**SUB-NETTING**

Sub netting is a process of dividing large network into the smaller networks.

Sub netting helps to reduce the network traffic and network complexity.

Sub netting is determine how many systems need to communicate with our network.

**Benefits**

1. It provides security
2. It allows organization of resources
3. It speeds up the network

**Subnet Mask**

It is used to determine the network and host portion of an IP address.

An IP address has 2 parts:

1. Network ID
2. Host ID

**Network ID:** It is the network portion of an IP address.

**Host ID:** It is thehost portion of an IP address.

For Example, Class A: N.H.H.H

255.0.0.0

Class B: N.N.H.H

255.255.0.0

Class C: N.N.N.H

255.255.255.0

**Network Range**

Every Network has their range of IP addresses to communicate each other’s.

There is four addresses used in every network.

1. Network address – It is represented with all bits as ‘Zero’ in the host portion of the address.
2. First valid IP address – It is where we can start to use the IP address.
3. Last valid IP address – It is where we can end to use the IP address.
4. Broadcast address – It is represented with all bits as ‘ones’ in the host of the address.

For Example:

**Class A: 115.17.8.15 255.0.0.0**

Network IP range = 115.0.0.0 to 115.255.255.255

Network IP = 115.0.0.0

First valid IP = 115.0.0.1

Last valid IP = 115.0.0.254

Broadcast IP = 11.255.255.255

**Valid IP Range**

**Note:** n=Number of Bits which is in host id

**Class A:** 2^n-2 =2^24-2

=1, 67, 77,214

**Class B:** 2^n-2 =2^16-2

=65, 534

**Class C:** 2^n-2 = 2^8-2

=254

**CIDR- Classless Inter-Domain Routing**

It is a standard scheme for routing network traffic across the internet.

CIDR specifies an IP address range using a combination of an IP address and its associated network mask.

Format- x.x.x.x/n. where n is the number of network ID bits in the network.

For Example, Class A: 115.17.18.15/8