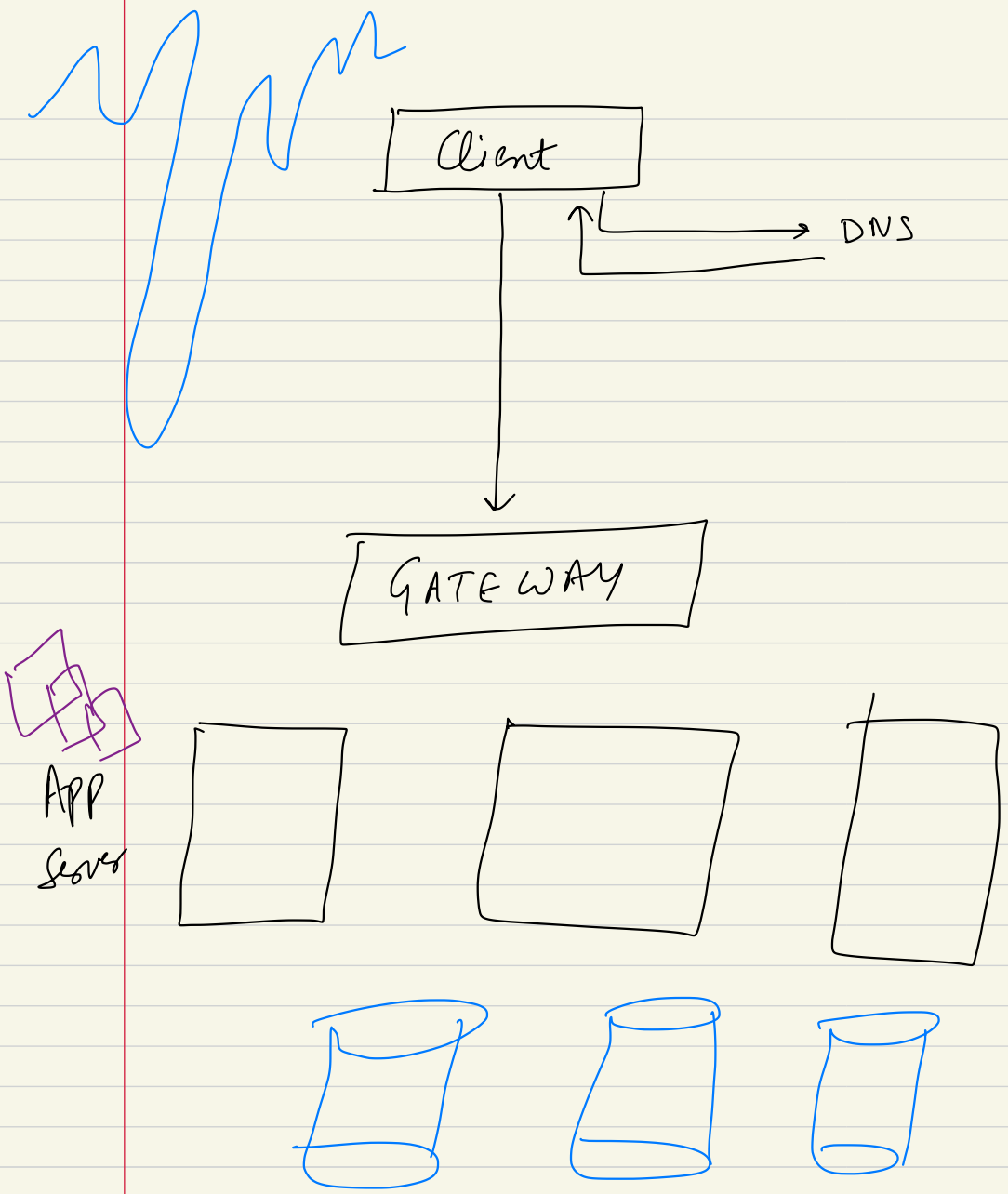

Client
DNS
GATEWAY
App
Server

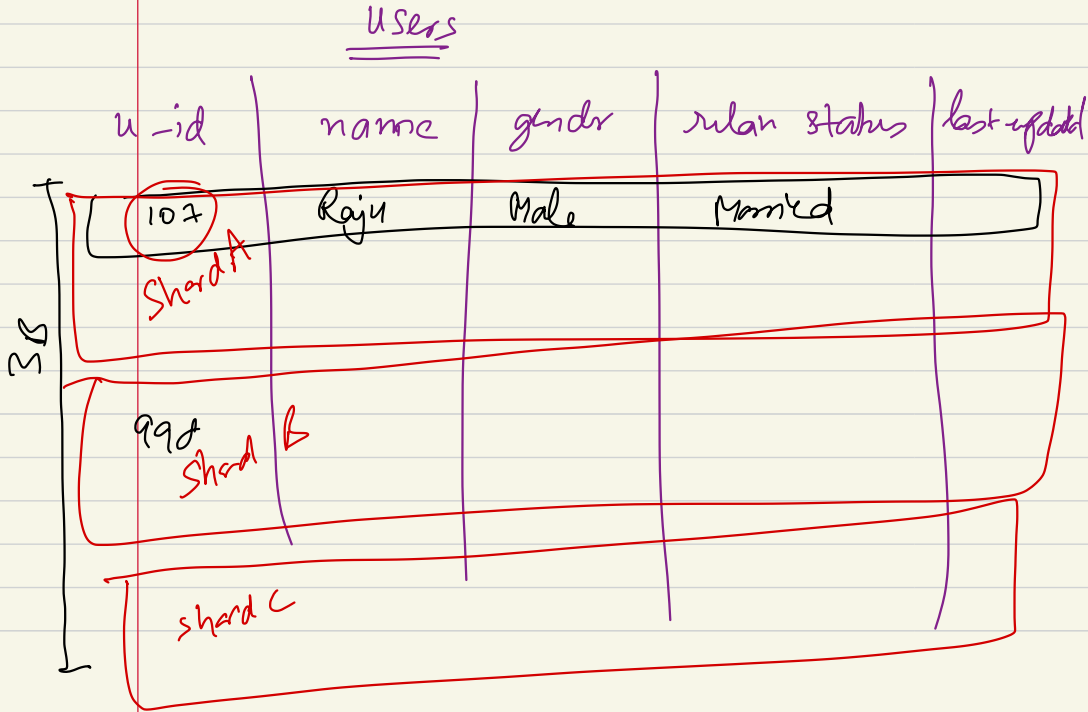
CAP Theorem

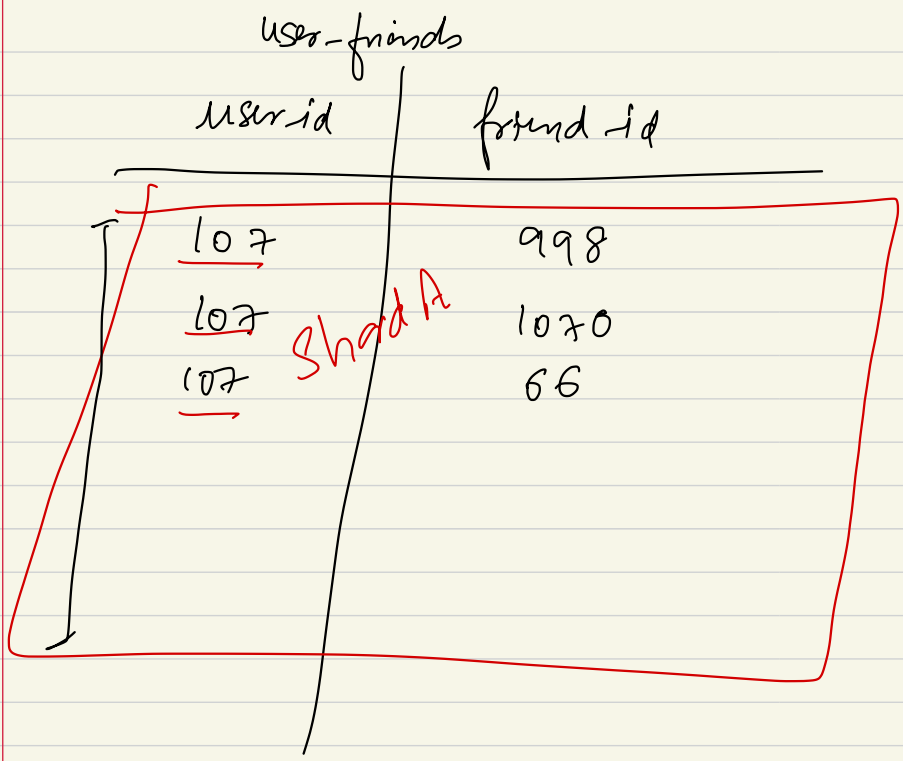
User database of FB

3B

1B MAU

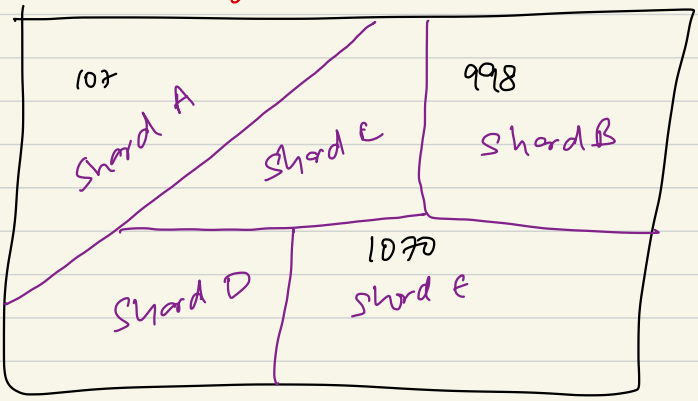
0.5B DAU

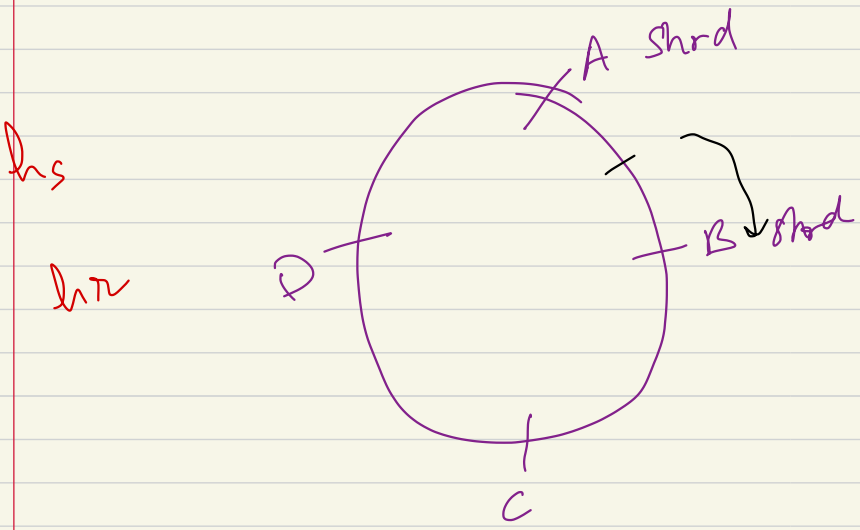


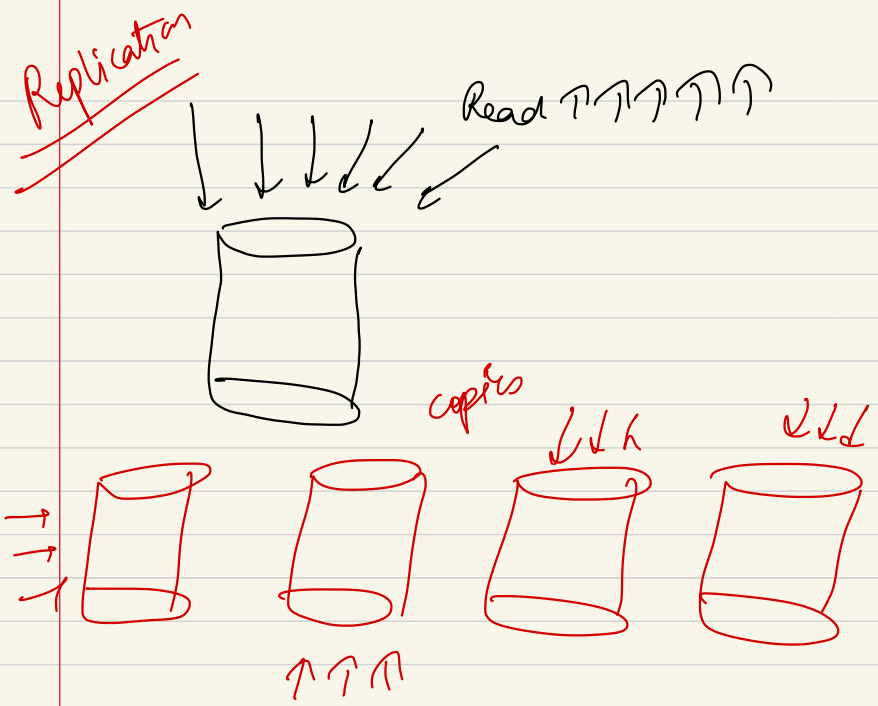

