

Insight Into Apache ShardingSphere

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About me



Zhengqiang Duan 端正强

- SphereEx Java Senior Software Engineer
- Committer of Apache ShardingSphere
- Love open source, currently focusing on the development of Apache ShardingSphere database middleware.



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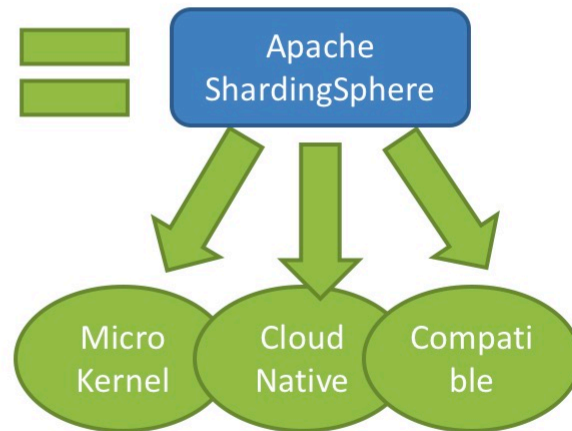
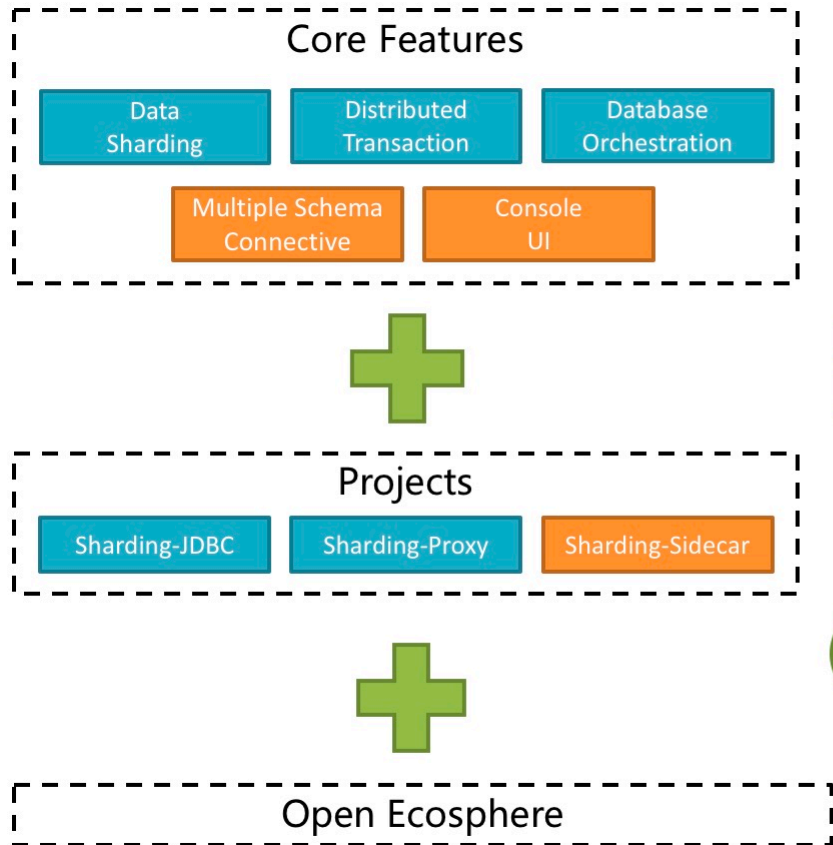


01

Introduction

简介

Introduction



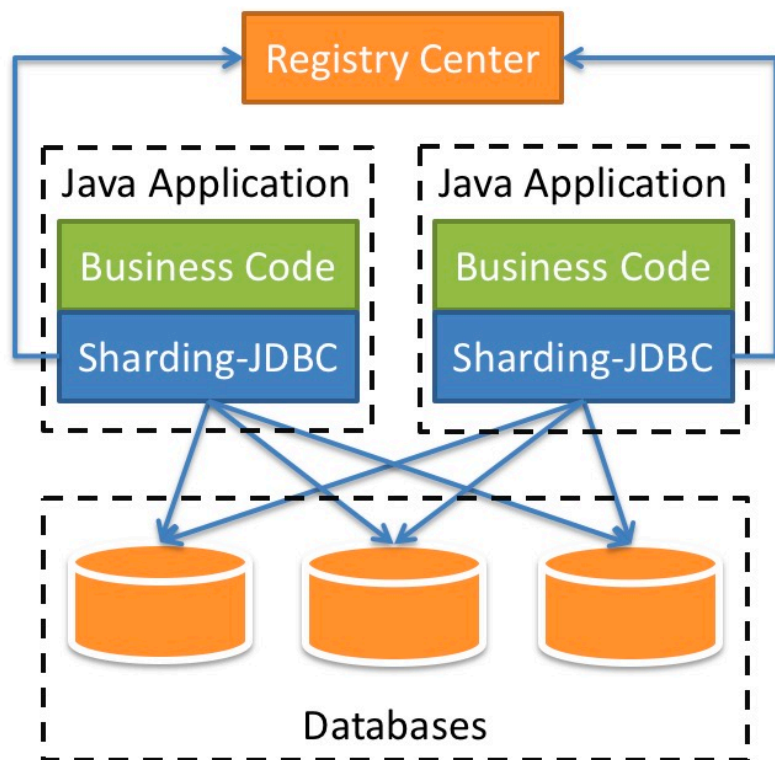
- Apache Top Level Project
- Open-source distributed database ecosystem
- Provide data sharding, distributed transaction and distributed governance functions
- Support MySQL, Oracle, SQLServer, PostgreSQL and any SQL92 followed databases

