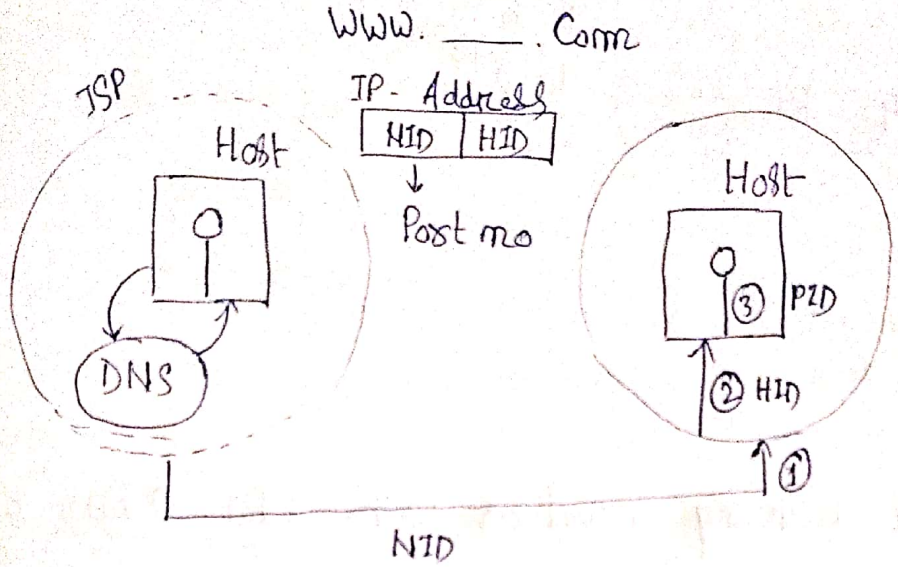
Network Layer

Concepts of IP-Addresses:



1. Domain Name Service (DNS)
2. Port no:

   Http ⇒ port no = 80

   SMTP ⇒ port no = 25

   FTP ⇒ Port no = 21

3. "DNS overhead."

4. Unary = 0

   Binary = 0, 1

   Octal (~~Actual~~) = 0, 1, 2, ... 7

   Decimal = 0, 1, 2, ---- 9

   Hexa-Decimal = 0, 1, 2, ---- 9, A, B, C, D --- F
   (A = 10, F = 15)

5. $2^1 = 2$

$2^2 = 4$

$2^{10} = 1024 = K$

$M = 2^{20}$

$G = 2^{30}$

$T = 2^{40}$

$K = 2^{10}$

$M = 2^{20}$

$G = 2^{30}$

$T = 2^{40}$

The possible binary numbers with 1 bit, 2 bits and 3 bits are —

1 bit	2 bits	3 bits	
0	0 0	0 0 0	P_1
1	0 1	0 0 1	
	1 0	0 1 0	P_2
	1 1	0 1 1	
		1 0 0	P_3
		1 0 1	
		1 1 0	P_4
		1 1 1	

For 1 bit = 2^1 parts

2 bits = 2^2 parts

⋮

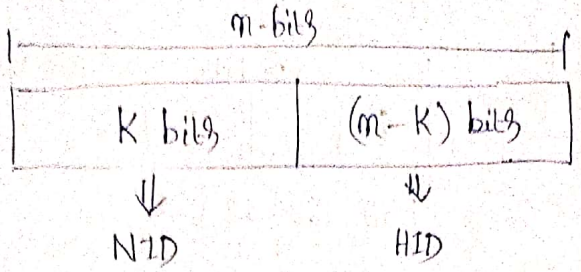
k bits = the no space/Address space will be divided into 2^K parts.

