TDE
DIGITAL CREATIVES IN SPORTS

Software and Server Architecture

Improving the Grand Prix experience for F1 viewers at home

S8 Graduation FHICT

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Introduction

In the feasibility study I discovered that the backend for the tool could have to deal with terabytes worth of data during a racing event. Therefore, a closer look at server and software architecture is necessary to confirm that the backend for the tool is up for the job. Jordi, a colleague with expertise in backend development and hosting already suggested that he could help with defining a solution. Therefore, I scheduled a meeting with him to discuss this in an open interview.

When is what data sent to the client?

RN365 gave feedback on the concept. They indicated that it's too risky to use exact position data to continuously visualize the position of the cars on the track. Instead, only the positions of the events happening on the track will be visualized. This also means that a continuous datastream to the client isn't necessary anymore and the client will only receive data when a new event happens.

Lambda servers

we're not working with a continuous datastream and the tool will also have a high variety of usage, as most users will connect during the race on sunday. The rest of the week, the tool won't be used at all.

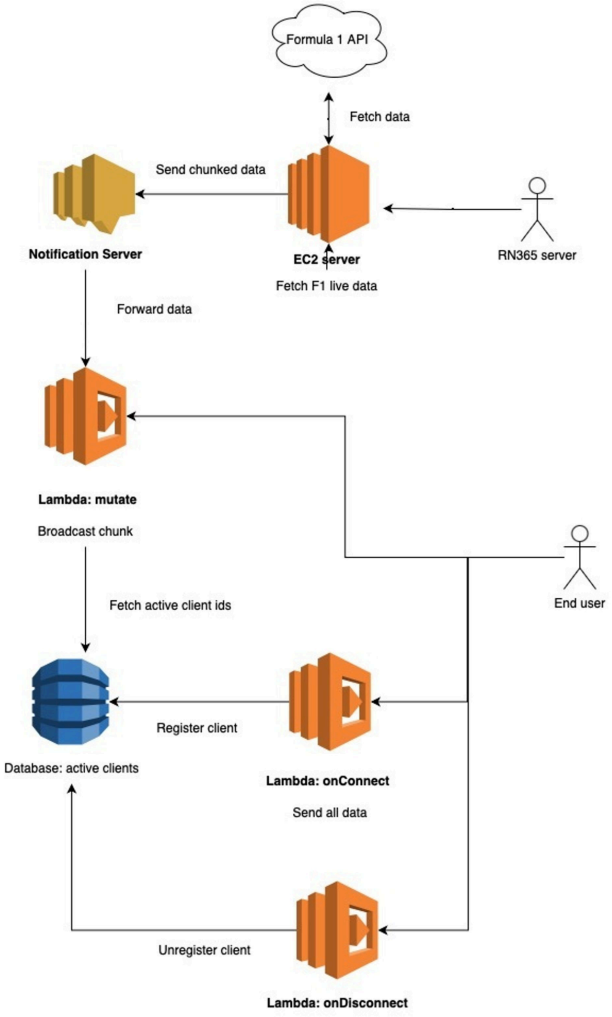
Amazon's Lambda servers will be a perfect fit for this case. A Lambda server is billed by usage, not periodically. Therefore, the server doesn't cost any money while it's not in use. Also, the server's scalability is handled all by Amazon itself. Therefore, we don't have to worry about server performance and servers crashing.

EC2 server

There is however, one task that needs to run continuously. This is the retrieving of data from the API and processing and detecting events. As this server will run continuously, a Lambda server isn't efficient. Instead, a normal EC2 server will be used for this task. Because it's just a single task that runs continuously, server performance won't be an issue.

IT Architecture Diagram

During the interview with Jordi, we visualized the architecture in a diagram. This diagram is visualized below.



https://s8-graduation.jordifranssen.com/img/ITArchitecture.jpg

Conclusion

The interview with Jordi gave a concrete plan to deploy the backend for the tool. With this architecture, I'm sure that hosting won't be unnecessarily expensive and that performance won't be an issue.

Summary

In the feasibility study, I discovered that potentially terabytes worth of data have to be processed during a racing event and concluded that some extra research needs to be conducted to define how the backend will support such large amounts of data. In an open expert interview with Jordi, I found that two types of servers will be used to host the backend of the tool. An EC2 server that continuously processes data from the FIA API and a few smaller Lambda servers to handle smaller tasks. This setup was chosen because the Lambda servers handle scalability all by themself, so they automatically scale up when demand is high. This is important as the tool will only be used during racing events. Lambda servers are also billed by usage, which saves costs when no races are held and demand is low. This setup was visualized in an IT architecture diagram.

Learning Outcome Clarification

- Learning Outcome 1: Professional Duties
- Learning Outcome 2: Situation-Orientation
- Learning Outcome 3: Future-Oriented Organisation
- Learning Outcome 4: Investigative Problem Solving
- Learning Outcome 6: Targeted Interaction

This deliverable is a professional duty on a bachelor level in the activities of Analyze, Advise, and Design as I analyzed what the architecture of the backend should look like, advised on what servers to use and designed an IT architecture diagram to visualize my findings. This is in line with IT-area User Interaction. Therefore, Learning Outcome 1: Professional Duties applies.

My work is relevant for one or more persons and creates value as I now know how to code the backend scripts. I also worked in a methodological and structured way in a context where approach and solution areas are open, with multiple stakeholders and multiple IT areas combined as I methodologically interviewed an expert in backend development and DevOps. Therefore, Learning Outcome 2: Situation-Orientation applies.

I took sustainability, business and money into consideration as I designed an IT architecture that saves money when demand is low. Also the Lambda server scale automatically, so the backend will never fail as a result of high demand. Therefore, Learning Outcome 3: Future-Oriented Organisation applies.

I identified a problem, which is the potential risk of a failing backend as a result of high demand, found an effective approach and came to an appropriate solution by using a variety of research strategies, methods and activities as I interviewed an expert on backend development and DevOps and visualized my findings in an IT architecture diagram. Therefore, Learning Outcome 4: Investigative Problem Solving applies.

I communicated appropriately to achieve the desired impact by interviewing an expert on backend development and DevOps. Therefore, Learning Outcome 6: Targeted Interaction applies.