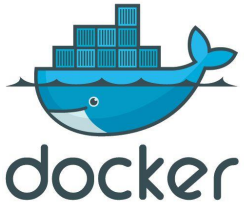
FLASS

Project further visualizing your LASS Data with
Freeboard, Thingspeak, Slack,Node Red,Docker



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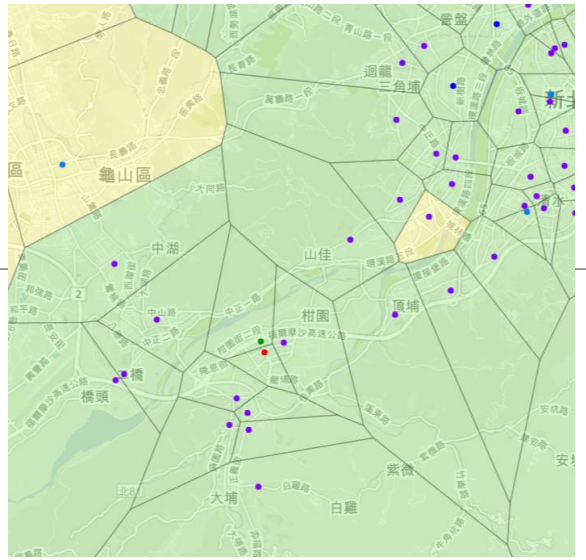
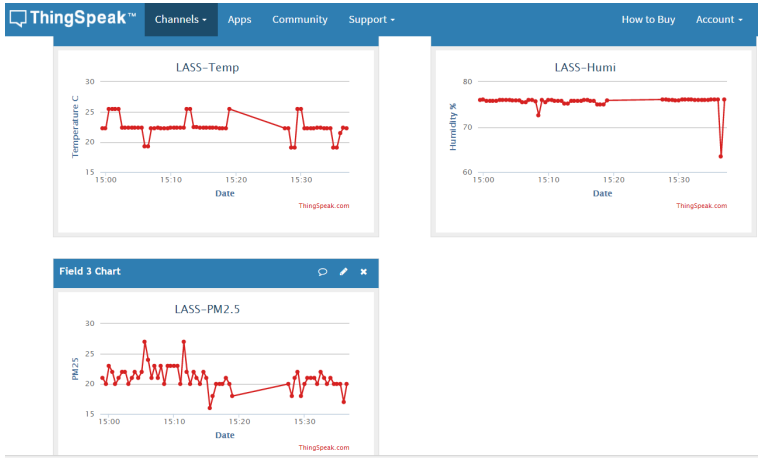
1. Overview

Objectives





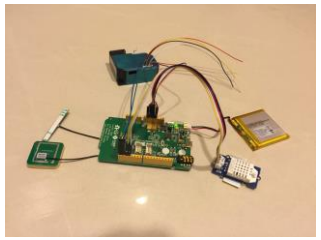
1. See both forest and tree.
   - Contribute to big data
   - I care more few special area
2. Learning IoT Cloud Services
   - Official LASS Arduino Linkit One device
   - Docker, Node Red, MQTT, Freeboard, Thingspeak, Slack
3. My own way to present my data
   - Thingspeak is free and good.
     - Official Python way through pc. https://lass.hackpad.com/LASS-Field-Try-1--QhzgWXt3HJd
   - Freeboard is pretty
     - Better visualize your own data
     - Access it from anywhere, any connected devices.
   - Open Source, Fully customizable

System map

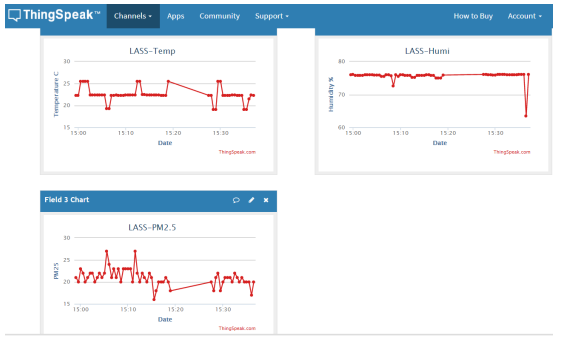
Input

Servers/App

Output



LASS/Test/howard/PM25



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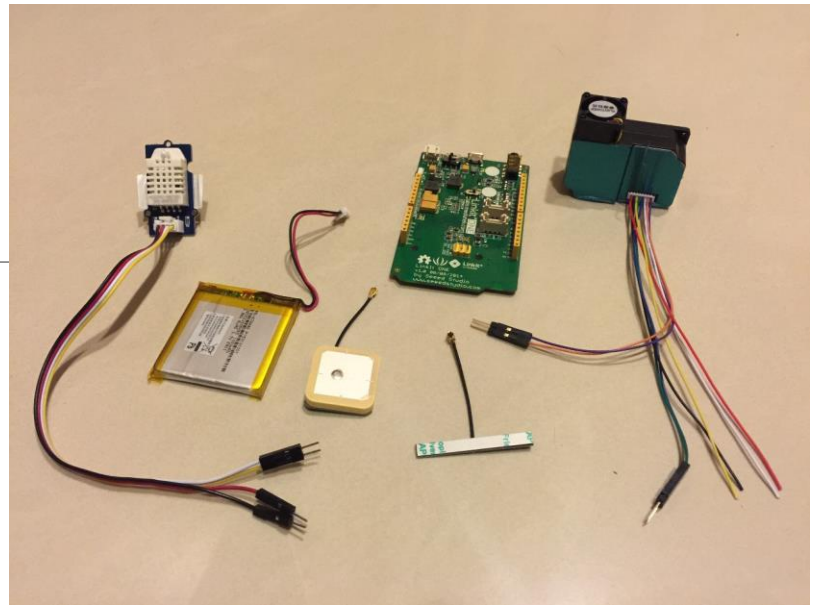
Official Linkit One LASS code



Basic:

- Hardware and instruction on Linkit-One
- https://lass.hackpad.com/ep/pad/static/7xQSIilMeGU

- Official code:
- https://github.com/LinkItONEDevGroup/LASS/tree/master/Device_LinkItOne/LASS

Customized configuration code

https://github.com/howardweng/FLASS

Linkit One Customized Code

1. WIFI Credentials

```
5 //System default wifi setting: SSID=LASS, PASS=LASS123456, WIFI_AUTH=LWIFI_WPA
6 #define WIFI_SSID "Crystalant 2.4G"          // REPLACE: your network SSID (name)
7 #define WIFI_PASS "      11111"   // REPLACE: your network password (use for WPA, or use as key for WEP)
8 #define WIFI_AUTH LWIFI_WPA   //Default:LWIFI_WPA // choose from LWIFI_OPEN, LWIFI_WPA, or LWIFI_WEP.
9 //------------------------------------------------------------
```

Arduino Code V.S. Log

Code

2. ID and Topic

```
17 //Step 3:MQTT info
18 //MQTT-IoT
19 #define MQTT_PROXY_IP "gpssensor.ddns.net"
20 #define DEVICE_TYPE   "LinkItONE"
21 #define DEVICE_ID "Howard222"
22 #define MQTT_TOPIC_PREFIX "LASS/Test/howard
23 #define PARTNER_ID "LASS-Partner1"
```

You can change your name for special topic to subscribe

Log

```
-----Loop ID: 9 tick= 2768582 -----
SensorValue(RecordID):92.00
SensorValue(BatteryLevel):100.00
SensorValue(BatteryCharging):1.00
SensorValue(speed):0.00
SensorValue(debugwifi):1.00
[Performence TIME-COUNT]:29894
[SENSOR-DUST-PM2.5]:15.00
[SENSOR-DUST-PM10]:18.00
SensorValue(Temperature):22.30
SensorValue(Humidity):75.50
Reconnecting to MQTT Proxy
Pack MQTT Topic:LASS/Test/howard/PM25
|ver_format=3|FAKE_GPS=1|app=PM25|ver_app=0.8.3|device_id=Howard222|ti
MQTT Companion channel published...
MQTT sending
LED:Wifi and gps ready!
```

Linkit One Code customization

3. Fake GPS location information

http://www.gps-coordinates.net/

```
27 //Do you want to use gps? 0:YES 1:FAKE GPS
28 #define FAKE_GPS 1 // FAKE_GPS : 0: default format with gps, 1: def
29 //NOTICE:If you choose 1 modify "FAKE" GPS location. Fill info belo
30 const char gps_lat[]= "24.94925";  // device's gps latitude
31 const char gps_lon[]= "121.37639";   // device's gps longitude
32 const char gps_alt[]= "30.0";          // device's gps altitude
33 #define GPS_SIGNAL_NOCHECK 1   // 0: log or send only when GPS have
34
35 //NOTICE: for Field TRY-PM2.5 DONT CHANGE AFTER THIS LINE!   --2015
36 //-----------------------------------------------------------------
37 //Step 5:About LASS
38 #define APP_ID (APPTYPE_SYSTEM_BASE+1)                  // REPLACE: th
```

