Will start at 9:10PM

HLD: Basics and Consistent Hashing

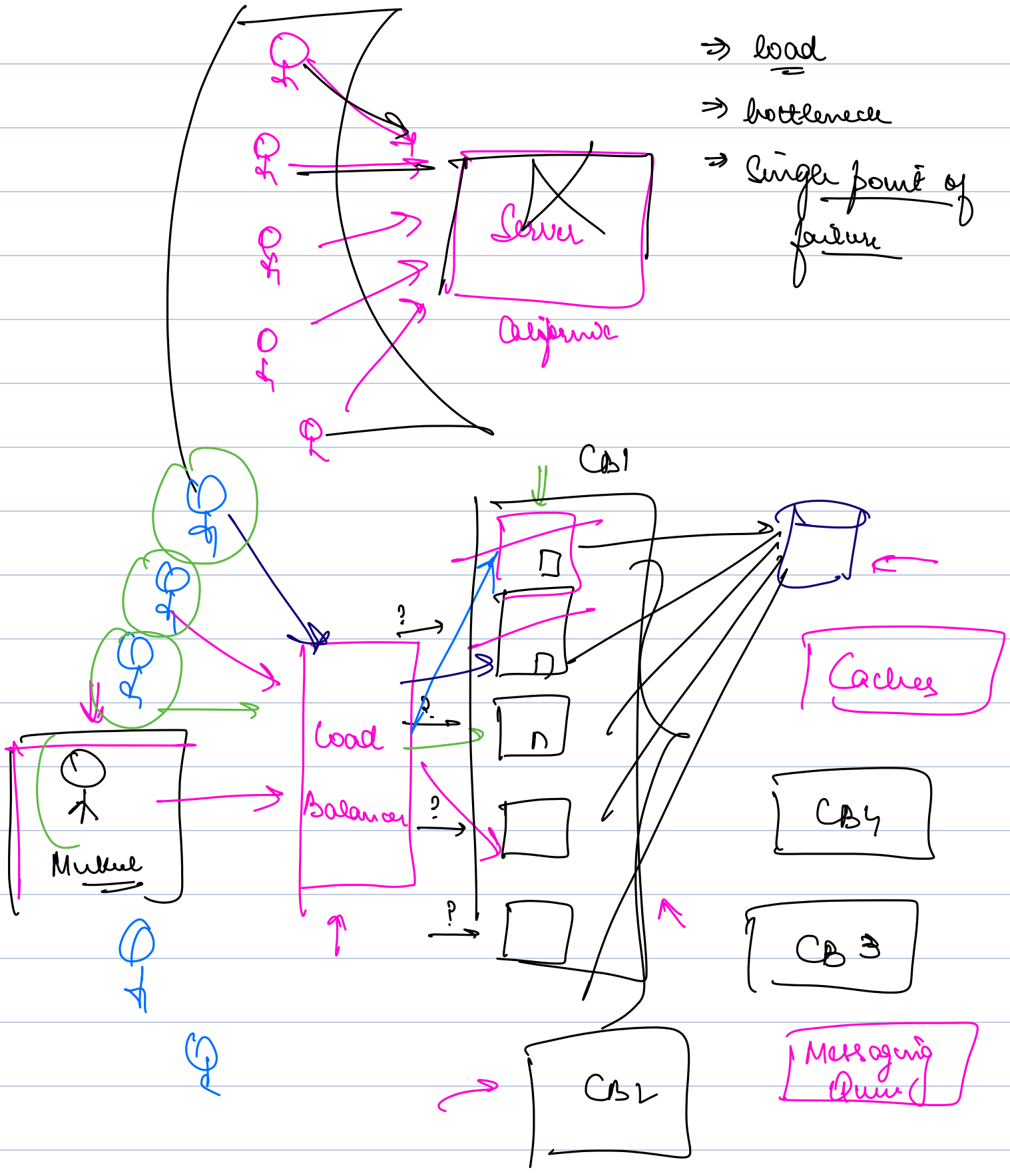
- < 2yoe in SWE and backlogs → watch HLD via recordings
  → clear backlog first
- Else → watch HLD classes
  especially if >= 2 yoe in SWE

Naman Bhalla

→ Typed Notes and Qns in Chat
  ↳ try to go through typed notes of the class before the class.

System Design

LLD: low level design
  ↳ how you can write better code
  ↳ extensible, maintainable, reusable.



System Design : Study of how diff infra layers work together to serve an app at

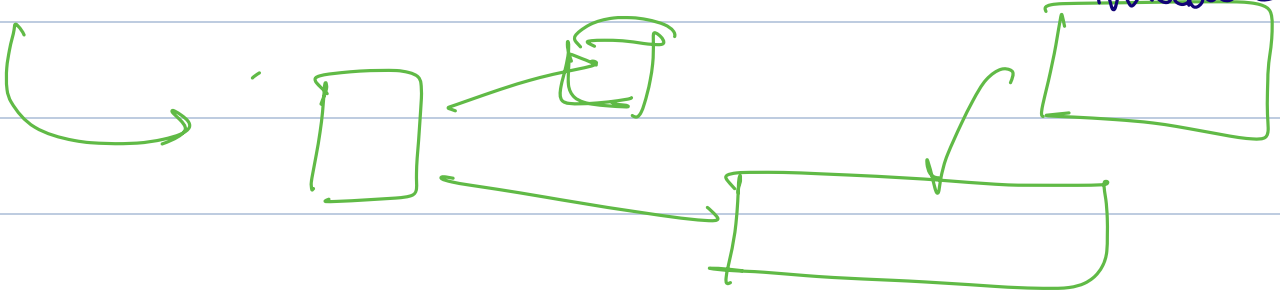
Scale to desired efficiency

What we are not going to cover

1) Not about knowledge. → what is built in use.

2) About Problem Solving Skills
↳ ability to make good decisions.

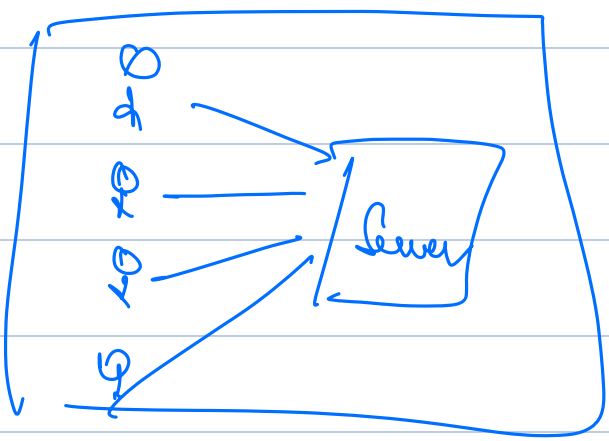
3) No implementation (neither in interviews)
↳ some of impl will be in project module.



