

HIGH LEVEL DESIGN - 101

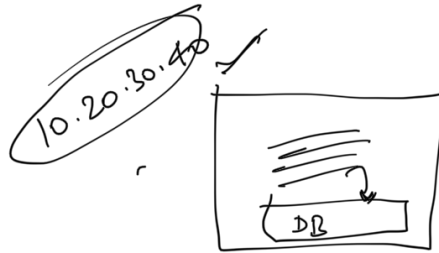
del.icio.us

↳ addbookmark(userid, site-url)
↳ getAllbookmark(userid)

Browser

del.icio.us

10.20.30.40



ICANN in p

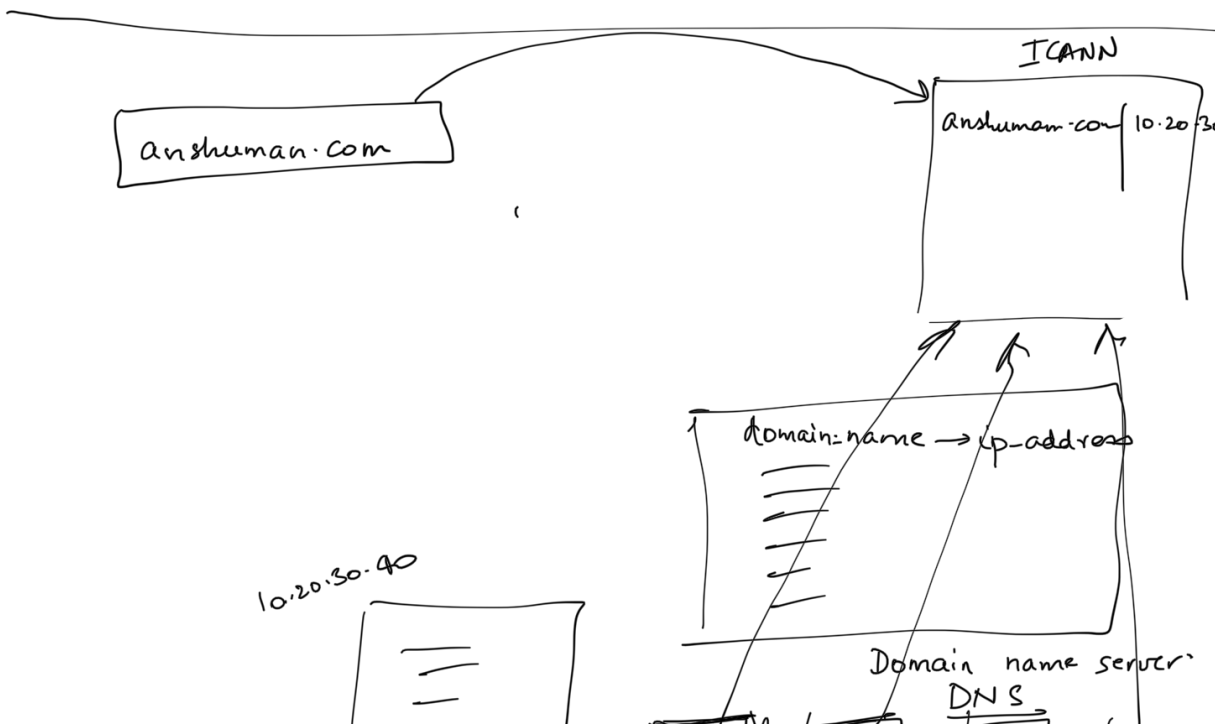
domain	owner	ex
google.com	larry page	
anshuman.com	Anshuman	

