

MICHIGAN STATE

UNIVERSITY

Beta Presentation

Airport Capacity & Ground Space Management

The Capstone Experience

Team NetJets

Ben Grycza
Kendall Korcek
Ryan MacDonald
Jay Scott
Ryann Seymour
Emily Telgenhoff

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Michigan State University

Spring 2025



*From Students...
...to Professionals*

Project Overview

- Web app to monitor airport and ground space capacities
- Interactive map with airport icons
- Airport traffic summaries with incoming flights
- Recommendation engine and simulation features to handle over-capacity scenarios



Team Member's Technical Tasks

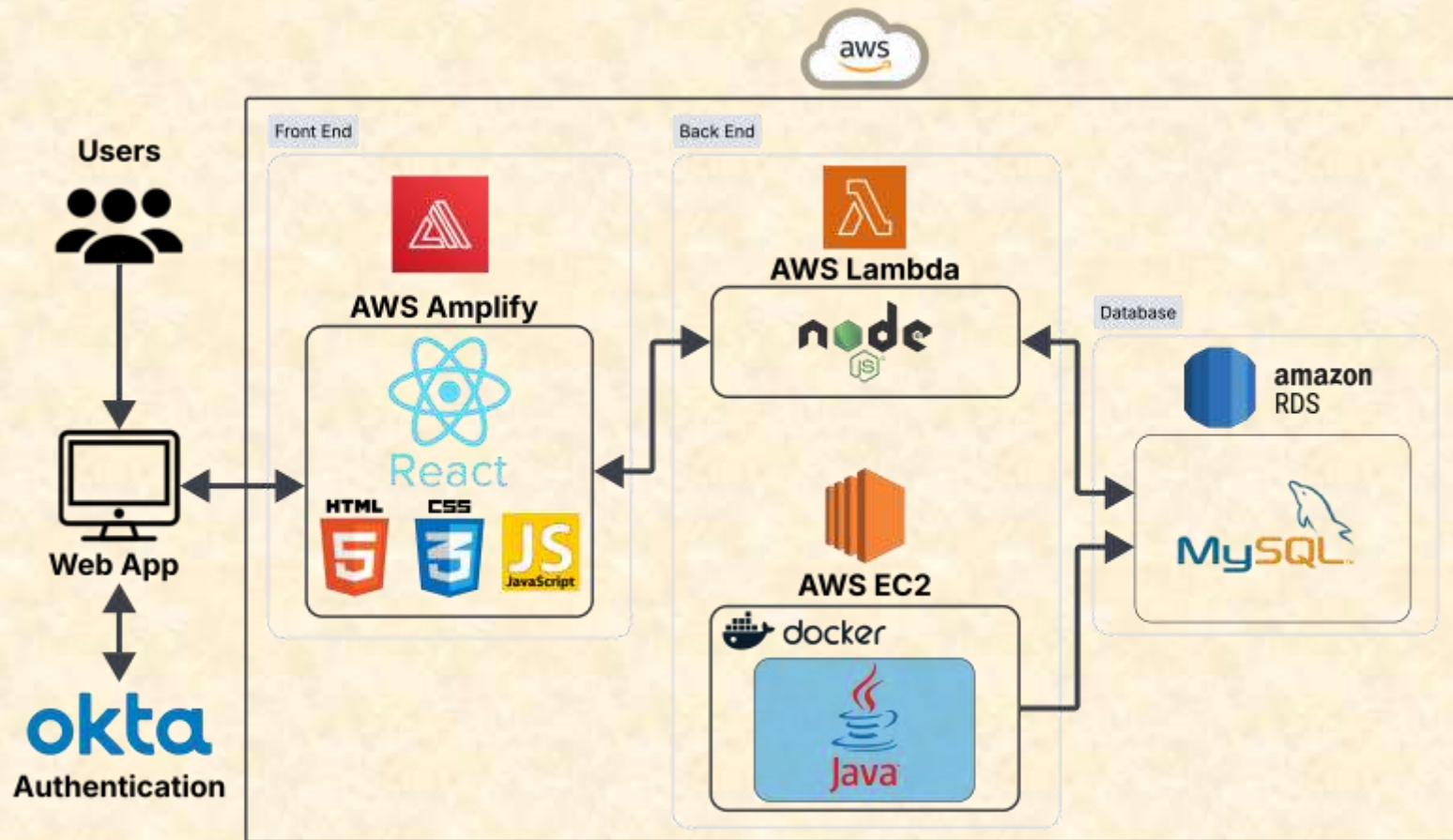
Technical Tasks Assigned

- Emily Telgenhoff
 - Airport Batch File Upload
 - Manual Maintenance Feature
 - Batch Airplane Simulation Feature
 - Airport Data Gathering/Markers Zoom In/Hover Bars/Airport capacity statuses
 - Flight metadata scraper for constant data updates
- Ryann Seymour
 - Summary Page basic layout with mock data
 - FBO map outline polygons on summary page that change color based on their population status
 - Okta Verification integration API + login page
 - Creation of cartesian grid graph and create algorithm to create data to populate it on summary page
 - UI for Batch Data Upload page
 - Notifications populate with real data
- Ben Grycza
 - Setup of our NodeJS server
 - Priorities of fbos added and allowing the user to change it in the UI
 - Add FBO option so that the user can draw in a box and it will give an estimated capacity and a polygon to display on the summary page
 - Edit FBO to change the shape and capacity of the FBO
- Jay Scott
 - Pair programming to setup NodeJS server
 - Created APIs to handle flight, airport, and FBO data
 - Initial React components for Arriving/Departing tables
 - Recommendation Engine
 - AWS Amplify/Lambda Hosting
- Kendall Korcek
 - Set up google Maps API integration with collapsable windows for searching airports and showing current alerts
 - UI and backend for simulator page displaying all planes current status and filtering between different categories
 - FBO batch upload function
 - Functionality for calculating the next closest airport
 - UI for simulator and recommendations
- Ryan MacDonald
 - AWS hosting of a backend server and a database
 - Data scraper that continuously processes live FAA data
 - Designed database for tracking planes and airports

