

# Vivitsu Maharaja

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## SUMMARY

My primary interest is in building and operating high-performance, scalable distributed systems. Typically these fall under the platform infrastructure domain, usually involving storage, streaming, database or workflow orchestration services.

I have prior experience working on data pipelines, ETL workflows, client/SDK development, workflow orchestration as well as high-performance telemetry, observability and performance testing of high-scale distributed systems.

As of May 2023, I'm part of the core replication/dataplane team working on a new distributed transaction log at AWS. The transaction log uses a variant of Paxos for leader election and data replication.

## EXPERIENCE

**Software Development Engineer**, Amazon Web Services, Seattle, WA Jul 2016 - Present

- **Transactional Services** Aug 2020 - Present
  - Built canaries to test performance, correctness and durability of a new replication service for a high-performance distributed transaction log. The replication service uses a variant of Paxos for leader election and data replication.
  - These canaries include a variable TPS generator at high load using a Poisson distribution to test for performance, a verifier based on cumulative checksums to test for data corruption and pathological load test scenarios to test validity, correctness and performance of the core data replication API.
  - Led the API integration effort for a new control plane service in the service's clients and SDKs. This included designing the API, as well implementing them in the existing Java and Rust SDKs.
  - Implemented high-throughput telemetry and observability for the storage backend for this distributed transaction log. The telemetry process runs as a sidecar alongside the core log service, ingesting metrics when processing data at high TPS/throughput (100s of MB/s and 10s of thousands of TPS). The telemetry framework uses a double-buffer architecture using statically allocated buffers to prevent performance impact on the core storage service's performance.
  - Improved the throughput and connection fan-out of a streaming database service by moving on-heap JVM buffers to off-heap memory, and increasing concurrency and parallelism by multi-threading the fanout buffer. After these improvements, the aggregate throughput per host was increased by 10x and the connection fanout was increased by 5x.
  - Shipped an updated version of a database snapshot service that uses LZ4 compression instead of GZIP to improve snapshot restore times when restoring database snapshots from backups.
- **AWS Builder Tools** Jan 2018 - Aug 2020
  - Responsible for feature development, operations and maintenance of AWS' SDK release orchestration service.
  - Led the operational readiness and security review for this service. This involved documenting the threat model for the platform, and identifying and driving mitigation for known operational and resiliency gaps in the service.
  - Built new workflow capabilities to support release automation for the official AWS PowerShell SDK. Until then the PowerShell SDK was built and published manually bypassing the release automation process.
- **Amazon Workdocs** Jul 2016 - Jan 2018
  - Implemented an album viewer to view multi-photo albums stored in users' WorkDocs account, and shipped a rewrite of the user's profile page as part of the WorkDocs UI redesign.

**Software Engineer**, LendingHome (now Kiava), San Francisco, CA Feb 2015 - Jul 2016

- I was the second engineer on the data engineering team at LendingHome and I built the first version of their data ingestion pipeline. The motivation was to ingest data from various data sources into a Redshift based data warehouse which was used for data analytics and business intelligence. I built the pipeline using asynchronous workflows that were triggered on a regular schedule with Celery and RabbitMQ being the message bus between the data extraction (from the source) and data ingestion (into Redshift) subsystems.

## SKILLS

- Programming Languages: Comfortable with Java. Familiar with Kotlin, Rust and Python.

## EDUCATION

**Master of Science**, Electrical & Computer Engineering May 2014  
University of Florida, Gainesville, FL. GPA: 3.33/4.0

**Bachelor of Engineering**, Electronics & Communication May 2011  
Dharmsinh Desai University, Nadiad, India. GPA: 62/100