CS & IT Engineering

Computer Network

Introduction to IP Addressing

Lecture Number- 01

By- Ankit Sir

Basics of IP addressing

$2^1 = 2$

$2^2 = 4$

$2^3 = 8$

$2^4 = 16$

⋮

$2^9 = 512$

$2^{10} = 1024 = 1K$ (Kilo)

$2^{20} = 1024 \times 1024 = 1M$ (Mega)

$2^{30} = 1024 \times 1024 \times 1024 = 1G$ (Giga)

$2^{40} = 1\,T$ (Tera)

$2^{50} = 1\,P$ (Peta)

$2^{60} = 1\,E$ (Exa)

$2^{70} = 1\,Z$ (Zetta)

$2^{80} = 1\,Y$ (Yotta)

Basics of IP addressing

(data)

1 Byte = 8 bits

1 KB = 1024 Bytes

1 MB = 1024 KB (Kilo Byte) ✓

1 GB = 1024 MB (Mega Byte)

1 TB = 1024 GB (Giga Byte)

1 PB = 1024 TB (Tera Byte)

1 EB = 1024 PB (Peta Byte)

1 ZB = 1024 EB (Exa Byte)

1 YB = 1024 ZB (Zetta Byte)

Bit → b ✓

Byte → B ✓

128 64 32 16 8 4 2 1

Basics of IP addressing

Binary Number (128 64 32 16 8 4 2 1)	Decimal Value
00000000	0
00000001	1
00000011	3 $[2^2-1]$
00000111	7 $[2^3-1]$
00001111	15 $[2^4-1]$
00011111	31 $[2^5-1]$
00111111	63 $[2^6-1]$
01111111	127 $[2^7-1]$
11111111	255 $[2^8-1]$

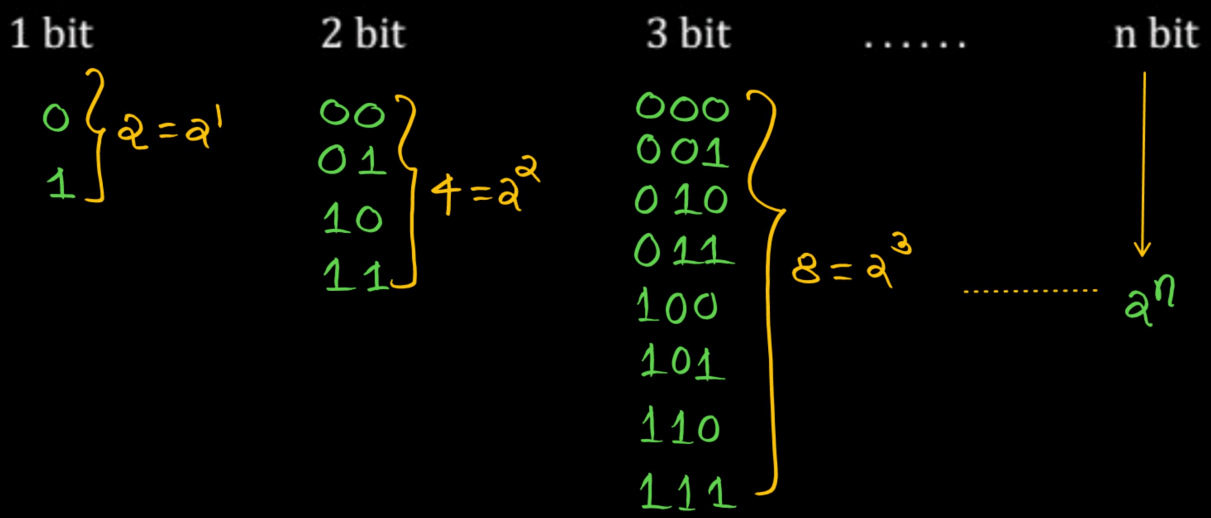
8bit
↓ Range
0 to 255
0 to 2^8-1

nbit
↓ Range
0 to 2^n-1

Basics of IP addressing

Binary Number	Decimal Value
128 64 32 16 8 4 2 1	
10000000 →	128
11000000 →	192
11100000 →	224
11110000 →	240 [255-15]
11111000 →	248 [255 - 7]
11111100 →	252 [255- 3]
11111110 →	254 [255 -1]
11111111 →	255

128
+64
192
+ 32
224
+16
240


1 bit
2 bit
3 bit
.....
n bit
0
1
$2 = a^1$
00
01
10
11
$4 = a^2$
000
001
010
011
100
101
110
111
$8 = a^3$
.....
a^n

2 bit

00

01

10

11

3 bit

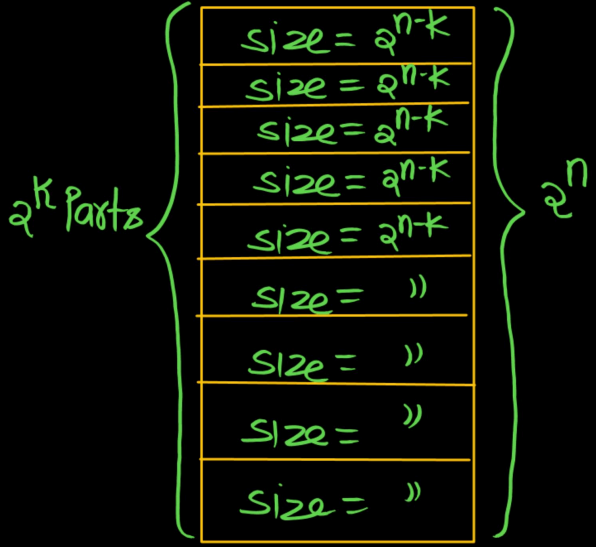
P_1 000, 001 } 2

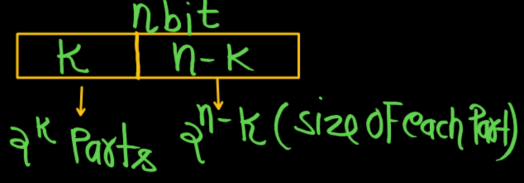
P_2 010, 011 } 2

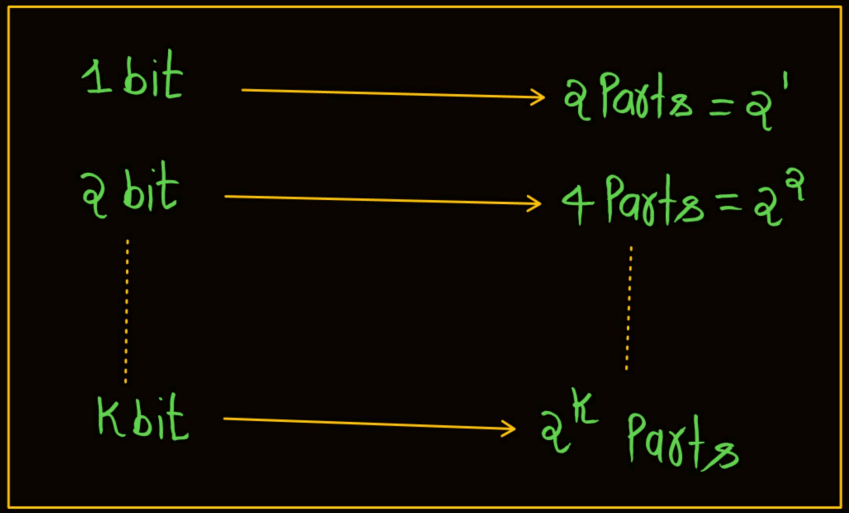
P_3 100, 101 } 2

P_4 110, 111 } 2

..... n bit



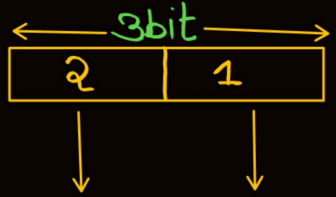




2^K Part $\longrightarrow$ 2^n

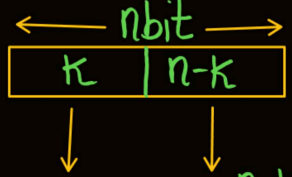
1 Part $\longrightarrow$ $\frac{2^n}{2^K}$

$= 2^{n-K}$



2^2 Parts 2^1 size of each Part

4 Parts 2 (size of each Part)



2^K Parts 2^{n-K} (size of each Part)

Introduction to IP addressing

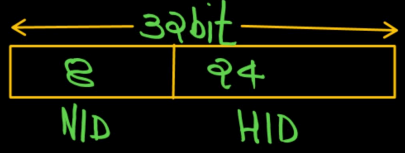
IPv4 Address = 32 bit ✓

$2^2 * 2^{30} = 4G$ (IP Addresses)

Total number of IP addresses = 2^{32} = 4,294,967,296

Initially in 1980's IP Addresses was divided into two Fixed Parts i.e.,

NID = 8 bit, and HID = 24 bit.



16M ≅ 1.6Cr. Host/N/w

2^8 N/w's

256 N/w's

2^{24} Host/ Network

$2^4 * 2^{20}$

16 M Host/Network

2^8 Parts

256 Parts

↓

256 N/w

$N_1 = 2^{24}$ IP

$N_2 = 2^{24}$ IP

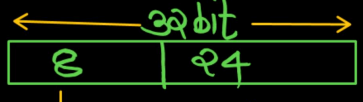
$N_3 = 2^{24}$ IP

$N_4 = 2^{24}$ IP

$N_5 = 2^{24}$ IP

$N_{256} = 2^{24}$ IP

2^{32} IP Add



2^8 Parts

2^{24} (size of each Part)

$2^8 * 2^{24} = 2^{32}$ IP

↓ N/w

↓ No. of IP Add in one N/w

IANA ⟶ Internet Assigned Number Authority

IANA —1980's→ 200 computer —Need→ 200 IP Add

Wastage = 16M - 200

Introduction to IP addressing

Disadvantage

There are only 256 Network's, and even a small organization must buy 16M computer (HOST) to purchase one network.

Solution ⟶ ClassFull Addressing

Telephone Networks

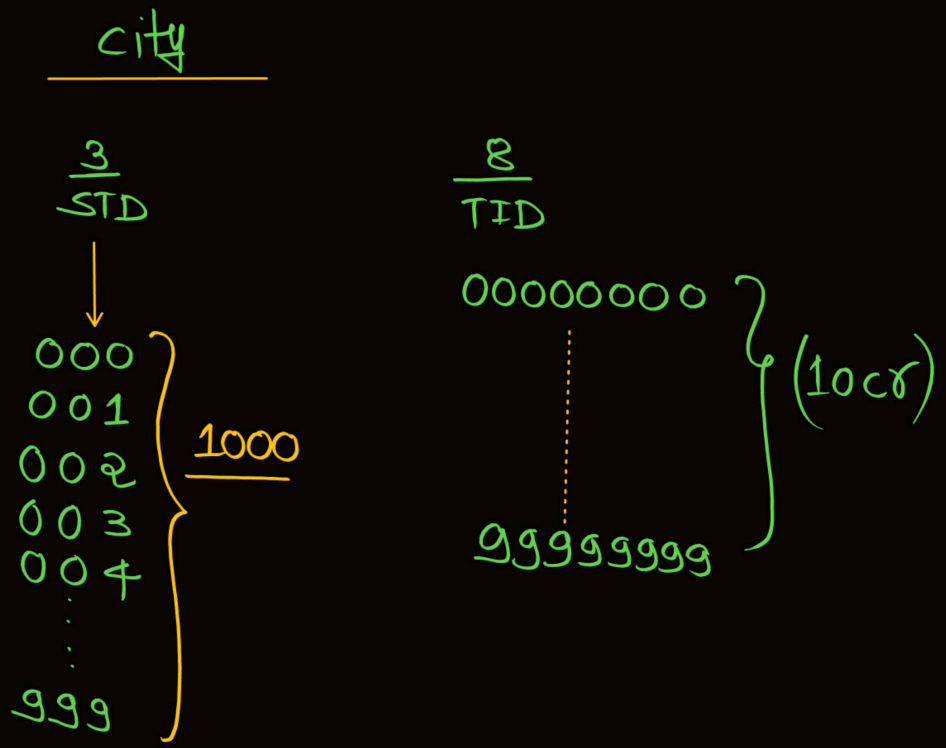
1. 11 digit Number
2. Two Parts
   - STD
   - TID
3. Unique

