CSE421 :- Assignment 2

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Ans. to the Question no -1

a) Given,

Prefix Mask = 10

so, first 10 bits are network bits

∴ 32 - 10 = 22 ; remaining 22 bits are host bits

∴ So first 10 bits, network bits, then host bits :-

1111 1111 . 1100 0000 . 0000 0000 . 00000000

ii.

∴ Subnet mask = 255 . 192 . 0 . 0 /10

Given,

IPv4 address = 10. 96. 99. 49

i.

network address = 10. 64. 0. 0 /10

iii.

number of possible hosts = 32 - 10 = 22 bits

so, hosts = $2^{22} - 2 = 4194302$

b)

from 'a'

b) S_one needs 254 hosts
S_two needs 600 hosts

S_two :-

$2^9 = 512$ (not enough)

$2^{10} - 2 = 1022$; so $32 - 10 = 22$

From 'a' we got 19.64.0.0 as our network address prefix 22,

∴ subnet mask 255.255.252.0
usable → 19.64.0.1 – 19.64.3.254

S_one :-

$2^8 = 256$

$256 - 2 = 254$ (enough hosts) ; so, $32 - 8 = 24$

prefix 24 ; usable hosts 19.64.4.1 – 19.64.5.254

∴ subnet mask 255.255.255.0

S_three :-

3 routers,

$2^3 - 2 = 6$, prefix = /29

∴ 19.64.6.0/29

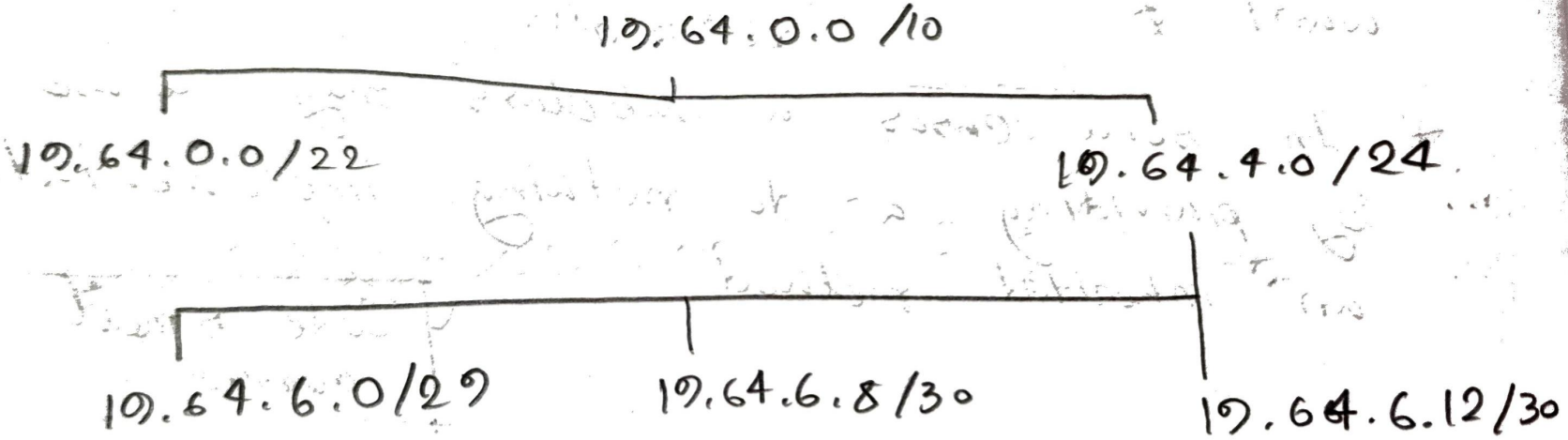
R1 to R3 → needs 2 IPs ∴ $32 - 2 = 30$

∴ 19.64.6.8/30

R2 to R3 → needs 2 IPs, $32 - 2 = 30$

∴ 19.64.6.12/30

∴ VLSM Tree :-



Ans. to the Q. NO - 2

a) TTL = 0 , router sends ICMP Time Excluded when destination is reached , then this will send a reply and Traceroute will stop wonking..

Because once the destination IP reponds Traceroute will stop.

b) Fragment offset = $\frac{\text{Byte offset}}{8}$

It is measured in 8-byte blocks, so IPV4 fragments align properly during reassembly.

c) IP address = 192.168.10.10/24

The network uses a single public IP address of 210.21.21.10/24

as the IP address is private (192.168.10.10/24), works only inside a local network. These private IP addresses are blocked on Public Internet and can not be reached directly.

d)

i.

Problem:

wrong excluded address range
Network ID Mismatch in DHCP pool
Default gateway mismatch
wrong Network in DNS

solution:

fixing range in excluded range
Matching DHCP with interface
set default route IP
configuring correctly

ii. Client sends DHCP release or server removes entry after lease expiry.

Ans. to the Q. No-3

a) Distance vector does not track neighbours because it focuses more on distances.

It detects failure via periodic updates, this is how distance vector works.

Distance vector is like a road sign, once ~~crossed, we can trace back~~ seen, make preferred path decision based on a distance

b) Link state routing protocols are more likely a road map. Unlike Distance vector, link state creates less traffic.

They are called centralized routing Algorithm because they only make the decision after learning about the whole network.

c) z receives update from w and y. updated once

	x	Y	z	w	v	M
z	∞	7	0	1	∞	~~4~~ 2

Ans. to the Q. No-4

a)

i. For R_1,

ip route 0.0.0.0 0.0.0.0 Ss/0

for R2,

ip route 0.0.0.0 0.0.0.0 S0/1

ii. We've to add ~~ardmi~~ AD at the end of the command

ip route 0.0.0.0 0.0.0.0 S0/1 10

b) We know lesser the AD, more preferred that is. So, AD = 1 → static routes highly preferred over dynamic routes. Cost = 0 → no path calculation.

c) Summarized static route can't represent that we are reachable via different hops.

The solution for this is Dynamic Routing

Ans. to the Q. No-5

a) IPV4 is 32 bits and IPV6 is 128 bits

Just by looking at the bit difference we can tell, the communication can not be possible

There are 3 possible ways:

i. dual stack
ii. Tunneling
iii. NAT-PT

b) ~~FF10::AC19:0:1000:E000~~

Given IPV6 address,

FF10:0000:0000:0000:AC19:0000:1000:E000

→ FF10:0:0:0:AC19:0:1000:E000

→ FF10::AC19:0:1000:E000

c) Given,

MAC address FO-B2-FO-EA-DF-35

subnet ID of (0010)h using EUI64

Now,

FO B2 FO | EA DF 35 (split)

→ FO B2 FO FF FE EA DF 35

Converting FO into binary → 11110000

Flipping bit we get,

11110010

Converting this binary into hexa → F2

Finally,

F2 B2 F0 FF FE EA DF 35

→ F2B2 : F0FF : FEEA : DF35

Ans. to the Q. No-6

a) No, it is not possible to know the mac address of a device in another network using ARP. ARP works only within the local broadcast domain.

b) Initially remains empty, but then switching on

(i)

~~MAC~~	~~Int~~	~~TTL~~
Switch	MAC	Int
S1	empty	—
S2	empty	—
S3	empty	—

(ii)

MAC	Int	TTL
A	Fo/1	60s
D	F1/0	60s

c) i. EE = 1110 1110

last bit = 0 , so it is unicast

ii. OUI = first 24 bits

= EE ; A9 ; B8

iii. local administrated address

= 2nd least significant bit of 1st octet

EE = 1110 1110

Here, its 2nd bit

1 → locally administered

0 → globally unique