Smart Weather Monitoring System

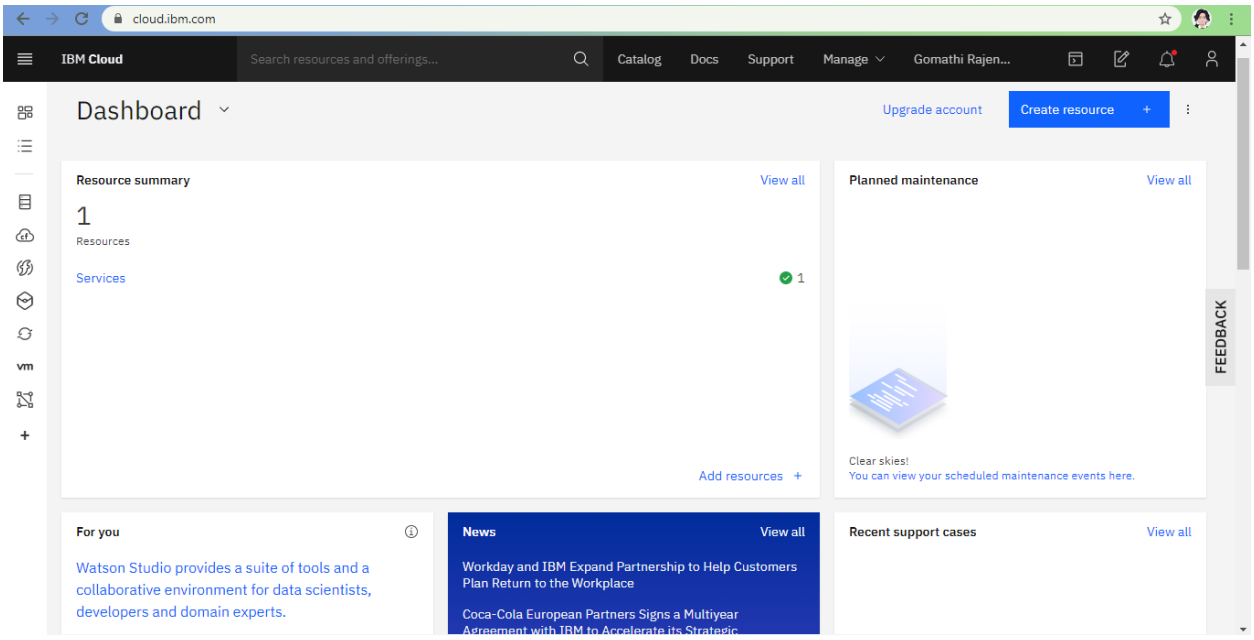
INTRODUCTION:

Smart Weather Monitoring system provides users to have real-time access to weather data from different locations. Weather information like temperature, humidity, and object temperature are monitored by using an online simulator. The online simulator is connected to the device in the IBM IoT platform. The cards and boards are designed to visualize the data in the form of graphs.

SETUP ENVIRONMENT:

1) Creating an IBM account:

An IBM account is created for using IBM Watson IoT Platform for the project. Upon successful registration and login to the cloud, the dashboard page appears as follows.



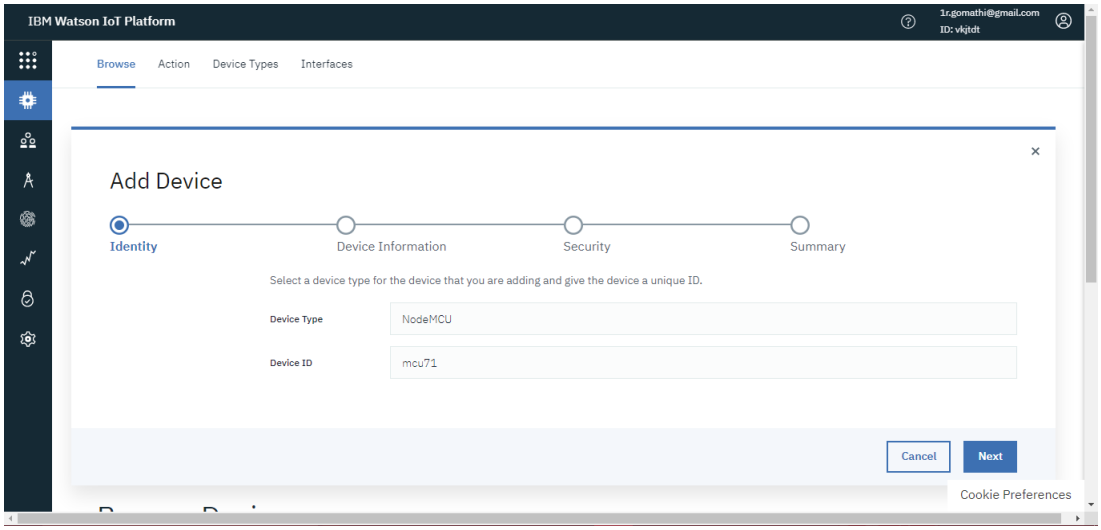
2) Create and Launch the IBM IoT Platform :

IBM Watson IoT Platform is a foundational cloud offering that can connect and control IoT sensors, appliances, homes, and industries. Built on IBM Cloud, Watson IoT Platform provides an extensive set of built-in and add-on tools. These tools can be used to process IoT data with real-time and historical analytics, extract key performance indicators (KPIs) from the data, add “smarts” in the cloud for non-smart products, and securely connect our own apps and existing tools to the Watson IoT Platform infrastructure. The Platform Service component provides IoT device connectivity, IoT data filtering and mapping, and device management tools. The IBM IoT Platform is created and launched through the following steps.

