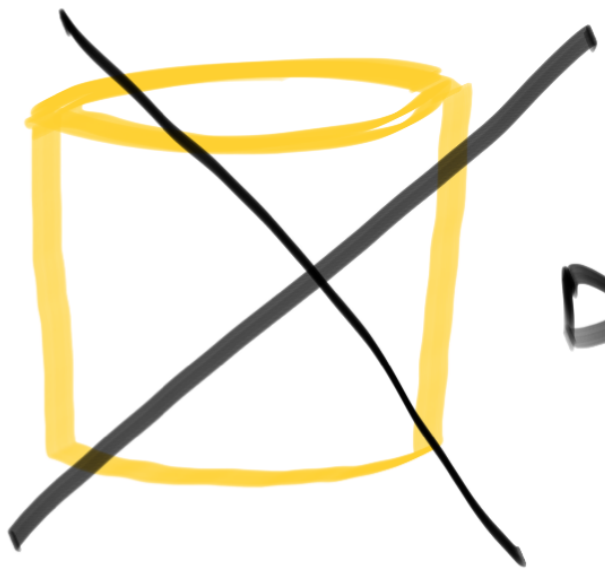
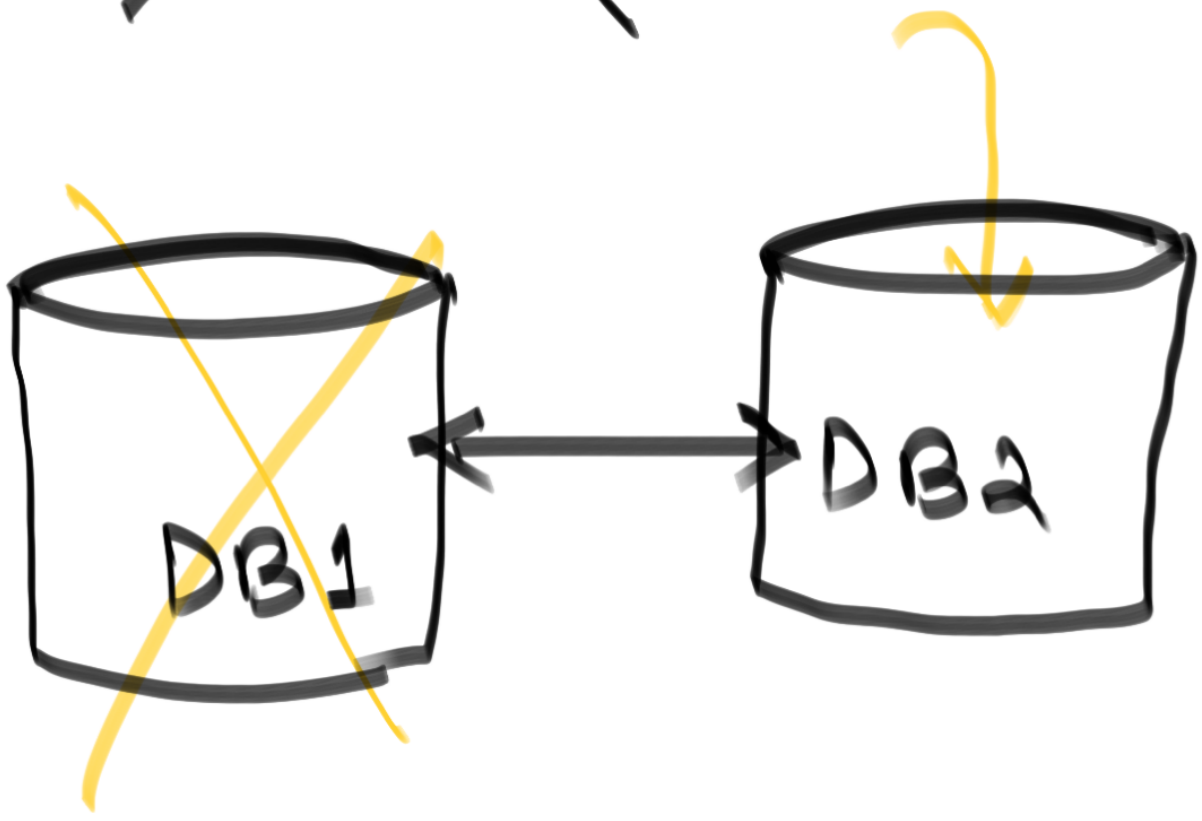
12 Aug 2025 : Bosscoder

Database Replication



(Service ↓)

Down



Database replication

(more than 1 instance of DB)

