CS & IT ENGINEERING

Computer Networks

Subnetting Parts – 04

DPP 05 (Discussion Notes)

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01 Question

02 Discussion

Q.1 Consider a class C network with 19 subnets and 6 hosts per subnet. Then which of the following is possible subnet mask? [MCQ]

A. 255.255.255.241

B. 255.255.255.244

C. Both (a) and (b)

D. None of these

class-C

$19 * 6 \leq 2^8 - 2$

$114 \leq 254$ (Yes)

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class-C

NID	HID
24	8

19 Subnet

5	3
SID	HID

No. of 1's in the SM = NID + SID = 24 + 5 = 29

No. of 0's in the SM = HID = 3 bit

No of subnet = $2^5 = 32$

$2^3 - 2 = 6$ Host/subnet

11111111.11111111.11111111.11111000

255.255.255.248 (Best subnet Mask)

(a) 255.255.255.241

11111111.11111111.11111111.11110001 → No. of 1's = 29

(b) 255.255.255.244

11111111.11111111.11111111.11110100 → No. of 1's = 29

Q.2

An organization need Class B network with 32 subnet and each subnet need 100 hosts which of the following is/are possible subnet mask? [MSQ]

A. 255.255.7.3 → 11111111.11111111.00000111.00000011 → 21 → 1's

B. 255.255.128.135 → 11111111.11111111.10000000.10000111 → 21 → 1's

C. 255.255.248.0 → 11111111.11111111.11111000.00000000 → 21 → 1's

D. 255.255.0.248 → 11111111.11111111.00000000.11111000 → 21 → 1's

Class-B

$32 * 100 \leq 2^{16} - 2$ (Yes)

A, B, C, D

Class-B

NID	HID
16	16

32 subnet

16	5	11
NID	SID	HID

No. of 1's in the sm = NID + SID = 16 + 5 = 21

No. of 0's in the sm = HID = 11

Q.3

A physics wallah organization is granted a class B network with IP address 186.24.0.0. For revolution 2.0, 10 bits are fixed for subnet. Then, the total number of hosts in each subnet are 62.

[NAT]

class-B

NID	HID
16	16

10	6
SID	HID

No. of subnet $= 2^{10}$

No. of Host/subnet $= 2^6 - 2 = 62$

Q.4

Consider a class C network 200.200.250.68. if 3 bits are borrowed from HID part, instead of first 3 subnet bits, last 3 bits are borrowed from HID part. Then which of the following is belong to 3rd subnet ID? [NAT]

A. 200.200.250.96

B. 200.200.250.64

C. 200.200.250.3

D. 200.200.250.2

IP Add = 200.200.250.68

NID = 200.200.250.0

Class-C

NID	HID
24	8

5	3
HID	SID

Subnet ID's (ADRule)

	4	2	1	
1st ←	0	0	0	
2nd ←	0	0	1	
3rd ←	0	1	0	→ 2
	0	1	1	
	1	0	0	
	1	0	1	
	1	1	0	
	1	1	1	

200.200.250.00000010

200.200.250.2

200.200.250.2

Q.5

Consider a class C network address of 220.220.220.0. it is divided into 3 subnets A, B and C each subnet need 90, 40 and 33 hosts respectively. Which of the following is a valid subnet mask for subnet B and C respectively? [MCQ]

A. 255.255.255.128 and 255.255.255.192.

B. 255.255.255.192 and 255.255.255.128.

C. Both the subnet mask are same.

D. None of these.

A = 90
B = 40
C = 33
163 ≤ $2^8 - 2$ (yes)

$\frac{2^8}{4} = \frac{2^8}{2^2} = 2^{8-2} = 2^6$

Class-C

NID	HID
24	8

3 subnet

No. of subnet = $2^2 = 4$ ← 2 (SID), 6 (HID) → No. of Host/subnet = $2^6 - 2 = 62$

VLSM

Subnet Mask

255.255.255.128

No.of 1's = NID+SID = 24+1 = 25

11111111.11111111.11111111.10000000

255.255.255.128

sm → 255.255.255.192

No.of 1's in the sm = NID+SID = 24+2 = 26

11111111.11111111.11111111.11000000

255.255.255.192

sm → 255.255.255.192

No.of 1's in the sm = NID+SID = 24+2 = 26

11111111.11111111.11111111.11000000

255.255.255.192

Q.6

Suppose, a class C network is divided into 3 subnets P, Q and R. Subnet P need 50 host, subnet Q need 40 hosts and subnet R need 120 hosts. Which of the following is an appropriate subnet mask for R? [MCQ]

