

# Life after CAP

**Do we have to choose two?**

# /usr/bin/whoami

- Alexey Kuntsevich
- Product owner of data products at Flixbus
- Did DBA of PostgreSQL and SQL Server for money
- Worked as a data engineer
- Consistently in love with databases

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- For reliability
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  - Load distribution
- For volume
- GDPR
- Because my boss told me to :)



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  - Is CAP availability good enough?
  - Even worse question: is CAP consistency good enough?
- Is “P” a real problem?
  - PACELC

Consistency, as in

CAP

ACID

# Consistency

- Linearizability
  - Serializability
  - Correctness
  - Strong consistency
  - Eventual consistency
- 
- So which one do we have? Which one do we need?



# Google Spanner

- CP in theory, CAP in practice
  - Google's private network FTW
  - PACELC flexible
  - TrueTime
  - External consistency
- ACID-compliant
  - Smart distributed locks and transactions
  - Fast reads (chances of stale data)
  - Read-only transactions
  - Read-write transactions
- Managed by Google

# Google Spanner

- Primary key is important
  - Sharding
  - Locking
  - Query planning
- Feels SQL-like
  - JOINS!!!
  - DML only via api, no query support
    - Writes are invisible until committed
  - Interleaved tables
- Vendor lock
  - Might get pricey
  - No local binary for testing
  - No jepsen report

# CockroachDB

- CP system
  - Replicated records
  - Write quorums
  - Read leases
- ACID compliant
  - NTP might be painful
    - Clock skew might cause anomalies
  - A bit less strict than external consistency
    - Very special cases
  - MVCC and serializable snapshot isolation
  - Garbage collection and time travel
  - Log of timestamped operations

# CockroachDB

- Find a good DBA
  - General deployment
    - You will need backups
  - Time synchronisation
  - Potentially HAproxy
- PostgreSQL compatible
  - Same driver binaries
  - Same sql flavour
    - Minor differences in type handling
    - Jsonb is coming
    - Custom way of bulk loading
- Open source