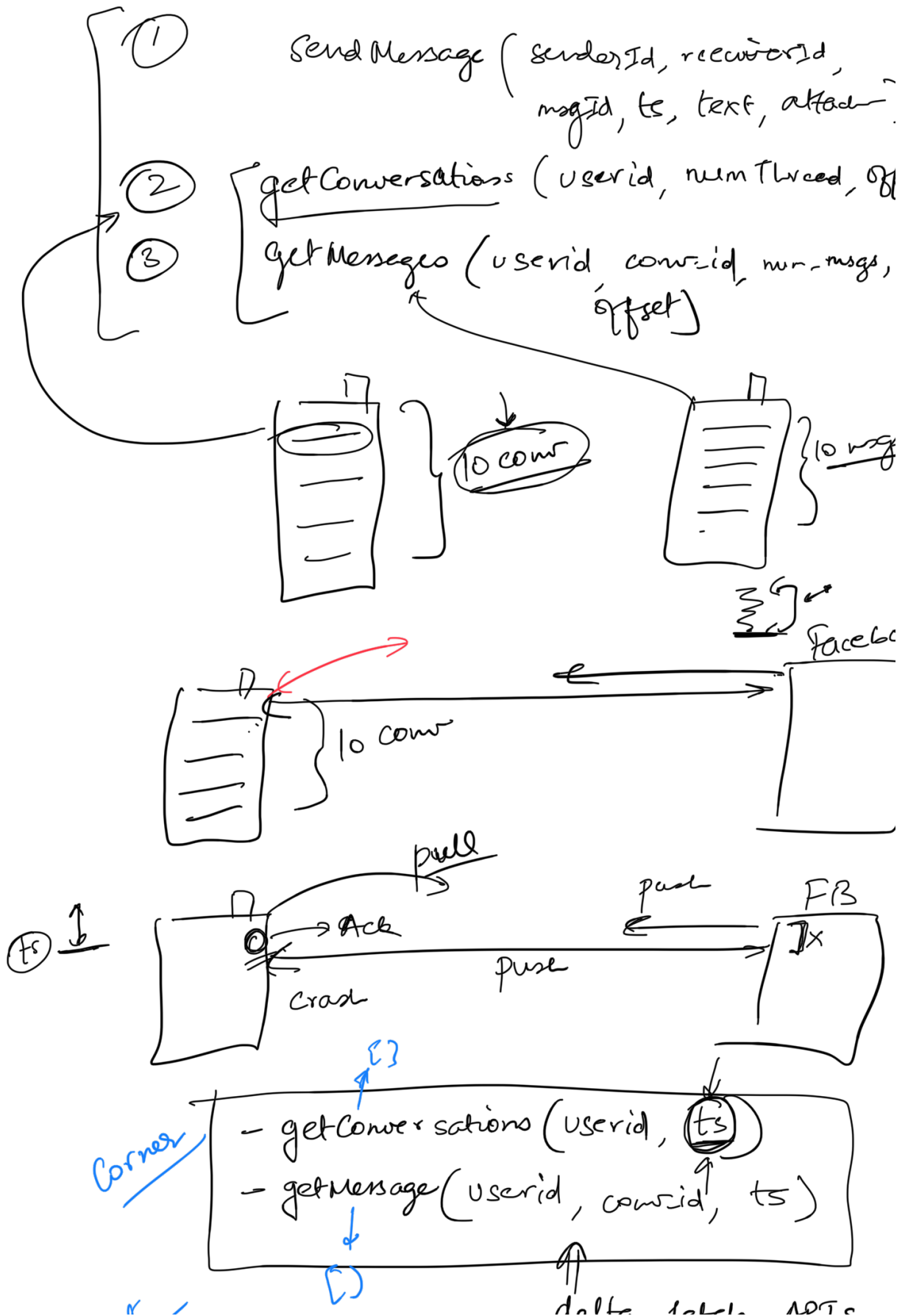
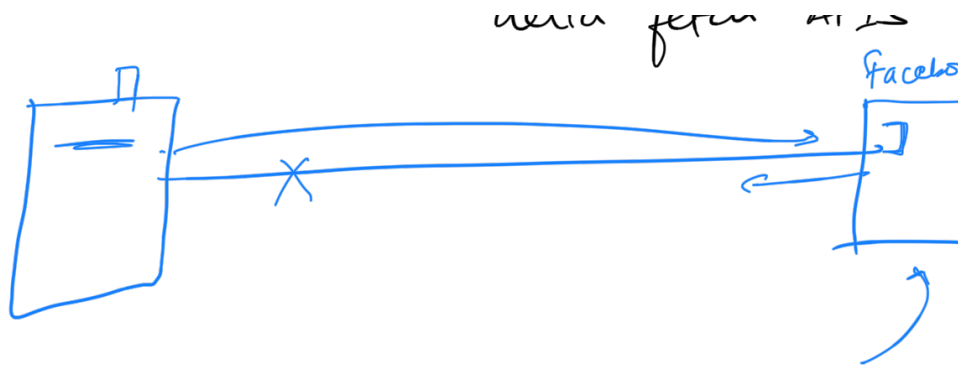


