

AWS Educate 資源融入課 堂上應用

實踐大學資訊科技與管理學系

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2021/03/22

大綱

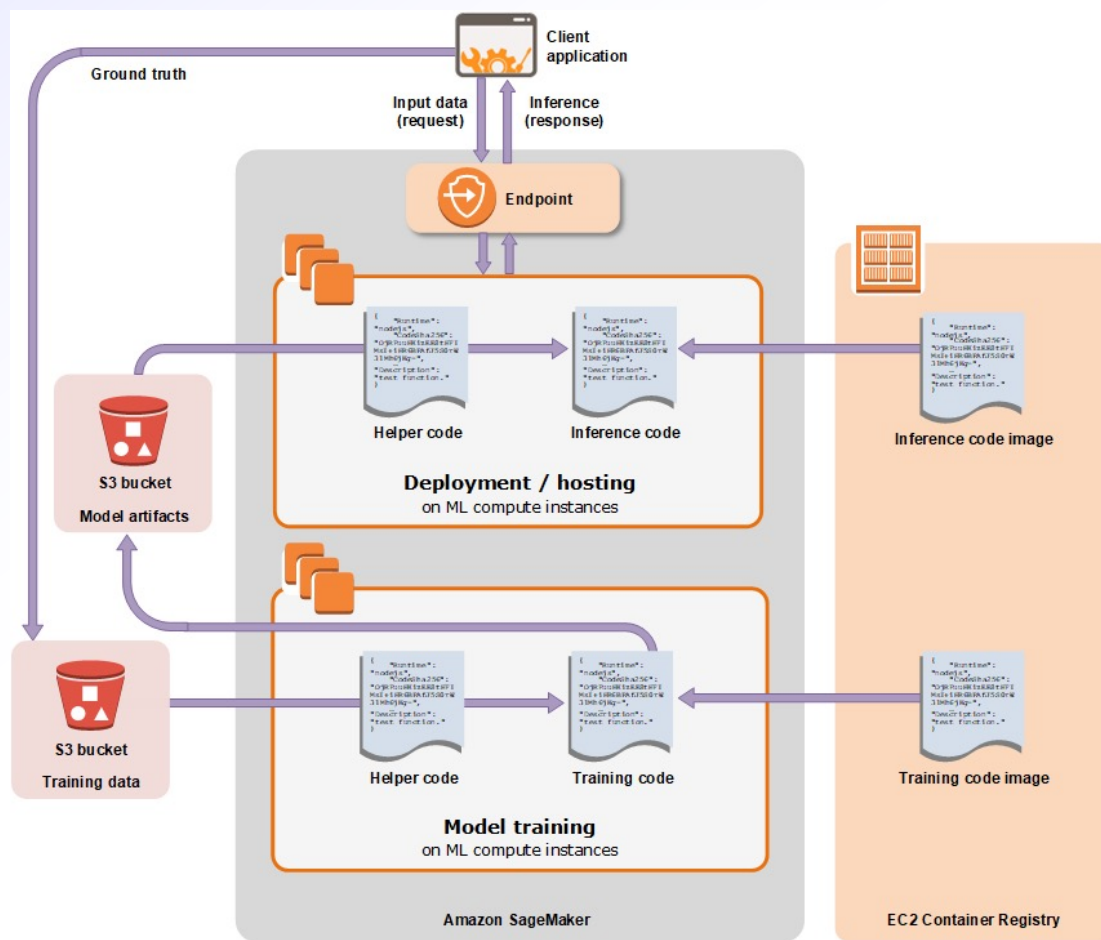
1. 專題-人臉辨識
2. 專題-物聯網與大數據分析



台北校區
實踐大學
SHIN CHIEN UNIVERSITY

人臉辨識

架構





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選取 Notebook instances

The screenshot displays the AWS Management Console interface for Amazon SageMaker. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', and user information. The left sidebar shows the 'Amazon SageMaker' menu with options like 'Amazon SageMaker Studio', 'Dashboard', 'Search', 'Ground Truth', and 'Notebook'. The 'Notebook instances' link under the 'Notebook' category is highlighted with a red rectangular box. The main content area shows the 'Amazon SageMaker Studio' dashboard, featuring an information card about the IDE and an 'Overview' section with icons for Ground Truth, Notebook, Training, Inference, and AWS Marketplace.

