Taipei Smart City

BeJo Li

GIoT:

Brace yourself

IoT ~~Winter~~ is coming

(不用等下季)

線上資源

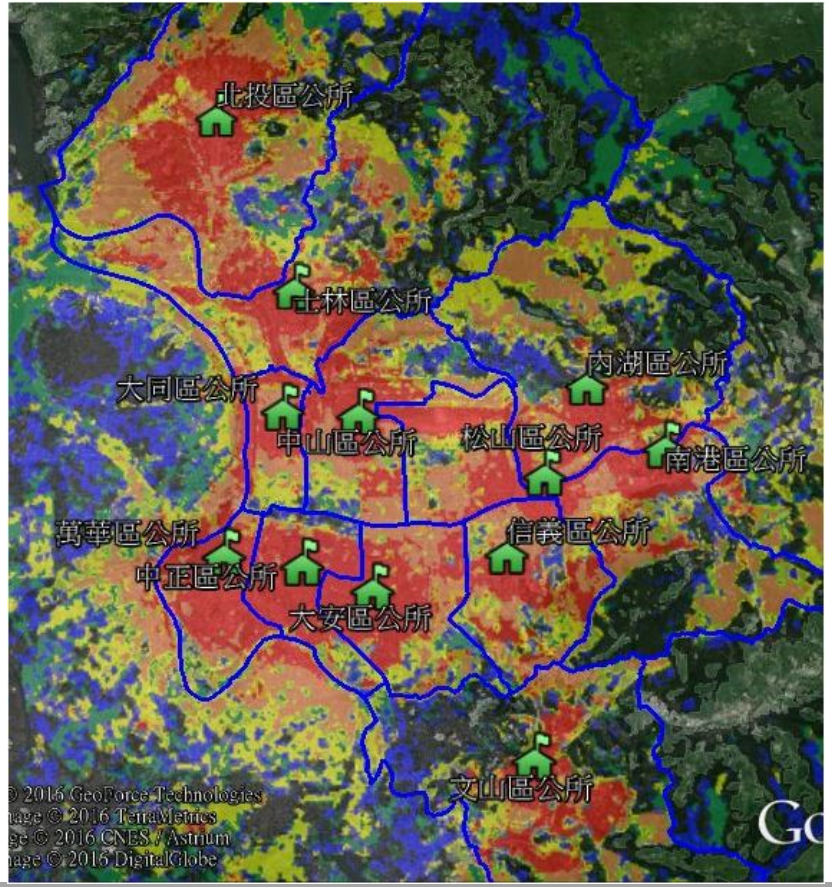
- Document and source code
  - https://github.com/giot-tw
- Gitter.im
  - https://gitter.im/giot-tw/public
- 購買商城
  - https://tw.mall.yahoo.com/item/GIoT-Module-GL6509-p0024104779117
- FB 粉絲團 - GIOT
  - https://www.facebook.com/giot.tw

Outline

- 參與單位
- 台北市實驗場環境介紹 -> **台北以外呢?!**
- GIoT's LoRa EcoSystem簡介
- 模組教學動手玩

Smart City - 台北市政府

台北全區覆蓋



≥ -102.000
≥ -112.000
≥ -118.000
≥ -124.000
≥ -132.000
< -132.000

(最佳) (差)