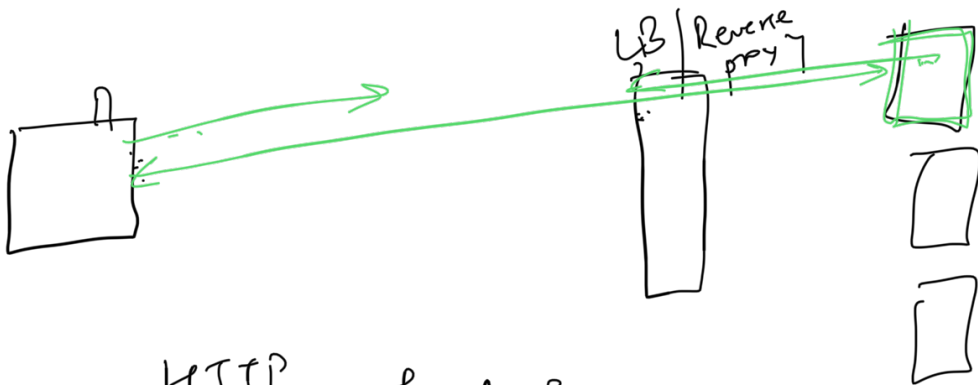
SYSTEM DESIGN



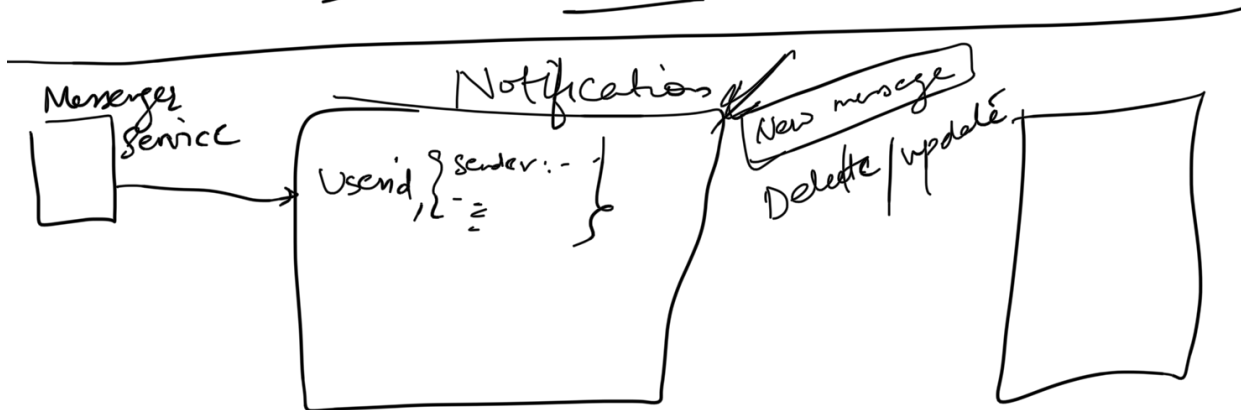
Websocket



Creation of Connection X

