CAP Theorem

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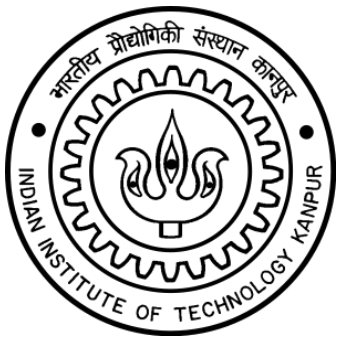

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Overview

C, A and, P

In a distributed system,

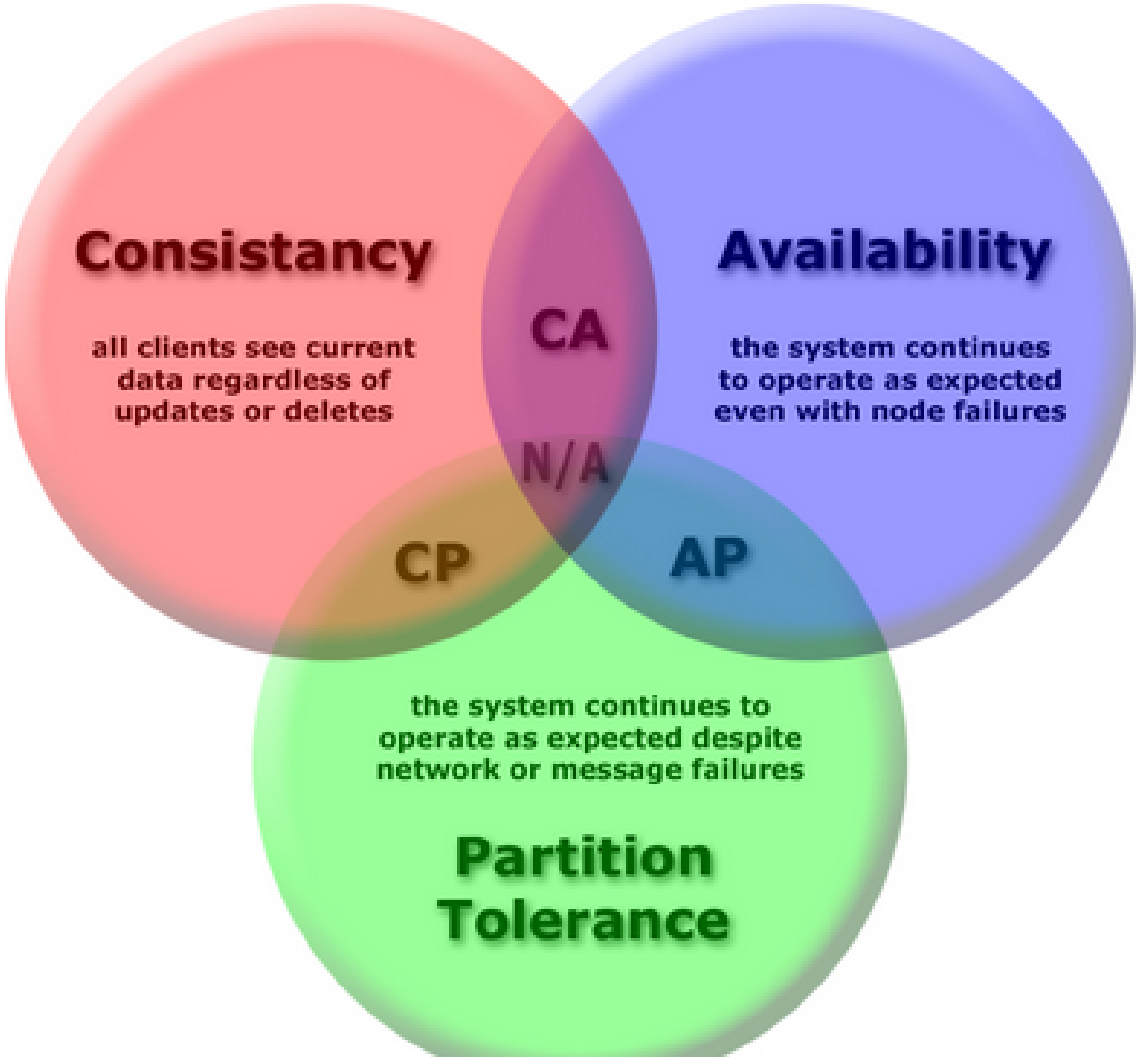
- **Consistency:** Same of copy of data at all locations
- **Availability:** Node is available and handle requests if it is not failed
- **Partition Tolerance:** System should keep above promises even nodes in the system are disconnected

