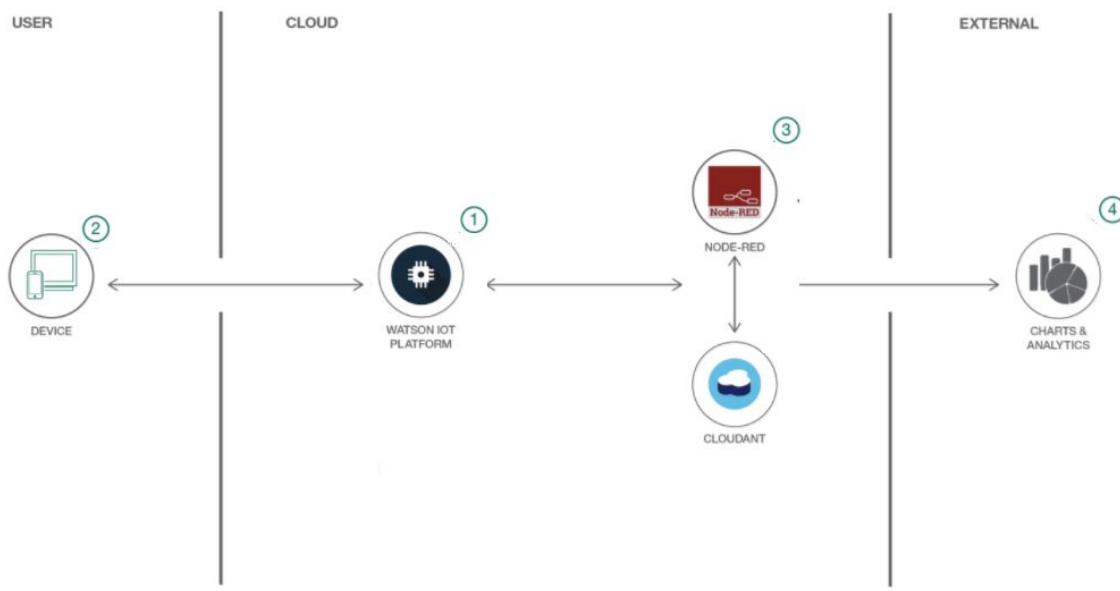


Publish health data using IBM Watson IoT Platform

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SSN College of Engineering
Reviewed by : Rajesh K Jeyapaul , IBM

Architectural Diagram:



1) IBM Watson IoT Platform

2) Device

3) Node-Red and Cloudant DB

1.Creating an IBM cloud account and registering devices:

Step 1: Create an account on bluemix.net

If you already have an account go to step 2.

Step 2: Login in using your IBM cloud account.

Step 3: You will be taken to your IBM cloud Dashboard. The screen will look similar to the picture shown below.

The screenshot shows the IBM Cloud Dashboard. At the top, there are navigation links for Catalog, Docs, Support, and Manage. Below the header, there are filters for Resource Group (All Resources), Region (United Kingdom), Cloud Foundry Org (kashyapravichand...@gmail.com), and Cloud Foundry Space (dev). A search bar is also present. On the left, there's a sidebar with a 'Dashboard' section. The main content area is divided into two sections: 'Cloud Foundry Apps' and 'Cloud Foundry Services'. The 'Cloud Foundry Apps' section shows one app named 'Pulsedemo' with a route of 'Pulsedemo.eu-gb.mybluemix.net', 256 MB of memory, and a state of 'Awake (1/1)'. The 'Cloud Foundry Services' section lists four services: 'Conversation-qc' (Conversation, Lite plan), 'Discovery-v3' (Discovery, Lite plan), 'Pulsedemo-cloudantNoSQLDB' (Cloudant NoSQL DB, Lite plan), and 'Pulsedemo-iotf-service' (Internet of Things Platform, Lite plan).

Step 4: Find the “Catalog” button on the top right corner of your screen. Press the button.

The screenshot shows the IBM Cloud Dashboard at <https://console.bluemix.net/dashboard/apps>. The Catalog button in the top navigation bar is circled in yellow. The dashboard displays two sections: 'Cloud Foundry Apps' and 'Cloud Foundry Services'. The 'Cloud Foundry Apps' section lists one app named 'Pulsedemo' with a route of 'Pulsedemo.eu-gb.mybluemix.net', 256 MB memory, and an 'Awake (1/1)' state. The 'Cloud Foundry Services' section lists four services: 'Conversation-qc', 'Discovery-v3', 'Pulsedemo-cloudantNoSQLDB', and 'Pulsedemo-iotf-service', all under the Lite plan.

After pressing the button the following screen will be opened:

The screenshot shows the IBM Cloud Catalog at <https://console.bluemix.net/catalog/?taxonomyNavigation=apps&search=label:lite>. A blue banner at the top states: 'Try the best of the Catalog for free with no time restrictions with Lite plans. The Lite filter is enabled. Remove the filter to see the full Catalog.' The search bar contains 'label:lite'. The left sidebar shows categories like 'All Categories (44)', 'Infrastructure (3)', 'Platform (41)', and 'Containers'. The main area shows results for 'Object Storage' (Provides flexible, cost-effective, and scalable cloud storage for unstructured data), 'Storage' (Order storage), 'Containers' (Get started by creating a Kubernetes cluster, or manage your container images in the registry), 'Kubernetes Cluster' (Deploy highly available apps to a cluster of compute hosts), and 'Container Registry' (Store and distribute Docker images by using this managed private registry). Each result has 'Lite' and 'IBM' buttons.

Step 5: Find “Boilerplate” link available on the side pane under “PLATFORMS”. Press the link.

Secure | https://console.bluemix.net/catalog/?taxonomyNavigation=apps&search=labellite

Catalog Docs Support Manage

All Categories (44) > Filter

labellite

Infrastructure (3)

- Compute
- Storage (1)
- Network
- Security
- Containers (2)
- VMware

Platform (41)

- Boilerplates (4)** (highlighted with a yellow circle)
- APIs (1)
- Application Services
- Blockchain
- Cloud Foundry Apps (10)
- Data & Analytics (8)
- DevOps (5)
- Finance
- Functions
- Integrate (2)
- Internet of Things (1)
- Mobile (1)
- Network
- Security (1)

Storage

Object Storage

Provides flexible, cost-effective, and scalable cloud storage for unstructured data.

Lite IBM

Containers

Kubernetes Cluster

Deploy highly available apps to a cluster of compute hosts.

Lite IBM

Container Registry

Store and distribute Docker images by using this managed private registry. Make informed

Lite IBM

Platform

Boilerplates

After pressing the link the page will redirect you to following section:

Secure | https://console.bluemix.net/catalog/?taxonomyNavigation=apps&search=labellite&category=blueprints

Catalog Docs Support Manage

All Categories (44) > Filter

labellite

Infrastructure (3)

Get started with a new app, now.

Internet of Things Platform Starter

Get started with IBM Watson IoT platform using the Node-RED Node.js sample application. With

Lite IBM

Node.js Cloudant DB Web Starter

Use the Cloudant NoSQL DB service with the 'SDK for Node.js™' runtime.

Lite IBM

Python Flask

A simple Python Flask application that will get you up and running quickly.

Lite Community

Ruby Sinatra

Develop a Ruby web application using the Sinatra framework.

Lite Community

Boilerplates (4)

APIs (1)

Application Services

Blockchain

Cloud Foundry Apps (10)

Data & Analytics (8)

DevOps (5)

Finance

Functions

Integrate (2)

Internet of Things (1)

Mobile (1)

Network

<https://console.bluemix.net/catalog/starters/ruby-sinatra>

Step 6: Click on “ Internet of Things Platform Starter” button.

