Store Monitoring

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Overview

In this project we want to monitor a Small chain store with 5 types of sensors and store monitored data in a database then able to monitor the time series of sensors and some

data analytics on data. During this project some common technologies used in python and other programming languages will be used such as:

- Object Oriented Programming to create sensors.
- Database to store data
- Configurations to initialize system with manual configurations (for each store these configs may change)
- Socket programming to connect to sensors and get data from them
- Parser for received information
- Some mathematical skills to apply on data and get some useful information

A normal store has at least 5 types of sensors described below.

1. Fridges
    a. Temperature (float with 2 point fraction)
    b. Humidity
    c. Fan status (Boolean)
    d. Oil alarm status (Boolean)
    e. Door status
2. Doors
    a. status of interior doors such as wearhouse door, management door
    b. Status of exit doors of store
3. Lightning system
    a. Group name of lights are On or OFF
4. Electrical system information
    a. Voltage
    b. Current
    c. Power factor
5. Environmental sensors
    a. Fan is ON or OFF
    b. Room Temp
    c. Room humidity

Due to this project no sensor will get any command. They are only readables and their control is not with this system. Every sensor due to its working rules automatically or by request, sent its information at a time. Doors and Lightning system sensors automatically send their information but the rest of sensor types are not able to send their information by request to the gateway.

Goals

1. Door sensors should monitor immediately after changed status

2. Other sensors should check every 10s
3. Every received data should be stored in a sqlite database with “time” and “id” of sensors. Design and architecture of database is on yours
4. Whole the project should be in a git repository.

Specifications

- Doors and lightning system sensors are working on port 4040 but the rest of sensors work on port 4080. All communications are by sockets and UDP protocol.
- In this project, the desired store has 5 doors (2 exit door, 2 for wearhouse and 1 for management section)
- 8 lightning system group (4 in store, 3 in warehouse, 1 in management section)
- 12 Fridge
- 1 electrical system information
- 8 environmental sensors (4 in store, 3 in warehouse, 1 in management section)
- Sensors can work asynchronously and during the call they have to generate an answer.
- A parser is needed to understand the answer of the coordinator from the server.
- Databases should keep the time, value and answer of the system.

Project description

Due to the project you have to create a store

Phases

I. Simulate a store

Store different sensor types should be generated and make sure about their correct answers. In this phase create 5 classes as sensors. The required API is on your own but It is highly recommended to keep it as simple as possible. Floating point sensors have random answers with normal distribution with different mean and variances. These parameters should be taken to them.

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