# Assignment -4
# IoT Based Safety Gadget for Child Safety Monitoring and Notification

| | |
|---|---|
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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

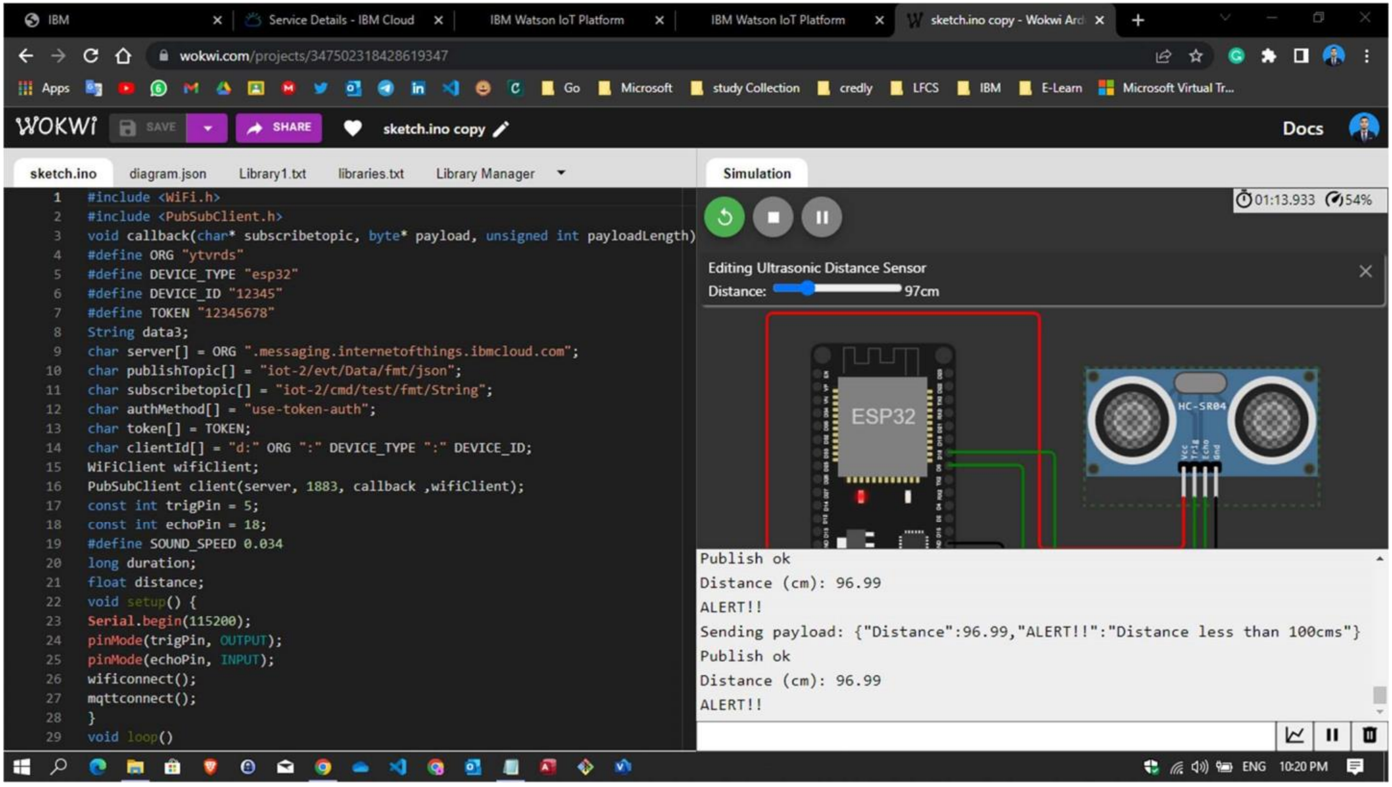
This Meta data given in IBM Watson IoT Platform

```
{
  "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/347502318428619347

