



## Connecting a Conveyor Belt Simulator to IBM Watson IoT Platform

Open Lab | Digital Summit '18

**Miracle Innovation Labs**

Miracle Software Systems, Inc.

# Connecting a Conveyor Belt Simulator to IBM Watson IoT Platform

## Introduction

This document contains a step-by-step process for creating a Bluemix IoT Service, running conveyor belt simulator locally, sending the state of the conveyor like start/stop and RPM to the Watson IoT, defining the rules in IoT platform and informing it to the user.

## Pre-Requisites

All attendees must have their workstation (with Internet) to participate in the lab (Both PC and MAC are compatible). The following pre-requisites will help you to make the Hands-on Lab experience easier.

- Active email ID for registering with IBM Cloud
- Download and Install Node JS
- Text Editor such as Sublime Text (or) Notepad ++

## Technology Involved

- IBM Bluemix (PaaS)
- Watson IoT Platform
- Miracle's conveyor belt Simulator
- Node JS

## Lab Steps

Let us get started with the lab!

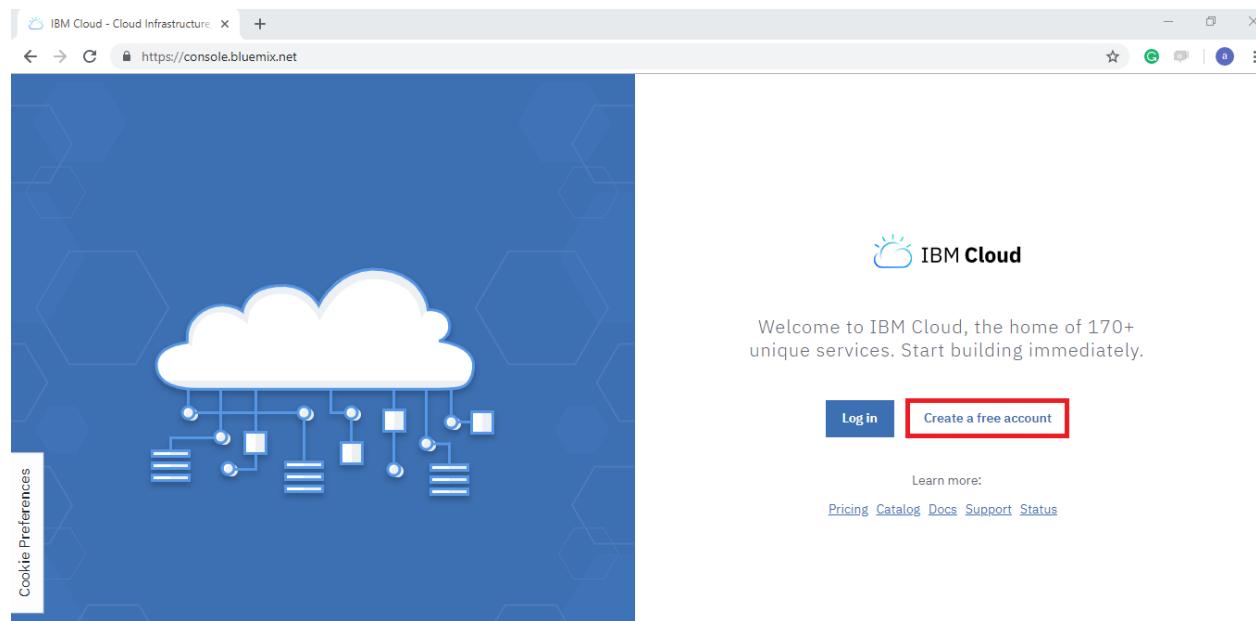
The following steps will outline how you can run a conveyor belt simulator locally.

This application helps in sending the state of conveyor to the user and notify them.

### Step #1 | Create IBM Cloud Account

The first step will be to make sure that we have access to the IBM Cloud Console with either the free trial option (or) the paid subscription option.

Login to IBM Cloud at <http://bluemix.net> (or) register at,  
<https://console.ng.bluemix.net/registration/>



Click on **Create a free account**, and the fields as required.

 IBM Cloud

Sign up for an IBMid and create your IBM Cloud account

## Build on IBM Cloud for free with no time restrictions

**Guaranteed free development with Lite plans**  
Develop worry-free and at no cost with cap based Lite plan services for as long as you like.

**Start on your projects right away**  
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**Get \$200 on us to try paid services**  
Ease into cloud pricing or try something new with \$200 in credit available for 1 month upon upgrade.

Ready to get started? Sign up today!

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---

**Email\***

\*Enter an email address.

---

**First Name\***



---

**Last Name\***



---

**Company**



---

**Country or Region\***

United States

---

**Phone Number\***

[Privacy - Terms](#)

 IBM Cloud

Sign up for an IBMid and create your IBM Cloud account

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Miracle Software Systems

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**Country or Region\***

United States

---

**Phone Number\***

9493415290

---

**Password\***

••••••••••••••••••••••••••••••••
(eye)


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Keep me informed of products, services, and offerings from IBM companies worldwide.

By email  By telephone

By clicking Create Account, I accept the [IBM Cloud privacy policy](#) and [IBM Cloud terms](#).

**Create Account**

After Clicking on **Create Account**, a confirmation mail will be sent to your registered mail id. Click on **Confirm account** and then login to your Bluemix account.

Log into IBM Cloud

---

Enter Email or IBMid: [Forgot your IBMid?](#)

**Continue**

---

New? [Create an IBM Cloud account](#)

After you login, you can see the dashboard where you can take a look at your applications and services.

The screenshot shows the IBM Cloud dashboard at <https://console.bluemix.net/dashboard/apps>. The top navigation bar includes links for Apps, Analytics Vidhya, API, Python, LORA, Raspberry Pi Measure, IBM Cloud Docs, GitHub API v3 | GitHub, Azure IoT Hub - "Sul", Manage Azure IoT H..., IoT Hub: connection, and Other bookmarks. The main menu has options for Catalog, Docs, Support, and Manage, with 'IBM Cloud' highlighted. A search bar and a user account icon are also present.

The dashboard features a section titled "Fast-track your app development" with three cards:

- Build with Watson**: Accelerate your AI development to build smarter solutions. Includes a "View Watson starter kits" button.
- Create enterprise-level web apps**: Develop and deploy cloud-native apps within minutes. Includes a "View App Service starter kits" button.
- Learn to build, deploy, and scale**: Use IBM Cloud to implement common patterns based on best practices and proven technologies. Includes a "View Solution tutorials" button.

A decorative graphic of interconnected nodes and icons is positioned above the second and third cards.

The next step is to take your application and deploy it back to IBM Cloud, so that you can share it with your friends.

## Step #2 | Create Application and Watson IoT Service

Click on **Catalog**, for creating an application

The screenshot shows the IBM Cloud Catalog page. On the left, there's a sidebar with 'All Categories (52)' and a 'Compute' section listing various services: Compute (10), Containers (1), Networking, Storage (1), AI (14), Analytics (4), Databases (3), Developer Tools (7), Integration (2), Internet of Things (1), Security and Identity (3), Starter Kits (2), Web and Mobile (2), and Web and Application (2). The main area displays several service cards:

- Liberty for Java™** (Lite • IBM): Develop, deploy, and scale Java web apps with ease.
- SDK for Node.js™** (Lite • IBM): Develop, deploy, and scale server-side JavaScript® apps with ease.
- ASP.NET Core** (Lite • IBM): Develop, deploy, and scale ASP.NET Core web apps with ease.
- Runtime for Swift** (Lite • IBM): A Kitura based server application that you can use as a starting point to get your own Kitura application up and running quickly on Bluemix.
- XPages** (Lite • IBM): Develop, deploy and scale IBM XPages applications with ease.
- Go** (Lite • Community): Develop, deploy, and scale Go web apps with ease.
- PHP** (Lite • Community): Develop, deploy, and scale PHP web apps with ease.
- Python** (Lite • Community): Develop, deploy, and scale Python web apps with ease.
- Ruby** (Lite • Community): Develop, deploy, and scale Ruby web apps with ease.

Click on **Starter Kits** on the left side pane, you will be able to see the available services. Select **Internet of Things Platform Starter**.

The screenshot shows the IBM Cloud Catalog page with the 'Starter Kits' section highlighted. The sidebar now includes 'Starter Kits (2)'. The main area shows two starter kit cards:

- Internet of Things Platform Starter** (Lite • IBM): 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...
- Node-RED Starter** (Lite • Community): This application demonstrates how to run the Node-RED open-source project within IBM Cloud.

The Starter Kit will have **SDK for Node.js** and **Cloudant NoSQL DB** services by default for us to use as services. It will also have **Node-RED** pre-installed for you.

Give a unique name to your application here and click on **Create**. Application names must be unique as they will be on a public domain.

The screenshot shows the IBM Cloud Catalog interface. At the top, there's a navigation bar with links for Analytics Vidhya, API, Python, LORA, Raspberry Pi, Measurement, IBM Cloud Docs, and Azure. Below the navigation bar, the main menu includes IBM Cloud, Catalog, Docs, Support, and Manage. A search bar is present, along with a user profile for 'murali.yerragulla'. The main content area displays a card for the 'Internet of Things Platform Starter'. The card title is 'Create a Cloud Foundry App'. It includes a brief description: '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.' Below the description, there are sections for 'View Docs', 'VERSION: 0.7.0', 'TYPE: Boilerplate', and 'LOCATION: Frankfurt, London, Dallas'. On the right side of the card, there are fields for 'App name' (set to 'Conveyor-belt-DS18'), 'Host name' (set to 'Conveyor-belt-DS18'), 'Domain' (set to 'eu-gb.mybluemix.net'), 'Choose a region/location to deploy in:' (set to 'London'), 'Choose an organization:' (set to 'ymurali320@gmail.com'), 'Choose a space:' (set to 'dev'), and 'Selected Plan:' (set to 'Cloudant Lite'). At the bottom right of the card, there is a prominent blue 'Create' button.

**Note:** Once created, the application will take about 2 minutes for staging and start running.

## Step #3 | Register your Conveyor Belt (Simulator)

Go back to your IBM Cloud account and click on your application.

IBM Cloud Catalog Docs Support Manage

Search for resource... murali.yerragulla's Acc...

**Dashboard**

RESOURCE GROUP All Resources CLOUD FOUNDRY ORG All Organizations CLOUD FOUNDRY SPACE All Spaces LOCATION All Locations CATEGORY All Categories Filter by resource name... Create resource

Learn more about migrating your eligible service instances to resource groups.

**Cloud Foundry Applications**

Name	Region	CF Org	CF Space	Memory (MB)	Status
Attritionn.py	London	ymurali320@gmail.com	dev	1024	Stopped (0/1)
Conveyor-belt-DS18	London	ymurali320@gmail.com	dev	256	Running (1/1)

**Cloud Foundry Services**

Name	Region	CF Org	CF Space	Plan	Service Offering
Apache Spark-4t	London	ymurali320@gmail.com	dev	ibm.SparkService.PayGoPer...	spark
Conveyor-belt-DS18-cloudantNoSQLDB	London	ymurali320@gmail.com	dev	Lite	cloudantNoSQLDB
Conveyor-belt-DS18-iotf-service	London	ymurali320@gmail.com	dev	iotf-service-free	iotf-service
Language Translator-Unity	London	ymurali320@gmail.com	dev	lite	language_translator

**Services**

Name	Location	Resource Group	Plan	Details	Service Offering
cognos-dashboard-embedded-ae	London	Default	Lite	Provisioned	IBM Cognos Dashboard Em...
cloud-object-storage-bv	global	Default	Lite	Provisioned	Cloud Object Storage
WatsonStudio	London	Default	Lite	Provisioned	Watson Studio
Machine Learning-9q	London	Default	Lite	Provisioned	Machine Learning
Cloudant-uc	London	Default	Lite	Provisioned	Cloudant

Click on **Internet of Things Service** and then, click on **Launch Dashboard** button. This will redirect you to your IoT Platform Organization space.