All Categories (44)

Infrastructure (3)

- Compute
- Storage (1)
- Network
- Security
- Containers (2)
- VMware

Platform (41)

- Boilerplates (4) >
- APIs (1)
- Application Services
- Blockchain
- Cloud Foundry Apps (10)
- Data & Analytics (8)
- DevOps (5)
- Finance
- Functions
- Integrate (2)
- Internet of Things (1)
- Mobile (1)
- Network

<https://console.bluemix.net/catalog/starters/internet-of-things-platform-starter>

The button will take you to page which looks like the image shown below.

Create a Cloud Foundry App

Internet of Things Platform Starter

Get started with IBM Watson IoT platform using the Node-RED Node.js sample application. With the Starter, you can quickly simulate an Internet of Things device, create cards, generate data, and begin analyzing and displaying data in the Watson IoT Platform dashboard.

[View Docs](#)

VERSION	0.7.0
TYPE	Boilerplate
REGION	United Kingdom, Germany, US South

App name:

Host name:

Domain:

Select region to deploy in: United Kingdom

Choose an organization: Loading...

Choose a space: Loading...

Selected Plan: **SDK for Node.js™**

Cloudant NoSQL DB

Internet of Things Platform

Need Help? [Contact IBM Cloud Sales](#)

Estimate Monthly Cost [Cost Calculator](#)

[Create](#)

Step 7: To create a Cloud Foundry App, fill in the required details. I am going to name the app as **Pusledemo**. After filling in the details click on the reset button present on the bottom right of the screen. **NOTE:** The app name must be unique.

Secure | https://console.bluemix.net/catalog/starter/internet-of-things-platform-starter?taxonomyNavigation=apps

IBM Cloud

Create a Cloud Foundry App

Internet of Things Platform Starter

Get started with IBM Watson IoT platform using the Node-RED Node.js sample application. With the Starter, you can quickly simulate an Internet of Things device, create cards, generate data, and begin analyzing and displaying data in the Watson IoT Platform dashboard.

App name: Pulsedemo

Host name: Pulsedemo Domain: eu-gb.mybluemix.net

Select region to deploy in: United Kingdom Choose an organization: kashyapravichandran@gmail.com Choose a space: dev

Lite IBM

View Docs

VERSION 0.7.0
TYPE Boilerplate
REGION Germany, US South, United Kingdom

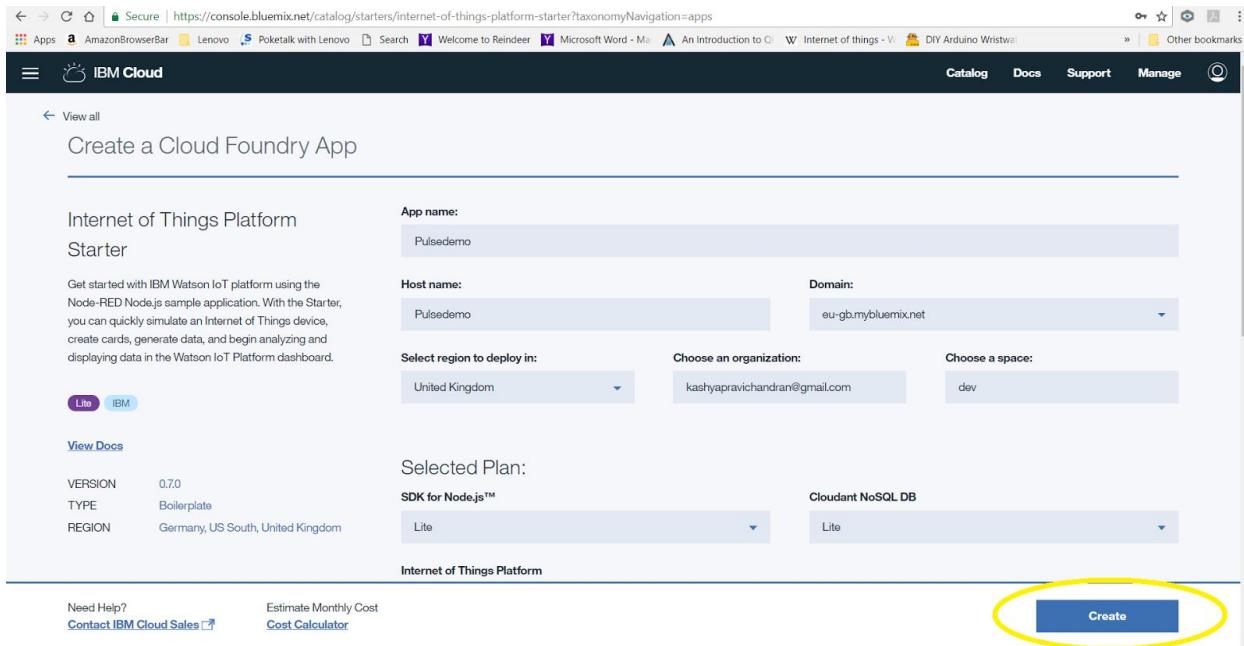
Selected Plan: SDK for Node.js™ Cloudant NoSQL DB

Lite Lite

Internet of Things Platform

Need Help? Contact IBM Cloud Sales Estimate Monthly Cost Cost Calculator

Create



Step 8: Go to your IBM cloud dashboard.

Secure | https://console.bluemix.net/catalog/starter/internet-of-things-platform-starter?taxonomyNavigation=apps

IBM Cloud

Create a Cloud Foundry App

Internet of Things Platform Starter

Get started with IBM Watson IoT platform using the Node-RED Node.js sample application. With the Starter, you can quickly simulate an Internet of Things device, create cards, generate data, and begin analyzing and displaying data in the Watson IoT Platform dashboard.

App name: Pulsedemo

Host name: Pulsedemo Domain: eu-gb.mybluemix.net

Select region to deploy in: United Kingdom Choose an organization: kashyapravichandran@gmail.com Choose a space: dev

Lite IBM

View Docs

VERSION 0.7.0
TYPE Boilerplate
REGION Germany, US South, United Kingdom

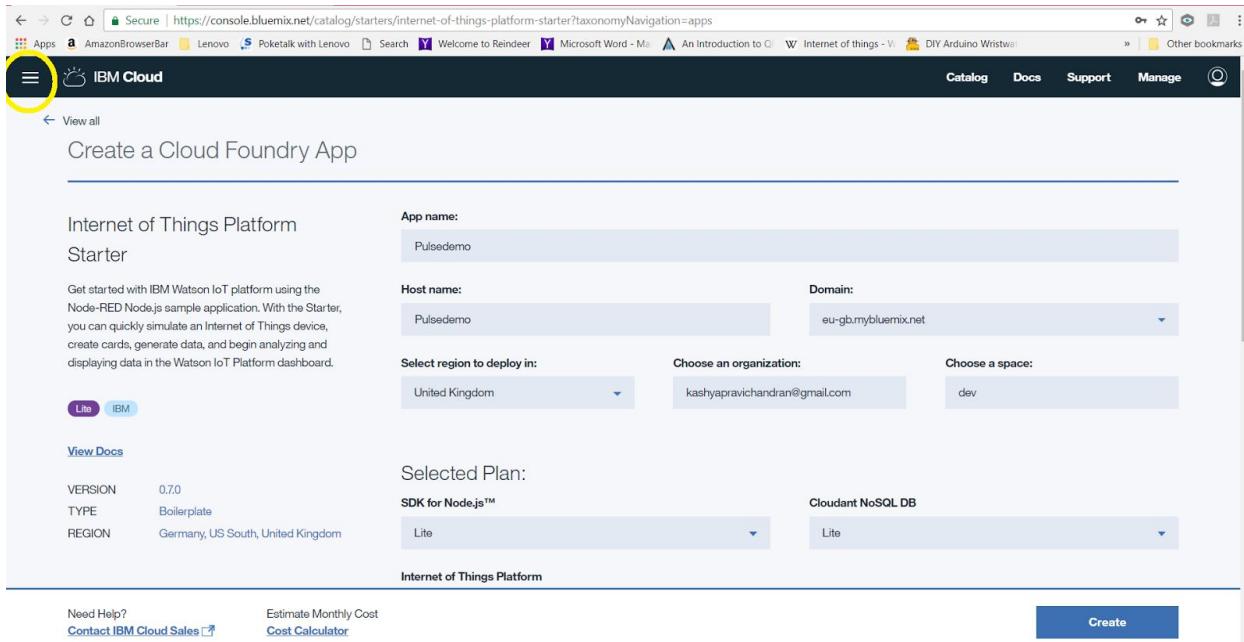
Selected Plan: SDK for Node.js™ Cloudant NoSQL DB

