David Rae

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Senior Backend & Distributed Systems Engineer

9+ years of experience owning production architecture end to end, from relational schema design and high-throughput event pipelines to zero-downtime cloud deployments. Proven track record replacing fragile legacy monoliths with resilient, containerized microservices, distributed inference routing, and compliant payment/document workflows.

Technical Skills

- **Languages & Frameworks:** TypeScript, Node.js, JavaScript (ES6+), Python, PHP, SQL, HTML/CSS, Bash/Shell
- **Architecture & APIs:** Distributed Systems, Event-Driven Architecture, Microservices, REST APIs, Async Worker Pools, Webhooks, Idempotency, Stripe API
- **Data & Caching:** MySQL (Schema Design, Composite Indexing, Query Profiling), Redis, High-Volume ETL & Batch Ingestion, Medallion Architecture
- **Cloud, DevOps & Networking:** GCP (Cloud Run, Cloud Build, Compute Engine, IAM), AWS (S3, ECS, SES), Docker, Linux Internals (Ubuntu/Debian/CentOS), CI/CD, Zero-Trust Networking (Tailscale/Headscale)
- **AI & Media Pipelines:** Whisper ASR, LLM Routing & API Integrations, FFmpeg Processing, Edge Model Caching

Professional Experience

Speechweave: Founder & Principal Systems Engineer

2025 - Present

- Architected a distributed, GPU-agnostic compute orchestration engine that dynamically routes Whisper speech-to-text and LLM inference workloads based on live spot pricing, boot latency, and execution benchmarks.
- Engineered a Zero-Trust Network Access (ZTNA) mesh using Docker, Tailscale/Headscale, and ephemeral auth keys to onboard untrusted worker nodes over outbound-only encrypted tunnels with zero open inbound ports.
- Built an edge caching proxy for multi-gigabyte ML models alongside heartbeat telemetry and dead-node detection to minimize downtime and transparently fail over interrupted jobs.

David Rae Dev: Senior Backend & Distributed Systems Engineer

2017 - Present

Full-lifecycle architectural owner and lead backend consultant across telecom, fintech, edtech, and proptech industries.

High-Throughput Event Pipelines & Legacy Modernization (Cloud VoIP Platform):

- Led the zero-downtime Strangler Fig migration of an on-premise CentOS/PHP telephony monolith into decoupled, containerized Node.js/TypeScript microservices on GCP (Compute Engine, Cloud Run).
- Re-architected batch billing into live Call Detail Record (CDR) and BroadWorks XSI event stream aggregation built to absorb holiday call-center bursts, with disk-buffered batch inserts to prevent MySQL lockups.
- Replaced a proprietary recording appliance with a C++ capture utility, FFmpeg dual-channel audio pipeline, and GPU-accelerated Whisper/LLM summarization, backed by an automated call-flow regression suite.
- Developed a multi-tenant BroadWorks administrative portal with granular role-based access control (RBAC).

Automated Billing, Document Lifecycle & Compliance (EdTech Platform):

- Architected an end-to-end CRM, student onboarding, and institutional billing platform using Node.js, TypeScript, MySQL, and Redis.
- Engineered idempotent Stripe API pipelines (Checkout, Payment Links, Invoicing, webhook reconciliation) and queue-driven headless PDF generation for fee schedules and audit statements.
- Eliminated credential-storage risk by designing passwordless, single-use cryptographic token handshakes for public form completion and sensitive financial document uploads.

High-Volume Data Ingestion & PII Security (PropTech & FinTech):

- Architected field-level encryption and automated PII redaction at rest for sensitive customer records (SSNs, driver's licenses, banking information).
- Built automated ingestion and normalization pipelines for real estate MLS data into MySQL, utilizing composite indexing and query profiling for sub-second search.

Earlier Experience

Independent Web Developer & Systems Support Specialist

2011 - 2017

- Built full-stack web applications, custom CMS tooling, and e-commerce platforms with PayPal payment integrations for regional small businesses. Managed Linux/Windows endpoint deployments, TCP/IP networking, and technical support for Auburn Union School District and PLNU.

Education

- Bachelor of Arts in Graphic Design - *Point Loma Nazarene University*