Assignment -4

GAS LEAKAGE MONITERING AND ALERTING SYSTEM FOR INDUSTRIES

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Student Register Number	**821219104015**

Write code and connections in wokwi for the ultrasonic sensor. Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events. Upload document with wokwi share link and images of IBM cloud.

Code 1:

File Name : sketch.ino

```
#include  <WiFi.h>
#include <PubSubClient.h>
void callback(char* subscribetopic, byte* payload, unsigned int payloadLength);
#define ORG "ytvrds"
#define DEVICE_TYPE "esp32"
#define DEVICE_ID "12345"
#define TOKEN "12345678"
String 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;
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;
Serial.print("Distance (cm): ");
Serial.println(distance);
if(distance<100)
{
Serial.println("ALERT!!");
delay(1000);
PublishData(distance);
delay(1000);
if (!client.loop())
{mqttconnect();
}
}
delay(1000);
}
void PublishData(float dist)
{mqttconnect();
String payload = "{\"Distance\":";
payload += dist;
payload += ",\"ALERT!!\":""\"Distance less than 100cms\"";
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++)
{
data3 += (char)payload[i];
}
Serial.println("data: "+ data3);
data3="";
}
```

Code 2:

File Name : diagram.json

This Meta data given in IBM Watson IoT Platform

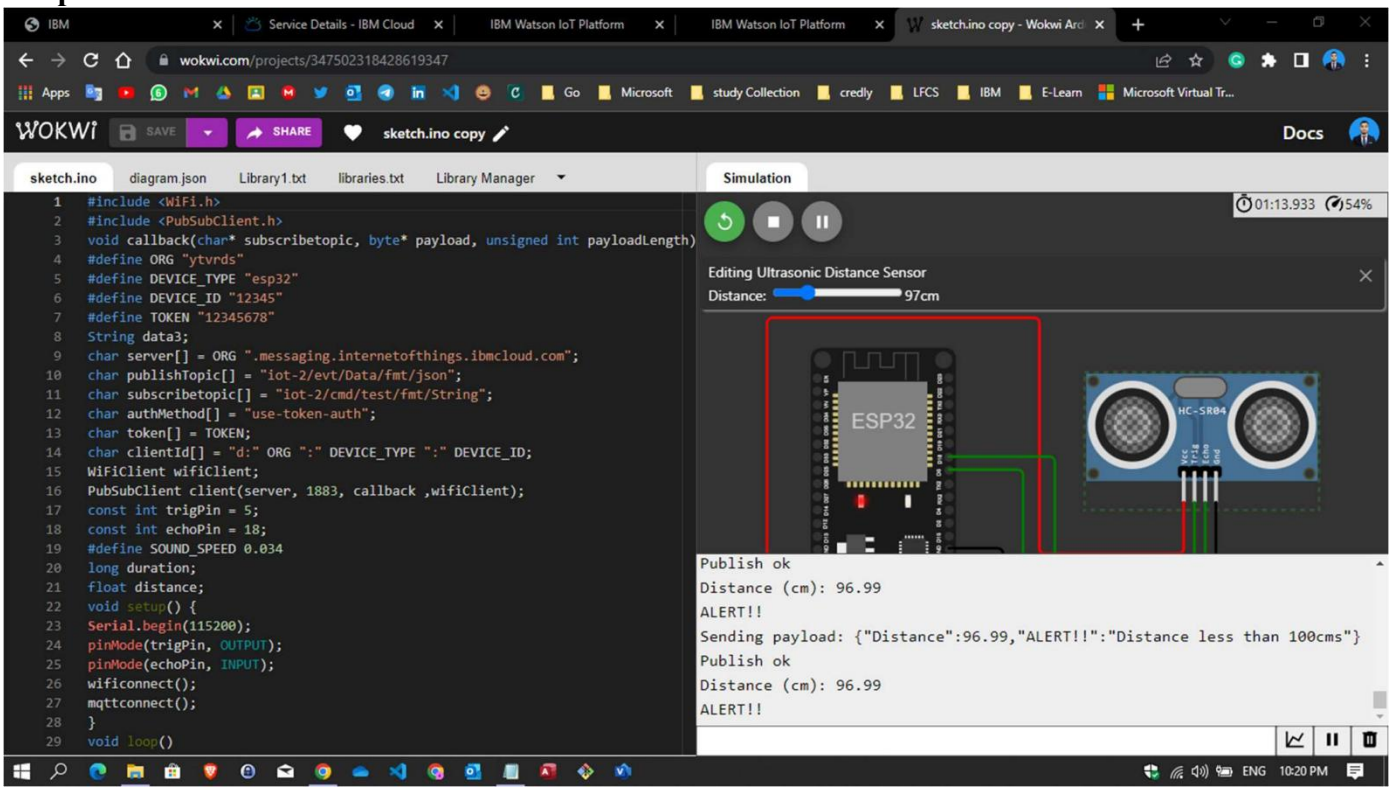
```
{
  "version": 1,
  "author": "abdulmohamedm",
  "editor": "wokwi",
  "parts": [
    { "type": "wokwi-esp32-devkit-v1", "id": "esp", "top": -4.67, "left": -112.87, "attrs": {} },
    { "type": "wokwi-hc-sr04", "id": "ultrasonic1", "top": 15.96, "left": 89.17, "attrs": {} }
  ],
  "connections": [
    [ "esp:TX0", "$serialMonitor:RX", "", [] ],
    [ "esp:RX0", "$serialMonitor:TX", "", [] ],
    [
```

```
    "esp:VIN",
    "ultrasonic1:VCC",
    "red",
    [ "h-37.16", "v-178.79", "h200", "v173.33", "h100.67" ]
   ],
   [ "esp:GND.1", "ultrasonic1:GND", "black", [ "h39.87", "v44.04", "h170" ] ],
   [ "esp:D5", "ultrasonic1:TRIG", "green", [ "h54.54", "v85.07", "h130.67" ] ],
   [ "esp:D18", "ultrasonic1:ECHO", "green", [ "h77.87", "v80.01", "h110" ] ]
 ]
}
```

