

Smart Farmer-IOT Enabled Smart Farming Application

DELIVERY OF SPRINT – 2

<u>PROJECT TITLE:</u>	Smart Farmer-IOT Enabled Smart Farming Application
<u>TEAM ID:</u>	PNT2022TMID25834
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5. Building Project

5.1 Connecting IoT Simulator to IBM Watson IoT Platform

Open link provided in above section 4.3

Give the credentials of your device in IBM Watson IoT Platform

Click on connect

My credentials given to simulator are:

OrgID: **157uf3** api: **a-157uf3-**

f5rg4qxp3 Device type: **abcd** token:

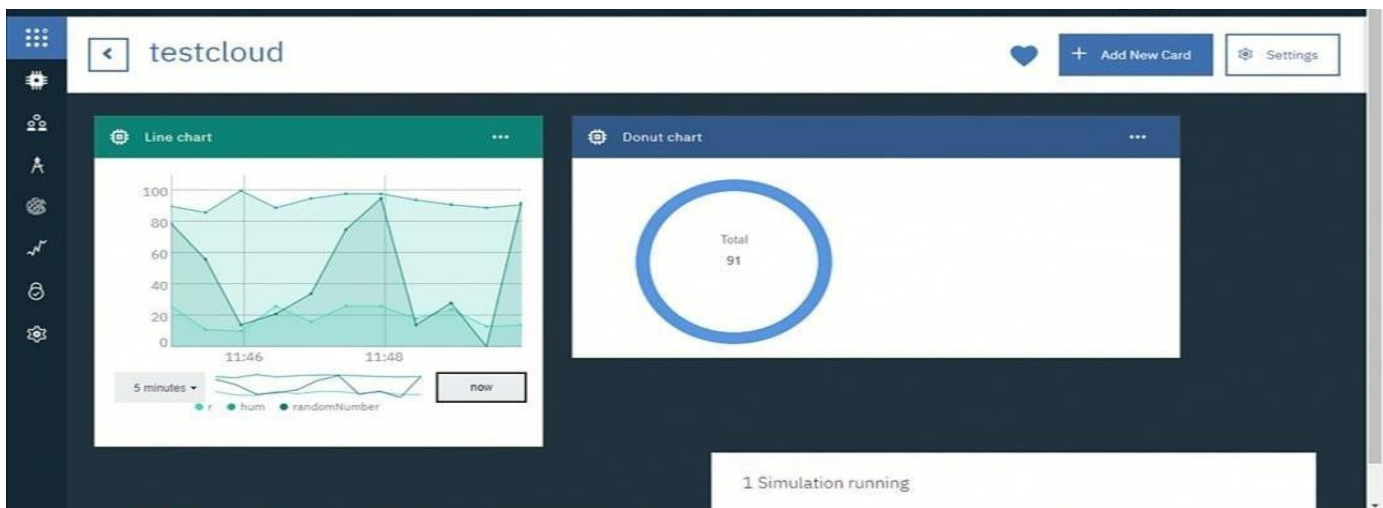
6ogMaaQHNWFEgOD8R?

Device ID : **7654321**

Device Token : **87654321**

You can see the received data in graphs by creating cards in Boards tab

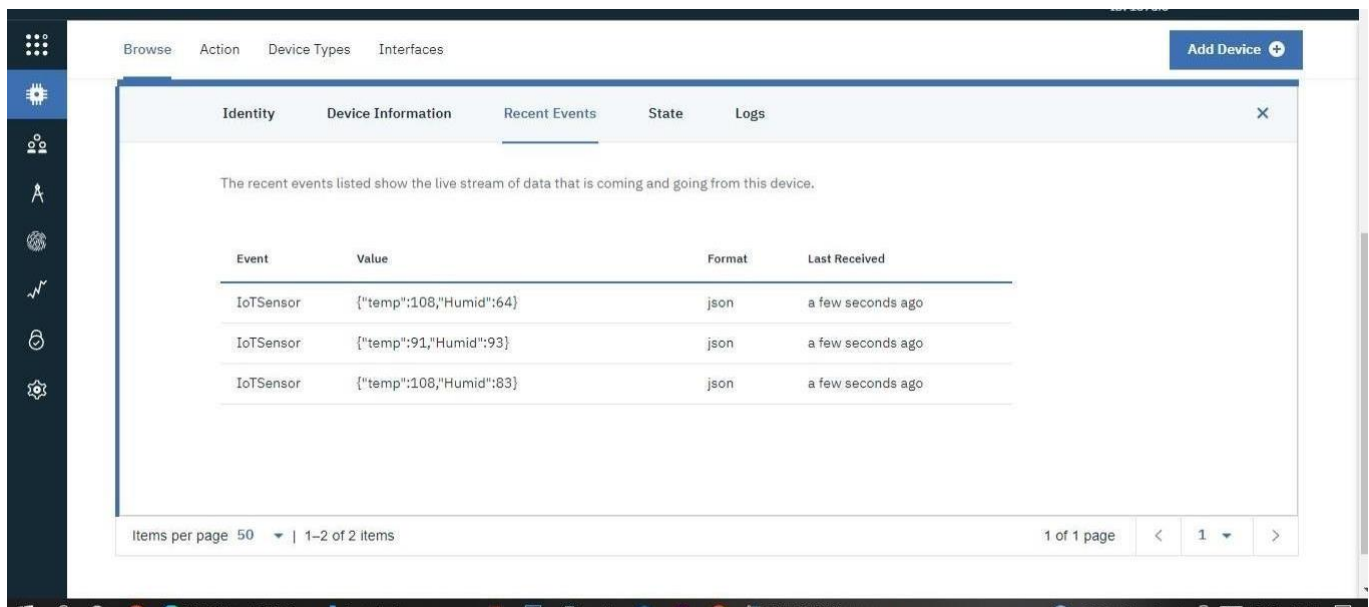
➤ You will receive the simulator data in cloud



