

## What is the problem?

Currently there are no systems to distribute data at a global scale with reliability and availability. There is no support for externally consistent distributed transactions.

## Summary

Spanner is a scalable, multi-version, globally distributed and synchronously-replicated database that was built and deployed at Google. It is a database that shards data across many sets of Paxos state machines in data-centers spread all over the world.

## Key Insights

- Spanner's main focus is managing cross-datacenter replicated data while also implementing important database features on top of their distributed-systems infrastructure.
- Spanner takes a easy-to-use, semi-relational interface, transactions and an SQL-based query language and extends on it by implementing scalability, automatic sharing, fault tolerance, consistent replication, external consistency, and wide-area distribution.

## Strengths

- Spanner's main feature : TrueTime - it uses the clock uncertainty in the time API makes it possible to build distributed systems with much stronger time semantics.
- Spanner is a highly distributed, fault-tolerant system that has strong ACID semantics, that scales well.

## Weaknesses

- It is only semi-relational and is not a true relational DB system.

## Summary of Key Results

- Spanner is a scalable, multi-version, globally distributed and synchronously-replicated database.

## Open Questions

- What more can be done to close the gap between Spanner and a similar functionality rdbms?
- Why wasn't Spanner made open source and are there problems in adopting Spanner?