02

Architecture

架构

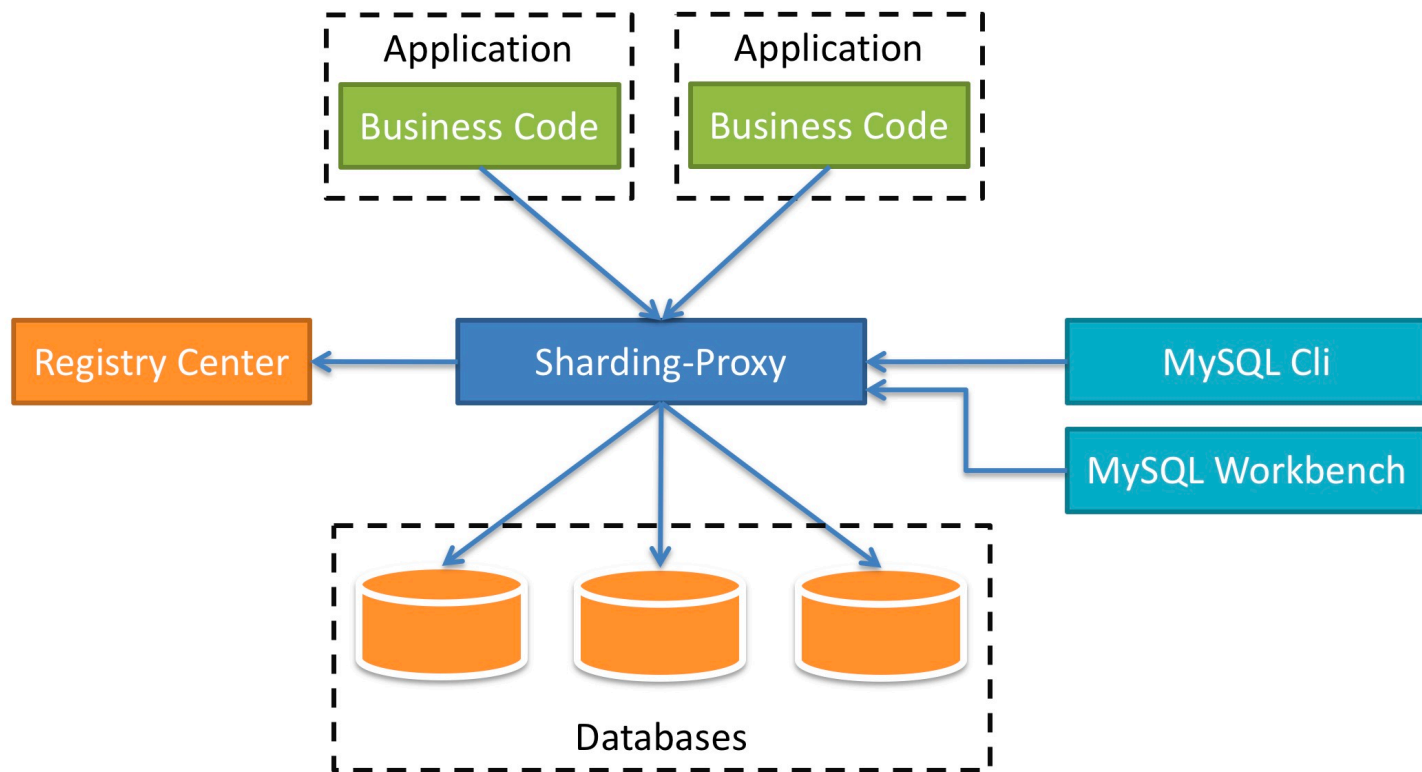
Architecture-Sharding-JDBC



Lightweight Java framework that provides extra service at Java JDBC layer.