User-friends
user_id
friend_id
107
107
107
998
1070
66
Shard A

Sharding : distributing data across multiple machines

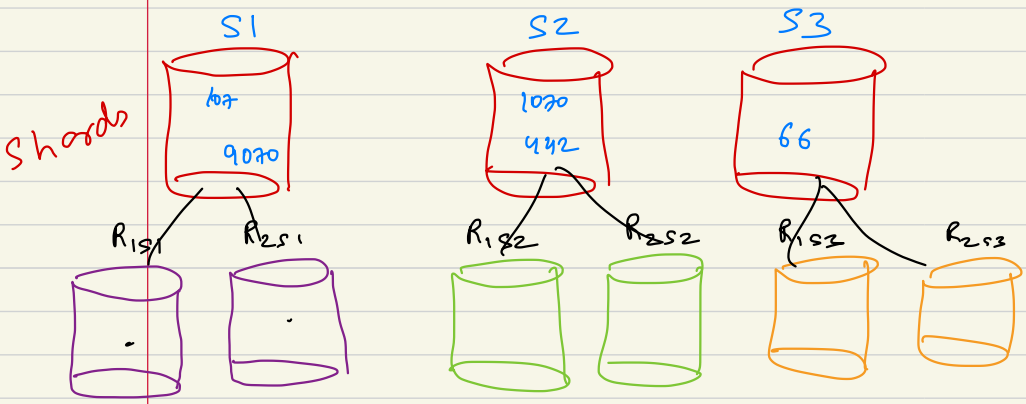
mutually exclusive, collectively exhaustive






Replication
Read
copies

3B users at Facebook



CAP

In distributed systems you can only choose 2/3 of the properties