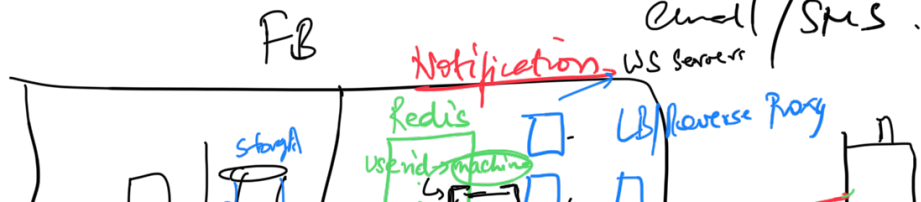


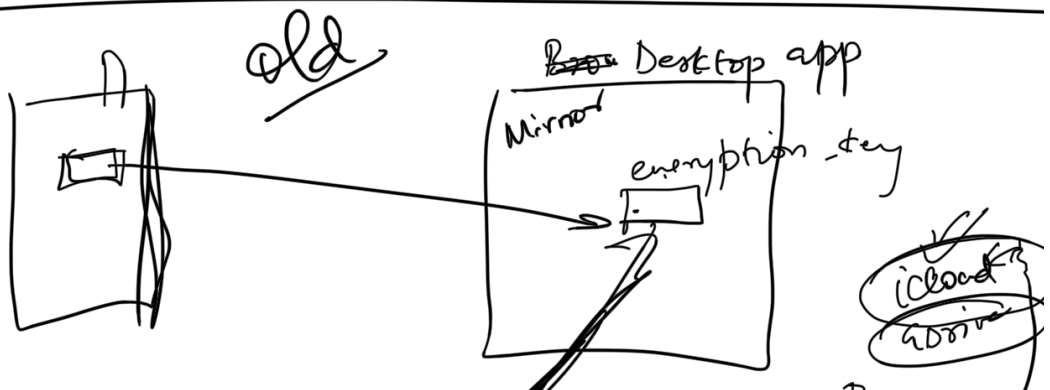
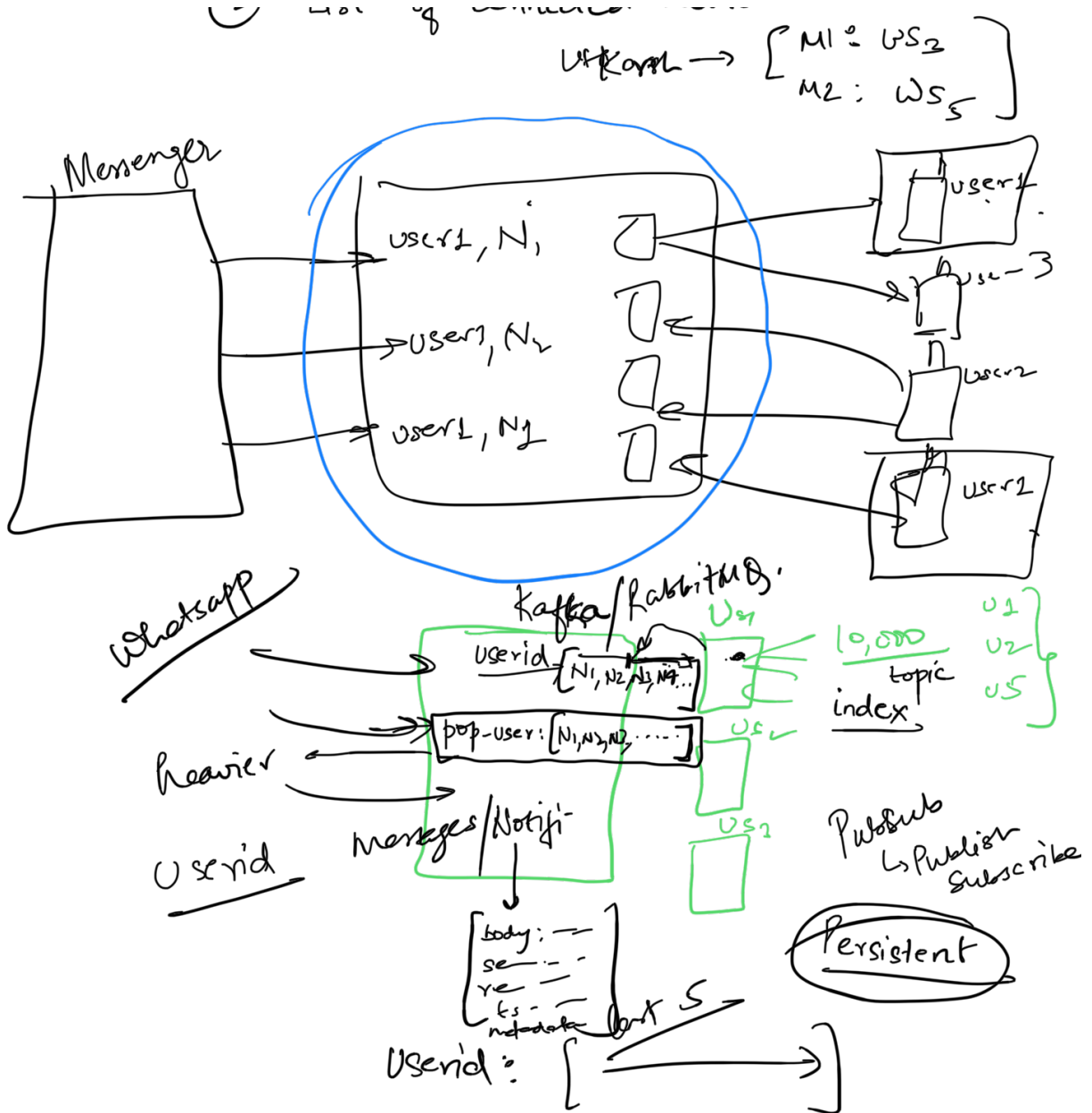
HTTP header?

