

Qno. 2

If a machine's MAC address is $02:1A:23:B2:45:A9$ then find the following IP address

a) 64 bit Interface ID

To convert to 64 bit Interface ID, insert $FFFE$ in the middle of mac address and flip the 7th bit as:

We have; MAC = $02:1A:23:B2:45:A9$

then by stuffing $FFFE$ we get

$021A:23FF:FE B2:45A9$

↳ stuffed $FF FE$ to the mac

the first part of address is

02
= $0000\ 0010$

↳ 7th bit

Inverting the 7th bit we have

= $0000\ 0000$

hence the 64 bit Interface ID is

= $001A:23FF:FE B2:45A9$

b) link local

We prefix with the link local prefix of $FE80::$
as

$FE80::1A:23FF:FE B2:45A9$

which is the link local address

c) Unique local address

In order to confirm the uniqueness of the local address, Duplicate address detection (DAD) is done.

In order to confirm this a solicited node multicast address is generated and an IPv6 packet is sent to check if other devices are configured with this address or not.

For this we have address of the form:

$FF02::1:FF_{xx}:xxxx$

↳ These comes from last 6 hex values of the above generated address

hence:

$FF02::1:FFB2:45A4$

Once packet is sent and it is confirmed that no other device responds to the above given solicited node multicast address, we can confirm the unique link local address as:

$FE80::1A:23FF:FEB2:45A4$

d) The solicited node multicast address is as given in (c) above:

$FF02::1:FFB2:45A4$

Qno. 6
- Answer

Let us consider that the team has purchased block of IP:

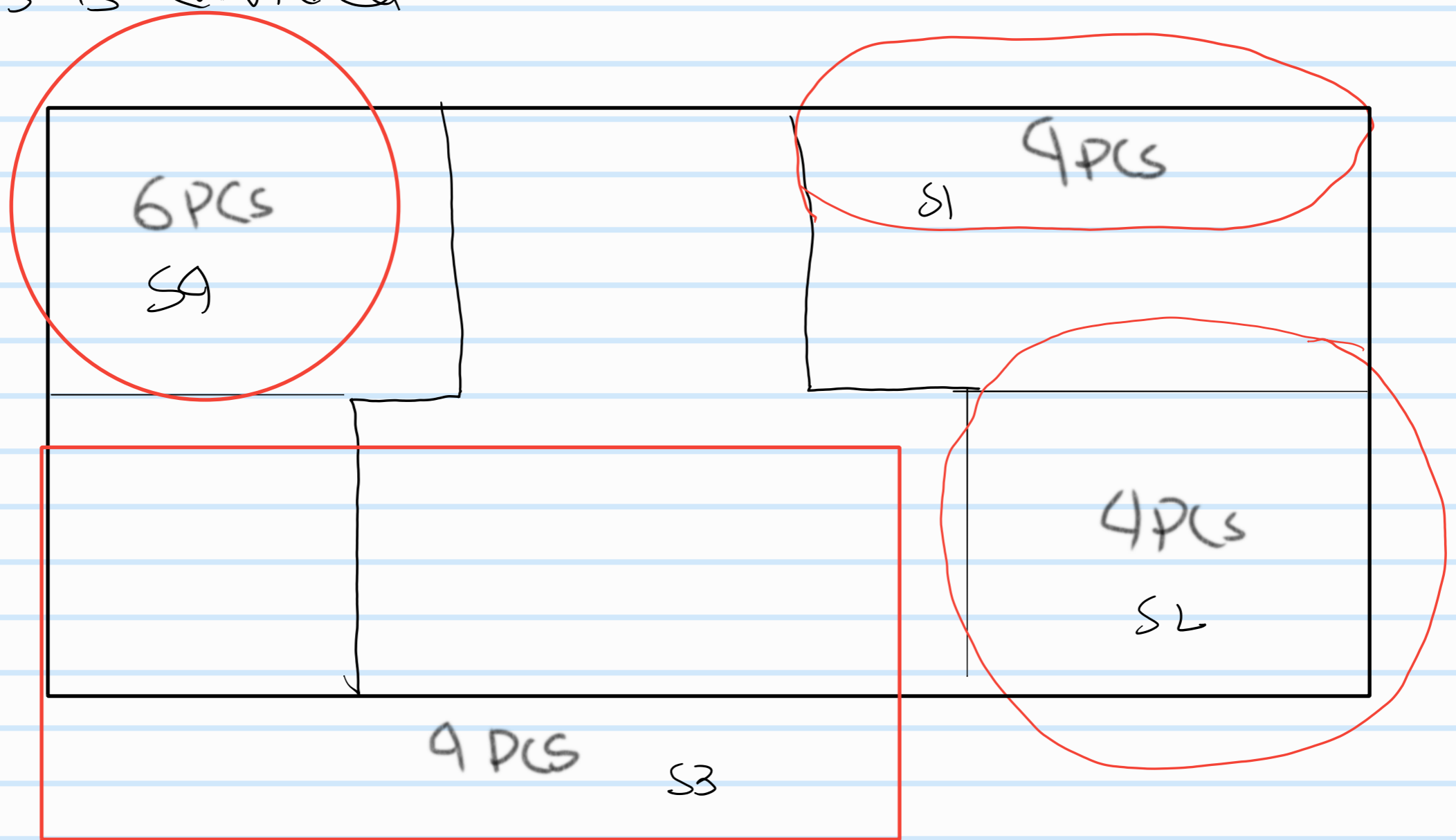
$2900:4206::/32$ from APNIC.

