MLD-5
Wednesday, 3 May 2023 10:30 am

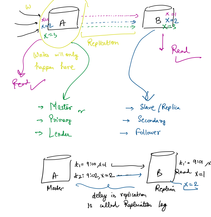
Lect 1 Lect Planning

① Quick update strategies
② CAP theorem

We will start at 9:05 AM

Agenda

① Replication
② Master slave with failures



→ Master
→ Primary
→ Leader

→ Slave / Replica
→ Secondary
→ Follower

Delay in replication
In which Replication log

RDS → Allows offering an managed Relational database

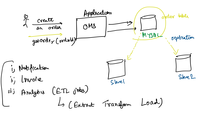
Primary (A) (MySQL) → Replica (B)

Replication log

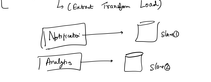
Master slave

eg1

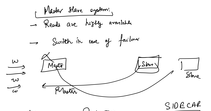
eg2 E-Commerce (OMS) → Order Management System
→ Order Creation, POST /orders



① Notification
② Invoice
③ Analytics (ETL jobs)
↳ (Cannot Transform Load)



Master Slave system,
→ Reads are highly available
→ Switch in case of failure

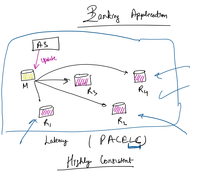


Advantages of Replication

→ Fault tolerance
→ Reducing read latency
→ Secondary reads
Can happen on replica and works on master

SIDECAR
design
Pattern
Observability
Sidecar/ai-gateway
(Envoy CDN)

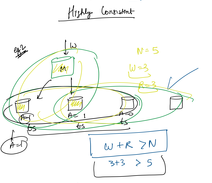
Banking Application



Latency (PACELC)

Highly Consistent

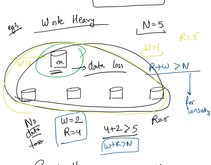
eg1



W+R > N
3+3 > 5

eg2 Write Heavy

N=5



N=5
data loss
here

W=2
R=4

W+2 > 5
R+W > N

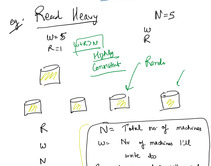
eg. Read Heavy

N=5

W=5
R=1

W+R>N
Highly Consistent

Reads



R
W
N

N= Total no of machines
W= No of machines that write to
R= No of machines that read from

W + R > N → Highly consistent system

5+5 > 5

10 > 5

R=1
W=5

N=5

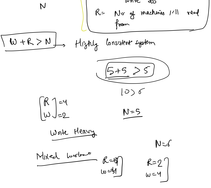
Write Heavy

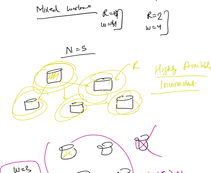
Mixed workload

R=1
W=4

N=5
R=2
W=4

N=5





Master Slave ... Master Master

R → Highly Consistent
W → Highly available

Tunable Consistency

Highly Consistent

R+W > N

PACELC

Eventually Consistent

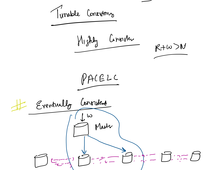
- Writes are better (approved performance) compared to highly consistent system.

Broadcast Algorithms :

Gossip protocol

Master Slave

Master is down X
↳ Switch to a replica

① Is down : Availability
Consistency

② Downtime : Consistent
(replica to be elected)
→ Make it master
→ Consistency
→ Availability