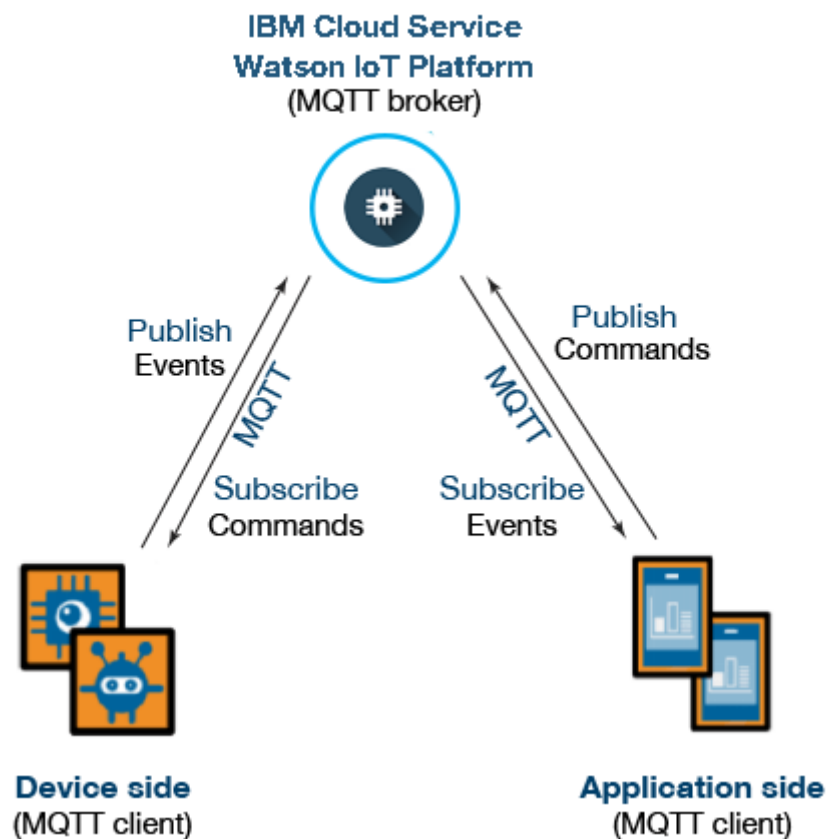


IBM WATSON IOT

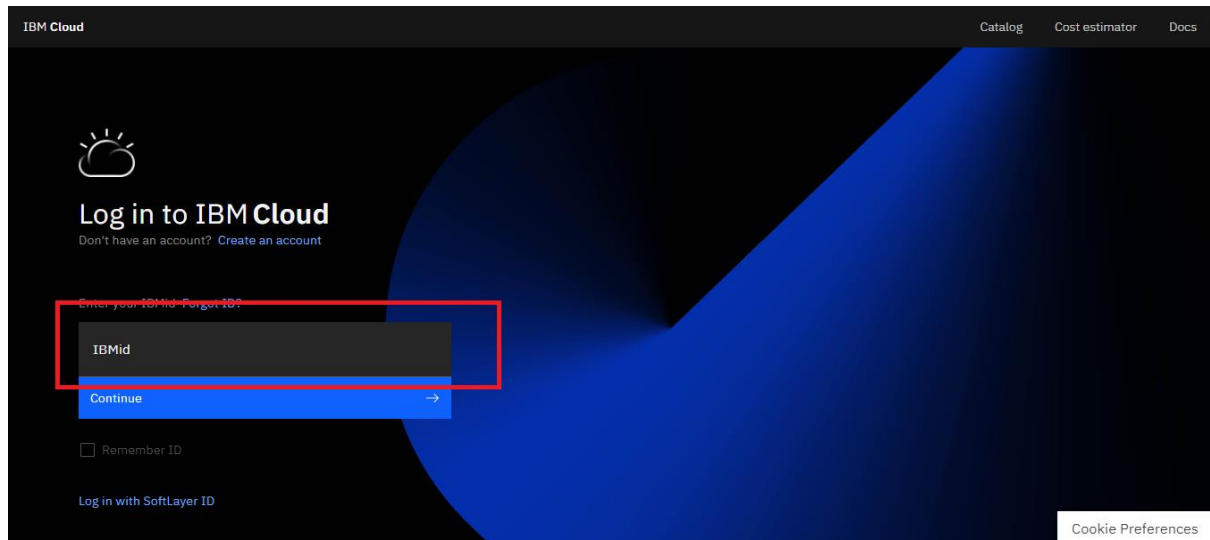
IBM WATSON iot platform is cloud-hosted service that is designed to simplify and derive the value from your IoT devices. Using their device management service, we can perform device actions like rebooting or updating firmware, receive device diagnostics and metadata, or perform bulk device addition and removal. They use an industry-standard MQTT protocol. First of all, we need to have an iot console for the communication with ESP8266. Lets have a look on it:



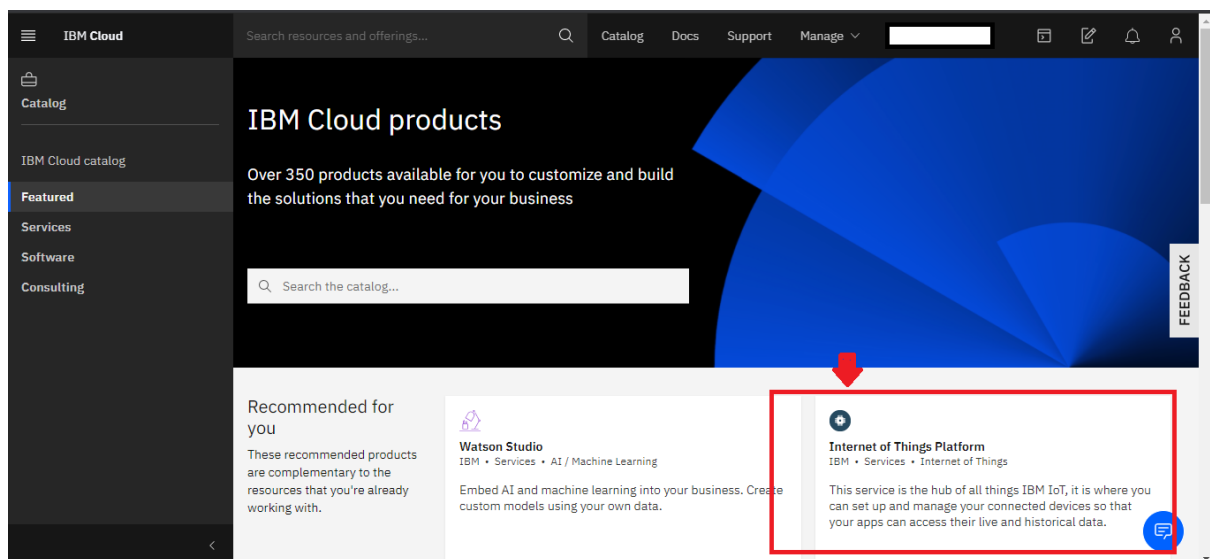
We actually using a single side in it. The **device side**.

For login: <https://cloud.ibm.com/login>

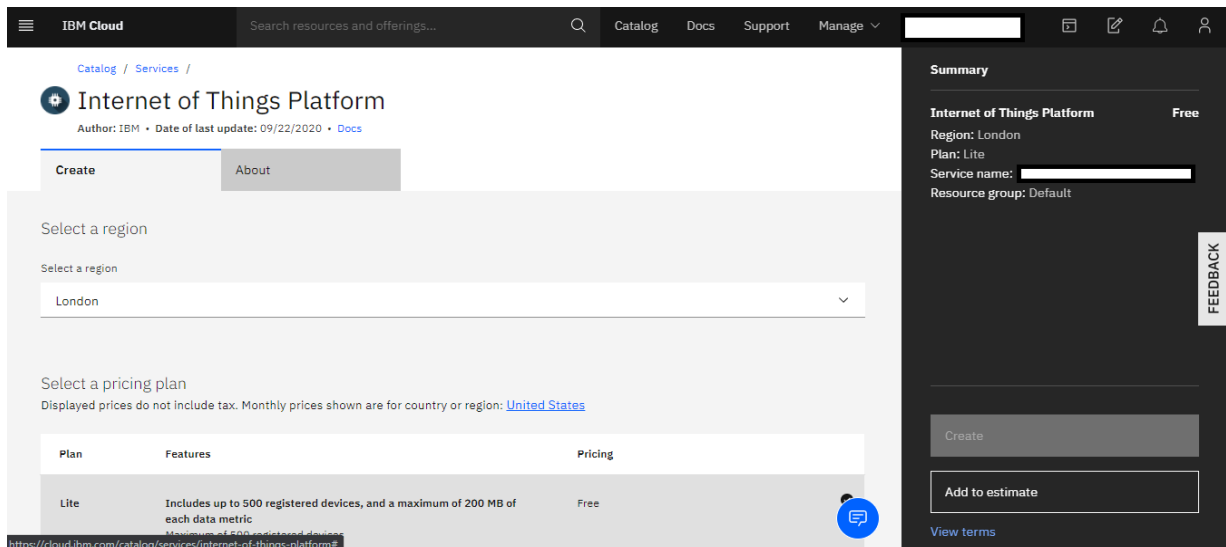
1. Enter your ibm id and password for logging in.