1. We have less chances of loosing Data

2. Even if one DB goes down,

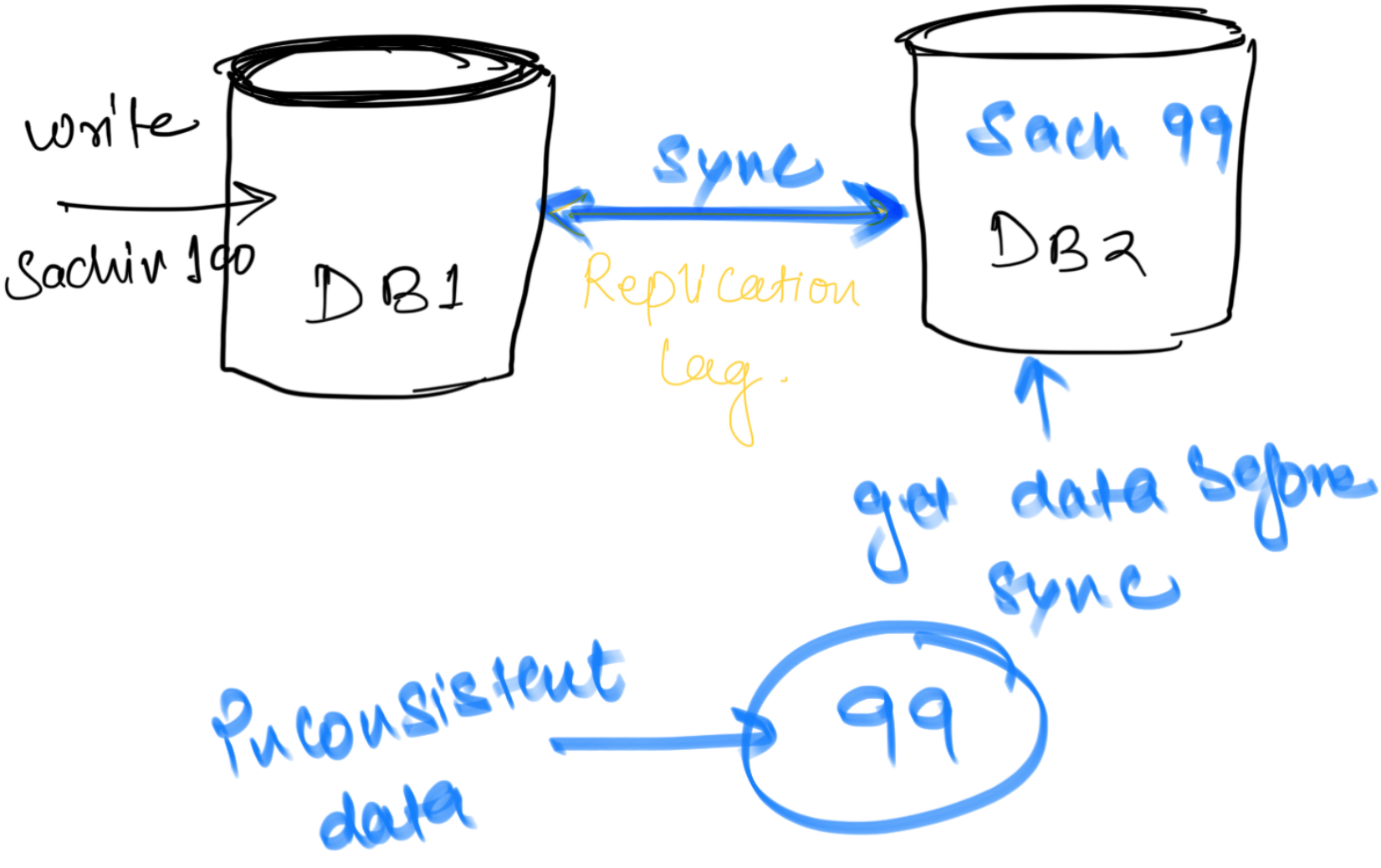
complete service is still up.

(3) Helps reducing latency

Fetching video (Delhi)

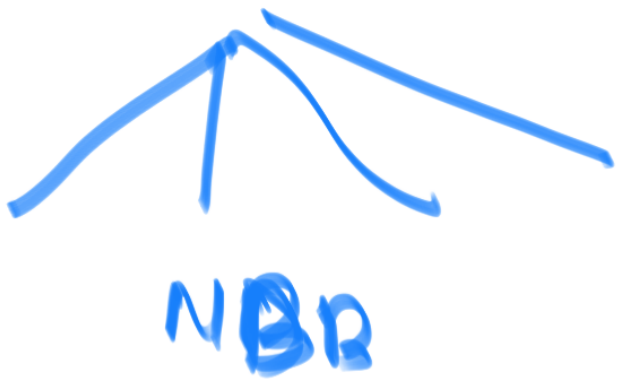
Challanges?

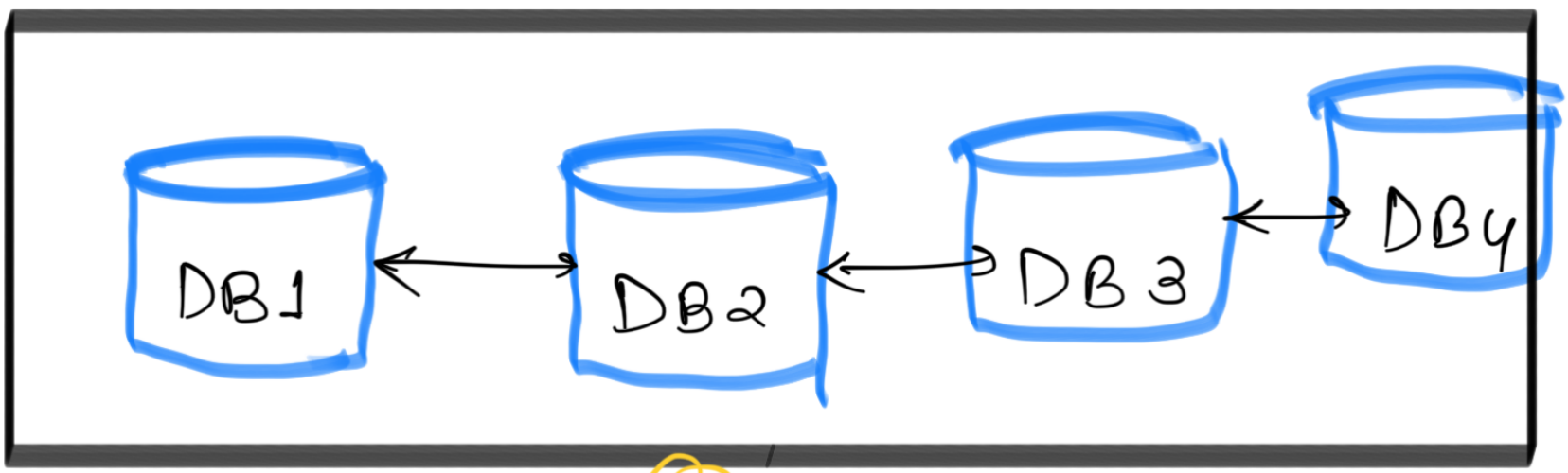
OS



Replication Lag: Time to update from primary DB to

Secondary DB.