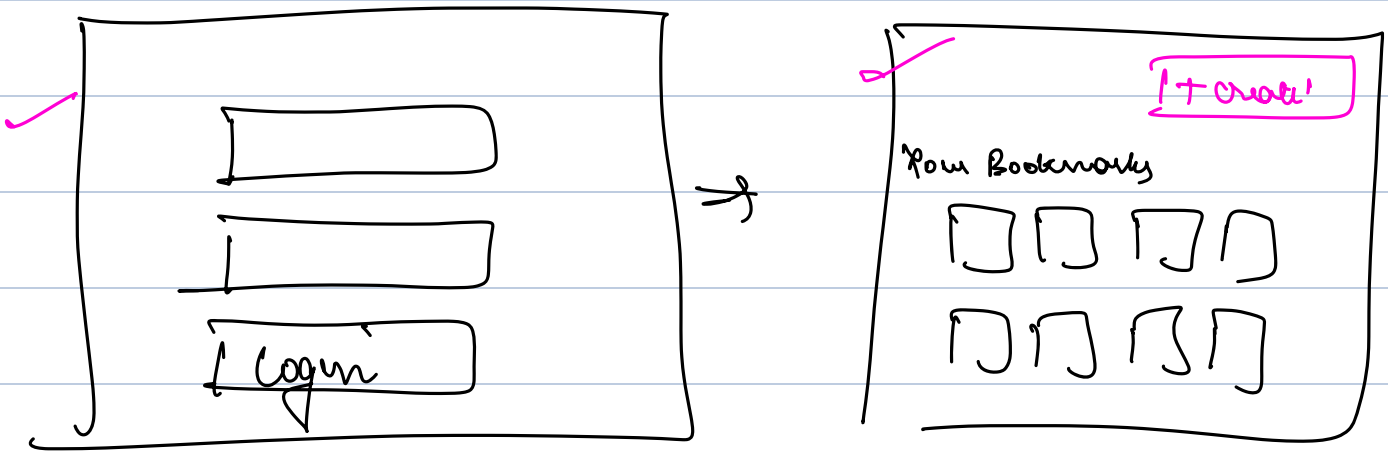
Why dist systems

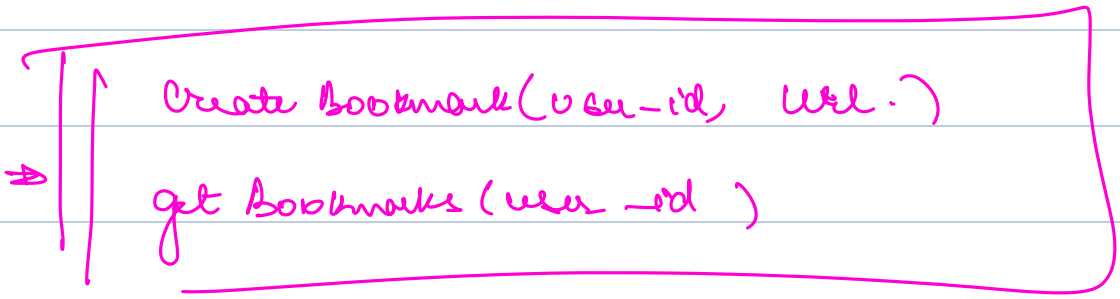
Deli. cio. us

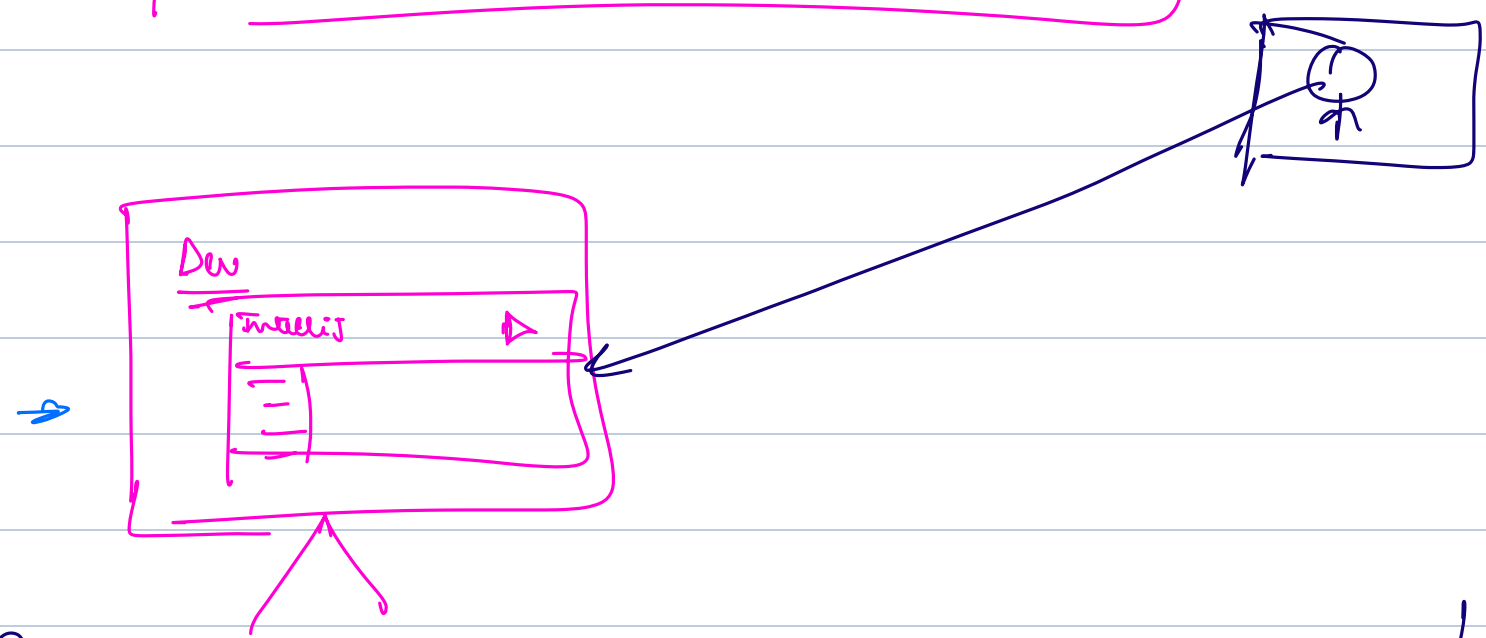
2003,
College student,
hostel room



→ No bookmarking.