➤ You can see the received data in Recent Events under your device

➤ Data received in this format(json)

```
{  
  "d": {  
    ▪ "name": "abcd",  
    ▪ "temperature": 17,  
    ▪ "humidity": 76,  
    ▪ "Moisture ": 25  
  }  
}
```



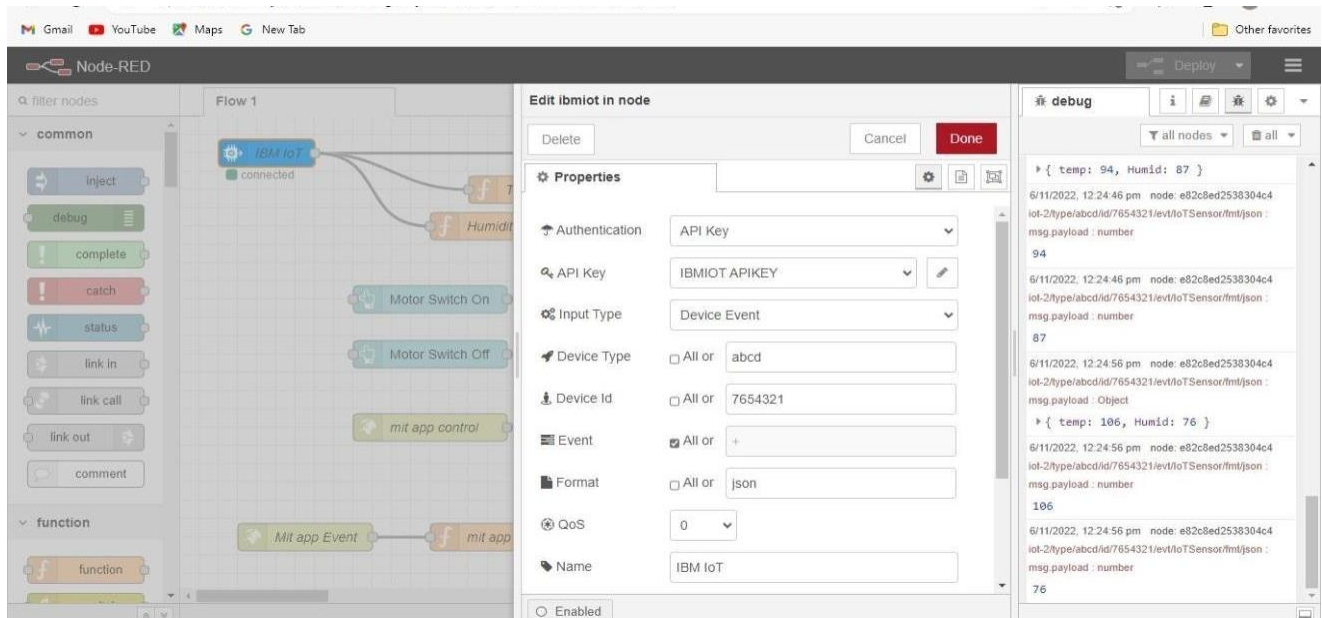
The screenshot shows a web application interface for managing IoT devices. The top navigation bar includes tabs for 'Browse', 'Action', 'Device Types', and 'Interfaces', along with an 'Add Device' button. The main content area is divided into sections for 'Identity', 'Device Information', 'Recent Events', 'State', and 'Logs'. The 'Recent Events' section is currently selected, showing a list of events received from an IoT sensor. The events are displayed in a table with columns for 'Event', 'Value', 'Format', and 'Last Received'.