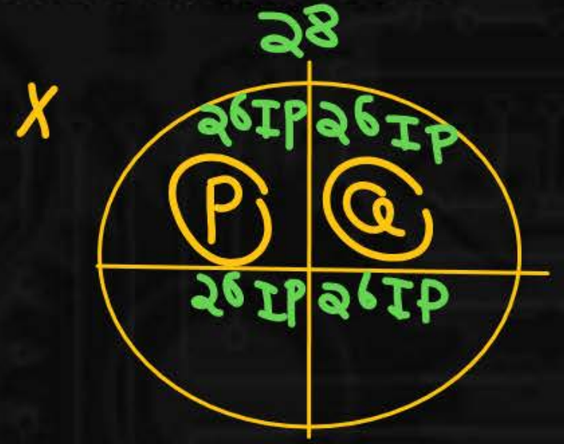
(Hints: using VLSM technique)

A. 255.255.255.128

B. 255.255.255.224

C. 255.255.255.0

D. 255.255.255.192



P = 50
Q = 40
R = 120

210 ≤ 2^8 - 2 (yes)

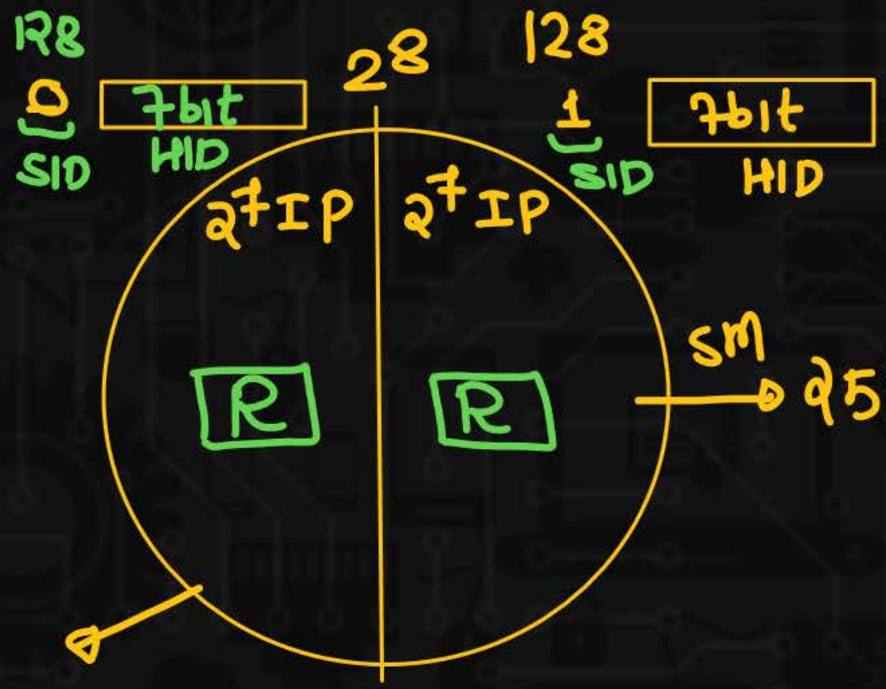
class-c

NID	HID
24	8

NID	SID	HID
24	2	6

No of subnet = 2^2 = 4

2^6 - 2 = 62 Host/sub



sm: 255.255.255.128

Q.7

Suppose, an organization is divided into 6 departments with network 199.198.197.196 For each department 3 bits are borrowed from HID part of given network. [MCQ]

class-C

SID	Department Number
010	1
100	2
110	3
101 →	4
111 →	5
101	6

class-C

NID	HID
24	8

3	5
SID	HID

Which of the following is direct broadcast address of department number 5 and 4 respectively?

Dept 5 → 199.198.197.111 11111 → 199.198.197.255

NID . SID HID

A. 199.198.197.191 and 199.198.197.255

B. 199.198.197.169 and 199.198.197.191

C. 199.198.197.169 and 199.198.197.255

D. 199.198.197.255 and 199.198.197.191

Dept - 4 → 199.198.197 . 101 11111 → 199.198.197.191
NID SID HID

Q.8 In a class B network. On the internet has a subnet mask 255.255.240.0 How many minimum number of subnets are possible? [MCQ]

A. 32

B. 30

C. 16 ✓

D. 14

11111111 · 11111111 · 1111 0000 · 00000000

NID SID HID

No. of 1's = 20, No of 0's = 12

NID + SID = 20

16 + SID = 20

SID = 4 bit

No. OF subnet = $2^4 = 16$


THANK YOU GW
SOLDIERS !