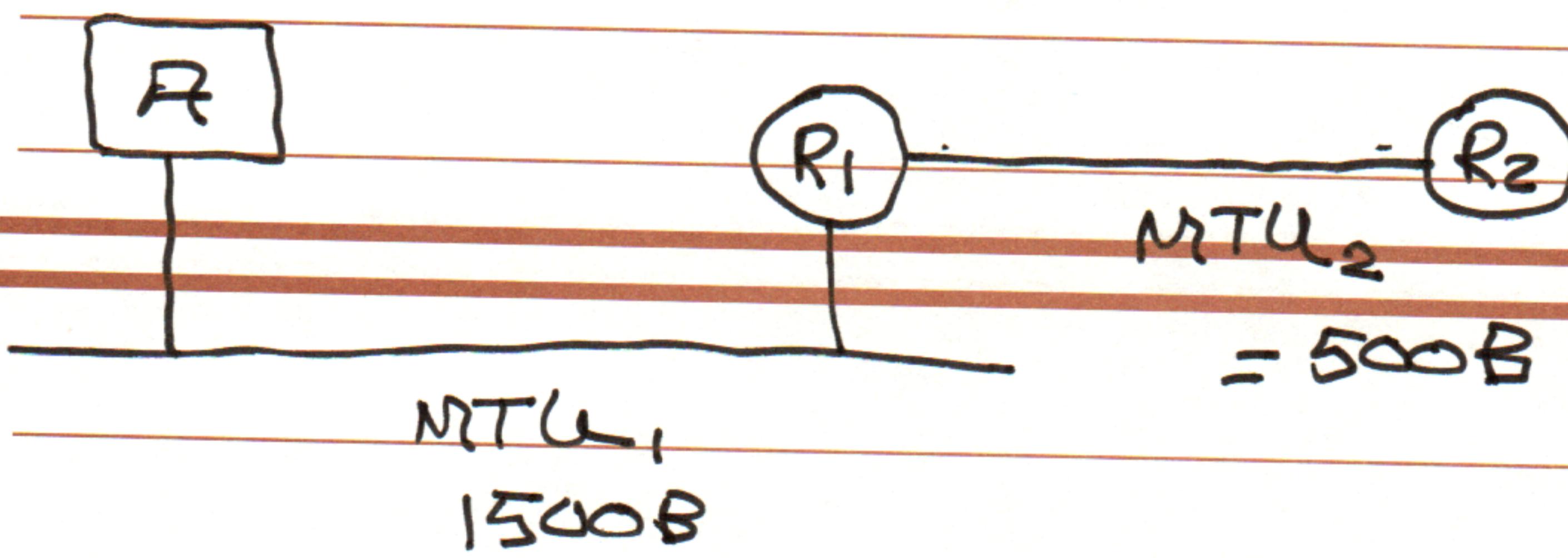