Telephone Networks

City	
3 STD	8 TID
011	24161913

Town	
4 STD	7 TID
0120	2448752

Villages	
5 STD	6 TID
05994	264297


city
3
STD
000
001
002
003
004
999
1000
8
TID
00000000
99999999
(10 cr)

Computer Networks

1. 32 bit Number 
2. Two Parts
   - NID
   - HID
3. Unique

Class A

8 bit	24 *bit*
NID	HID

2^8 N/w

256 N/w

2^{24} Host/N/w

$= 2^4 * 2^{20}$

= 16 M Host/N/w

$\cong$ 1.6cr Host/N/w

Note: Designed For Big govt. organization

For EX: NASA

Class B

16 bit	16 *bit*
NID	HID

2^{16} N/w

$2^6 * 2^{10}$

64 K N/w

2^{16} Host/N/w's

$2^6 * 2^{10}$

64 K Host/N/w

Note: Designed For MNC's

For EX: TCS, IBM, WIPRO etc

Class C

24 bit	8 *bit*
NID	HID

2^{24} N/w

$2^4 * 2^{20}$

16 M N/w

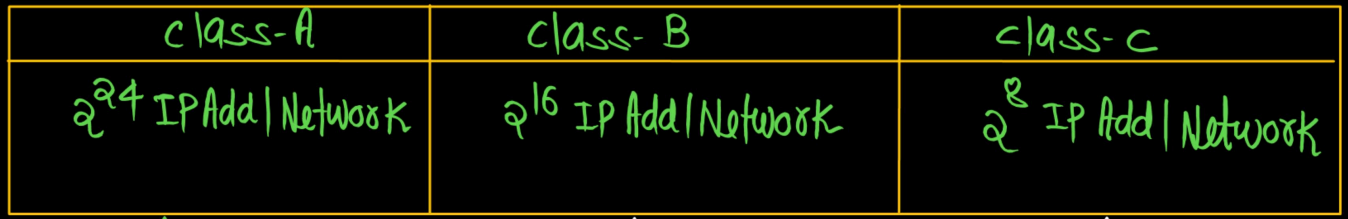
$\cong$ 1.6cr N/w

2^8 Host/N/w

256 Host/N/w

Note: Designed For small organizations

For EX: schools, colleges etc.



Wastage = 2^{24} − 70,000

= 16707216

Wastage = 2^{16} − 500

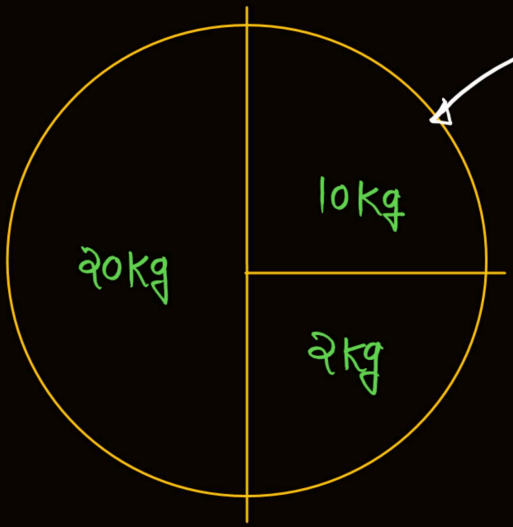
= 65,536 − 500

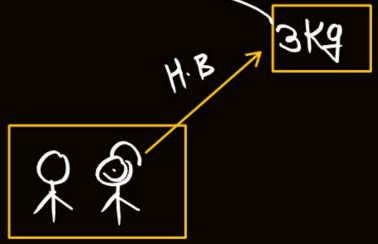
= 65,036 IP Add

Wastage = 2^{8} − 200

= 256 − 200 = 56 IP

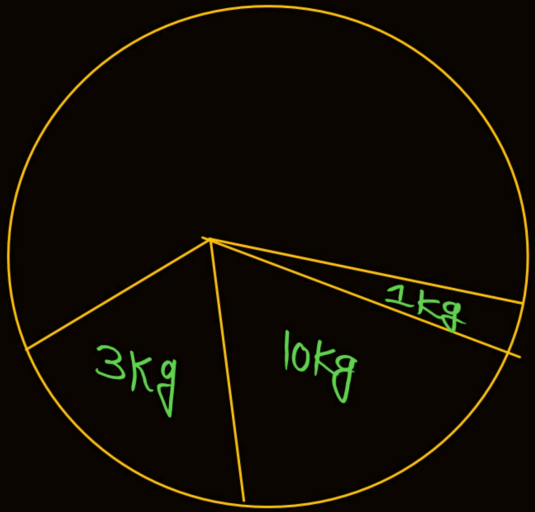
Classful Addressing



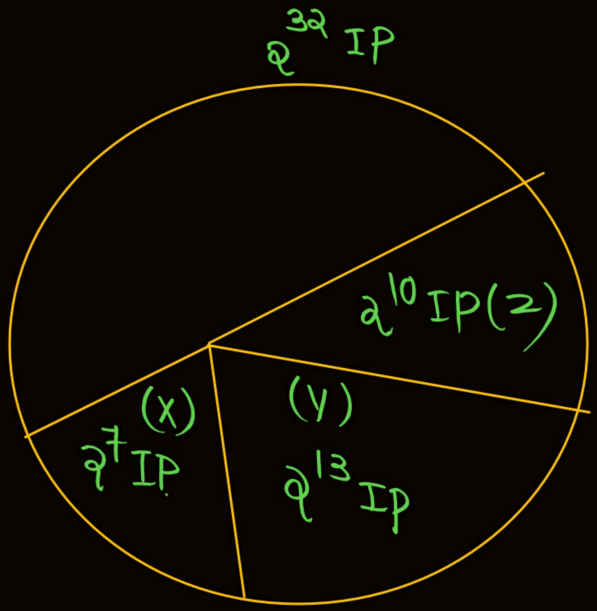


wastage = 10kg - 3kg
= 7kg

Classless Addressing



Class Addressing



CS & IT Engineering

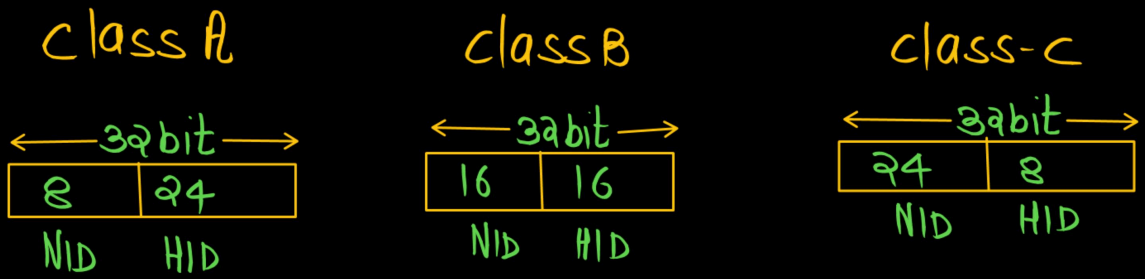
Computer Network

IPv4 Addressing

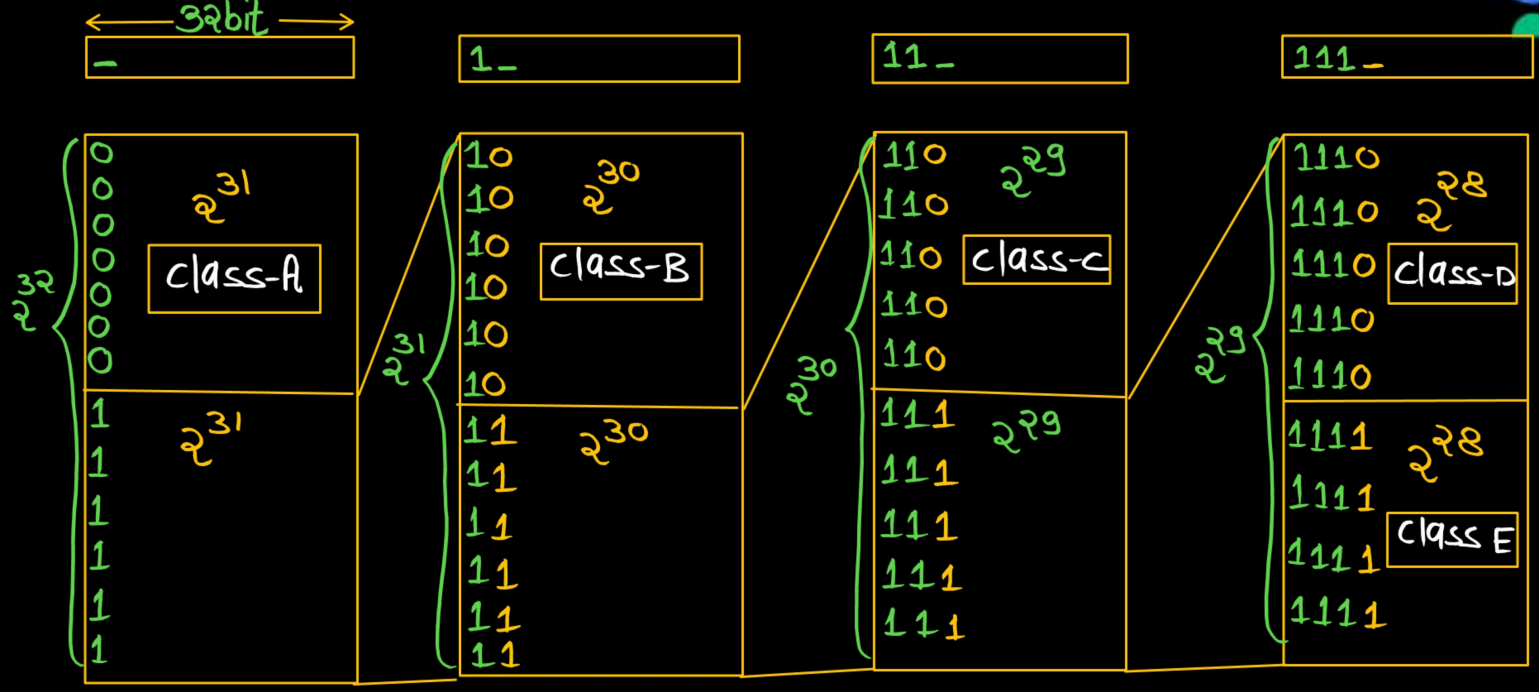
Lecture Number- 02

By- Ankit Sir

Classfull addressing



Classful Addressing



No. of IP Addresses Present in class-A = 2^{31}

" " " " " " class-B = 2^{30}

" " " " " " class-C = 2^{29}

" " " " " " class-D = 2^{28}

" " " " " " class E = 2^{28}

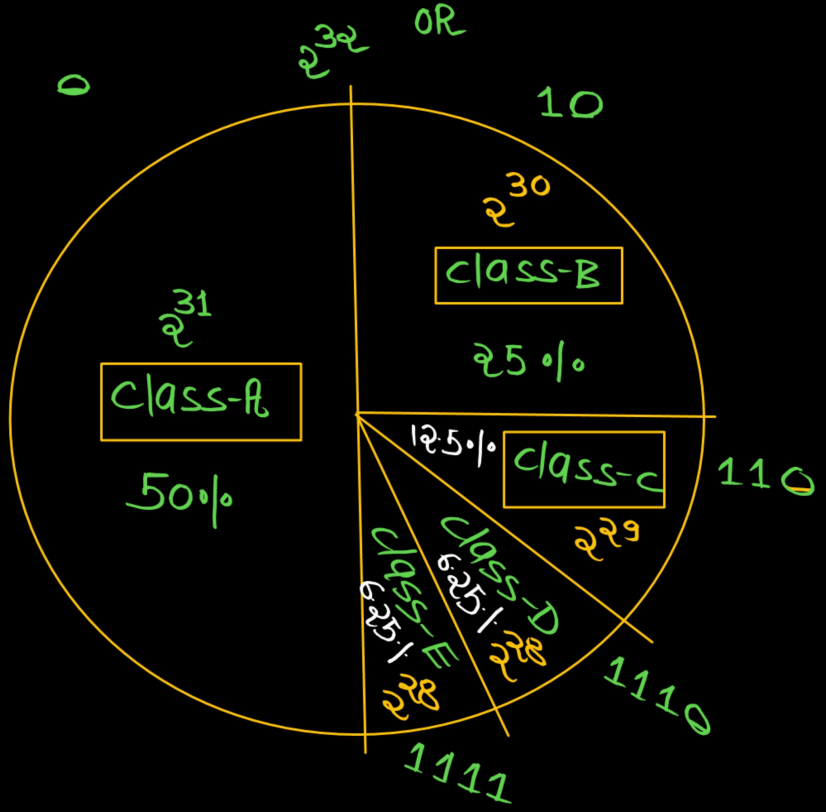
class-A → 0

Class-B → 10

Class-C → 110

Class-D → 1110

ClassE → 1111


0
2^32 OR
10
2^30
Class-B
25%
2^31
Class-A
50%
125%
Class-C
110
2^29
Class-D
6.25%
2^28
1110
Class-E
6.25%
2^28
1111

