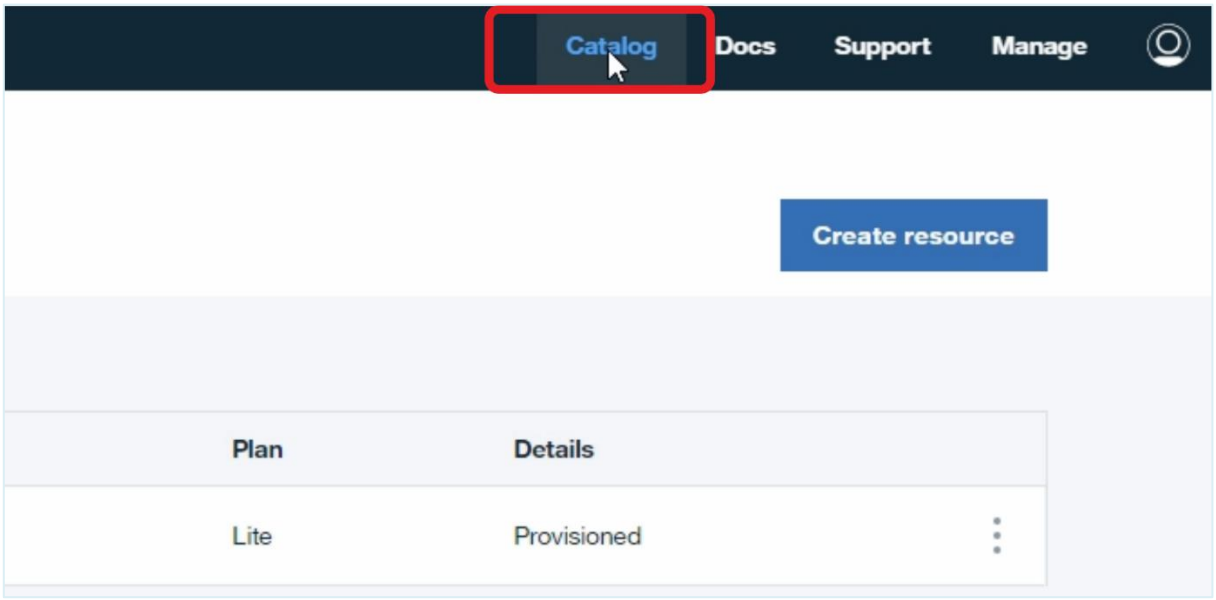
IoT Starter Kit – Part 3c: How to connect to IBM Cloud

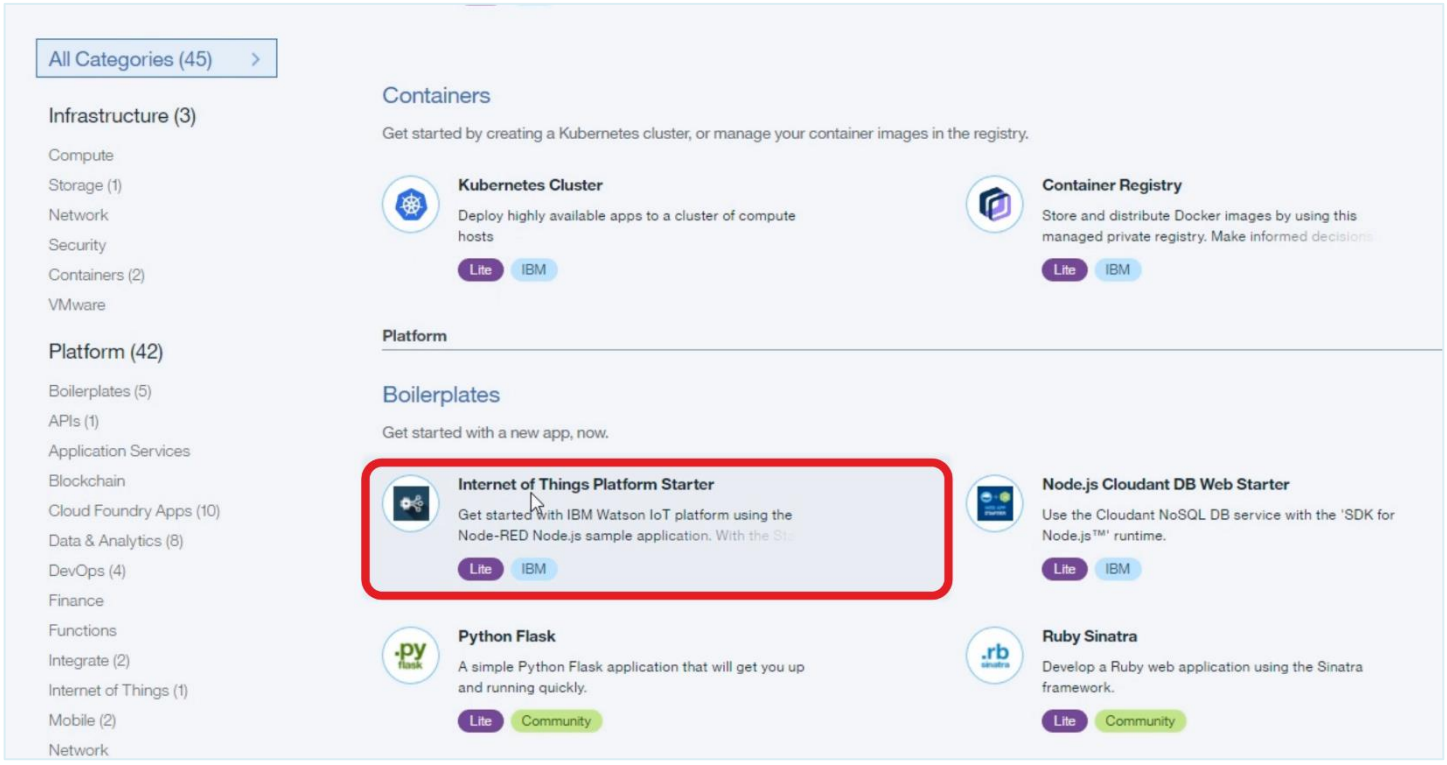
In this part we will connect an IQRF gateway to IBM Cloud. IBM provides developers some free services for a limited time and you don't have to enter any credit card details on the beginning. It is one of the possible clouds that you can get connected to from your IQRF Gateway Daemon using the MQTT channel.

IBM Cloud and Watson IoT platform

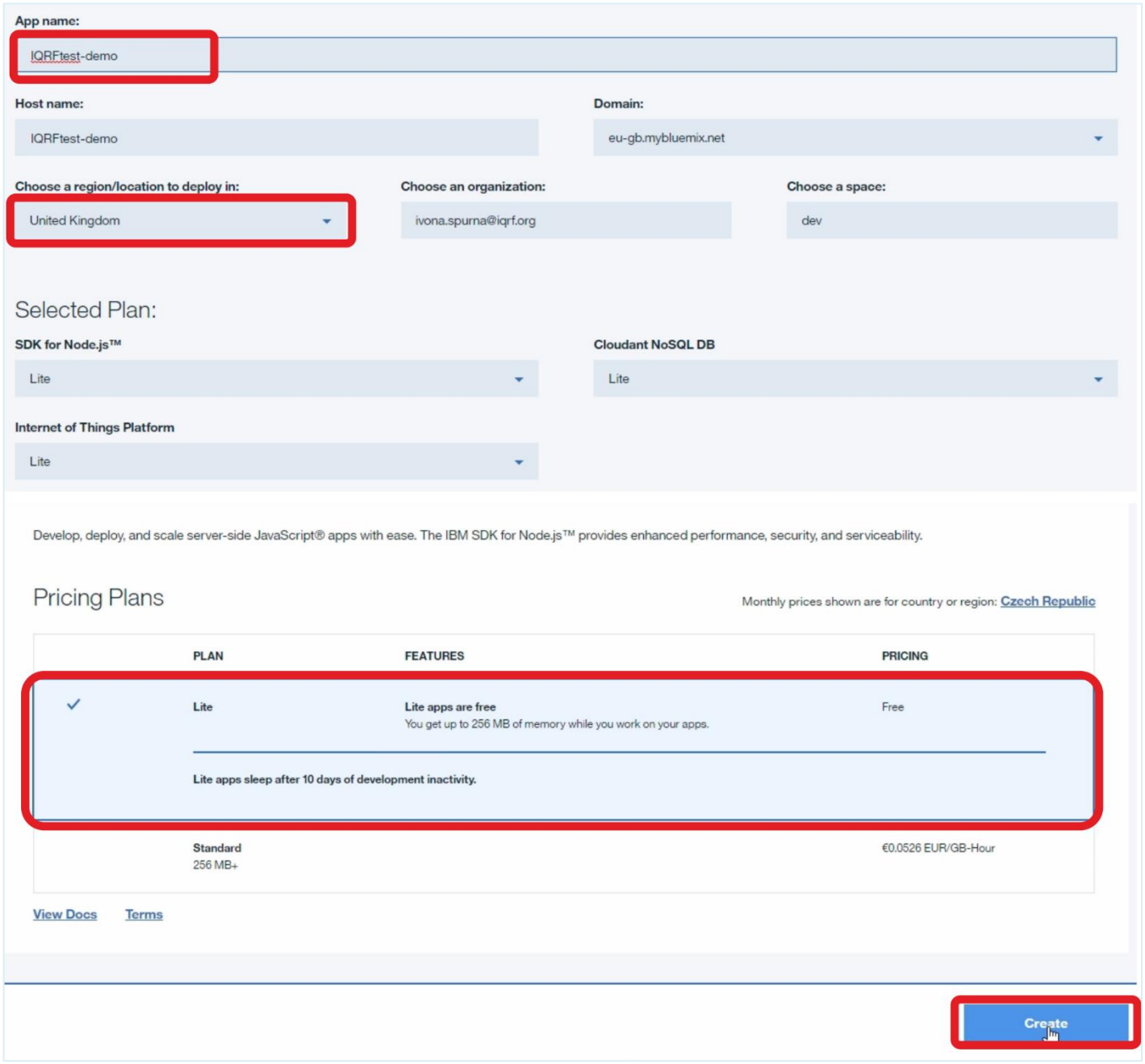
Log in to your IBM Cloud account on console.bluemix.net.