Lite Lite

Internet of Things Platform

Need Help? Contact IBM Cloud Sales Estimate Monthly Cost Cost Calculator

Create



Note: At this stage, the app is deployed and the following services are provisioned:

- Watson IoT Platform (MQ Broker)
- Node.js Runtime
- Cloudant database

Next step is to get into the Watson IoT Platform console.

Step 9: Click on **Pulsedemo-iotf-service** under cloud foundry services.

Name	Service Offering	Plan
Pulsedemo-cloudantNoSQLDB	Cloudant NoSQL DB	Lite
Pulsedemo-iotf-service	Internet of Things Platform	Lite

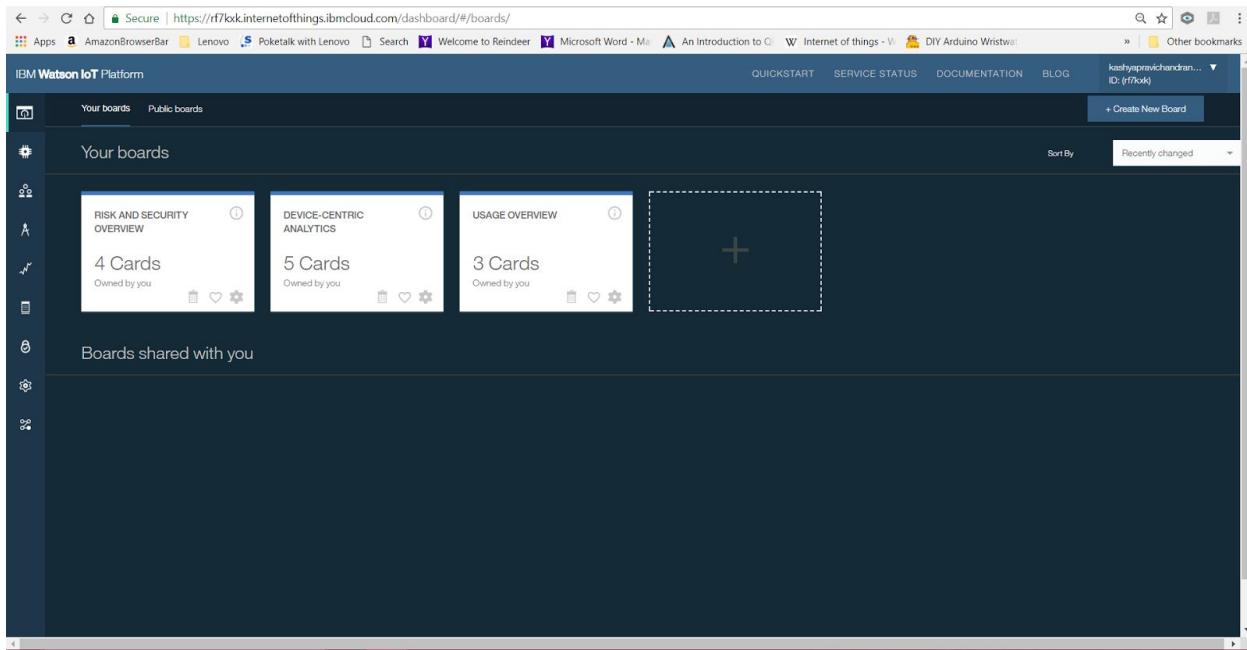
This action will redirect you to following page.

The screenshot shows the IBM Cloud interface. On the left, a sidebar has 'Manage' selected. The main area displays a service named 'Pulsedemo-iotf-service' with a status of '0.42% Used | 199.17 Megabyte available'. Below the service name, it says 'Location: United Kingdom', 'Org: kashyapravichandran@gmail.com', and 'Space: dev'. A central graphic depicts a central node connected to various blue rectangular blocks representing data or components. Below the graphic, a heading reads 'Let's get started with Watson IoT Platform'. A sub-section below it says 'Securely connect, control, and manage devices. Quickly build IoT applications that analyze data from the physical world.' At the bottom, there are two buttons: 'Launch' (highlighted in green) and 'Docs'.

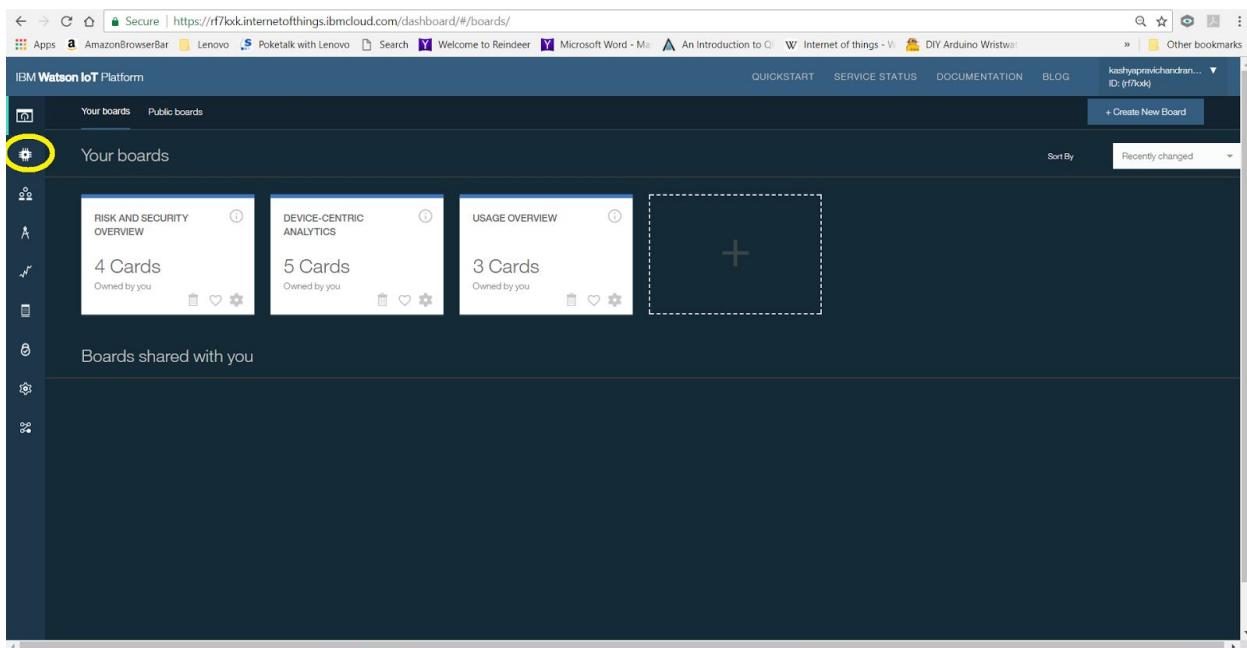
Step 10: Find the **launch** button and press it.