Analytics Vidhya API Python LORA Raspberry Pi Measur IBM Cloud Docs Azure

IBM Cloud Catalog Docs Support Manage

Search for resource... murali.yerragulla's Acc...

**Manage**

Plan Connections

Dashboard /

Conveyor-belt-DS18-iotf-service 0.32% Used | 199.35 Megabyte exchanged available

Details

Location: London Org: ymurali320@gmail.com Space: dev



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**

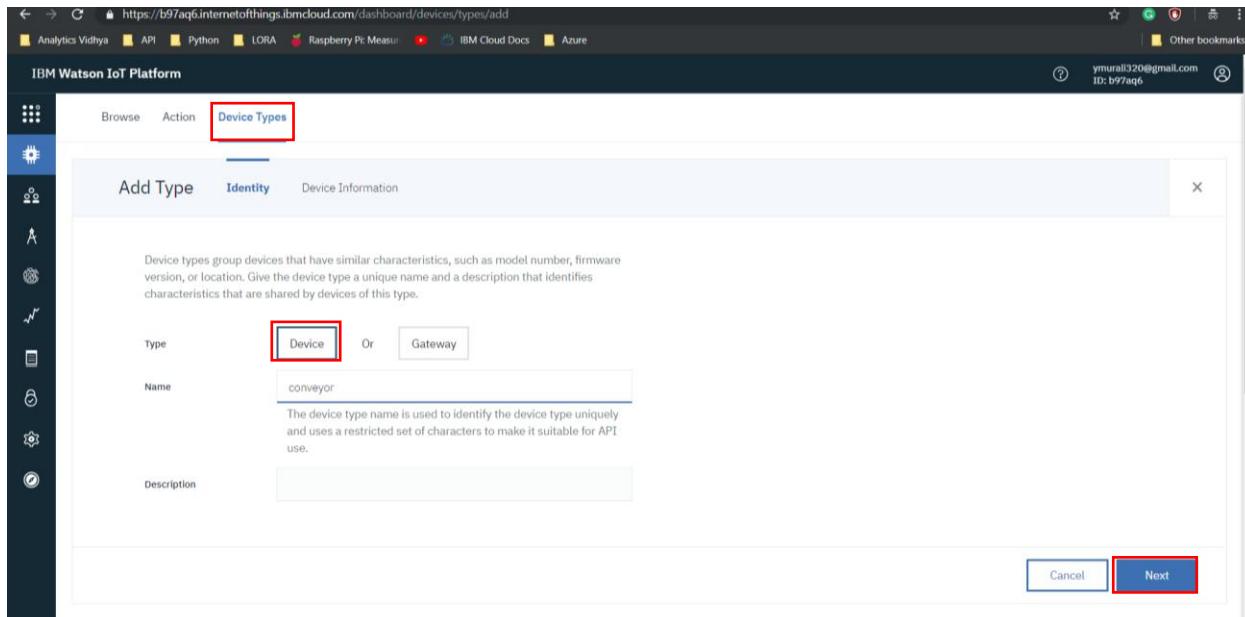
**Lite** Non-Production Production

The Lite service plan provides a lightweight development environment to get you started with the connectivity capabilities of Watson IoT Platform.

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.

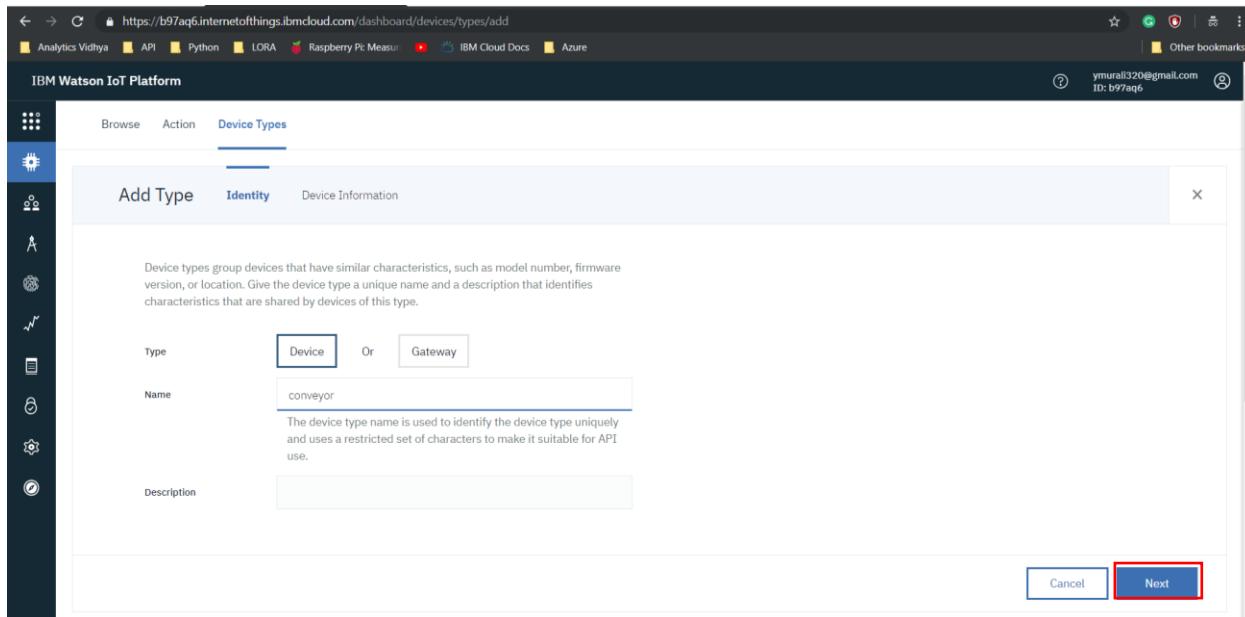
The Production service is a fully managed SaaS offering that enables you to manage and analyze enterprise IoT data.

As the Organization is new, there will be no registered devices so, click on **Device Type**.

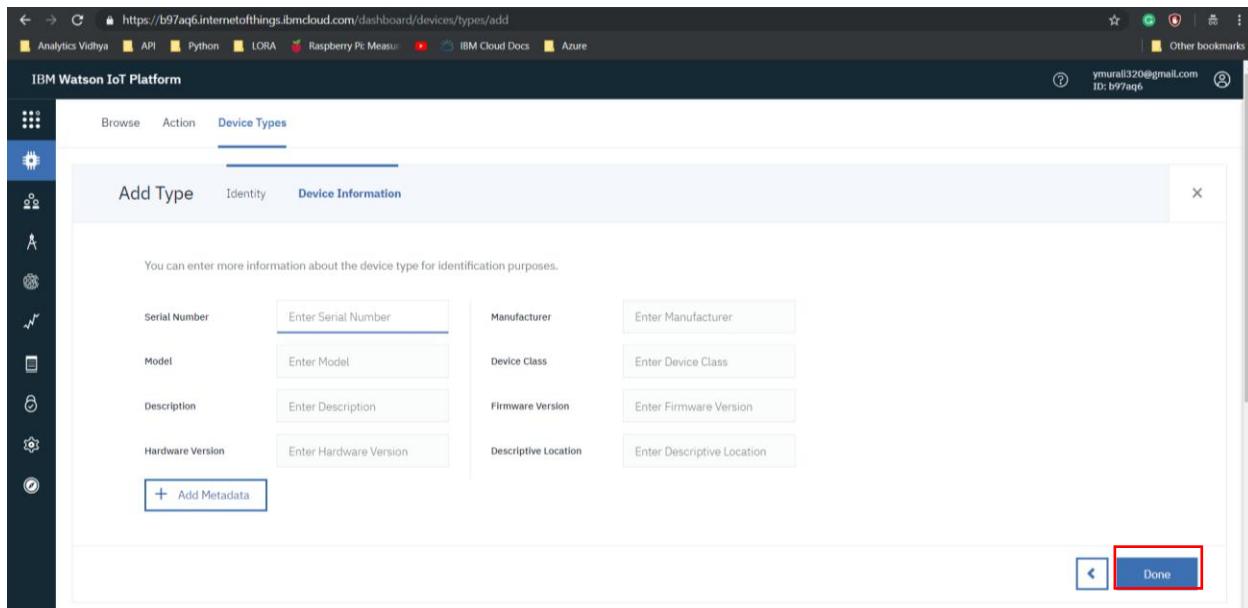


Observe that we have 2 options. As we want to create a Device Type and not a Gateway, click on **Device** .

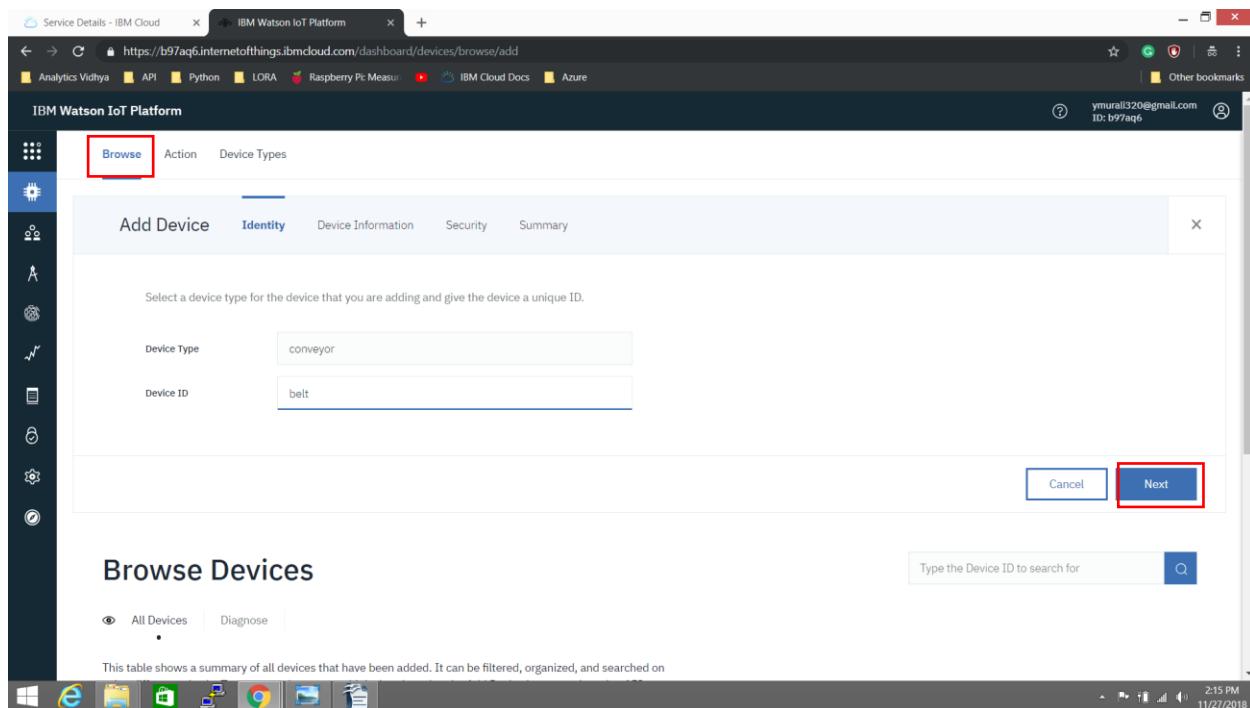
Specify a name for the device type to be added and give description (Optional). For example you can give **Conveyor** for Name field. Click on **Next** option.