- Applicable in any ORM framework based on JDBC
- Support any third-party database connection pool
- Support any kind of JDBC standard database——MySQL, Oracle, SQLServer, PostgreSQL and any SQL92 followed databases

Architecture-Sharding-Proxy

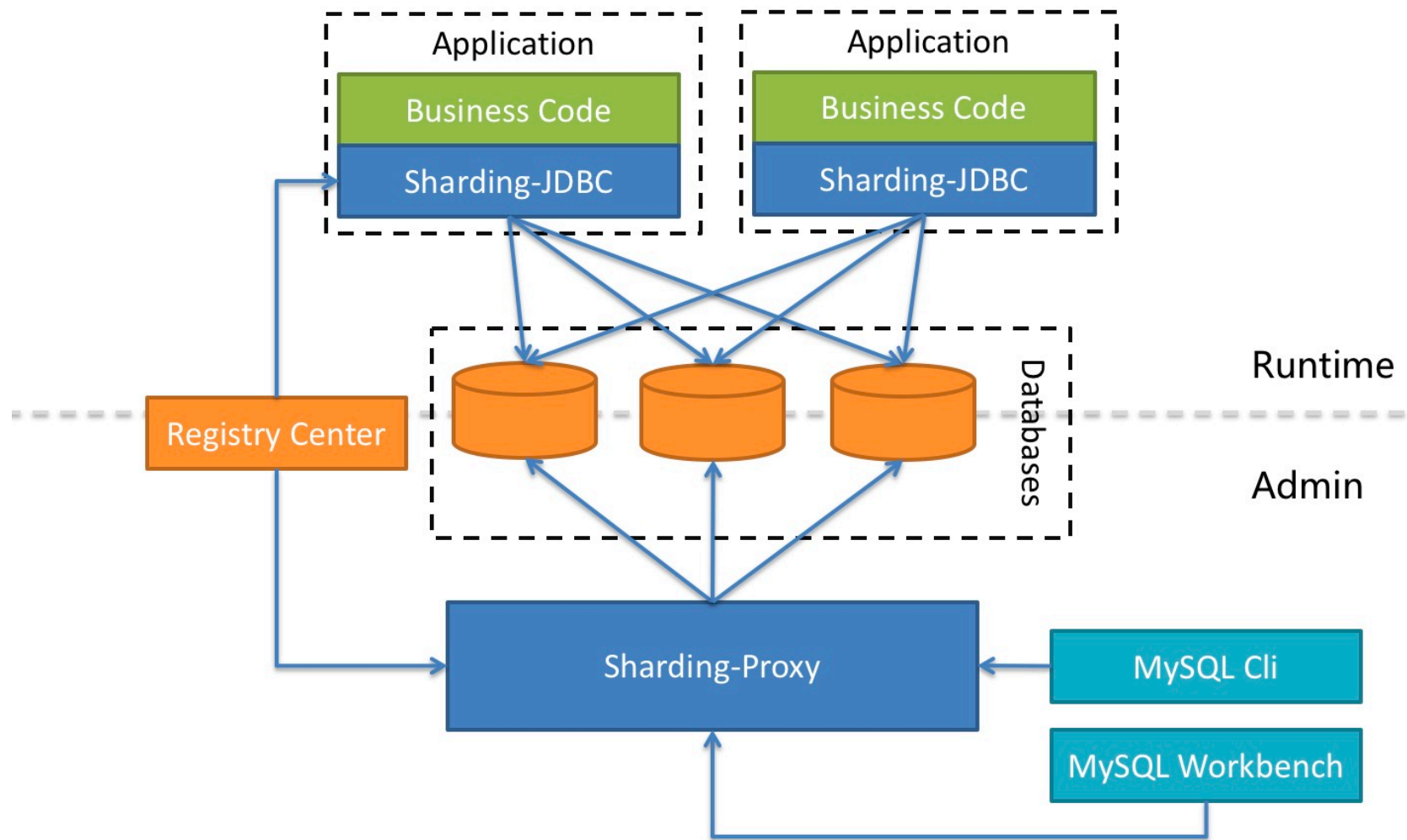


- Transparent to applications, it can be used directly as MySQL/PostgreSQL
- Applicable to any kind of terminal that is compatible with MySQL and PostgreSQL protocol

Architecture-Compare

	Sharding-JDBC	Sharding-Proxy
Database	Any	MySQL/PostgreSQL
Connections Count Cost	High	Low
Supported Languages	Java Only	Any
Performance	Low loss	Relatively High loss
Decentralization	Yes	No
Static Entry	No	Yes

