https://chhay.page.link/m11

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L1. MongoDB

NoSQL

- Volume, velocity, variety.
- Horizontal scale with commodity servers.
- High availability.

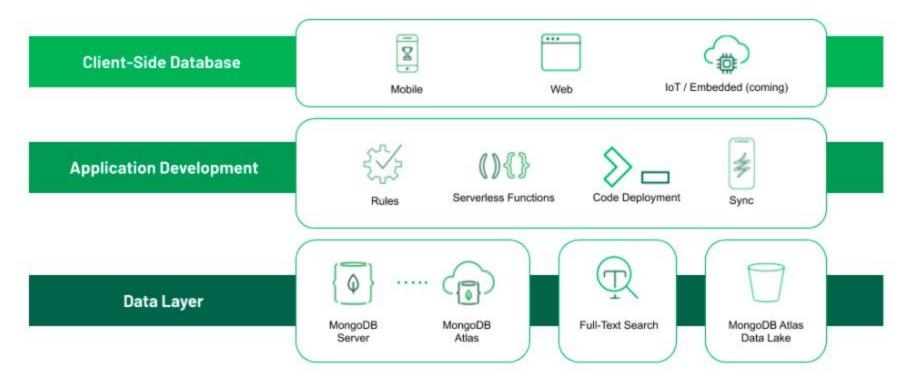
MongoDB Overview

- "MongoDB is a general purpose, document-based, distributed database built for modern application developers and for the cloud era."
- JSON documents:
 - Arrays, nested objects.
 - Dynamic schemas.
- Full ACID transactions (mostly single documents, multi supported).
- Relationships: reference and embedded.
 - Normalized relational DBs: reference.
 - Denormalized (redundant data): embedded. Violates NF.

MongoDB vs. Relational DBs

- Document data model ⇔ relational data model.
- Documents ⇔ Rows.
- Collections ⇔ Tables.
- Declarative JSON queries ⇔ SQL.
 - Translations to SQL. <u>Example</u>.
- JOINs can be done with <u>\$lookup</u> (LEFT OUTER JOIN).
- Aggregation: multi-stage pipeline, map-reduce, single-collection functions (count/distinct). <u>Examples</u>.
- Consistency can be compromised for availability and partition tolerance.

MongoDB



L2. Exercise

- Install <u>Community Server</u> and <u>Compass GUI</u> (Community Edition).
- Translate relational DB schema to JSON.
 - One-to-many relationships.
 - Many-to-many relationships.

To start:

- \$ cd ~/Documents/mongodb/
- \$ mkdir -p data/db
- \$./bin/mongod --dbpath ./data/db
- Start MongoDB Compass UI, connect to mongodb://localhost:27017

- Insert sample data.
 - o bloguser1.json
 - bloguser2.json
- Create collection: BlogUsers
- Add Data > Insert Document

- Documentation
 - o <u>CRUD operations</u>.
 - BSON data types.
 - 1-to-many embedded. Also notice "subset" pattern.

- Query data
 - \(
 \) "username":"username1"
 }
 - ("blogposts.content": "leaping dogs")

- Documentation
 - Query embedded documents.

 Project: in your application stack, replace your storage subsystem and data access layer with MongoDB. What do we need to change?

- Documentation:
 - Java driver.
 - Quick start with POJO.
 - CodecRegistry for BSON <-> POJO conversion.
 - CRUD examples.

L3. Ask Me Anything

Example Topics

- Differences between: startups, Microsoft, Google, Facebook.
- Resumes.
- Interviews.
- Day-in-the-life.
- Software engineering roles.
- Career growth.
- Motivations for teaching.
- Your questions here