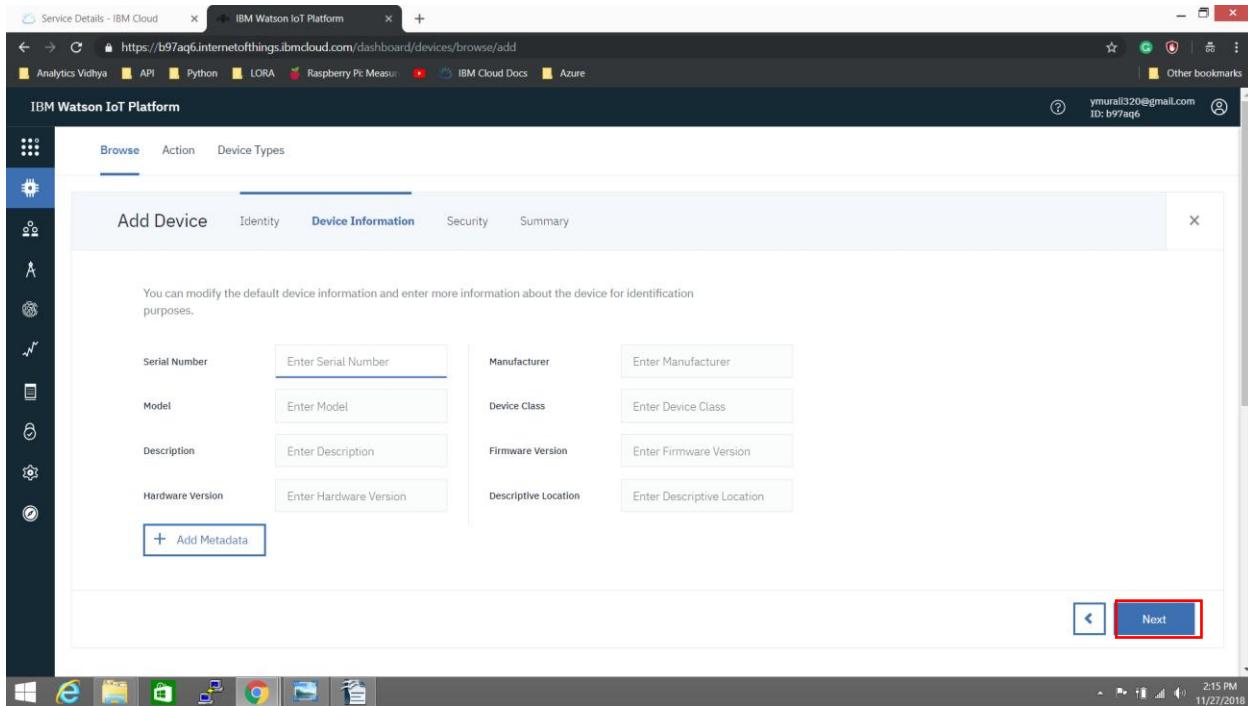
If you want to insert any “Device Information”, you can insert it here (This is optional). Click on **Done**



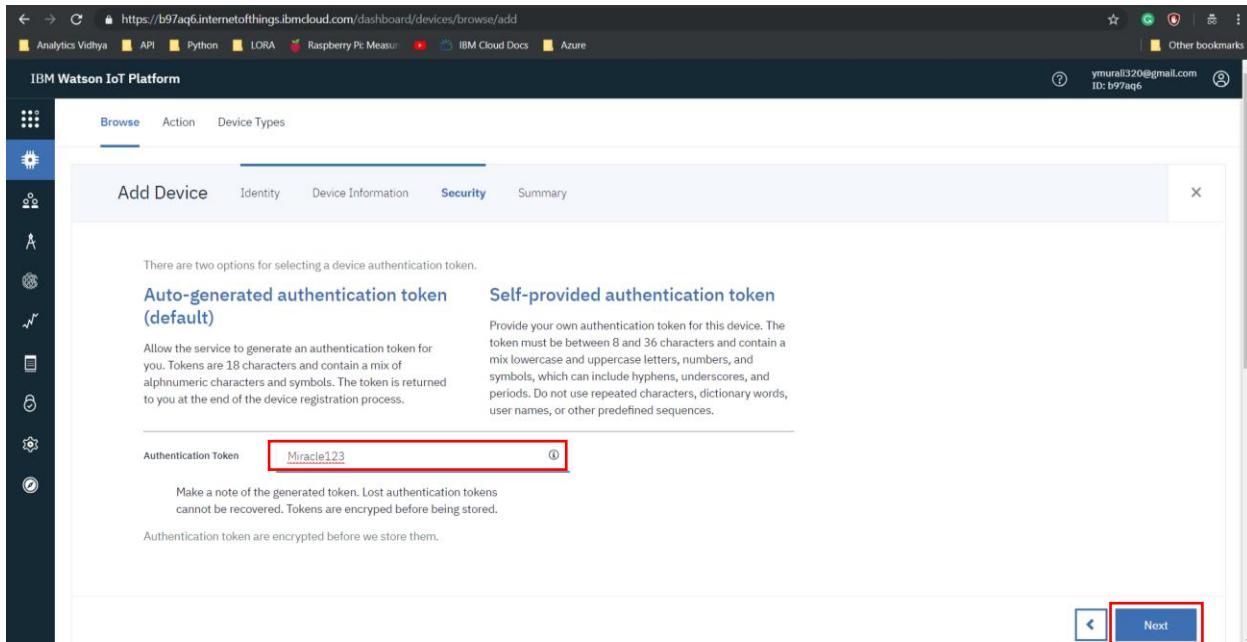
Click on **Add Device** on top right corner. When prompted, **Select the Existing Device Type** as **Conveyor** and provide the Device ID, then click on **Next**.



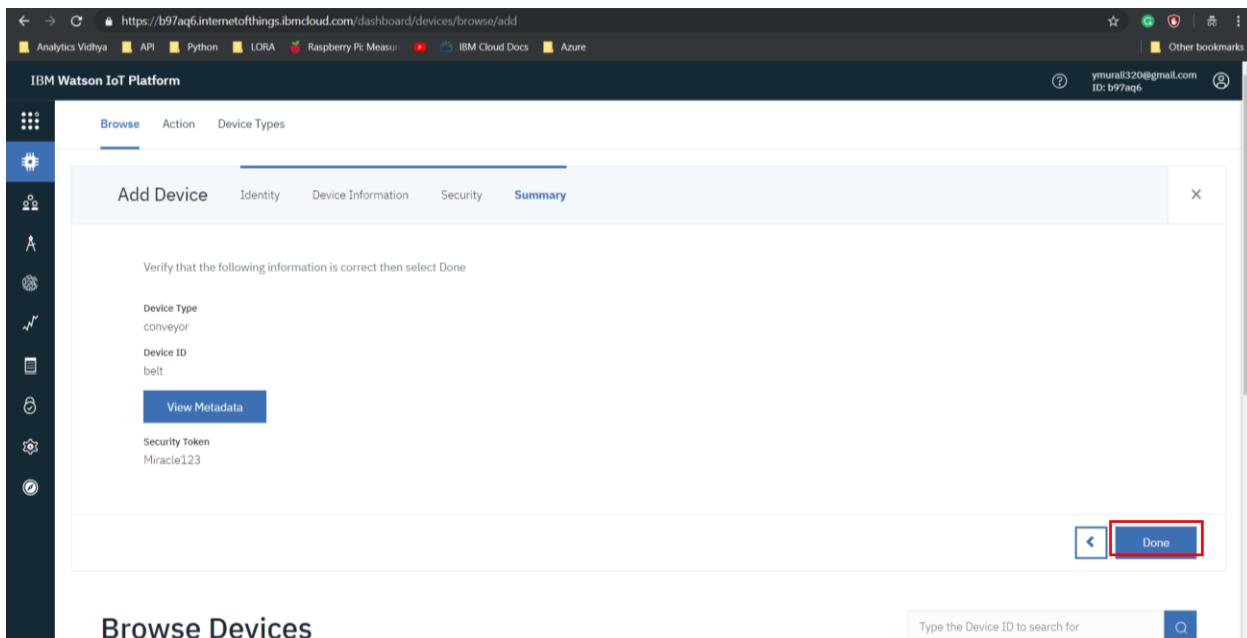
If you want to insert any "Device Information", you can insert it here (This is optional).



In the Next page, you can either add your own authentication token, or allow the IoT Platform to generate a token for you. If you want to add your own token, enter the token. Otherwise leave the field empty. Click on **Next**.



Click on **Next**.



## Browse Devices

Click on **Done**, the Device Type is created successfully.

**Note:** After registering, save the credentials for the registered device.

The screenshot shows the IBM Watson IoT Platform interface. On the left, there's a sidebar with various icons and links like 'DEVICE DRILLDOWN', 'Device Credentials', 'Connection Information', etc. The main content area is titled 'Device belt'. Under 'Device Credentials', it lists the following information:

Organization ID	b97aq6
Device Type	conveyor
Device ID	belt
Authentication Method	use-token-auth
Authentication Token	Miracle123

A warning message below states: 'Authentication tokens are non-recoverable. If you misplace this token, you will need to re-register the device to generate a new authentication token.' There's also a link to 'Find out how to add these credentials to your device'.

## Click Apps on the Dashboard to Generate API Keys

The screenshot shows the 'Browse API Keys' page. A red box highlights the 'A' icon in the sidebar. The main table displays two API keys:

Key	Description	Role	Expires
a-s4astc-eawedxsgki	Bound to Bluemix Application	Standard Application	-
a-s4astc-lo6bbwfjje	-	Visualization Application	-

A red box highlights the '+ Generate API Key' button at the top right of the page.

IBM Watson IoT Platform

Generate API Key Information Permissions

Description:

API Key Expires: Off  On

**Browse API Keys**

Type the app description to search for

Click on **Next**.

IBM Watson IoT Platform

Generate API Key Information Permissions

The application will have access for the following role:

For more information about roles, see [User, application, and gateway roles](#).

**Browse API Keys**

Type the app description to search for

Click on **generate key**.

The screenshot shows a browser window with multiple tabs open, including Zimbra Compose, mTalk, IoT Explained, IoT platforms - IoT, middleware - Goon, Service Details, IBM Watson IoT, and Conveyor Belt. The main content area is titled "IBM Watson IoT Platform" and shows a message: "The API key has been added." It details generated API keys and authentication tokens, with a warning about non-recoverable tokens. A red box highlights the "API Key" and "Authentication Token" fields. Another red box highlights the "Close" button at the bottom right of the dialog.

