IoT Project Part 2

Introduction

The goal of this assignment is to create a small IoT network using wireless technologies, Raspberry PIs and Logentries cloud service. This assignment should be completed in groups of 2 students.

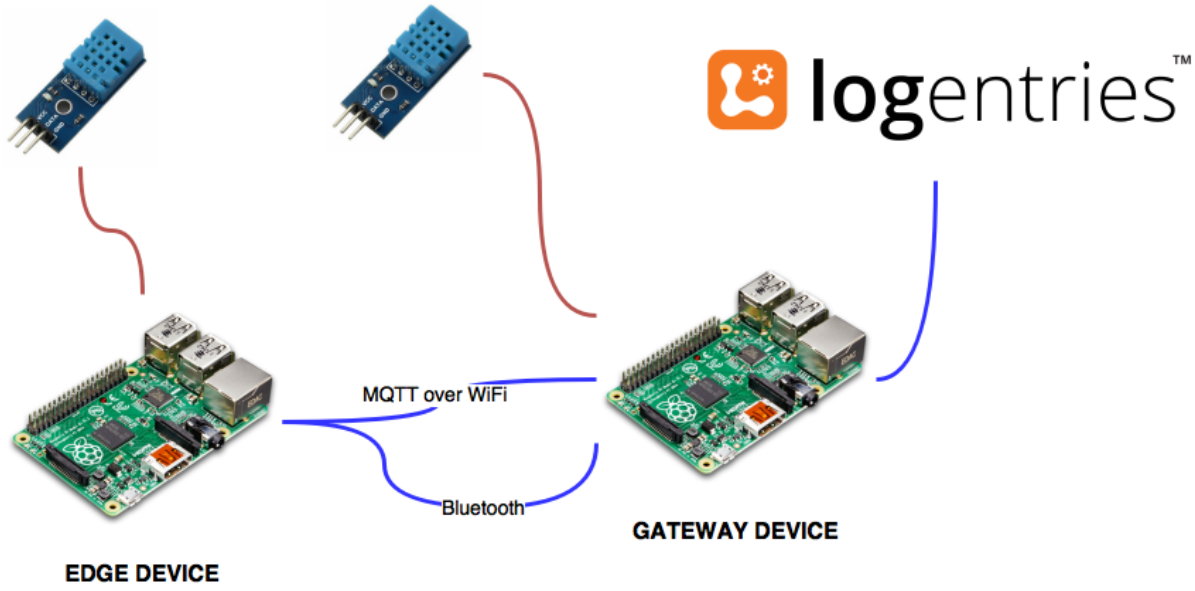

Figure 1 System architecture

At the end of this assignment each group should be able to:

1. Read temperature/humidity data from DHT11 sensors connected to edge device and DHT11 sensor connected to gateway device
2. Send data from edge device to gateway via RFCOMM (Bluetooth) and MQTT (WiFi)
3. Send data from both sensors to InsightOps
4. Create alerts and widgets in InsightOps

Scenario

Assume that your system is powered by photovoltaic cells that gather natural light and convert it into electricity during the day (12 hours) and store enough energy to power the system during the night (12 hours). As an engineer, you have decided to use WiFi during the day, but after 12 hours you are switching over to Bluetooth as it consumes less energy. The handover should be seamless. You can assume that 1 hour is exactly 10 seconds for the purposes of this assignment.

Log format – Edge device

The format of each log line produced by the edge device, should contain, **at least the following fields:**

```
YYYY-MM-DD HH:MM:SS.ms Protocol=<MQTT/RFCOMM> SensorID=<studentName>,
Temperature=xx.x, Humidity=x
```

Make sure to:

- format milliseconds to 6 decimal places
- include **SensorID** for easy identification
- include the **Protocol** field to differentiate between MQTT or RFCOMM

For example:

```
2017-11-01 21:22:54.327823    Protocol=MQTT, SensorID=John,
Temperature=20.0, Humidity=30
```

Log format – Gateway

The format of each log line produced by the edge device, should contain, **at least the following fields:**

```
YYYY-MM-DD HH:MM:SS.ms SensorID=<studentName>, Temperature=xx.x, Humidity=x
```

Make sure to:

- format milliseconds to 6 decimal places
- include **SensorID** for easy identification

For example:

```
2017-11-01 21:22:54.327823    SensorID=John, Temperature=20.0, Humidity=30
```

Alerts

Alerts are notifications informing the user about an unusual event taking place in the system. Alerts usually take form of a single line message written in plain English and should be self-explanatory.

Refer to this video to learn more about tags and alerts used by Logentries. Please note that you are not required to use Logentries in this assignment:
https://logentries.com/resources/how-to-videos/tags-alerts/

Alerts & Widgets

You are asked to design various alerts and widgets in the InsightOps environment. Your imagination is the limit. Note: you are allowed and in fact you should, extend log information and include anything you like.

Report

The purpose of the report is to present steps and methodology used when building the IoT system. Students are free to decide on the structure of the report; however, the following elements need to be included in order to obtain full marks:

- System architecture diagram and description
- Rationale for any design choices made
- Screenshots of widgets created (source: InsightOps dashboard)
- Screenshots of alerts triggered (source: InsightOps dashboard)
- Short discussion on how your system could be improved in the future

Submission

Please upload **code and your report (doc,pdf)** to CS Moodle (1 per group).