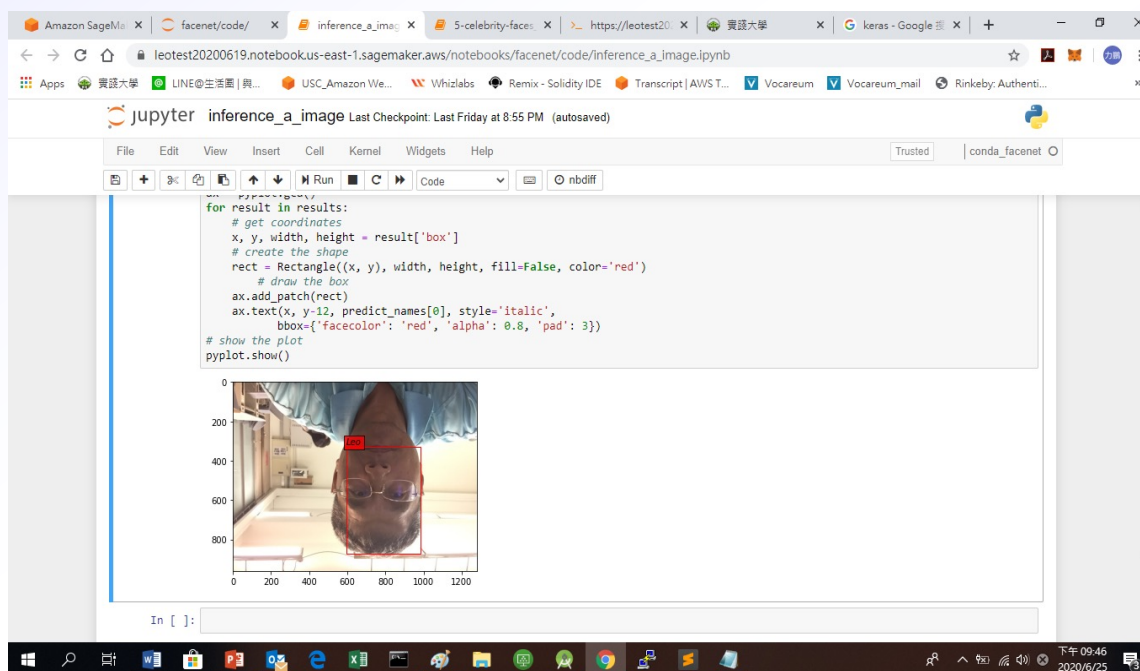
建立環境

- `conda create -n facenet python=3.6 numpy=1.16.1 jupyter`
- `source activate facenet`
- `pip install tensorflow==1.3`
- `pip install keras==2.1.2`
- `pip install opencv-python`
- `pip install scikit-learn scikit-image imageio`
- `pip install mtcnn==0.0.8`
- `pip install matplotlib h5py Pillow`

