



A CONTACT TRACING SYSTEM USING **Node.js**

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IOT FINAL PROJECT

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GOALS

- To calculate the number of students present in a room in a given time period.
- Show Historical Data of a given Matricula number.

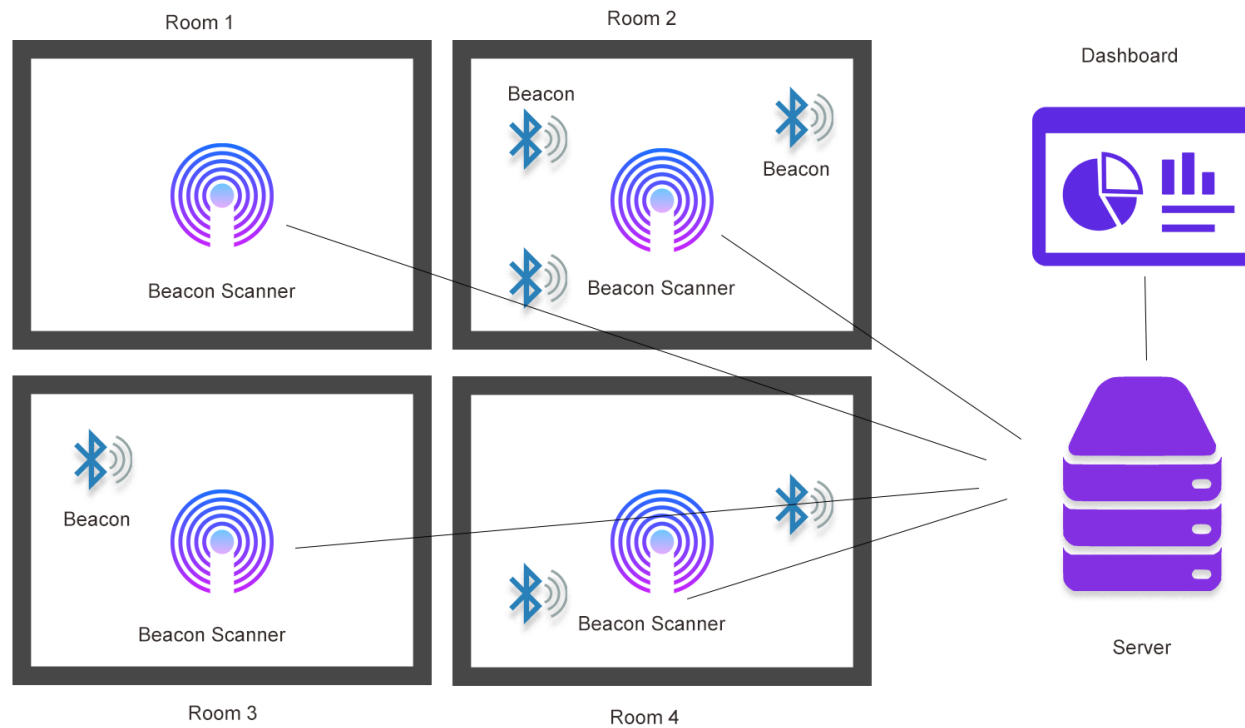
Assumptions:

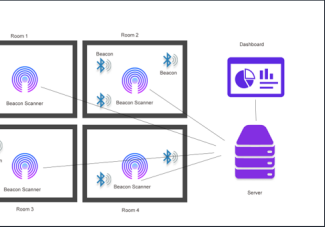
- Students are registered with the system and are given a beacon with static UUID.

PACKAGES IN USE

- **Scanner:**
 - “node-beacon-scanner” and “noble” packages for scanning Beacon Devices
 - MQTT Client
- **Server:**
 - “Express” web App Framework for building HTTP REST API
 - “Mosca” Node.js MQTT Broker
 - “Vonage” for sms service
- **Dashboard:**
 - React.js
 - MQTT Client for receiving published data
 - React-chartjs-2 for analytics
- **Simulator:**
 - “bleno” package for simulating iBeacons

