

Andre Ballard

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PROFILE

Senior Software Engineer with 9+ years of experience building **cloud-native, AI-driven, and event-driven platforms** across **healthcare, finance, and industrial IoT domains**. Highly skilled in full-stack development, microservices architecture, and building data-intensive distributed systems using **Python, C#, and modern frameworks**. Proficient in multi-cloud environments on **Azure and AWS**, leveraging **Docker, Kubernetes, and Terraform** for scalable, secure, and resilient deployments. Experienced in implementing **high-throughput streaming pipelines, ML inference services, predictive analytics, and observability frameworks** to drive operational excellence. Recognized for modernizing legacy systems, mentoring engineering teams, and delivering compliant, high-performance solutions that accelerate business impact.

SKILLS

Backend: Python (FastAPI, Flask), C# (.NET Core, .NET Framework, ASP.NET MVC 5), Node.js, GraphQL, gRPC

Frontend: React, Next.js, Angular, TypeScript, MUI v8, RxJS, NgRx, Redux Toolkit, Tailwind CSS, WebSocket APIs

Data & Storage: PostgreSQL, SQL Server, MongoDB, CosmosDB, Snowflake, Elasticsearch, TimescaleDB, Data Lakes

AI & ML: TensorFlow, PyTorch, Scikit-learn, ML.NET, SageMaker, LangChain, MLflow, Kubeflow, Triton Inference Server

Cloud & Infrastructure: Azure, AWS, Docker, Kubernetes, Helm, Terraform, GitHub Actions

DevOps, Security & Reliability: CI/CD, IaC, OAuth2, JWT, Zero Trust, HIPAA, GDPR, SOC 2, mTLS, ELK Stack

PROFESSIONAL EXPERIENCE

Microsoft, Senior Software Engineer

Apr 2021 - Present

PROJECT: Real-Time Event-Driven Healthcare Platform for Global Hospital Networks

Drove the transformation of a **legacy EHR and device ecosystem** into a **cloud-native Azure platform** by delivering scalable backend services, real-time data streaming infrastructure, and **embedded clinical AI capabilities** that accelerated product delivery and enhanced operational reliability.

- Led the modernization of legacy EHR and medical device systems into a modular, cloud-native microservices architecture on **Azure**, using **Azure Kubernetes Service (AKS), Docker, .NET Core**, and **FastAPI** to provide scalable deployments, improved fault isolation, and real-time observability.
- Designed and built high-throughput event-driven pipelines using **Apache Kafka** and **Azure Event Hubs** to process millions of device and EHR events per hour. Implemented event-sourcing and **CQRS** patterns to ensure durability, auditability, and low-latency stream processing.
- Developed **RESTful, GraphQL, and gRPC services** in .NET Core and FastAPI, implementing **mTLS, JWT**, and **Azure AD B2C** authentication. Used gRPC to optimize interservice communication with smaller payloads and significantly lower latency.
- Implemented **FHIR R4-based microservices** for real-time vital, lab, and clinical data synchronization. Integrated FHIR Subscriptions with GraphQL and gRPC to enable sub-second updates to internal dashboards and partner applications.
- Built time-series and search capabilities using **TimescaleDB** and **Elasticsearch** for storing vitals, telemetry, and device performance metrics, while leveraging **PostgreSQL** for relational workloads.
- Developed and integrated **AI/ML inference services** for clinical NLP and predictive analytics. Used **ONNX Runtime** and **Azure ML** to deploy **LSTM, Transformer**, and **clinical-text embeddings** that powered early-warning predictions and automated clinical documentation.
- Implemented de-identification and PHI masking pipelines using **Azure Cognitive Services** and **custom NLP models**. Integrated **vector search systems** such as **Weaviate** and **Qdrant** to support clinical assistants, semantic retrieval, and coding recommendations.
- Adopted serverless patterns with **Azure Functions v4** and **.NET 8** for real-time ETL, low-latency ingestion tasks, and audit-log processing. Secured sensitive operations using **Azure Confidential Ledger** for tamper-proof records.
- Built internal developer tooling and platform consistency by developing **reusable service templates, Helm charts**, and **shared libraries**. Improved developer experience with **GitHub Actions-based CI/CD**, automated quality gates, and end-to-end observability using **OpenTelemetry, Prometheus**, and **Tempo**.
- Collaborated on frontend components for clinician dashboards using **Angular, TypeScript**, delivering real-time vitals, alerts, and device-status visualizations backed by **WebSockets, SignalR**, and **event-driven APIs**.