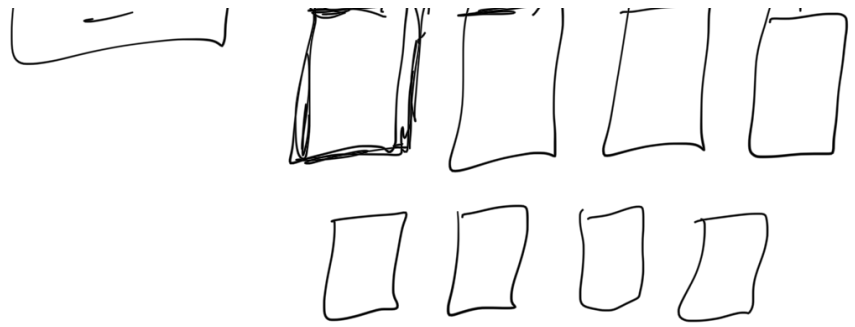
GoDaddy.com



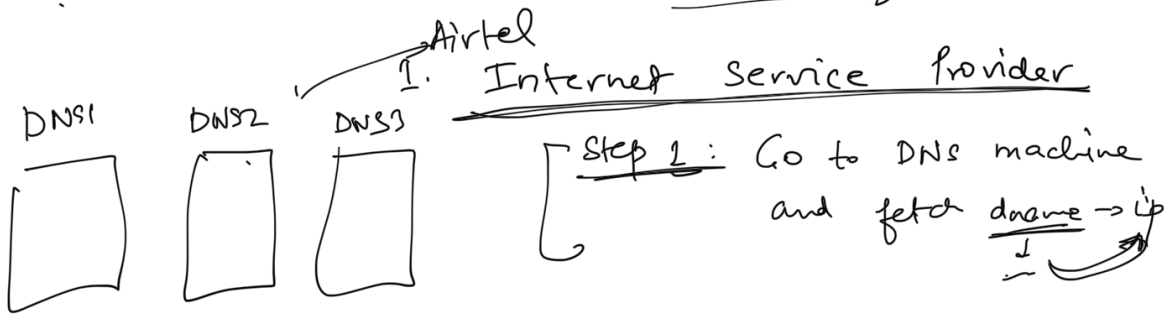
domains.pro

hamedu

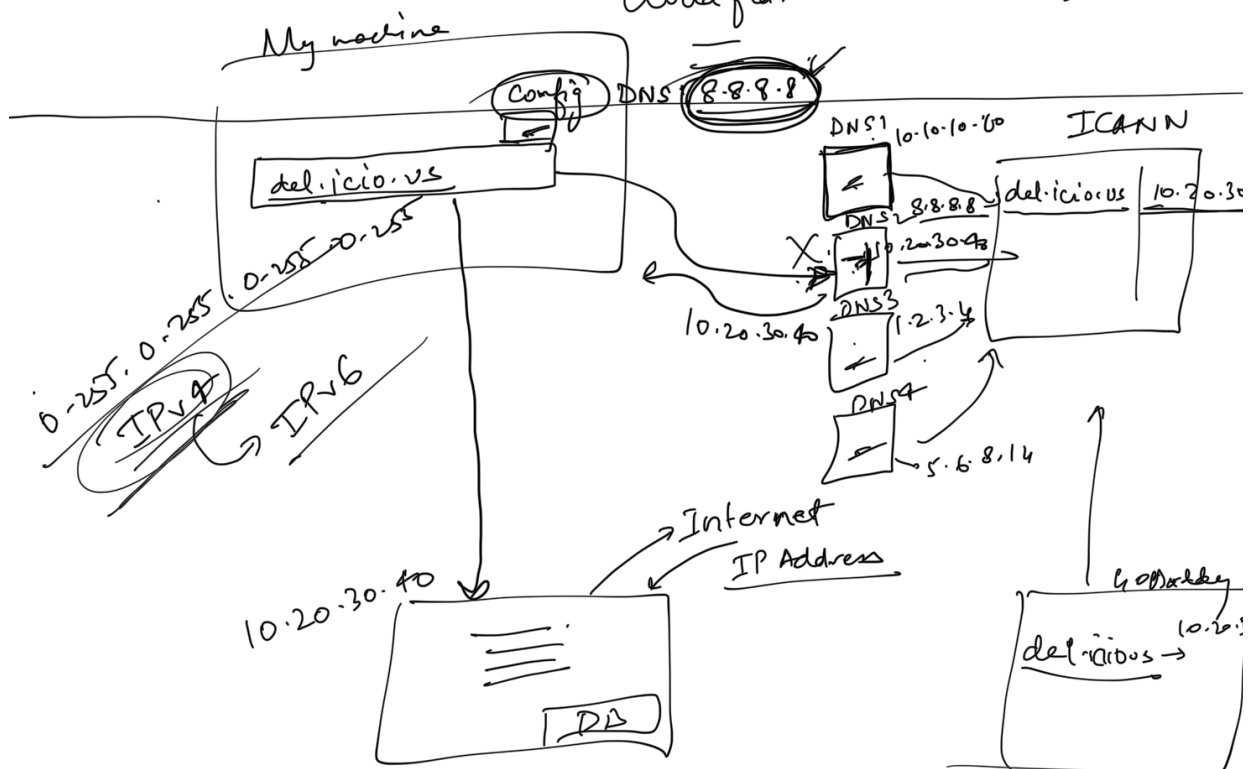




Q1. Who pays and maintains DNS machines?



