ECE 558 IoT MQTT Project

Using RPi 3B+

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Description:

- Components used: RPi 3B+, AHT20, Red LED, and Push Button.
- Hosted HiveMQ broker for data movement to and from connected IoT device and Android App.
- Python code to drive the RPi. Used vim as a coding environment.
- Adafruit AHTx0 library was included for AHT support.
- GPIO.Board library was imported for LED and push button. GPIO mode was using internal pull-up registers from RPi.

Working:

Android Application

- Download the .apk file on your android phone. Run the app. The app gets connected to the internet. Connects to the HiveMQ broker.
- The application subscribes to the topics created on the web socket.
- Displays temperature and humidity at the default time interval set in python code. The interval slider is used to pull the sensor value at the assigned time interval subscribed by the device.
- Pushbutton is pressed or not status is updated on the application.
- LED control is available.
- Android is event-driven which runs all the codes concurrently. All these readings from sensors are subscribed/published continuously.

RPi

- RPi is connected to PuTTY using SSH. You can have GUI using VNC viewer. The raspbian image is loaded upon power on, activates red led(PWR) and light green(ACT).
- The device does some primary initializations and connects to the internet over WiFi.
- Sensor values are published over MQTT
- RPi subscribes to push button and led topics. If any inputs are detected it runs a separate python thread for that specific sensor.