Computer Networks

# Chapter One

Computer Network

* Is the infrastructure that provides communication between computers

Internet

* Global network of interconnected networks that connects many different types of computers and other devices
* A Heterogeneous network that connects everyone across the world

Connectivity

* The ability to communicate
* The quality of communication

Scalability

* The ability to grow gracefully, without having to do major redesign or replacement of existing components or having to rebuild from scratch

# Chapter Three

Heterogeneous network

* All different networks coming together
* Requires ‘adapter’ to connects different networks together.

# Chapter Six

Propagation Time

Data Rate

* Data rate = data/time
* Time = data/data rate
* Propagation Velocity = distance / speed

# Chapter Seven

Two Models

* Define steps differently but functionally both have to do the same thing.

Switch

* Heterogenous network

Routing

* Homogenous network

Node

* Anything that has an IP address.

Client – server

* Client receives the service.
* Server give the service.

IoT (Internet of Things)

* Any smart devices

# Chapter Eight (Data Transmission Media)

Transferring Media

* What kind of mediums we use to connect one point to another point
* Guided
  + Physical mediums
    - Fiber, cable
* Un-Guided
  + Non-Physical mediums
    - Atmosphere, space

Wavelength

* How much it can travel in a cycle

Frequency

* In one second how many cycles are traveling

Peak Power

* Highest peak

Trough

* Lowest peak

Amplitude

* The distance from mid-point to a peak

Full Duplex

* Can both sides can talk at a time

Half Duplex

* Only one side can talk at a time

Simplex

* Only one side can talk at all

Twisted Pair Cable

* They are twisted to reduce interference
* Categories based on speed and frequencies

Amplifiers

* Analog
* Increases the sound of everything around

Repeater

* Digital
* Increases the sound of everything within a certain threshold

Straight Through Cable

* Used for connecting similar devices

Crossover Cables

* Used for connecting different type of devices

# Chapter Nine

Optical Fiber

* Propagation velocity = 0.66c
  + Because effective distance is 1.5x
* Uses infrared frequency light.
* Uses bright and dim light to represent 0s and 1s.
* Advantages
  + High data rates
  + Thinner
  + Electronically isolated

# Chapter Ten

Encoding

* When you transfer your data, you have to convert it into a specific format.
* Digital

Modulation

* FM
  + Frequency Modulation
  + Fixed
* AM
  + Amplitude Modulation
  + Variable
* QAM
  + Quadrature Amplitude Modulation
  + Mirror AM
* Analog

Baud Rate

* Number of state changes per second

# Chapter Twelve (Noise)

Noise

* There are different distributions of noise