- From the Catalog section in the dashboard, 'Internet of Things Platform' is selected to launch the IoT Platform.
- 'Create' button is pressed to create an IoT Platform for the project leaving the default region provided.
- After creating the IoT platform, it is redirected to the IBM Watson IoT platform launch page. The IoT platform is launched by clicking on the 'Launch' button

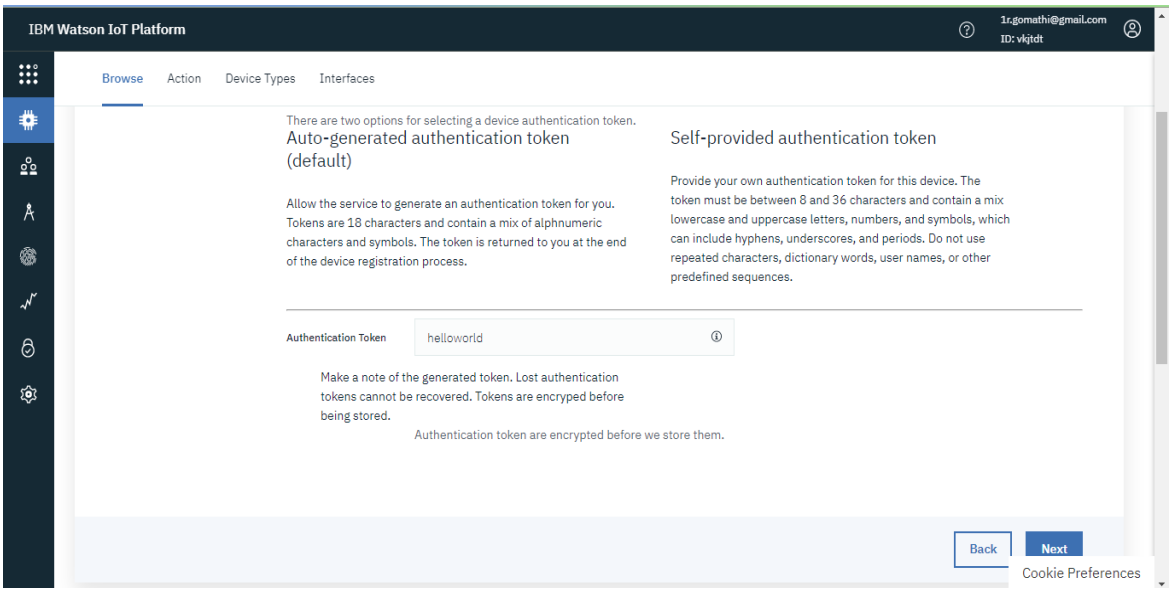
CONFIGURING IBM IOT PLATFORM:

1. Creating a Device in IBM Watson IoT Platform.
   - Click on 'Create a device' on the IoT Platform dashboard to create a device.
   - Click on 'Next' after giving proper device type and device name.

