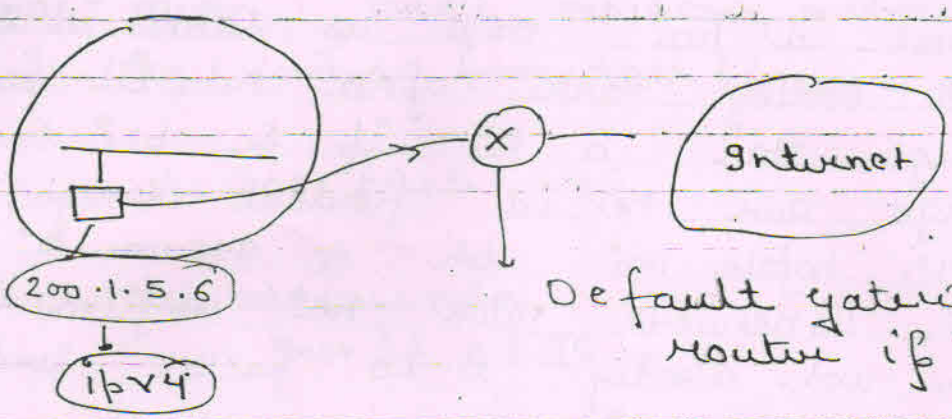
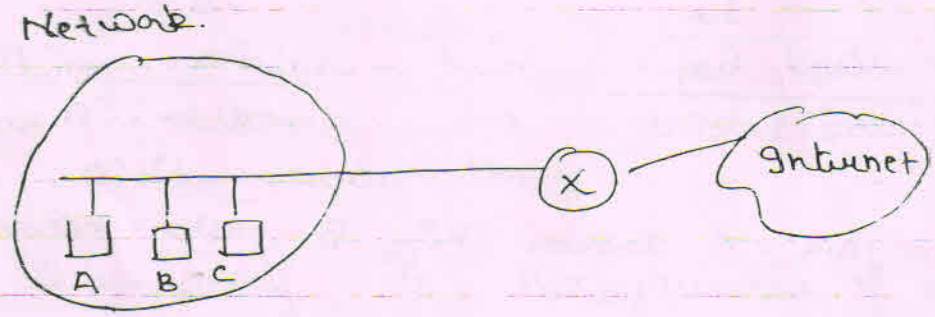


- Now yeh Subnet mask kyo dekhata hai, woh isliye Subnet mask ~~k~~ toh router ko chahiye hota hai, route decide karne k liye, toh hamara system Subnetmask ka karta kya hai.

- Suppose kohi System A hai aur System B hai agar dono ek hi ~~Stb~~ network mein belong karte hai toh woh directly data exchange karsakte hai, router ki dawasKta hi nahi hogi.



& Agar hamko A se B ko data send karna hai toh hamare pass 2 way hai ya toh hum router par data send kare then router decide karega. usko konse interface par forward karna hai. Ya phir A ka pass uska

Subnet_id hai now us subnet id se woh anding karke apna net_id pata karega then B ki ip se bhi ending karga aur net_id findout karega, agar match hojata hai toh A assume ki B bhi us network mein hai ~~us~~ jisme woh hai toh woh directly B ko packet send kardega. Router ko nahi karega.

Given two ip address and corresponding ~~Sub~~ Subnetmask ~~and~~ then what you Conclude from them -

I_A :→ 200.1.2.10
S_A :→ 255.255.255.128

I_B :→ 200.1.2.69
S_B :→ 255.255.255.192.

Now

I_A	I_B
anding S_A	S_A
200.1.2.0	200.1.2.0

Here A assume ki B uske network mein hi hai.

Now

I_B	I_A
S_B	S_B
200.1.2.0	200.1.2.64

Here B assume ki A kisi aur network mein hai.

Supernetting

Now given Direct broadcast address, what you can conclude from that ??