CAP Theorem - 1/2

CAP Theorem - Eric Brewer

Though its desirable to have Consistency, High-Availability and Partition-tolerance in every system, unfortunately no system can achieve all three at the same time [1] [2]

CAP Theorem - 2/2



Ideal System

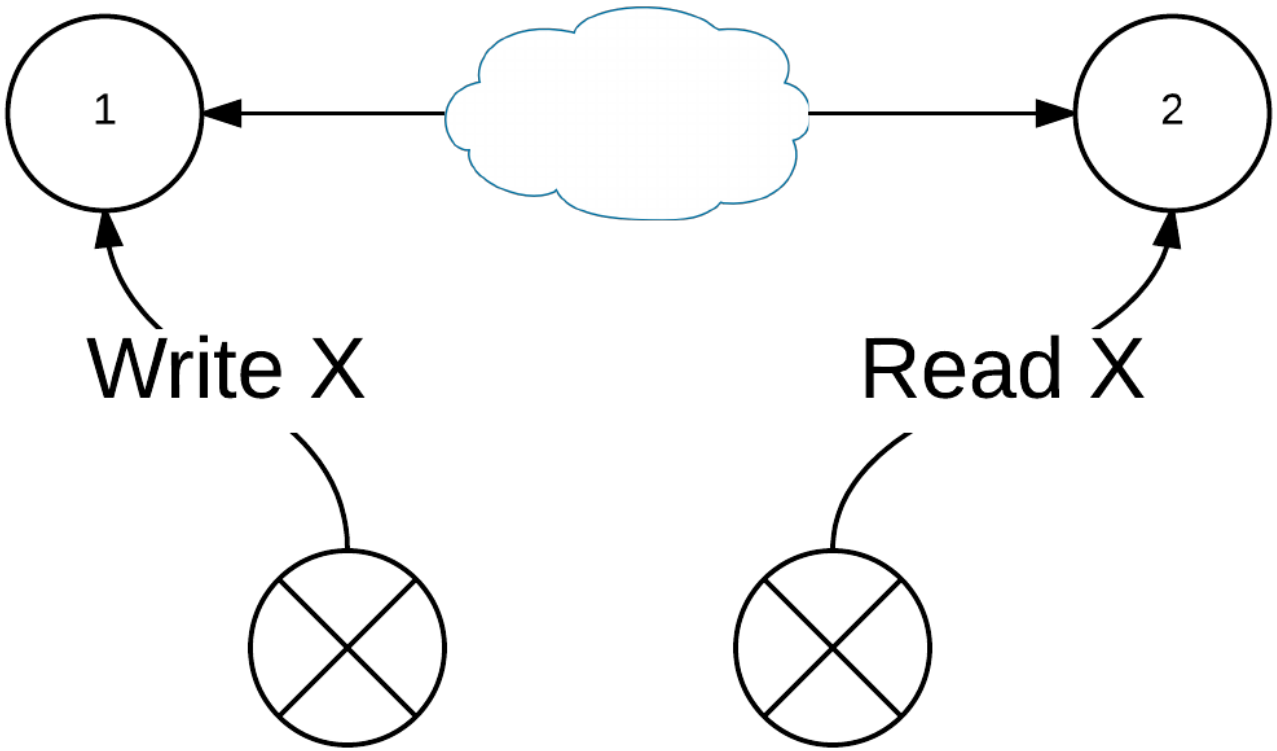


Figure : System is available and allows to read consistent values even there is network partition or latency