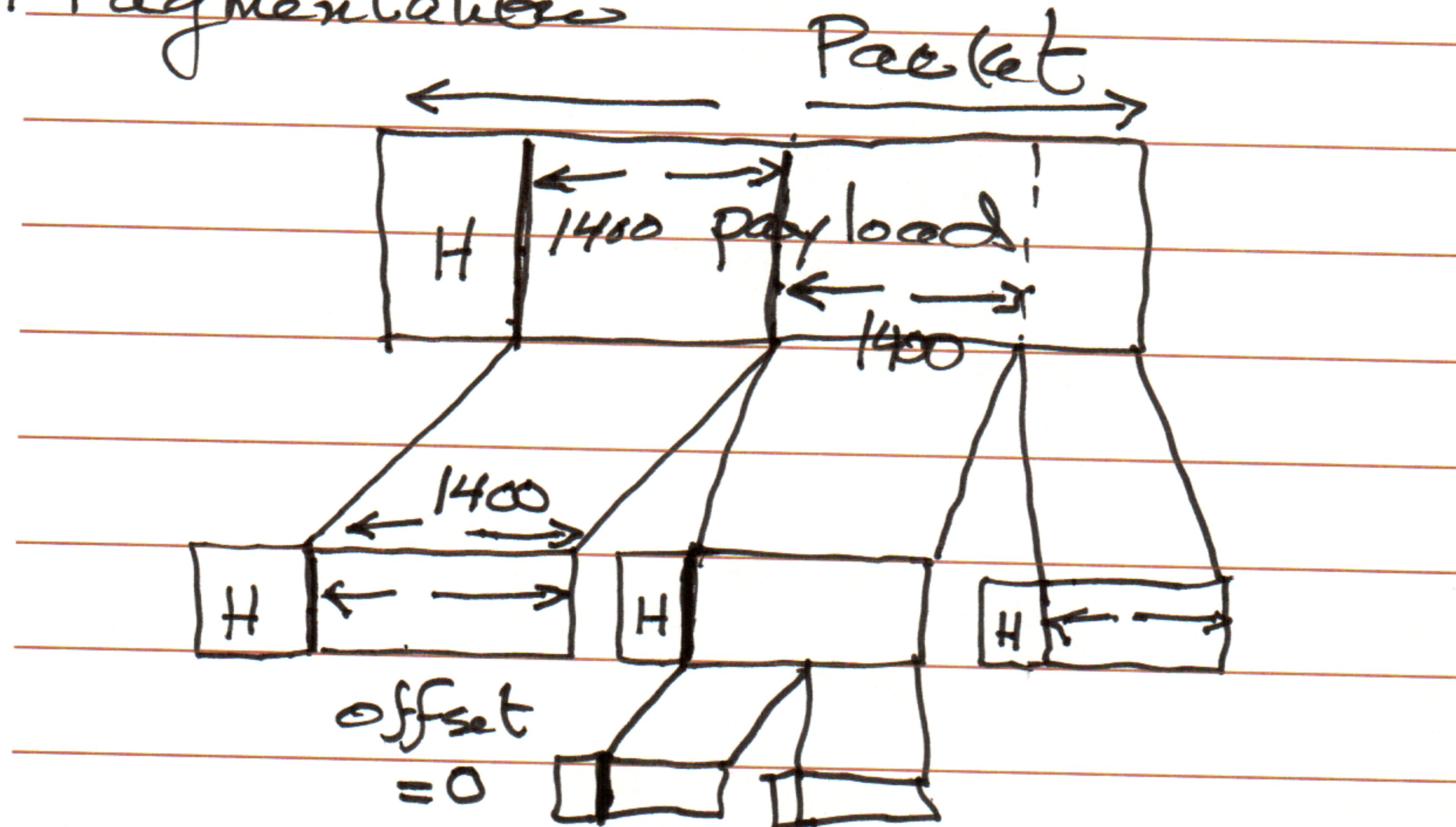


