IOT Assignment 2

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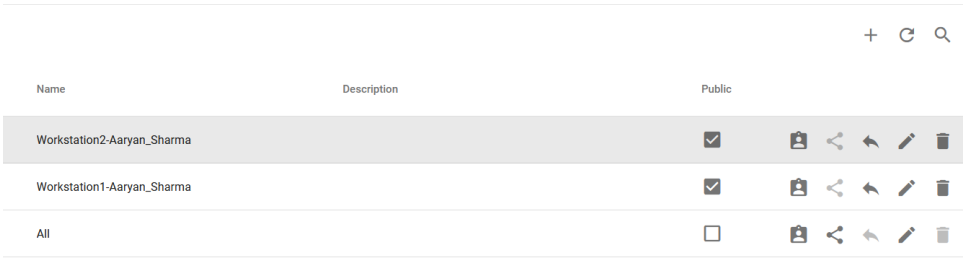
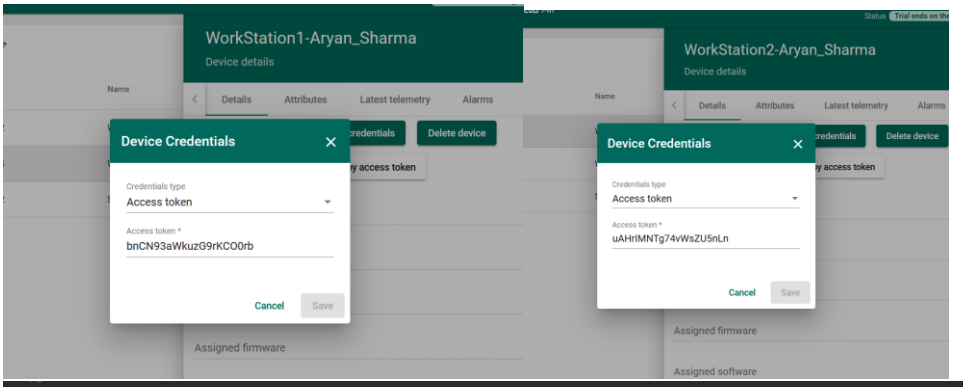
A station gathers data (such temperature, rain height, etc.) from various sensors and publishes its status using a MQTT Broker*, hosted by the Cloud Platform (Thingsboard dashboard).

For you to see the dashboard, create two stations, each with a separate token and port that must be open and setup. Check that the port number, token 2, and broker where your dashboard will be hosted are operational and accessible. Compare the access token here with the token in the code.





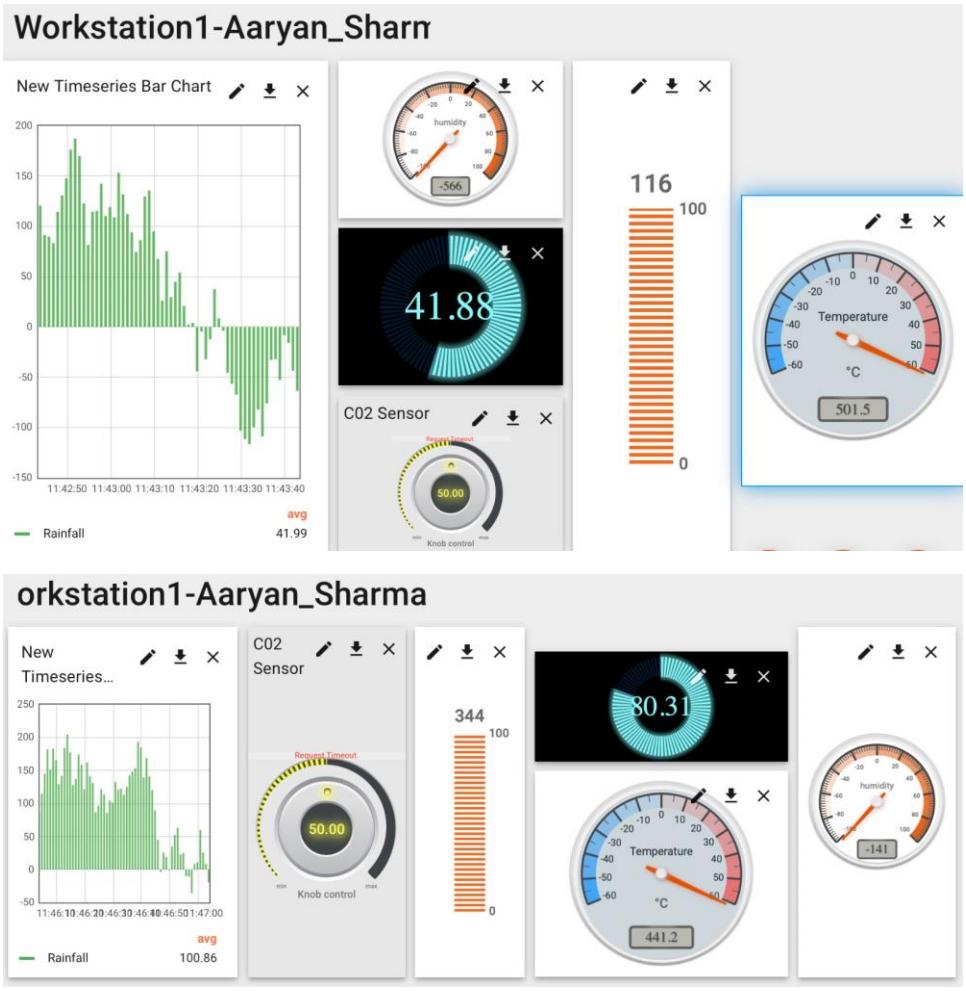

```
50
51  # MQTT client definition
52  # AccessToken of Virtual Environment Station 1 in ThingsBoard
53  ACCESS_TOKEN1 = 'bnCN93aWkuzG9rKCO0rb'
54  # AccessToken of Virtual Environment Station 2 in ThingsBoard
55  ACCESS_TOKEN2 = 'uAHrIMNTg74vWsZU5nLn'
56
57  broker = "demo.thingsboard.io"  # Host Name
58  port = 1883  # Data Listening port
59
```

