
- Connecting devices i.e.
 - **Router**, which connects the network to other networks
 - **Switch**, which connects devices together
 - **Modem**, which changes the form of data

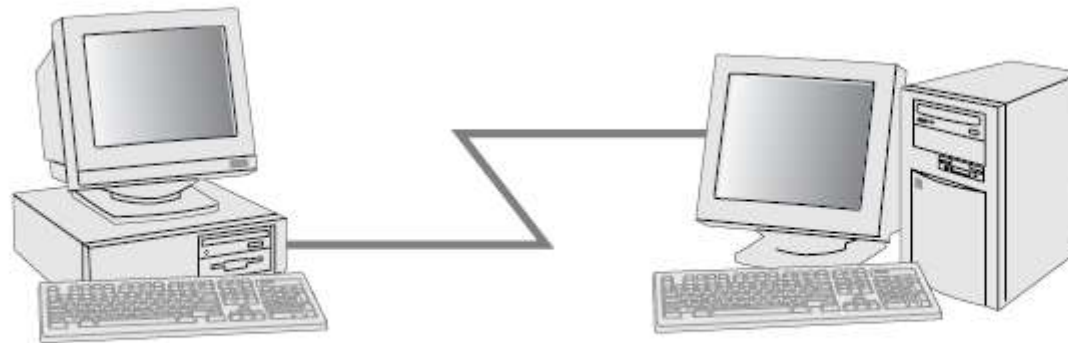
Link

- A link can be a cable, air, optical fiber, or any medium which can transport a signal carrying information



Computer Networks

- A computer network is simply two or more computers connected together so they can exchange information
- When we connect two computers at home using a **plug-and-play router**, we have created a network, although very small

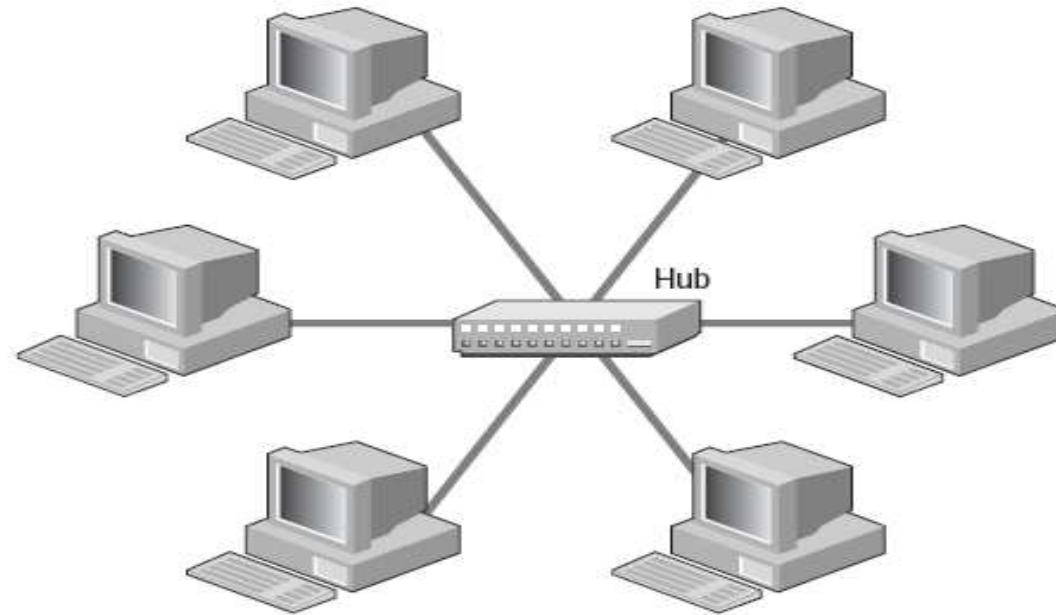


Two Networked Computers



COMPUTER NETWORK

- Most networks use **hubs** to connect computers together
- A large network may connect thousands of computers and other devices together



Computers Networked With a Hub



Needs for Computer Network

- Without a network, you can access resources only on your own computer
- These resources may be devices or folder in your computer, such as **disk drive**, or they may be connected to your computer, such as a **printer** or CD ROM drive
- These devices are accessible only to you
- Networking allows you to **share resources** among a group of computer users



Needs for Computer Networking

Sharing Files and Devices

- Each computer on your network can share **folders**, **entire disk drives**, or a **CD-ROM drive**
- Other computers on your network can **access documents** and **other files** stored in the folders, and on the drives
- Instead of copying a document to a USB/portable Hard-disk and giving it to another person to view, anyone can **open and view** the document using the network



Need for Computer Networking

Sharing a Printer

- If you have a printer connected to your computer, you can **share the printer** with other computers on the network
- Instead of buying a printer for every computer, all computers can print across the network
- Suppose you want to print a document on a **color laser printer** that is connected to another computer in the office
- Instead of copying your file to a USB, going to the other computer, and interrupting the person using that computer, you can **print directly** over the network



Need for Computer Networking

Sharing an Internet Connection

- If you already have access to the Internet from one computer on your network, you can share that Internet connection with other computers on the network (like Hotspot in Smartphone)
- Then all the computers on your network can browse the Web at the same time, using this single Internet connection



Network Criteria

- A network must be able to meet a certain number of **criteria**
- The most important of these are performance, reliability, and security

Performance

- It can be measured in many ways, including **transit time** and **response time**
- **Transit time** is the amount of time required for a message to travel from one device to another
- **Response time** is the lapsed time between an inquiry and a response
- Performance of a network depends on a number of factors, including:
 - Number of users
 - Type of transmission medium
 - Capabilities of the connected hardware
 - Efficiency of the software



Network Criteria

Reliability

- Network reliability is measured by the *frequency of failure*, the time it takes a link to **recover from a failure**, and the network's **robustness** in a disaster

Security

- Network security issues include:
 - Protecting data from **unauthorized access**
 - Protecting data from **damage**
 - Developing, & implementing policies and procedures for **recovery** from data breaches and data losses



References

Chapter 1

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



THANKS