IP Address Representation

- Binary : 11001000 . 11111100 . 00111111 . 11110111
- decimal : 200 . 252 . 63 . 247

Hexadecimal : C8 . FC . 3F . F7

$(\text{Hexadecimal})_{16} \longrightarrow \{0\text{-}15\}$

$0000 \rightarrow 0$
$0001 \rightarrow 1$
$0010 \rightarrow 2$
$0011 \rightarrow 3$
$0100 \rightarrow 4$
$0101 \rightarrow 5$
$0110 \rightarrow 6$
$0111 \rightarrow 7$
$1000 \rightarrow 8$
$1001 \rightarrow 9$

$1010 \rightarrow 10 \rightarrow A$
$1011 \rightarrow 11 \rightarrow B$
$1100 \rightarrow 12 \rightarrow C$
$1101 \rightarrow 13 \rightarrow D$
$1110 \rightarrow 14 \rightarrow E$
$1111 \rightarrow 15 \rightarrow F$

$\{0\text{-}9, A\text{-}F\}$

Class-A → 0 → 2^{31} IP (1-126)

0 -------

0 0000000 → 0 X

0 0000001 → 1

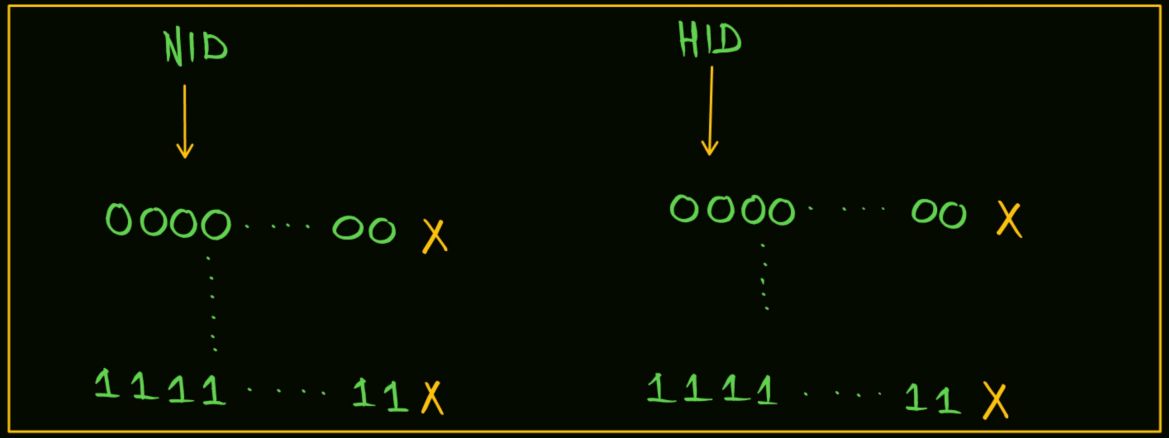
0 0000010 → 2

0 0000011 → 3

0 1111110 → 126

0 1111111 → 127 X

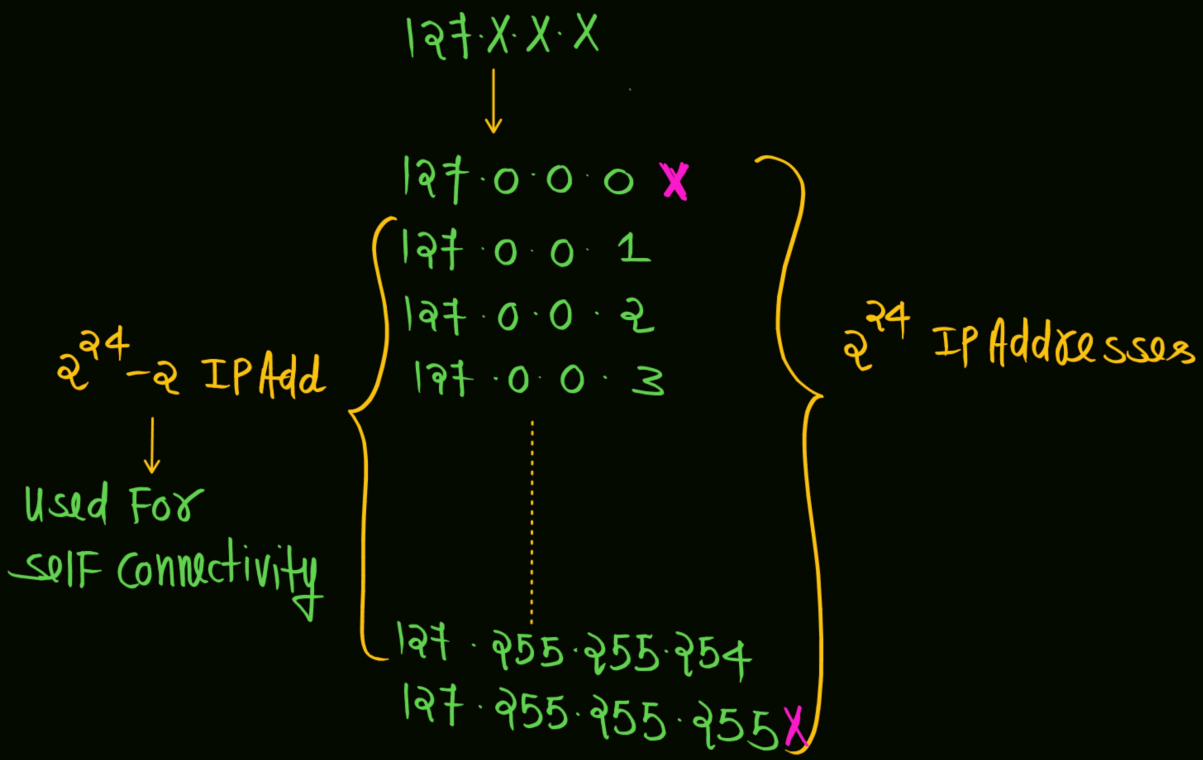
0.0.0.0 → DHCP client or Default Route



Note: Whenever we Have all 0's or All 1's either in the NID or in the HID OF any IP Address. These IP addresses are reserved For some special purpose. So we can't assign these IP Addresses to any Host (computer)

127.X.X.X ⟶ self connectivity
or
Loop Back testing
or
Interprocess comm

{ 127.0.0.0 X
127.255.255.255X } Not Used For self connectivity


127.X.X.X
127.0.0.0 X
127.0.0.1
127.0.0.2
127.0.0.3
127.255.255.254
127.255.255.255 X
2^{24} IP Addresses
$2^{24}-2$ IP Add
Used For
self Connectivity

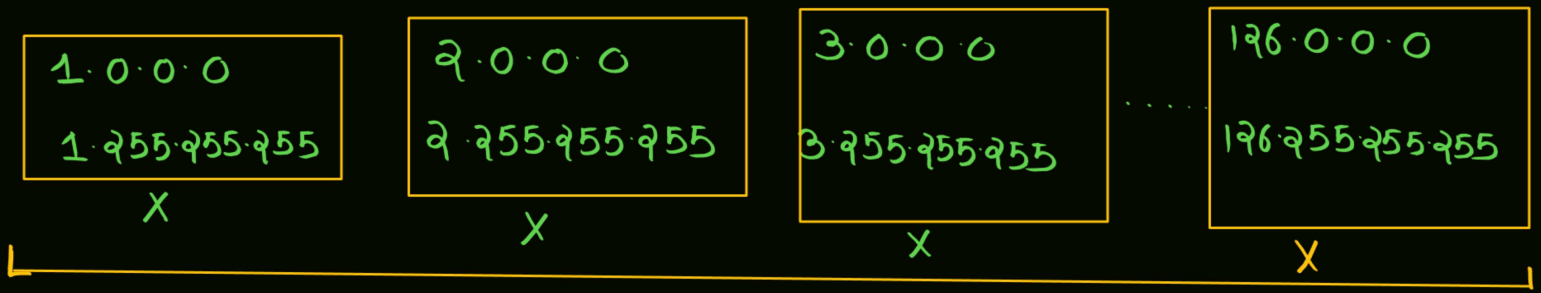
2^8 N/W (T) → $2^7 - 2 = 126$ N/W (P)

2^{24} Host/Network (T) → $2^{24} - 2$ Host/Network (P)

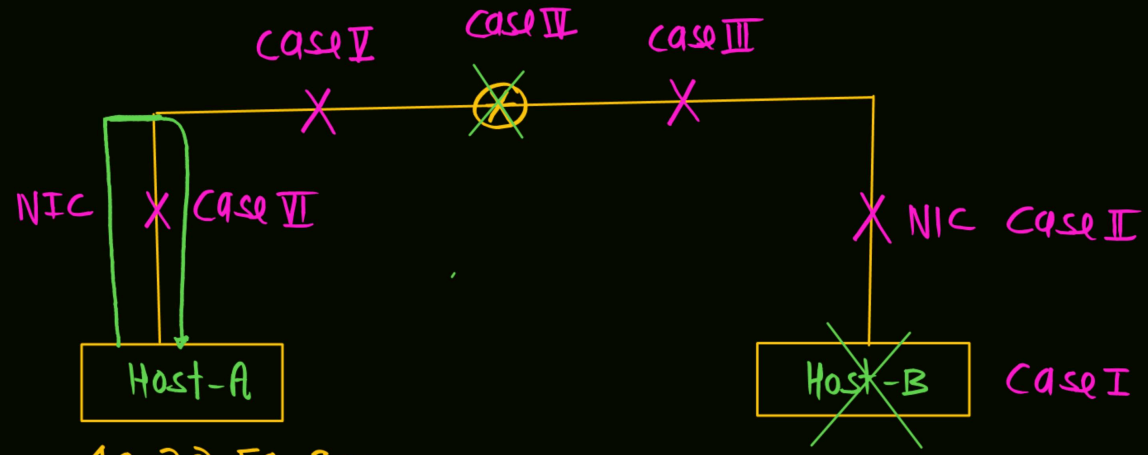
HID = 24bit

00000000 . 00000000 . 00000000 → 0 . 0 . 0 X

11111111 . 11111111 . 11111111 → 255 . 255 . 255 X



Not assigned to any computer



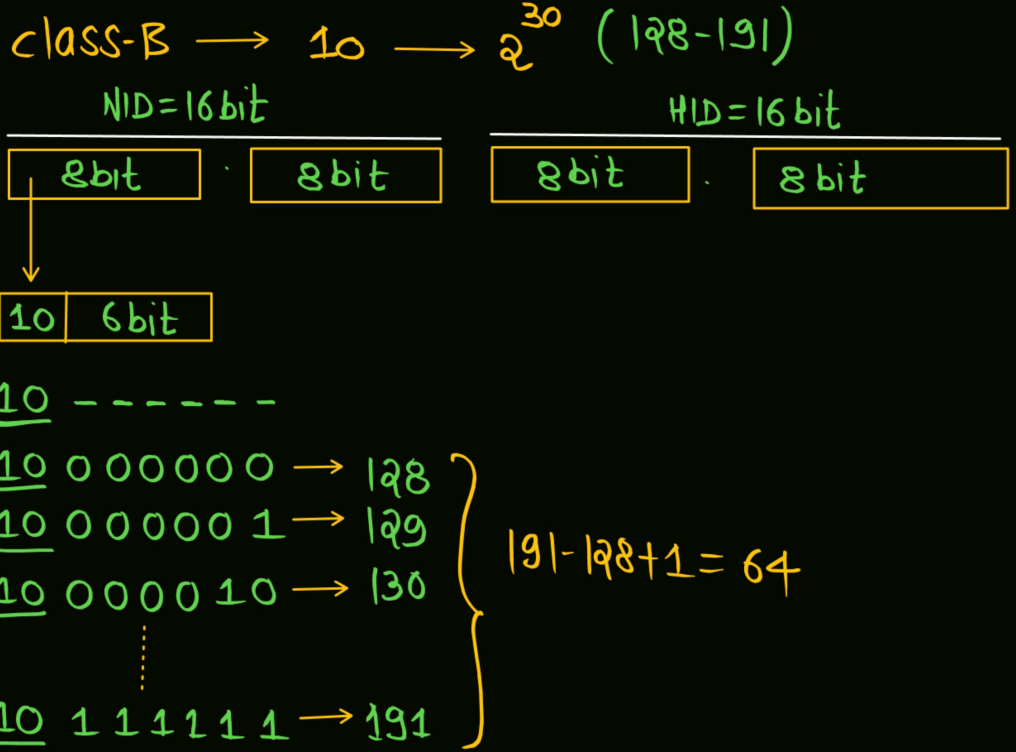
SIP	DIP	
10·39·50·93	127·X·X·X	Valid ✓

SIP X	DIP	
127·X·X·X	10·39·50·93	Invalid X

① 127.X.X.X will Always be used as a Destination IP Address

② 127.X.X can not be used as a source IP Address

③ 127.X.X.X is reserved For some special purpose. so we can't Assign these IP Addresses to any computer (Host)