ARCHITECTURE



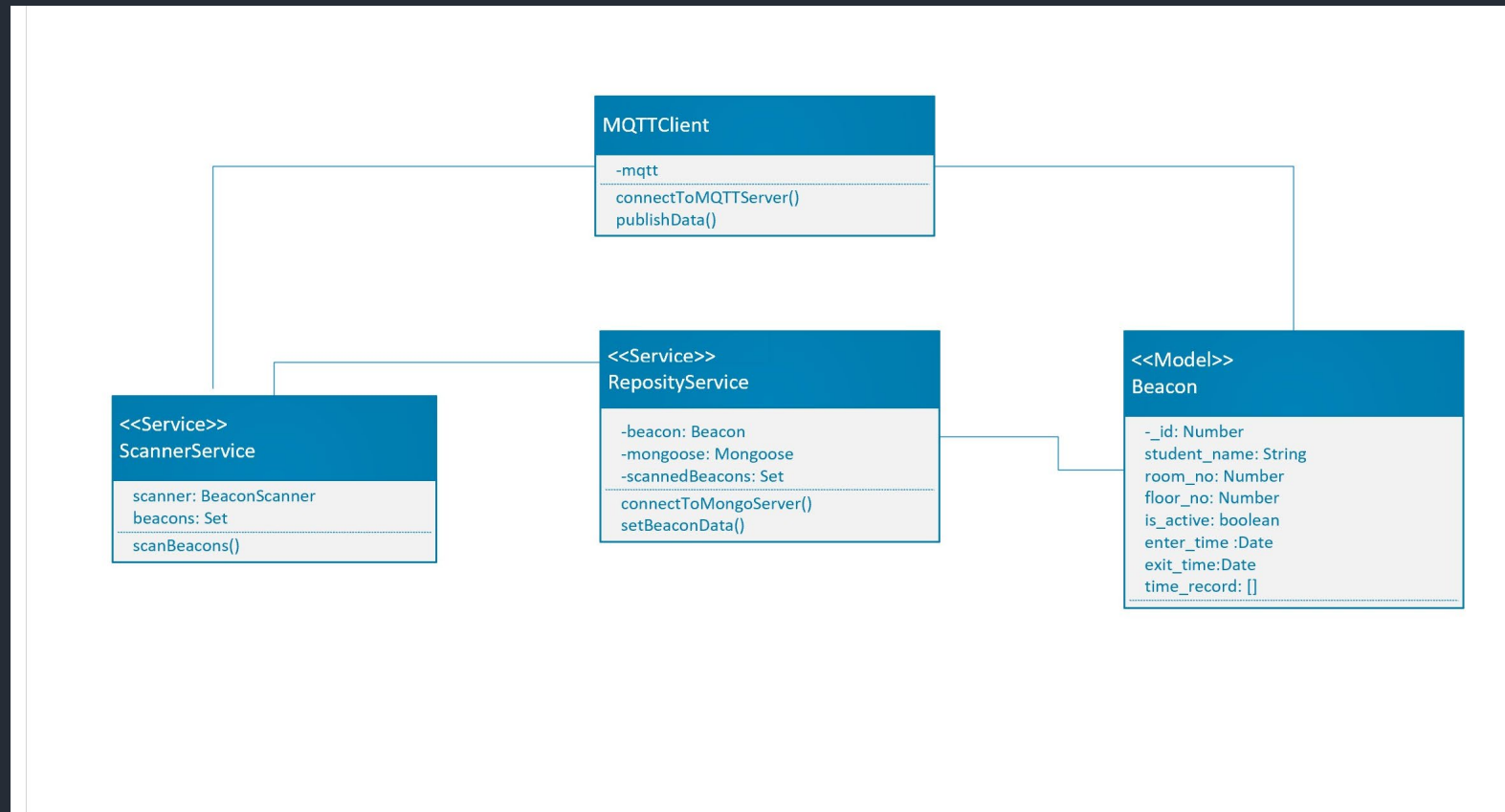


ON SCANNER

Beacon scanner is the device which collects the beacon UUIDs using noble library.

- It also sends the data to server using MQTT.
- It stores historical data of beacons along with their location of in the Mongo DB.