200. 1. 15. 255.

broadcast address mein
Host id all 1's

200. 1. 0000 1111 . 11111111

Now, 12 bits hai one hai, but aaisa bhi toh hosakta hai ki

200. 1. 00001 111. 11111111

net-id ka part ho. host

** Toh ek broadcast address se hum kuch conclude nahi karsakte hai (sahi se).

Concept of Supernetting : (aggregation).

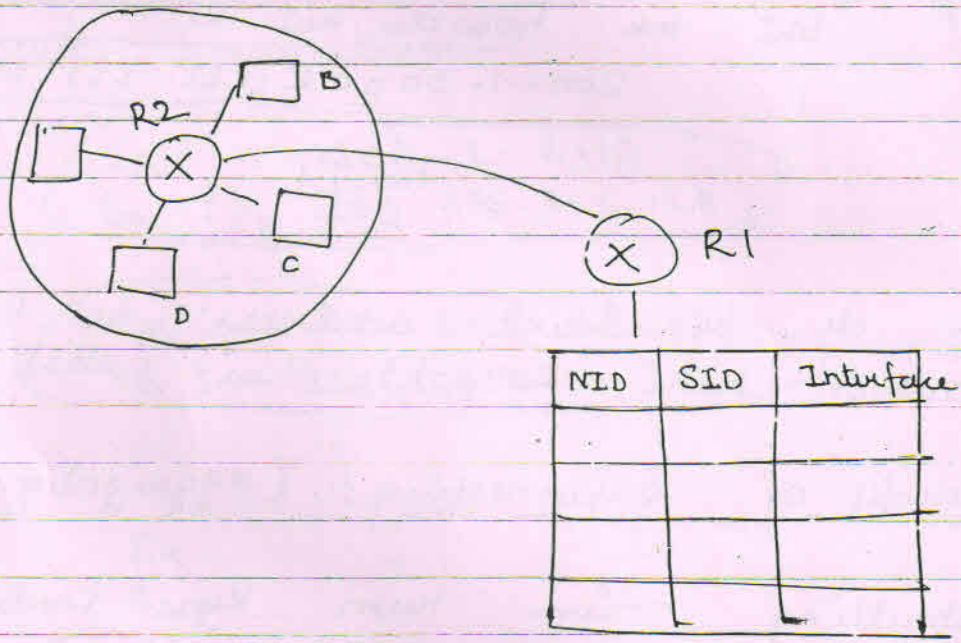
- Subnetting mein hum kya karte the bigger network ko small-small network mein divide karte the.
- But Supernetting is the reverse of subnetting
- Yaha par hum small-small network ko combine karke bigger network mein convert karte hai

IPv6 → 128 bit ka hota hai

- But question yeh hai aaisi Requirement kyo aaye.

→ Agar router ki table bahut badi hogayi toh searching time decrease ho jada hojayega toh tulay increase hojata hai, ek reason yeh bhi Subnetting ka.

For example :-



NID	SID	Interface

- Suppose Abhi R1 table four entries rakega (A, B, C, D) ki, but ham aaisa bhi toh karsakte hai ek R1 ek entry rakhe then R2 decide karega ki woh ip address kis subnet ko belong karta hai.

- Is problem ko resolve karne k liye Subnetting ka concept aaya.

- First of all, all networks are not suitable for aggregation, only some are suitable.

Some rules are there for supernetting.

1. All the networks should be contiguious
2. Size of all the network should be same and should be in the powre of 2
3. First ip address should be divisible by size of block.

Example :-

200.1.0.0/24
200.1.1.0/24
200.1.2.0/24
200.1.3.0/24

→ ready by supernetting

i) Contiguous → obeying

ii) all the network is of equal size = 2^8 (power of 2)

iii) Blocksize = $2^8 * 4 = 2^{10}$

First ip address = 200.1.0.0 is dividisible by 10 ?

∴ Yes last 10 digits are

Now subnetmask kya hoga →

uske liye sabhi ip ko binary mein likho.