This screenshot is identical to the one above, showing the same service details and Watson IoT Platform introduction. However, the 'Launch' button is now highlighted with a yellow circle, indicating it is the target for the user to click.

A new tab will be opened which is your IBM Watson IoT Platform page.



Step 11: Upon opening your IBM Watson IoT Platform page choose “Device” section present on the side pane.



You will be redirected to a page called **devices**.

The screenshot shows the IBM Watson IoT Platform dashboard. At the top, there's a navigation bar with links like 'QUICKSTART', 'SERVICE STATUS', 'DOCUMENTATION', 'BLOG', and a user profile section. Below the navigation bar is a header titled 'IBM Watson IoT Platform' with a 'Browse' button highlighted. The main content area is titled 'Browse Devices' and contains a table with columns for 'Device ID', 'Device Type', 'Class ID', 'Date Added', and 'Descriptive Location'. A large bee icon is centered on the page, and below it, a message says 'You don't have any devices.' with a link to 'Create a device.'

Note: Using IBM Watson IoT Platform , we will be performing the following device registration operations:

- (1) Create a device type
- (2) Create device ID
- (3) Authentication tokens

Step 12: To create a new device type press on the **Device type** button present on the top left side of the screen.

This screenshot is identical to the one above, showing the 'Browse Devices' section of the IBM Watson IoT Platform. The 'Device Types' button in the top navigation bar is specifically circled in yellow to indicate the step being described.

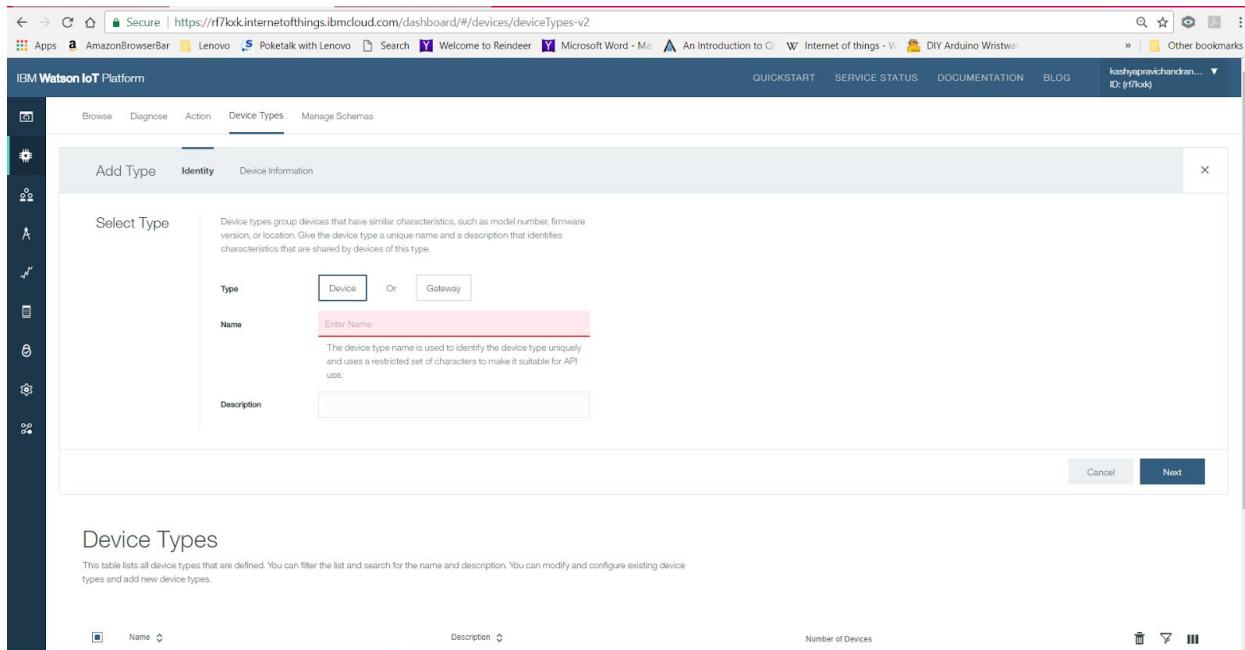
After pressing the button the following section of the page will open up.

The screenshot shows the 'Device Types' section of the IBM Watson IoT Platform. At the top, there is a navigation bar with links for 'QUICKSTART', 'SERVICE STATUS', 'DOCUMENTATION', 'BLOG', and a user profile. Below the navigation bar, there is a search bar and a 'Device Types' button. The main content area has a heading 'Device Types' and a sub-instruction: 'This table lists all device types that are defined. You can filter and search for the name and description. You can modify and configure existing device types and add new device types.' A table with columns 'Name', 'Description', and 'Number of Devices' is shown, but it is currently empty. There is a small icon of a bee above the table. Below the table, a message says 'You don't have any device types created.' and a 'Add Device Type' button.

Step 13: Press the **Add device type** button present on the top right corner.

This screenshot is identical to the one above, showing the 'Device Types' page. However, the 'Add Device Type' button at the top right is now highlighted with a yellow circle, indicating where the user should click.

After pressing the button wait for the page to load up. The new page will look as shown in the below image.



The screenshot shows the 'Add Type' screen in the IBM Watson IoT Platform. The 'Identity' tab is active. A modal window titled 'Select Type' is open. It contains a 'Type' section with 'Device' and 'Gateway' options, where 'Device' is selected. Below it is a 'Name' field labeled 'Enter Name' with a placeholder 'The device type name is used to identify the device type uniquely and uses a restricted set of characters to make it suitable for API use.' A 'Description' field is also present. At the bottom right of the modal are 'Cancel' and 'Next' buttons.

Step 14: Enter the following details.

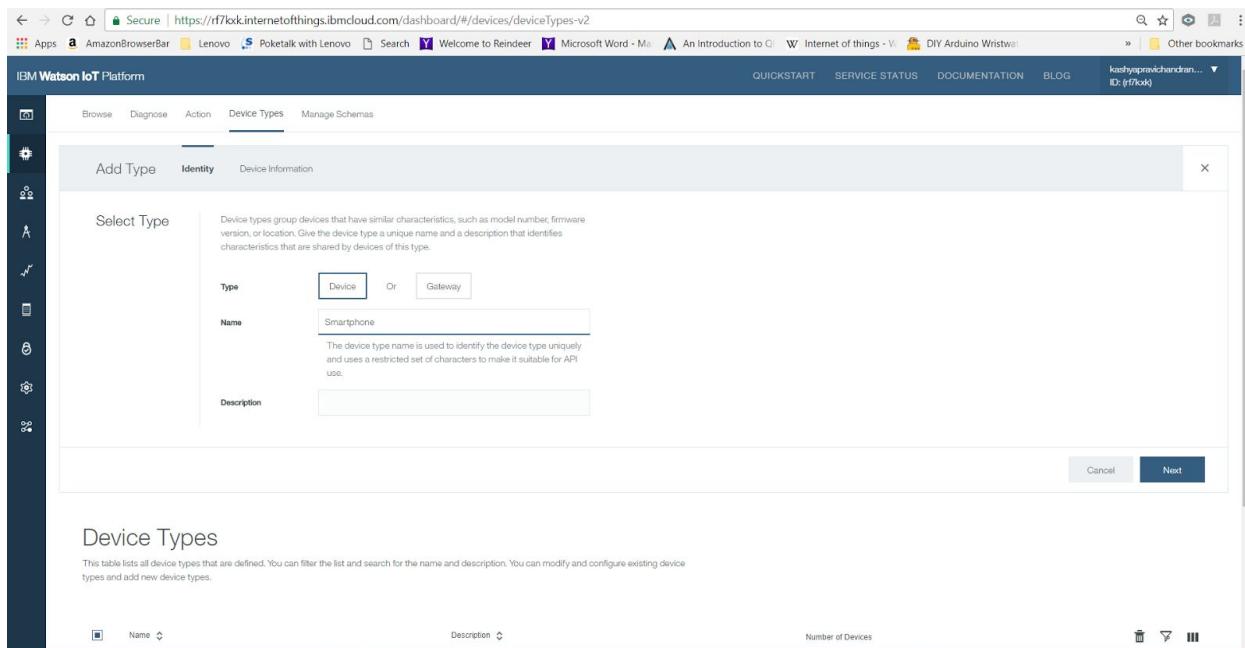
Choose Device when asked to choose between device and gateway