2. Google → 8.8.8.8 → 8.8.4.4
Cloudflare → 1.1.1.1

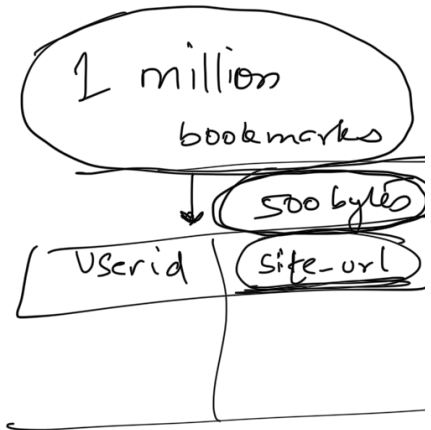
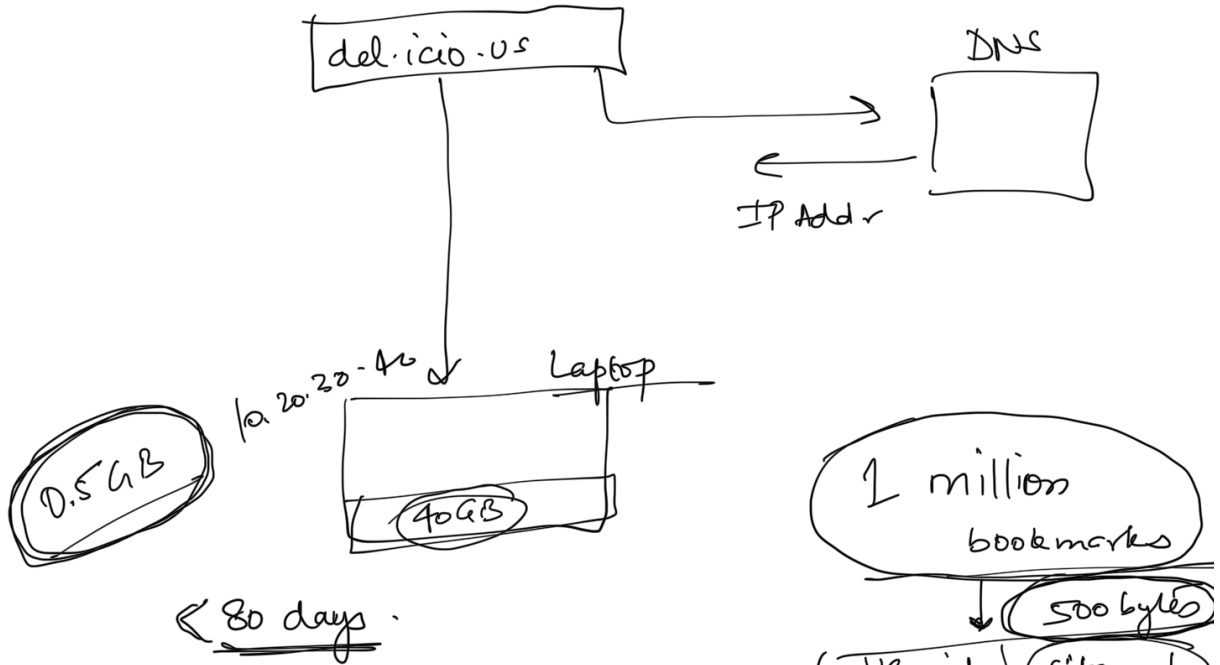


IP Addr.

[0-255] · [0-255] · [0-255] · [0-255]
 ↑
 ...
 ↳ IP, 4

~~2 (0,1)~~ $\frac{8 \text{ bits.}}{1 \text{ byte}}$ \rightarrow IPv6
0-255

IPv4

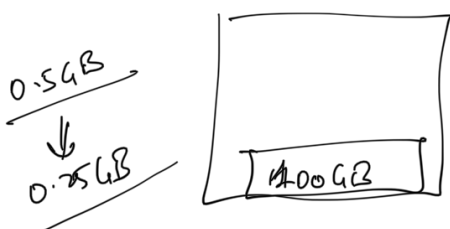


1 day \rightarrow 1 million * 500 bytes

$$\frac{1000 * 1000 * 500 \text{ bytes}}{\downarrow \quad \downarrow} \\ \text{MB} \quad \text{KB}$$

$$= 500 \text{ MB} = 0.5 \text{ GB}$$

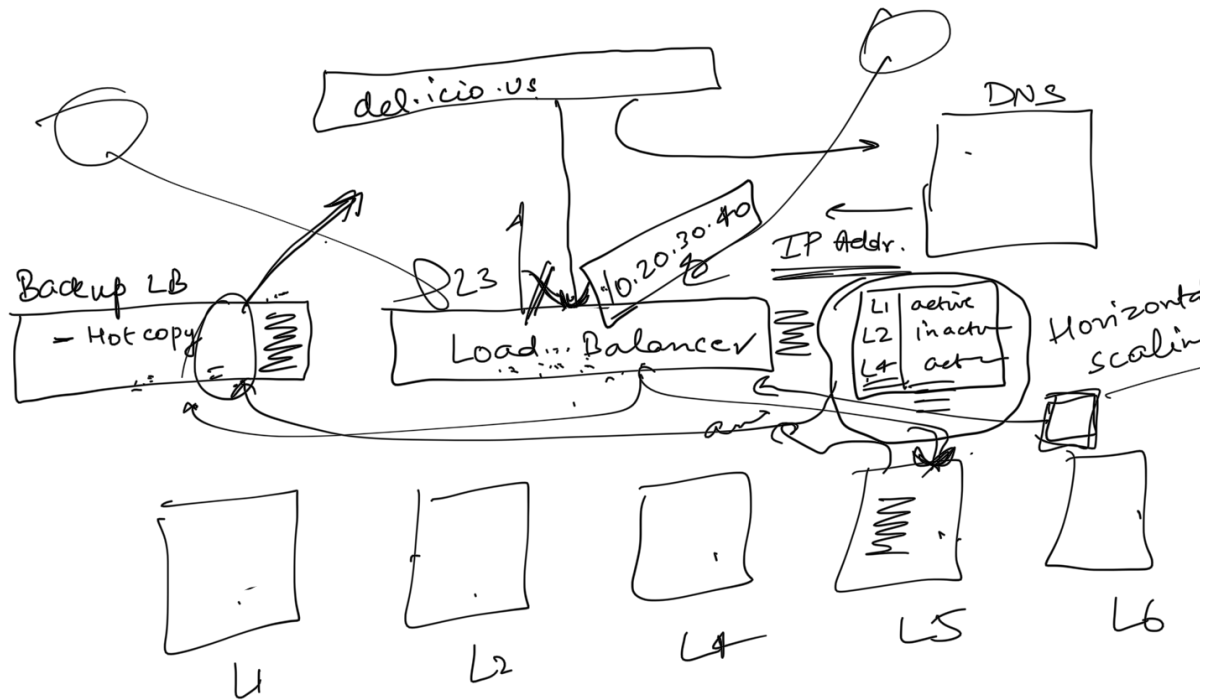
① Buy better laptop, buy ~~extended~~ HD.



