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Royal University of Phnom Penh

Data Communication I

Chapter 1.1: Introduction to Data Communication

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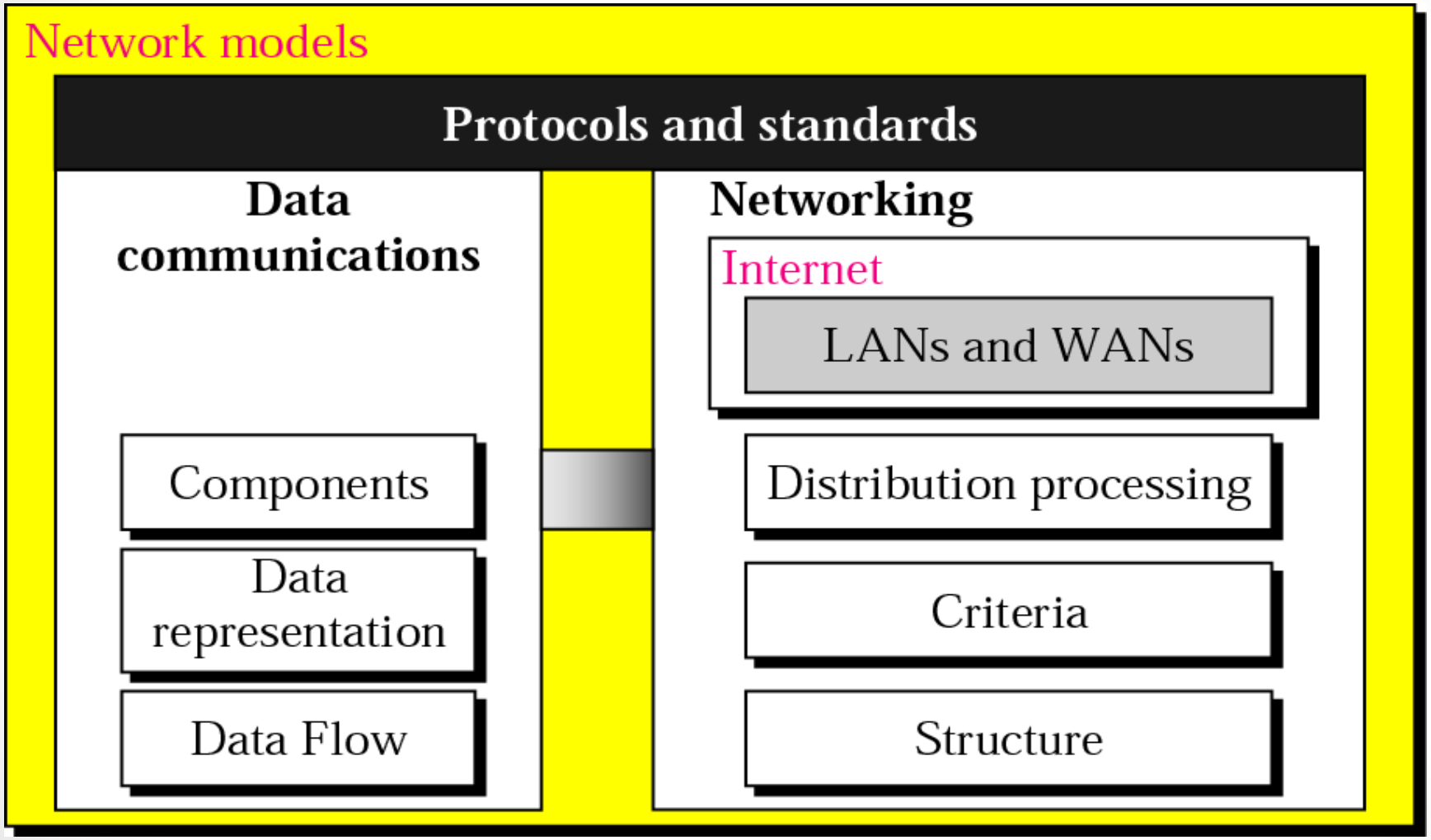
Objective