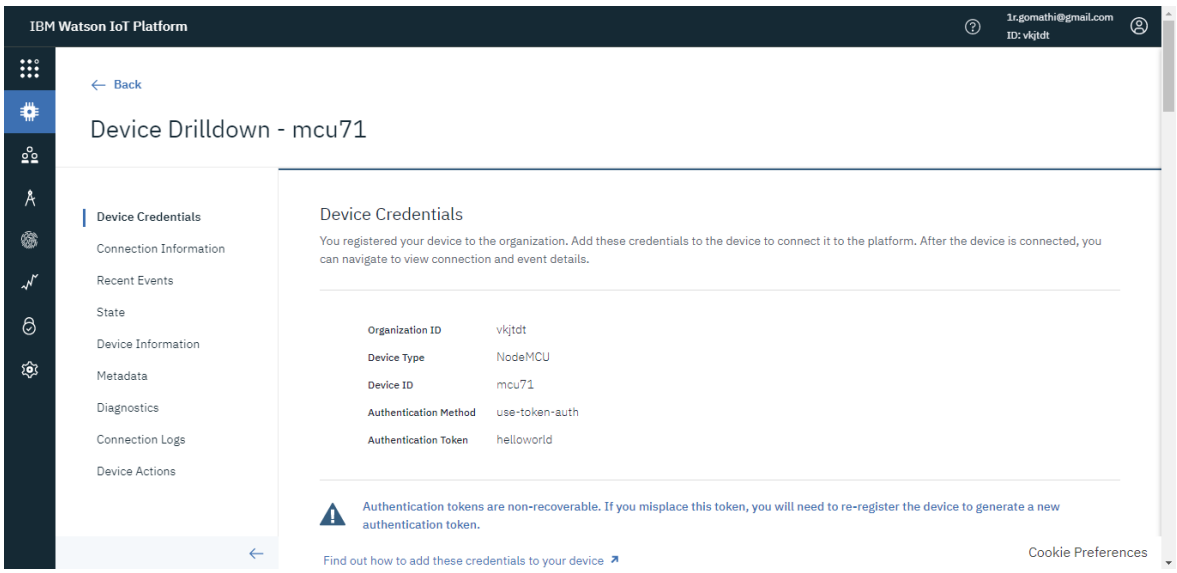


2. Generating Auth Token:

Provide Authentication Token in the security field and click 'Next'

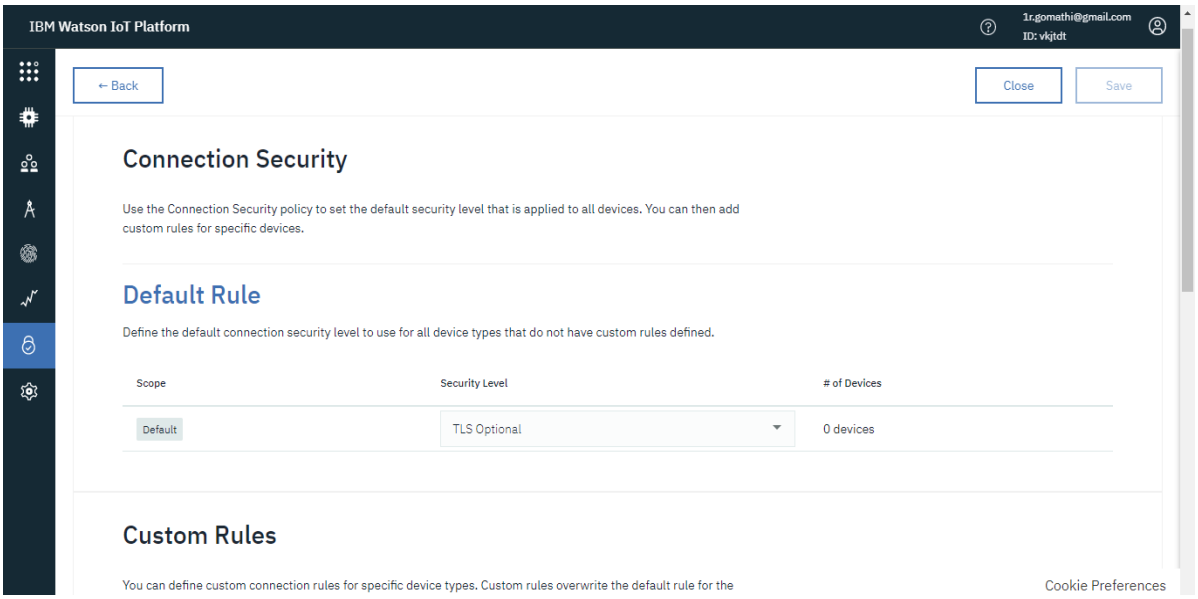


3. Copy Device credentials in Notepad:



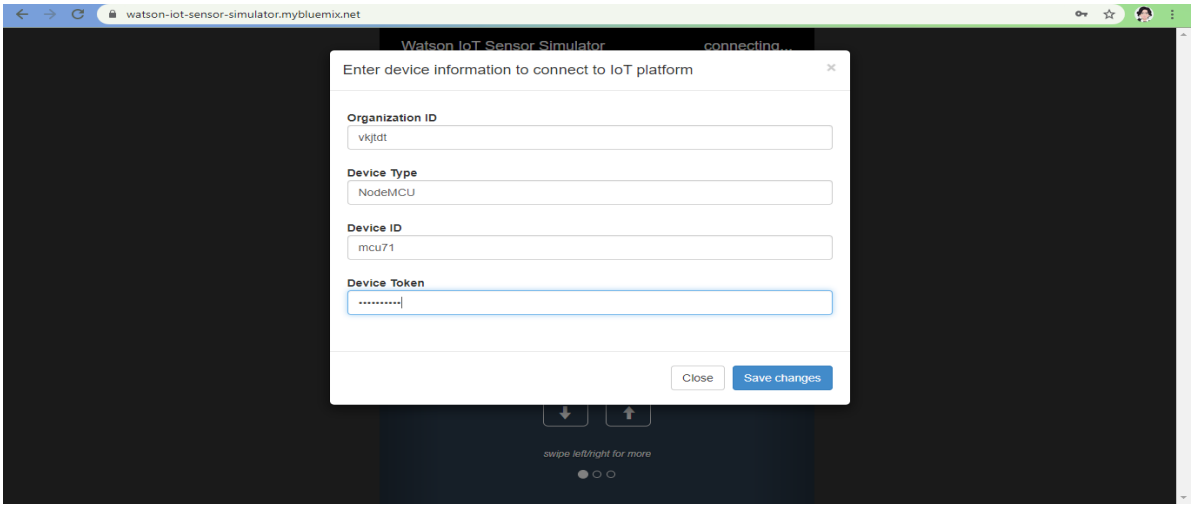
4. Configure connection security:

- Hover the mouse towards the navigation pane and click on Security for configuring the connection security.
- In the Security tab, click on the edit icon for connection security
- In the connection security tab, select the default rule as TLS Optional
- After selecting the TLS optional rule it is prompted with a warning. Click on OK and then click on save for saving the rule created.

