University of Puerto Rico Mayagüez Campus
Electrical and Computer Engineering Department

Final Project: AC ON Design Doc
Provisioning and Configuration Document

Harry Márquez Torres
Jessy Rodríguez Colón

Provisioning

Provisioning by definition, is the process of creating infrastructure and making it available to the end user. In this project, provisioning refers to the microprocessor, sensors, breadboard, etc. We first need to buy the ESP-32 and temperature sensor LMT84. The connection between the microprocessor and sensor will be made by using a breadboard, resistor and jumper cables. The LMT84 has three pins, one for input voltage, another for reading the output, and the ground pin. These three pins will be connected to the ESP-32 via a breadboard. The output pin will be connected to the analog pin 34. Also, a proximity sensor and LCD display need to be provisioned.

Configuration

Configuration by definition, is the process of configuring the provisioned IT infrastructure resources. In this project, the configuration stage starts with setting up the cloud in AWS. Then the name harryjessy.site was assigned to the website. Node-Red is then installed to the website. For the website to work correctly, MQTT broker, dashboard and mongodb were also installed. Also, the virtual assistant needs to be configured for a user to be able to ask for the temperature.

The temperature sensor needs to be calibrated for it to work properly. The LMT84 sends an output voltage to the ESP-32 depending on the temperature it detects. If the temperature is higher, the voltage would be lower and vice versa. To configure it, various tests need to be conducted by using a blower and an AC. Voltage will be read in these two scenarios to find the slope and behavior of the Voltage vs Temperature. ADC configuration also needs to take place for the ESP-32 to be able to read the signal. Analog to Digital converter are certain parameters that are needed to convert an analog signal to a digital one, for the microprocessor to be able to read the signal.

The proximity sensor also needs to be calibrated to work properly. Like the temperature sensor, an output voltage to the ESP-32 depending on the people it detects. Various tests need to be conducted to determine how many people are in the room depending on the voltage readings. ADC configuration also needs to take place for the ESP-32 to be able to read the signal.

A display must be configured with the correct libraries that are compatible with the ESP-32. The LCD needs to be set up in the main code with the specific pins and connections. The temperature signal needs to be converted to a format compatible with the LCD for display. This also needs to be done with the occupancy signal.