

# Work Case: Comprehensive Admin Tool for Aviation Management

## Project Overview

We developed a comprehensive Admin Tool tailored for the aviation industry, designed to streamline client and user management, aircraft administration, and operational base management. This tool offers a centralized interface for both our company and clients, enhancing control over various applications, user roles, and operational data.

## Client Requirements

- **Client Administration:** Ability to manage client profiles, subscription details, and access to applications.
- **Role and Access Management:** Configuration of roles and permissions, secure authentication, and authorization mechanisms.
- **Aircraft Administration:** Management of aircraft details, including adding, modifying, and removing aircraft from the system.
- **Operational Base Management:** Detailed handling of operational bases including location data, services available, and personnel details.
- **User Management:** Allow client administrators to manage users within their organization, including adding, modifying, or removing user access.

## Solution and Features

1. **Centralized Client and User Management:** The tool provides a robust system for managing client data and user roles. This includes secure access management using Keycloak for SSO and role-based access control.
2. **Aircraft and Base Administration:** Admins can maintain up-to-date records of aircraft and operational bases. The system supports detailed entries including aircraft specifications, operational statuses, and maintenance records.
3. **Operational Profile Management:** Tailored for the unique needs of aviation operations, the tool includes functionalities for managing operational profiles, covering both airplanes and helicopters.
4. **Custom Dashboard and Interface:** A dynamic dashboard provides real-time updates and controls, enabling quick access to crucial information and functions. The frontend is built using React with TypeScript for a responsive and user-friendly experience.
5. **Scalable Backend Architecture:** Implemented with a microservices architecture using Node.js and TypeScript, the backend ensures efficient handling of data and operations. PostgreSQL serves as the primary database, with Redis for caching and RabbitMQ for asynchronous processing.
6. **Advanced Security and Performance:** The system integrates enhanced security measures, including OAuth and threat detection, and ensures optimal performance with data caching strategies.

## Technical Enhancements

- **Microservices and Containerization:** The backend is divided into microservices, each handling specific functionalities. Docker and Kubernetes are used for containerization, ensuring consistent environments and easy scalability.

- **API Gateway and Monitoring:** An API Gateway centralizes all client requests, providing security and load balancing. Comprehensive logging and monitoring are implemented using ELK stack and Prometheus with Grafana.
- **CI/CD Pipeline:** A robust CI/CD pipeline automates testing and deployment, ensuring quick and reliable updates.

### **Impact and Benefits**

The Admin Tool has significantly streamlined administrative processes for both our company and our clients. By centralizing various functionalities and offering detailed control over data and operations, it has improved efficiency, security, and scalability. The responsive design ensures accessibility across devices, providing users with a seamless experience whether in the office or on the go.

### **Future Enhancements**

Future plans include integrating advanced analytics and reporting tools for deeper insights into operational data and client interactions, as well as expanding the mobile app functionalities to cover more aspects of the admin tool.