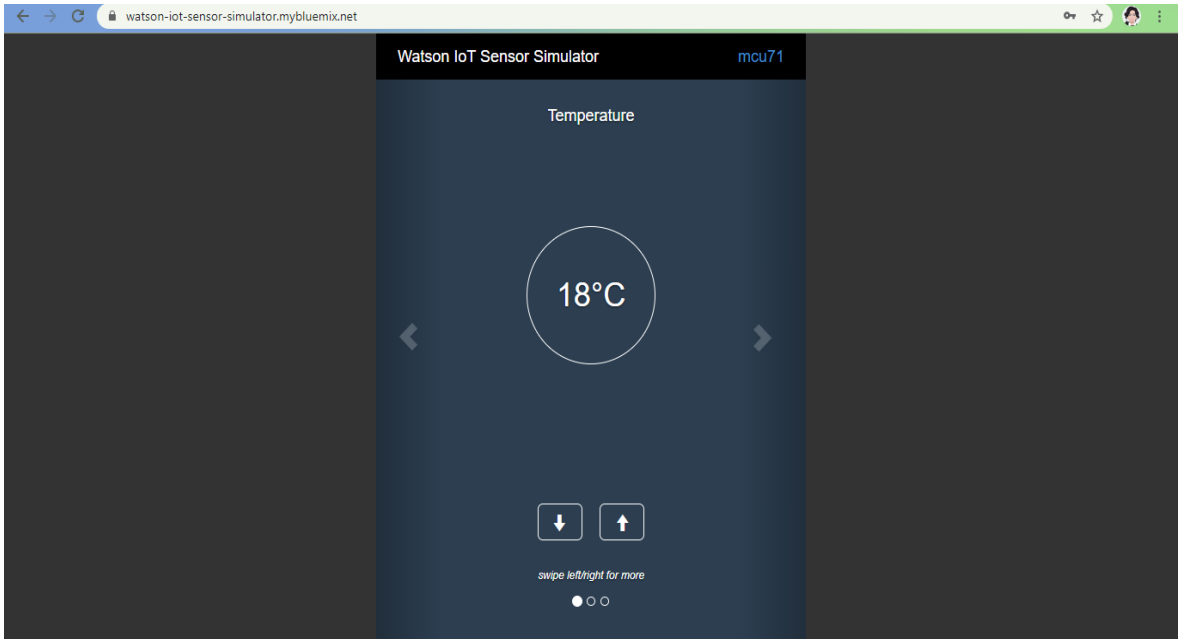


CONNECTING THE SENSOR TO THE DEVICE:

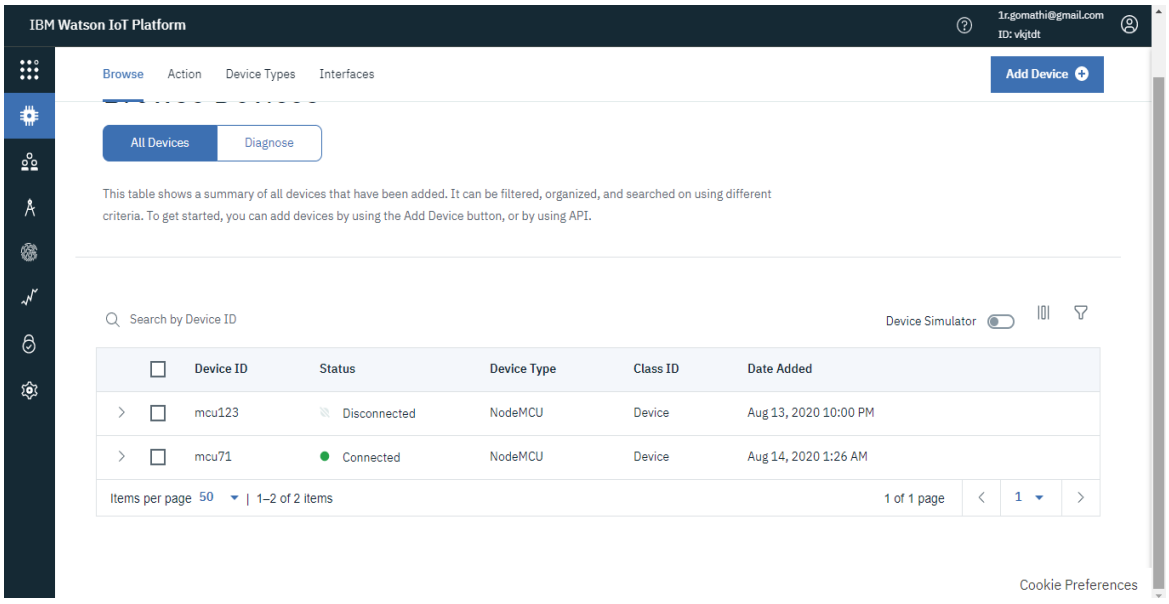
- Go to the Watson IoT simulator
- Connect to IoT Platform using device credentials