Consistency : Every read should return back the latest write

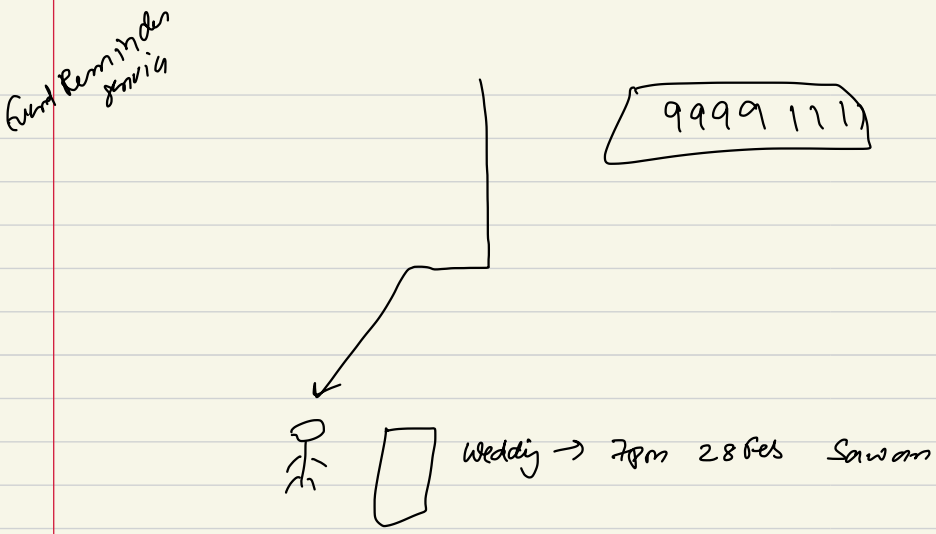
Availability : You're available to register requests

Partition Tolerance

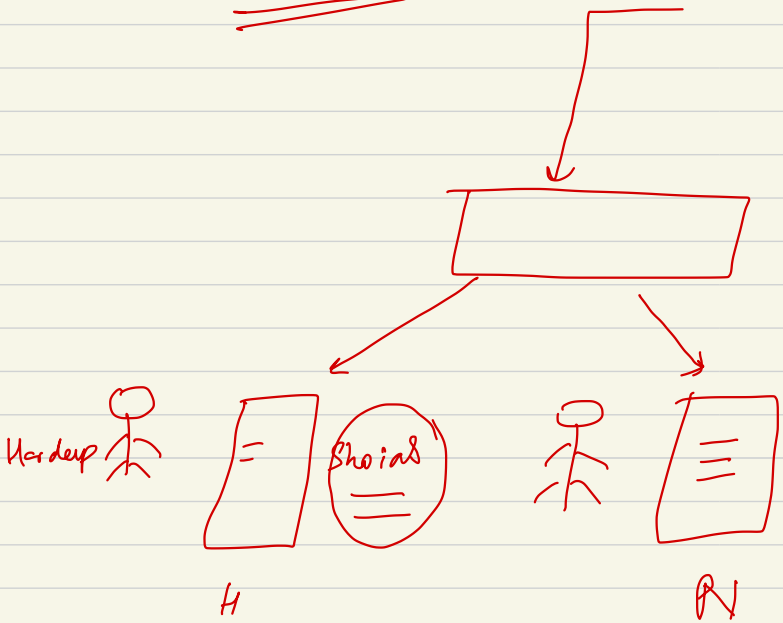
Every machine has the same latest view of the truth

Whenever queried, you should be able to respond back without any error....