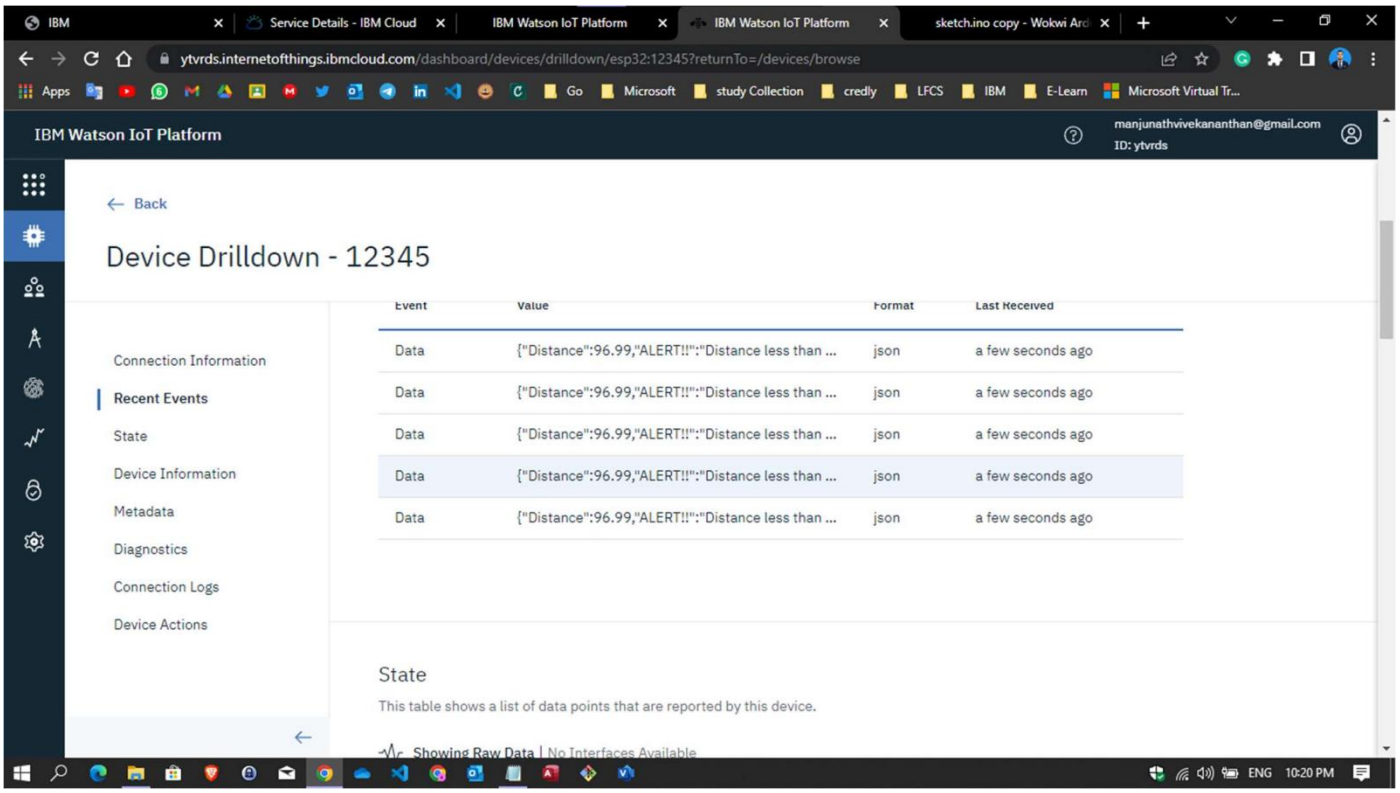
Wokwi Link :