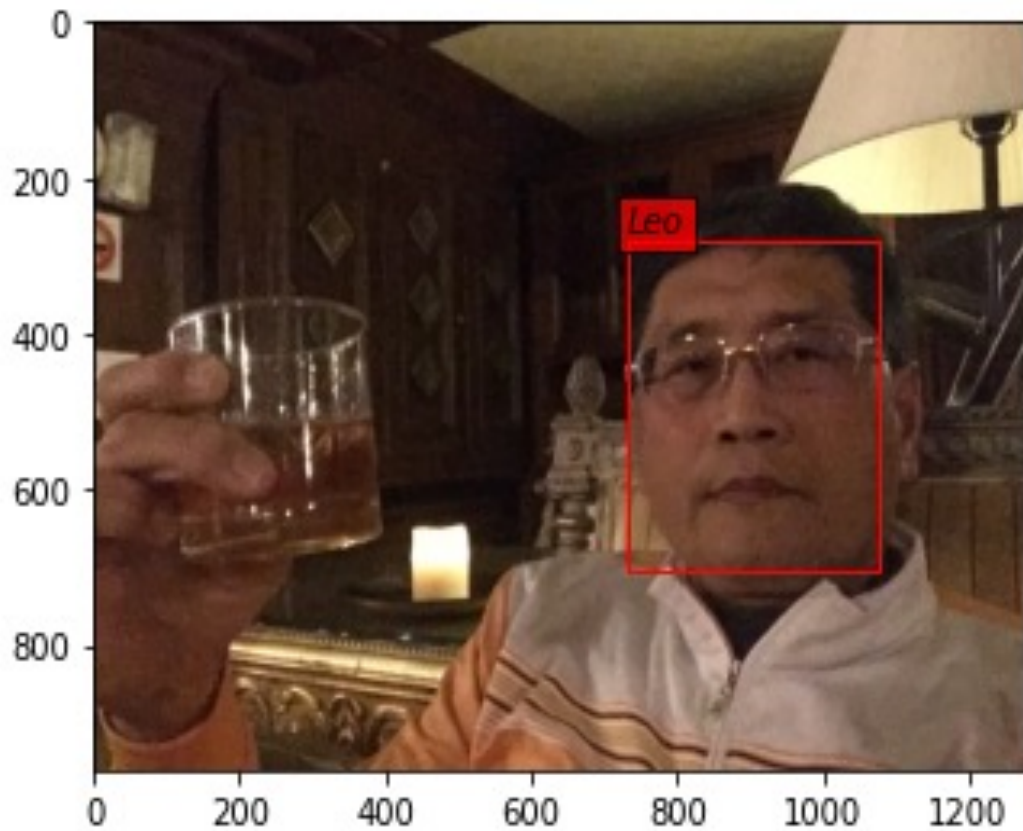


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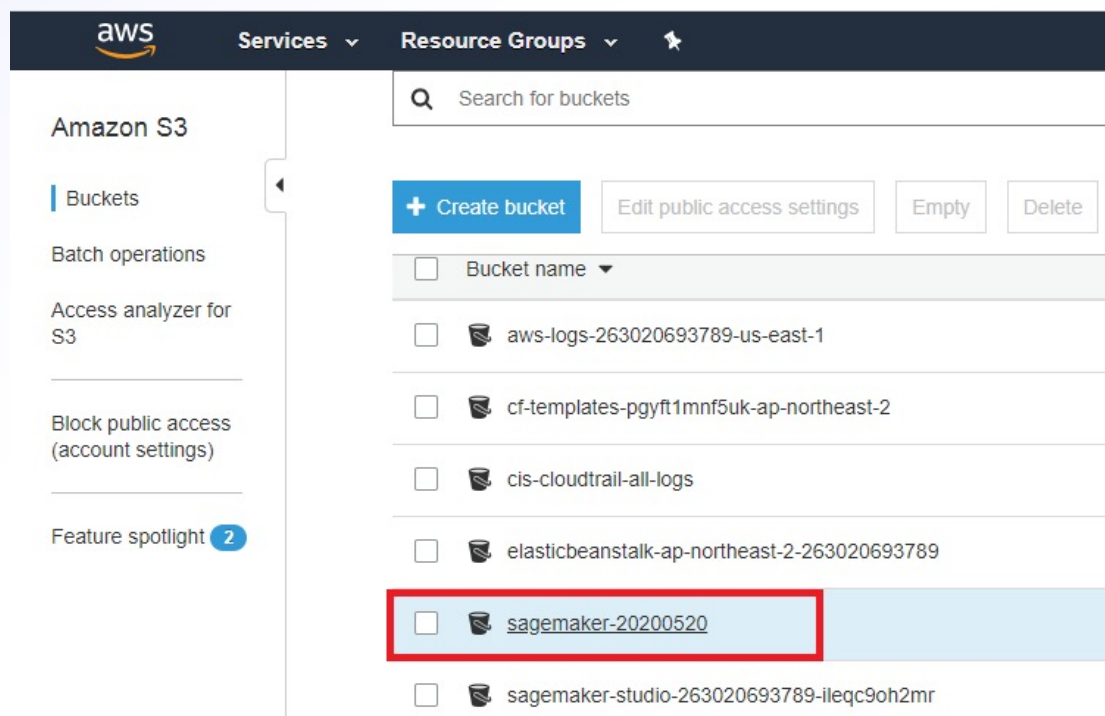
透過Sagemaker執行訓練



辨識成果



在S3建立共享資料夾



無移植的難度

jupyter

Files Running Clusters

Select items to perform actions on them.

☐ 0 /

☐ docs

☐ MicroPython

jupyter

Files Running Clusters SageMaker Examples Conda

Select items to perform actions on them.

☐ 0 / facenet / code

..

