

Aerologistics - Flight Information Explorer

A full-stack explorer for global airlines, airports, and flight routes with map visualization

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Executive Summary

A full-stack flight information explorer with a fast, card-based search UI for airlines and airports, live route lookups, and interactive Leaflet.js/OpenStreetMap route visualization, deployed on AWS EC2.

The Problem

Exploring global airline networks, airport metadata, and flight routes is scattered across disconnected sources, making it hard to quickly search, cross-reference, and visualize how airlines and airports actually connect.

Key Features

- Search airlines by country name or IATA/ICAO code
- Explore all routes departing from a selected airport
- Interactive Leaflet.js + OpenStreetMap route visualization
- Airport metadata lookup with connected airline listings
- CSV-based aviation dataset ingestion via PapaParse into PostgreSQL
- Responsive, card-based UI across devices

Technology Stack

Node.js	Express.js	PostgreSQL	JavaScript
Leaflet.js	AWS EC2		

Architecture

A Node.js and Express.js backend serves airline, airport, and route data sourced from CSV datasets (parsed with PapaParse) into a PostgreSQL database. The vanilla JavaScript frontend renders searchable, card-based results and plots routes on an interactive Leaflet.js map backed by OpenStreetMap tiles. The application is deployed on an AWS EC2 (Ubuntu) instance.

Challenges & Engineering Decisions

Challenge Cross-referencing three linked datasets (airlines, airports, routes) from raw CSV sources.	Solution Parsed and normalized CSV datasets with PapaParse into a relational PostgreSQL schema.
Challenge Designing a search experience that works starting from an airline, airport, or route.	Solution Built a card-based UI that lets users pivot freely between all three entities.
Challenge Rendering many overlapping routes on one map without it becoming unreadable.	Solution Integrated Leaflet.js with OpenStreetMap tiles for clear, interactive route visualization.
Challenge Keeping lookups fast without reaching for a heavy client-side framework.	Solution Kept the frontend framework-free (vanilla JS) to minimize footprint and maximize speed.
Challenge Deploying and keeping a Node/Express + PostgreSQL stack running on a bare EC2 instance.	Solution Deployed and manage the stack directly on an AWS EC2 (Ubuntu) instance.

Takeaway

AeroLogistics turns scattered global aviation data into a fast, explorable, map-driven experience - combining clean relational data modeling with practical full-stack deployment on AWS EC2.

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