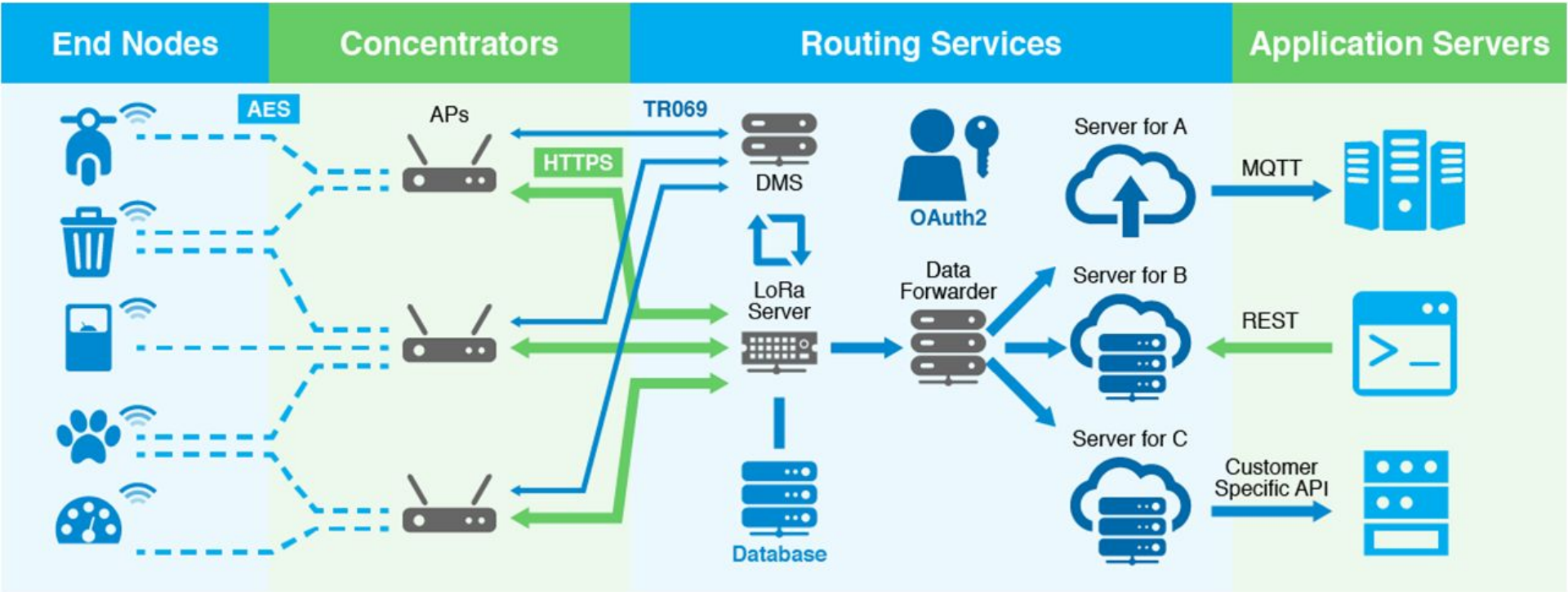
台北以外呢?

- 洽詢GIoT 業務單位
  - 新竹一定有!!!
- 台北VS非台北
  - 參與台北專案可達成全台漫遊

Gemtek - GIoT

- 我們提供**基站?雲端?終端?應用?**
- 一個非常傻瓜的簡單方法 - 解決方案
  - 基地站台管理與監控
  - 訊息路由派送(Routing) - 送達資料到你手上
  - LoRa 模組當Modem, SIM Card

GIoT Network Architecture



LoRa 模組

- General
  - General
  - Different versi… to support AT
  - generic GPIO and I2C & UART in…
  - Compact form factor: 15 x 39 x 2…
  - Castellated SMT edge for easy P…
  - Optional version with pin heade…
  - Separate versions for 915 MHz a…
  - High receiver sensitivity: down to -13…
  - Industrial grade
- Operational
  - Single operating voltage at 3.3V
  - Temperature range: -40°C to +85°C
  - Low-power consumption

