Smart Farmer - IoT Enabled Smart Farming Application

SPRINT DELIVERY-1

Team ID: PNT2022TMID43384

1. INTRODUCTION:

Smart Farming is the Implementation of various technologies and devices like internet, cloud etc for farming applications. The main aim of this project was to increase the production by implementing IoT in farming. Better crop management, better resource management, cost- effective agriculture, enhanced quality and quantity, crop monitoring and field monitoring, etc.

2. PROBLEM STATEMENT:

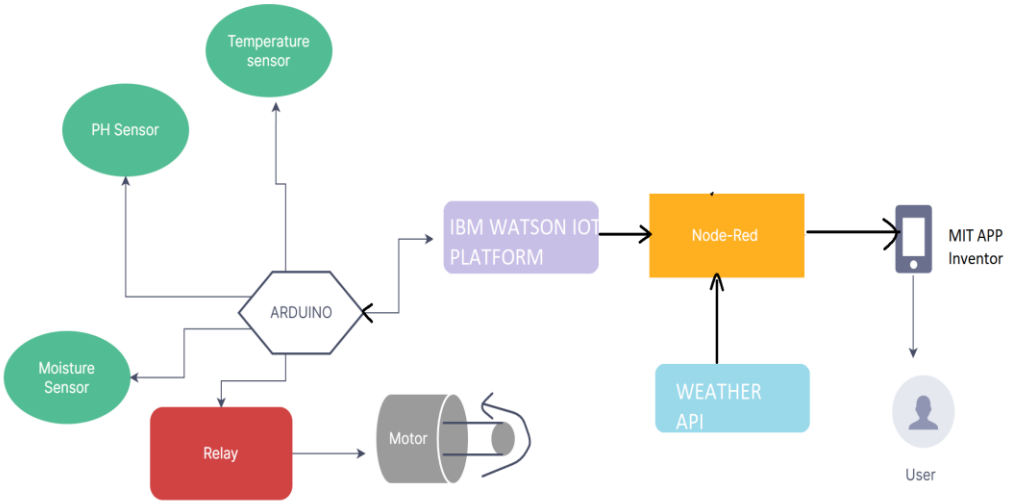
Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	a farmer	keep crops healthy and organic	I am facing difficulties in knowing about the climatic changes, soil moisture content and also controlling irrigation pumps	I am not having enough information and technological knowledge to solve this issue	frustrated
PS-2	a farmer	implement IoT in farming to monitor climatic changes	I am not able to find the required components	because the farm is in a rural area and the components are costly	disappointed

3. PROPOSED SOLUTION:

The Idea was considering various factors for the better growth of farming. The solution for the idea was monitoring soil factors, temperature and effect of pesticides by use of sensors and passing the information from these to the farmers by SMS.

According to the information obtained from sensors, farmers can turn on their motors if required from anywhere by using their mobile phones.

