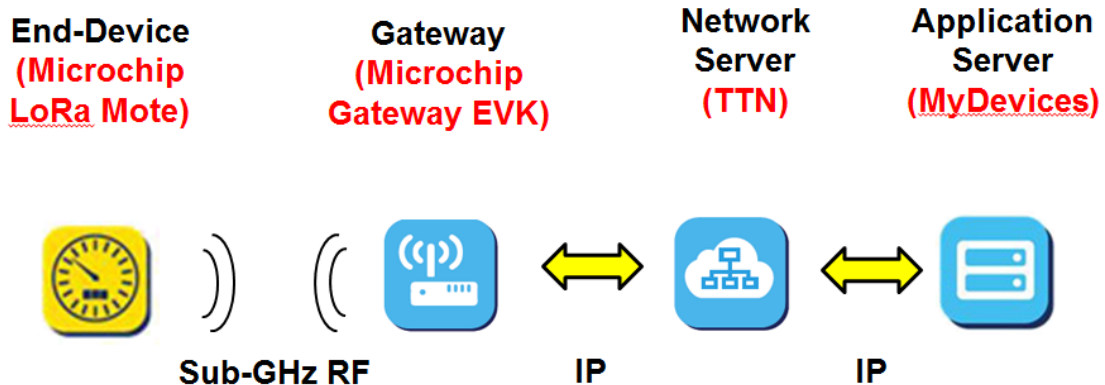


Microchip + TTN + MyDevices LoRa Demo Setup

Gabriel Wang

As we know, the whole LoRaWAN system consists of End Device, Gateway, Network Server and Application Server. The LoRaWAN physical topology can be shown as following picture.

LoRaWAN Physical Topology



In this demo, we will use the End Device Microchip DM164138 or Mote board from DV164140-1, the Microchip Gateway EVK DV164140-1, thethingsnetwork Network Server and MyDevices Application Server.

1, Preparations

1.1 Hardware Preparations:

- 1.1.1 DV164140-1 including Microchip LoRa Mote, and an 8-channel Gateway
- 1.1.2 A router which can connect to internet/cloud

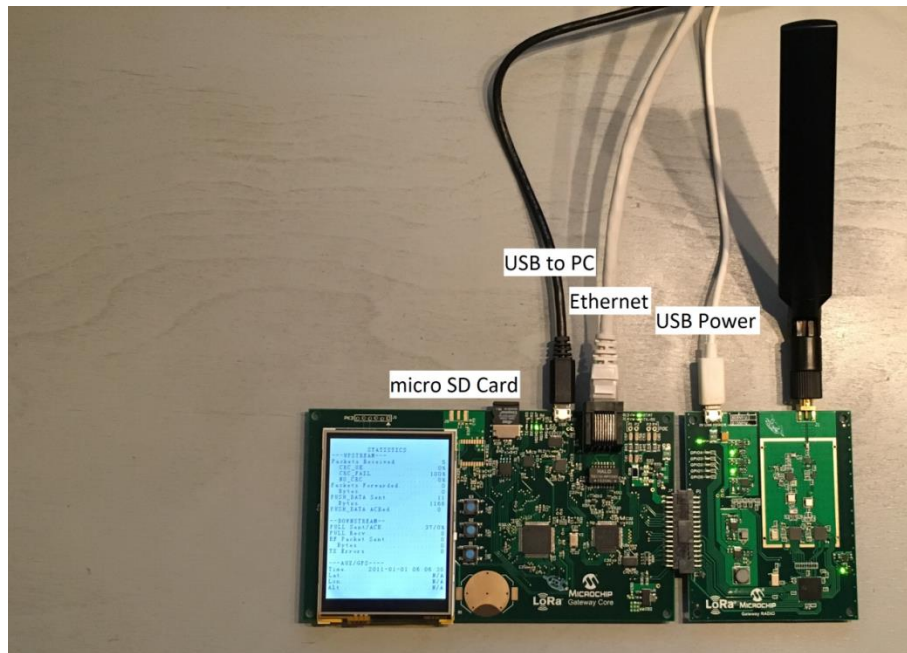
1.2 Software Preparations:

- 1.2.1 LoRaDevUtility for LoRa Mote and Gateway configuration
- 1.2.2 Create an account in <https://console.thethingsnetwork.org/>
- 1.2.3 Create an account in <https://mydevices.com/>

2, Connect Microchip LoRa Mote to TTN

2.1 Setup the Gateway Hardware

- 2.1.1 Connect the Gateway Radio Board to the Gateway Core Board.
- 2.1.2 Connect the antenna to the Gateway Radio Board.
- 2.1.3 Connect an Ethernet cable from your router to the Ethernet jack on the Core Board.
- 2.1.4 Connect a micro USB cable from computer to the USB jack on the Gateway Core Board.
This will be used to configure the Gateway through the LoRaDevUtility.
- 2.1.5 Install the micro SD card into the slot on the Gateway Core Board. This card is used to store the Gateway parameters.



