CSE563: Internals of Application Servers

Spring Semester 2021

Final Demo: Sample Application

A covid vaccination drive is going on at IIIT-H & to help people overcome the vaccine hesitancy IIIT-H is providing transport facility using buses. College wants this transport experience to be comfortable, hassle free & want to span different areas of the city. College recently came to know about the application platform developed by you & is very much interested to use that, as transportation requires so much co-ordination in these times.

Sensors:

- GPS: Sends placeholder-id & co-ordinates. Each bus is installed with one such sensor, one sensor is at IIIT-H campus and each police barricade has one such sensor.
- Biometric: Sends placeholder-id & person-id (it will be unique on place-id level)
- Temperature: Sends current temperature of the place
- Light Sensors: Sends Lux Level of the place

Controllers (in each bus):

- Lights
- Air Condition
- Buzzer

Use cases:

1. Whenever someone boards a bus, he/she will do biometric check-in. Fare should be calculated based on distance multiplied by a fixed rate & should be displayed on dashboard for that bus application instance (if your group does not have a dashboard, send a SMS notification to guard) so that guard will collect that amount.
2. When the bus is not empty, if temperature is more than a threshold switch on the air conditions or lighting is lower than a lux level switch on the lights.
3. Since college wants to span maximum area, if more than two (>=3) buses come in a circle of given radius, except one send buzzer command to the rest. Run this service after every 2 minutes. (For the circle calculation part take suitable assumptions for connectivity).
4. Also, as such services requires proper coordination from administration in covid times, whenever a bus comes closer to a barricade by a threshold distance **start/trigger** an algorithm which sends an email to administration mentioning unique identifier of the bus & an email body notifying them.

Use case 1 & 4 requires streaming data, you may split this application into two algorithms (suggestion: keep 1&2 same algorithm, 3 as periodic recurring algorithm & 4 as separate algorithm which also triggers email algorithm). In use case 4 an algorithm service must be started & email should not be sent from the same algorithm. Take suitable assumptions as required.