4. BLOCK DIAGRAM:

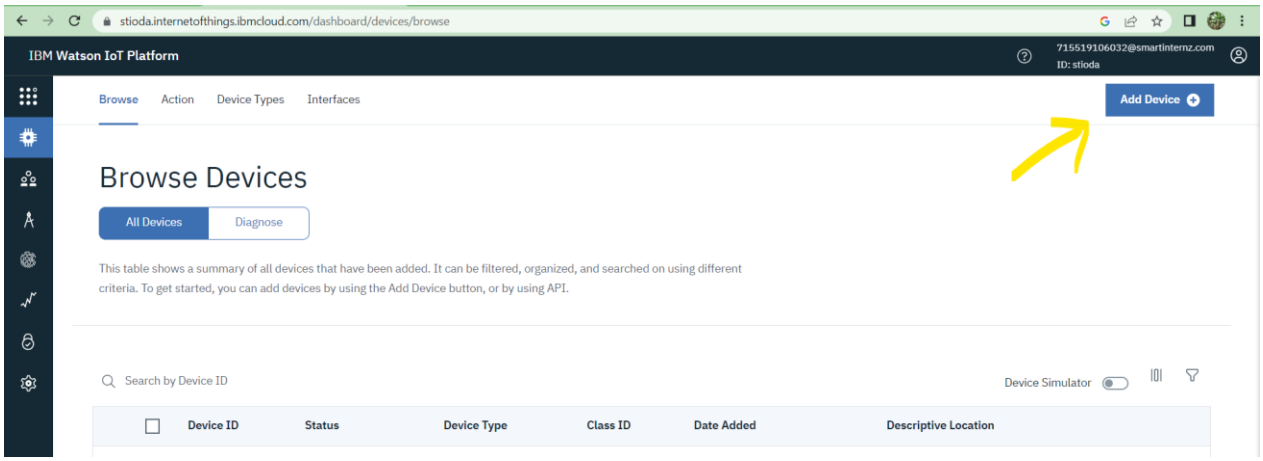


5. SOFTWARE INSTALLATION:

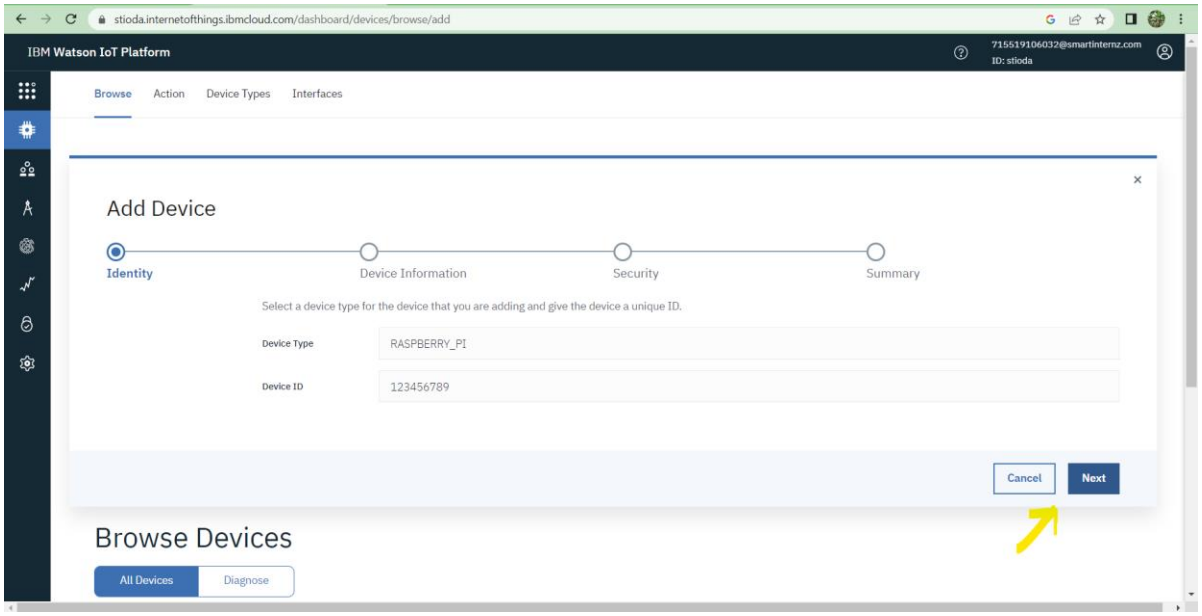
5.1. CREATION OF IBM WATSON IOT PLATFORM AND A DEVICE

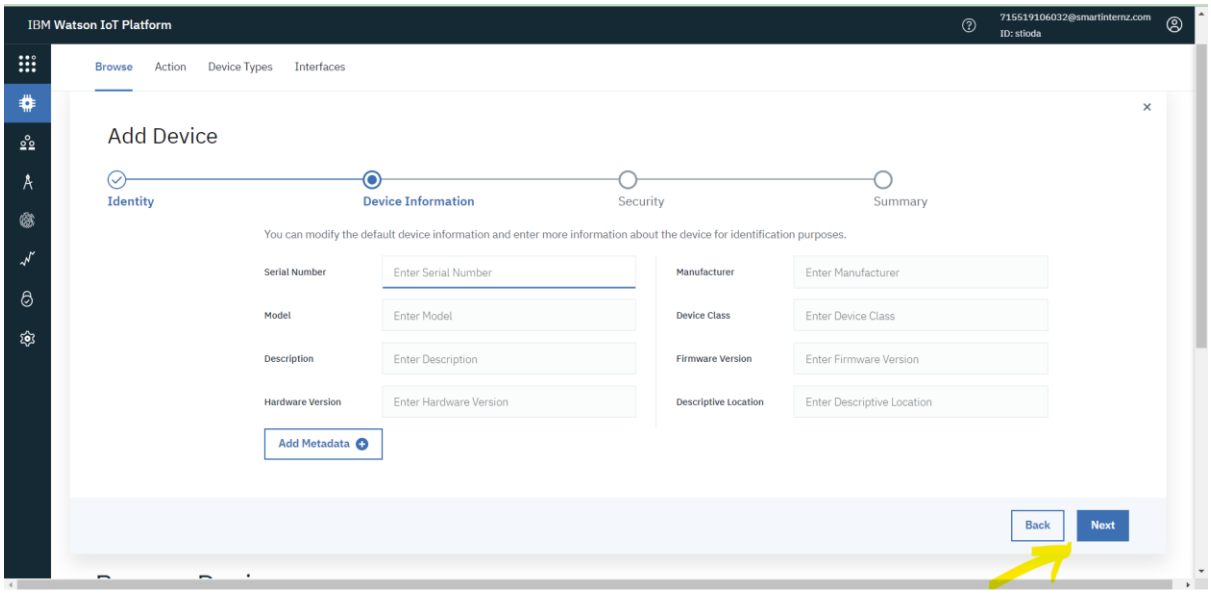
IBM Watson IoT platform was a fully managed, cloud-hosted service with capabilities for device registration, connectivity, control, rapid visualization and data storage.

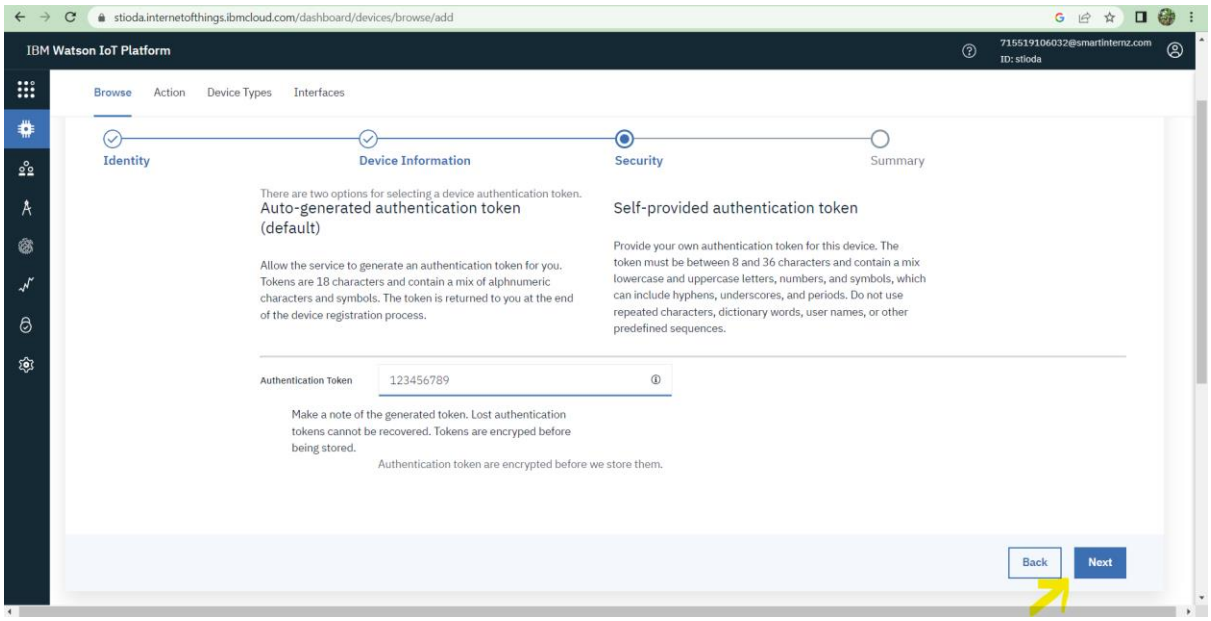
1.Click Add device in IBM Watson IoT platform