Click on the **Catalog** button in the upright corner and find the **Internet of Things Platform Starter**.

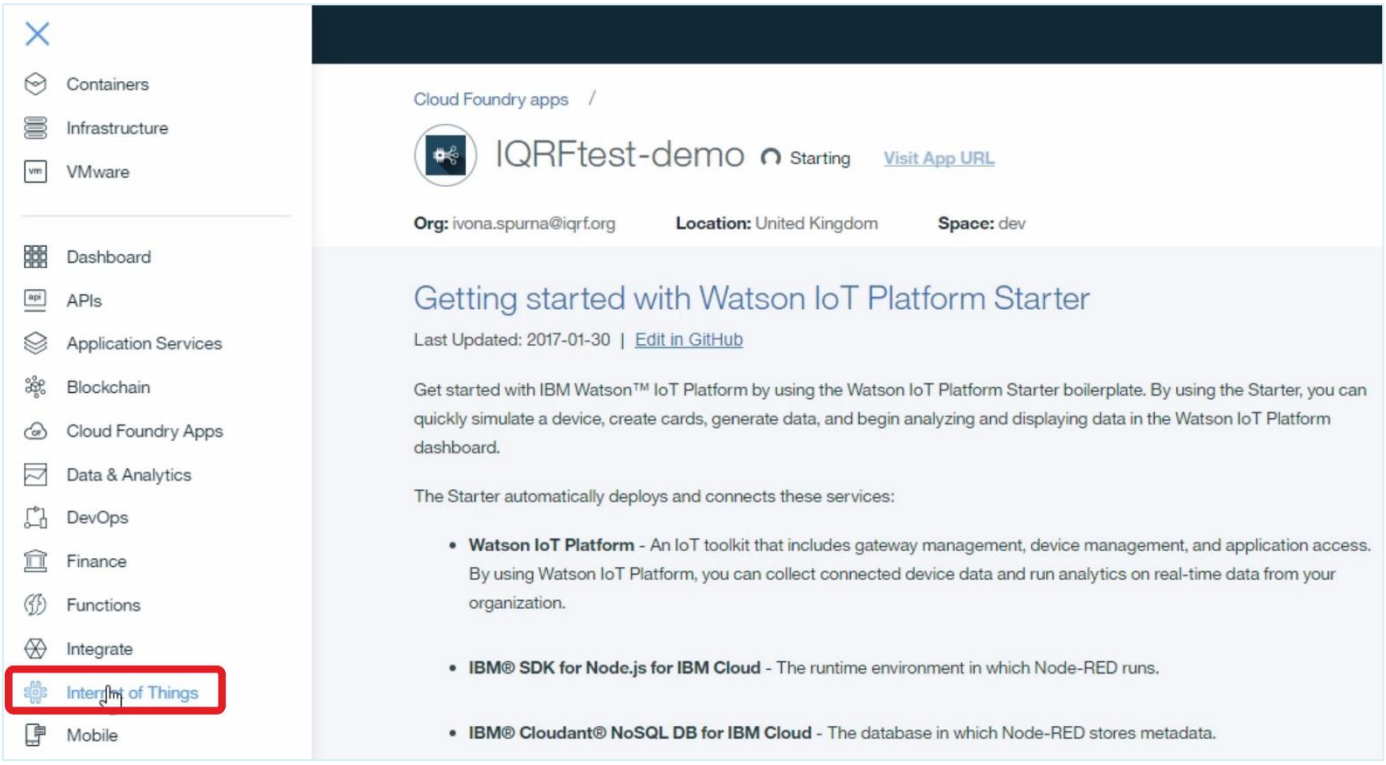




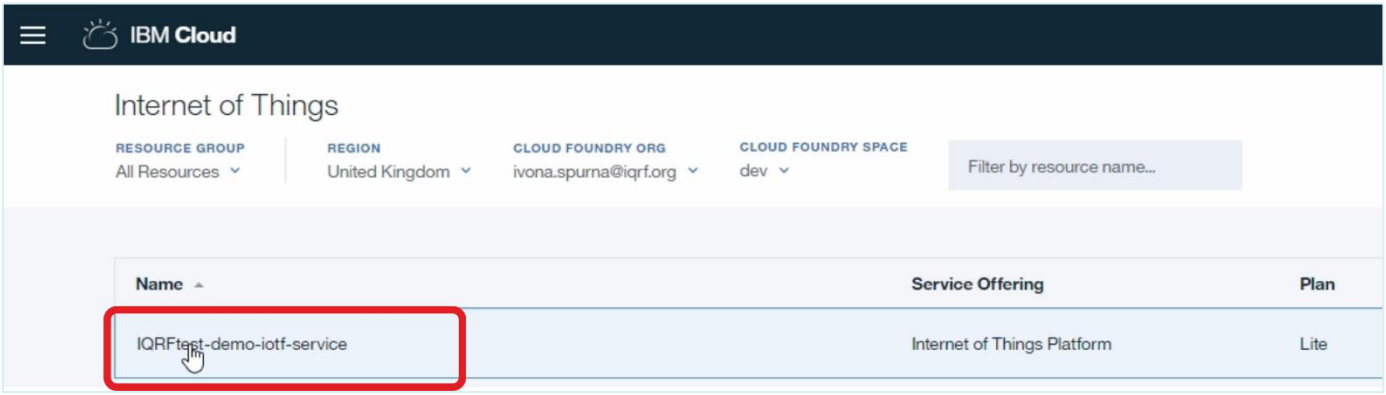
Fill in this form to set up your cloud application. Type in a unique **app name**, select your **deployment location** and your **pricing plan** and click on **Create**.



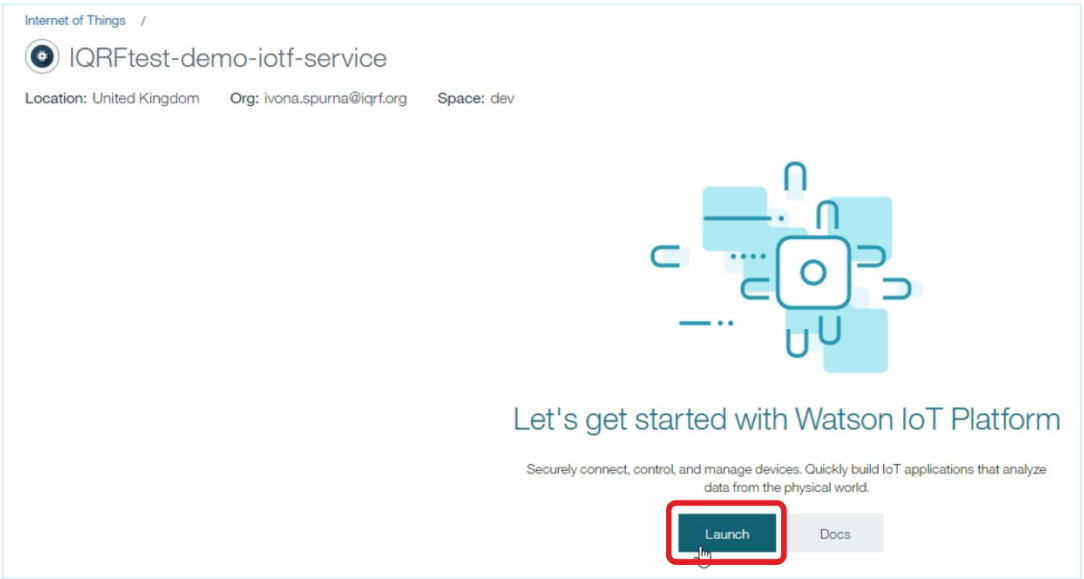
Click on the **Internet of Things** item in the left menu.



