Cloud Based Temperature , Humidity Reading and Location Tracking

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Project Components:-

This project consits of two parts

1)Hardware Part

2)Software Part

1) Hardware Part

Raspberry Pi,DHT11 sensor and a Mobile phone.

Through the Raspberry pi,the values of the DHT 11 Sensor is been sent to the IBM Watson Cloud Platform.The values are then taken to the node red and a UI is been created using the node red. Have also created a UI in the IBM watson for the purpose to check wheather the value is been read or not

The Location is been tracked using the Webhooks Relay and Owntracks. The GPS value from the mobile phone is sent to the Webhooks Bucket and from there the value is been sent to the node red dashboard. A Geofencing is also been created so that if the package/in case if something goes out of the respected boundry a trigger will be generated.

2)Software Part

Thonny(Python 3.7) :- Python code to get value from the DHT 11 Sensor and send to the IBM IoT Platform and also to Enable the trigger Light if temperature Exceeds a limit.

IBM Watson IoT Platform:- To Store the data from the DHT11 Sensor

Node Red:- To Create a UI from the data from the DHT 11 sensor and Webhooks, To trigger Warnings if temperature exceeds a limit or the object is outside the geofence.

Webhooks:- To Store the Location data from the Owntracks

Owntracks:- Gets the Location value from our Mobile

Source Code:-

```
import RPi.GPIO as GPIO

import dht11

import time

import sys

import ibmiotf.application

import ibmiotf.device

import random
```

```
import json

organization = "nraif4"

deviceType = "testdevicetype"

deviceId = "b827eb4f731f"

authMethod = "token"

authToken = "VSAPE8nyodnkWIU1bi"


GPIO.setwarnings(False)

GPIO.setmode(GPIO.BOARD)

GPIO.cleanup()


SensorInstance = dht11.DHT11(pin = 13)  # read data using pin 13


# Initialize the device client.

T=0

H=0


def myCommandCallback(cmd):

    print("Command received: %s" % cmd.data['command'])

    GPIO.setup(7,GPIO.OUT)


    if cmd.data['command']=='lighton':

        print("LIGHT ON IS RECEIVED")

        GPIO.output(7,1)


    elif cmd.data['command']=='lightoff':

        GPIO.output(7,0)

        print("LIGHT OFF IS RECEIVED")

    if cmd.command == "setInterval":
```

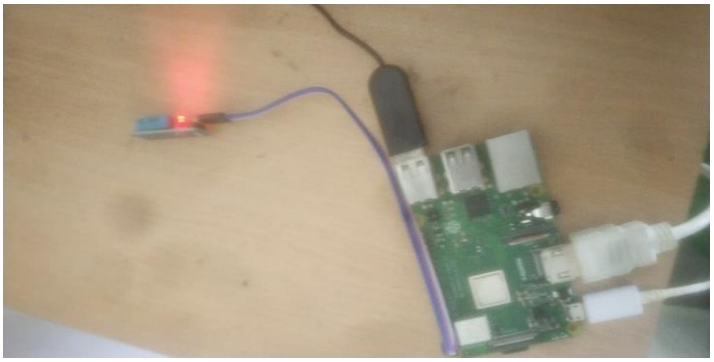
```
            if 'interval' not in cmd.data:
                print("Error 'interval'")
            else:
                interval = cmd.data['interval']
        elif cmd.command == "print":
            if 'message' not in cmd.data:
                print("Error 'message'")
            else:
                print(cmd.data['message'])
try:
    deviceOptions = {"org": organization, "type": deviceType, "id": deviceId, "auth-method": authMethod, "auth-token": authToken}
    deviceCli = ibmiotf.device.Client(deviceOptions)

except Exception as e:
    print("Caught exception connecting device: %s" % str(e))
    sys.exit()

deviceCli.connect()
while True:
        #Get Sensor Data from DHT11
        SensorData = SensorInstance.read()
        if SensorData.is_valid():
        #if True:
            T = SensorData.temperature
            H = SensorData.humidity
        else:
            print ("SensorData Invalid")
        #Send Temperature & Humidity to IBM Watson
```

```
    data = {"d":{ 'temperature' : T, 'humidity': H }}
    #print data
    def myOnPublishCallback():
        print ("Published Temperature = %s C" % T, "Humidity = %s %%" % H, "to IBM Watson")
    success = deviceCli.publishEvent("Data", "json", data, qos=0, on_publish=myOnPublishCallback)
    if not success:
        print("Not connected to IoTF")
    time.sleep(1)
    deviceCli.commandCallback = myCommandCallback
deviceCli.disconnect()
```