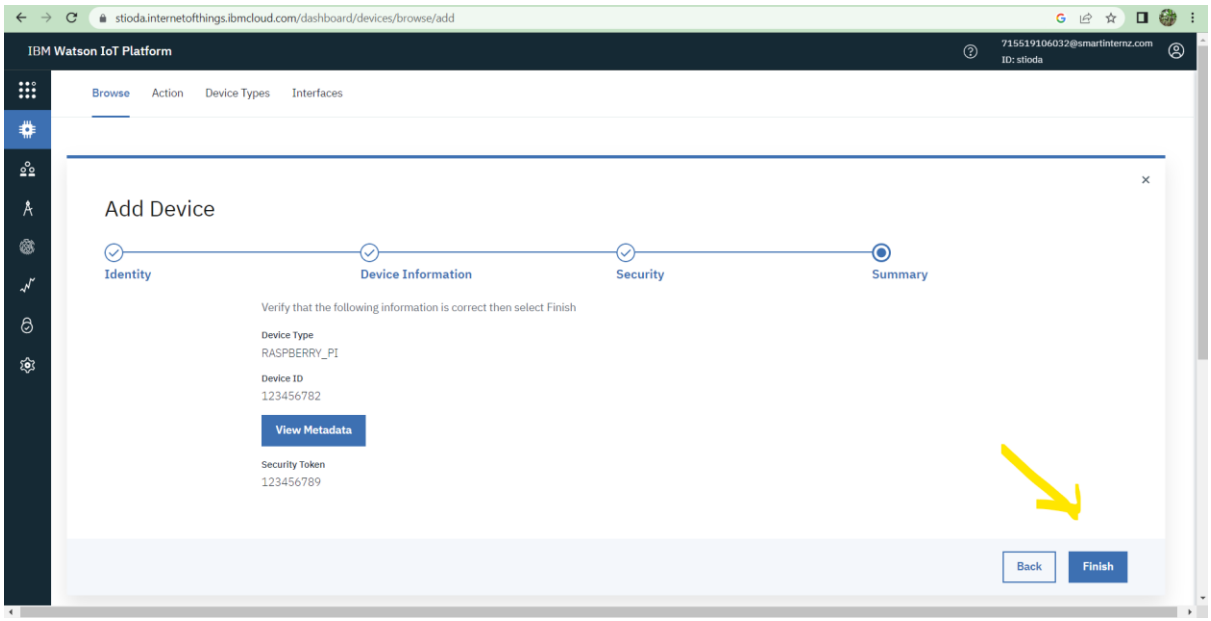


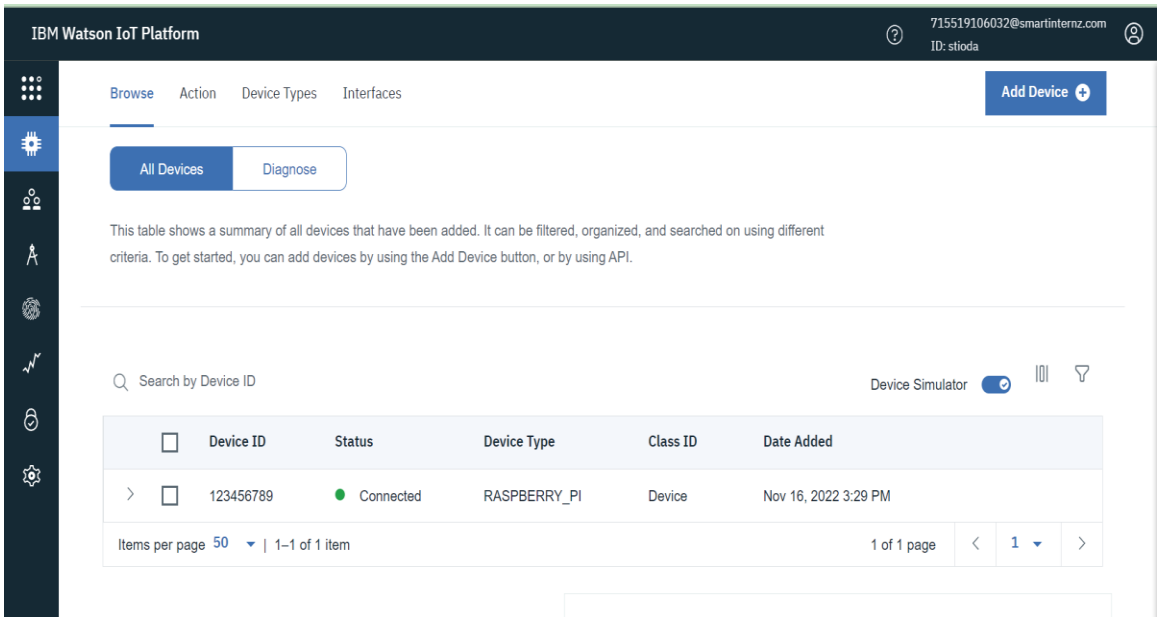
2.Add Device through fill device type and device Id authentication token and other fields



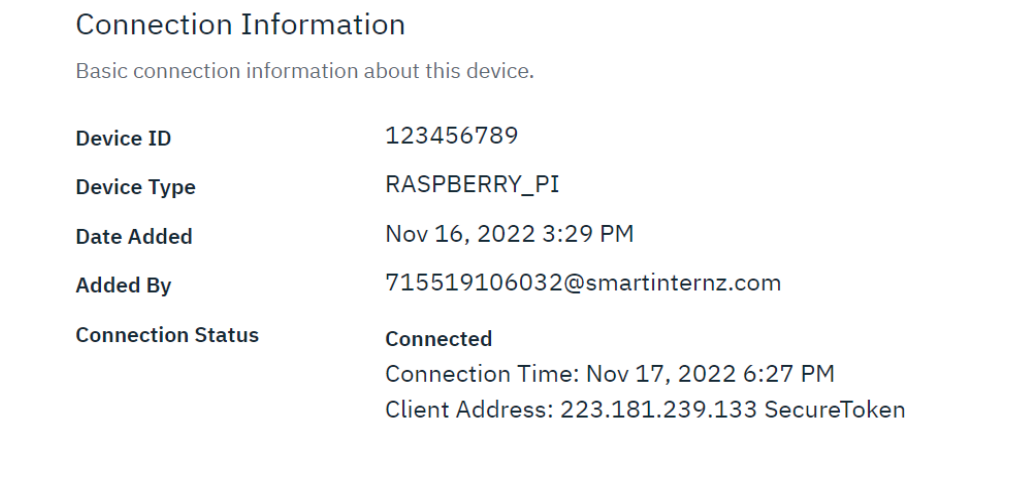

IBM Watson IoT Platform
715519106032@smartinternz.com
ID: stioda
Browse
Action
Device Types
Interfaces
Add Device
Identity
Device Information
Security
Summary
You can modify the default device information and enter more information about the device for identification purposes.
Serial Number
Enter Serial Number
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
Back
Next


stioda.internetofthings.ibmcloud.com/dashboard/devices/browse/add
IBM Watson IoT Platform
715519106032@smartinternz.com
ID: stioda
Browse
Action
Device Types
Interfaces
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
123456789
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.
Back
Next


stioda.internetofthings.ibmcloud.com/dashboard/devices/browse/add
IBM Watson IoT Platform
715519106032@smartinternz.com
ID: stioda
Browse
Action
Device Types
Interfaces
Add Device
Identity
Device Information
Security
Summary
Verify that the following information is correct then select Finish
Device Type
RASPBERRY_PI
Device ID
123456782
View Metadata
Security Token
123456789
Back
Finish



