Project Brief

Fleet Management System

Overview

Designed and implemented a prototype fleet management platform for bus scheduling and real-time tracking. The system demonstrates how GPS data from buses can be collected, transmitted, and visualized, even in the absence of physical devices, by using simulated telemetry. The goal was to validate a scalable IoT-driven solution for transport operators.

Technologies Used

- Backend: Bun (Elysia framework)
- Frontend: VueJs
- Database: PostgreSQL
- Device Simulation: Rust (GPS + telemetry generator)
- Communication: MQTT broker & WebSockets

Architecture

Bus Device [Rust] → MQTT Broker → Bun Server → PostgreSQL → VueJs Dashboard

Implementation Details

- Developed a Rust-based simulator that publishes random but realistic GPS coordinates, speed, and fuel levels to an MQTT broker.
- Server (Bun/Elysia) subscribes to telemetry topics, stores data in PostgreSQL, and relays updates via WebSockets.
- VueJs dashboard renders bus locations on a map and updates in real time.
- Tauri desktop build enables cross-platform use for dispatch teams.

Key Outcomes

- Showcased a working **IoT data pipeline** from device → server → visualization.
- Built with lightweight, modern tools to prove feasibility for low-cost deployments.
- Demonstrated potential to expand into **smart mobility solutions** for regional transport operators.