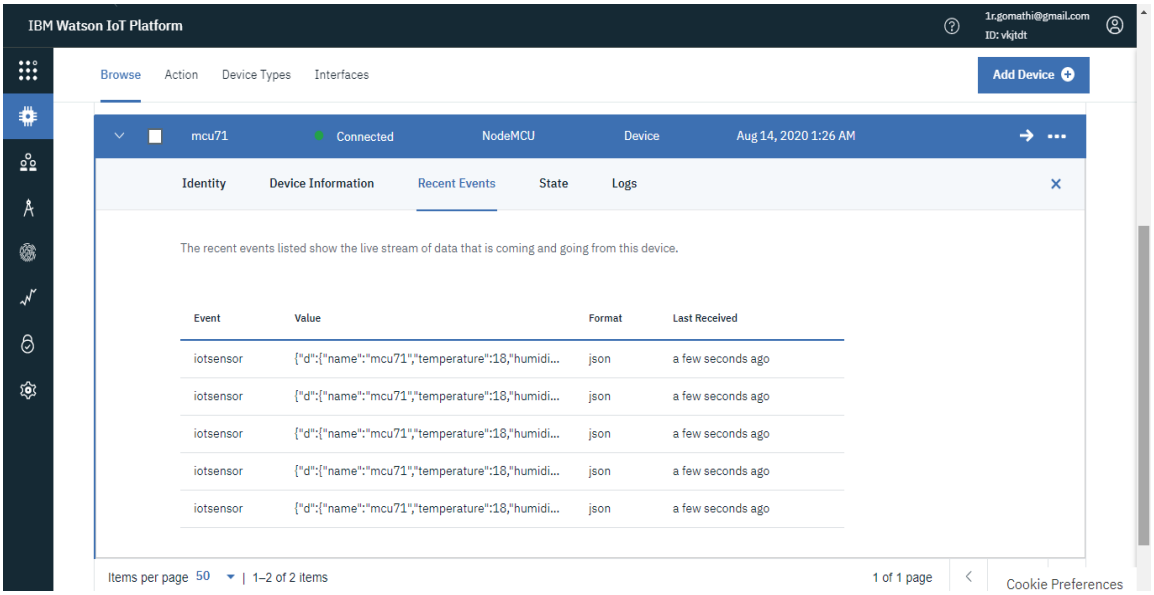
- The sensor simulator looks as follows



- Now, the device status in the IBM IoT platform changes to connected.

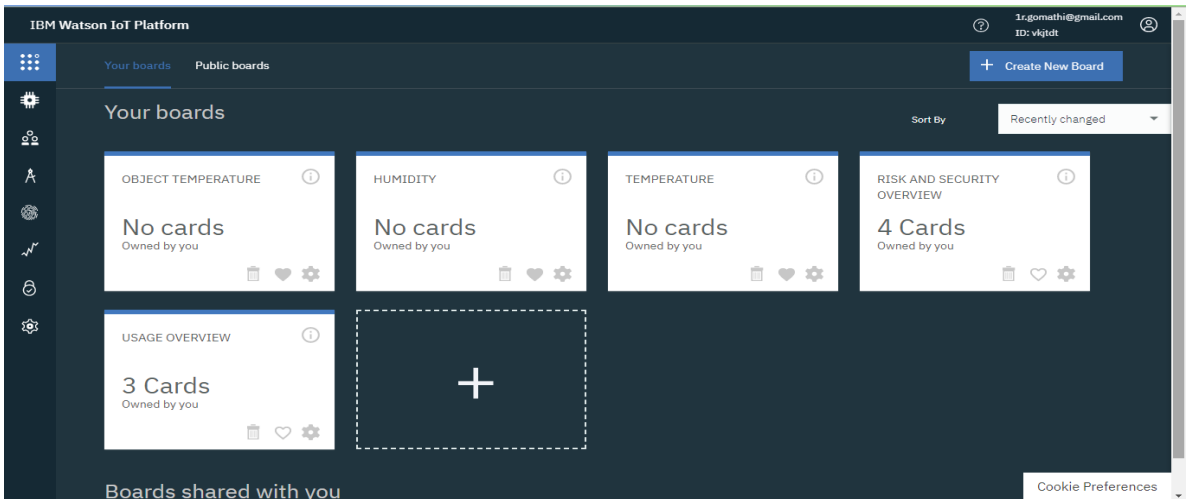


- The json data which is received by that device from the online simulator is seen by clicking on 'Recent events' on the connected device

