

Work Experience

Senior Software Engineer (Observability)	Grab (Singapore)	Aug 2021–Present
<ul style="list-style-type: none">• PIC for Grab's logging stack – Manage >1PiB Opensearch clusters, logging pipeline and logging agents.• (Service Reliability) Added synthetic testing to the logging pipeline to measure indexing, query latencies and data completeness of archived and real-time logs to verify data reliability. SLAs are defined based on these SLI metrics.• (Service Reliability) Setup AWS Playground subaccount replicating the existing production sub account setup with the ability to multiplex live logs or replay old logs for testing.• (Service Reliability) Added log buffering layer in Azure to improve reliability of logs sent from Azure to AWS.• (Service Reliability) Identified and fixed performance bottlenecks e.g. Opensearch query WAF to prevent expensive queries on the cluster which allowed us to open the cluster for programmatic querying and reduced p95 query latencies by >50%, optimized LDAP authorization flow which reduced p95 Kibana login time by >50%.• (Cost Savings) Identified and drove cost savings initiatives e.g. Kafka rack awareness which reduced cross-AZ costs by 50%, switched Opensearch, Logstash to Graviton-based workloads which reduced total cluster costs by ~20%• (Misc) Migrated >1PiB logging clusters from Elasticsearch + Opendistro to Opensearch without downtime due to Opendistro EOL. This involved planning, budgeting and executing.• (Misc) PIC for migrating tenant organization from GCP to AWS in a new region.• (Misc) Setup log archiving pipeline to sink logs into S3 for longer retention. Also setup self-serve backfilling pipeline for engineers to rehydrate logs into Opensearch from S3 log archives for adhoc log exploration.• (Misc) Setup automation to update AMLs for stateless and stateful workloads to reduce toil from CVE tickets.		
Software Engineer Intern (Payments)	Shopee (Singapore)	Jan 2021 – June 2021
<ul style="list-style-type: none">• Created Prometheus metrics to trace performance bottlenecks when connecting to upstreams.• Developed pre-deployment validation for stored credentials when connecting to partner APIs.		
Software Engineer Intern (Drivers)	Ninja Van (Singapore)	Apr 2020 – Aug 2020
<ul style="list-style-type: none">• Designed and built a 2-way cross-platform messaging system for communication during parcel delivery.		
DevOps / SRE Intern	Upguard (California, US)	Aug 2019 - Mar 2020
<ul style="list-style-type: none">• Developed release package upload tool for Forward Deployed Engineers to install packages on customers' VMs.• Oversaw Nginx version upgrade and configurations for enabling Modsecurity WAF.		
Software Engineer Intern (Shippers)	Ninja Van (Singapore)	May 2019 – Aug 2019
<ul style="list-style-type: none">• Developed a webhook history tool to allow tracking and searching of fired webhooks.		

Education

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| • B.COMP. COMPUTER SCIENCE , NATIONAL UNIVERSITY OF SINGAPORE
Awarded NUS Undergraduate Merit Scholarship | 2017–2021 |
| • NUS OVERSEAS COLLEGES (SILICON VALLEY) | 2019-2020 |

Projects

- **(Grab) Opensearch Cold Tier using JuiceFS (FUSE backed storage)**
Added a cold data tier backed by JuiceFS (FUSE) in our Opensearch logging cluster as part of a cost-reduction initiative.
- **(Grab) Benchmarking alternative Storage Engines (e.g. Clickhouse, Quickwit, Loki)**
Benchmarking alternative storage engines e.g. Clickhouse, Loki as part of a cost-reduction initiative for the logging cluster.
- **(Grab) Rack Aware Kafka Producer (Logstash Plugin)**
Developed Rack aware Kafka producer Logstash Plugin to reduce cross-AZ traffic between Producer and Kafka.
- **(Grab) Clickhouse Backup**
Created script for backup and restore of Clickhouse cluster metadata and data.
- **(Grab) RCA Troubleshooting LLM Service**
Developed tool to automate investigation of common troubleshooting flows e.g. panics, Hystrix errors.
- **YPT Stop Human Trafficking Hackathon**
Achieved 1st in a Tech for Good hackathon which aimed to use transportation tech to solve human trafficking.