**Generated Details**

API Key	a-s4astc-sr5tew2jfg
Authentication Token	S-7ekeVshHcCkz8kJPf

**API Key Information**

Description	-
Role	Visualization Application
Expires	Never

⚠ Make a note of the generated authentication token. Lost authentication tokens cannot be recovered. If you lose the token, you must reregister the API to generate a new token.

[View API Key](#) [Add Another](#) [Close](#)

**Browse API Keys**

This table shows a summary of the API keys that have been added for the organization. It can be filtered,  Type the app description to search for [Q](#)

Save the API Key and Authentication Token, Then click on **Close**.

The screenshot shows the same browser setup as the previous one. The main content area now displays a confirmation dialog: "Warning. API Key: a-s4astc-bgdvky9wjw". It contains a warning message about copied tokens and a "Confirm Close" button, which is highlighted with a red box. The rest of the interface remains the same, showing the "Browse API Keys" section and the system tray at the bottom.

**The API key has been added.**

Authentication tokens are non-recoverable. Generate a new authentication token.

**Generated Details**

API Key	a-s4astc-bgdvky9wjw
Authentication Token	hkSn82-XI4NP?BqAIN

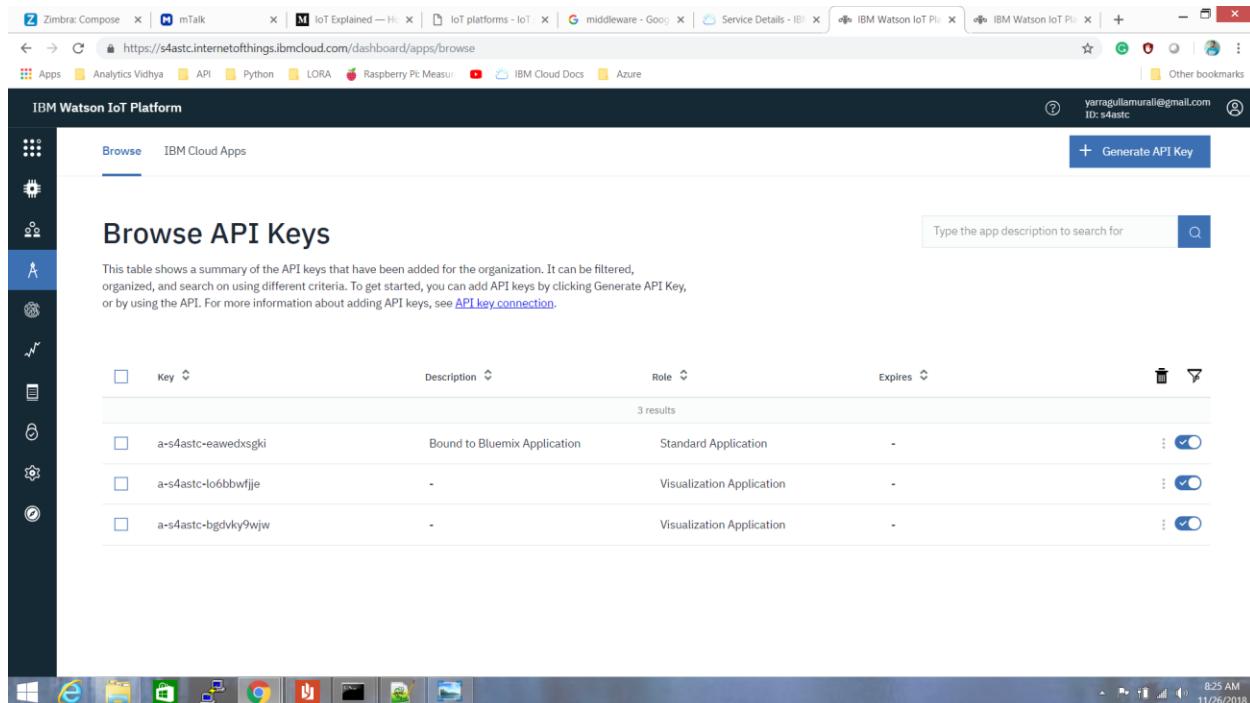
⚠ Have you copied the API key authentication token? This is your only opportunity to copy the token. Lost authentication tokens cannot be recovered. If you lose this token, you must reregister the API to generate a new token.

[Confirm Close](#)

[View API Key](#) [Add Another](#) [Close](#)

**Browse API Keys**

This table shows a summary of the API keys that have been added for the organization. It can be filtered,  Type the app description to search for [Q](#)



The screenshot shows the 'Browse API Keys' section of the IBM Watson IoT Platform. It lists three API keys:

Key	Description	Role	Expires
a-s4astc-eawedxskgi	Bound to Bluemix Application	Standard Application	-
a-s4astc-lo6bbwfjje	-	Visualization Application	-
a-s4astc-bgdvky9wjw	-	Visualization Application	-

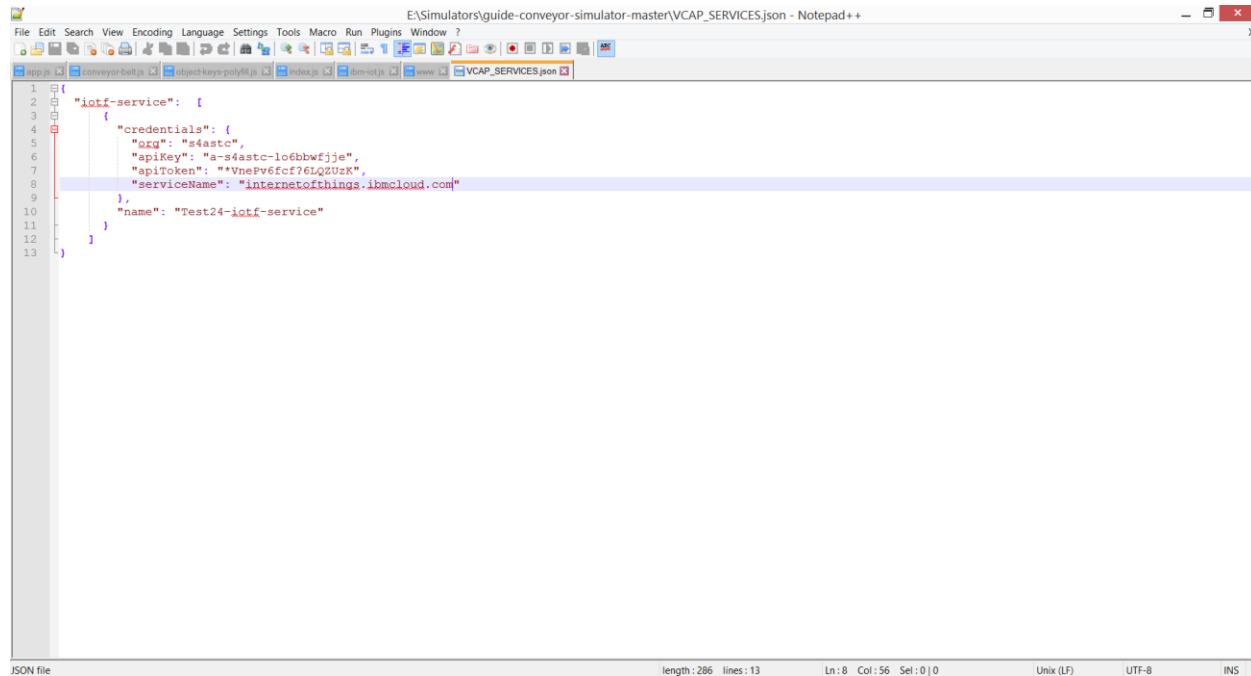
## Step #4 | Configure the Simulator

For your simulator to communicate device data via MQTT to the IoT Platform we will need to configure it with the required endpoints and the registration details. Open the **VCAP\_SERVICES.json** file.

Update the details of the file with the configuration details as mentioned in the comments. The following are the details that you should have with you to modify the file,

```
{
  "iotf-service": [
    {
      "credentials": {
        "org": "<org name>",
        "apiKey": "<API key>",
        "apiToken": "<Authentication Token>",
        "serviceName": "internetofthings.ibmcloud.com"
      },
      "name": "<IoT service name>"
    }
  ]
}
```

]  
}



```

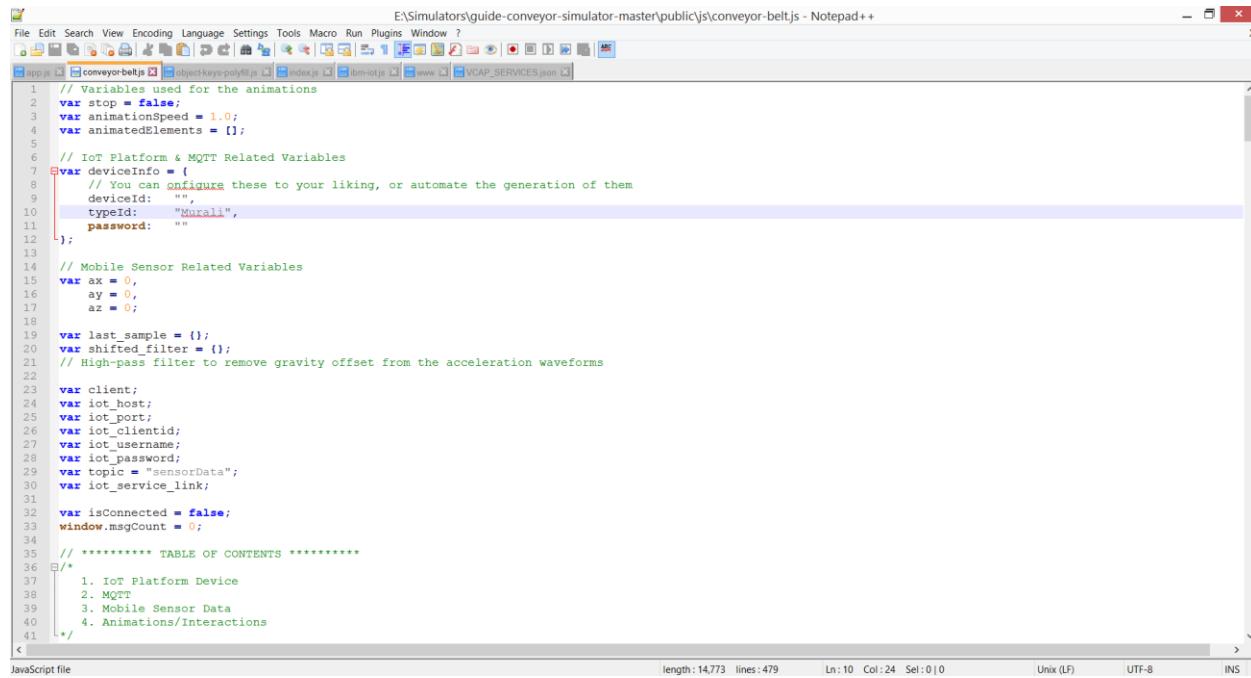
E:\Simulators\guide-conveyor-simulator-master\VCAP_SERVICES.json - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
app.js conveyor-belt.js object-keys-polyfill.js index.js ibm-iot.js www VCAP_SERVICES.json

1 {
2   "iotf-service": [
3     {
4       "credentials": {
5         "org": "a4astc",
6         "apiKey": "a-s4astc-lo6bbwfjje",
7         "apiToken": "**VnePv6fcf76LQZUzK",
8         "serviceName": "internetofthings.ibmcloud.com"
9       },
10      "name": "Test24-iotf-service"
11    }
12  ]
13 }