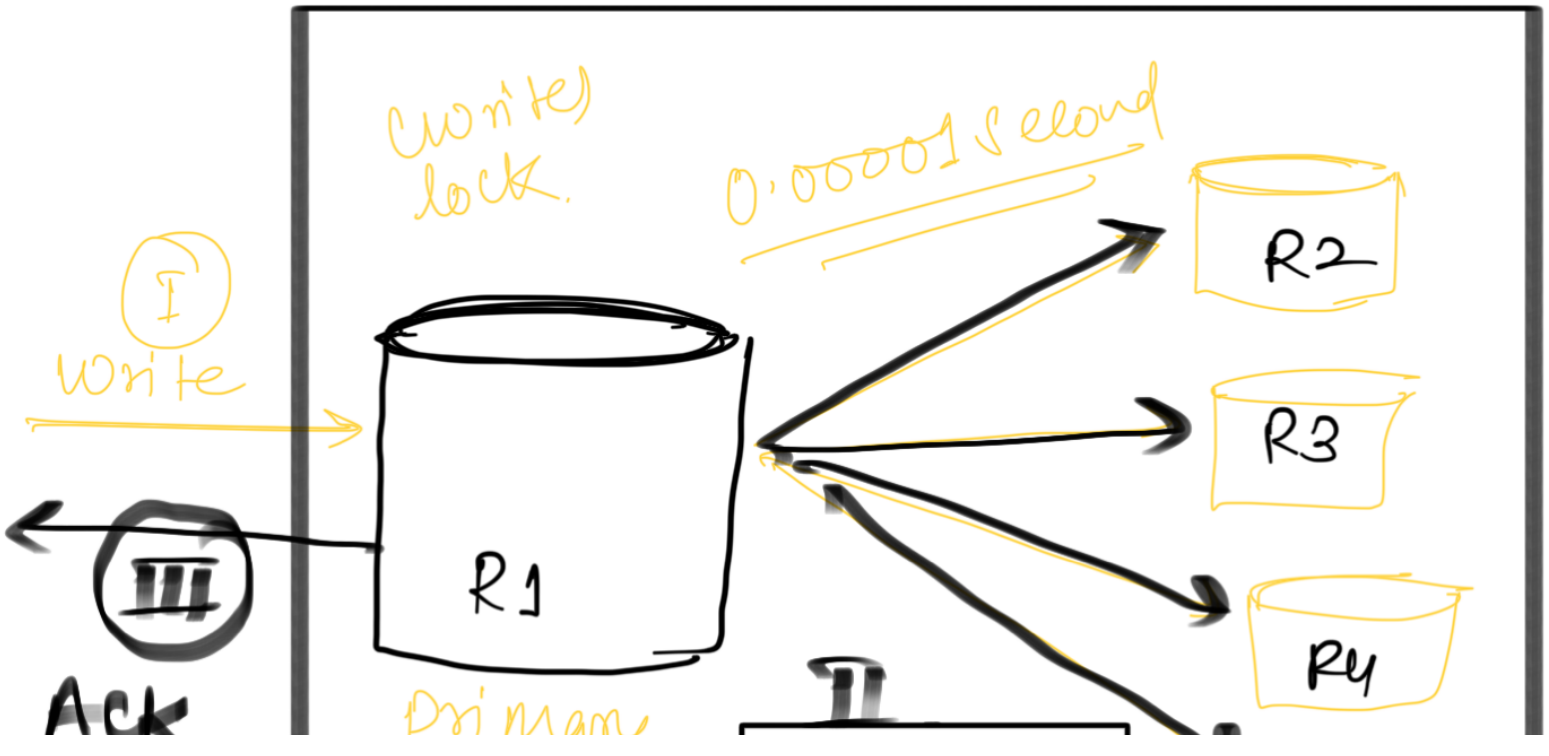


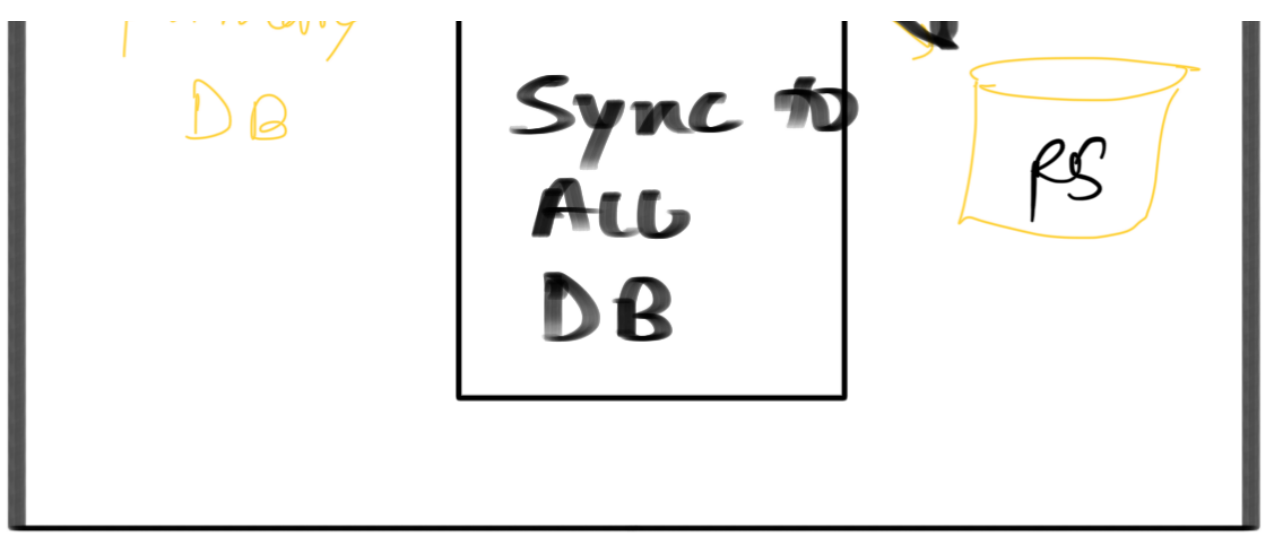
CAP

✓ ✗

✗ ✓

@ Synchronous Replication