Architecture-Hybrid



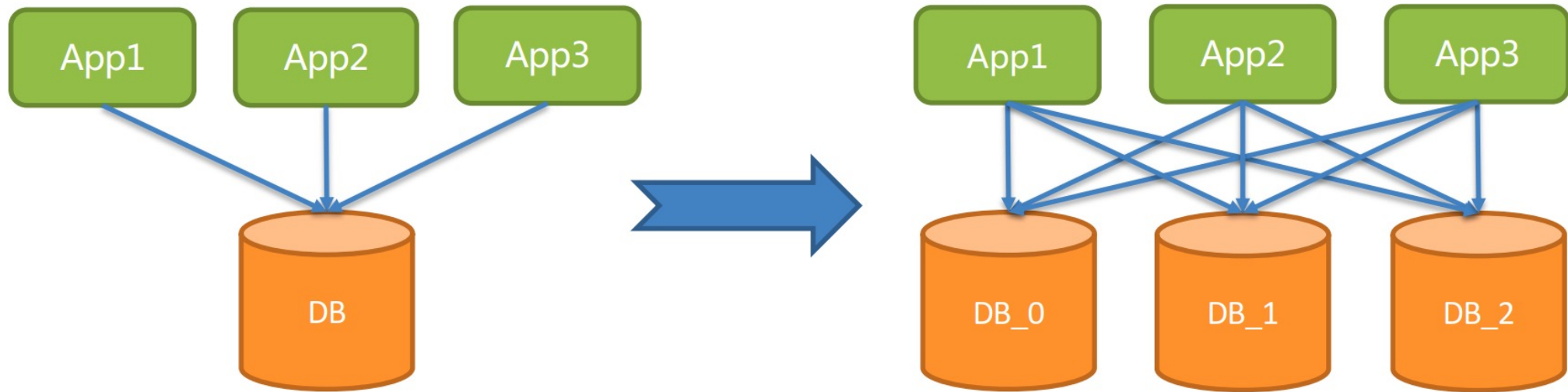
03

Features

特性

Features - Data sharding

Vertical Sharding



Features - Data sharding

Horizontal Sharding

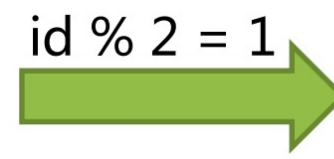
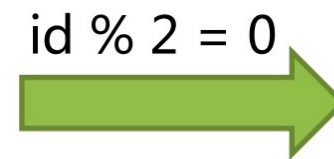
SELECT * FROM t_user WHERE id=1

