CS & IT ENGINEERING

COMPUTER NETWORKS

IPv4 Addressing

Lecture No-12

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Subnetting Part-5

Subnetting Category 5

Separate SID & HID

class-c

NID	HID
24	8

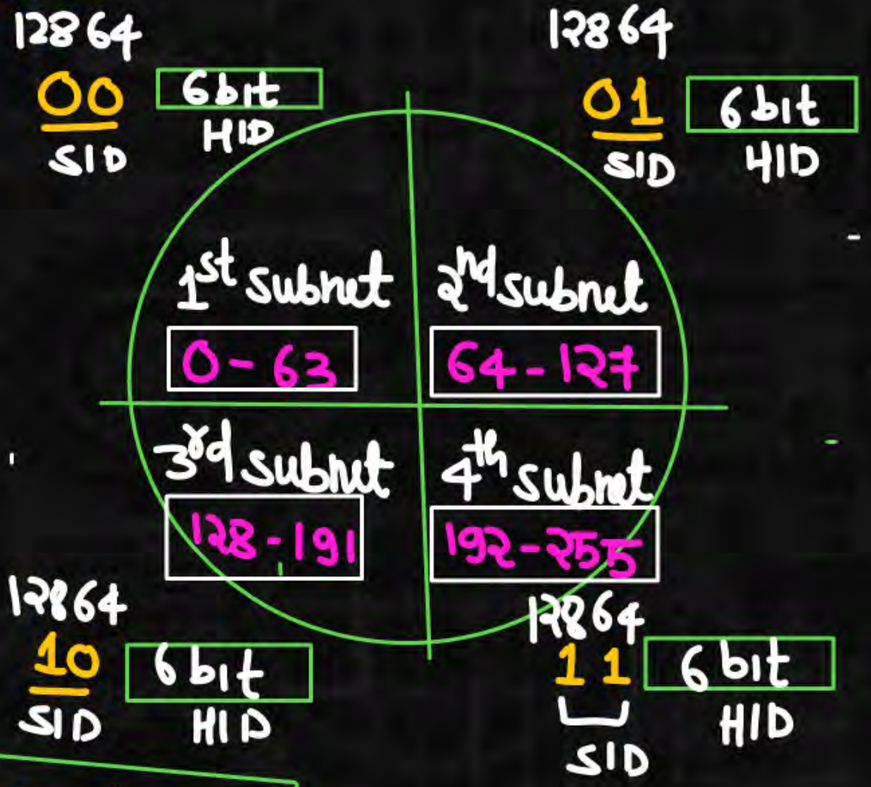
4 subnet

2	6
SID	HID

2^2 = 4 subnet

$2^6 - 2$ = 62 Host/subnet

1st sub → 00
2nd " → 01
3rd " → 10
4th " → 11



Subnet Mask

255.255.255.192 (128+64)

2nd subnet

200.200.200.01 ------
NID SID HID

200.200.200.01000000 → 200.200.200.64 SID

200.200.200.01000001 → 200.200.200.65 [SID : 200.200.200.64, HID : 200.200.200.1]

200.200.200.01000010 → 200.200.200.66 [SID 200.200.200.64, HID 200.200.200.2]

200.200.200.01000011 → 200.200.200.67 [SID 200.200.200.64, HID 200.200.200.3]

⋮

200.200.200.01111110 → 200.200.200.126 [SID 200.200.200.64, HID 201.200.200.62]

200.200.200.01111111 → 200.200.200.127] DBA

Q.1 IP Address = 200.200.200.126

Subnet Mask = 255.255.255.192 then find the SID and HID?

IP Address: 200.200.200.01111110

128 64 32 16 8 4 2 1

SID | HID

Subnet Mask: 255.255.255.11000000

NID | SID | HID

SID = 128*0 + 64*1 = 64

HID = 32*1 + 16*1 + 8*1 + 4*1 + 2*1 + 1*0

HID = 62

SID = 200.200.200.64

HID = 200.200.200.62

SID = 64

HID = IP Add - SID

HID = 126 - 64

HID = 62

OR

IP Add
AND
Net mask

NID

IP Add
AND
Subnet Mask

SID

HID = IP Add - SID
= 126 - 64
HID = 62
HID = 200.200.200.62

IP Add = 200.200.200.01111110
AND
Subnet Mask = 255.255.255.11000000

SID = 200.200.200.01000000

SID = 200.200.200.64

Q.2

IP Address = 200.200.200.120

Subnet Mask = 255.255.255.240 then find the SID and HID?