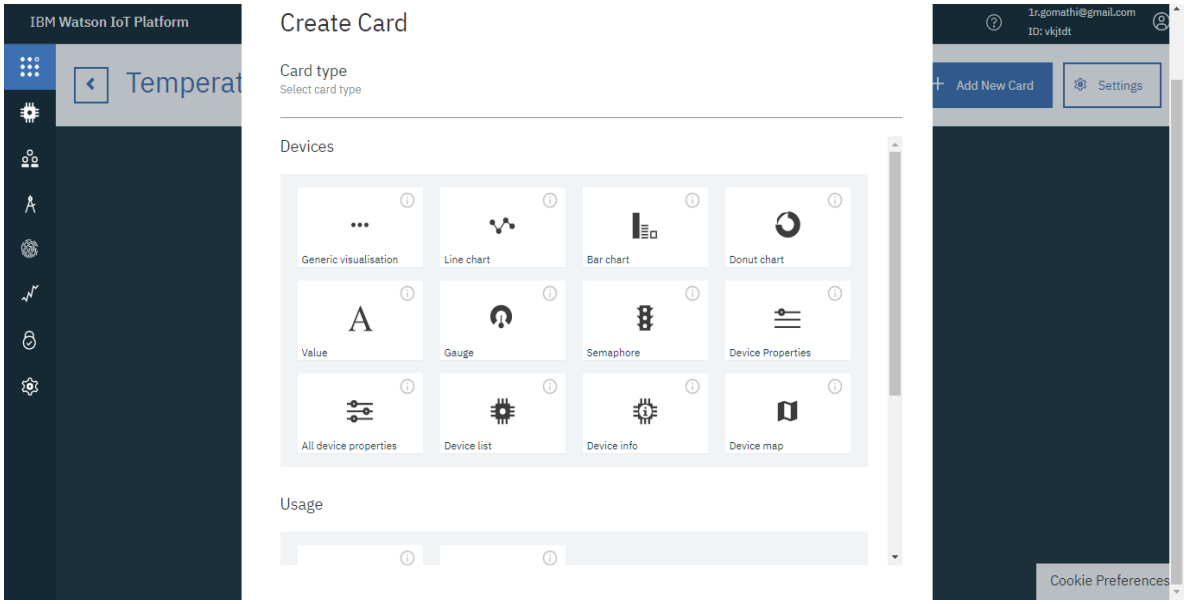


VISUALISING DATA IN BOARDS AND CARDS:

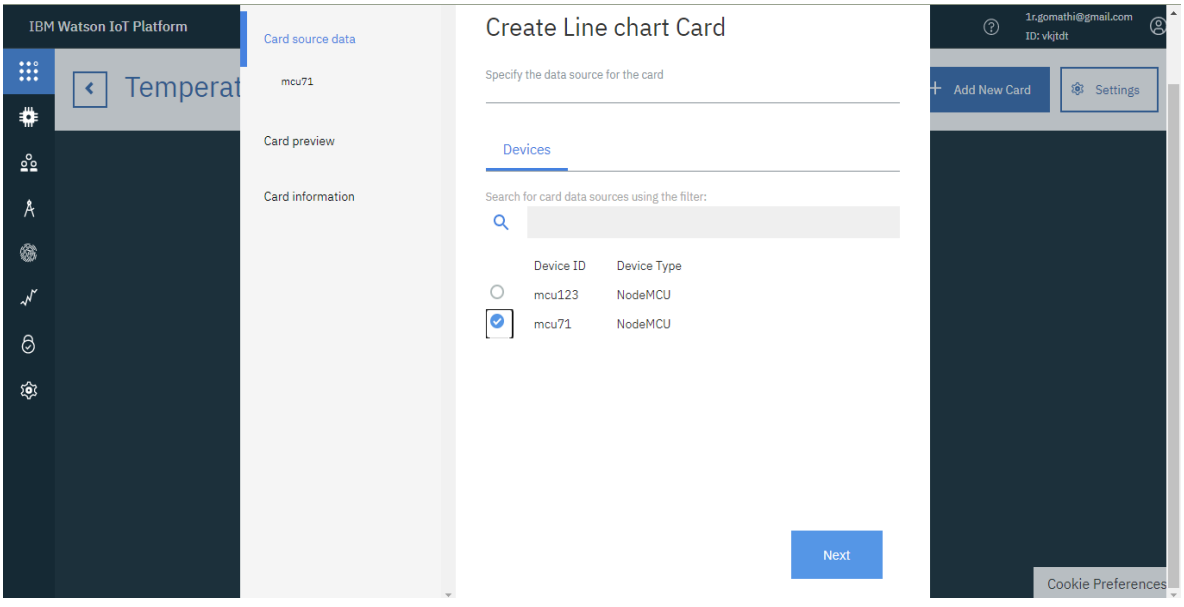
- To see json data in graphical format create board in the IoT platform To create boards, navigate to the menu in the left corner of screen and click on boards and click on “+” to create a new board in the boards section.
- In Create New board window, specify the board name and click on “NEXT”
- Create Boards for visualizing Temperature, Humidity and Object Temperature respectively