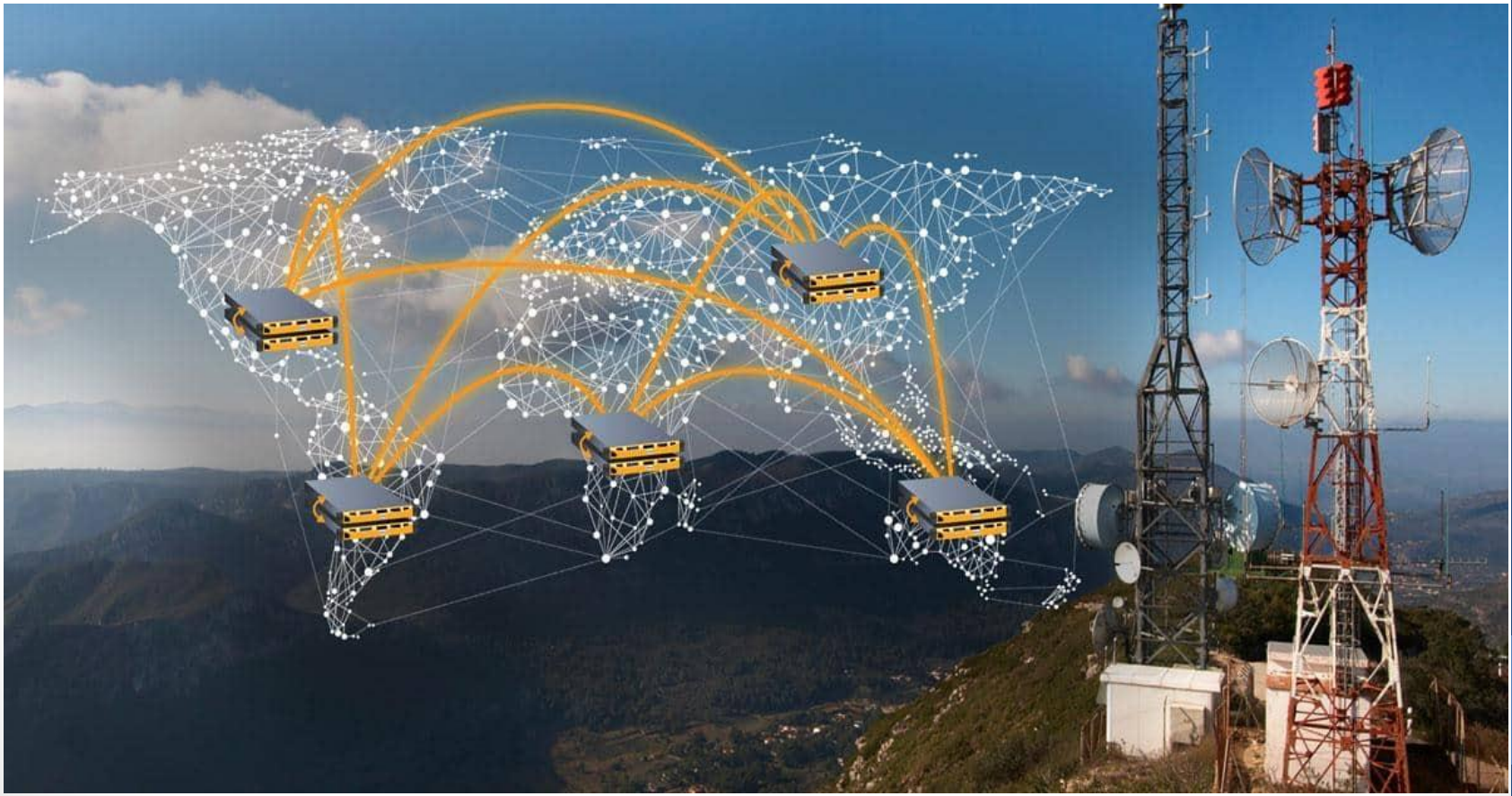
- Overview
- What is Data Communication?
- Data communication characteristics
- Components
- Data Flow

Overview


Network models
Protocols and standards
Data communications
Components
Data representation
Data Flow
Networking
Internet
LANs and WANs
Distribution processing
Criteria
Structure

What is Data Communication?

- The term telecommunication means communication at a distance.



What is Data Communication?

