

Marc Lally

Senior Software Engineer | Node | React | Serverless | AWS

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TLDR;

- Senior Software Engineer | TypeScript · Node · React · Python · Rust | PostgreSQL · Redis · MongoDB · GraphQL | AI-Embedded Workflows & Agents | DevOps | Terraform | Serverless | Docker | Likes Challenges

Profile

- As a Senior Software Engineer, I design and operate distributed systems that form the backbone of growing companies. My approach centers on translating complex business constraints into elegant, durable technical solutions that scale reliably while remaining operationally sustainable. I've led cross-functional teams through architectural transformations, established platform-wide standards, and consistently elevated engineering maturity.

Technical Scope & Impact

- Design and evolve scalable distributed systems optimizing for reliability, cost efficiency, and velocity. Lead service-oriented and serverless architecture with clear boundaries, data ownership models, and operational visibility. Establish API standards (REST/GraphQL) with rigorous versioning and governance. Code at impact: TypeScript/Node, Python, Rust. Own data architecture across SQL and NoSQL systems, design AWS-native platforms (Lambda, API Gateway, DynamoDB), and establish observability, CI/CD, and security standards at the platform level. Build API's and Frontend functionality and UI to match through Javascript, React. Build AI Workflows and Agents to automate tasks and processes.

Leadership

- Drive architectural direction across teams through data-driven strategy and clear decision frameworks. Mentor senior engineers and emerging technical leads, elevating decision quality and developing the next generation. Bridge engineering, product, and business stakeholders, translating requirements into coherent technical direction and credible delivery plans. Enable teams to move at velocity without sacrificing system integrity - ensuring short-term decisions align with long-term platform health and organizational scalability.

Education

University College London, B.Sc. (Hons) in Computer Science – London, UK

Sept 2018 – June 2021

- B.Sc. Computer Science (Hons)
- University College London (2:1)

Certifications

- AWS Certified Solutions Architect - Associate Level - Validation of cloud architecture expertise
- AWS Certified Developer - Associate Level - Validation of cloud development expertise

Experience

Senior Backend Engineer, UK Ministry of Defence – UK

Feb 2025 – Jan 2026

- Architected AI-powered security workflows using vector embeddings to surface anomalies in high-throughput identity logs, improving threat detection speed.
- Delivered high-throughput Node.js microservices on AWS Lambda and DynamoDB, implementing fine-grained IAM policies for secure GovCloud deployment. Optimized AWS Concurrency and execution context reuse to maintain sub-100ms latency for JWT-authenticated traffic volumes.
- TDD (Jest/Supertest), raising code coverage and cutting production regressions. Established contract testing with Pact to stabilize distributed service boundaries.
- Hardened security posture by integrating threat modeling and automated dependency scanning into CI/CD pipelines. Built "secure-by-default" patterns for OAuth 2.0 and JWT identity flows.
- Aggressive profiling with AWS X-Ray and performance tuning of DynamoDB GSI/LSI patterns. Scaled platform throughput via intelligent request batching and SQS-driven async processing.
- Implemented comprehensive observability with structured logging, distributed tracing, and custom metrics enabling rapid incident resolution.
- Built backend functionality in Node/AWS and integrated internal tooling into the workflows. Built AI Agents to optimize and control the workflows and run DevOps tasks.

Senior Full Stack Developer | Tech Lead, Codeium – Remote

Mar 2023 – Dec 2024

- Full-stack development of enterprise-grade AI coding assistants, optimizing real-time inference delivery and high-throughput vector indexing workflows.
- Architected scalable React/TypeScript interfaces for complex developer workflows, including VS Code and JetBrains IDE integrations.
- Designed and implemented zero-trust authentication and authorization patterns for multi-tenant enterprise deployments.
- Optimized frontend performance and state management (Redux/Zustand), reducing client-side latency for large repositories.
- Established rigorous E2E testing patterns (Playwright/Cypress/Jest) and CI/CD automation, ensuring stability across diverse deployment environments.
- Developed agentic workflows for automated technical design reviews, leveraging LLMs for context-aware code reasoning and architectural consistency checks.
- Design and build scalable frontend interfaces using React to support extension of functions or new features.