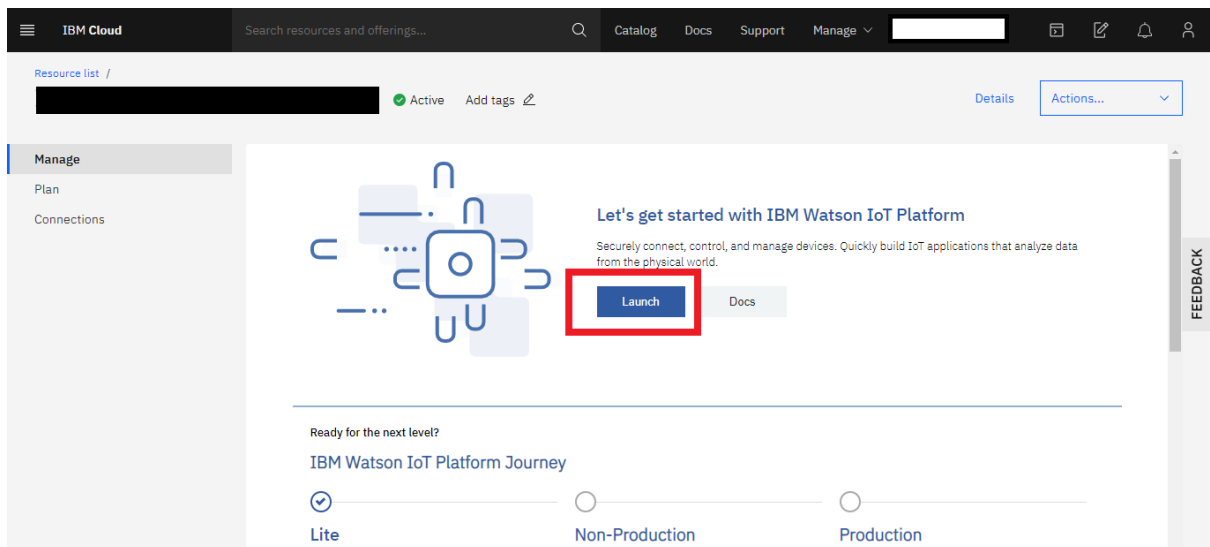
2. Click on **create resources** + button from the upcoming window and search **for internet of things** in it and, you will see a window like this and click on **internet of things**.



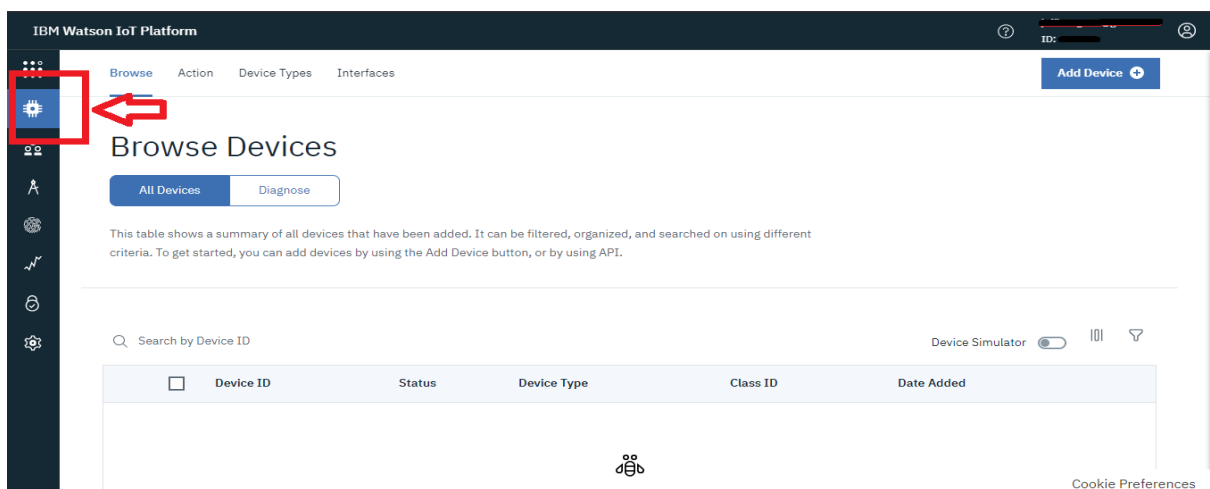
3. On next page there are some pre-filled information, leave that information as it is and click on **Create** button on right side of summary window. I have a free plan and my service name is default name in it.



4. In this page click on the **launch** button for initiating the cloud console.



5. Now the page redirected to Internet of things page. Click on **Bluemix id** or click on the **devices** button as shown in picture for device to add and connect with cloud service. And click **Add Devices +** in it.



6. Provide a **Device Type** name as your wish and **Device ID** (MAC ID of your device) in the window. And click **next**.