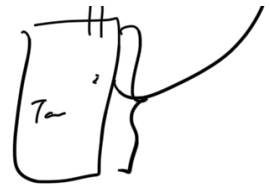


(2) Websocket / Push Notification OR

Email / SMS



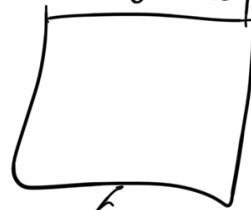


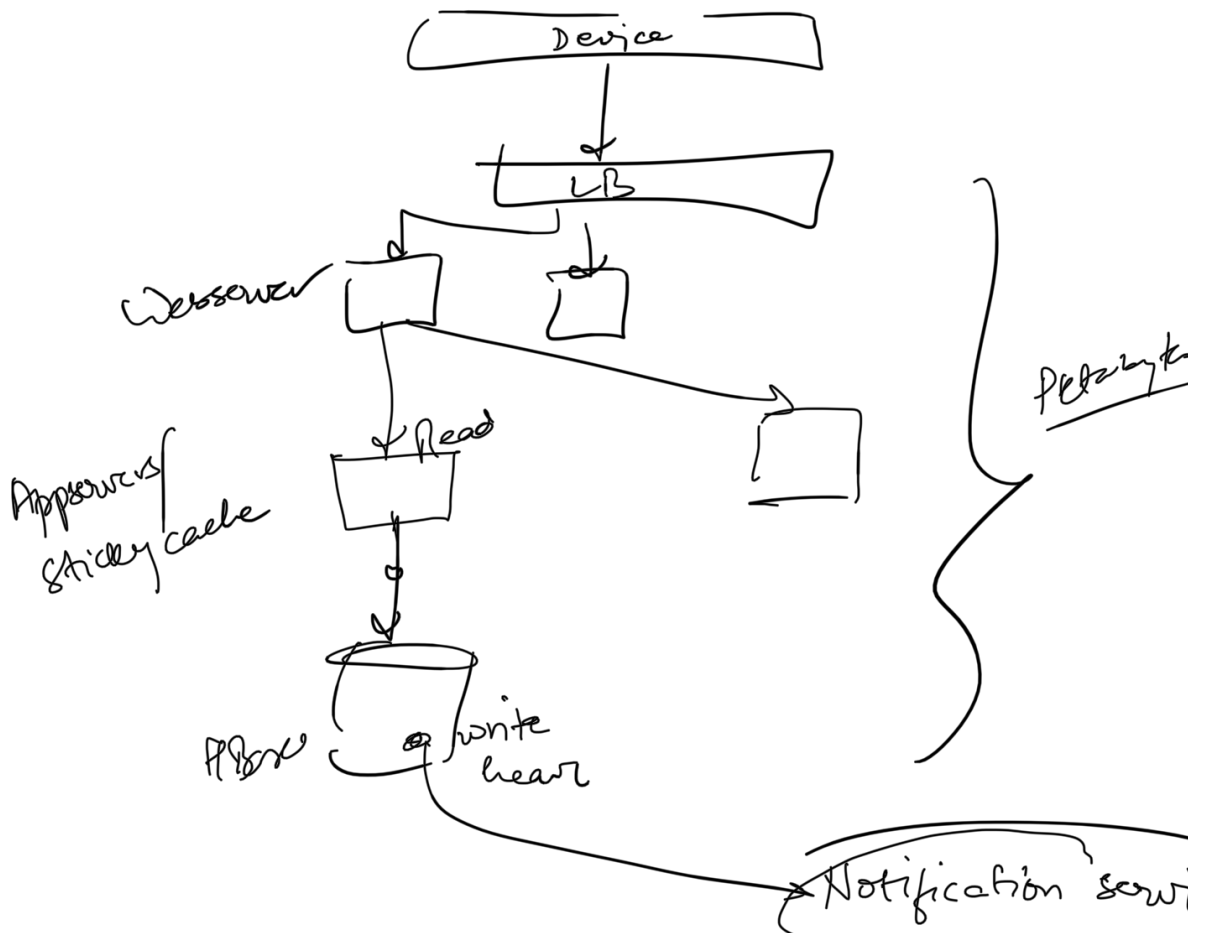


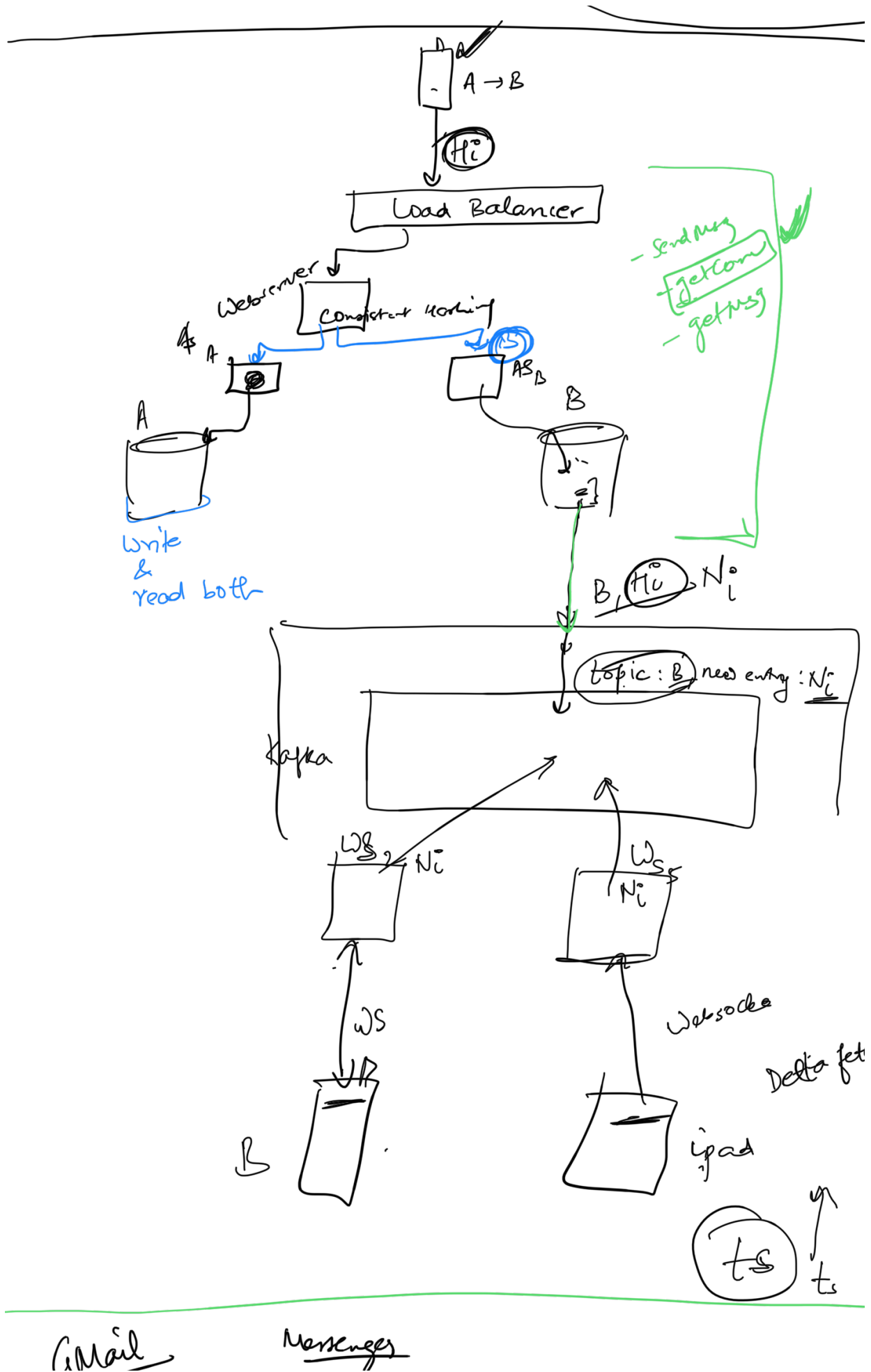
Now



whatsapp ~ ?







