

SENDING DATA FROM RASPBERRY-PI TO IBM WATSON

Team ID	PNT2022TMID45113
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

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Sell on IBM Cloud Catalog settings

Catalog

Search the catalog...

Category ^ Viewing 206 products

Recommended products (6)

- Compute (30)
- Containers (9)
- Networking (30)
- Storage (20)
- AI / Machine Learning (17)

Analytics Engine
By IBM

Submit your Apache Spark applications as needed and customize the Spark runtimes to satisfy the requirements of your application.

AnonTech ViziVault Platform
By Anon Technology, Inc.

Manage personal information as-a-service safely, securely, and in compliance with data privacy regulations using ViziVault

API Connect
By IBM

An enterprise-grade platform for creating, securing, managing, sharing, monetizing, and analyzing custom APIs located on-premises...

cloud.ibm.com/catalog/services/internet-of-things-platform

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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

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	Free

Summary

Internet of Things Platform Free

Location: Frankfurt
Plan: Lite
Service name: Internet of Things Platform-m
Resource group: Default

☒ I have read and agree to the following license agreements:
[Terms](#)

Create

Add to estimate

cloud.ibm.com/services/iotf-service/crm%3Av1%3Abluemix%3Apublic%3Aiotf-service%3Aeu-de%3Aa%2Fec78c3fe2a14cdbaa35fd6f397bbd7b%3Ab9c0837...


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Resource list / Internet of Things Platform-rn 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?

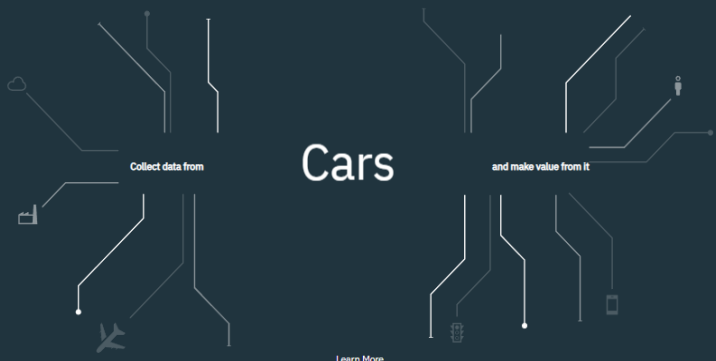
IBM Watson IoT Platform Journey

Lite Non-Production Production

internetofthings.ibmcloud.com

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IBM Watson IoT Platform Sign in



Cars

Collect data from and make value from it

Learn More



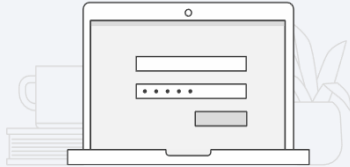
Powerful web dashboard

Flexible, scalable and easy to use

Cookie Preferences

login.ibm.com/authsvc/mtfims/sps/authsvc?StateId=e52e5035-f473-4d2b-a64c-bb61b4f9fd0

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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.

eswariramasamy57@gmail.com

[Use another method](#) [Send OTP](#)

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login.ibm.com/authsvc/mtfims/sps/authsvc?StateId=0f13e0a7-710d-4464-898a-27b5ada5bdc9

