

SENDING DATA FROM RASPBERRY-PI TO IBM WATSON

DATE	14 NOVEMBER 2022
TEAM ID	PNT2022TMID53571
PROJECT NAME	GAS LEAKAGE MONITORING AND ALERTING SYSTEM FOR INDUSTRIES

AIM:

To send sensor data (or any dummy data) from Raspberry –Pi to IBM Watson .In our case it is DHT sensors Data.

REQUIREMENTS:

HARDWARE:

- RASPBERRY-PI (3B)(WITH ETHERNET CABLE OR WIFI CONNECTED)
- USB MOUSE
- USB KEYBOARD
- VGA TO HDMI CABLE
- A MONITOR
- RASPBERRY’S POWER SUPPLY
- DHT-11 Sensor
- Connecting Wires

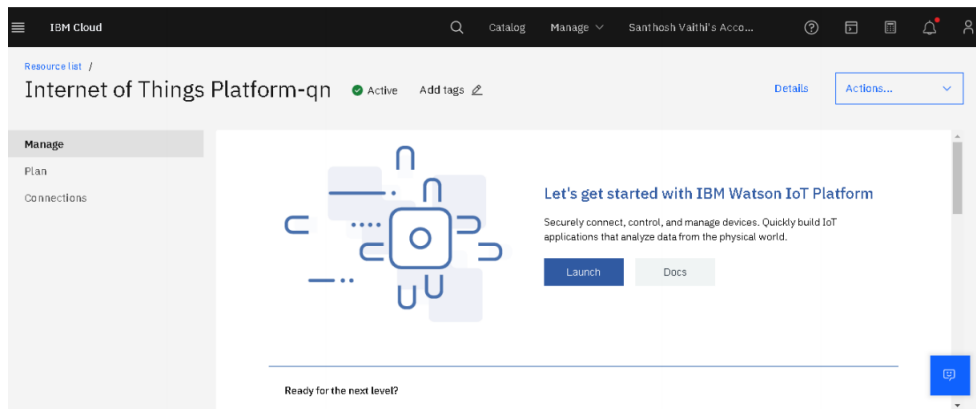
SOFTWARE:

- IBM BLUEMIX ACCOUNT

STEPS TO BE FOLLOWED

Step-1: Create a device in IBM Watson:

- Firstly, login into your IBM-Bluemix account with your e-mail ID and Password.



STEP-2: INSTALLING NECESSARY PACKAGES ON YOUR PI:

- Now we are going to install necessary packages on your pi.
- Open your terminal in your pi and type the following commands
- curl -LO

https://github.com/ibm-messaging/iot-raspberrypi/releases/download/1.0.2.1/iot_1.0-2_armhf.deb

- sudo dpkg -i iot_1.0-2_armhf.deb
- service iot status

Following are the images as to what appears on your pi's terminal when u type these commands

```
File Edit Tabs Help
--2017-10-23 06:55:22-- http://ftp.nl.debian.org/debian/pool/main/o/openssl/lib
ssll.0.0.1.0.1t-1-deb8u6_armhf.deb
Resolving ftp.nl.debian.org (ftp.nl.debian.org)... 130.89.149.21, 2001:67c:2564:
a128::21
Connecting to ftp.nl.debian.org (ftp.nl.debian.org)[130.89.149.21]: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 ... 115608 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
ases/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 0 157 0 --:--:-- 0:00:01 --:--:-- 157
100 609 0 609 0 0 457 0 --:--:-- 0:00:01 --:--:-- 457
100 110k 100 110k 0 0 26117 0 0:00:03 0:00:03 --:--:-- 48190
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-sys-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.
```

- Then open your terminal and type pip install ibmiot

```
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 (88kB)
    100% |#####| 81kB 910kB/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-2.19.4-py2.py3-none-any.whl (88kB)
    100% |#####| 22kB 1.0MB/s
Collecting requests-toolbelt==0.7.0 (from ibmiotf)
  Downloading requests-toolbelt-0.8.0-py2.py3-none-any.whl (54kB)
    100% |#####| 61kB 1.0MB/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% |#####| 13kB 1.4MB/s
Collecting idna<2.7,=>2.5 (from requests==2.5.0->ibmiotf)
  Downloading idna-2.6-py2.py3-none-any.whl (98kB)
    100% |#####| 61kB 1.7MB/s
Collecting chardet<3.0,=>3.0.2 (from requests==2.5.0->ibmiotf)
  Downloading chardet-3.0.4-py2.py3-none-any.whl (133kB)
    100% |#####| 14kB 1.0MB/s
Collecting certifi==2017.4.17 (from requests==2.5.0->ibmiotf)
Using cached certifi-2017.7.27-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/f9/45/bbc33ad957e82f7b71ba80e316d65a83d9d735a0d12e0c0418
Running setup.py bdist_wheel for dicttoxml ... done
Stored in directory: /home/pi/.cache/pip/wheels/45/62/59/96910b33ec6a7b2ae66a13765401b50de75468024078e12cce
Running setup.py bdist_wheel for paho-mqtt ... done
Stored in directory: /home/pi/.cache/pip/wheels/20/db/0d/acdc8f289011b7be7de71deeef0642f8b3be0313dfff0493
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-2.19.4 requests-toolbelt-0.8.0 urllib3-1.22 xmltodict-0.11.0
pi@raspberrypi:~$
```

