

IBM workshop

Prototyping with Node-Red

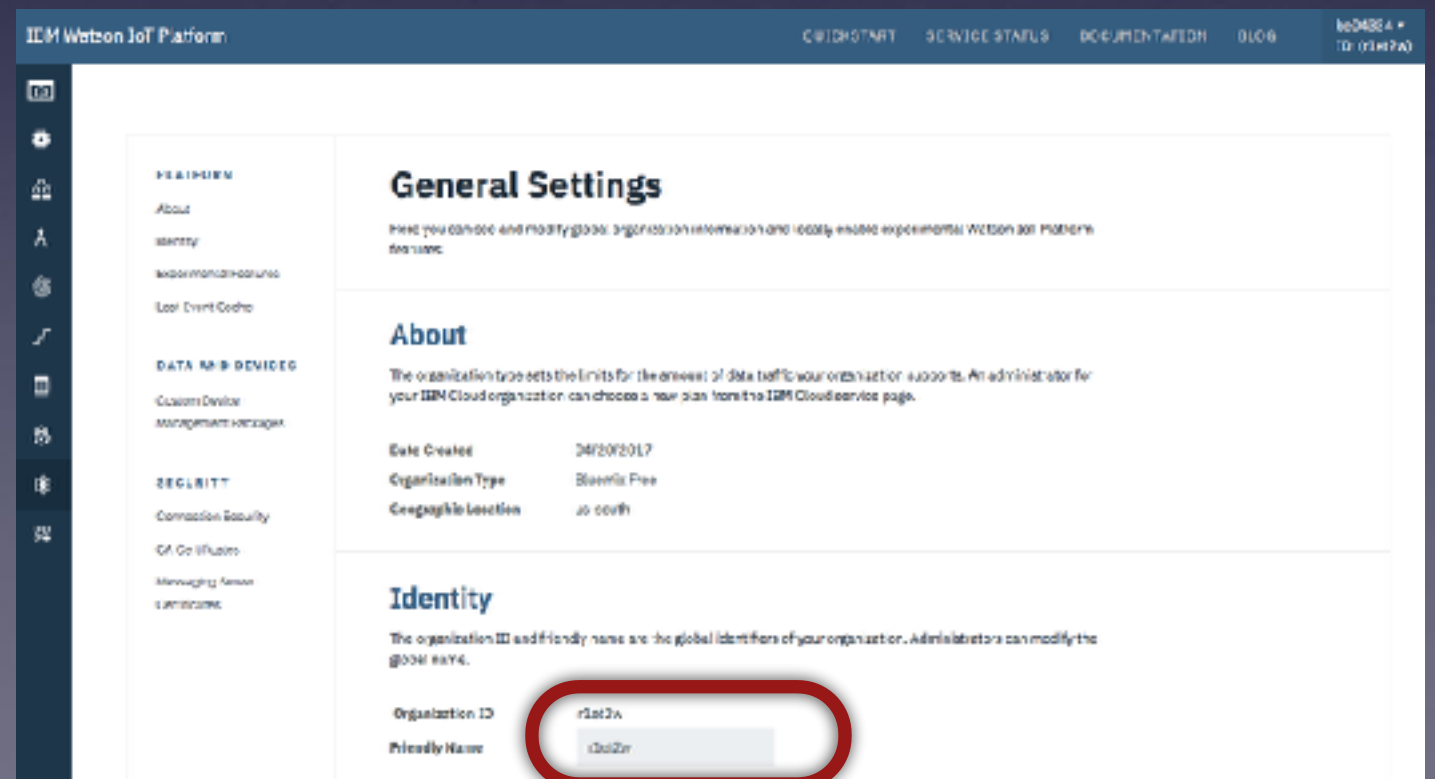
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Create a Watson IoT boilerplate in IBM Cloud

- Goto the IBM Cloud catalog
- Select the “Internet of Things Platform Starter” boilerplate - give it a unique Name - CREATE - and be patient while your application is restaging...

