IP Addressing : [04-08-2025]

Host → (clint, Routen, Senver)

যখন দুটি computer connect করা হয়, তখন logical Connection এর জন্য IP Address লাগে।

IP Address/Logical Address =
Network Address + Host Address

একটি Network এর under এ multiple Host থাকতে পারে।

Example:

1000 PC VAP এর under এ আছে, তাহলে 1000 pc এর প্রতিটি Host Address VAP এর Senver এর একই হবে।
Network Address.
→ Network Address
→ Host Address

IP Address :

has 32 bit.

8bit . 8bit . 8bit . 8bit

Classful IP Addressing :

Class C → NNNH

Class B → N.N.H.H

Class A → N.H.H.H

Class 'C': (Can connect 256 host) **IP → NNNH**

N.N.N.0 → Network Address
N.N.N.255 → Broadcast Address
→ Reserved Address

যে কোন IP Address এর 1st Address

Have 256 IP's from which we can connect,

$2^8 - 2 = 254$ (connectable host)

192.168.10.1
192.168.10.3
↓
Network Address

Subnet Mask:
Larger network এর ছোট ছোট Logical Segment এরাকে. (Logical segment of a Logical segment)

Network Address = 1 and
Host Address = 0

Subnate of **Class-C**:

Network address 24 bit

11111111.	11111111.	11111111.	00000000
255	255	255	0

Subnet mask = 255.255.255.0

Class "B": IP → N.N.H.H

No of host = $2^{2H} - 2 = 2^{2\times8} - 2 = 65534$ (connectable Host)

↓
যেটা class এ, Multiple class use করলে IP আলাদা হয়ে যায়।

Subnet mask = 255.255.0.0

H.H.H.H
H.H.N.N
HHNN

Class-"A": [IP → N. H. H. H]

No of host = $2^{H} - 2 = 2^{3\times8} - 2$ = 16 million.

Subnet Mask: 255.0.0.0

(07-08-25)

যখন কোন device connect করা হয় একটা Network এ, আমুক তখন massag পাঠায় একটি.

There are three type of message transfer mechanism.

- # Unicast: One to One
- # Multicast: One to group/many
- # Broadcast: One to all

Example:

1. CSE = 2000 Host [Always Broadcast way]

Here if we want to connect in Class-C, it will take 7-8 net. so, we have to use Class-B, so will create 65534 massage and sent it to all. in this case, (65534 - 2000) = 63534 will not utilize, so, it will increase trafic.

To solve this we use VLSM (variable length subnet Mask) manually, $2^0 = 1$, $2^1 = 2$, $2^2 = 4$, ... $2^{10} = 1024$, $2^{11} = 2048$

Host bit = 11

Network bit = 32 − 11 = 21 bit

IP এর 32 bit - Host bit = Network bit

Subnet mask = 11111111.11111111.11111000.00000000
255 255 248 0

= 255.255.248.0

2. CE : 1500 host
Host bit = 11 bit
Network bit = 32 - 11 = 21 bit
Subnet = 11111111.11111111.11111000.00000000 = 255.255.248.0

3. EEE = 1200 host
Host bit = 11 bit ; Network bit = 32 - 11 = 21 bit
Subnet = 255.255.248.0

4. Pharmacy : 1000 Host $2^{10} = 1024$
Host bit = 10 bit ; Network bit = 32 - 10 = 22
Subnet mask = 11111111.11111111.11111100.00000000 = 255.255.252.0

5. English : 100 Host $2^7 = 128$
Host bit = 7 bit ; Network bit = 32 - 7 = 25 bit
Subnet mask = 255.255.255.10000000
= 255.255.255.128

6. BBA : 64 Host
Host bit = 7 bit Network bit = 32 - 7 = 25 bit
Subnet Mask = 255.255.255.128

We design classless inter domain routing (CIDR) using VLSM.

CIDR:

Base / Network Address : 10.10.0.0 / (16) → Network bit

Package ⇒ (Network Address), IP Address (First and Last host), Subnet mask, Broadcast Address.

↓ Share to find

↳ Only Provided

Example: 1.