- I have sent DHT-11 Sensors data to ibm bluemix .To get the code u need to login into IOT GYAN.
- Then I get the image as follows in my pi's shell:

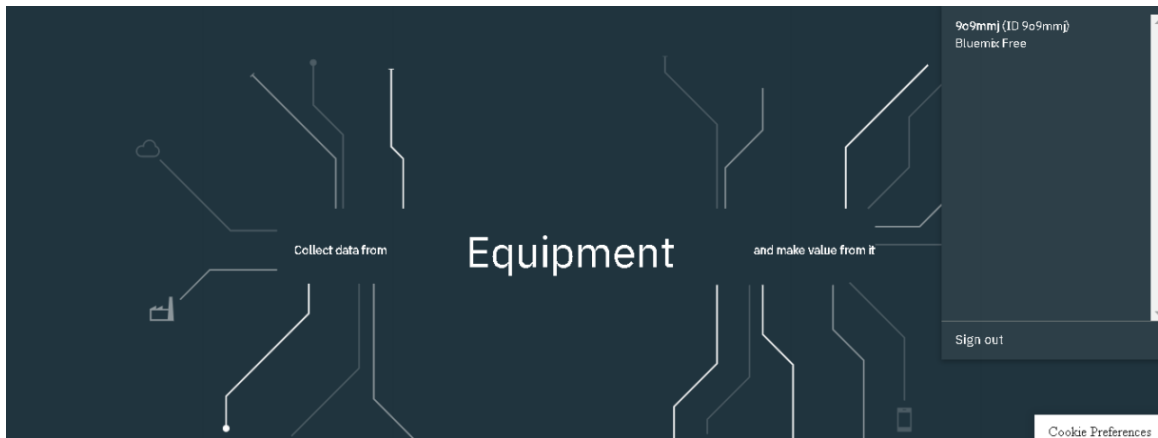
```
File Edit Shell Debug Options Window Help
Python 2.7.13 (default, Jan 19 2017, 14:48:08)
[GCC 6.3.0 20170124] on linux2
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: /home/pi/Downloads/dht11toibmiot.py =====
2017-10-23 07:19:37,768 ibmiotf.device.client INFO 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
|
```

Step-3: checking your data sent on IBM Bluemix:

- After you have sent your sensors data you can check whether it is received at your iot platform

Just look at the image below and if u see the same wifi kind of symbol on your created device then

your data is being received.



Browse Action Device Types Interfaces Add Device

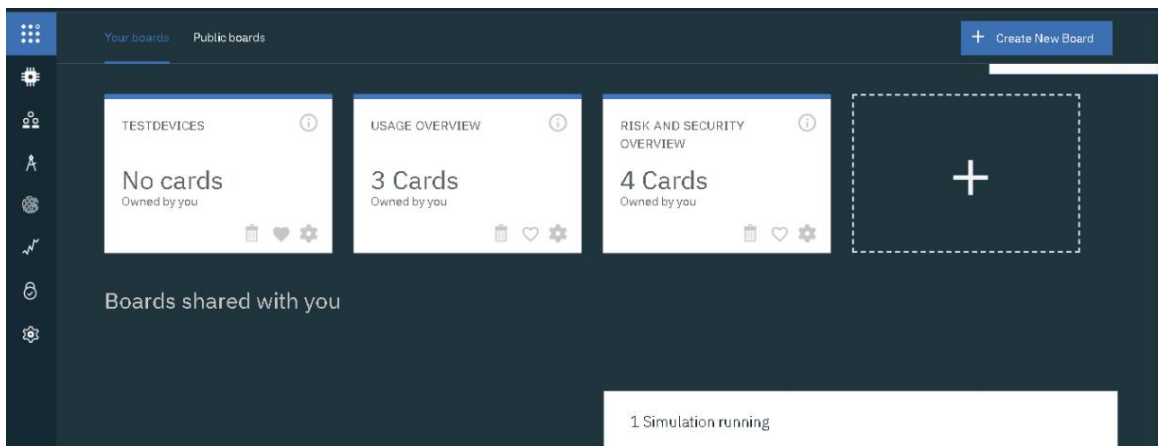
The recent events listed show the live stream of data that is coming and going from this device.

