



Serverless Provider Data Management for a Top 10 US Medical Center

Transitioning an elite academic health system from error-prone manual data workflows to a secure, event-driven AWS cloud platform to accelerate profile approvals by 60%.

Overview

We engineered a secure, multi-tenant SaaS provider data management platform leveraging an event-driven architecture on AWS.

- Replaced chaotic email-based tracking with automated approval chains and dynamic ticketing integration via Ivanti.
- Achieved a 60% reduction in average data update times, shrinking change latencies from weeks to under a week while establishing a flawless, encrypted audit trail.



Client Profile

This leading academic health system sits at the forefront of medical research, clinical education, and patient care. The integrated health system coordinates care across multiple inpatient and outpatient facilities with a workforce of over 40,000 healthcare professionals.

Challenges: Fragmented Directories and High Regulatory Risk

Coordinating physician data without a unified tool created systemic vulnerabilities:

- **Inaccurate Provider Profiles:** Changes to doctor credentials, locations, or insurance panels were managed manually over disparate email chains, frequently stalling out and burying updates.
- **Administrative Resource Strain:** Office staff spent excessive hours executing repetitive tracking workflows, reducing their availability for patient-facing services.

- **Human Error Propagation:** Manual data replication across scattered on-premises environments increased the risk of database errors, impacting the public "Find-a-Doctor" directory and Epic EHR synchronization.
- **Absence of Governance & Audits:** The client had no centralized method to monitor historical modifications, making it impossible to track who changed specific credentials, when, or why.

QBurst Solution: Event-Driven Cloud Transformation

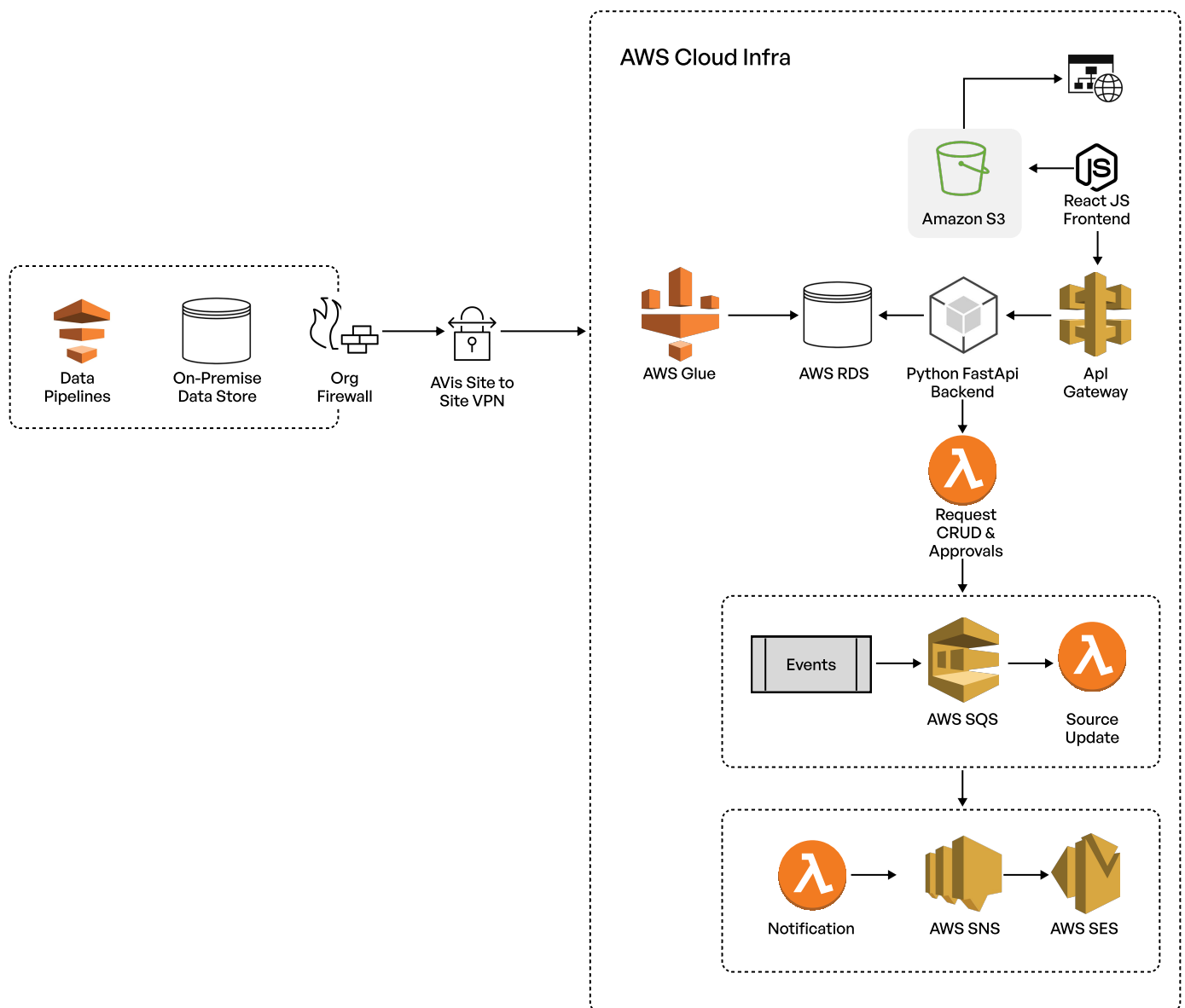
We designed and deployed an enterprise-grade, serverless SaaS platform backed by a modern ReactJS front-end and a Python FastAPI backend. The system unifies data intake, automatically routing change requests through strict, hierarchical approval stages.

