Distributed System: Collaborative Text Editor

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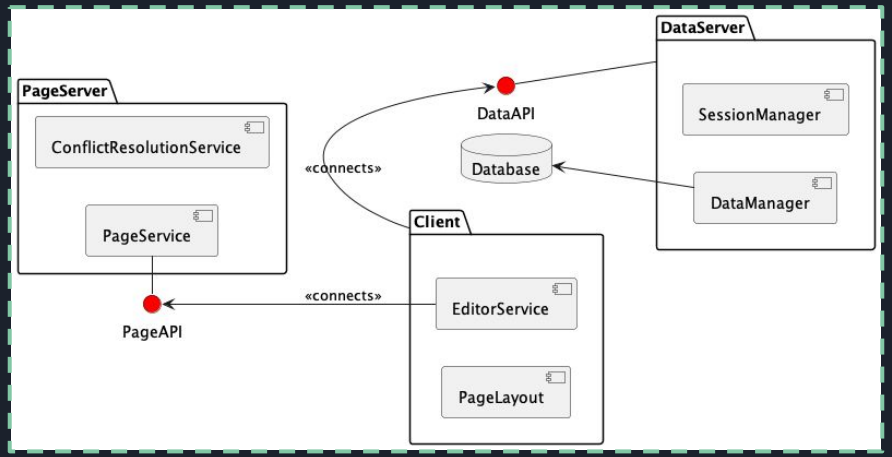
Outline

- Overall Design
- ReST APIs
- Operational Transformation
- Data consistency & Replication
- Demo

Overall Design

Three main components:

- **`DataServer`**: handles data access and manages sessions.
- **`PageServer`**: serves clients with service pages and provide conflict-resolution strategies.
- **`Client`**: interact with `PageServer` in order to make use of the collaborative text editor.



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ReST APIs

Routes Creation:

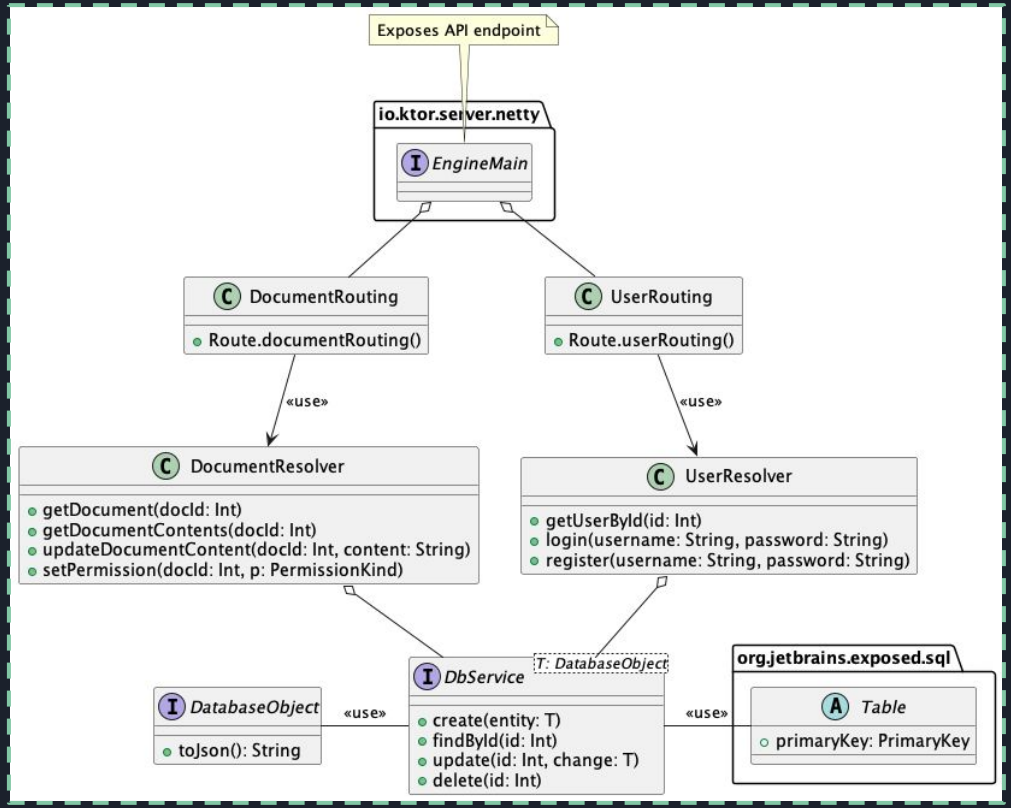
- DocumentRoutes
- UserRoutes

Routes Implementation:

- DocumentRouting
- UserRouting

Data Resolver:

- DocumentResolver
- UserResolver



Session Manager

EtcdConnector:

- putSession:

  Add new entry to the database

- getSessionForUser:

  Check the existence of a user’s session

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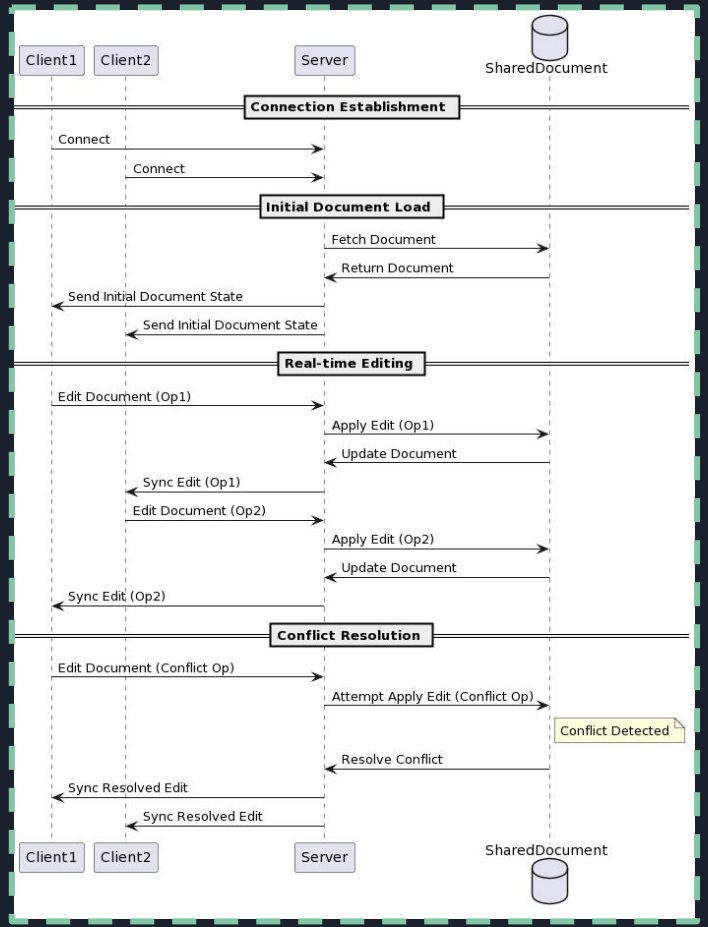
Operational Transformation

- **OT** is a set of mechanisms and algorithms for supporting a range of **collaboration functionalities** in advanced collaborative software systems (this technology is used inside Google Document)
- It is designed to ensure that all participants of a collaborative editing application have a synchronized view of the shared data, despite potentially conflicting edits

ShareDB

- **ShareDB**, a real-time database backend based on *Node.js*;
- **ShareDB** is designed to handle concurrent document editing and synchronization;
- **ShareDB**'s technology is base on **Operational Transformation** (OT);



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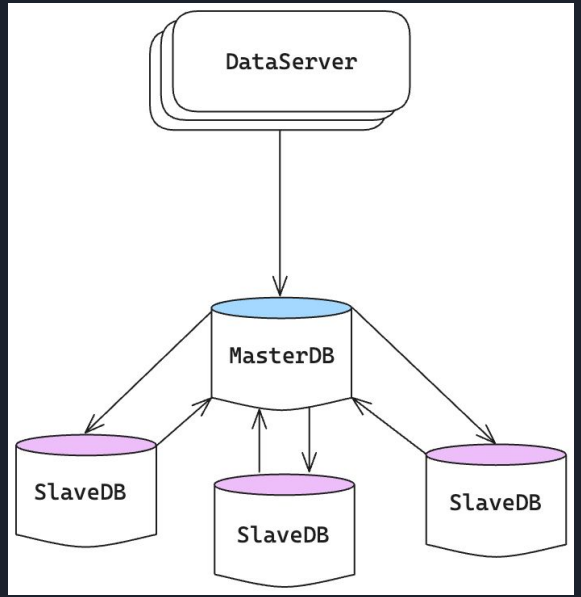
Data Consistency & Replication

- **Relational Database**: ACID Properties
- **Master-Slave** architecture with Load Balancing:
  - **Writes** on master
  - **Reads** on slaves
- Highly Availability thanks to new master selection when current master **fails** (automatic failover)
- Seamless querying on data store



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Demo