Now let us assume the network as follows:

1) No of subnets = 5
2) S1 : 4 host
S2 : 4 host

S3: 4 hosts
 S4: 6 hosts
 S5: 4 hosts

this is divided as:



+ S5 ⇒ All scanner, Printers, Servers and such

total no of hosts = 22

Now the address block can be given as:

Sector	Host Bit	N/W bit	N/W Address
S1	93	35	2400:4206::/35
S2	93	35	2400:4206::2000/35
S3	93	35	2400:4206::4000/35
S4	93	35	2400:4206::6000/35
S5	93	35	2400:4206::8000/35

Physical network design

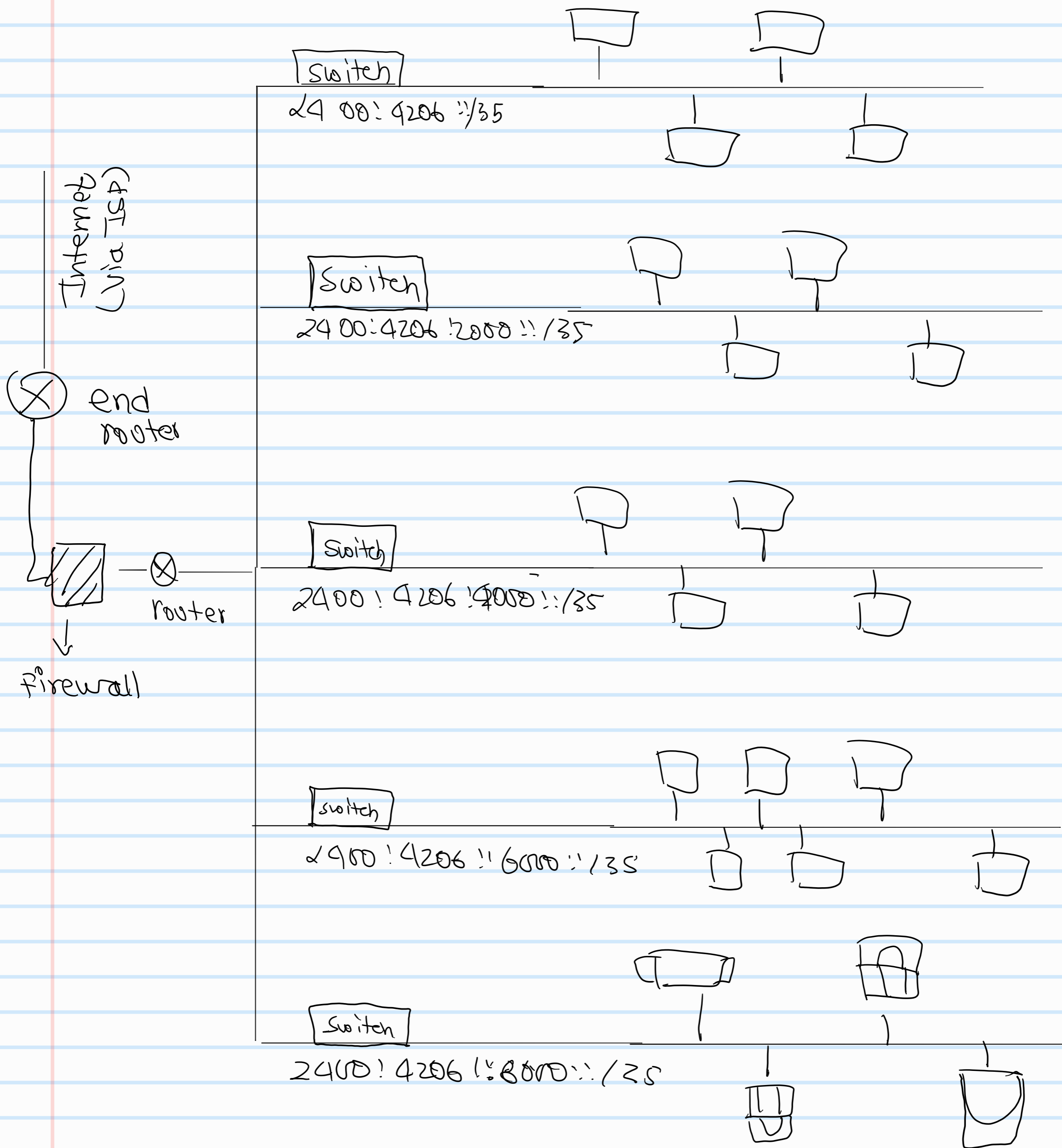


fig: logical network deployment