Name the device type. Here we are going to use **Smartphone**.

Describe the device if you want to. Additional information about the device are optional.

You can choose to ignore it. Here we are going to ignore those details.

Click on the done button once you are done.



The screenshot shows the 'Add Type' screen in the IBM Watson IoT Platform. The 'Identity' tab is active. A modal window titled 'Select Type' is open. It contains a 'Type' section with 'Device' and 'Gateway' options, where 'Device' is selected. Below it is a 'Name' field containing 'Smartphone' with a placeholder 'The device type name is used to identify the device type uniquely and uses a restricted set of characters to make it suitable for API use.' A 'Description' field is also present. At the bottom right of the modal are 'Cancel' and 'Next' buttons.

The screenshot shows the 'Device Information' section of the 'Add Type' form. It includes fields for Serial Number, Manufacturer, Model, Device Class, Description, Firmware Version, and Descriptive Location. A 'Done' button is highlighted with a yellow circle.

After pressing the **Done** button you will be redirected to the following page.

The screenshot shows a confirmation message: 'You added the new device type: Smartphone'. Below it is a 'Register Device' section with a 'Register Devices' button highlighted with a yellow circle.

On the new page find the button which reads **Register Device** and press it. The button is marked on the above image.

On the new page enter the following details. Device id, authentication method and authentication token. We can choose to ignore the rest. The process is illustrated using the images given below.

Secure | https://rf7okk.internetofthings.ibmcloud.com/dashboard/#/devices/browse-v2

IBM Watson IoT Platform

Browse Diagnose Action Device Types Manage Schemas

Add Device Identity Device Information Security Summary

Identity

Select a device type for the device that you are adding and give the device a unique ID.

Select Existing Device Type: Smartphone

Device ID: myphone

Cancel Next

Browse Devices

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.

<input type="checkbox"/>	Device ID	Device Type	Class ID	Date Added	Descriptive Location	Actions
	myphone	Smartphone		2018-01-12T10:00:00Z	Bees	

Secure | https://rf7okk.internetofthings.ibmcloud.com/dashboard/#/devices/browse-v2

IBM Watson IoT Platform

Browse Diagnose Action Device Types Manage Schemas

Add Device Identity Device Information Security Summary

Device Information

You can modify the default device information and enter more information about the device for identification purposes.

Serial Number	Enter Serial Number	Manufacturer	Enter Manufacturer
Model	Enter Model	Device Class	Enter Device Class
Description	Enter Description	Firmware Version	Enter Firmware Version
Hardware Version	Enter Hardware Version	Descriptive Location	Enter Descriptive Location

+ Add Metadata

Next

Browse Devices

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.

<input type="checkbox"/>	Device ID	Device Type	Class ID	Date Added	Descriptive Location	Actions
	myphone	Smartphone		2018-01-12T10:00:00Z	Bees	

Secure | https://rf7lxk.internetofthings.ibmcloud.com/dashboard/#/devices/browse-v2

Apps AmazonBrowserBar Lenovo Poketalk with Lenovo Search Welcome to Reindeer Microsoft Word - Ma An Introduction to Q Internet of things - V DIY Arduino Wristwatch Other bookmarks kashyapravichandran... ID: (rf7lxk)

IBM Watson IoT Platform

QUICKSTART SERVICE STATUS DOCUMENTATION BLOG

Browse Diagnose Action Device Types Manage Schemas

Add Device Identity Device Information Security Summary

Device Security

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 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 password

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.

Next

Browse Devices

Secure | https://rf7lxk.internetofthings.ibmcloud.com/dashboard/#/devices/browse-v2

Apps AmazonBrowserBar Lenovo Poketalk with Lenovo Search Welcome to Reindeer Microsoft Word - Ma An Introduction to Q Internet of things - V DIY Arduino Wristwatch Other bookmarks kashyapravichandran... ID: (rf7lxk)

IBM Watson IoT Platform

QUICKSTART SERVICE STATUS DOCUMENTATION BLOG

Browse Diagnose Action Device Types Manage Schemas

Add Device Identity Device Information Security Summary

Summary

Verify that the following information is correct then select Done

Device Type Smartphone

Device ID myphone

[View Metadata](#)

Security Token password

Done

Browse Devices

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.

<input type="checkbox"/>	Device ID	Device Type	Class ID	Date Added	Descriptive Location			
--------------------------	-----------	-------------	----------	------------	----------------------	--	--	--

The screenshot shows the IBM Watson IoT Platform dashboard. On the left, there's a sidebar with various icons and a list titled 'DEVICE DRILLDOWN' containing items like 'Device Credentials', 'Connection Information', 'Recent Events', etc. The main content area is titled 'Device myphone'. It has two sections: 'Device Credentials' and 'Connection Information'. In the 'Device Credentials' section, it shows the following details:

Organization ID	r7kxk
Device Type	Smartphone
Device ID	myphone
Authentication Method	use-token-auth
Authentication Token	password

Below this, there's a warning message: '⚠ Authentication tokens are non-recoverable. If you misplaced this token, you will need to re-register the device to generate a new authentication token.' A link 'Find out how to add these credentials to your device' is also present. The 'Connection Information' section is partially visible below.

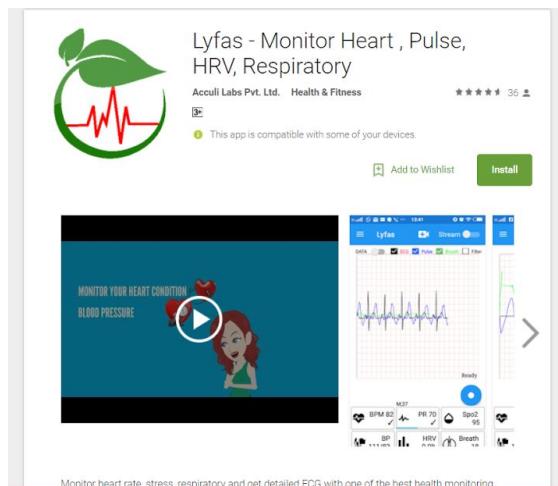
We have now successfully registered a device to our IBM Watson IoT Platform. Note down device ID, Device type, authentication token and organization ID for further use.