class-B → 10 → 2^{30} (128-191)
NID = 16 bit
HID = 16 bit
8 bit
8 bit
8 bit
8 bit
10
6 bit
10 ------
10 000000 → 128
10 000001 → 129
10 000010 → 130
10 111111 → 191
191-128+1 = 64

2^{16} N/W (T) → 2^{14} N/W (P)

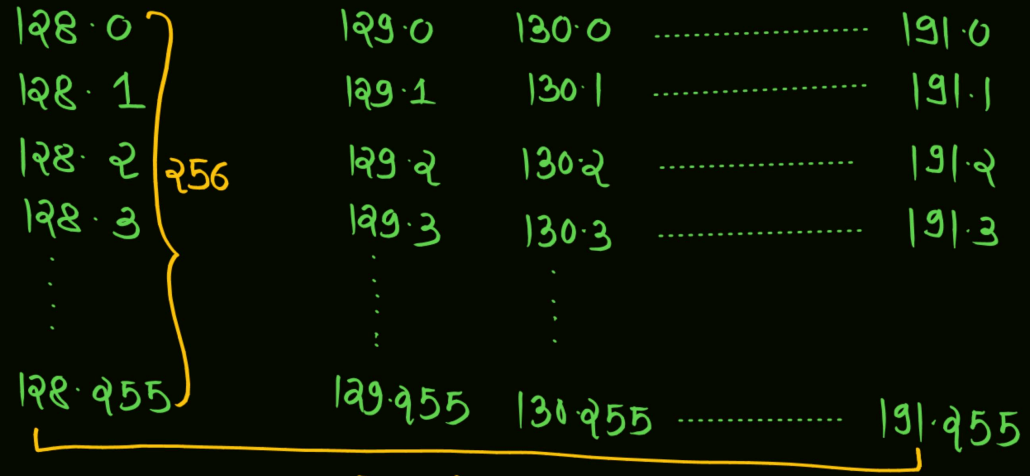
2^{16} Host|Network (T) → $2^{16} - 2$ Host|Net (P)

HID = 16 bit

X 00000000 · 00000000 → 0 · 0 X

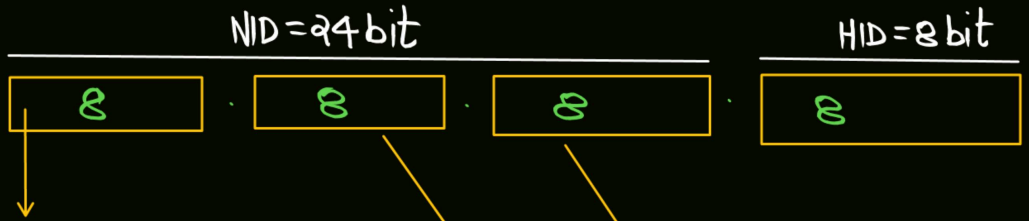
⋮

X 11111111 · 11111111 → 255 · 255 X



$256 * 64 = 2^8 * 2^6 = 2^{14}$ NW's

Class-C → 110 → 2^{29} IP (192-223)



110 - - - - -

110 00000 → 192
110 00001 → 193
110 00010 → 194
⋮
110 11111 → 223

$32 * 2^8 * 2^8 = 2^5 * 2^8 * 2^8 = 2^{21}$ N/W

$২^{২৪}$ N/W (T) → $২^{২১}$ N/W (P)

$২^{৪}$ Host/Network (T) → $২^{৪} - ২$ Host/Network

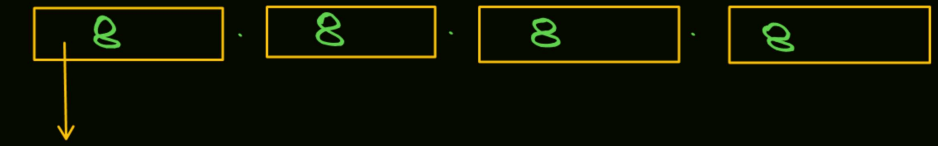
HID = ৪ bit

00000000 → ০ X

⋮

11111111 → ২৫৫ X

class-D → 1110 → 2^{28} IP (224-239)



1110 ----

1110 0000 → 224

1110 0001 → 225

⋮ ⋮

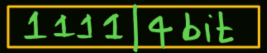
1110 1111 → 239

Note:

① No Network id and No Host-id in class D

② class D is reserved for Multicasting

Class E → 1111 → 2^{28} (240-255)



1111 ----

11110000 → 240

11110001 → 241

⋮ ⋮

1111 1111 → 255

① No Network-id and No Host-id in class E

② Class E is reserved For research and Future purpose.

Classfull addressing (short Notes)

- Class A → 0 → (1 - 126), No. of IP Addresses = 2^{31} ✓
- Class B → 10 → (128 - 191), No. of IP Addresses = 2^{30} ✓
- Class C → 110 → (192 - 223), No. of IP Addresses = 2^{29} ✓
- Class D → 1110 → (224 - 239), No. of IP Addresses = 2^{28} ✓
- Class E → 1111 → (240 - 255), No. of IP Addresses = 2^{28} ✓

0 + 128 = 128 + 64 = 192 + 32 = 224 + 16 = 240

A B C D E

Classfull addressing (short Notes)

Class	Number of Networks	Number of hosts/Network
Class A	$2^7 - 2 = 126$	$2^{24} - 2$ = 1,67,77,214 hosts
Class B	$2^{14} = 16,384$	$2^{16} - 2$ = 65,534 hosts
Class C	$2^{21} = 20,97,152$	$2^8 - 2$ = 254 hosts
Class D	No NID and HID, all 28 remaining bits are used to define multicast address	
Class E	No NID and HID, it is meant for research and future purpose	

CS & IT Engineering

Computer Network
IPv4 Addressing

Lecture Number- 03

By- Ankit Sir

Q. Which of the following IP addresses have error

MSQ

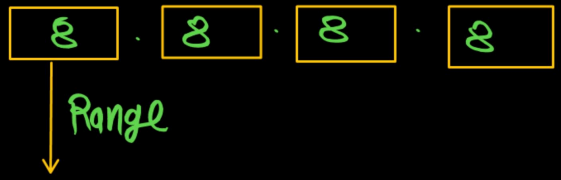
A. 150.168.045.78 ✓ (X)

B. 190.100.1.100.20 ✓ (X) 5 octet

C. 10.75.301.100 ✓ (X)

D. 11100010.10.254.100 ✓

Ans: (A, B, C, D)



Q. To utilize a Class A network efficiently , an organization should have -------- number of host in a network

MCQ

A. 20 Million

B. 64 Thousands

C. 2.1 Billion

D. 16Million ✓

Class-A

NID	HID
8	24

↓

No. of Host/Net $= 2^{24} - 2$

$= 2^4 * 2^{20} - 2$

$= 16M - 2$

$\cong 16M$

Q. In hexadecimal notation IPv4 Address has-----hex digits

MCQ

A. 16

B. 8 ✓

C. 4

D. 32

11001000 . 11111100 . 00111111 . 11110111

C8 . FC . 3F . F7

2 + 2 + 2 + 2 = 8 Hex digit

Q

Find the class C address from the following.

MCQ

A. 01111111.01010101.11111110.00001111

B. 11101111.01001110.11001100.01010011

C. 10001111.00000011.11111100.00111100

D. 11011111.11001111.11100010.11111010

classA → 0

class-B → 10

class-C → 110

class-D → 1110

class-E → 1111

Q. The Dotted decimal notation (DDN) format for the given Hexadecimal notation (HDN) C22F1582 is

MCQ

A. 194.50.21.145

B. 194.47.21.130

C. 194.45.21.120

D. 194.47.20.130

C2·2F·15·82

1100 0010 · 0010 1111 · 0001 0101 · 1000 0010

194 · 47 · 21 · 130

(OR)

194 · 47 · 21 · 130

$(C2)_{16}$ $(2F)_{16}$ $(15)_{16}$ $(82)_{16}$

$16^1\ 16^0$

$12*16^1+2*16^0$

$192+2=194$

$2*16+15$

47

$1*16+5$

21

$8*16+2$

130

Q. The Dotted decimal notation (DDN) format for the given Hexadecimal notation (HDN) 172A84C8

MCQ

A. 24.40.132.200

B. 23.42.132.200

C. 23.42.130.200

D. 23.42.132.198

$(17)_{16}$ $(2A)_{16}$ $(84)_{16}$ $(C8)_{16}$

1*16+7 2*16+10 16*8+4 16*12+8

93 42 132 200

Q. Suppose, instead of using 16 bits for network part of a Class B, 20 bits had been used. Then the number of Class B networks and hosts per network are

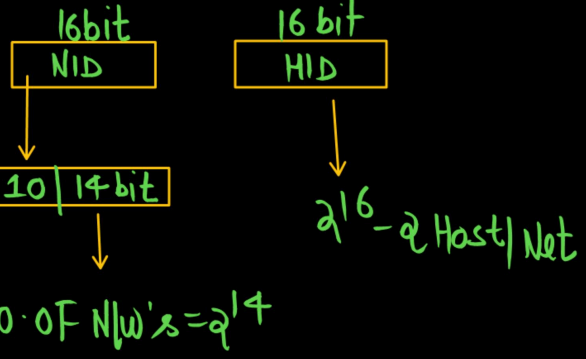
A. $2^{10}, 2^{12}$

B. $2^{18}, 2^{12}$

C. $2^{18}, 2^{12} - 2$ ✓

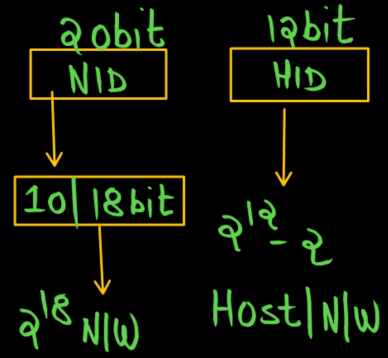
D. $2^{10}, 2^{12} - 2$

Class-B



MCQ

IPAdd = 32bit



Q. Number of Networks and Number of Host in class B are 2^m, $(2^n - 2)$ respectively. Then the relation between m and n is

MCQ

A. 3m = 2m

B. 7m = 8n

C. 8m = 7n ✓

D. 2m = 3n

No. of N/w's in class B = $2^m = 2^{14}$, $m = 14$

No. of Host in class B = $2^n - 2$, $2^{16} - 2$, $n = 16$

$m = 14$, $n = 16$

$\frac{m}{n} = \frac{14}{16}$

$\frac{m}{n} = \frac{7}{8}$

$8m = 7n$

Q. How many networks are possible in a class B addressing system ? (Assuming Classful addressing scheme is followed.)

MCQ

A. 2^{16}

B. 2^{14}

C. $2^8 - 2$

D. $2^{16} - 2$

Q. How many hosts can be present in a class C network ? (Assuming Classful addressing scheme is followed.)

MCQ

A. 2^{21}

B. $2^{21} - 1$

C. 2^{16}

D. $2^8 - 2$ ✓

class-C

NID HID

24 8

$2^8 - 2 = 254$

Q. How many bits are allocated for NID and HID in 23.192.157.234 address ? (Assuming Classful addressing scheme is followed.)

