Oracle Sharding POC

@ State Grid Corporation of China

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State Grid Corporation of China (SGCC)

- Largest electric utility in the world
  - Provides power to over 1.1 billion people across 88% of China
  - Global presence with subsidiaries in Philippines, Brazil, Portugal, Australia and Italy
  - 1.72 million employees, $585 billion in assets, $348.9 billion revenue (2017)
  - Ranked #2 in Fortune Global 500 (2nd largest company globally by revenue)
- Company mission
  - As a super-large state-owned enterprise crucial to national energy security and economic lifeline, SGCC has a mission to provide safer, cleaner, and more economical and sustainable power supply

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Challenges

- SGCC is adopting Microservice architecture for the growing business
  - Microservice architecture provides resiliency through loose coupling and flexibility to meet growing and changing business needs
- Microservice architecture in turn requires a highly scalable, loosely-coupled, and ultra-reliable distributed database
- State Grid wanted to prove that their business-critical ordering service system can leverage Oracle Sharding to meet these requirements
  - Ordering service currently has 200-300 million users distributed across 26 subsidiaries. Goal is to build centralized ordering service
- To minimize the impact on their development processes, the new distributed database must support their current development framework based on Spring+Mybatis

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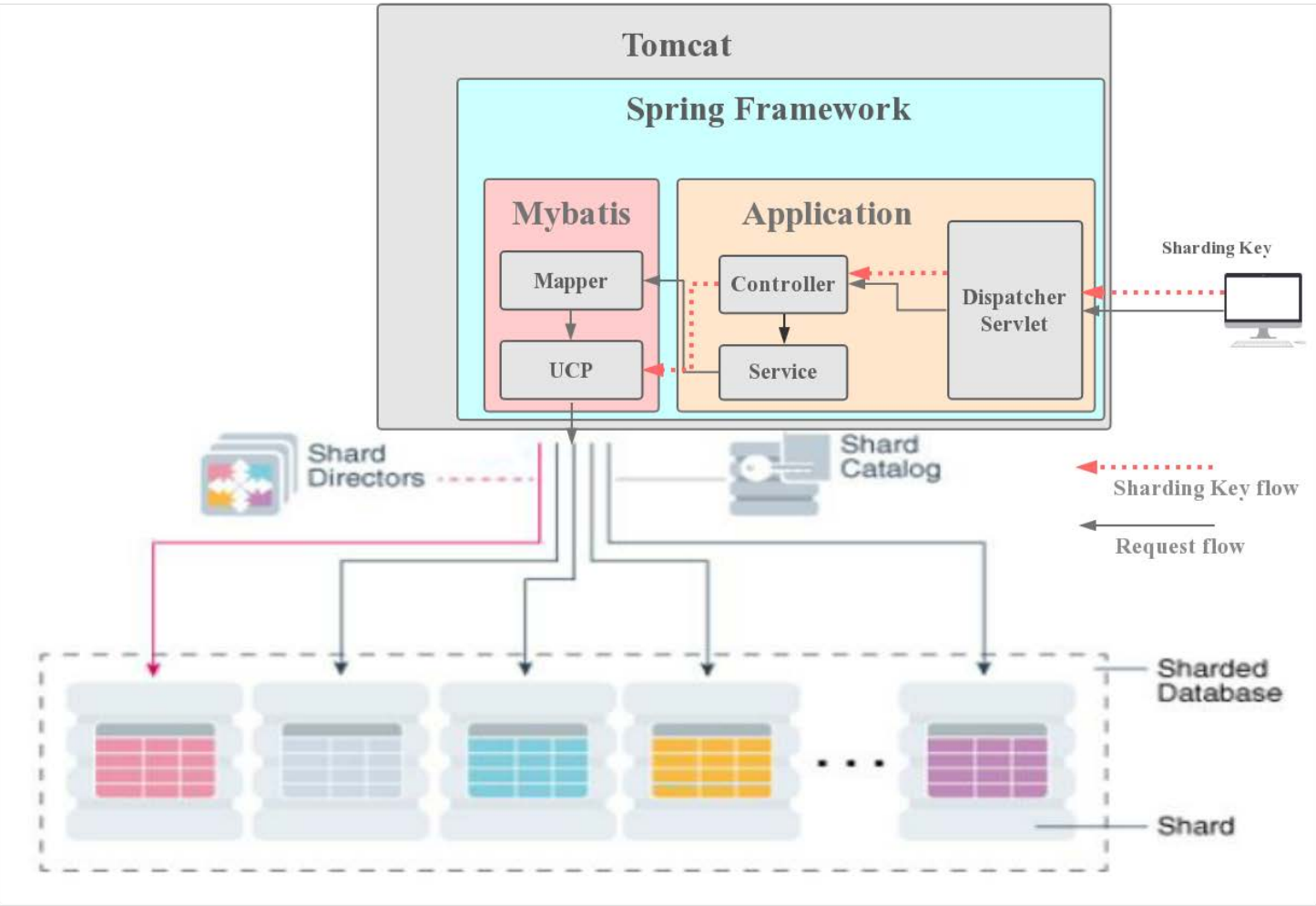
Architecture



- Schema sharded using Order Number
- Client uses Spring-MyBatis Java persistence framework using Oracle UCP as Data Source
- To avoid modifying MyBatis source code, local thread was added to pass the Sharding key from Controller to the UCP Data Source directly – allowing high performance direct access to shards

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Results

- Successfully leveraged Oracle Sharding in Spring+MyBatis Framework without modifying any application code
  - Good example for how to integrate Sharding API into Java persistence frameworks in general
- In the future, Oracle user-defined Sharding also allows data to be stored close to State Grid's customers distributed in different locations
- Oracle Sharding provides the highly scalable, loosely-coupled, and ultra reliable distributed database required by new generation microservice-based applications