走 Uart

吃 3.3V

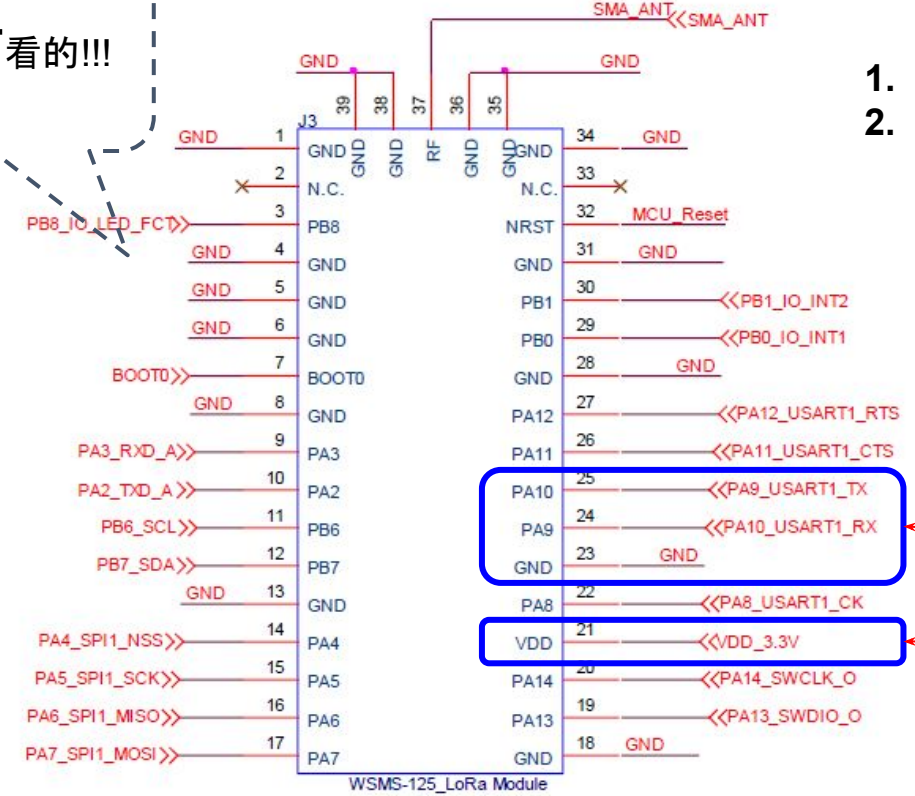
用AT command

來接線吧

- 3.3v
- TX → RX
- RX → TX
- GND
- Baud 9600
- 下載程式碼

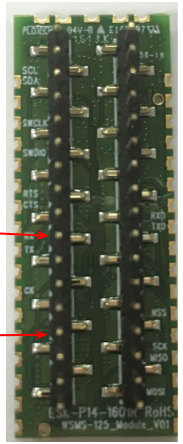
四根 PINs

這是從**正面**看的!!!



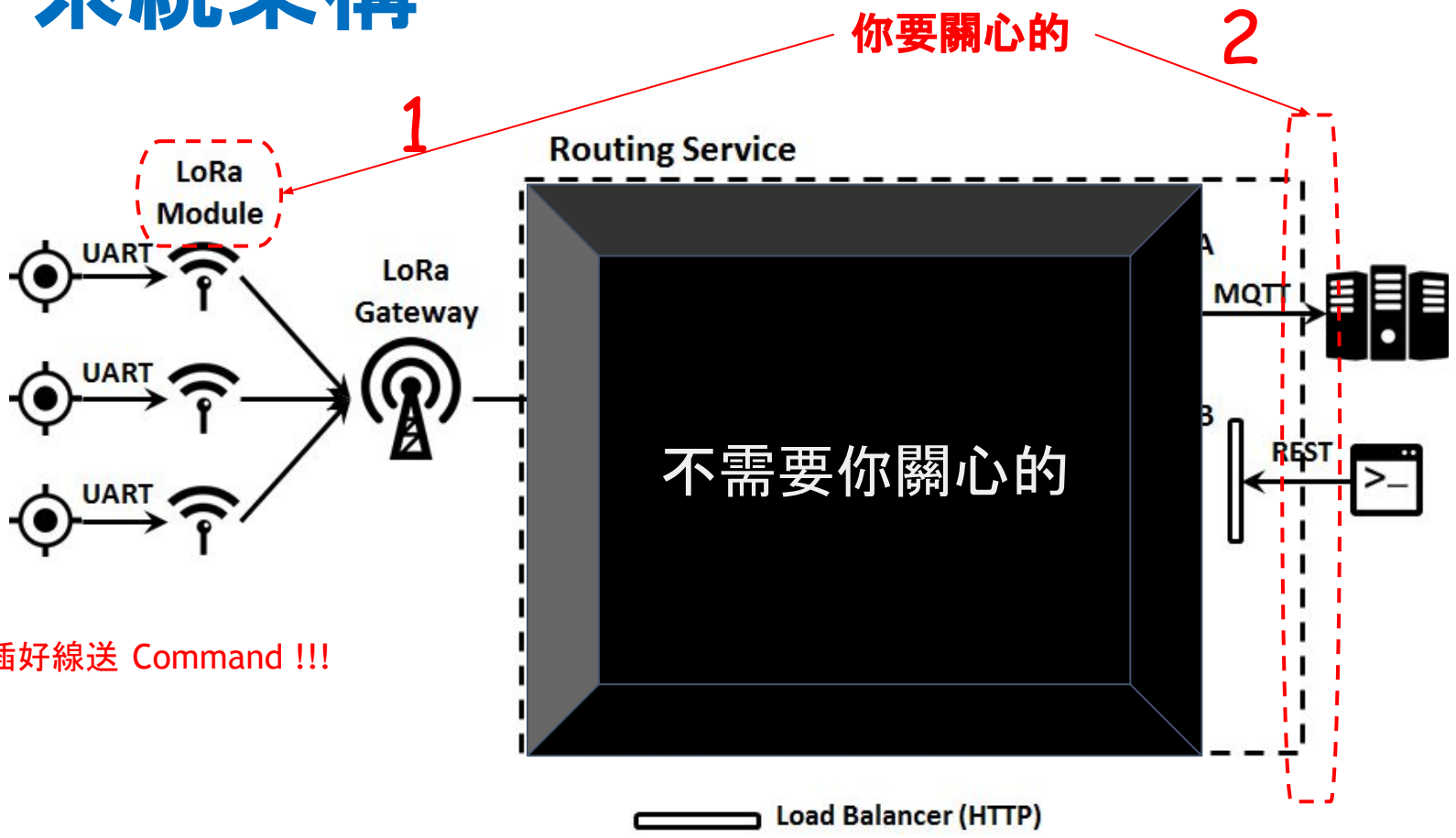
1. **排針面向自己，注意左邊那排。**
2. **由下數來第 8, 7, 6, 4**

