

Fleet Management System

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Project Engineering

BEng (Hons) Software & Electronic Engineering

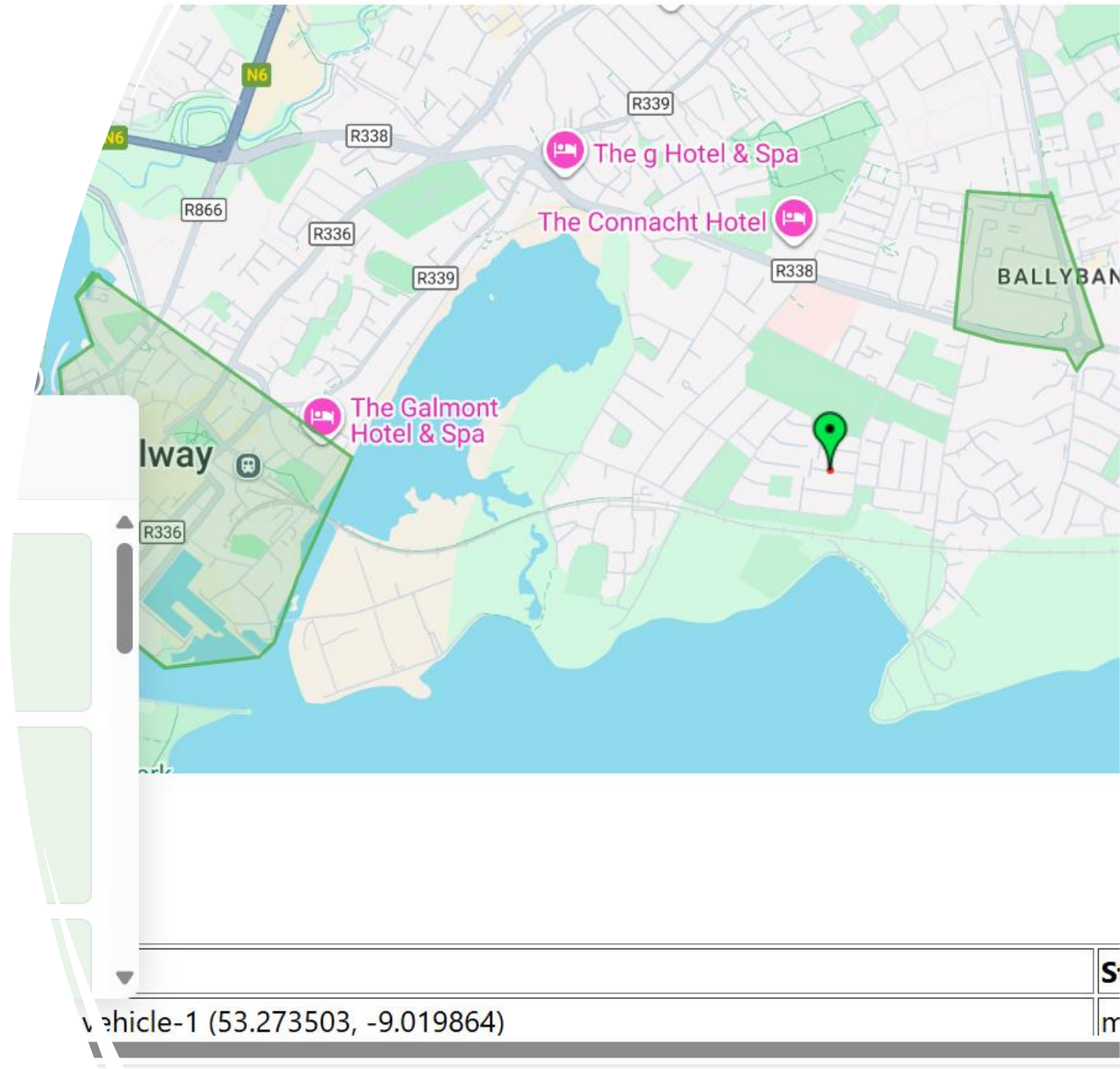


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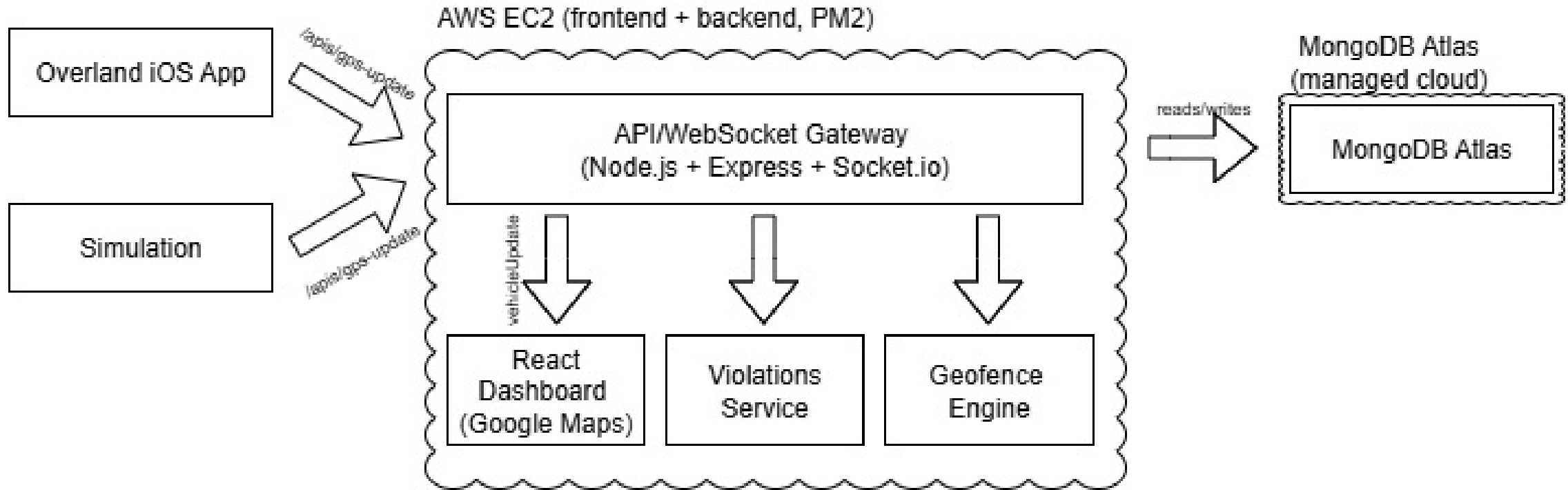
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Overview

