

$$I_A: 200 \cdot 1 \cdot 2 \cdot 10$$

$$S_A: (255 \cdot 255 \cdot 255 \cdot 128)$$

$$I_B: 200 \cdot 1 \cdot 2 \cdot 64$$

$$S_B: (255 \cdot 255 \cdot 255 \cdot 192)$$

$$\frac{I_A}{S_A}$$

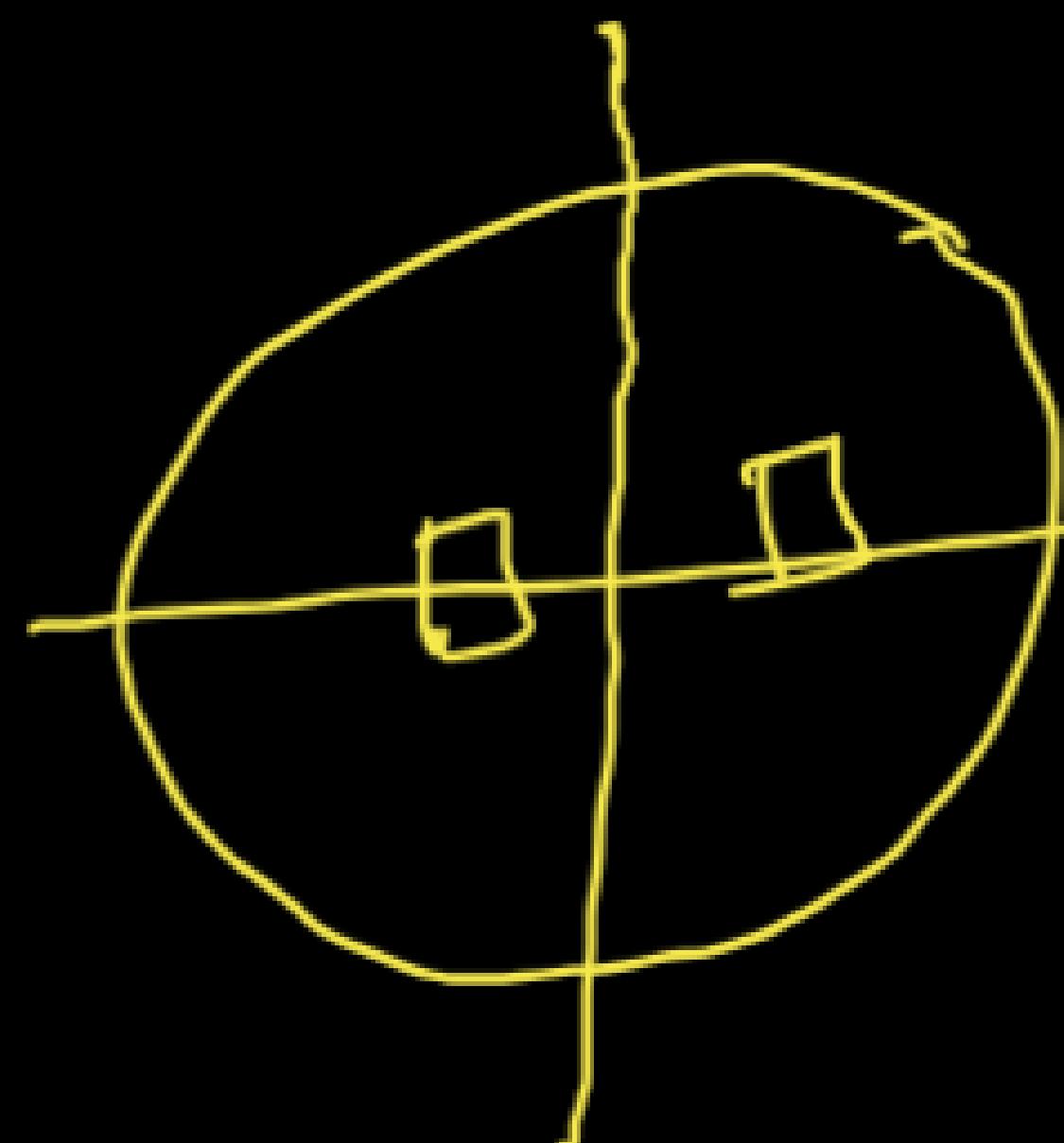
$$\frac{I_B}{S_A} = \frac{200 \cdot 1 \cdot 2 \cdot 0}{200 \cdot 1 \cdot 2 \cdot 10}$$

Same N/W  $\rightarrow A$

$$\frac{I_B}{S_B}$$

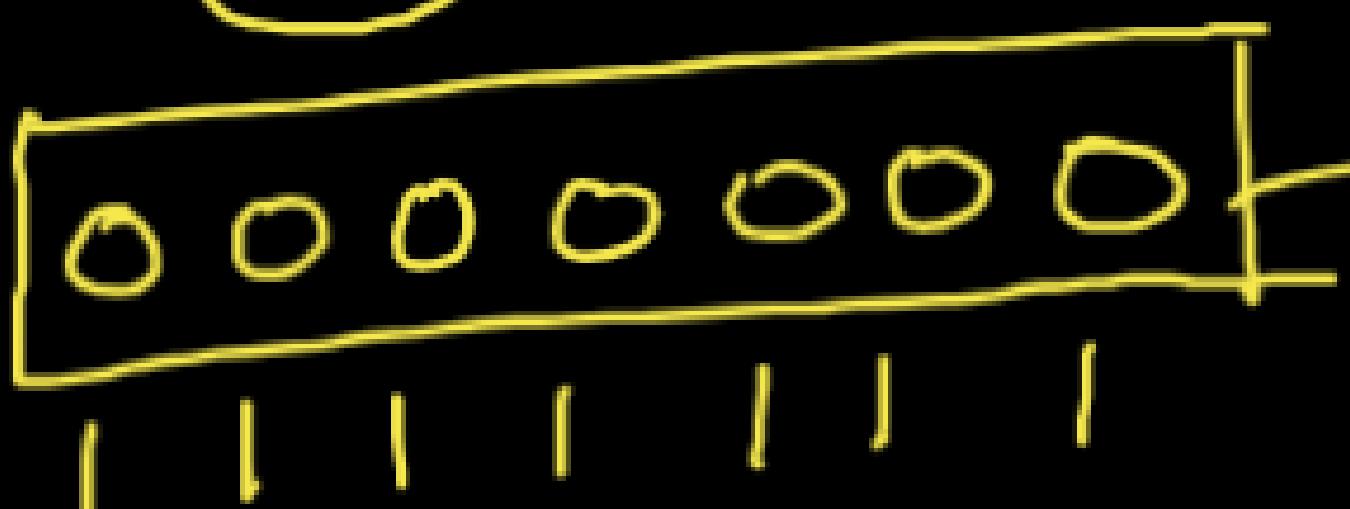
$$\frac{200 \cdot 1 \cdot 2 \cdot 64}{200 \cdot 1 \cdot 2 \cdot 0} \neq \frac{200 \cdot 1 \cdot 2 \cdot 0}{200 \cdot 1 \cdot 2 \cdot 10}$$

Diff N/W  $\rightarrow B$



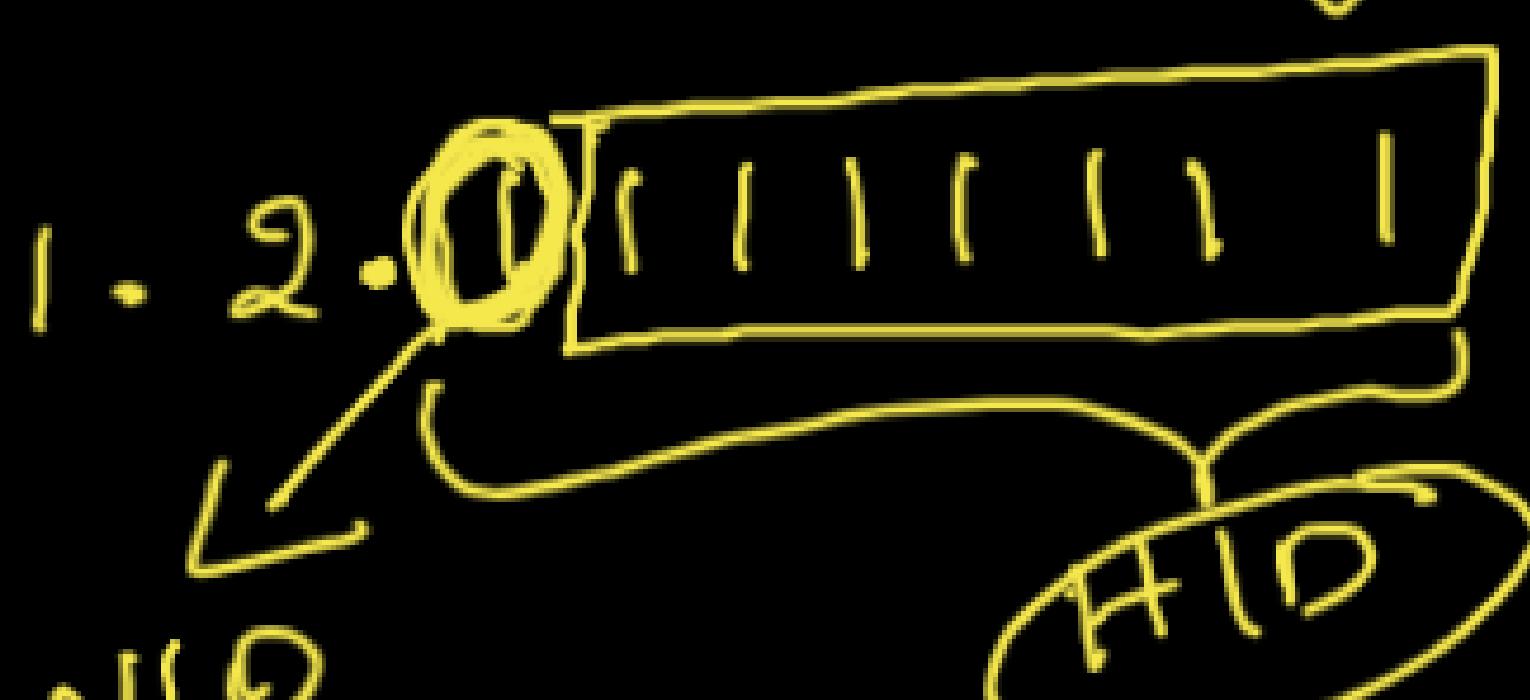
what is DBA:  $\rightarrow$  H1D put all 1's

✓  $200 \cdot 1 \cdot 2 \cdot 128 / 25 \rightarrow ?$  DBA  $NID=25$   $H1D=7$

$200 \cdot 1 \cdot 2 \cdot 1$    $\rightarrow$  H1D.