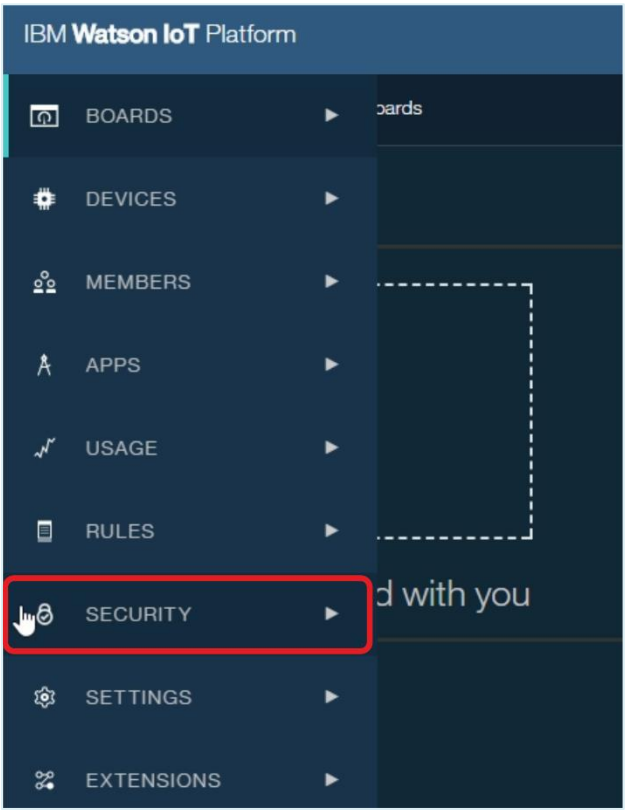
Click on the service which was created when you set up your cloud application.



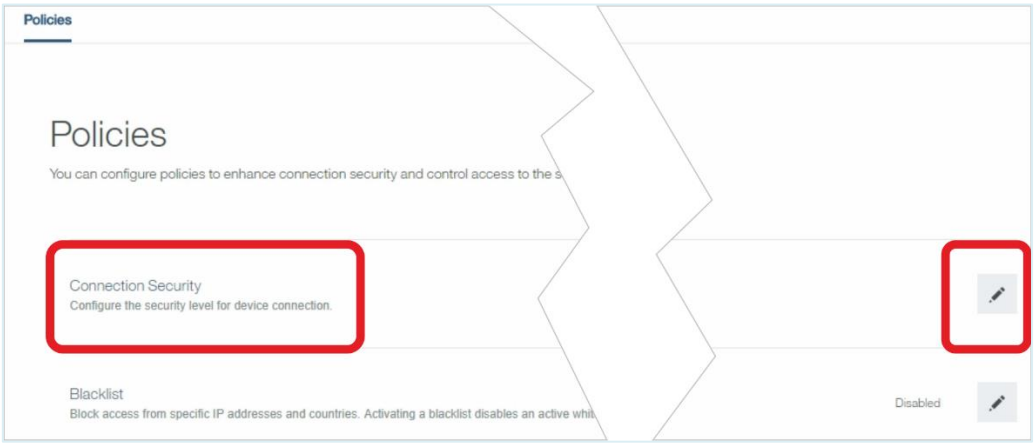
Launch the **Watson IoT platform**.

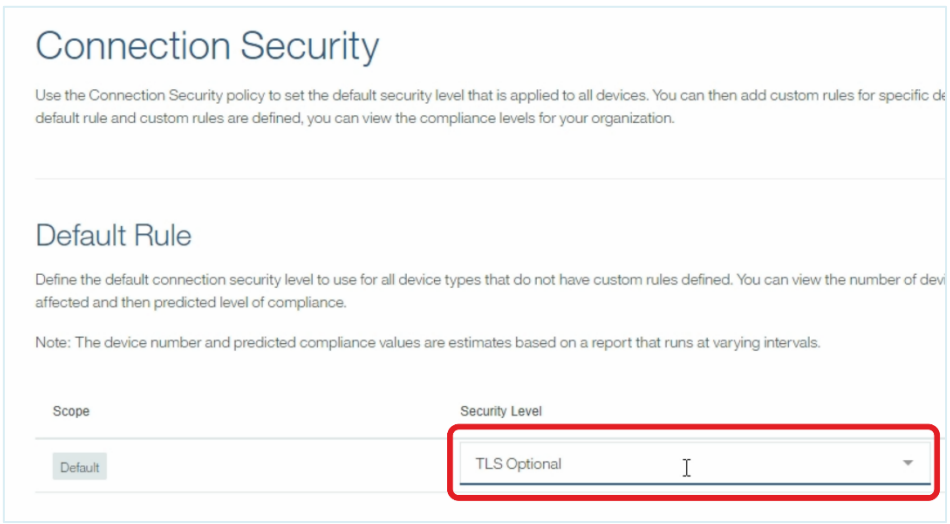


Click on the **Security** item in the left menu and check the connection security.

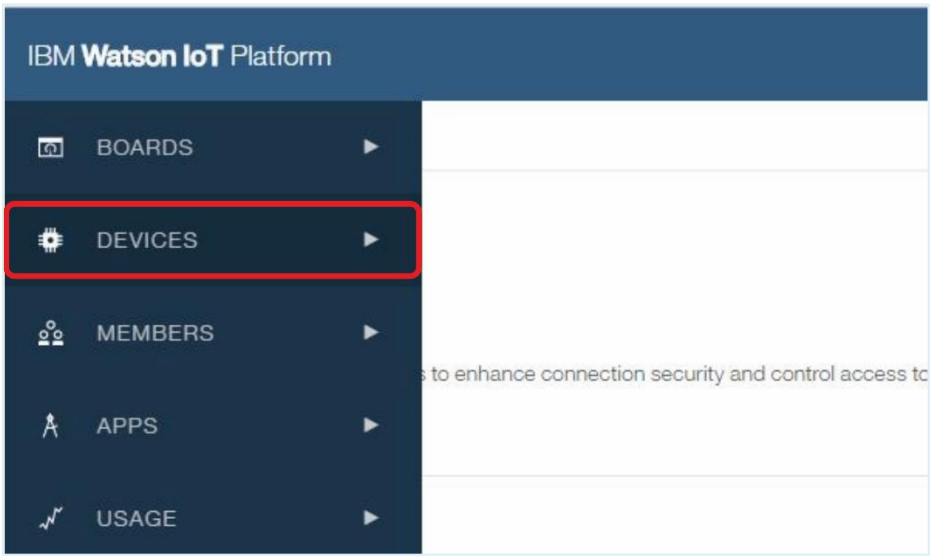


Set up the **Security** level. We have chosen the **TLS Optional**. Save the configuration.