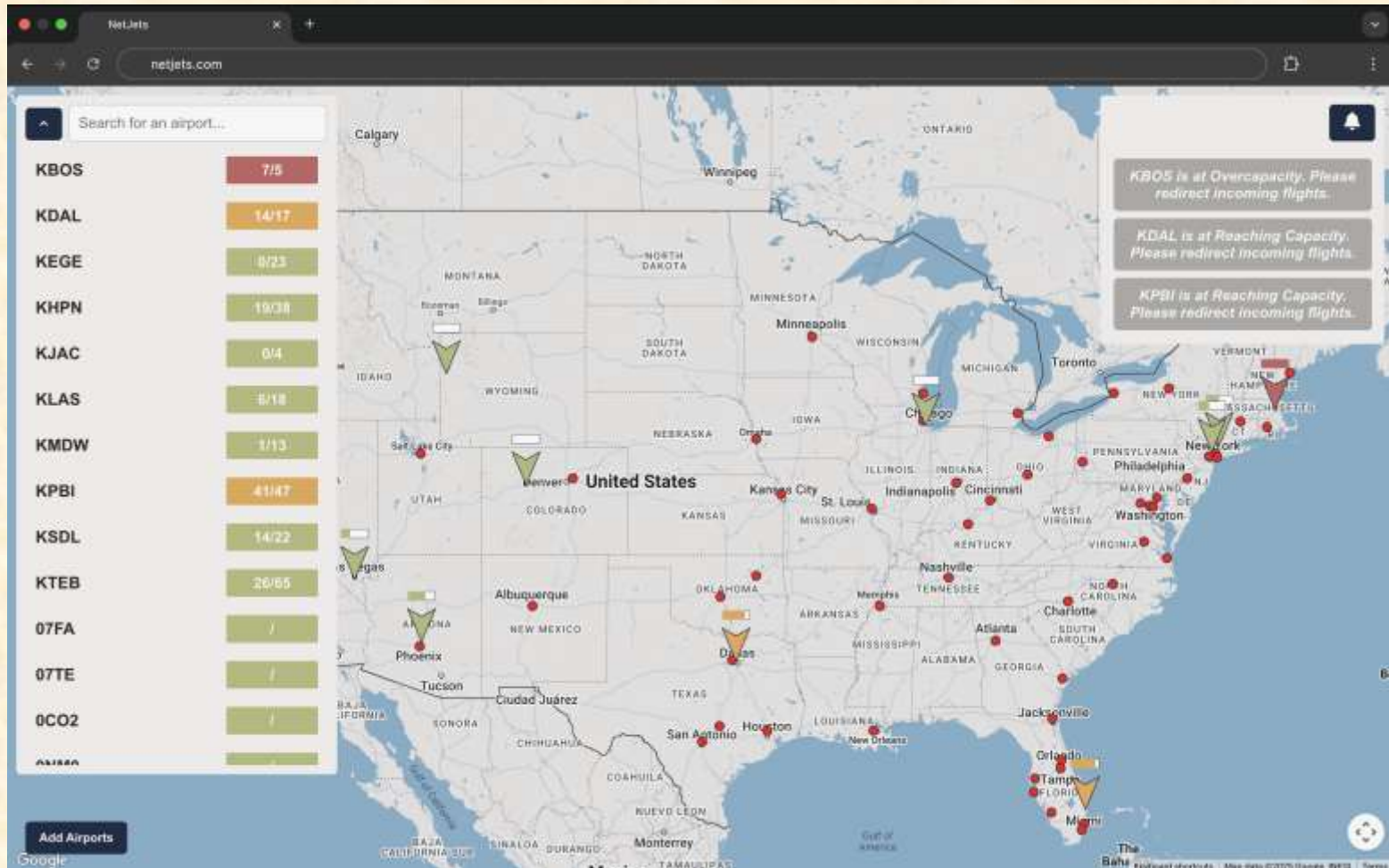
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