

# Understand consistency models

## For distributed shared memory systems

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# Converge to consensus :Difficult to have common mental model

Are we on the same page?



Bottleneck : **Shared system context**

# Need for Replicas

For high availability, fault tolerance, performance and reliability of data

# Consistency problem with replicas

CAP Theorem<sup>1</sup> and

What is this PACELC<sup>2</sup> (They say CAP is only part of the story)

Pronounced pass-elk, it states that given there is a network

**P**artition, then how does the system trades-off **A**vailability and **C**onsistency; **E**lse, in normal running condition how does the system trades-off **L**atency and **C**onsistency.

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<sup>1</sup>gilbert2002brewer.

<sup>2</sup>abadi2012consistency.

# Time, Clocks and Ordering of Events in Distributed Systems

CAP Theorem talks about necessity of ordering of events so that the bottleneck shared resource gets accessed one at a time in order.

They proved their theorem with **atomicity** and **linearizability**. Atomic and Linearizable In CAP theorem paper Gilbert and Lynch say that, consistency guarantee means that operations on an atomic data object happen in a certain order such that each operation is completed at a single instant.

Partial ordering, Total ordering<sup>3</sup>

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<sup>3</sup>lamport1978time.





# Consistency has been defined?

- 1 Consistency by Relational database lens: ACID
- 2 Consistency by German scholars: The paper I am reading right now
- 3 Consistency by Sathish's suggestion: Paper: **BASE**
- 4 Consistency how I understand:

I am reading the basically available , soft and eventually consistent consistency models. Idea is to connect it all in the form of a story.<sup>4</sup>

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<sup>4</sup>**Pritchett2008.**



# Make Titles Informative.

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# Summary

- The **first main message** of your talk in one or two lines.
  - The **second main message** of your talk in one or two lines.
  - Perhaps a **third message**, but not more than that.
- 
- Outlook
    - Something you haven't solved.
    - Something else you haven't solved.

# For Further Reading I



A. Author.

*Handbook of Everything.*

Some Press, 1990.



S. Someone.

On this and that.

*Journal of This and That*, 2(1):50–100, 2000.