SELECT * FROM t_user WHERE id=2



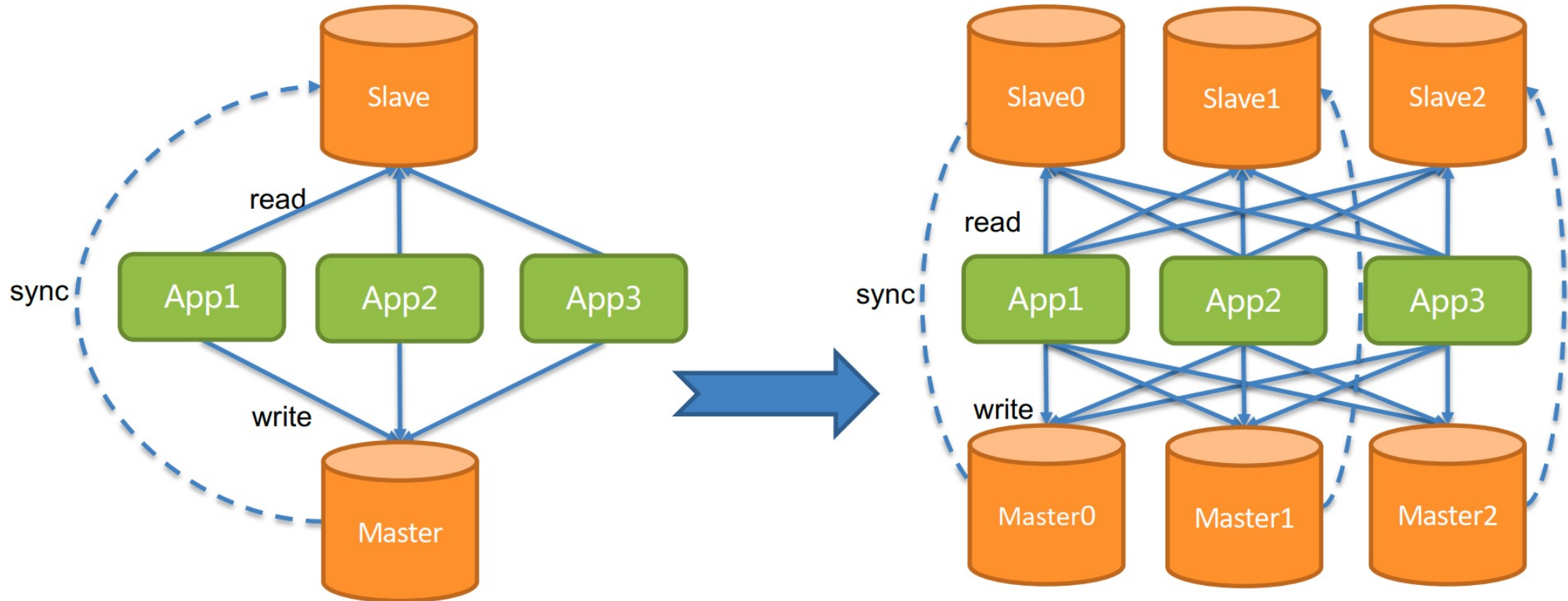
SELECT * FROM t_user WHERE id=10

SELECT * FROM t_user WHERE id=11



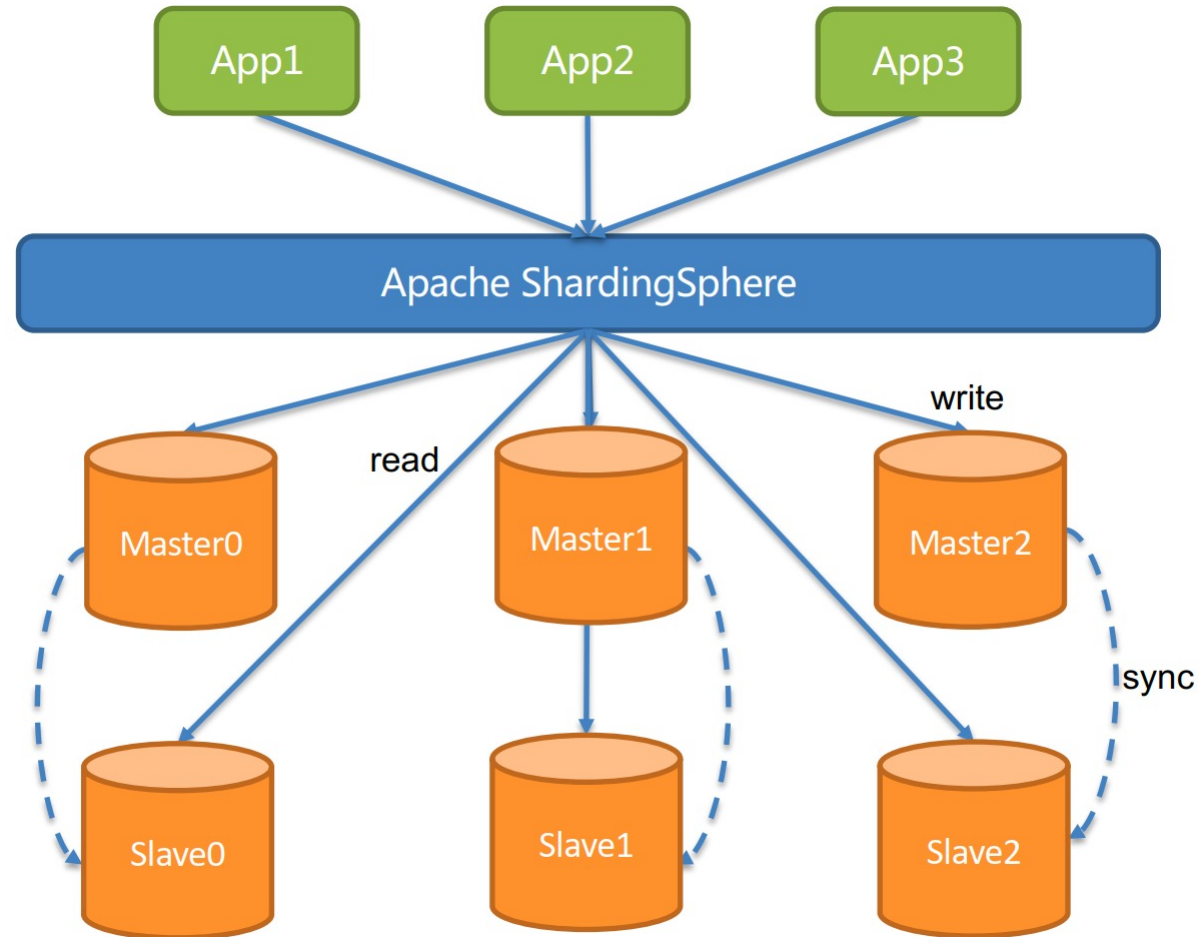
Features - Data sharding

Data Sharding & Readwrite-splitting



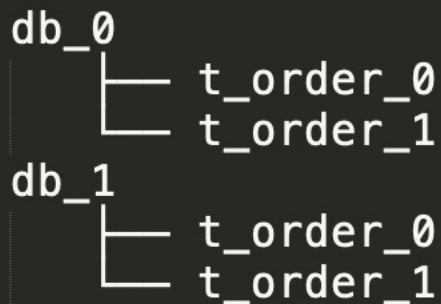
Features - Data sharding

Integrate ShardingSphere



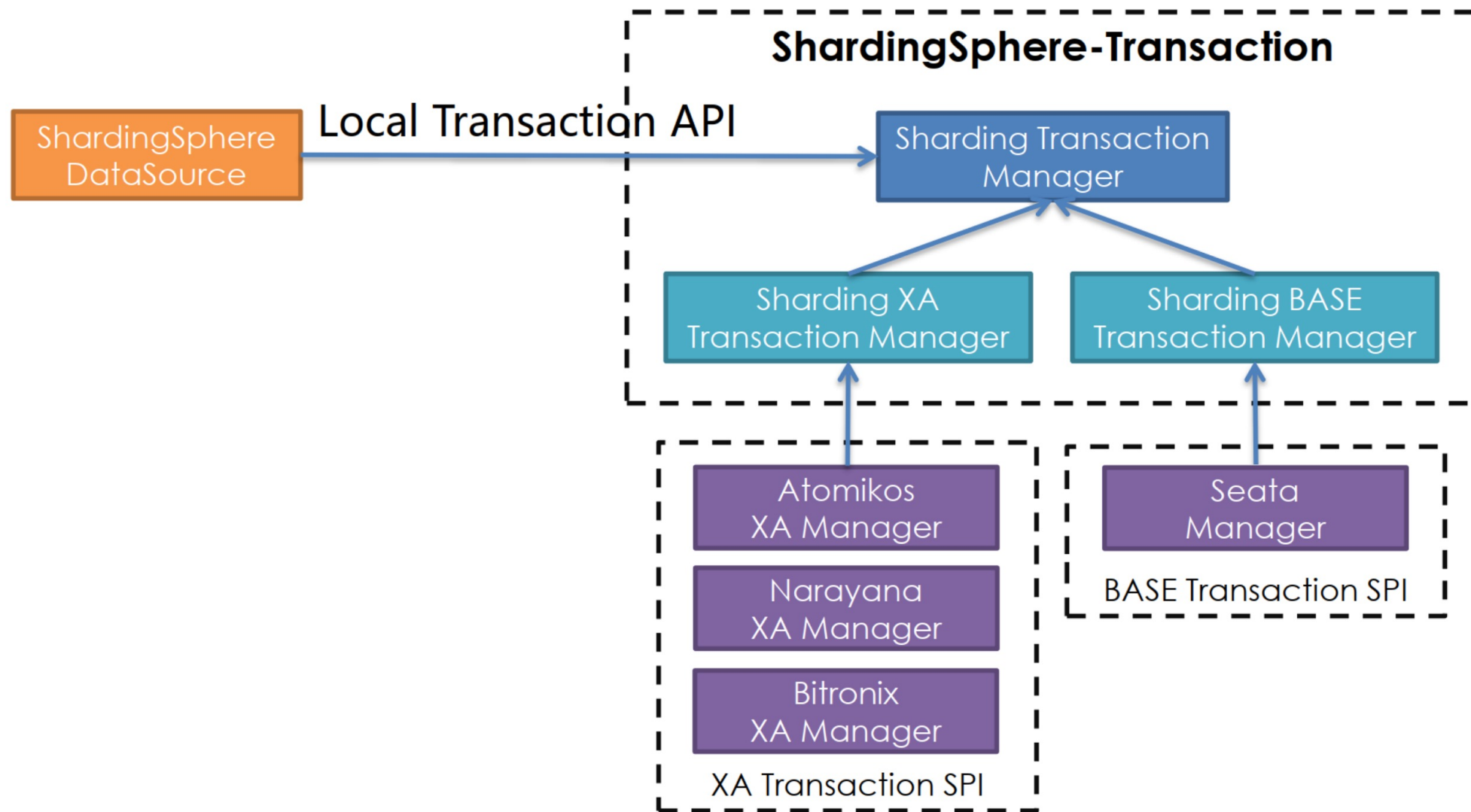
Features - Data sharding

- Execute SQL transparently: oriented to logical SQL operations
- Customized Sharding Algorithm
 - Java Class: xxx.xxx. XXXShardingAlgorithm
 - Inline Expression: t_order_\${order_id % 2}
 - Built-in algorithm: hash, range, time
- Built-in distributed ID generator
 - UUID
 - SNOWFLAKE



```
logic sql: select * from t_order where order_id = ?;  
actual sql: select * from db_0.t_order_0 where order_id = ?;
```


Features - Distributed transaction



Features - Distributed transaction

	Local transaction	2PC (3PC) transaction	BASE transaction
Business transformation	None	None	Relevant interface
Consistency	Not support	Support	Eventual consistency
Isolation	Not support	Support	Business-side guarantee
Concurrency performance	No influence	Serious recession	Minor recession
Situation	Inconsistent operation at business side	Short transaction & low concurrency	Long transaction & high concurrency

Features - Database Governance

Dynamic Configuration

Highly Available

Circuit Breaker

Authority & Data Encryption & SQL Audit

APM & Application Topography & Monitor Notification

Features - New Features

- Dist SQL (Distributed SQL): design to break the boundary between middleware and database
 - RDL (Resource & Rule Definition Language)
 - RQL (Resource & Rule Query Language)
 - SCTL (ShardingSphere Control Language)
- Data Scaling (Dev): common solution for migrating or scaling data

```
CREATE datasources (  
  ds0=127.0.0.1:3306:demo_ds_0:root:pwd,  
  ds1=127.0.0.1:3306:demo_ds_1:root:pwd)
```