2.2 Configure the Gateway Parameters

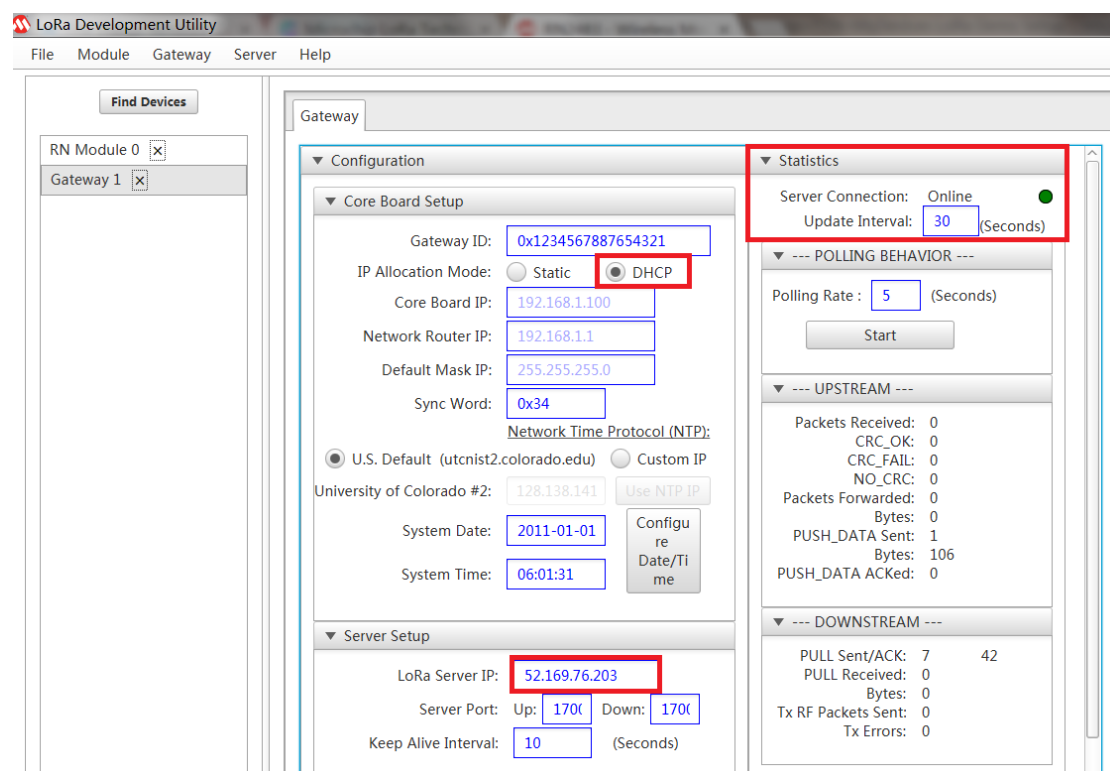
2.2.1 In the “Core Board Setup” section, select “DHCP” for the IP Allocation Mode.

2.2.2 In the “Server Setup” section, set your LoRa Server IP to the TTN server. You can find the correct address here:

https://www.thethingsnetwork.org/wiki/Backend/Connect/Gateway#connect-a-gateway_server-addresses

For the US, it is router.eu.thethings.network or 52.169.76.203. Since the IP address is required, but may change over time, you should check the hostname on an IP resolver site like <http://whatismyipaddress.com/hostname-ip>

