SENDING DATA FROM RASPBERRY-PI TO IBM WATSON

Team ID	PNT2022TMID19147
Project Name	GAS LEAKAGE MONITORING AND ALERTING SYSTEM FOR INDUSTRIES

Aim:

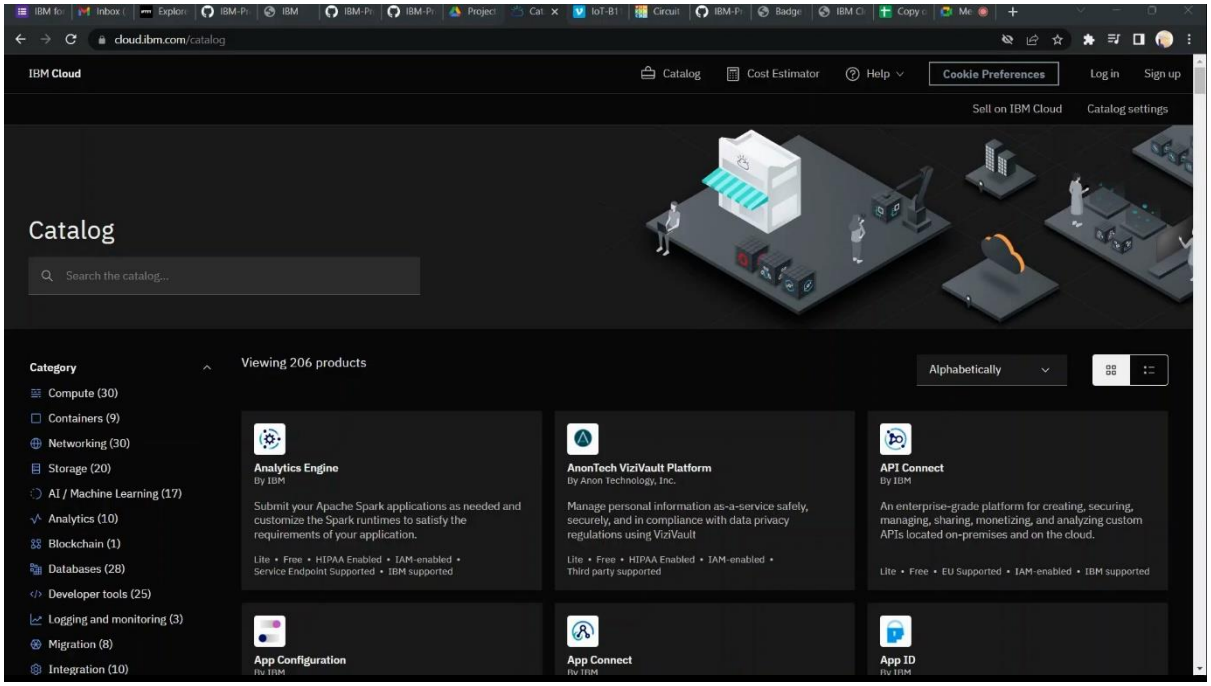
To send sensor data from the Raspberry Pi to IBM Watson. In our case, the data is from DHT sensors.

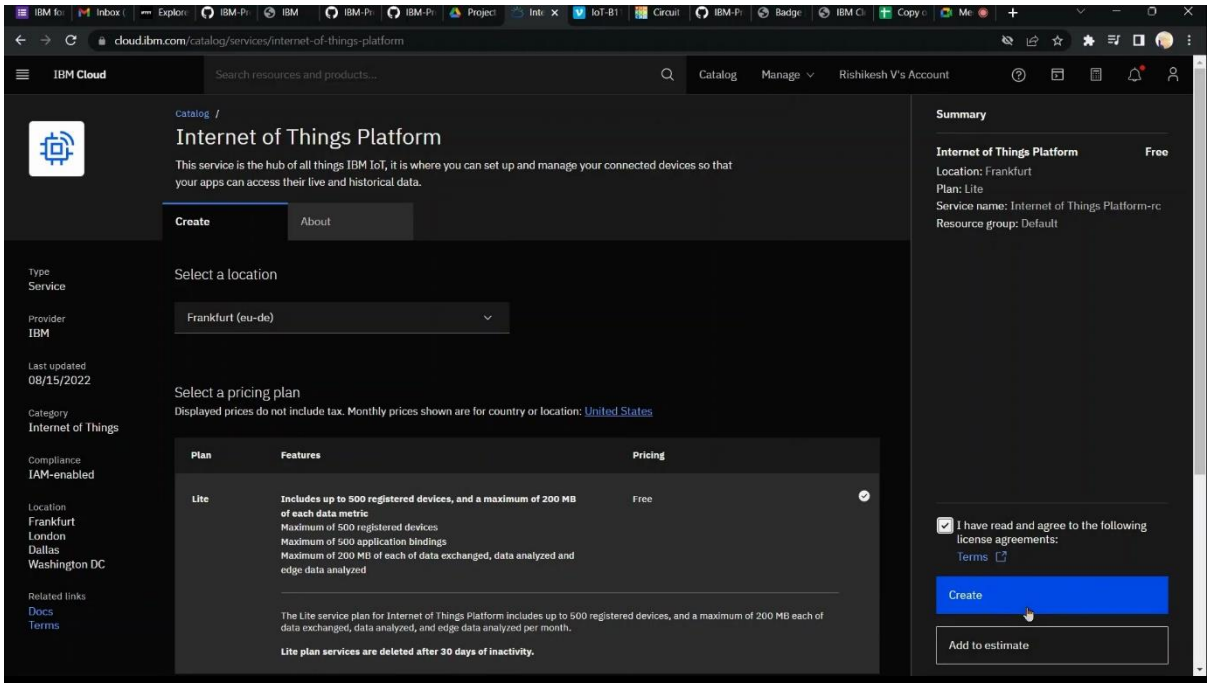
Requirements:

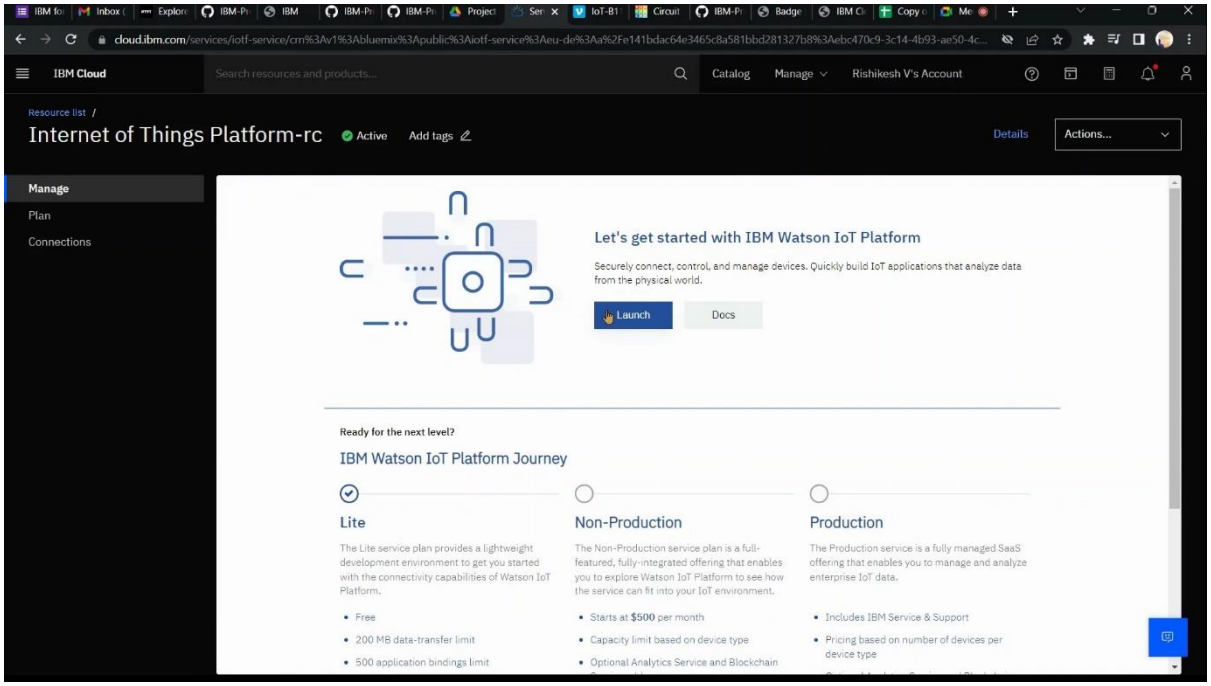
- Hardware Requirements
  - RASPBERRY-PI (3B)(WITH ETHERNET CABLE OR WIFI CONNECTED)
  - USB MOUSE
  - USB KEYBOARD
  - DHT-11 Sensor
  - MONITOR
  - RASPBERRY'S POWER SUPPLY
  - VGA TO HDMI CABLE
  - Connecting Wires
- Software Requirements
  - IBM BLUEMIX ACCOUNT