Senior Full Stack Developer, Shell Global Energy – Remote

July 2022 – Feb 2023

- Engineered a horizontally-scalable GraphQL layer (Apollo Server) on Node.js/Lambda. Optimized data fetching for high-throughput daily transactions through DataLoader batching and Redis-based caching strategies.
- Developed robust payment pipelines with Stripe and Adyen, implementing PCI DSS Level 1 compliance, idempotency keys, and sophisticated webhook retry policies to ensure transaction integrity.
- Implemented fault-tolerant architectural patterns including circuit breakers, bulkheading, and dead-letter queues to maintain platform stability under extreme load.
- Implemented comprehensive monitoring with CloudWatch, X-Ray, and custom dashboards; configured intelligent alerting enabling rapid incident resolution and proactive issue detection.
- Mentored 6+ engineers on distributed systems, payment processing, and system design; conducted 40+ technical interviews.
- Improved deployment velocity enabling 5+ releases daily through CI/CD automation and feature flags; conducted disaster recovery drills.
- Design and build new frontend interface UI for Shell internal tooling/order and management system using React.js, TypeScript, and GraphQL.

Senior Full Stack Developer | Tech Lead, Studio Rotate – Remote

June 2021 – July 2022

- Directed technical delivery for high-visibility Next.js/Vue.js applications. Defined clean API contracts and schema governance to support extensive user sessions without architectural sprawl.
- Built and managed infrastructure using Terraform and AWS, deploying Node.js/Serverless backends with automated CI/CD pipelines via GitHub Actions.
- Elevated engineering maturity by introducing ESLint/Prettier standards, trunk-based development, and peer code review workflows. Mentored senior engineers on system design and performance profiling.
- Implemented deep observability and alerting; analyzed performance metrics to identify and eliminate bottlenecks, resulting in a significant improvement in system throughput.
- Resolved critical production incidents through systematic root cause analysis, establishing post-mortem practices that converted failures into long-term system improvements.
- Designed and built mostly backend Serverless API to support builds taking place for Chillys and Big Green Egg. Built frontends in Vue.js and React.js

Senior Backend Developer, Sainsburys Digital

Dec 2020 – June 2021

- Modernized legacy Node.js/TypeScript services by refactoring to a modular architecture and patching critical vulnerabilities. Integrated Google DV360 API via a Next.js middleware layer, processing massive ad impression datasets.
- Optimized the critical rendering path; reduced React bundle sizes and slashed LCP through aggressive code-splitting and asset optimization.
- Hardened data security by implementing end-to-end encryption and field-level access controls, ensuring strict compliance without slowing down feature delivery.
- Architected modular, decoupled components and reusable utilities that streamlined the onboarding process for new engineers from weeks to just a few days.
- Collaborated on GraphQL schema design and cross-team API contracts, leading architecture walkthroughs to ensure technical alignment.
- Advanced PostgreSQL performance through strategic indexing, connection pooling (PgBouncer), and schema normalization, resulting in a significant gain in query efficiency under concurrent load.

Senior Fullstack Developer | Tech Lead, KFC Europe

Dec 2019 – Nov 2020

- Orchestrated integrations between web ordering, POS (NCR/MICROS), and loyalty platforms. Established strict API boundaries and contract testing (Pact) to prevent integration drift across microservices.
- Designed multi-tenant AWS Lambda services secured via OAuth 2.0 and JWT, ensuring PCI DSS Level 1 compliance for high-availability fast-food infrastructure.
- Optimized PostgreSQL and DynamoDB schema designs to meet sub-50ms p95 latency targets. Implemented multi-layer caching (Redis/CloudFront) to achieve performance gains.
- Coordinated technical delivery across global teams, enabling a high-release-velocity environment (50+ monthly features) with a heavy focus on stability.
- Mentored 6 engineers through the complexities of distributed systems and payment processing; served as a key technical interviewer.
- Aggressively tuned Lambda resource allocation and cold starts, cutting execution time and infrastructure burn.
- Helped to architect and build using terraform and cloudformation the transformation of core KFC Services into an AWS eco-system, with a focus on high availability and scalability. AWS SQS and SNS with Lambda were used to replace legacy services.