Event	Value	Format	Last Received
event_1	{"temperature":31,"humidity":79}	json	a few seconds ago
event_1	{"temperature":42,"humidity":81}	json	a few seconds ago
event_1	{"temperature":13,"humidity":77}	json	a few seconds ago
event_1	{"temperature":9,"humidity":72}	json	a few seconds ago
event_1	{"temperature":25,"humidity":71}	json	a few seconds ago

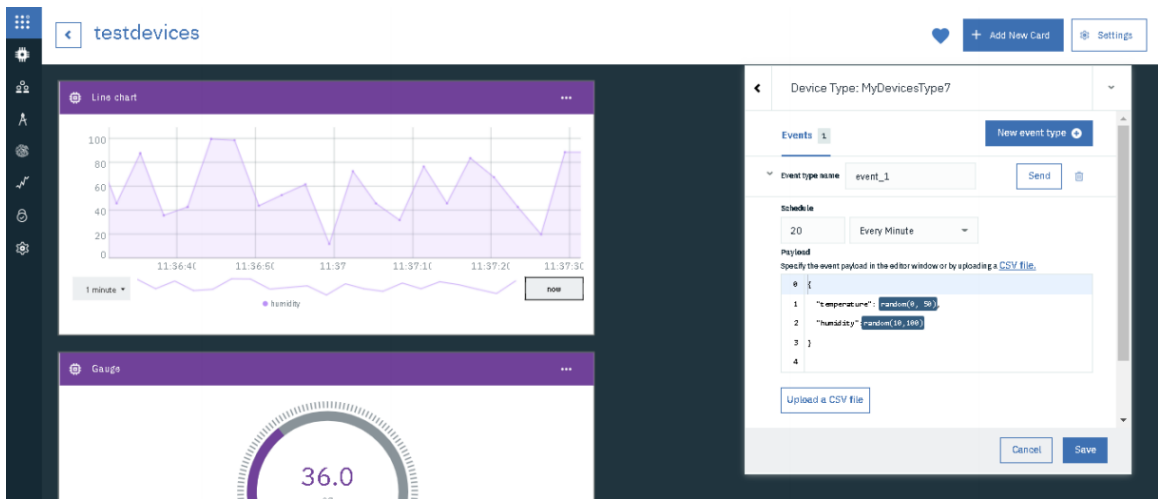
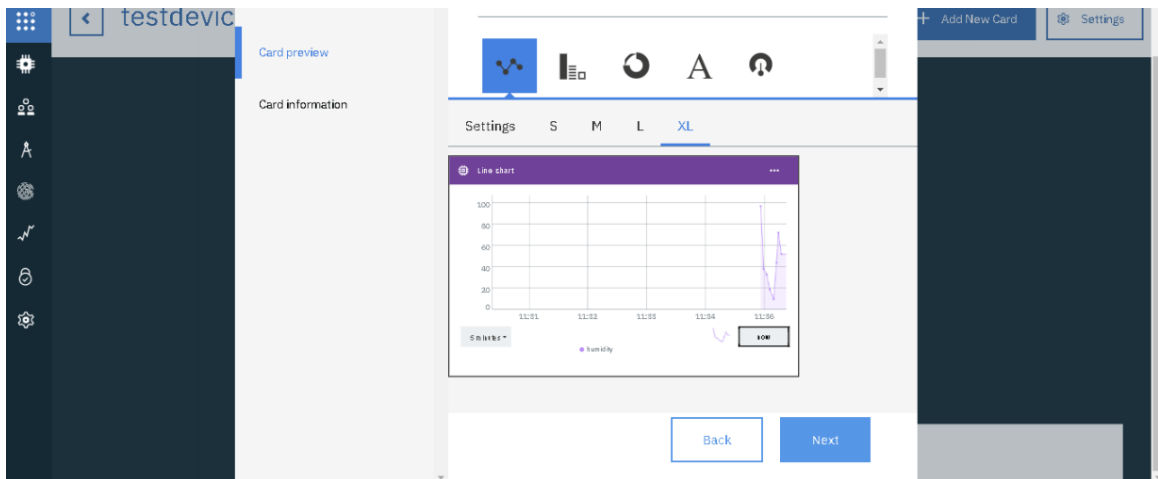
1 Simulation running

Step-4: Creating boards and cards for visualization of data:

- Click on Create a new board to create a board .



- Select the type of Graph u want accordingly and click next



RESULT:

Hence, we were able to send data from our pi to IBM Watson and visualize it on a graph.