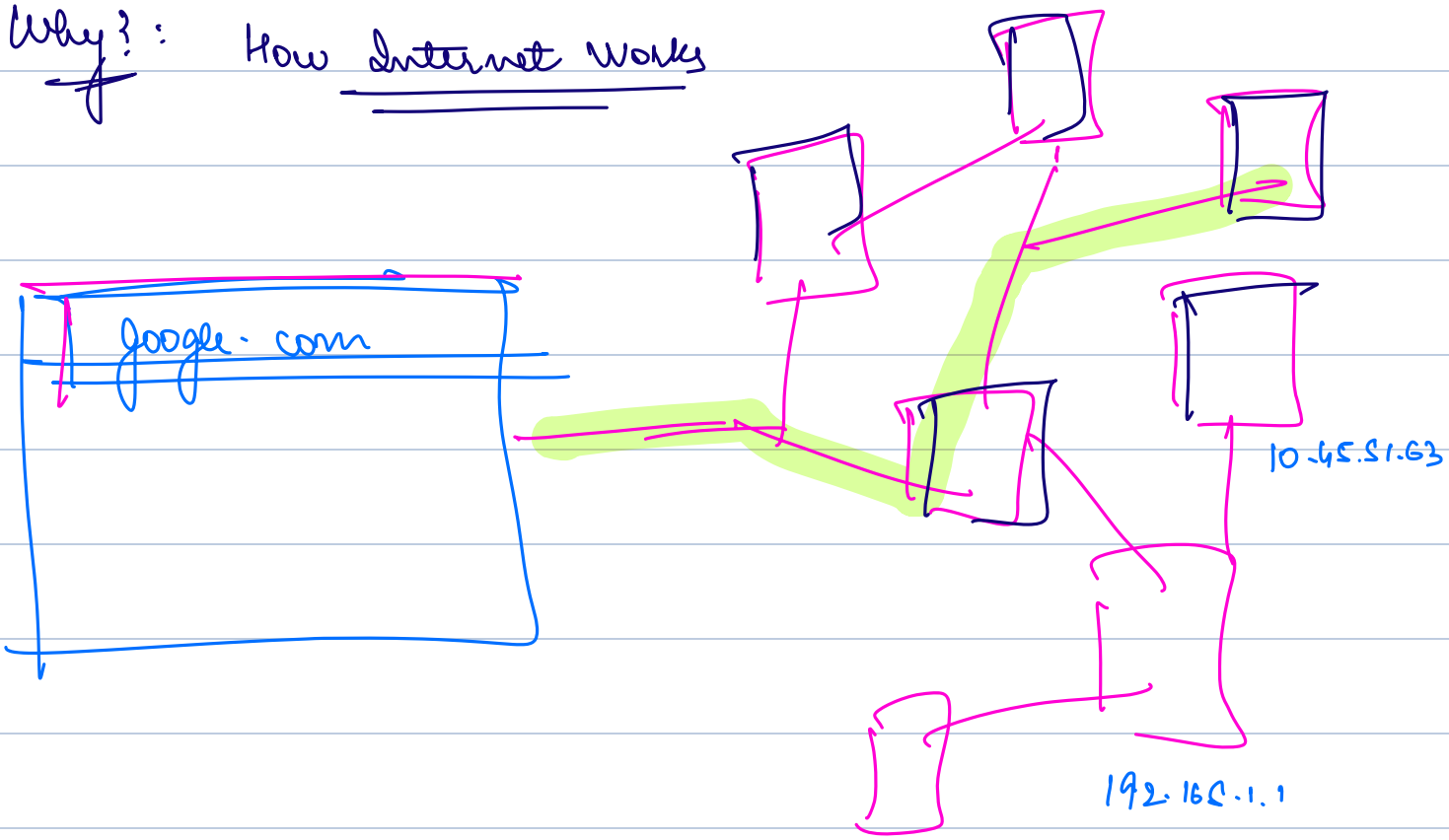






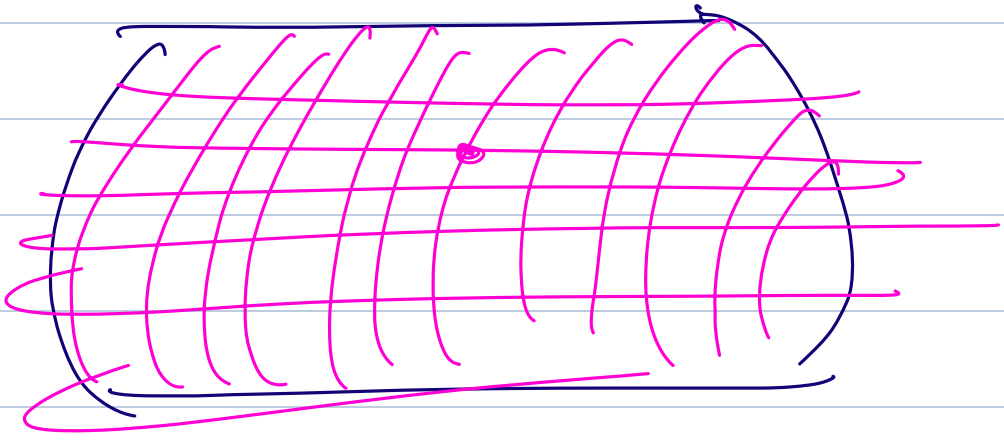
If an app^n is running on my laptop, an external user will not be able to access that.

Why? : How Internet Works



How internet reaches a server

Latitude / longitude



⇒ every machine conn on net ⇒ Number

⇒ I/P address

↳ helps internet route very fast, without any ambiguity.

IPv4 → (majorly)

IPv6

192.168.1.1

A . B . C . D

(0-255)

0.0.0.0 → 255.255.255.255

8 8 8

32 Bits

→ 2^{32}

≈ 4B

→ IPv4 can no longer give unique add to everyone.

→ IPv6 → 128 Bits

→ IPv4

NAT (N/W address translator)

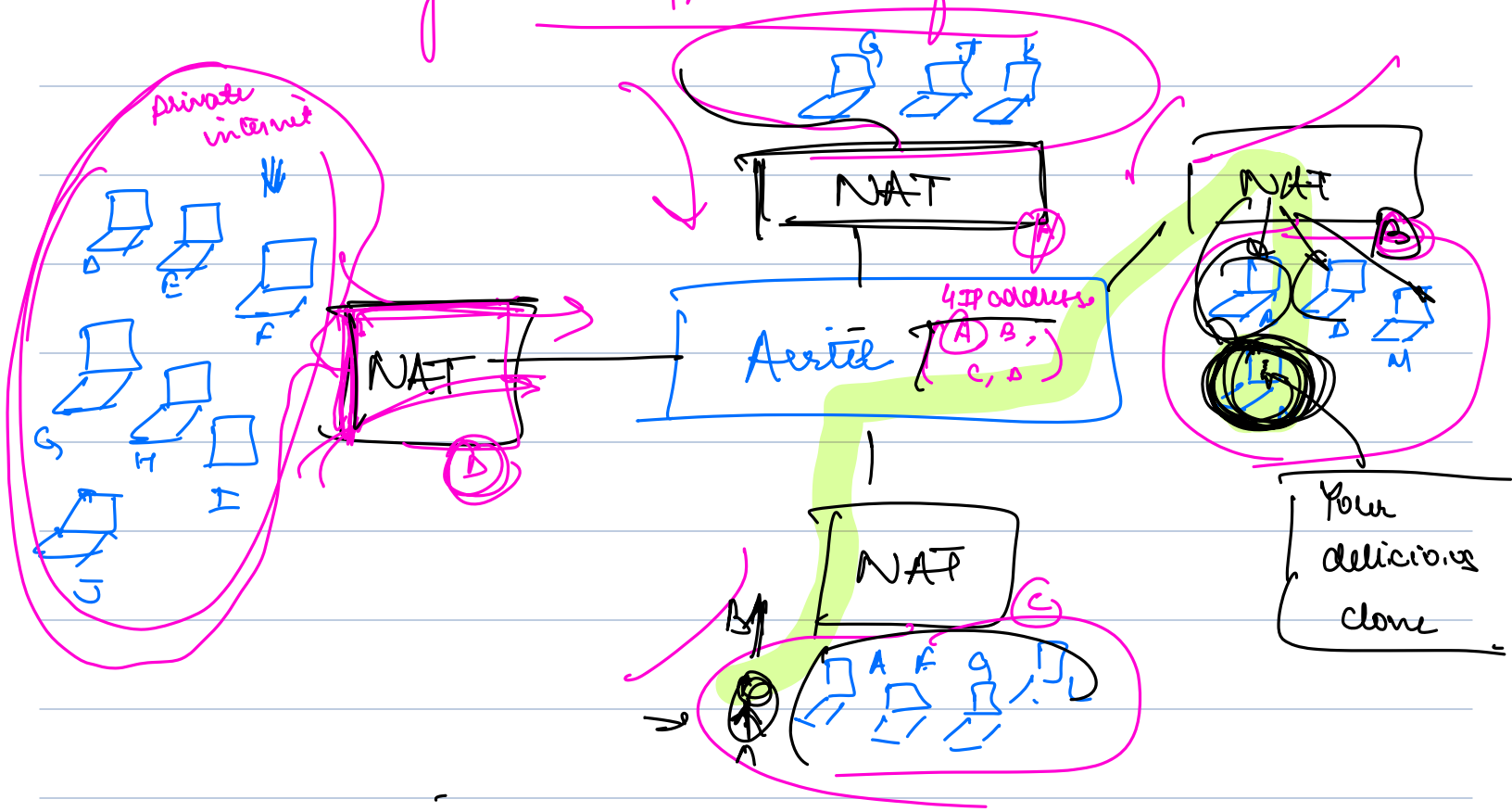
↳ allows to create an internet within an internet

ICANN

→ Non Profit Organization

→ anyone who wants to get an I/P add

gets an I/P add from ICANN



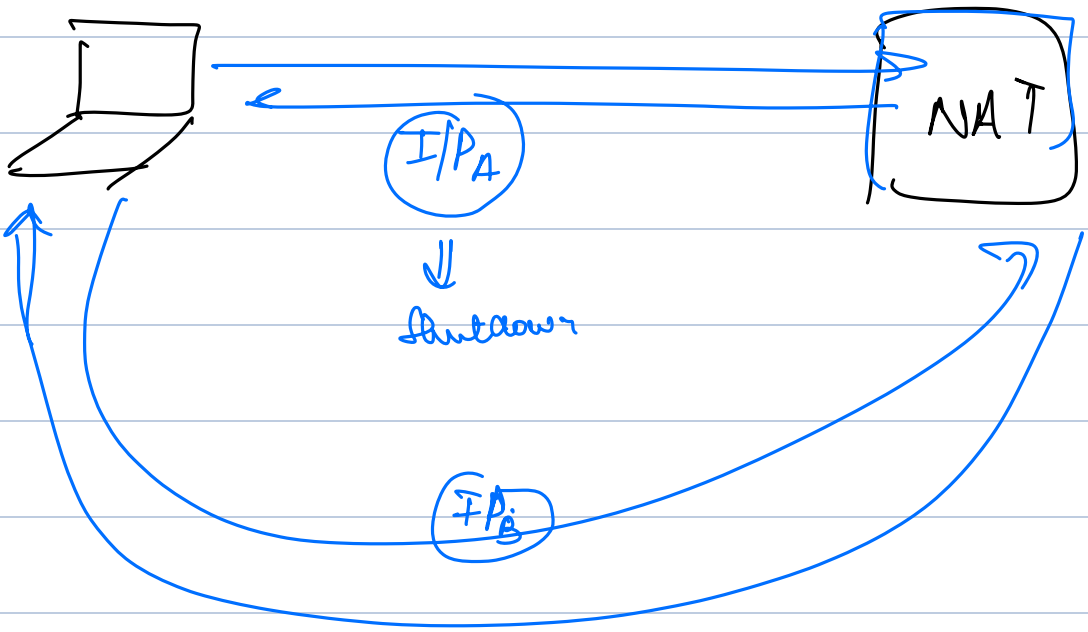
A = 10.21.31.41

B = 31.71.

(1)

Private I/P address

(2) Dynamic I/P address



Everytime you connect to internet you may get a diff I/P address.