Senior Frontend Engineer, Preqin

Feb 2019 – Nov 2019

- Directed frontend architecture for a high-traffic financial platform. Combined React, TypeScript, and Elasticsearch to deliver high-performance search and complex data visualization for institutional investors.
- Authored technical specifications and ADRs, ensuring architectural decisions aligned with accessibility (WCAG 2.1 AA) and performance-first design principles.
- Reduced bundle sizes and significantly improved Core Web Vitals (LCP 2.1s → 1.2s) through custom Webpack/Vite configurations and code-splitting strategies.
- Implemented exhaustive test suites using Jest and React Testing Library, achieving high coverage across the critical paths of global financial data flows.
- Mentored junior and mid-level engineers on React patterns, TypeScript, and accessibility, building technical capacity through regular pair programming and code reviews.
- Optimized Elasticsearch query patterns and mapping, reducing p95 search latency from 800ms to 150ms across massive financial taxonomies.

Senior Front End Developer, MelodyVR

Jan 2018 – Dec 2018

- Built a custom React-based CMS on Node.js/Serverless, enabling content teams to orchestrate and distribute VR assets across cross-platform channels with zero downtime.
- Designed a scalable, component-driven UI architecture using Storybook and design tokens, which accelerated iterative feature delivery.
- Managed resilient data pipelines handling high-frequency content updates, ensuring schema stability and zero-downtime deployments.
- Architected CI/CD pipelines using GitHub Actions and Terraform (IaC), slashing deployment cycles from hours to minutes and enabling 16x faster shipping frequency.
- Optimized asset delivery and page performance, cutting load times through aggressive code-splitting and caching strategies.
- Established a rigorous testing culture using Jest and Supertest and catching the vast majority of regressions in CI.
- Established a rigorous testing culture using Jest and Supertest, achieving better coverage and catching the vast majority of regressions in CI.

Senior Back End Developer, Big Clever Learning

Apr 2017 – Nov 2017

- Architected a decoupled microservices platform using Node.js and Koa. Defined service boundaries via OpenAPI/Swagger 3.0 to ensure strict contract enforcement.
- Managed polyglot persistence across PostgreSQL, MongoDB, and Redis; delivers high availability and sub-50ms latency for a large user base.
- Integrated Stripe for high-volume billing, maintaining PCI compliance while managing transactions with robust idempotency and error handling.
- Pioneered contract and automated testing suites, ensuring stability across critical financial and counseling data flows.
- Containerized the platform with Docker and modernized infrastructure via Terraform, significantly reducing deployment overhead and improving environment consistency.
- Identified and resolved systemic latency issues, dropping execution times while optimizing cloud infrastructure costs.

Senior Back End Developer, FutureBrand

Oct 2016 – Mar 2017

- Spearheaded the integration of OAuth 2.0 and SAML 2.0, enabling secure SSO across diverse enterprise ecosystems with robust token management and key rotation in PHP.
- Developed 20+ custom plugins for Craft CMS using PHP and MySQL, delivering bespoke workflows and complex data models for global enterprise clients.
- Significantly reduced production regressions by introducing comprehensive test suites to a large legacy codebase.
- Executed incremental refactors to modernize legacy systems while ensuring zero downtime and maintaining strict backwards compatibility.
- Mentored 3 developers on authentication patterns and enterprise integration through pair programming.
- Optimized MySQL for CMS platform serving numerous sites; reduced page load time.