DBA  $\rightarrow$  H1D 1's

$200 \cdot 1 \cdot 2 \cdot 255$

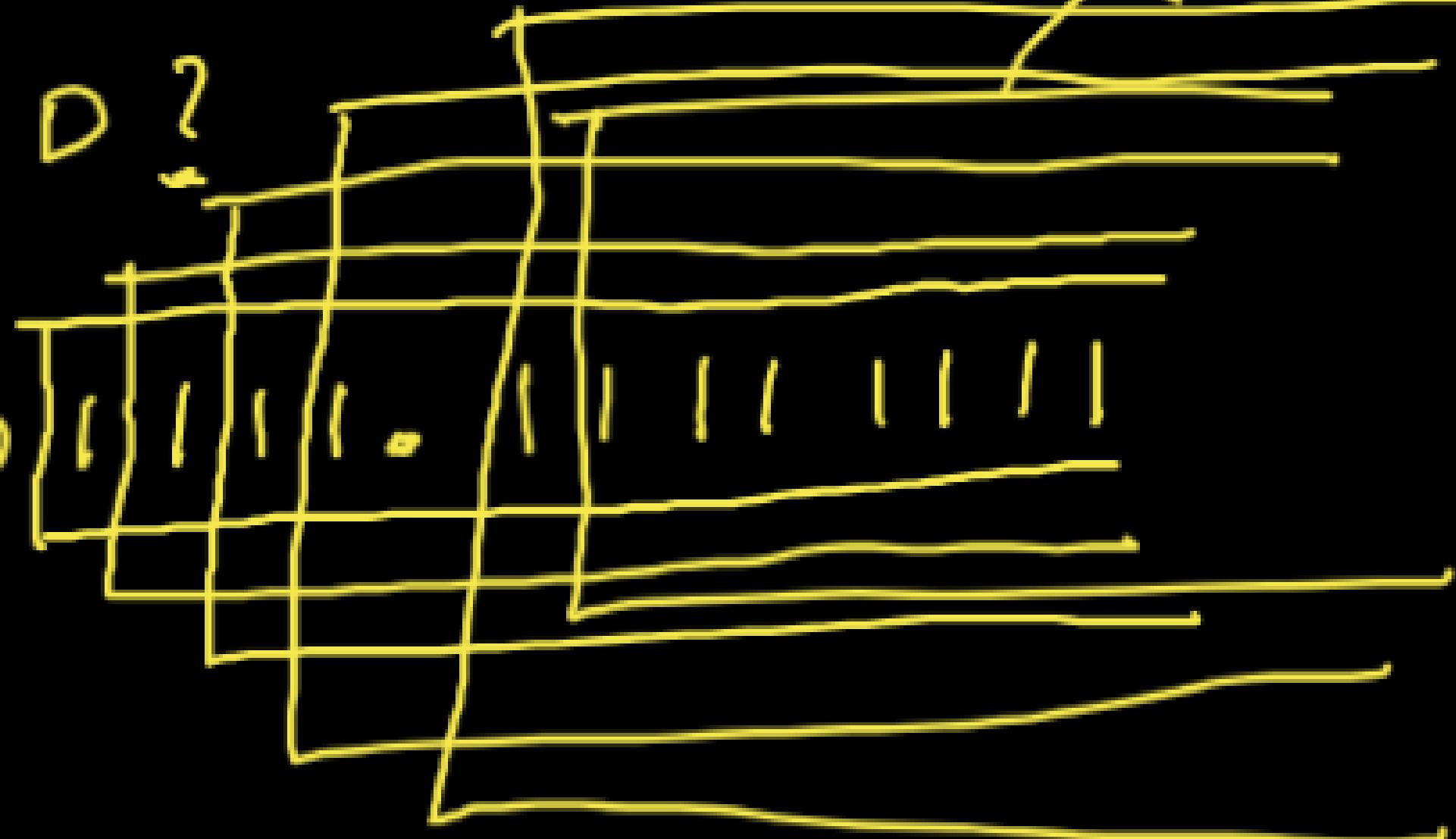
$200 \cdot 1 \cdot 2 \cdot 0$  

But  
1's  $\rightarrow$  may not  
be H1D

200.1.15.255 → DBA (we don't know NID)

Can you guess NID?