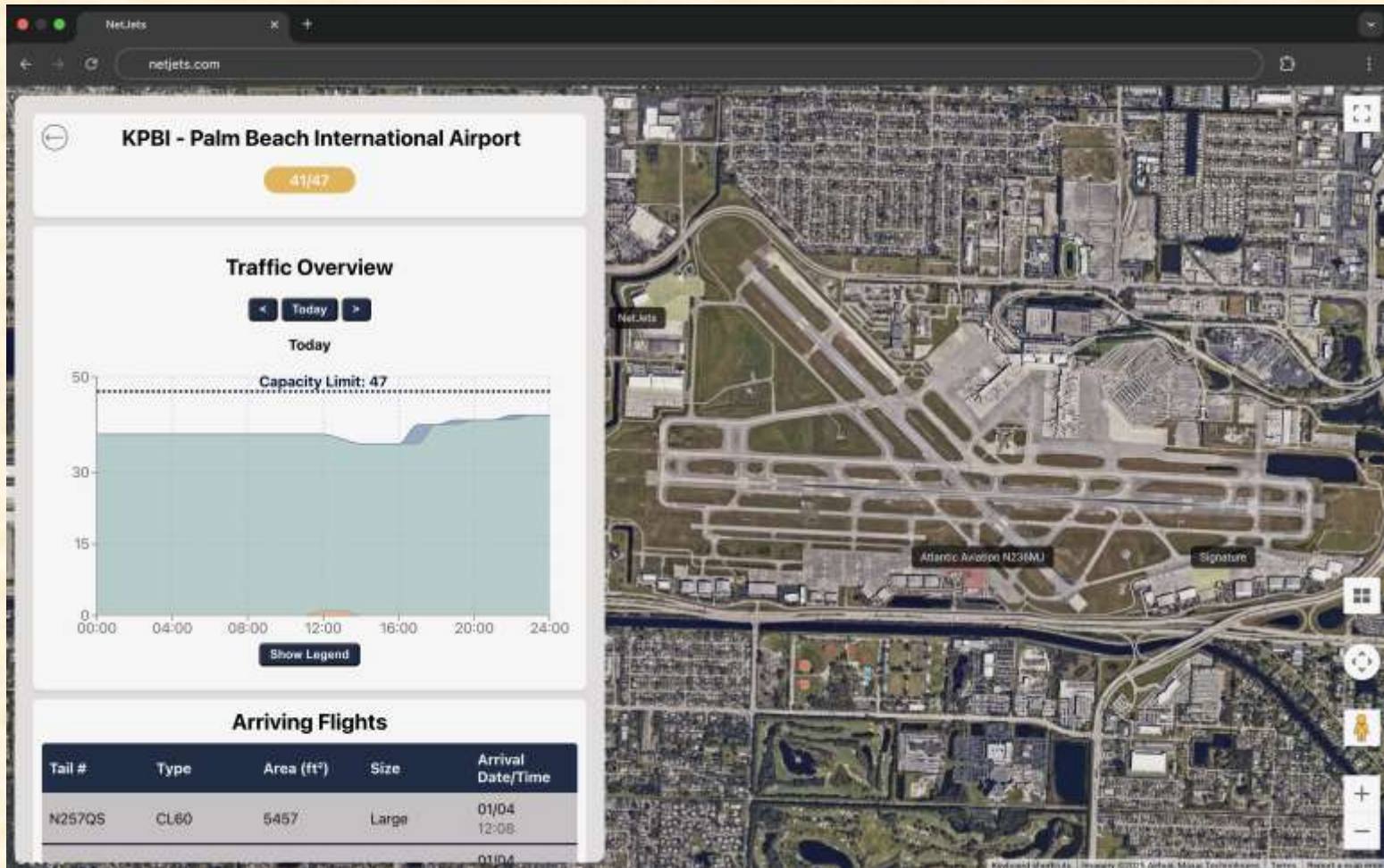
System Architecture