MCQ

A. 16, 16

B. 8, 16

C. 8, 24

D. 24, 8

Class A (1-126)

NID	HID
8	24

Q. What is the possible number of networks and addresses in each network under class B addresses in IPv4 addressing format.

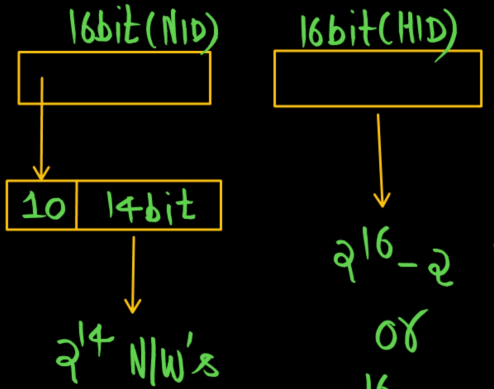
MCQ

A. $2^{16}, 2^{16}$

B. $2^{16}, 2^{16} - 2$

C. $2^{14}, 2^{16} - 2$

D. $2^{14}, 2^{16}$ ✓



Q. IP Address 200.198.32.65 belong to which class ?

MCQ

Class-C [192-223)

A. Class A

B. Class B

C. Class C ✓

D. Class D

Class A - (1-126)
Class-B (128-191)
Class-C (192-223)
Class-D (224-239)
Class-E (240-255)

0+128 = 128+64 = 192+32 = 224+16 = 240
A B C D E

Q. Percent of Addresses occupied by Class D ?

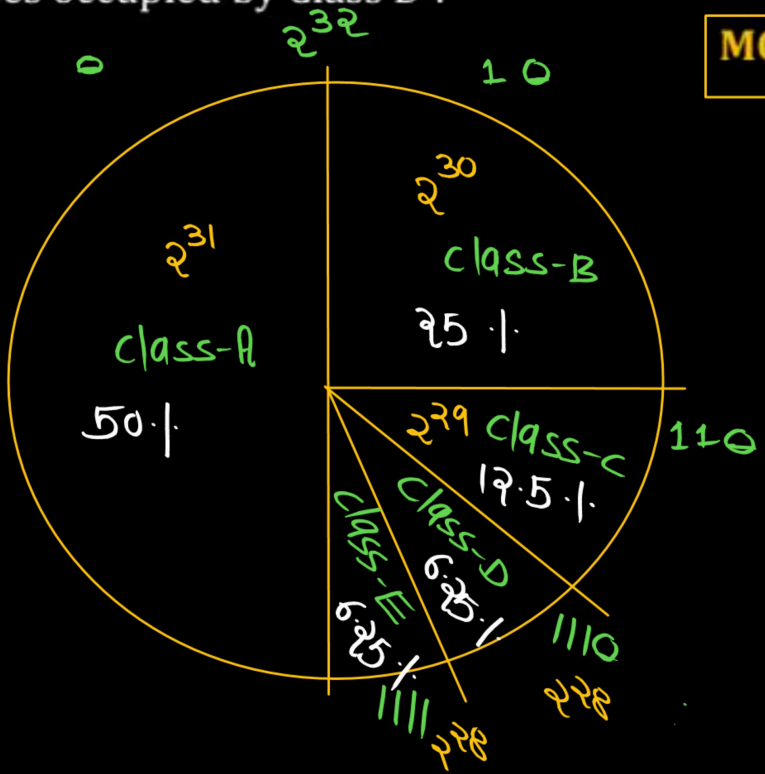
MCQ

A. 50 %

B. 25 %

C. 6.25 %

D. 12.5 %



Q. In IPv4 addressing format, the number of networks all allowed under class C addresses is

GATE-2016

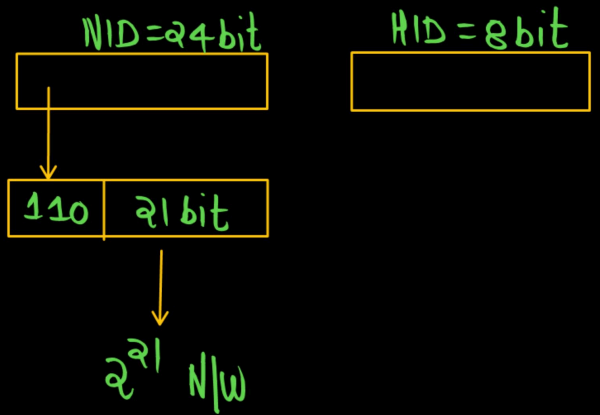
MCQ

A. 2^{24}

B. 2^{7}

C. 2^{14}

D. 2^{21}



Q. Let 2^p and 2^q be the number of networks present in class B and class C under IPv4 addressing format, the value of p + q is _____.

[NAT]

No. of N|w's in class-B $= 2^{14} = 2^P$, $P = 14$

No. of N|w's in class-C $= 2^{21} = 2^Q$, $Q = 21$

$P + Q = 14 + 21 = 35$

Q. Which of the following is/are VALID IP addresses belonging to class C under IPV4 addressing format? [MSQ]

A. 191. 82. 129. 75

B. 208. 21. 97. 120

C. 224. 82. 31. 128

D. 223. 32. 64. 124

Class-C

↓

(192-223)

Ans: (B, D)

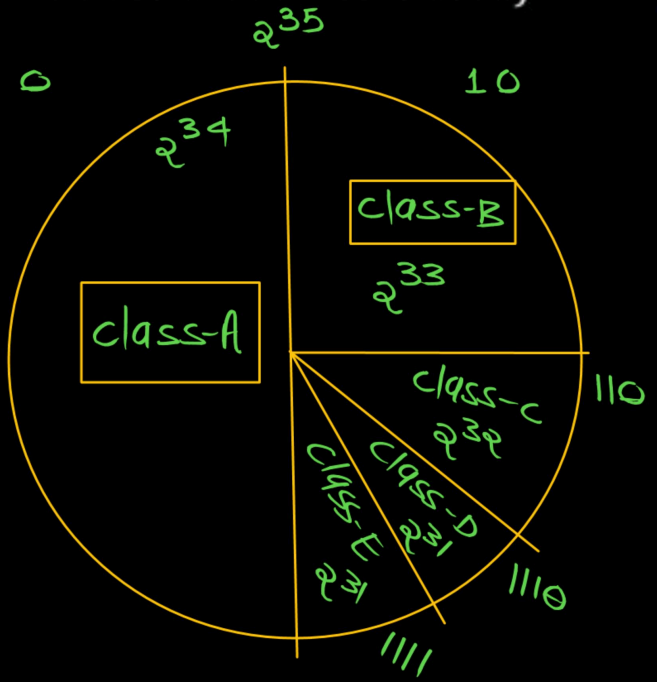
Q. Consider a hypothetical IPv4 address of 35 bits where class A contain 2^{34} IP addresses. Then the number of IP address present in class D will be : (Assume classful address is used). [MCQ]

A. 2^{28}

B. 2^{32}

C. 2^{34}

D. None of these



Q.

[MCQ]

Consider the following statements-

I: The ratio of the number of IP addresses contained in class A to that of class E is 8:1. (correct)

II: The number of IP addresses contained in class D is 75% less than the number of IP addresses contained in class B. (correct)

Which of the above given statement(s) is/are INCORRECT?

A. I only

B. II only

C. Both I and II

D. Neither I nor II ✓

No. of IP Addresses in class A = 2^{31}

No. of IP Addresses in class-E = 2^{28}

$2^{31} : 2^{28}$

$2^3 * 2^{28} : 2^{28}$

8 : 1

No. of IP Addresses in class-B = 2^{30}

No. of IP Addresses in class-D = 2^{28}

$$\frac{2^{30} - 2^{28}}{2^{30}}$$

$$\frac{2^{28} * 2^{2} - 2^{28}}{2^{30}}$$

$$\frac{2^{28}[4-1]}{2^{30}} = \frac{3}{4} = 75\%$$

Q. If the number of networks present in class B are 2^m, then number of hosts present in class C are : (classful addressing scheme is followed) [MCQ]

No. of N/w's present in class B $= 2^m = 2^{14}$, $m = 14$

No. of Host present in class-C $= 2^8 - 2 = 254$

A. $2^{m-2} = 2^{14-2} = 2^{12}$

B. $2^{m+2} - 2 = 2^{14+2} - 2 = 2^{16} - 2$

C. $\sqrt{2^{m+2}} - 2 = \sqrt{2^{14+2}} - 2 = \sqrt{2^{16}} - 2 = 2^8 - 2$

D. $2^m = 2^{14}$

Q. If number of network present in class B and class C are 2^p and 2^q respectively. And number of hosts present in B and class C are (2^m-2) and (2^n-2) respectively. Then which of the following is/are correct? [MSQ]