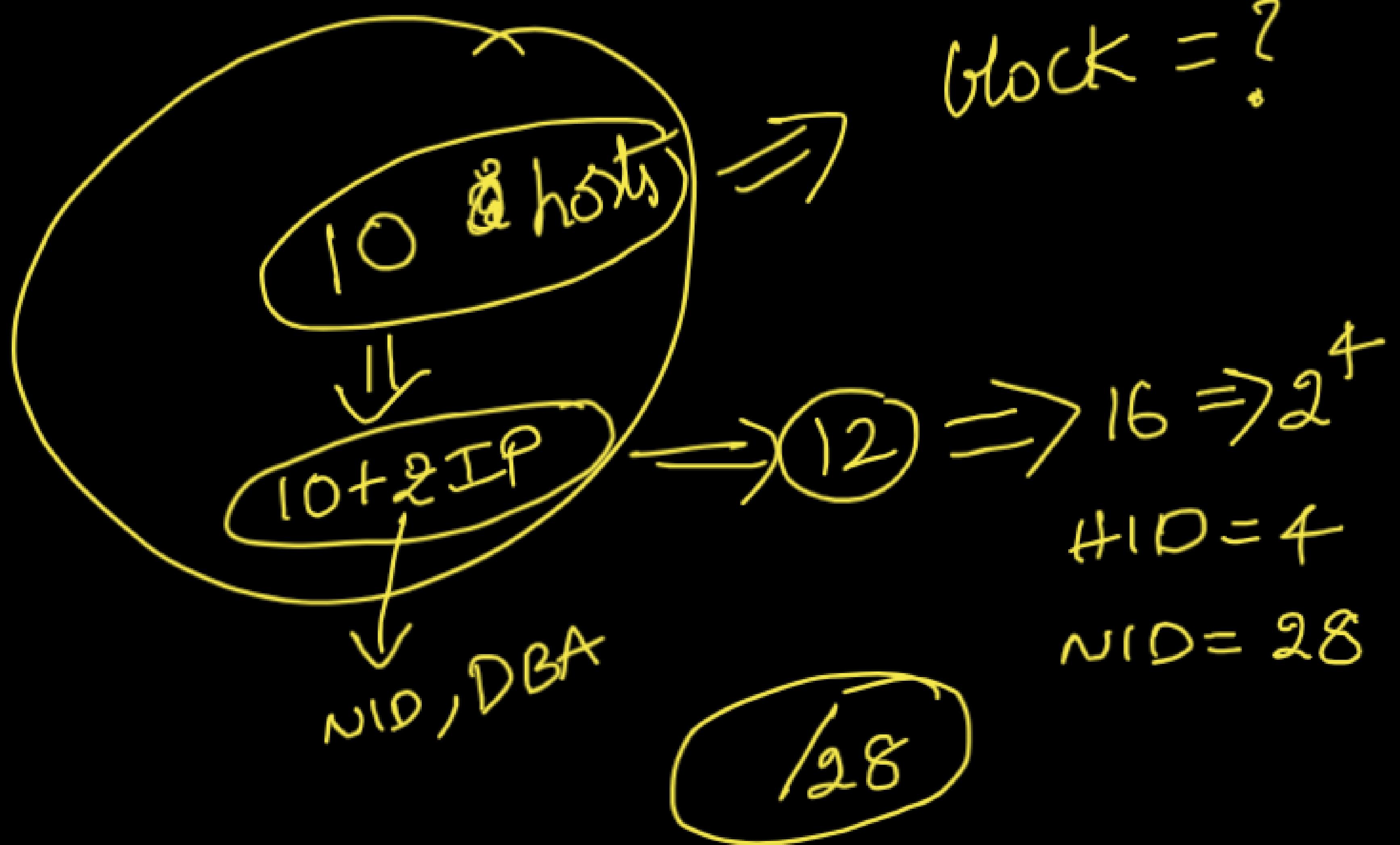
200.1.0000

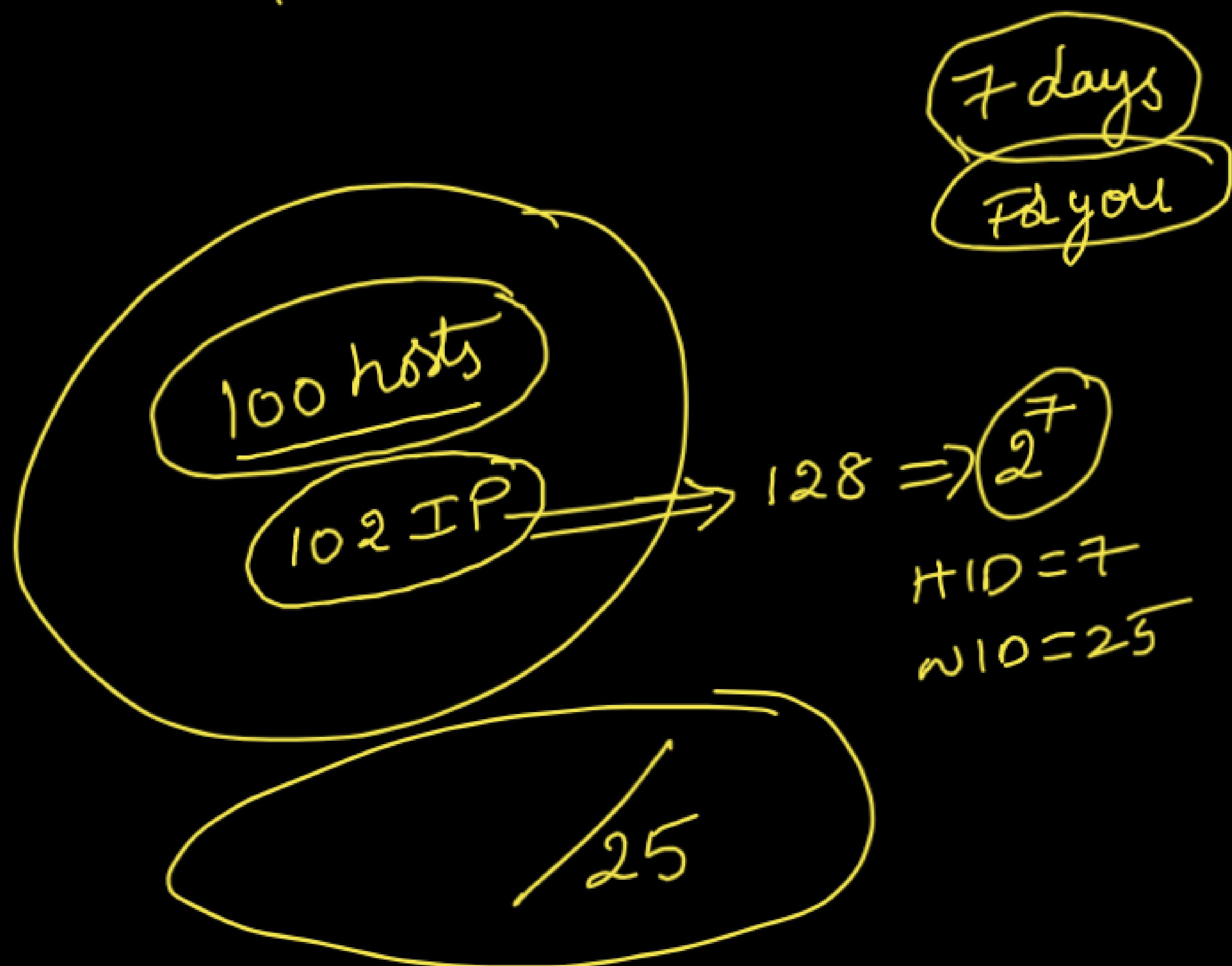


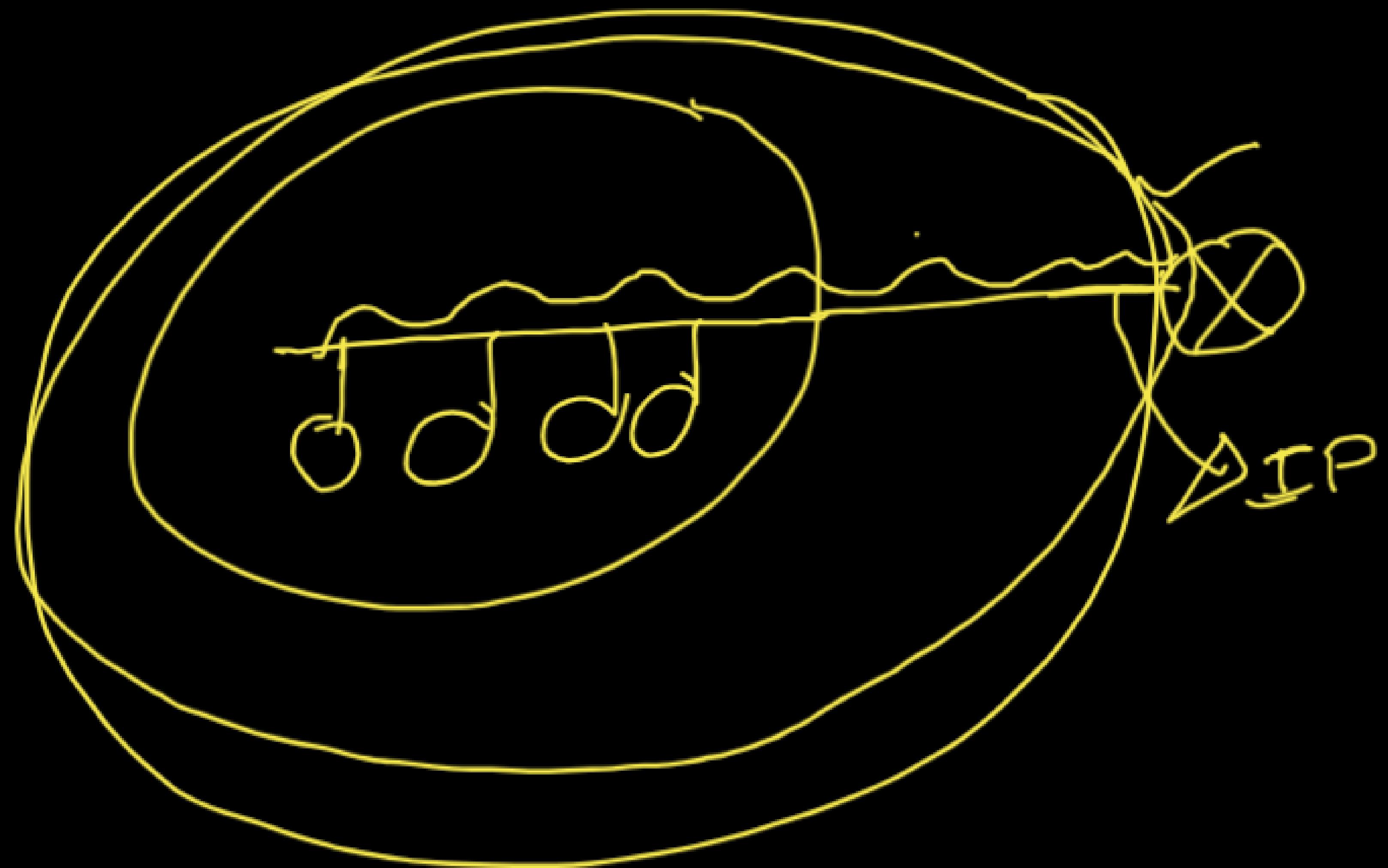
+ Class C

$10 \cdot 1 \cdot 2 \cdot 3 \rightarrow$  classfull.

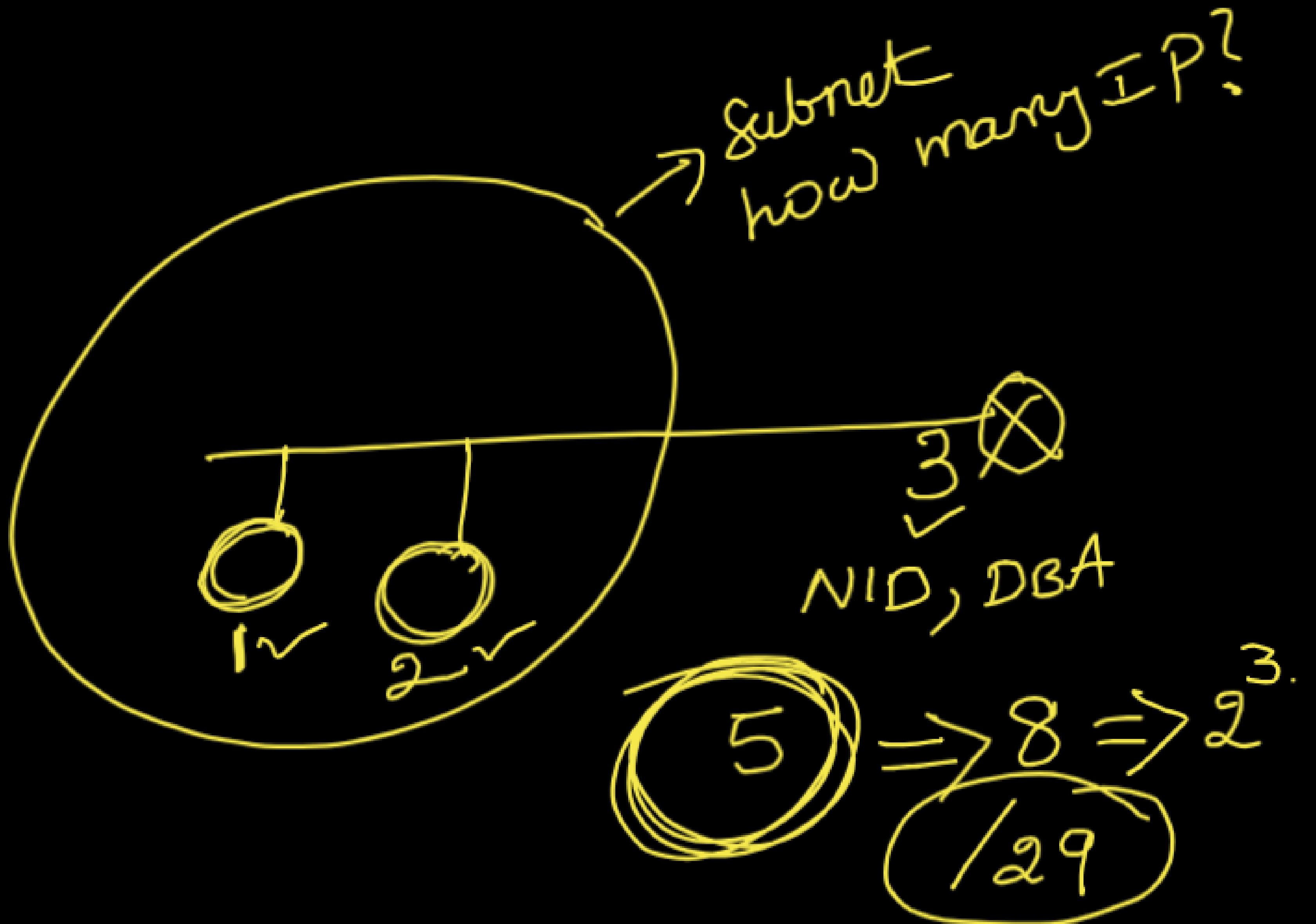
$(10 \cdot 1 \cdot 2 \cdot 3) / 15 \rightarrow$  classless