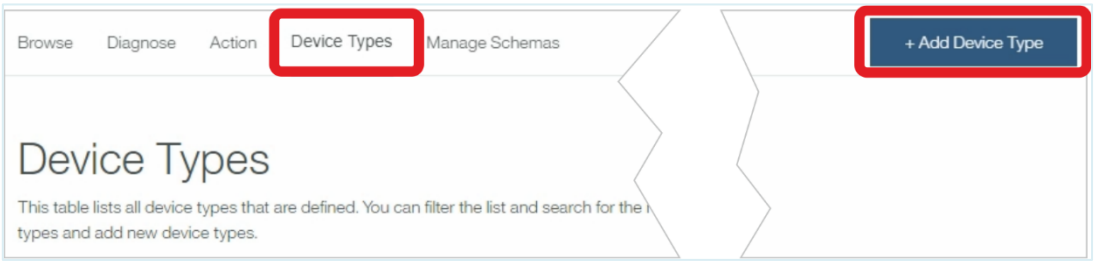




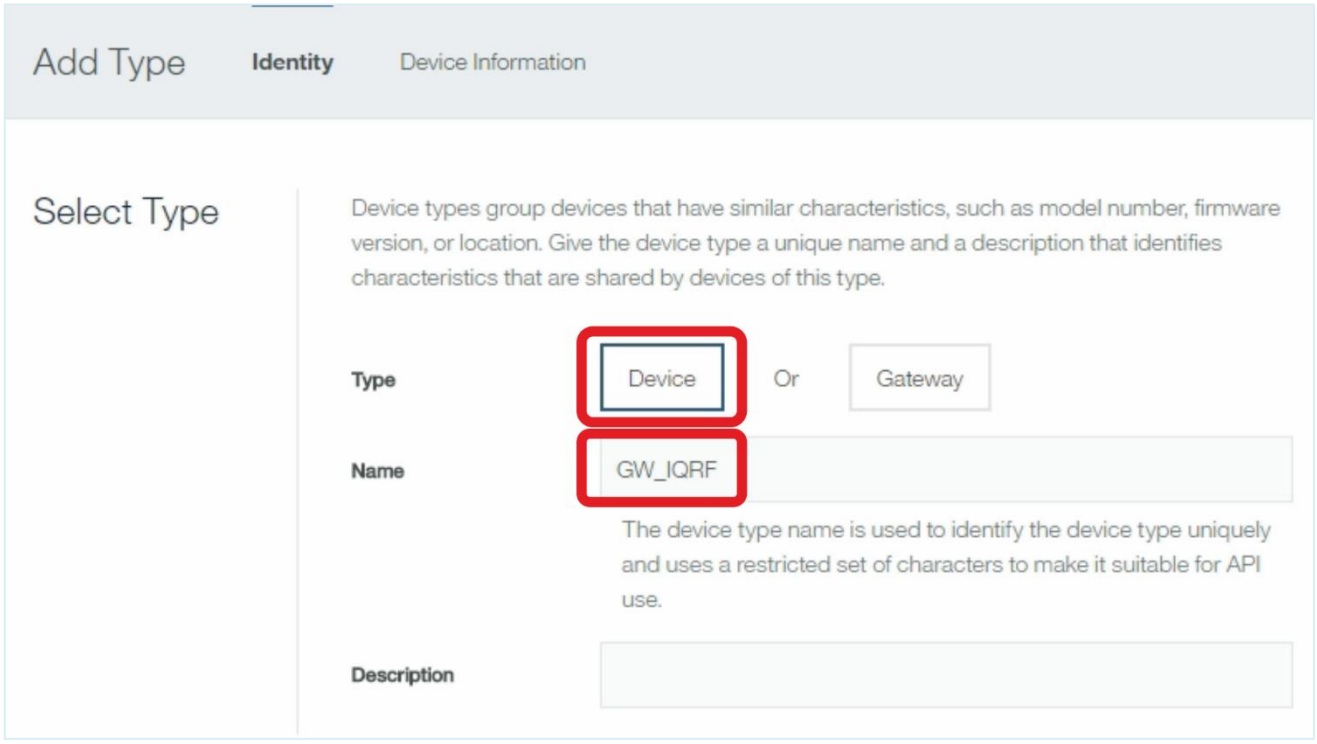
Click on the **Devices** item in the left menu.



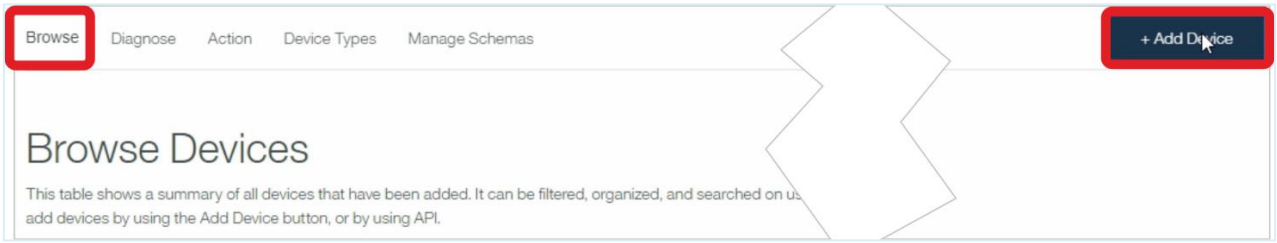
First, create the device type.



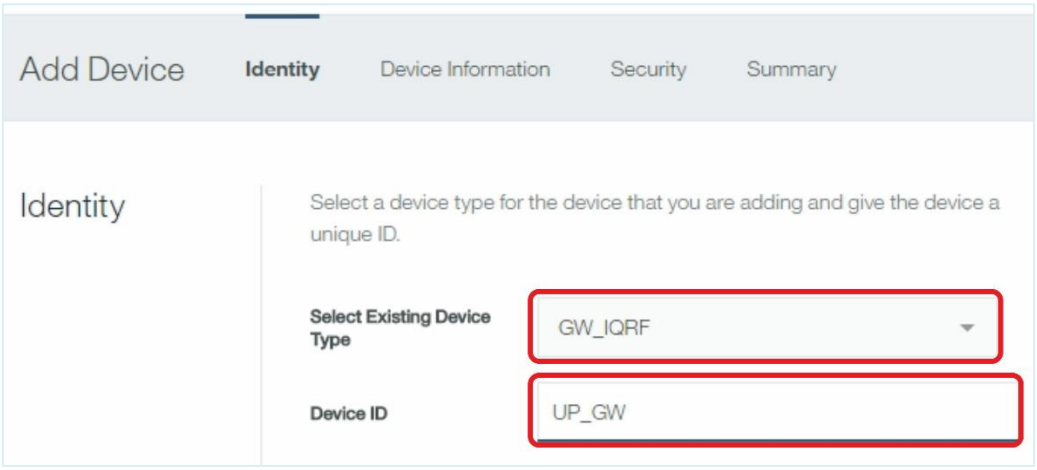
It's important to select the type "**device**". Then, fill in your name of the device type.



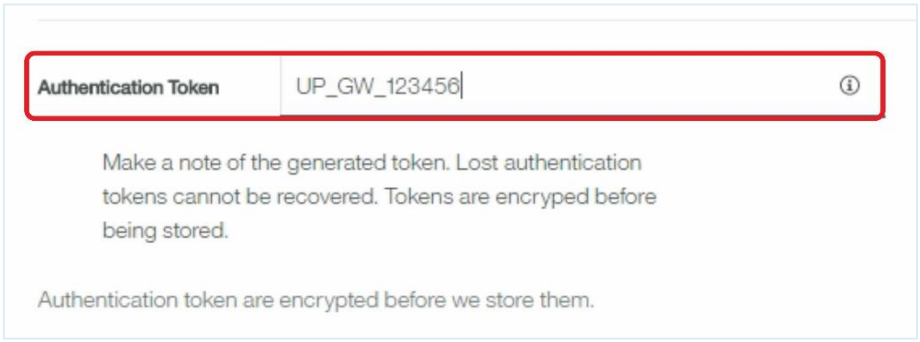
Click on the **Browse** menu. Create a new virtual device by clicking on **Add device**.



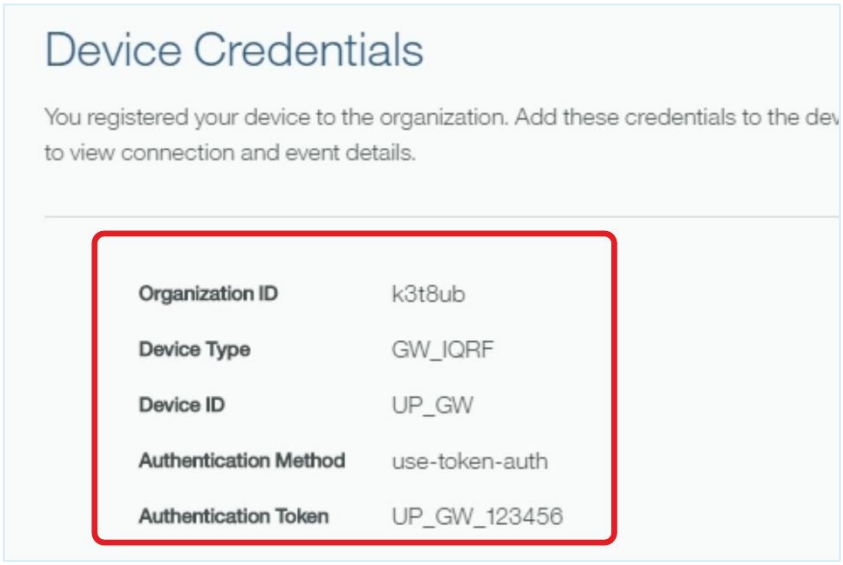
Select the **Device Type**, enter the **Device ID** and click on **Next**.



