Senior Project Specification

Dr. Baliga

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Project Title: FAA Virtualization Software

Github: https://github.com/whelanc5rowan/VirtualizationFAA

Project Summary:

The FAA Virtualization Software is meant to be an improvement upon existing virtualization software currently in use at the FAA. Andrew Tasso, computer scientist at the FAA, approached us for this task, as the FAA has limited resources that cannot be allocated to this task at this time. The existing software needs to be improved up in the following ways:

* Existing functionality needs to be ported over to the Cesium web app
* Improve visualization ability
* Architectural Improvements
* Ability to provide launch and reentry visualization
* Take sets of flight data and put it onto a 3d quote
* Visualize traffic and trajectory in a 3d space
* Needs to be containerized

Project Goals

The goals of this project are to improve upon the software that is currently in use by the FAA. The FAA needs the software to have a better interface that is more accessible to clients. We will accomplish by porting the front end to Cesium. We are also going to provide back end improvements to the software. We will provide improvements on that front by containerizing the application using Docker, and by splitting the application into multiple components (it is currently 1 repository, when it should be split into multiple).

Features

The final project will be able to be accessed on an internet browser on <https://cesiumjs.org/>. It can take in collected data of aircraft flight paths and display them in the 3D World map. The trajectories of each aircraft will be visualized. The project will have refined visuals that are aesthetically appealing and easy to view. This will include visualizations of the aircraft's launch and reentry states. Airspaces will be able to be viewed with the inclusion of restricted airspaces. The user will be able to view multi-day whole-country scenarios. It will be containerized to use less resources. The program will adopt the use of continuous integration. If the stretch goal is reached, then the program will also be able to handle streamed in-flight path data.

Limitations:

The FAA wants us to implement the software using Cesium, an open source Javascript library, so we will be using Javascript to code the front end. Data for the visualization software is stored using MongoDB, so we will need to be able to interface with that as well.