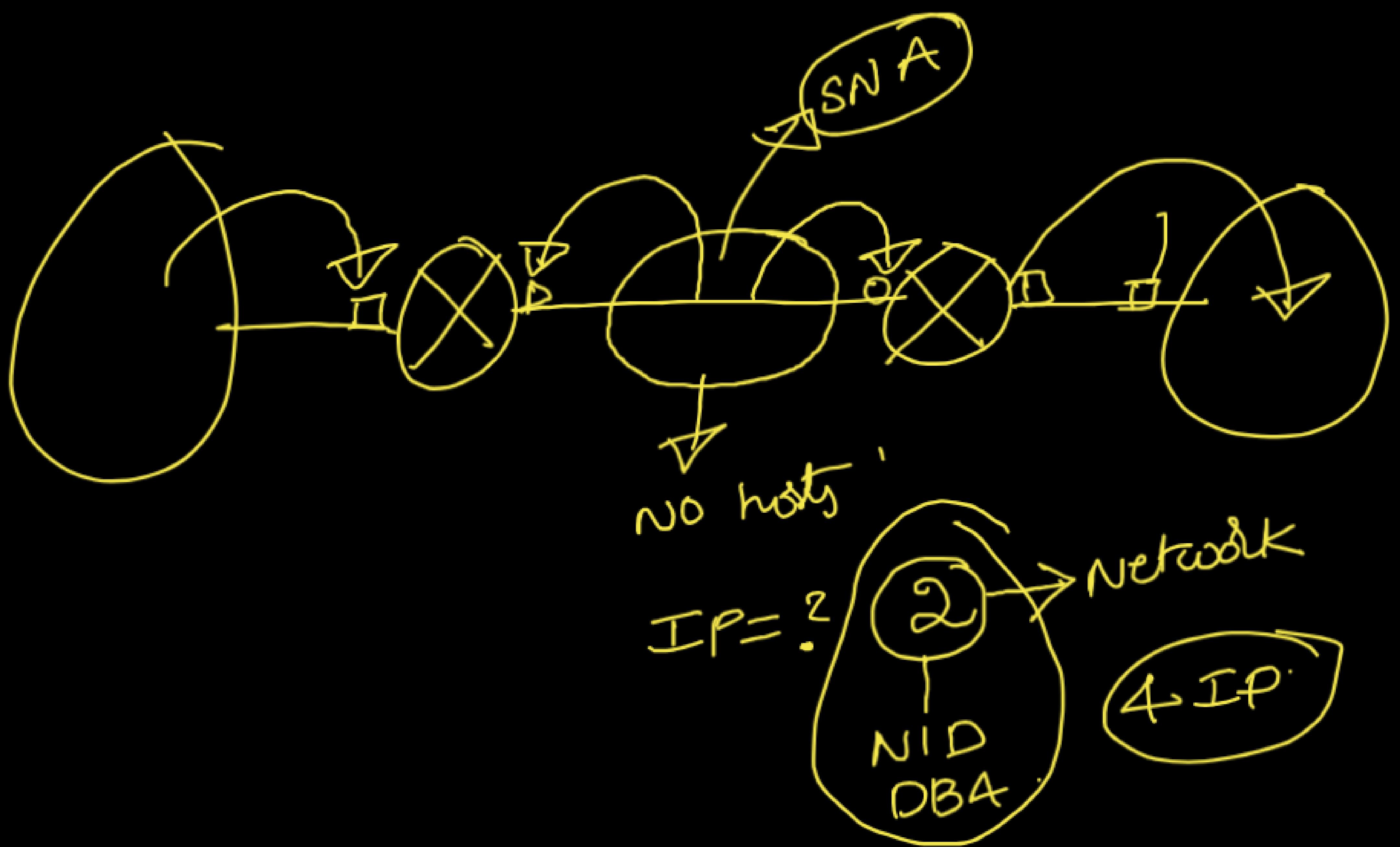


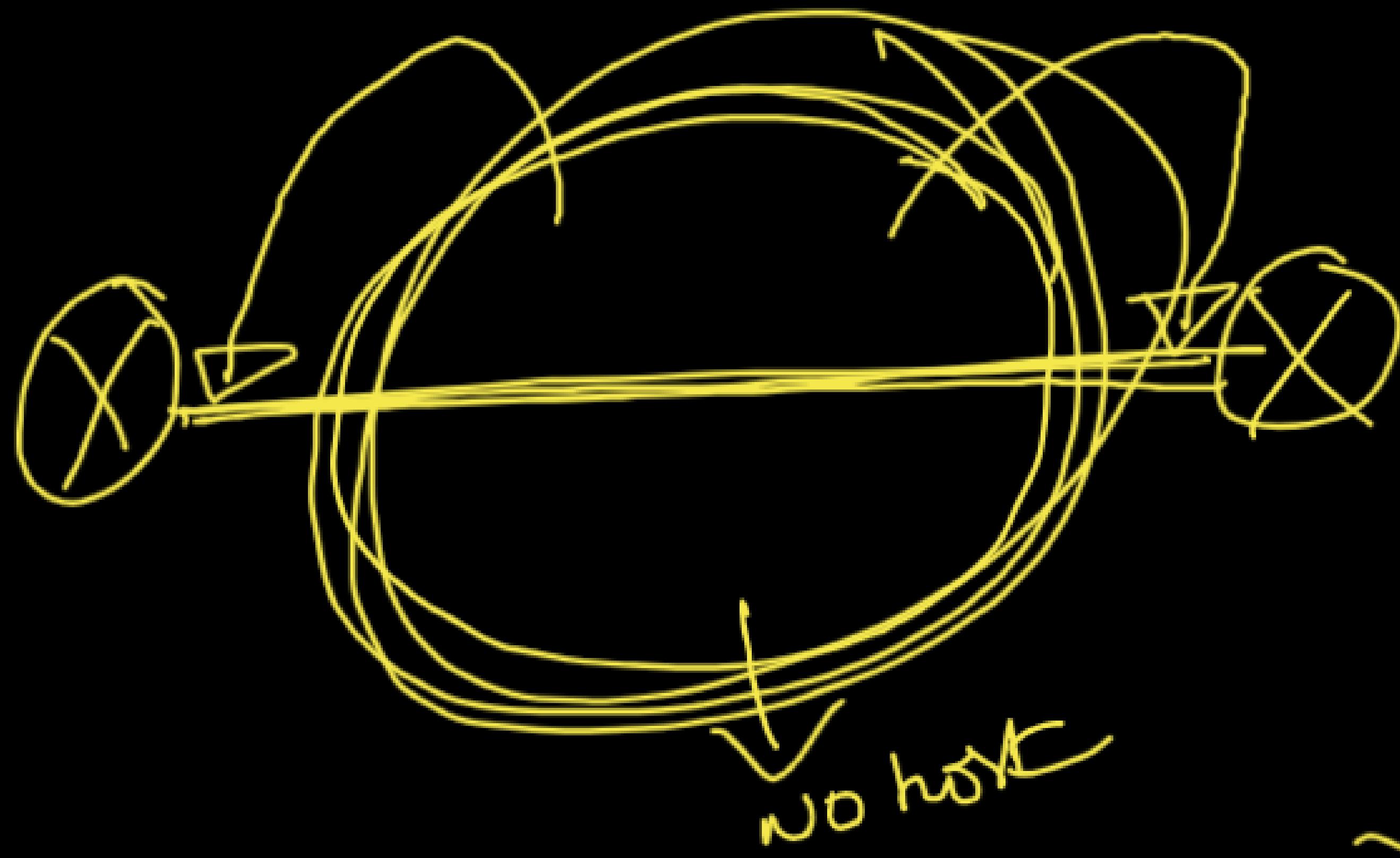




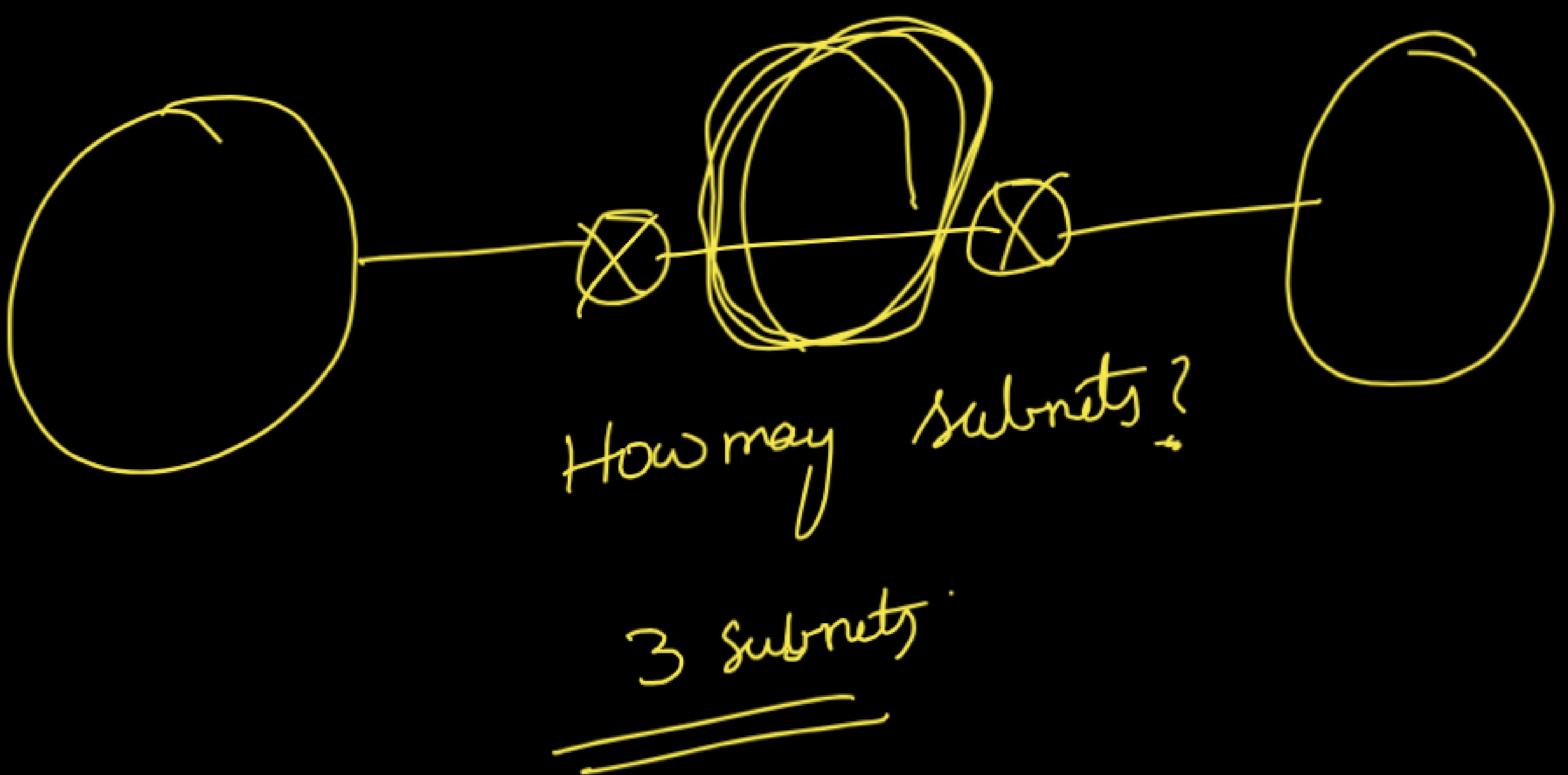


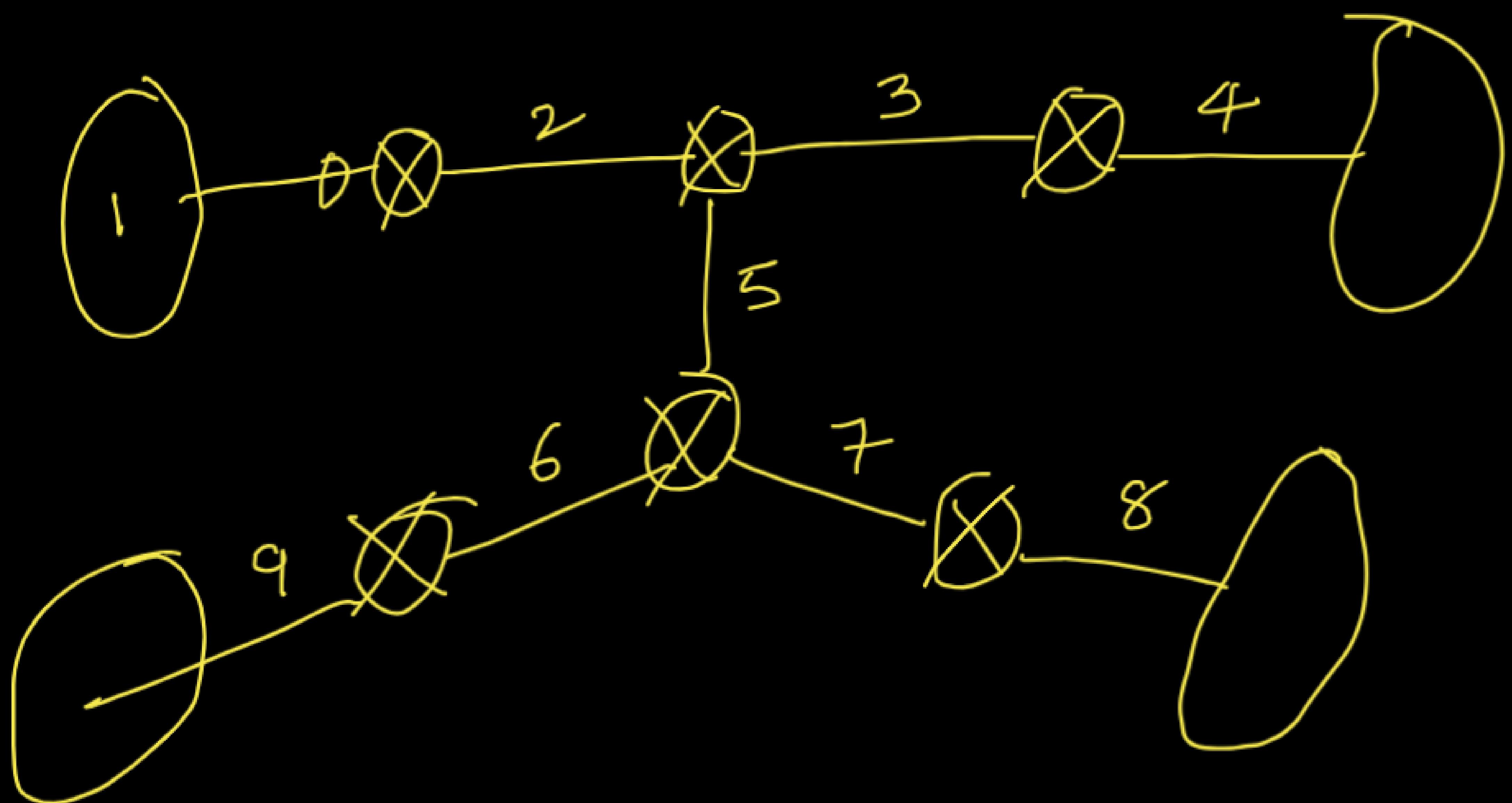


