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Assignment - Last

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sec : 22

Ans: to ques no: 1

(ii)

For LAN with R1 : 2000 hosts ip + 1 = 2001 + 2 = 2003

1022 hosts ip + 1 = 1023 + 2 = 1025

512 hosts ip + 1 = 513 + 2 = 515

For 4 WAN R4-R1, R5-S1

LAN 2000 + 2 = 2002 ; 512 + 2 = 514

1022 + 2 = 1024 ;

FOR WAN R6-R5, 2 + 2 = 4

For R_1, R_2, R_4, R_5 connection there are 5 links;

5 + 2 = 07

For, R_1 to R_2 link → 2 ; 2 + 2 = 4

Now, 2002 → 2048

1024 → 1024

514 → 1024

7 → 8

4 → 4

4 → 4

2048 $\longrightarrow \log_2(2048) = 11 \rightarrow$ 10000000000 → 8 (3rd)

1024 $\longrightarrow$ 10 $\longrightarrow$ 1000000000 → 4 (3rd)

1024 → 10 → 4 (3rd)

8 → 3 → 1000 → 8 (4th)

4 → 2 → 100 → 4 (4th)

4 → 2 → 4 (4th)

1.2.128.0/17

→ 1.2.128.0 /21

→ 1.2.136.0 / 22

→ 1.2.140.0 / 22

→ 1.2.144.0/ 29

→ 1.2.144.8 /30

→ 1.2.144.12/30

(Ans)

(i)

(1.2.128.0/17); 32-17 = 15

∴ max number of subnets = $\frac{2^{15}}{4}$ [4 possible networks]

= 8192

Ans: to ques: no: 2

(i)

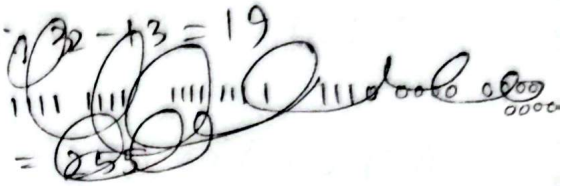
R_3 has four LANs:

LAN 1 : 175.120.0.0/13

Lan 2 : 175.112.0.0/13

Lan 3 : 175.104.0.0/13

Lan 4 : 175.96.0.0/13



Here, only second octates are being changed.

96 → 01100000

104 → 01101000

112 → 01110000

120 → 01111000

Here, 1st 3 bits are common, which are 0 1 1

So, total (8+3) = 11 bits are summerized network portion

base address is .

∴ Sumerized Network : 175.96.0.0/11 ;

11111111 1110 0000 00000000 00000000

= 255.224.0.0

subnet mask

∴ Static Route on R1 : ~~ip route 175.96.0.0 255.224.0.0~~

~~ip route 175.112.0.0 255.248.0.0 serial~~

ip route 175.96.0.0 255.224.0.0 20.2.2.2

(ii)

ip route 175.112.0.0 255.248.0.0 80 50

Ans: to ques: no: 3

Total packet size = 4560 bytes; Header = 20 bytes.

∴ Data = (4560 − 20) = 4540 bytes.

MTU (380) − 20 = 360 bytes = Max Data per fragment

(i)

Number of fragments = $\left[\frac{4540}{360}\right]$ = 12.61

= 13 fragments.

(ii)

		fragment offset
1st fragment	5120 − 360 = 4760 →	0 bytes
2nd fragment	4760 − 360 = 4400 →	360
3rd "	4400 − 360 = 4040 →	720
4th "	4040 − 360 = 3680 →	1080 bytes

∴ fragment offset of the 4th fragment = $\frac{1080}{8}$ = 135

∴ Ans = 135

(iii)

5th fragment 3680 − 360 = 3320; still more data left;

∴ MF = 1 as more are remaining

Ans: to ques: no: 4

Problem: DHCP discovery messages are broadcasts. Routers, by default do not forward broadcast packets. Therefore, Dipu's devices (on his local network) cannot reach Zahin's DHCP server 2 floors away on a different network.

Solⁿ: Configure the router connected to Dipu's network with a DHCP Relay Agent. On a Cisco router, this is done by applying "ip helper-address [IP of Zahin DHCP server]" command to the interface of Dipu's device.

Ans: to ques: no: 5

False. Even with a single public ip, multiple devices can access the internet simultaneously using NAT, PAT etc. Router maps multiple private internal ip addresses to a single public ip by tracking unique port numbers for each session.

Ans: to ques: no: 6

IN DVR; through f_0, f_1, f_2, S_0 and S_1 interfaces, R_2 will send routing updates. Because, in DVR, a router periodically broadcasts or floods it's entire routing table to all directly connected neighbours.

Ans: to ques: no: 7

i) Eui-64 portion (980: FF : FE 00)

So, MAC = 0B : 80 : 00 : 00 : 00 : 00

ii) FE80 means Link-local unicast address.

Ans: to ques: no: 8

S_3

MAC	interface
PC_3	F_0
PC_5	f_2
PC_4	f_1

Currently, S_3 sends ~~frame~~ frame to PC_3 via F_0 but doesn't know about PC_2, so it'll flood the frame. That's how they are different.

S_2

PC_3	f_1
PC_5	F_2
PC_4	f_2

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Attack type: | ICMP Flood

An attacker sends a massive volume of ping (ICMP echo request) packets. The server consumes all its CPU and bandwith trying to reply, leaving no resources to handle legitimate http requests.

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Forwarding | S_1, S_2 and S_3 will flood the broadcast ARP request out of every port except the one where it was received.

PC1's next 2 functions: i) Updating ARP cache: stores PC5's MAC address

ii) Data encapsulation | Wraps the IP packet in an ethernet frame using PC5's MAC and sends it

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~~IPV6 tunnel~~ IPV6 tunneling.

Because, it's used to send IPV6 traffic across an IPV4 only network by wrapping the IPV6 packet inside an IPV4 header.

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i) Unicast.

ii) MAC is flat cause IPV4 is divided into Network and host portions to help routers find specific paths. whereas Mac identifies hardware globally and contains no location data.

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DVR to handle change in topology:

1) Periodic updates: Routers send their entire table to neighbours at fixed intervals.

2) Triggerred updates: changes are sent immediately to speed up convergence.

3) Infinity Metric (poison reverse): Unreachable network are assigned a maximum hop count.

Also, uses split horizon.