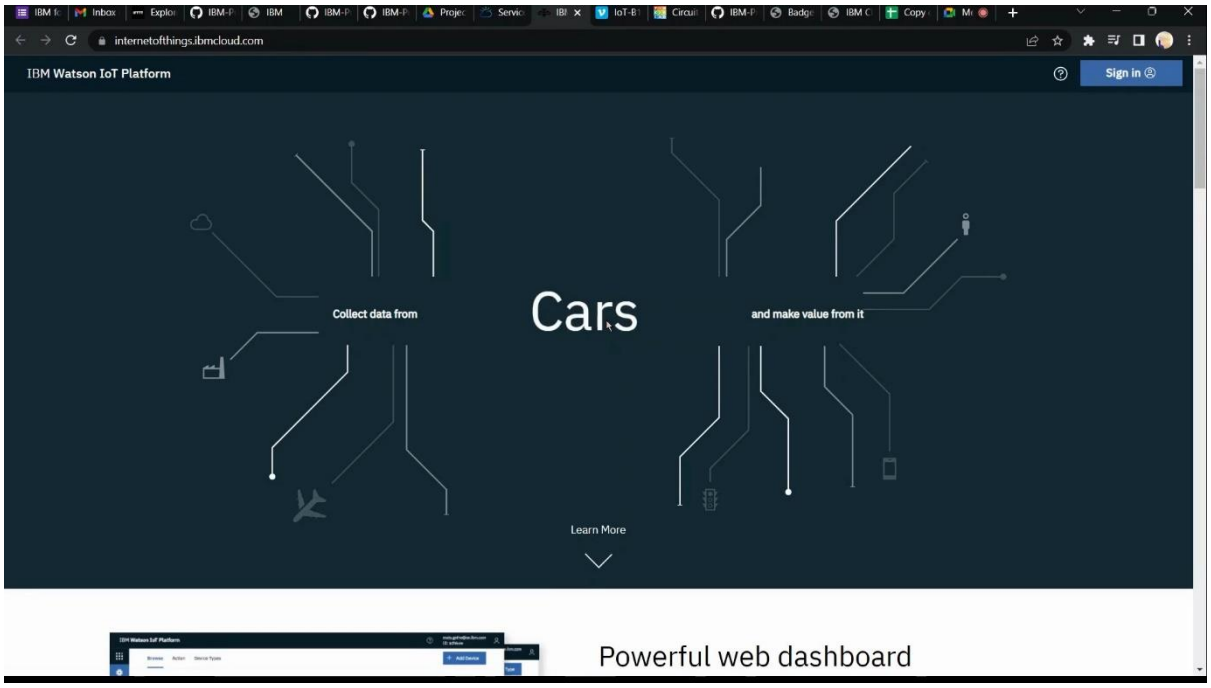
Procedure

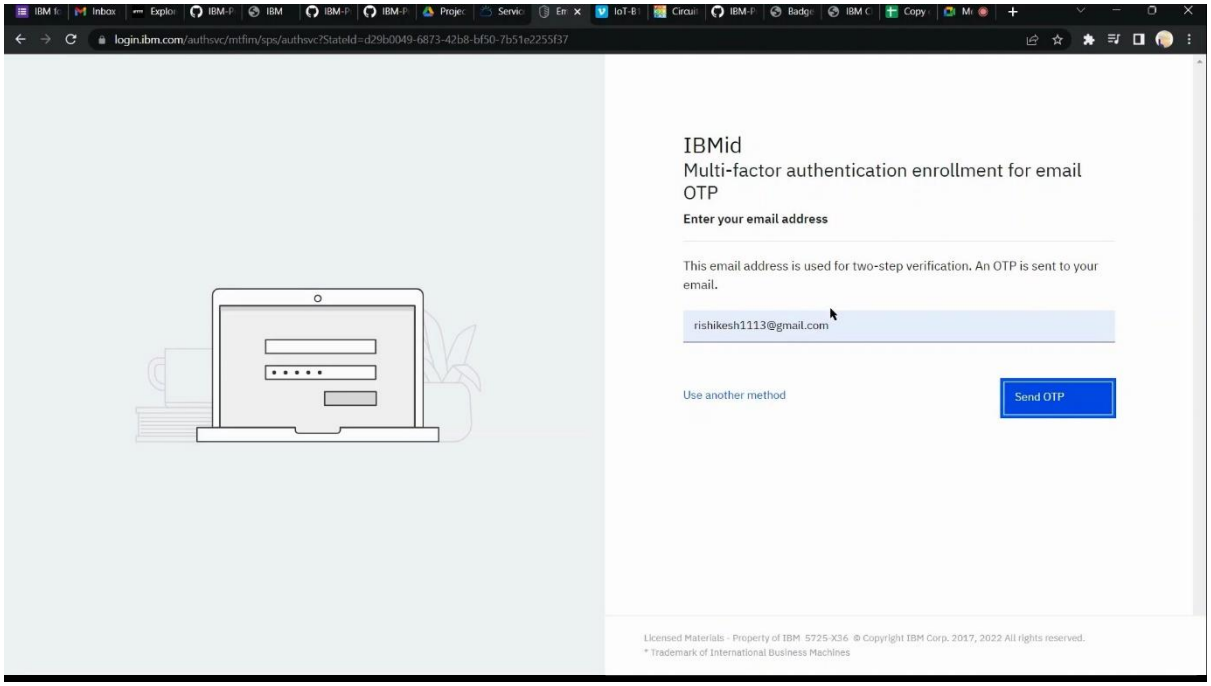
- Create an Device in IBM WATSON


cloud.ibm.com/catalog
IBM Cloud
Catalog
Cost Estimator
Help
Cookie Preferences
Log in
Sign up
Sell on IBM Cloud
Catalog settings
Catalog
Search the catalog...
Category
Compute (30)
Containers (9)
Networking (30)
Storage (20)
AI / Machine Learning (17)
Analytics (10)
Blockchain (1)
Databases (28)
Developer tools (25)
Logging and monitoring (3)
Migration (8)
Integration (10)
Viewing 206 products
Alphabetically
Analytics Engine
By IBM
Submit your Apache Spark applications as needed and customize the Spark runtimes to satisfy the requirements of your application.
Lite • Free • HIPAA Enabled • IAM-enabled • Service Endpoint Supported • IBM supported
AnonTech ViziVault Platform
By Anon Technology, Inc.
Manage personal information as-a-service safely, securely, and in compliance with data privacy regulations using ViziVault
Lite • Free • HIPAA Enabled • IAM-enabled • Third party supported
API Connect
By IBM
An enterprise-grade platform for creating, securing, managing, sharing, monetizing, and analyzing custom APIs located on-premises and on the cloud.
Lite • Free • EU Supported • IAM-enabled • IBM supported
App Configuration
App Connect
App ID


cloud.ibm.com/catalog/services/internet-of-things-platform
IBM Cloud
Search resources and products...
Catalog
Manage
Rishikesh V's Account
Catalog /
Internet of Things Platform
This service is the hub of all things IBM IoT, it is where you can set up and manage your connected devices so that your apps can access their live and historical data.
Create
About
Type
Service
Provider
IBM
Last updated
08/15/2022
Category
Internet of Things
Compliance
IAM-enabled
Location
Frankfurt
London
Dallas
Washington DC
Related links
Docs
Terms
Select a location
Frankfurt (eu-de)
Select a pricing plan
Displayed prices do not include tax. Monthly prices shown are for country or location: United States
Plan
Features
Pricing
Lite
Includes up to 500 registered devices, and a maximum of 200 MB of each data metric
Maximum of 500 registered devices
Maximum of 500 application bindings
Maximum of 200 MB of each of data exchanged, data analyzed and edge data analyzed
Free
The Lite service plan for Internet of Things Platform includes up to 500 registered devices, and a maximum of 200 MB each of data exchanged, data analyzed, and edge data analyzed per month.
Lite plan services are deleted after 30 days of inactivity.
Summary
Internet of Things Platform
Free
Location: Frankfurt
Plan: Lite
Service name: Internet of Things Platform-rc
Resource group: Default
I have read and agree to the following license agreements:
Terms
Create
Add to estimate