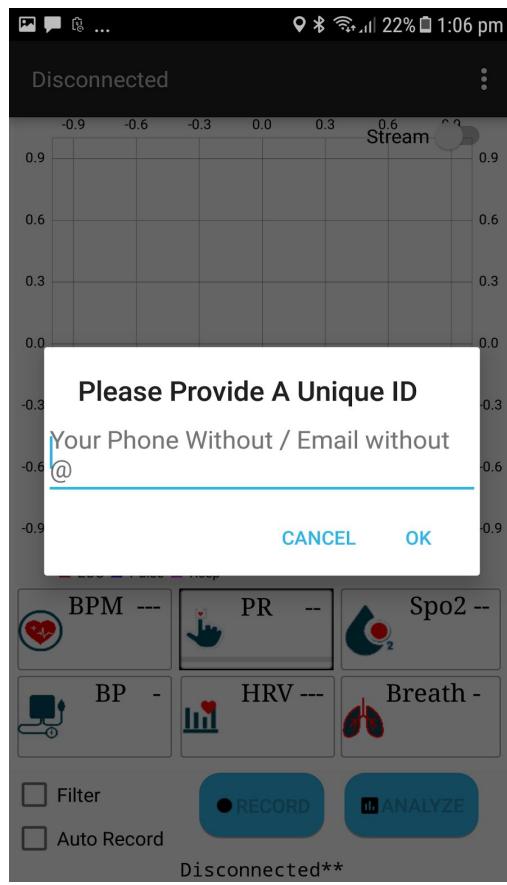
2. Installing and configuring a mobile app.

Installing the mobile app (Lyfas)

On an Android device install Lyfas - Monitor Heart , Pulse, HRV, Respiratory by Acculi labs pvt. Ltd. from the Google Play store.

Register yourself with either your email id or your mobile phone no.

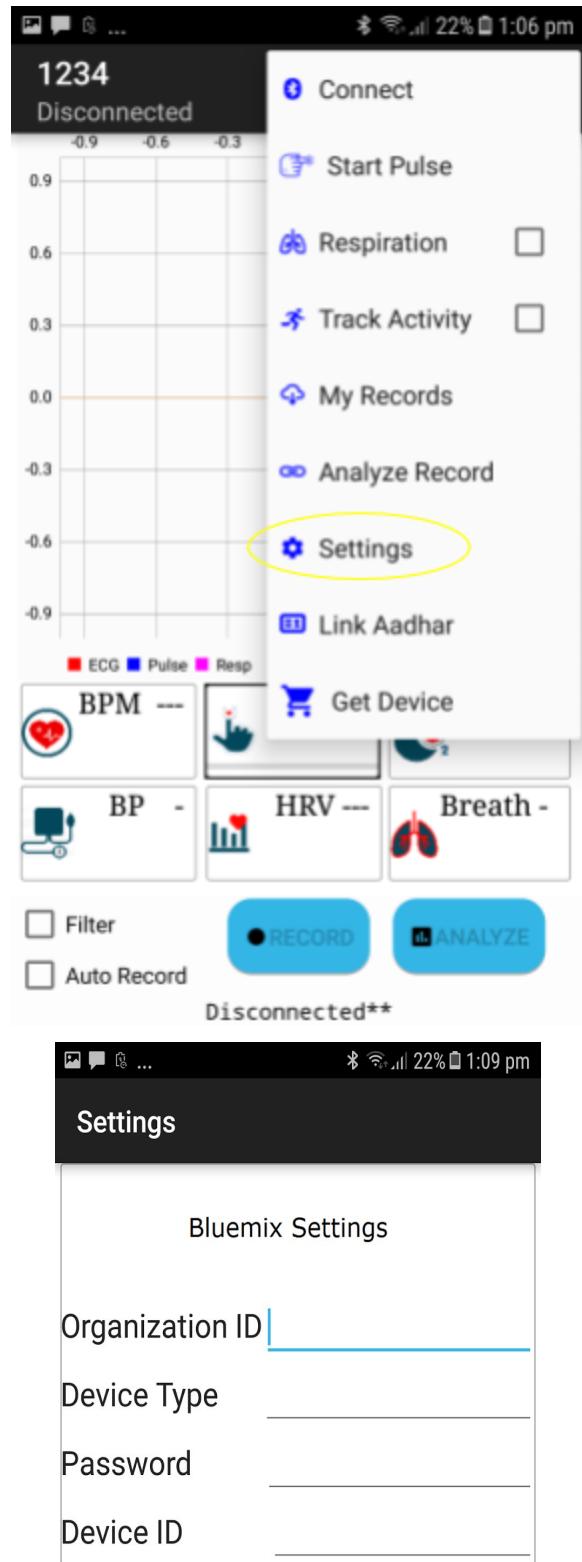




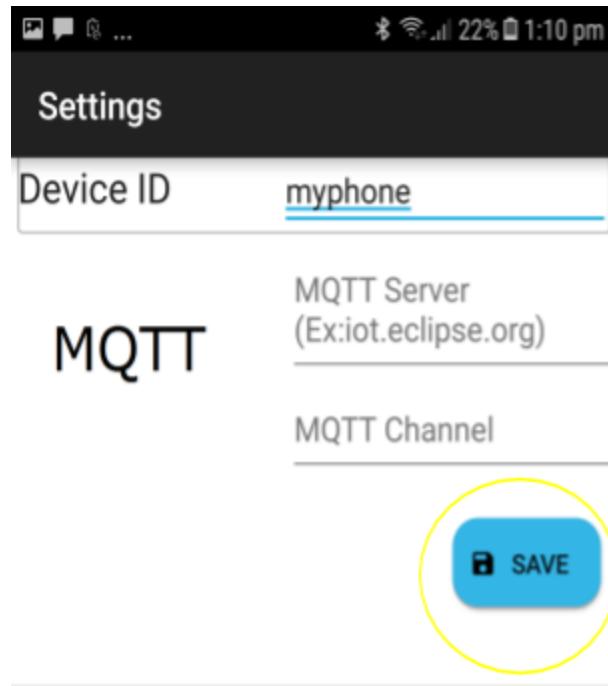
Configuring Lyfas to work with your IBM Watson IoT Platform.

Step 1: Open Lyfas app on your android smartphone.

Step 2: In the settings page under bluemix details enter the device ID, Device Type, Password and organization ID based on the values noted down.

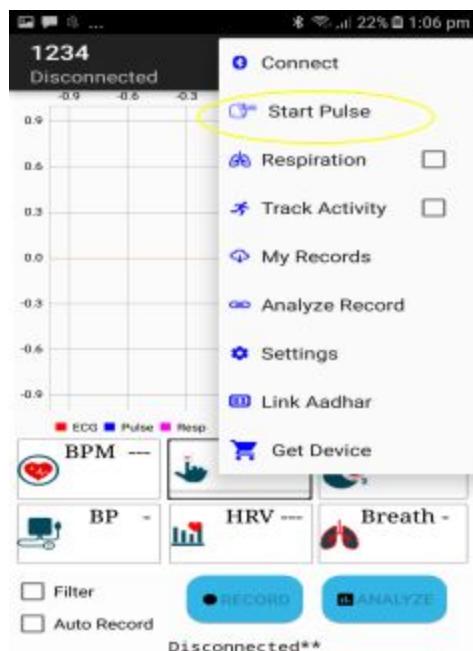


Step 3: Save the changes made

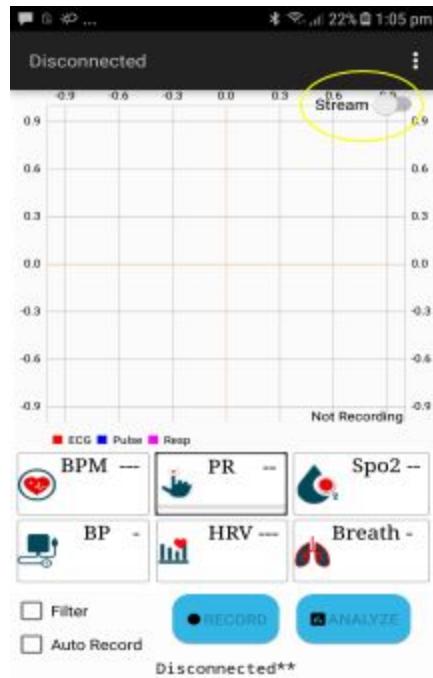


Pushing Data from the mobile app to your IBM Watson IoT Platform.