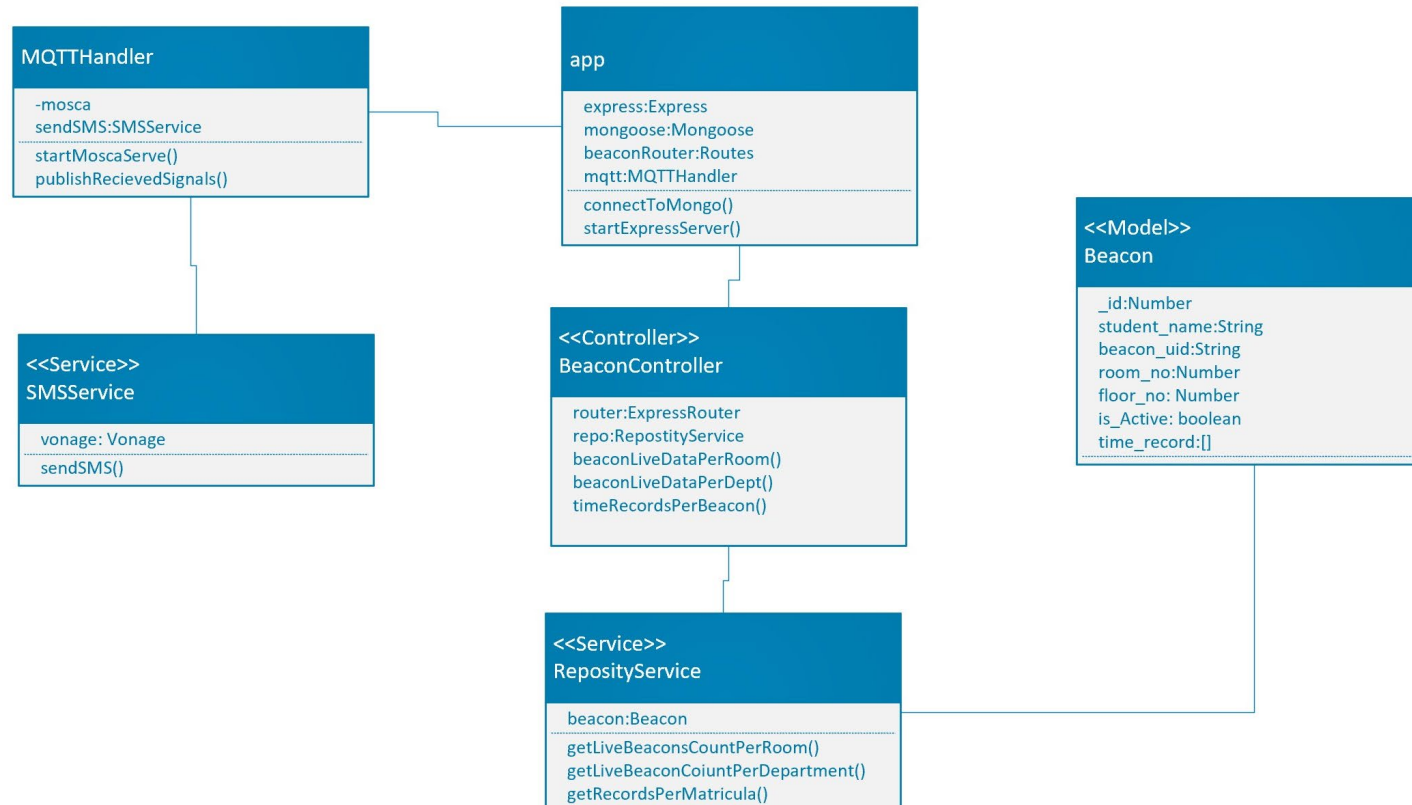
CLASS DIAGRAM OF BEACON SCANNER



MQTT SERVER

- Receives signals from beacon scanners.
- Sends alerts when the rooms are overcrowded.
- Provides REST services to the client dashboard such as:
 - Number of active beacons per room.
 - Number of active beacons per Department.
 - Gross time spent in each room by a beacon associated to a matricula number .