IBM Cloud
Search resources and products...
Catalog
Manage
Rishikesh V's Account
Resource list /
Internet of Things Platform-rc
Active
Add tags
Details
Actions...
Manage
Plan
Connections
Let's get started with IBM Watson IoT Platform
Securely connect, control, and manage devices. Quickly build IoT applications that analyze data from the physical world.
Launch
Docs
Ready for the next level?
IBM Watson IoT Platform Journey
Lite
The Lite service plan provides a lightweight development environment to get you started with the connectivity capabilities of Watson IoT Platform.
Free
200 MB data-transfer limit
500 application bindings limit
Non-Production
The Non-Production service plan is a full-featured, fully-integrated offering that enables you to explore Watson IoT Platform to see how the service can fit into your IoT environment.
Starts at $500 per month
Capacity limit based on device type
Optional Analytics Service and Blockchain
Production
The Production service is a fully managed SaaS offering that enables you to manage and analyze enterprise IoT data.
Includes IBM Service & Support
Pricing based on number of devices per device type


internetofthings.ibmcloud.com
IBM Watson IoT Platform
Sign in
Collect data from
Cars
and make value from it
Learn More
Powerful web dashboard


login.ibm.com/authsvc/mtfim/sps/authsvc?StateId=d29b0049-6873-42b8-bf50-7b51e2255f37
IBMid
Multi-factor authentication enrollment for email OTP
Enter your email address
This email address is used for two-step verification. An OTP is sent to your email.
rishikesh1113@gmail.com
Use another method
Send OTP
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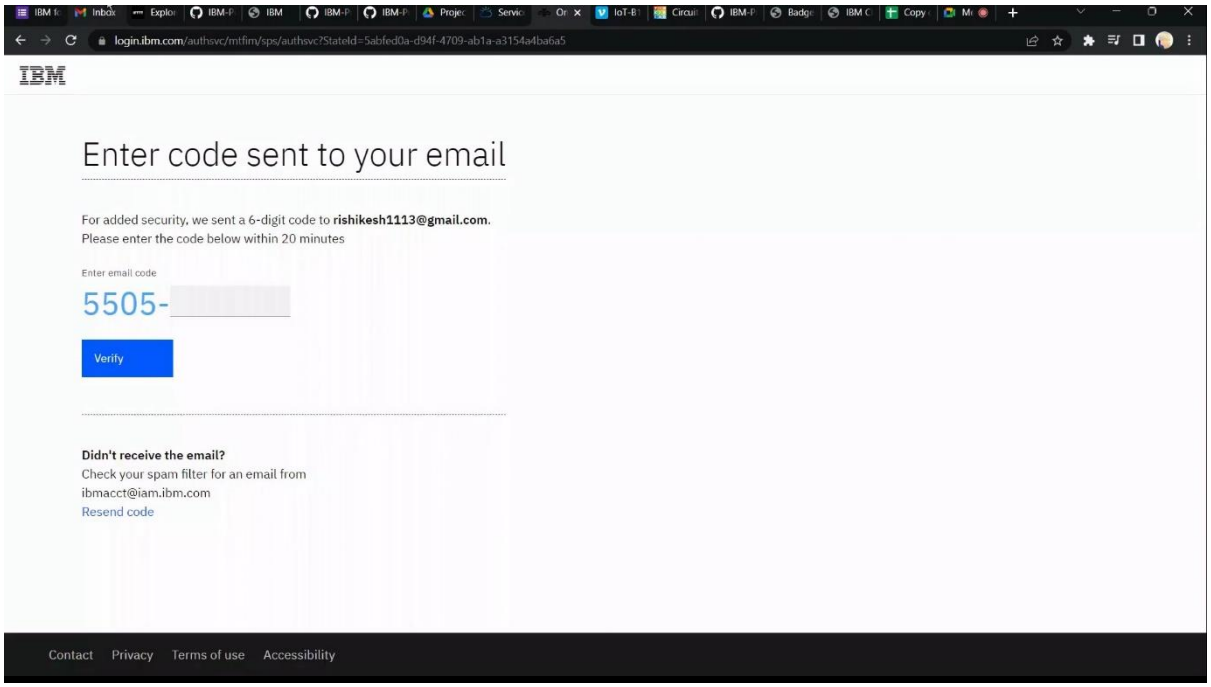
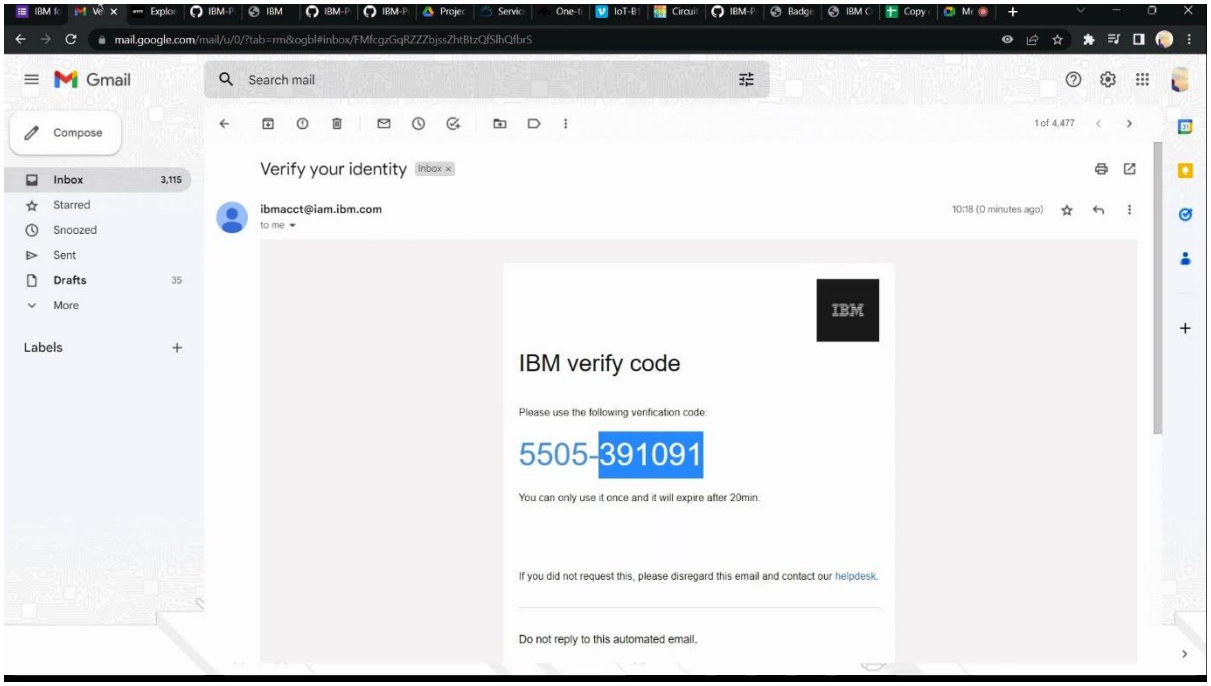
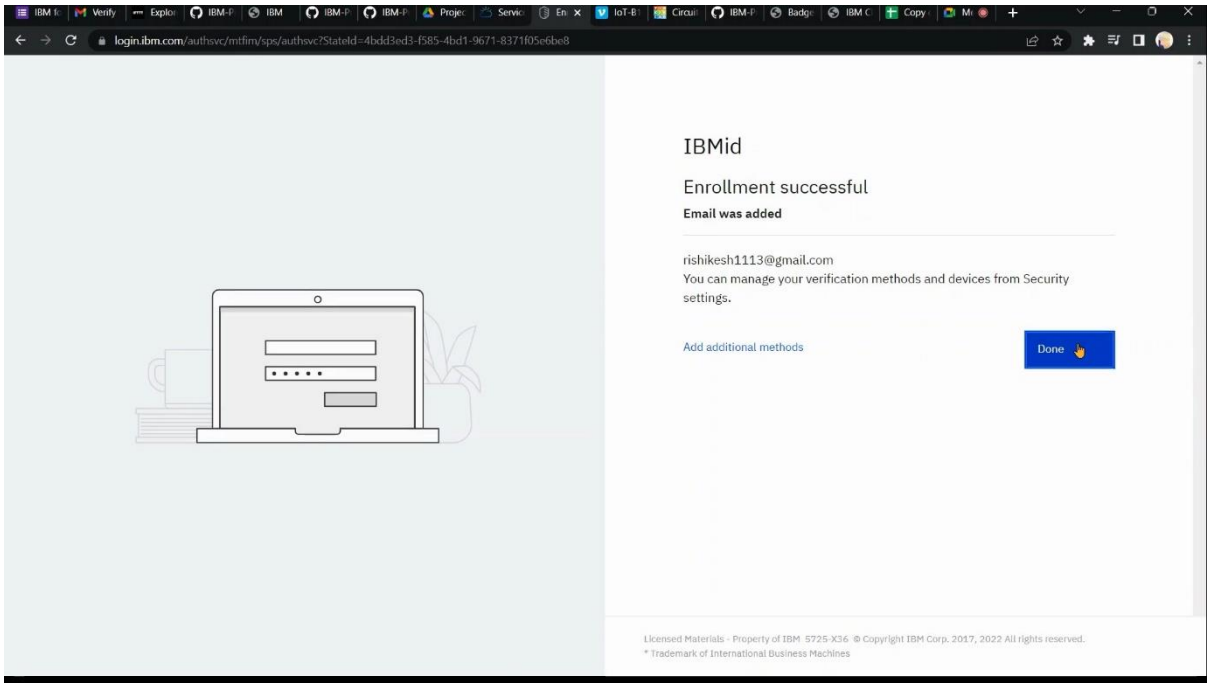