Step 1: Start Cam scanning your pulse. When you trigger this command the flashlight glows. Place your finger on the flash light (Note: place gently over the flash. Long hard press might result in burn injury)



Step 2: Switch on stream.



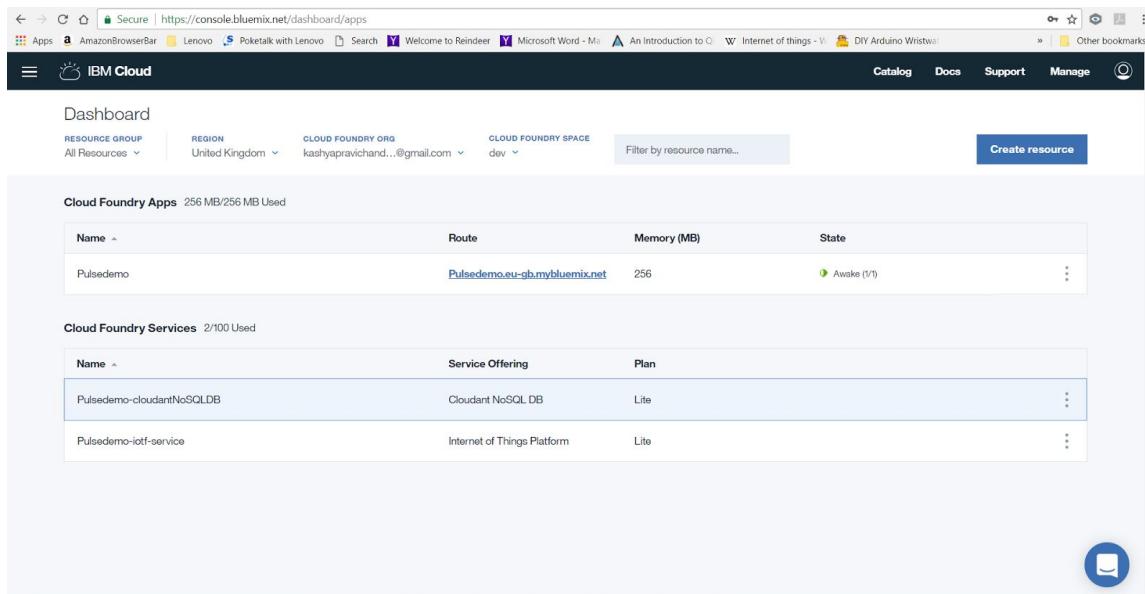
At this stage, the pulse data which was present locally on your android device is now pushed into the IBM Watson IoT cloud.

Step 3: Goto your IoT Services page from your bluemix dashboard. Choose **devices** from the side panel. In that page choose your device. Goto Status and see your data coming into the cloud.

Event	Value	Format	Last Received
status	{"d": {"Time": "Fri Nov 24 14:58:25 GMT+05:30 2017", "HRV": 0...}	json	a few seconds ago
status	{"d": {"Time": "Fri Nov 24 14:58:23 GMT+05:30 2017", "HRV": 0...}	json	a few seconds ago
status	{"d": {"Time": "Fri Nov 24 14:58:21 GMT+05:30 2017", "HRV": 0...}	json	a few seconds ago
status	{"d": {"Time": "Fri Nov 24 14:58:19 GMT+05:30 2017", "HRV": 0...}	json	a few seconds ago
status	{"d": {"Time": "Fri Nov 24 14:58:17 GMT+05:30 2017", "HRV": 0...}	json	a few seconds ago

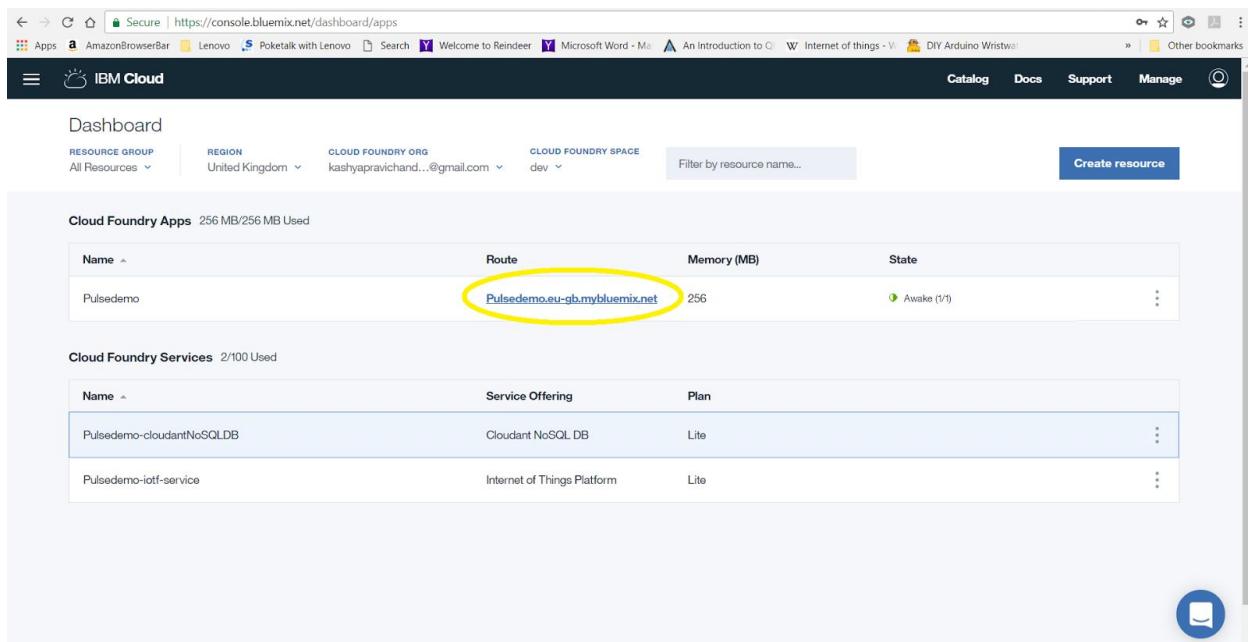
3.Using Node-Red with your IBM watson IoT Platform and IBM cloudant.

Step 1: Go to your IBM cloud/ Bluemix dashboard.



The screenshot shows the IBM Cloud/Bluemix dashboard. In the top navigation bar, the URL is https://console.bluemix.net/dashboard/apps. The dashboard header includes 'IBM Cloud' and links for Catalog, Docs, Support, and Manage. Below the header, there are sections for 'Cloud Foundry Apps' and 'Cloud Foundry Services'. The 'Cloud Foundry Apps' section lists one app named 'Pulsedemo' with a route of 'Pulsedemo.eu-gb.mybluemix.net', 256 MB of memory, and a state of 'Awake (1/1)'. The 'Cloud Foundry Services' section lists two services: 'Pulsedemo-cloudantNoSQLDB' (Cloudant NoSQL DB, Lite plan) and 'Pulsedemo-iotf-service' (Internet of Things Platform, Lite plan). A blue message icon is visible in the bottom right corner of the dashboard area.