iMail

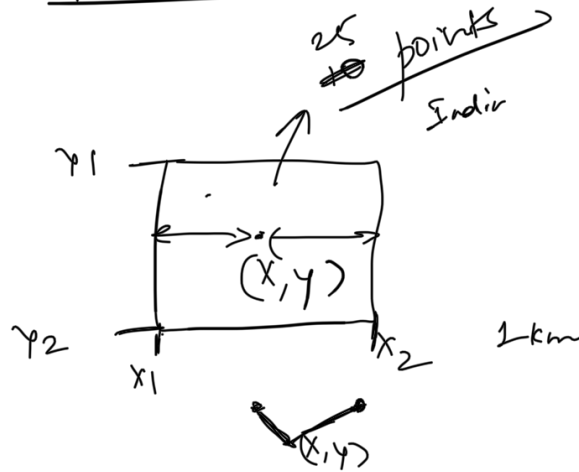
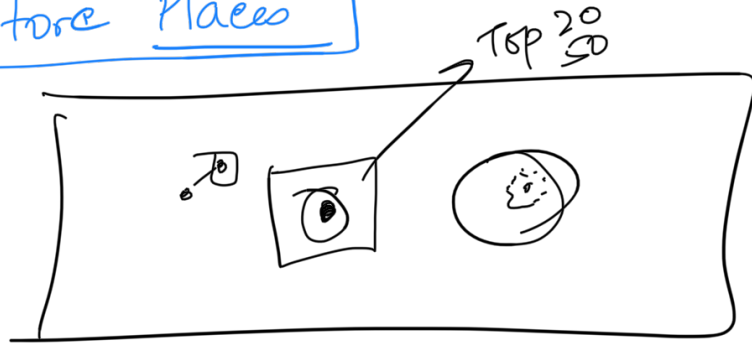
Messenger

...

↳ fail fast

Store Places

1 mile
Sunnyvale
10 mile



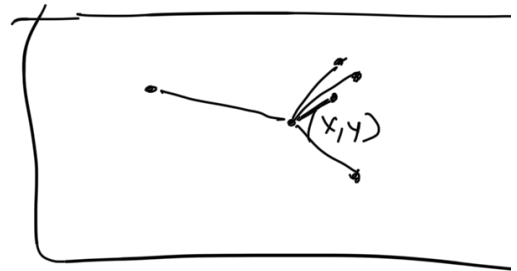
20 places

- ① How to store (x, y)
- ② How to query.

