Assignment - 02

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section: 22

Question: ~~Fall 2~~ Spring 2024 set - B

Section-A

Answer to the question No.1

(i) Given network address = 1.2.128.0/17

considering subnetting upto /30,

maximum number of subnets = 2^{30-17}

$= 2^{13} = 8192$

(ii) Here, root network = 1.2.128.0/17

requirement: R1 = 2000 hosts, bits 11, mask 21

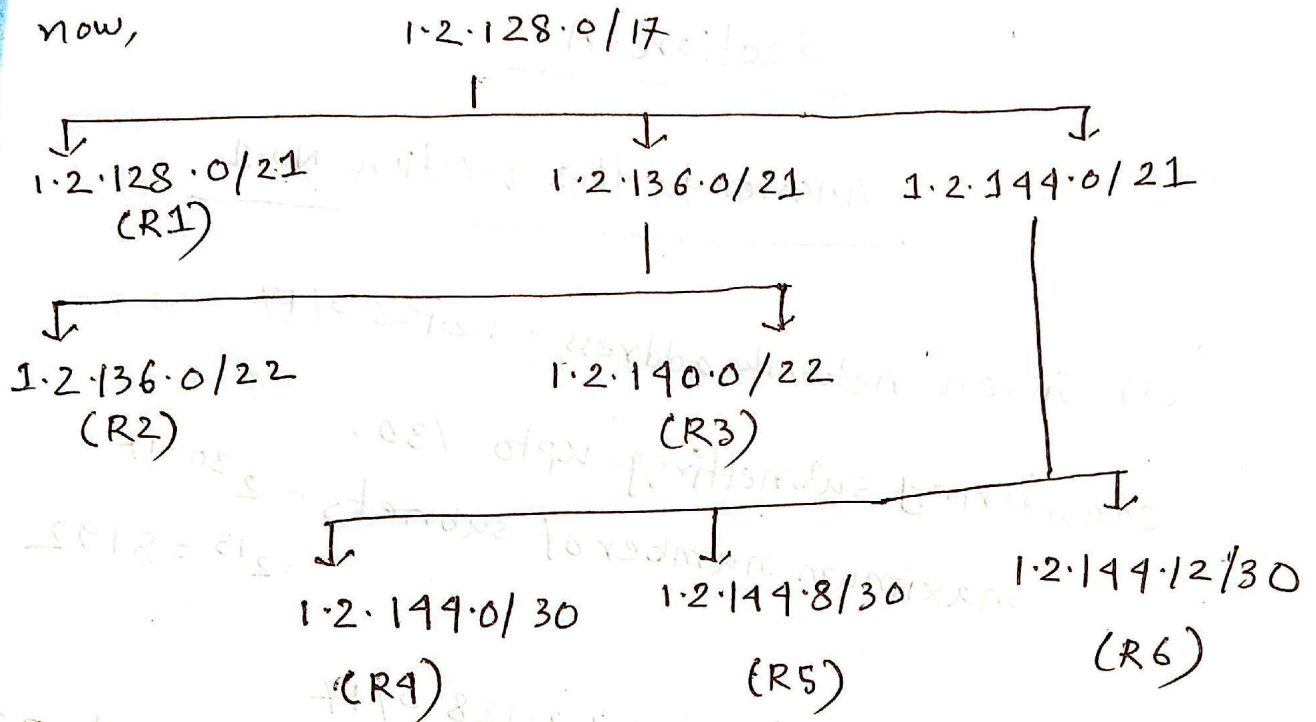R2 = 1022 hosts, bits 10, mask 22

R3 = 512 hosts, bits 10, mask 22

$\downarrow$

(because we allocate

512+2 hosts, actually)

P.T.O.

now,   1.2.128.0/17

1.2.128.0/21   1.2.136.0/21   1.2.144.0/21
   (R1)

1.2.136.0/22   1.2.140.0/22
   (R2)   (R3)

        1.2.144.0/30   1.2.144.8/30   1.2.144.12/30
           (R4)   (R5)   (R6)