Main Homepage



Airport Summary Page



Simulation Page

NetJets Flight Simulator

KPBI Capacity: 13/47
FBO Capacity: 0/0

Arriving (Blue square)
Departing (Orange square)
Parked (Green square)
Maintenance (Red square)

Local Time: 4/3/2025, 01:46:43 GMT
FBO: All FBOs

Tail Number: Search Tail Number
Plane Type: All Types
Plane Size: All Sizes

Select an FBO

Tail Number	Status	Type	Size	Next Event
N266QS	Arriving	CL60	Large	2/24, 23:57
N863QS	Arriving	C700	Super Mid-Size	3/10, 21:10
N258QS	Arriving	CL60	Large	3/10, 21:22
N603QS	Arriving	C88A	Mid-Size	3/10, 21:31
N117QS	Parked	GL5T	Long Range Large	TBD
N121QS	Parked	GL5T	Long Range Large	TBD
N123QS	Parked	GL5T	Long Range Large	TBD
N156QS	Parked	GLEX	Long Range Large	TBD
N160QS	Parked	GLEX	Long Range Large	TBD
N166QS	Parked	GLEX	Long Range Large	TBD
N167QS	Parked	GLEX	Long Range Large	TBD
N168QS	Parked	GLEX	Long Range Large	TBD

Hide Simulation Tab

SIMULATION

Search Tail Numbers
Search by Tail Number

Tail Numbers (Select Multiple)

- N00QS
- N100QS
- N110QS

Selected Planes

Tail Number	Plane Type	Size	Time	FBO Name
Run Simulation				
Reset Selection				

Batch File Upload Page

NetJets App
netjets.com

Batch File Upload

Upload CSV/Batch Files to insert or update data.

Airport Data Upload FBO Data Upload

Download Example Choose File Add All Airports

Airports in the Uploaded File

IDENT	Name	Latitude	Longitude	Airport Size	Country	Region	Municipality	IATA	Remove Airport
KTEB	Teterboro Airport	40	-74	large_airport	USA	US-CA	PST	TEB	Delete
KSMM	Small Test Airport	15.6	-102	small_airport	USA	US-FL	EST	SMM	Delete
KDNR	Red Airport	0	200	small_airport	USA	US-MI	EST	DNR	Delete

What's left to do?

- Features
- Stretch Goals
- Other Tasks
 - Data-related bug fixes
 - UI improvements
 - Finishing Code Documentation



Questions?

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