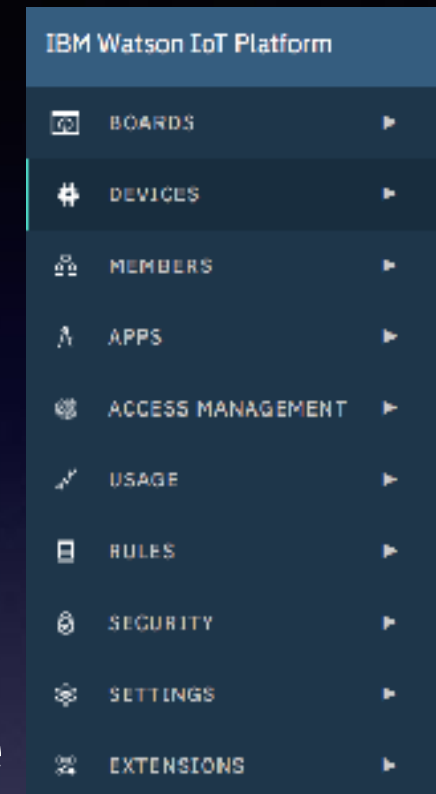
Create a Watson IoT boilerplate

- Select the created IoT service and click “Launch” - button
- Check configuration settings and note the Organisation ID



Add device to the Watson IoT platform

- Goto DEVICES and create a new Device type e.g. ESP8266
- Goto “Browse” and add a new device
- Add a Device ID e.g. 5ecf7f0c4770 (Mac ID)