① Reduce replication lag

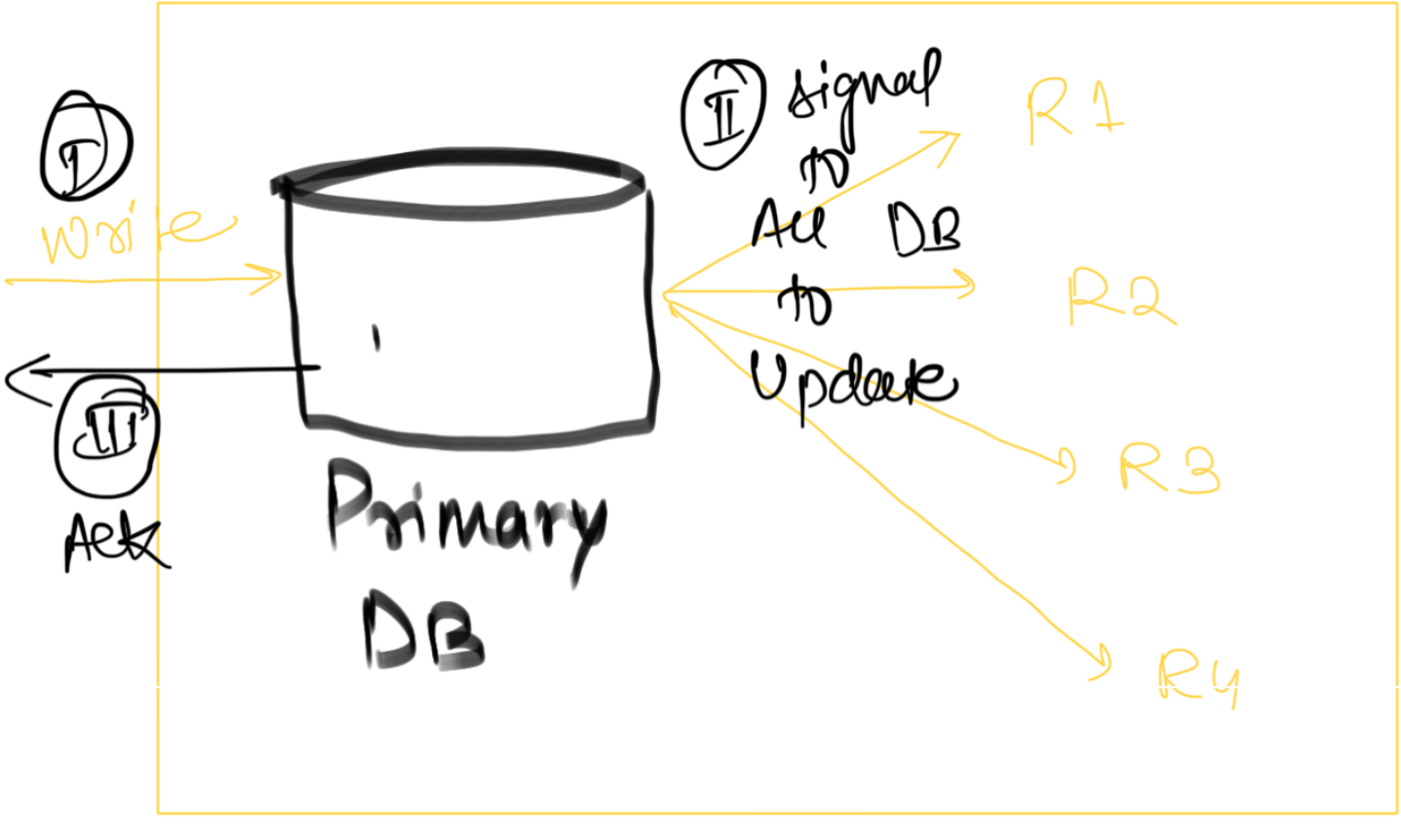
② → R2 is down (Even if 1 DB is down)
→ Sync to DB false

service goes down.