MQTT SERVER

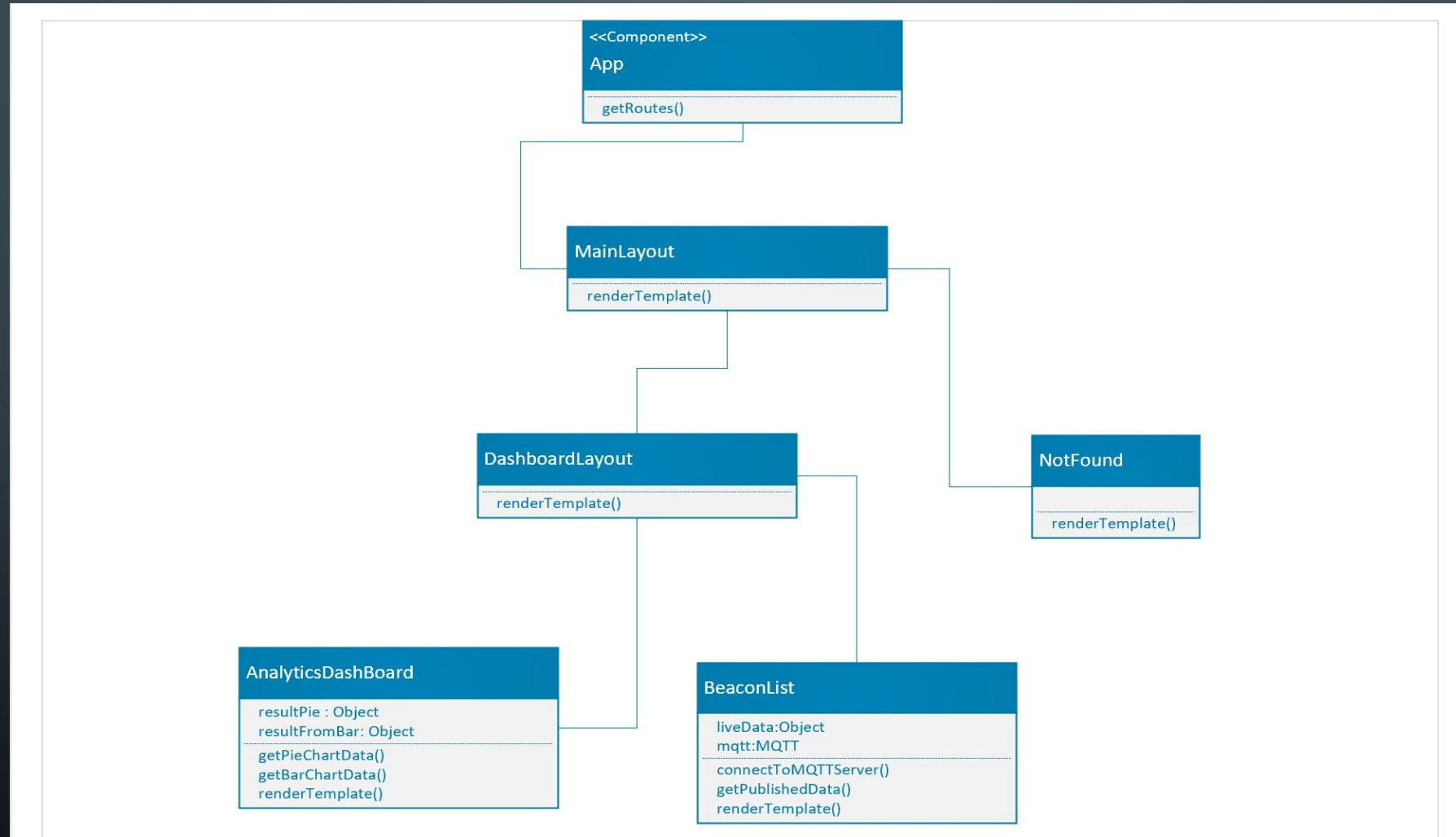


CLIENT DASHBOARD

The client dashboard fetches the data from the server with MQTT and HTTP protocols. It displays the information about the beacons

- In a detailed list
- As analytical graphs

DASHBOARD



BEACON SIMULATOR

- Simulation of the BLE device carried by the students.
- Emits a beacon with a static UUID provided by the admin.
- Implemented using Bleno package.