Fill in the **Authentication Token** and click on Next.

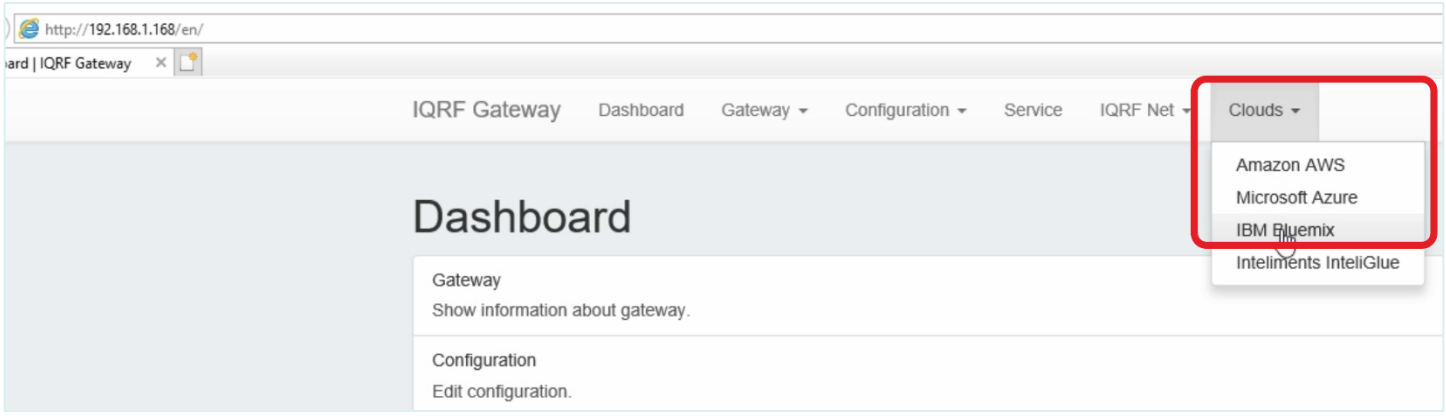


Copy the device credentials. You will use them in the next steps.

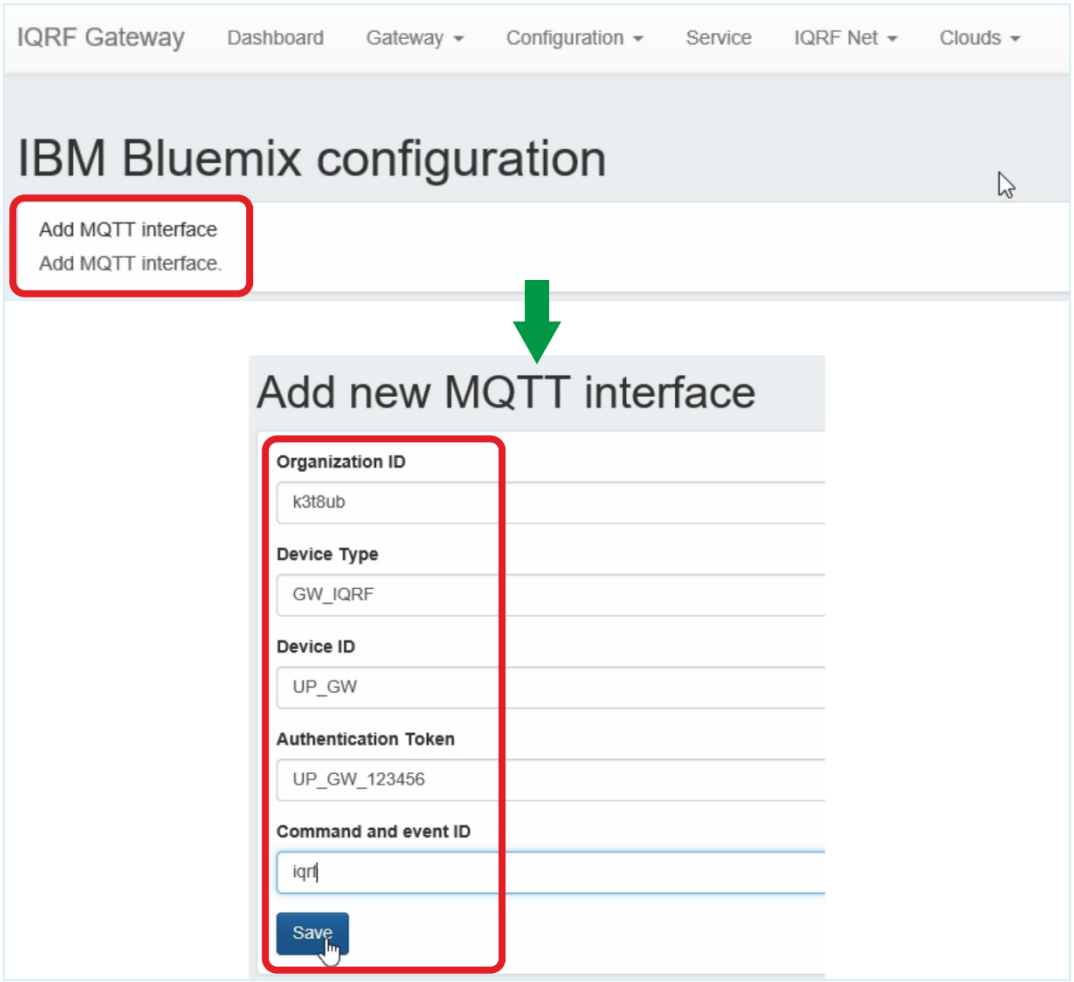


Configure MQTT channel on IQRF Gateway

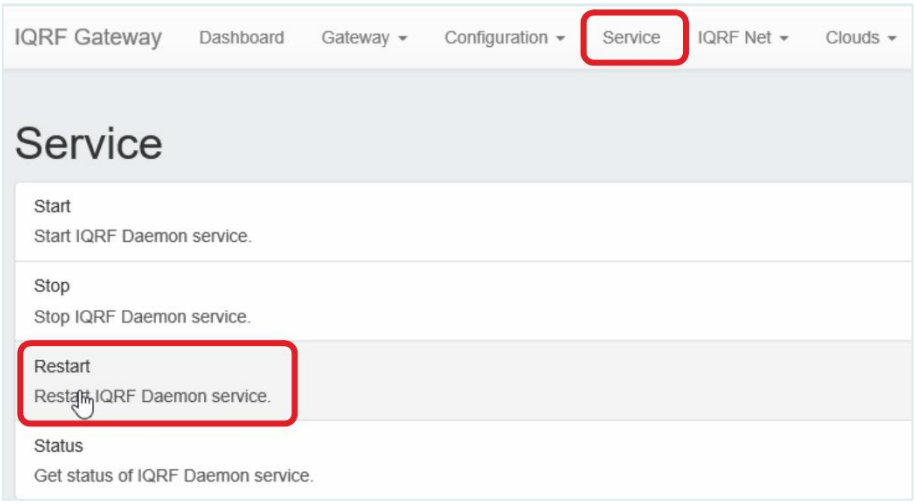
Configure the MQTT channel to IBM Cloud. Go to the IQRF Gateway Deamon web application and click on the **IBM Bluemix** in the **Clouds** menu.



Click on Add MQTT Interface, fill in the copied information about the virtual device in IBM Cloud and save the configuration.