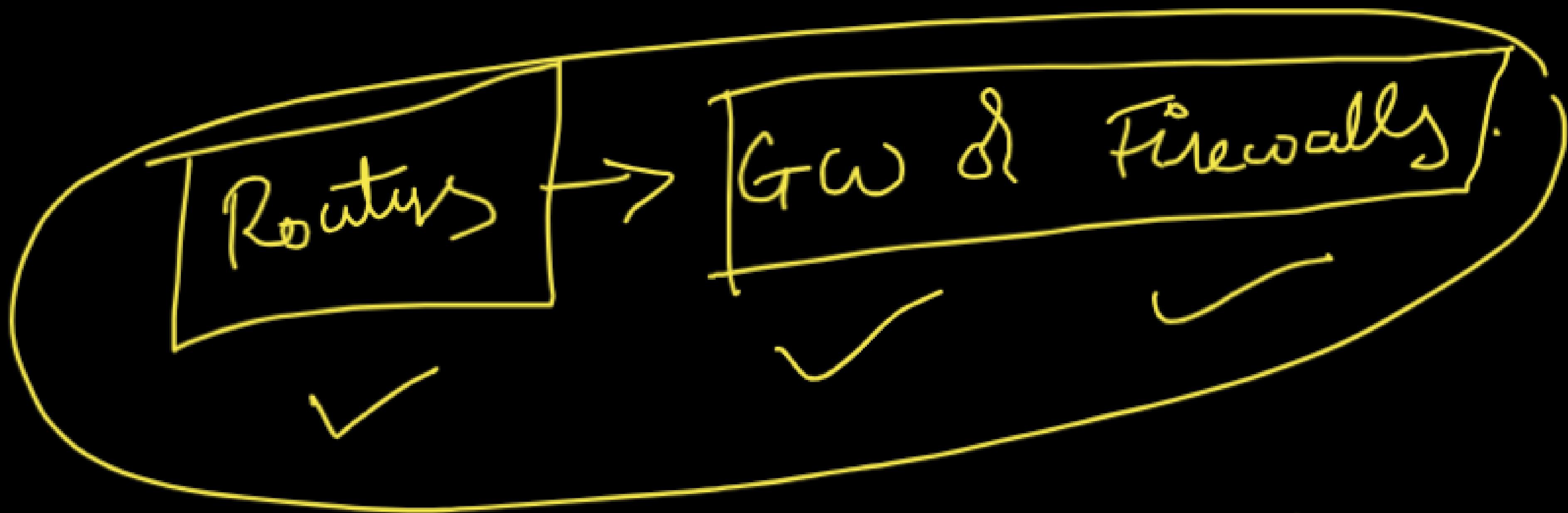


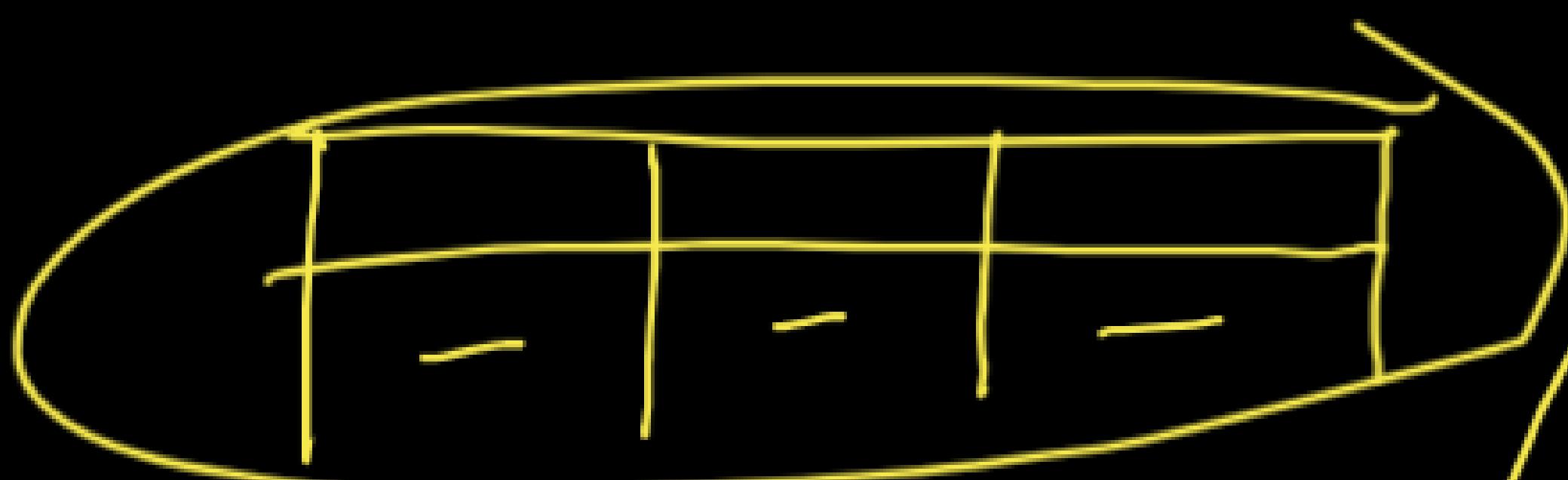


(2IP + DBA + NID)  
= 4IP



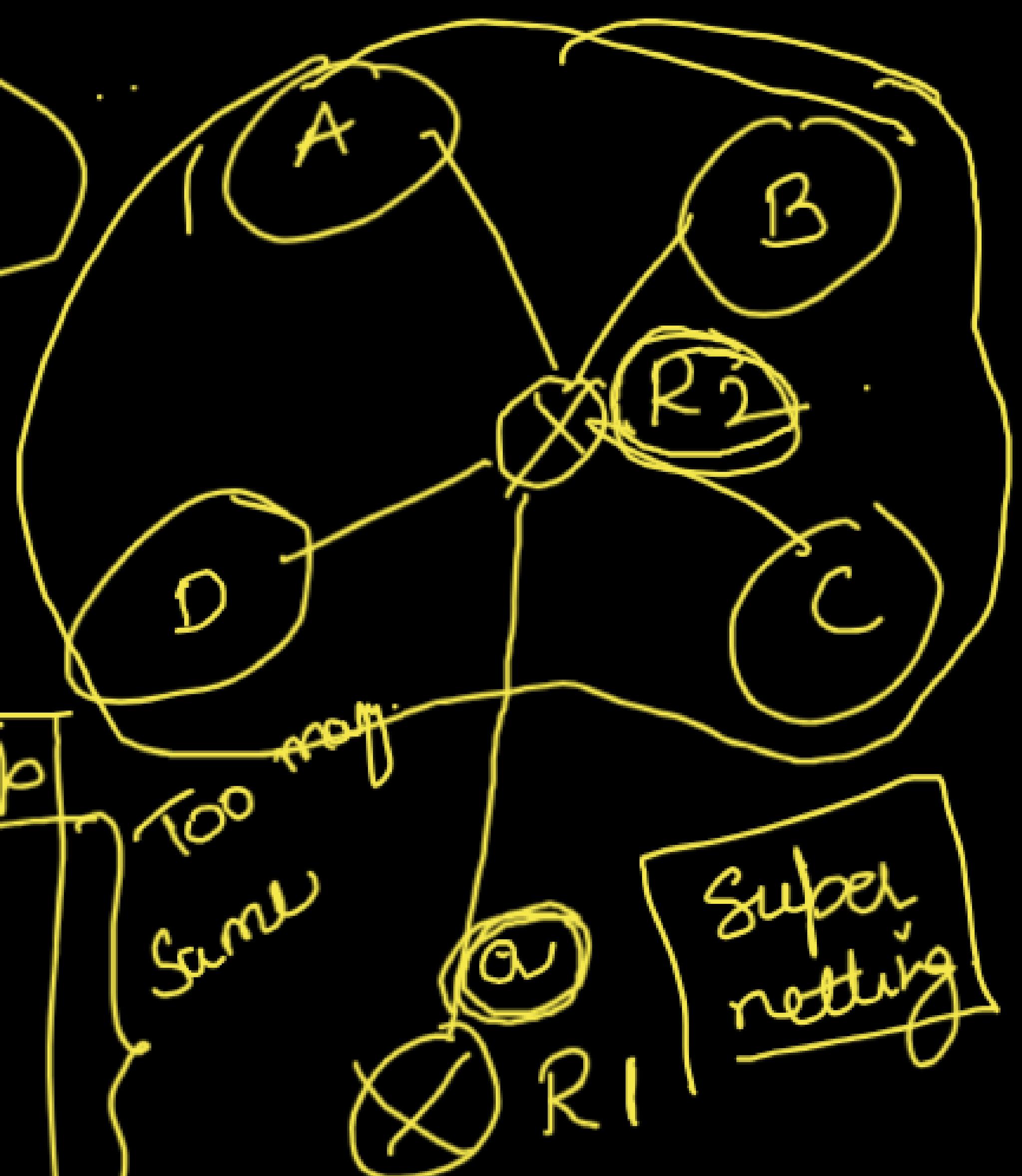