- The word data is information that has been translated into a form that is efficient for processing.
- In the context of computer information system, data represented by binary information units in the form of 0s and 1s.
- Data communications are the exchange of data between two devices via some form of transmission medium such as a wire cable.

What is Data Communication?

Types of Data used in a Data communication system:

- Text and Numeric Data: text consists of words, sentence or paragraphs. The text is normally stored as ASCII code format. The numeric data can be represented in different number system such as decimal, hexadecimal, octal, and binary number.

- Audio and Video data: audio data are continuous wave form signals. Audio can be any music, speech. Video data comprises motions pictures that create actions and movement. It can be produced by a video camera.

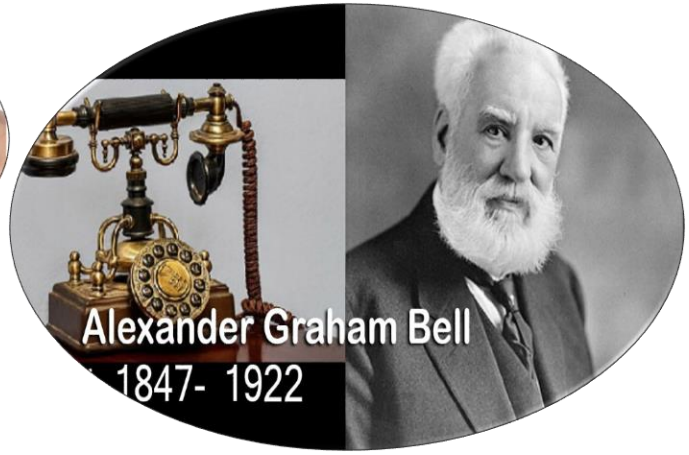
- Images: image may be charts, graphs, pictures, sketches and freehand drawing. Image data is also represented by a bit patterns.

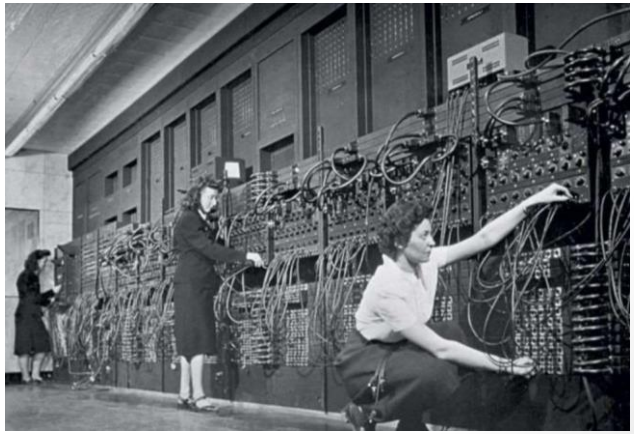
What is Data Communication?

Types of Data used in a Data communication system:

A brief history of Data Communication

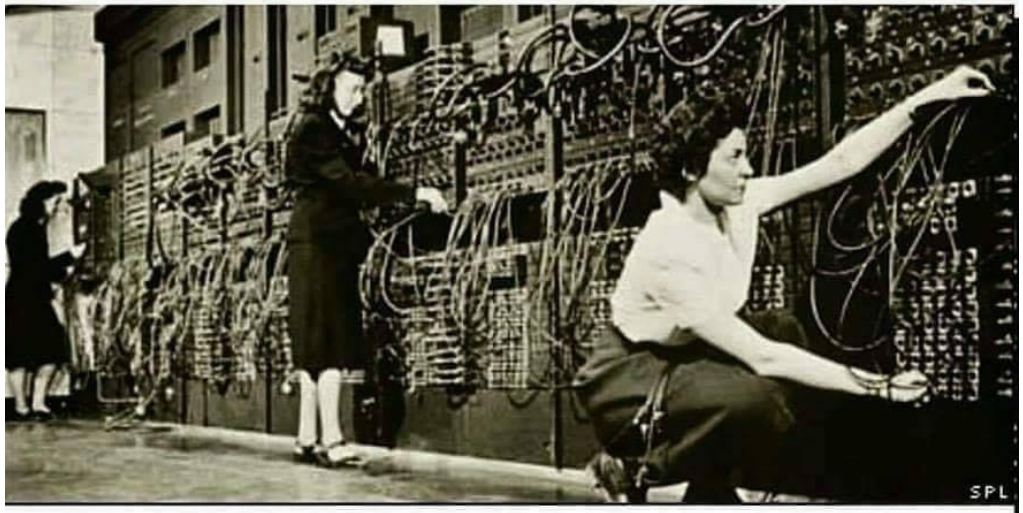
- 1838: Samuel Morse and Alfred Veil invent Morse Code telegraph system
- 1876: Alexander Graham Bell invented Telephone
- 1930: Development of ASCII Transmission Code
- 1943-46:Electronic Numerical Integrator and Calculator(ENIAC) built during WWII by USA
- 1950: IBM releases its first computer IBM 710
- 1960: IBM releases the first commercial computer IBM 360