Step 2: Inside the section marked on the image shown below there is link. Press the link.



This screenshot is identical to the one above, showing the IBM Cloud/Bluemix dashboard. However, the 'Route' column for the 'Pulsedemo' app has been highlighted with a large yellow circle. This indicates that the user should click on this link to be redirected to the Node-RED configuration page.

You will be redirected to the node-red webpage of your app.

Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.

The version running here has been customized for the IBM Watson IoT Platform.

More information about Node-RED, including documentation, can be found at nodered.org.

[Go to your Node-RED flow editor](#)

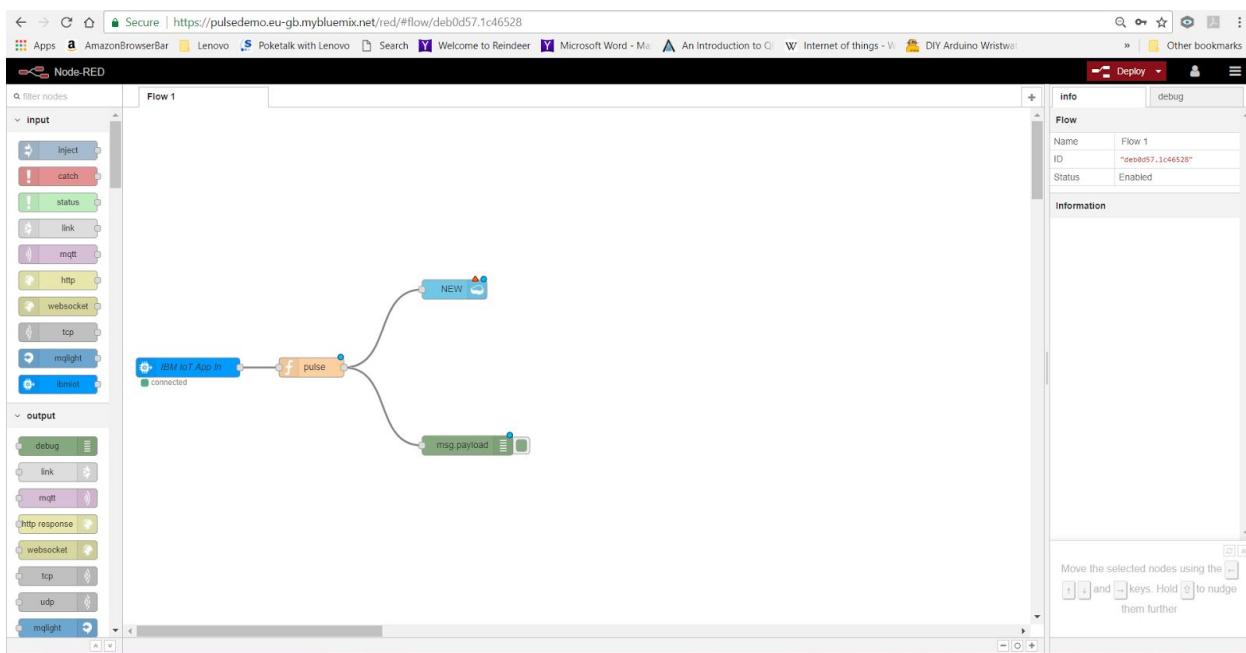
[Learn how to customise Node-RED](#)

Click on **Go to your Node-Red flow editor** button.

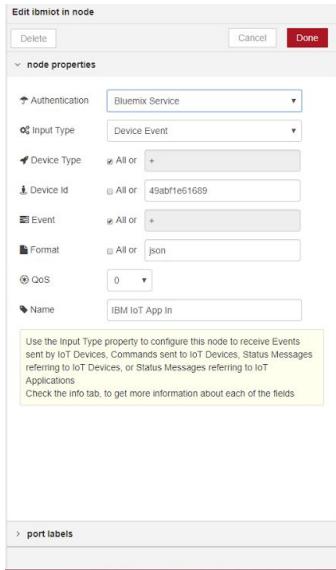
When the pages finishes loading you will see a couple of blocks connected. This is used push data to the IBM watson IoT Platform.

Create a new flow below the existing flows. Using an Watson IoT Platform input, get the data from the cloud. Using a function node select the desired data. The selected data is pushed into an Cloudant database using a cloudant output now.

A sample Node-Red flow is as follows,



While creating an IBM Watson IoT Platform node enter the information noted down before. This include information about the device, device type and the authentication token. Enter these values into the node.

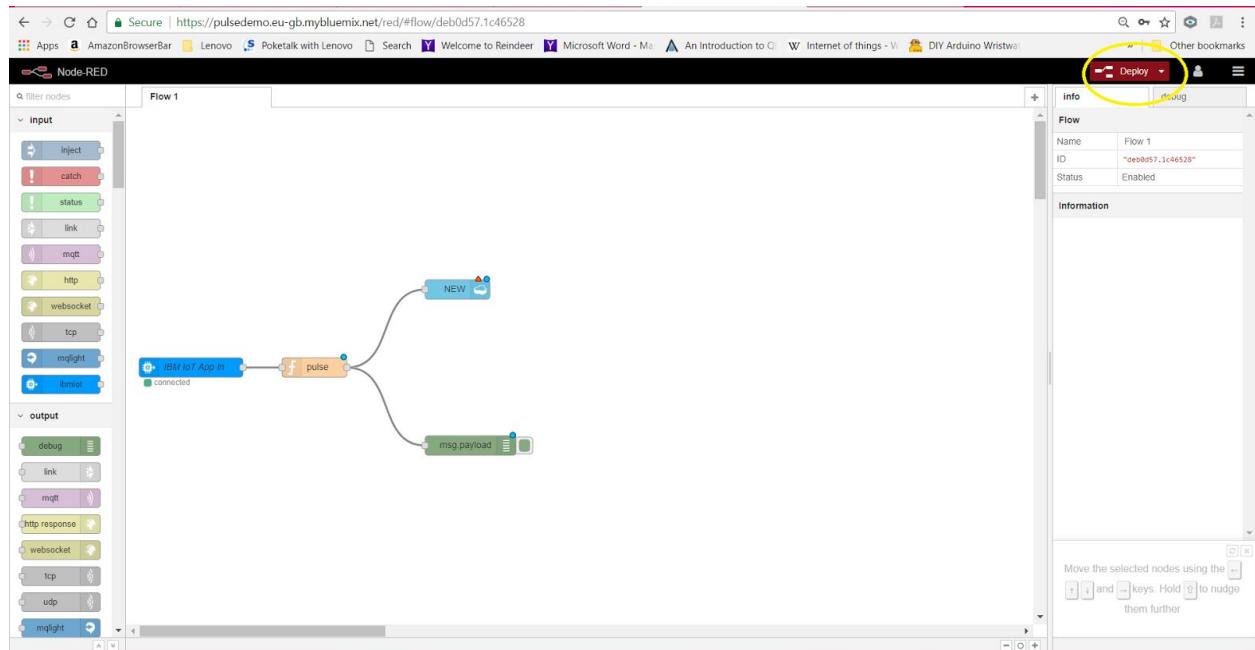


The above slide can be obtained by double clicking on the IBM Watson IoT Platform. Enter the details on this slide.

Edit the properties of all the nodes as required. To make a function node yield the required results write a JS code in the node's properties.

After creating a flow, deploy the flow to make it work with Watson IoT Platform and Clouddant.

The deploy button is marked in the image which follows,



After deploying your Node-Red flow, observe the flow, modify your cloudant database. To access your cloudant database, from your bluemix dashboard click on the cloudant services button which is present under cloud foundry services.