Bailey Nepe
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PROFESSIONAL SUMMARY

Software Engineer with expertise in React, Node.js, TypeScript, AWS, and PostgreSQL, passionate about designing scalable, high-performance systems. Adept at identifying and resolving complex infrastructure bottlenecks through Dockerization, CI/CD improvements, and database optimisations. Skilled at mentoring junior developers and collaborating across teams to deliver impactful solutions.

TECHNICAL SKILLS

- **Backend & Cloud:** Node.js, TypeScript, Docker, TRPC, AWS (ECS, S3, CloudFront, RDS)
- **Databases & Performance:** PostgreSQL (partitioning, indexing, CTE), Redis
- **Frontend:** React, Next.js, Code Splitting, Lazy Loading, Vitest, Playwright
- **CI/CD & DevOps:** GitHub Actions, multi-environment testing, Railway, Code pipeline, Terraform
- **Collaboration & Leadership:** Agile methodologies, code reviews, pair programming, stakeholder engagement

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PROJECTS

PilotPrep - Learning Management System (LMS) - (*In Development)*

staging.pilotprep.co.nz

Developed a multi tenant LMS tailored for pilot training and aviation education, enabling organisations to whitelabel the product and create custom-branded learning platforms.

Features

- **Multi Tenant LMS:** A pilot training platform that enables organisations to whitelabel and customize their learning experience.
- **Frontend Excellence:** Built with React, leveraging React Query and TanStack Router; pre-cache queries at build time and is deployed on CloudFront for optimal page load times.
- **Robust Backend:** Utilizes Node.js with TRPC and Prisma for type-safe APIs and efficient PostgreSQL interactions.
- **Key Features:** Custom Markdown-to-React parser for interactive modules and real-time communication via WebSockets.
- **Streamlined Deployment & Quality:** Containerised with Docker and deployed via Railway with automated E2E tests using Playwright, complemented by caching and database optimizations.

EXPERIENCE

NumberWorks'nWords - Remote

Software Developer   May 2022 - Present

- Migrated from a single EC2 instance to a Dockerized environment on AWS ECS, with Cloudfront for static assets and RDS for data, creating a fully automated CI/CD pipeline.
    - Resulted in significantly faster deployments, fewer manual steps, and reduced deployment errors.
    - Established a staging environment mirroring production to catch errors earlier and ensure consistent data sync across deployments.
- Implemented advanced compression (Brotli, gzip) for large API payloads, reducing bandwidth usage and improving end-user load times.
- Optimized back-end performance with Redis caching for frequently accessed and expensive queries, cutting API response times from seconds to milliseconds.
    - Set up intelligent cache invalidation strategies, including WebSocket partial updates to keep data in sync without re-fetching entire payloads.
- Enhanced PostgreSQL performance by using partitioning, indexing, and CTEs, bringing a critical 15-second query down to ~300ms and subsequent queries to ~50ms.
    - Restructured tables, removing redundant columns, and added indexes to minimize the need for large table joins.
- Refactored front-end React components using lazy loading and memoization to reduce bundle size and improve initial page load performance.
- Mentored new developers through pair programming and in-depth code reviews, accelerating their onboarding and ensuring high-quality, maintainable code.
- Spearheaded bug-fixing efforts, partnering with cross-functional teams to identify root causes and rapidly deploy fixes.

Waikato Aviation - Hamilton

Deputy Chief Flying Instructor   Aug 2019 - Feb 2020

- Mentored instructors on instructional techniques, aligning teaching standards to improve overall instructional consistency and quality.
- Developed instructor mentoring standard operating procedures, improving junior instructor supervision and documentation.
- Managed training plans and oversaw the progression of over 70 students, taking action to ensure on-time and satisfactory completion.
- Collaborated with customers to establish educational requirements and goals, developing tailored plans to achieve desired licences.