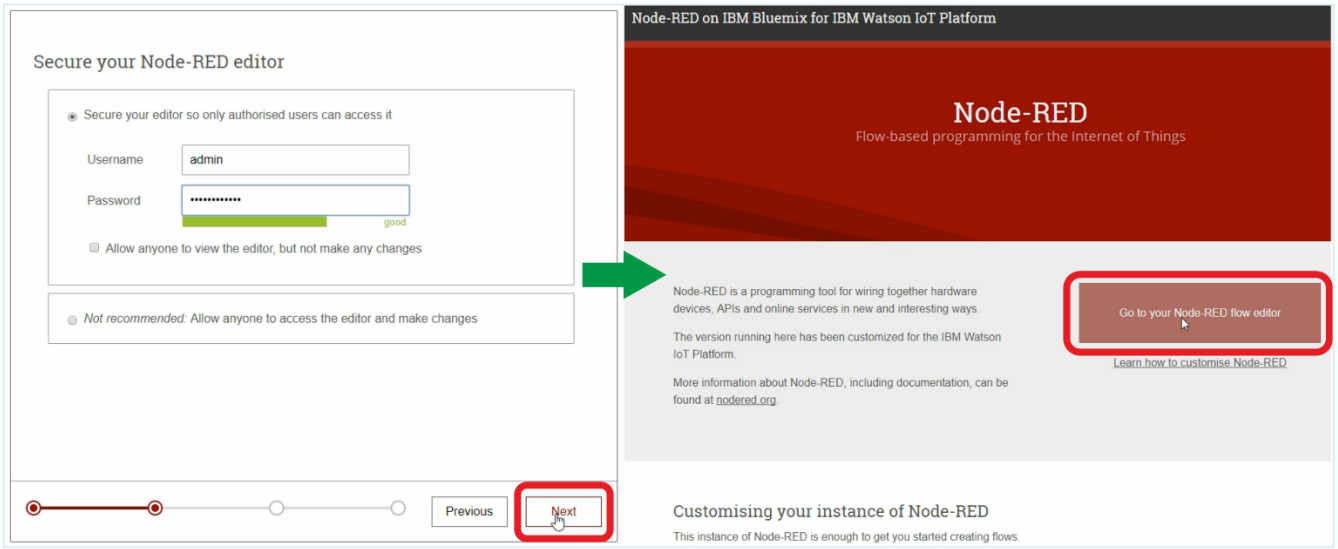
Restart the IQRF Gateway Daemon service.



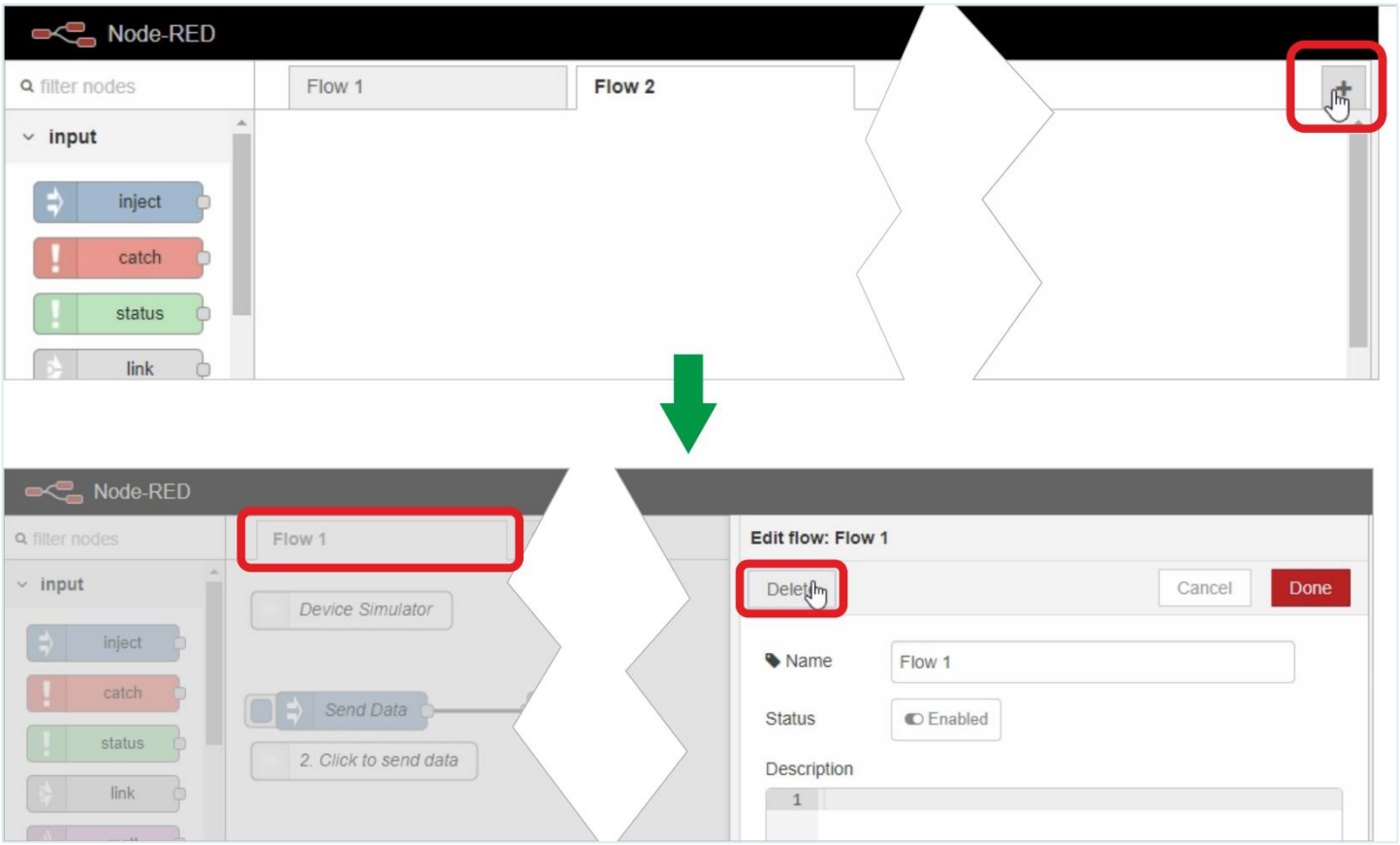
Node-RED

Find **Cloud Foundry Apps** in the **IBM Cloud** and check the status of your application. It should be running.

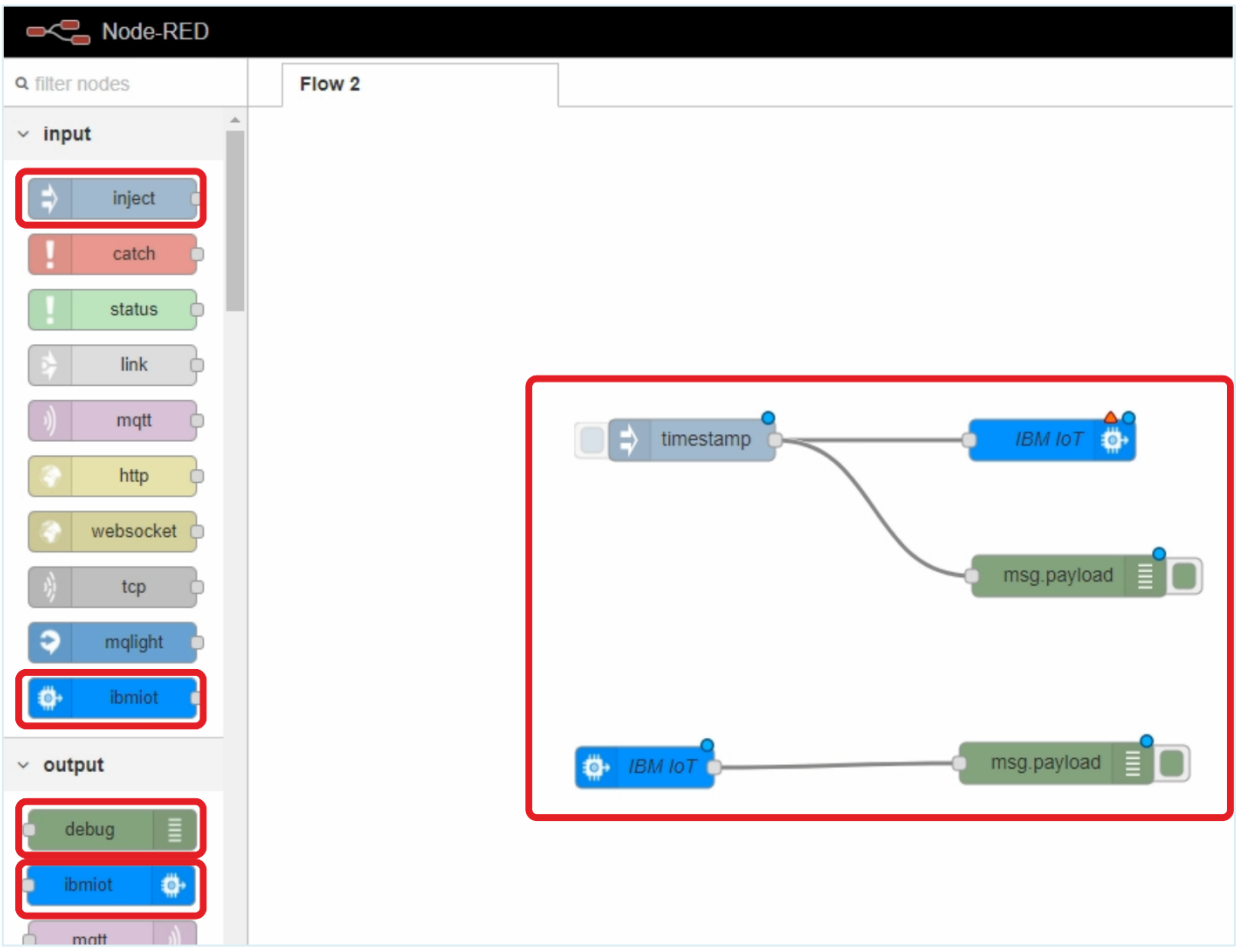
Click on the link of your web application. Go through the wizard and set up the **Node-RED** application. Go to your Node-RED flow editor and log in to it.