Fragmentation

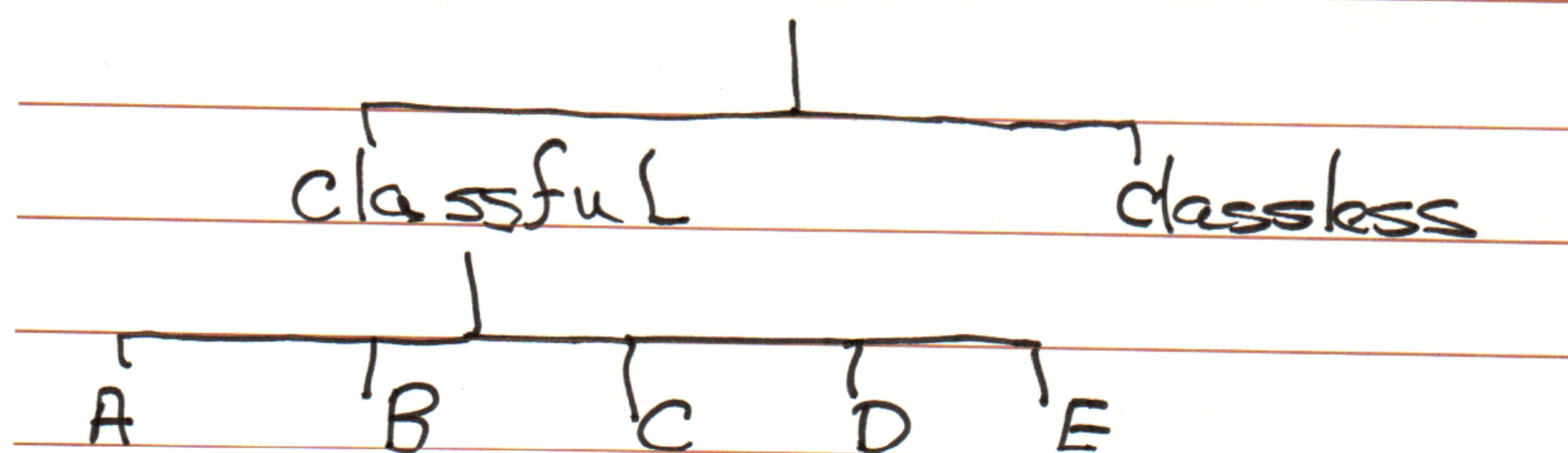
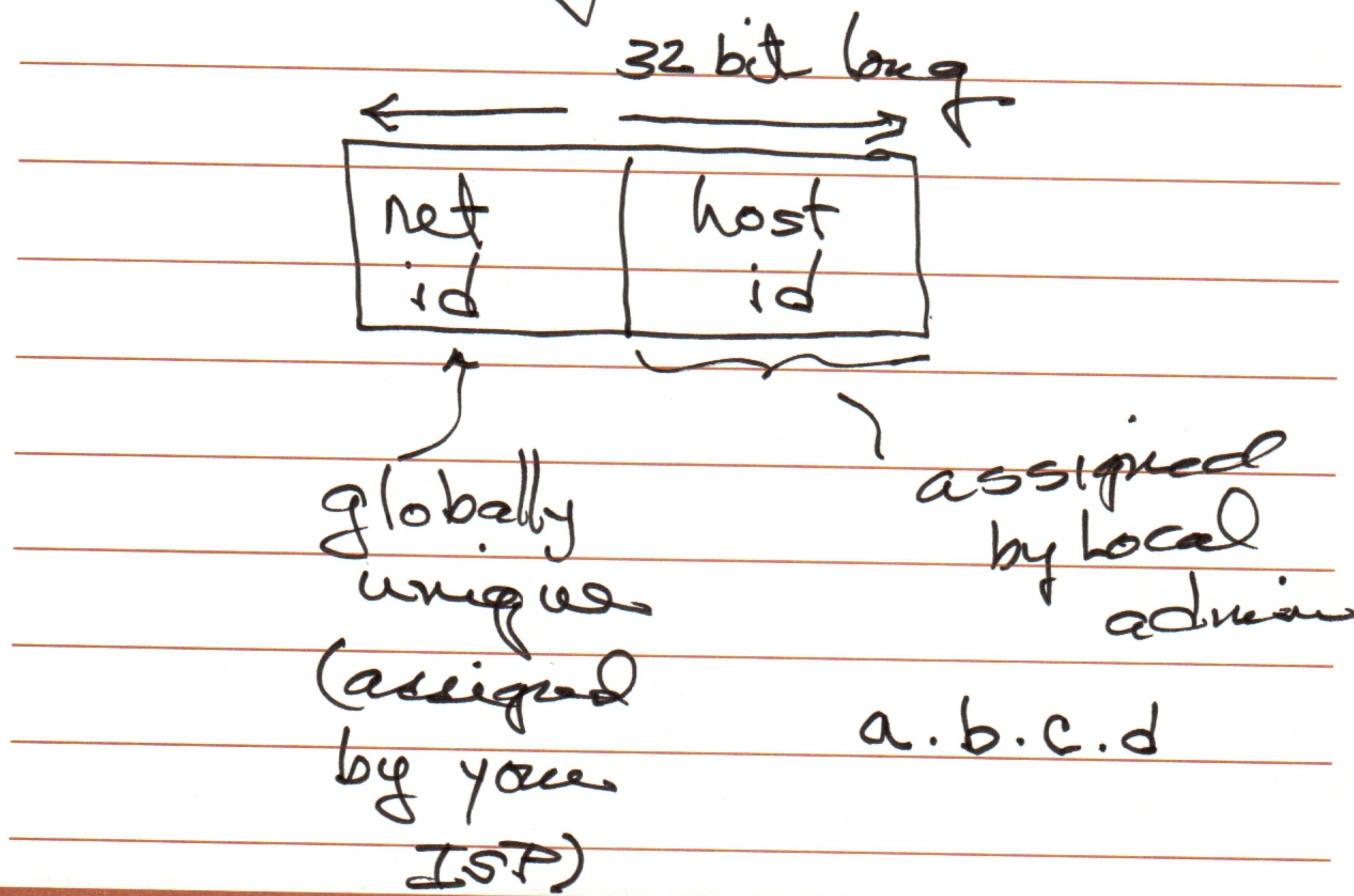


length of the payload of each fragment must be a multiple of 8 (except possibly the last frag.).