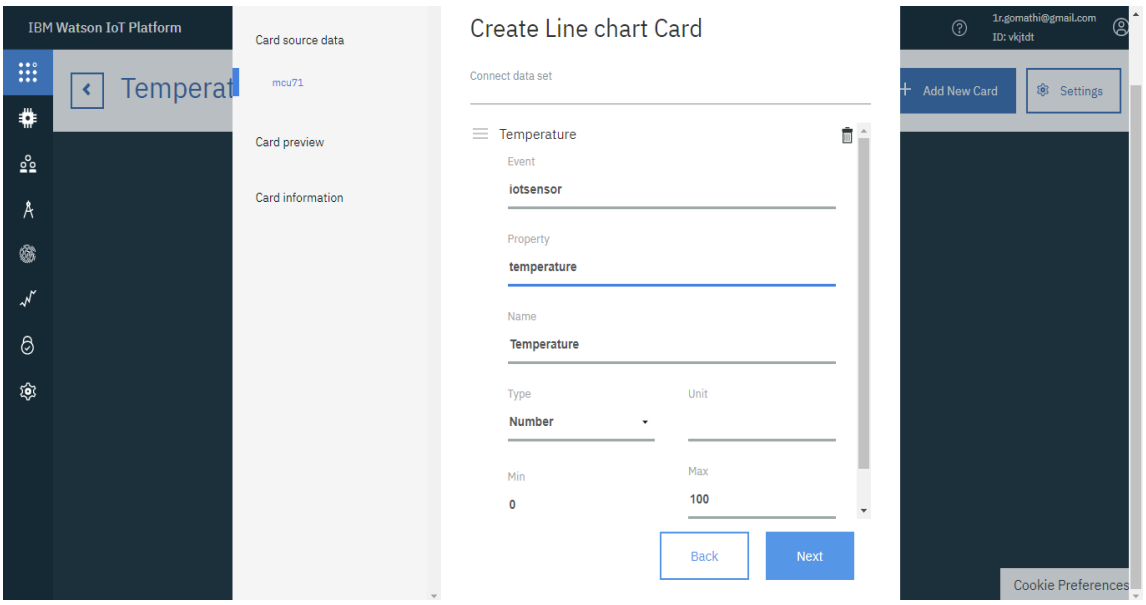
- In the Boards we need to create cards in order to visualize the individual sensor parameters. As we have three different parameters like temperature,humidity and object temperature we need to create 3 different cards to visualize each parameter.
- Click on the 'Temperature' board created in the board's menu.
- Now,Click on Add new card to create new cards to visualize data in the graphical format.
- Select the type of visualization in the card type while creating new card.



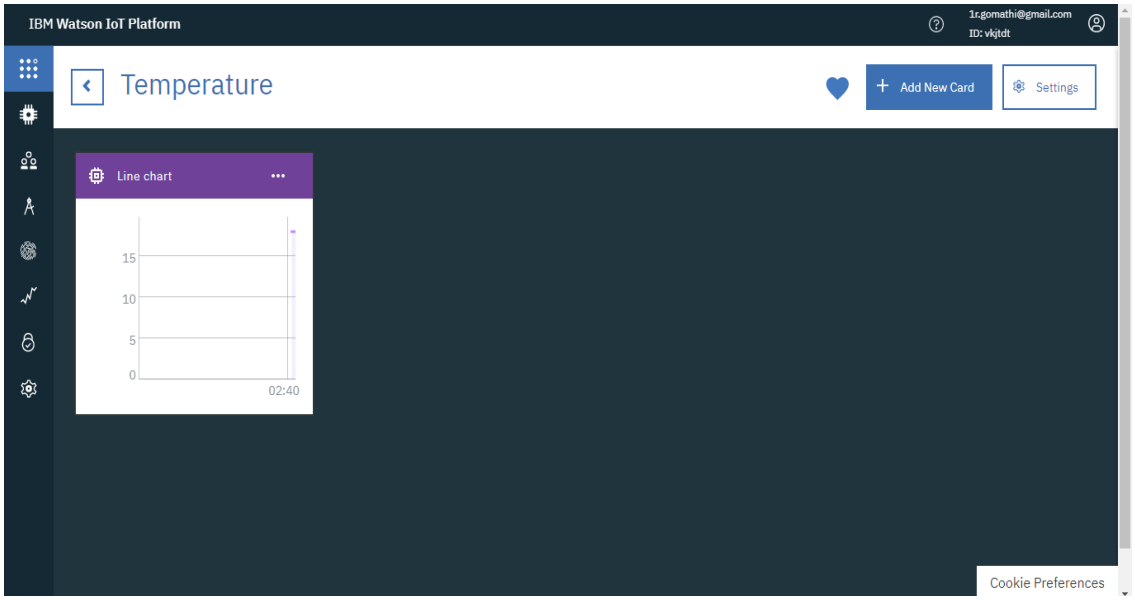
- Select the connected device from which we get the data in the platform and click on "NEXT"