Why not laptop

1. Private I/P
2. Dynamic I/P

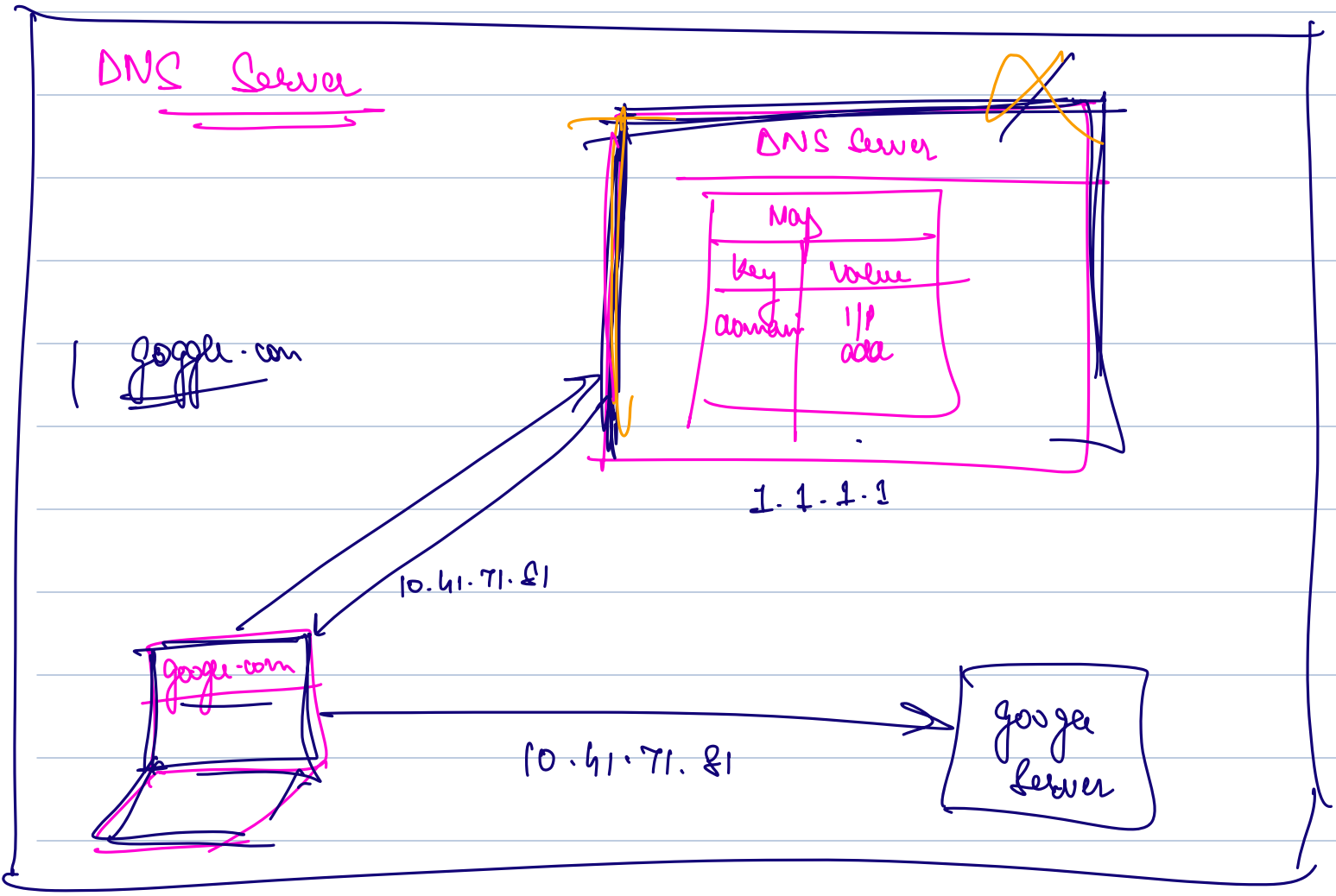
↳ ISP do sell public static IPs

↳ costly

↳ 4k/ month

→

- → 10.41.31.48
- → 81.71.21.42
- → 45.61.72.34
- → 101.21.21.47

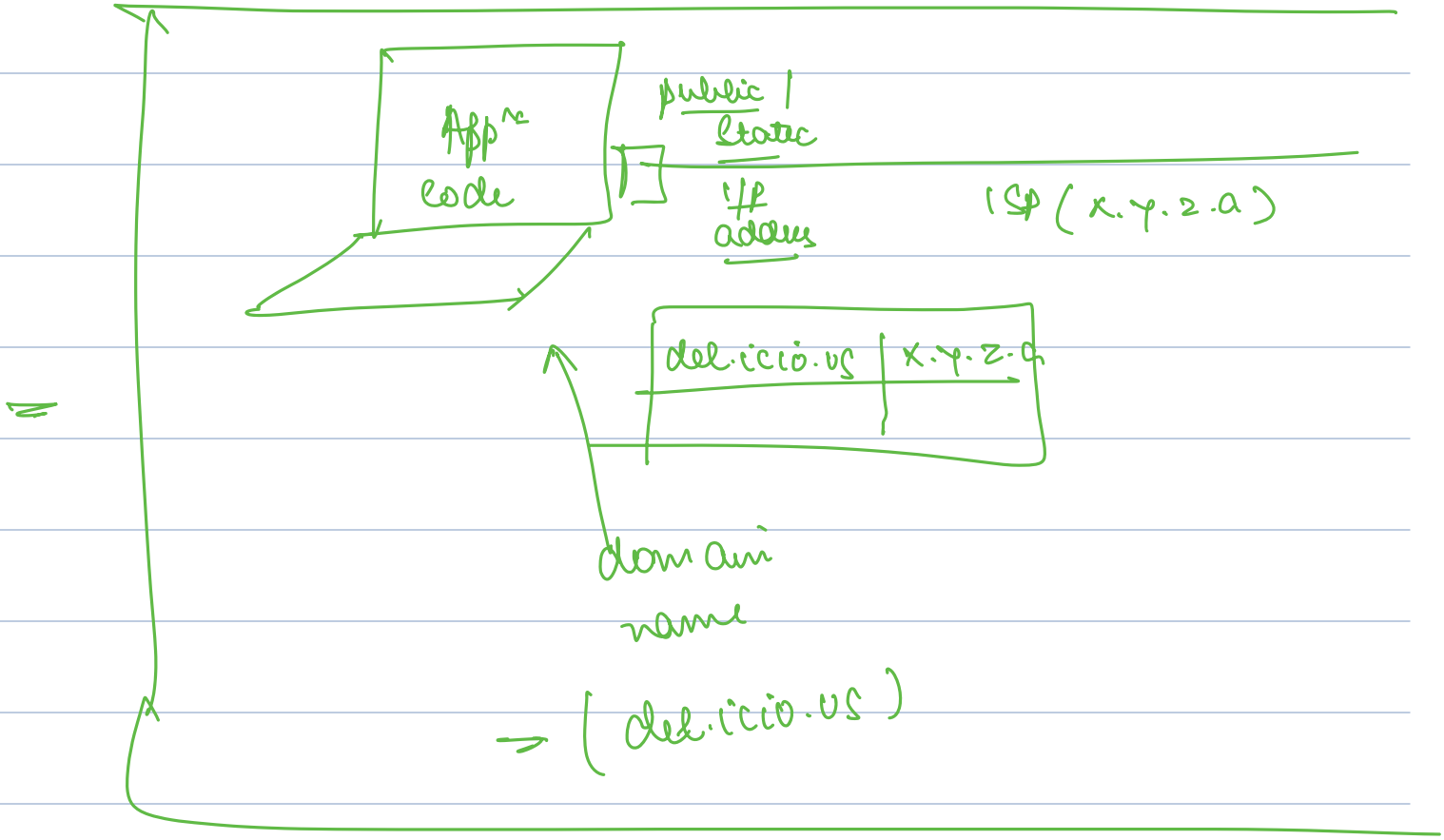


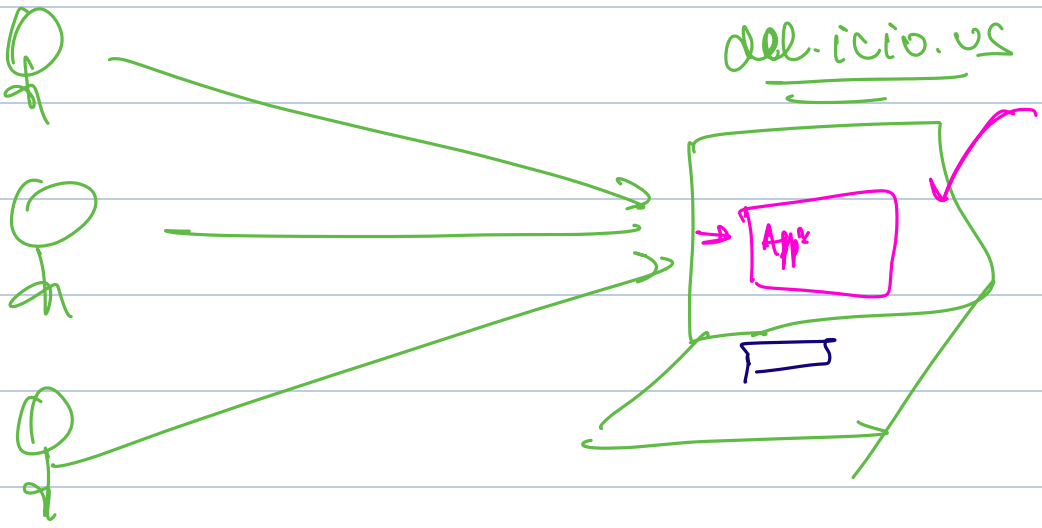
- 1.1.1.1 → Cloudflare
- 4.4.8.4 / 8.8.8.8 → Google
- ISPs also have their own DNS

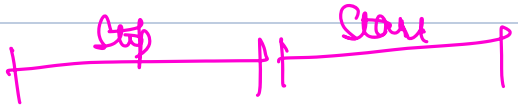