```

length: 286 lines: 13 Ln: 8 Col: 56 Sel: 0 | 0 Unix (LF) UTF-8 INS

Go to Conveyor\_Belt\_Simulator/public/js and open **conveyor-belt.js** file. Configure type id at line number #10 and save the file.



```

E:\Simulators\guide-conveyor-simulator-master\public\js\conveyor-belt.js - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
app.js conveyor-belt.js object-keys-polyfill.js index.js ibm-iot.js www VCAP_SERVICES.json

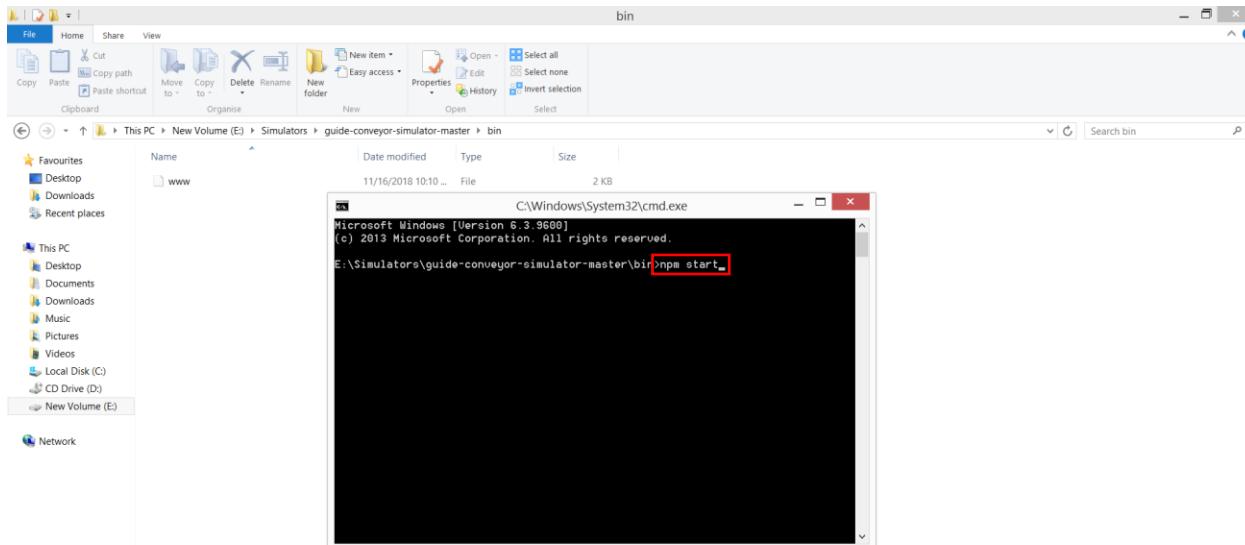
1 // Variables used for the animations
2 var stop = false;
3 var animationSpeed = 1.0;
4 var animatedElements = [];
5
6 // IoT Platform & MQTT Related Variables
7 var deviceInfo = {
8   // You can configure these to your liking, or automate the generation of them
9   deviceId: "A",
10  typeId: "Murali",
11  password: ""
12 };
13
14 // Mobile Sensor Related Variables
15 var ax = 0,
16 ay = 0,
17 az = 0;
18
19 var last_sample = {};
20 var shifted_filter = {};
21 // High-pass filter to remove gravity offset from the acceleration waveforms
22
23 var client;
24 var iot_host;
25 var iot_port;
26 var iot_clientid;
27 var iot_username;
28 var iot_password;
29 var topic = "sensorData";
30 var iot_service_link;
31
32 var isConnected = false;
33 window.msgCount = 0;
34
35 // ***** TABLE OF CONTENTS *****
36 /* 1. IoT Platform Device
37 2. MQTT
38 3. Mobile Sensor Data
39 4. Animations/Interactions
40 */

```

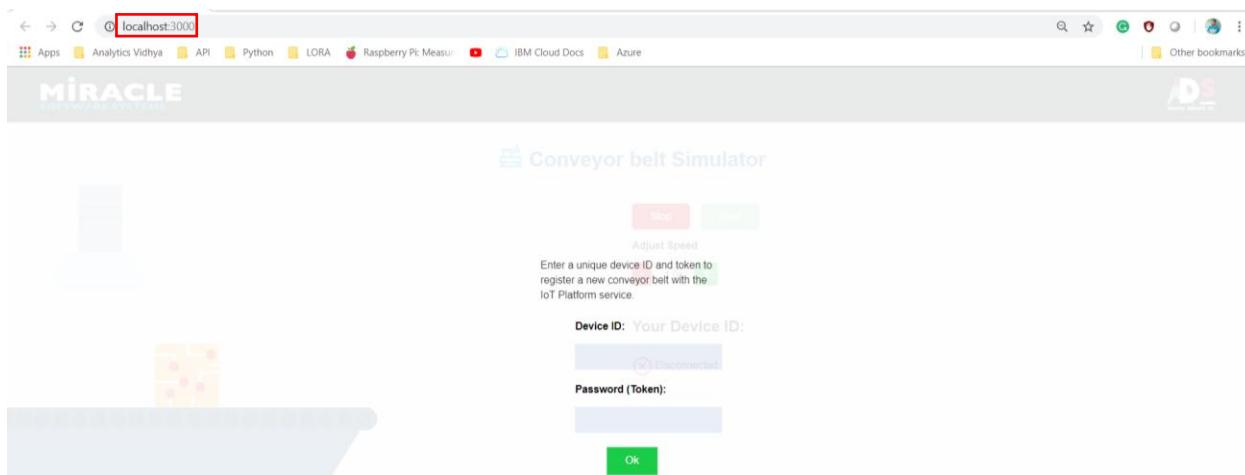
length: 14,773 lines: 479 Ln: 10 Col: 24 Sel: 0 | 0 Unix (LF) UTF-8 INS

## Step #5 | Launch the Simulator

Go to Conveyor\_Belt\_Simulator/bin Directory and give **cmd** in the path to open command prompt and run **npm start**.



Open **localhost: 3000** on your web browser to launch the Conveyor Belt Simulator.

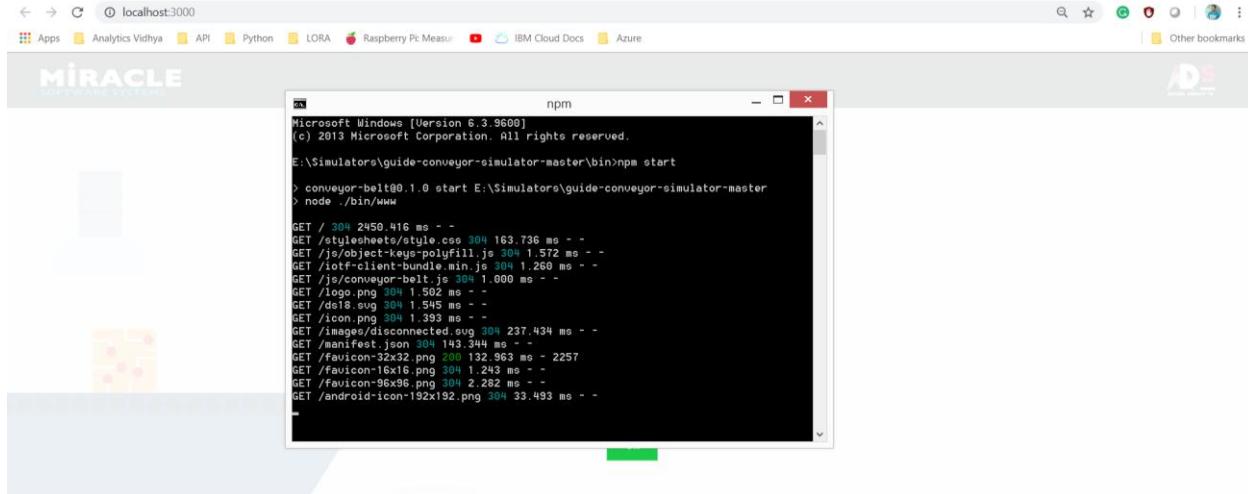


Enter device id and password (auth token), and click on **OK**.

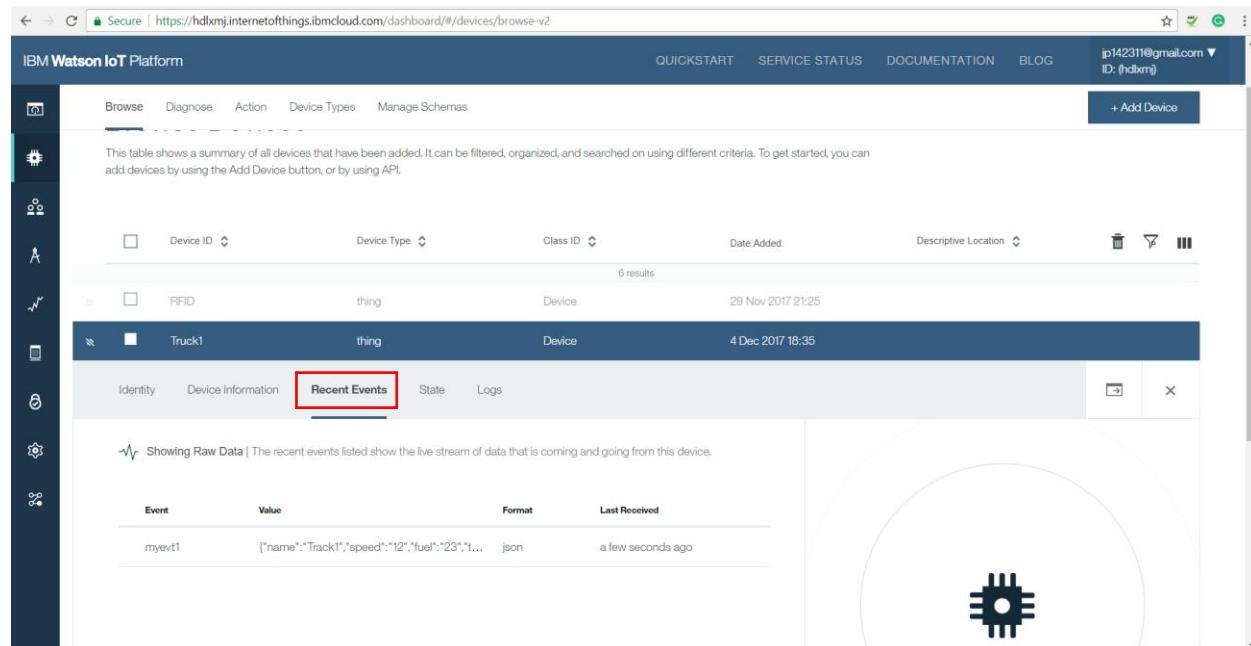
If the data is published successfully to Watson IoT platform, then publish message appears as shown below.

```
{
  "d": {
    "id": "conveyor",
    "ts": "1543238329006",
    "g": "0.00",
    "running": true,
    "rpm": "1.0"
  }
}
```

