Ip-address:

- Ip - Internet protocol
  - It is used to uniquely identify devices in a network.

Types of Ip:

Public IP
Private IP

Public Ip Vs Private IP

Versions of Ip :-

- IPv4
- IPv6

why IPv4 to IPv6

$2^{32} = 4.3$ billion

IPv4   Vs   IPv6

- 32 bit   128 bit → 2 $2^{128} = 340$ trillion trillion trillion

4 blocks   8 blocks 8×16

8 bit/block   16 bit/block

2001:0db8:85a3:0000:0000:8a2e:0370:7334

IPv4 :-

eg:) 192.168.0.1

11000000 . 10100010 . 00000000 . 00000001

octet

each octet
0 to 255

why?

Class of IPv4:

class A
class B
class C
class D
class E

Address Class	RANGE	Default Subnet Mask
A	1.0.0.0 to 126.255.255.255	255.0.0.0
B	128.0.0.0 to 191.255.255.255	255.255.0.0
C	192.0.0.0 to 223.255.255.255	255.255.255.0
D	224.0.0.0 to 239.255.255.255	Reserved for Multicasting
E	240.0.0.0 to 254.255.255.255	Experimental

Note: Class A addresses 127.0.0.0 to 127.255.255.255 cannot be used and is reserved for loopback testing.

what is subnetting?

what is Subnetmask?
32 bit number
Set host bit to
0 & Nw bit to 1

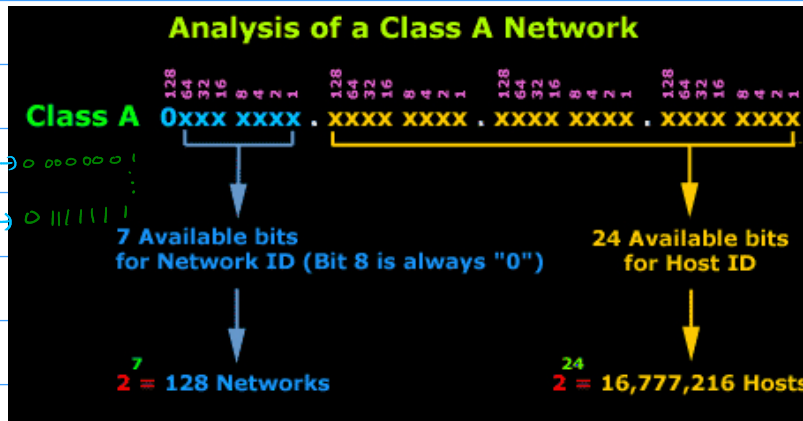# Host bit & Network bit :

subnet mask

Class A —   255.0.0.0
             Nw bit / host bit

Class C —   255.255.255.0
             Nw bit / host bit

Class B —   255.255.0.0
             Nw bit / host bit

Analysis of a Class A Network

$0 \rightarrow 0\,000\,000\,1$

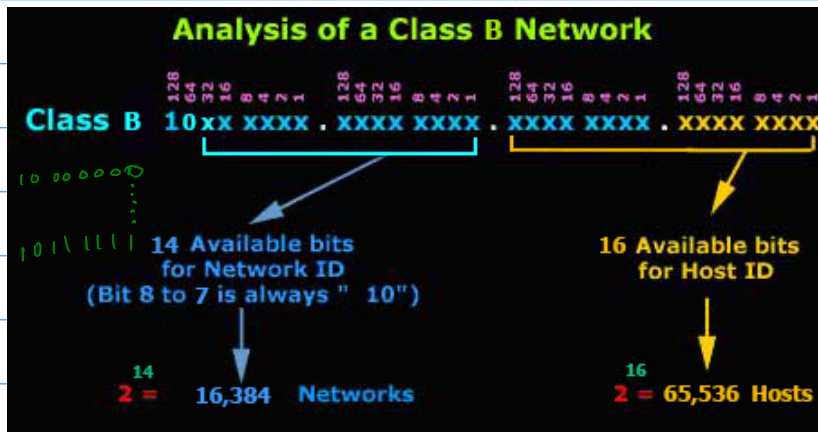$127 \rightarrow 0\,111\,111\,1$

no. of Network $= 2^{n-1} = 2^{8-1}$

no. of host $= 2^n = 2^{24}$

no. of usable host $= 2^n - 2 = 2^{24} - 2$
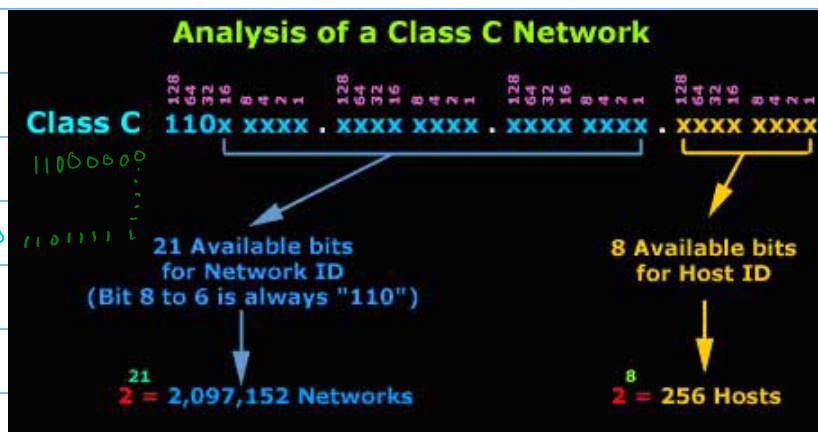
no. usable Network $= 2^{n-1} - 2 = 2^{8-1} - 2$

Analysis of a Class B Network

$128 \rightarrow 10\,00\,0000$

$191 \rightarrow 101\,1\,1111$

no. of Network $= 2^{n-2} = 2^{16-2}$

no. of host $= 2^n = 2^{16}$

no. of usable host $= 2^n - 2 = 2^{16} - 2$

no. of usable Network $= 2^{n-2} = 2^{16-2}$

Analysis of a Class C Network

$192 \rightarrow 11000000$

$223 \rightarrow 11011111$

no. of Network $= 2^{n-3} = 2^{24-3} = 2^{21}$

no. of host $= 2^n = 2^8$

no. of usable host $= 2^n - 2 = 2^8 - 2$

no. of usable Network $= 2^{n-3} = 2^{24-3}$
$= 2^{21}$

Class D - Multicast

Class E - R&D