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IBM

Enter code sent to your email

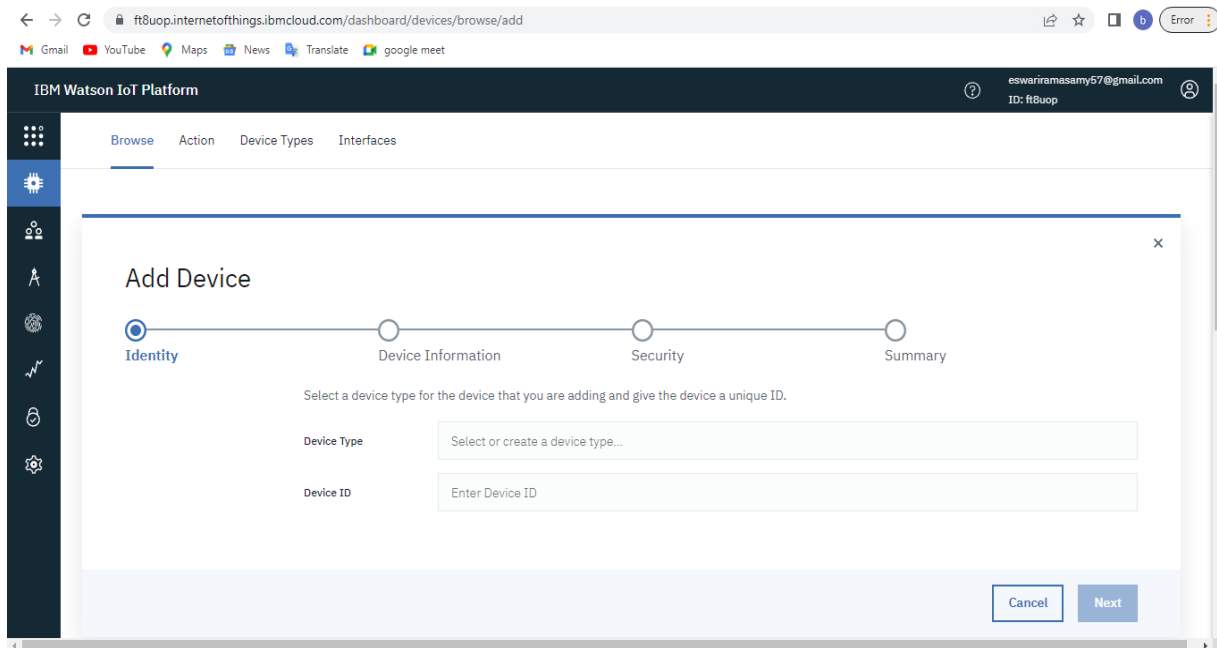
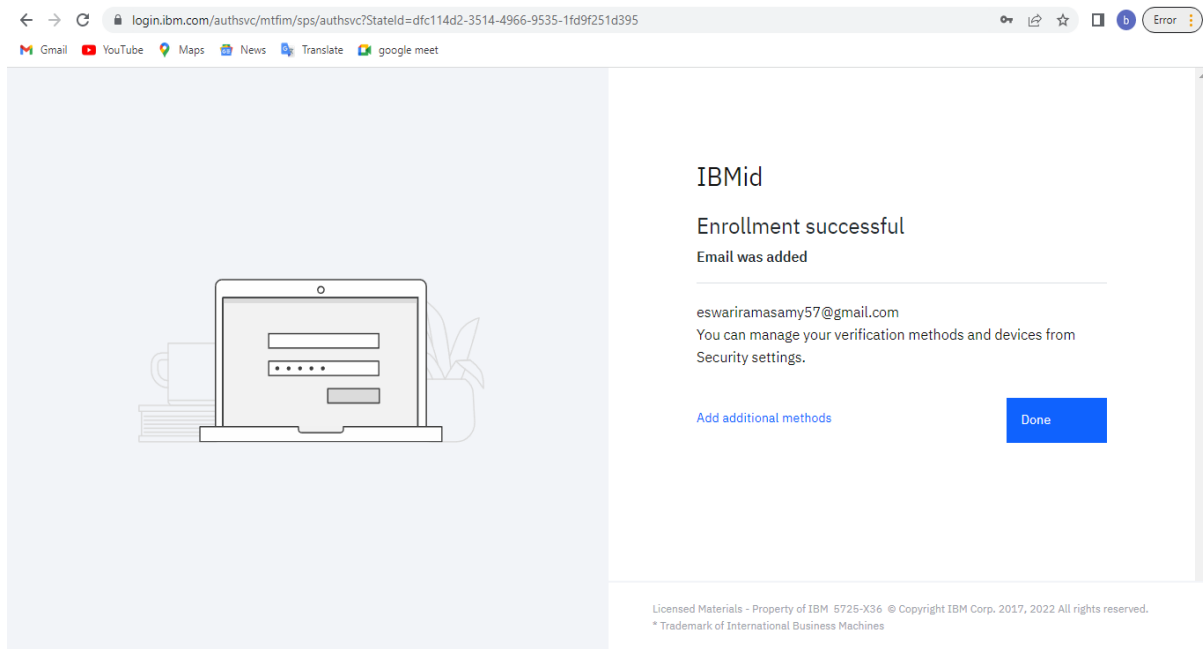
For added security, we sent a 6-digit code to **eswariramasamy57@gmail.com**.
Please enter the code below within 20 minutes

Enter email code

0485-

[Verify](#)

Didn't receive the email?
Check your spam filter for an email from
ibmacct@iam.ibm.com
[Resend code](#)



ft8uop.internetofthings.ibmcloud.com/dashboard/devices/browse/add

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IBM Watson IoT Platformeswariramasamy57@gmail.comID: ft8uop

BrowseActionDevice TypesInterfaces

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 +

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IBM Watson IoT Platformeswariramasamy57@gmail.comID: ft8uop

BrowseActionDevice TypesInterfaces

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 alphanumeric 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 of 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

Enter an optional token

Make a note of the generated token. Lost authentication tokens cannot be recovered. Tokens are encrypted before being stored.

Authentication token are encrypted before we store them.

← Back

Device Drilldown - 6789

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	ft8uop
Device Type	GASLEAKAGE
Device ID	6789
Authentication Method	use-token-auth
Authentication Token	45678901

⚠

Authentication tokens are non-recoverable. If you misplace this token, you will need to re-register the device to generate a new authentication token.