https://wokwi.com/projects/347665080823841362

Output and Simulation :



Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display inthe device recent events.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Service Details - IBM Cloud
IBM Watson IoT Platform
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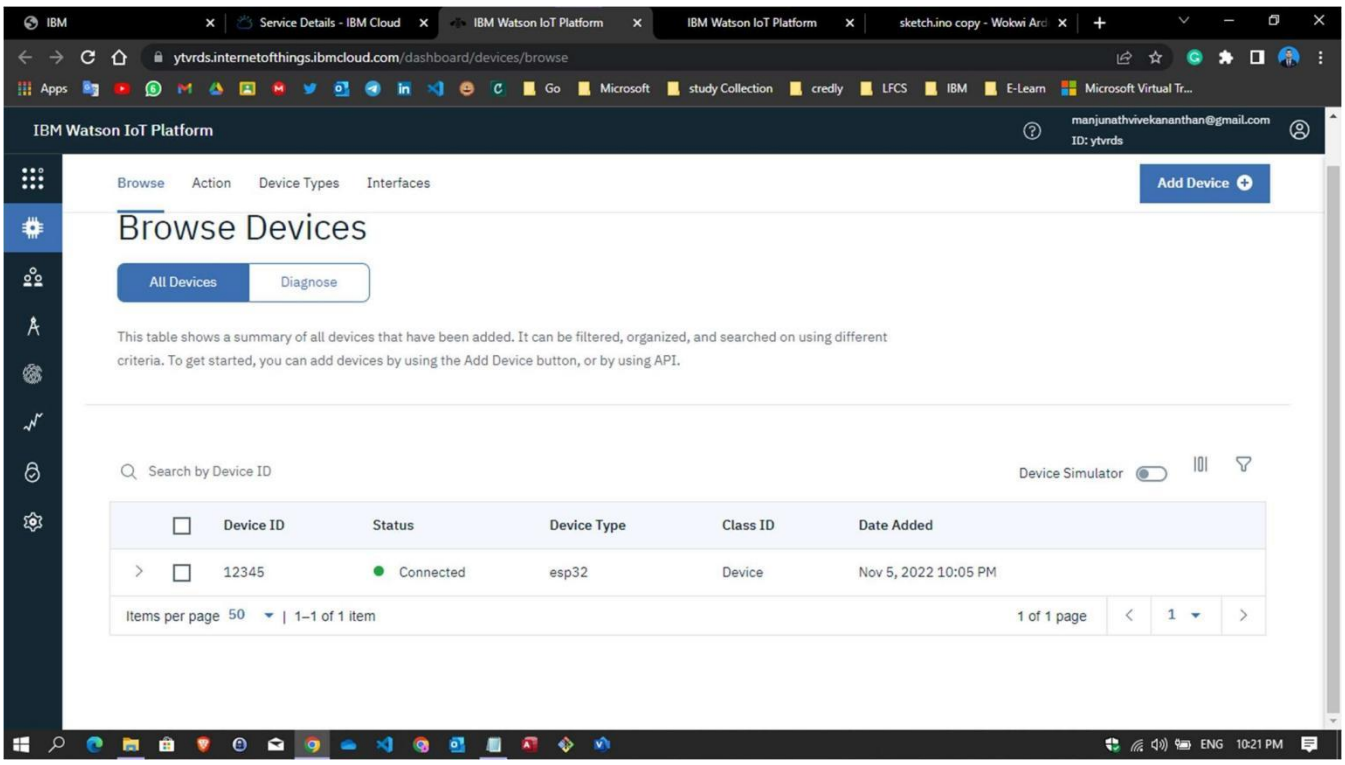
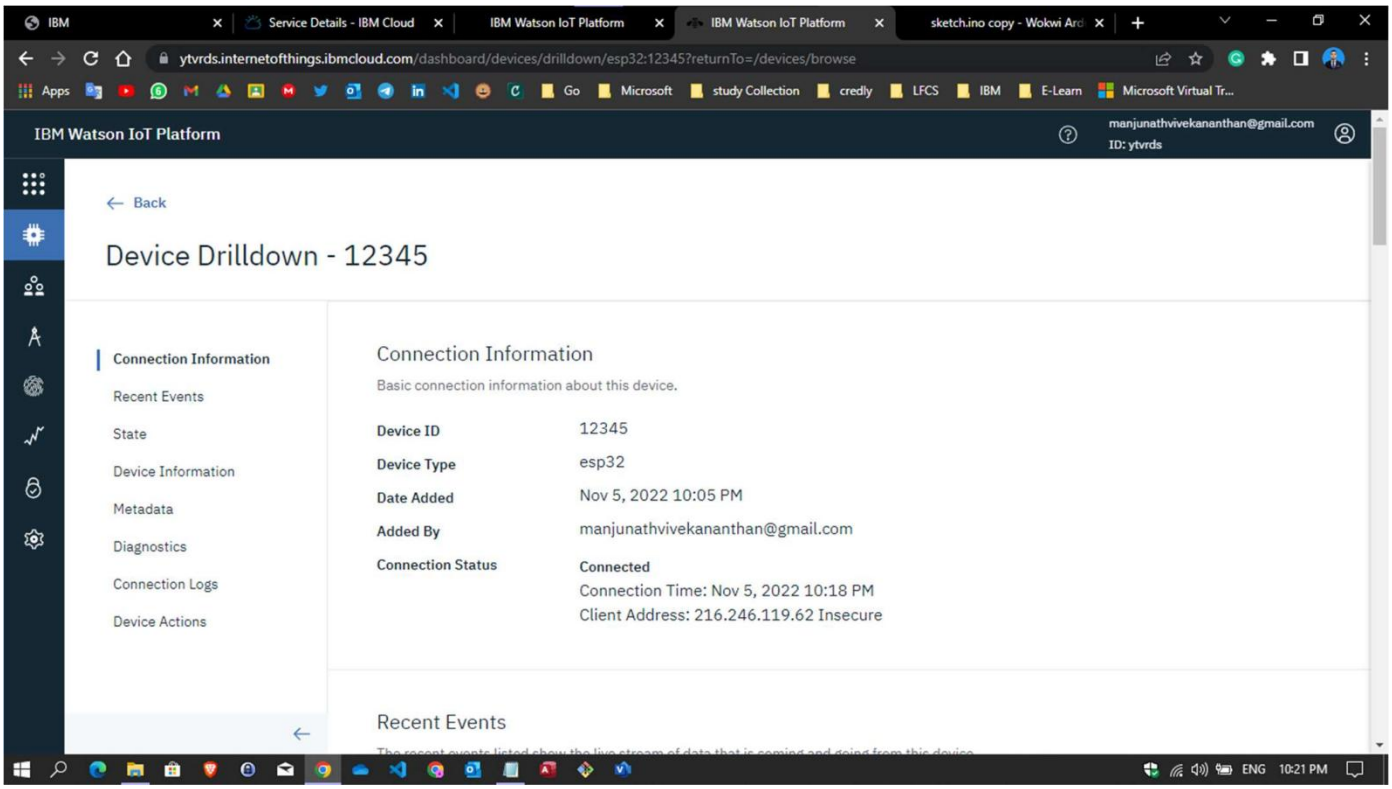
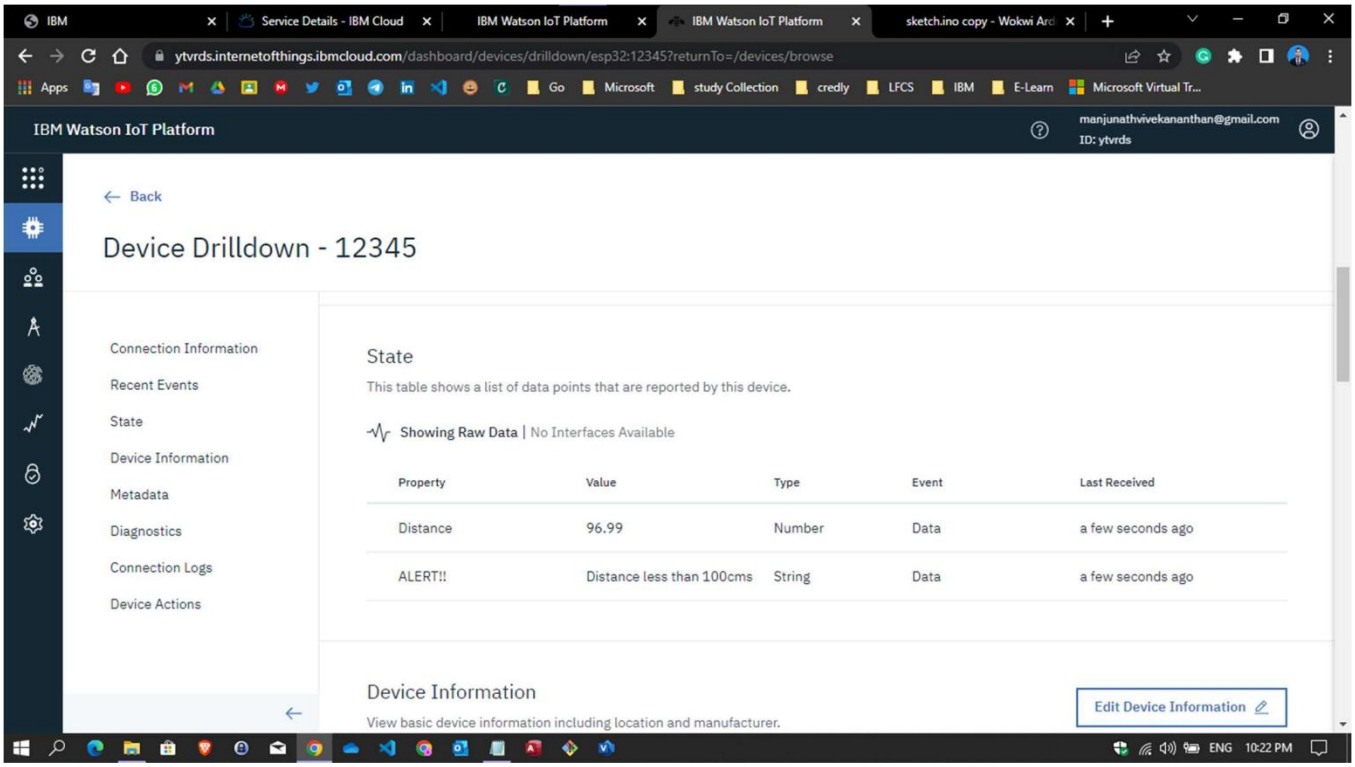
ytvrds.internetofthings.ibmcloud.com/dashboard/devices/drilldown/esp32:12345?returnTo=/devices/browse
Apps
Go
Microsoft
study Collection
credly
LFCS
IBM
E-Learn
Microsoft Virtual Tr...
IBM Watson IoT Platform
manjunathvivekananthan@gmail.com
ID: ytvrds
Back
Device Drilldown - 12345
Connection Information
Recent Events
State
Device Information
Metadata
Diagnostics
Connection Logs
Device Actions
Event
Value
Format
Last Received
Data
{"Distance":96.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":96.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":96.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":96.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
Data
{"Distance":96.99,"ALERT!!":"Distance less than ...
json
a few seconds ago
State
This table shows a list of data points that are reported by this device.
Showing Raw Data | No Interfaces Available
ENG
10:20 PM


