Research Duck Fed System

Functional Requirement

A scientist is trying to understand how ducks are being fed in parks around the world. She wants to collect the following information:
- What time the ducks are fed
- What food the ducks are fed
- Where the ducks are fed
- How many ducks are fed
- How much food the ducks are fed

The scientist would like to crowdsource this information by creating a web application where people can submit these data points. The scientist would like to be able to view all submissions (please note that user management/authentication is not a requirement/expectation.)

Non Functional Requirement

- Able to support people around the world (Scalable)
- Apply Security Policy
- Deployment
- Apply E2E Testing

Capacity Estimation

Request

Countries in the world: 195
Users per country: 1000
Request per day: 195 * 1000 = 195,000
Request per second: 195,000 / 86400 = 2.25/s = 3/s
Retrieve data everage 10 page per day

Storage

Document size ~16MB
Transaction per day: 195000 * 16MB = 3.12TB
Transaction 5 years: 5616TB = 5.6PB

Bandwidth

195000 * 16MB / 86400s = 36.1 MBps

API design

GET feed
POST feed

Data model/schema

Duck_Fed
- datetime
- Location (lat, lng, address)
- duck_number
- food_type
- food_weight
- created_date

System high level system design

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Appendix

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