

## SPRINT - 3

Date	15 November 2022
Team ID	PNT2022TMID48693
Project Name	Smart waste management system for metropolitan cities
Points	20

Created a IOT device to sense the level of bins and do code for device and send to Node Red using the API keys from Watson platform

CODE :

```
#include <WiFi.h> #include <PubSubClient.h> void
callback(char* subscribetopic, byte* payload, unsigned int
payloadLength);

#define ORG "0kzyfe"           // IBM organisation id
#define DEVICE_TYPE "final"    // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "1234"      // Device ID mentioned in ibm watson iot platform
#define TOKEN "&sVA*)3VSDPzwM6!Jx" // TokenString
data3;

char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[] = "iot-2/evt/Data/fmt/json"; char
subscribetopic[] = "iot-2/cmd/test/fmt/String"; char
authMethod[] = "use-token-auth"; char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;

WiFiClient wifiClient;
PubSubClient client(server, 1883, callback ,wifiClient);

const int trigPin = 5; const int
echoPin = 18; #define
SOUND_SPEED 0.034 long
duration; float distance; float
level;

void setup()
{ Serial.begin(115200);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
wificonnect();
mqttconnect();
}
```

```

void loop()
{
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW); duration =
  pulseIn(echoPin, HIGH); distance =
  duration * SOUND_SPEED/2; level =
  400 - distance; Serial.print("Distance
  (cm): "); Serial.println(level);
  if(level>300)
  {
    Serial.println("ALERT!!");
    delay(1000);
    PublishData(level);
    delay(1000); if
    (!client.loop())
    { mqttconnect();
    }
  }
  else
  {
    Publishdata2(level);
    delay(1000); if
    (!client.loop())
    { mqttconnect();
    }
  }
  delay(1000);
}

```

```

void PublishData(float dist) { mqttconnect(); String payload =
  "{"Level\":"; payload += dist; payload +=
  ",\\"ALERT!!\":"\"Bin Level less than 100 Units \\""; payload +=
  "}";
  Serial.print("Sending payload: ");
  Serial.println(payload);

```

```

if (client.publish(publishTopic, (char*) payload.c_str())) {
  Serial.println("Publish ok");
} else {
  Serial.println("Publish failed");
}
}

```

```

void Publishdata2(float dist)
{ mqttconnect(); String
payload = "{\"Level\":\"";
payload += dist; payload +=
"}";
Serial.print("Sending payload: ");
Serial.println(payload);

if (client.publish(publishTopic, (char*) payload.c_str())) {
Serial.println("Publish ok");
} else {
Serial.println("Publish failed");
}
}

```

```

void mqttconnect() { if
(!client.connected()) {
Serial.print("Reconnecting client to ");
Serial.println(server);
while (!client.connect(clientId, authMethod, token))
{ Serial.print("."); delay(500);
}
initManagedDevice();
Serial.println();
}
}

```

```

void wificonnect()
{
Serial.println();
Serial.print("Connecting to ");
WiFi.begin("Wokwi-GUEST", "", 6); while
(WiFi.status() != WL_CONNECTED)
{ delay(500);
Serial.print(".");
}
Serial.println("");
Serial.println("WiFi connected");
Serial.println("IP address: "); Serial.println(WiFi.localIP());
}

```

```

void initManagedDevice() { if
(client.subscribe(subscribetopic))
{ Serial.println((subscribetopic));
}
}

