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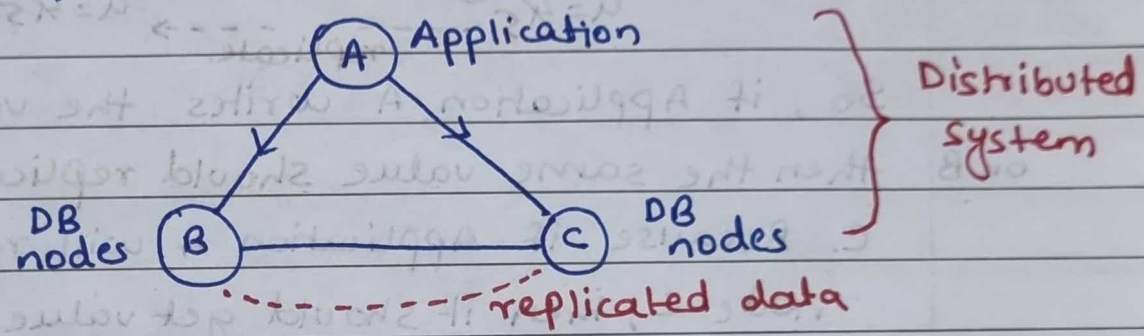
#2: CAP Theorem:

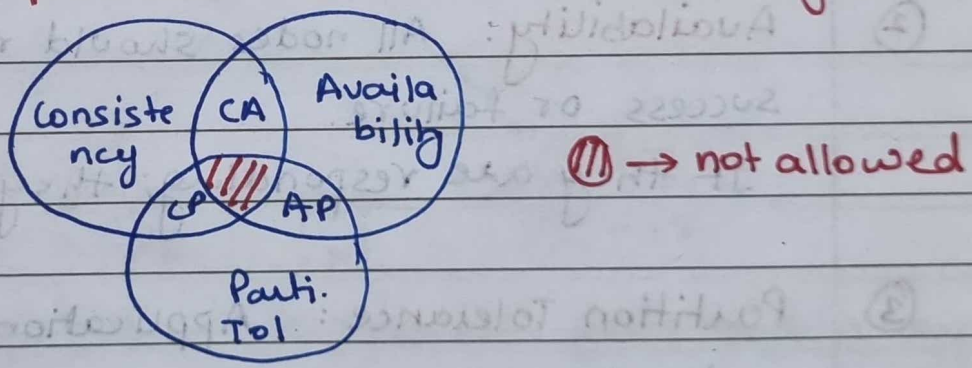
Consistency, Availability, Partition Tolerance

- It defines a desirable property of distributed system with replicated data. (CAP)



Both the DB nodes should be synced, such that Application A can query from either DB nodes, and gets same response.

But these properties cannot be used all together.



CA : Consistency Availability

CP : Consistency Partition Tolerance

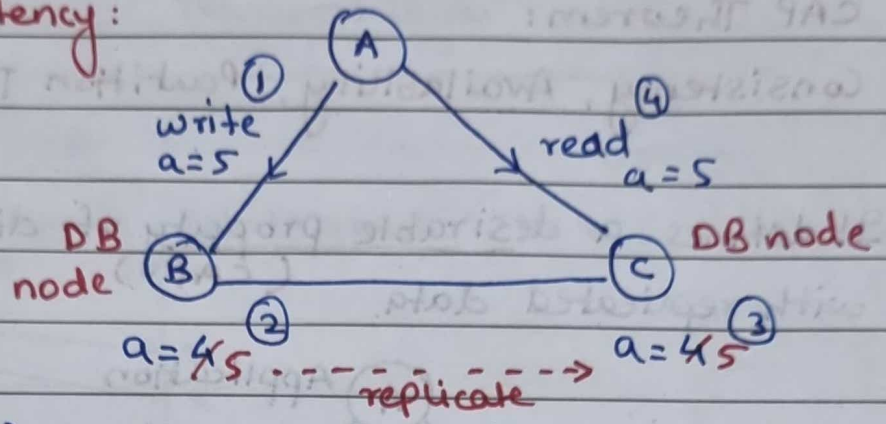
AP : Availability " "

CAP : cannot be used in distributed system with replicated data.