Not C, Only AP

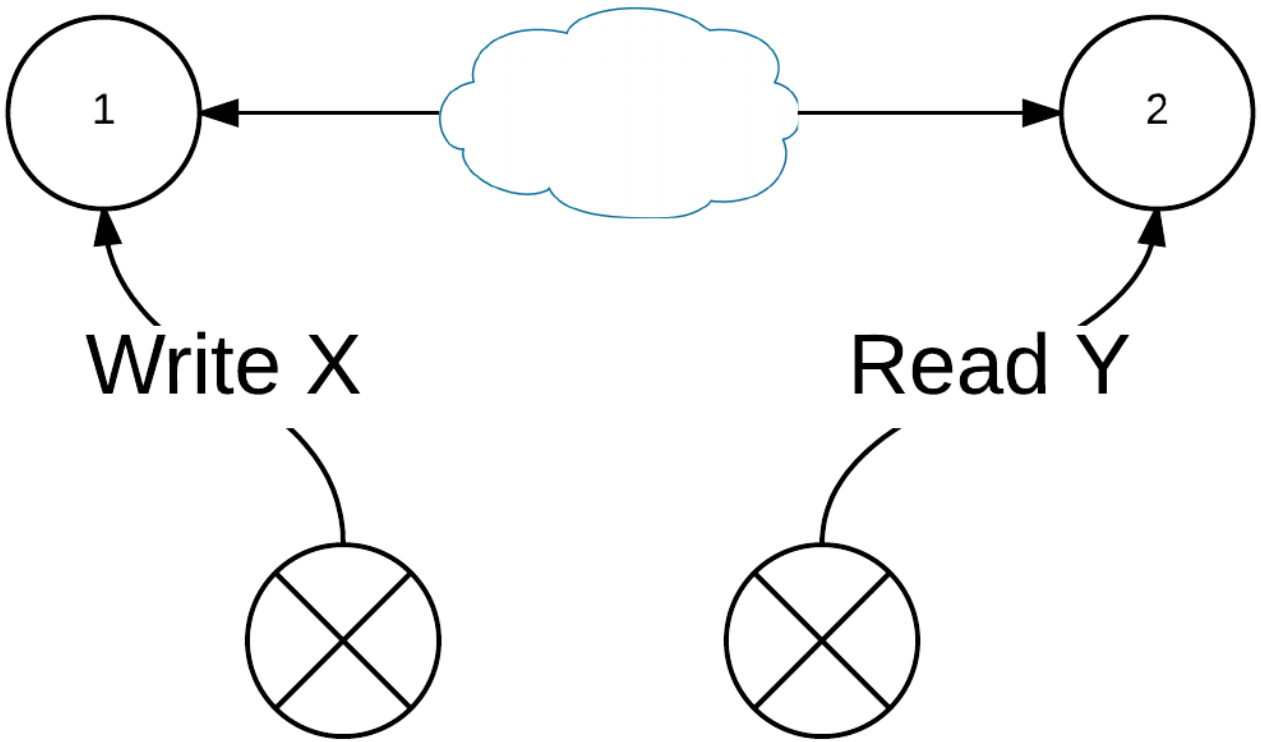


Figure : In case of partition or latency, the system is available and allows to read inconsistent values