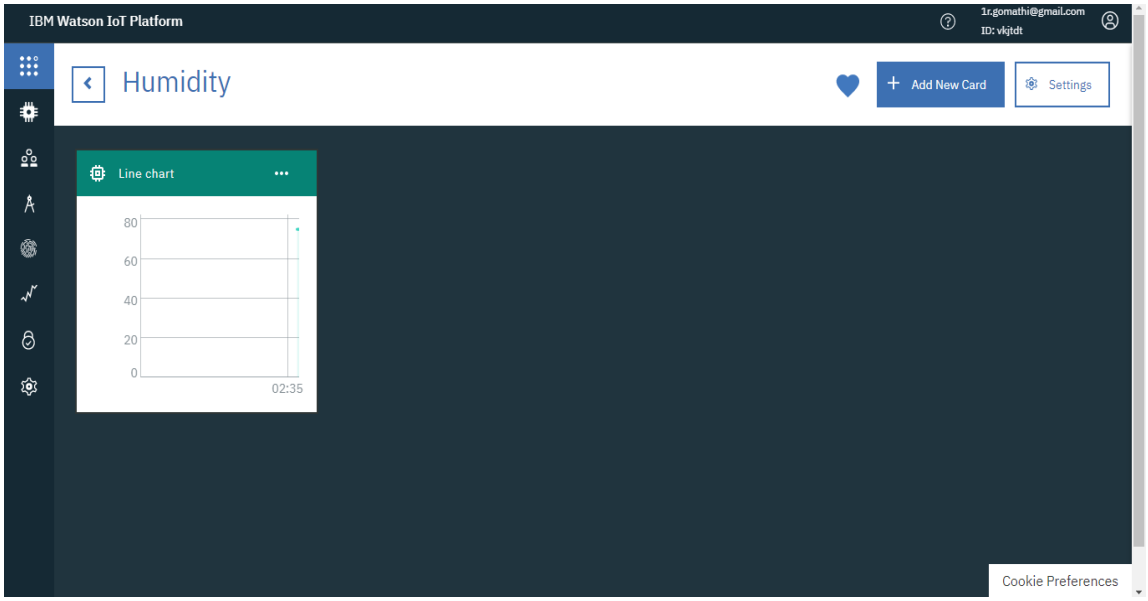
- In the next step, click on Create new data set to connect the device with the card and click on “NEXT”
- Choose event as “iotsensor” as we have connected our device to Watson simulator.
- In the property drop-down list, select property of the data set.

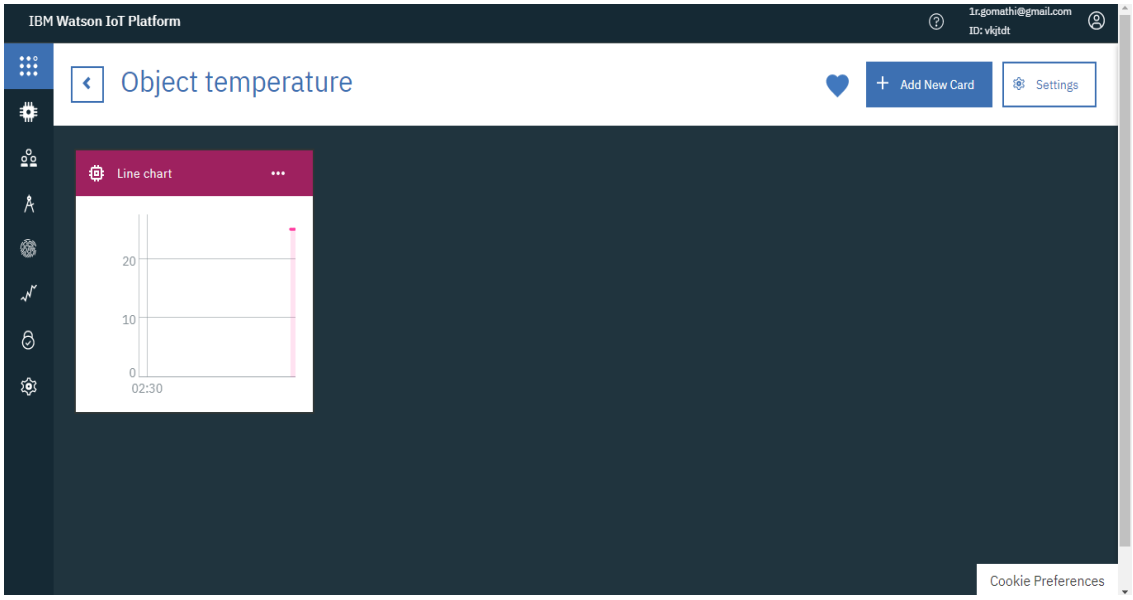


- The final card looks as follows



- Similarly cards are made for all the three parameters for visualizing as follows





CONCLUSION:

Thus 'Smart Weather Monitoring System' is implemented using IBM Watson IoT Platform by connecting real time sensors with the device on the IoT platform and the data are visualized using Boards and Cards for the parameters considered. The final Event payload on the connected device during simulation is as follows.