

NECTEC IoT Camp 2016

ແນະນຳຕົວເອງ

ណັງ ວິໄຈວັດນ

ກາຮັດວຽກ : ປະລຸງງາຕີຈາກກາຄວິ່ນທາງການຄອມພິວເຕອນ ມາວິທຍາລັຍ
ຮຽນຄາສຕ່າງ



ປະສົບກາຮັດນ : Web Development (front&back-end), Game
Development, Android development, IoT & Firmware Development.

ປັຈຸບັນ :

Full-stack Software Developer ບຣິເຫຼັກເມກເກອຣ໌ເວເຊີຍ
ປະຈານຂມຮມ Chiang Mai Maker Club

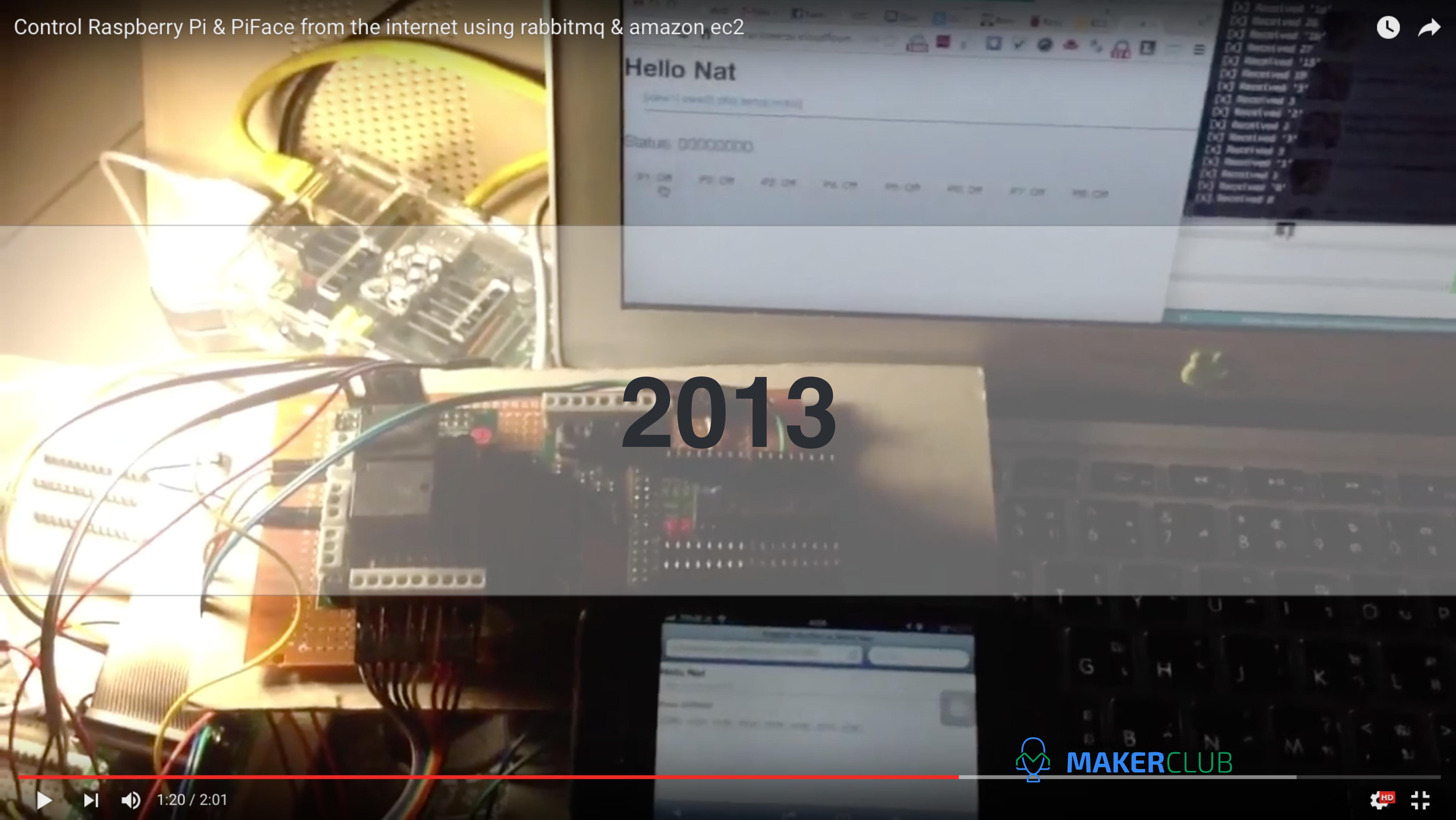
Day 1

- Overview the “Internet of things”
- Cloud Services
- ESP8266
- ESPresso Lite
- NETPIE.io
- ESPert Cloud
- Node.JS / Chocolate / NodeRED