背面



正面

系統架構



- 插好線送 Command !!!

Hello world

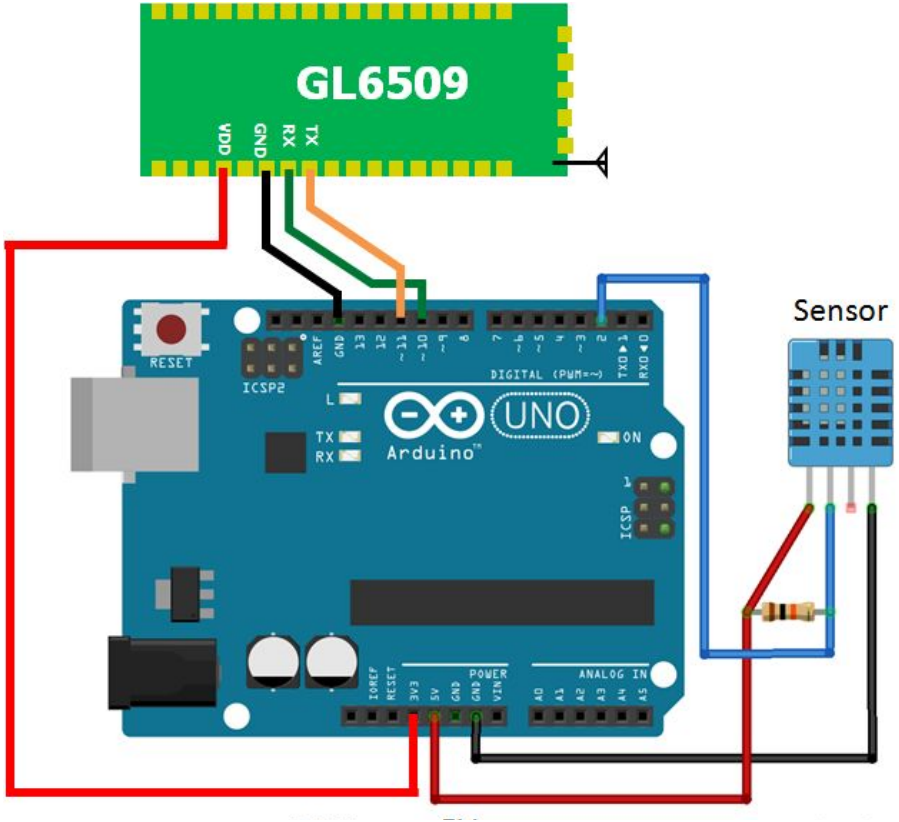
- AT
  - OK

Demo

- AT
  - 喚醒LMU
- AT+ECHO=1
  - 開啟回呼
- AT&W
  - 儲存設定
- AT&H
  - 目前支援的指令集
- AT+SGMR?
  - 看韌體版號
- AT+DTX
  - AT+DTX=22, 0123456789abcdef012345