IBM
Service Details - IBM Cloud
IBM Watson IoT Platform
IBM Watson IoT Platform
sketch.ino copy - Wokwi Ard
ytvrds.internetofthings.ibmcloud.com/dashboard/devices/browse
Apps
Go
Microsoft
study Collection
credly
LFCS
IBM
E-Learn
Microsoft Virtual Tr...
IBM Watson IoT Platform
manjunathvivekananthan@gmail.com
ID: ytvrds
Browse
Action
Device Types
Interfaces
Add Device
Browse Devices
All Devices
Diagnose
This table shows a summary of all devices that have been added. It can be filtered, organized, and searched on using different criteria. To get started, you can add devices by using the Add Device button, or by using API.
Search by Device ID
Device Simulator
Device ID
Status
Device Type
Class ID
Date Added
12345
Connected
esp32
Device
Nov 5, 2022 10:05 PM
Items per page 50
1–1 of 1 item
1 of 1 page
1
ENG
10:21 PM


IBM Watson IoT Platform
manjunathvivekananthan@gmail.com
ID: ytvrds
Back
Device Drilldown - 12345
Connection Information
Recent Events
State
Device Information
Metadata
Diagnostics
Connection Logs
Device Actions
Connection Information
Basic connection information about this device.
Device ID 12345
Device Type esp32
Date Added Nov 5, 2022 10:05 PM
Added By manjunathvivekananthan@gmail.com
Connection Status Connected
Connection Time: Nov 5, 2022 10:18 PM
Client Address: 216.246.119.62 Insecure
Recent Events


