

Software Engineer - Full-Stack/Back-End

Drone Flight Log API

At Shield AI, we fly hundreds of flights with dozens of drones every week. Each flight consists of valuable information to improve our reliability, testing, and mission effectiveness. It's extremely critical to store every single flight and make it accessible across the company.

Implement a basic system responsible for consumption, storage, and retrieval of drone flight logs. This system should have some interface so that it is convenient to interact with logs; either an API or accompanying client library is recommended.

At the minimum a flight log consists of the following:

- Drone ID (unique integer for drone)
- Drone Generation (non-unique integer)
- Start Time (UTC time)
- End Time (UTC time)
- Lat (Lat of average location)
- Lon (Lon of average location)
- Building Layout Map (s3 path to a picture file)

Inserting Logs

The system must support inserting logs in bulk or individually. Recommended means of inputting logs are API requests or CSV uploads. Logs should be persisted with consideration towards efficiency of storage and search.

Retrieving Logs

The system must support retrieval of logs by filtering on parameters. Here are a few queries to consider:

- Get all flight logs for drone generation 16
- Get all flight logs from Jan 1st 2018 to present day
- Get all flight logs shorter than 15 minutes (you can assume logs will never be longer than 30 min)

Invalid queries should have proper error handling and respond with the appropriate error

Extras (choose one to implement)

1. Implement a new query to search flight logs by latitude/longitude. For simplicity, the queries only have to support querying within [a bounded rectangle](#). This can be implemented explicitly or using a general format like GeoJson.
2. Support picture uploads when inserting flight logs. This involves taking a picture as input to the API and saving the picture in an object store like S3.

Additional Considerations

In the interest of time, it is not necessary to implement the following, but please briefly (< 150 words total) answer how you would adjust your solution to address these issues.

1. Security - How would you protect against outsiders from inserting/querying logs?
2. Scalability - How would you handle redundancy and availability if the system had to scale to 1 million requests/sec?
3. Data Integrity/Storage - How would you ensure data consistency, integrity, and retrieval if you had to store 100 million drone flight logs?
4. Testing - How would you test the robustness of your code? Think in terms of sending erroneous requests as well as overloading the system with requests