☐ 5-celebrity-faces_example.ipynb

☐ demo-images_5c.ipynb

☐ demo-images_o.ipynb

☐ demo-svm_5c.ipynb

☐ demo-svm_o.ipynb

☐ inference_a_image.ipynb

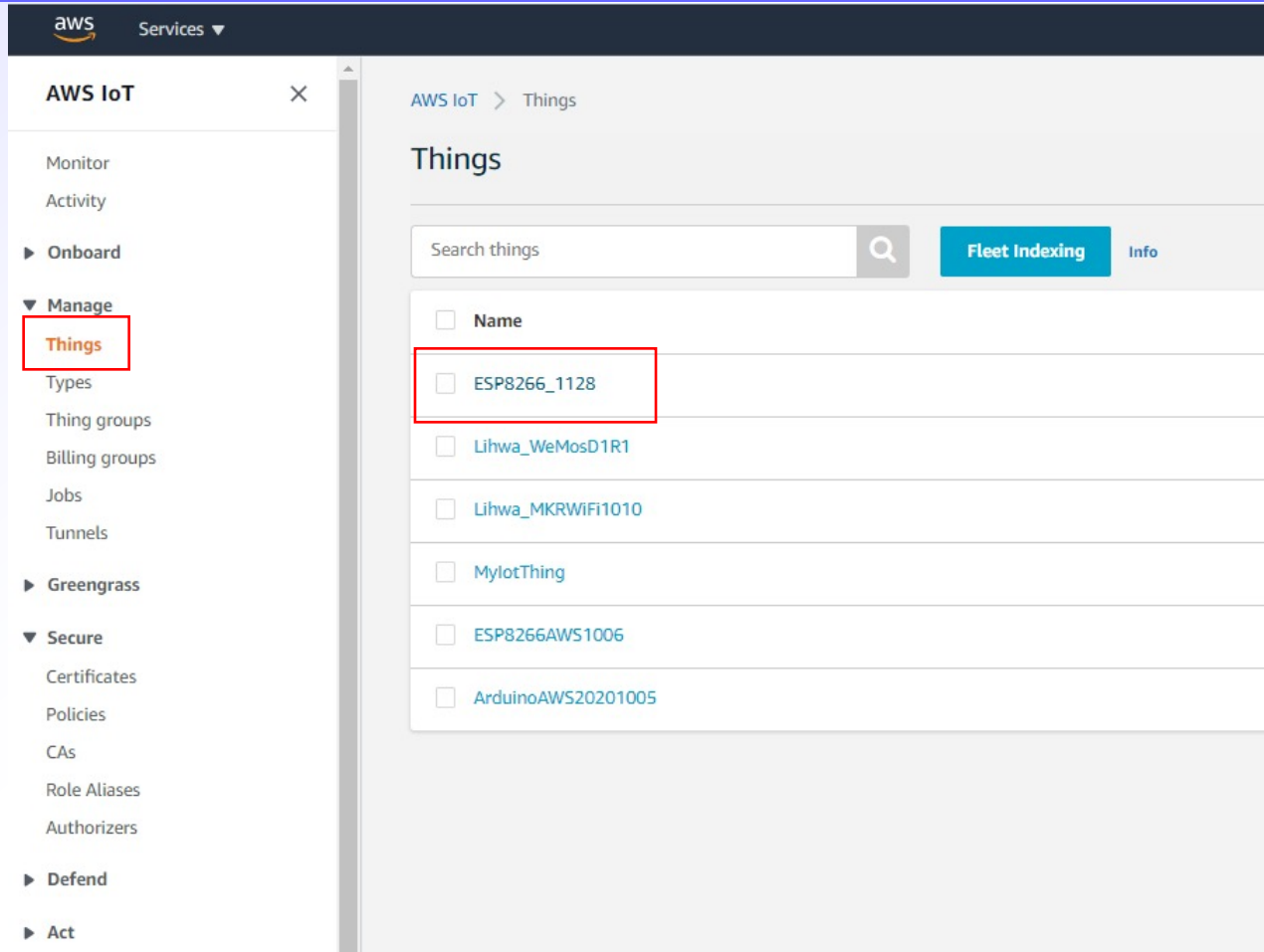
☐ new_data_example.ipynb

☐ inception_resnet_v1.py

物聯網

ArduinoESP8266+AWS

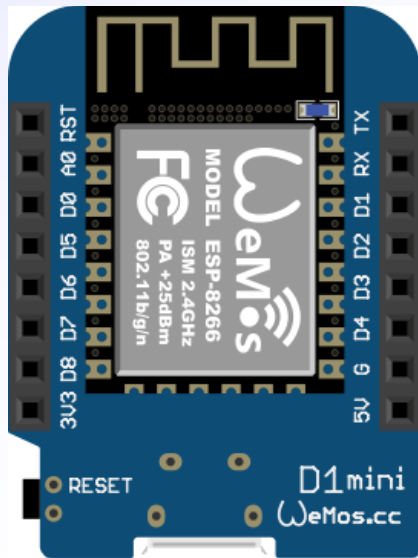
AWS IoT建立



The screenshot displays the AWS IoT console interface. On the left, the 'AWS IoT' sidebar is visible, with the 'Manage' section expanded and 'Things' highlighted. The main content area shows the 'Things' page, which includes a search bar and a list of IoT devices. The first device in the list, 'ESP8266_1128', is highlighted with a red box.

Name
ESP8266_1128
Lihwa_WeMosD1R1
Lihwa_MKRWIFI1010
MyIotThing
ESP8266AWS1006
ArduinoAWS20201005

Arduino 套件



Arduino ESP8266



溫度感應元件

建立MQTT Thing



AWS IoT > Things > Create things

Creating AWS IoT things

An IoT thing is a representation and record of your physical device in the cloud. Any physical device needs a thing record in order to work with AWS IoT. [Learn more.](#)