Event Reminder service

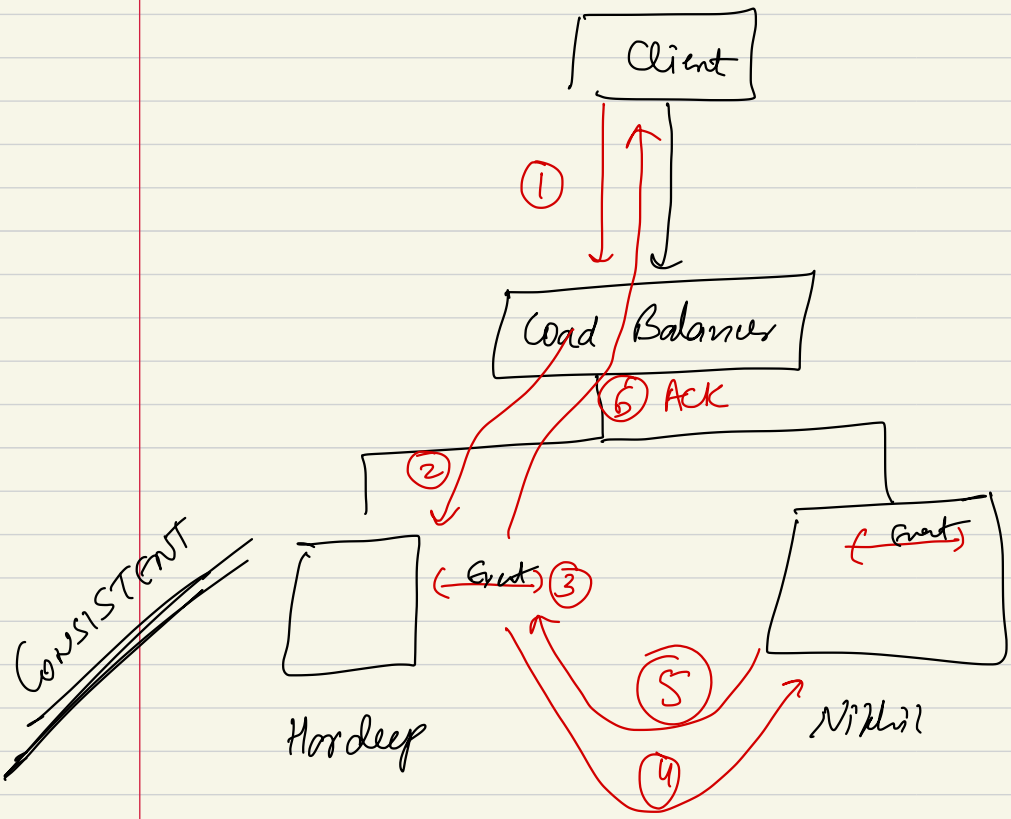


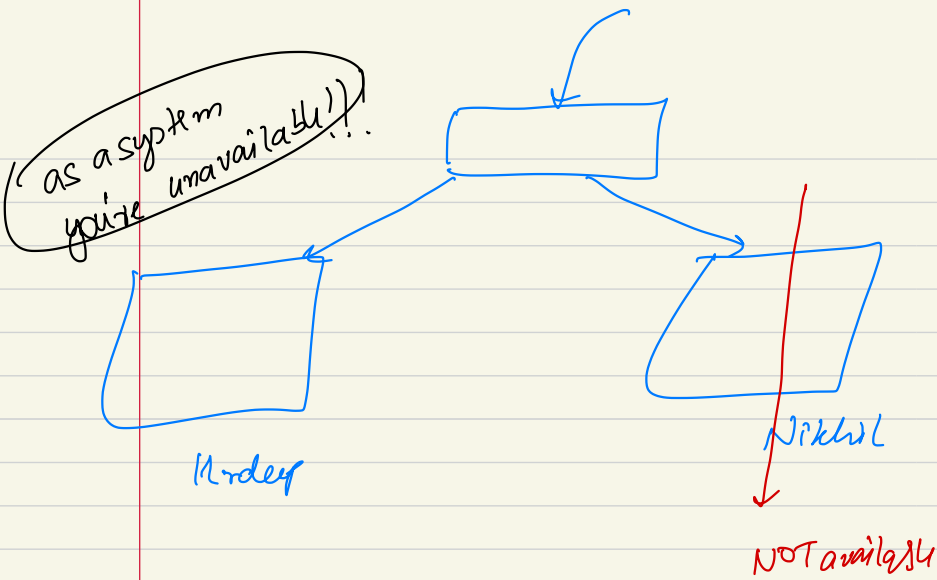
Popular



(A) NOT CONSISTANT

Updated Protocol

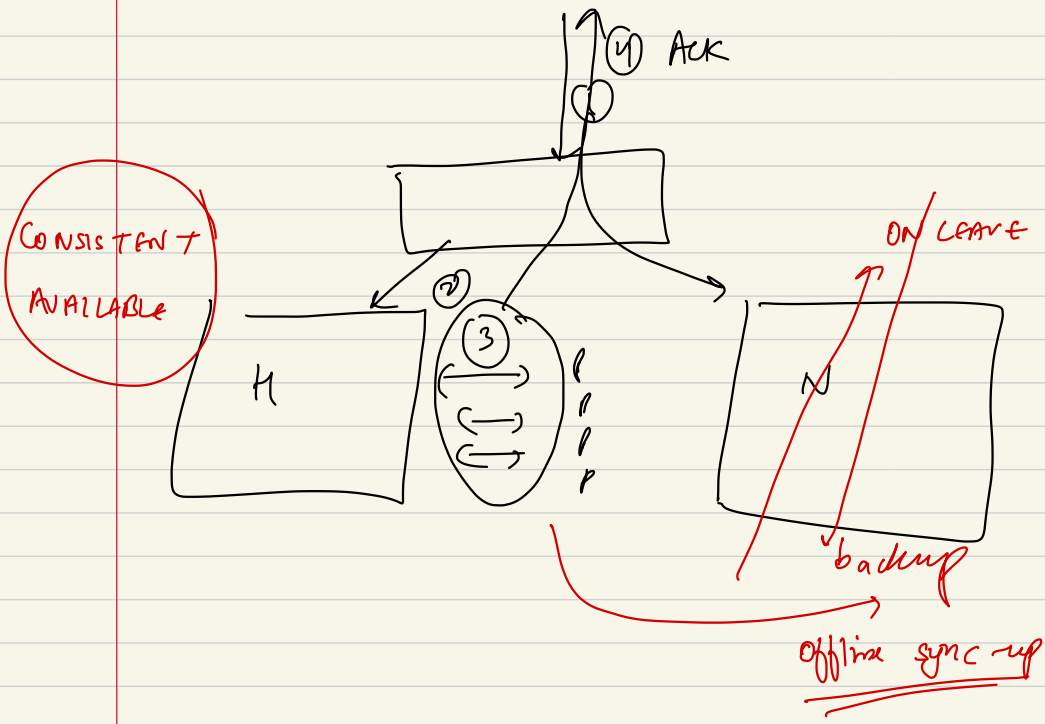




Given the protocol, all WRITE requests

