Assignment-2

CSE-421

Q1 (I)

Given address,

7.16.255.255 → Broadcast Address

/18 Mask → 255.255.192.0

subnet boundary in 3rd octet.

7.16.255.255

Block size = $2^{(8-2)} = 64$ (3rd octet)

∴ Answer: 7.16.192.0/18

(II)

7.16.192.0/18

R2 LAN: $2^{12} = 4096$ pre: /20

subnet: 7.16.192.0/20

R1 LAN: $2^6 = 64$ << ∴ $2^7 = 128$ (/25)

subnet: 7.16.208.0/25

R4 LAN (64 Hosts):

$2^6 = 64 << 2^7 = 128$ (/25)

subnet: 7.16.208.128/25

WAN LINKs

R2 - R2: 7.16.209.0/30

R2 - R3: 7.16.209.4/30

R2 - R3: 7.16.209.8/30

(III)

128 - 67 = (61) → Ans.

Q2

191.46.42.16/28 → connected to PC D

194.52.0.0/15 → connected to PC E

191.54.20.128/25 → C ~ R2

(II)

R2 to R4 LAN →

D: pc C is 192.52.64.12/30

Net ID: 192.52.64.12

Exit interface: S 0/0/0

Command: ip route 192.52.64.12
255.255.255.252 S0/0/0 50

(III)

Target: Default route (0.0.0.0/0)
pointing to ISP

Next Hop: 192.64.52.1

Command: ip route 0.0.0.0 0.0.0.0
192.64.52.1

S* is a candidate default route or gateway of last resort.

(IV)

primary AD = 50

∴ 50+1 = 51 (AD should be higher)

AD > 50 (51, 52, 53 ----)

(V)

Because 172.42.64 is a public IP. If R4 lacks a default route pointing to R1, it drops packets for unknown destinations.

Q-3

Total packet = 2584 bytes

Header = 32

∴ 9th packet size = 272 bytes

(VI)

272 bytes

(VII)

272 − 32 = 240 bytes

6 × 240 = 1440 bytes

1440/8 = 180 → Ans

(III)

2584 - 32 = 2552 bytes

2552/240 = 10.63 ≃ 11 packets

Q4

R2 detects neighbors via active physical interfaces on shared subnets broadcasting Hello packets

(II)

R2 sends to it's Directly connected networks only.

Table: 192.152.10.0/16

192.141.6.0/24

192.11.0124

191.54.20.128/25

Q5

(I)

2001:adb8:12ef::a20:4

Global unicast

(II)

::1

Loopback

Q7

I

The offset counts in 8-byte units.

$2^{13} \times 8 = 65,536$, covering the max packet size (2^{16})

(II)

It provides unique ID for fragments so the destination can reassemble the correct pieces into original packet.

Q9

I

Because the server uses a private IP not routable to the Internet.

II

Configure static NAT port to a

10.10.5.50 : 8080

Q11

(D)

ARP request asking "who has

192.168.1.20

switch s1 : Learns A's MAC on ingress, broadcasts to other ports

switch s2: Learns A's MAC on uplink, floods out to Host C

(II)

switches automatically learn MAC addresses from incoming frames to build forwarding tables without manual configeration.