

# Computer Networks Notes

B.Tech. CSE

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# 1 Computer Networks

## 1.1 Data Communication:

the exchange of information between two devices via some form of transmission medium, such as wired cable. The 4 fundamental characteristics of this are:

- Delivery
- Accuracy
- Time
- Jitter (variation in packet delivery time)

## 1.2 Components of data communication:

There are 5 components in data communication:

- Sender
- Reciever
- Message (the data to be transferred)
- Transmission medium
- Protocol(the rules and regulations to be send)

## 1.3 Data representation:

how we can represent data. It represents in the form of text, numbers, image, audio and video.

## 1.4 Data flow:

There are 3 types of data flow:

- Simplex One way: sender stays sender and reciever stays reciever. Unidirectional.
- Half-Duplex The direction can be changed but at a time there can only be one directional travel. Each station can both transmit and receive but not at the same time.
- Duplex Simultaneous Data transfer over both nodes. Both stations can transmit and receive simultaneously.

## 1.5 Networks:

Network is a set of devices connected by communication links. A network must be able to meet a certain number of criteria. These are:

- Performance (Throughput and latency)
- Reliability (low amount of downtime)
- Flexibility (Scalability)
- Security (There should be no data manip)

## 1.6 OSI model

### 1. Physical layer

It is either Analog or Digital.

It is a kind of continuous wave form that changes over time. What matters in this is: For Analog:

- Amplitude
- Frequency
- Phase

For Digital:

- Bitrate
- Bit interval

### 1.6.1 Transmissin impairment

The quality of signal deteriorates during transmission. it may have three causes:

- Attenuation
- Distortion
- Noise

Def<sup>n</sup> :

Attenuation is the loss of energy over the transmitted distance. It in measured in decibels (dB)

$$Attenuation = 10 \log\left(\frac{10}{\phantom{10}}\right)$$

## 1.7 Layers of OSI model