CS & IT ENGINEERING

COMPUTER NETWORKS

IPv4 Addressing

Lecture No-12

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Subnetting Part-4

Subnetting Category 5

Separate SID & HID

class-c

NID	HID
24	8

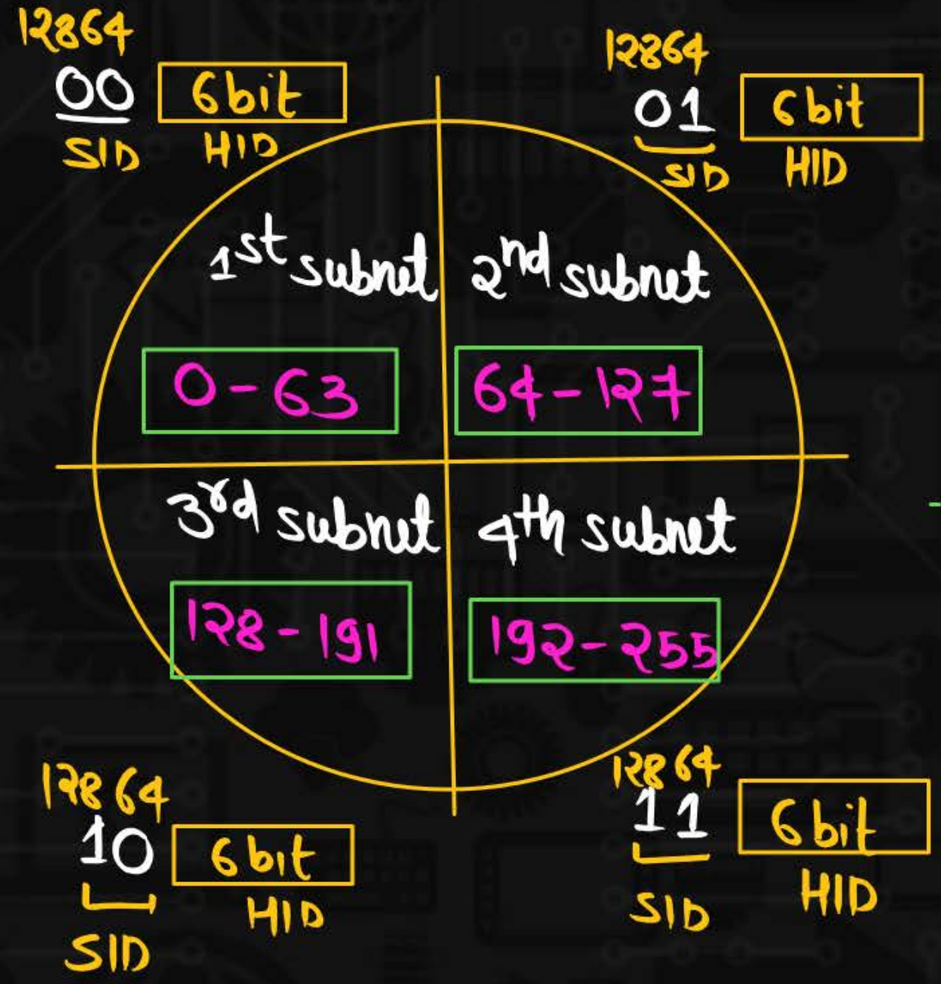
4 subnet

2	6
SID	HID

$2^2 = 4$ subnet

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

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



Subnet Mask = 255.255.255.192

2nd subnet

200.200.200.01 ------

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 200.200.200.62

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. 0 1 1 1 1 1 0

(128 64 32 16 8 4 2 1)

NID | SID | HID

Subnet Mask: 255.255.255. 1 1 0 0 0 0 0 0

NID | SID | HID

SID = 128*0 + 64*1 = 64

HID = 32*1 + 16*1 + 8*1 + 4*1 + 2*1 + 1*0 = 62

SID = 200.200.200.64

HID = 200.200.200.62

SID = 64

HID = IP Add - SID

HID = 126 - 64 = 62

IP Add
AND
Net mask
NID

IP Add = 200.200.200.01111110
AND AND
Subnet mask = 255.255.255.11000000
SID = 200.200.200.01000000

SID = 200.200.200.64

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

HID = 200.200.200.62

Q.2

IP Address = 200.200.200.120

Subnet Mask = 255.255.255.240 then find the SID and HID?

SID = 112

HID = 8

IP Add = 200.200.200. 0 1 1 1 1 0 0 0

(64 32 16 8 — SID: 0 1 1 1 | HID: 1 0 0 0)

AND AND

SM = 255.255.255. 1 1 1 1 0 0 0 0

(NID | SID | HID)

SID = 200.200.200. 0 1 1 1 0 0 0 0

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

subnet Mask = 255.255.255.41 then find the SID and HID?

IP Add = 200.200.200.01111000

32 8 1

AND

SM = 255.255.255.00101001

SID = 200.200.200.00101000

SID = 200.200.200.40

HID = IP Add - SID

HID = 120 - 40 = 80

HID = 200.200.200.80

SID = 32*1 + 8*1 + 1*0 = 40

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 AND
SM = 255.255.255.11110000
SID = 200.34.22.10010000

SID = 200.34.22.144

Subnetting Category 6

Subnet Mask = 255.255.255.224

11111111.11111111.11111111.11100000

NID | SID | HID

No. of 1's = 27, No. of 0's = 5

NID + SID = 27

24 + SID = 27

SID = 3bit

No. of subnet = 2^3

HID = 5bit

No. of IP Add | subnet = 2^5

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

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 $= 2^3$

SM = 255.255.255.224

11111111.11111111.11111111.11100000

No of 1's = 27 , No of 0's = 5

NID + SID = 27

HID = 5 bit

No of IP Add/subnet = 2^5

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

For class-A

NID + SID = 27

8 + SID = 27

SID = 19 bit

No of Subnet = 2^{19} in class A

For class-B

NID + SID = 27

16 + SID = 27

SID = 11 bit

No of subnet in class B = 2^{11}

For class-C

NID + SID = 27

24 + SID = 27

SID = 3 bit

No 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 $= 2^3$

ADRule: 11111111.11111111.11111111.11100000

11111111 — class-A

11111111.11111111 — class-B

11111111.11111111.11111111 — class-C

11100000 — HID

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 $= 2^4$

ADRule : 11111111.11111111.11111111.11110000

class-A | class-B | class-C | 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 $= 2^{4}$

E. Number of subnet in class C → Not possible

AD Rule: 11111111.11111111.111111|00.00000000

11111111 → class-A

11111111.11111111 → class-B

11111111.11111111.111111 → class-C

00.00000000 → HID

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

ADRule : 11111111 · 111111 00 · 00000000 · 00000000

11111111 : class-A

11111111 · 111111 : class-B

00 · 00000000 · 00000000 : HID


THANK YOU
GW
SOLDIERS !