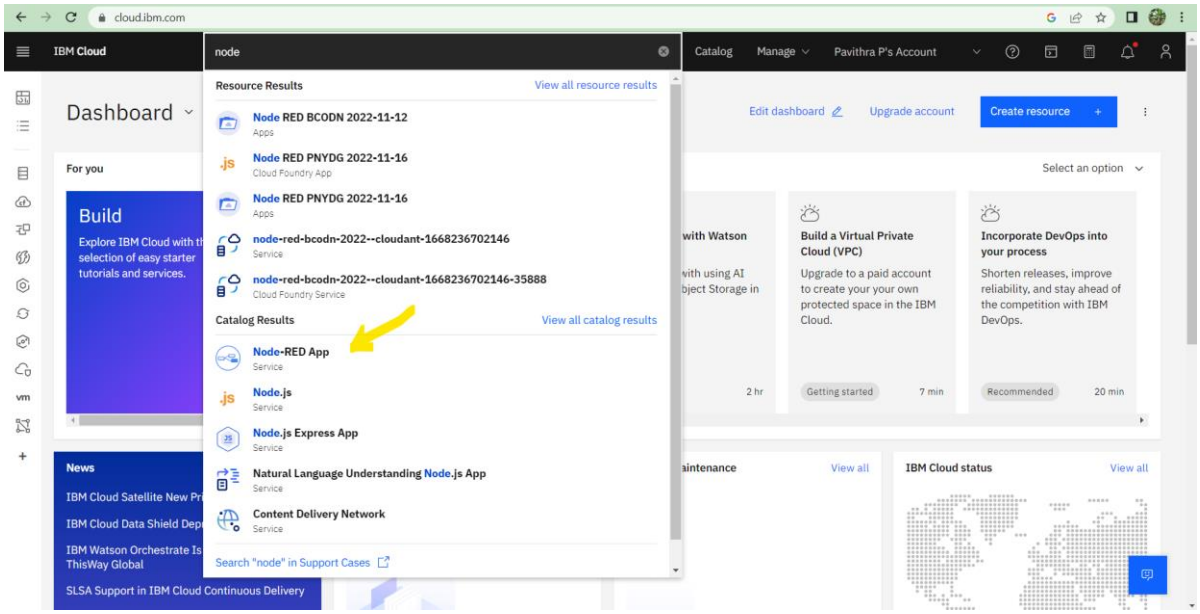
3.You can see our information here

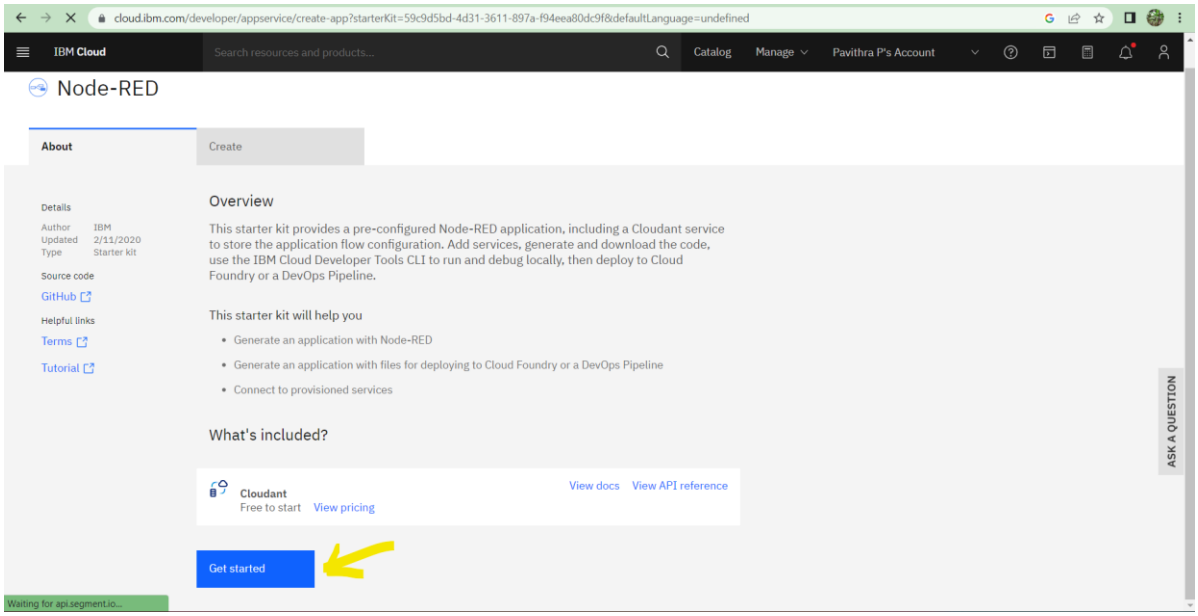


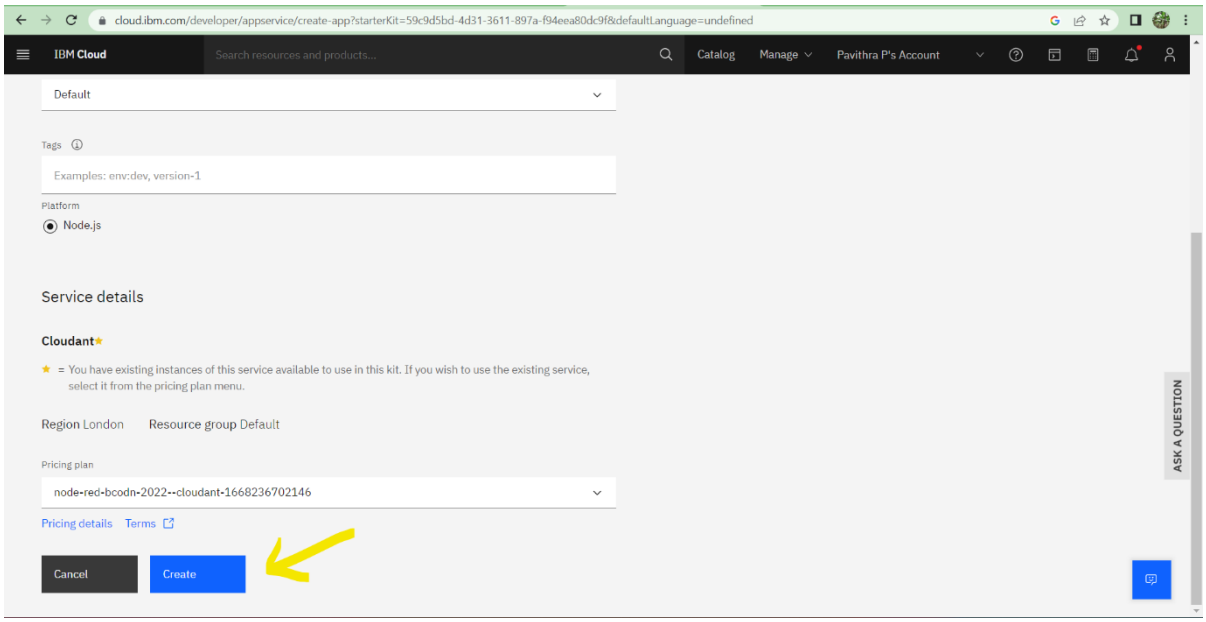
5.2. CREATION OF NODE-RED SERVICE

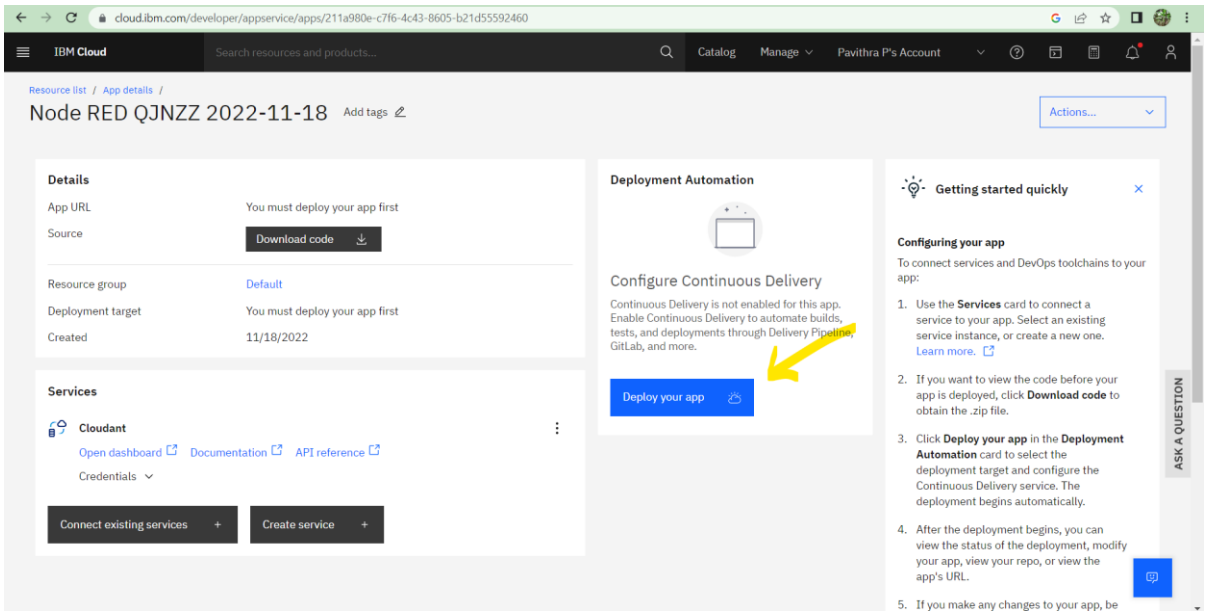
Node-RED is a programming tool for writing together hardware devices, APIs and online services in new and interesting ways. It provides a browser-based editor that makes it easy to wire together flows using the wide range of nodes in the palette that can be deployed to its runtime in a single click.