4. APP type

Standard LASS string from Serial

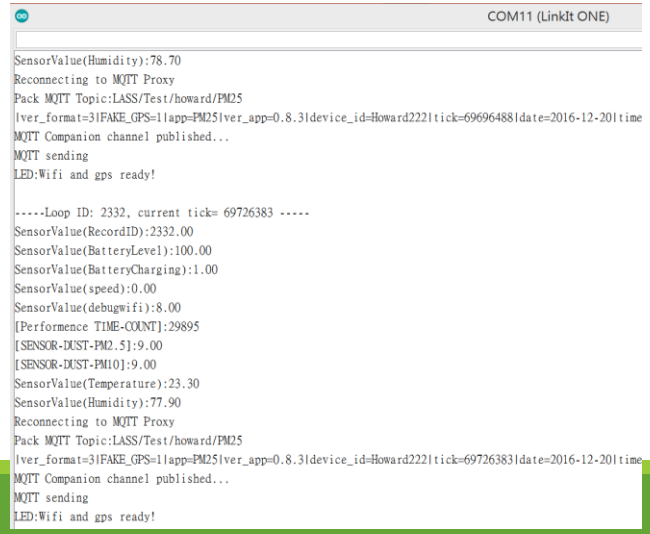
1. Make sure your data is running on Linkit One. As long as your format is this. You can use this system

standard LASS string (Other data format data need customization)

#15/PM25

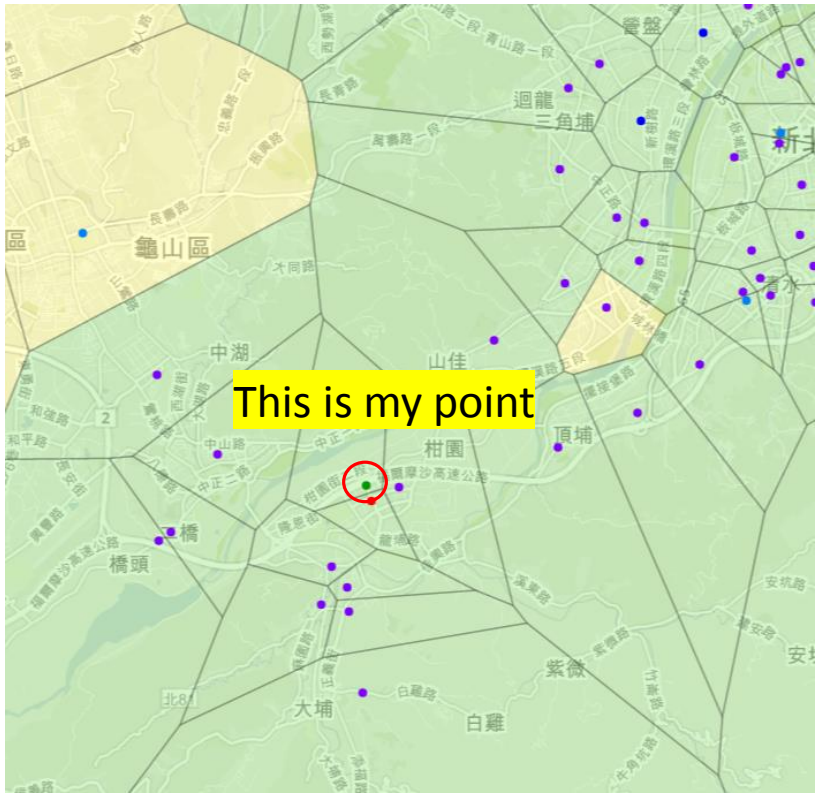
|ver_format=3|FAKE_GPS=1|app=PM25|ver_app=0.8.3|device_id=Howard222|tick=81534326|date=2016-12-20|time=08:54:25|device=LinkItONE|s_0=2727.00|s_1=100.00|s_2=1.00|s_3=0.00|s_4=8.00|s_d0=7.00|s_t0=22.80|s_h0=82.20|s_d1=8.00|gps_lat=24.948171|gps_lon=121.376746|gps_fix=1|gps_num=9|gps_alt=30.0

#16/Temp #17/Humidity



Make sure your data on LASS system. Standard LASS view

2. You can see your point at. Weather Map: http://nrl.iis.sinica.edu.tw/LASS/GIS/voronoi/voronoi.html#

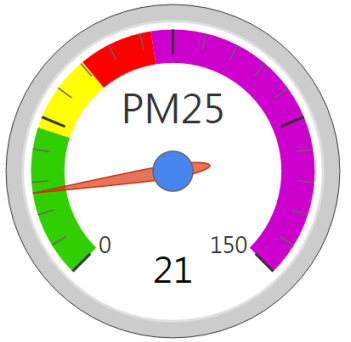


3. You can see individual on this .
http://nrl.iis.sinica.edu.tw/LASS/show.php?device_id=Howard222

deviceID

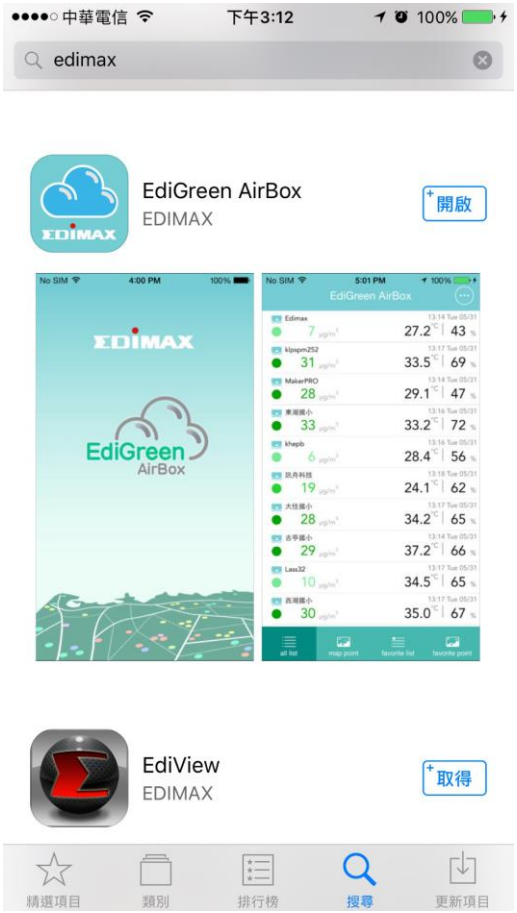
LASS Location Aware Sensing System **PM2.5 即時資訊**

時間：Mon Dec 19 2016 15:30:25 GMT+0800 (台北標準時間)
地點： Shulin District, New Taipei City, Taiwan 238
溫度：22.3℃； **濕度**：76.1%

