

Lec 03 :- CAP Theorem

Back of the Envelope
Calculation

monolith v/s microservice Architecture.

CAP Theorem :-

Peecheh Lec hum Sabse jayda focused the

"Scalability" he

(To humne Distributed System se achieve
karti thi

To aaj hum in "Distributed System" ek famous
theorem (CAP Theorem) ka padhenge.

CAP

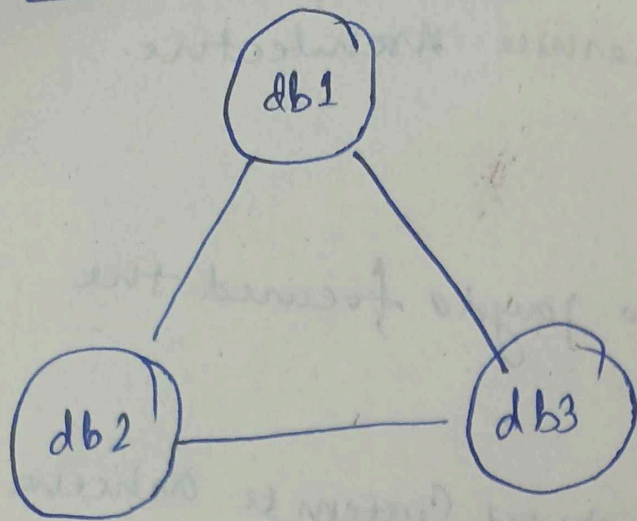
Consistency

Availability

Partition Tolerance

P10

Scenario



* Teeno mai same data h,

To agar db1 mai data write /
update hota h to use
no changes ko db2 aur
db3 ko bhi upadaye.
Same for db2 aur db3.

C → Consistency

→ client gets the same data, at the same time
no matter the node (db)

↳ matlab client chahi kahi bhi db
(db1, db2, db3) kahi se bhi data le,
use same data hi mile.

A → Availability

→ whenever client sends req, he gets a
response.
irrespective of consistency.

P → Partition Tolerance.

→ Our application should always be up.
(Always operate)

→ matlab agar db3 band hogata ho
bhi system fail naa hove.

In a Real world,

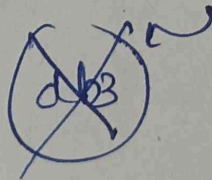
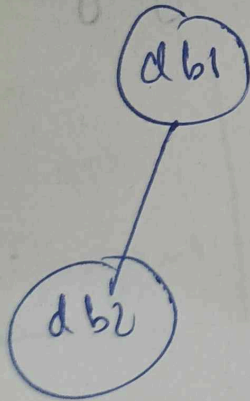
CAP! - No matter what, you will always get max
2 out of there 3.

CA, CP or AP

Teeno chahiye nahi ya hi, lekin hume

"Partition Tolerance" chahiye hi chahiye.

Case 1 -



due to Partition
Tolerance.

ab agar mai consistency force karu to
data ~~db~~ go db1 mai h usko db3
mai nikaal payege.

to aise mai ye kar sakta hu ki sirf "Read"
operation support karu, par ~~usko bhi~~ home fir.

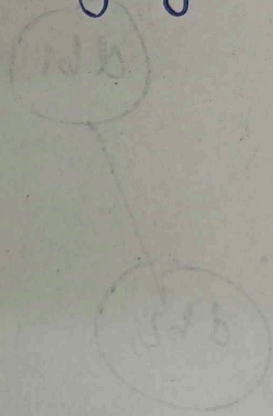
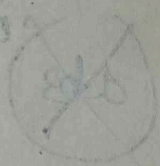
agar kor write operation data to use response
ni milega to availability reh gayi

Case:

Aur agar main availability force karri to,
as db3 aur baki db communicate ni kar
sake to dono syne mai hi to

consistency reh gayi.

not to function
write



Consistency v/s Availability

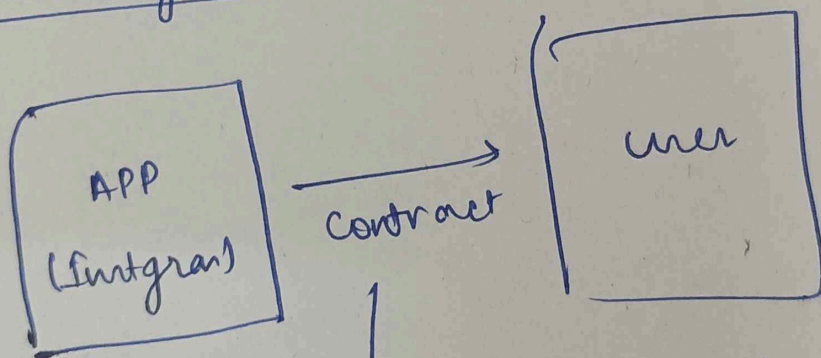
Consistency: Response (Up to date mandatory)

eg: banks.

Availability \rightarrow Response (Up to date optional)
(Always get clear response is mandatory)

Downtime of an Application

Availability Numbers! -



ye contract k app aur user ke beech mai jo batata hga ki ye app saal mai kitni baar down reh sakta.

eg: 100% available \rightarrow 365 days
99% of 365 dy = 3.65 days down rahega
99.9% - - - = 8.77 men down
99.99%
99.999%

To humlog availability ko
"no. of 9's" mai represent karke h.
Jitne 9's apke point ke age hogi, unka aacha
→ cur ans ko kehke h availability numbers.

Back of the Envelope Calculations