Class-C ⇒ 192.168.5.0 / (24) → Network Address

First host ⇒ (IP + 1) ⇒ 192.168.5.1

Subnet mask ⇒ 255.255.255.0

Broad cast Address ⇒ 192.168.5.255

Last host ⇒ (Broadcast # - 1) ⇒ 192.168.5.254

Example 2

Base = 10.10.0.0/21

First host = 10.10.0.1

Subnet mask = 255.255.248.0

CSE = 2000 Example

Base এর সাবনেট মাস্ক Binary

Broad cast : 10.10.00000000.00000000

7 → 111 11111111 → 255

11 bit (host bit)

= 10.10.7.255

Last host = 10.10.7.254

[LAB-5 → 320]

The Types of IP address :

11/08/25

Public ip Address : This can be accessed from any-where in the world.

private IP Address : This is assigned for local net-work area.

Class	Private IP	Public IP
Class A	10.0.0.0 to 10.255.255.255	1.0.0.0 to 9.255.255.255 11.0.0.0 to 126.255.255.255
Class B	172.16.0.0 to 172.31.255.255	128.0.0.0 to 172.15.255.255 172.32.0.0 to 191.255.255.255
Class C	192.168.0.0 to 192.168.255.255	192.0.0.0 to 192.167.255.255 192.169.0.0 to 223.255.255.255

[10.__.__.__/19] → mention করা না হলে full টাকে IP address consider করবো, এবং Base Address বের করতে হবে।

Base Address

Example :

Find the following requirement : [192.168.0.0/24] ← Bass Address

CSE = 100
BBA = 125
Pharma = 70
EEE = 80
CE = 15
Eng = 62

→ sort :
BBA = 125,
CSE = 100,
EEE = 80,
Pharma = 70,
Eng = 62
CE = 15

NAME	Host Requirement	Network Address	Subnet Mask	First Host	Last Host	Broadcast Address
BBA	125 (7)	192.168.0.0/25	255.255.255.128	192.168.0.1	192.168.0.126	192.168.0.127
CSE	100(7)	BA(BBA)+1 ⇒ 192.168.0.128/25	255.255.255.128	192.168.0.129	192.168.0.254	192.168.0.255
EEE	80 (7)	BA(CSE)+1 ⇒ 192.168.1.0/25	255.255.255.128	192.168.1.1	192.168.1.126	192.168.1.127
Pharma	70(7)	192.168.1.128/25	255.255.255.128	192.168.1.129	192.168.1.254	192.168.1.255
ENG	62(6)	192.168.2.0/26	255.255.255.192	192.168.2.1	192.168.2.62	192.168.2.63
CE	15 (5)	192.168.2.64/27	255.255.255.224	192.168.2.65	192.168.2.94	192.168.2.95

BBA → 125 → $2^7 = 128$ ∴ Host bit = 7

11111111. 11111111. 11111111. 10000000 ← Subnet mask
255 255 255 128

Broadcast Address → 192.168.0.0000 0000
+ 0111 1111
127

CSE →

BA → 192.168.0.1000 0000
111 1111
255

ENG → Host Bit = 6

255.255.255.11 00 0000
192

192.168.2.0000 0000
+ 11 1111
63

CE →

255.255.255.111 00000

~~192.168.2.11 00000 00100000~~
~~11111 11111~~

192.168.2.0100 0000
+ 1 1111
95

CSE → 319 [Lecture - 11]

Example:

IP: 14.12.15.17 /(19) → Network bits

* IP in binary, then Subnet mask in binary, then ~~ADD~~ **AND** them the result is Network Address.

IP: 14 . 12 . 15 . 17

IP → 00001110 . 00001100 . 00001111 . 00010001

SubNet Mask → 11111111 . 11111111 . 11100000 . 00000000

AND Operation → 00001110 . 00001100 . 00000000 . 00000000

→ 14 . 12 . 0 . 0

Network / Base Address ⇒ 14.12.0.0 [32 - 19 = 13 ⇒ Host Bit]

Broad cast Address ⇒ 14.12.00000000.00000000

11111 11111111

31 . 255

⇒ 14.12.31.255