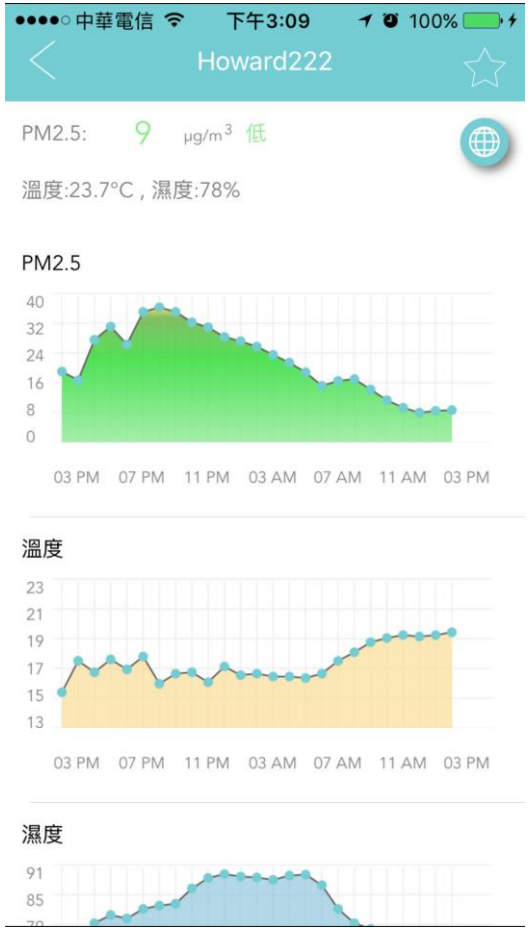


- **一般民眾活動建議**：
  正常戶外活動。
- **敏感性族群活動建議**：
  正常戶外活動。

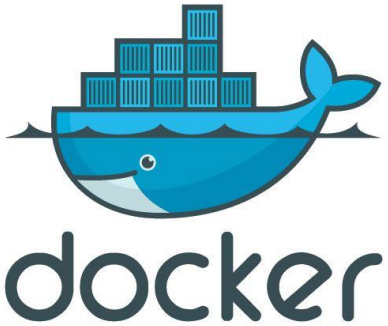
APP: Airbox


edimax
EdiGreen AirBox
EDIMAX
開啟
EdiView
EDIMAX
取得
精選項目
類別
排行榜
搜尋
更新項目


EdiGreen 空氣盒子
全部列表
地圖列點
最愛列表
最愛列點


Howard222
PM2.5: 9 μg/m³ 低
溫度:23.7°C , 濕度:78%
PM2.5
溫度
濕度


READY TO GO
READY
READY TO GO



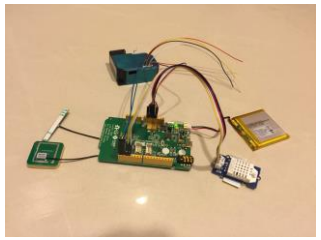
2. System environment setting

System map

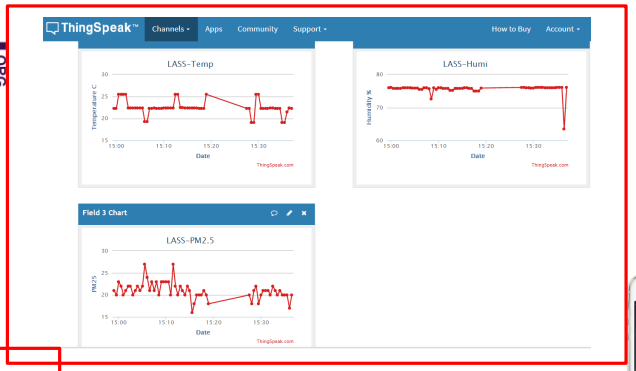
Input

Servers/App

Output



LASS/Test/howard/PM25



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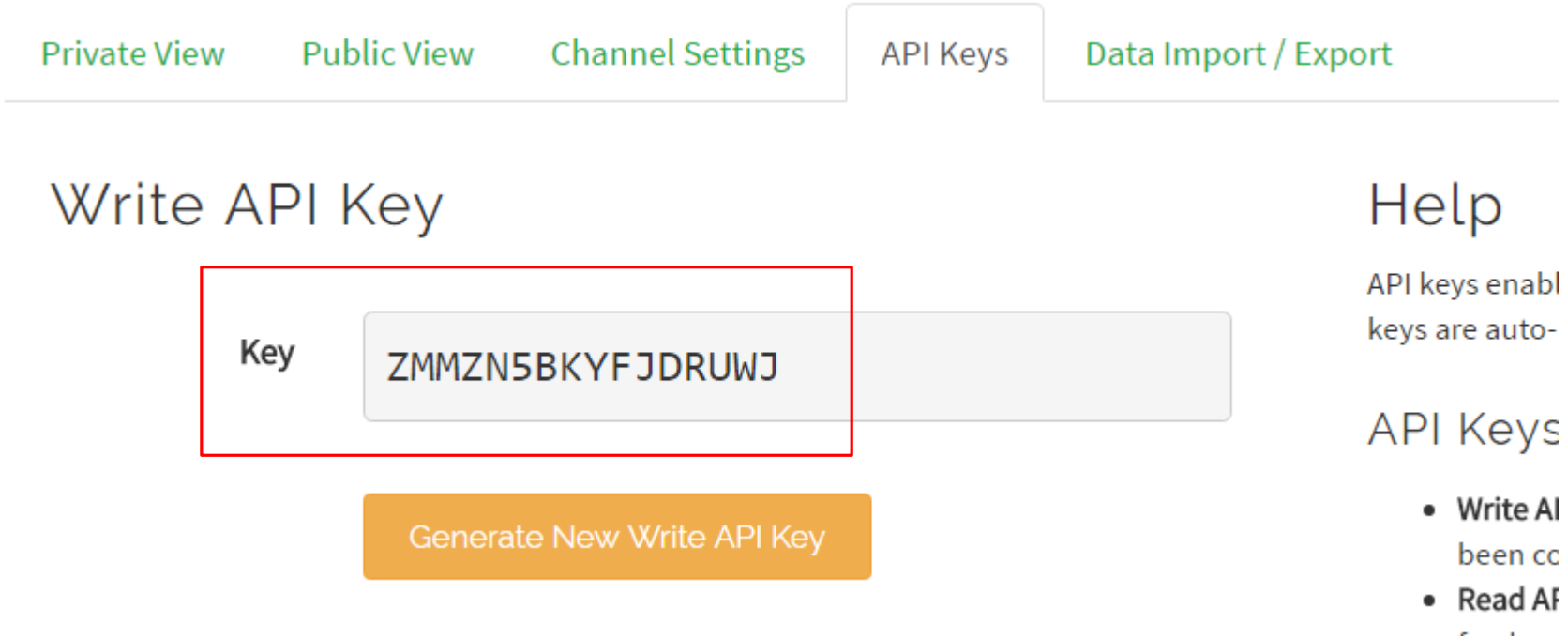
Private View | Public View | Channel Settings | API Keys | Data Import

Channel Settings

Percentage complete	50%
Channel ID	202375
Name	LASS
Description	LASS data from Node-Red
Field 1	Temperature C ☑
Field 2	Humidity % ☑
Field 3	PM25 ☑