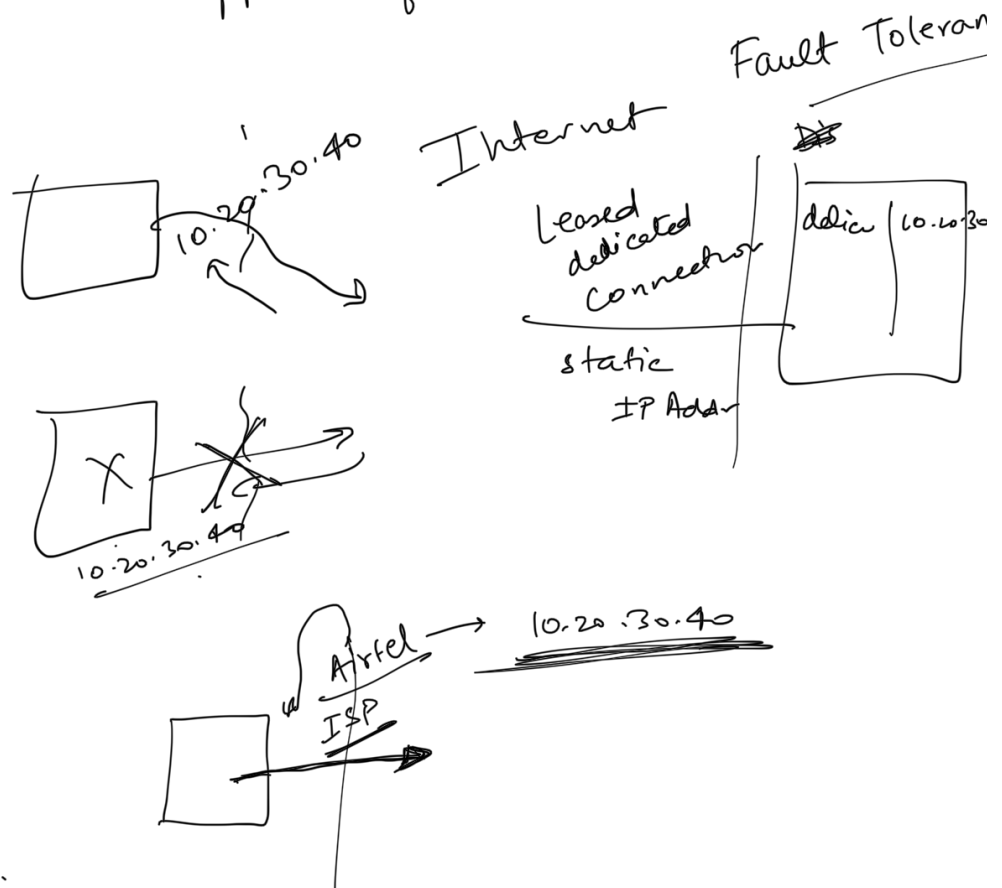
Vertical scaling

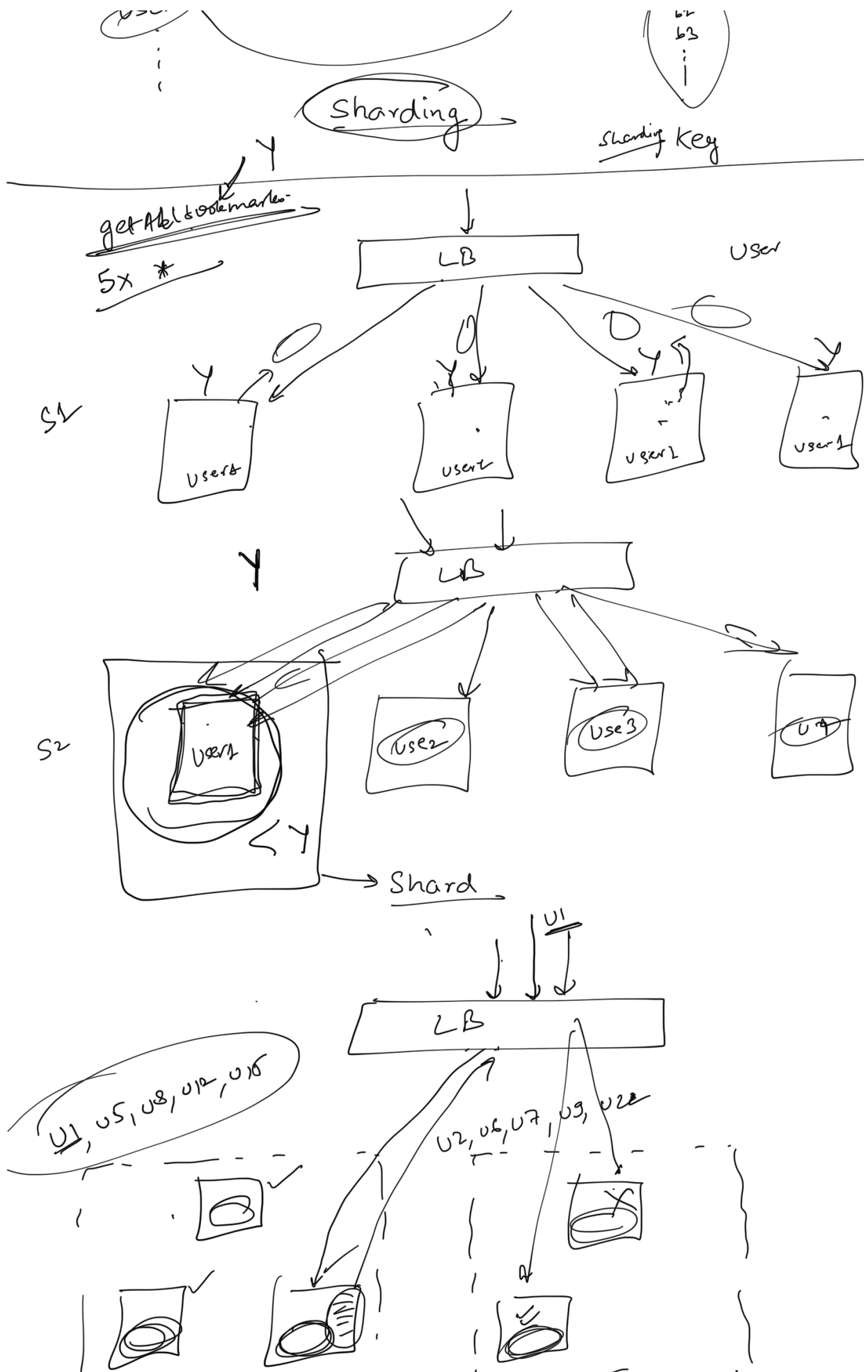
200 days

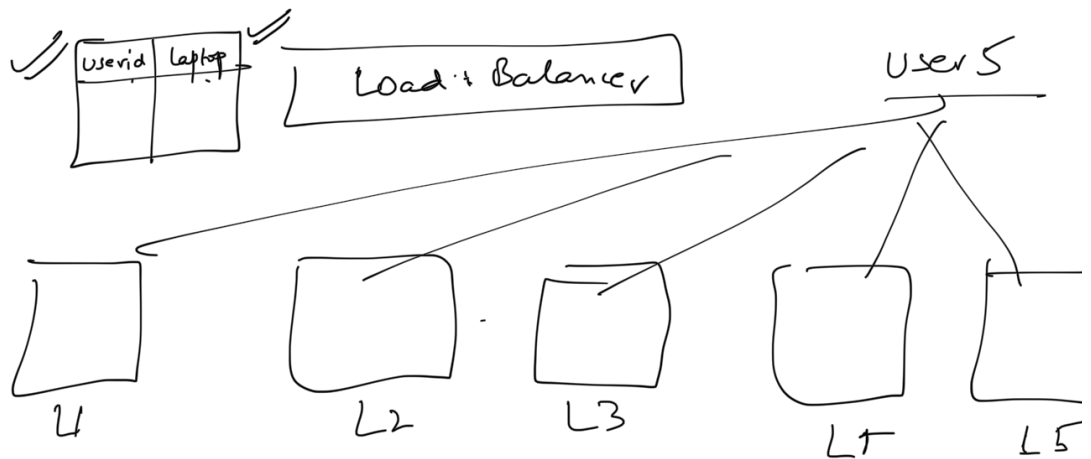
② Buy more laptops-



2. What happens if Load Balancer dies?





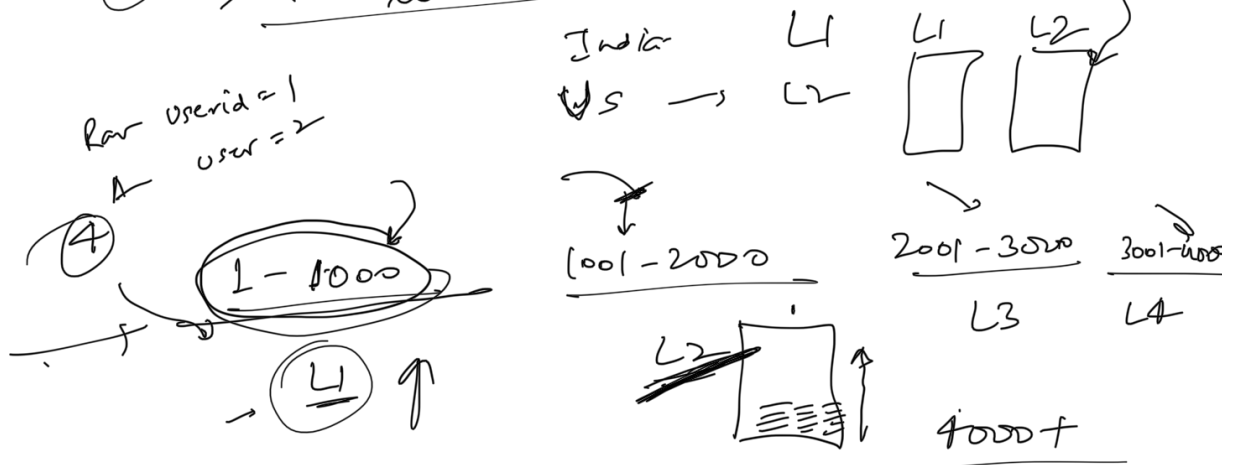


① HashTable, Table of $userid \rightarrow laptop$.
 ↳ BAD: slow down LB

