

Full-Stack Portfolio: Case Studies

Project 1: Comprehensive eCommerce Platform

Project Description:

Development of a complete, end-to-end eCommerce platform from scratch. The solution features a robust user frontend, a complex administrative dashboard for inventory and order management, secure payment gateway integration, and real-time notifications. The focus was on scalability, security, and a seamless user experience across all devices.

Technology Stack:

Frontend: React, Redux, Tailwind CSS, Framer Motion

Backend: Node.js, Express.js

Database: PostgreSQL

Security/Deployment: JWT Authentication, Stripe Integration, AWS EC2, Docker

Complex Challenges & Full-Stack Solutions:

Challenge 1 (Database Architecture & Performance): Designing a schema to efficiently manage thousands of unique products with multiple variations, while maintaining rapid response times for concurrent user searches and filtering requests.

Solution: Engineered an optimized PostgreSQL database structure with advanced indexing and materialized views. Implemented efficient query optimization and database clustering to handle high traffic and ensure data integrity.

Challenge 2 (Secure Real-time Inventory): Preventing overselling by ensuring real-time inventory updates across the platform during high-concurrency flash sales events.

Solution: Utilized Redis for distributed locking and Webhooks with Stripe to handle payment confirmations asynchronously. Implemented transactional database operations on the Backend to guarantee accurate inventory deductions only upon successful payment.

Project 2: Interactive Social Media Dashboard

Project Description:

A high-performance social media management dashboard that allows users to connect multiple profiles, schedule posts, view real-time analytics, and interact with audience comments across different platforms (e.g., Twitter, LinkedIn).

Technology Stack:

Frontend: Vue.js, Vuex, BootstrapVue

Backend: Node.js, Fastify

Database: MongoDB

API/Security: RESTful APIs, OAuth 2.0 (for platform integration)

Complex Challenges & Full-Stack Solutions:

Challenge 1 (Complex API Third-Party Integration): Securely managing multiple OAuth tokens and differing API rate limits for various social media platforms simultaneously.

Solution: Developed a specialized backend service using Node.js to manage token refresh flows and implement intelligent request queuing. Designed a robust OAuth integration workflow with granular error handling.

Challenge 2 (Scalable Data Aggregation): Displaying unified, real-time analytics from multiple distinct sources without significant performance lag on the client side.

Solution: Built an ETL (Extract, Transform, Load) pipeline in the Backend that fetches and normalizes data periodically. Implemented MongoDB aggregation pipelines to serve pre-calculated analytical data quickly via lightweight APIs to the Frontend.