Register a single AWS IoT thing

Create a thing in your registry

Create a single thing

Bulk register many AWS IoT things

Create things in your registry for a large number of devices already using AWS IoT, or register devices so they are ready to connect to AWS IoT.

Create many things

Cancel

Create a single thing

下載Certificate

✓ **Success**
Successfully created thing.

✓ **Success**
Successfully generated certificate. Please download certificate files.

Certificate created!

Download these files and save them in a safe place. Certificates can be retrieved at any time, but the private and public keys cannot be retrieved after you close this page.

In order to connect a device, you need to download the following:

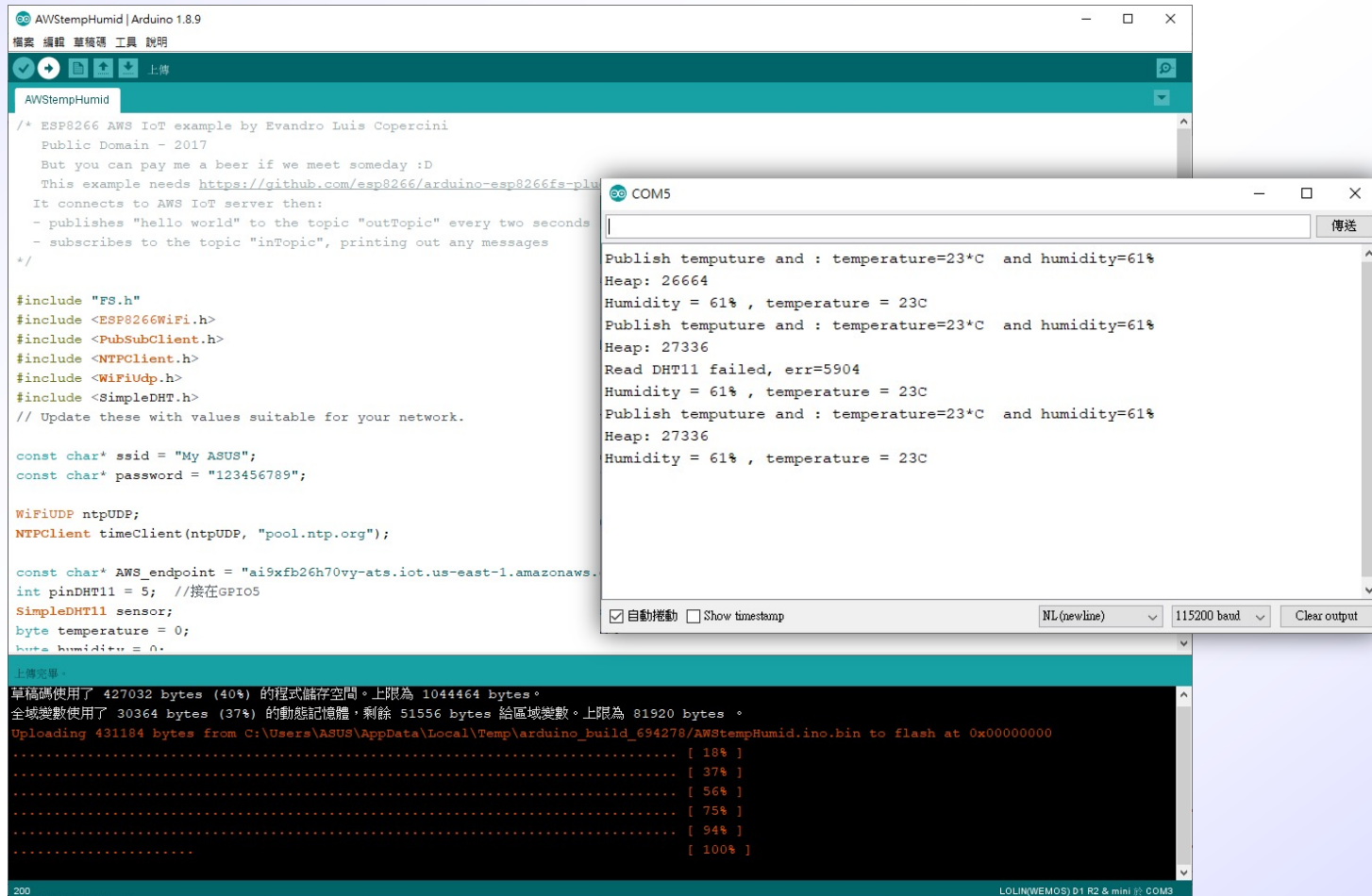
A certificate for this thing	aa1576b047.cert.pem	Download
A public key	aa1576b047.public.key	Download
A private key	aa1576b047.private.key	Download

