eWee — Ensuring Wellness with Energy Efficiency

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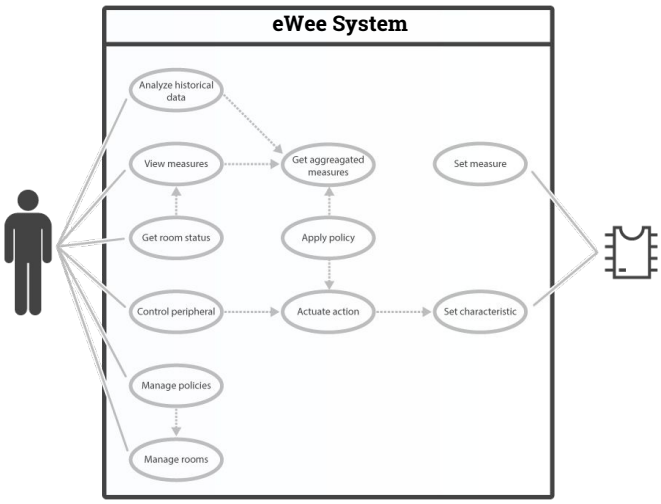
Problem & solution domain

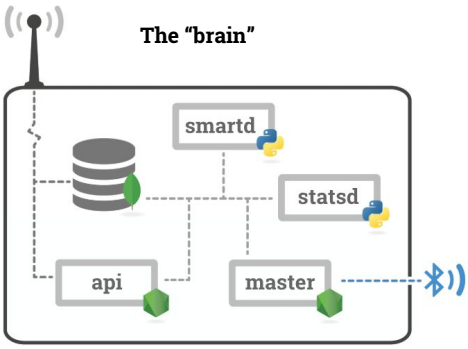
eWee main objective is to create an ecosystem of sensors and actuators capable of providing user comfort (i.e., optimal room conditions, according to user needs), while taking into account energy efficiency (e.g., turning off the lights and conditioner when there's no one in the room).

eWee is a plug-and-play, scalable system capable of dealing both with small and large environments and compatible with third parties devices that implement the Bluetooth LE standard GATT profile and provide compatible services.

eWee system can be applied in either consumer and business environments: homes, offices, commercial spaces, hotels, hospitals, etc.



The "brain"



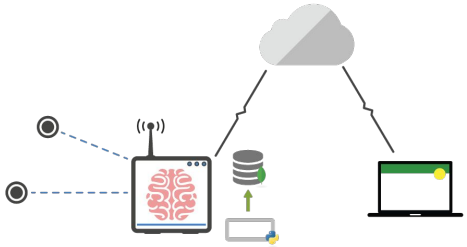
Technologies

- Raspberry Pi 2B or higher as "Brain", the main component of the architecture
- Raspberry Pi Zero W as range extender
- ESP32 or any other device that implements standard GATT profiles as BLE edge devices for sensing data and actuate actions

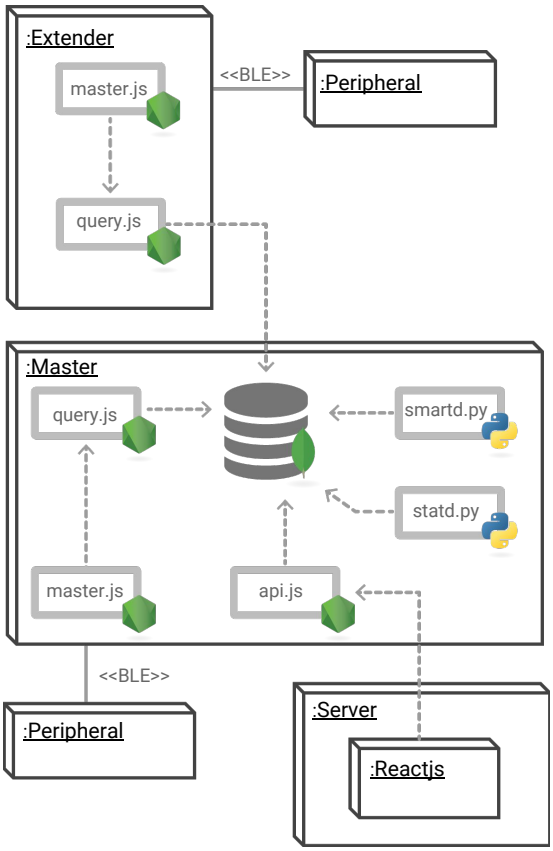
Prototype and demonstration

We show a working prototype tested in some rooms with multiple sensors.

We also provide a working demo with a Raspberry Pi 3 as Brain, an ESP32 as sensor and another one as actuator, and a web UI for managing the system interacting with the APIs. Other devices are simulated by a python script to provide a realistic behaviour of the system.



System architecture



Future work

- Home assistant integration
- Learn policies via Reinforcement Learning exploiting user voice interaction
- Services for business
  - User authentication
  - Advanced analytics
  - Real time alerts
  - Settings for net admins