From the topology, R4, R5, R6 have point to point
router to router and router to switch links.
Hence we assign them to /30 subnet. "

Here, 1.2.140.0/22 was assigned to R3 and could
not be branched anymore so we went to 1.2.144.0/21

Answer to the question No. 2

(i) ALL R3 LANs here are-

same for all   converted to o

175 . 96 . 0 . 0 /13 → 175 . 0110 0000 . 0 . 0

175 . 104 . 0 . 0 /13 → 175 . 0110 1000 . 0 . 0

175 . 112 . 0 . 0 /13 → 175 . 0111 0000 . 0 . 0

175 . 120 . 0 . 0 / 13 → 175 . 0111 1000 . 0 . 0

so, summary ~~static~~ zed network will be-

175 . 0110 0000 . 0 . 0 /11

= 175 . 96 . 0 . 0 /11

and mask = 11 because 8+3 bits match

and summarized static route from R1:

ip route   175 . 96 . 0 . 0   255 . 224 . 0 . 0

(ii) ip route 175 . 112 . 0 . 0   255 . 248 . 0 . 0 s0[.1] 50

Answer to the question No. 3

(i) Total packet size = 4560 bytes

header = 20 bytes

total data = 4540 bytes

MTU = 380 bytes.

data per fragment = 360 bytes

$\therefore$ number of fragments $= \dfrac{4540}{360}$

$= 12.61 = 13$.

(ii) fragment offset of 4th fragment $= \dfrac{3 \times 360}{8}$

$= 135$

(iii) As 5th fragment is not last fragment, the MF bit will be 1.

Answer to the question No. 4

Here, Dipu's devices do not receive any IPv4
configuration from the Dhcp server because
dhcp servers use broadcast addresses. And
broadcasts are not transmitted across diffrent
routers and at Zahin's Dhcp server is located
in another network. So, the solution here would
be to configure a Dhcp relay agent on Dipus
router with ip-helper-addrees <.....,.....>
and forward the dhcp requests as unicast
packets.

Answer to the question No.5

The following statement is false because multiple devices can share a public IP address using NAT/PAT. Private IP and port is translated into public IP and unique port here by the router. This is widely deployed in household and office networks. So, the statement is false.

Section - B

Answer to the question No.6

If all the routers use distance vector routing, then R2 will send routing updates to

through So[.1] to R4 and S1[.2] to R2.
But it will not send routing updates to directly
connected LANs. Because, in DVR, routers only
send routing table updates to neighbouring
routers who also run using RIP. And ## in this
case, the LANs and end devices are not considered.

Answer to the question no. 7

(i) given ⑩ IPv6 address

= FE80:0:0:B0B:980:FF:FE00::

∴ MAC address

= 980:FF:FE00:0

= 0980:00FF:FE00:0000

= 09:80:00:00:00:00

now, 09 = 0000 1001, flipping the 7th bit we

get = 0000 1011 = 0B

∴ final MAC Address = 0B:80:00:00:00:00

(ii) As the address began with FE80: , it is a link local address.

Section-C

Answer to the question No.9

To stop a website from responding to any HTTP requests by using Ping, a type of DOS attack can be used named Ping Flood or ICMP flood. In this process, the attacker sends massive ICMP echo requests which exhausts the server, and in turn the valid and important Http requests fail.

Answer to the question No.11

Because the global internet infrastructure worldwide not being converted to IPV6 from IPV4, the IPV6 packets have to be encapsulated inside IPV4 packets while travelling.

Because numerous devices still use IPV4, a technique named tunneling has been developed for this transfer process where after the encapsulated packet being send, it is reverted to IPV6 at the endpoint by removing the IPV4 header.

Answer to the question . No.13

In Distance Vector Routing, the protocol handles any change with the topology by sending periodical routing table updates. Initially, all the routers only know their directly connected networks. Then they send hello packets to each other to let know of their existence and share their connections after a fixed period of time using a timer. whenever a change happens, the routing table information is changed and it is sent to others in the periodical update.