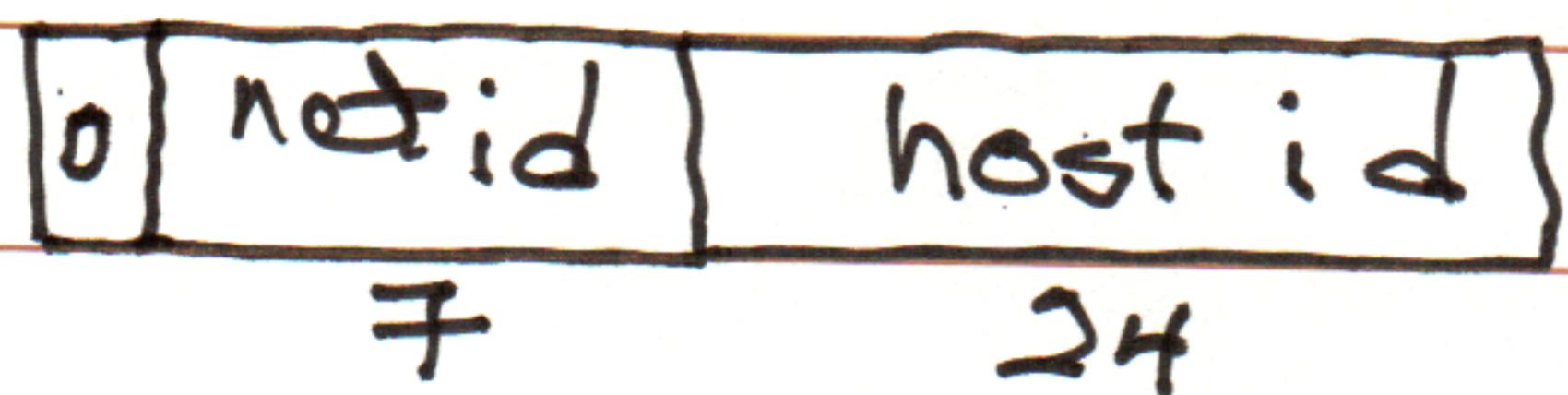
$$\frac{1400}{8} = 175$$

$$2^{32} \approx 4G$$

IP addressing



Class A

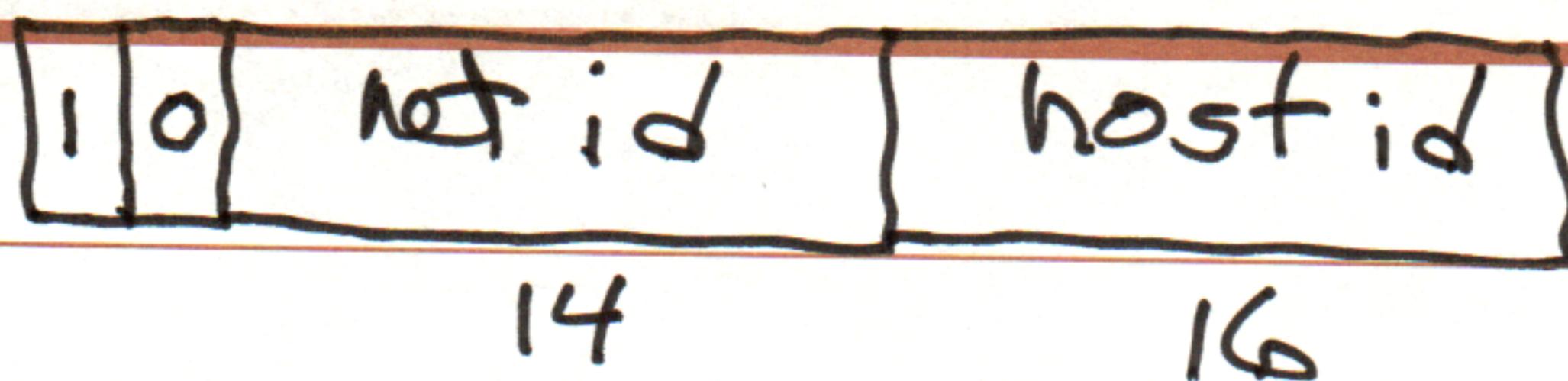


0 0000000 \Rightarrow 0

⋮
⋮

0 1111111 \Rightarrow 127

Class B