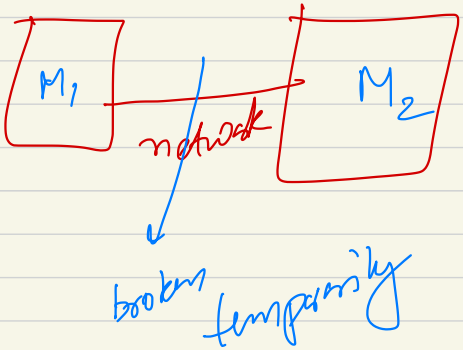
WILL FAIL

II Updated Protocol



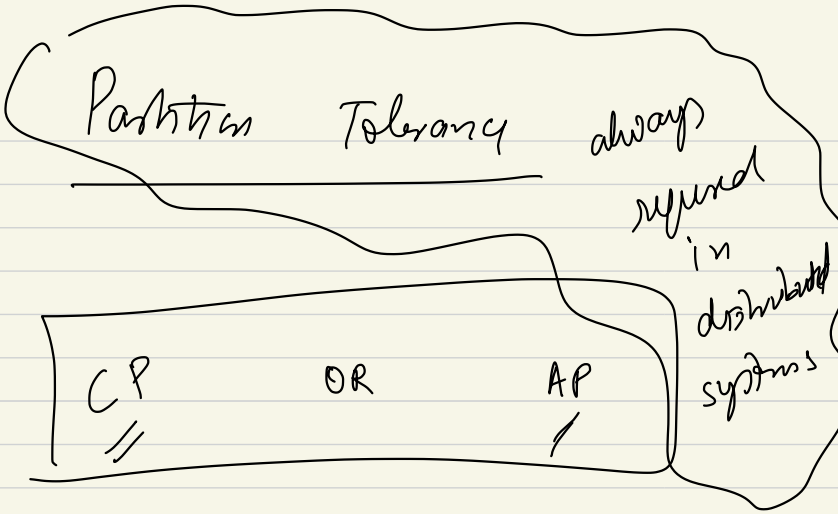
PARTITION

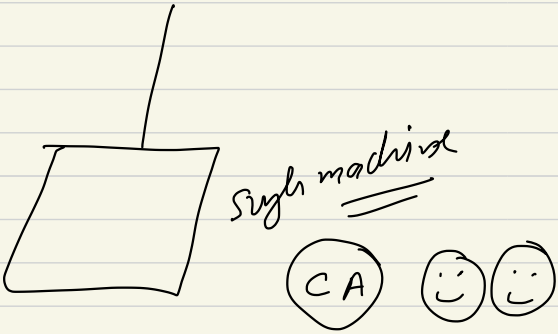
Network Partition

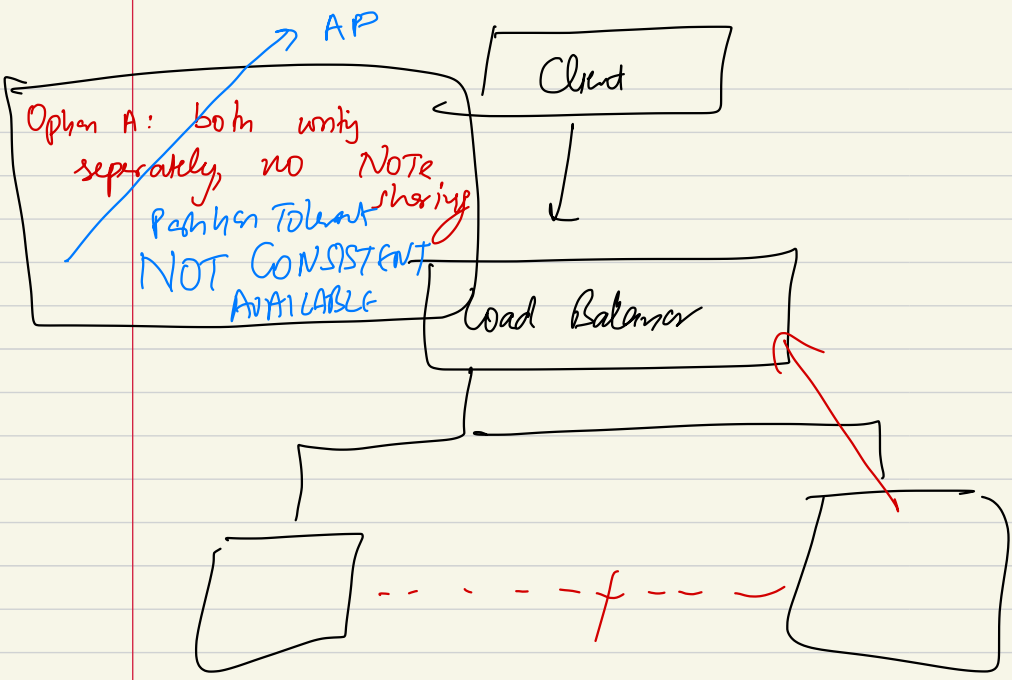


Network is always unreliable :-)

