

JUNWANG ZHAO

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🎓 EDUCATION

Peking University Sep, 2013 – Jul, 2016

Master of Computer Architecture

Nanjing University of Science and Technology Sep, 2009 – Jul, 2013

Bachelor of Computer Science

💼 CAREER

Transwarp Technology Infrastructure Department

Senior Database Core developer Jul, 2023 - now

Alibaba Cloud Database OLAP Department

Senior Database Core developer May, 2021 – June, 2023

Huawei IT Product Line

Senior developer Apr, 2018 – May, 2021

Startimes Research Institute

Junior developer Jul, 2016 – Mar, 2018

📁 PROJECTS

Spacture & Hippo Jul, 2023 – now

Spacture(Spatial Database) & Hippo(Vector Database) Kernel Development.

- Select HA, backup tools, and extensions for Spacture.
- Integrate DiskANN index to Hippo and optimizes performance, increasing performance by 30%.
- Add JSON type support to Hippo.
- Design and implement HippoBench, which supports a variety of opensource datasets, standardizing tools used for POC tuning and performance optimization scenarios.

AnalyticDB PostgreSQL High Availability Jun, 2022 – Jun, 2023

Improve the FTS (Fault Tolerance System) logic of ADBPG to adapt to multi-replica architecture

- Modify the FTS state machine to adapt to multi-replica architecture, when one of the replicas is promoted to the primary, the other replicas need to establish replication with the new primary.
- Designed an HA solution based on independently deployed agents per instance node, similar to Patroni.

AnalyticDB PostgreSQL Iceberg table Jan, 2022 – Jun, 2022

Apache Iceberg is an opensource big data table format designed to provide an efficient metadata management framework for data lakes.

- Develop the Iceberg-C library and Iceberg-FDW (Foreign Data Wrapper).
- Query the Iceberg Table on OSS (Object Storage Service) directly, seamlessly connecting data lakes with data warehouses.

AnalyticDB MySQL Storage Engine Support Z-order Sort

May, 2021 – Jan, 2022

AnalyticDB MySQL is a massively scalable real-time high-concurrency online analytical cloud computing service developed by Alibaba.

- Design and implement Z-order sort, during the build process sort the data according to the z-value and write it into the Storage Engine.
- Based on statistical information, column metadata can be used to increase the probability of data skipping in multi-dimensional query, thereby filtering out unnecessary data blocks and improving query speed.
- Achieved result: When the query condition does not include the leading column, the performance is better than that of a cluster index sort.

TaurusDB for MySQL

May, 2020 – May, 2021

TaurusDB for MySQL is a cloud-native database solution that adheres to the principle "LOG IS THE DATABASE."

- Use mmap for binlog
- Participated in the development of the Storage Abstraction Layer/Log Store module for TaurusDB for MySQL, where logs are written to FusionStorage through PLOG.

FusionStorage OBS Index Layer

Apr, 2018 – May, 2020

OBS Index Layer based on MongoDB, and utilizes the mongo-rocks storage engine to persist data to FusionStorage.

- Adapt MongoDB transport layer to use libxnet(a wrapper lib for ibverbs, RoCE, bypass kernel)
- Integrate the mongo-rocks storage engine with FusionStorage's PLOG interface.
- Hot spot analysis, improve write, query, and Compaction performance through reasonable batch processing, index optimization, and parameter tuning measures.

🔗 OPEN SOURCE CONTRIBUTION

- Patroni
 - Abstract MPP handler and decouple it from DCS
- pgvectorBench
 - A lightweight, fast, flexible, and easy-to-use benchmarking tool dedicated to pgvector
- pg_cron
 - add possibility to schedule jobs on the last day of month
 - PRs contributed to pg_cron

🔧 SKILLS

- C/C++ > Rust > Python > Java
- Familiar with Epoll and Reactor Pattern
- Daily Used Tools: GDB/Perf/Valgrind/gperftools

⚙️ OTHERS

- Blog: <https://zhjwpku.com>
- Wechat Official Account: PostgreSQL Opensource Ecosystem
- English: CET-6 VET/VEWT
- Paper Notes(Chinese): paper notes
- GSoC: Google Summer of Code (X.Org, Ceph)