

Node-RED web Application

Team ID	PNT2022TMID27888
Project Name	Smart Waste Management System for Metropolitan Cities

OBJECTIVE:

To develop the web Application using Node-RED service. Also display the Bin location on the Node-RED web UI.

STEP 1:

Develop a python code to display the location of the bin along with the bin status.

PYTHON CODE:

```
import wiotp.sdk.device
```

```
import time
```

```
import random
```

```
import requests
```

```
import urllib.parse
```

```
# The address variable contains the location where the Smart bins are installed.
```

```
address= ['Kodambakkam','T.nagar','West mambalam','vadapalani','ekkattuthangal']
```

```
myConfig = {
```

```
    "identity": {
```

```
        "orgId": "dluuhi",
```

```
        "typeId": "SWMS",
```

```
        "deviceId": "6032"
```

```
    },
```

```
    "auth": {
```

```
        "token": "311519106032"
```

```

    }
}

def myCommandCallback(cmd):
    print("Message received from IBM IoT Platform: %s" % cmd.data['command'])
    m=cmd.data['command']

client = wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()

for x in address:
    url = 'https://nominatim.openstreetmap.org/search/' + urllib.parse.quote(x) +'?format=json'
    response = requests.get(url).json()
    a = response[1]["lat"]  # a variable contains the latitude of the particular Smart bin
    b = response[1]["lon"]  # b variable contains the longitude of the particular Smart bin
    bin_stat = random.randint(0,100)
    ln_percent = str(bin_stat)+ "%"

# The above random.randint() function generate the random bin values which are then published to
#the IBM Watson cloud Platform

myData={'Latitude':a, 'Longitude':b,"Bin Status":ln_percent}
client.publishEvent(eventId="status", msgFormat="json", data=myData, qos=0, onPublish=None)
print("Published data Successfully: ", myData)
client.commandCallback = myCommandCallback
time.sleep(2)
client.disconnect()

```

OUTPUT:

```
Python 3.7.4 Shell
File Edit Shell Debug Options Window Help
Python 3.7.4 (tags/v3.7.4:09359112e, Jul 8 2019, 20:34:20) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Python\Python37\Bin\location.py =====
2022-11-11 15:05:56,492 wiotp.sdk.device.client.DeviceClient INFO Connected successfully: d:dluuh:SWMS:6032
Published data Successfully: {'Latitude': '13.0517176', 'Longitude': '80.2300054', 'Bin Status': '13%'}
Published data Successfully: {'Latitude': '13.03969', 'Longitude': '80.23565', 'Bin Status': '18%'}
Published data Successfully: {'Latitude': '13.038996', 'Longitude': '80.223169', 'Bin Status': '87%'}
Published data Successfully: {'Latitude': '13.0495316', 'Longitude': '80.211027', 'Bin Status': '66%'}
Published data Successfully: {'Latitude': '13.0169222', 'Longitude': '80.2054236', 'Bin Status': '41%'}
2022-11-11 15:06:11,326 wiotp.sdk.device.client.DeviceClient INFO Disconnected from the IBM Watson IoT Platform
2022-11-11 15:06:11,326 wiotp.sdk.device.client.DeviceClient INFO Closed connection to the IBM Watson IoT Platform
>>>
```

STEP 2:

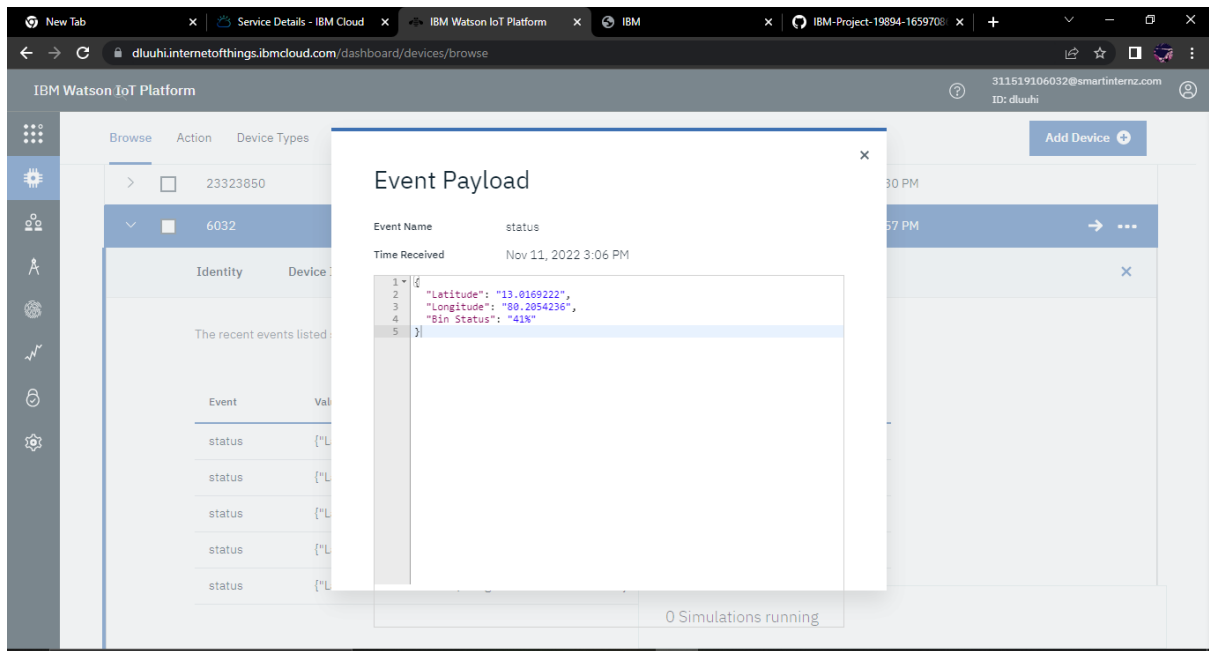
View the output in IBM Watson IoT Cloud Platform.

IBM Watson IoT Platform:

The screenshot shows the IBM Watson IoT Platform dashboard. The top navigation bar includes 'Browse', 'Action', 'Device Types', and 'Interfaces'. The main content area displays a table of devices. The selected device, ID 6032, is shown in detail. The 'Recent Events' tab is active, displaying a list of events with columns for Event, Value, Format, and Last Received. The events show a sequence of location updates and status changes.

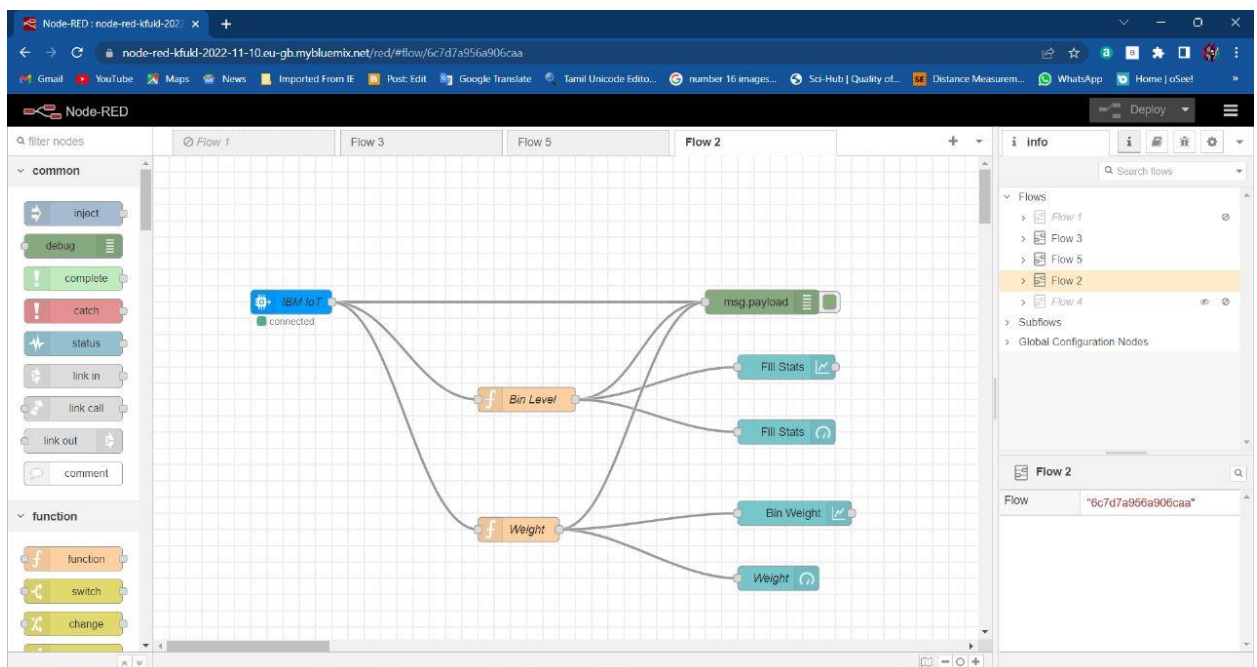
Event	Value	Format	Last Received
status	["Latitude": "13.0169222", "Longitude": "80.2054...", "Bin Status": "41%"]	json	9 minutes ago
status	["Latitude": "13.0495316", "Longitude": "80.2110...", "Bin Status": "66%"]	json	9 minutes ago
status	["Latitude": "13.038996", "Longitude": "80.22316...", "Bin Status": "87%"]	json	9 minutes ago
status	["Latitude": "13.03969", "Longitude": "80.23565", "Bin Status": "18%"]	json	9 minutes ago
status	["Latitude": "13.0517176", "Longitude": "80.2300...", "Bin Status": "13%"]	json	9 minutes ago

