NETWORK FUNDAMENTALS

BY

SURAJKARTHIC

IPV4

- CLASSES OF IP
- SUBNET MASK
- NID & BID
- PRIVATE IP RANGE
- DEFAULT SUBNET MASK
- CALC OF NO OF N/W AND HOST PORTIONS

WHERE IT IS USED?

- CLASS RANGE
- A 0 – 127
- B 128 - 191
- C 192 - 223
- -------
- D 224 - 239 --> MILITARY & RESERVED PURPOSE
- E 240 -254 --> Reserved for Future uses and also R&D Process
-

SUBNET MASK

- **CLASS A ----** Larger MNC------- **N.H.H.H**
- **CLASS B -----**Midlevel comp------ **N.N.H.H**
- **CLASS C -----**Small Comp & Home Users---- **N.N.N.H**

NETWORK AND HOST PORTION

_ • _ •_ •_

- Network portion means / related to network **N** .Host refers to computers **H**
- **DEFAULT SUBNET MASK**
- N = 255
- H = 0
- To get the default subnet mask for each class
- **CLASS A N.H.H.H 255.0.0.0**
- **CLASS B** N.N.H.H 255.255.0.0
- **CLASS C** N.N.N.H 255.255.255.0

NID & BID

- Network ID ..Its like ur department name
- Its the collective representation of all computers in ur network or lan - usually in IP
-

- To find NID
- Find class
- Get number of network and host portions
- Make host portions zero.

NID & BID

- 192.168.1.10
- Class - C
- SM - N.N.N.H
- NID - 192.168.1.0 **FIRST IP ADDRESS**
- DG - 192.168.1.1 **SECOND IP ADDRESS**
- BID - 192.168.1.255 **LAST IP ADDRESS**

- 128.15.10.10
- Class - B
- SM - N.N.H.H
- NID - 128.15.0.0
- DG - 128.15.0.1
- BID - 128.15.255.255
-

BID

- Broadcast ID
- When we need to send a single msg to all the computers in our LAN. Then ill use broadcast ID
- 192.168.1.10 is my computer IP, then we can identify the following
- 192.168.1.0 - the first IP will be my NID
- 192.168.1.1 - the second IP will be my Default gateway IP / Modem IP / Router IP
- 192.168.1.255 - the last IP will be my BID

PRIVATE IP ADDRESS &PUBLIC IP ADDRESS

- Is Ip address UNIQUE ?

PRIVATE IP ADDRESS &PUBLIC IP ADDRESS

- Is Ip address UNIQUE ?

- Public IP is unique everywhere.
- Private IP is unique inside a LAN but not between LAN
-

PRIVATE IP RANGE

CLASS	Public IP Range	Private IP
A	0.0.0.0 - 127.255.255.255	10.0.0.0 - 10.255.255.255
B	128.0.0.0 - 191.255.255.255	172.16.0.0 - 172.31.255.255
C	192.0.0.0 - 223.255.255.255	192.168.0.0- 192.168.255.255

CALCULATION OF NUMBER OF NETWORK AND HOST FOR EACH CLASS

EX: CLASS A uses more number of computers. - How Much?

CLASS		priority bit (p)
A	N.H.H.H	1
B	N.N.H.H	2
C	N,N,N,H	3

To find no of n/w = 2 power n-p
To find no of hosts = 2 power h and -2

A
NO of n/w = 2 power 8-1 = 127 n/w
No f host = 2 power 24 and -2 = 16777216 hosts