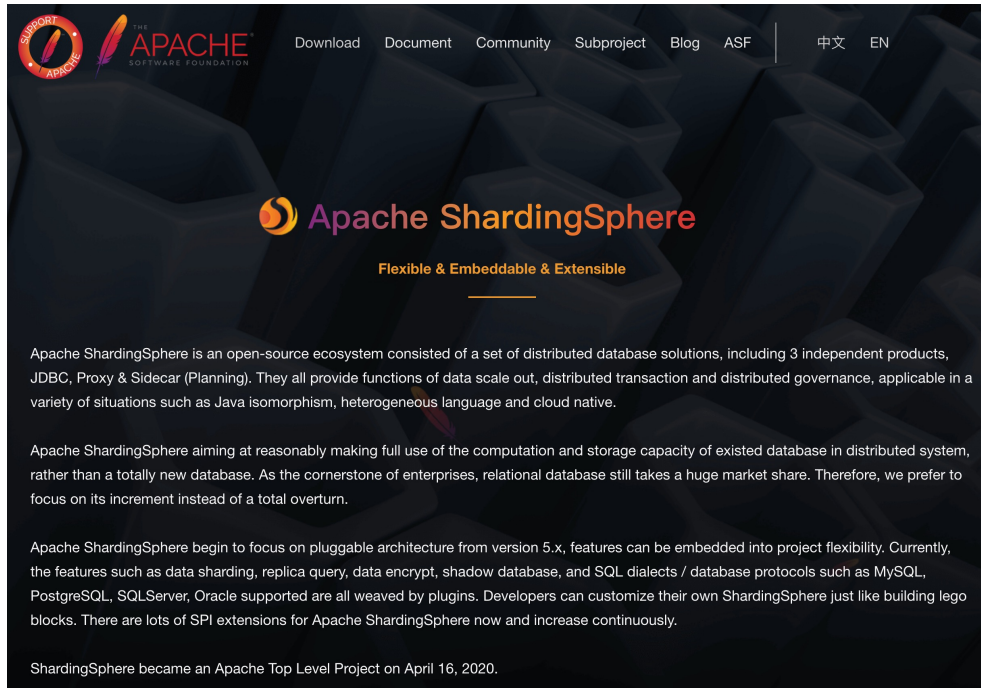
```
CREATE SHARDING RULE (  
  t_order=hash_mod(order_id, 4),  
  t_item=mod(item_id, 2)  
)
```

04

Community

社区

Community



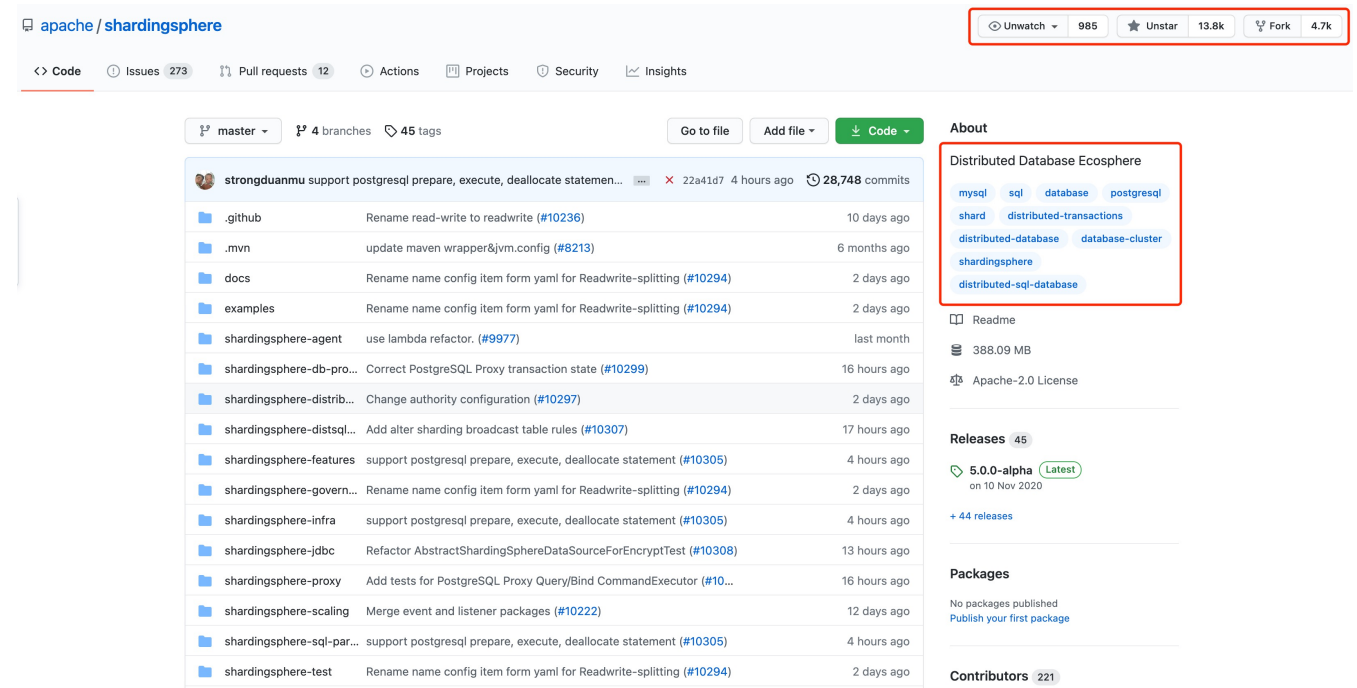
The banner features the Apache ShardingSphere logo and navigation links: Download, Document, Community, Subproject, Blog, ASF, 中文, EN. The main text reads: **Apache ShardingSphere** Flexible & Embeddable & Extensible. Below this, there are three paragraphs of text describing the project's goals and features.