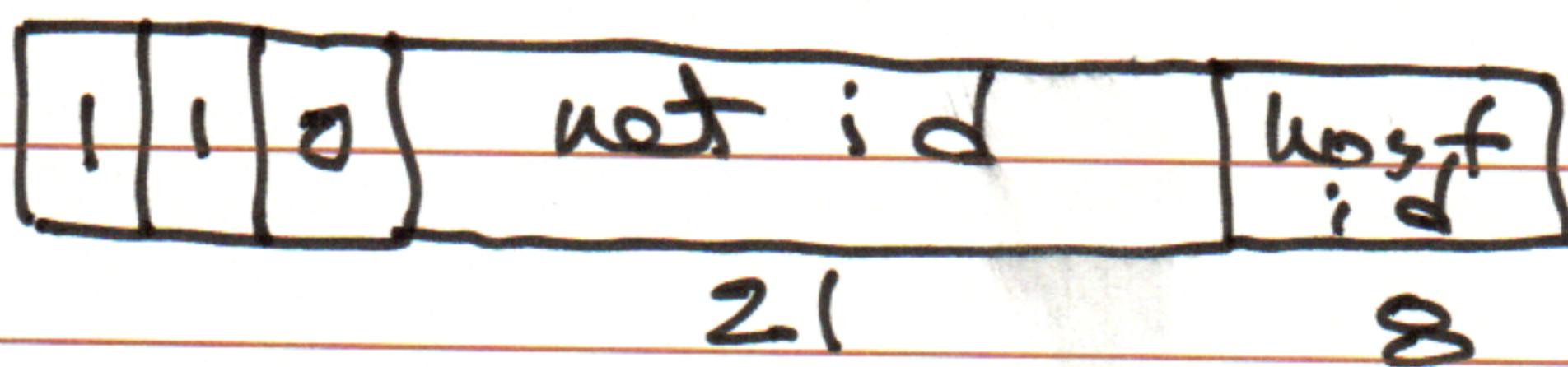
10 000000 \Rightarrow 128

128.125.x.x

⋮
⋮
⋮

10 111111 \Rightarrow 191

Class C



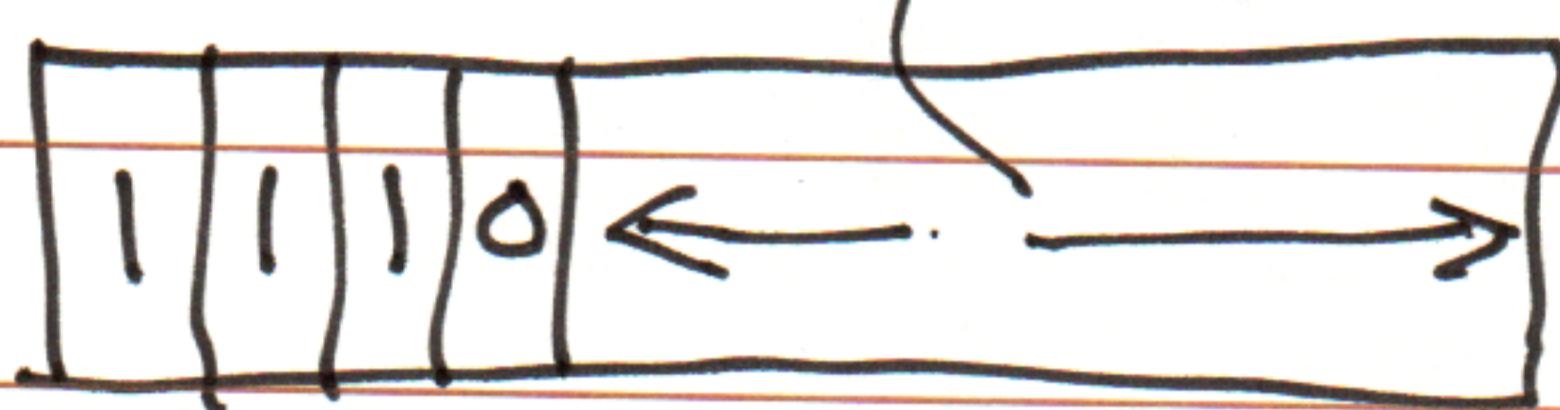
110 000000 \Rightarrow 192

⋮
⋮

110 111111 \Rightarrow 223

Class D

multicast group add.