Output and Simulation :



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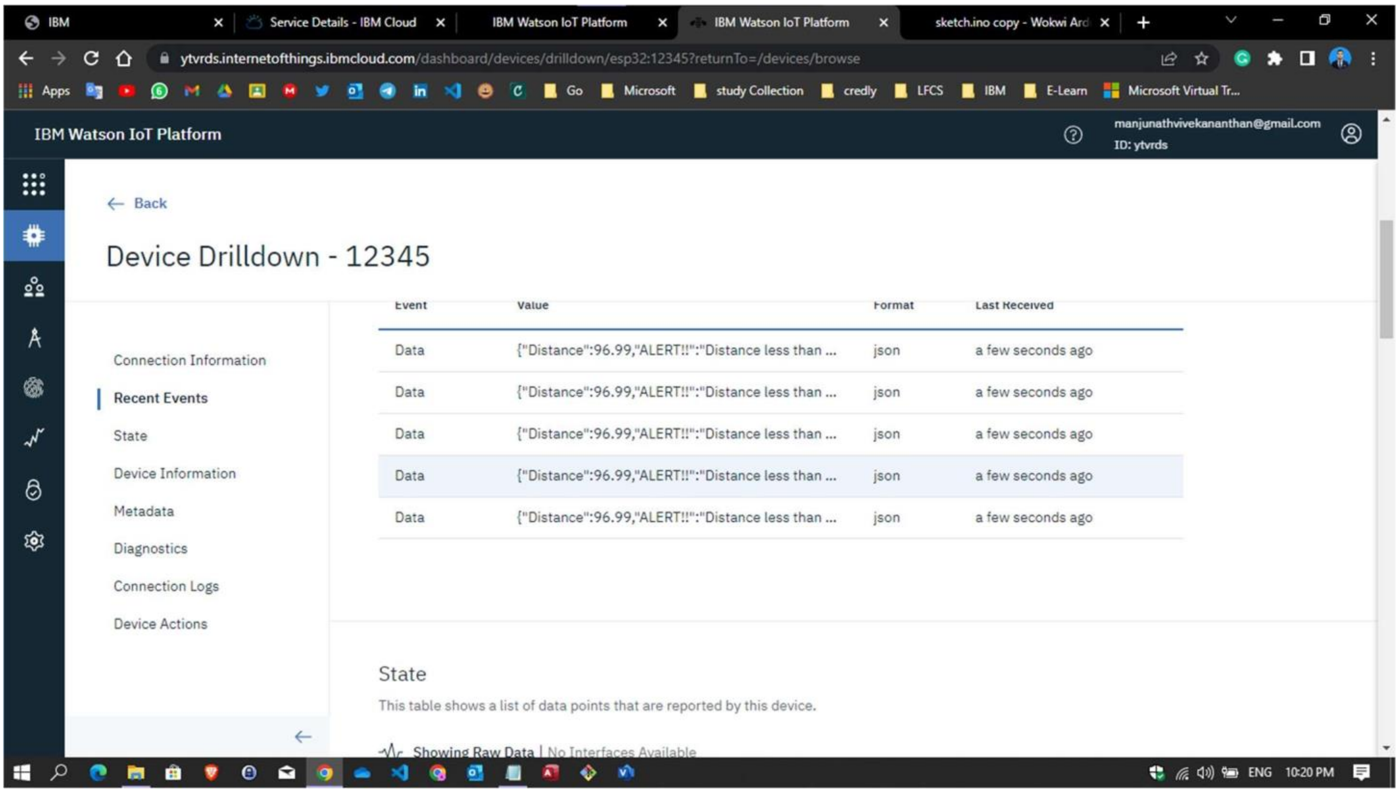
pinMode(echoPin, INPUT);
wificonnect();
mqttconnect();
}
void loop()
```

```
Publish ok
Distance (cm): 96.99
ALERT!!
Sending payload: {"Distance":96.99,"ALERT!!":"Distance less than 100cms"}
Publish ok
Distance (cm): 96.99
ALERT!!
```