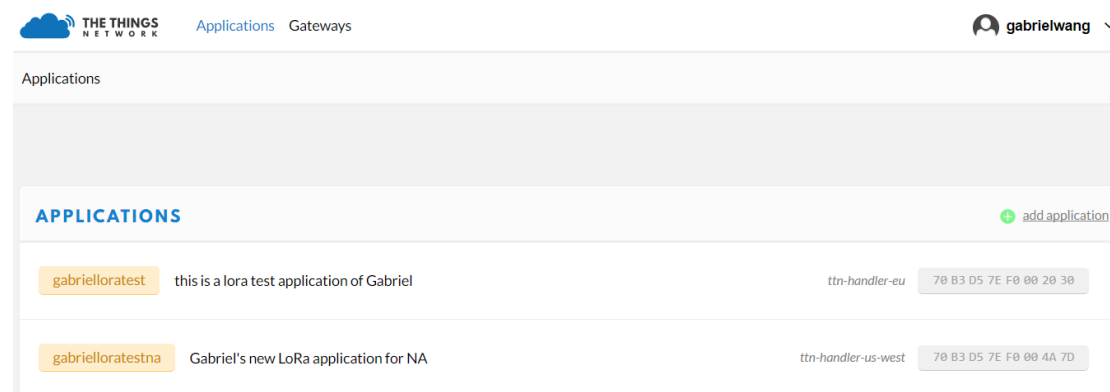
2.2.3 In the “General Actions” section, click the “Save Settings to SD Card” button.



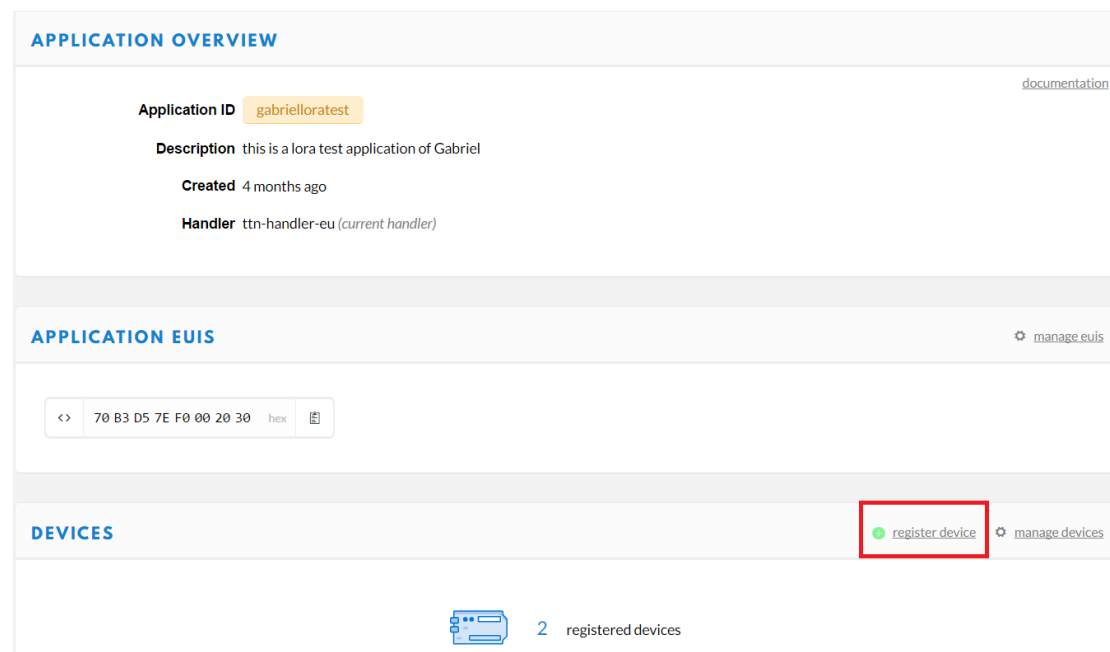
Once you have completed these steps, you should see in the LoRaDevUtility software that you are “Online”. If it is not online, you may need to enable enable Port Forwarding in your router to open up the port 1700. Or sometimes, you may need to restart the router, the Gateway and the LoRaDevUtility, and try it again.

2.3 Create an Application on TTN Console

2.3.1 Go to <https://console.thethingsnetwork.org/>, click “APPLICATIONS”, and add an application like this:



2.3.2 Go inside the application, and register your LoRa End Device.



2.3.3 Go inside the device Settings, you can choose to use “ABP” or “OTAA”. Here is an example to use “ABP” activation. The Network Session Key, the Application Session Key, and the Device Address will be generated by the TTN, and you will use these 3 parameters soon.

