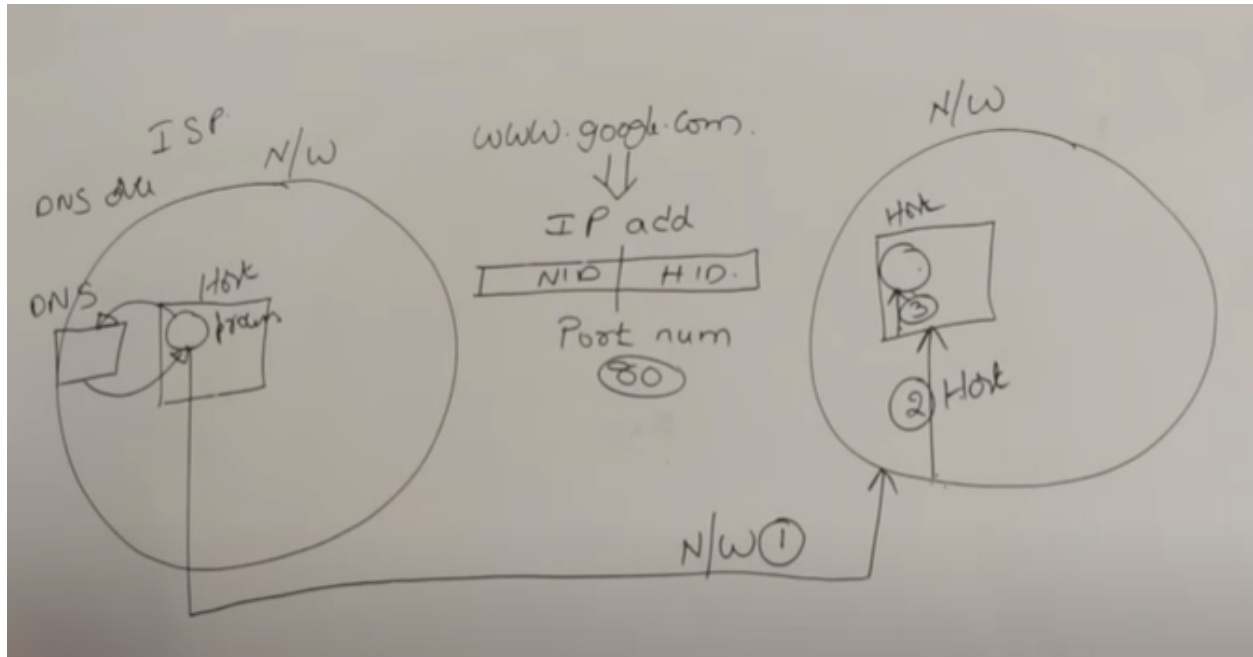


# IP Addresses

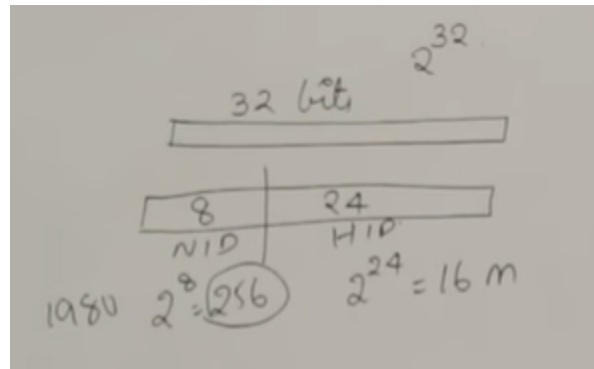
Just a 32-bit number acting as the address of a machine on a network.

