

LAB – 13 -Pushing Data to Thingsboard Open-source IoT Platform Using MQTT Protocol

Aim:

To write a python program to push and display sensor data value on thingsboard web page using the MQTT Protocol using any python IDE.

Task:

1. Install paho-mqtt in any python IDE
2. Create a account in **www.thingsboard.io** and create a device
3. Create ACCESS TOKEN for the device and use it in the python MQTT Protocol client program
4. Write python MQTT Protocol client program to push and display temperature, humidity, wind speed data and rain sensor data (rainy or not) in a web page of **www.thingsboard.io** using JSON format using paho-mqtt library (get sensor data from user and assume that which is coming from a sensor)
5. Display the pushed sensor data by the task 4 code in **www.thingsboard.io** by Creating a dashboard with Analogue gauges WIDGET

Algorithm:

1. Import paho.mqtt.client, time and json.
2. Create a host server on thingsboard.io and get the access token.
3. Create a JSON object in the function and return it as a dictionary.
4. Run the web application using the run method.
5. MQTT Protocol client program to push and display temperature, humidity, wind speed data and rain sensor data (rainy or not) in a webpage of thingsboard.io using json format using paho-mqtt library.

Program:

```
import paho.mqtt.client as paho          #MQTT library
import os
import json
import time
from datetime import datetime

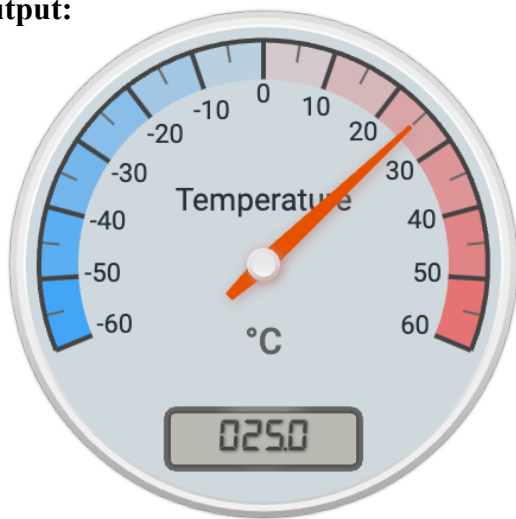
ACCESS_TOKEN='token_id'                 #Token of your device
broker="demo.thingsboard.io"            #host name
port=1883                                #data listening port

def on_publish(client,userdata,result):   #create function for callback
    print("data published to thingsboard \n")
    pass
client1= paho.Client("control1")         #create client object
client1.on_publish = on_publish          #assign function to callback
client1.username_pw_set(ACCESS_TOKEN)    #access token from thingsboard device
client1.connect(broker,port,keepalive=60)#establish connection
```

while True:

```
payload={"  
payload+="\"Humidity\":60,";  
payload+="\"Temperature\":25";  
payload+="}"  
ret= client1.publish("v1/devices/me/telemetry",payload) #topic-v1/devices/me/telemetry  
print("Please check LATEST TELEMETRY field of your device")  
print(payload);  
time.sleep(5)
```

Output:



Pre-Lab Questions:

1. What is the MQTT protocol? Why is it used in the IoT system?
2. What is the ThingsBoard platform? List the capability/support provided by ThingsBoard ?

Post Lab Questions:

1. Write the statements to connect MQTT client to ThingsBoard keepalive time of 5 seconds and explain.

2. Write the statements to publish data from the MQTT client using JSON format to ThingsBoard and explain.

Result:

Thus,a Python program was successfully developed and executed using an MQTT client to push sensor data to the Thingsboard platform.