- Goal: live vehicle tracking, geofences, real-time entry/exit alerts
- Area: cloud, networking, geospatial
- Why: lightweight visibility for small operators (low cost, quick to deploy)



Architecture



Technologies

Frontend:

- React
- Google Maps JavaScript API
 - markers, polygons, polylines

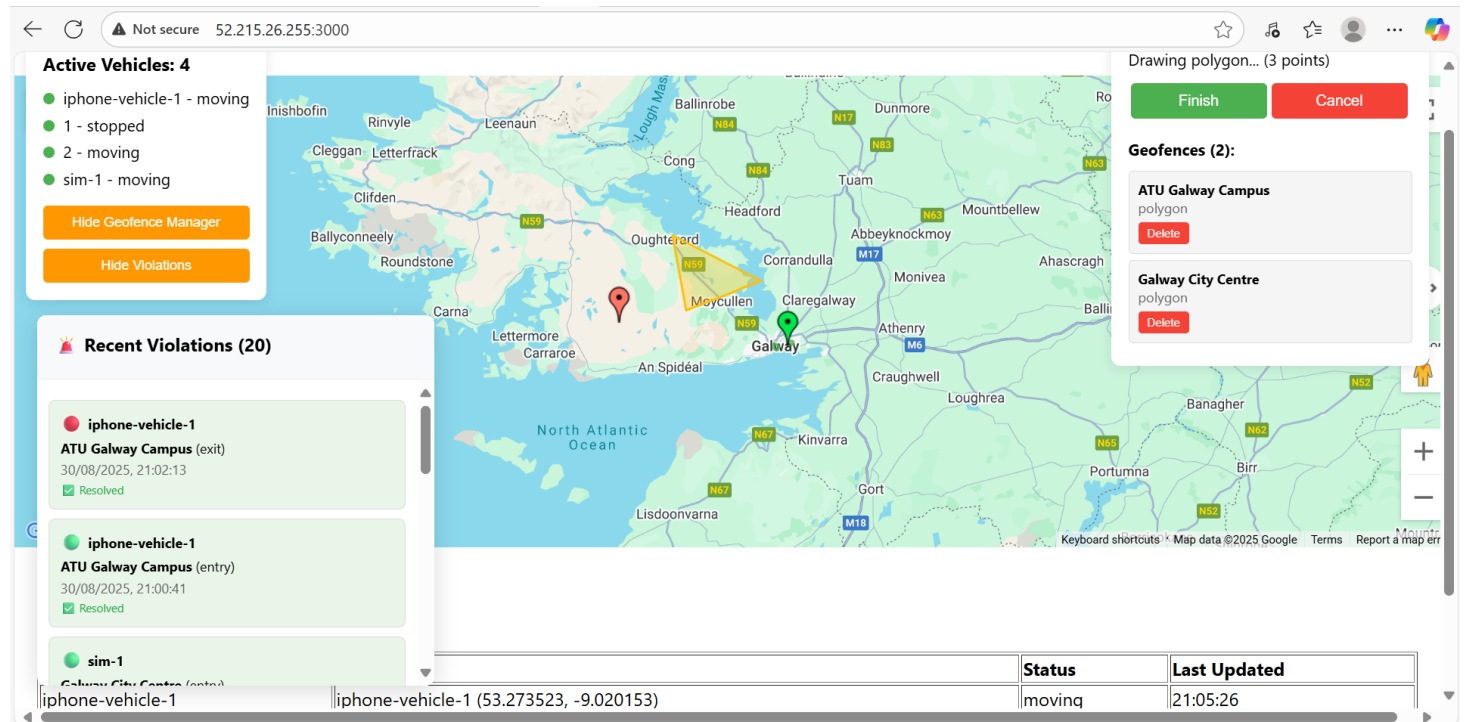
Backend:

- Node.js
- Express
- Socket.IO
- MongoDB Atlas
- AWS EC2
- PM2



Dashboard

- Colour-coded markers; live updates via Socket.io
- Geofence manager (draw polygon; create/delete)
- Violations panel (entry/exit, Resolve)
- History view (recent route replay)



Active Vehicles: 4

- iphone-vehicle-1 - moving
- 1 - stopped
- 2 - moving
- sim-1 - moving

[Hide Geofence Manager](#)

[Hide Violations](#)

Recent Violations (20)

- iphone-vehicle-1**
ATU Galway Campus (exit)
30/08/2025, 21:02:13
✓ Resolved
- iphone-vehicle-1**
ATU Galway Campus (entry)
30/08/2025, 21:00:41
✓ Resolved
- sim-1**
Galway City Centre (entry)

Geofences (2):

- ATU Galway Campus**
polygon
[Delete](#)
- Galway City Centre**
polygon
[Delete](#)

Drawing polygon... (3 points)

[Finish](#) [Cancel](#)

	Status	Last Updated
iphone-vehicle-1 (53.273523, -9.020153)	moving	21:05:26

Results

- Real entry/exit events logged at Galway City Centre & ATU Galway Campus
- Latency: updates within a few seconds
- Stable on EC2 during tests

The screenshot displays the AWS Fleet Management console interface. The top navigation bar includes the AWS logo, account ID (3407...), and user name (alan-hynes). The main content area is divided into two panels. The left panel shows a terminal window with the following log output:

```
0|fleet-api | Geofence Violation Alert: FLEET ALERT: Vehicle ipho  
ne-vehicle-1 entry ATU Galway Campus at 8/30/2025, 8:00:41 PM  
0|fleet-api | Geofence Violation Alert: FLEET ALERT: Vehicle ipho
```

The right panel, titled "Fleet Management", displays "Active Vehicles: 4" with a list of vehicles and their status:

- iphone-vehicle-1 - moving
- 1 - stopped
- 2 - moving
- sim-1 - moving

Below the list are buttons for "Show Geofence Manager" and "Hide Violations". The bottom section shows two entries for "sim-1" with the location "Galway City Centre (entry)" and timestamps "30/08/2025, 18:39:50" and "30/08/2025, 18:39:40", both marked as "Resolved". The right side of the console features a map of Galway City Centre with a red line indicating a vehicle's path. The map includes labels for "BALLYBAN" and "BUSIN". The bottom of the map shows "Map data ©2025" and "Report a map err".

Challenges & Fixes

Overland
upload
queue after
downtime

Fix: clear queue in iOS settings

GPS jitter
near edges

Fix: merge window to debounce

Deployment
reliability

Fix: PM2 + /health checks