CSE 421

ASSIGNMENT- 2

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SECTION: 22

Assignment-2

CSE 421

Answer to question no.-1

I) Given the ~~subne~~ prefix Mask is 17.

So the subnet mask is

~~11111111.11111111.10000000.00000000~~

11111111.11111111.10000000.00000000

So the subnet mask is

255.255.128.0

II) Given the IP address is:-

107.168.177.108

Now this IP address in binary is.

01101011.10101000.10110001.01101100

11111111.11111111.10000000.00000000

01101011.10101000.10000000.00000000

∴ The network address B:-

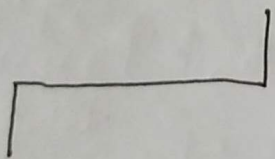
~~107.16~~ 107.168.128.0/17.

III) From the question (b) we get, the network address B:-

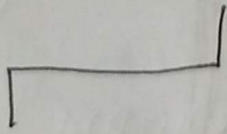
107.168.128.0/17.

~~III~~ According to the question we can say that there are 5 networks.

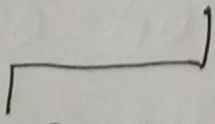
107.168.128.0/17



107.168.128.0/20

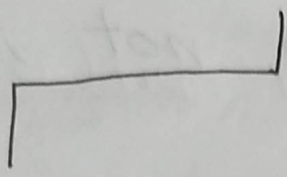


107.168.144.0/21



107.168.152.0/21

107.168.160.0/30



107.168.160.4/30.

Answer to question no!-2

I) Here the ISP router ~~user~~ uses the PAT. Although both devices use the same source port, the router assigns different public port numbers allowing it to correctly forward replies.

II) Here the devices A and B use Private IP addresses. and Isp router uses a Public IP address. The difference between these ~~two~~ two

are

i) Private IPs are not routable on the internet.

ii) Public IPs are globally unique and Internet routable.

Answer to question no:- 3

I) Given,

Total packet size = 7240 bytes.

Header = 40 bytes

Payload = packet size = 7200 bytes

MTU = 800 bytes.

Each fragment carries!

800 - 40 = 760 bytes.

Number of fragments = $\frac{7200}{760}$

= 9.47 ≈ 10

Total 10 fragments.

II) Packet size, used by first 9 fragments: 9 × 760 = 6840 bytes.

Remaining Packet size.

7200 − 6840

= 360 bytes.

After adding header we get,

360 + 40 = 400 bytes.

∴ Last fragment size = 400 bytes.

III) Fragment offset unit = 8 bytes.

Packet size before 8th fragment:

7 × 760 = 5320 bytes.

Fragment offset = $\frac{5320}{8}$

= 665.

IV) As it is a final segment that's why the MF bit is set to zero.

Answer to question no!-4

I) Removing the leading zeros we get,

~~2001:db8:0:1:0:0:~~

2001:db8::1::100

II) ff02::1

III) 2001::3C10::

Answer to question no!-5

I) Here the topology shows two links between R1 and R2. So using only one next hop it ~~giv~~ gives

no redundancy and if 10.10.10.0/30 fails the route dies. We can improve it ~~that~~ by adding a second static route via the other link

II) Here,

R2 → toward R1

R1 → toward ISP

Answer to question no!-6

I) As we know ARP request is a broadcast frame. Here S2 recieves from E and floods out other ports (toward S1, toward S3, and toward R2) And S1 recieves from S2 and floods toward its attached hosts

(C and D). And S3 recieves (from S2) and floods toward its attached hosts (A and B). Routers drop (do not forward the broadcast).

so the R2 recieves the frame but does not forward. Therefore R1 and S4 never recieve it (because routers won't propagate L2 broadcast domains). Hence we can say S1, S2, ~~S2~~ S3 forwards and R2 drops, as a result R1/S4 don't get it.

II) ARP reply ~~B~~ is unicast from A back to B (path A → S3 → S2

→ E). Switches learn from source MAC:

Here S3 learns

A's MAC on port connected to A.

E's MAC already learned earlier on uplink (f1) from the original request.

S2 learns:-

E's MAC on port to E (f1) from the request.

A's MAC on port toward S3 (f2) from the reply.

Therefore,

S2 table will have

E_MAC → f1.

A_MAC → f2

S3 table

A_MAC → f2

E_MAC → f1.

Answer to question no!- 7

Flow Label is added in IPv6 not in IPv4. It is used to identify a packet flow so routers can give consistent handling especially for real time traffic without inspecting deeper headers every time.

Answer to question no! -8

Each router only exchanges routing info with its neighbors so no

routers has full central control of the network.

The difference between these two are :-

Distance vector	Link State
1) knows only distance /next hop info from neighbors.	1) Builds full topology map.
2) It uses Bellman Ford	2) It uses Dijkstra.
3) Large updates.	3) mostly triggered updates. when change occurs.
4) It is slower, can suffer count to infinity	4) faster, more CPU/ memory heavy

Answer to question no!-9

I) DHCP Discover is a broadcast and routers don't forward broadcasts. The main problem is missing DHCP relay on ~~the~~ the router interface facing LAN2 The solution is configure IP helper address on the router interface connected to LAN2

II) For renewal the exchange is DHCPREQUEST. and DHCPACK

If the ~~client~~ server does not respond client later rebroadcasts in rebinding phase.

Answer to question no! -10

I) OUI is the first 24 bits that is first 3 bytes

AF:CC:FE

II) As MAC has no hierarchy unlike IP address. It does not indicate location/network just a unique identifier so it can not be ~~agger~~ aggregated for routing like hierarchial addresses.

Answer to question no! -11

As we know ARP request is Broadcast that is ~~FF:FF:FF:FF:FF:FF~~

FF:FF:FF:FF:FF:FF

When the router recieves ARP requests:

1) Receives Ethernet frame (dst = broadcast), decapsulates.

2) Reads ARP: sender IP/MAC, target IP.

3) Updates its ARP cache with sender IP → sender MAC and learns the requester.

Here the Router sends ARP reply with its interface MAC (unicast ~~to~~ back to sender). Router may reply with its own MAC (proxy ARP) so traffic goes through router.