Whenever the distance is less than 100 cms send an "alert" to the IBM cloud and display in the device recent events.



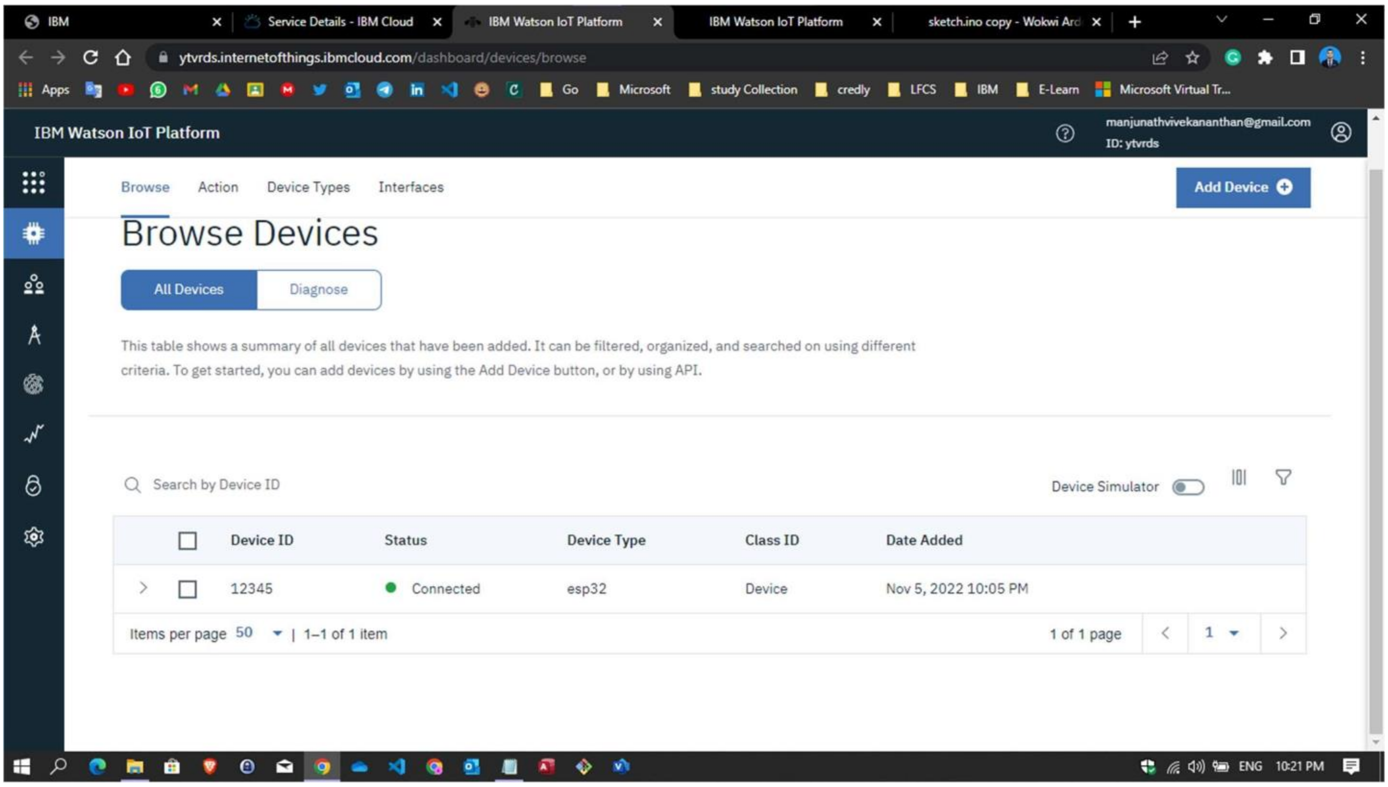
Device Drilldown - 12345

| 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

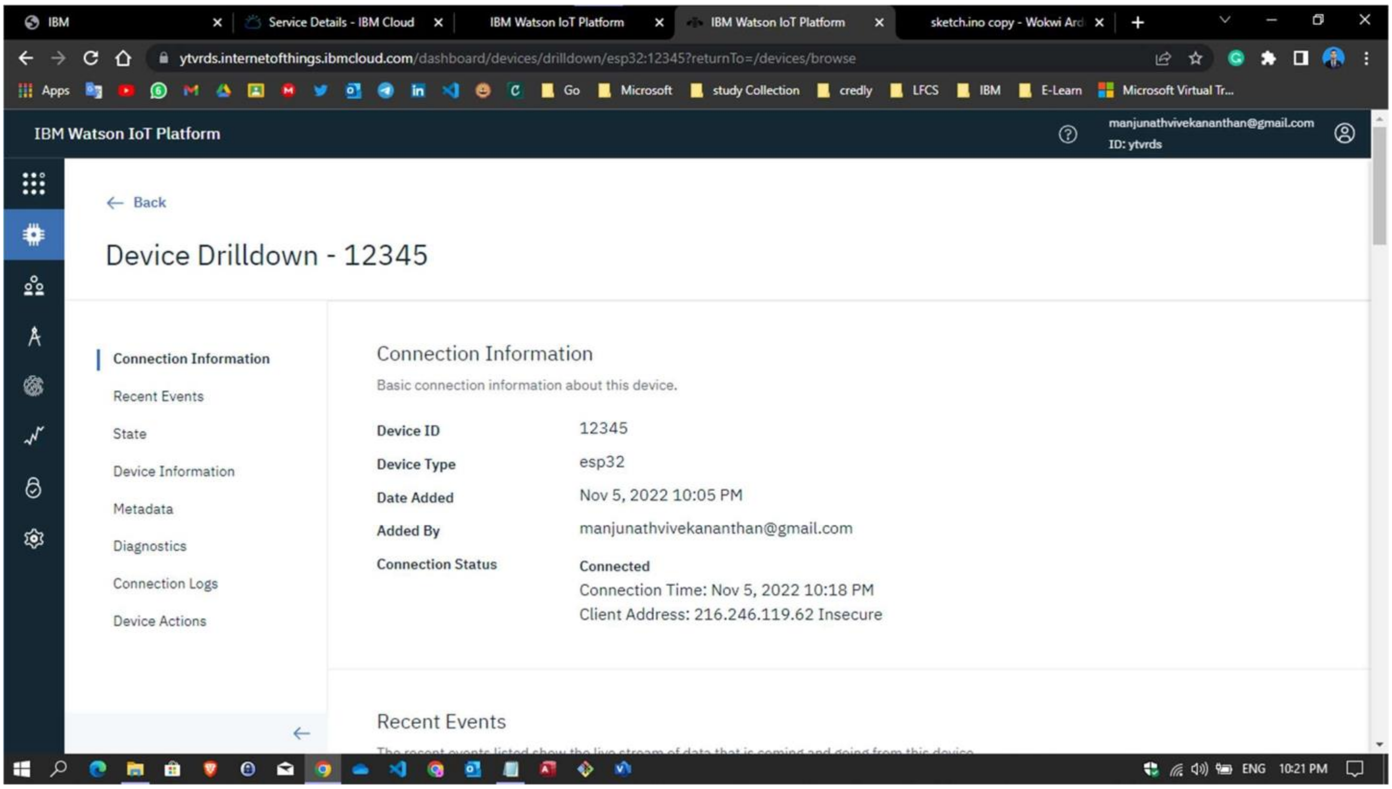


Browse Devices

