

Michael L. Welles

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Overview

Principal-level backend engineer with 20+ years building distributed systems that power products at scale. Expert in architecting scalable, observable, and cost-efficient platforms using Go, Kubernetes, and event-driven architectures. Proven track record mentoring engineers and accelerating teams (2.5× velocity increase at MediData) while driving product outcomes through cross-functional collaboration. Deep experience with modern backend technologies including AWS, Kafka, GraphQL, Kubernetes, and comprehensive observability tooling. Comfortable navigating ambiguity, making pragmatic architectural tradeoffs, and modernizing legacy systems while shipping production code daily.

Core Technologies

Backend & Languages: Go, Python, Rust, TypeScript **Distributed Systems:** Kafka, AWS SQS/SNS, event-driven architecture, async patterns, pub/sub **Cloud & Infrastructure:** Kubernetes, Docker, AWS (comprehensive), Terraform, Azure **Data & APIs:** GraphQL, PostgreSQL, DynamoDB, Elasticsearch, Spark, Databricks **Observability & Ops:** Distributed tracing, metrics/logging, SLOs/alerting, incident response, CI/CD **Reliability:** Concurrency, idempotency, retry/backoff, fault tolerance, zero-downtime deployments

Experience

Consulting Principal Engineer, CubeNexus.ai

Aug 2025 - Present · Remote

Advising on technical strategy and architecture for a geospatial intelligence platform. Rebuilt ingestion pipeline to handle multi-terabyte datasets, added real-time telemetry streaming with event-driven architecture, hardened API backend (Python/FastAPI), and established CI/CD across repositories. Focus on scalability, observability, and cost optimization.

Principal Engineer, Istari Digital

Feb 2024 - Jul 2025 · New York, NY

Led team building secure backend registry service for zero-trust digital collaboration platform connecting engineering tools with programmatic and AI-assisted workflow automation.

- Architected and shipped distributed backend service (Python, FastAPI, SQLAlchemy, PostgreSQL) handling complex asset lineage and metadata traversal with cryptographically verified provenance tracking.
- Designed database schema optimizing for graph-like relationship queries, implemented query tuning for deep lineage traversal, and managed zero-downtime schema migrations under production load.
- Built cryptographic core in Rust with Python bindings, wrapped by SDKs for automation agents and frontend—enabling type-safe APIs across multiple language ecosystems.
- Established comprehensive observability with distributed tracing, structured logging, and SLO-based alerting. Monitored latency, correctness, and operational metrics to maintain 99.9% uptime.
- Led cross-functional collaboration with product and design to evolve features from MVP to polished production implementation. Mentored junior engineers on distributed systems patterns, async programming, and production debugging.
- Delivered all major milestones on time through clear project decomposition, continuous delivery with feature flags, and pragmatic architectural decisions balancing velocity with quality.

Director of Software Development, Raytheon Technologies

Sep 2021 - Nov 2023 · New York, NY

Technical lead for real-time data platform processing flight telemetry from Pratt & Whitney commercial jet engines at scale.

- Architected streaming data pipeline (Databricks, Spark, Python) ingesting thousands of engine sensors, processing through fault detection and anomaly detection models, triggering severity-based automated alerts at massive scale.
- Designed event-driven ML model orchestration pipeline with parallel evaluation of multiple models using async patterns and concurrent processing—zero added latency.
- Built comprehensive audit trails tracing every output field to specific code revisions or model versions, ensuring data correctness and operational compliance.
- Led "inner-sourcing" effort creating reusable SDKs, quickstart kits, and tooling used across 40+ teams adopting the platform—multiplying impact through mentorship and knowledge sharing.

- Managed team of 14 developers across three agile projects, coaching on distributed systems design, observability best practices, and incident response.

Head of Technology, Dayforward

Jan 2020 - Sep 2021 · New York, NY

Head of technology for life-insurance startup. Led team designing and building algorithmic underwriting and policy-management platform from zero to production.

- Built distributed backend platform with Go microservices on Kubernetes, federated GraphQL API, and Vue.js frontend—launched in 10 months alongside regulatory approval.
- Owned architecture for complex product features including policy calculations, underwriting decision engines, and multi-party approval workflows with strict compliance requirements.
- Established CI/CD pipeline, feature flag system, and observability stack (metrics, logging, distributed tracing) for continuous delivery with rapid iteration cycles.
- Partnered with product and design leadership to navigate ambiguity, make pragmatic tradeoffs, and drive from ideation to MVP to production at startup velocity.
- Mentored engineers on Go best practices, microservices patterns, GraphQL federation, and Kubernetes operations—building team capability while shipping features.

Lead Engineer / Chief Technologist, Riverdrop

Jan 2018 - Feb 2019 · New York, NY

Led team of three senior engineers building specialized product search engine with ML-driven data processing pipeline.

- Designed event-driven data flow using AWS SQS/SNS for reliable asynchronous processing with DynamoDB storage, implementing retry logic, dead-letter queues, and idempotency patterns.
- Built search API in Go against Elasticsearch indexes, optimizing query performance and relevance scoring for product discovery workloads.
- Architected system as microservices with discrete transformation steps, packaged as Docker images and deployed via CI/CD to Kubernetes (built and managed with Terraform).
- Established observability for distributed pipeline with latency tracking, error rate monitoring, and cost analysis across AWS services.

Director of Engineering (Mobile), MediData

Feb 2017 - Jan 2018 · New York, NY

Led engineering teams for Patient Cloud platform collecting clinical trial data from patients and clinicians via mobile devices and wearables.

- Managed products including native apps (iOS/Android), backend APIs, native SDK, and wearables platform. Launched two major mobile initiatives while migrating all development to modern languages (Swift, Kotlin).
- Instituted organizational and process improvements increasing average team velocity by 2.5× through improved CI/CD, testing automation, and cross-functional collaboration.
- Mentored mobile and backend engineers on API design, async patterns, and production operational excellence.

Principal Architect / Director of Mobile, Huge

May 2013 - Feb 2017 · Brooklyn, NY

- Led cross-functional team of 20+ engineers, QA analysts, designers, and product managers. Evangelized agile best practices, CI/CD, and engineering standards across the organization.
- Instituted engineering guild system for cross-office knowledge sharing and formal R&D sponsorship. One guild-led initiative generated new product proposal securing \$5M contract—demonstrating ROI of technical mentorship and innovation culture.
- Directed client projects including real-time streaming platforms, IoT accessories, and mobile commerce applications at scale.

Senior Software Engineer – iTunes Store Video Workflow Group, Apple

Mar 2008 - May 2011 · Cupertino, CA

Senior engineer on team encoding and assembling all iTunes video media for millions of users globally.

- Owned encoding toolchain for distributed processing cluster, specified deliverable media formats, developed validation test suites, and created reference media for hardware compliance testing.

- Led two major workflow rewrites for HDTV launch and international video expansion, ensuring scalability and reliability under growing user demand.

Earlier Career Highlights

1999 - 2008

****Senior Software Architect, The New York Times**** (2007-2008): Created tools for managing releases and production deployment. Oversaw offshore CMS development. ****Founder, Partner, Bangstate**** (1999-2008): Founded and managed five-person development consultancy. Delivered projects for clients including The Associated Press, Forbes Magazine, and Time Inc.

Education

Bachelor of Arts in History, The University of Chicago

Chicago, IL