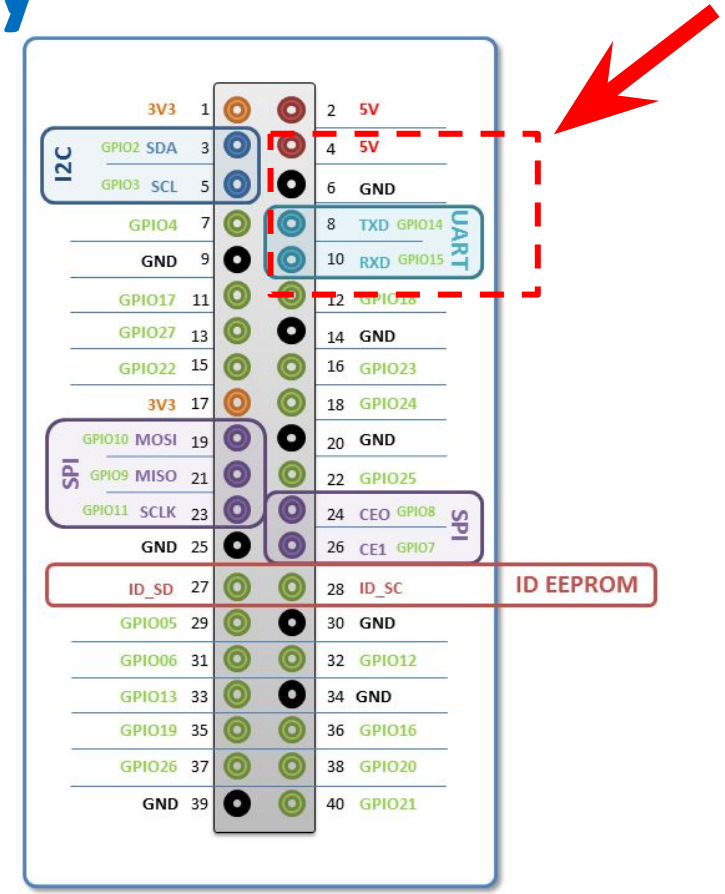
Example Arduino

- Host
  - Arduino
- Interface
  - UART to LPWAN Module
    - P10, 11
    - RX/TX
  - 3.3v power support
    - P1/G
    - VDD/G
- Source code
  - Lab01_giot_AT-DTX



Example - Raspberry

- Host
  - Raspberry pi B+
- Interface
  - UART to LPWAN Module
    - P8,10
    - RX/TX
  - 3.3v power support
    - P1/G
    - VDD/G
- Source code
  - Github



MQTT 訂閱帳號

- 每桌各有一個測試帳號
  - https://cust00-01.giotgateway.com/giot-mqtt
  - MQTT (Example)
    - "host": "52.193.146.103",
    - "port": "80",
    - "topic": "client/200000033/200000033-GIOT-MAKER",
    - "clientId": "200000033-generic-service",
    - "username": "200000033",
    - "password": "*"
  - **mosquitto_sub** -h 52.193.146.103 -p 80 -t client/200000033/200000033-GIOT-MAKER -I 200000033-generic-service -u 200000033 -P <PASSWORD>

模組特性

- Module is like a SIM card
  - AES key support
  - Identity - LoRa mac address (IEMI)
  - 11 bytes of user-assigned payload (22 Hex)
    - Max length is 11 Ascii or 22 Hex
- 60s 冷卻時間
- SF 10 - Default
- LoRaWAN 1.0
- Class A
- ABP (Activation by Personalization) mode
- 資料你產生，訊息GIoT 幫你使命必達

11 bytes example:

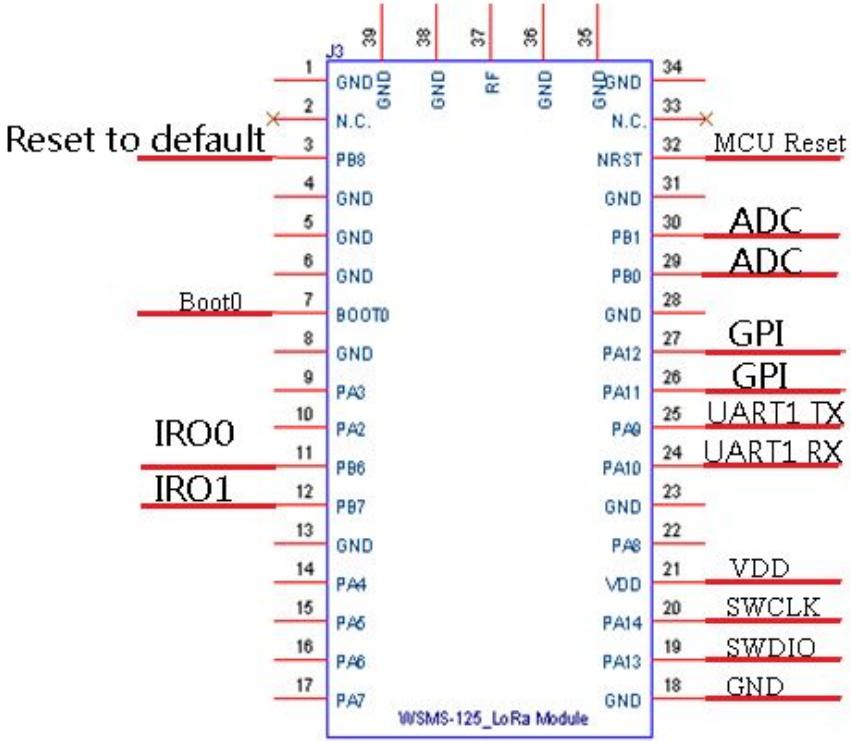
Index	Temperature	Battery level	GPS Latitude	GPS Longitude
0xff	0xff	0xff	0xffff ffff	0xffff ffff

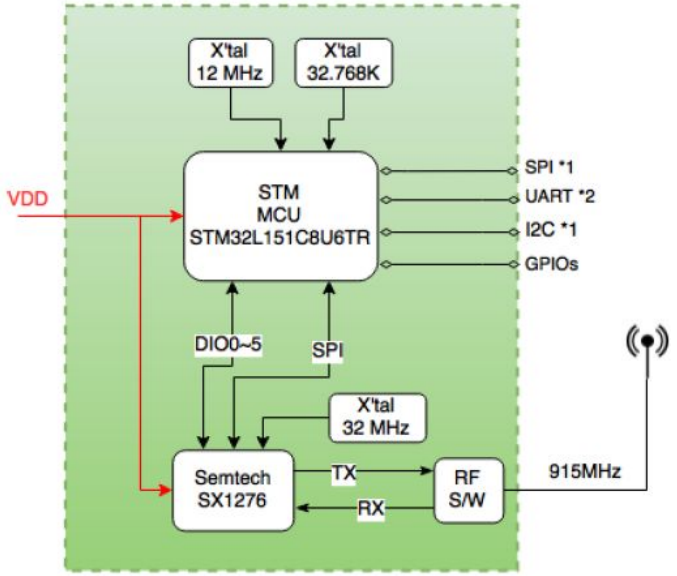
Example - Data

Receive data

```
$ mosquitto_sub -h <Server_IP> -p 80 -t client/200000001/200000001-GIOT-MAKER -I 200000001-generic-service -u 200000001 -P PASSWORD
RECV:
{
    "id" : "e18a47a2-9c3c-4157-b61a-5131e34e6813",    // Unique index for this message
    "macAddr" : "04000011",                           // Module ID
    "data" : "1459268303",                            // Your Data
    "buff" : "2016-03-09T09:18:56.310Z",              // Cloud server receive timestamp
    "recv" : "2016-03-09T09:18:55.000Z",              //  LoRa Gateway receive timestamp
    "extra" : {                                       // Lora Gateway which receive your data
                "gwip" : "192.168.1.110",             // Lora Gateway Wan IP
                "gwid" : "00001c497b48db94",          // Lora Gateway ID
                "repeater" : "00000000ffffffff",      // Lora Repeater ID, if bypass
                "systype" : 4,                        // System ID for indicating service area
                "rssi" : -94,                         // RSSI when this frame is into Gateway
                "snr" : 93                            // SNR when this frame is into Gateway
    }
}
```

其他腳位


J3
Reset to default
Boot0
IRO0
IRO1
MCU Reset
ADC
ADC
GPI
GPI
UART1 TX
UART1 RX
VDD
SWCLK
SWDIO
GND
WSMS-125_LoRa Module


X'tal 12 MHz
X'tal 32.768K
VDD
STM MCU STM32L151C8U6TR
SPI *1
UART *2
I2C *1
GPIOs
DIO0~5
SPI
X'tal 32 MHz
Semtech SX1276
TX
RX
RF S/W
915MHz

FAQ

Thank you!