Event	Value	Format	Last Received
IoTSensor	{"temp":108,"Humid":64}	json	a few seconds ago
IoTSensor	{"temp":91,"Humid":93}	json	a few seconds ago
IoTSensor	{"temp":108,"Humid":83}	json	a few seconds ago

At the bottom of the table, there is a pagination control showing 'Items per page 50' and '1-2 of 2 items'. The bottom of the screen shows a Windows taskbar with various application icons.

5.2 Configuration of Node-Red to collect IBM cloud data

The node IBM IoT App In is added to Node-Red workflow. Then the appropriate device credentials obtained earlier are entered into the node to connect and fetch device telemetry to Node-Red.



Once it is connected Node-Red receives data from the device

Display the data using debug node for verification

Connect function node and write the Java script code to get each reading separately.

The Java script code for the function node is:

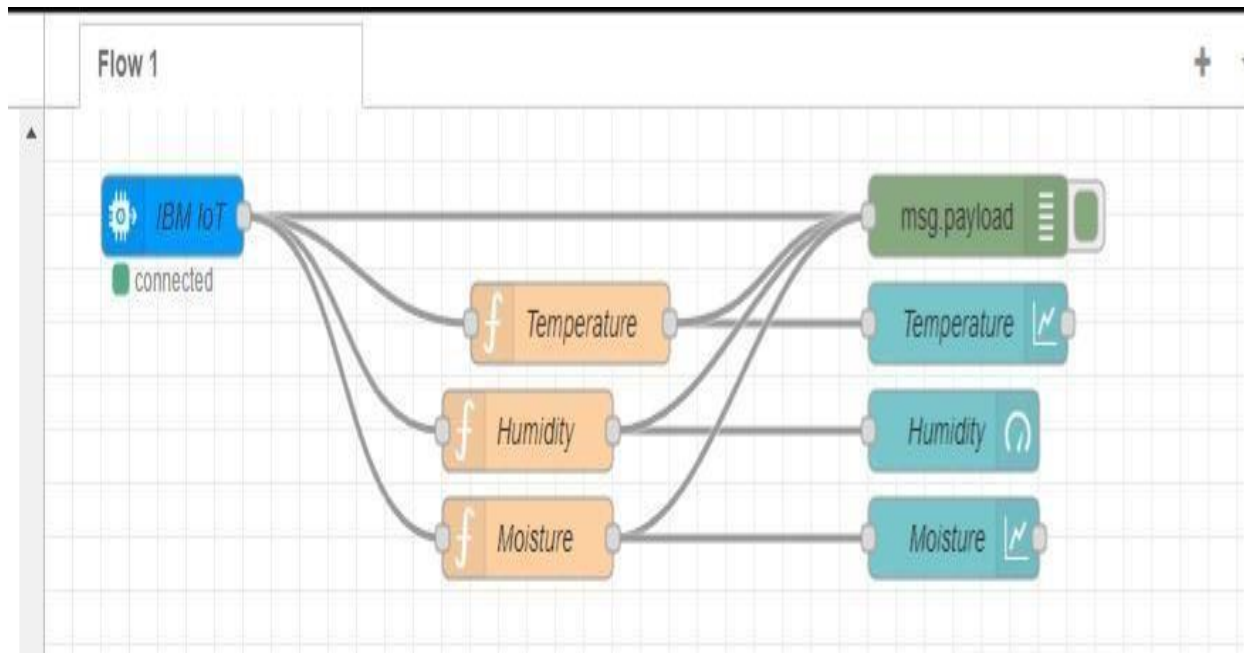
```
msg.payload=msg.payload.d.temperature return
```

```
msg;
```

