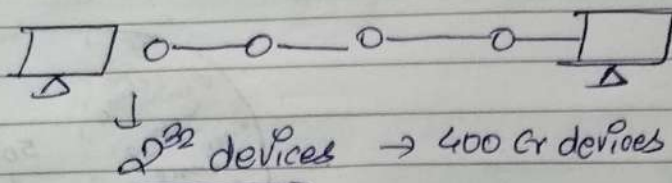


Lecture - 4 - IP Addressing In Depth

1) IPv4: 32 bit



2) IPv6: 128 bits \rightarrow 2^{128} devices

 \nwarrow 128
 IPv6 \rightarrow Hexa-decimal form is used.
 \downarrow

Range \rightarrow 0000 : 0000 : 0000 : 0000 : 0000 : 0000 : 0000 : 0000
 FFFF : FFFF : FFFF : FFFF : FFFF : FFFF : FFFF : FFFF
 \nwarrow
 $4 \text{ bits} \times 4 = 16 \text{ bits}$
 $\times 8$
128 bits

Class A: 0-127
 Class B: 128-191
 Class C: 192-223
 Class D: 224-239
 Class E: 240-255

For binary,

Class A: 0-----
 \nearrow

First bit
 was made 0

\rightarrow 00000000 ?
 01111111 } $2^7 \rightarrow$ 128 values

- Class B : 10 -----

First two bits were 10

$$\begin{bmatrix} 10\ 000000 \\ 10\ 111111 \end{bmatrix} \rightarrow 2^6 \rightarrow \underline{\underline{64}}$$

- Class C : 110 -----

$$\downarrow 2^5 \rightarrow \underline{\underline{32}}$$

$$\begin{bmatrix} 110\ 00000 \\ 110\ 11111 \end{bmatrix}$$

D : 000

FF : FF

- Class D : 1110 -----

$$\downarrow 2^4 \rightarrow \underline{\underline{16}}$$

$$\begin{bmatrix} 1110\ 0000 \\ 1110\ 1111 \end{bmatrix}$$

- Class E : 1111 -----

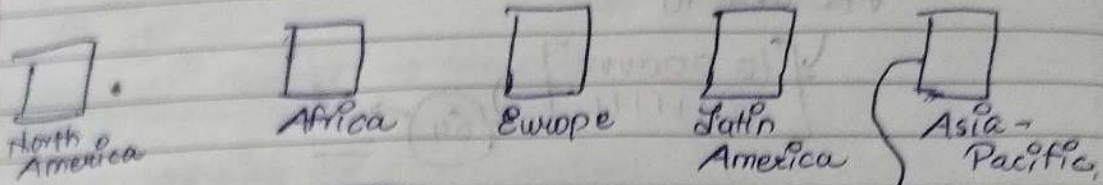
$$\downarrow 2^4 \rightarrow \underline{\underline{16}}$$

$$\begin{bmatrix} 1111\ 0000 \\ 1111\ 1111 \end{bmatrix}$$

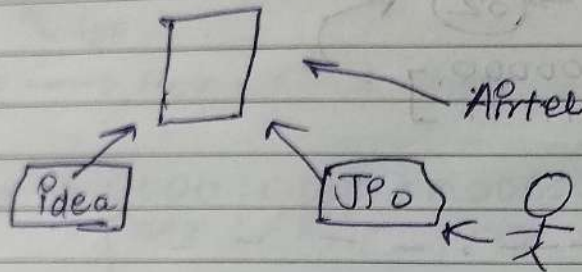
Class A	- 0
Class B	- 10
Class C	- 110
Class D	- 1110
Class E	- 1111

International Assigned Number Authority [IANA]

distributes IP Address



Distributes IP to ISPs of Particular Countries



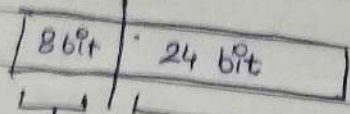
Idea : 2 Cr
 Jio : 5 Cr
 Airtel : 4 Cr
 X : 5 Lakh
 Y : 50000
 Z : 10000

IP's are distributed in meaningful way.

[73.0.0.0 - 73.255.255.255] $\rightarrow 2^{24}$ address

1.67 Cr

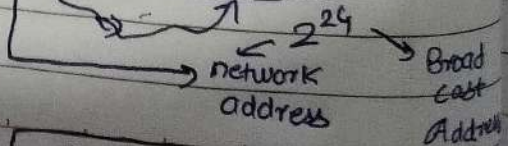
Class A : 0-127



Network IP Host IP

devices that connect with internet

$2^{24} \rightarrow 1.67 Cr$



Idea, Jio

$2^7 = 128$ network ID

network address
& host address.

Total no. of Host IP $\rightarrow 2^{24} - 2$

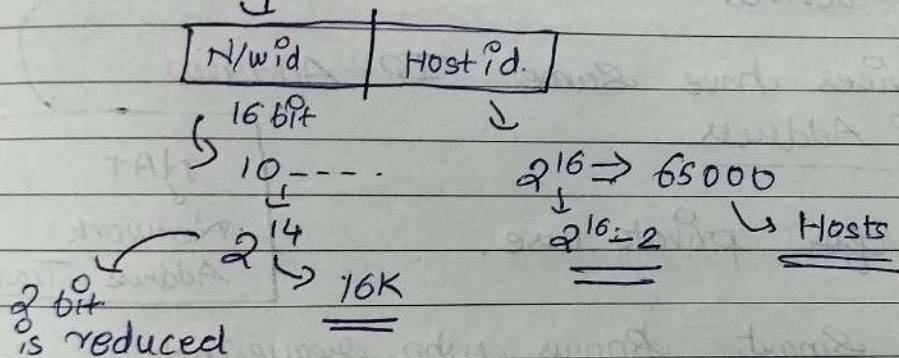
- Broadcast Address \rightarrow To deliver message to all devices.

1-126
 \rightarrow Given to ISP.

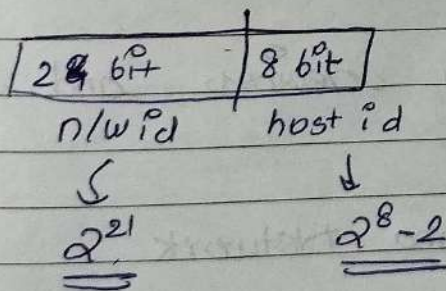
127
 \rightarrow Loop back Address

0
 \rightarrow when we want IP Address,
0.0.0.0 is default as IP
& ISP allocates IP.

* Class B



* Class C



* Class D is reserved for multi-casting.

\downarrow
 2^{28} address

- Zoom call

\rightarrow 1 Packet is reserved as multi-casting
 \rightarrow Delivered to all.