Application ID

gabrielloratest

Device ID

gabrielloranode

Activation Method

ABP

Device EUI

<> 00 04 A3 0B 00 1B 2C A0 hex

Application EUI

<> 70 B3 D5 7E F0 00 20 30 hex

Device Address

<> 26 01 10 8F hex

Network Session Key

<> hex

App Session Key

<> hex


Status

● 23 minutes ago


2.3.4 Go to LoRaDevUtility to configure your LoRa End Device (Micorchip LoRa Mote). Remember to save the NwkSKey, AppSKey and DevAddr, and then click “join”. Then you can transmit uplink message now.


2.3.5 Monitor the uplink message on TTN.

2.3.6 Add “MyDevices” integrations to TTN following these steps:

THE THINGS NETWORK


ApplicationsGateways

gabrielwang

ApplicationsgabrielloratestIntegrations


OverviewDevicesPayload FormatsIntegrationsDataSettings

INTEGRATIONS


Cayenne


add integration

mydevicesttneu

THE THINGS NETWORK


ApplicationsGateways

gabrielwang


ApplicationsgabrielloratestIntegrations

OverviewDevicesPayload FormatsIntegrationsDataSettings


ADD INTEGRATION




Cayenne
v2.4.0
myDevices




Data Storage
v2.0.1
The Things Industries B.V.




HTTP Integration
v2.4.0
The Things Industries B.V.





IFTTT Maker
v2.4.0
The Things Industries B.V.

THE THINGS NETWORK

ApplicationsGateways

gabrielwang

ApplicationsgabrielloratestIntegrations



Cayenne (v2.4.0)
myDevices
Quickly design, prototype and commercialize IoT solutions with myDevices Cayenne
[documentation](#)