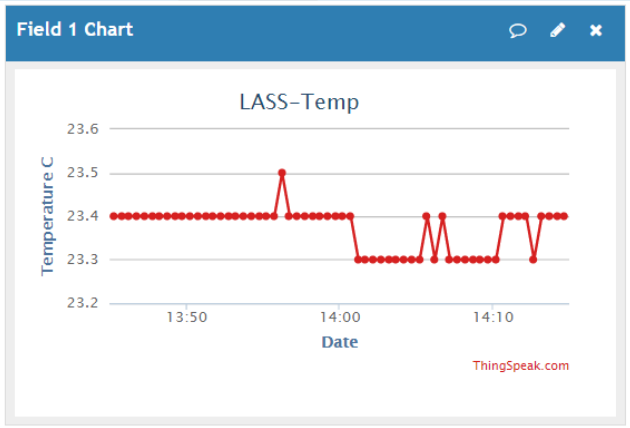
Thingspeak.com

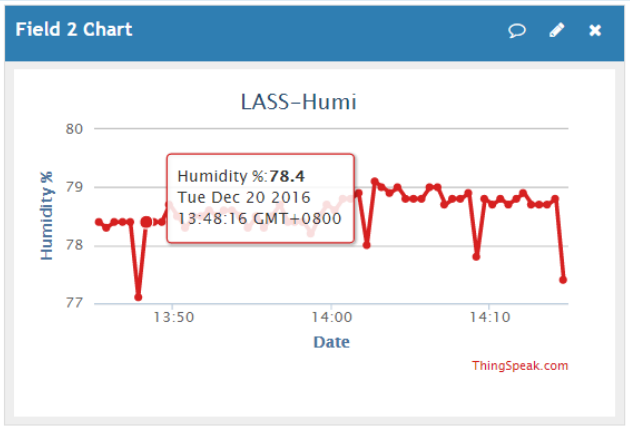
freeboard

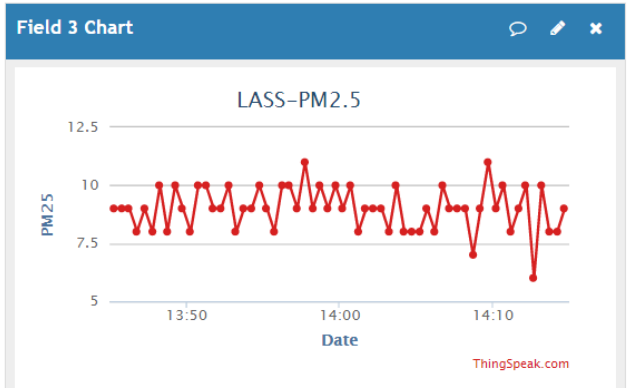


Thingspeak.com

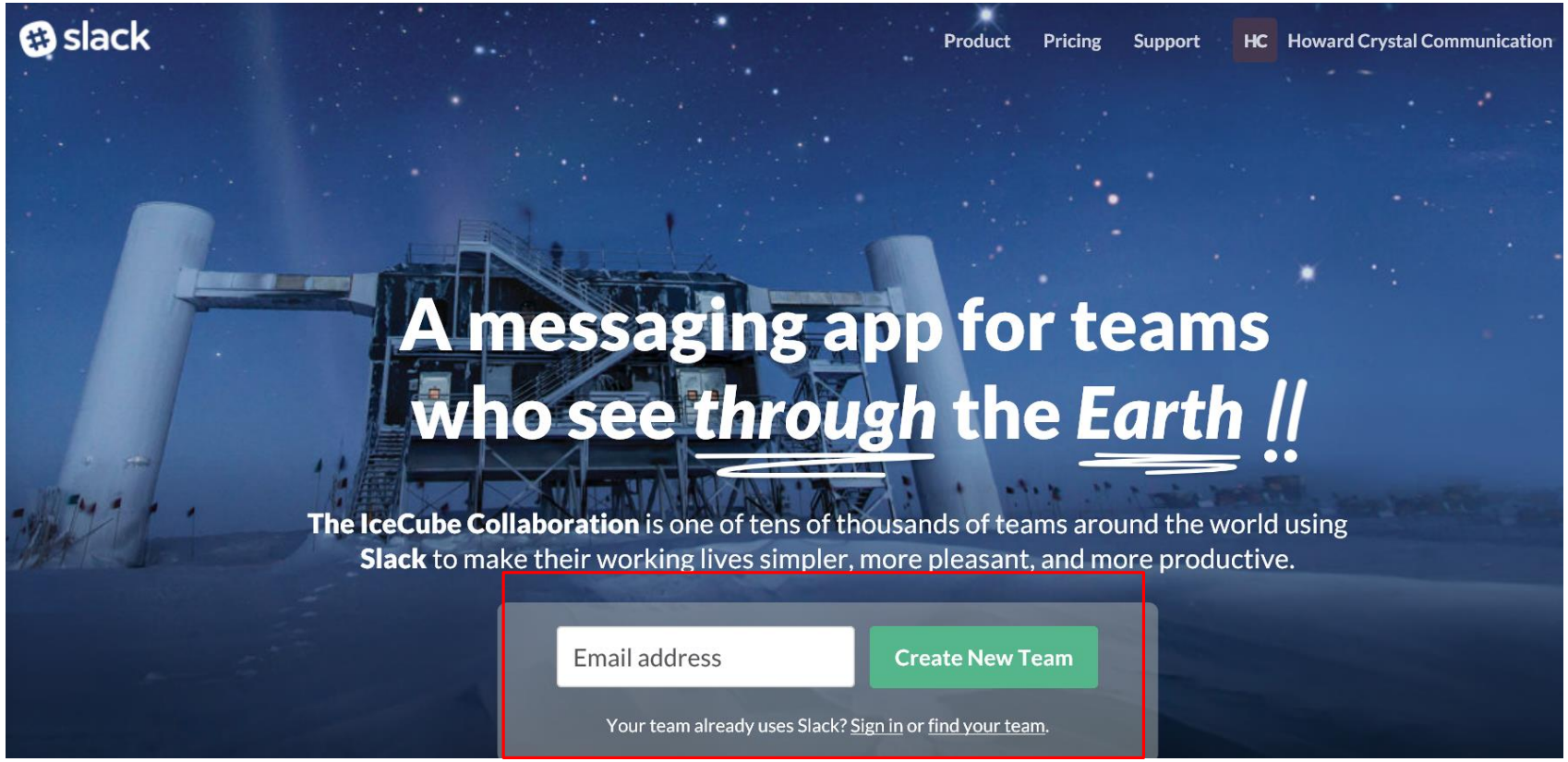
freeboard

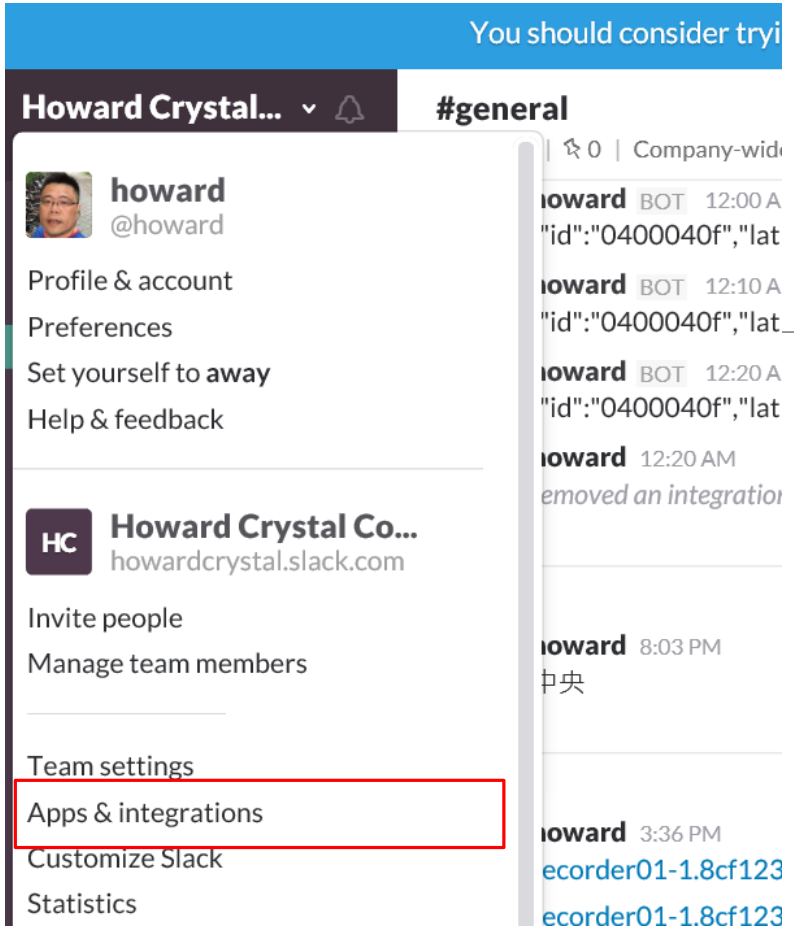


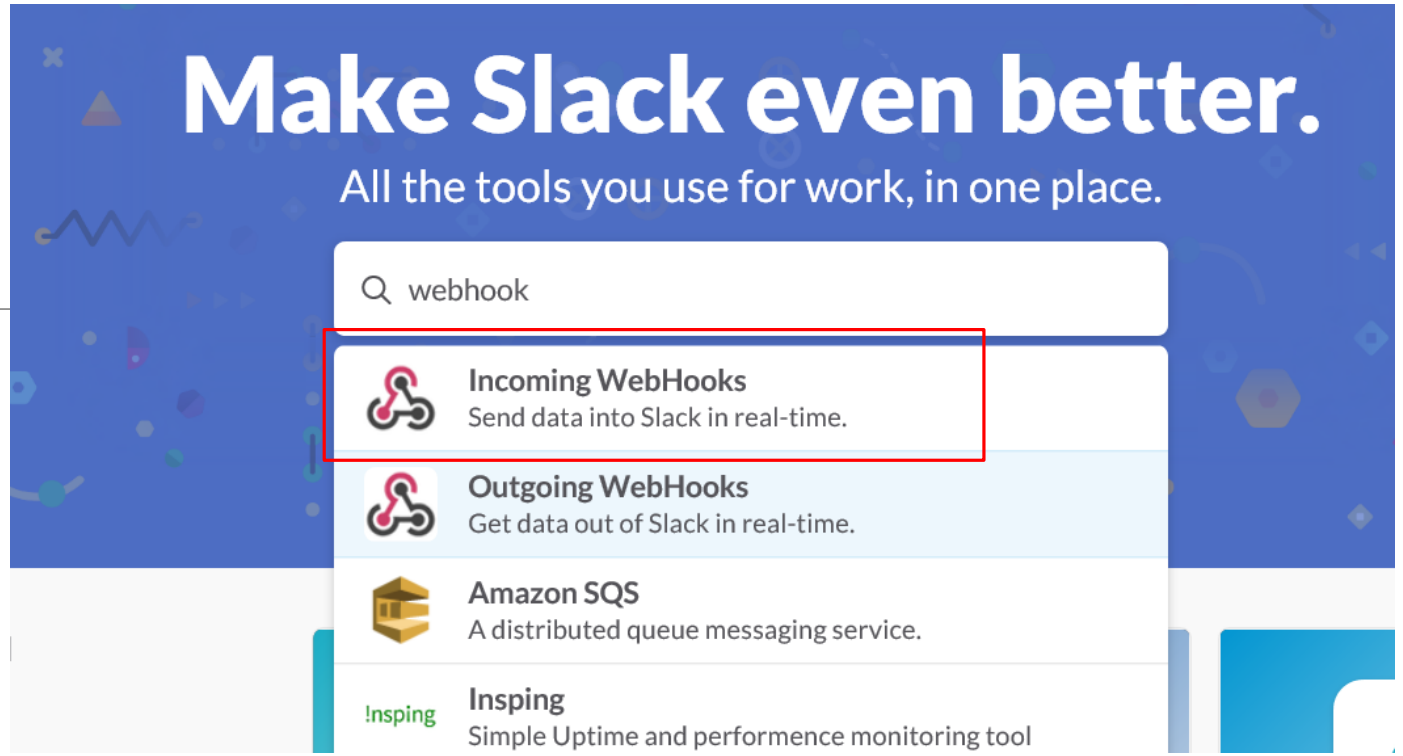




Slack.com


slack
Product
Pricing
Support
HC
Howard Crystal Communication
A messaging app for teams
who see through the Earth !!
The IceCube Collaboration is one of tens of thousands of teams around the world using
Slack to make their working lives simpler, more pleasant, and more productive.
Email address
Create New Team
Your team already uses Slack? Sign in or find your team.





Webhook URL

Send your JSON payloads to this URL.