//


Partition Tolerance
always required in distributed systems
CP
OR
AP


Sugh machine
CA



Option B

Not sharing happening, and WRITE will only be acknowledged when both copies have it

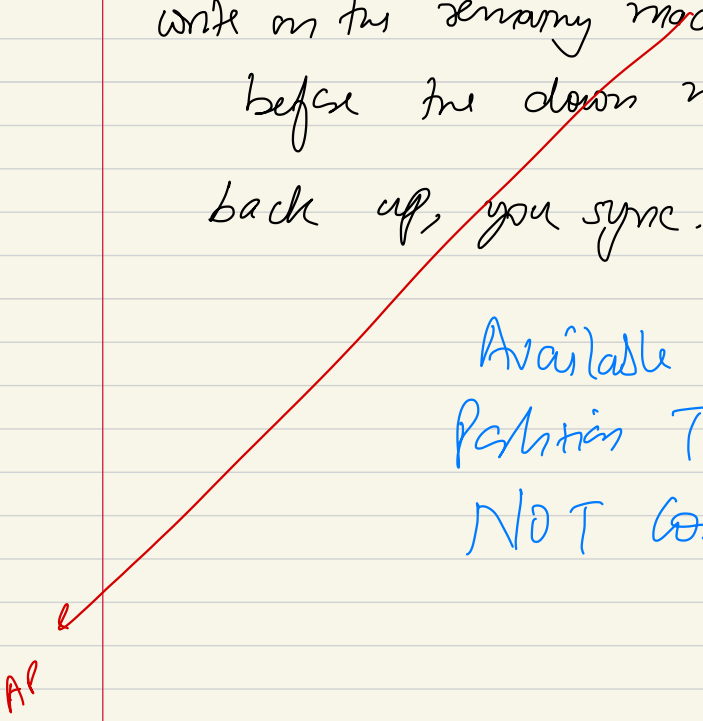
Partition Tolerant

Consistent

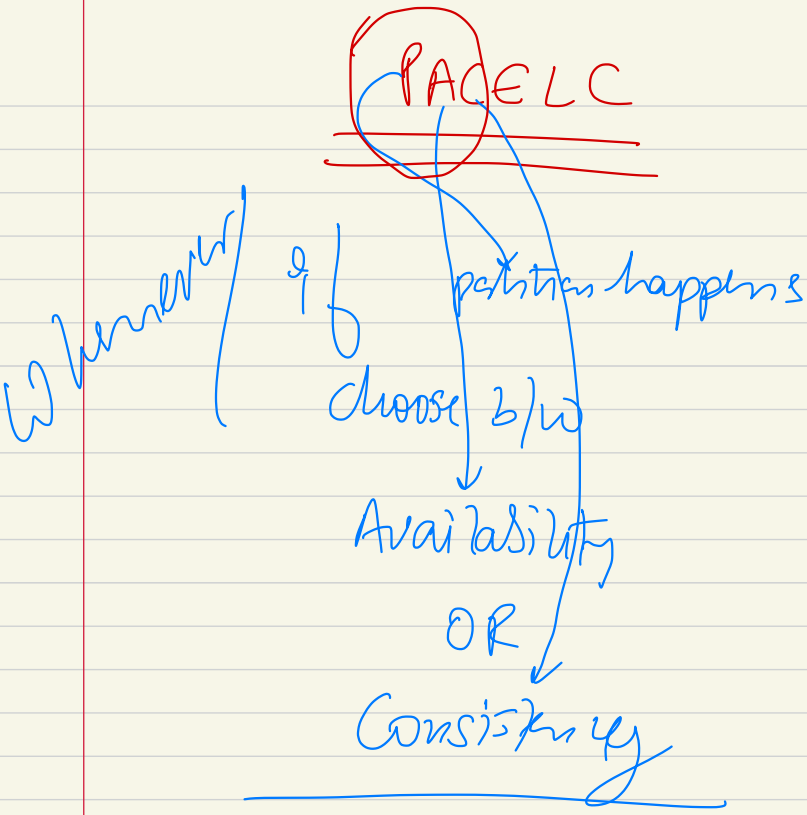
NOT AVAILABLE

Option C

You write at both places, but when a machine is down, you ONLY write on the remaining machine, and before the down machine comes back up, you sync.....