B Network 16384 Host 65536

C Network 2097152 Host 256
No of host = 2 power 8 and -2 = 254 hosts

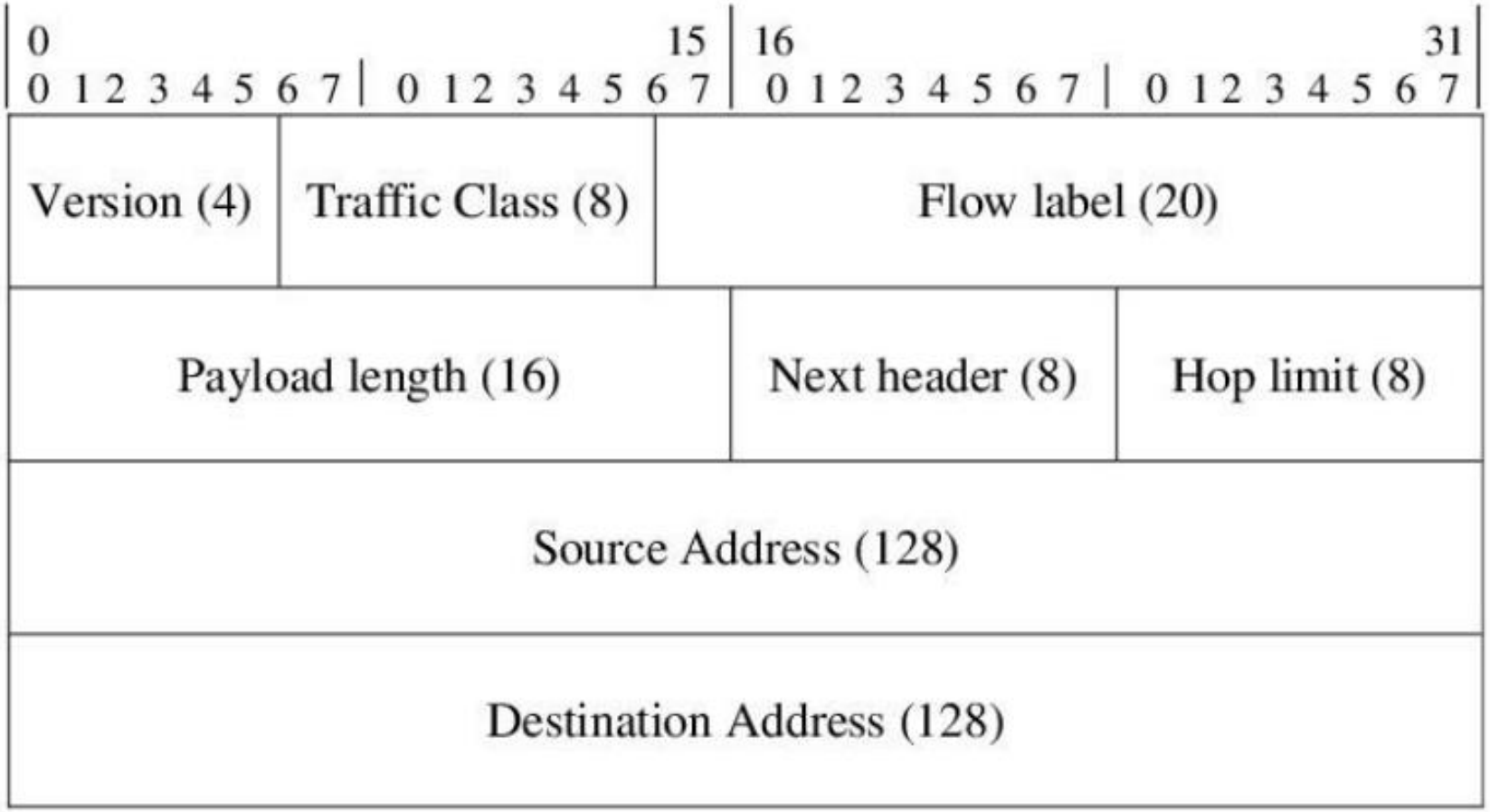
IPV6

- IPv4 addresses are being consumed rapidly due to a large number of new devices connecting to the internet every day.
- One day IPv4 addresses might be exhausted.
- As a 32-bit address, IPv4 has 2^32 = 4.294.967.296 possible addresses.
- While a 128-bit IPv6 address has 2^128 = 2^32 * 2^96 possible addresses.
- 2^96 is equal to 79 octillion addresses

IPV6

- An IPv6 address consists of 16-bit hexadecimal numbers separated by a colon (:). Hexadecimal numbers are case insensitive. In case zeros occur, they can be skipped.

- IPv6 addresses examples:
- 2001:0db8:0020:130F:0000:0000:087C:140B
- 2001:0db8:0:160F::850C:140B
- IPv6 also has reserved addresses, which cannot be used like the reserved IPv4 ones.


0 15 16 31
0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7 | 0 1 2 3 4 5 6 7
Version (4)
Traffic Class (8)
Flow label (20)
Payload length (16)
Next header (8)
Hop limit (8)
Source Address (128)
Destination Address (128)