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.

| | 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



## Device Drilldown - 12345

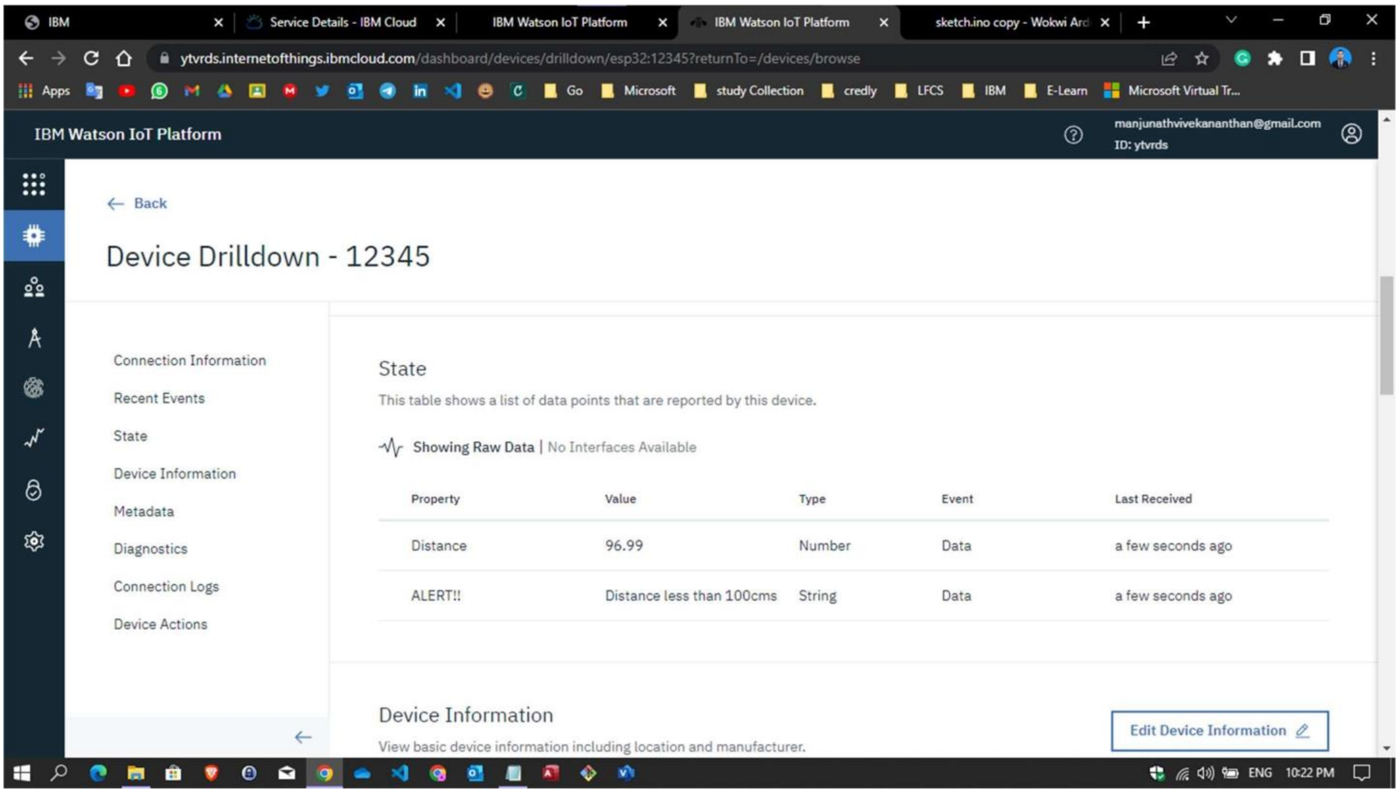
### Connection Information

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<br>Connection Time: Nov 5, 2022 10:18 PM<br>Client Address: 216.246.119.62 Insecure |