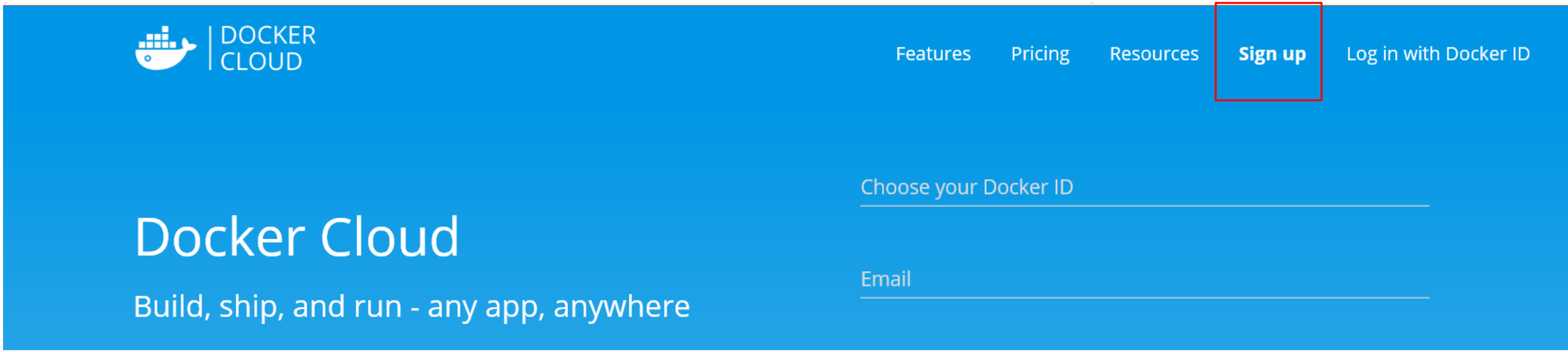
https://hooks.slack.com/services/T25U2LCTS/B37SD3SQ0/28RRoMS0mPnUZZi

Show setup instructions

Copy URL • Regenerate

Docker Cloud

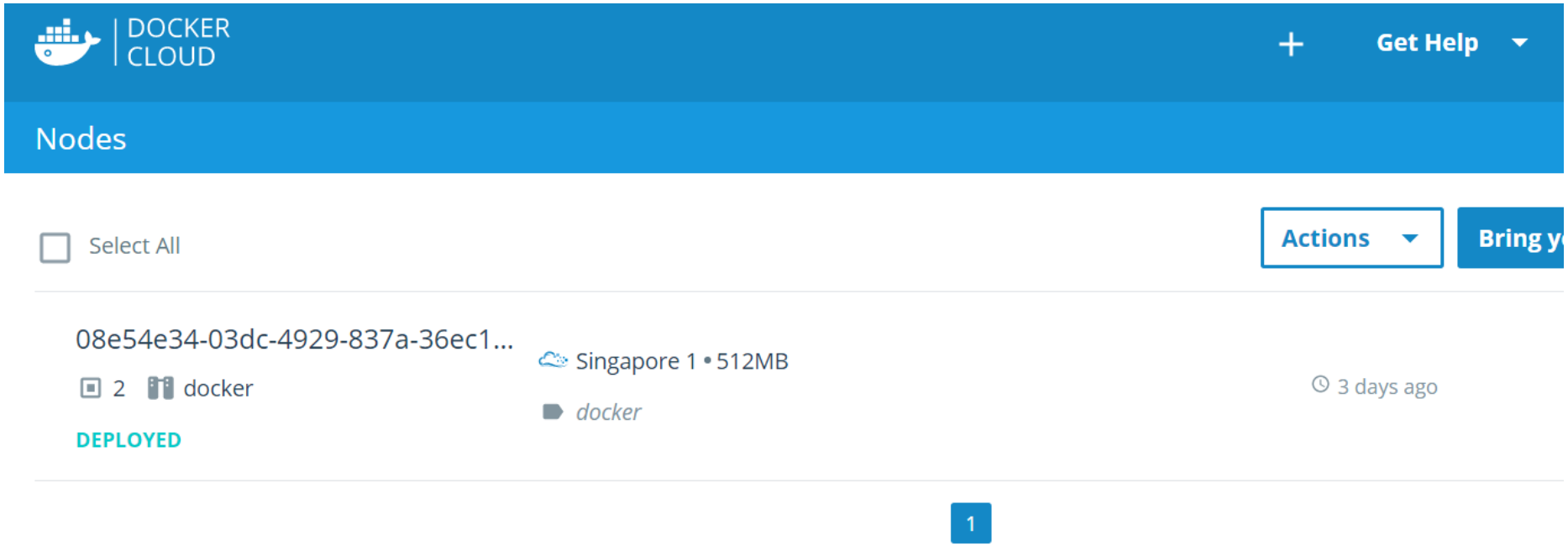
Setup Docker Cloud account https://cloud.docker.com



Docker Cloud node available for Node-RED

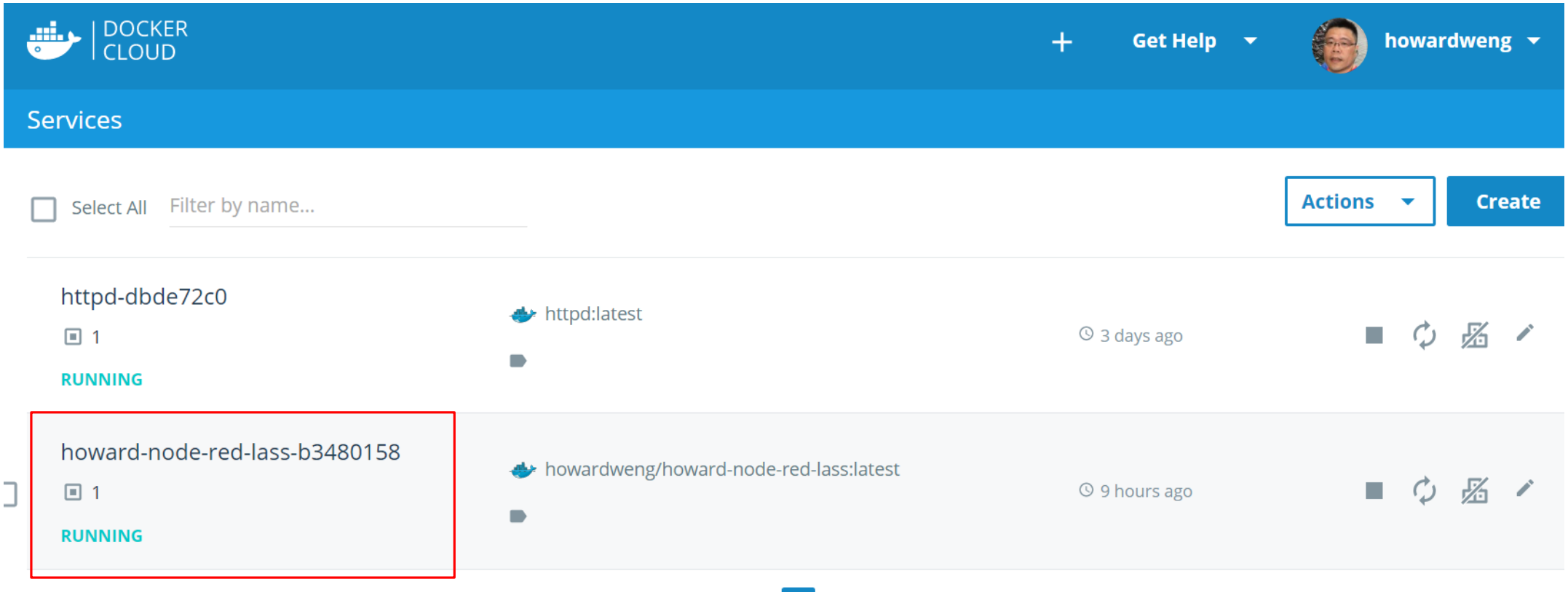
Follow instruction to have one available node from Cloud Providers (Microsoft Azure, AWS, DigitalOcean..)

- PS. One node with Docker is free of charge. But cloud provider is to initiate a virtual machine with cloud provider, and it is a charge service, but not too expensive. I am using Digital Ocean now, because the registration is easier.



