COMPUTER NETWORKS (CCS-303)

TUTORIAL 5

U19CS012

1> In classful addressing, find the class of following IP addresses

1>

Class	Start Address	End Address
CLASS A	0.0.0.0	127. 255. 255. 255
CLASS B	128.0.0.0	191. 255. 255. 255
CLASS C	192.0.0.0	223. 255. 255. 255
CLASS D	224.0.0.0	239. 255. 255. 255
CLASS E	240.0.0.0	255. 255. 255. 255

(a) 238. 34. 2. 1 – CLASS D

The first byte is '238' (in Range 224.0.0.0 – 239.255.255.255)

Therefore, Class of IP Address [238.34.2.1] is Class D

(b) 129. 14. 6. 8 – CLASS B

The first byte is '129' (in Range 128.0.0.0.0 - 191.255.255.255)

Therefore, Class of IP Address [129.14.6.8] is Class B.

2> In classless addressing, if last IP address of given block is 25. 34. 255. 255 / 16 → the mask

A) Find the first address

① The binary representation of given address

00011001 00100010 11111111 11111111

25 34 255 255

② First address can be found by ANDing the given address with the mask (/16 ⇒ 11111111 11111111 00000000 00000000)

[Anding is done bit-by-bit]

Address :	0001 1001	0010 0010	1111 1111	1111 1111
Mask :	1111 1111	1111 1111	0000 0000	0000 0000
First Address	0001 1001	0010 0010	0000 0000	0000 0000

25. 34 . 0 . 0

Ans: The first address of Block - 25.34.255.255 /16

= 25.34.0.0

3.) In classless addressing, if first IP address of given block is 211.17.180.0 /24

3.) ① Binary representation of given address

1101 0011 0001 0001 1011 0100 0000 0000

② The last address can be found by ORing the given addresses with the complement of the mask.

ORing is done bit by bit.

(/24) [24 1's 8 0's]

↓

Mask = 1111 1111 1111 1111 1111 1111 0000 0000

③ Address - 1101 0011 0001 0001 1011 0100 0000 0000

Mask Complement (OR) 0000 0000 0000 0000 0000 0000 1111 1111

1101 0011 0001 0001 1011 0100 1111 1111

211 . 17 . 180 . 255

Ans: Last address of given block is 211.17.180.255.

SUMMARY, In IPv4 addressing

(x.y.z.t /n)

x.y.z.t = one of the addresses /n = the mask

① The first address in block can be found by setting the rightmost 32-n bits to '0'

② The last address in block can be found by setting the rightmost 32-n bits to '1'

③ The number of addresses in the block can be found using 2^{32-n}

U19CS012

4.) In classless addressing, if the IP address in given block is
201.54.105.16 / 26

Address : 1100 1001 0011 0110 0110 1001 0001 0000

A) Find the First address – 201.54.105.0

setting the rightmost 32-26 = 6 bits to '0'

1100 1001 0011 0110 0110 1001 00 00 0000

B) Find the Last address – 201.54.105.63

setting the rightmost 32-26 = 6 bits to '1'

1100 1001 0011 0110 0110 1001 00 11 1111

C) Find the total addresses in the block $= 2^{32-26} = 2^6 = 64$

The number of address can also be found by complementing the mask and interpreting it as decimal & add 1 to it

{complement of mask} 00000000 00000000 00000000 0011 1111 = 63

+ 1

64

D) How many IP addresses can be actually used for assignment to various networking devices (eg. Laptop) & why?

D) Total no. of usable IP addresses = 26-2

= 62

First address is reserved for network id set.

Last address is reserved for network broadcast id.

SUBMITTED BY

BHAGYA VINOD RANA

U19CS012

CSE (3rd Yr)