Report on FIT IoT Lab and Riot OS

Introduction

FIT IoT Lab is one of the most useful setup to use remotely located test-bed containing real sensor to overcome the problem of unavailability of the hardware. In this project, we booked one LoRa node from FIT IoT Lab, Sacley to derive the temperature and humidity data to "The Things Network" via LoRa gateway and also visualized the data using TTN integration with Cayenne dashboard.

Description of the setup

In order to access the remotely located testbed, Initially we created an account in FIT IoT Lab and used Jupyter Lab as an interface to interact with FIT IoT Lab by logging in on labs.iot-lab.info.

Here, we've used an example which is already given in Jupyter notebooks namely ttn-senors and registered our console by creating a new application and then adding a new device using the given specifications in Lab exercise documents.

After registering our device on application tab, we've used the credentials such as device ID, Application EUI and Application Key in the steps as given in ttn-sensors.ipynb in Jupyter and execute it. Figure 1, shows the window after we executed the example in Jupyter.

This was how we settled up to achieve our first data and make a connection with Testbed sensors.

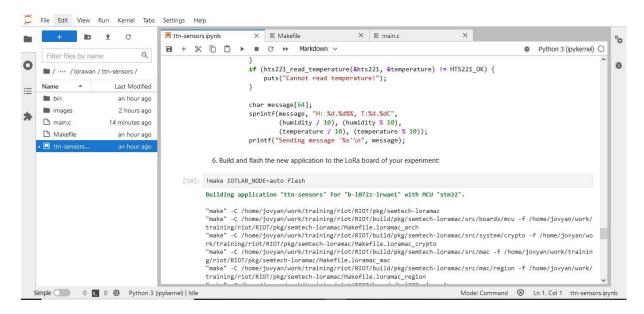


Figure 1: Successful execution of the program as given in ttn-sensors.ipynb example

The Things Network

After setting up our Jupyter commands as given in previous steps and successful execution, we are theoretically able to get our sensor data every 20 Seconds(as per the example program). We could see that data at TTN by logging in to TTN as we did before in previous step.

After logging in to the TTN console, this is how we had our data in terms of Temperature and Humidity as given in the Figure 2.

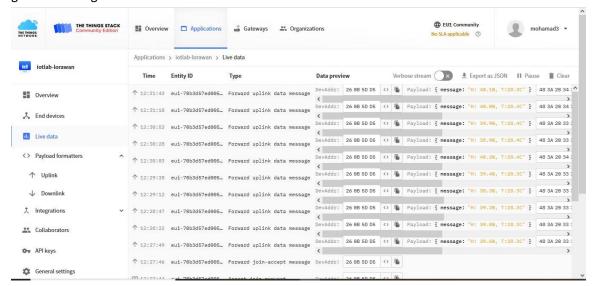


Figure 2: Temp. and Humidity data from the sensor on TTN

Web dashboard

In the next step, we had improved our Data Visualization using an integration of Cayenne dashboard to The Things Network by going through an example as given on TTN website namely **ttn-cayenne-lpp**. After following each steps as given in that example to visualize the data in Cayenne dashboard, for example by adding a New device \rightarrow LoRa \rightarrow The Things Network \rightarrow Semtech LoRa and putting device EUI.

In order to give our sensor data to Cayenne, we need to set our data in form of Cayenne by doing TTN→ Payload Formats→ Cayenne Low Power Payload (LPP).

After that we went to Webhook \rightarrow Add \rightarrow Cayenne. Then, we were ready to see our data on Cayenne Dashboard as given in figure 3. We also put threshold value in terms of Temperature, e.g. If our temperature exceeds our threshold value, we'll be notified using E-mail or SMS.

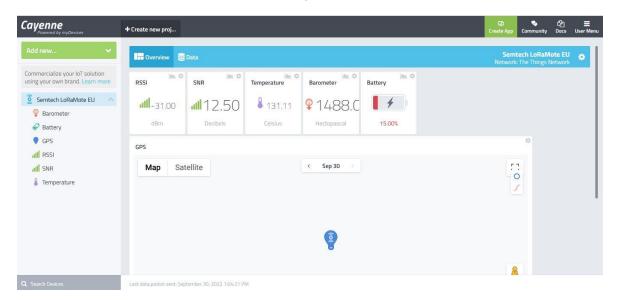


Figure 3: Overview of our Sensor's data in Cayenne dashboard