

# Ashwanth Fernando

## Principal Software Engineer

Distributed Systems | Backend Engineering | AWS and GCP  
Microservices | Product Focused and Customer First Mindset

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Australian Citizen

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## Summary

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- Hands-on principal-level engineer/architect with **15+ years** building, scaling **distributed systems** and teams at **Apple, Canva, eBay, Atlassian** and **Walmart** driving reliability, performance, and business impact for multi-million-user products.
- **Platform Engineering at scale:** Built core platform systems at **Walmart** (Fortune 1) for config management, auto-generated CRUD APIs, and parallel deployment orchestration for application server fleets, enabling an **8,000-developer ecosystem** to rapidly build and scale ecommerce for Walmart US and Canada. Evangelized adoption through internal tech talks and drove migration from expensive proprietary third-party platform to open-source stack, **saving \$100+M annually**.
- Led development of 5 frontier live/collab products at **Canva** - Talking Presentations, Reactions, Remote Control, Playlist, Canva Live on the **1B+ presentations/year** platform, growing **10+M MAUs in 2 years**. Authored **patents** and evangelized through engineering blog posts.
- Architected active-active load balancer with **ZooKeeper** for **Atlassian's** Elasticsearch cluster, eliminating manual failover during maintenance and reducing downtime by **20+ hours/quarter**. Increased customer **NPS for search by 15%**.
- Scaled **Canva Search from 20M to 80M MAU** (4x growth) by re-architecting ingestion from monolithic to distributed microservices, adding **Redis** L2 caching, and offloading auxiliary data from **Solr** to **MySQL**.
- **Leadership:** Led teams up to 12; built/managed a 6-engineer squad at Canva while remaining hands-on (20%); authored **5 patents**; shipped **99.999% availability** load balancers and **10x commerce dialog conversions**.
- **Deep and broad expertise:** I consistently learn and improve myself across a variety of technologies in the backend + cloud + AI/ML stack.
- **Current focus areas:** **Instruction Fine Tuning** for **LLMs, RAG, Agentic Workflows, Distributed Systems, Platform Engineering, Cloud-Native Architectures**, Vibe coding cleanup (certain languages only).

## Technical Skills

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**Languages:** Java (primary), Go, Python, Kotlin, Scala, Node.js

**Cloud & Data:** AWS (EC2, RDS, DynamoDB, SNS/SQS, ElastiCache), GCP (BigQuery, Dataform, Pub/Sub)

**Distributed Systems & Messaging:** Kafka, Spark, Redis, ZooKeeper, event-driven and microservices architectures, consistent hashing, active-active topologies, load balancing

**Frameworks & APIs:** Spring, GraphQL, gRPC, Temporal, Protobuf

**Search & Storage:** Apache Solr (indexing/serving at scale), caching strategies

**AI/ML Infra:** LLMs, RAG, LangGraph, agentic workflows, Prefect

**Testing & Quality:** TDD, unit/integration, regression/performance testing (incl. bespoke tooling)

**DevOps:** GitHub, Bitbucket, Spinnaker, Terraform, Kubernetes, Helm

## Experience

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### Principal Engineer, Tentacle Software

Jan 2022 - Present

*I started a boutique engineering consultancy for high-throughput, low-latency platforms: consistent-hashing topologies, scalability, extensibility, resilience, and automated delivery. I bring my entire gamut of high quality global experience across a range of capabilities to these companies from project management, coding, devops and making hundreds of decisions balancing between tactical and strategic. Typical project duration is between 4 months to 1.5 years.*

#### Responsibilities:

- **o-to-1 builds:** I've led the design and architecture of several greenfield services, and personally implemented the surrounding operational ecosystems, from IaC and CI/CD to SLOs, observability, and runbooks, blending strategic direction with hands-on engineering to drive faster delivery and more reliable systems.
- Led technical roadmaps, architecture reviews, worked cross functionally with PMs, Product Leads, Security Architects, and other stakeholders.
- Drove JVM tuning, microservice performance, and cost optimisation; coached teams on reliability, observability, and CI/CD best practices.

#### Client: Atlassian

- Designed and led the development of consistent-hashing load balancer initially for insta-switch active-passive elastic search routing, then for active-active Elasticsearch, increasing **Confluence search availability +7% globally**.
- Partnered with deployment engineering teams to architect insta-deploy to all regions from main branch, cutting **deploy lead time from 1 week to 10 hours**.
- **Technology Stack:** Java, Spring, Spinnaker, Zookeeper, Elasticsearch, AWS, Docker.