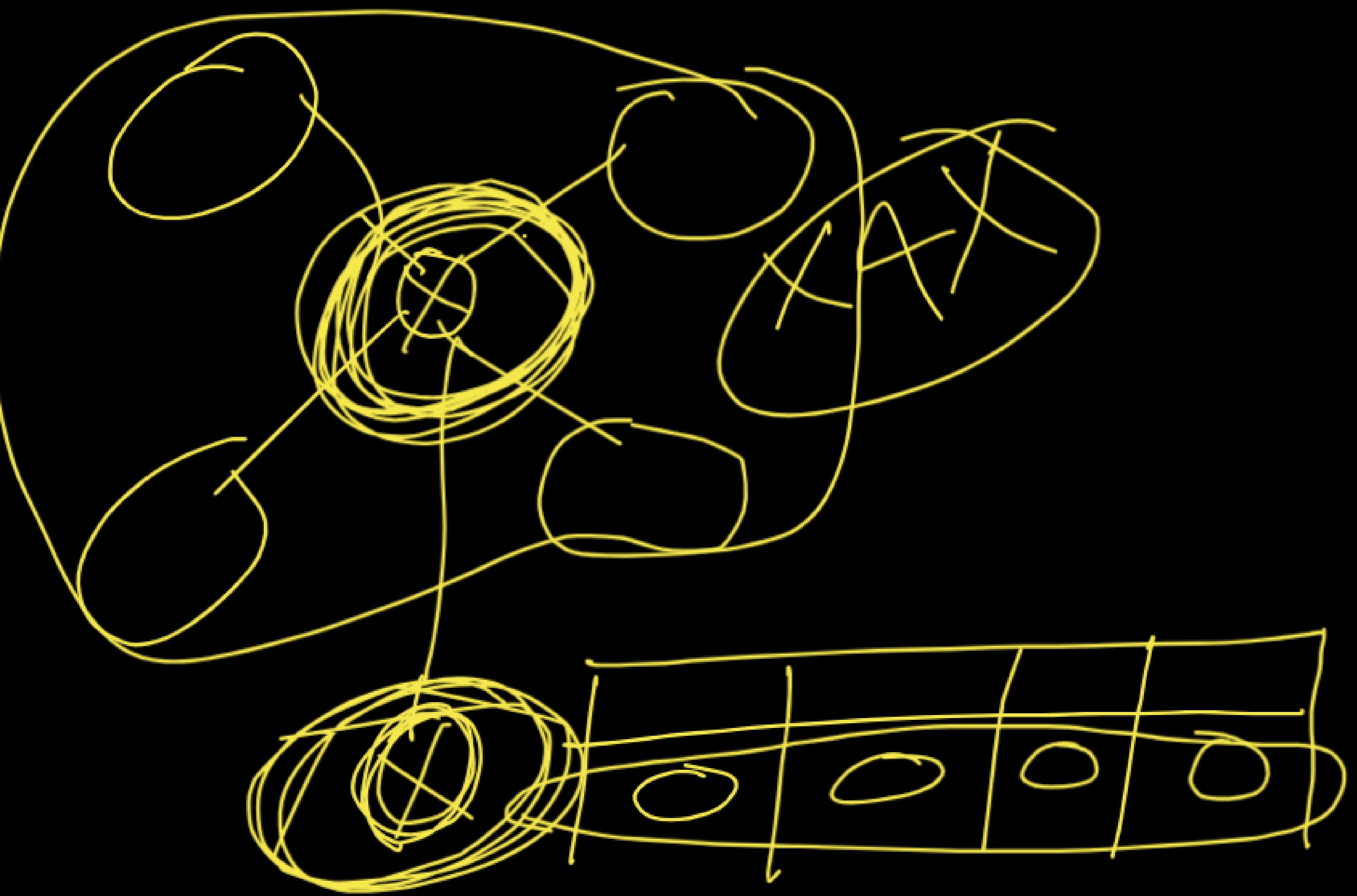
Routing table at R1:

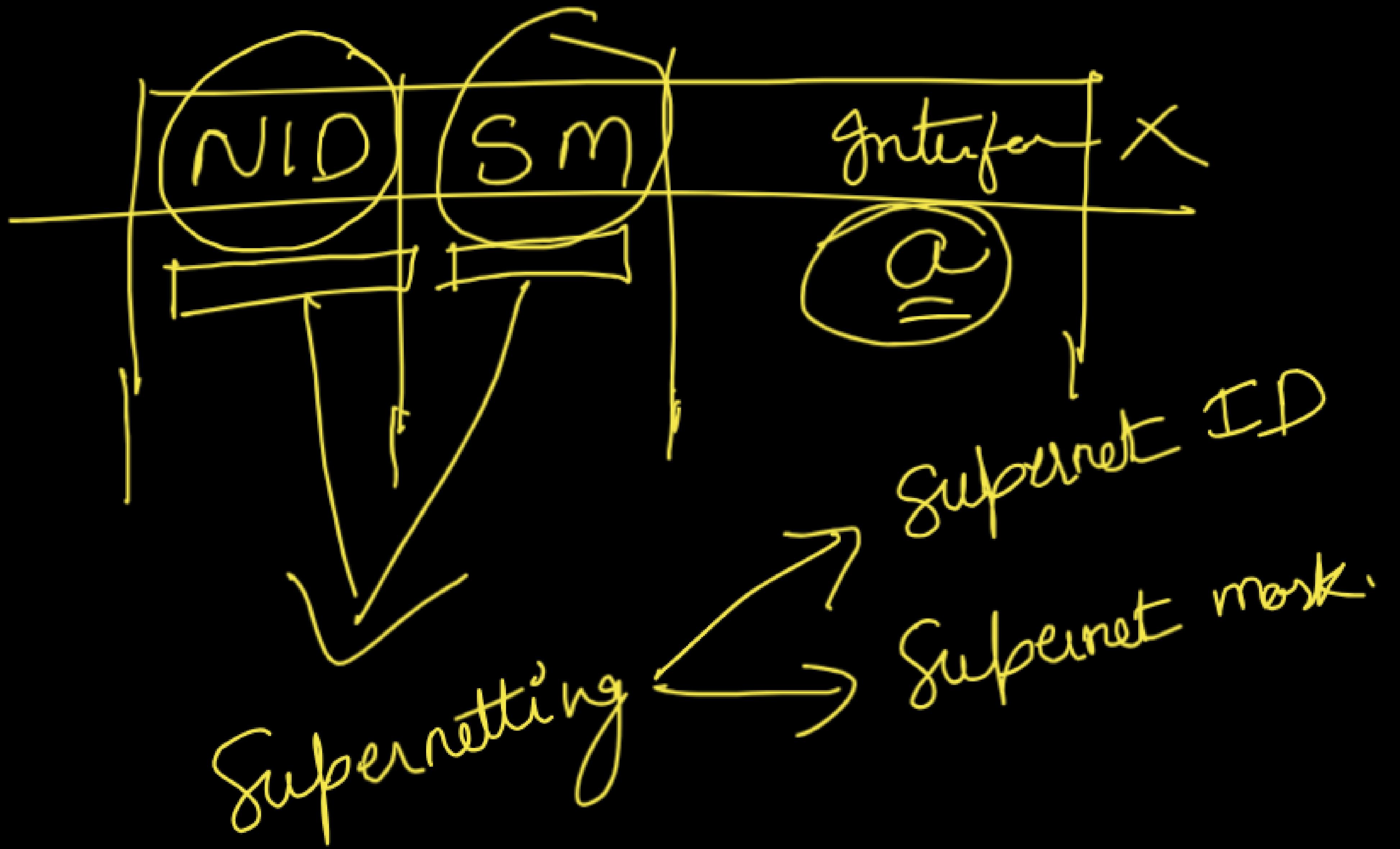
NID	Sm	Next hop
NA	SA	a
NB	SB	a
Nc	Sc	a
D	SD	a
0	0	0