PROJECT: AI Driven Industrial IoT Predictive Maintenance and Digital Twin Platform

Redesigned legacy IoT infrastructure into AWS-based FastAPI microservices, built high-volume streaming pipelines, and integrated ML inference and digital-twin services to support predictive maintenance and real-time equipment monitoring.

- Architected a modular backend platform using **Python (FastAPI)** on **AWS ECS (Fargate)**, implementing clear service boundaries for ingestion, processing, storage, and API layers.
- Engineered high-throughput ingestion pipelines using **Kafka** on **Amazon MSK** and **AWS Kinesis**, reliably processing 500,000+ telemetry messages per second with message ordering, deduplication, and schema validation.
- Developed event-driven processing services using **async Python consumers** for real-time enrichment, device normalization, and routing of messages to **ML** and **persistence layers**.
- Designed scalable data storage models using **Amazon Timestream** and **TimescaleDB** for time-series data, **Amazon RDS(PostgreSQL)** for relational data, and **Amazon S3** for archival storage.
- Implemented digital-twin and dependency modeling in **Amazon Neptune**, enabling sub-100 ms impact analysis and rapid fault-localization queries.
- Built ML inference services integrated with **AWS SageMaker** and **GPU-enabled ECS tasks**, providing low-latency predictive maintenance via asynchronous **gRPC** calls and reducing inference latency by 45%.
- Created **REST** and **GraphQL APIs** in **FastAPI** for telemetry, analytics, and digital-twin operations, and integrated these endpoints with **Next.js dashboards** using **WebSockets** and **SSE** for real-time visualization.
- Established **CI/CD automation** using **GitHub Actions**, **Docker**, and **Terraform**, including automated test suites, security scans, and approval workflows.
- Led architecture reviews and code quality initiatives, standardizing **async patterns**, **error-handling strategies**, and **performance best practices** across backend teams.

Infosys, Software Engineer

Aug 2017 - Jun 2019

PROJECT: Global Banking Platform Modernization and Omnichannel Payments System

Contributed to modernization of legacy banking platforms on AWS, developing Python-based backend microservices, implementing ML-driven fraud detection pipelines, and building real-time transaction systems processing millions of daily payments.

- Developed **fraud and risk ML models** using **scikit-learn**, **TensorFlow**, **Keras**, and **XGBoost**, performing data preprocessing, feature engineering, model training, and evaluation.
- Implemented **real-time ML inference pipelines** using **Python services** deployed on **AWS EC2**, processing transaction events asynchronously to minimize latency.
- Engineered high-throughput, event-driven pipelines with **Apache Kafka** and **RabbitMQ**, supporting reliable ingestion, enrichment, and routing of millions of transactions per day with idempotent consumers.
- Built secure backend APIs using **Python(Flask)**, integrating with payment networks (Zelle, PayPal) and core banking systems. Implemented **OAuth 2.0**, **JWT**, and encrypted communication with **AWS KMS**.
- Optimized relational data storage and queries on **Amazon RDS (PostgreSQL)** database, reducing transaction latency by ~35% via query tuning, indexing, and batch operations.
- Implemented monitoring and logging with **AWS CloudWatch** and Python logging, tracking pipeline throughput, service health, and ML inference metrics.
- Participated in **CI/CD pipelines** using **Jenkins** and **Docker** for containerized builds, automated unit testing, and deployment to **EC2** instances.
- Improved production reliability, contributing to incident response, root-cause analysis, and process improvements that reduced **MTTR** by 50%.
- Collaborated with **cross-functional teams**, including QA, DevOps, and product managers, to deliver features for fraud detection, payments orchestration, and compliance reporting.

Revature, Software Engineer

May 2017 - Aug 2017

- Completed hands-on enterprise-level training in backend and full-stack development using **C# (.NET Framework 4.6)**, **ASP.NET MVC 5**, and **Python**, building production-simulated systems under **Agile Scrum** and **CI** workflows.
- Configured build automation and deployments using **Jenkins** and **MSBuild**, with code reviews and sprint tracking in **TFS 2017** (Team Foundation Server).
- Built a machine-learning recommendation microservice prototype with **Python Flask** and **scikit-learn**, integrating it with the ASP.NET backend via **RESTful APIs** for model inference.
- Practiced **version control (Git/TFS)**, **sprint planning**, and **peer reviews**, simulating real-world collaborative engineering workflows in enterprise teams.

EDUCATION