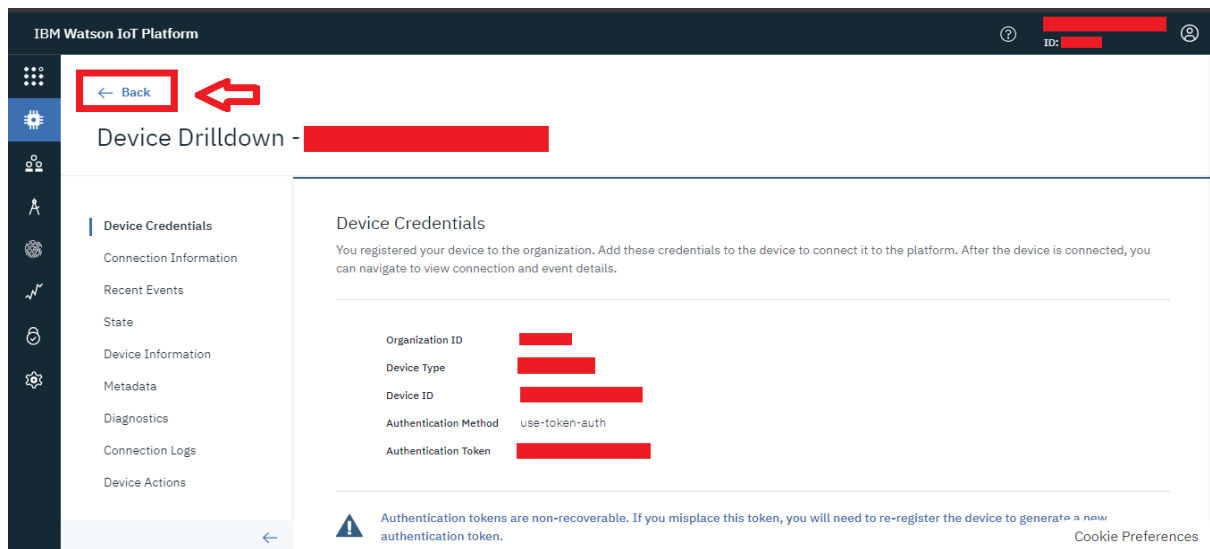
The screenshot shows the 'Add Device' wizard in the IBM Watson IoT Platform. The 'Identity' step is active, indicated by a blue circle and a blue underline. The progress bar shows four steps: Identity, Device Information, Security, and Summary. Below the progress bar, the text reads: 'Select a device type for the device that you are adding and give the device a unique ID.' There are two input fields: 'Device Type' and 'Device ID'. Both fields contain redacted information (red bars) and have red arrows pointing to them. At the bottom right, there is a 'Cancel' button and a 'Next' button (partially visible). A 'Cookie Preferences' link is also present.

7. Leave that information unfilled and click on **next**. Same for **Security** section, leave it unfilled and You don't have to generate token, it will be generated automatically (**default settings**). Now you can see a page device type and device id information that you have given. And click **next**.

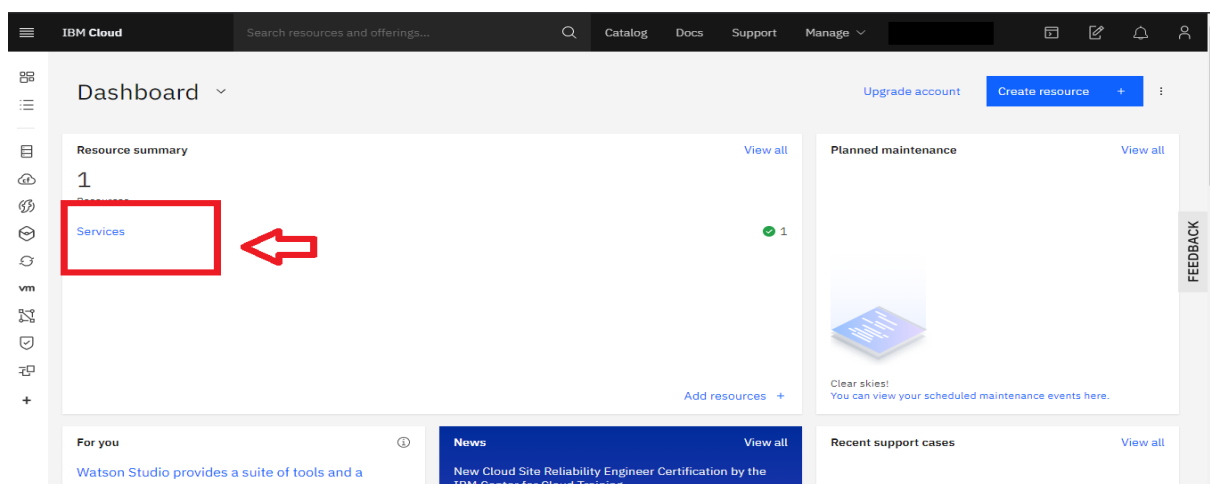
The screenshot shows the 'Add Device' wizard in the IBM Watson IoT Platform. The 'Device Information' step is active, indicated by a blue circle and a blue underline. The progress bar shows four steps: Identity, Device Information, Security, and Summary. Below the progress bar, the text reads: 'Verify that the following information is correct then select Finish'. There are two input fields: 'Device Type' and 'Device ID'. Both fields contain redacted information (red bars). Below these fields is a 'View Metadata' button. Below the button, the text reads: 'Security Token To be generated'. At the bottom right, there is a 'Back' button and a 'Next' button (partially visible). A 'Cookie Preferences' link is also present.