```

```

Serial.println("subscribe to cmd OK");
} else {
Serial.println("subscribe to cmd FAILED");
}
}

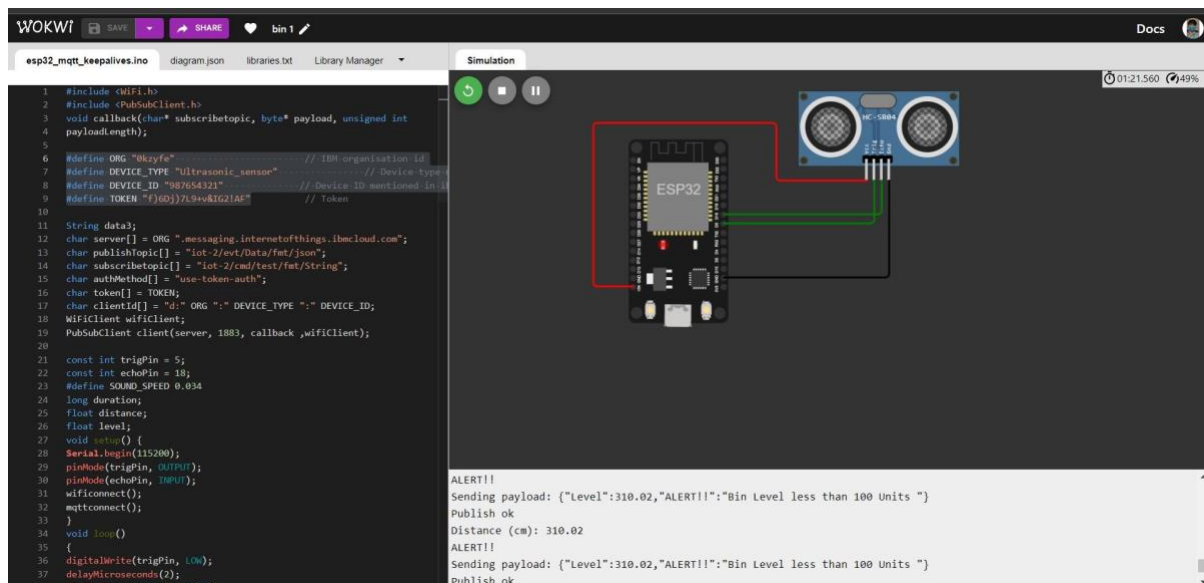
```

```

void callback(char* subscribetopic, byte* payload, unsigned int payloadLength)
{
Serial.print("callback invoked for topic: ");
Serial.println(subscribetopic); for (int i =
0; i < payloadLength; i++) {
//Serial.print((char)payload[i]);
data3 += (char)payload[i];
}
Serial.println("data: " + data3);
data3="";
}

```

Sensor circuit:



Watson IoT Platform:

IBM Watson IoT Platform

rsangeetrsangeet07@gmail.com  
ID: 0kzyle

Browse Action Device Types Interfaces

Add Device

987654321 Connected Ultrasonic\_sensor Device Nov 12, 2022 1:48 PM

Identity Device Information Recent Events State Logs

Device ID 987654321  
Device Type Ultrasonic\_sensor  
Date Added Nov 12, 2022 1:48 PM  
Added By rsangeetrsangeet07@gmail.com  
Connection Status **Connected**  
Connection Time: Nov 15, 2022 2:05 PM  
Client Address: 106.198.11.75 SecureToken

>	<input type="checkbox"/>	BIN1	Connected	BIN_1	Device	Nov 15, 2022 12:18 PM
>	<input type="checkbox"/>	BIN2	Connected	BIN_2	Device	Nov 15, 2022 12:22 PM
>	<input type="checkbox"/>	BIN3	Connected	BIN_3	Device	Nov 15, 2022 12:24 PM