How can you make your app^{n} live

1. Public + Static I/P address.
2. Domain name
   - (google.com / naman.dev)
   - from domain registrars
     - godaddy.com
     - namecheap.com
     - porkbun.com
   - give you a f^{n} to update your DNS setting.

1. Public + Static I/P address
2. Domain Name
3. Set DNS settings of your domain in Domain Registrar.







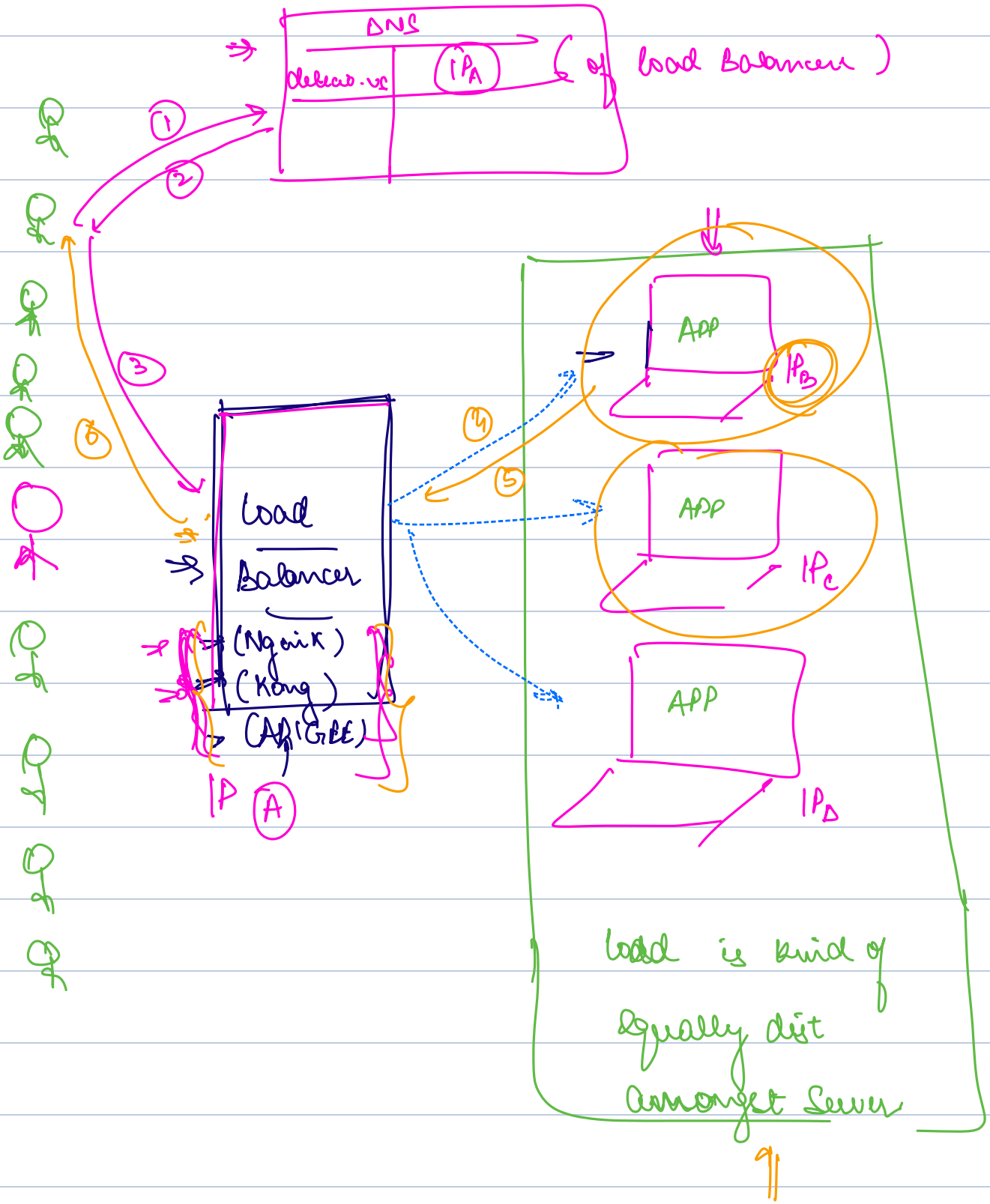
My website will be down when:

SPOF

(1) Deploying new version

② Overloaded

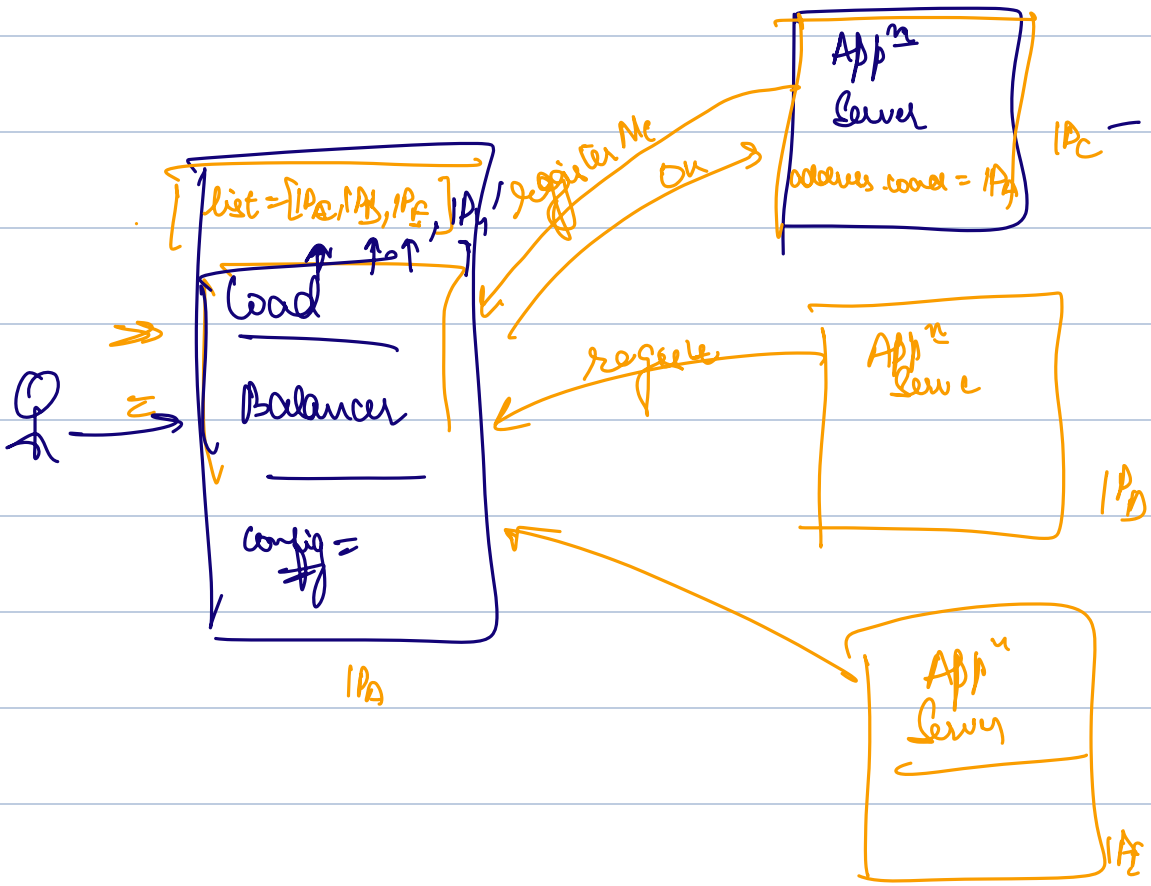
③ hardware failures



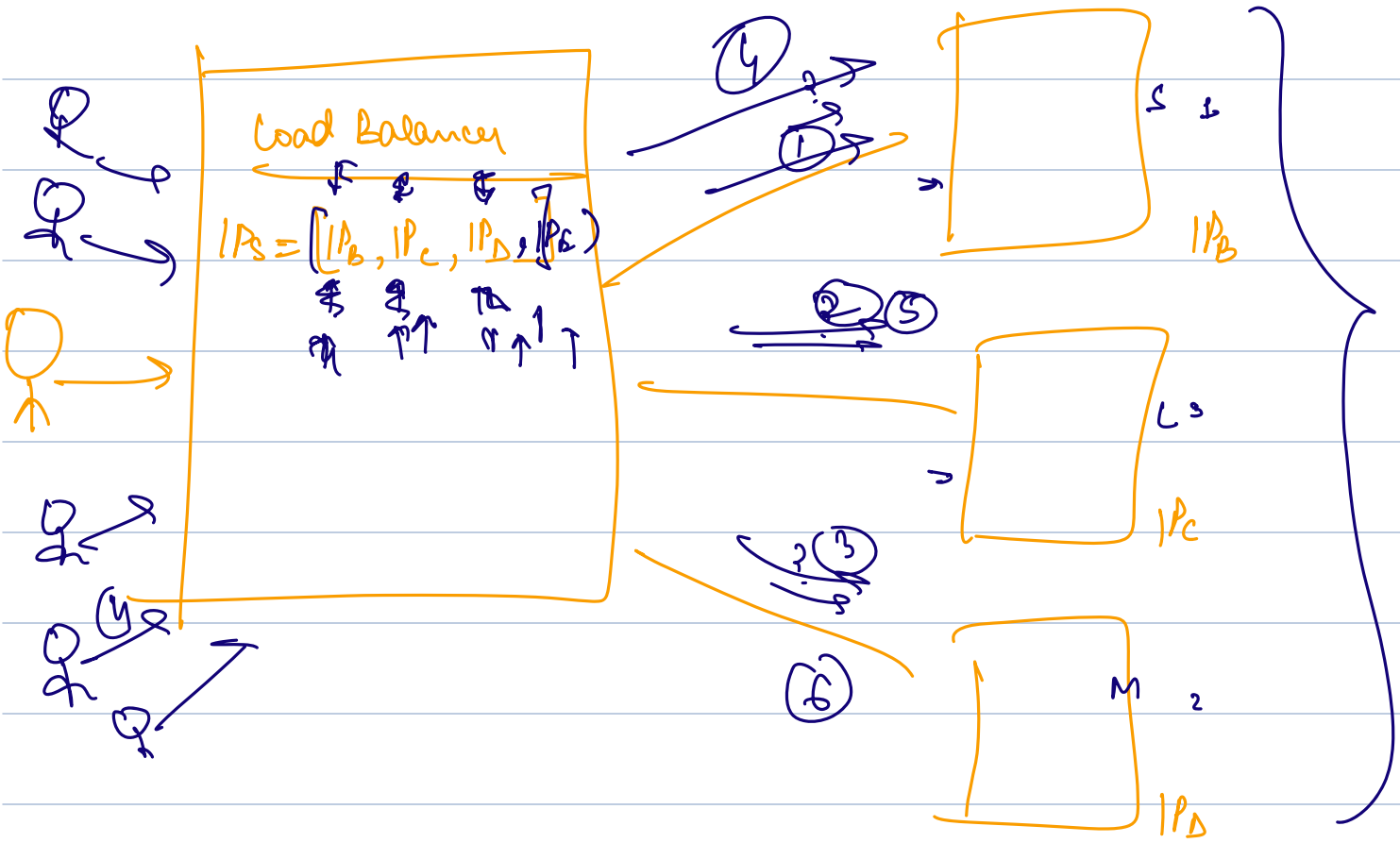
WORKING OF LOAD BALANCER

(1) How load balancer gets to know about app^n server.

↳ when an app^n server starts, it registers itself with load balancer.