#### Client: Macquarie Bank

- Led a cross-functional program across 5 teams (20+ microservices) in the Wealth Adviser Platform to remove latency hotspots fixing caching strategy, reactive processing, database-schema flaws, JVM GC settings, and request-processing logic; contributed targeted PRs while delivering runbooks, dashboards, and diagnostic artifacts so teams could self-remediate at pace. **Results: p95 down 14%, p99 down 9%, throughput up 3.5x**.
- **Technology Stack:** Java, Spring, Reactor, PubSub, Redis, GraphQL, Spanner, GCP, Docker.

#### Client: WEX

- Contributed to streaming analytics platform using **Spark Structured Streaming** to process **1.2M+ daily events**, implementing tumbling windows, watermarking, and stateful aggregations for real-time hotel booking metrics across global travel partners.
- Built event-sourced financial reconciliation system with idempotent transaction processing, maintaining **<1s accuracy** for multi-currency merchant accounts and ensuring consistency across distributed ledger replicas.
- Modernized Kafka → Spark → BigQuery pipeline with CDC, schema evolution, and exactly-once delivery guarantees, reducing reconciliation lag **by 65%** and supporting 40+ partner integrations.
- **Technology Stack:** Spark, Java, GoLang, GoMock, Kafka, Testify, Docker.

#### Client: Coles

- Partnered with security, product, and cross-team stakeholders to define requirements for a BFF (Backend-for-Frontend) service, v1 architecture, priority use cases, and a scale-out migration plan for remaining workloads.
- Led the build of the BFF and DevOps ecosystem, cutting **end-to-end latency for Coles online grocery (coles.com.au) by >40%**.
- **Technology Stack:** Java, Kotlin, Spring, Reactor, Azure, Docker, ArgoCD.

**Founding Engineer, Packsmith**

Jul 2024 – Nov 2024

*Packsmith is an AI-driven distribution platform specializing in last mile logistics for e-commerce brands.*

- Led the end-to-end technical strategy for the distributed reverse logistics platform, collaborating closely with PMs and Founders on architectural decisions, requirements and milestones.
- Built a priority/vip tagging system for Shopify feeds, improving shipping times for priority orders by 140%.
- Built workflows in Temporal to optimize shipment flow, ensuring accurate stage progression and significantly reducing operational overhead.
- **Technology Stack:** GoLang, GCP, Temporal, Docker, Helm, Kubernetes, Terraform, PubSub.

**Engineering Manager|Staff Engineer, Canva, Sydney, Australia**

Nov 2018 - Jan 2022

*Canva is a \$42B USD visual design platform and Australia's most successful tech company, with a mission to make design accessible for everyone. Used by millions globally to create presentations, social media graphics, documents, and more. I worked in the Search and Presentation teams.*

- Scaled **Canva Search** from **20M** to **80M MAU** by decomposing a monolithic ingestion pipeline into a microservices architecture, implementing cache deduplication and invalidation systems, and re-architecting Solr indexes to offload non-queryable fields to MySQL — reducing index footprint and improving query performance. Optimized request processing logic, fine-tuned JVM GC for consistent SLAs, and delivered autocorrection, query suggestions, trending insights, and feedback systems end-to-end while mentoring engineers on search platform design.
- Published technical blogs on Canva's engineering platform and delivered internal and external talks on auto-correct and Canva Live builds.
- Scaled team from 0 to 6 engineers, shipping 7 live collaboration products in under 2 years that drove **10+M MAU growth (20% of Canva's total users)**. Owned full people management lifecycle (hiring, 1-1s, performance reviews), collaborated with PMs and peer managers on roadmaps, while remaining hands-on in architecture, design, and helping with code reviews and small changes.