login.ibm.com/authsvc/mtfim/sps/authsvc?StateId=5abfed0a-d94f-4709-ab1a-a3154a4ba6a5
IBM
Enter code sent to your email
For added security, we sent a 6-digit code to rishikesh1113@gmail.com.
Please enter the code below within 20 minutes
Enter email code
5505-
Verify
Didn't receive the email?
Check your spam filter for an email from
ibmacct@iam.ibm.com
Resend code
Contact
Privacy
Terms of use
Accessibility


mail.google.com/mail/u/0/?tab=rm&ogbl#inbox/FMfcgzGqRZZZbjssZhtBtzQfSlhQfbrS
Gmail
Search mail
Compose
Inbox 3,115
Starred
Snoozed
Sent
Drafts 35
More
Labels
1 of 4,477
Verify your identity
Inbox ×
ibmacct@iam.ibm.com
to me
10:18 (0 minutes ago)
IBM
IBM verify code
Please use the following verification code:
5505-391091
You can only use it once and it will expire after 20min.
If you did not request this, please disregard this email and contact our helpdesk.
Do not reply to this automated email.


login.ibm.com/authsvc/mtfim/sps/authsvc?StateId=4bdd3ed3-f585-4bd1-9671-8371f05e6be8
IBMid
Enrollment successful
Email was added
rishikesh1113@gmail.com
You can manage your verification methods and devices from Security settings.
Add additional methods
Done
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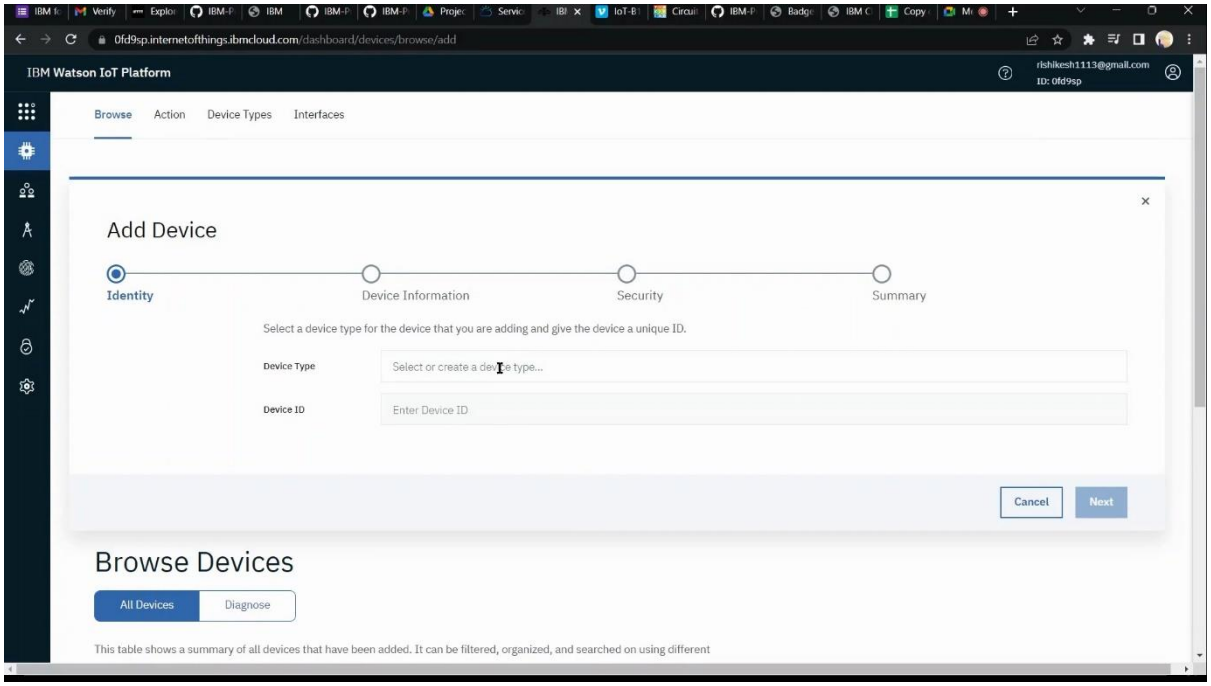
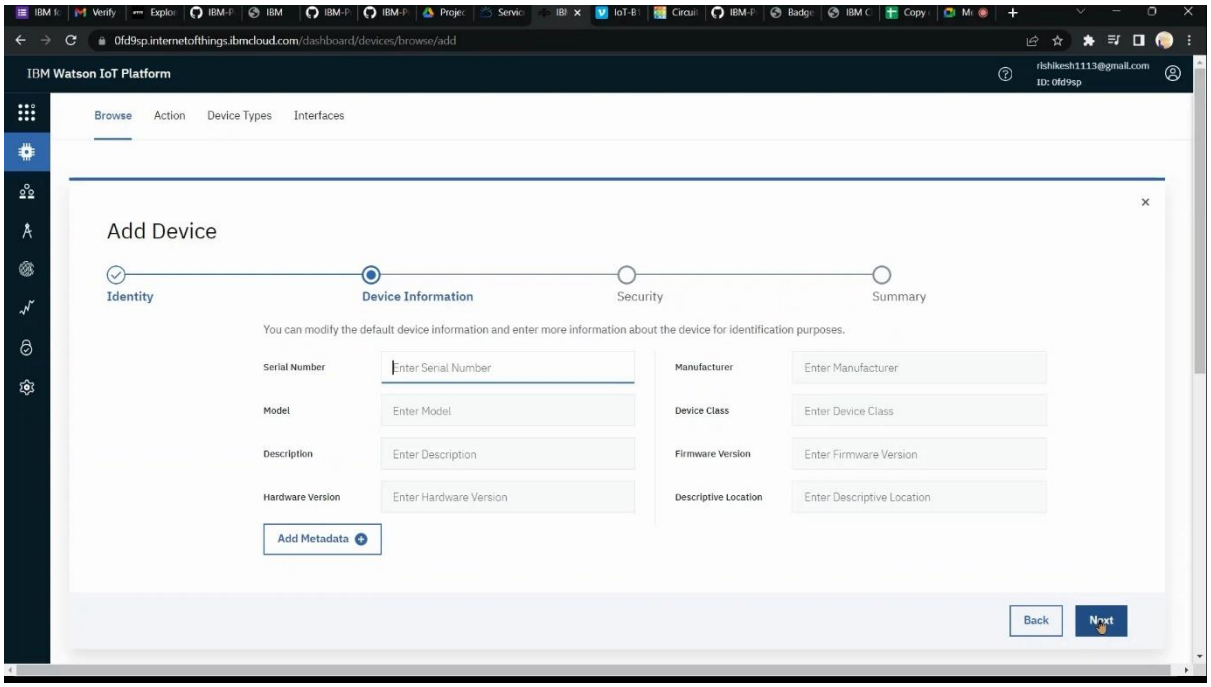
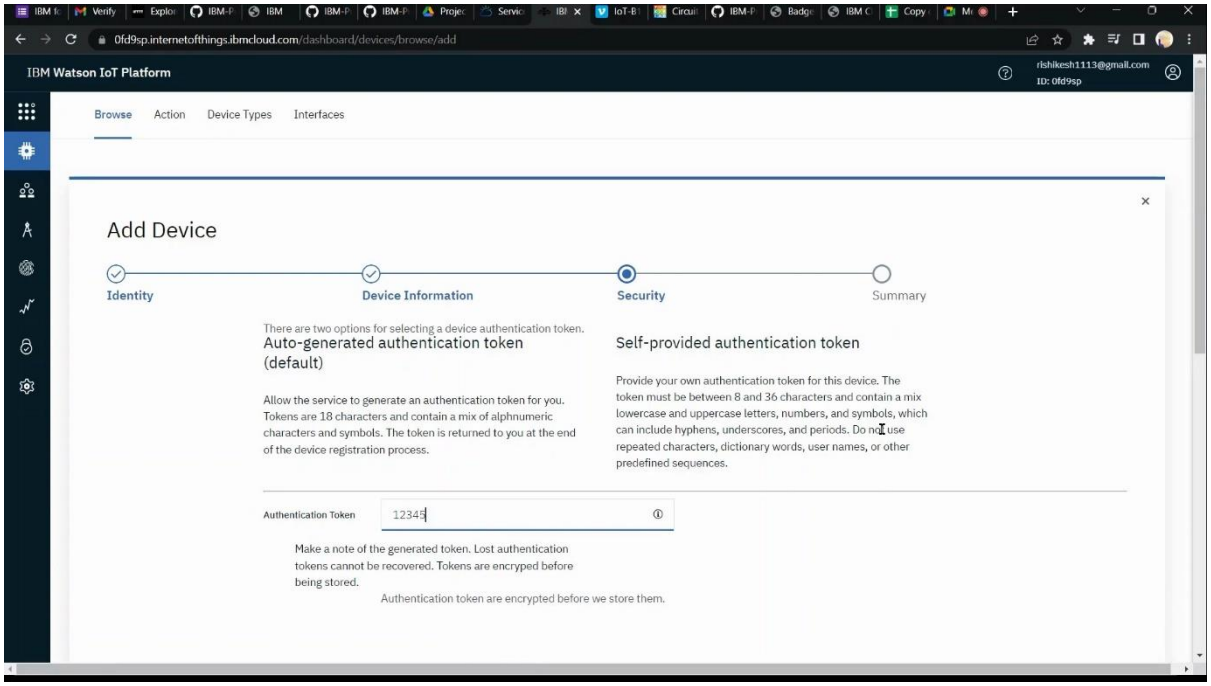
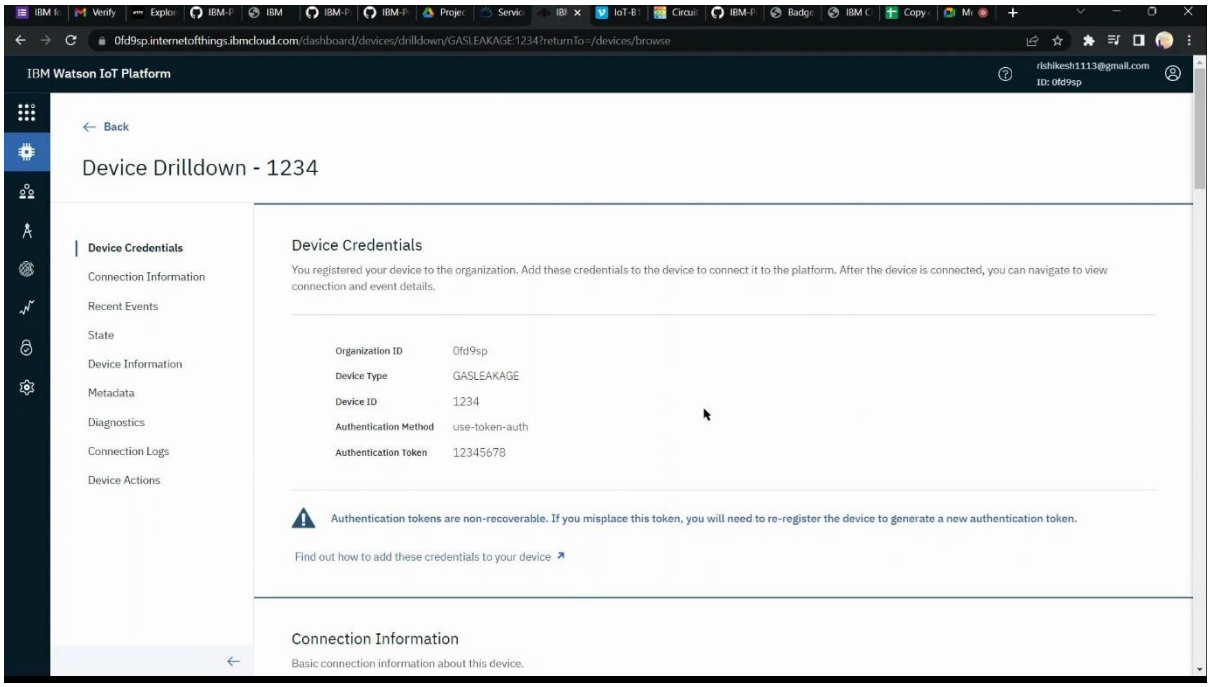
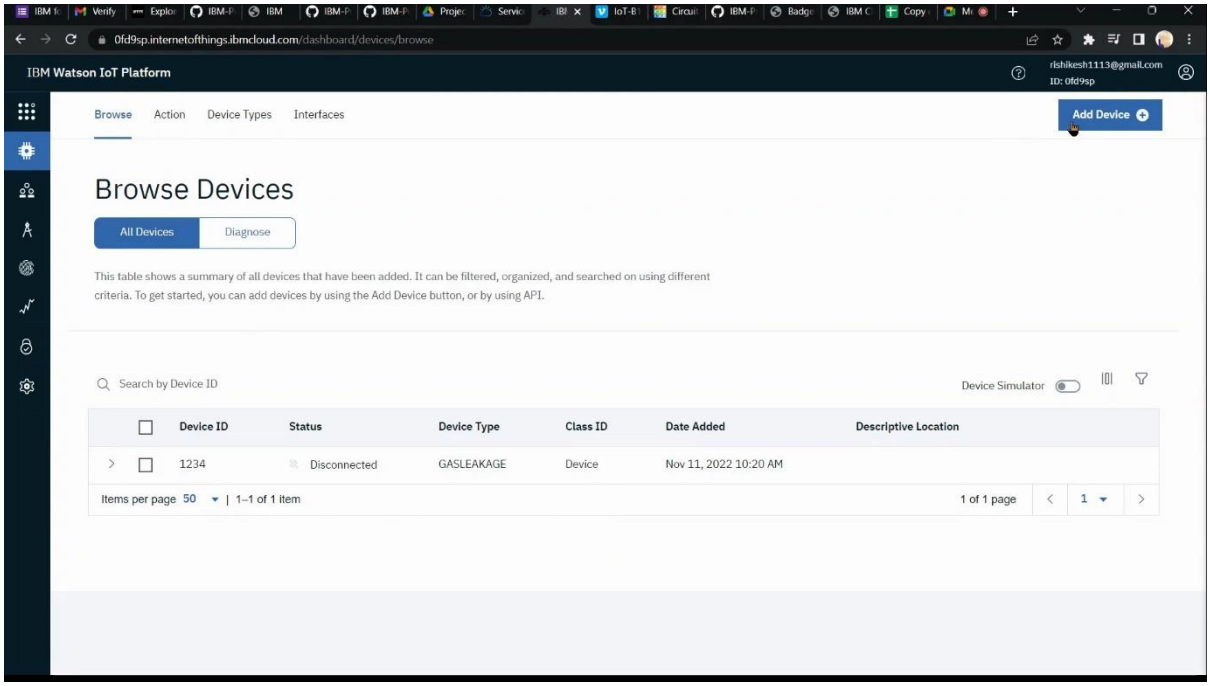

0fd9sp.internetofthings.ibmcloud.com/dashboard/devices/browse/add
IBM Watson IoT Platform
rishikesh1113@gmail.com
ID: 0fd9sp
Browse
Action
Device Types
Interfaces
Add Device
Identity
Device Information
Security
Summary
Select a device type for the device that you are adding and give the device a unique ID.
Device Type
Select or create a device type...
Device ID
Enter Device ID
Cancel
Next
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