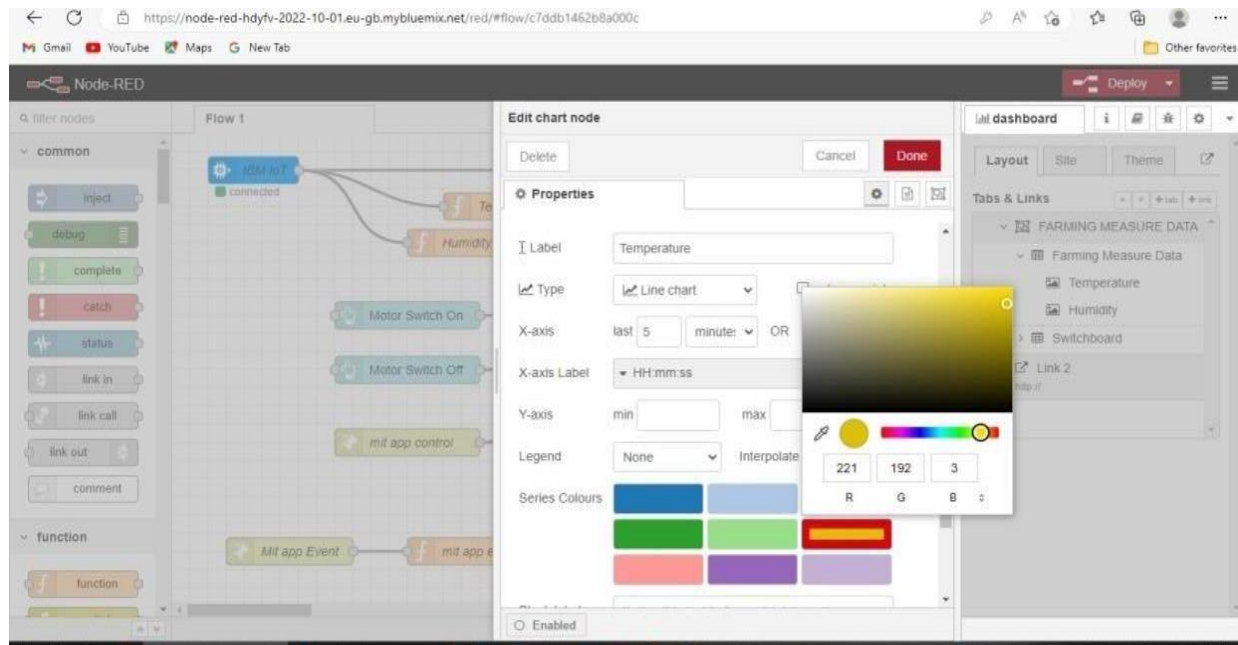
Finally connect Gauge nodes from dashboard to see the data in UI

```
Published Temperature = 109 C Humidity = 64 % to IBM Watson
Published Temperature = 105 C Humidity = 86 % to IBM Watson
Published Temperature = 105 C Humidity = 83 % to IBM Watson
Published Temperature = 102 C Humidity = 86 % to IBM Watson
Published Temperature = 103 C Humidity = 60 % to IBM Watson
Published Temperature = 106 C Humidity = 83 % to IBM Watson
Published Temperature = 101 C Humidity = 85 % to IBM Watson
Published Temperature = 106 C Humidity = 84 % to IBM Watson
Published Temperature = 95 C Humidity = 74 % to IBM Watson
Published Temperature = 107 C Humidity = 73 % to IBM Watson
Published Temperature = 92 C Humidity = 96 % to IBM Watson
Published Temperature = 93 C Humidity = 82 % to IBM Watson
Published Temperature = 98 C Humidity = 80 % to IBM Watson
Published Temperature = 107 C Humidity = 71 % to IBM Watson
Published Temperature = 94 C Humidity = 87 % to IBM Watson
Published Temperature = 106 C Humidity = 76 % to IBM Watson
Published Temperature = 98 C Humidity = 81 % to IBM Watson
Published Temperature = 103 C Humidity = 95 % to IBM Watson
Published Temperature = 92 C Humidity = 66 % to IBM Watson
Published Temperature = 99 C Humidity = 76 % to IBM Watson
Published Temperature = 93 C Humidity = 68 % to IBM Watson
```

Data received from the cloud in Node-Red console



Nodes connected in following manner to get each reading separately



This is the Java script code I written for the function node to get Temperature separately.

5.3 Configuration of Node-Red to collect data from OpenWeather

The Node-Red also receive data from the OpenWeather API by HTTP GET request. An inject trigger is added to perform HTTP request for every certain interval.

HTTP request node is configured with URL we saved before in section 4.4 The data we receive from OpenWeather after request is in below JSON

```
format:{"coord":{"lon":79.85,"lat":14.13},"weather":[{"id":803,"main":"Clouds","description":"brokenclouds","icon":"04n"}],"base":"stations","main":{"temp":307.59,"feels_like":305.5,"temp_min":307.59,"temp_max":307.59,"pressure":1002,"humidity":35,"sea_level":1002,"grnd_level":1000},"wind":{"speed":6.23,"deg":170},"clouds":{"all":68},"dt":1589991979,"sys":{"country":"IN","sunrise":1589933553,"sunset":1589979720},"timezone":19800,"id":1270791,"name":"Gūdūr","cod":200}
```

In order to parse the JSON string we use Java script functions and get each parameters

```
var temperature = msg.payload.main.temp;  
  
temperature = temperature-273.15;  
  
return {payload : temperature.toFixed(2)};
```

In the above Java script code we take temperature parameter into a new variable and convert it from kelvin to Celsius

Then we add Gauge and text nodes to represent data visually in UI