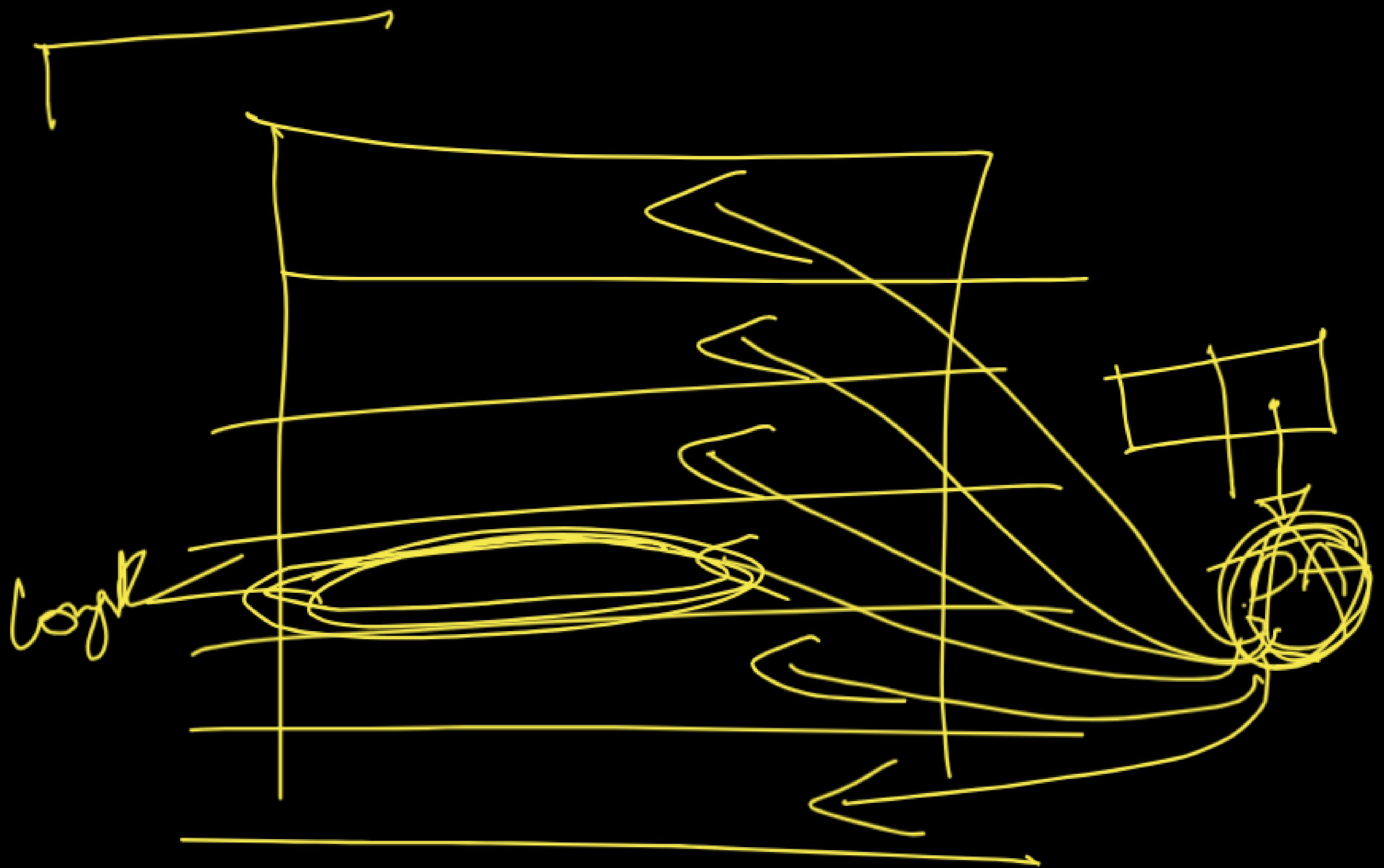


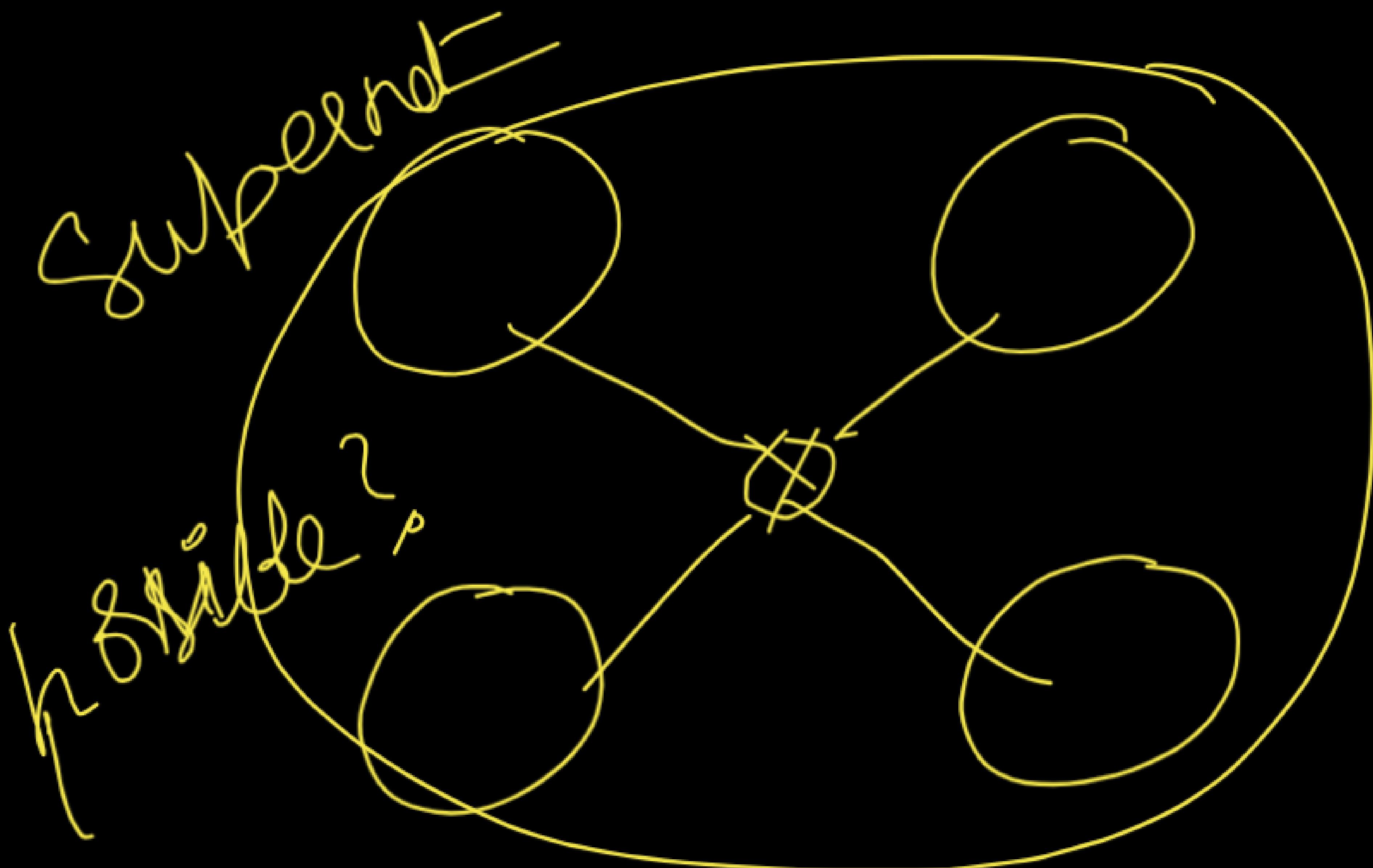
Super netting

R1









When Can  
We Combine?