- Provide a token or have the system generate one for you (take note !)



Temperature and humidity monitoring - Setup

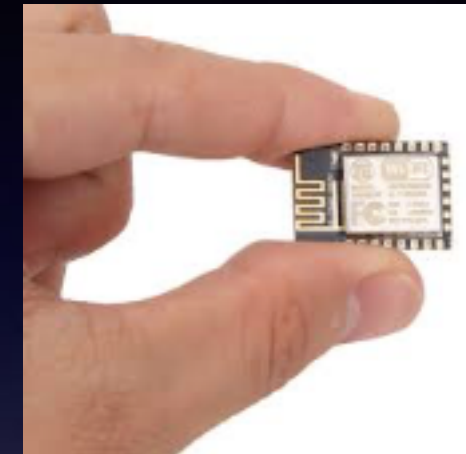
- Hardware :

- Nodemcu - ESP8266 Hardware

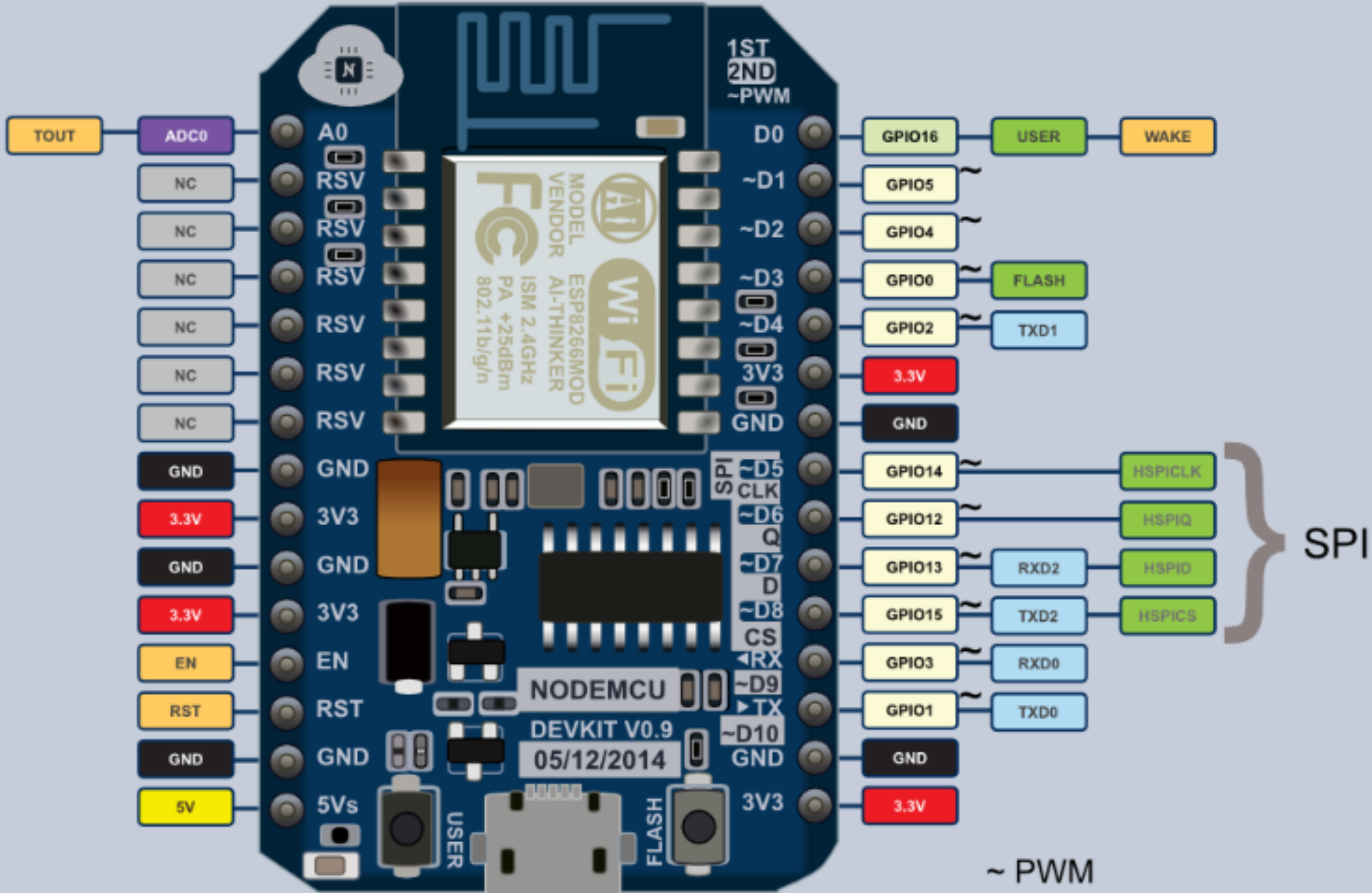
- 3.3V device - WiFi 802.11 b/g/n 2.4 Ghz
 - RAM 64Kb, DRAM 96Kb, 64Kb boot ROM, 4Mb Flash
 - Timers, deep sleep mode
 - Peripherals...
 - GPIO (up to 16), PWM, ADC (1)
 - UART, I2C, SPI