A. Relation between p and q will be $2q = 3p$.

B. The number of networks present in class A $2^{n-1} - 2$ possible.

C. Relation between m and n will be $m = 2n$.

D. Relation between p and n will be $4p = 7n$.

$2^{8-1} - 2 = 2^7 - 2 = 126$ N/W

No. of N|w's Present in class B $= 2^P = 2^{14}$, $P = 14$

No. of N|w's " " class-C $= 2^Q = 2^{21}$, $Q = 21$

No. of Host present in class-B $= 2^m - 2 = 2^{16} - 2$, $m = 16$

No. of Host present in class-C $= 2^n - 2 = 2^8 - 2$, $n = 8$

$P = 14$, $Q = 21$

$\frac{P}{Q} = \frac{14}{21} \times 2$

$\frac{P}{Q} = \frac{2}{3}$

$3P = 2Q$

$m = 16$, $n = 8$

$\frac{m}{n} = \frac{16}{8} \times 2$

$\frac{m}{n} = \frac{2}{1}$

$m = 2n$

$P = 14$, $n = 8$

$\frac{P}{n} = \frac{14}{8} \times 4$

$\frac{P}{n} = \frac{7}{4}$

$4P = 7n$

Q. In classful addressing, a large part of the available addresses are _____.

MCQ

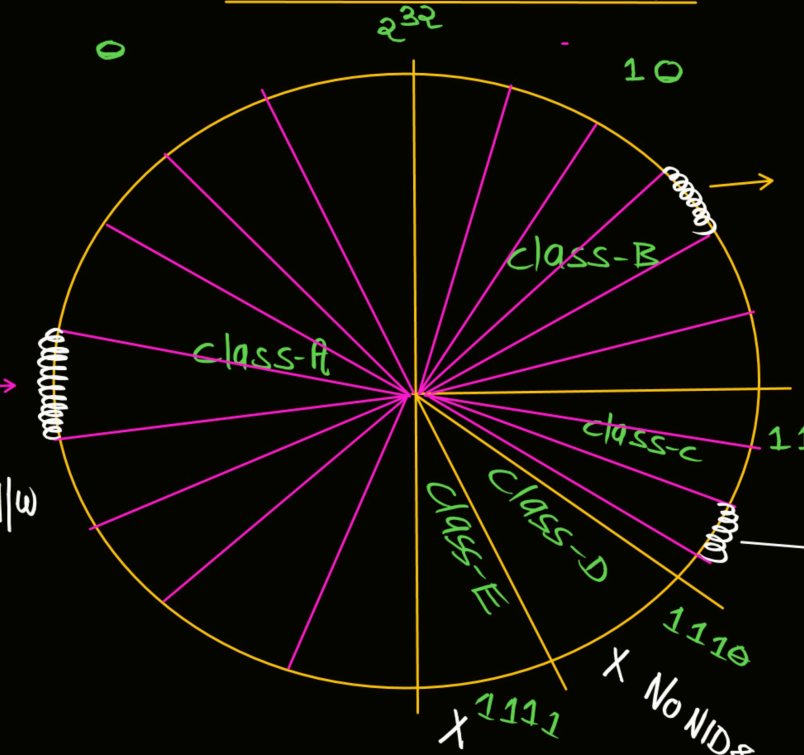
A. Dispersed

B. Blocked

C. Wasted

D. Reserved

classFull Addressing



$\begin{pmatrix} 2^{24} * 128 \\ 2^{24} * 2^{7} \\ 2^{31} \end{pmatrix}$

2^{24} IP Add | N|w
or
$2^{24} - 2$ Host | N|w

2^{16} IP Add | Network
or
$2^{16} - 2$ Host | Network

2^{8} IP Add | Network
or
$2^{8} - 2$ Host | Network

class A : 2^{24} IP Addresses in one Network

class-B : 2^{16} IP Addresses in one Network

class-C : 2^{8} IP Addresses in one Network

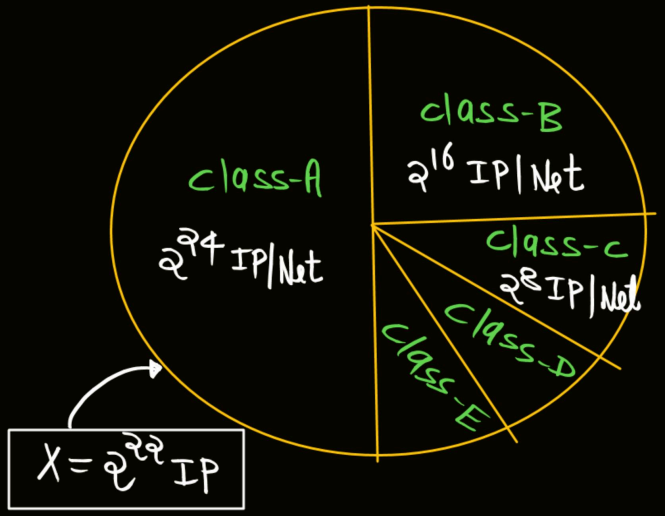
(B)

$(2^{14} * 2^{16}) = 2^{30}$

(C)

$2^{21} * 2^{8} = 2^{29}$

I : organization $X = 2^{22}$ IP Add



IP Addresses wasted $= 2^{24} - 2^{22}$

$= 2^2 * 2^{22} - 2^{22}$

$= 4 * 2^{22} - 2^{22}$

$= 3 * 2^{22}$

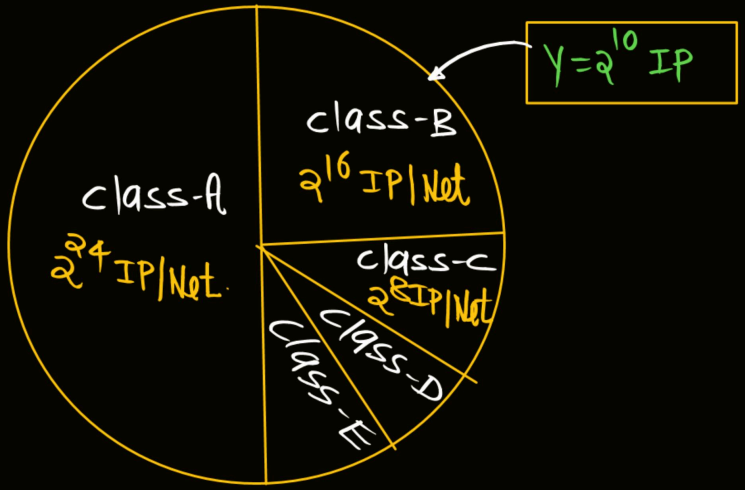
$= 3 * 2^2 * 2^{20}$

$= 3 * 4 * 2^{20}$

$= 12\,M$

$= 1,25,82,912$

II organization $Y = 2^{10}$ IP Addresses



IP Addresses wasted

$= 2^{16} - 2^{10}$

$= 2^6 * 2^{10} - 2^{10}$

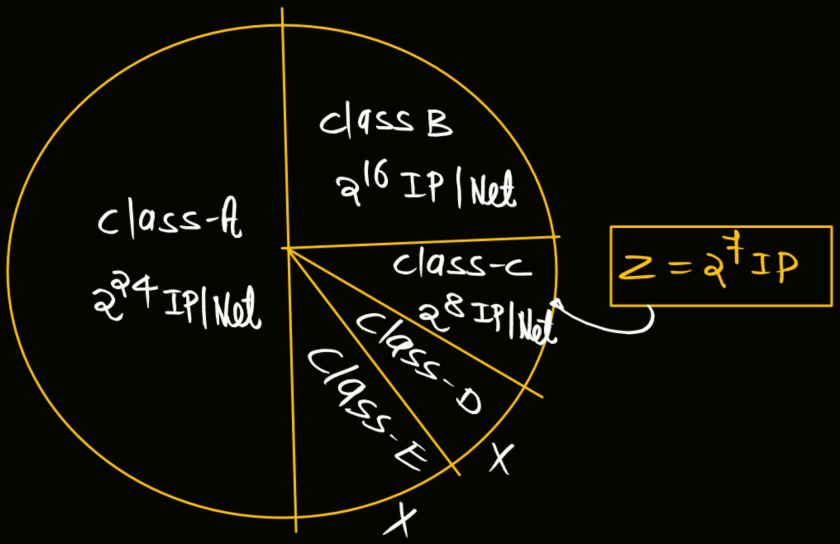
$= 64 * 2^{10} - 2^{10}$

$= 63 * 2^{10}$

$= 63K$

$= 64512$

Organization $z = 2^7$ IP Add



IP Addresses wasted

$= 2^8 - 2^7$

$= 256 - 128$

$= 128$

CS & IT Engineering

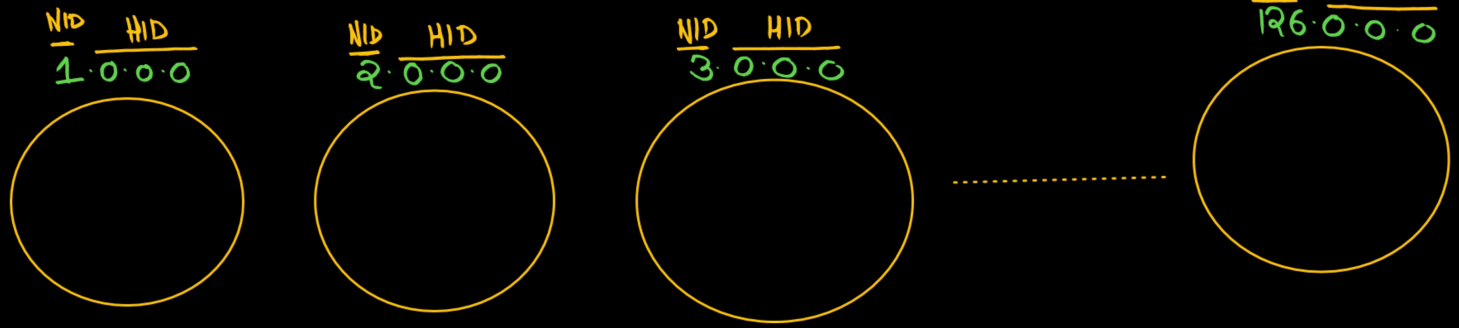
Computer Network

IPv4 Addressing

Lecture Number-4

By- Ankit Sir

class-A [1 - 126]



NOTE:

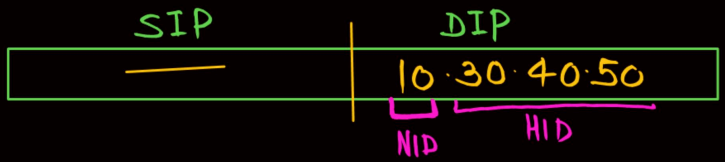
When ever we have all 0's in HID part of any IP address , that IP address represent the NID of entire network this is the reason we can't assign this IP address to any host.

Identification Problem

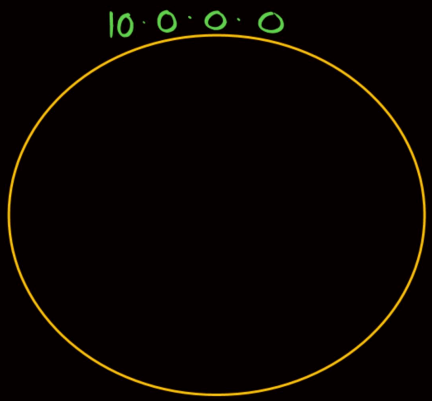
To send a packet from source to destination we need 3 identification steps.

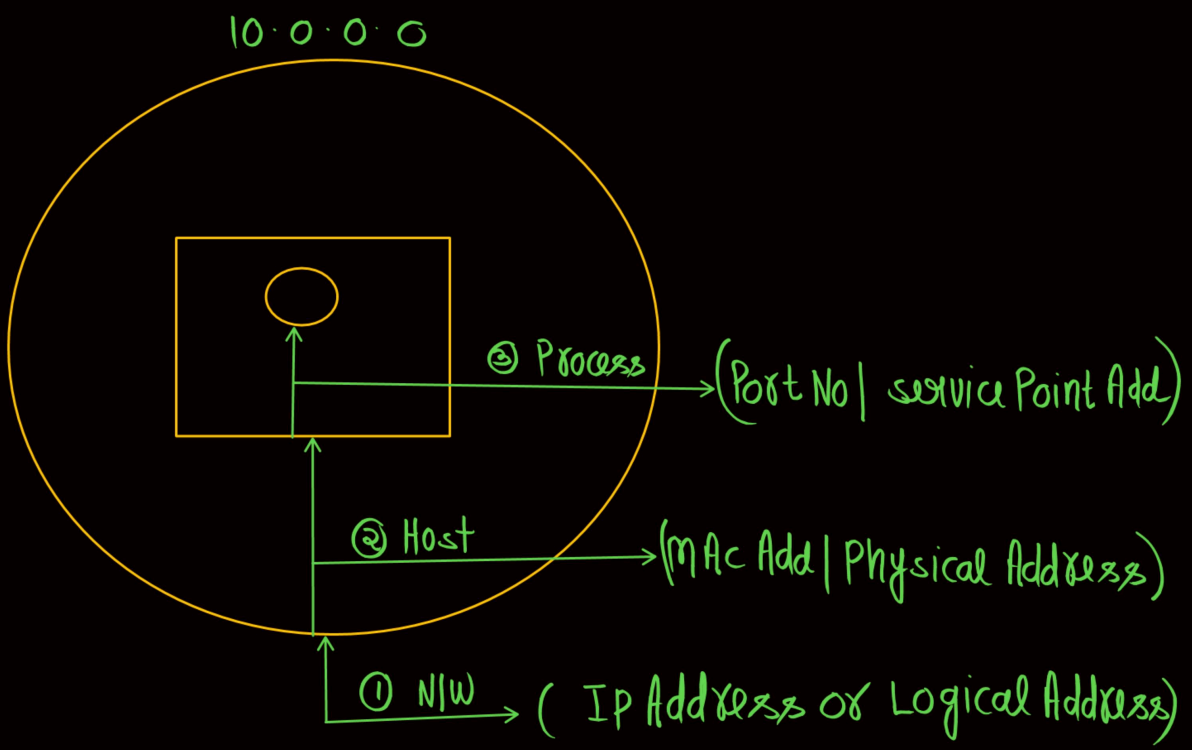
1. Identify the Network
2. Identify the host with in the network i.e. among all computer one computer is Identified.
3. Identify the process with in the Host.

1.