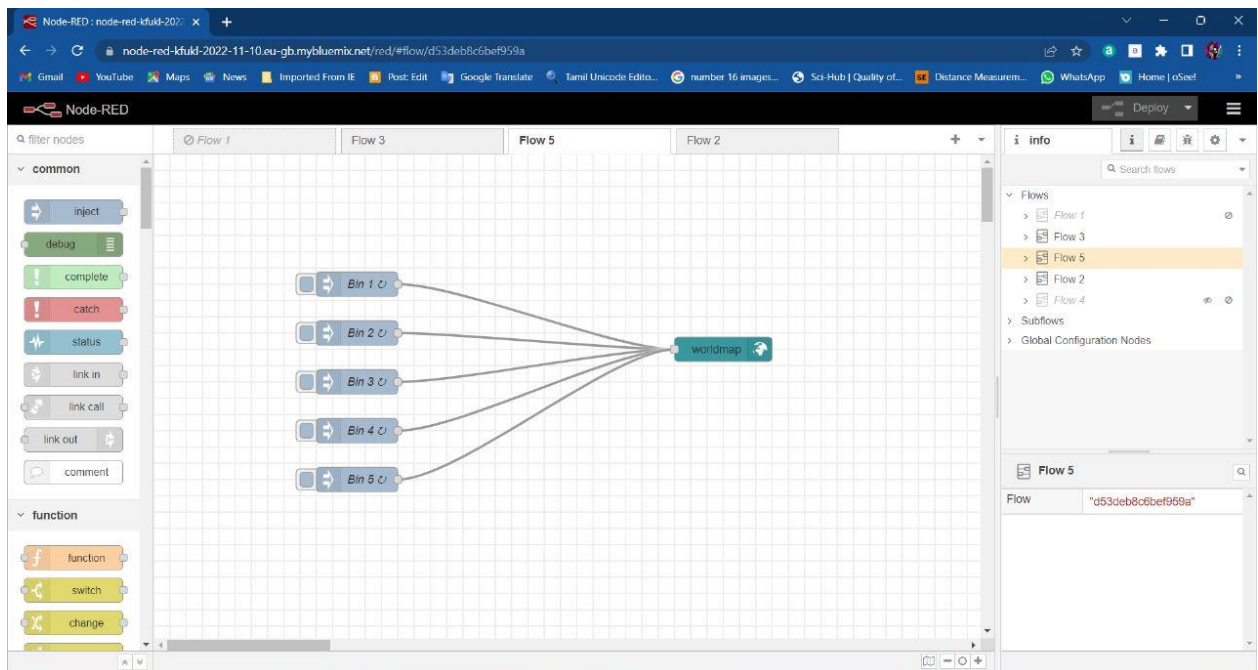
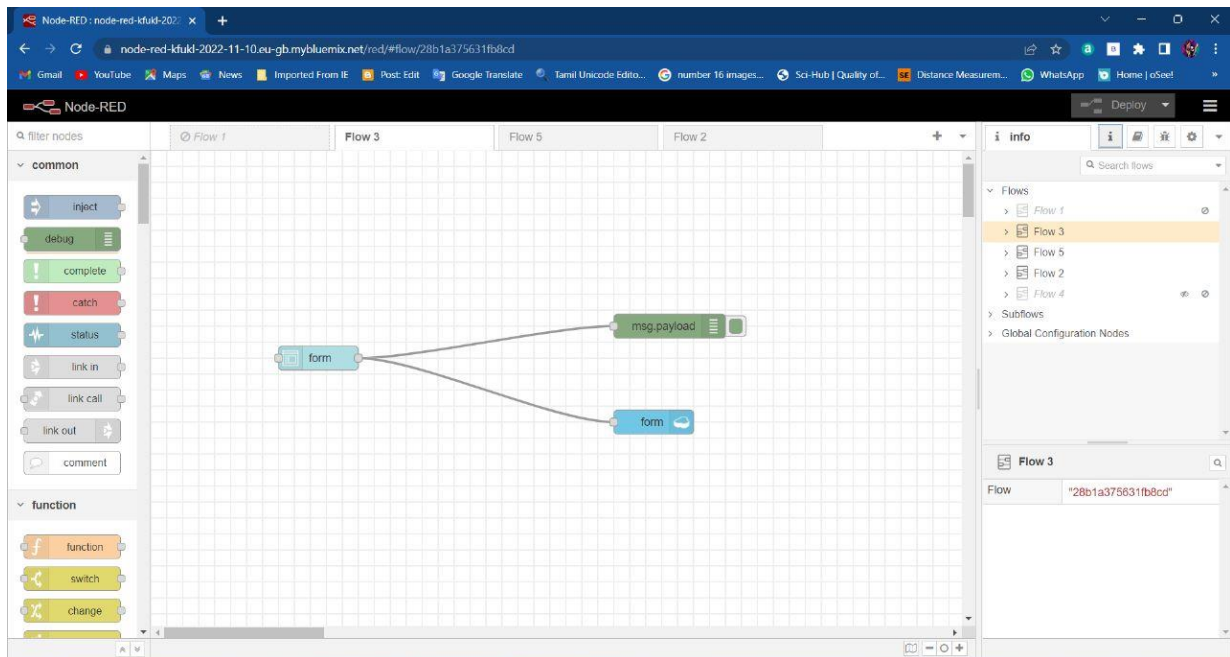
0 Simulations running