1.Create a Node red service in IBM cloud and search Node in catalog






cloud.ibm.com/developer/appservice/create-app?starterKit=59c9d5bd-4d31-3611-897a-f94eea80dc9f&defaultLanguage=undefined
IBM Cloud
Search resources and products...
Catalog
Manage
Pavithra P's Account
Default
Tags
Examples: env:dev, version-1
Platform
Node.js
Service details
Cloudant
= You have existing instances of this service available to use in this kit. If you wish to use the existing service, select it from the pricing plan menu.
Region London
Resource group Default
Pricing plan
node-red-bcodn-2022--cloudant-1668236702146
Pricing details
Terms
Cancel
Create
ASK A QUESTION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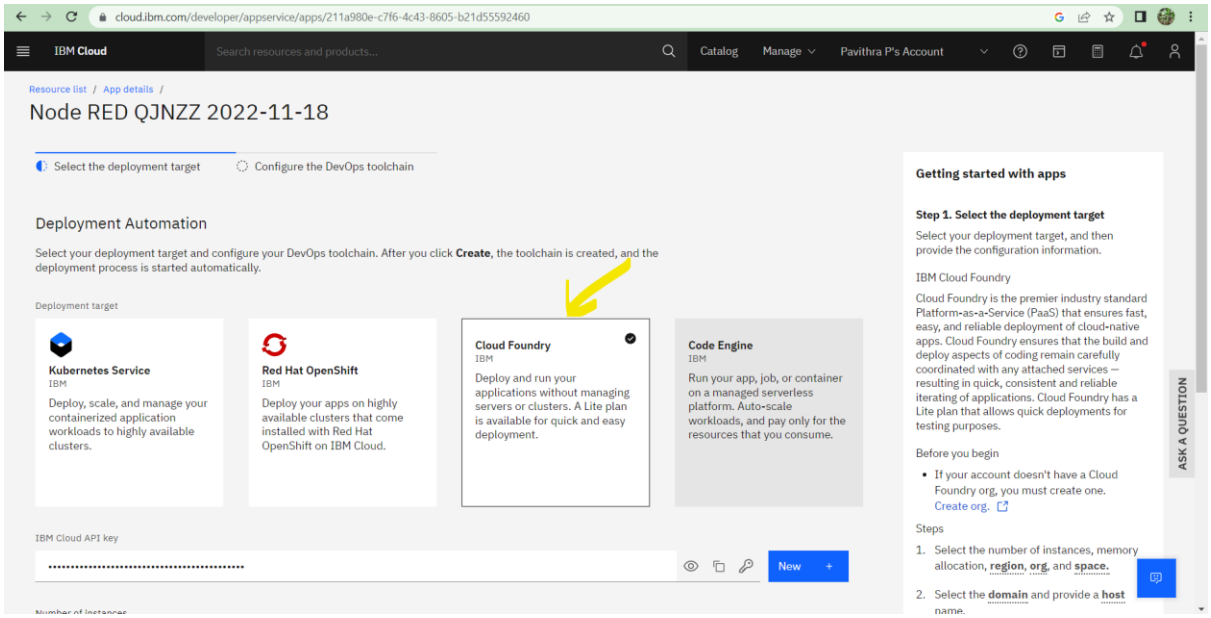
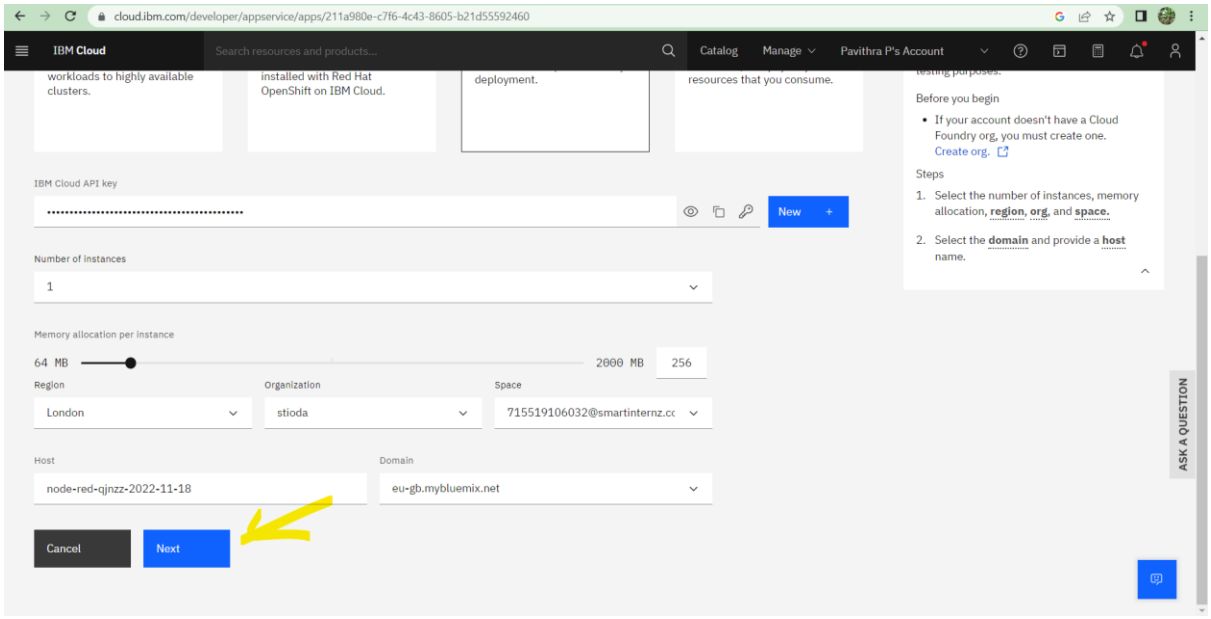
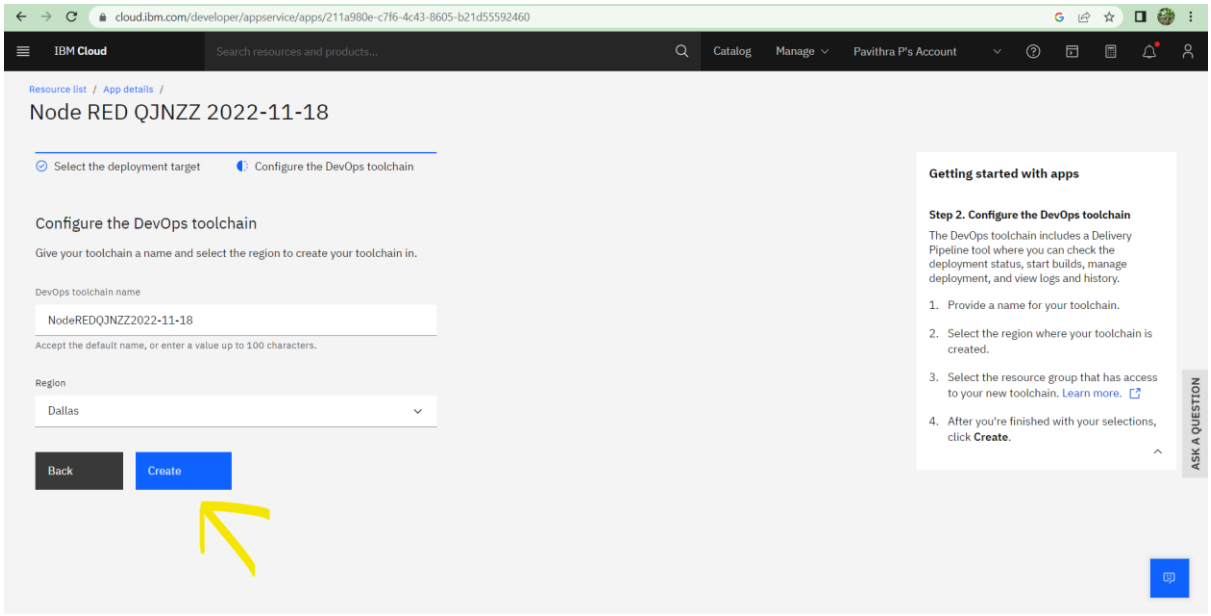
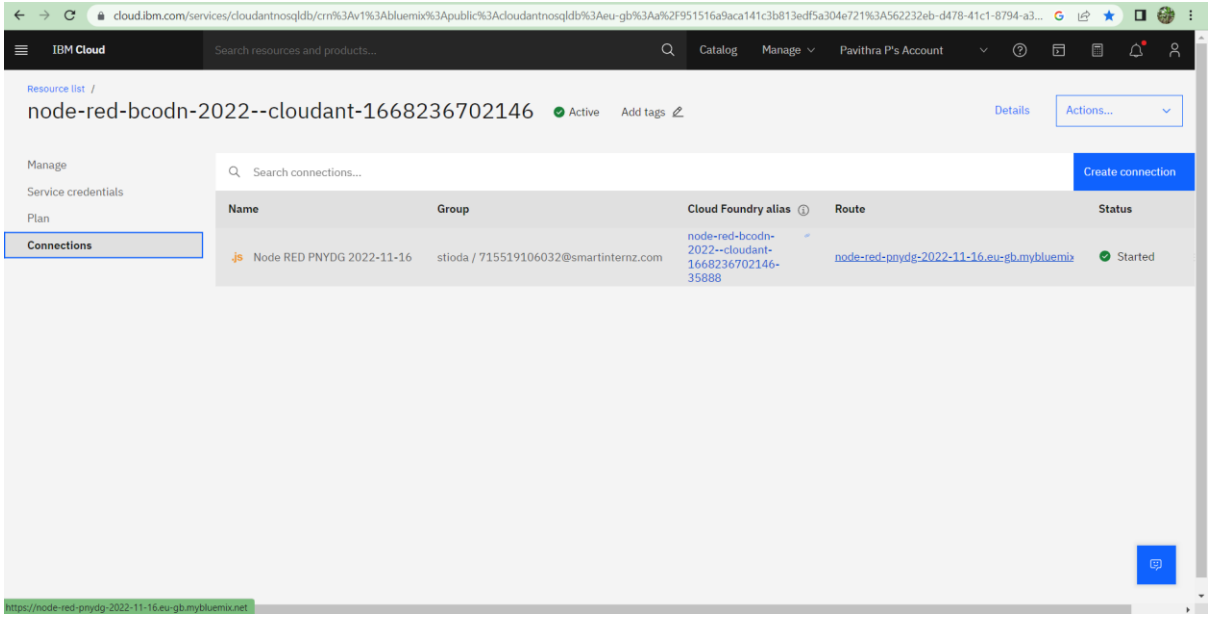
IBM Cloud
Search resources and products...
Catalog
Manage
Pavithra P's Account
Resource list / App details /
Node RED QJNZZ 2022-11-18
Add tags
Actions...
Details
App URL
You must deploy your app first
Source
Download code
Resource group
Default
Deployment target
You must deploy your app first
Created
11/18/2022
Services
Cloudant
Open dashboard
Documentation
API reference
Credentials
Connect existing services
Create service
Deployment Automation
Configure Continuous Delivery
Continuous Delivery is not enabled for this app. Enable Continuous Delivery to automate builds, tests, and deployments through Delivery Pipeline, GitLab, and more.
Deploy your app
Getting started quickly
Configuring your app
To connect services and DevOps toolchains to your app:
1. Use the Services card to connect a service to your app. Select an existing service instance, or create a new one. Learn more.
2. If you want to view the code before your app is deployed, click Download code to obtain the .zip file.
3. Click Deploy your app in the Deployment Automation card to select the deployment target and configure the Continuous Delivery service. The deployment begins automatically.
4. After the deployment begins, you can view the status of the deployment, modify your app, view your repo, or view the app's URL.
5. If you make any changes to your app, be
ASK A QUESTION