Process ID
The unique identifier of the new integration process

yourid

Access Key
The access key used for downlink

no selection

default keydevicesmessages

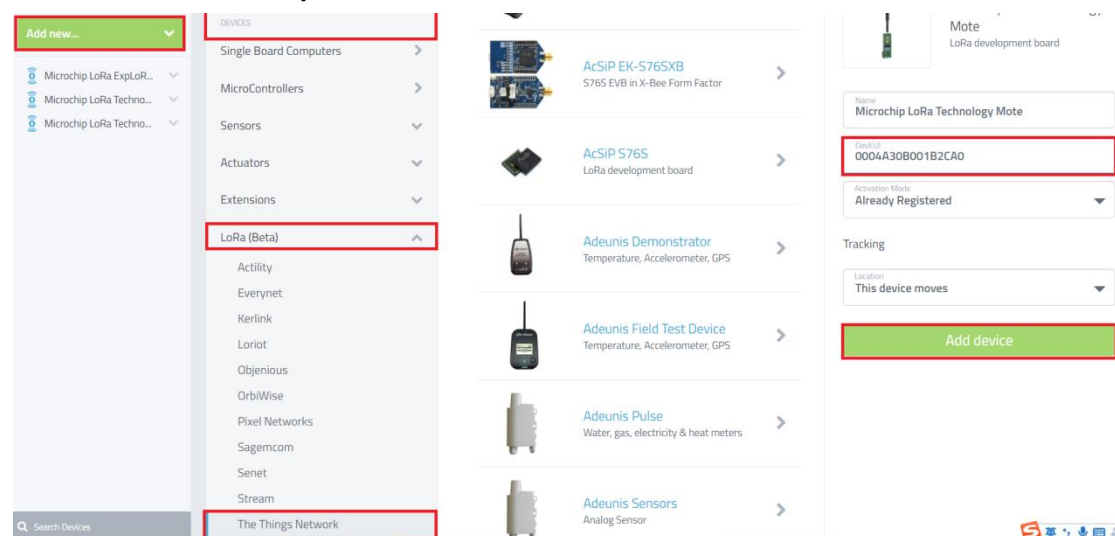
CancelAdd integration

3, Connect Microchip LoRa Mote to MyDevices

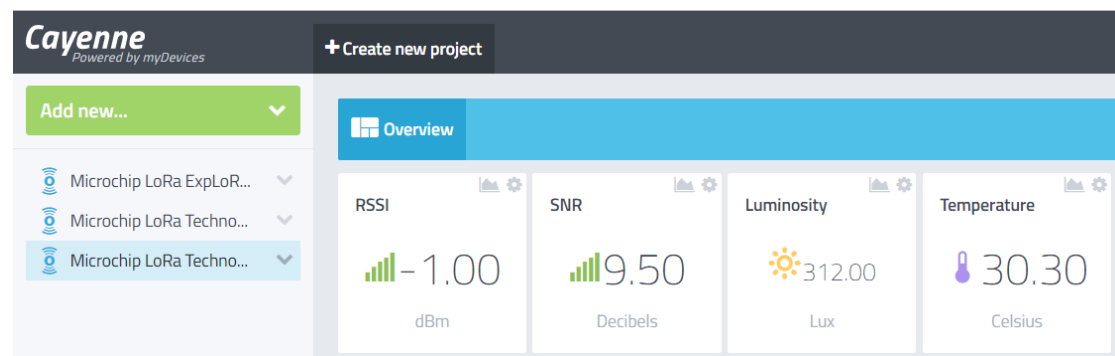
3.1 Sign In your MyDevices account.

3.2 Add new Device/Widget -> LoRa(Beta) -> The Things Network -> Microchip LoRa Mote.

3.3 Fill in the correct 8 bytes DevEUI, and then "Add device".



3.4 Go to the dash board to see the data sent from Microchip LoRa Mote.



4, Others

4.1 SODAQ board

You can also use Microchip LoRa ExpLoRer designed by SODAQ as the LoRa End Device in this demo. The only difference is that you need to set the APP EUI and APP Key for OTAA, or set the NwkSKey, AppSKey and DevAddr for ABP in the source code instead of using the LoRaDevUtility. The SODAQ board will transmit uplink message including temperature every 15 seconds.

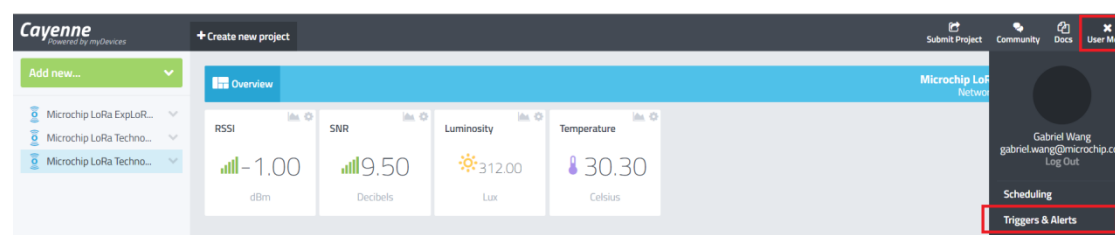
You can get more information about SODAQ here: <http://support.sodaq.com/explorer/>

4.2 Mobile APP for MyDevices

Search "Cayenne" in App Store or Google Play, and install the APP on your mobile phone, and then you can monitor the data sent from the LoRa End Devices.

4.3 Triggers & Alert from MyDevices

A trigger can be set up to send an alarm to your phone/email.



Cayenne
Powered by myDevices

+ Create new project

Submit Project Community Docs User M...

Add new...

Microchip LoRa ExplOR...
Microchip LoRa Techno...
Microchip LoRa Techno...

Triggers

My Triggers

RN2483 Trigger

if Microchip LoRa Technology Mote
Gabriel - AnalogSensor - Channel 1

Temperature

30

Min -500 Step 1 Value 30 Max 500

☒ Sensor above
☐ Sensor below

then notify...

Add custom recipient

+86 131 5739 3952

gabriel.wang@microchip.com

Add more recipients?

Select All

☒ Send Text Message (requires mobile phone number)
☒ Send Email

中国移动 13:16 70%

+86 131-5739-3952

短信/彩信 今天12:34

Temperature has reached threshold value of 30. This is connected to Microchip LoRa Technology Mote.

Temperature has reached threshold value of 30. This is connected to Microchip LoRa Technology Mote.

中国移动 13:33 69%

< 返回

发件人: No-Reply myDevices >

收件人: Gabriel Wang - A15170 > 隐藏

Trigger Notification
今天 12:34

Cayenne

Hi Gabriel Wang,
Your sensors need your attention.

Device Notification

Microchip LoRa Technology Mote
Temperature
has reached threshold value
30

This sensor is connected to Microchip LoRa Technology Mote

Cayenne Dashboard

相机 短信/彩信

文件夹 删除 回复 转发

中国移动 4G 17:57 53%

10690529019370211601

短信/彩信 今天17:49

[SNY]Luminosity has reached threshold value of 10. This is connected to Microchip LoRa Technology Mote.