- More details -> <https://github.com/esp8266/esp8266-wiki/wiki>

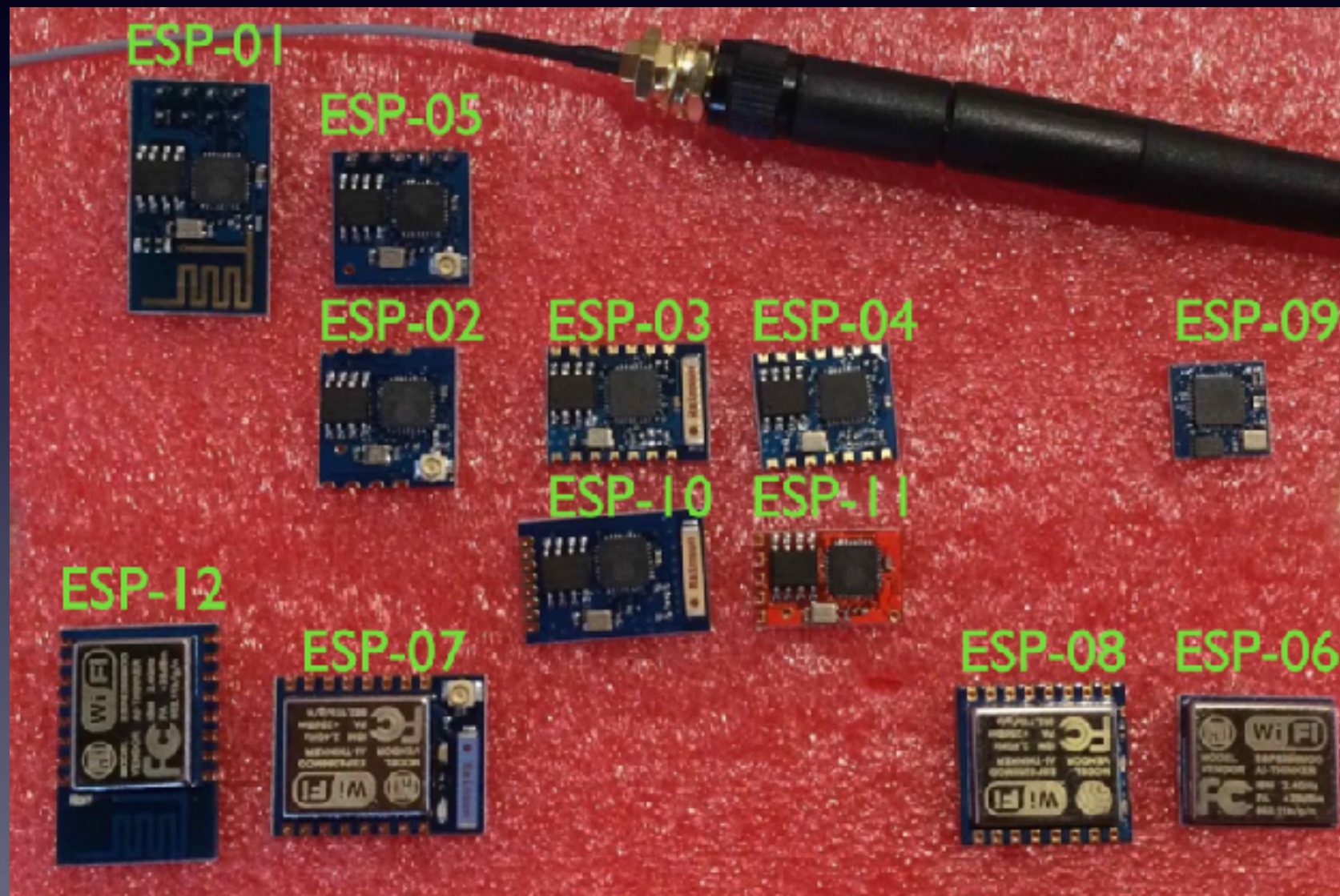
- <http://www.instructables.com/id/Get-Started-with-ESP8266-Using-AT-Commands-NodeMCU/>