Screenshots:-



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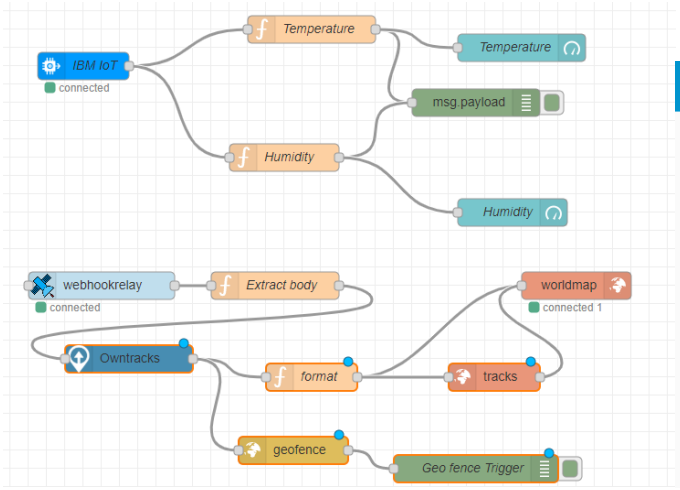
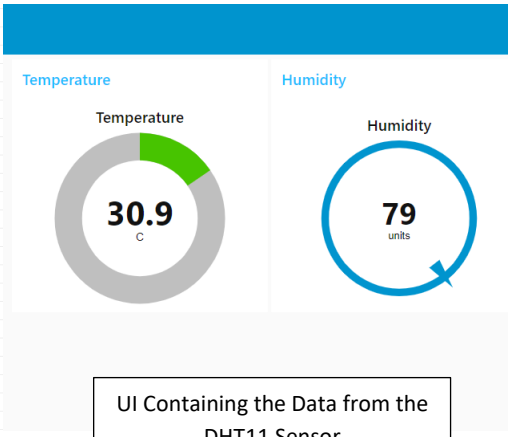
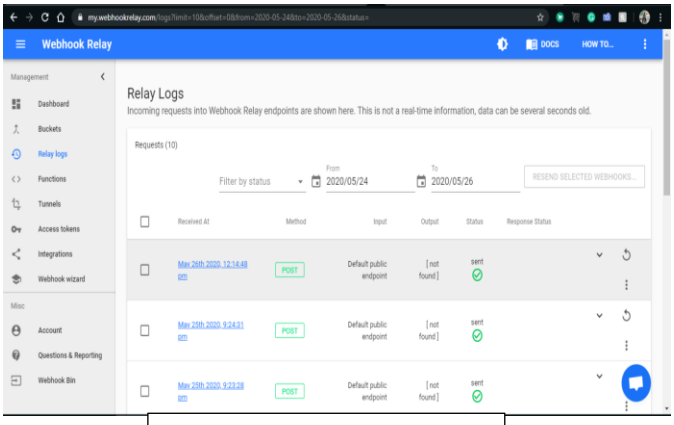


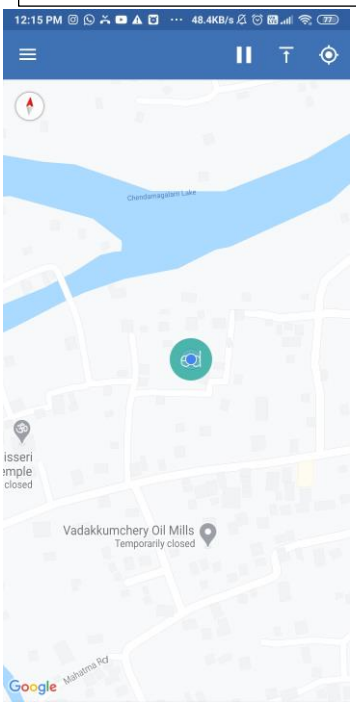
The Flow nodes in the Node Red



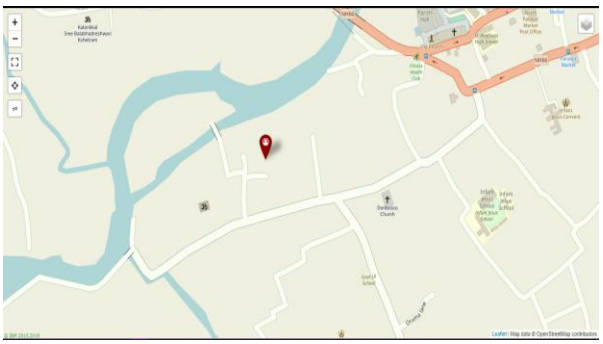
UI Containing the Data from the DHT11 Sensor



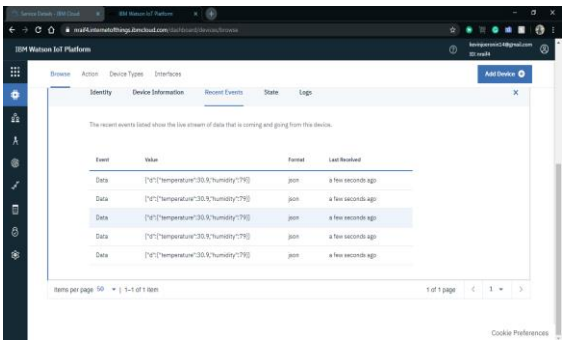
Webhooks Relay Bucket Containing location data



Owntracks Mobile App



The Location been Displayed in Node Red UI, Which shows the marking location of device



DHT 11 Data been Stored in IoT Watson Platform

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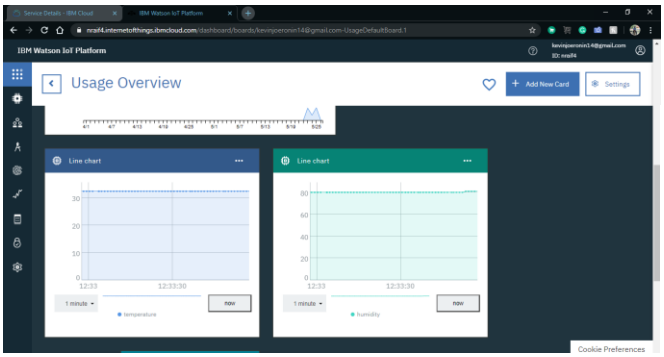
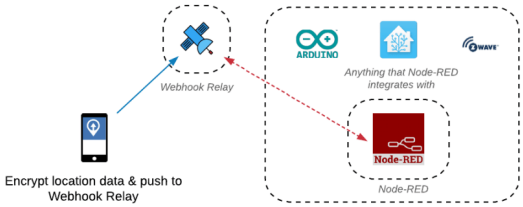


Data been Read at the IBM IoT Watson Platform



The Flow of Sending Location from Mobile to the Node red