IP Addressing

IP Addres is a address that uniquely identify a node/Host in a local/global N/w.

	IPv4	IPv6
No. of bits	32 bits	128 bits
No. of Addresses (Address space)	2^{32}	2^{128}
	4,29,49,67,296	$3.40282367 e^{38}$
		3.4×10^{38}

340282366920938463463374607431

192.168.10.1 → Decimal Dotted Notation.

Binary

11000000 . 11101010 . 00001010 . 00000010

8 bits
1 byte

192 . 234 . 10 . 2

32 bits of IP Addres is divided into 4 segment seperated by decimal dots.

IP Address Fractional Number

192.234.10.2

value of any segment lies between 0 — 255

	binary	decimal
bt	00000000 →	0
	11111111 →	255

IPv4 Range →

0.0.0.0 —— 1st Adder

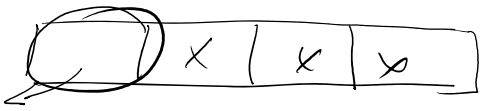
255.255.255.255 → last Adder

2^{32}

Classful Addressing

Large, middle, small

high moderate low



large , moderate , low

high

1st byte	Binary start	Binary End	Decimal start	Decimal End
Class A	0 0000000	0 1111111	0	127
Class B	10 000000	10 111111	128	191
Class C	110 00000	110 11111	192	223
Class D	1110 0000	1110 1111	224	239
Class E	1111 0000	1111 1111	240	255

→ 229.16.34.14 → D

265.234.226.14 → Not an IP Addr Invalid

Note → Only Class A, B & C are available for Public allocation.

- class D → multicasting
- class E → Reserved for experimental & Research

Unicasting → A, B, C address are unicast address.

communication is b/w a pair of nodes.
one to one mapping.

Broadcasting → when one node communicating to all the nodes in the network.
one to all

Multicasting → when one node communicating to some selected nodes in the network.
one to many.

IP Address

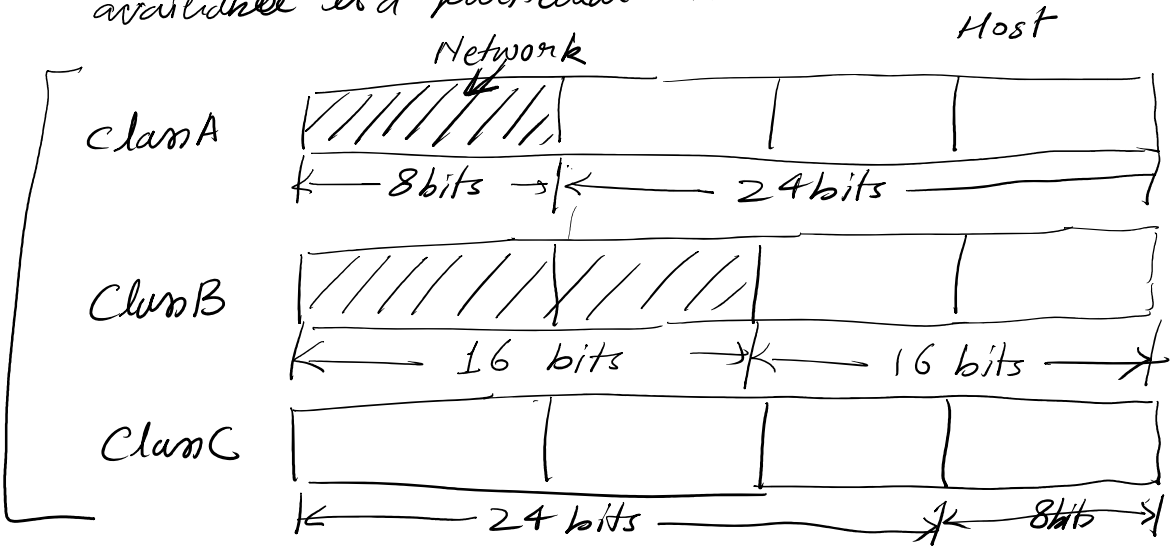
① Network Id → H/w

② Host Id. → Host

As First Octet of IP Addres is used determine the class of the IP Address.

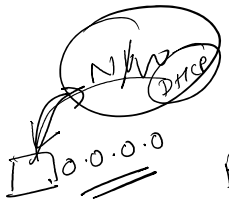
Similarly the N/W Id is used to determine the N/W.

Host Id is used to identify the number/range of IP Addresses available in a particular N/W.



	N/W bits	Host bits	No. of N/W	No. of Hosts/N/W
Class A	8	24	$2^7 - 2 = 126$	$2^{24} = 16,77,216$
Class B	16	16	$2^{14} = 16384$	$2^{16} = 65536$
Class C	24	8	$2^{21} = 2097152$	$2^8 = 256$

In class A special purpose N/W



0.0.0.0 → Booting

127.xx.yy.zz → Loopback Testing

0.0.0.0

Range: 1.xx.yy.zz – 126.xx.yy.zz

1.0.0.0 – 1.255.255.255

126.0.0.0 – 126.255.255.255

0 – 255

Subnet Mask

Class A — N/W bits 8, Host bits 24

Set all the N/W bits to 1

Set all the host bits to 0

11111111 . 00000000 . 00000000 . 00000000

255 . 0 . 0 . 0

255.0.0.0

255.0.0.0

Class B 255.255.0.0

Class C 255.255.255.0

Subnet mask used to identify a particular network.

192.168.10.0] ↓ [192.16.10.255] 256

↓ N/W Id ↓ Broadcast id

192.168.10.1 — 192.168.10.254

↓

192.168.10.221

① What is the network id of the N/w this Ip adders belongto:

A	B	Q = A & B
0	0	0
0	1	0
1	0	0
1	1	1

class C

Default subnet mask

255.255.255.0

Subnet mask AND [11111111.11111111.11111111.00000000

IP Address 11000000-10101000-00001010-11011101

→ 11000000.10101000.00001010.00000000

N/W Id → 192. 168. 10. 0

What is the N/W Id of the network containing:

IP Addres → 172.69.42.60

(a) 172.69.42.0

✓(b) 172.69.0.0

(c) 172.0.0.0

(d) None of these

172.69.42.60

Subnet Mask 255.255.0.0

Class — B

(IP Addu) AND (Subnet Mask)

172.69.0.0