(2) How load balancer decides which server to forward request to



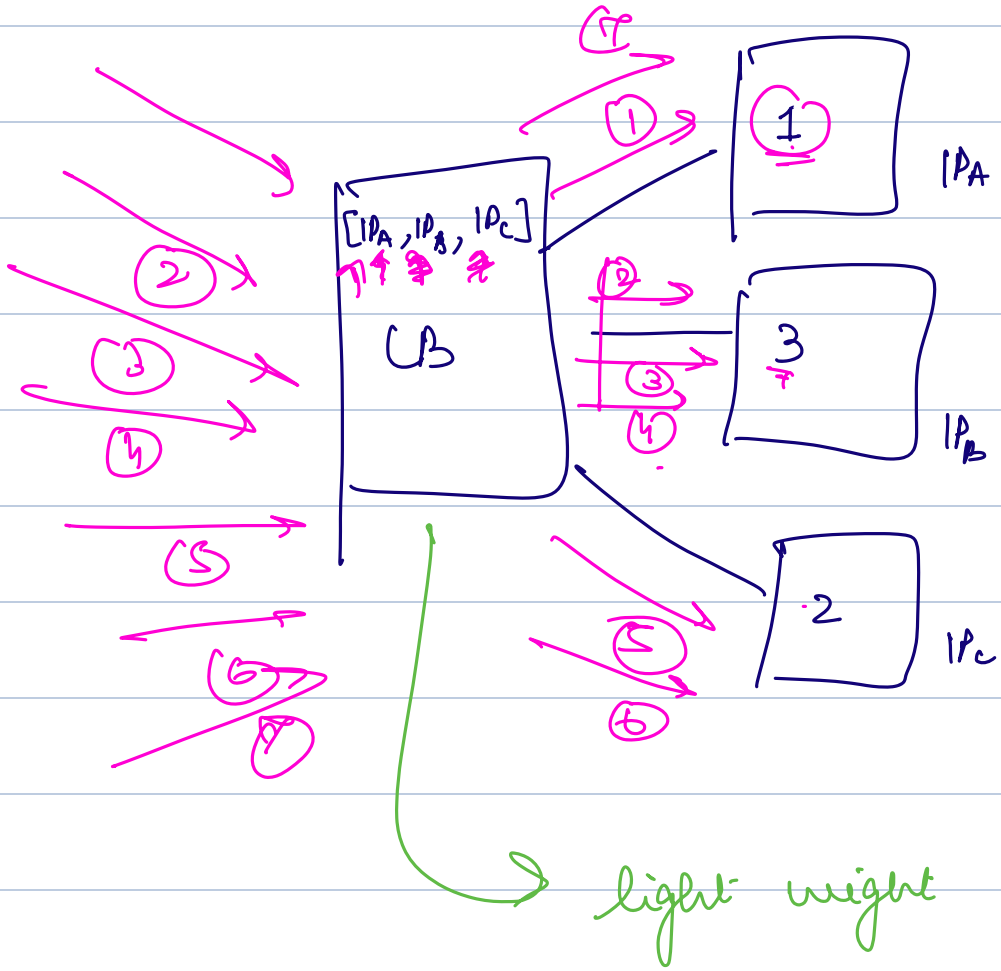
(1) Round Robin

↳ don't think much

→ MOST POPULAR

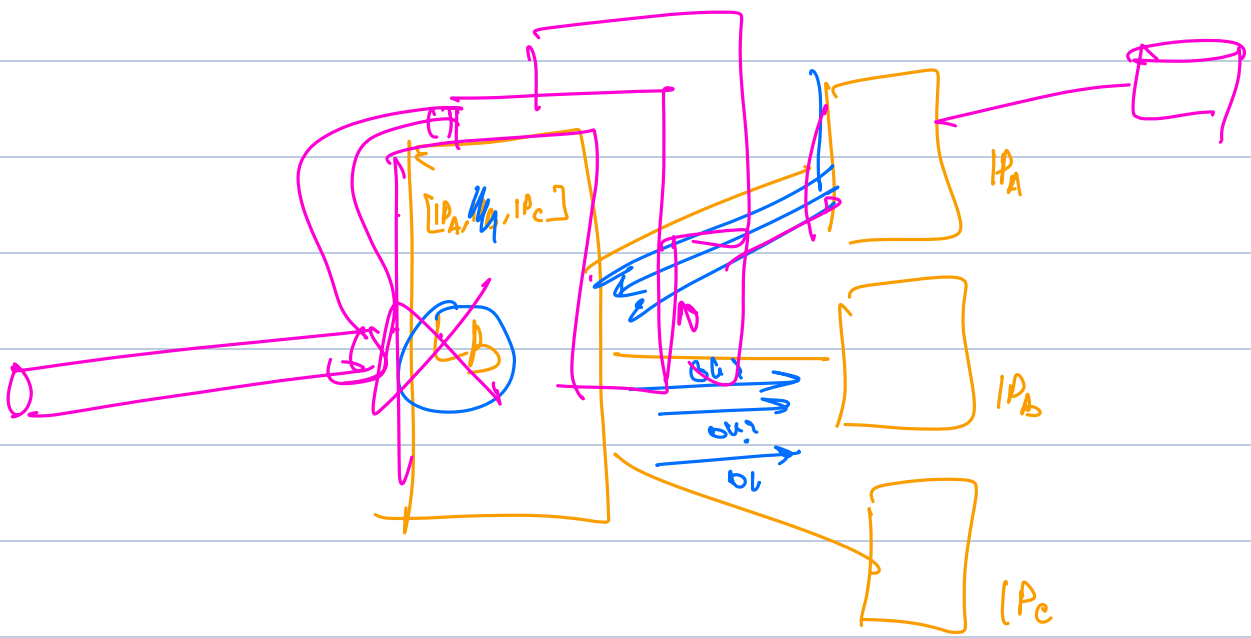
(2) Weighted Round Robin

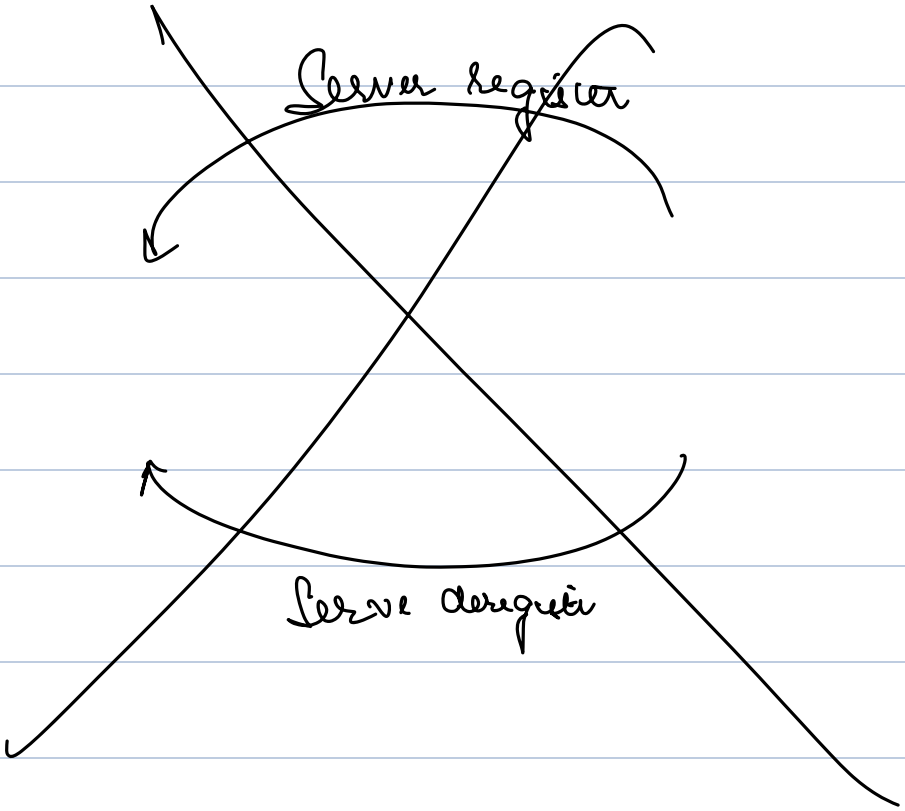
→ dist req in ratio



(3) What if a server dies

how will LB get to know a server has died.

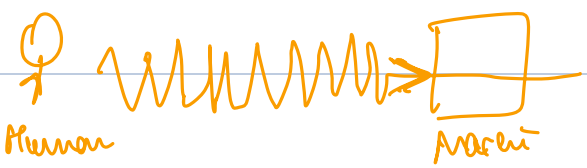




how do we check if a human is alive

(1) Hospital

↳ Heartbeat

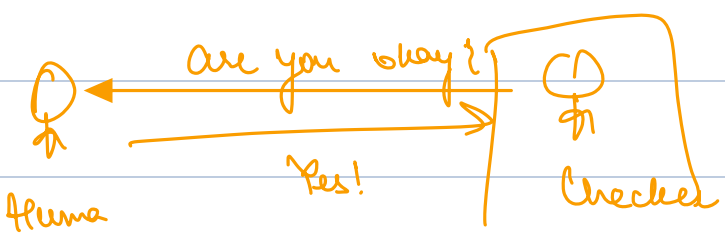


(Checker)

(2) Normal

=

↳ Healthcheck



Load Balancer

→ Heart Beat

⇒ every server has to send a "hello" to load balancer every t seconds.

⇒ if LB doesn't get a hello from a server in 3^{rd} t sec since last one, it will assume dead