Not *A*, only *CP*

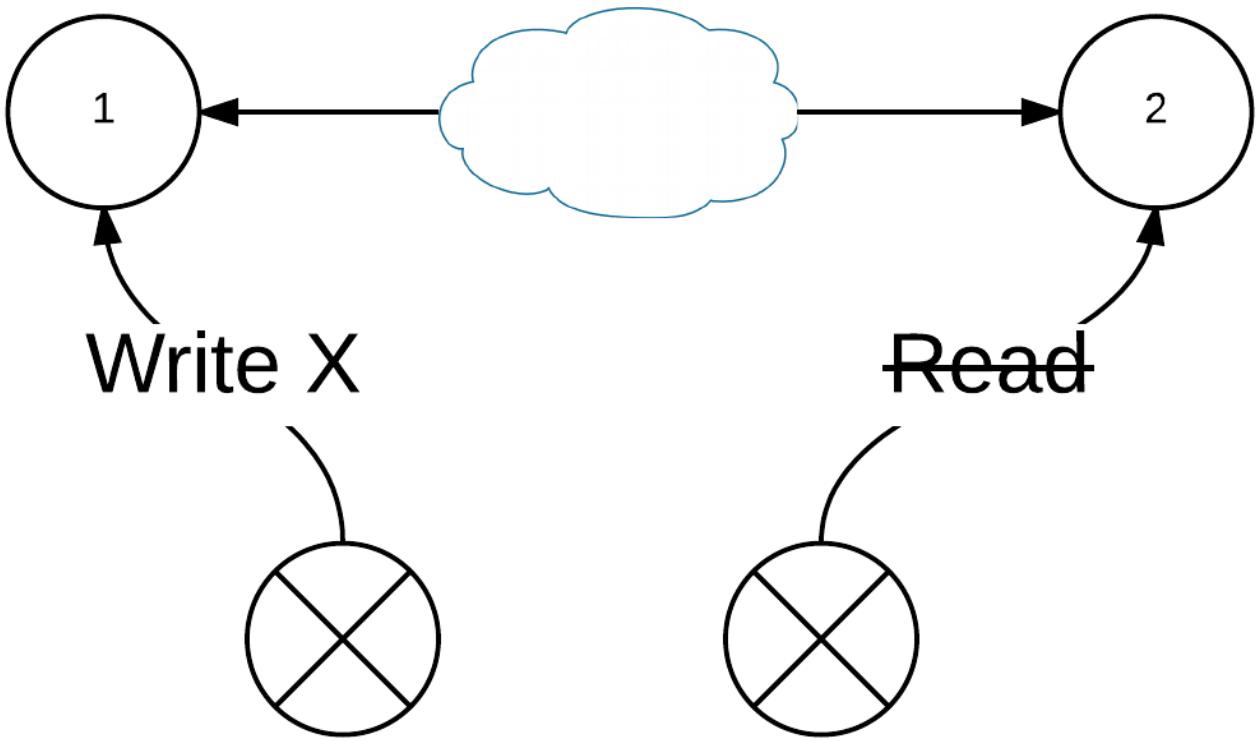


Figure : In case of partition or latency, the system is not available and does not allow to read inconsistent values

