Computer Networks Notes

B.Tech. CSE

Gurmukh Singh

Instructor:
Mrs. Shubhani Agarwal

Contents

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

$\underline{Def^n}$:
Attenuation is the loss of energy over the transmitted distance. It in measured in decibels (dB)

1.7 Layers of OSI model

subsection

1.8 CRC: Cyclic Redundancy Check

1. This is used for error detection methods. item

2. It is a very powerful method and widely used in real time enviroment.

3. It can detect all odd errors.

4. It can detect single and double bit errors.

5. It can detect burst error of length equals to polynomial degree.

   Efficiency = Channel utilization for sending the message = $\frac{number of message bits}{total number of bits}$

2 Forwarding and Routing Protocols

Forwarding means sending packets in a "right" manner.

1. Cost effective

2. Time efficient

3. No congestion

Routing protocols are of 3 types:

1. Unicast

2. Multicast

3. Broadcast

2.1 Unicast

Unicast is of further two types :

1. Intra-Domain

   (a) Distance version- RIP (Routing Information Protocol)
   (b) Link State version - (OSPFC - Open Source Path First) (Uses Djikstras)

2. Inter-Domain

   (a) Path vector (BGP)