cloud.ibm.com/developer/appservice/apps/211a980e-c7f6-4c43-8605-b21d55592460
IBM Cloud
Search resources and products...
Catalog
Manage
Pavithra P's Account
Resource list / App details /
Node RED QJNZZ 2022-11-18
Select the deployment target
Configure the DevOps toolchain
Deployment Automation
Select your deployment target and configure your DevOps toolchain. After you click Create, the toolchain is created, and the deployment process is started automatically.
Deployment target
Kubernetes Service
IBM
Deploy, scale, and manage your containerized application workloads to highly available clusters.
Red Hat OpenShift
IBM
Deploy your apps on highly available clusters that come installed with Red Hat OpenShift on IBM Cloud.
Cloud Foundry
IBM
Deploy and run your applications without managing servers or clusters. A Lite plan is available for quick and easy deployment.
Code Engine
IBM
Run your app, job, or container on a managed serverless platform. Auto-scale workloads, and pay only for the resources that you consume.
IBM Cloud API key
New
Getting started with apps
Step 1. Select the deployment target
Select your deployment target, and then provide the configuration information.
IBM Cloud Foundry
Cloud Foundry is the premier industry standard Platform-as-a-Service (PaaS) that ensures fast, easy, and reliable deployment of cloud-native apps. Cloud Foundry ensures that the build and deploy aspects of coding remain carefully coordinated with any attached services — resulting in quick, consistent and reliable iterating of applications. Cloud Foundry has a Lite plan that allows quick deployments for testing purposes.
Before you begin
If your account doesn't have a Cloud Foundry org, you must create one.
Create org.
Steps
1. Select the number of instances, memory allocation, region, org, and space.
2. Select the domain and provide a host name.
ASK A QUESTION

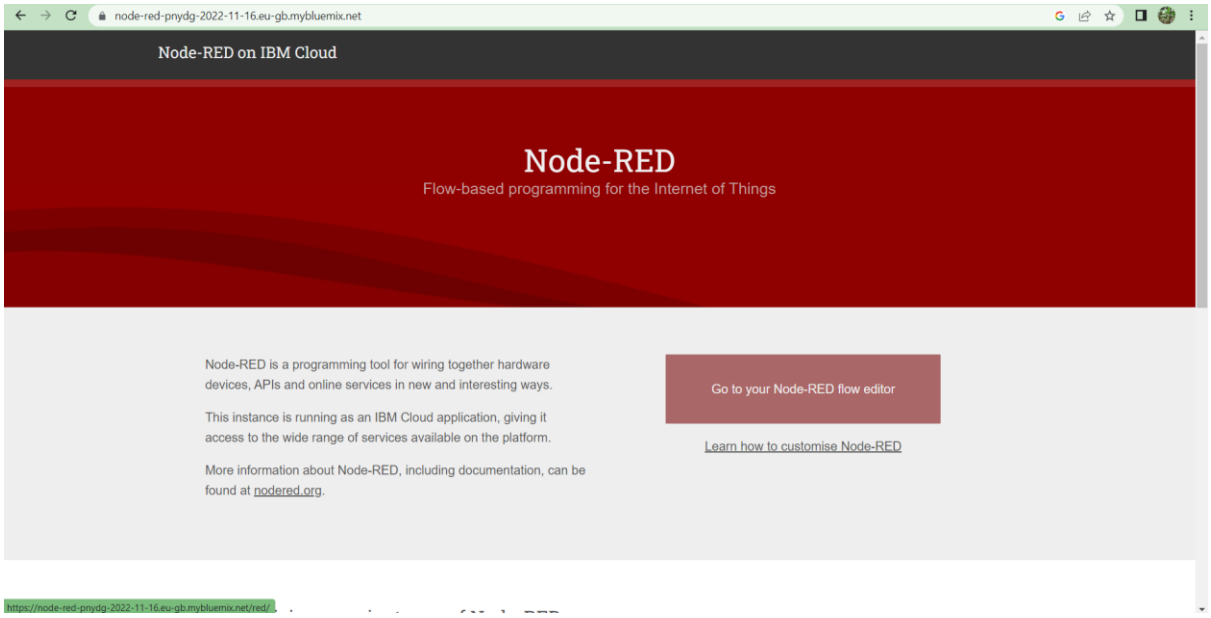

cloud.ibm.com/developer/appservice/apps/211a980e-c7f6-4c43-8605-b21d55592460
IBM Cloud
Search resources and products...
Catalog
Manage
Pavithra P's Account
IBM Cloud API key
New
Number of instances
1
Memory allocation per instance
64 MB
2000 MB
256
Region
London
Organization
stioda
Space
715519106032@smartinternz.cc
Host
node-red-qjnzz-2022-11-18
Domain
eu-gb.mybluemix.net
Cancel
Next
Before you begin
If your account doesn't have a Cloud Foundry org, you must create one.
Create org.
Steps
1. Select the number of instances, memory allocation, region, org, and space.
2. Select the domain and provide a host name.
ASK A QUESTION

