

# **Data Communication & Computer Network**

**Data communication** refers to the exchange of data between a source and a receiver via form of transmission media such as a wire cable. Data communication is said to be local if communicating devices are in the same building or a similarly restricted geographical area.

The meanings of source and receiver are very simple. The device that transmits the data is known as source and the device that receives the transmitted data is known as receiver.

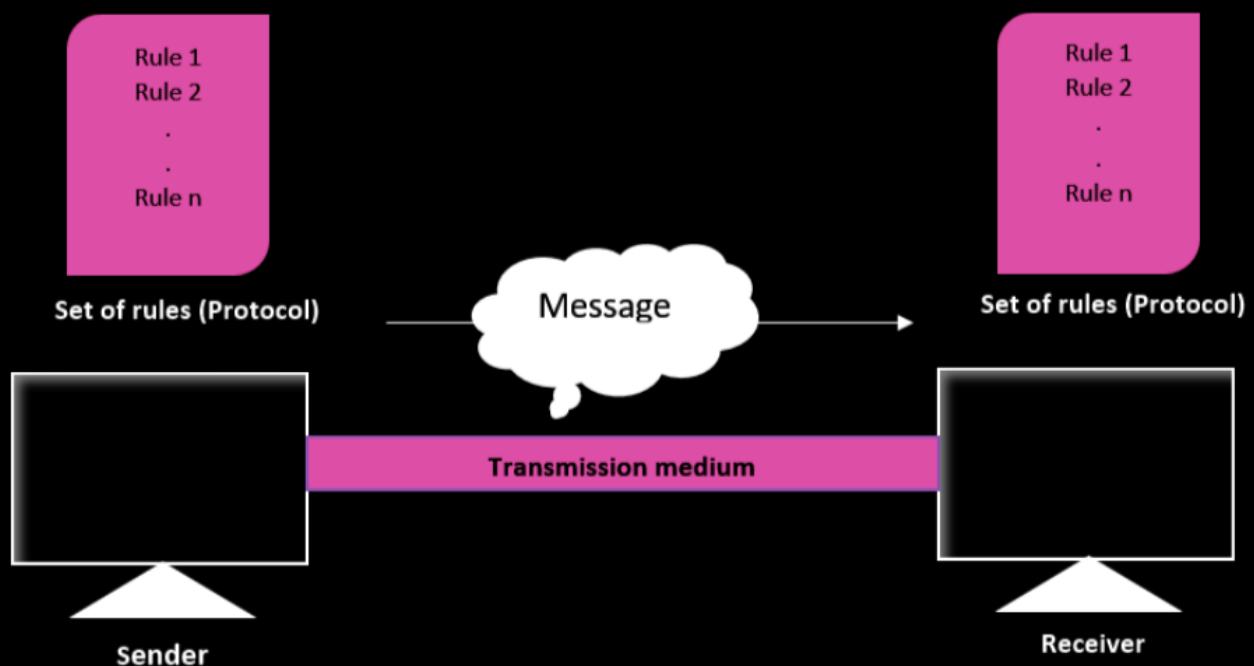
# **Data Communication System**

## **Components :**

There are mainly five components of a data communication system:

1. Message
2. Sender
3. Receiver
4. Transmission Medium
5. Set of rules (Protocol)

All above mentioned elements are described below:



## 1. Message :

This is most useful asset of a data communication system. The message simply refers to data or piece of information which is to be communicated. A message could be in any form, it may be in form of a text file, an audio file, a video file, etc.

## 2. Sender :

To transfer message from source to destination, someone must be there who will play role of a source. Sender plays part of a source in data communication system. It is simple a device that sends data message. The device could be in form of a computer, mobile, telephone, laptop, video camera, or a workstation, etc.

### **3. Receiver :**

It is destination where finally message sent by source has arrived. It is a device that receives message. Same as sender, receiver can also be in form of a computer, telephone mobile, workstation, etc.



#### 4. Transmission Medium :

In entire process of data communication, there must be something which could act as a bridge between sender and receiver, Transmission medium plays that part. It is physical path by which data or message travels from sender to receiver.

Transmission medium could be guided (with wires) or unguided (without wires), for example, twisted pair cable, fiber optic cable, radio waves, microwaves, etc.

## 5. Set of rules (Protocol) :

To govern data communications, various sets of rules had been already designed by the designers of the communication systems, which represent a kind of agreement between communicating devices. These are defined as protocol. In simple terms, the protocol is a set of rules that govern data communication. If two different devices are connected but there is no protocol among them, there would not be any kind of communication between those two devices. Thus the protocol is necessary for data communication to take place.

A **protocol** performs the following functions:

1. **Data sequencing.** It refers to breaking a long message into smaller packets of fixed size. Data sequencing rules define the method of numbering packets to detect loss or duplication of packets, and to correctly identify packets, which belong to same message.

2. **Data routing.** Data routing defines the most efficient path between the source and destination.

4. **Flow control.** A communication protocol also prevents a fast sender from overwhelming a slow receiver. It ensures resource sharing and protection against traffic congestion by regulating the flow of data on communication lines.

5. **Error control.** These rules are designed to detect errors in messages and to ensure transmission of correct messages. The most common method is to retransmit erroneous message block. In such a case, a block having error is discarded by the receiver and is retransmitted by the sender.

**7. Connection establishment and termination.** These rules define how connections are established, maintained and terminated when two nodes of a network want to communicate with each other.

8. **Data security.** Providing data security and privacy is also built into most communication software packages. It prevents access of data by unauthorized users.

## **The effectiveness depends on four fundamental characteristics of data communications**

- 1. Delivery:** The data must be delivered in correct order with correct destination.
- 2. Accuracy:** The data must be delivered accurately.
- 3. Timeliness:** The data must be delivered in a timely manner. Late delivered data is useless.
- 4. Jitter:** It is the uneven delay in the packet arrival time that causes uneven quality.

# What is jitter?

Information is transported from your computer in data packets across the internet. They are usually sent at regular intervals and take a set amount of time. Jitter is when there is a time delay in the sending of these data packets over your network connection. This is often caused by network congestion, and sometimes route changes.



# Computer Network

A computer network is a group of computers linked to each other that enables the computer to communicate with another computer and share their resources, data, and applications.