Available
Partition Tolerance
NOT Consistent


PACELC
Whenever
if
partition happens
choose b/w
Availability
OR
Consistency

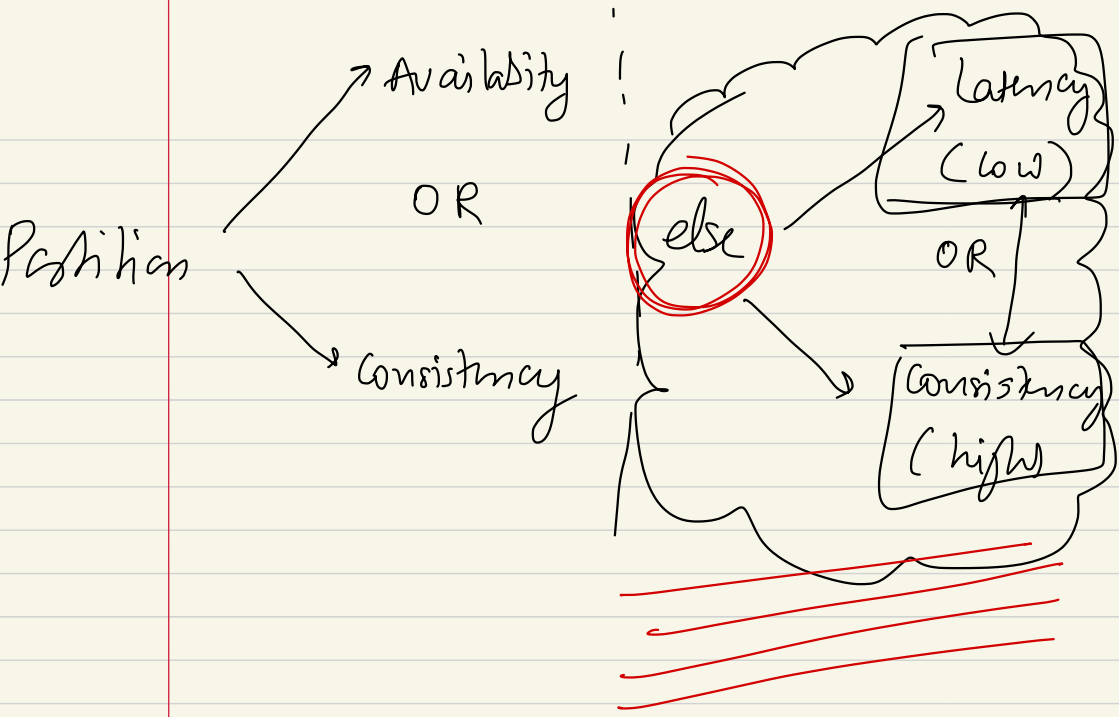
else .....

when partition is

NOT happening

Latency

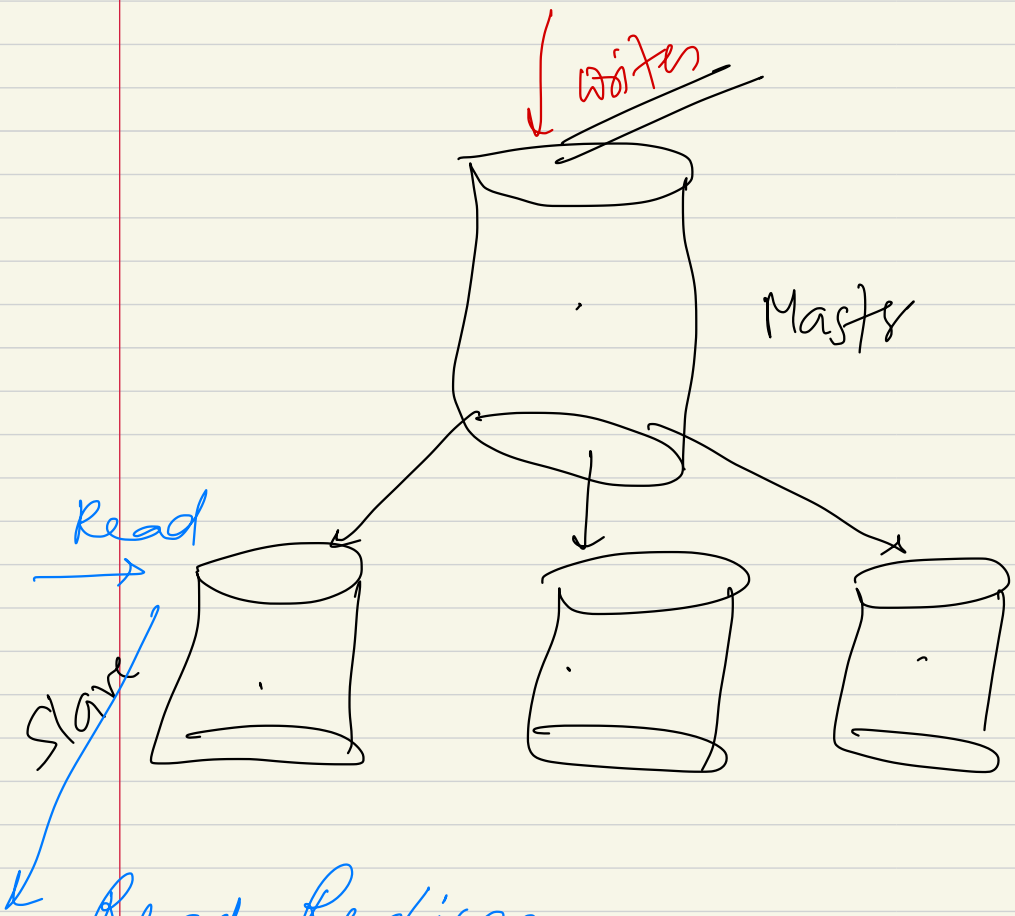
Consistency



Low latency ≡ Fast

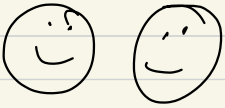
High latency ≡ Slow

Master Slave Replication



Read load >>>
write Load

Consistency: every read will return the latest write



Latency: amount of time it takes for the request to be processed...