Node-RED customized Docker Image

Docker Image name, please search: howardweng/howard-node-red-lass

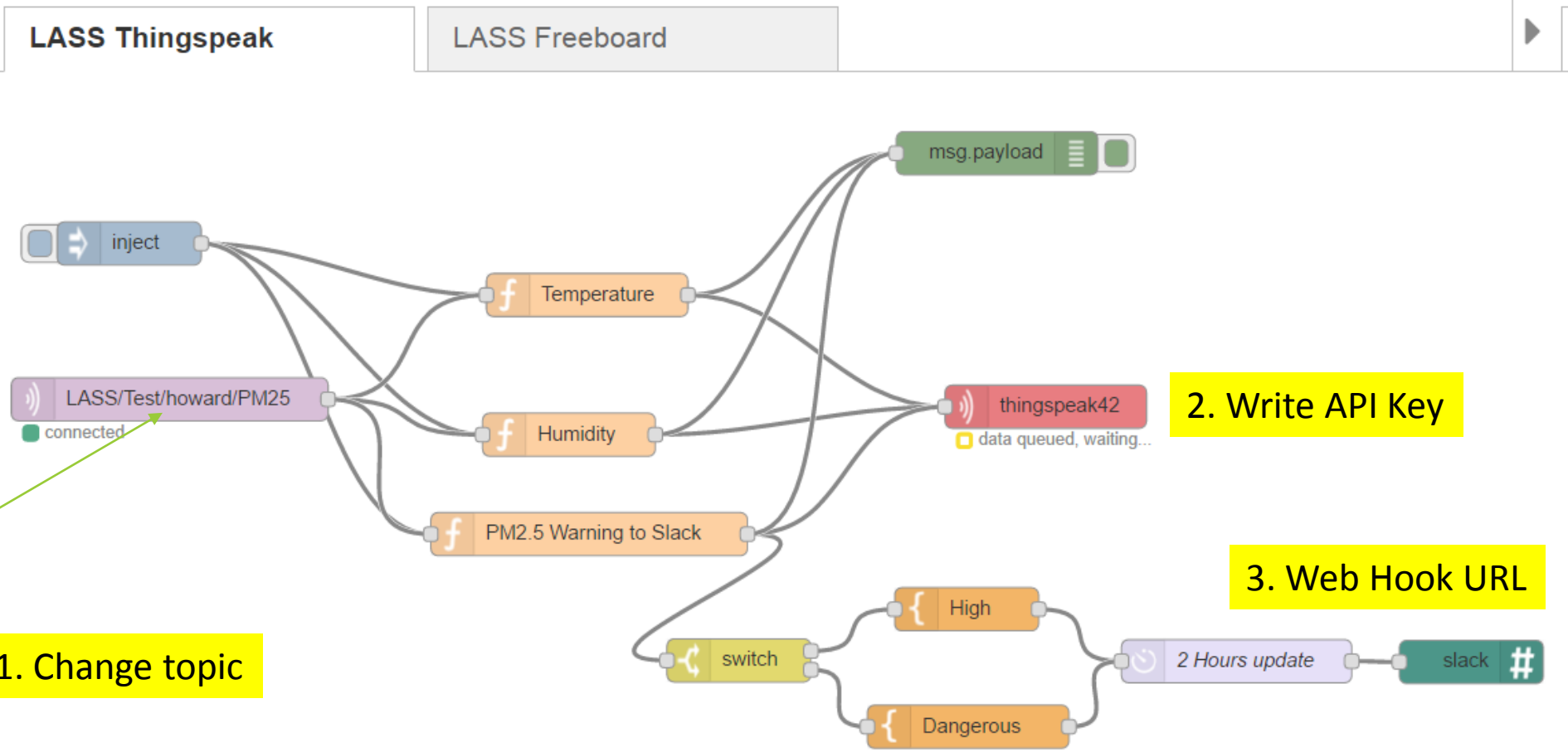


Pushing Data to system

3.1 Pushing data to Thingspeak

Node-Red to bridge Thingspeak

```
-----Loop ID: 92, current tick= 2768582
SensorValue(RecordID):92.00
SensorValue(BatteryLevel):100.00
SensorValue(BatteryCharging):1.00
SensorValue(speed):0.00
SensorValue(debugwifi):1.00
[Performence TIME-COUNT]:29894
[SENSOR-DUST-PM2.5]:15.00
[SENSOR-DUST-PM10]:18.00
SensorValue(Temperature):22.30
SensorValue(Humidity):75.50
Reconnecting to MQTT Proxy
Pack MQTT Topic:LASS/Test/howard/PM25
|ver_format=3|FAKE_GPS=1|app=PM25|ver_a
MQTT Companion channel published...
MQTT sending
LED:Wifi and gps ready!
```