8. In the next page we can see a summary & credentials of our account that we have created. Which is very useful in connecting the ESP8266 with IBM WATSON IOT. **Organization ID (Bluemix ID)**,

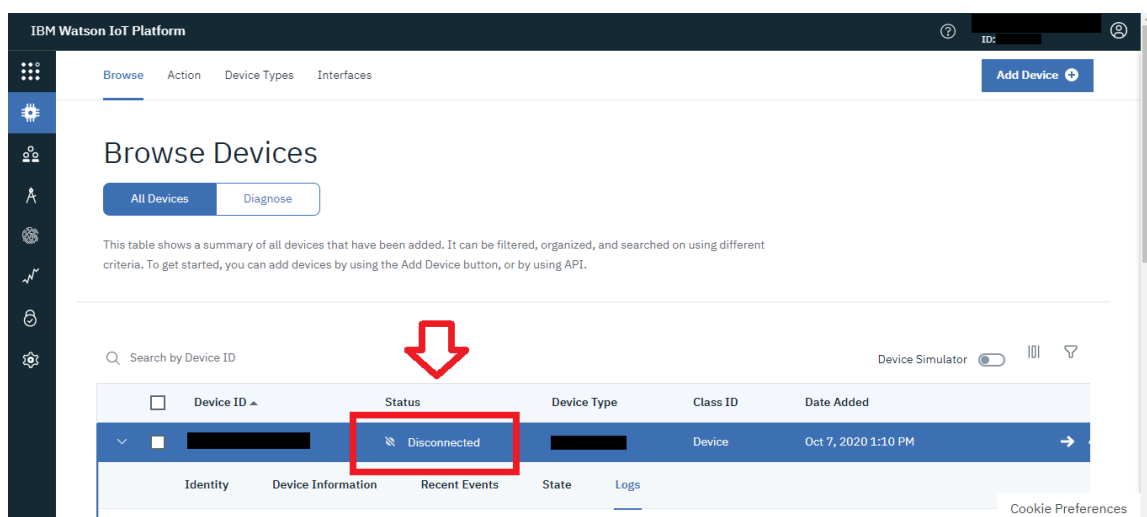
Device type and ID, Authentication token and method, are very useful So please note down. You can use while you are uploading the code. Click **back**.



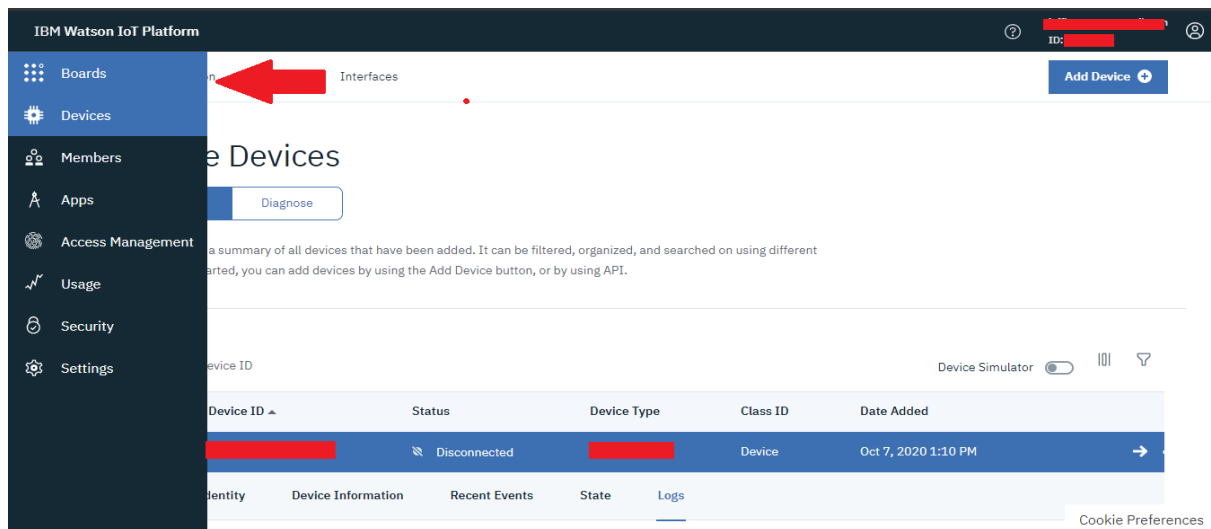
9. In the **dashboard** of IBM cloud console and there we can see the added service in it. Click on the added service to know more about it.