- Install necessary package on the Raspberry pi

```
File Edit Tabs Help
2017-10-23 06:55:22-- http://ftp.nl.debian.org/debian/pool/main/o/openssl/libssl1.0.0_1.0.1t-1+deb8u6_armhf.deb
Resolving ftp.nl.debian.org (ftp.nl.debian.org)... 138.89.149.21, 2001:67c:2564::128:25
Connecting to ftp.nl.debian.org (ftp.nl.debian.org)[138.89.149.21]:80... connect
ed.
HTTP request sent, awaiting response... 200 OK
length: 867950 (848K) [application/x-debian-package]
Saving to: 'libssl1.0.0_1.0.1t-1+deb8u6_armhf.deb'

libssl1.0.0_1.0.1t- 100%[=====] 847.61K  358KB/s   in 2.4s

2017-10-23 06:55:25 (358 KB/s) - 'libssl1.0.0_1.0.1t-1+deb8u6_armhf.deb' saved [
867950/867950]

pi@raspberrypi:~$ sudo dpkg -i libssl1.0.0_1.0.1t-1+deb8u6_armhf.deb
Selecting previously unselected package libssl1.0.0:armhf.
(Reading database ... 115606 files and directories currently installed.)
Preparing to unpack libssl1.0.0_1.0.1t-1+deb8u6_armhf.deb ...
Unpacking libssl1.0.0:armhf (1.0.1t-1+deb8u6) ...
Setting up libssl1.0.0:armhf (1.0.1t-1+deb8u6) ...
pi@raspberrypi:~$ curl -LO https://github.com/ibm-messaging/iot-raspberrypi/rel
eases/download/1.0.2.1/iot-1.0-2_armhf.deb
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left   Speed
100 164    0 164    0    0    0  0 --:--:--  0:00:01 --:--:-- 157
100 860    0 860    0    0    0  0 --:--:--  0:00:01 --:--:-- 457
100 119k 100 119k    0    0 20117    0 0:00:03 0:00:03 --:--:-- 48108
pi@raspberrypi:~$ sudo dpkg -i iot-1.0-2_armhf.deb
(Reading database ... 115626 files and directories currently installed.)
Preparing to unpack iot-1.0-2_armhf.deb ...
Unpacking iot (1.0-1) over (1.0-1) ...
Setting up iot (1.0-1) ...
Processing triggers for systemd (232-25+deb8u1) ...
pi@raspberrypi:~$ service iot status
● iot.service - LSB: IoT service
   Loaded: loaded (/etc/init.d/iot; generated; vendor preset: enabled)
   Active: active (running) since Mon 2017-10-23 06:56:25 UTC; 17s ago
     Docs: man:systemd-sysv-generator(8)
    CGroup: /system.slice/iot.service
            └─2562 /opt/iot/iot /dev/null

Oct 23 06:56:24 raspberrypi systemd[1]: Starting LSB: IoT service...
Oct 23 06:56:24 raspberrypi iot[2567]: Starting the iot program
Oct 23 06:56:25 raspberrypi iot[2562]: **** IoT Raspberry Pi Sample has started ****
Oct 23 06:56:25 raspberrypi iot[2562]: Config file not found. Going to Quickstart mode
Oct 23 06:56:25 raspberrypi iot[2562]: Running in Quickstart mode
Oct 23 06:56:25 raspberrypi systemd[1]: Started LSB: IoT service.
```



```
File Edit Tabs Help
pi@raspberrypi:~$ pip install ibmiotf
Collecting ibmiotf
  Downloading ibmiotf-0.3.0.tar.gz (50kB)
    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 (60kB)
    100% |#####| 61kB 910kB/s
Collecting pytz>=2017.2 (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 xmldict>=0.10.2 (from ibmiotf)
  Downloading xmldict-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% |#####| 21kB 1.7MB/s
Collecting charset>=3.1.0,<=3.6.2 (from requests>=2.5.0->ibmiotf)
  Downloading charset-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/bbc33ad957e02f7b71ba60e316d85a83d9d735e0d12e0c0418
Running setup.py bdist_wheel for dicttoxml ... done
Stored in directory: /home/pi/.cache/pip/wheels/4b/02/5d/96010b33ec6a7b2ae6da137654b1b59def5468624078e12c0e
Running setup.py bdist_wheel for paho-mqtt ... done
Stored in directory: /home/pi/.cache/pip/wheels/20/d8/6d/acdc8f2890111b7be7de71d9e8ef0642f83be8313dfff0493
Successfully built ibmiotf dicttoxml paho-mqtt
Installing collected packages: dicttoxml, iso8601, paho-mqtt, pytz, urllib3, idna, charset, certifi, requests, requests-toolbelt, xmldict, ibmiotf
Successfully installed certifi-2017.7.27.1 charset-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 xmldict-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 07:10:37.760 ibmiotf.device.client INFO Connected successfully: d:geg114: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

IBM Watson IoT Platform

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
6789	Disconnected	GASLEAKAGE	Device	Nov 16, 2022 3:05 PM

Items per page 50 | 1-1 of 1 item

1 of 1 page

IBM Watson IoT Platform

Browse Action Device Types Interfaces

6789 Disconnected GASLEAKAGE Device Nov 16, 2022 3:05 PM

Identity Device Information Recent Events State Logs

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

Event	Value	Format	Last Received
event_1	{\"randomNumber\":89}	json	a few seconds ago
event_1	{\"randomNumber\":64}	json	a few seconds ago
event_1	{\"randomNumber\":18}	json	a few seconds ago
event_1	{\"randomNumber\":2}	json	a few seconds ago
event_1	{\"randomNumber\":71}	json	a few seconds ago

3 Simulations running

- Create boards and cards for visualization