### Recent Events

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



## Device Drilldown - 12345

### State

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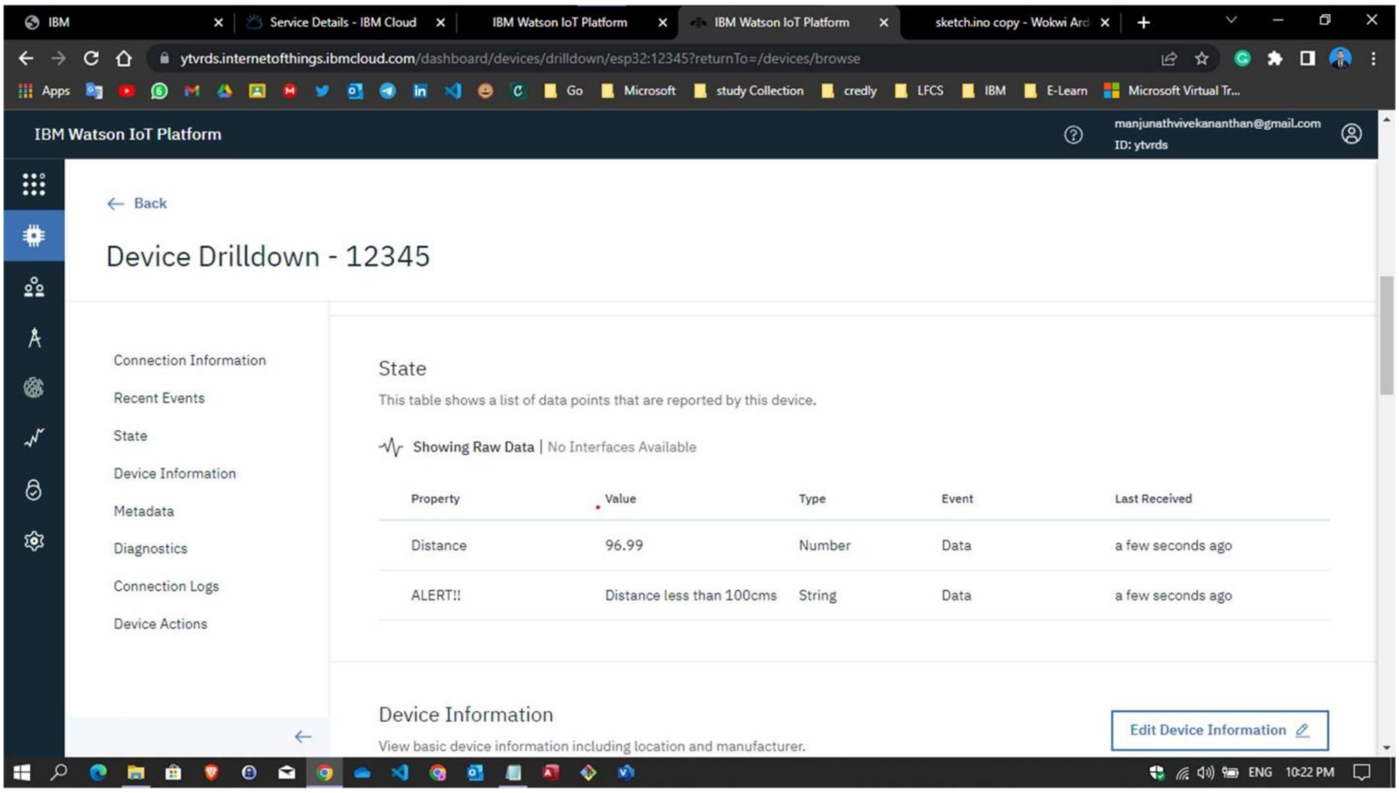
Showing Raw Data | No Interfaces Available

| 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.



IBM
Service Details - IBM Cloud
IBM Watson IoT Platform
IBM Watson IoT Platform
sketch.ino copy - Wokwi Ard
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

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Device Information

View basic device information including location and manufacturer.