**Senior Staff Engineer, eBay, San Jose, California**

Nov 2014 - Aug 2018

*eBay is a global e-commerce marketplace connecting 132 million active buyers with sellers worldwide, facilitating over \$73B in gross merchandise volume annually. One of the original internet pioneers, eBay operates in 190+ markets. I worked in the Search and New Product Development teams.*

- Headed the design of a **dynamic configuration system** and **page assembler** for eBay's **core search**, enabling business teams to adapt search UI/UX without direct engineering involvement, cutting **months off typical release cycles**.
- Built **dialog system SDK** to quickly ship **multi-turn dialogs** that include carousels, text, videos, images, questions to production. Has integrations for **Facebook** and **Google Assistant**. This dialog system can ship new complex conversations in a matter of minutes and **increased Shopbot sales by more than 10x**.
- Created an **open-source regression-testing framework (Regressr)**, adopted across multiple departments for real-time performance comparisons between service versions.
- Led multiple project teams of **6+ engineers**, setting technical vision, coordinating development roadmaps, and facilitating inter-team collaboration.

**Principal Engineer (ICT 5), Apple, Cupertino, California**

Sep 2013 - Oct 2014

*Apple is a global technology company that designs and manufactures smartphones, tablets, computers, and accessories. I worked on the device activations platform, which is a globally distributed load balancer with 99.999% availability across several API services. I worked in the Emerging Technologies team.*

- Principal Engineer for a **globally distributed load balancer** with **99.999% availability** across several API services most notably **device activations**.
- Oversaw a team of **12 engineers**, managing project timelines, code reviews, and architectural decisions. Regularly facilitated consensus-building on design proposals and led strategic engineering initiatives.
- Operationalised infrastructure for device activations across **US, Canada and Europe**.
- Built significant parts of the platform such as **config management, heartbeat monitoring** and **deployment orchestration**.

- **Technology Stack:** Node.js, Zookeeper, OpenTelemetry, Java, Oracle, Akamai GSLB.

**Staff Software Engineer**, Walmart, San Bruno, California

Oct 2010 - Sep 2013

*Walmart is the world's largest retailer and Fortune #1 company, operating 10,500+ stores across 19 countries with \$648B in annual revenue. With 2.1 million associates and serving 240 million customers weekly, Walmart is a global commerce and technology leader. I worked in the Canada and @Platform teams.*

- Served as **architect and technical lead** for **Walmart Canada's SEO platform** and base-variant management system, reducing **bounce rates by 30%**.
- Integrated product reviews into the website with **BazaarVoice**.
- Built **cloud deployment parallelization** for Walmart's **300+ applications** saving **deployment times by well over 80%**.
- Instituted an **enterprise-wide configuration management framework**, unifying deployment practices for over **200 microservices**.
- Built **automatic CRUD HATEOAS generator** to autogenerate CRUD APIs for database tables saving IaaS teams **well over 8 months of manual work**.
- **Technology Stack:** Java, ATG, Groovy, Spring, Zookeeper, JavaEE, Glu.

## EXTENDED CAREER HISTORY

**Software Engineer**, Best Buy

Aug 2005 - Oct 2009

**Software Engineer**, Pearson VUE

Nov 2009 - Apr 2010

**Software Engineer**, Walgreens

Apr 2010 - Sep 2010

## Courses & Certifications

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- AWS Solutions Architect Associate - AWS (In Progress)
- Advanced Learning Algorithms - DeepLearning.AI
- Machine Learning Specialisation - DeepLearning.AI
- Supervised Machine Learning: Regression and Classification - DeepLearning.AI
- Generative AI with Large Language Models - Coursera

## Patents & Intellectual Property

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- **Systems and methods for interactive presentations** - US 20230205552
- **Systems and methods for storing and replaying presentations w/ video and audio** - US 20230205808
- **Systems and methods for remotely controlling electronic presentations** - US20230076902A1
- **System and method for increasing throughput of a PaaS system** - US 9342369 B2
- **Verification of complex multi-application and multi-node deployments** - US 20140109082

## Blogs & Publications

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- Building a Data-Driven Autocorrection System - Canva Engineering Blog
- Lessons Learnt from Building Reactive Microservices for Canva Live - Medium/Canva
- Introducing Regressr: An Open Source Regression Testing Tool - eBay Tech Blog

## Hobbies & Interests

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- **Travelling:** Exploring new places across Australia, discovering hidden gems and scenic landscapes
- **Culinary exploration:** Trying out new dinner spots and experiencing diverse cuisines
- **Continuous learning:** Working on algorithmic problems and building proof-of-concept projects in free time
- **Fitness:** Long walks to stay active and facilitate thinking.