NID = 10.0.0.0




10.0.0.0
③ Process
(Port No | service Point Add)
② Host
(MAc Add | Physical Address)
① N|W
(IP Address or Logical Address)

ARP request

ARP request is Broadcasting

ARP reply is unicasting

PortNo = 16 bit

↓ Range

0 to $2^{16} - 1$

0 to 65,535

SMTP → 25

HTTP → 80

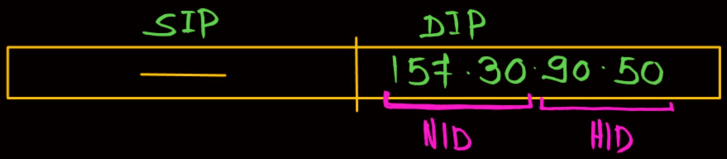
FTP [20
21

DNS — 53

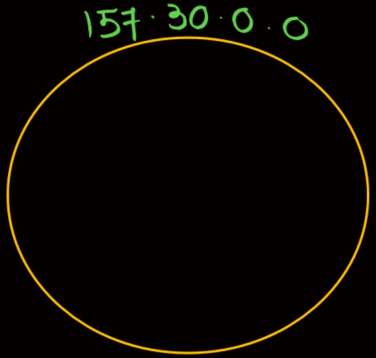
Well Known Number

Assigned & control by IANA

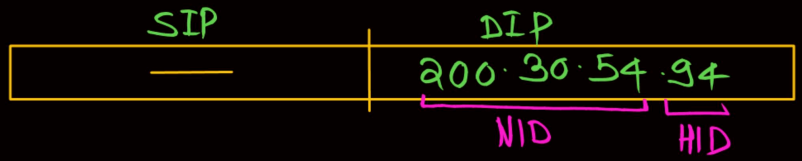
2.



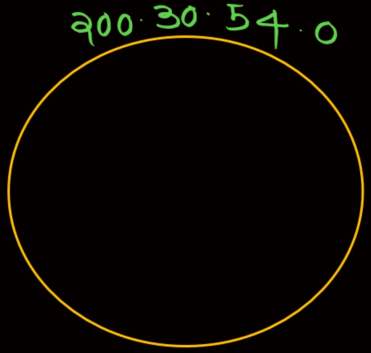
NID = 157.30.0.0



3.



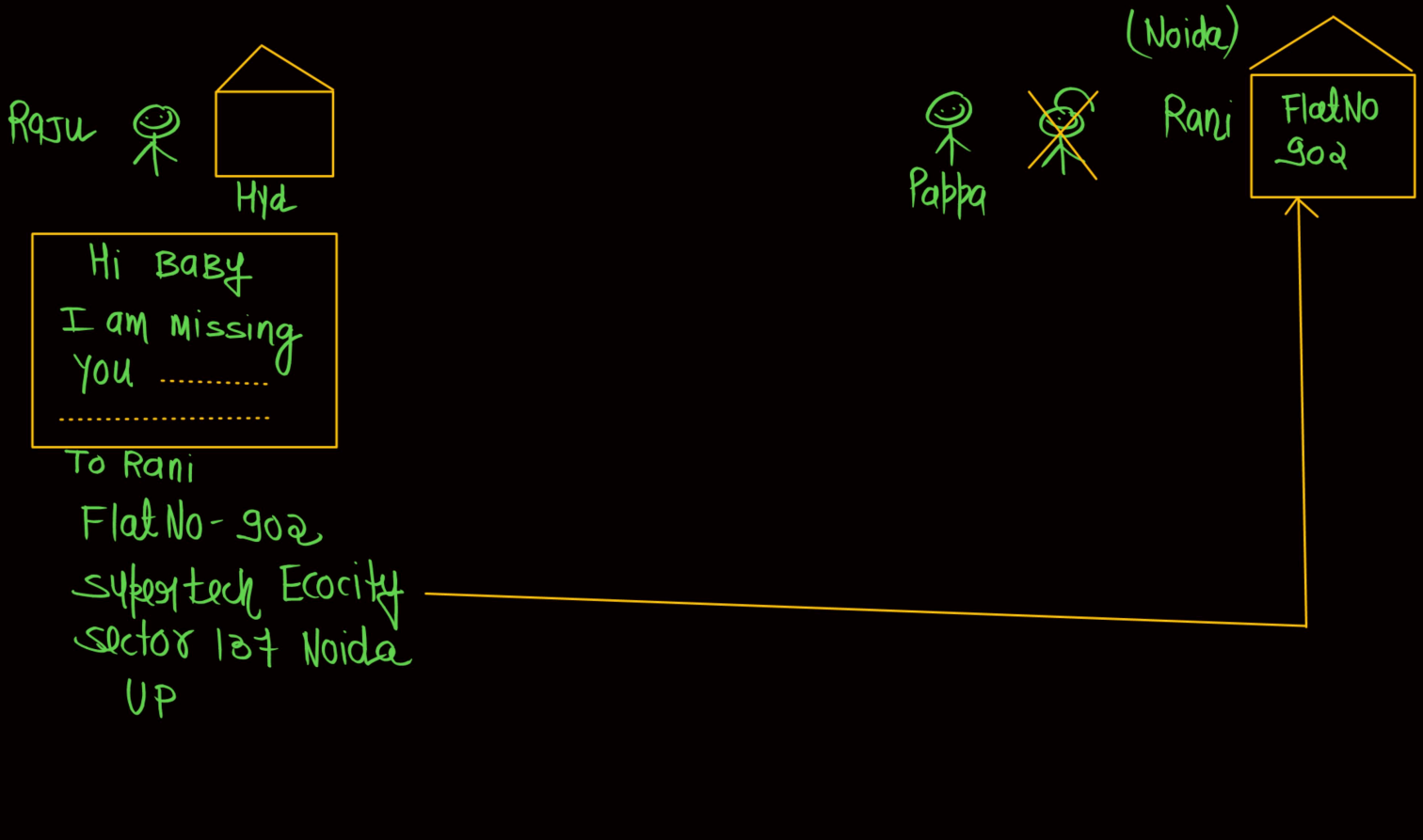
NID = 200.30.54.0



a. Solution for identification of network is IP Address or logical Address. Now we get destination IP using DNS.

b. Solution For Identification of Host within the Network is physical Address or MAC Address. given an IP Address we get MAC address using ARP (Address Resolution protocol).

c. Solutions for the identification of process within the Host is Port Number


Raju
Hyd
Hi Baby
I am missing
you .....
.....
To Rani
Flat No - 902
Supertech Ecocity
sector 137 Noida
UP
Pappa
Rani
(Noida)
Flat No
902

TYPES OF COMMUNICATION

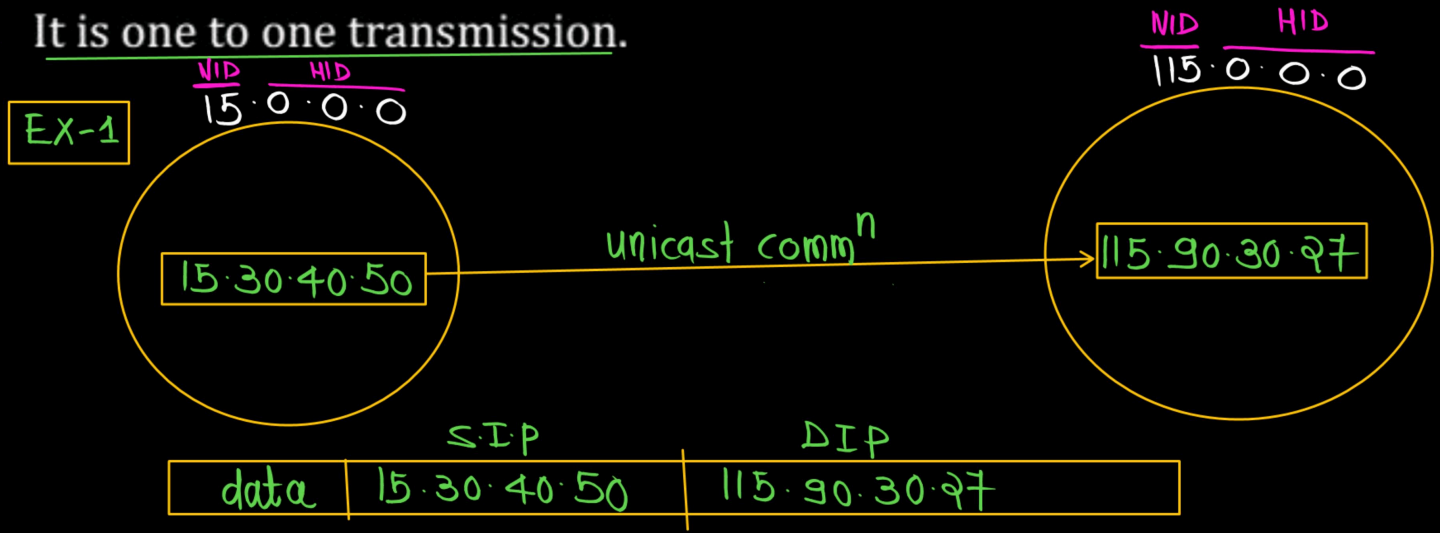
(i) Unicast Communication (1 : 1)

(ii) Broadcast Communication (1 : All)

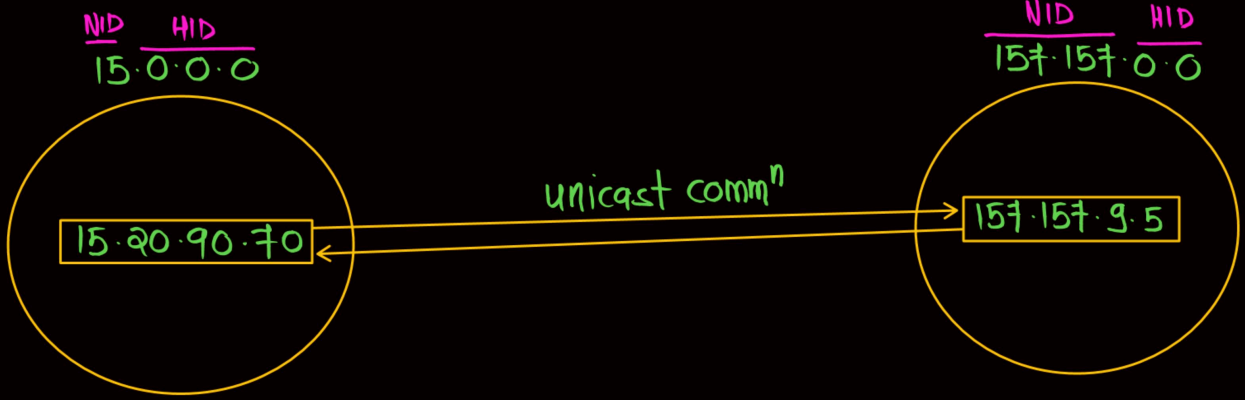
(iii) Multicast Communication (1 : Many)

Unicast Communication:

1. Transmitting the data from one computer to another computer is called as unicast communication.
2. It is one to one transmission.