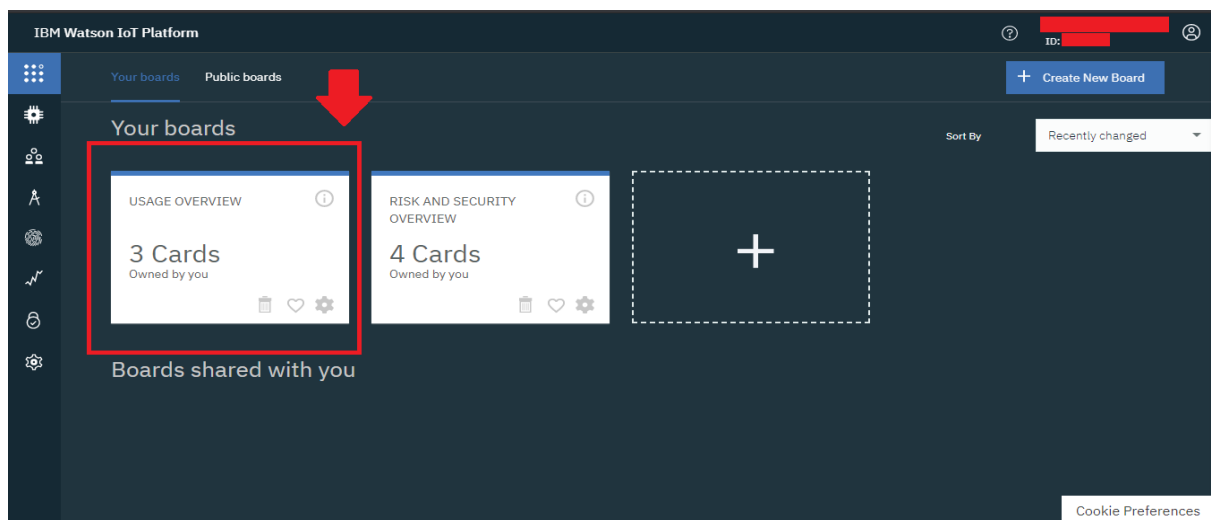
Connection status can be seen in here: when **ESP8266** connected it indicates the **"connected"** status



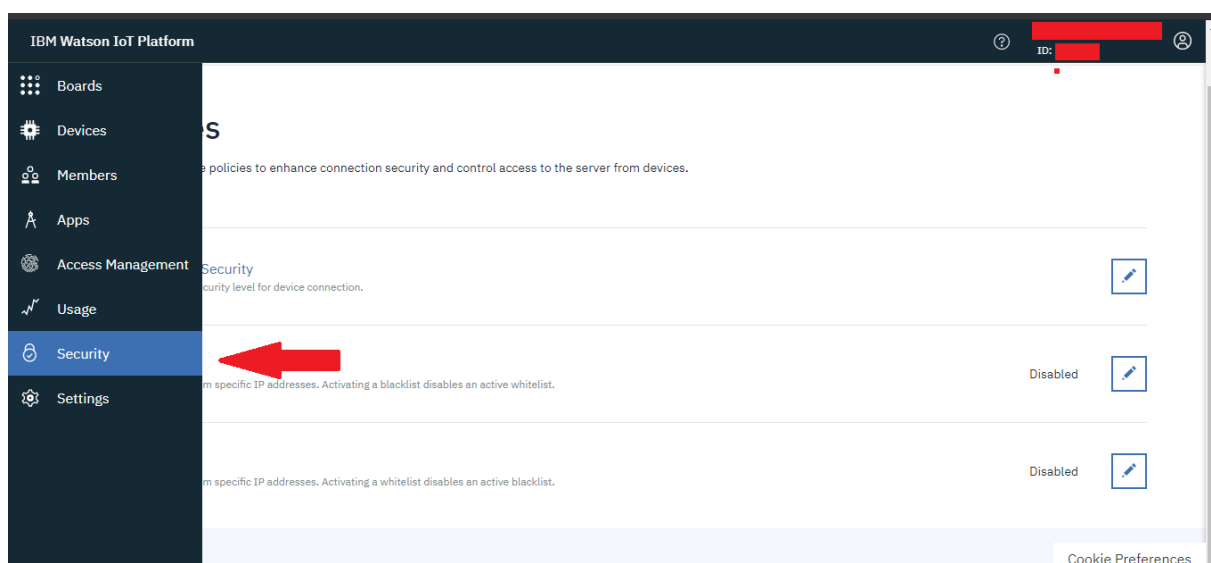
10. Click on **boards** for viewing **boards shared with us**:



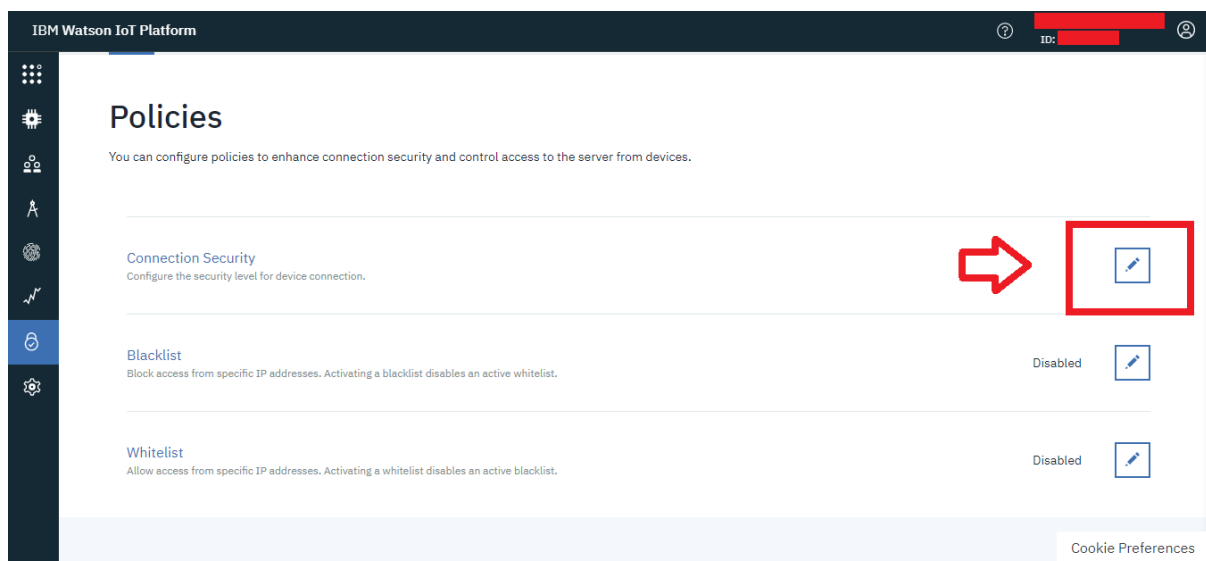
There we can see the different board customize option on **add new card** along with default boards.



