Capstone Project

Specialized Parking Oriented Technology

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Introduction

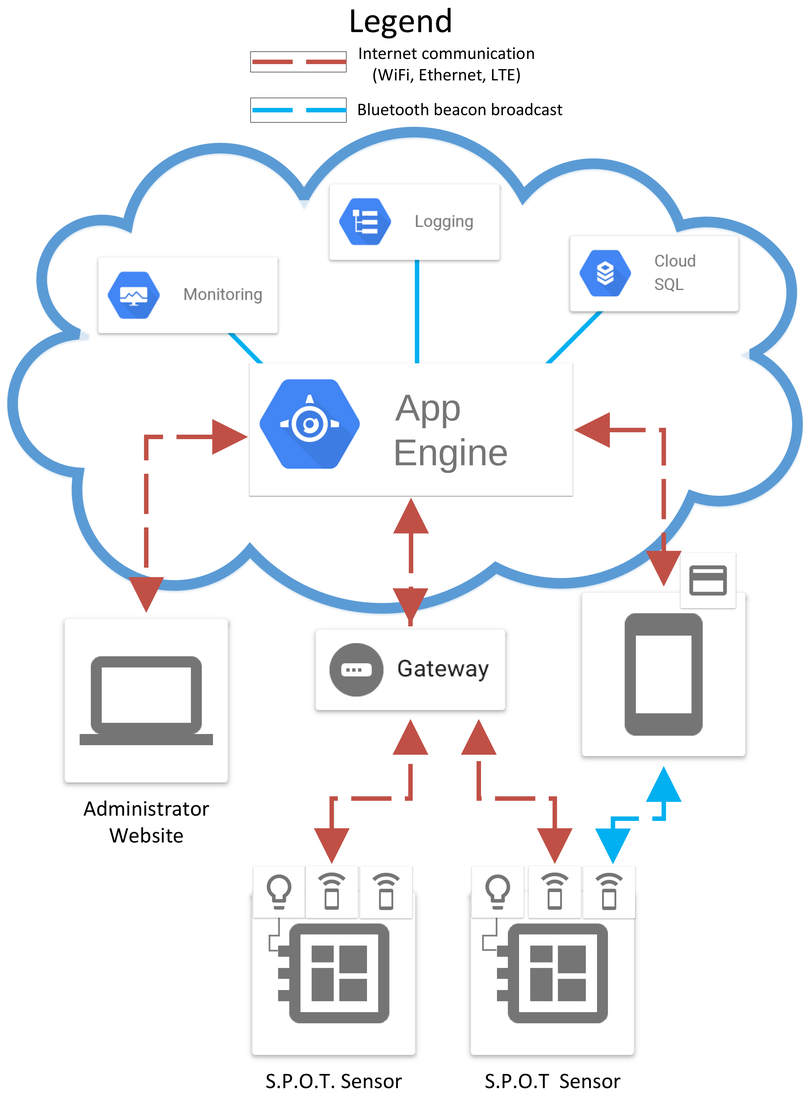
The purpose of this project is to design a power efficient parking management system that will make parking easier to manage for parking services as well as give users an easier time with finding and paying for parking. Users will be able to track the number of available spaces in parking lots and automatically verify their parking through their smart phones. Parking services can track parking spot status and manage user account information through a secure website.

Gateway

The gateway is a low power device that handles status information between the sensors and the cloud. We are using a Raspberry Pi 3B as our gateway. The gateway forwards spot statuses to the Google Cloud's App Engine while forwarding verification messages from the App Engine

Power

Website



S.P.O.T Sensor

- The sensor unit initiates communication between the user and the app through Bluetooth and between the S.P.O.T unit and the gateway which connects to the rest of the system
- The unit serves multiple functions:
  - Allows interface between user and system
  - Communicates spot status with the user through LEDs
  - Powers a Bluetooth beacon for the mobile app to identify the spot a user is parking in.

App Engine

The Google Cloud's App Engine will be in charge of connectivity and computations between the gateway, database, and mobile application, as well as hosting the administrator website. It will be in charge of monitoring data from aggregated sensor information from the gateway. The App Engine will update the new status from the sensor and handle the verification of the parking user through receiving their Bluetooth string and checking the permit associated with the user's account from the database. The App Engine is also responsible for handling payments by deducting the user account's balance and logging payment and occupation activity.

Mobile App

The APP DOES STUFF

Conclusion