STEP 3:

Creating a Node-red UI to view data in graphical form.

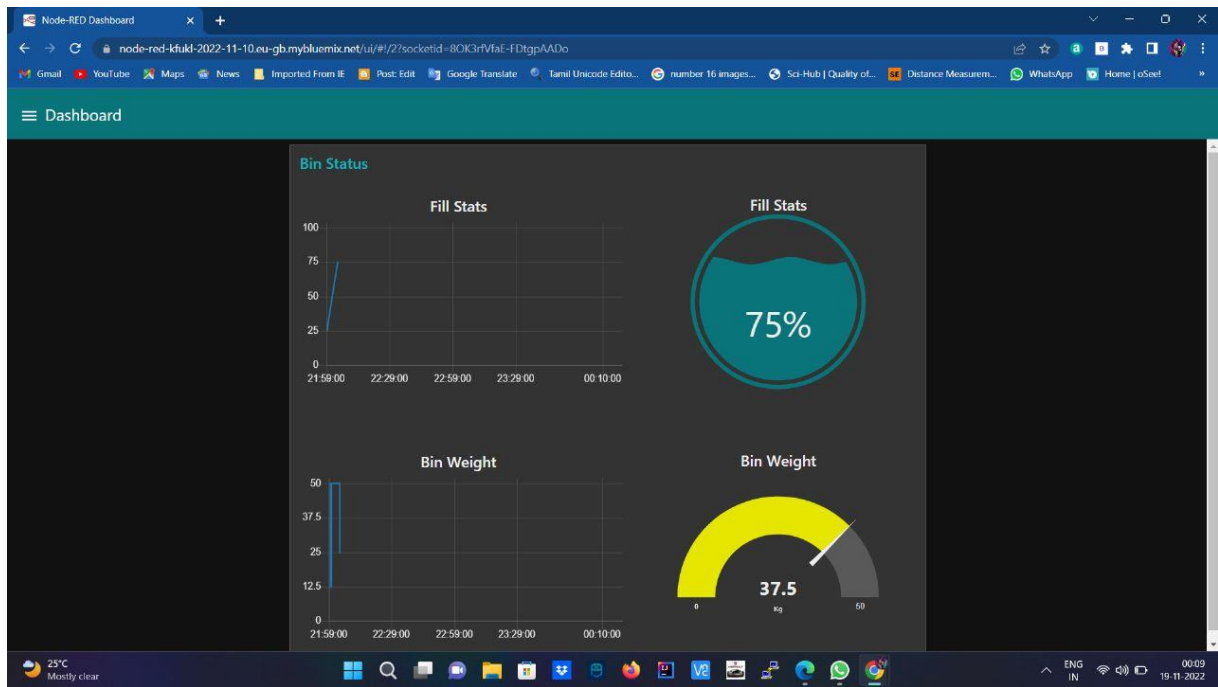




STEP 4:

- Display the location on the Map in Node-RED Web UI
- Send the notification if the bin value crosses the threshold value

Node-RED Dashboard:



NOTE:

The result above indicates that the Fill status is 75% full, meaning that if any further trash is deposited to the smart bin, it will reach its threshold value. The fill status then changes its colour to red.