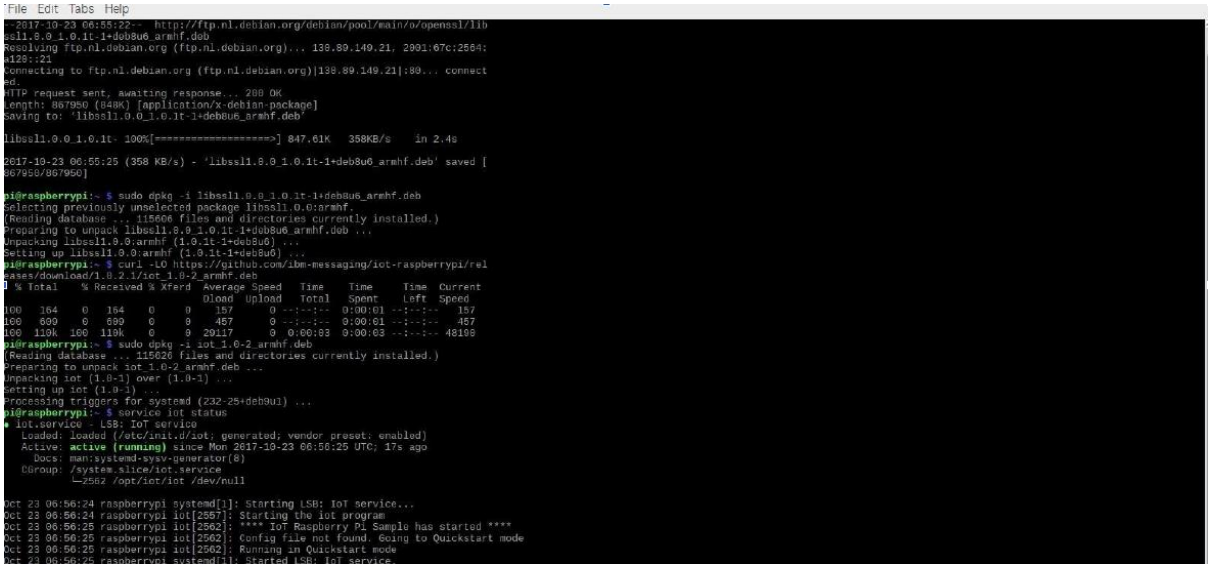

0fd9sp.internetofthings.ibmcloud.com/dashboard/devices/browse/add
IBM Watson IoT Platform
rishikesh1113@gmail.com
ID: 0fd9sp
Browse
Action
Device Types
Interfaces
Add Device
Identity
Device Information
Security
Summary
You can modify the default device information and enter more information about the device for identification purposes.
Serial Number
Enter Serial Number
Model
Enter Model
Description
Enter Description
Hardware Version
Enter Hardware Version
Manufacturer
Enter Manufacturer
Device Class
Enter Device Class
Firmware Version
Enter Firmware Version
Descriptive Location
Enter Descriptive Location
Add Metadata
Back
Next

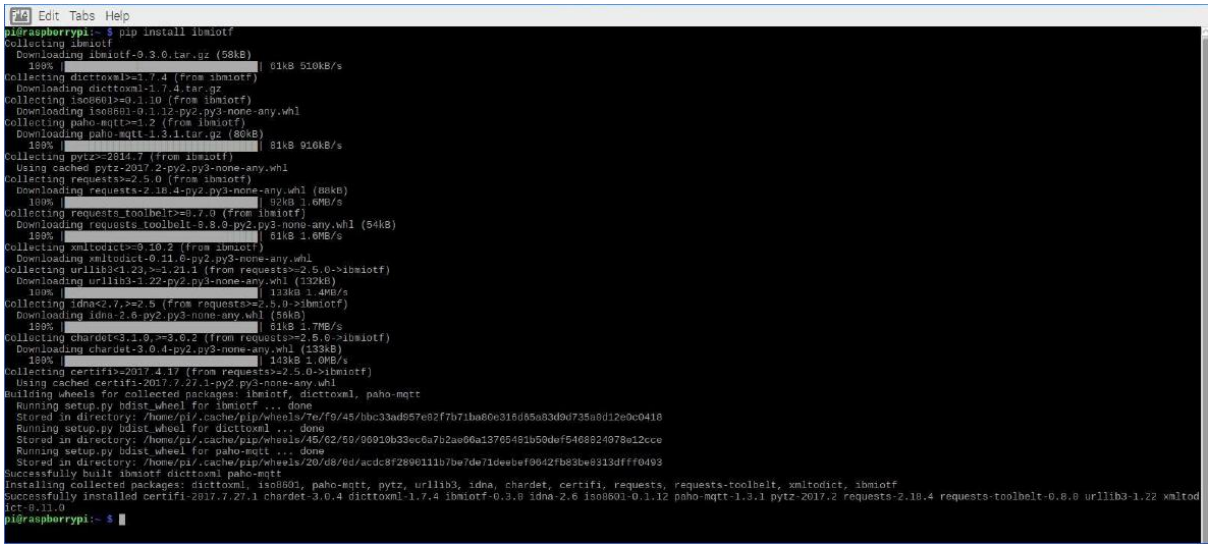

0fd9sp.internetofthings.ibmcloud.com/dashboard/devices/browse/add
IBM Watson IoT Platform
rishikesh1113@gmail.com
ID: 0fd9sp
Browse
Action
Device Types
Interfaces
Add Device
Identity
Device Information
Security
Summary
There are two options for selecting a device authentication token.
Auto-generated authentication token (default)
Allow the service to generate an authentication token for you. Tokens are 18 characters and contain a mix of alphnumeric characters and symbols. The token is returned to you at the end of the device registration process.
Self-provided authentication token
Provide your own authentication token for this device. The token must be between 8 and 36 characters and contain a mix lowercase and uppercase letters, numbers, and symbols, which can include hyphens, underscores, and periods. Do not use repeated characters, dictionary words, user names, or other predefined sequences.
Authentication Token
12345
Make a note of the generated token. Lost authentication tokens cannot be recovered. Tokens are encryped before being stored.
Authentication token are encrypted before we store them.


0fd9sp.internetofthings.ibmcloud.com/dashboard/devices/drilldown/GASLEAKAGE:1234?returnTo=/devices/browse
IBM Watson IoT Platform
rishikesh1113@gmail.com
ID: 0fd9sp
Back
Device Drilldown - 1234
Device Credentials
Connection Information
Recent Events
State
Device Information
Metadata
Diagnostics
Connection Logs
Device Actions
Device Credentials
You registered your device to the organization. Add these credentials to the device to connect it to the platform. After the device is connected, you can navigate to view connection and event details.
Organization ID 0fd9sp
Device Type GASLEAKAGE
Device ID 1234
Authentication Method use-token-auth
Authentication Token 12345678
Authentication tokens are non-recoverable. If you misplace this token, you will need to re-register the device to generate a new authentication token.
Find out how to add these credentials to your device
Connection Information
Basic connection information about this device.



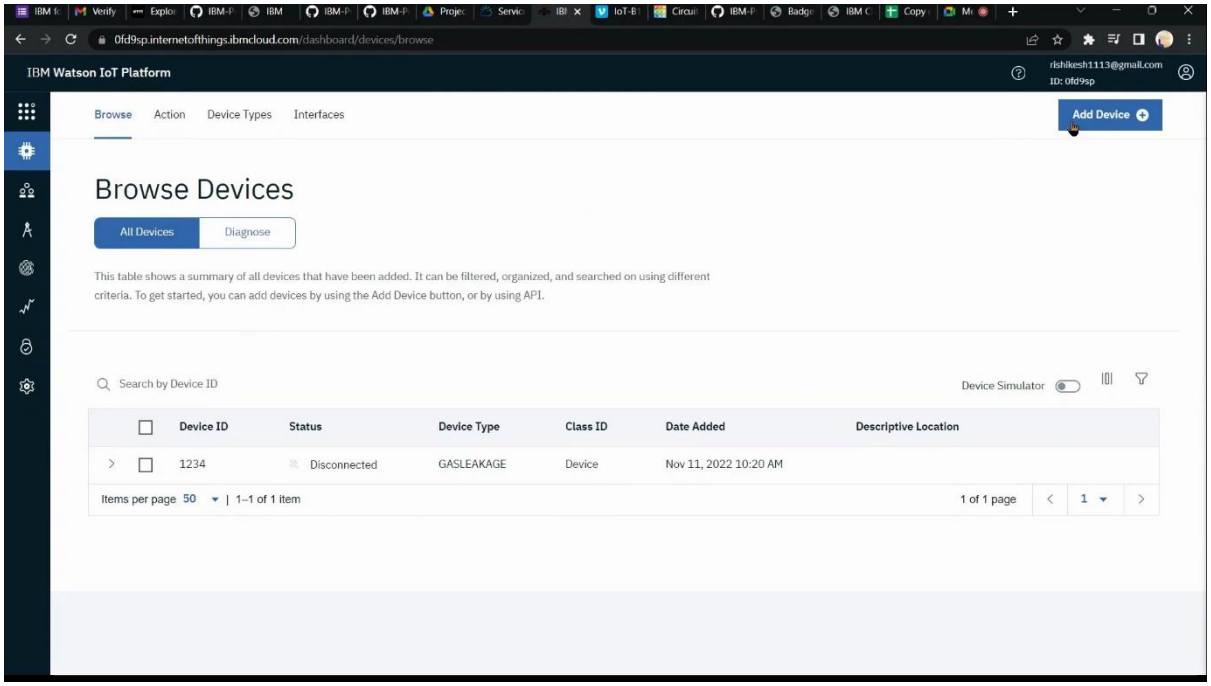
- Install necessary package on the Raspberry pi