SELECT * FROM
TABLE WHERE

$x \geq x_1$ AND $x <$
AND $y > y_1$ $y <$

place	x	y
-------	---	---

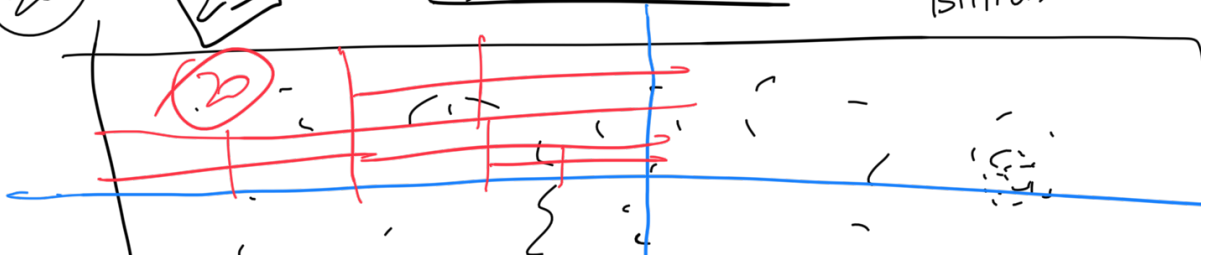


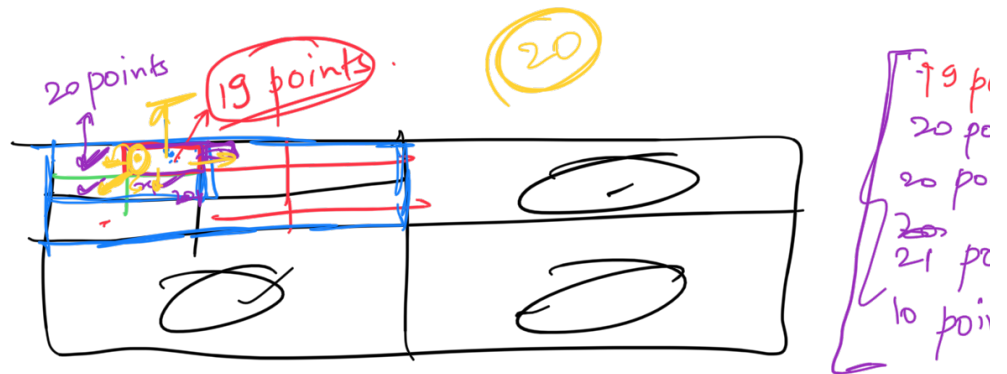
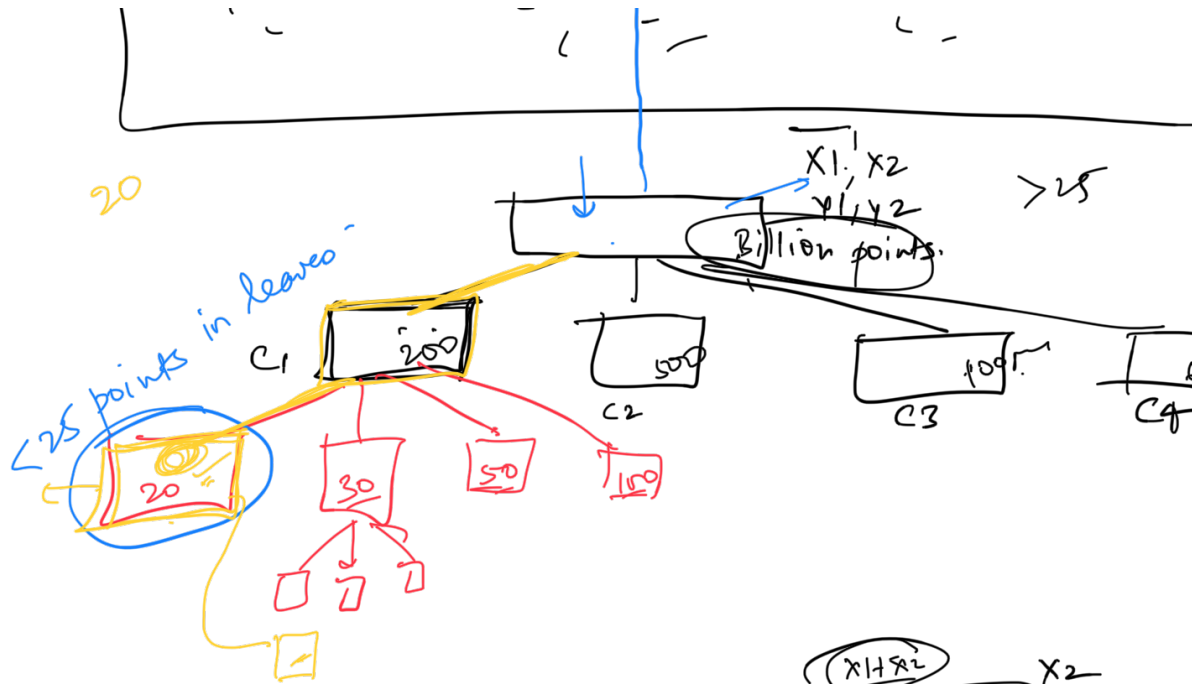
20