Consistency ✓

Availability ✗

(B) Asynchronous Replication



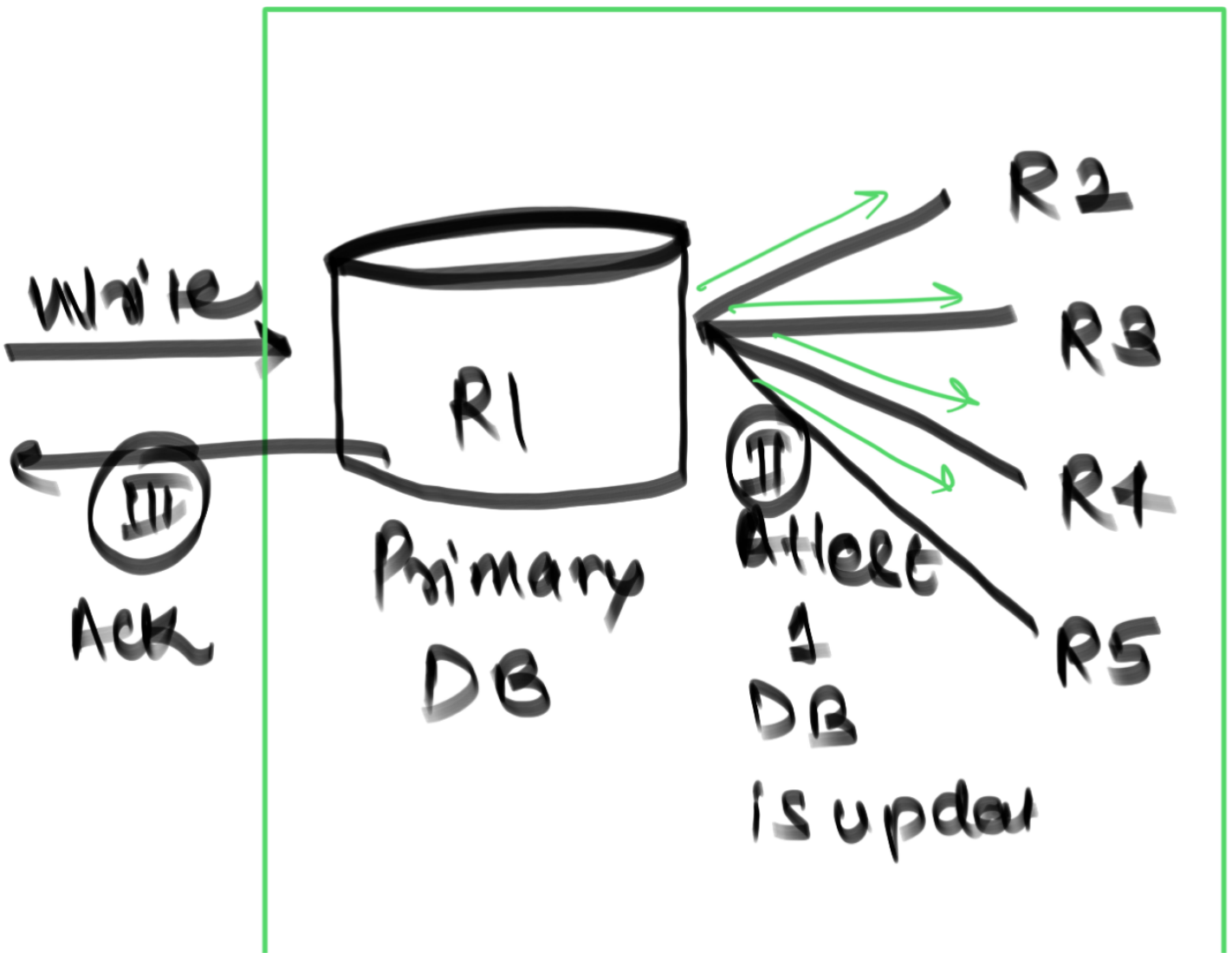
① → Write in Primary DB

→ Send signal to All DB for update. (Background)

→ R2 is down, System will be up.

→ Av ✓ Cons ✗

③ Semi - Synchronous



① Write in R1

→ Send signal to All other DB to update

② Wait for Atleast any 1 DB to update

→ Success

Que: When to Choose DB?

Availability

→ less important

→ Website / Instagram

10 photos

8 photos

Asynchronous Replication

Consistency

① Important Data

(Banking Ticket booking)

→ Synchronous Replication

(IRCTC – 20 mins)

Sync

Semi - Synchronous

(Instagram / ——)

DB

Master

Slave

main DB goes down

(Background)

heartbeat

R2

R1

R3

Primary DB

R4

Slave DB → master

(Monitor.) (Vice- monitor)

(Normal)

S2

P1

S1

S3

Cheartbeat mechanism

10s / 1 minute

Are u alive?

