Task 1: 2 min 45 sec

Hello, my name is Joshua Morton, and this presentation focuses on a client project I’ve being a core software developer on over the past three months. My elective module was Software Architecture, which was perfectly timed with this project as I actively contributed to architectural decisions we have since implemented.

Our client in the aviation sector has been operating a Baggage Handling System (BHS). Spanning multiple terminals, this mission critical system is the backbone of the entire airport, responsible for real time communication of faults, traffic spikes and other operational events.

This system had been in production for over a decade and the client is content, however it had some rough edges that needed to be addressed regarding hosting cost, ease of development and security concerns.

2 min 5 sec (-40)

I’ll give a brief technical overview of the system before delving into how my elective module directly correlated with the solutions we implemented.

Their immediate concern was their running costs. Their infrastructure was on-premises, requiring a dedicated Network Engineering team. In total, they spent over £200,000 annually on top-end hardware & maintenance as well as salaries.

Secondly, authentication. Each user logged in with the same Username and Password. This was a fundamental security failure. As the number of Stakeholders increased, so did the need for identity recognition.

Finally, the system was split into two distinct applications sharing a database - a website and a mobile app. These were built with different technologies, all of which are now unsupported, wasting labor and resources on development and maintenance as changes had to be made in two different places.

1min 15sec (-50)

A key area of learning for me was cloud-based hosting architectures, I learned about their powerful services such as automatic horizontal & vertical scaling, load balancing, continuous integration pipelines and authentication services – all at affordable prices when compared to the monumental task implementing all these in-house.

We chose Amazon Web Services (AWS) as our service provider, utilizing Amplify for hosting & scaling, Cognito for user account administration and application authentication and terraform for continuous integration and deployment. All in all, costing approximately one quarter of the previous operating costs.

I invested time learning about various different system architectures, such as distributed microservices and clean monoliths and this research helped our team to design a clean and easily maintainable system to solve our clients challenges.

We adopted Jamstack architecture to implement the system itself, meaning a one or many JavaScript Frontend’s served by a single Backend API. Using a unified Microsoft .NET API, we were able to deduplicate all business logic for serving data to both our Website and Mobile application, ensuring that functionality was identical between both applications and vastly reducing the complexity of future feature development.

Task 2: 2 min 45 sec

Task 3: 4 min 30 sec