② $userid \% \text{ num-laptops}$ →

	5 laptops	6 laptops
<u>12</u>	→ 2	0
<u>15</u>	→ 0	3
<u>16</u>	→ 1	4
<u>21</u>	→ 1	3
<u>25</u>	→ 0	1
<u>29</u>	→ 4	0
<u>28</u>	→ 3	4

③ Geo location

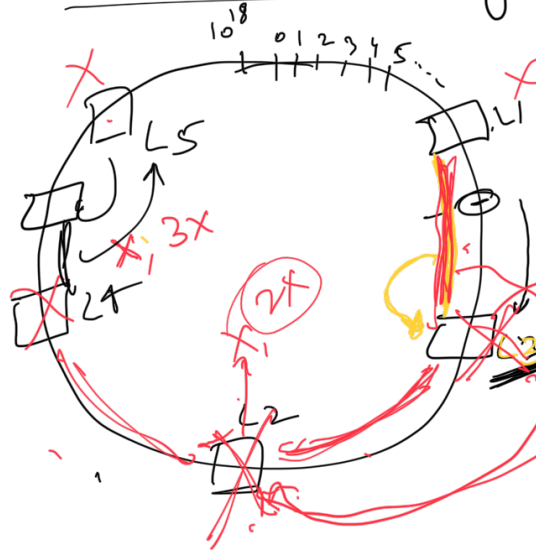
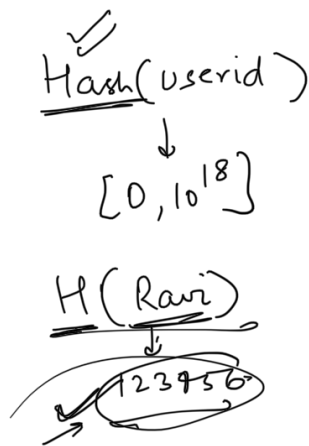


- ① Skew of load
- ② Addition of more laptop is not benefitting existing laptops