Create a payload, then release it: We may establish a connection between the client and our broker using host:"demo.thingsboard.io", port:1883 and topic:"v1/devices/me/telemetry." It is

constructed using Python and sent in JSON format. We must enter our access token in the "username" field on the connection form to complete it. Remote connectivity is crucial since only then will the payload display live data and dashboard readings. Additionally, download the required libraries to speed up the connection to the cloud service.

First, we download httpie and use the command line tool httpie to make HTTP requests with JSON payloads (For Windows). You can use cURL for mac

Real-time modifications require the WebSocket API and its authorization, which may be deduced from: Using this bash script and an X-Authorization token, http POST http://demo.thingsboard.io/api/auth/login 'Content-Type:application/json' 'Accept:application/json' username=iotassignment2@thingsboard.org password=aryan



Below code is a Python script that sends simulated telemetry data to two virtual environment stations in ThingsBoard, an IoT platform. It uses the paho-mqtt library to establish MQTT connections and send the data as payloads to the ThingsBoard cloud. First, the required libraries are imported, including paho-mqtt for MQTT communication, time for time-related

functions, and random for generating random values for the simulated telemetry data. Next, several functions are defined to generate random values for temperature, humidity, wind direction, wind intensity, and rain height. These functions are called by another function named `get_payload` to generate a JSON payload containing the telemetry data. Afterward, the script defines two MQTT clients and connects them to the ThingsBoard cloud using access tokens specific to the two virtual environment stations. The client objects also have the on_publish callback function assigned to handle publishing events. Finally, the script enters a loop that generates new payloads every five seconds and sends them to the respective virtual environment stations using the MQTT clients. The payloads are printed to the console, and the loop continues indefinitely until the script is stopped.

```
def get_payload():  # Generate the payload to send
    payload = '{"Temperature":"'
    payload += get_temperature()
    payload += '", "Humidity":"'
    payload += get_humidity()
    payload += '", "Wind direction":"'
    payload += get_wind_direction()
    payload += '", "Wind intensity":"'
    payload += get_wind_intensity()
    payload += '", "Rain height":"'
    payload += get_rain_height()
    payload += '"}'
    return payload
```

```
client1 = paho.Client("control1")  # Create client1 object
client1.on_publish = on_publish  # Assign function to callback of client1
# Assign to client1 the access token of  Virtual Environment Station 1 in ThingsBoard
client1.username_pw_set(ACCESS_TOKEN1)
# Establish connection using the func connect from the class client
client1.connect(broker, port, keepalive=60)

client2 = paho.Client("control1")  # Create client2 object
client2.on_publish = on_publish  # Assign function to callback of client2
# Assaign to client2 the access token of  Virtual Environment Station 2 in ThingsBoard
client2.username_pw_set(ACCESS_TOKEN2)
# Establish connection using the func connect from the class client
client2.connect(broker, port, keepalive=60)
```

```
# Sending data
while True:
    payload1 = get_payload()  # Get a new payload1
    payload2 = get_payload()  # Get a new peyload2
    # Send the payload 1 to client1 topic
    ret = client1.publish("v1/devices/me/telemetry", payload1)
    # Send the payload 2 to client2 topic
    ret = client2.publish("v1/devices/me/telemetry", payload2)
    print("Please check LATEST TELEMETRY field of your devices")
    print(payload1)
    print(payload2)
    time.sleep(5)  # Wait 5 second to resend another payload to the devices
```