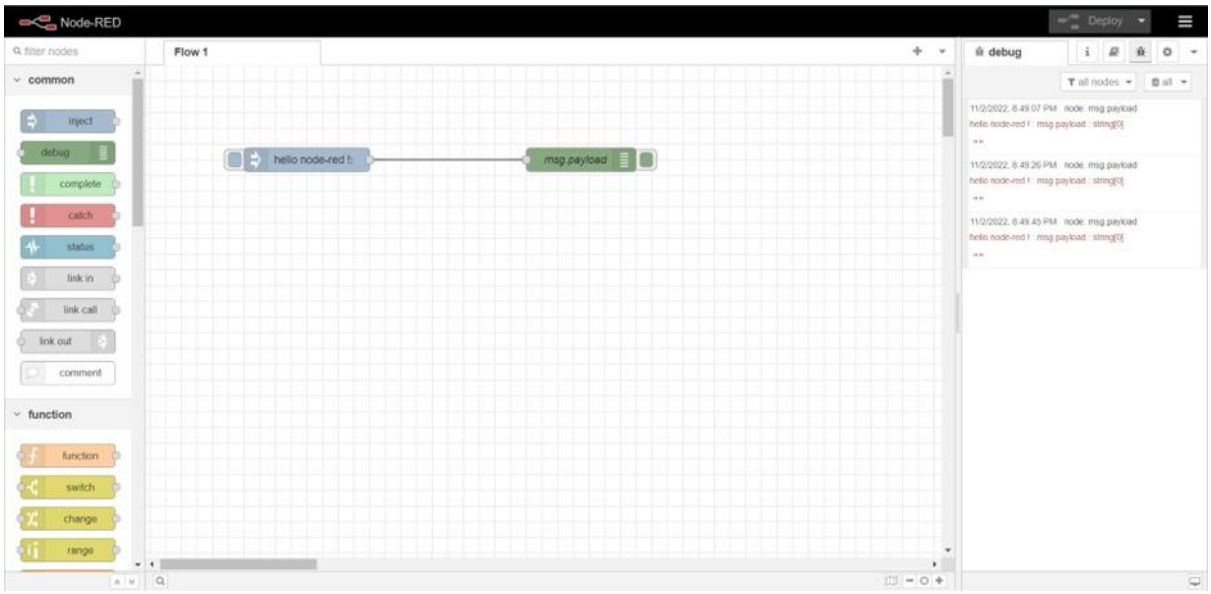


2.Create NODE RED connections



3.Open Node-Red editor

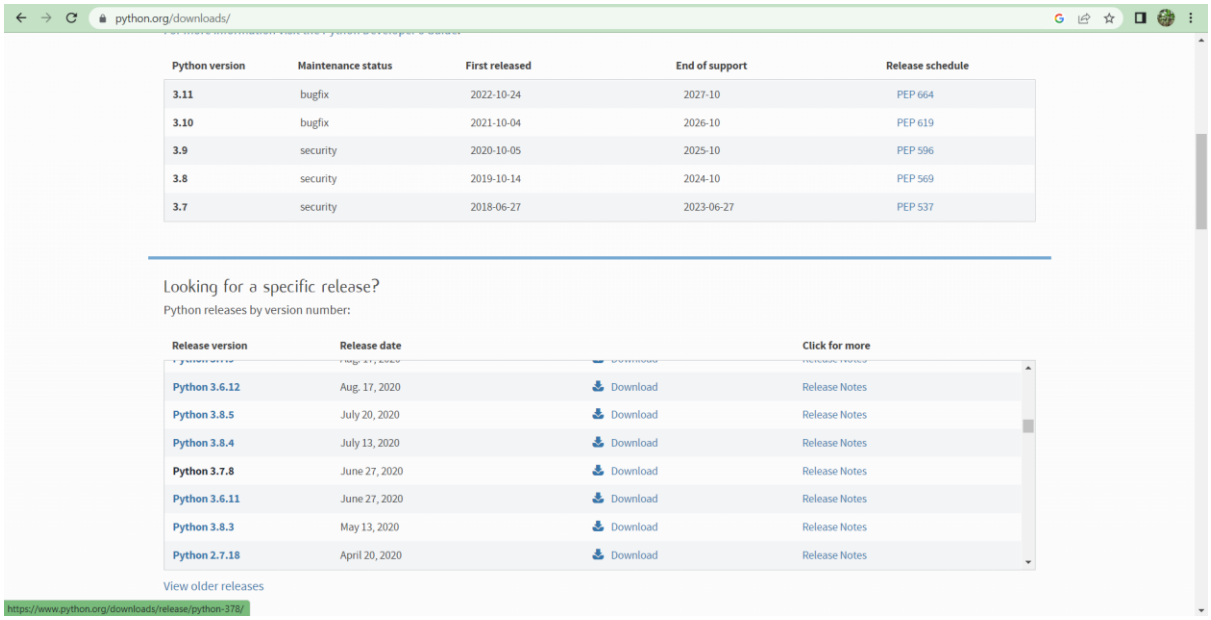


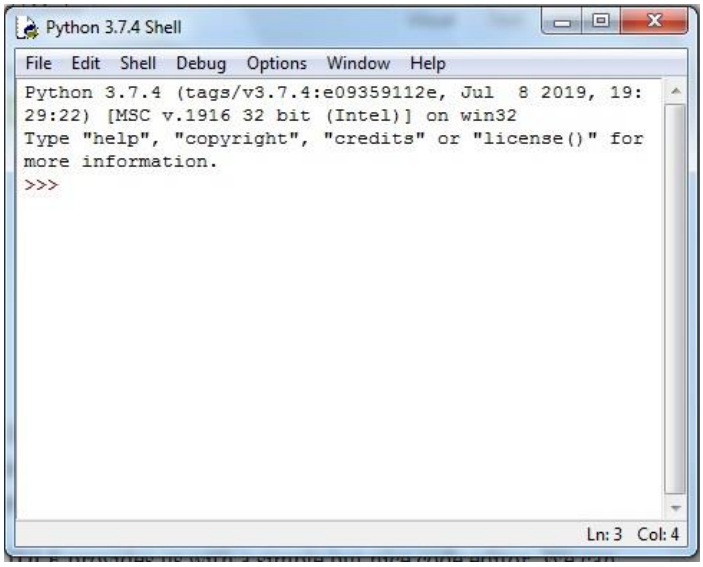


5.3. DEVELOPING PYTHON CODE

Python IDLE: Python IDLE offers a full-fledged file editor, which gives you the ability to write and execute python programs from within this program. The built-in file editor also includes several features, like code completion and automatic indentation, that will speed up your coding workflow.

1.Download Python 3.7.8

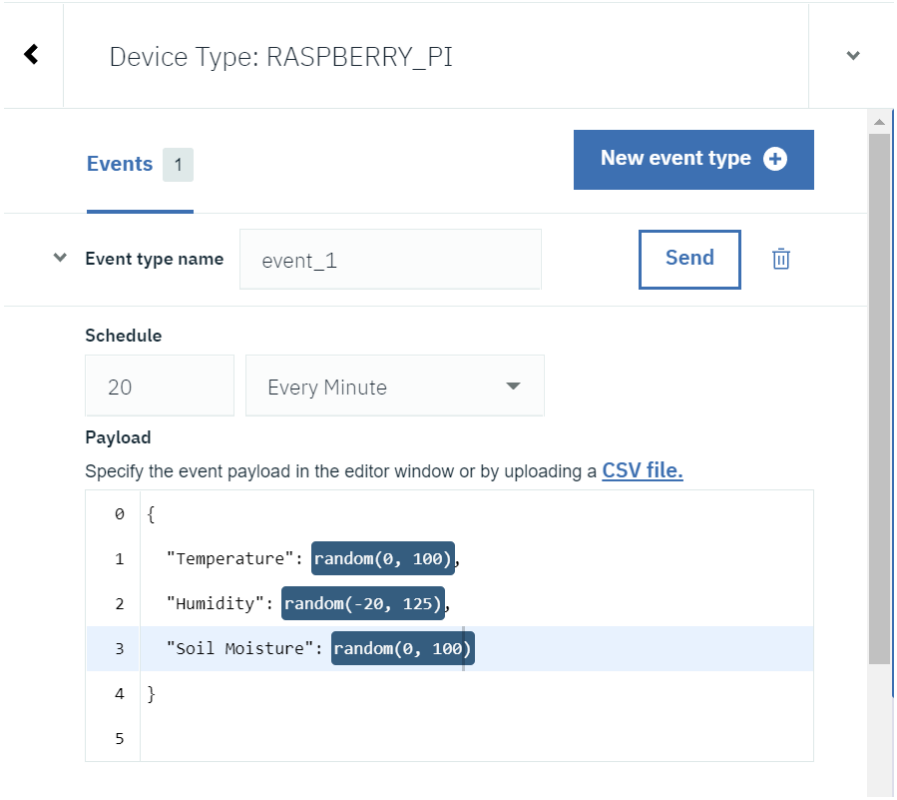




5.4. IOT SIMULATOR

The IoT Device Simulator is a solution that enables customers to create and simulate hundreds of virtual connected devices, without having to configure and manage physical devices, or develop time consuming scripts.

In our project in the place of sensors we are going to use IoT sensor simulator which give random readings to the connected cloud.



5.5 MIT APP INVENTOR

MIT App Inventor used to build mobile application. It is an visual programming environment that allows everyone to create apps.

Open MIT APP INVENTOR in browser and click create apps and create new project.