Baixuan Ning

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Education

University of Toronto — Toronto, Canada
M.Eng. in Computer Engineering; Grade: 3.77/4.0 — Jan. 2022 – Apr. 2023 (expected)

Beijing University of Posts and Telecommunications — Beijing, China
B.Eng. in Computer Science; Grade: 88.2/100 (Top 15%) — Sep. 2017 – Jul. 2021

Work Experience

Kuaishou Technology — Jul. 2021 – Dec. 2021
(Key-Value Storage Engine Team) - Software Engineer — Beijing, China

- Participated in designing and building a hash-based key-value storage engine for NVMe SSD from scratch in C++, achieving 300% throughput improvement in write and 50% CPU usage reduction in read compared with RocksDB.
- Implemented log builder, compaction and multi-version for the hash-based storage engine to support basic operations, recovery, garbage collection and high concurrency.
- Analyzed and fixed performance regression issues in RocksDB v6.20, improving put/get performance of memory table by about 7%.
- Supported TitanDB for Flink State Backends, resulting in 2x read and 3x write throughput improvements in big value scenarios.

Microsoft — Jul. 2020 – Oct. 2020
(Bing ObjectStore Team) - Software Engineer Intern — Beijing, China

- Developed a data comparison tool to check data consistency across data centers in ObjectStore using Apache Spark, Apache Yarn and Java Native Interface in C#, Java and C++.
- Optimized such tool through compressing and hashing the raw data, applying algorithm with the least shuffle times, changing the granularity of the comparison, and tuning Java garbage collection for Spark.
- Achieved high performance that compares 100TB raw data in 5 data centers within 1.5 hours by using the tool, resulting in 19x performance enhancement compared with the original tool.

ByteDance — Aug. 2019 – Apr. 2020
(Message Queue Team) - Research & Development Engineer Intern — Beijing, China

- Designed and implemented a distributed transoceanic data synchronization component for MySQL binary logs and Redis data using Apache RocketMQ in Java.
- Achieved 96% of cross-ocean bandwidth utilization, reduced P95 latency of processing to 70ms, and reached 80,000 TPS for a single machine.
- Deployed the system to data centers, resulting in making the system running stably in Singapore, the United States and China.
- Enhanced the web back-end with the control and management interaction of RocketMQ, user authority control, timing tasks, alarms, and monitoring functions in Go on ByteDance Cloud Platform.

Projects

Distributed Log Search System — Mar. 2022 – Apr. 2022

- Extended distributed search feature for Compressed Log Processor(CLP) using Celery, RabbitMQ and MySQL in Python.

Distributed Key-Value Storage System — Jul. 2019 – Aug. 2019

- Implemented the consensus algorithm Raft with log replication, leader election and error recovery in Go.
- Constructed a key-value storage system with strong consistency based on Raft.

Skills & Interests

Languages: experienced in C, C++; comfortable in Java, Rust, C#, Scala, Go, Python, TypeScript.
Systems: have experience in RocksDB, Apache Flink, Apache Spark, Apache RocketMQ, Apache Yarn; understand Log-Structured Merge-tree (LSM-tree) and consensus algorithms like Raft.
Developing Tools: experienced in Linux, Git, Docker; familiar with team tools like Jira, GitLab.
Interests: storage engine, operating systems, distributed systems (in random order).