IBM Watson IoT Platform
manjunathvivekananthan@gmail.com
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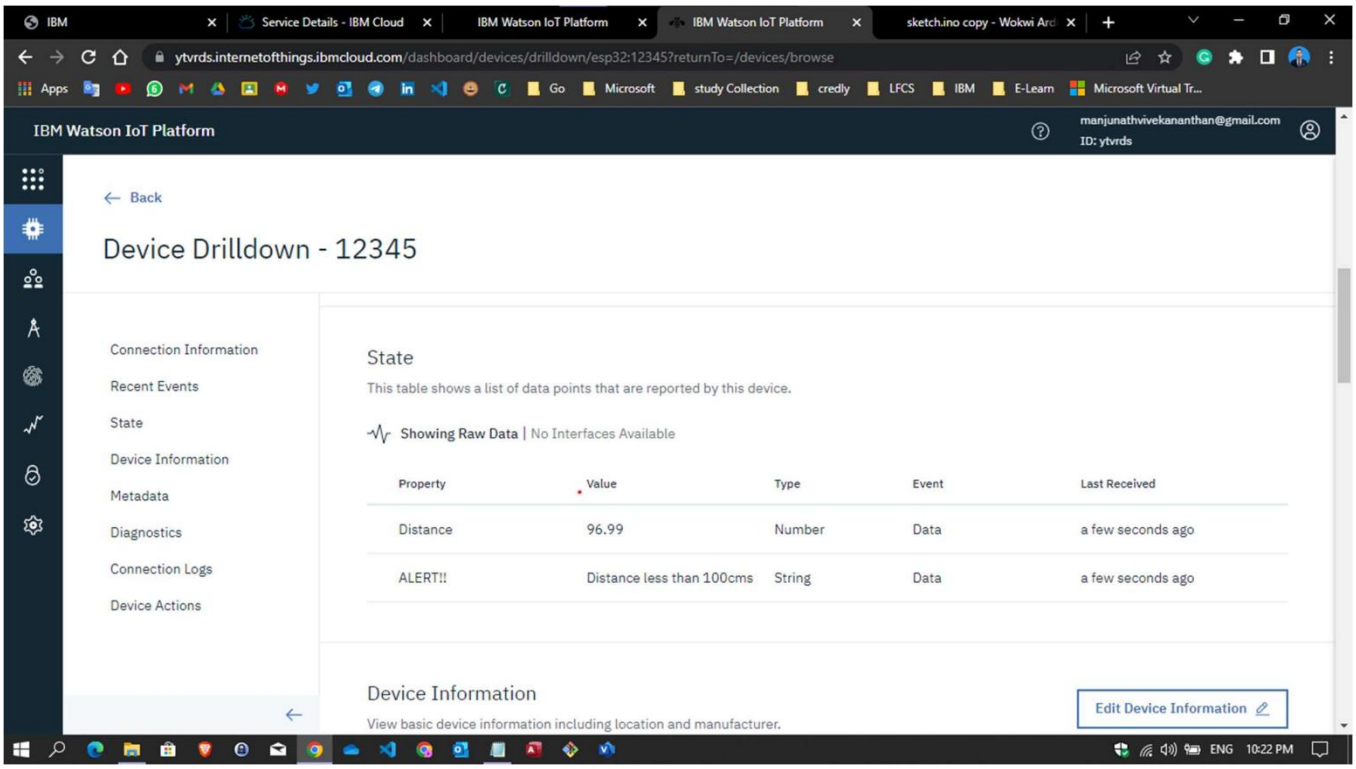
Back
Device Drilldown - 12345
Connection Information
Recent Events
State
Device Information
Metadata
Diagnostics
Connection Logs
Device Actions
State
This table shows a list of data points that are reported by this device.
Showing Raw Data | No Interfaces Available
Property Value Type Event Last Received
Distance 96.99 Number Data a few seconds ago
ALERT!! Distance less than 100cms String Data a few seconds ago
Device Information
View basic device information including location and manufacturer.
Edit Device Information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IBM Watson IoT Platform
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ytvrds.internetofthings.ibmcloud.com/dashboard/devices/drilldown/esp32:12345?returnTo=/devices/browse
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ID: ytvrds
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Device Drilldown - 12345
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State
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Property
Value
Type
Event
Last Received
Distance
96.99
Number
Data
a few seconds ago
ALERT!!
Distance less than 100cms
String
Data
a few seconds ago
Device Information
View basic device information including location and manufacturer.
Edit Device Information
ENG
10:22 PM