No

Alive

Sync All DB

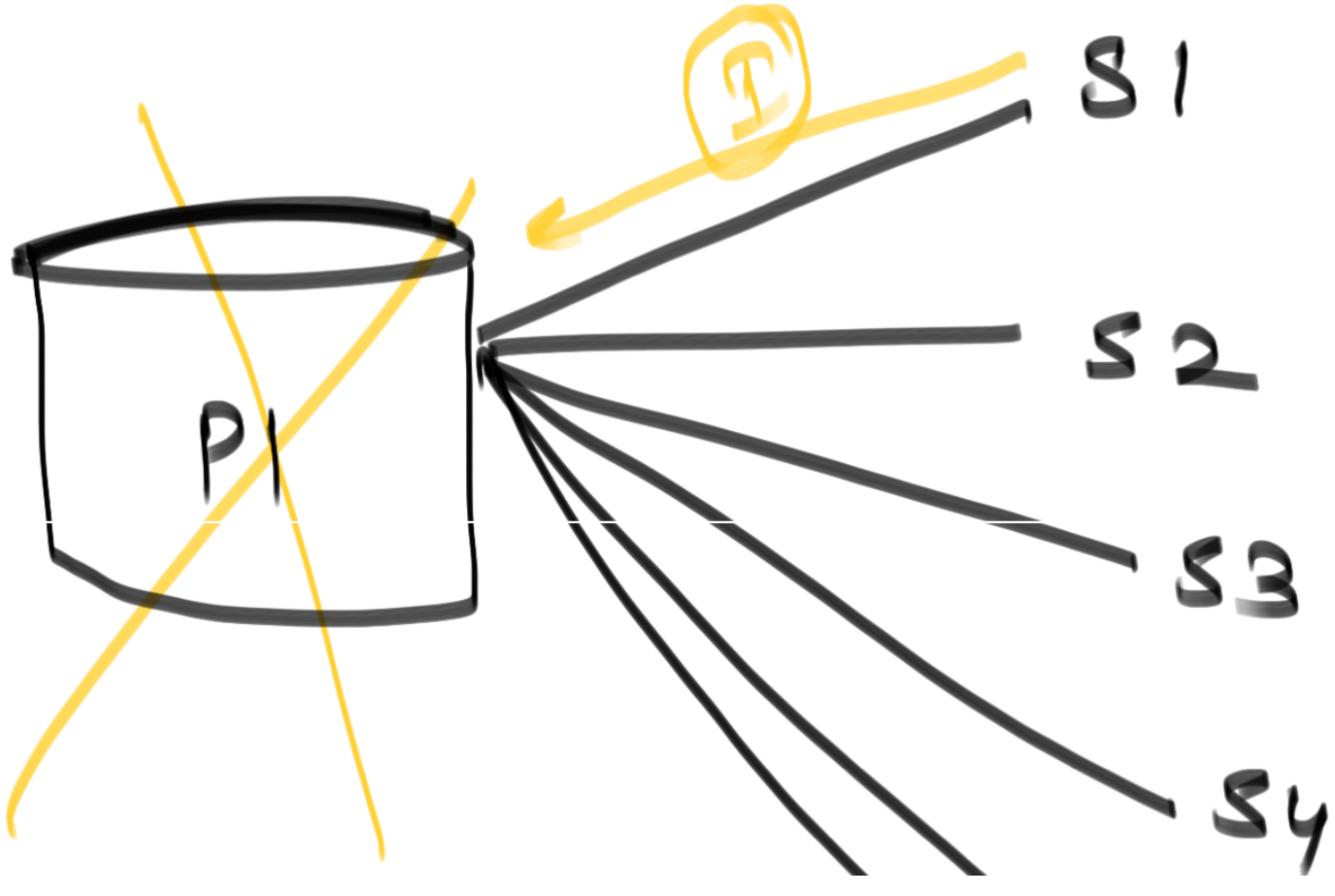
Slave

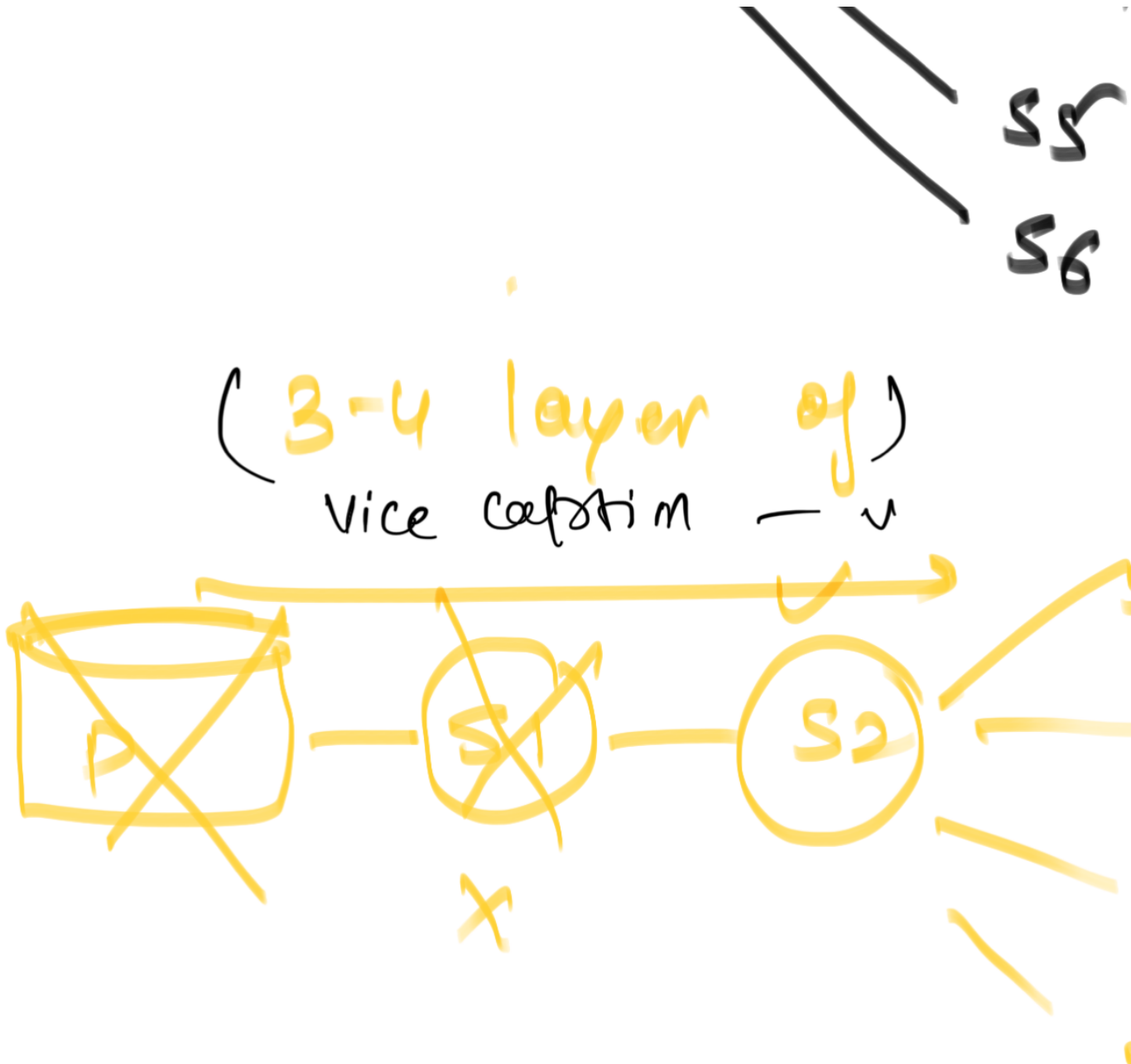
IO T

