Dr. Christine Julien, c.julien@utexas.edu The University of Texas at Austin

Emerging Technologies I

MIS 284N | Fall 2018

Project Milestone 4

Overview: The fourth milestone will focus more on the Android device. We will program to a RESTful web interface (Open Weather Map) to retrieve and process weather data, and we will update the Android app to pass pieces of this retrieved weather data on to the Raspberry Pi along the MQTT connection we already have working.

Step 1: Visit the Open Weather Map site and create a login (https://home.openweathermap.org/users/sign_up). Once you're signed in visit https://home.openweathermap.org/api_keys and generate an API key. (The website says it might take up to an hour to get your key activated. I don't recall this being the case, but I guess you should be prepared.)

Step 2: Read through the details of getting started with the API here: https://openweathermap.org/appid. In particular, note the limits on the use of the API.

Step 3: Clone the starter repository here: https://github.com/UT-APAD/SampleRESTWeatherApp. Step through what this code is doing. It uses Volley and GSON. I went ahead and wrote the classes to process the basic OpenWeatherMap JSON data. Also look at the permissions in the Android manifest file. To get this code to work, you'll have to make a change: I've not shared my OpenWeatherMap API key with you. You'll have to use your own.

Step 4: Play around with the OpenWeatherMap API. See what other information you can get out of it. Can you use the String icon to create a URL to request the icon representing the weather (you might want to use Picasso to help out here)? Do one thing interesting with the OpenWeatherMap API that results in some visual effect in the Android app.

Step 5: Create a new Android app from scratch. Figure out all of the steps you need to do to make this app capable of both MQTT communication with the Raspberry Pi and RESTful calls to the OpenWeatherMap API. Retrieve weather data from OpenWeatherMap. Integrate your interesting thing from Step 4. Then manually switch the WiFi network of your Android device. Use a *weather* topic in MQTT to send some bit of weather information (your choice) to the Raspberry Pi. Print it to the terminal. Use a *steps* topic to send back a publication from the Raspberry Pi to the Android device anytime weather data is received. Display the received steps in the Android app.

What to submit

Via Canvas, submit a (very) brief writeup that includes a description of the interesting thing you did and how it leveraged the OpenWeatherMap API. Include a screenshot of your Android app running.

Tuesday, November 20, in class, demonstrate Step 5.

UT Honor Code: As a student of The University of Texas at Austin, I shall abide by the core values of the University and uphold academic integrity.