1110 0000 \Rightarrow 224

1110 1111 \Rightarrow 239

Class E



experimental

1111 0000 \Rightarrow 240

1111 1111 \Rightarrow 255

Quickies

0.0.0.11

200.3.7.0

200.3.7.11

C

net id host
id

0.50.50.50

50.0.0.0

50.50.50.50

A

net id host id

0.0.200.11

150.3.~~256~~3

150.3.0.0

150.3.200.11

B

net id host id

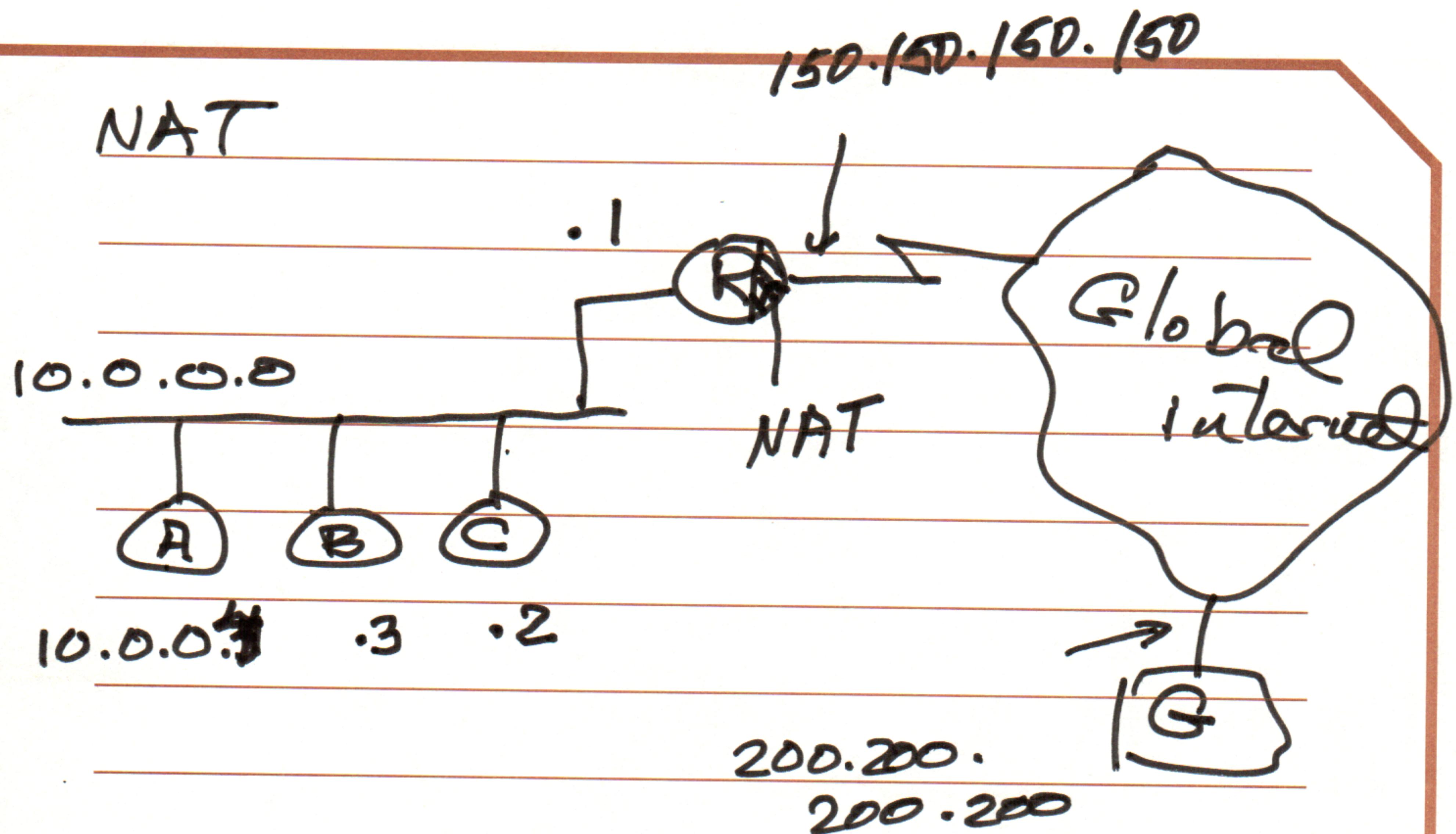
Direct Broadcast of USC net.