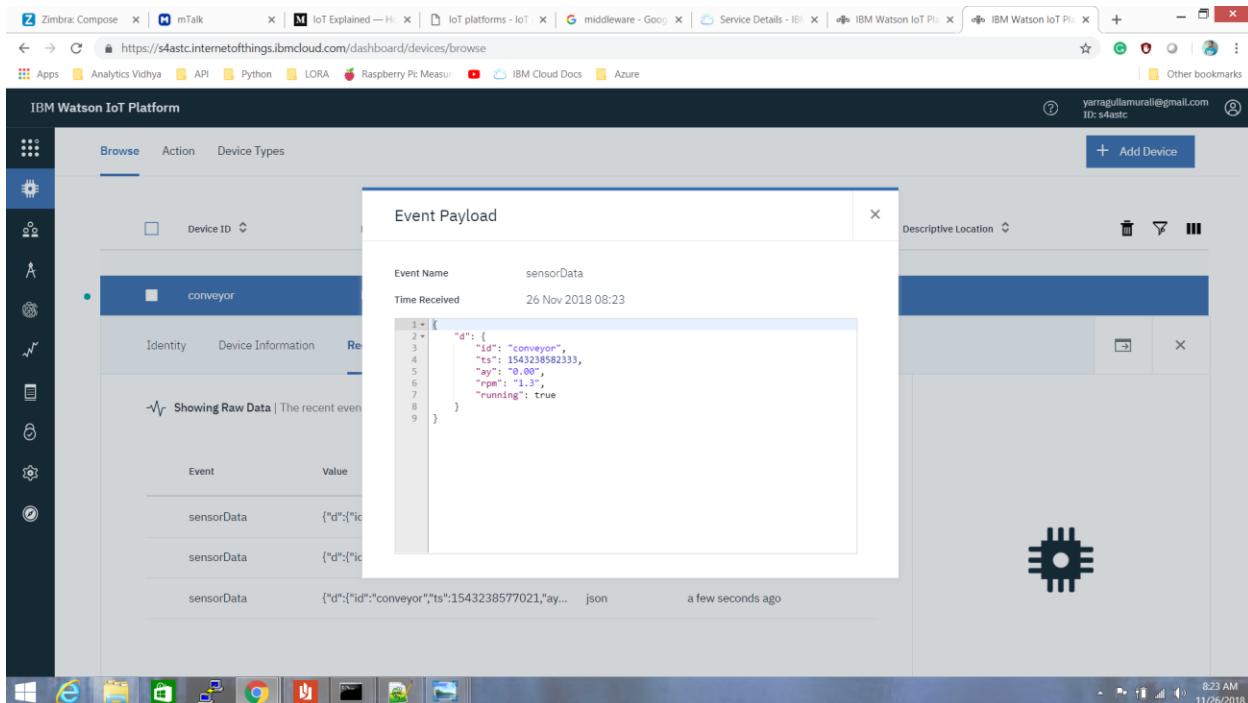
Open Command prompt for checking the response.



Go back to Watson IoT Dashboard for checking the JSON payload.

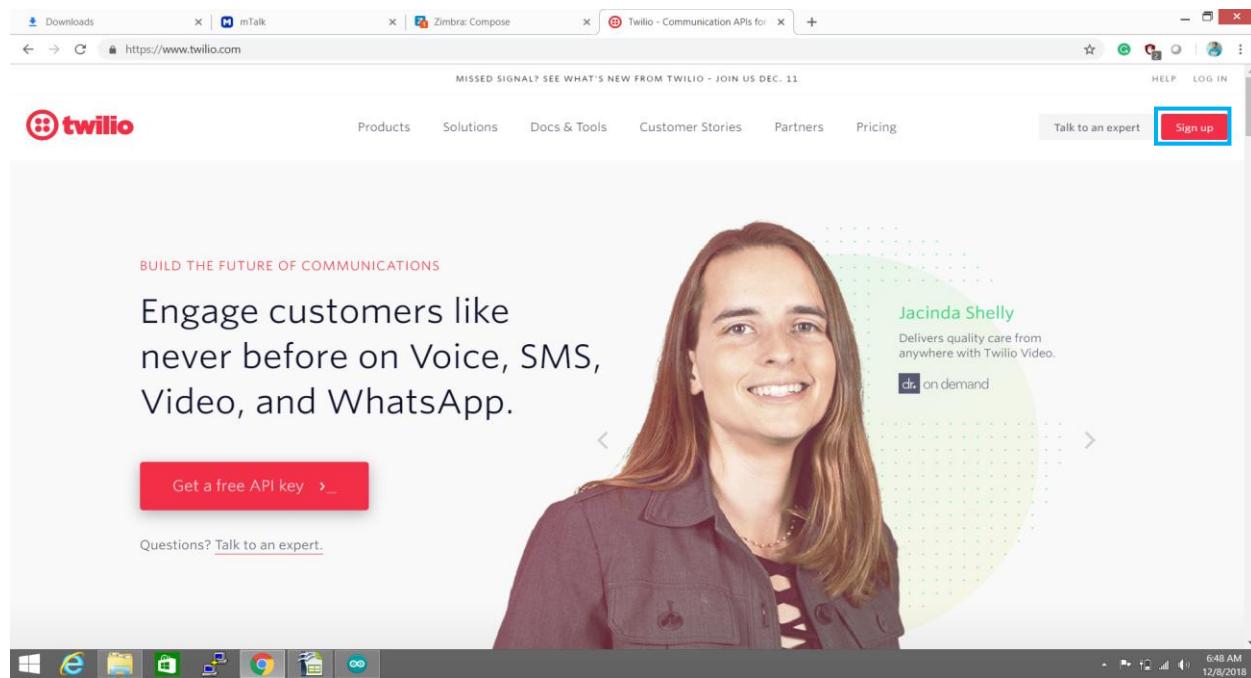


Event	Value	Format	Last Received
myevt1	[{"name": "Track1", "speed": "12", "fuel": "23", "t..."}]	json	a few seconds ago

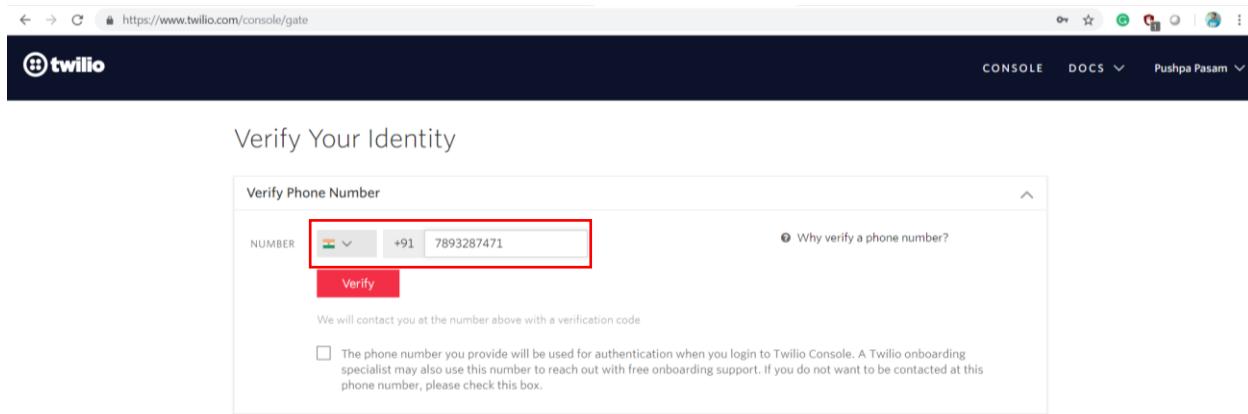


## Step #6 | Twilio Account Creation

To create the twilio account, go to <https://www.twilio.com/> and click on **Sign up**.

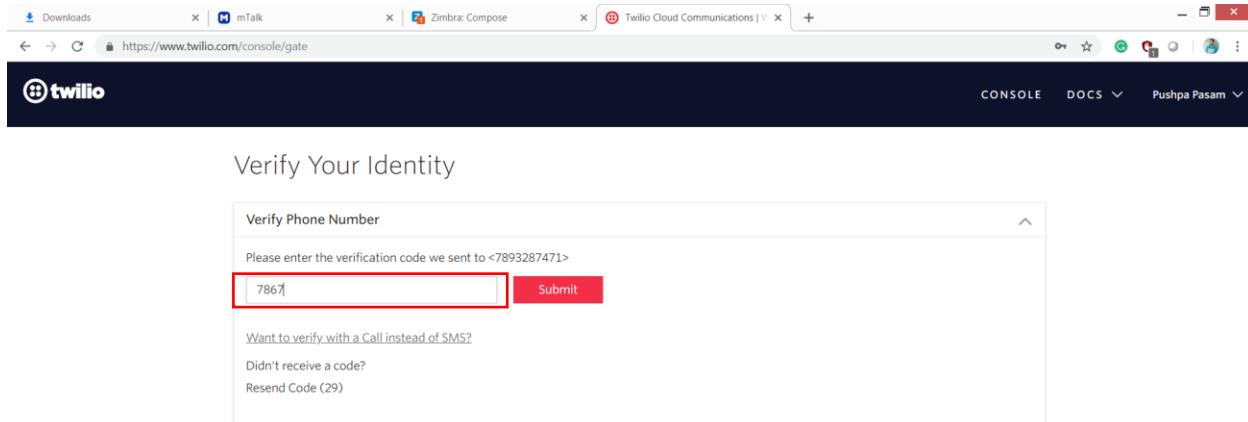


After providing the basic details of the user, click on get started. It requests you to Verify Phone Number. Please provide a valid phone number for verification.



The screenshot shows a browser window with the URL <https://www.twilio.com/console/gate>. The page title is "Verify Your Identity". A form titled "Verify Phone Number" is displayed. In the "NUMBER" field, the country code "+91" and the phone number "7893287471" are entered. A red box highlights this input field. Below the input fields, there is a "Verify" button. To the right of the input fields, a link "Why verify a phone number?" is visible. At the bottom of the form, a note states: "We will contact you at the number above with a verification code" and a checkbox: "The phone number you provide will be used for authentication when you login to Twilio Console. A Twilio onboarding specialist may also use this number to reach out with free onboarding support. If you do not want to be contacted at this phone number, please check this box." The checkbox is unchecked.

Enter the verification code, which is received to your mobile number.



The screenshot shows a browser window with the URL <https://www.twilio.com/console/gate>. The page title is "Verify Your Identity". A form titled "Verify Phone Number" is displayed. In the input field, the verification code "7867" is entered. A red box highlights this input field. To the right of the input field, there is a "Submit" button. Below the input field, there is a link "Want to verify with a Call instead of SMS?". Underneath the link, there are two options: "Didn't receive a code?" and "Resend Code (29)".



After successful login into Twilio account it will prompt us to create the project. Skip these steps and click on **Twilio home** button.

Create a Project

**Templates**

**Products**

**Flex** New

An omnichannel contact center within minutes and customize every element of the experience, including the agent desktop, channels, interaction routing, and reporting using common web frameworks like React.js and REST APIs.

APPLICATION PLATFORM

**Learn & Explore**

Learn about Twilio products and solutions by playing TwilioQuest. Quest is an interactive, self-paced game which will help you to master products like Twilio Voice and Messaging while earning experience points and loot.

