SPANNING THE GLOBE

Google's Revolutionary Database

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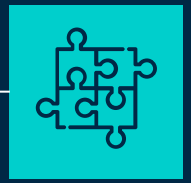
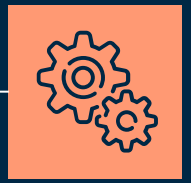
TABLE OF CONTENTS



01

The Need?

Why do we even need such a database



02

Advancements

How was this achieved

03

Findings

What can be inference from this undertaking

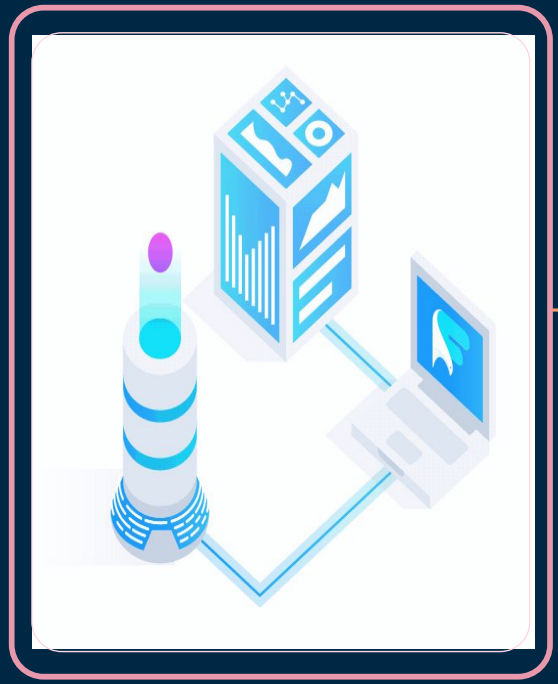
Introduction

01

The paper "Spanner: Google's Globally-Distributed Database" was published by Google in 2012.

What is SPANNER?

- New approach to Distributed Database Systems
- Available, Scalable & Consistent
- Addresses limitations faced by other Google systems like Bigtable and Megastore.



The time API

Synchronization

A novel time API that exposes clock uncertainty.

External Consistency

Non-blocking reads in the past, lock-free read-only transactions, and atomic schema

Research Gap

Despite the extensive research on Spanner, there are still some gaps in the literature that the current study aims to address.

Limited Evaluation of Performance

Theoretical analysis of small-scale experimental evolutions

Comparison with other Systems

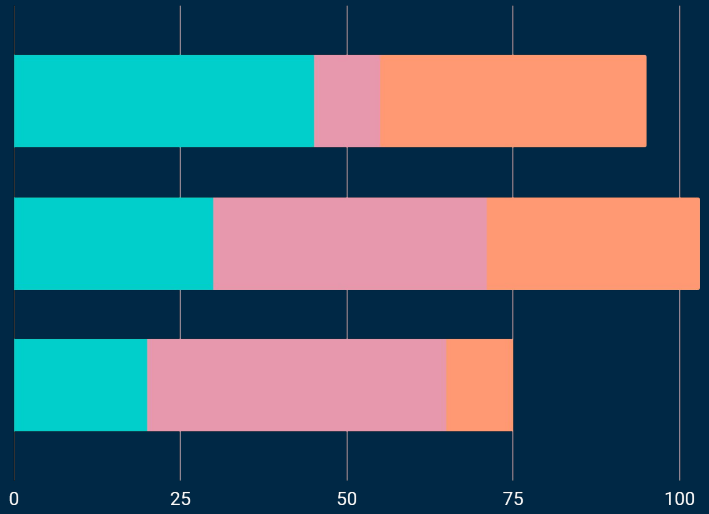
Need for a more comprehensive comparative analysis

Suitability for specific use case

Domain-specific evaluations to asses long-term performance

Key Contributions

How this new implementation differs from previous systems in consistency, availability & scalability



TRUE TIME

Highly accurate global clock to maintain consistency

Paxos-Based Replication

Adaptation of Paxos algorithm to ensure consistent replication

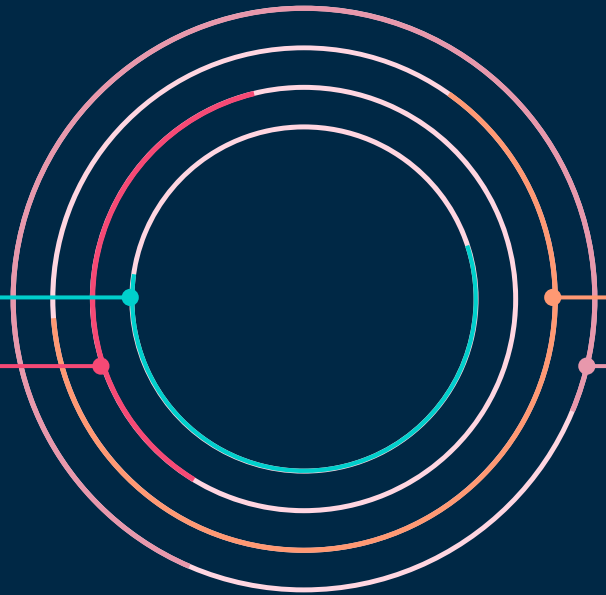
Distributed Transactions

Maintaining ACID properties across multiple nodes of system

Findings

Timestamping to maintain consistency and correctness

Clock Synchronization



Impact of design of Query Engine on global scale

Query Processing

Schema Evolution

Updates to be made in gradual manner maintaining global consistency

Constant Development

Innovation and adaptation in distributed systems

CONCLUSION

Thank You

Reference

https://www.usenix.org/conference/osdi12/technical-sessions/presentation/corbett