Senior Full Stack Developer | Team Lead, Purple Bridge Publishing

Jan 2015 – Sept 2016

- Led delivery of complex enterprise web applications on LAMP stack; established engineering standards including code style guides and security policies reducing incidents.
- Designed normalized data models and RESTful APIs handling complex educational content management and regulatory compliance for UK schools.
- Established PHPUnit testing and TDD; drove coverage and reduced production bugs.
- Pioneered Docker and Jenkins CI/CD; reduced deployment time from 2 hours to 10 minutes enabling daily releases.
- Mentored engineering team of 6 through code reviews, interviews, and design sessions focused on architectural thinking.
- Optimized MySQL for concurrent users; improved load times through indexing and caching.

Senior Full Stack Developer, MediaCode London

May 2006 – Oct 2014

- Built and maintained custom enterprise software and system integrations for financial services, healthcare, and e-commerce clients delivering solutions across diverse domains.
- Owned end-to-end requirements discovery and specification; produced technical architecture diagrams and design documents aligned with business objectives.
- Systematically optimized legacy system performance; implemented database indexing, query optimization, and caching improving response times
- Provided 24/7 production support with critical issue resolution; maintained uptime SLAs and built operational runbooks.
- Mentored multiple generations of developers on Laravel, database design, API development, and debugging techniques; conducted numerous interviews.
- Designed and optimized complex schemas for diverse domains; implemented proper normalization and backup procedures ensuring data integrity.

Business Support Analyst, Orange

Mar 2001 – Feb 2006

- Engineered technical integrations and automated reporting for telecommunications services serving 10 European countries with an extensive customer base; connected disparate legacy systems enabling real-time data visibility.
- Established development standards and code review practices across operations teams, reducing defects.
- Spearheaded digital transformation from manual processes to automated workflows; built tools and dashboards reducing administrative overhead.
- Designed data warehouses and reporting schemas enabling business intelligence for C-suite strategic decisions.
- Mentored junior developers on troubleshooting and database optimization; conducted technical interviews.
- Maintained 24/7 on-call availability for mission-critical billing systems resolving critical issues within SLAs.

Software Developer, HSBC

Jan 1997 – Jan 2001

- Developed mission-critical online banking software with stringent security requirements; implemented SSL encryption, input validation, and threat modeling.
- Ensured regulatory compliance with banking standards (BSA, AML, KYC); embedded controls into product design and testing.
- Facilitated cross-functional collaboration across product, systems, QA, operations, and risk teams; shipped features maintaining uptime.
- Supported full lifecycle from requirements through production; maintained 24/7 on-call rotation for critical incident resolution.
- Developed core banking features (transaction processing, account management, reporting) with rigorous QA and security testing.
- Optimized complex database systems storing terabytes of transactional data; ensured data integrity and backup/recovery.

Software Developer, Next Ltd

Jan 1994 – Jan 1997

- Built customer account and transaction web applications for Next's online division; implemented transactional integrity and comprehensive audit logging.
- Contributed across full lifecycle including requirements analysis, design, implementation, testing, and deployment meeting regulatory timelines.
- Implemented security best practices including password hashing, secure session management, and encryption ensuring PCI compliance.
- Supported production systems through rapid incident response; participated in 24/7 on-call rotation for mission-critical banking infrastructure.
- Learned fundamental software engineering principles in disciplined corporate environment; developed expertise in requirements-driven development and compliance-first design.
- Designed database schemas for transaction systems; understood ACID properties and data consistency requirements for critical systems.

Skills

Senior Software Engineer: Node/React | Javascript | AWS | Serverless | AI Workflows/Agents

Core Expertise: Distributed Systems | Serverless | TypeScript/Node

Distributed Systems: Scalable, high-throughput production environments

Platform Strategy: Service-oriented and serverless architecture design with operational excellence

Multi-Stack: TypeScript/Node, Python, Rust

Security & Compliance: PCI DSS Level 1, OAuth 2.0, SAML, and high-availability infrastructure