#learnthesmarterway

Date: __/__/____

① Consistency:



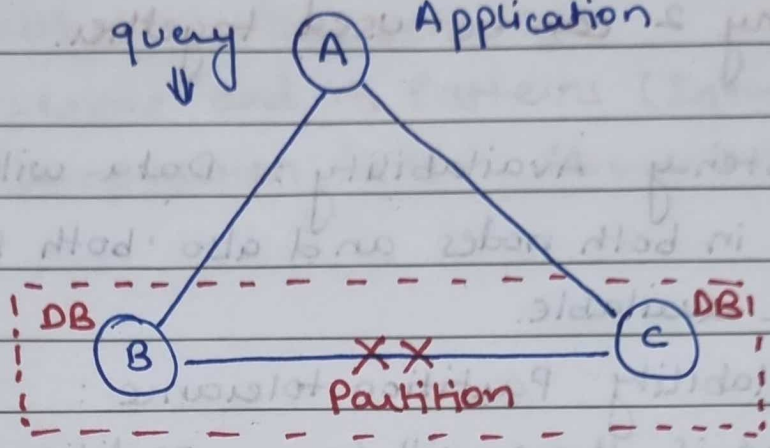
So, if Application A writes the value of a=5 on B then the same value should replicate to node C. Because if Application A will read from node C, then it should get value as 5.

So data should be synced / consistent on both the nodes.

② Availability: All nodes should respond: either success or failure.
If they are responding, they are availability.

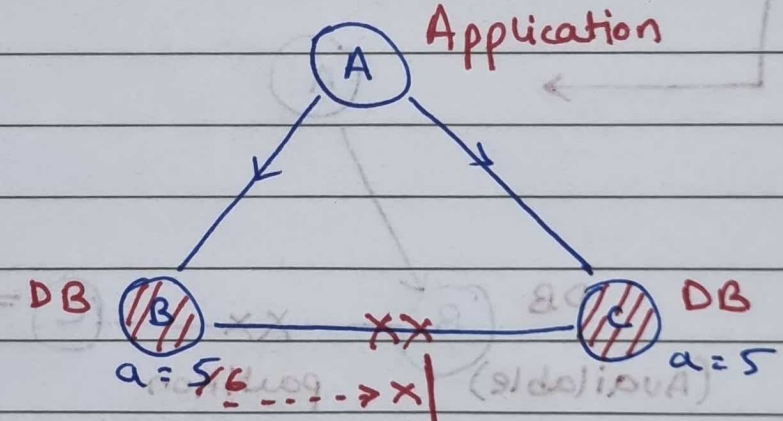
③ Partition Tolerance: Application can query and will get the result but there is partition (internally) in the system.
But from User perspective, System is up.
User will get the response.

Date: __/__/____



→ User can get the response from any DB.

Now we will see, why All 3 cannot be used together.



① Consistency: If write operation performed in any DB, then data should be consistent in both.

② Availability: If B has query then it should respond, and if C has query it should respond.

③ Partition Tolerance: Now if there is partition breakage, then it can't be consistent.

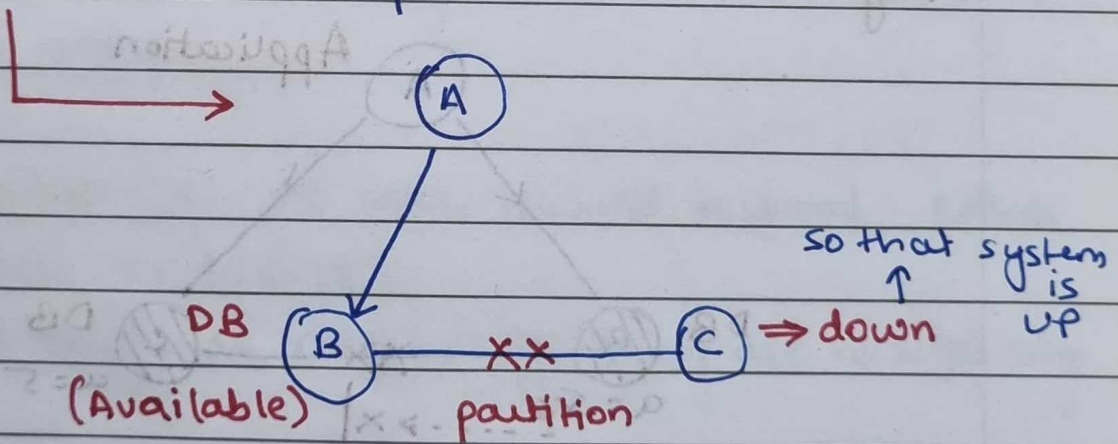
Date: __/__/____

→ So any 2 can be used together.

① Consistency Availability : Data will be consistent in both nodes and also both the nodes are available.

② Availability Partition tolerance :
Even if there will be a partition breakage, but both nodes are available, without consistent data.

③ Consistency Partition tolerance : Data will be consistent, but only one node will be avaible, because there is partition tolerance.



So only Consistency and Partition tolerance is possible. (Not availability of both)

→ So based on requirements we can choose :
CA, CP, AP