INTERACTIVE LEARNING EXPERIENCE

**3rd Party Integration**

Use Twilio with Wordpress, Zoho, Zapier, and other CRMs and products ask that you get an account in order to integrate SMS or Voice into their service.

CODING REQUIRED

**Account Notifications**

Resolve fraud and billing issues quickly by notifying customers using SMS or WhatsApp

CODING REQUIRED

https://www.twilio.com/console

Click on **Dashboard** and scroll down and select **#Phone Numbers**.

Studio

- Build an IVR
- Send Appointment Reminders
- Connect with your customers using Chat Bots
- Effortlessly send SMS Surveys

**Build with Studio**

**Phone Numbers**

Get a number to start sending messages and making calls with Twilio.

**Get a Number**

Phone Numbers

**Invite Your Team**

Email:  Developer:

**Manage Users** [I don't have developers](#)

**See What's Possible**

What can I build with Twilio? [Use Cases](#)

What have others built with Twilio? [Case Studies](#)

View our SaaS partners [Partner Showcase](#)

**Talk to Twilio** [Get help from an expert](#)

**Looking to use Twilio as a plugin with another service?**

Were you sent here by another service such as Wordpress or Zoho to create a Twilio account?

**Yes** **No**

Waiting for www.twilio.com...

Click on **Get a Number**, and under that section select **Getting Started**.

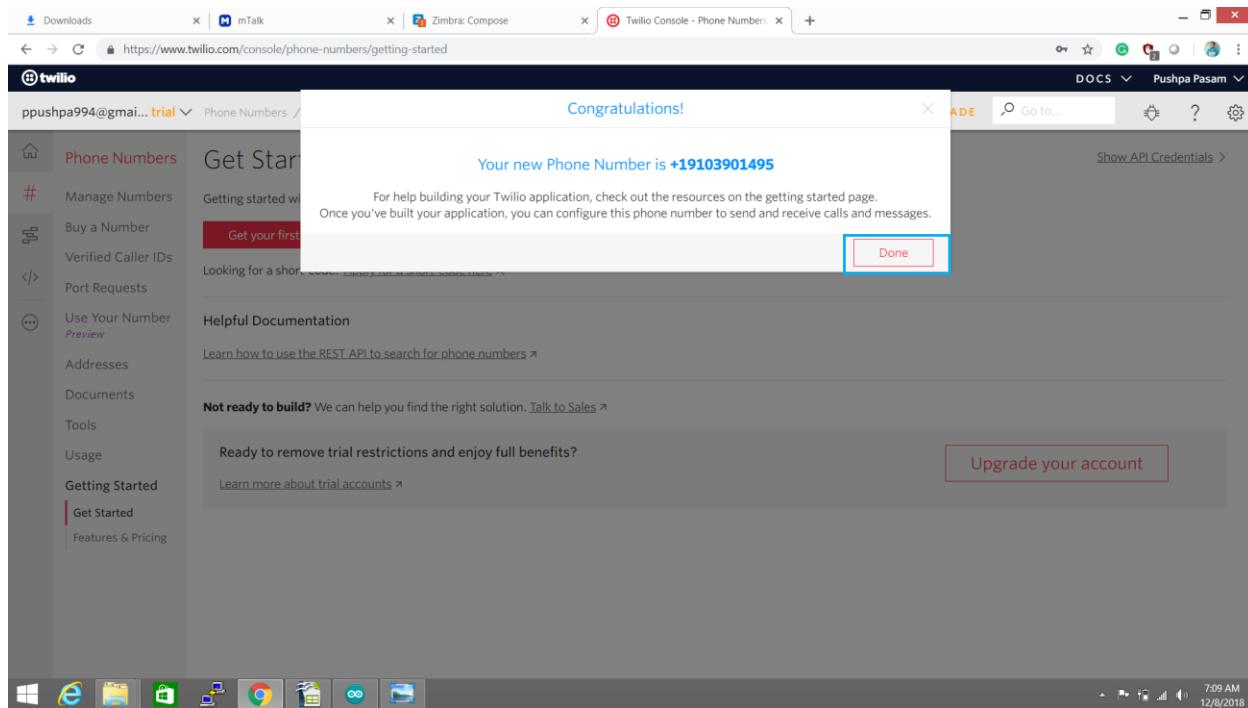
The screenshot shows the Twilio Console interface. The left sidebar has a 'Getting Started' section with a 'Get Started' button highlighted by a red box. The main content area is titled 'Get Started with Phone Numbers'. It includes a sub-section 'Get your first Twilio phone number' with a red box around it. Below it is a note about short-codes and a link to apply for one. There's also a 'Helpful Documentation' section with a link to the REST API. A note for users not ready to build is present, along with a link to talk to sales. A 'Ready to remove trial restrictions and enjoy full benefits?' section with a link to learn more about trial accounts is shown. A 'Upgrade your account' button is located in the bottom right corner of this section. The browser address bar shows the URL <https://www.twilio.com/console/phone-numbers/getting-started>. The system tray at the bottom indicates the date and time as 12/8/2018 7:09 AM.

**Click on Get your first Twilio phone Number to send the messages by using US number given by twilio.**

This screenshot shows the 'Your first Twilio Phone Number' modal window. It displays the phone number '(910) 390-1495'. Below the number, there's a link to search for a different number. The modal lists the capabilities of this number: Voice, SMS, and MMS. The 'SMS' capability is highlighted with a red box. A 'Choose this Number' button is also highlighted with a red box. The background shows the same Twilio Console interface as the previous screenshot, with the 'Getting Started' section visible. The browser address bar shows the URL <https://www.twilio.com/console/phone-numbers/getting-started>. The system tray at the bottom indicates the date and time as 12/8/2018 7:09 AM.

We have the different services for that phone number like voice, SMS, MMS.

If you want to change the number just cancel and buy the new number otherwise click on **Choose this Number**. After selection of the plan click on **Done**



We need **ACCOUNT SID**, **AUTH TOKEN** and registered phone number to send the messages to the any number.

## Step #7 | Data Reading with Node-Red and Twilio Integration

Go to your Bluemix Application Dashboard and click on **Route**.

The screenshot shows the IBM Cloud dashboard at <https://console-regional.au-syd.bluemix.net/dashboard/apps>. The top navigation bar includes links for Catalog, Docs, Support, Manage, and a user profile icon.

**Cloud Foundry Apps** (256 MB/256 MB Used)

Name	Route	Memory (MB)	State
nodejs-cloudlab	nodejs-cloudlab.mybluemix.net	256	Stopped (0/1)
ThingChat-2017	ThingChat-2017.mybluemix.net	256	Awake (1/1)

**Cloud Foundry Services**

Name	Service Offering	Plan
ThingChat-2017-cloudantNoSQLDB	Cloudant NoSQL DB	Lite
ThingChat-2017-iotf-service	Internet of Things Platform	Lite

This will redirect you to Node-Red tool in Bluemix. Click on **Go to your Node-Red Flow Editor**. Select the not recommended option.

The screenshot shows the Node-RED interface at <https://thingchat-2017.mybluemix.net>. The title bar reads "Node-RED on IBM Bluemix for IBM Watson IoT Platform".

**Node-RED**  
Flow-based programming for the Internet of Things

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.

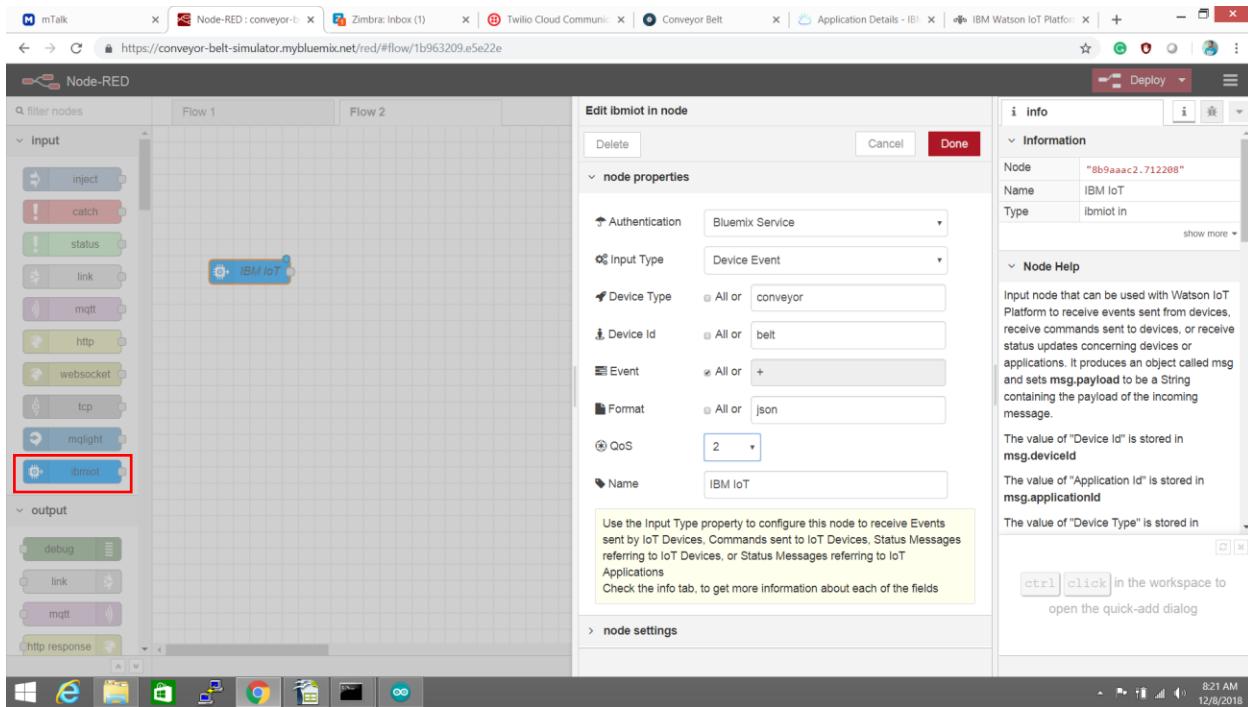
More information about Node-RED, including documentation, can be found at [nodered.org](http://nodered.org).