Sm, SID-

NID ✓  
Subnet ID ✓  
Subnet ID ✓

## Rules for supernetting & aggregation:

- 1) Contiguous  $\rightarrow$  all IP's
- 2) Same size  $\rightarrow$  all n/w same size and  $n/w \geq 2^k$
- 3) IP up of subnet  $\rightarrow$  evenly divisible by size of supernet



$200 \cdot 1 \cdot \frac{32 \cdot 0}{24} / \underline{24}$   
 $200 \cdot 1 \cdot \frac{33 \cdot 0}{24} / \underline{24}$   
 $\vdots$   
 $200 \cdot 1 \cdot \frac{47 \cdot 0}{24} / \underline{24}$

(i) Contain contiguous

(ii) Equal and  $n/w = 2^k - 16$

$$16 \times 2^8 = 2^{12} \rightarrow IP$$

$200 \cdot 1 \cdot 0010 \boxed{0000.000000}$

$$\begin{aligned}
2^{\text{12}} & \\
HID = 12 & \\
NID = 20 & \\
32^{\text{12}} &
\end{aligned}$$

$200 \cdot 1 \cdot 32 \cdot 0 / \underline{20}$

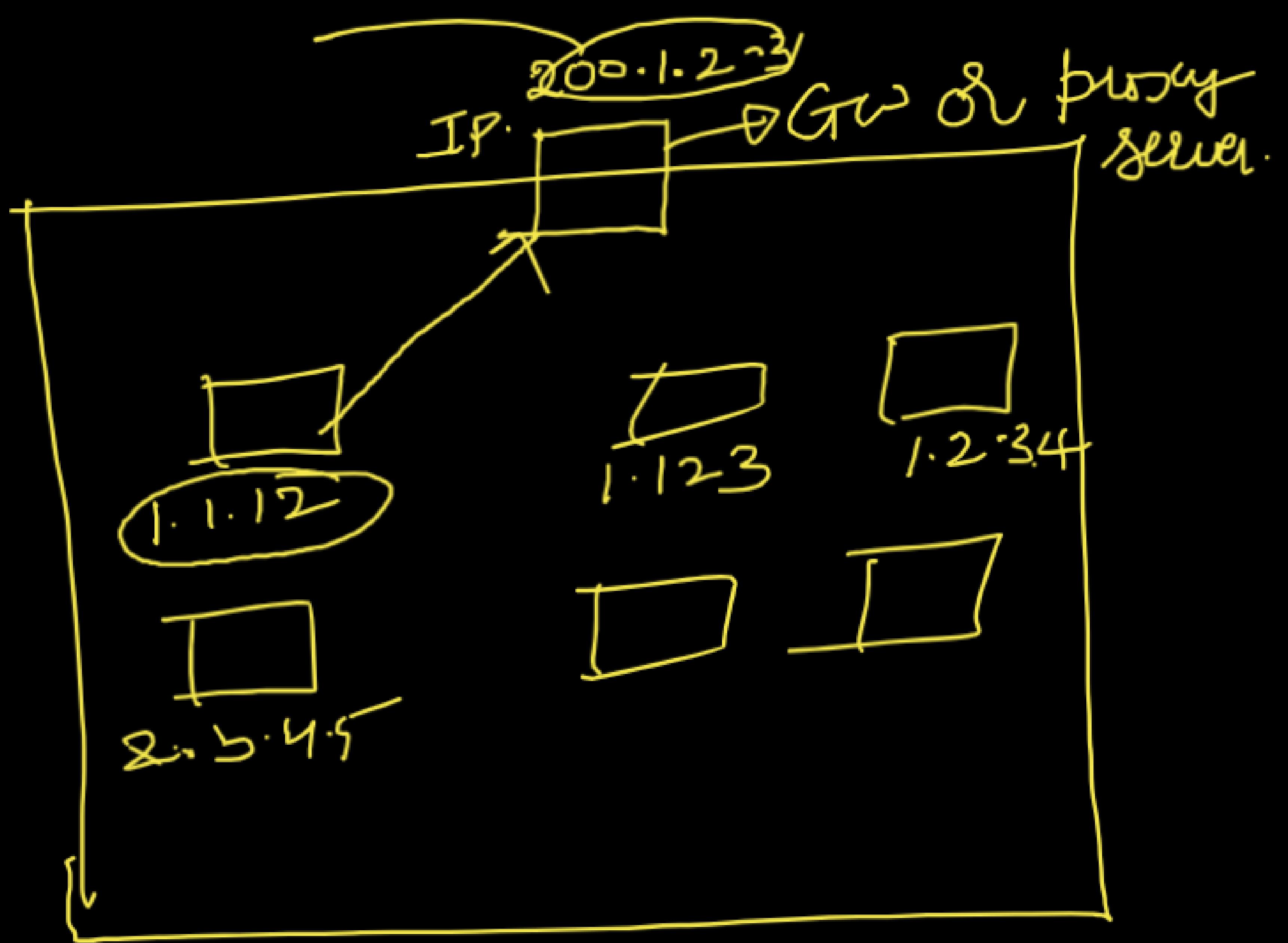
SID.

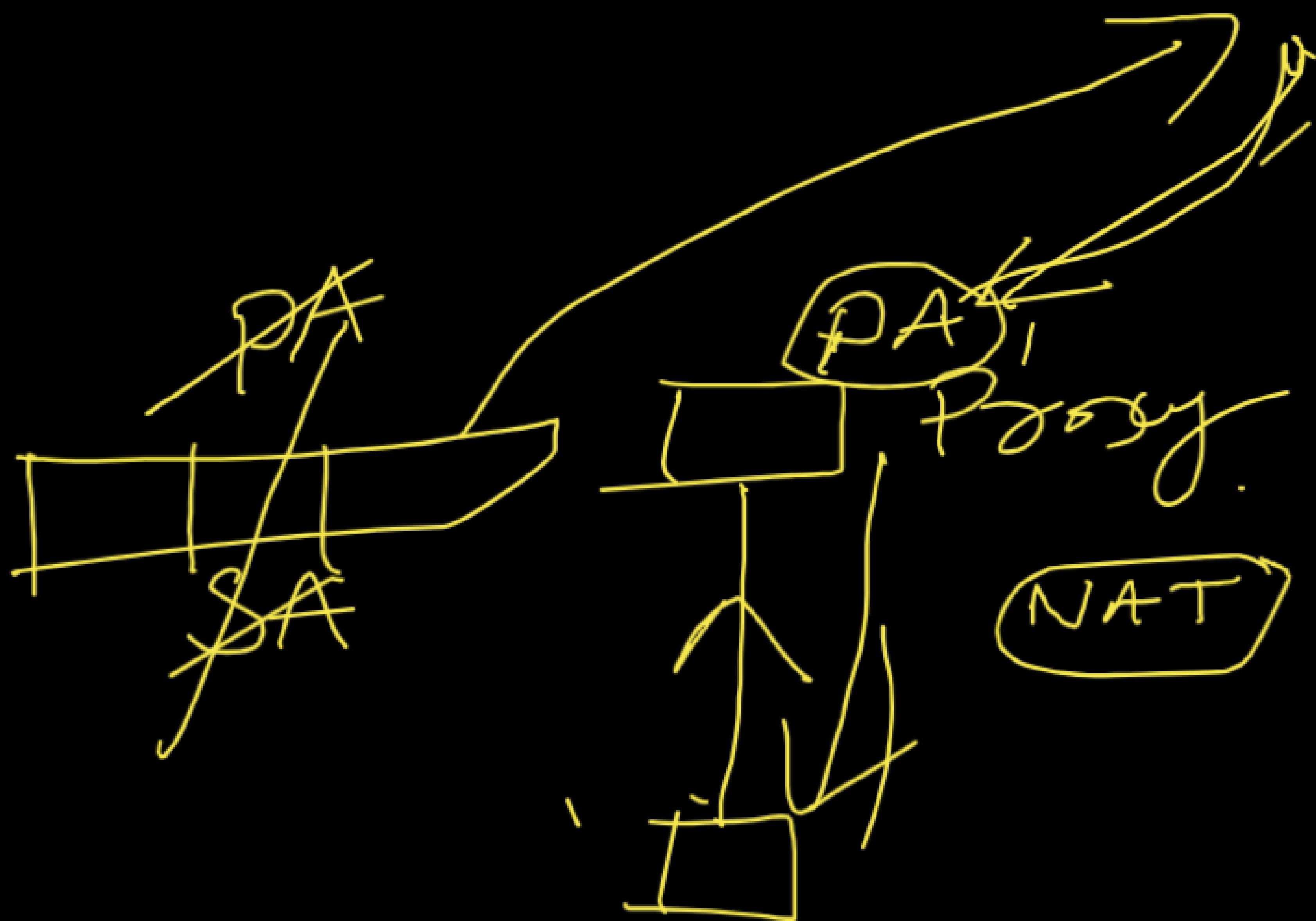
$$\begin{aligned}
NID = 32 - HD & \quad Sm = 111111.111111.11100000 \\
& \quad .000000 \\
& = 255.255.240.0
\end{aligned}$$

$$\begin{array}{c}
 \boxed{100 \cdot 1 \cdot 2 \cdot 0 / 25} \\
 \boxed{100 \cdot 1 \cdot 2 \cdot 128 / 26} \\
 \boxed{100 \cdot 1 \cdot 2 \cdot 192 / 26}
 \end{array}
 \rightarrow 25 \quad \boxed{24} \quad \left. \begin{array}{r} 100 \cdot 1 \cdot 2 \cdot 10 \quad \underline{\underline{000000}} \\ \vdots \quad \vdots \quad \vdots \quad \vdots \end{array} \right\} \text{contig.}$$

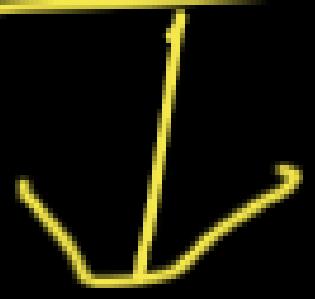
$$\begin{array}{l}
 2^6 \times 2 = \cancel{2^8} = \underline{\underline{410}} \\
 100 \cdot 1 \cdot 2 \cdot 128 \quad \underline{\underline{25}} \\
 100 \cdot 1 \cdot 2 \cdot 0 / \cancel{24}
 \end{array}$$

$$\begin{array}{l}
 25 - \cancel{2^7} \\
 25 - \cancel{2^7} \quad \boxed{2^8} \\
 410 = 8 \\
 410 = 24
 \end{array}$$

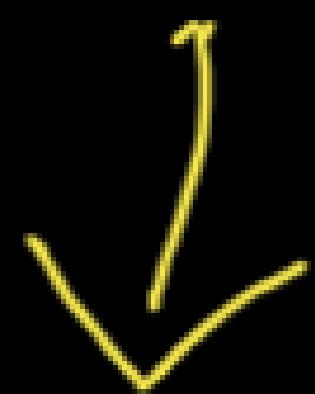




Reserved



use for free in local n/w



Private addr



Valid only in private n/w's

Private:

{ 10.0.0.0 to 10.255.255.255  
172.16.0.0 to 172.31.255.255  
192.168.0.0 to 192.168.255.255 }

















































































































