Not *P*, only *AC*

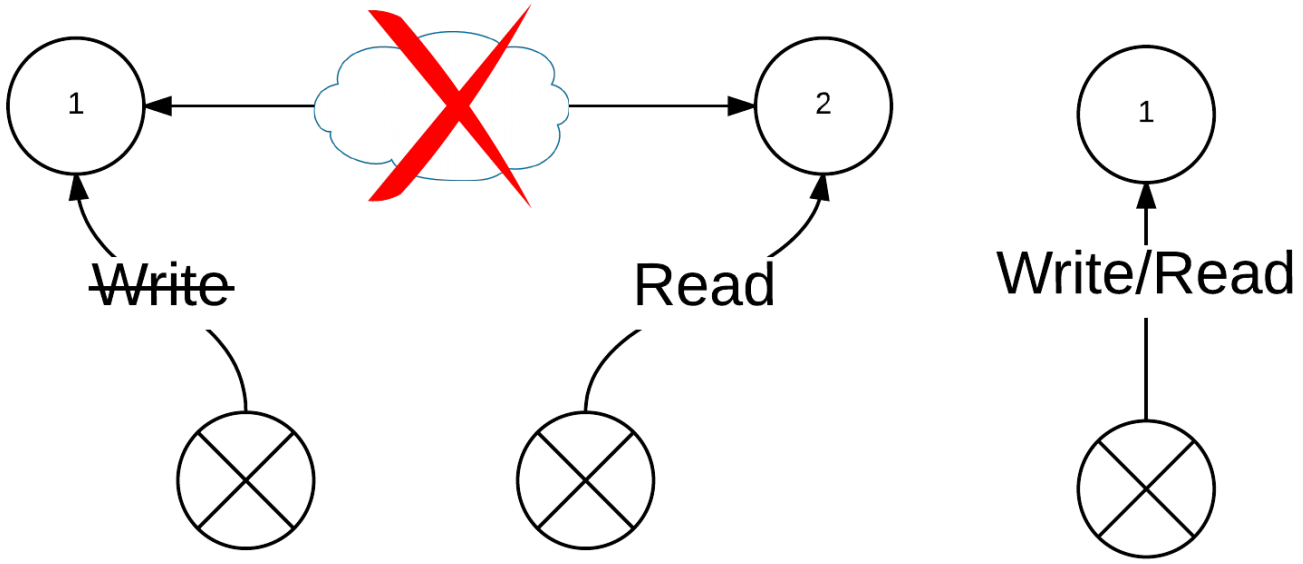


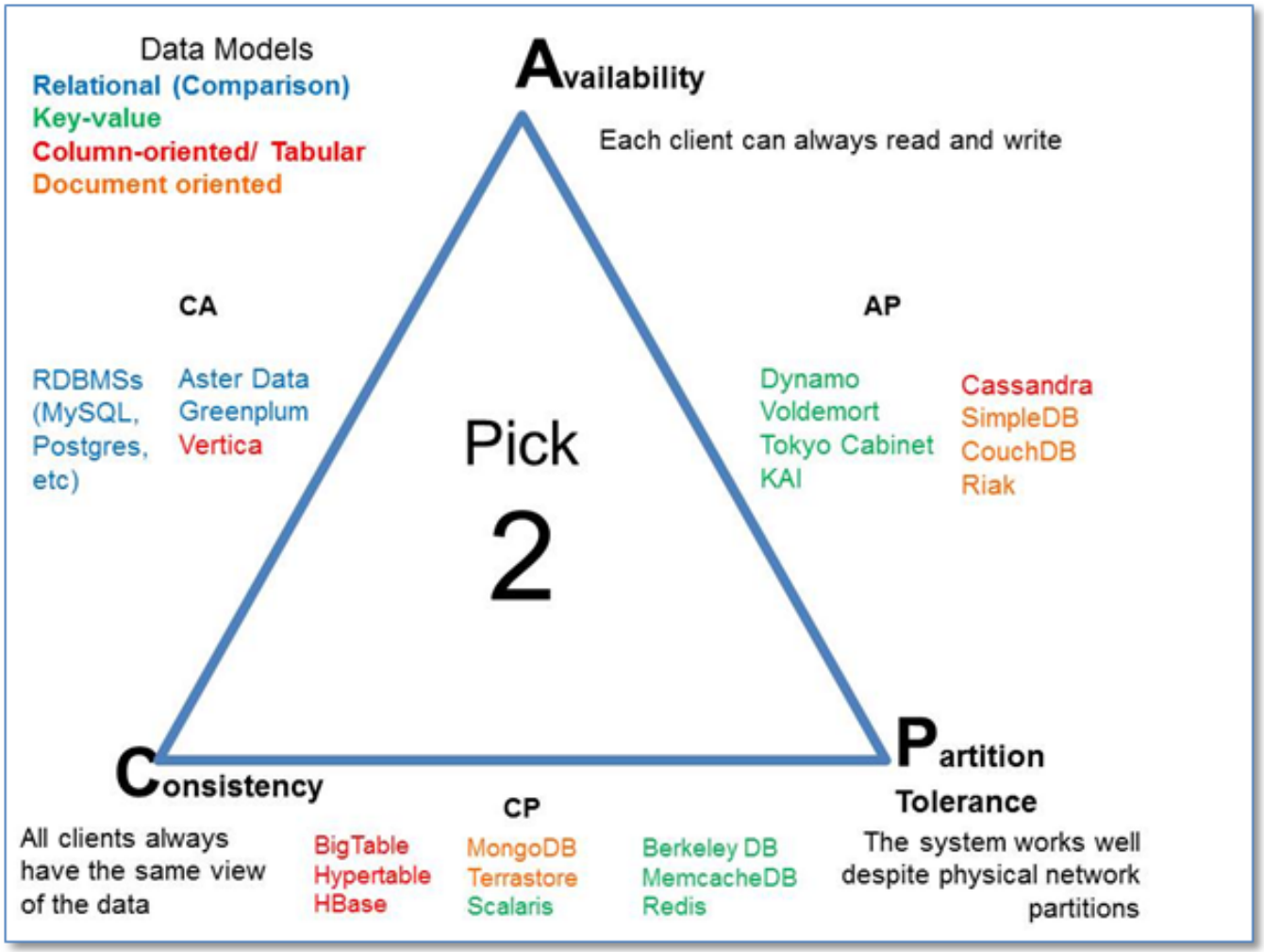
Figure : In case of partition or latency, the system is available and allows to read consistent values - in other words, system is not distributed

P is fixed, choice is between C and A

In real scenario, no distributed system can be partition intolerant. Partitions are norms in distributed system. A distributed system has to be partition tolerant to work with unreliable network. So, only choice is left between C and A.

Instead of partition, latency should be considered. [3]

Databases and *CAP*



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