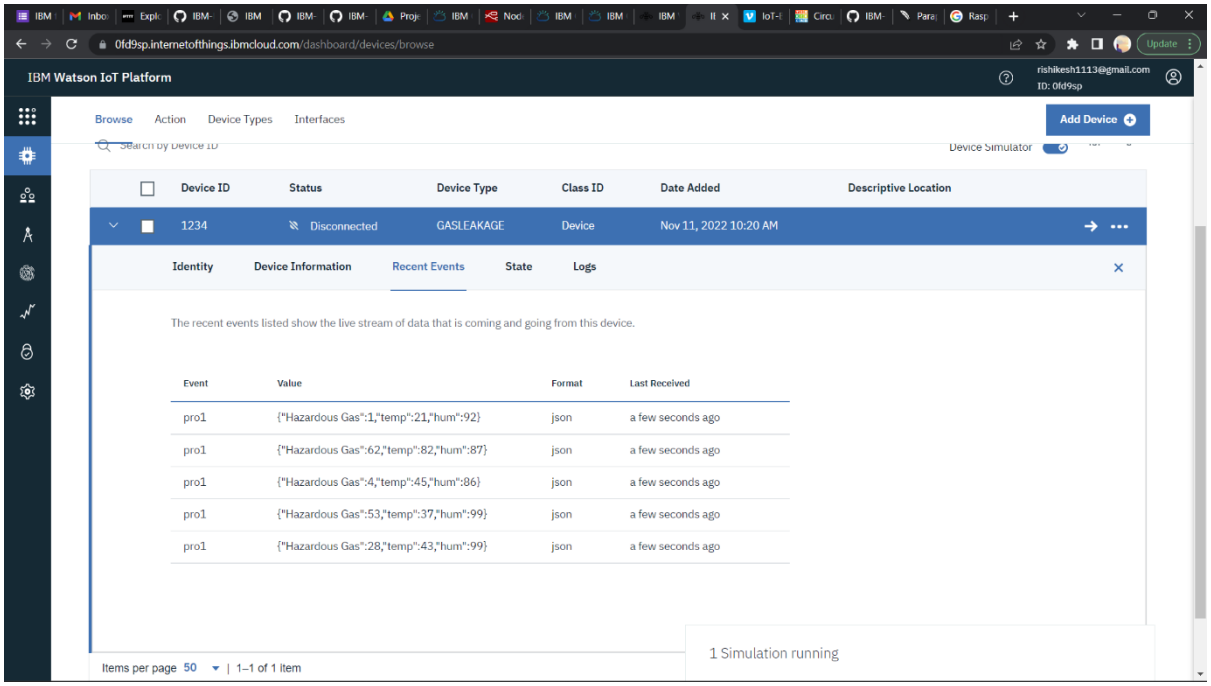



File Edit Tabs Help
pi@raspberrypi:~ $ pip install ibmiotf
Collecting ibmiotf
Downloading ibmiotf-0.3.0.tar.gz (58kB)
100% | 61kB 510kB/s
Collecting dicttoxml>=1.7.4 (from ibmiotf)
Downloading dicttoxml-1.7.4.tar.gz
Collecting iso8601>=0.1.10 (from ibmiotf)
Downloading iso8601-0.1.12-py2.py3-none-any.whl
Collecting paho-mqtt>=1.2 (from ibmiotf)
Downloading paho-mqtt-1.3.1.tar.gz (80kB)
100% | 81kB 916kB/s
Collecting pytz>=2014.7 (from ibmiotf)
Using cached pytz-2017.2-py2.py3-none-any.whl
Collecting requests>=2.5.0 (from ibmiotf)
Downloading requests-2.18.4-py2.py3-none-any.whl (88kB)
100% | 92kB 1.6MB/s
Collecting requests_toolbelt>=0.7.0 (from ibmiotf)
Downloading requests_toolbelt-0.8.0-py2.py3-none-any.whl (54kB)
100% | 61kB 1.6MB/s
Collecting xmltodict>=0.10.2 (from ibmiotf)
Downloading xmltodict-0.11.0-py2.py3-none-any.whl
Collecting urllib3<1.23,>=1.21.1 (from requests>=2.5.0->ibmiotf)
Downloading urllib3-1.22-py2.py3-none-any.whl (132kB)
100% | 133kB 1.4MB/s
Collecting idna<2.7,>=2.5 (from requests>=2.5.0->ibmiotf)
Downloading idna-2.6-py2.py3-none-any.whl (56kB)
100% | 61kB 1.7MB/s
Collecting chardet<3.1.0,>=3.0.2 (from requests>=2.5.0->ibmiotf)
Downloading chardet-3.0.4-py2.py3-none-any.whl (133kB)
100% | 143kB 1.0MB/s
Collecting certifi>=2017.4.17 (from requests>=2.5.0->ibmiotf)
Using cached certifi-2017.7.27.1-py2.py3-none-any.whl
Building wheels for collected packages: ibmiotf, dicttoxml, paho-mqtt
Running setup.py bdist_wheel for ibmiotf ... done
Stored in directory: /home/pi/.cache/pip/wheels/7e/f9/45/bbc33ad957e82f7b71ba80e318d85a83d9d735a8d12e0c0418
Running setup.py bdist_wheel for dicttoxml ... done
Stored in directory: /home/pi/.cache/pip/wheels/45/62/59/96910b33ec6a7b2ae06a13765481b50def5408824078e12cce
Running setup.py bdist_wheel for paho-mqtt ... done
Stored in directory: /home/pi/.cache/pip/wheels/20/d8/0d/acdc8f2890111b7be7de71deebef0042fb83be8313dfff0493
Successfully built ibmiotf dicttoxml paho-mqtt
Installing collected packages: dicttoxml, iso8601, paho-mqtt, pytz, urllib3, idna, chardet, certifi, requests, requests-toolbelt, xmltodict, ibmiotf
Successfully installed certifi-2017.7.27.1 chardet-3.0.4 dicttoxml-1.7.4 ibmiotf-0.3.0 idna-2.6 iso8601-0.1.12 paho-mqtt-1.3.1 pytz-2017.2 requests-2.18.4 requests-toolbelt-0.8.0 urllib3-1.22 xmltodict-0.11.0
pi@raspberrypi:~ $