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IBM Watson IoT Platform

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ID: 0kzyle

Browse Action Device Types Interfaces

Add Device

987654321 Connected Ultrasonic\_sensor Device Nov 12, 2022 1:48 PM

Identity Device Information Recent Events State Logs

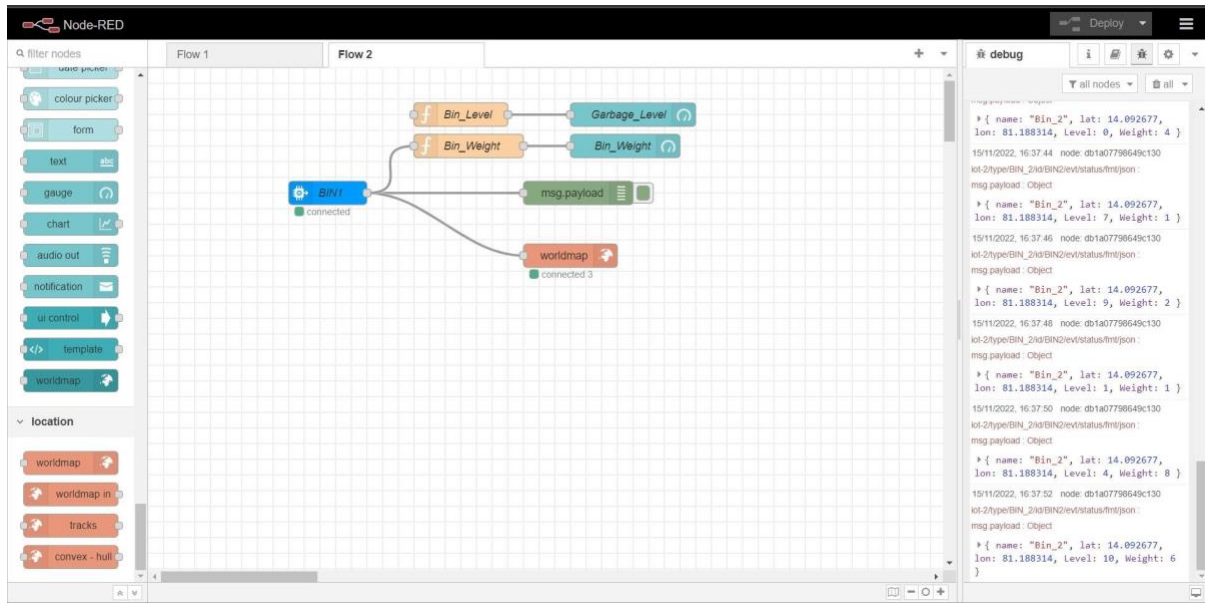
The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
status	{"Level":266,"Alert":"Bin is available"}	json	a few seconds ago
status	{"Level":212,"Alert":"Warning!! Trash is about to ...	json	a few seconds ago
status	{"Level":389,"Alert":"Bin is available"}	json	a few seconds ago

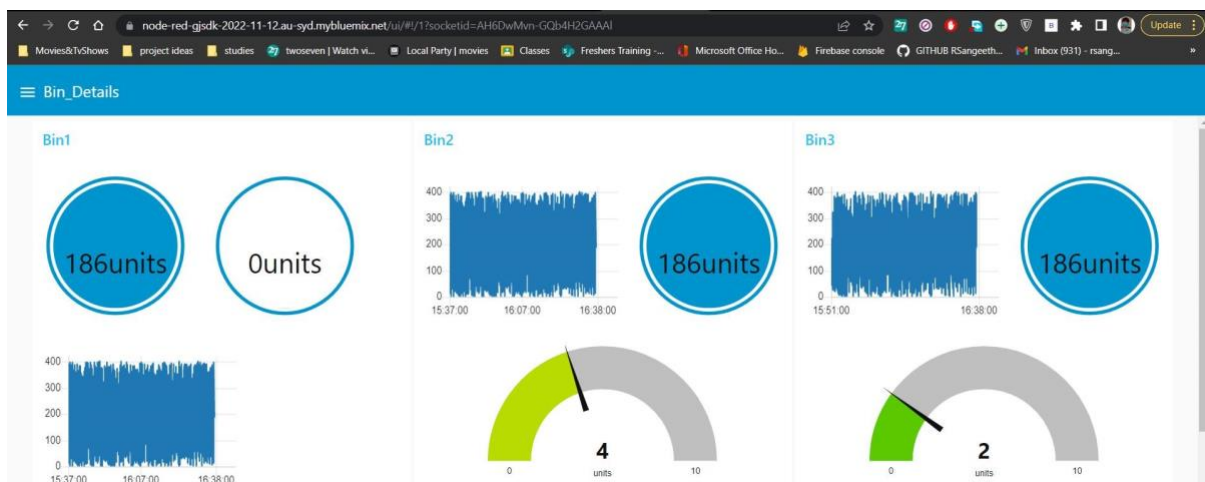
>	<input type="checkbox"/>	BIN1	Connected	BIN_1	Device	Nov 15, 2022 12:18 PM
>	<input type="checkbox"/>	BIN2	Connected	BIN_2	Device	Nov 15, 2022 12:22 PM
>	<input type="checkbox"/>	BIN3	Connected	BIN_3	Device	Nov 15, 2022 12:24 PM

0 Simulations running

Node-RED Connections :



Web UI :



Run the code here : <https://wokwi.com/projects/348375948659262034>