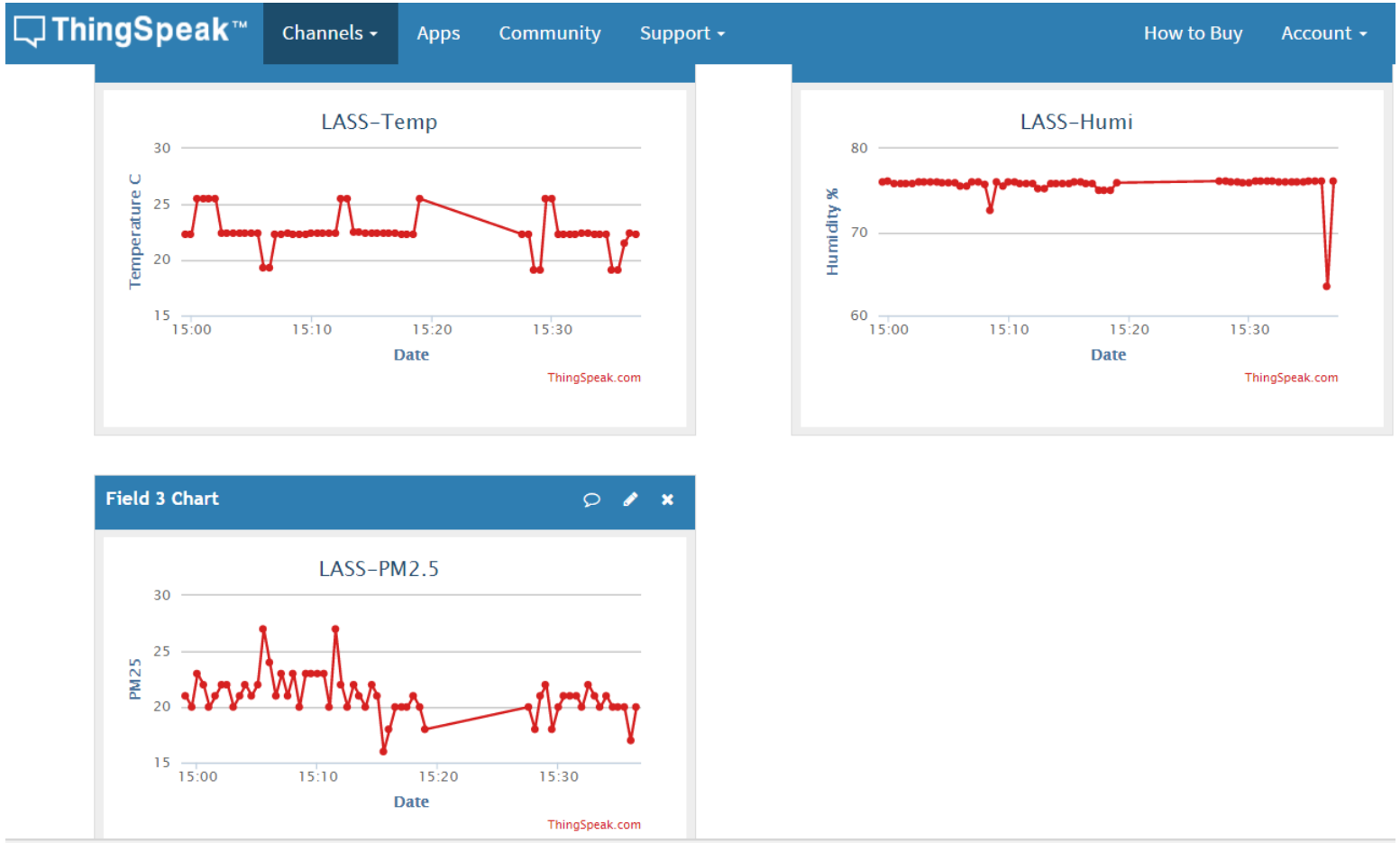


1. Change topic

2. Write API Key

3. Web Hook URL

ThingSpeak.com



Slack

slack

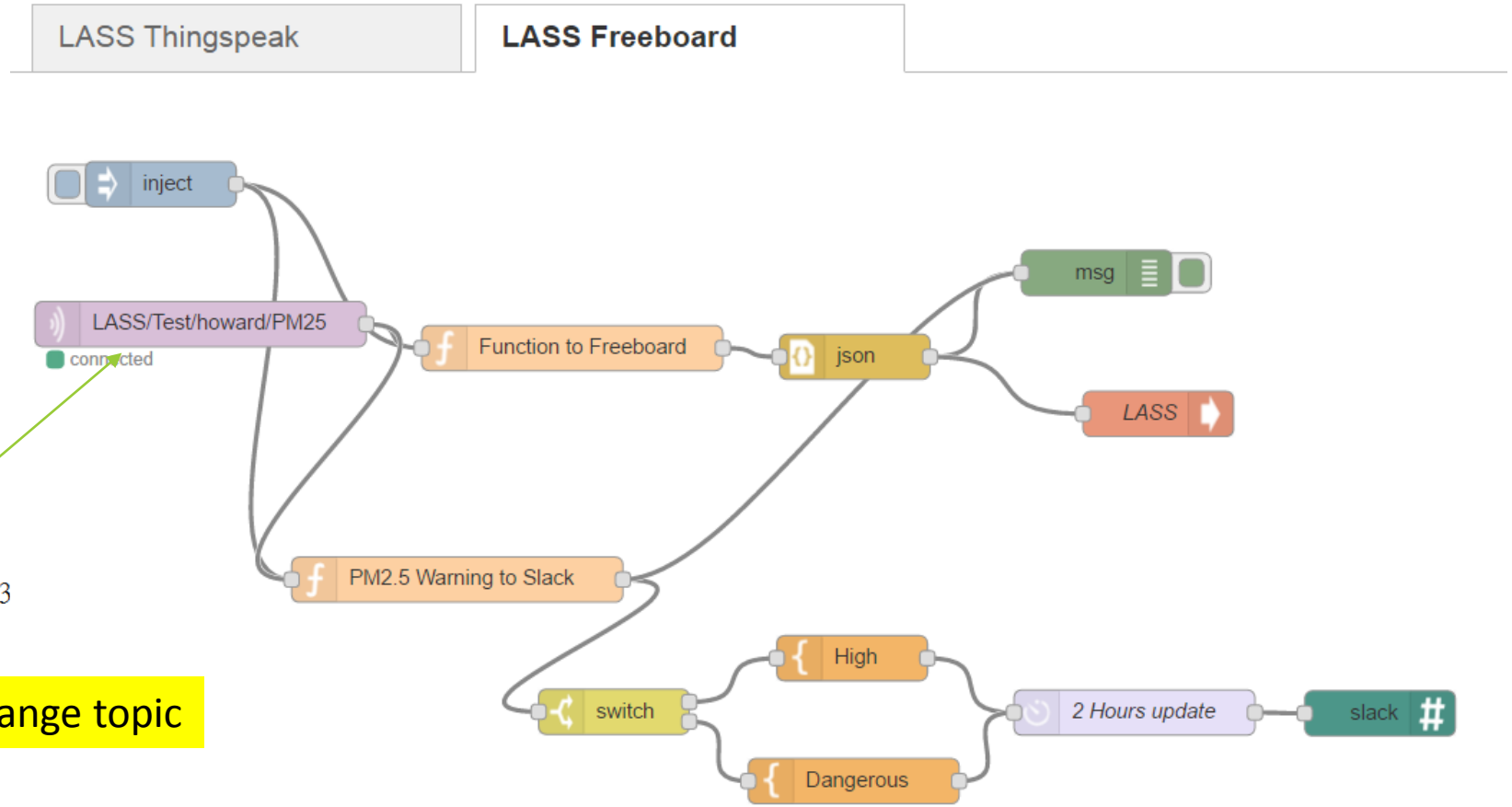

●●●●○ 中華電信
下午6:31
100%
familylocations
注意
Name1 BOT 10:23 PM
PM2.5: 40.00,Bad: 空氣品質不好, 請注意
PM2.5: 40.00,Bad: 空氣品質不好, 請注意
Today
NEW MESSAGES
Name1 BOT 11:07 AM
PM2.5: 36.00,Bad: 空氣品質不好, 請注意
PM2.5: 36.00,Bad: 空氣品質不好, 請注意
Name1 BOT 5:49 PM
PM2.5: 36.00,Bad: 空氣品質不好, 請注意
PM2.5: 36.00,Bad: 空氣品質不好, 請注意
Message familylocations

3.2. Pushing data to Freeboard

Node-RED to bridge Freeboard

```
-----Loop ID: 92, current tick= 2768582 -----
SensorValue(RecordID):92.00
SensorValue(BatteryLevel):100.00
SensorValue(BatteryCharging):1.00
SensorValue(speed):0.00
SensorValue(debugwifi):1.00
[Performence TIME-COUNT]:29894
[SENSOR-DUST-PM2.5]:15.00
[SENSOR-DUST-PM10]:18.00
SensorValue(Temperature):22.30
SensorValue(Humidity):75.50
Reconnecting to MQTT Proxy
Pack MQTT Topic:LASS/Test/howard/PM25
|ver_format=3|FAKE_GPS=1|app=PM25|ver_app=0.8.3
MQTT Companion channel published...
MQTT sending
LED:Wifi and gps ready!
```