128.125.255.255

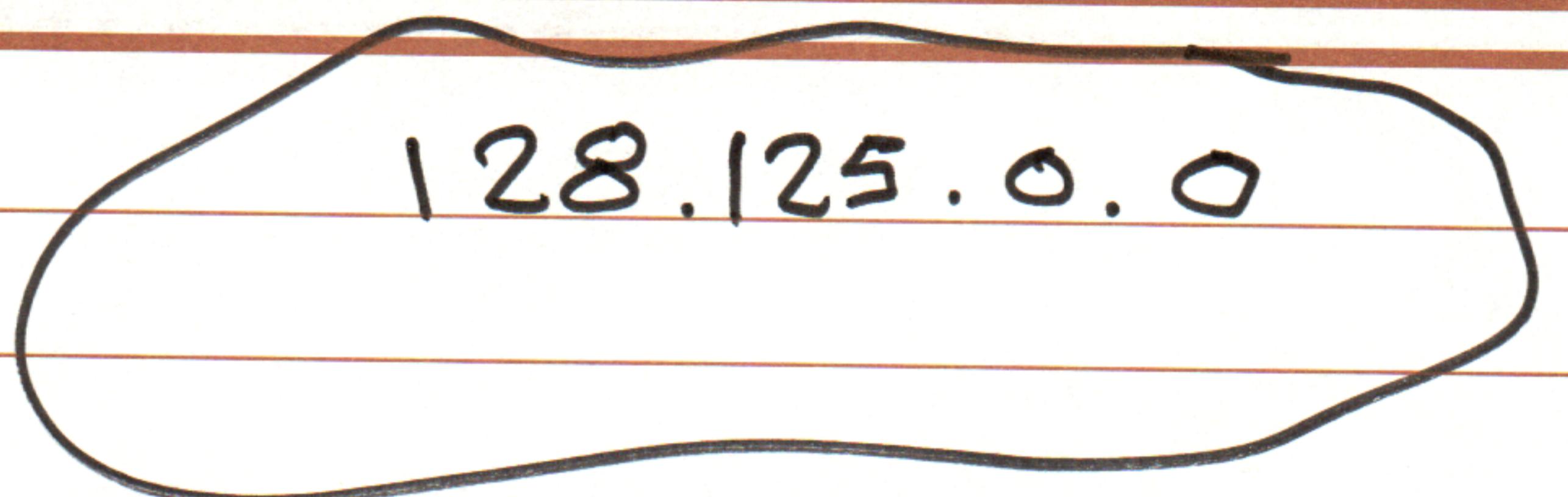
128.125.x.x

128.125.0.0

NAT

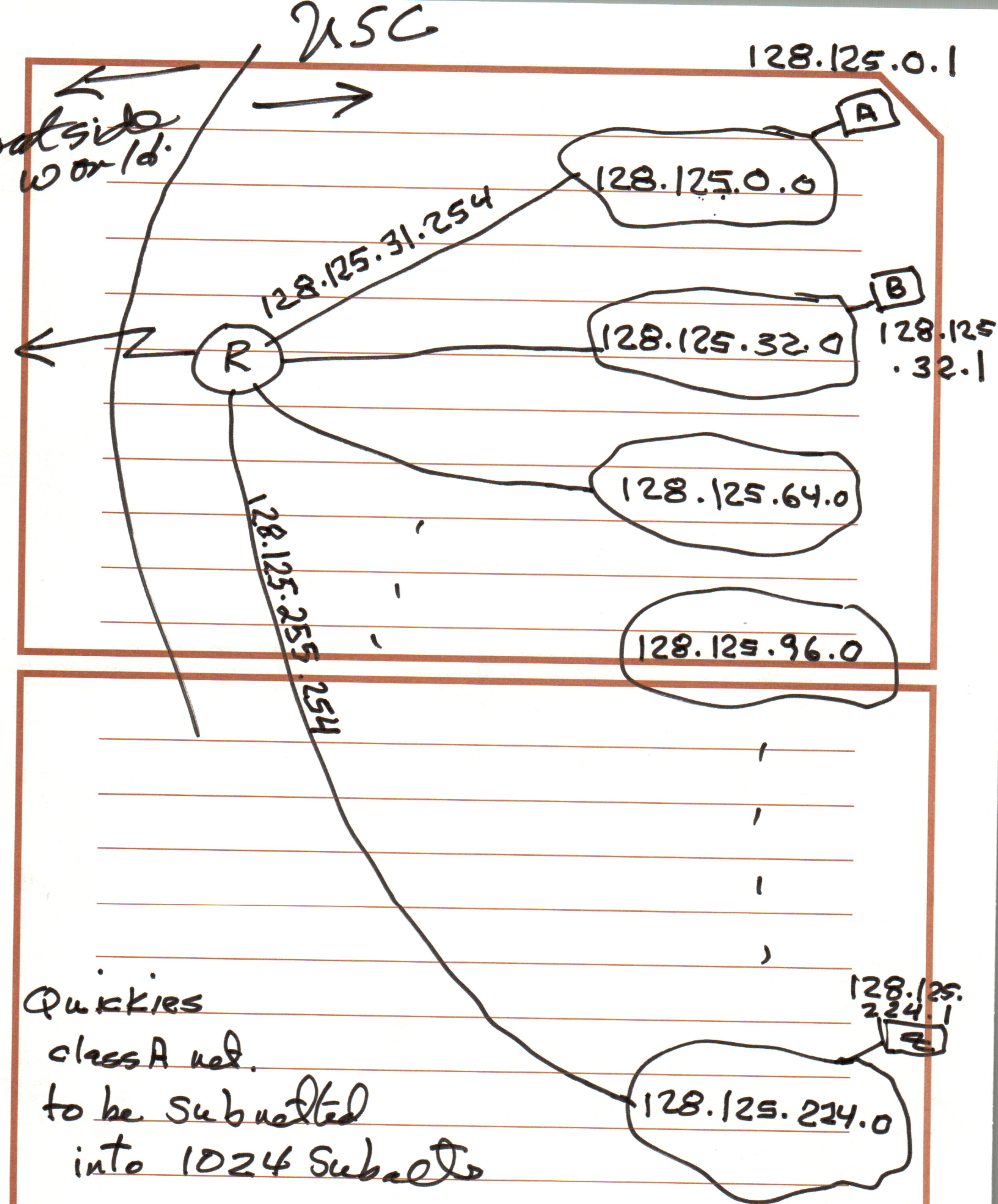


USC network



of devices 2^{16}

128.125.SSSS host bits for each subnet
host bits of the original network.



Quikies

class A net.

to be subnetted
into 1024 Subnets

need to steal 10 bits from host part
to represent the subnets (leaving 14 bits for host).

Subnet Mask :

The SM is a 32-bit sequence which consists of "1's" in every network & subnet locations and a "0" in every host locations.

Default Masks (No Subnetting)

Class A 255.0.0.0

Class B 255.255.0.0

Class C 255.255.255.0

Back to our example:

SM ~~255.255.255.224.0~~ 255.255.224.0

Quickies

Class A with 512 subnets

SM: 255.255.128.0

Class B with 32 subnets

SM: 255.255.248.0

Class C with 16 subnets

SM: 255.255.255.240

How do we use the Mask
to separate the net id from
host id?

128.125.3.4

255.255.0.0

AND bit-by-bit.

Logical

Logical AND

$$0 \cdot 0 = 0$$

$$0 \cdot 1 = 0$$

$$1 \cdot 0 = 0$$

$$1 \cdot 1 = 1$$

$$A \cdot 0 = 0$$

$$A \cdot 1 = A$$

128.125.0.0

Back to our example

A wants to communicate
with B.

A 128.125.0.1

SM 255.255.224.0

128.125.0.0 ↗

B 128.125.32.0

SM_A 255.255.224.0

128.125.32.0 ↙

NOT
the
same

A & B are located on
different subnets \Rightarrow A
needs help of R.