A brief history of Data Communication

First computer programmer was a lady



That's why the language of computer is difficult to understand

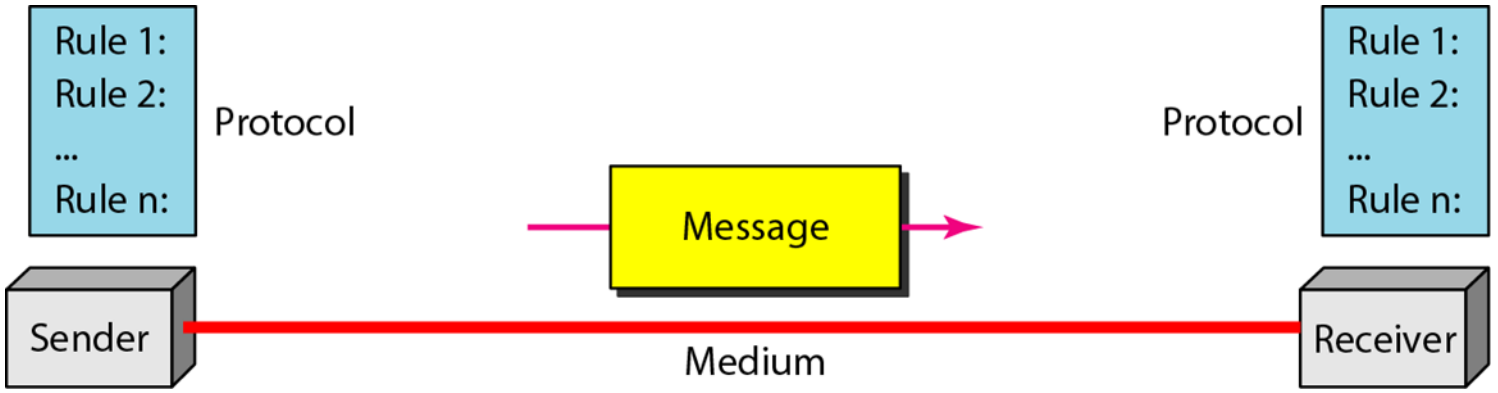
Data communication characteristics

The effectiveness of a data communication system depends on the three fundamental characteristics:

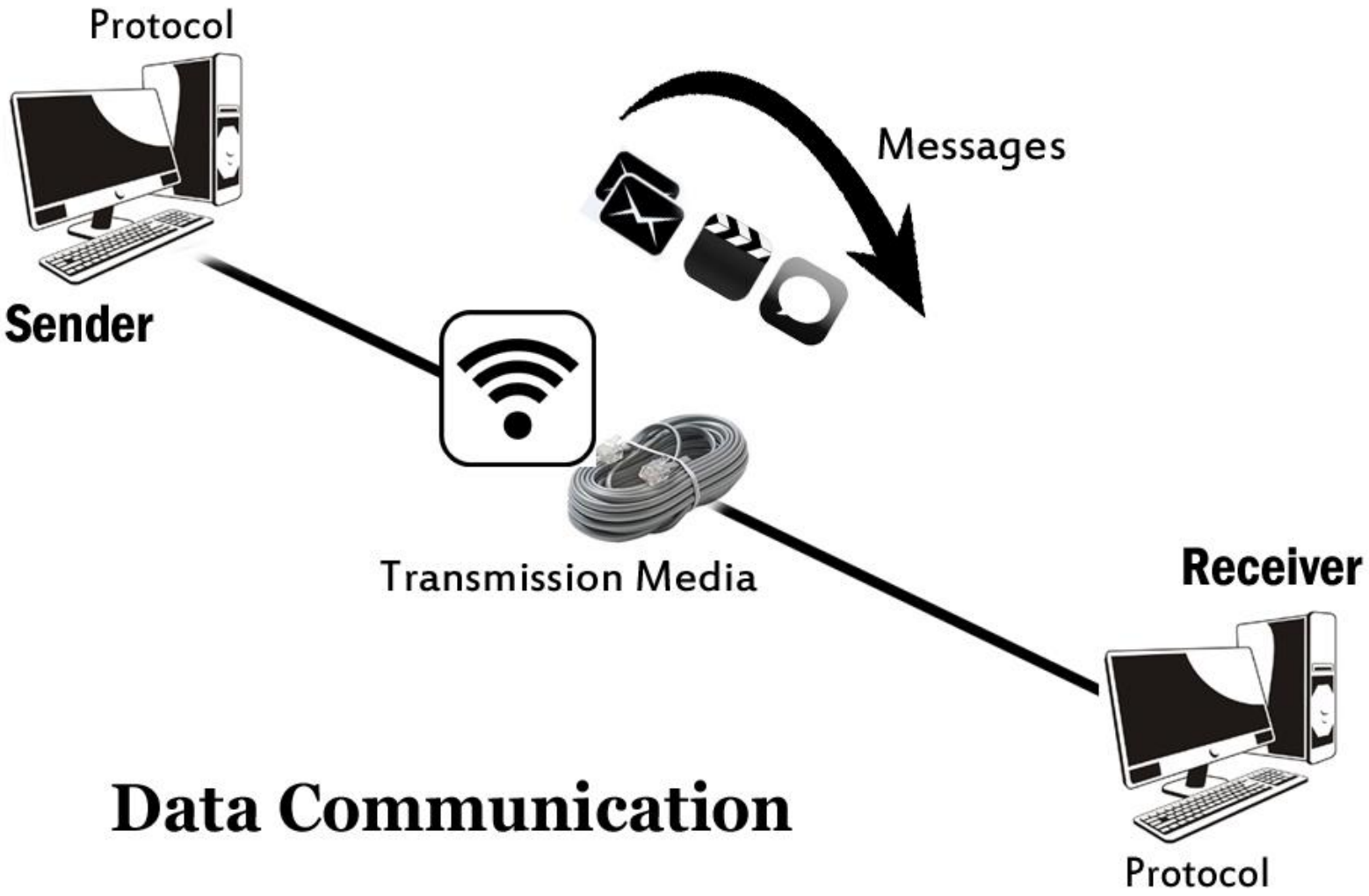
1. Delivery: the system must deliver to the right destination
2. Accuracy: the delivery must be accurate
3. Time: spend less time to transmit and receive data

