Interdisciplinary Project

Efficient Storage and Indexing of ADS-B Feeds

Flight Safety – Flight Data Analysis

Motivation

The Flight Safety team at the Institute of Flight System Dynamics deals both with on-board recorded and broadcast data. One of the broadcast types is ADS-B, a series of timestamped messages about position, speed, altitude, aircraft type and airline call-sign. We collaborate with the platform adsbexchange.com and would like to assist improving the service. They collect and serve six years of unfiltered messages all around the globe.

Messages are stored as JSON encoded objects and compressed. Processing data is a costly operation. We suggest to develop / find a different storage format. It should be efficient in storage and indexing operations. Ultimately, our goal is to quickly merge aircraft QAR with ADS-B data as time series.

Task

Collect all requirements for the new storage format and develop a new format to maximize efficiency. If applicable, existing formats like *.parquet could already prove useful.

Fields of Activity

- Discuss with all stakeholders the requirements to maximize performance
- Find a sufficient data structure and serialization format
- Prove-of-concept handling the new format in MATLAB
- Advertising the benefits

Requirements

- Understanding of data and database structures
- Interest in low-level code development