Yusuf Birader

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PROFESSIONAL EXPERIENCE

Symphony, *Software Engineer, (symphony-collaboration.github.io)*   2023-Present
- Created a serverless runtime on Kubernetes for adding real-time collaboration to web applications.
- Integrated a CRDT-based conflict resolution mechanism with real-time state propagation.
- Built a load-testing tool which simulates N virtual collaborating users to determine system SLOs.
- Horizontally scaled backend architecture increasing capacity from 240 to 10,000+ concurrent users.
- Engineered a custom backend orchestrator and reverse proxy which dynamically schedules collaborative sessions as Kubernetes pods and handles service discovery and request forwarding.
- Setup real-time monitoring with Prometheus and built a dashboard UI with React, Tailwind CSS and Grafana.
- Implemented a persistence layer with snapshotting that periodically persists state to Google Cloud Storage during collaborative sessions and stores metadata in PostgreSQL via the Prisma ORM.
- Automated the deployment of Symphony on Google Cloud Platform (GCP) including Google Kubernetes Engine (GKE), Cloud SQL, and Cloud Storage down to a one-click deploy using Terraform via the Symphony CLI.
- Reduced K8s pod cold-start time by 10x using balloon pods with K8s PriorityClass resources.
- Developed a security model in line with the principle of least privilege by utilising namespacing, configuring K8s Role-based access control (RBAC), Google Workload Identity, and private subnets with VPC peering.
- Authored a case study on Symphony's problem domain, design decisions, and challenges.

Freelancer, *Software Engineer*   2021-2023
Client projects worked on during this time include:

37signals, (Security, Performance & Infrastructure)
- Re-engineered spam infrastructure using Rails and Rspamd to allow rolling updates of spam-rules.
- Designed and implemented a rolling account log, with fuzzy search allowing spammy signups to be found and marked as fake across all 37signals' services with the click of a button.
- Optimised internal tooling including reducing billing dashboard load times by 40% by fine-tuning Active Record queries and implementing transfers of primary account owners via our internal dashboard.
- Improved Basecamp project export pipeline performance by 20%.
- Responded to security reports from ethical hackers as part of 37signals' bug bounty program.
- Independently released pzip, an open-source concurrent zip archiver, 15x faster than Info-ZIP, written in Go.

Hardwary- Hacker News for Hardware, which served 30k requests per day at its peak (Rails, PostgreSQL).

Terminal- A web-based tool for debugging webhooks (Express, Next.js, PostgreSQL MongoDB, RabbitMQ).

D Young & Co LLP, *Trainee Patent Attorney*   2021-2022
- Prosecuted UK and European patent applications related to networking, databases, and cloud infrastructure.
- Implemented text-processing scripts in Ruby, improving time-efficiency of billable legal work by 20%.

University of Warwick, *Researcher*   2020-2021
- Researched the orbital dynamics of planetary remnants in extra-solar systems. Supervised by Dr. Dimitry Veras.

EDUCATION

University of Warwick, *Physics (BSc)* – First Class Honours with Seymour Prize   2018-2021

PUBLICATIONS

- Orbit decay of 2–100 au planetary remnants around white dwarfs with no gravitational assistance from planets, *MNRAS*, Volume 510, Issue 3, March 2022, Pages 3379 3388, https://doi.org/10.1093/mnras/stab3490

SKILLS & INTERESTS

Languages & Frameworks: Go, Ruby, JavaScript, TypeScript, Python, Rails, React, HTML, CSS, SQL
Other Technologies: PostgreSQL, MongoDB, Redis, Docker, Kubernetes, Helm, Terraform, Nginx, Prometheus, Grafana, Elasticsearch, Kibana, Rspamd, Temporal
Cloud: AWS CDK, SDK, EC2, ECS, RDS, S3, CloudFront, SNS, IAM, DynamoDB and GCP GKE, Cloud SQL, Cloud Storage, Monarch, Workload Identity
Interests: Adventure travel in South Asia, Europe and the Middle East, long distance cycling, karate