Michael L. Welles

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Overview

Hands-on Principal Engineer with 15+ years building production distributed systems at scale for regulated industries. Deep expertise in cloud-native architectures, data-intensive applications, and systems where security and uptime are non-negotiable. At Dayforward (fintech/life insurance), architected and shipped algorithmic underwriting platform with microservices on Kubernetes in under 10 months. At Raytheon, built real-time telemetry pipelines processing thousands of jet engine sensors with fault detection and automated alerting. I lead technical design while staying hands-on with code—partnering with product to define architecture, mentoring teams, and maintaining rigorous standards for security, compliance, and reliability.

Core Technologies

Languages & Frameworks: Python, Go, Java, Rust, TypeScript **Data & Databases:** Databricks, Spark, PostgreSQL, DynamoDB, Elasticsearch **Cloud & Infrastructure:** Kubernetes, Docker, AWS (SQS/SNS, S3, SageMaker, IAM, VPC), Azure, Terraform **Reliability & Observability:** CI/CD, distributed tracing, metrics/logging, SLOs/alerting, incident response **Async Patterns:** Message queues, pub/sub, event-driven architecture, concurrency, idempotency, retry/backoff

Experience

Head of Technology, Dayforward

Jan 2020 - Sep 2021 · New York, NY

Head of technology for a life insurance fintech startup in a highly regulated environment. Led team that designed and built algorithmic underwriting and policy management platform from ground up.

- Architected distributed system with containerized Go microservices on Kubernetes, federated GraphQL API, and Vue.js frontend. Delivered initial platform in under 10 months, launching the same day the company received regulatory approval.
- Designed secure, compliant architecture handling sensitive financial and health data with encryption at rest and in transit, role-based access control, comprehensive audit logging, and strict data retention policies.
- Partnered with product and compliance teams to translate regulatory requirements into technical guardrails—building automated validation for underwriting rules, policy calculations, and premium computations with full traceability.
- Established CI/CD pipeline with automated security scanning, policy compliance checks, and zero-downtime deployments for a system requiring 24/7 uptime.

Principal Engineer, Istari Digital

Feb 2024 - Jul 2025 · New York, NY

Principal engineer for zero-trust digital collaboration platform serving DoD and aerospace engineering teams with strict security and compliance requirements.

- Led team building secure backend registry service (Python, FastAPI, SQLAlchemy, PostgreSQL) with Zanzibar-based authorization model. Designed database schema for complex asset relationships, tuned queries for lineage traversal, and managed zero-downtime migrations.
- Designed cryptographically verified asset lineage and DoD-compliant control tagging preserving dependencies and provenance without exposing sensitive payloads—enabling zero-knowledge collaboration and data sovereignty.
- Built cryptographic core in Rust with Python bindings, wrapped by SDKs for automation agents and frontend. Ensured CI/CD validated all compliance requirements on each release for ATO submission to secure and classified networks.
- Delivered all major milestones on time, successfully relaunching product for commercial and government clients.

Director of Software Development, Raytheon Technologies

Sep 2021 - Nov 2023 · New York, NY

Technical lead for next-generation data platform at Raytheon's Enterprise Data Services, building real-time flight telemetry systems for commercial aerospace.

- Built streaming data platform (Databricks, Spark, Python) processing thousands of jet engine sensors through fault detection and anomaly detection models. Designed event-driven architecture triggering severity-based automated

alerts from emergency grounding to routine inspection scheduling—where downtime and accuracy are mission-critical.
- Designed ML model training and orchestration pipeline with comprehensive audit trails tracing every output field to specific code revisions or model versions. Implemented parallel model evaluation without adding latency using asynchronous patterns and concurrent processing.
- Led "inner-source" effort creating reusable SDKs for parsing proprietary engine data formats, quickstart kits for Databricks projects, and synthetic data generators.
- Led team of 14 developers across three agile projects while supervising platform migration support for 40+ teams.

Consulting Principal Engineer, CubeNexus.ai

Aug 2025 - Present · Remote

Advising on technical strategy and architecture for geospatial intelligence platform with LLM-based querying and 3D visualization.
- Rebuilt ingestion pipeline to handle multi-terabyte datasets (PySpark, Pandas), added real-time telemetry streaming with event-driven architecture, and hardened API backend (Python/FastAPI).
- Established CI/CD across repositories and mentored team on distributed systems patterns and cloud-native best practices.

Lead Engineer / Chief Technologist, Riverdrop

Jan 2018 - Feb 2019 · New York, NY

Chief technologist for early-stage startup building specialized product search engine with ML-driven data processing.
- Designed ML-driven ETL pipeline (Python, spaCy, NLTK, scikit-learn) with image recognition and classification models on AWS SageMaker. Built asynchronous data flow using AWS SQS/SNS for event-driven processing with DynamoDB for metadata storage.
- Implemented retry logic, dead-letter queues, and idempotency for reliable distributed processing. Developed search API in Go against Elasticsearch indexes and React.js/TypeScript frontend.
- Architected system as microservices with discrete transformation steps, each packaged as Docker images and deployed via CI/CD to Kubernetes (built and managed with Terraform).

Director of Engineering (Mobile), MediData

Feb 2017 - Jan 2018 · New York, NY

Led engineering teams for Patient Cloud platform collecting clinical trial data directly from patients and clinicians via mobile devices and wearable sensors in regulated healthcare environment.
- Managed products including patient outcomes apps (iOS/Android), clinician outcomes platform, native SDK, wearables platform, and supporting backend.
- Launched two major mobile initiatives, migrated all native development to Swift and Kotlin, and instituted organizational improvements that increased average team velocity by 2.5×.

Principal Architect / Director of Mobile, Huge

May 2013 - Feb 2017 · Brooklyn, NY

- Led cross-functional team of 20+ iOS, Android, and backend engineers, QA analysts, designers, and product managers. Evangelized agile best practices, continuous integration and continuous delivery.
- Instituted engineering guild system for cross-office knowledge sharing and formal sponsorship of guild-proposed R&D initiatives. One guild-led initiative generated a new product proposal that secured a $5M development contract.
- Directed notable client projects including smart Bluetooth audio/video accessories with live streaming and voice commands, companion app for AAA game publisher that scanned players into avatars, and numerous B2B and B2C mobile commerce applications.

Senior Software Engineer – iTunes Store Video Workflow Group, Apple

Mar 2008 - May 2011 · Cupertino, CA

Senior engineer on team of five responsible for encoding and assembling all iTunes video media. Owned encoding toolchain used by 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.

Earlier Career

Manager of Mobile Technology, Consumer Reports (Jul 2011 - May 2013): Founded mobile applications group and built in-house team for iOS/Android development. **Senior Software Architect, The New York Times** (Aug 2007 - Mar 2008): Created tools for managing releases and production deployment. **Founder, Partner, Bangstate** (Jun 1999 - Mar 2008): Founded and managed five-person development consultancy delivering projects for clients including The Associated Press, American Bar Association, Atlantic Records, Forbes Magazine, and Time Inc.

Education

Bachelor of Arts in History, The University of Chicago

Chicago, IL