Components

There are Five components in Data Communication



Components


Protocol
Messages
Sender
Transmission Media
Receiver
Protocol
Data Communication

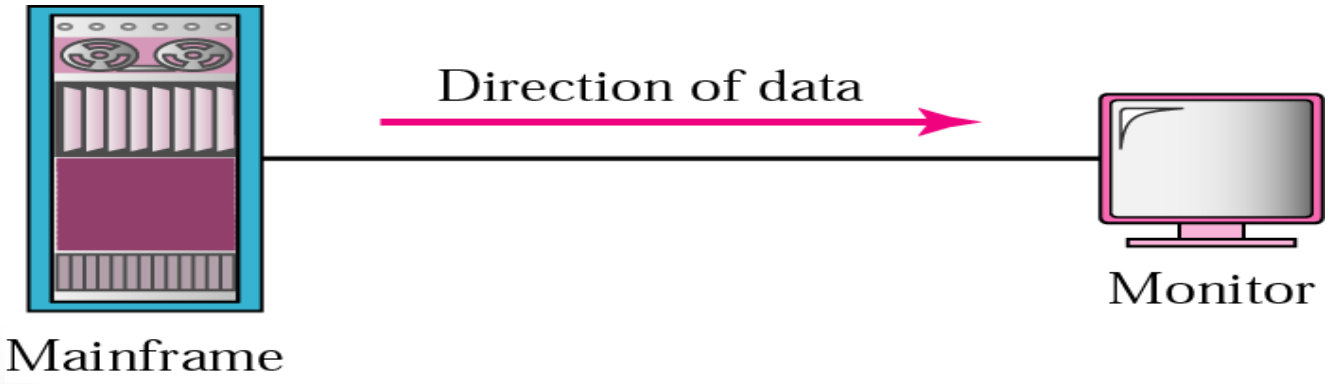
Components

1. Message: it is the information to be communicated.
2. Sender: it is the device which sends the data message. It can be a computer, workstation,…
3. Receiver: it is the device which receives the data messages.
4. Medium: it is the physical path by which a message travels from sender to receiver. Example Twisted Pair wire, Fiber optic cable, radio waves,…
5. Protocol: it is a set of rules that governs data communications. Without protocol, two devices may be connected, but cannot communicate.

Data Flow

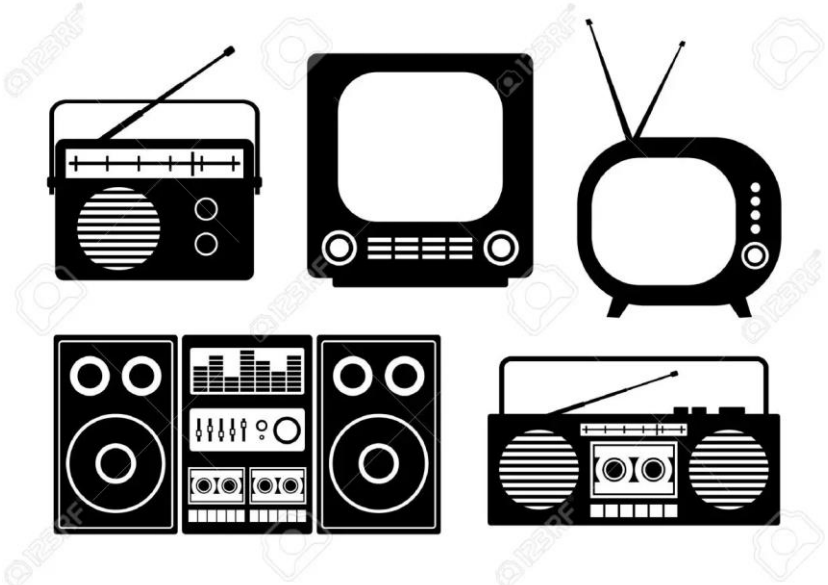
- **Buses and networks** are designed to allow communication to occur between individual devices that are interconnected.
- The flow of information, or data, between nodes, can take a variety of forms
- There are Three type of data flow