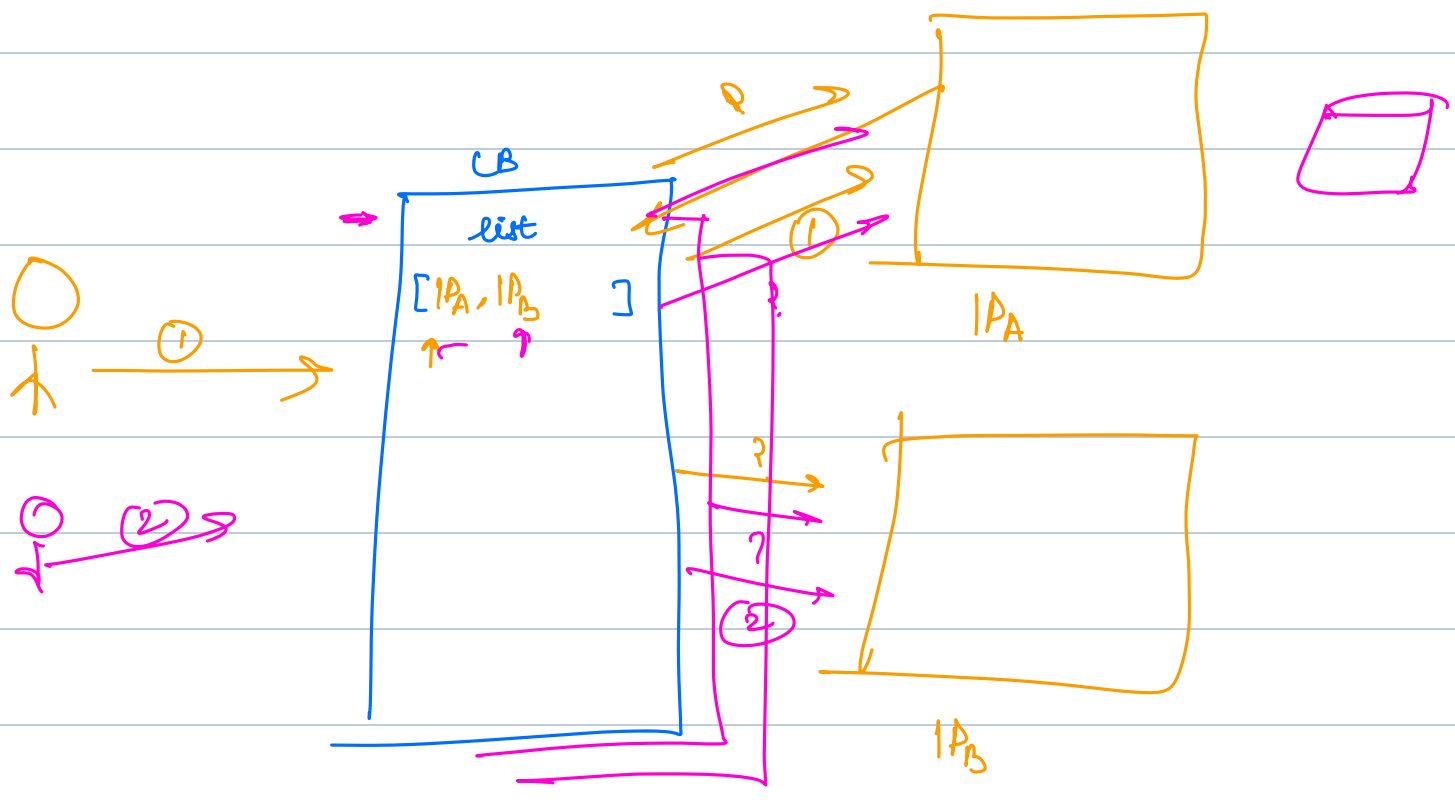
t = 10 sec

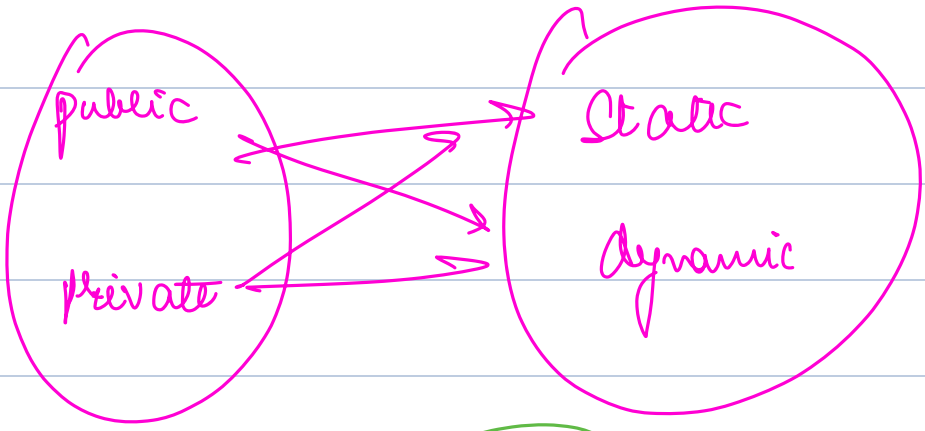
30 sec

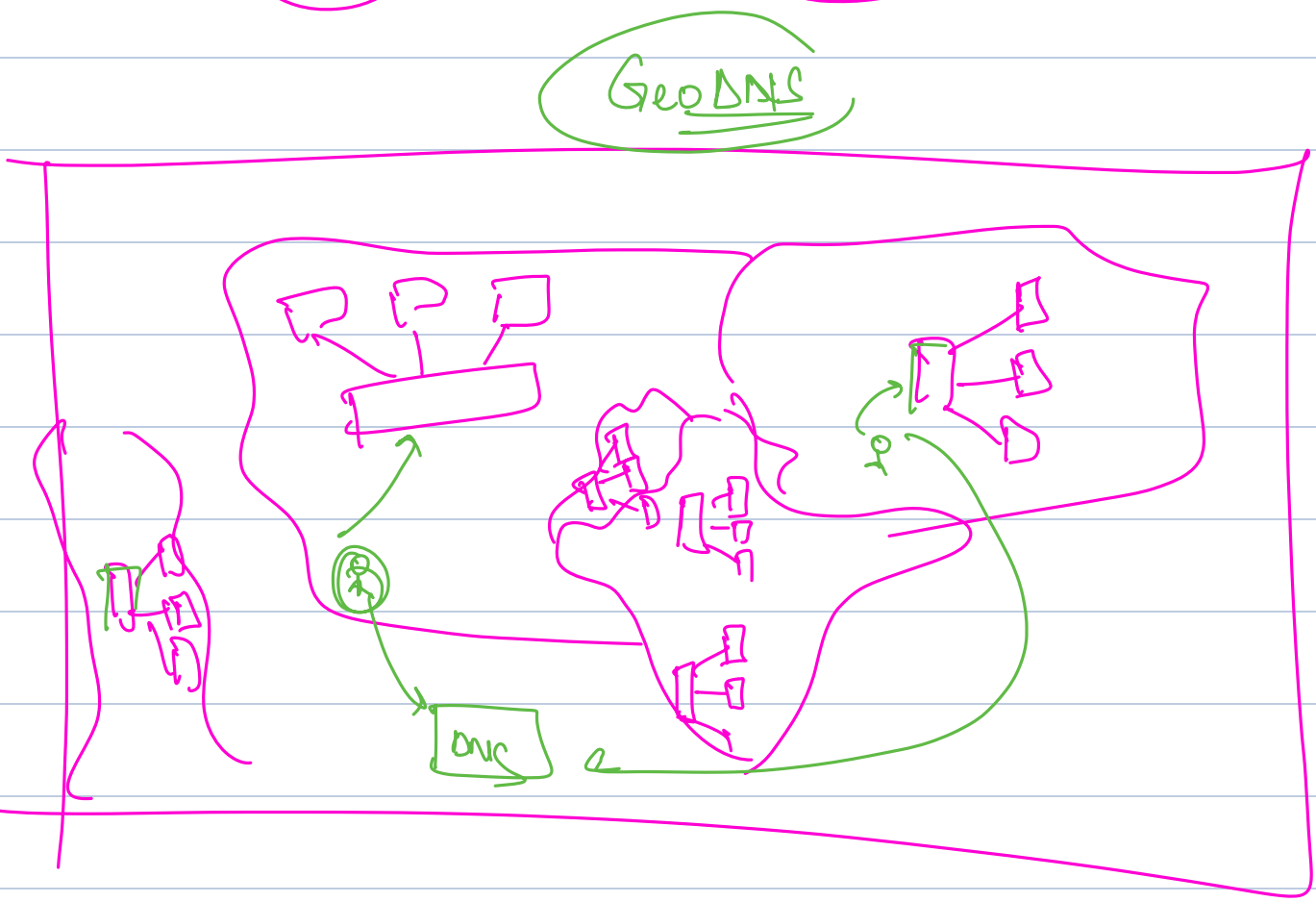
→ Health Check

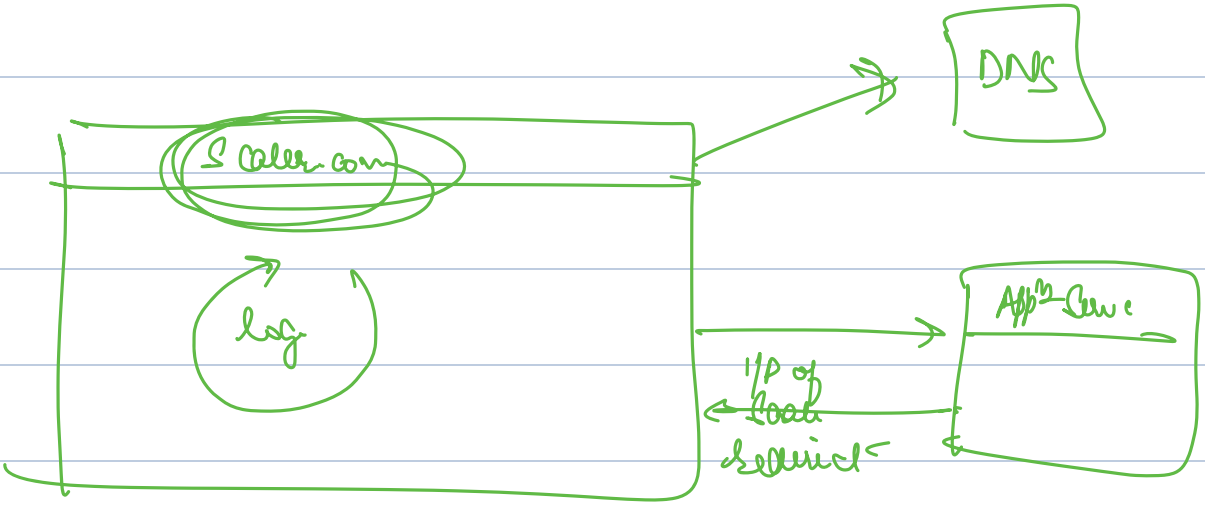
⇒ LB will ask servers every t sec if they are okay

⇒ if server doesn't respond, LB will assume it is dead




public
private
Static
dynamic


GeoDNS
DNS


DNS
log
App Server
IP of