Apache ShardingSphere is an open-source ecosystem consisted of a set of distributed database solutions, including 3 independent products, JDBC, Proxy & Sidecar (Planning). They all provide functions of data scale out, distributed transaction and distributed governance, applicable in a variety of situations such as Java isomorphism, heterogeneous language and cloud native.

Apache ShardingSphere aiming at reasonably making full use of the computation and storage capacity of existed database in distributed system, rather than a totally new database. As the cornerstone of enterprises, relational database still takes a huge market share. Therefore, we prefer to focus on its increment instead of a total overturn.

Apache ShardingSphere begin to focus on pluggable architecture from version 5.x, features can be embedded into project flexibility. Currently, the features such as data sharding, replica query, data encrypt, shadow database, and SQL dialects / database protocols such as MySQL, PostgreSQL, SQLServer, Oracle supported are all weaved by plugins. Developers can customize their own ShardingSphere just like building lego blocks. There are lots of SPI extensions for Apache ShardingSphere now and increase continuously.

ShardingSphere became an Apache Top Level Project on April 16, 2020.



The screenshot shows the GitHub repository page for `apache/shardingsphere`. It includes the repository name, statistics (985 Unwatch, 13.8k Unstar, 4.7k Fork), and navigation links (Code, Issues, Pull requests, Actions, Projects, Security, Insights). The main content area shows a list of recent commits with details like author, commit message, and time ago. The right sidebar contains an 'About' section with a 'Distributed Database Ecosystem' tag cloud, a 'Releases' section showing the latest version (5.0.0-alpha), and a 'Contributors' section.

apache / shardingsphere

Unwatch 985 Unstar 13.8k Fork 4.7k

<> Code Issues 273 Pull requests 12 Actions Projects Security Insights

master 4 branches 45 tags Go to file Add file Code

strongduanmu support postgresql prepare, execute, deallocate statemen... 22a41d7 4 hours ago 28,748 commits

File	Commit Message	Time Ago
.github	Rename read-write to readwrite (#10236)	10 days ago
.mvn	update maven wrapper&jvm.config (#8213)	6 months ago
docs	Rename name config item form yaml for Readwrite-splitting (#10294)	2 days ago
examples	Rename name config item form yaml for Readwrite-splitting (#10294)	2 days ago
shardingsphere-agent	use lambda refactor. (#9977)	last month
shardingsphere-db-pro...	Correct PostgreSQL Proxy transaction state (#10299)	16 hours ago
shardingsphere-distrib...	Change authority configuration (#10297)	2 days ago
shardingsphere-distsql...	Add alter sharding broadcast table rules (#10307)	17 hours ago
shardingsphere-features	support postgresql prepare, execute, deallocate statement (#10305)	4 hours ago
shardingsphere-govern...	Rename name config item form yaml for Readwrite-splitting (#10294)	2 days ago
shardingsphere-infra	support postgresql prepare, execute, deallocate statement (#10305)	4 hours ago
shardingsphere-jdbc	Refactor AbstractShardingSphereDataSourceForEncryptTest (#10308)	13 hours ago
shardingsphere-proxy	Add tests for PostgreSQL Proxy Query/Bind CommandExecutor (#10...	16 hours ago
shardingsphere-scaling	Merge event and listener packages (#10222)	12 days ago
shardingsphere-sql-par...	support postgresql prepare, execute, deallocate statement (#10305)	4 hours ago
shardingsphere-test	Rename name config item form yaml for Readwrite-splitting (#10294)	2 days ago

About

Distributed Database Ecosystem

mysql sql database postgresql shard distributed-transactions distributed-database database-cluster shardingsphere distributed-sql-database

Readme

388.09 MB

Apache-2.0 License

Releases 45

5.0.0-alpha Latest on 10 Nov 2020

+ 44 releases

Packages

No packages published Publish your first package

Contributors 221

Website: <https://shardingsphere.apache.org>
GitHub: <https://github.com/apache/shardingsphere>

Community



<https://shardingsphere.apache.org/community/en/powered-by/>

Welcome on board

<https://shardingsphere.apache.org/>

<https://github.com/apache/shardingsphere>

<mailto:dev-subscribe@shardingsphere.apache.org>



wechat group



THANKS