The cloud-native architecture enforces the principle of least privilege, isolating data views via role-based access controls while maximizing backend performance:

- **Automated Workflow Orchestration:** When a manager alters a provider profile on the dashboard, the platform triggers an automated workflow. It pushes notifications across approval layers, integrating with Ivanti via automated ticketing for mission-critical manual interventions.
- **Serverless Event Ingestion:** Implemented an asynchronous pipeline utilizing Amazon EventBridge, Amazon SQS, and AWS Lambda to handle high-concurrency payloads with zero permanent infrastructure overhead.
- **Compliant Data Processing & ETL:** Deployed AWS Glue and AWS Step Functions to execute structured extract, transform, and load (ETL) routines, cleanly updating downstream applications and formatting automated weekly data quality reports for administrators.
- **Enterprise Security and Privacy:** To maintain absolute HIPAA compliance, all data payloads are fully encrypted in transit and at rest using custom keys managed through AWS Key Management Service (KMS).

Key Features

- **Role-Based ReactJS Console:** A clean web portal for managers to initiate updates and administrators to inspect compliance metrics.
- **Built-in Fault Tolerance:** Configured dedicated Dead Letter Queues (DLQs) within Amazon SQS to isolate failed payloads safely, preventing data loss during transmission drops.
- **Granular Traceability Observability:** Complete end-to-end transaction tracing and logging enabled via Amazon CloudWatch and AWS X-Ray.
- **Automated Integrity Diagnostics:** Weekly background scripts scan data lakes to generate and email automated data quality reports, flagging anomalies before they reach production directories.



Detailed System Architecture

Impact

- **60% Acceleration in Approval Cycles:** Turnaround times for critical physician profile updates plummeted from 2–3 weeks to under one week.
- **Alleviated Operational Fatigue:** Office staff were liberated from repetitive follow-up loops and manual ticketing entries, shifting focus back to core operational efficiencies.
- **Flawless Data Fidelity:** Eliminating multi-point manual data entry minimized clerical discrepancies, generating clean data quality reports across public and internal systems.
- **Hardened Privacy Posture:** Migrating data to a secure AWS cloud backed by KMS encryption ensured complete compliance with data privacy regulations.
- **Future-Ready Extensibility:** The decoupled, serverless design establishes an elastic foundation capable of supporting additional hospital networks and clinics instantly without software re-engineering.