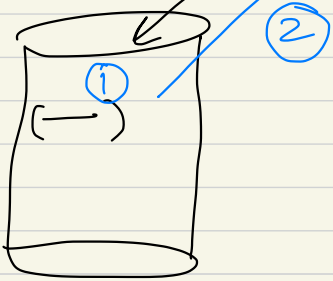
I

low latency

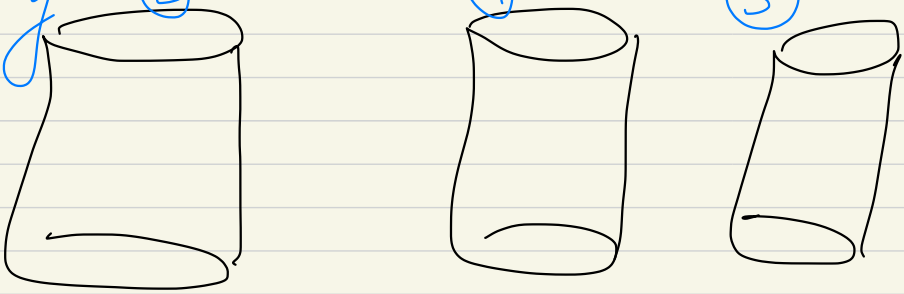
low consistency

eventual consistency

Varaprasad

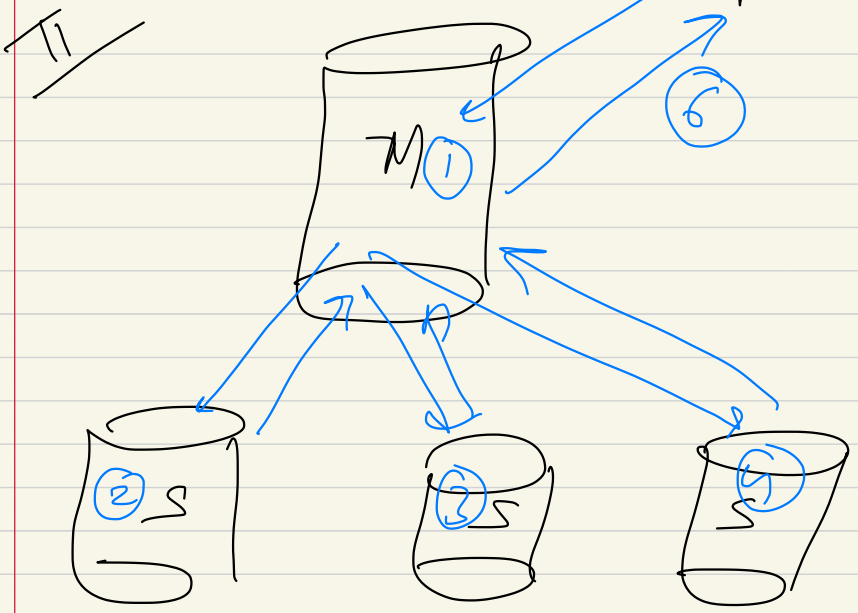


offline



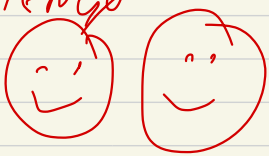
durability might get compromised

Vinaprasad

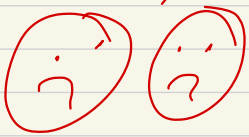


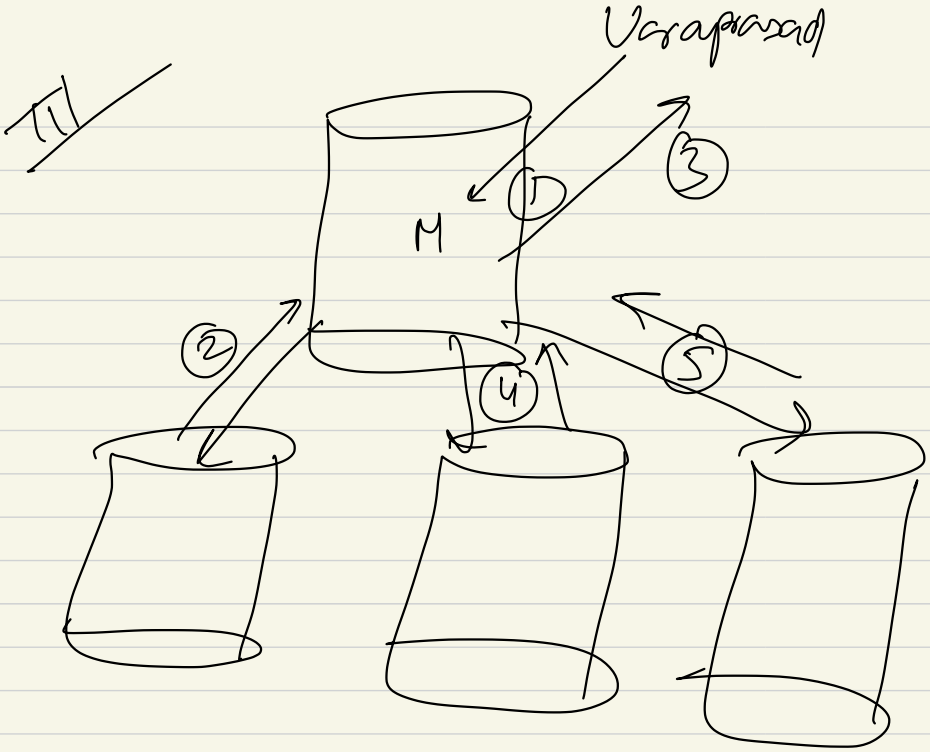
~~HIGH CONSISTENCY~~

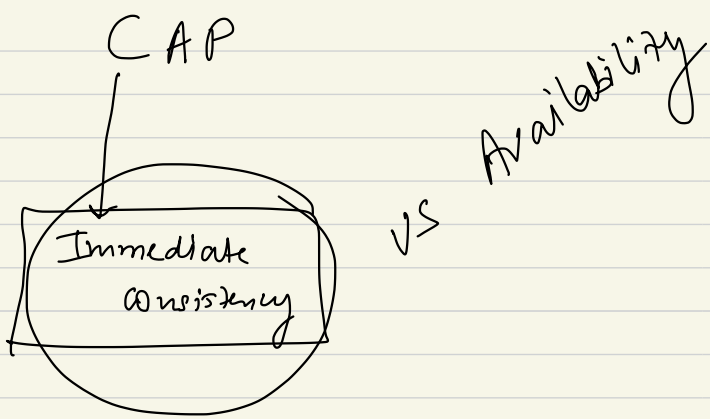
immediate consistency

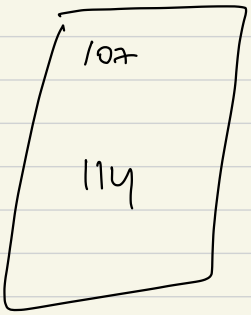


HIGH LATENCY




Varaprasad
M
1
2
3
4
5


CAP
Immediate
Consistency
VS
Availability


107
114


608
1030