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Fleet Management System

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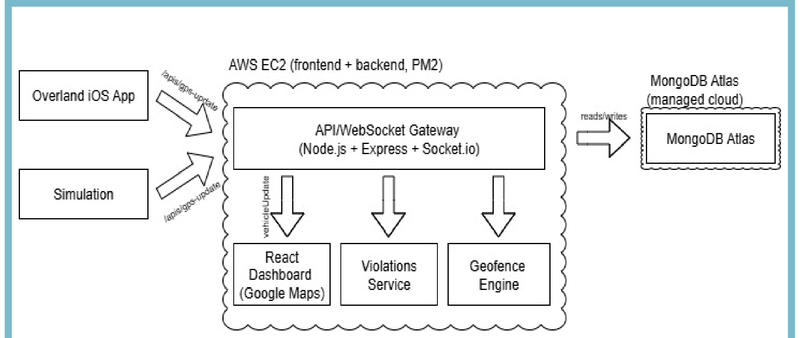
Summary

This project delivers a cloud-hosted fleet system that shows live vehicle position on a Google Map, draws polygon geofences, and detects **entry** and **exit** events in real time. An Overland iOS app (or a simulator) posts GPS points to a Node.js/Express API on AWS EC2. The server stores snapshots and history in MongoDB Atlas, checks geofences, and pushes updates to the React dashboard with Socket.io. The dashboard shows a vehicle list, colour-coded markers, a geofence manager, a violations panel with resolve actions, and a simple history view. The build is deployed on EC2 with PM2 and includes a /health check for uptime during tests.

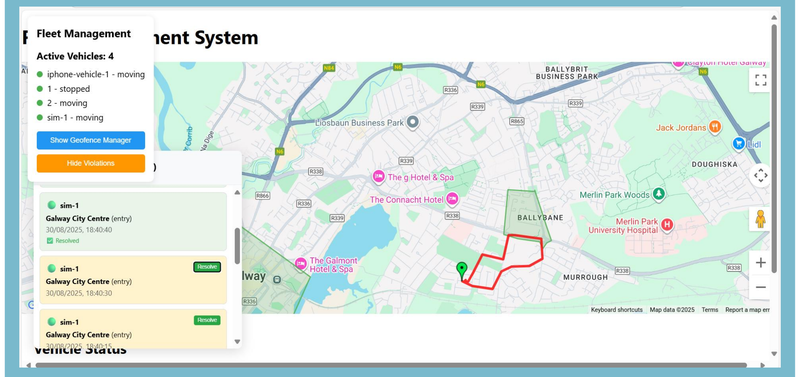
Architecture Diagram



Tools Used

- **Frontend:** React, Google Maps JavaScript API
- **Backend:** Node.js Express, Socket.io
- **Database:** MongoDB Atlas
- **Cloud:** AWS EC2, PM2
- **Dev/Test:** VS Code, TalendAPI, curl
- **GPS Source:** Overland iOS app (simulator as backup)

Web Interface



Topics Covered

- Real-time data with Socket.io
- Geofencing: point-in-polygon and circle checks
- Cloud deployment on AWS EC2 with PM2
- Rest API design for ingest and read paths
- MongoDB Atlas: snapshot, history, and violations
- Google Maps integrations in React
- Monitoring: /health, logs, and basic metrics
- Testing with live phone data and a simulator

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