L5 L6
 L7
 L8
 ⋮
 L1000

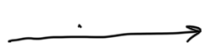
$F(\text{input}) \rightarrow \text{output}$

Consistent Hashing



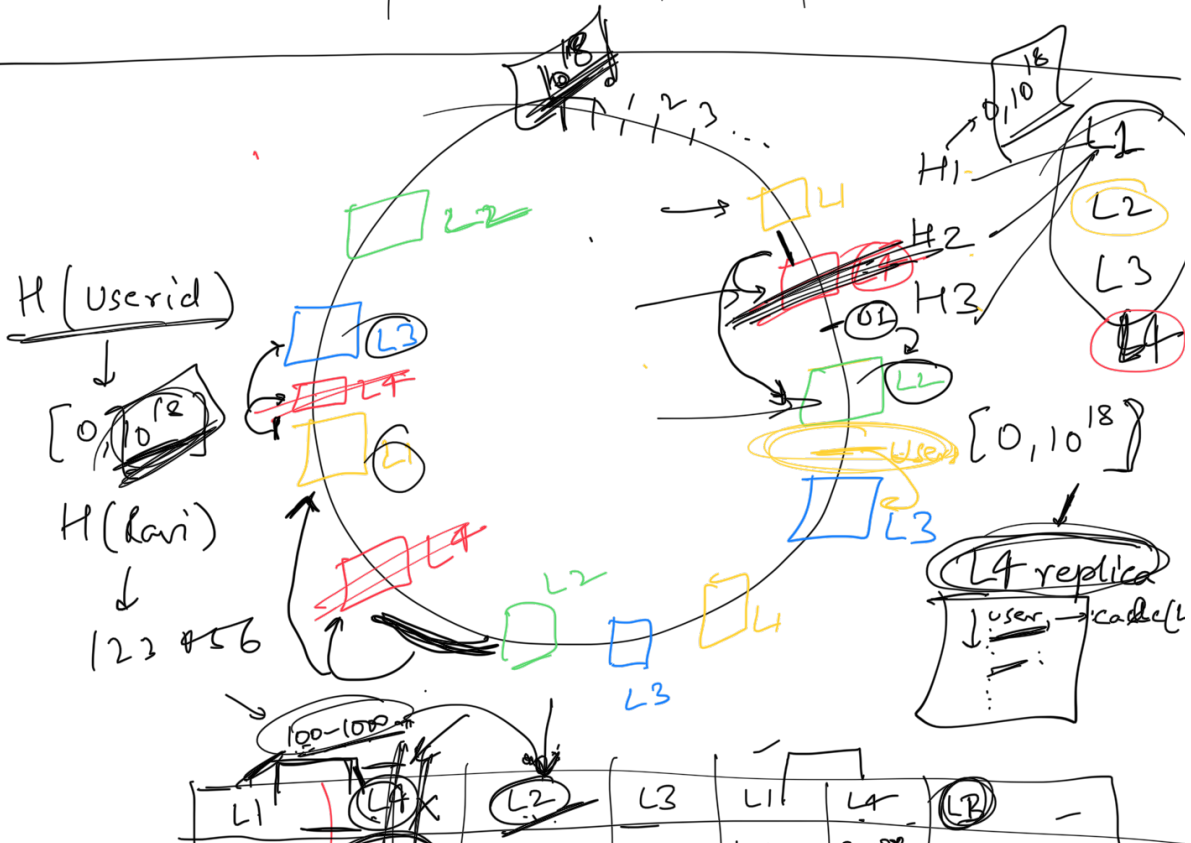
H
 $\text{L1} \rightarrow$
 $\text{L2} \rightarrow$
 $\text{L3} \rightarrow$
 $\text{L4} \rightarrow$
 $\text{L5} \rightarrow$