IO Later, IO more

0.2 $

3-4 levels

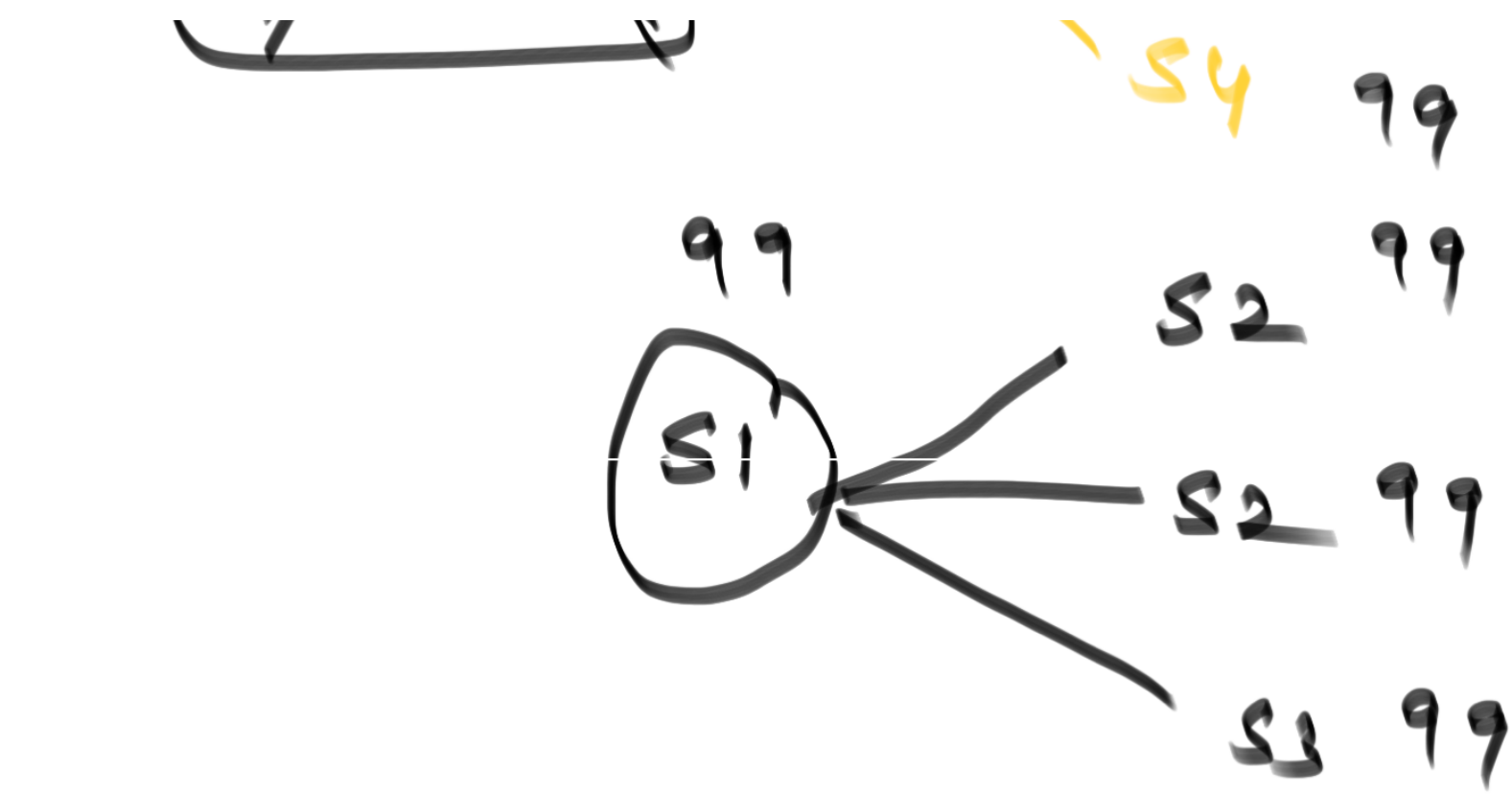




(Hierarchy.)

Coach → VC1 → VC2 → VC3

(Pre-Provide)