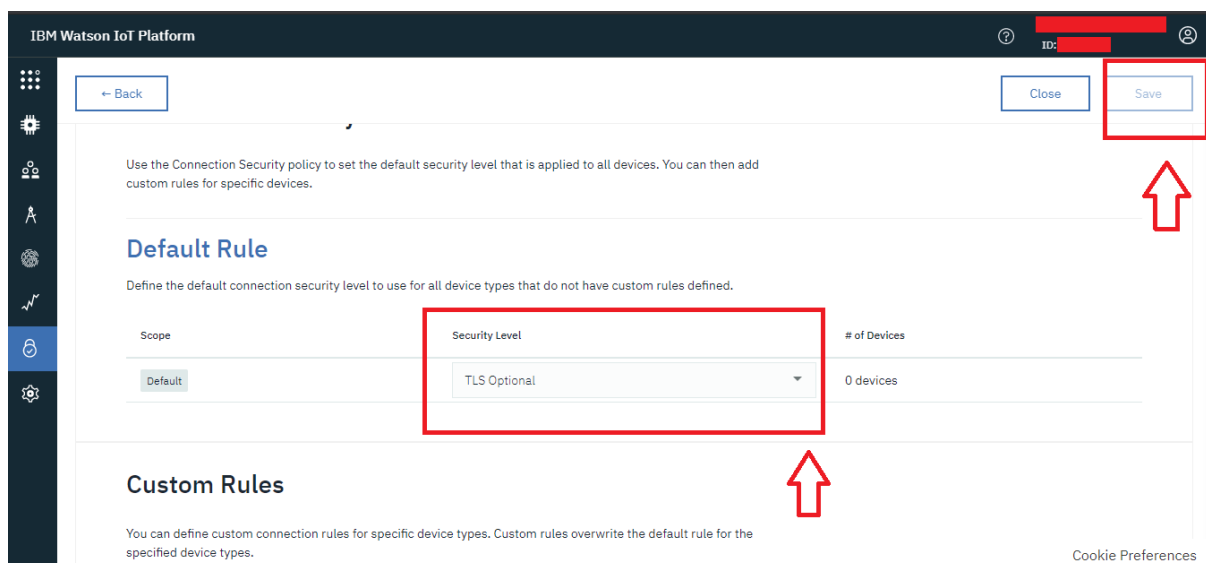
11. Click on **security** options for configuring the secure connection mode with devices.



12. Select first option **connection security** in it.



Select the security level as **TLS optional** and click **save** on above option.



Now the connection parameters and all others are sets up. Now we have only two more sections one is **subscribing message** indication and **credential configurations** on **source code/repo**. We can demonstrate the subscribing message by the editing of **metadata** section.

SOURCE CODE CONFIGURATIONS:

13. Credential configurations are in *global.h* and *ibm.cpp*

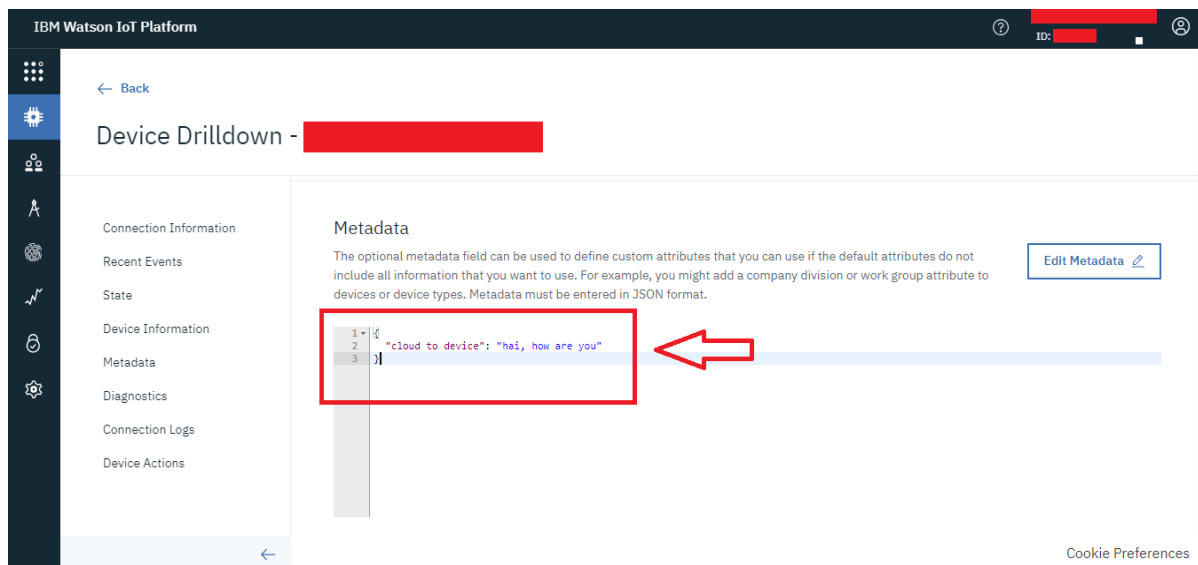
```
IBM_WATSON_IOT  global.h  ibm.cpp  ibm.h  random.cpp  random.h
1  #ifndef __GLOBAL_H
2  #define __GLOBAL_H
3
4  #define WLAN_SSID "YOUR SSID"
5  #define WLAN_PASS "YOUR PASSWORD"
6
7  #endif
```

Provide your *ssid* and *password* of WIFI router here.

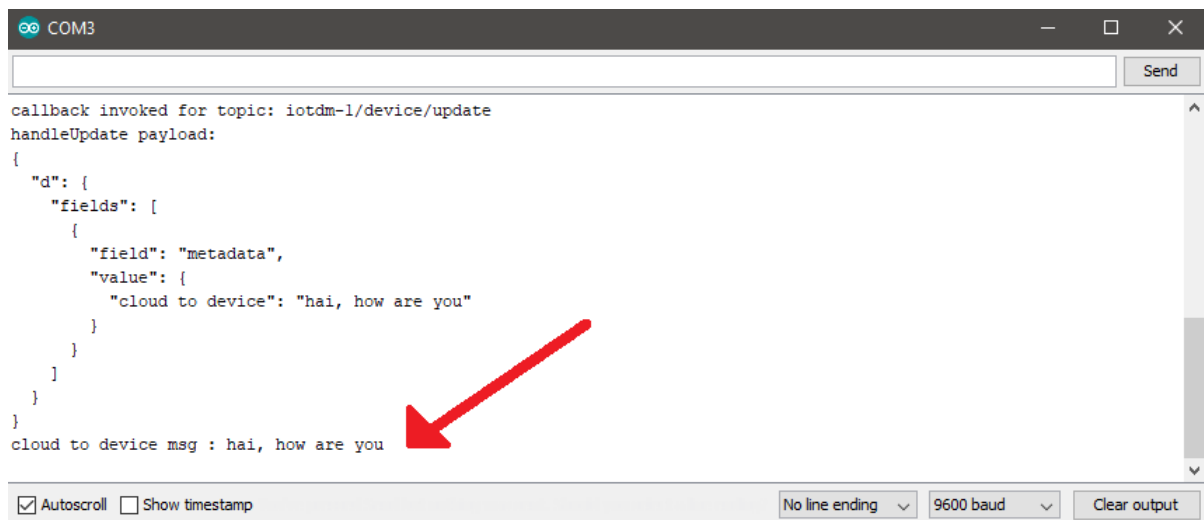
```
IBM_WATSON_IOT  global.h  ibm.cpp  ibm.h  random.cpp  random.h
1  #include <ESP8266WiFi.h>
2  #include <PubSubClient.h>
3  #include <ArduinoJson.h>
4  #include "ibm.h"
5
6  /*++++++ IBM_WATSON credential & parameters ++++++*/
7  #define ORG          "Bluemix id"
8  #define DEVICE_TYPE  "IBM DEVICE TYPE"
9  #define DEVICE_ID    "IBM DEVICE_ID"
10 #define TOKEN        "IBM TOKEN"
11
12 char server []      = ORG ".messaging.internetofthings.ibmcloud.com";
13 char authMethod[]   = "use-token-auth";
14 char token []       = TOKEN;
15 char clientId []    = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
```

Please enter **Organization ID (Bluemix ID)**, **Device type and ID**, **Authentication token** here from step 8. Don't change any other options below it.

14. Change the metadata string by clicking on the **Edit metadata** option on top. And change the string from **PublishInterval(default)** to **cloud to device** and mention your **data** part to be send from cloud to device(ESP8266) in that double quotes on right. Here my data part to be sends to ESP8266 is **"Hai, how are you"**. And click **save** below it for sending to device.



The serial output can be seen in real time when we click **save** from above window. Use baud rate of 9600 to listen, and a led blink will happen in each time when the cloud message **subscribed**. Output can see in below with red arrow.



If you want to **publish** the data, just type **send** in serial window and click **"send"** button. You can see the output on serial window with **"Publish OK"** message.