* If there are 'm' bits the no. of possible ways = 2^m

If 'K' bits chosen the entire space will be divided into 2^K parts = 2^k parts

2^K parts = 2^m numbers

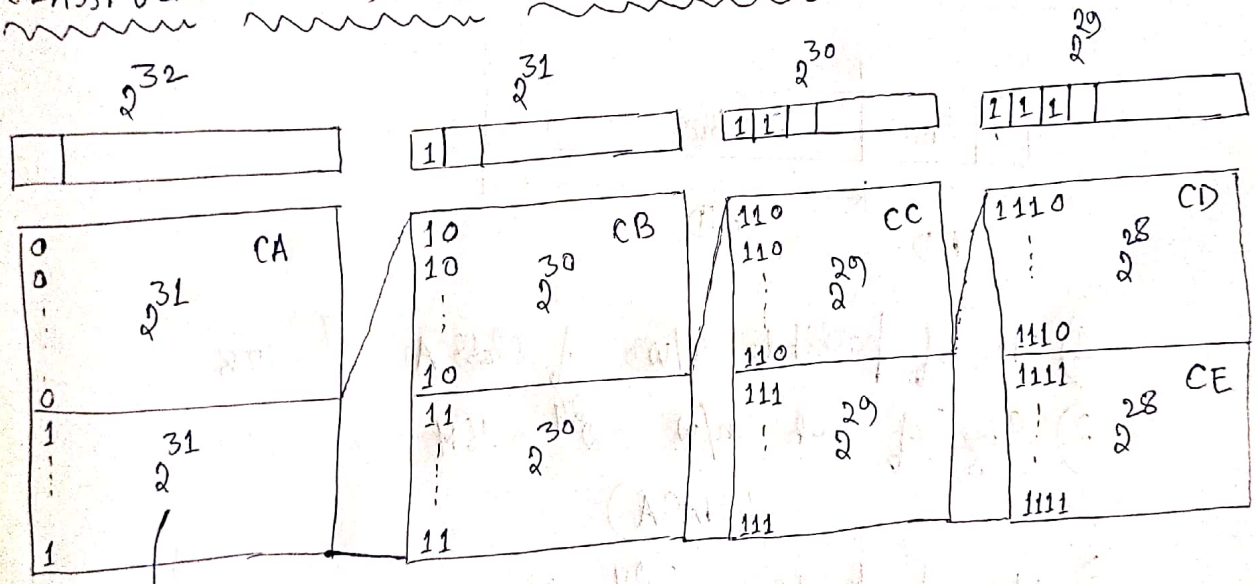
1 parts = $2^m/2^k$ numbers = 2^{m-k}



∴ Size of Each n/w = (2^{n-k}) ~~bits~~

If IP Address Size = 32 bits, then
the total no. of IP-Addresses = 2^{32} IP-Addresses

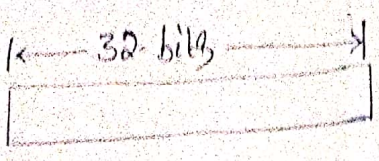
CLASSFULL IP-ADDRESS CLASSIFICATION :⟶

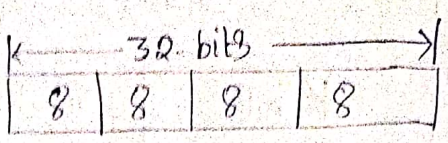


No. of possible IP-Addresses

No. of IP-Addresses possible in a n/w
of class 'A' = 2^{31}
—— 'B' = 2^{30}
—— 'C' = 2^{29}
—— 'D' = 2^{28}

Representations of IP-Addresses ——
Binary Notation
Dotted Decimal

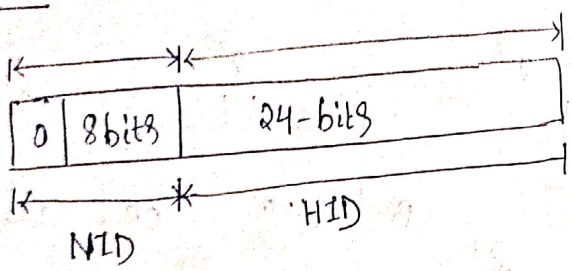




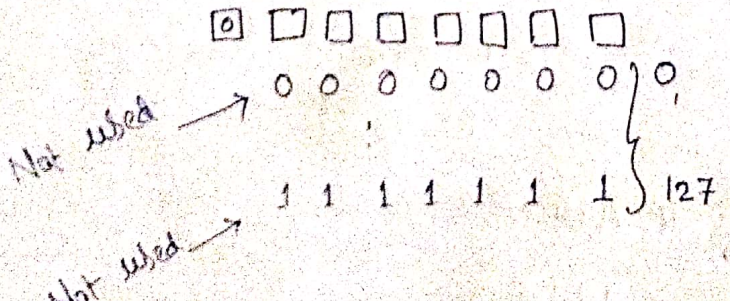
192. 168. 173. 9

CA Starts With 0
CB Starts With 10
CC Starts With 110
CD Starts With 1110
CE Starts With 1111.

Class A:



1) No. of possible n/ws of Class A = $2^7 = 128$
2) Size of each n/w = $2^{24} = 16M$
(NASA)
3) No. of hosts = $(2^{24} - 2)$
4) Practically 126 N/ws are possible in CA



Range of Class A = 0 – 126.