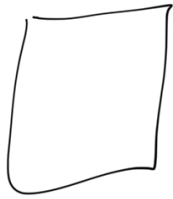
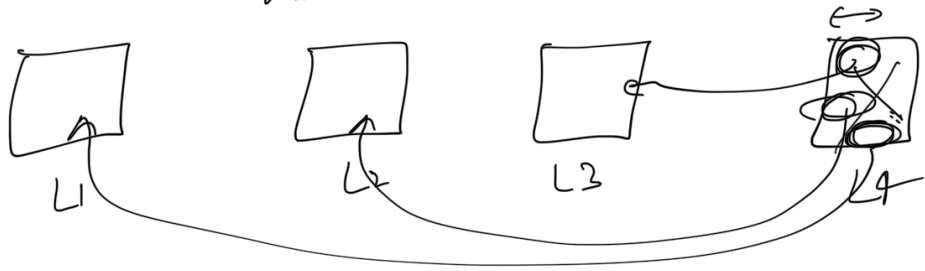
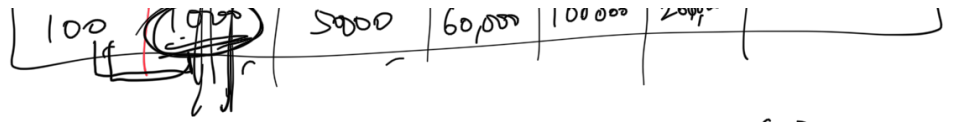
$\text{H}(\text{L1})$
 \downarrow
 $[0, 10^{18}]$



L1	L3	L2	L4	L5
100	200000	1000000	100M	10B

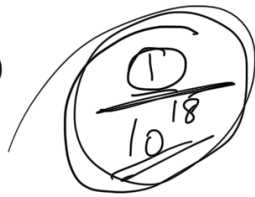
Load Balancers



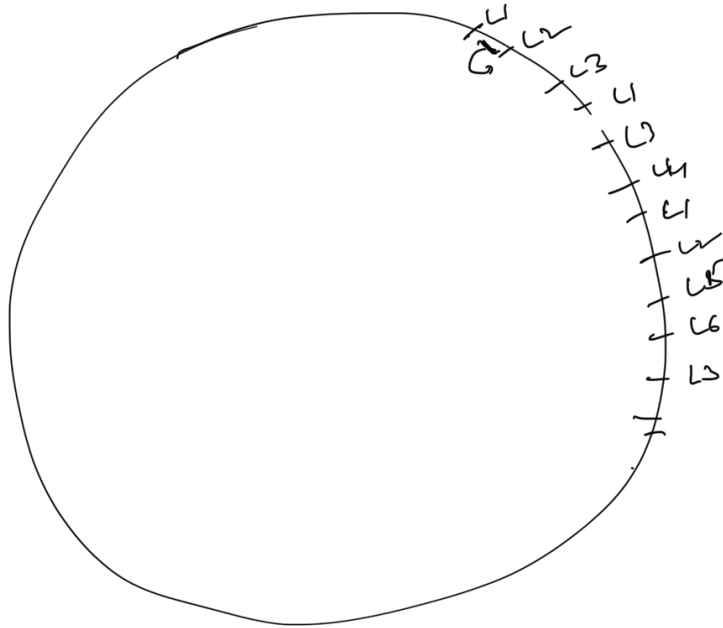
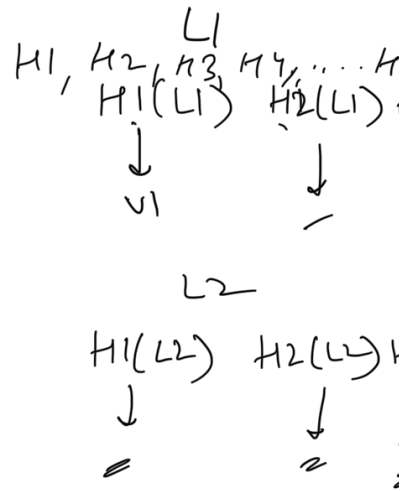