You also need to download a root CA for AWS IoT:

A root CA for AWS IoT [Download](#)

[Activate](#)

Arduino IDE



The screenshot displays the Arduino IDE interface with the 'AWStempHumid' sketch loaded. The code is an ESP8266 AWS IoT example that publishes temperature and humidity data to an AWS IoT topic. The serial monitor shows the output of the program, including the publish status, heap memory usage, and sensor readings. The bottom status bar indicates the board is 'LOLIN(WEMOS) D1 R2 & mini 於 COM5'.

```
AWStempHumid | Arduino 1.8.9
檔案 編輯 草稿碼 工具 說明
AWStempHumid
/* ESP8266 AWS IoT example by Evandro Luis Copercini
Public Domain - 2017
But you can pay me a beer if we meet someday :D
This example needs https://github.com/esp8266/arduino-esp8266fs-plugin
It connects to AWS IoT server then:
- publishes "hello world" to the topic "outTopic" every two seconds
- subscribes to the topic "inTopic", printing out any messages
*/

#include "FS.h"
#include <ESP8266WiFi.h>
#include <PubSubClient.h>
#include <NTPClient.h>
#include <WiFiUdp.h>
#include <SimpleDHT.h>

// Update these with values suitable for your network.

const char* ssid = "My ASUS";
const char* password = "123456789";

WiFiUDP ntpUDP;
NTPClient timeClient(ntpUDP, "pool.ntp.org");

const char* AWS_endpoint = "ai9xfb26h70vy-ats.iot.us-east-1.amazonaws.com";
int pinDHT11 = 5; //接在GPIO5
SimpleDHT11 sensor;
byte temperature = 0;
byte humidity = 0;

// 上傳完畢。
草稿碼使用了 427032 bytes (40%) 的程式儲存空間。上限為 1044464 bytes。
全域變數使用了 30364 bytes (37%) 的動態記憶體。剩餘 51556 bytes 給區域變數。上限為 81920 bytes。
Uploading 431184 bytes from C:\Users\ASUS\AppData\Local\Temp\arduino_build_694278\AWStempHumid.ino.bin to flash at 0x00000000
..... [ 18% ]
..... [ 37% ]
..... [ 56% ]
..... [ 75% ]
..... [ 94% ]
..... [ 100% ]

200 LOLIN(WEMOS) D1 R2 & mini 於 COM5
```