**Intro to computer network, need for IP, DNS, Network and Host**



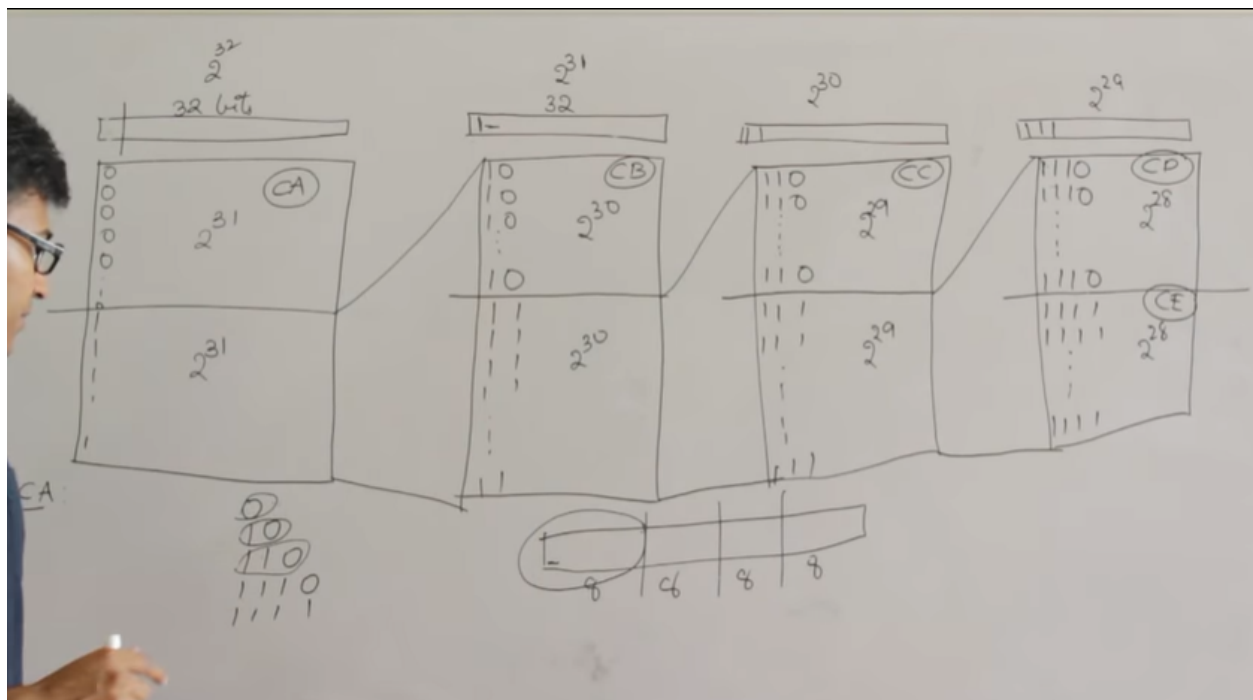
$$\begin{array}{c}
 \begin{array}{|c|c|}
 \hline
 n & n-k \\
 \hline
 k & n-k \\
 \hline
 \end{array} \\
 2^n \\
 (K) - 2^k \\
 2^k \text{ parts} - 2^n \text{ num} \\
 1 \text{ part} - \frac{2^n}{2^k} = 2^{n-k}
 \end{array}$$

Network Id → k bits, Host Id → n-k bits



256 is a very small number for a network Id and 16M is a very large number for a host Id, so this system is discarded. Instead Classful System is used.

## Classful System



Each class can be depicted by prefix unique to that class:

CA: 0

CB: 10

CC: 110

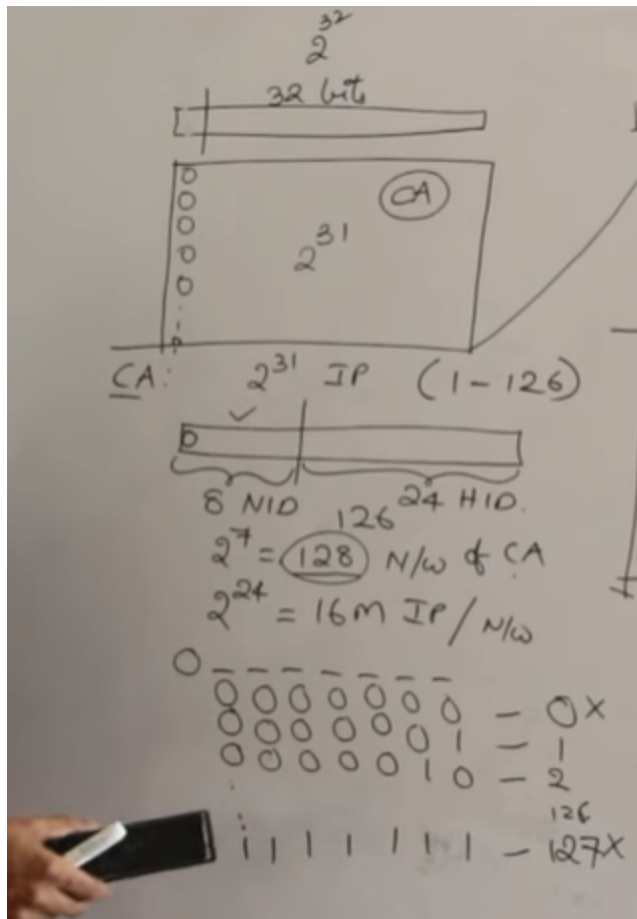
CD: 1110

CE: 1111

## IP Address Representations

- 32-bit binary number
- 32-bit binary number converted to decimal equivalent
- The 32-bit IP can be divided into 4 octets where the binary number of each octet is converted into its decimal equivalent and the 4 decimal numbers are separated with '.'

## Class A



Prefix: 0

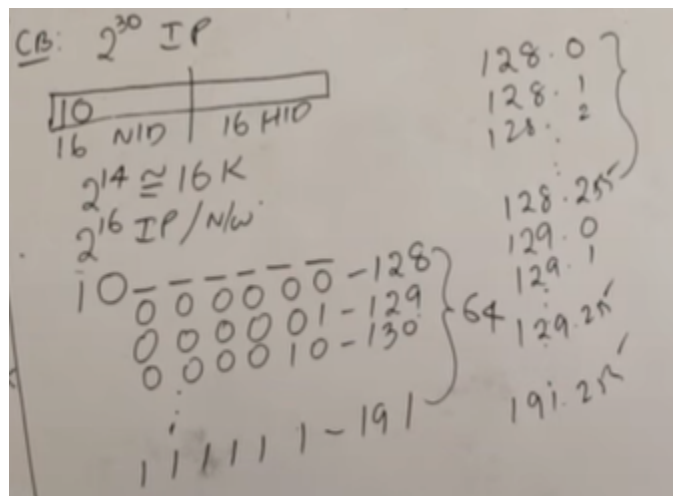
Network IDs: 126

Host IDs: approx. 16M

Range of 1 Octet: 1-126

Used in ultra-huge networks like NASA and Pentagon

## Class B



Prefix: 10

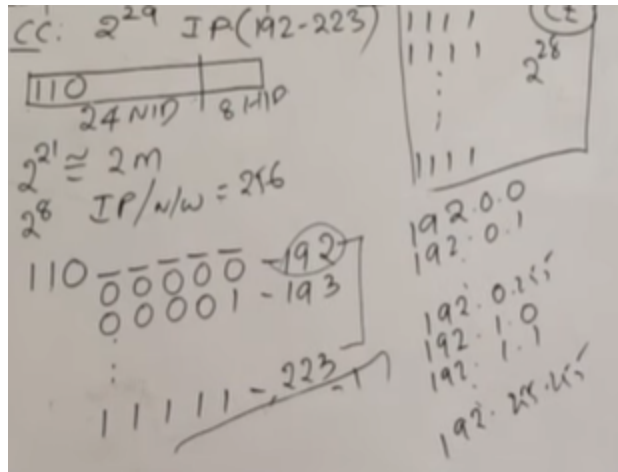
Network IDs: 2<sup>14</sup>

Host IDs: 2<sup>16</sup>

Range of 1 Octet: 128-191

Used by Banks, IRCTC

## Class C



Prefix: 110

Network IDs:  $2^{21}$

Host IDs:  $2^8$

Range of I Octet: 192-223

Used by small offices and universities

## Class D

Prefix: 1110

Not divided into separate NID and HID.

Range of I Octet: 224-239

No Practical Uses, Used in Multicasting

## Class E

Prefix: 1111

Not divided into separate NID and HID.

Range of I Octet: 240-255

No Practical Uses, Reserved Class