The NODEMCU Development kit



ESP-xx modules



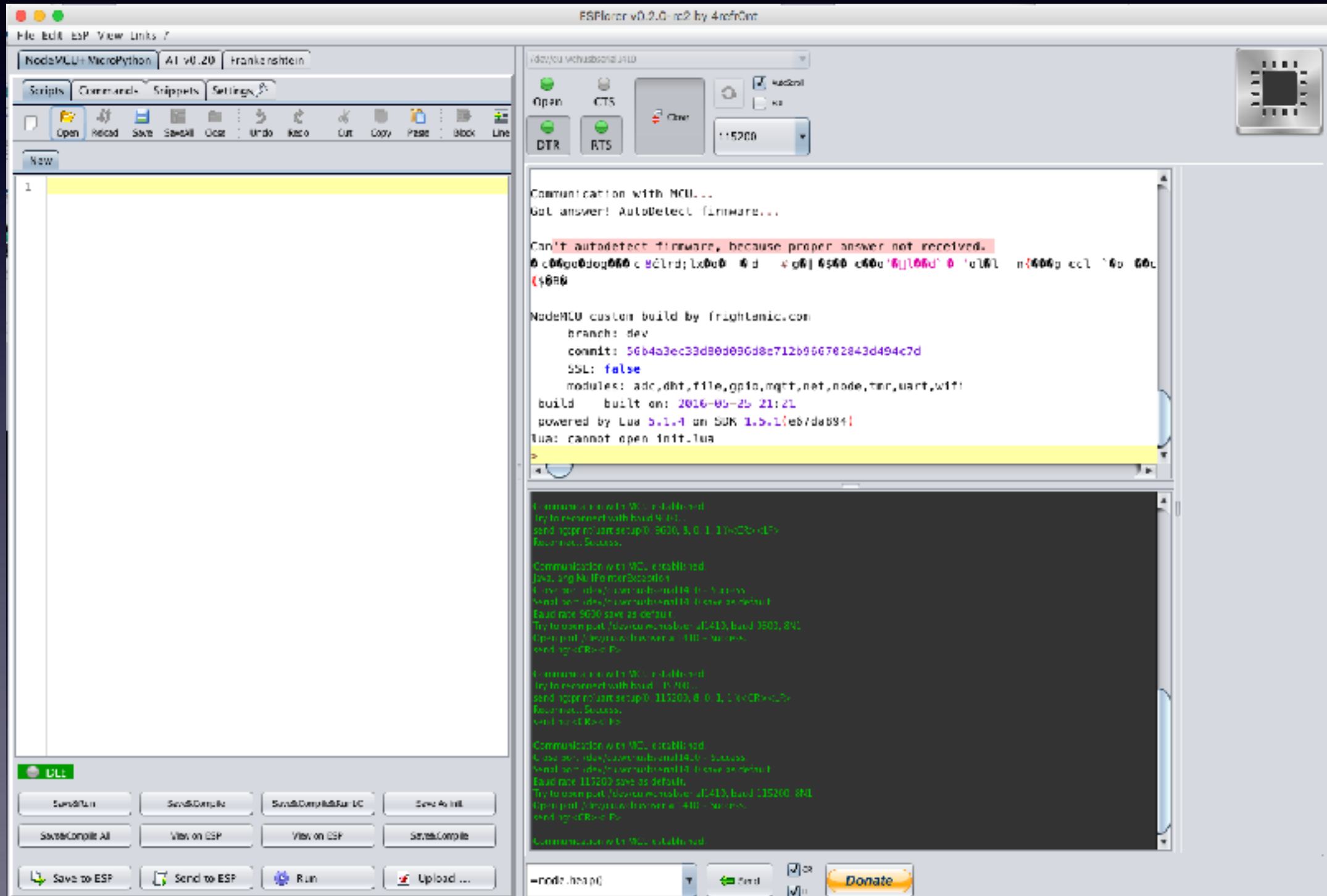
ESP8266 Software Stack

- Get a custom Firmware build (via e-mail):
 - <http://nodemcu-build.com> (takes a couple of minutes)
 - Select “dev branch” and modules: adc, dht, file, gpio, mqtt, net, node, timer, uart, wifi
- Flash the ESP8266 using “ESP8266Flasher.Exe”
 - More details see: <http://benlo.com/esp8266/esp8266QuickStart.html>

Programming the ESP8266

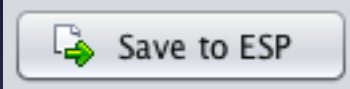
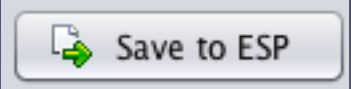
- Test Firmware using ESPLorer:
 - <http://esp8266.ru/esplorer-latest/?f=ESPlorer.zip>
- Alternative tool: LuaLoader:
 - <http://benlo.com/esp8266/LuaLoader.zip>
- Make sure to select the right COM port and set baud rate at 115200

Result after Firmware update



Programming the ESP8266

<https://developer.ibm.com/recipes/tutorials/cloud-ready-temperature-humidity-sensor-for-ibm-iot-foundation/>

- In the ESPlorer IDE:
 - Add a new file called “mainIoT.lua”
 - modify the code using your orgID, macID and token
 - Check the WiFi credentials
 - Add a new file called “init.lua” and save it to ESP - 
 - Restart the ESP8266 -> check console for possible error messages

Check device status in Watson IoT

IBM Watson IoT Platform

CLICK START SERVICE STATUS DOCUMENTATION BLOG

Device ID: 5ecf7f0c4770 ID: 5ecf7f0c4770

Devices

Browse | Diagnose | Action | Device Types

Refresh + Add Device

	Device ID	Device Type	Class ID	Date Added	Location
Results 1-1 of 1	5ecf7f0c4770	ESP8266	Device	Jun 13, 2016 5:48:40 PM	

Device 5ecf7f0c4770

Device Refresh

Connection Information

Device ID: 5ecf7f0c4770
Device Type: ESP8266
Date Added: Monday, June 13, 2016
Added by: 5ecf7f0c4770
Connection Date: Registered Refresh