a. Simplex Communication



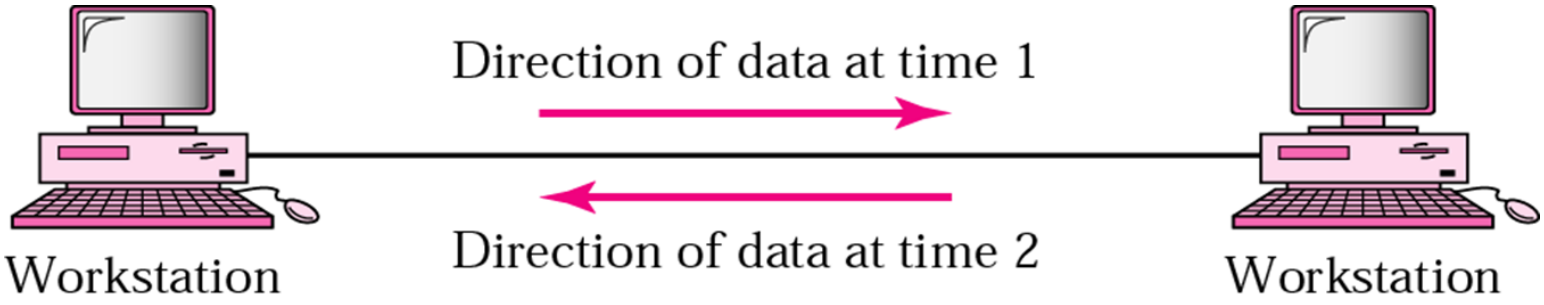
Data Flow

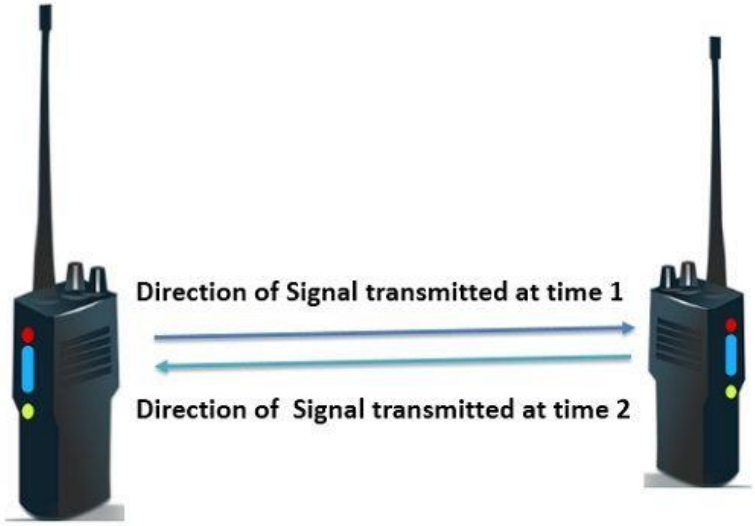
a. Simplex Communication



Data Flow

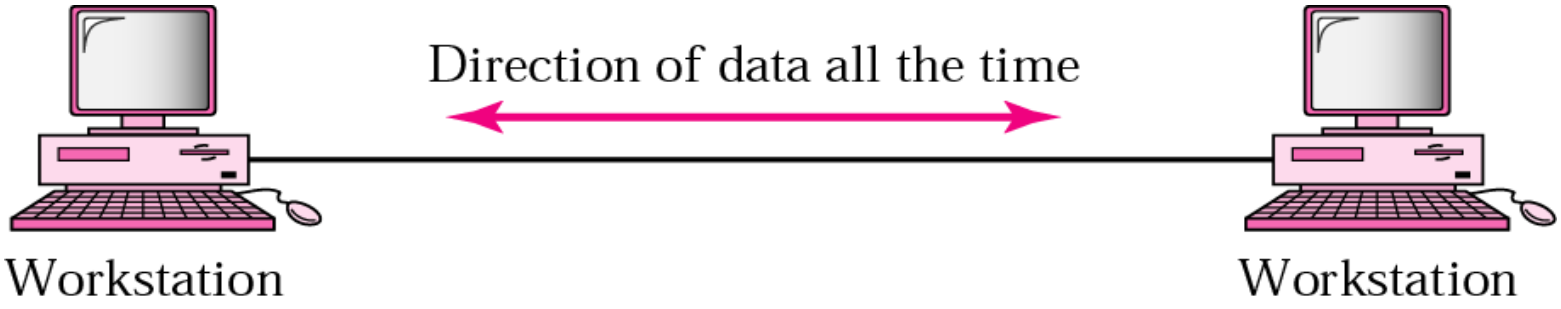
b. Half-Duplex Communication





Data Flow

c. Full-Duplex Communication



Data Flow

Simplex Communication

- Data can flow only in one direction
- Not moved in both direction, one way street
- Not perform both action either send or receive data
- Direction of flow not change

Half-Duplex Communication

- Data can flow in both directions but not at the same time
- One way at one time
- Device with half duplex mode can send and receive data but not at same time

Full-Duplex Communication

- Data can flow in both direction simultaneously
- Fast speed and time is not waited

Quiz

Why need data-communication?

- It enhances communication and availability of information
- It allows for more convenient resource sharing
- It makes file sharing easier
- It is highly flexible
- It is an inexpensive system
- It increases cost efficiency
- It boosts storage capacity

Why not data-communication?

- It lacks independence
- It poses security difficulties
- It lacks robustness (server down→ all clients down)
- It allows for more presence of computer viruses
- It requires an efficient handler

Q&A