$H(L1) \rightarrow x$

$H(L2) \rightarrow \text{circle with } x$



$\left. \begin{matrix} H1 \\ H2 \\ H3 \end{matrix} \right\}$

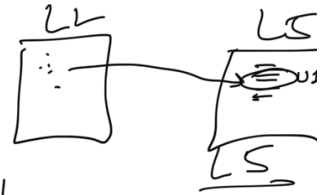
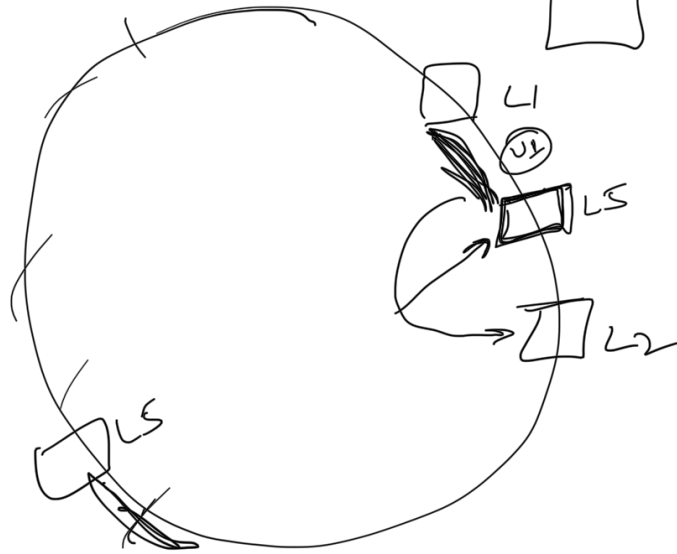


Li
1p hot users

$L2$
1 L

$L3$
2 L

$L4$
2 L



123456

$H(\text{Rohini})$

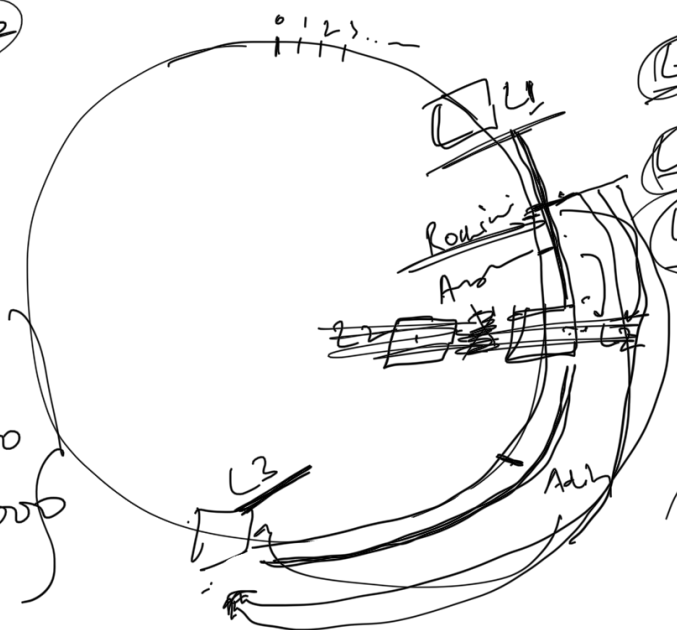
\downarrow

$[0, 10^{18}]$

Rohini $\rightarrow 120$

And $\rightarrow 1200$

Adity $\rightarrow 12000$

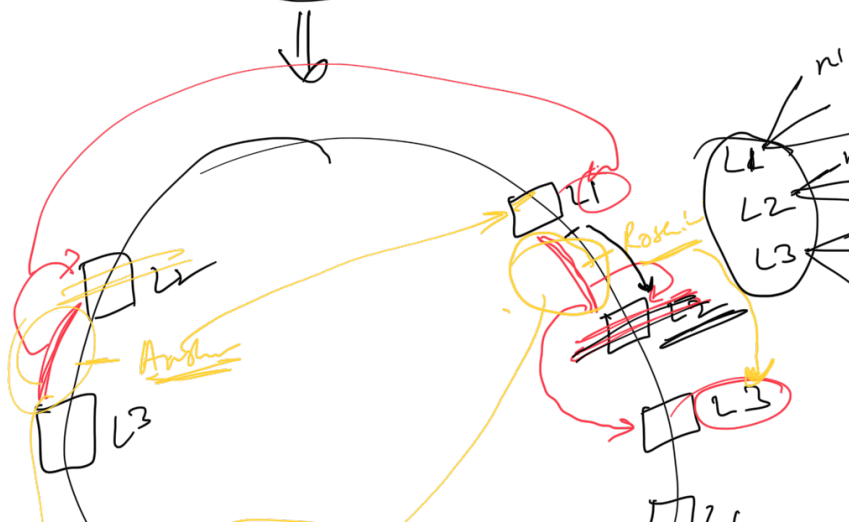


$H(\text{Rohini})$

$H(\text{Rahul})$

\downarrow

1m



1400