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

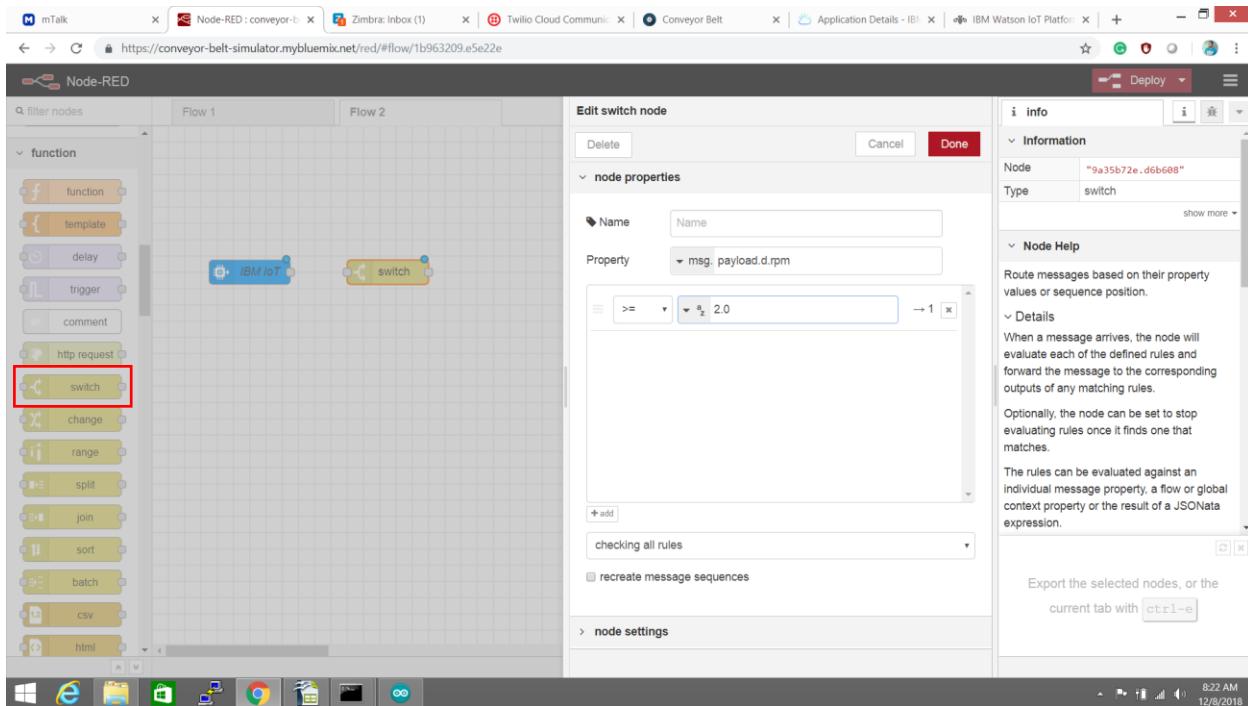
[Learn how to customise Node-RED](#)

Node-Red Flow sheet will be opened with a set of input and output nodes and lot more. Click on + icon to create the new flow.

Drag the IBM IoT input node into the workflow and edit it accordingly, with device information

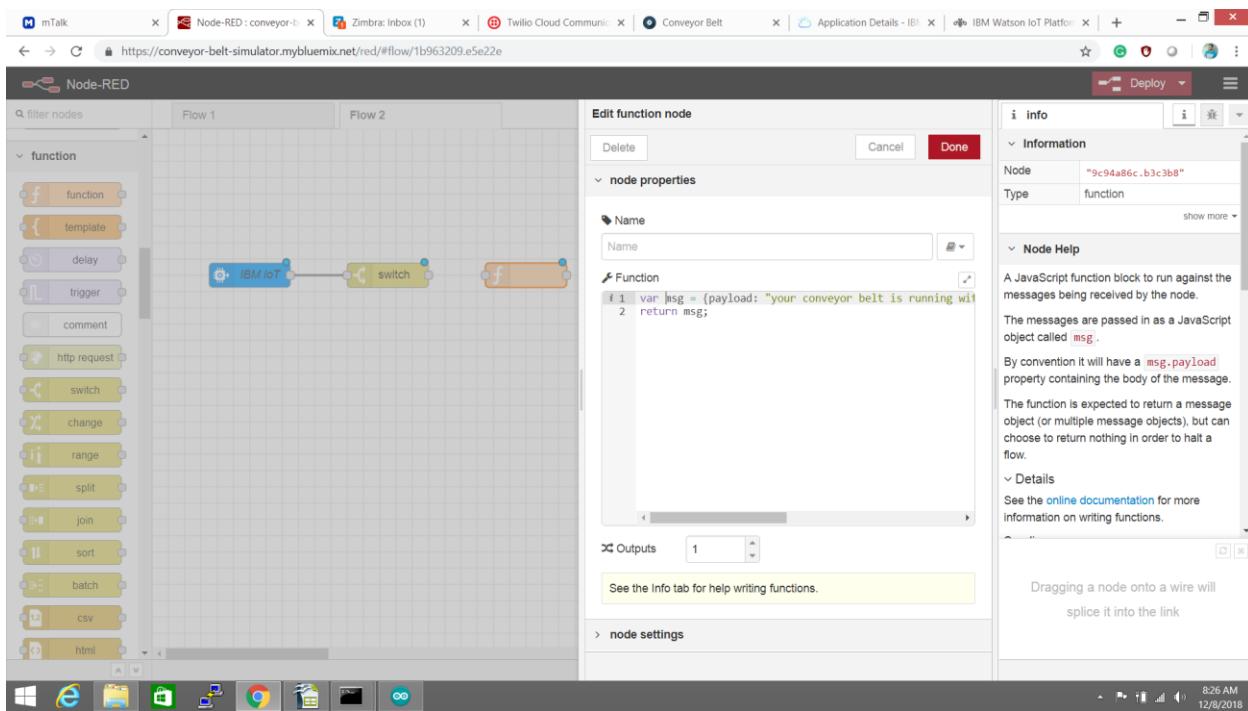


Use switch node to define the threshold value to the RPM to send the message to registered phone number.

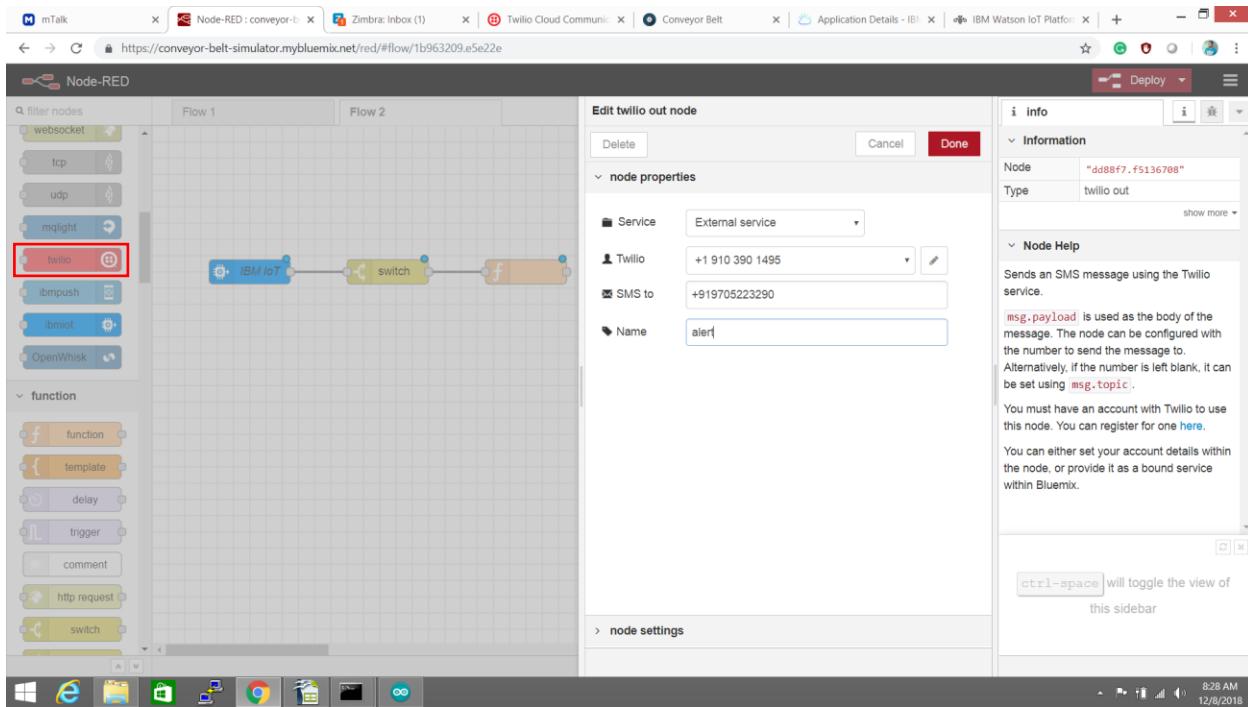


Use function node to write the below custom message.

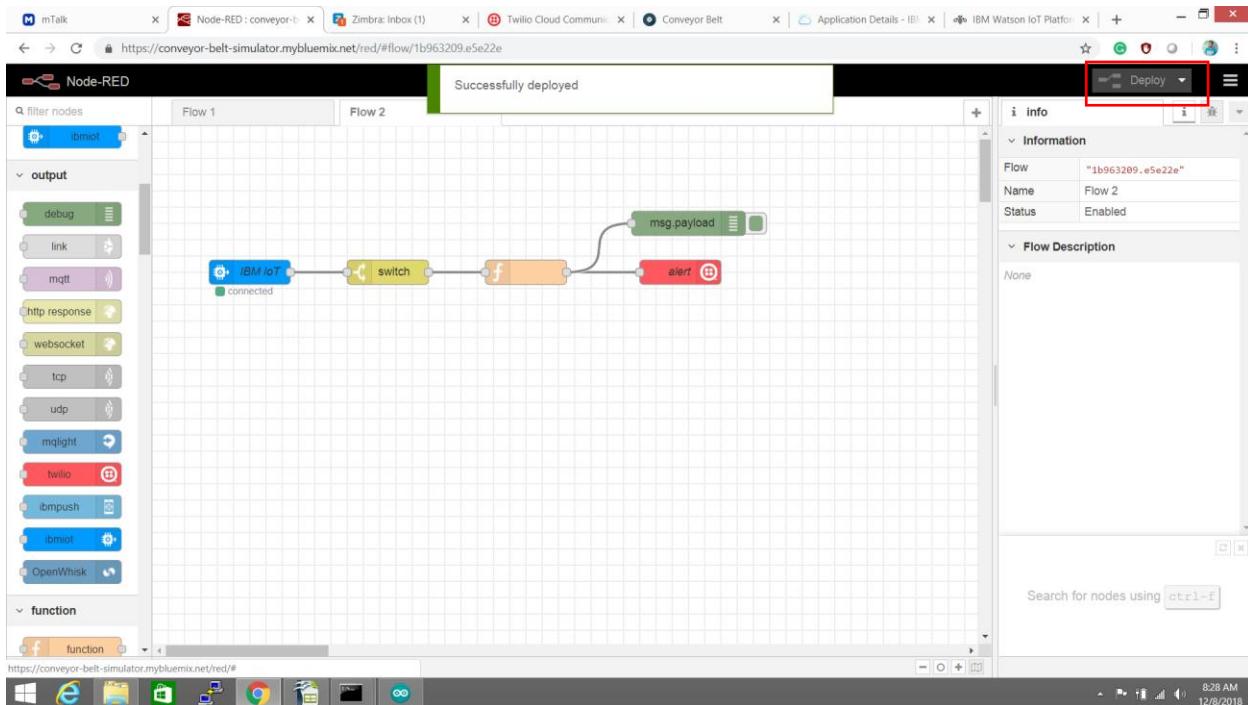
```
var msg = {payload: "your conveyor belt is running with a speed of  
" +msg.payload.d.rpm+ " and has crossed the speed limit."}  
  
return msg;
```



Drag Twilio node into the workflow and edit that node with SID and TOKEN, which are there in Twilio account.



After connecting all the nodes click on deploy to save the modifications.





Now, send the data from Conveyor belt simulator once again to see the output in Node-Red and vary the RPM to send the message to registered Phone Number.

For any questions regarding the lab please feel free to reach out to [innovation@miraclesoft.com](mailto:innovation@miraclesoft.com). **We hope you enjoyed the session with us!**