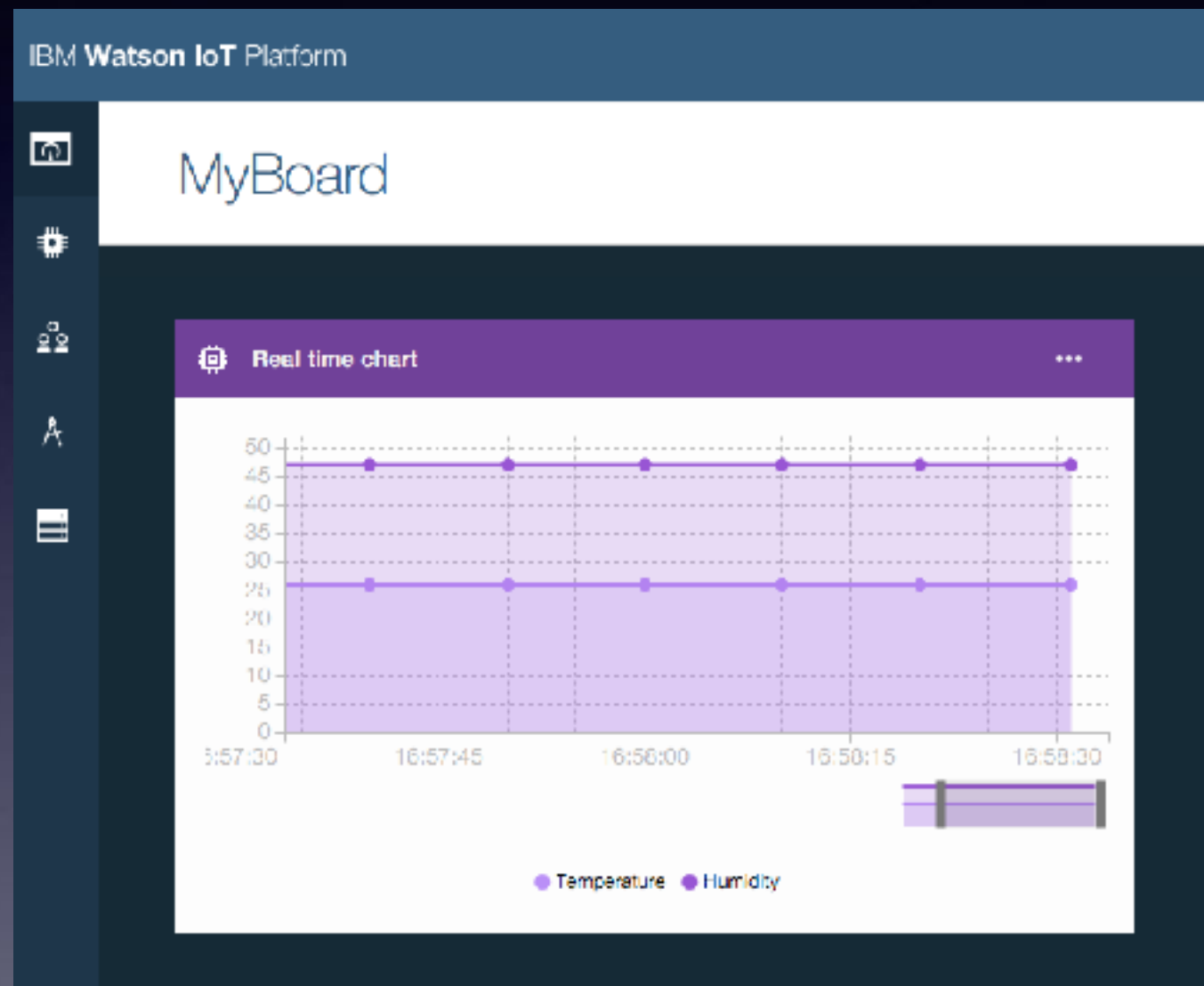
Recent Events

Event	Format	Time Received
status	json	Jun 13, 2016 4:47:30 PM
status	json	Jun 13, 2016 4:47:40 PM
status	json	Jun 13, 2016 4:47:40 PM
status	json	Jun 13, 2016 4:47:40 PM
status	json	Jun 13, 2016 4:47:50 PM
status	json	Jun 13, 2016 4:47:50 PM
status	json	Jun 13, 2016 4:47:50 PM
status	json	Jun 13, 2016 4:48:00 PM
status	json	Jun 13, 2016 4:48:00 PM
status	json	Jun 13, 2016 4:48:00 PM

Sensor Information

Event	Datapoint	Value	Time Received
status	d.Temperature	26	Jun 13, 2016 4:48:00 PM
status	d.Humidity	47	Jun 13, 2016 4:48:00 PM

Add a Real time chart to the Watson IoT Dashboard



Detailed info: <https://developer.ibm.com/recipes/tutorials/visualizing-data-in-watson-iot-platform/>

Store sensor data into Clouding DB using Node-red

- Create a new DB in your Clouding DB



The screenshot shows the 'Databases' page in the Clouding DB interface. On the left is a sidebar with navigation links: Databases (selected), Replication, Warehousing, Active Tasks, Account, and Support. The main area has a 'Your Databases' tab and a table listing existing databases. The table has columns for Name, Size, # of Docs, Update Seq, and Actions. Two databases are listed: 'iotdb' and 'nodered'. The 'iotdb' database has a size of 7.9 KB, 24 documents, and an update sequence of 2. The 'nodered' database has a size of 43.3 KB, 3 documents, and an update sequence of 9. Each database row has three action icons: a refresh icon, a lock icon, and a delete icon.

Name	Size	# of Docs	Update Seq	Actions
iotdb	7.9 KB	24	2	  
nodered	43.3 KB	3	9	  

- Modify the existing Node-red flow or create a new one