EX-2



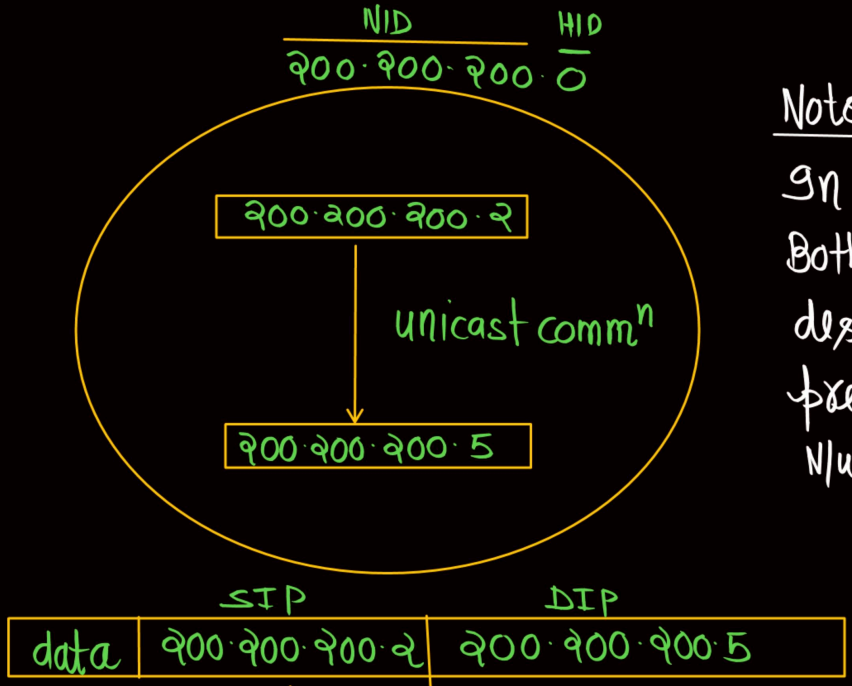
(I)

(Valid)

(II)

(Valid)

EX-3



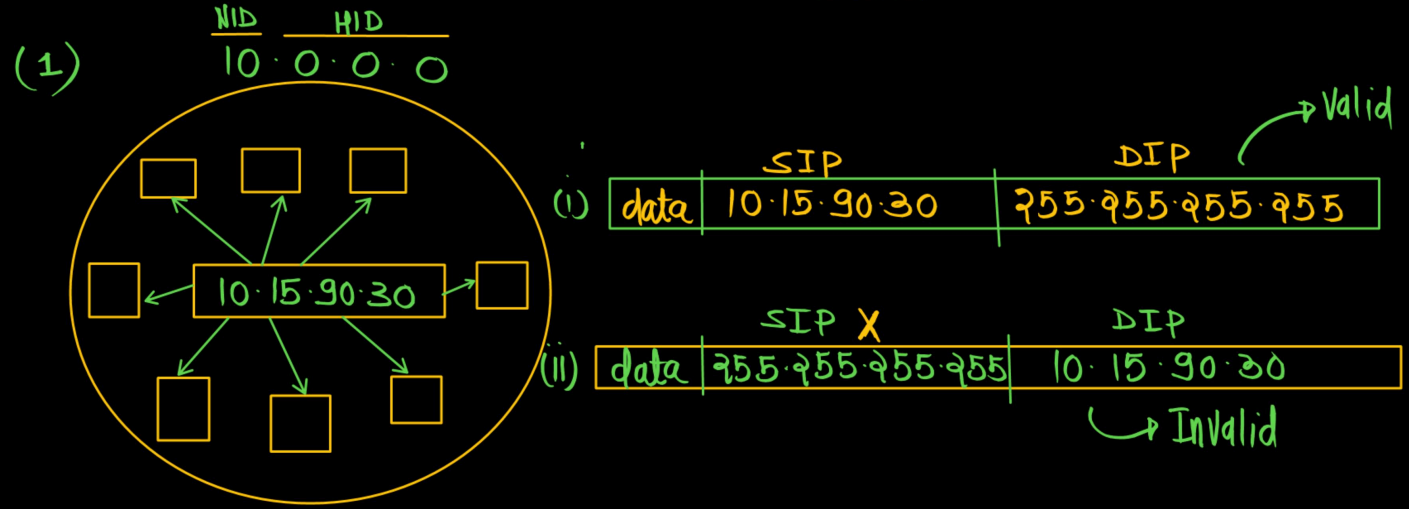
Note

In unicast comm^n Both source and destination can be present in the same N/w or different N/w


Broadcast communication
(1 : All)
Limited Broadcasting
Direct Broadcasting

Limited Broadcasting:

Transmitting data from one computer to all other computer in the same network is called as Limited Broadcasting.

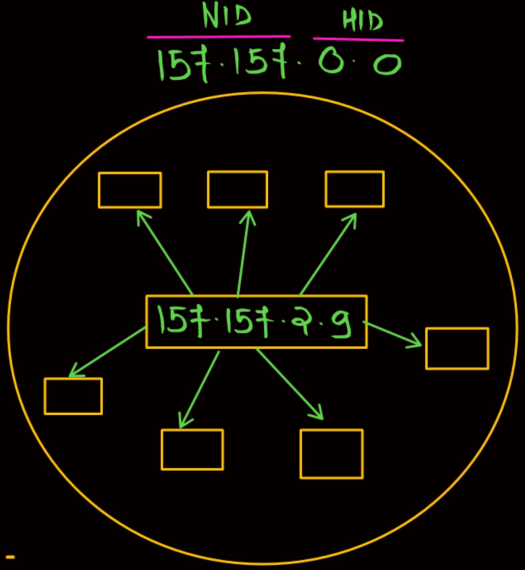


Note

1. Limited Broadcast Address will Always be used as destination IP Add

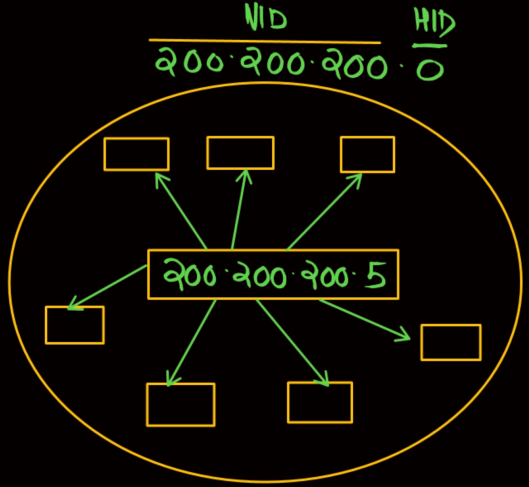
2. Limited Broadcast can't be used as a source IP Address

(2)



	SIP	DIP
data	157.157.2.9	255.255.255.255

3.

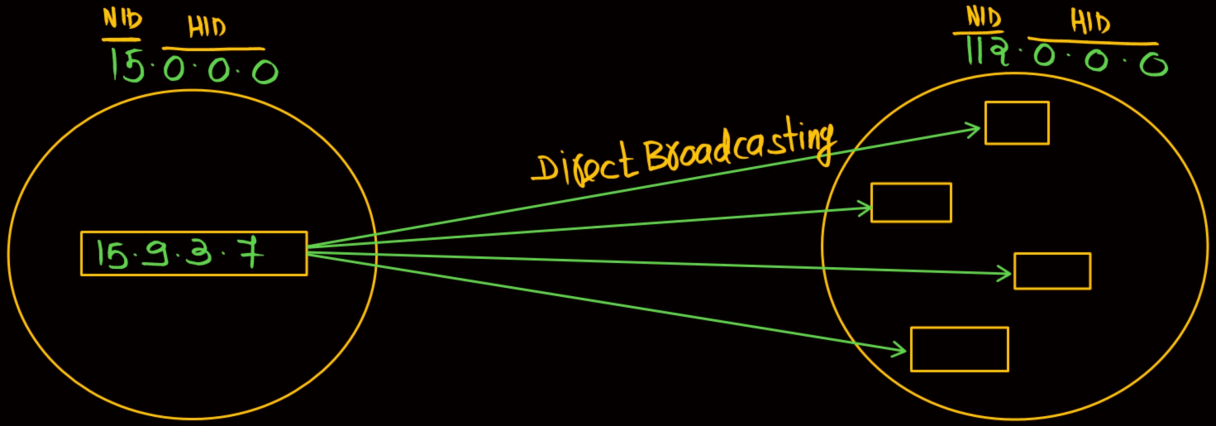


	SIP	DIP
data	200.200.200.5	255.255.255.255

Direct Broadcasting:

Transmitting data from one computer to all other computer in the different network is called as Direct Broadcasting.

(1)



(i)

	SIP	DIP
data	15.9.3.7	112.255.255.255

(Valid)

(ii)

	SIP ✗	DIP
data	112.255.255.255	15.9.3.7

(Invalid)

Note

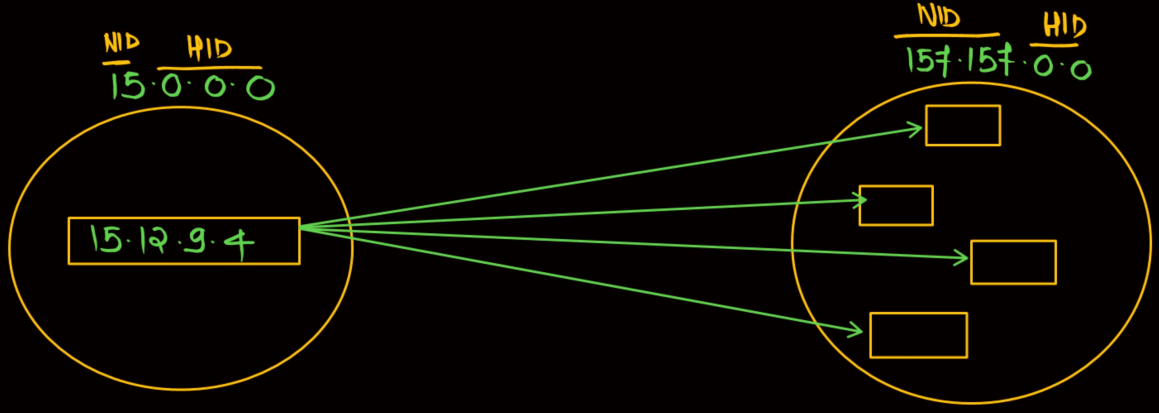
① Direct Broadcast Address will Always be used as a destination IP Add

② Direct Broadcast Address can't be used as a source IP Address

NOTE:

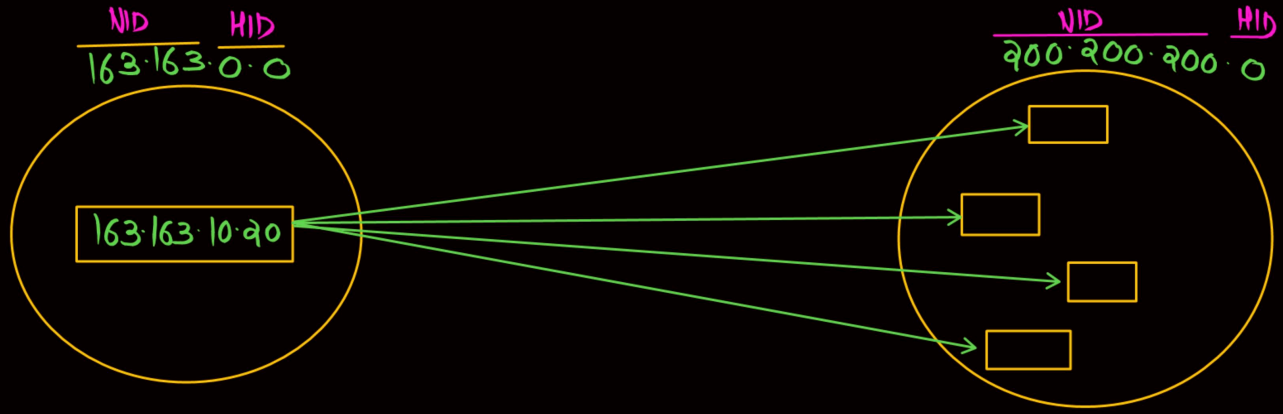
When ever we have all 1's in HID part of any IP address , that IP address represent the Direct broadcast address so this is the reason we can't assign this IP address to any host. (Computer)

2.



data	SIP	DIP
	15.12.9.4	157.157.255.255

3.


NID
HID
163.163.0.0
163.163.10.20
NID
HID
200.200.200.0


SIP
DIP
data
163.163.10.20
200.200.200.255

Short Notes

	NID	HID	
1.	Valid	0's	→ NID of entire N/w
2.	Valid	1's	→ Direct Broadcast Address (DBA)
3.	1's	1's	→ Limited Broadcast Address (LBA)

Limited Broadcast Address = २५५.२५५.२५५.२५५

Direct Broadcast Address

- class-A → N.२५५.२५५.२५५
- class-B → N.N.२५५.२५५
- class-C → N.N.N.२५५

	IP Address	Network-Id	Direct Broadcast Address	Limited Broadcast Address
CA	19.35.21.31 (NID HID)	19.0.0.0	19.255.255.255	255.255.255.255
CA	119.31.34.2 (NID HID)	119.0.0.0	119.255.255.255	255.255.255.255
CB	150.0.94.31 (NID HID)	150.0.0.0	150.0.255.255	"
CB	190.34.17.31 (NID HID)	190.34.0.0	190.34.255.255	"
CC	200.200.34.92 (NID HID)	200.200.34.0	200.200.34.255	"
CC	217.39.47.9 (NID HID)	217.39.47.0	217.39.47.255	"
CD	226.9.7.97	X	X	X
CE	243.2.3.5	X	X	X