S1
S2
S3
S4
P1
P2

replication

T1

J1

J2

J3

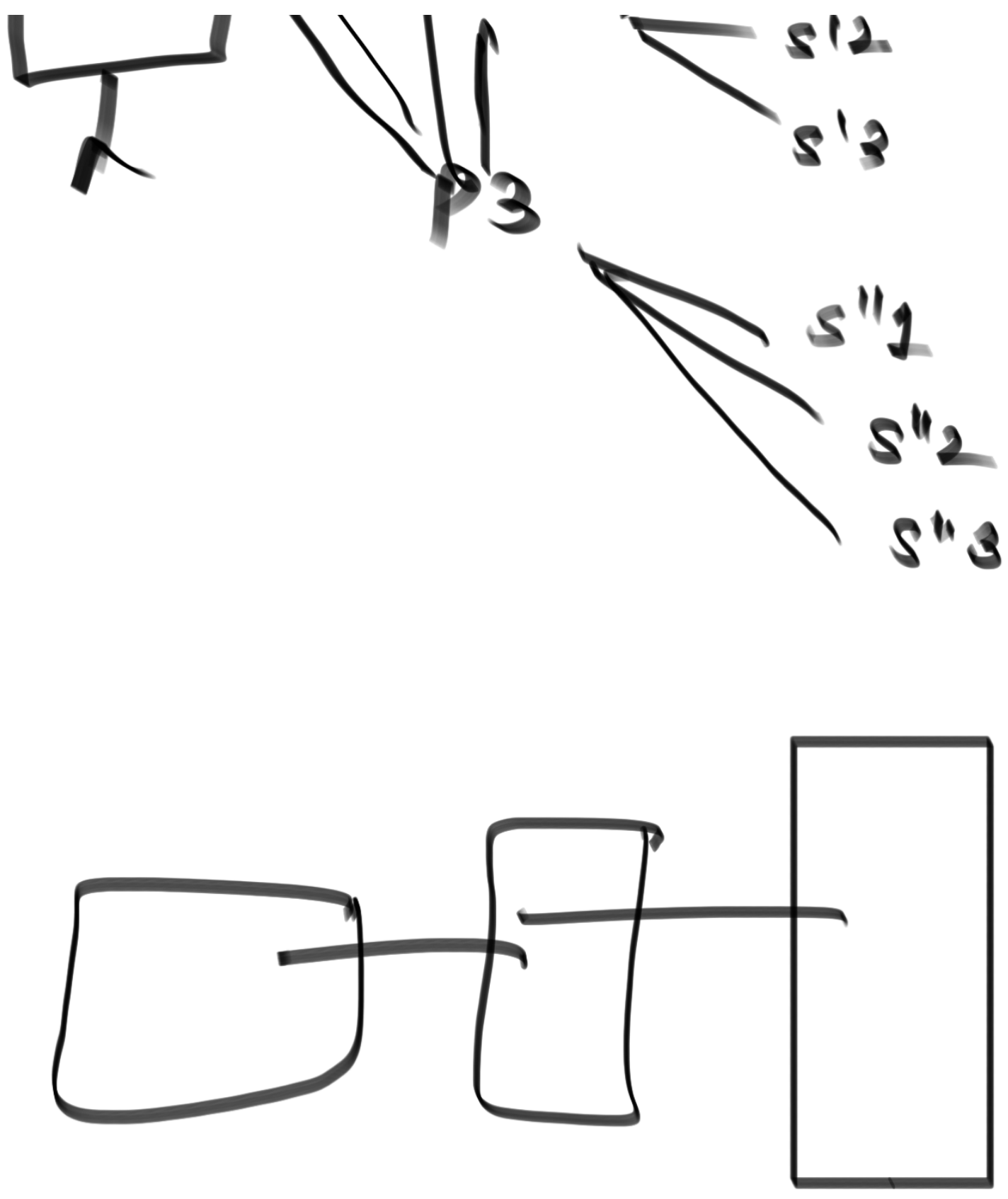
J4

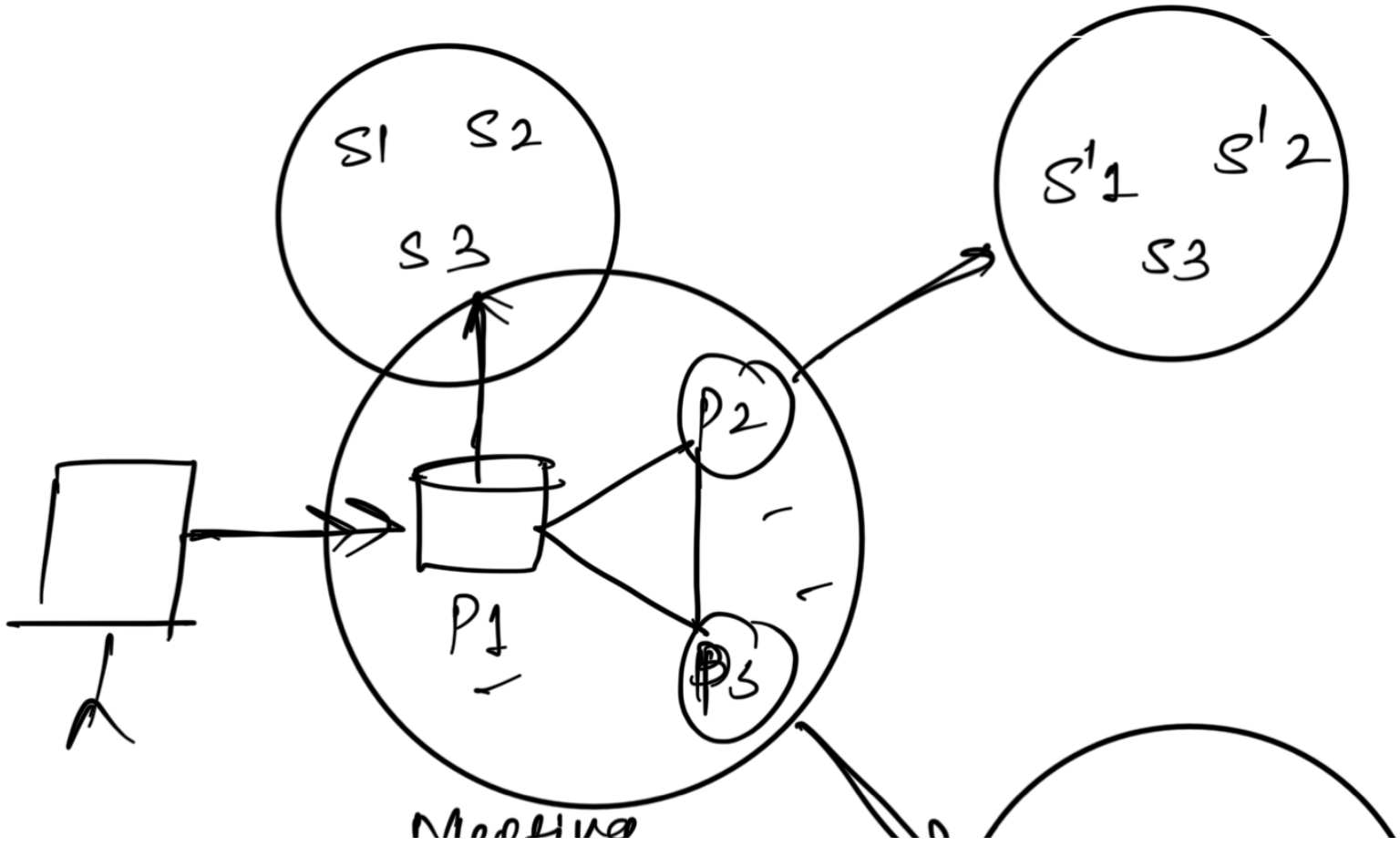
Principal

T2

T3

3 Master – 5 slave


P3
S'2
S'3
S''1
S''2
S''3


S1
S2
S3
S'1
S'2
S3
P2
P1
P3

Meeting

Allegro

10 : 10

10 minute

S"1 S"2

S"3

Sharding

Partitioning

when to choose which DB

2hours

2hour

→ Design schema

→ Solving problem

DSA + HLD + LLD

4DB - Auto Scale