25

Quad Tree

Billion





$\log x_1$

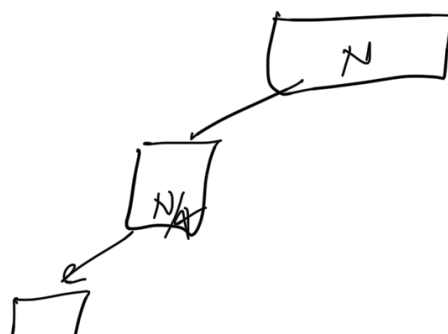
Billion

100 - 150

20 point



$4^3 = 64$



$\log_4 N$

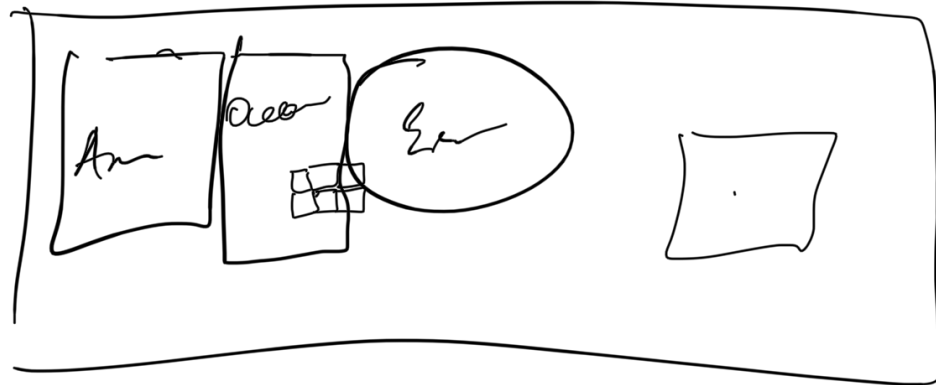
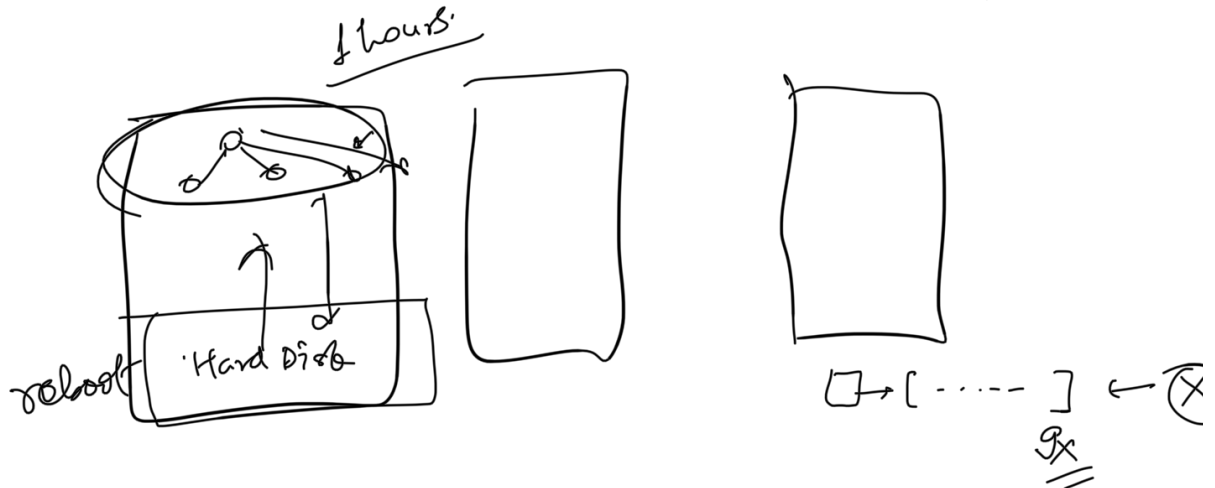
W/B

in step $\rightarrow N/4^i = 1$

$$4^i = N$$

$$\log_4 4^i = \log_4 N$$

$$i = \boxed{\log_4 N}$$

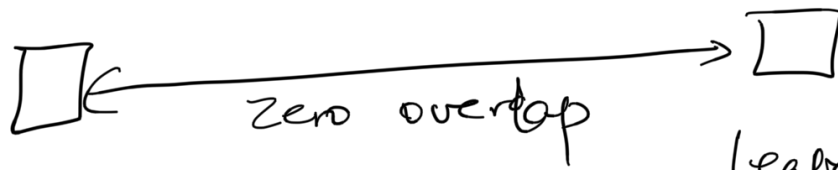


		c_{121}	c_{122}	
c_{11}		c_{123}	c_{12}	c_{124}
c_{13}	$\textcircled{c_1}$	q_1	c_2	
c_3			c_4	

~~Leaf~~



□ □ □ □



leaves will
have
Zero overlap

~~(x14)~~