IP Add = 200.200.200. 0 1 1 1 | 1 0 0 0 (128 64 32 16 | 8 4 2 1)
SID | HID

AND

Subnet Mask = 255.255.255. 1 1 1 1 | 0 0 0 0
SID | HID

SID = 200.200.200.112

HID = IP Add − SID
= 120 − 112
HID = 8

HID = 200.200.200.8

Q.3 IP Address = 200.200.200.120 (SID | HID)

subnet Mask = 255.255.255.41 then find the SID and HID?

		128	64	32	16	8	4	2	1
IP Add	= 200.200.200.	0	1	1	1	1	0	0	0
AND	AND								
Subnet Mask	= 255.255.255. (NID)	0	0	1	0	1	0	0	1
		H	H	S	H	S	H	H	S
SID	= 200.200.200.	0	0	1	0	1	0	0	0

SID = 200.200.200.40

SID = 32×1 + 8×1 + 1×0

SID = 40

HID = IP Add − SID

= 120 − 40

HID = 80

HID = 200.200.200.80

Q.4 Find the subnet Address for the Following

IP Address: 200.34.22.156

Mask: 255.255.255.240

A. 200.33.22.144

B. 200.34.22.143

C. 200.34.22.13

D. 200.34.22.144 ✓

IpAdd = 200.34.22.10011100

AND

Subnet Mask = 255.255.255.11110000

SID = 200.34.22.10010000

SID = 200.34.22.144

Subnetting Category 6

SM = 255.255.255.224

11111111.11111111.11111111.11100000

NID | SID | HID

No. of 1's = 27

NID + SID = 27

24 + SID = 27

SID = 3 bit

No of subnet = $2^3 = 8$

No. of 0's = 5

HID = 5

No. of Host/subnet = $2^5 - 2 = 30$

Q.1 If Subnet Mask is 255.255.255.224 then find

A. Number of IP Address/subnet possible 2^5

B. Number of Host/subnet possible $2^5 - 2$

C. Number of subnet in class A $= 2^{19}$

D. Number of subnet in class B $= 2^{11}$

E. Number of subnet in class C $= 2^3$

Q.1 If Subnet Mask is 255.255.255.224 then find

A. Number of IP Address/subnet possible $= 2^5$

B. Number of Host/subnet possible $= 2^5 - 2$

C. Number of subnet in class A $= 2^{19}$

D. Number of subnet in class B $= 2^{11}$

E. Number of subnet in class C : 2^3

AD Rule

11111111. 11111111. 11111111. 111 00000

HID

class A

class-B

class-C

Soln: 255.255.255.224

11111111.11111111.11111111.11100000

No. of 1's = 27

No. of 0's = 5

HID = 5 bit

No. of IP Addresses | subnet = $2^5 = 32$

No. of Host | subnet = $2^5 - 2 = 30$

Class-A

NID + SID = 27

8 + SID = 27

SID = 19 bit

No. of subnet in class A = 2^{19}

Class-B

NID + SID = 27

16 + SID = 27

SID = 11 bit

No of subnet in classB = 2^{11}

Class-C

NID + SID = 27

24 + SID = 27

SID = 3 bit

No of subnet in classC = 2^3

Q.2 If Subnet Mask is 255.255.255.240 then find

A. Number of IP Address/subnet possible $= 2^4$

B. Number of Host/subnet possible $= 2^4 - 2$

C. Number of subnet in class A $= 2^{20}$

D. Number of subnet in class B $= 2^{12}$

E. Number of subnet in class C $= 2^4$

AD RULE: 11111111.11111111.11111111.11110000
(11111111 = class-A; class-B; class-C; 0000 = HID)

Q.3 If Subnet Mask is 255.255.252.0 then find

A. Number of IP Address/subnet possible $= 2^{10}$

B. Number of Host/subnet possible $= 2^{10} - 2$

C. Number of subnet in class A $= 2^{14}$

D. Number of subnet in class B $= 2^{6}$

E. Number of subnet in class C = Not Possible

SM: 11111111.11111111.111111**00**.**00000000**

00.**00000000** — HID

11111111 — class-A

11111111.11111111 — class-B

11111111.11111111.111111**00** — class-C

Q.4 If Subnet Mask is 255.252.0.0 then find

A. Number of IP Address/subnet possible $= 2^{18}$

B. Number of Host/subnet possible $= 2^{18} - 2$

C. Number of subnet in class A $= 2^{6}$

D. Number of subnet in class B = Not Possible

E. Number of subnet in class C = Not Possible

SM: 11111111.11111100.00000000.00000000

11111111 → class-A

11111111.11111100 → class-B

00.00000000.00000000 → HID


THANK YOU
GW
SOLDIERS !