Create a **new flow** and **delete** the example. You will do it by double-clicking on the Flow 1 tab. Then press delete.

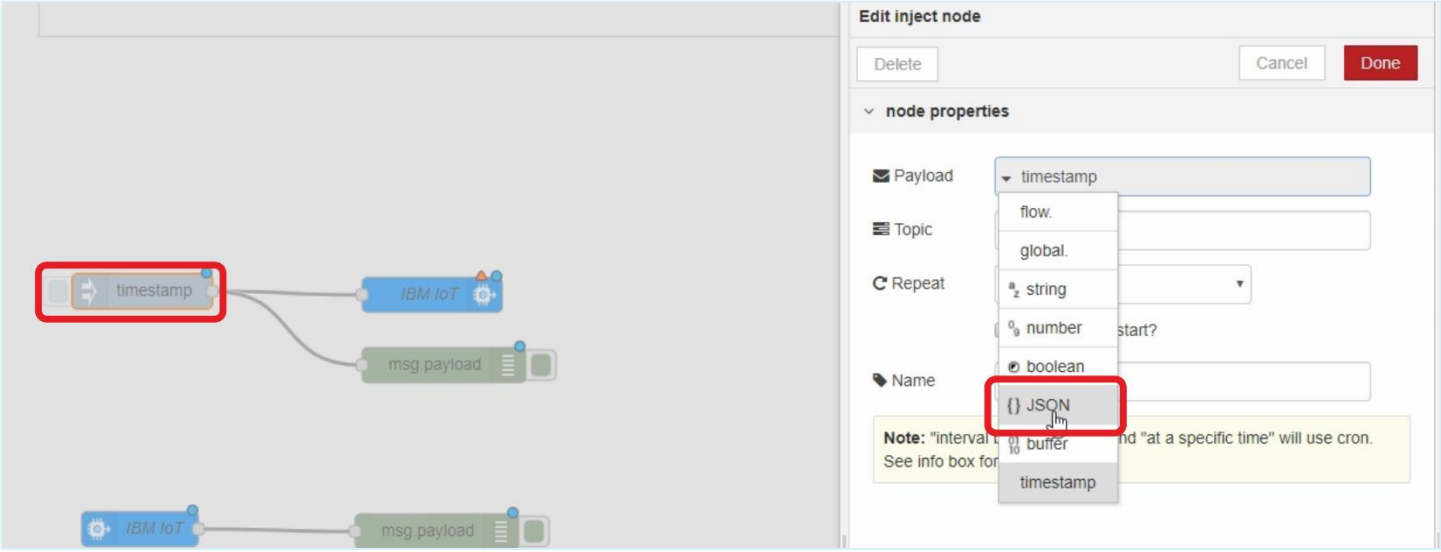


Insert **ibmiot input**, **ibmiot output**, two **debug outputs** and **inject input**. Connect the objects like this.



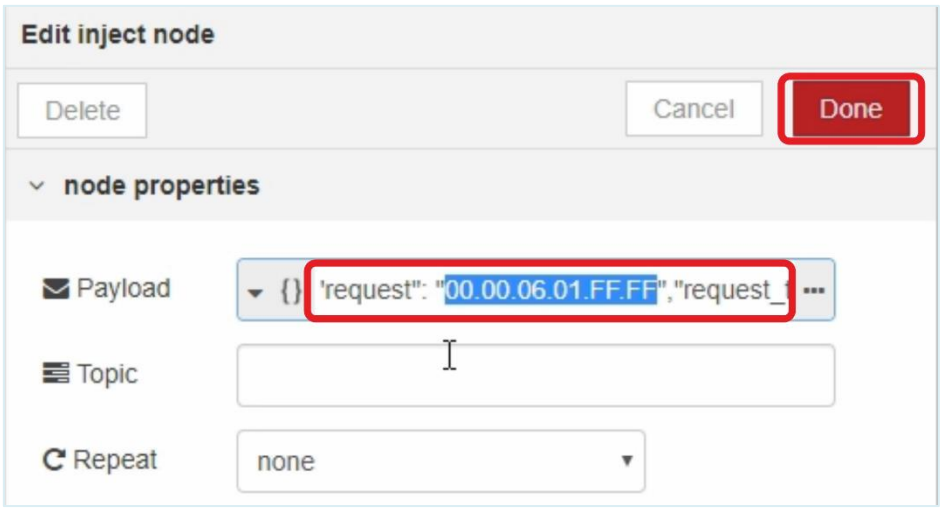
With the inject input we will send **DPA commands** to the MQTT broker on the IBM Cloud and from there our UP board will collect them. We will send the commands to the debug window as an output, as well. We will receive all messages from the MQTT broker and they will be displayed in the debug window.

Double-click on the **inject input**, change the payload type to JSON and insert here the DPA command in JSON format.

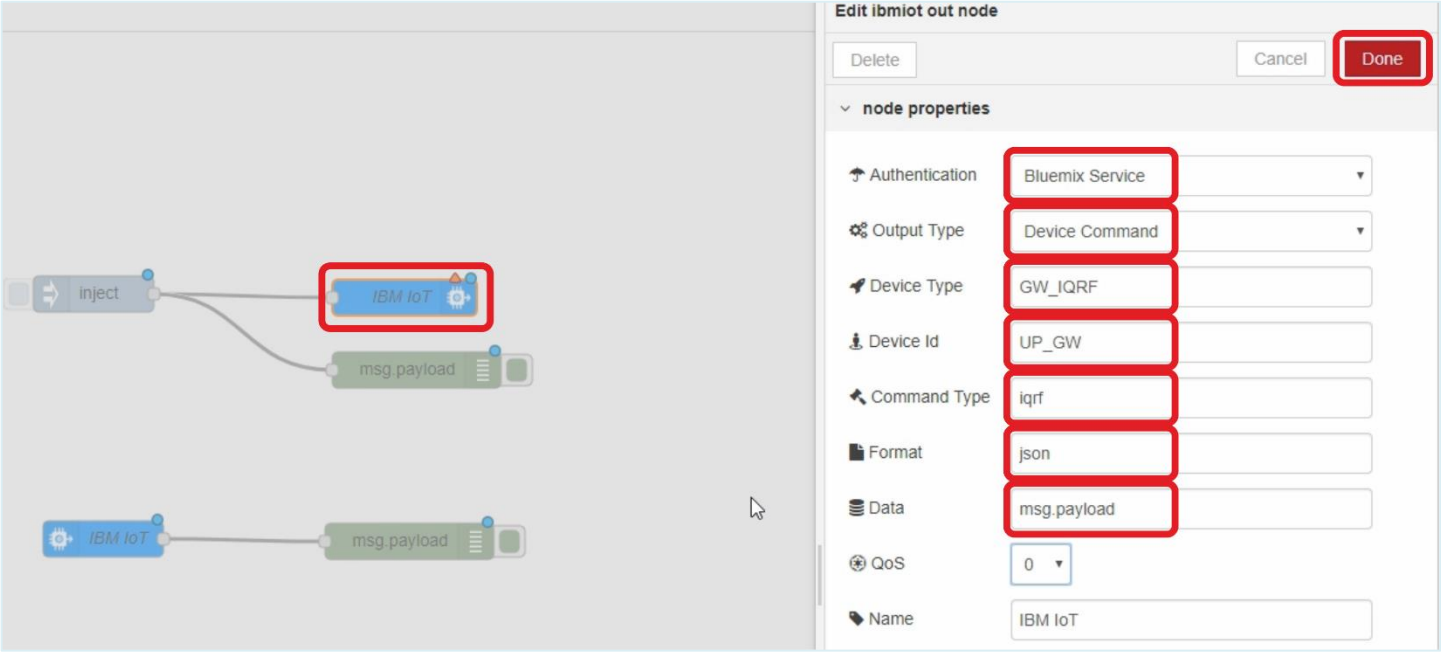


We use the command which will turn on the red LED on the IQRF coordinator. Click on **Done**.