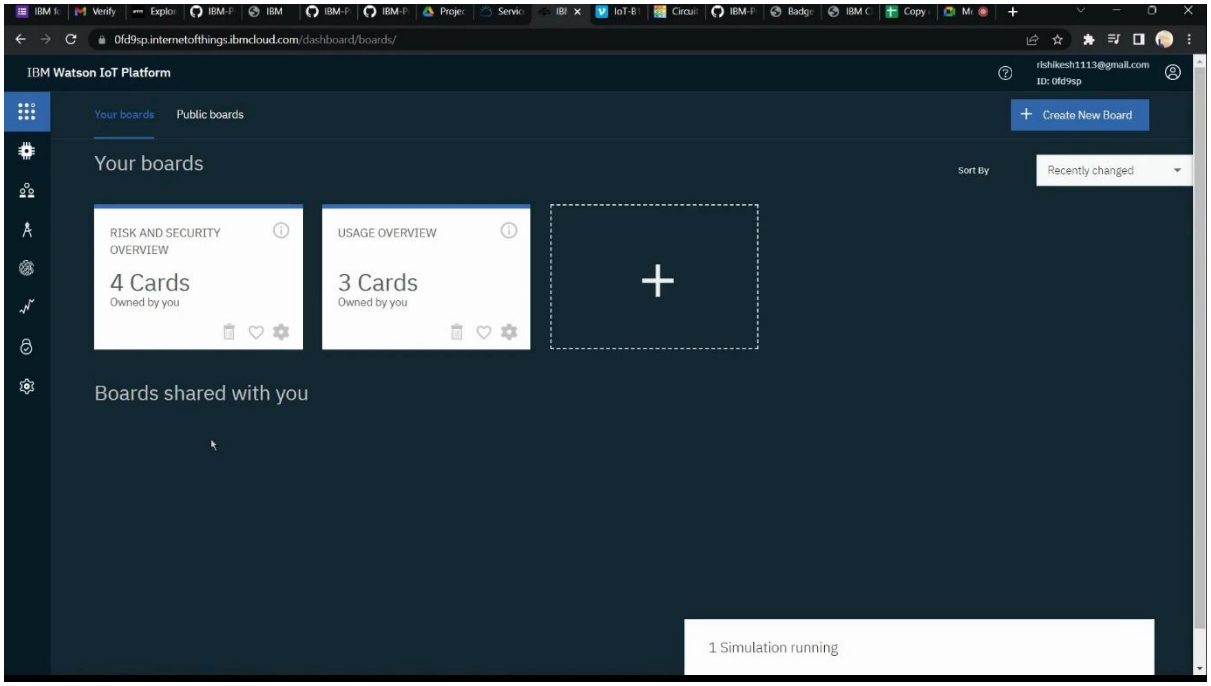

File Edit Shell Debug Options Window Help
Python 2.7.13 (default, Jan 19 2017, 14:48:08)
[GCC 6.3.0 20170124] on linux2
Type "copyright", "credits" or "license()" for more information.
>>>
========== RESTART: /home/pi/Downloads/dht11toibmiot.py ==========
2017-10-23 07:10:37,768 ibmiotf.device.Client INFO Connected successfully: d:gegtl4:mydevice:mydevice
Published Temperature = 28 C Humidity = 50 % to IBM Watson
SensorData Invalid
Published Temperature = 28 C Humidity = 50 % to IBM Watson
SensorData Invalid
Published Temperature = 28 C Humidity = 50 % to IBM Watson
SensorData Invalid
Published Temperature = 28 C Humidity = 50 % to IBM Watson
Published Temperature = 29 C Humidity = 50 % to IBM Watson
Published Temperature = 29 C Humidity = 50 % to IBM Watson

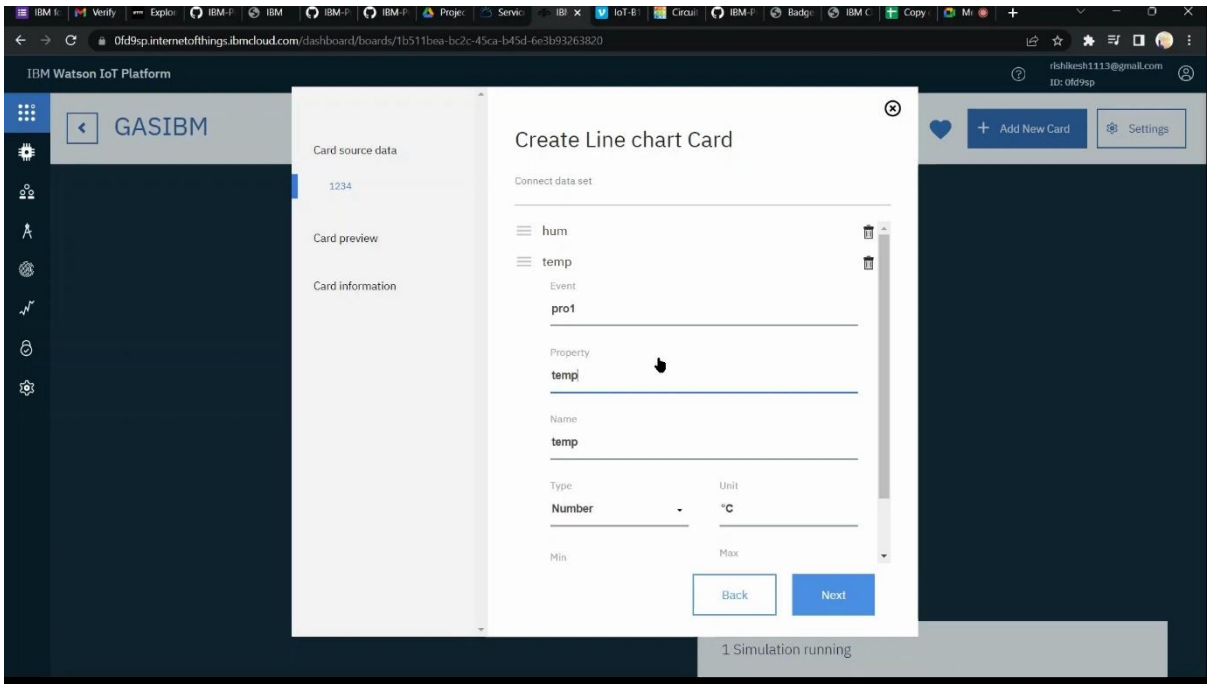
- Check for the Data to be sent to IBM Bluemix

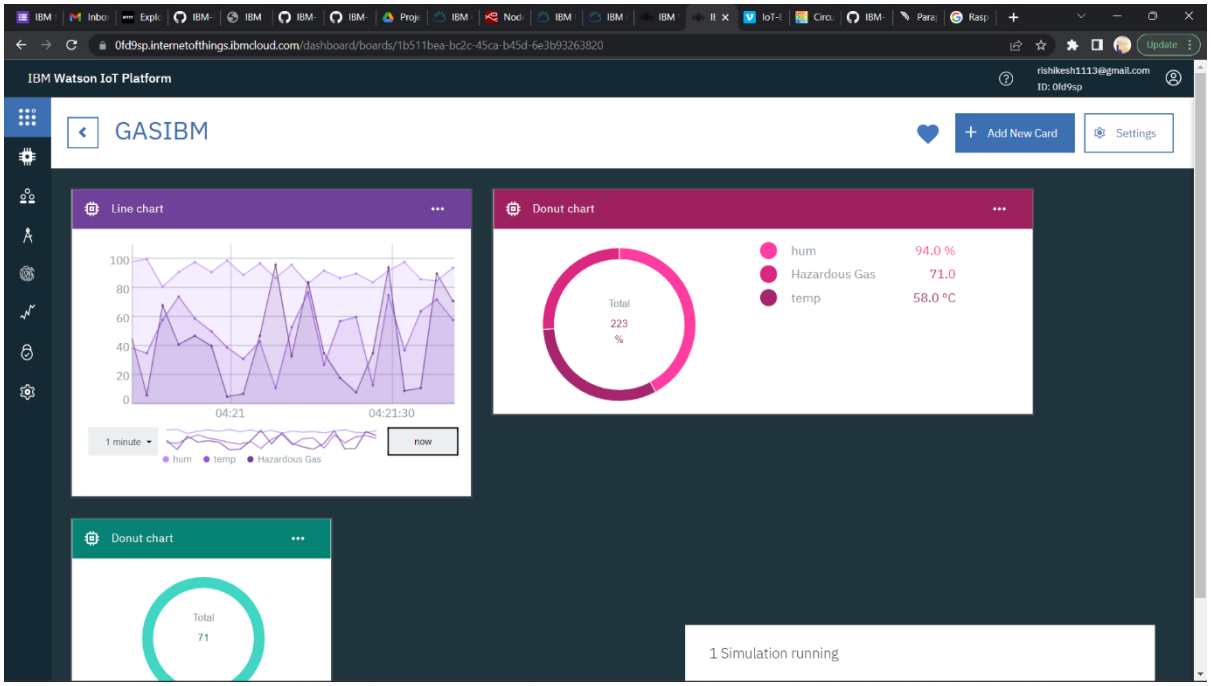




- Create boards and cards for visualization






0fd9sp.internetofthings.ibmcloud.com/dashboard/boards/1b511bea-bc2c-45ca-b45d-6e3b93263820
IBM Watson IoT Platform
rishikesh1113@gmail.com
ID: 0fd9sp
GASIBM
Add New Card
Settings
Line chart
100
80
60
40
20
0
04:21
04:21:30
1 minute
now
hum
temp
Hazardous Gas
Donut chart
Total
223
%
hum
94.0 %
Hazardous Gas
71.0
temp
58.0 °C
Donut chart
Total
71
1 Simulation running