Data Communication and Types of Data Transmission

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Article published on December 13th 2011 | Data Recovery

Communication means the exchange of information or messages. The process of transferring data from one location to another is called Data Communication. In this process, data is transmitted electronically from one location to another by using standard methods.

Today, computer networks are commonly used for data communication. For this purpose, we use cables, telephone lines, computers, and wireless devices that are linked in a network.

Types of Data Transmission: Therefore, data transmission is divided into:

(i) Analog data transmission.

(ii) Digital data transmission.

(i) Analog Data Transmission:

The transfer of data from one place to another in the form of analog signals or in the form of continuous waves is called analog data transmission. The analog signal consists of a continuous electrical wave. The light waves, sound waves or radio waves are examples of analog signals.

(ii) Digital Data Transmission:

The transfer of data from one place to another in the form of digital signals is called digital data transmission. A digital signal consists of individual electrical pulses that represent bits grouped together into bytes. Computer accepts and processes data in the form of digital signals. Data is also transmitted from one computer to another through telephone line, microwave system and satellite. In this system, a modem is used on both sides. A modem is an electronic device that can convert the analog signal into digital and vice versa.

Characteristics of Communication System: The communication system depends upon the following fundamental characteristics.

Delivery: The data must be delivered from source device to the correct destination device.

Accuracy: The data must be delivered accurately, If there is any error occurred during transmission, the data must be re-transmitted.

Timeliness: Data must be delivered within time. It is very important in real time systems because data becomes useless if it is delivered late. For example, in television transmission, the video signals must be delivered within time as they are produced without any significant delay. This kind of delivery is called real-time transmission.

Elements of Communication System: The basic elements of a communication system are:

Message: The message is the information or data that is to be communicated. It may be in the form of text, numbers, pictures, sounds, videos or any combination of these.

Sender: A device that is used to send or transmit messages to another device is called Sender. It is also called Transmitter or Source. A sender may be a computer, workstation, telephone handset,

video camera and mobile phone.

Medium: The path through which data is transmitted (or sent) from one location to another is called transmission medium. It is also called communication channel. It may be a wire, or fiber optic cable, or telephone line etc. If the sender and receiver are within a building, a wire is used as the medium. If they are located at different locations, then a medium may be telephone line, fiber optics, microwave or satellite system.

Receiver: A device that is used to receive messages from another device (sender) is called Receiver. It is also called Sink. A receiver may be a computer, workstation, telephone handset, mobile phone, television set, printer, fax machine, and so on.

Protocol: A set of rules that guides (or governs) data communication is called protocol. It represents an agreement between the communicating devices. Without a proper protocol, the devices may be connected but they cannot communicate with each other. For example, a person whose mother language is English cannot communicate with a person who can speak only Swedish.

Today, all type of computers and mobile devices serve as senders and receivers in communication system.

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Article Keywords:
data communication, types of data transmission

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