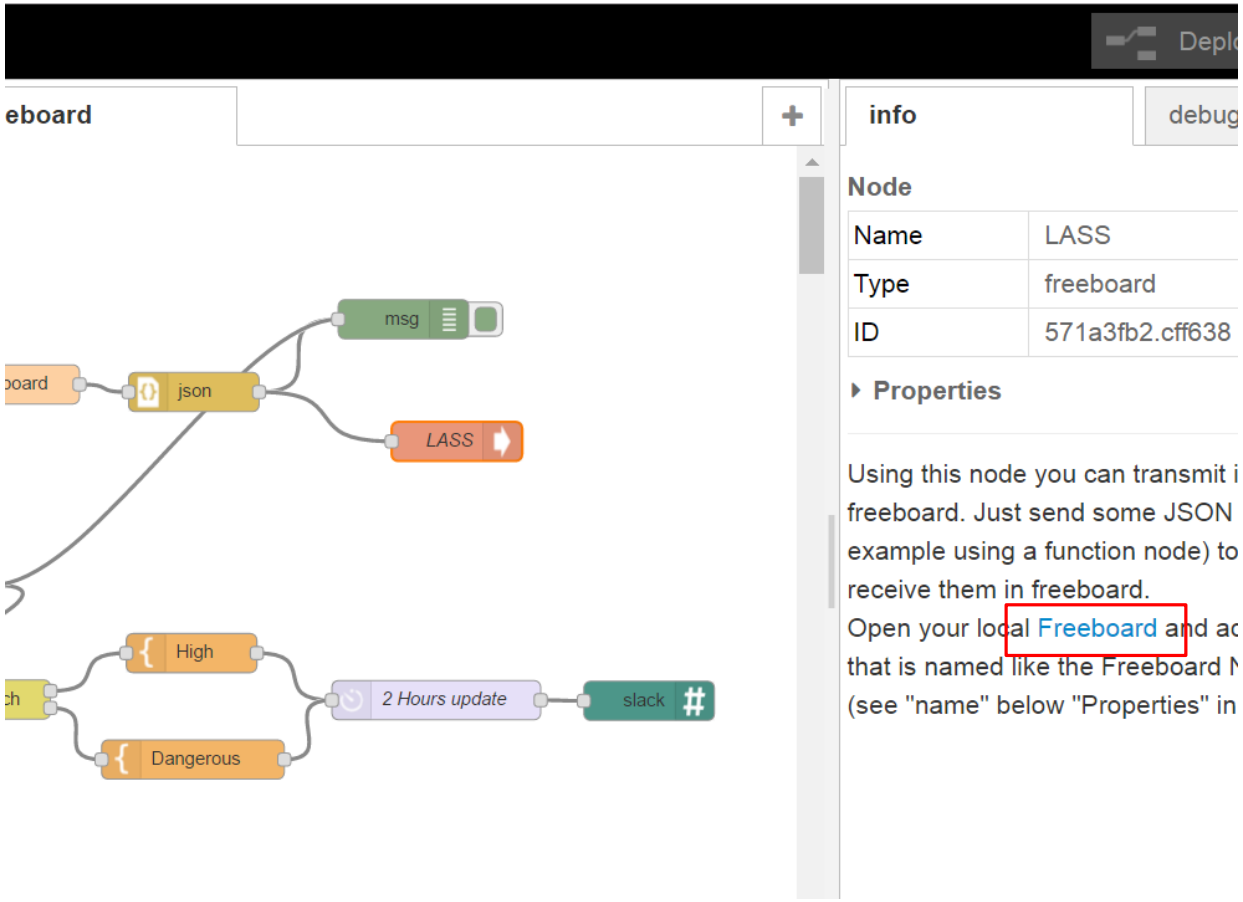
1. Change topic

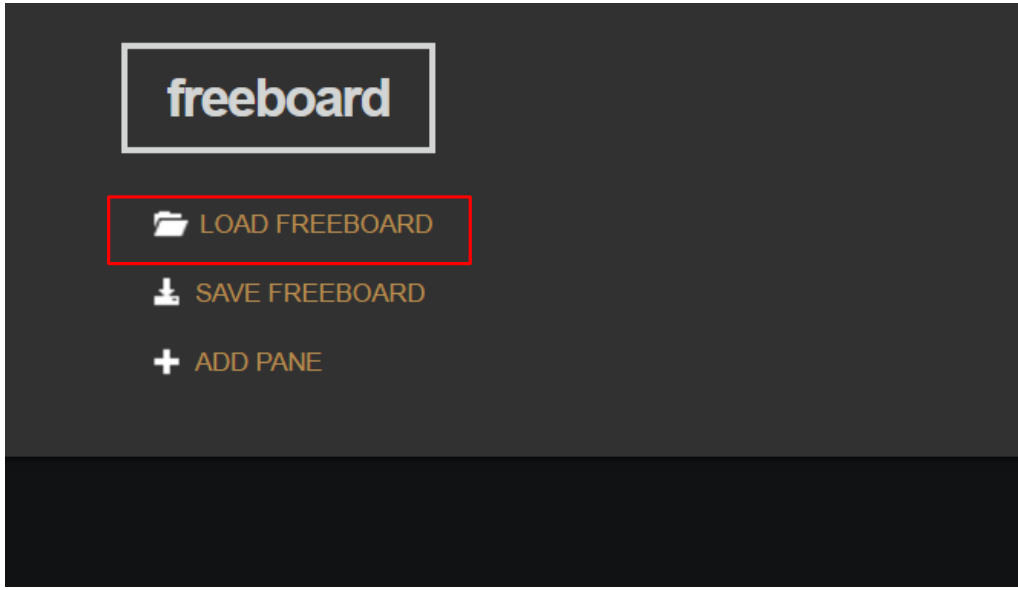


Download Freeboard Template

On Github. Download Freeboard Json file, unzip, and upload

https://github.com/howardweng/FLASS/tree/master/node-red-freeboard-json

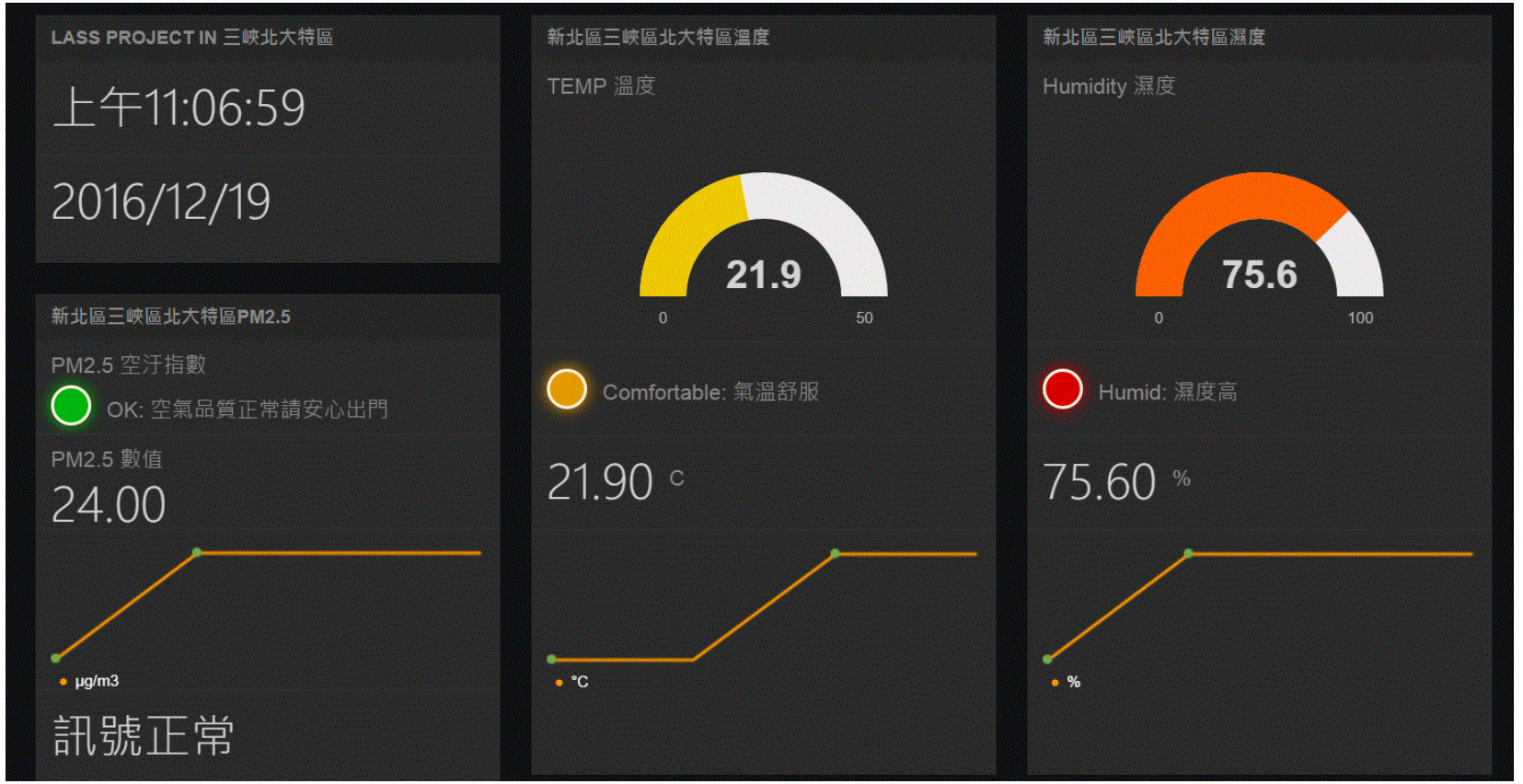

Deplo
eboard
info
debug
Node
Name
LASS
Type
freeboard
ID
571a3fb2.cff638
Properties
Using this node you can transmit i
freeboard. Just send some JSON
example using a function node) to
receive them in freeboard.
Open your local Freeboard and ac
that is named like the Freeboard N
(see "name" below "Properties" in
msg
json
LASS
High
2 Hours update
slack
Dangerous


freeboard
LOAD FREEBOARD
SAVE FREEBOARD
ADD PANE

freeboard

https://github.com/howardweng/FLASS/blob/master/node-red-freeboard-json/freeboard_howard_lass.zip

Freeboard JSON for Node-RED. Please Download unzip



Slack

slack


●●●●○ 中華電信
下午6:31
100%
familylocations
注意
Name1 BOT 10:23 PM
PM2.5: 40.00,Bad: 空氣品質不好, 請注意
PM2.5: 40.00,Bad: 空氣品質不好, 請注意
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NEW MESSAGES
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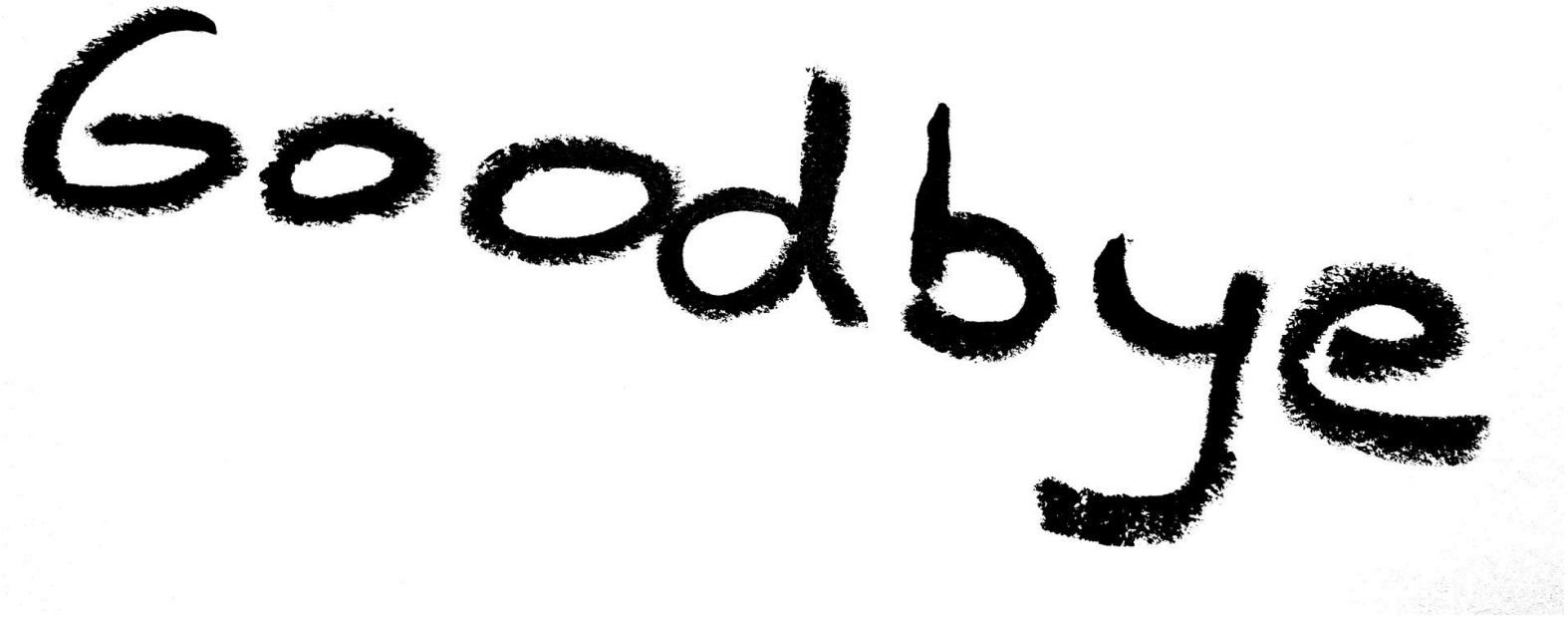
PM2.5: 36.00,Bad: 空氣品質不好, 請注意
Name1 BOT 5:49 PM
PM2.5: 36.00,Bad: 空氣品質不好, 請注意
PM2.5: 36.00,Bad: 空氣品質不好, 請注意
Message familylocations



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