整合至Arduino 套件

WEMOS - wemos.ino | Arduino 1.8.9

檔案 編輯 草稿碼 工具 說明



wemos

```
#include "FS.h"
#include <ESP8266WiFi.h>
#include <PubSubClient.h>
#include <NTPClient.h>
#include <WiFiUdp.h>
#include <SimpleDHT.h>
```

匯入需要的程式庫

```
// Update these with values suitable for your network.
```

```
const char* ssid = "My ASUS";
const char* password = "123456789";
```

輸入 網路名稱
密碼

```
WiFiUDP ntpUDP;
NTPClient timeClient(ntpUDP, "pool.ntp.org");
```

```
const char* AWS_endpoint = "ai9xfb26h70vy-ats.iot.us-east-1.amazonaws.com"; //MQTT broker ip
```

詳細資訊請看下一頁

AWStempHumid | Arduino 1.8.9
檔案 編輯 串列埠 工具 說明

AWStempHumid

This example needs <https://github.com/esp8266/arduino-esp8266fs-plugin>
It connects to AWS IoT server then:
- publishes "hello world" to the topic "outTopic" every two seconds
- subscribes to the topic "inTopic", printing out received messages

```
*/  
  
#include "FS.h"  
#include <ESP8266WiFi.h>  
#include <PubSubClient.h>  
#include <NTPClient.h>  
#include <WiFiUDP.h>  
#include <SimpleDHT.h>  
// Update these with values suitable for your network  
  
const char* ssid = "My ASUS";  
const char* password = "123456789";  
  
WiFiUDP ntpUDP;  
NTPClient timeClient(ntpUDP, "pool.ntp.org");  
  
const char* AWS_endpoint = "ai9x6b26h70vy-ats.iot.us-east-1.amazonaws.com";  
int pinDHT11 = 5; //接在GPIO5  
SimpleDHT11 sensor;  
byte temperature = 0;  
byte humidity = 0;  
String incoming;  
void callback(char* topic, byte* payload, unsigned int length) {  
  Serial.print("Message arrived [");  
  Serial.print(topic);  
  Serial.print("] ");  
  for (int i = 0; i < length; i++) {  
    Serial.print((char)payload[i]);  
  }  
}
```

串接碼使用了 427032 bytes (40%) 的程式儲存空間，上限為 1044464 bytes
全球變數使用了 30364 bytes (37%) 的動態記憶體，剩餘 51556 bytes 給區域變數，上限為 81920 bytes
Uploading 431184 bytes from C:\Users\ASUS\AppData\Local\Temp\arduino_build_808943\AWStempHumid.ino.bin to flash at 0x00000000
[18%]
[37%]
[56%]
[75%]
[94%]
[100%]

COM5
Attempting MQTT connection...

自動啟動 ☐ Show timestamp NL (newline) 115200 baud Clear output

0:00 / 1:02

Writes the data from an MQTT message to an AWS S3

The screenshot illustrates the steps to create an Amazon S3 bucket in the AWS Management Console. It is divided into three numbered sections:

- Services:** The 'Services' menu is highlighted in the top-left navigation pane.
- Storage > S3:** In the 'All services' list, the 'Storage' category is expanded, and the 'S3' service is selected.
- Create bucket:** In the 'Amazon S3' console page, the 'Create bucket' button is highlighted in the top-right corner.

Amazon S3 Buckets (23)

Buckets are containers for data stored in S3. [Learn more](#)

Find buckets by name

	Name	Region	Access	Creation date
<input type="radio"/>	a-20200005	Asia Pacific (Seoul) ap-northeast-2	Unknown Error	November 4, 2020, 14:34 (UTC+08:00)
<input type="radio"/>	aws-logs-263020693789-us-east-1	US East (N. Virginia) us-east-1	Unknown Error	November 25, 2019, 14:55 (UTC+08:00)
<input type="radio"/>	cf-templates-pgyft1mnf5uk-ap-northeast-2	Asia Pacific (Seoul) ap-northeast-2	Unknown Error	June 3, 2019, 10:24 (UTC+08:00)
<input type="radio"/>	cis-cloudtrail-all-logs	US East (N. Virginia) us-east-1	Unknown Error	June 10, 2019, 21:07 (UTC+08:00)

優點

- 容易擴充功能
- 服務連接方便
- 資訊安全
- 高可靠度
- 容易管理



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謝謝聆聽