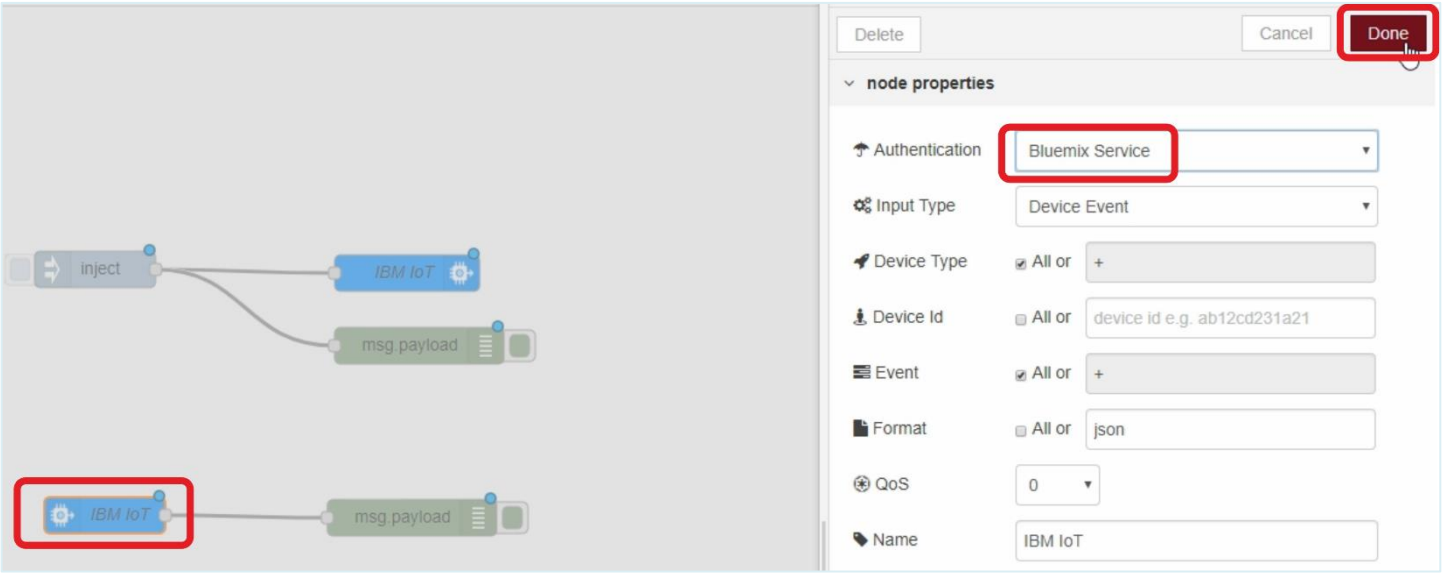

```
{
"ctype": "dpa",
"type": "raw",
"msgid": "1510754980",
"request": "00.00.06.01.FF.FF",
"request_ts": "",
"confirmation": "",
"confirmation_ts": "",
"response": "",
"response_ts": ""
}
```

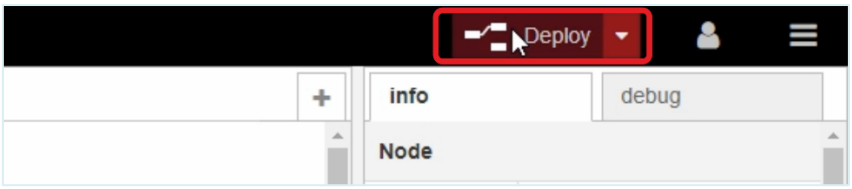
Click on the **ibmiot output**. Change the authentication **to Bluemix service**, set the output type to **Device** command, and fill in the information of your virtual device you have created earlier. Enter "**iqrf**" as the command type. Enter "**msg.payload**" as the Data and click on **Done**.



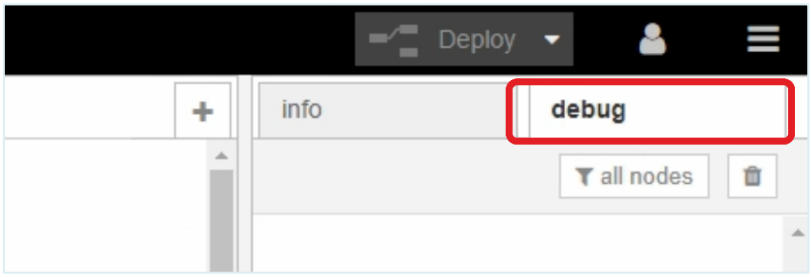
Click on the **ibmiot input** and select **Bluemix service** as the authentication type. **Save** the configuration.



Click on the **Deploy** button.

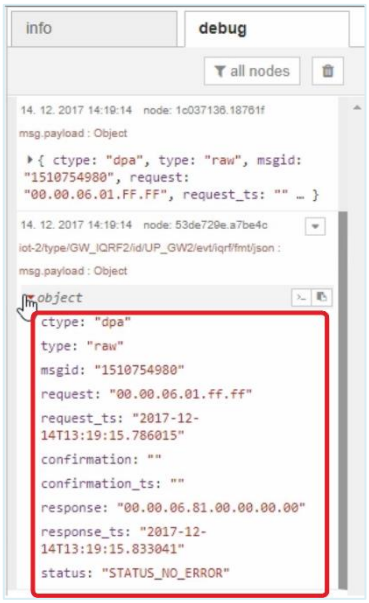


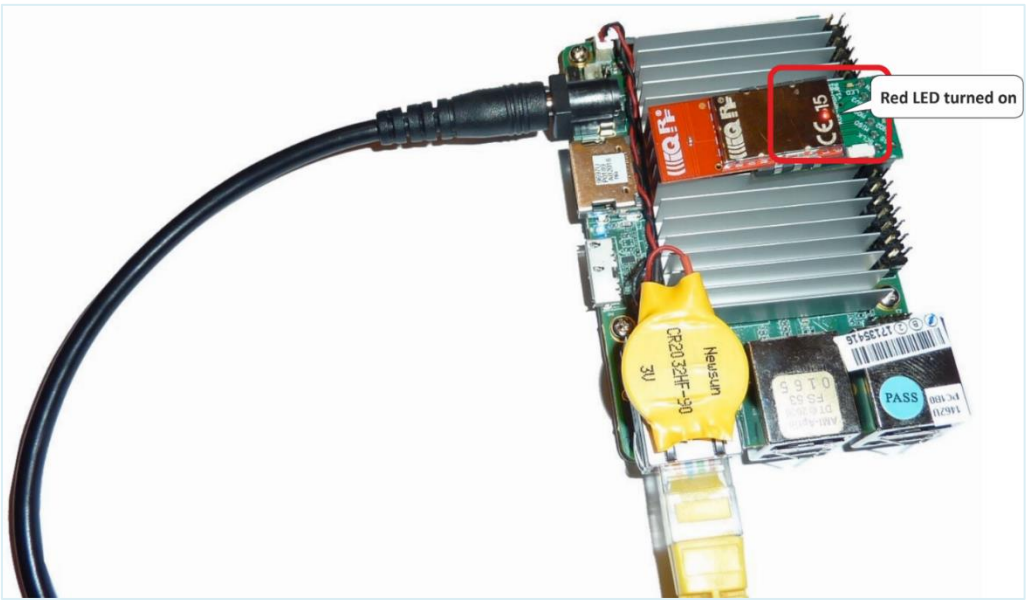
Show the **Debug** tab.



Click on the left corner of the **Inject** button. You will send the prepared command to the MQTT broker and to the debug output as well.

In the **Debug** tab, you can see the ongoing communication between IBM Cloud and the UP board. You can easily double check that the command has been executed.





In the same way, you can turn the red LED off as well as send any other DPA command to your network.