200. 1.00000000. 0000 0000
200. 1.00000001. 0000 0000
200. 1.00000010. 0000 0000
200. 1.00000011. 0000 0000

jaha tak bits same hai woh hamare net_id ka part hoga.

255. 255. 11111100. 00000000
255. 255. 252. 0
✓ Subnetting mask

aur net_id.

Kohi bhi ip-address lelo us charo me se aur uski anding perform karo subnetmask se toh hamra net_id mil jayega.

255. 255. 252. 0
200. 1. 1. 0
200. 1. 0. 0 / 202

net_id

Shortcut:-

① Jahaa ip address = net_id of whole subnet network

② ~~Broad~~ Subnetmask:-

Kitane bits ip address hogi mera, hone k baad

$2^8 * 4 = 2^{10}$ toh. (10 bit 0 hogy last se)

255.255.252.0 ✓

- Us router mein (external) router mein yeh wali entry, un char ko rakne k bajaye.

	nid	Subnet id	interface
✓	200.1.0.0	255.255.252.0	a

One more example :-

Check whether this is suitable for Supernetting or not.

100.1.2.0/24 + Subnet 255.255.255.0 ←

100.1.2.0/25
100.1.2.128/26
~~100.1.2.128/26~~
100.1.2.192/26

→ 100.1.2.128/25

dekne par unequal size lagte hai but hum kya karpaka last k do ko merge kargey then uske result ko first hai toh we get ~~Subnet m~~ Supernet mask.

H. Some question regarding ip addressing

Ques:→ For a Class B network an appropriate mask with 200 Subnets each with 220 System is -

Ans~

Class B :→ 16 bit → net_id
16 bit → host_id

200 subnet K liye 8 bits lagege subnet K liye.

255. 255. 255. 0

↓

Subnet mask ip

Ques2:→ Match the following :

	List I	List II
A	200. 10. 192. 100	i Class A
B	7. 10. 230. 1	ii Limited broadcast
C	128. 1. 1. 254	iii Directed broadcast
D	255. 255. 255. 255	iv Class C
E	100. 255. 255. 255	v Class B

Ans]

A → ~~iii~~ iv
B → i
C → v
D → ii
E → (i) / (iii)

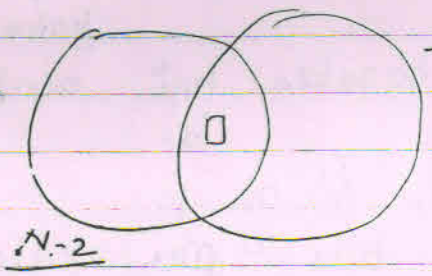
Ques-3] A device has two or more IP address the device is -

Ans→

(a) work station
(b) Router
(c) Gateway
(d) all the above.

H→ Jo device network layer se deal karta hai uske pass atleast ek ip-address toh hoga hi.

- Work station matlab host can have one or more ip



agar ek network down hota hai toh dusra start hojayega usse connect karlega.

Ques-4] A host with ip address 200.100.1.1 wants to send a packet to all host in the same network. What is ~~Source~~ Source ip address and destination IP address

Ans-

Source → 200.100.1.1
destination → 255.255.255.255
(Limited broadcasting)

Ques:-5 A host with ip-address 10.100.100.100 wants to use loopback testing. What is Source & distination IP.??

Ans

Loop-back testing :-

↳ matlab aapke sari layer properly work karrahai hai, NIC work karrahai hai ki nahi property uske liye 127 wali class IP address reserved hai.

Source IP :- 10.100.100.100
distination IP :- 127.0.0.0

Yaha par kuch bhi ho sakta hai except all 0's and all 1's.

Ques-6:→ How many bits are allocated for NID and HID in 23.192.157.234 address??

Ans

This is class A address

⇒ NID = 8 bits.
HID = 24 bits

Ques-7 Consider default subnet mask for a network is 255.255.255.0

Ans

(a) How many number of subnets and host per subnet are possible if m bits are borrowed from HID