cmmc.io/docs



2006



Control Raspberry Pi & PiFace from the internet using rabbitmq & amazon ec2

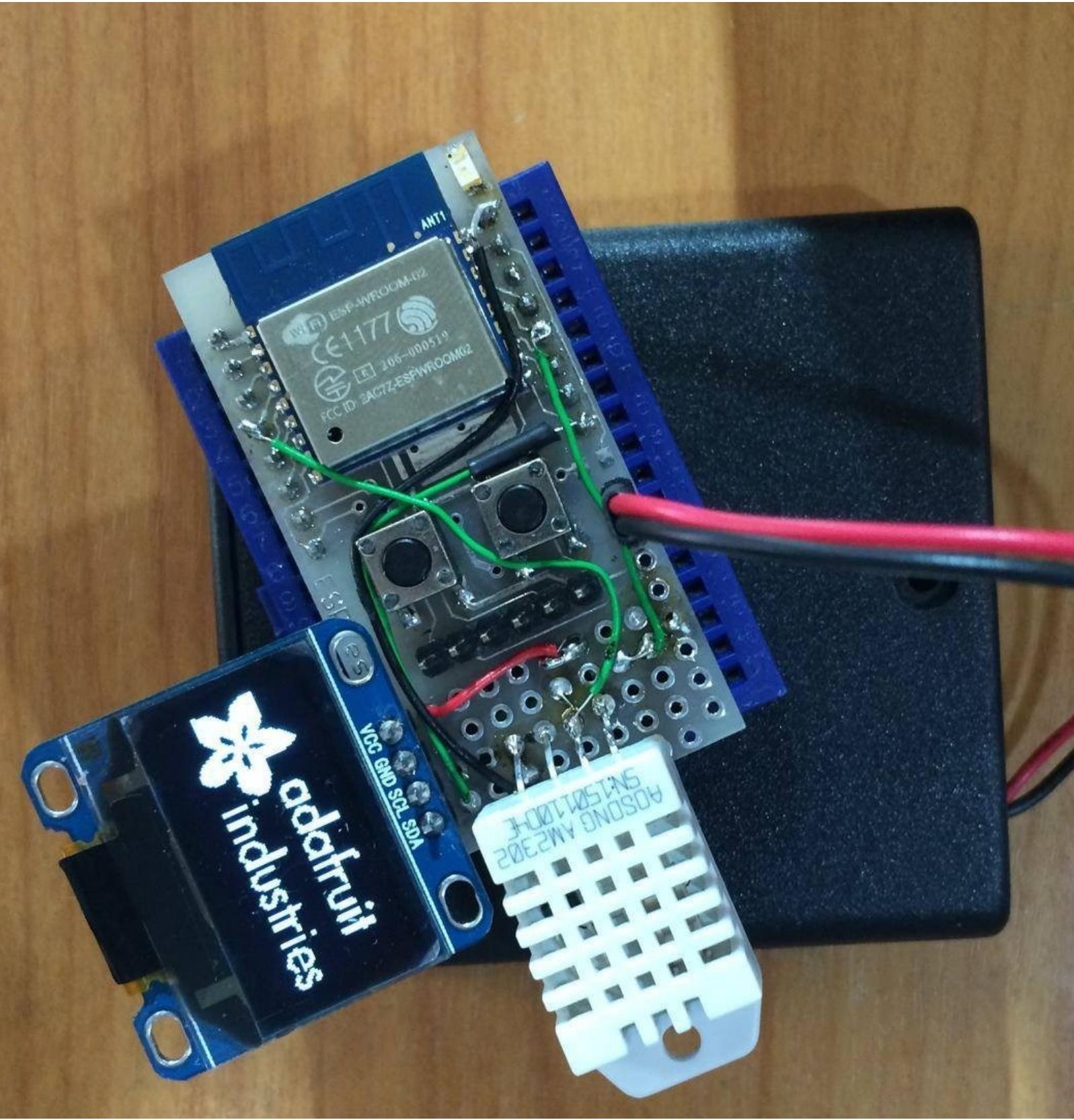


Chiang Mai Maker Club

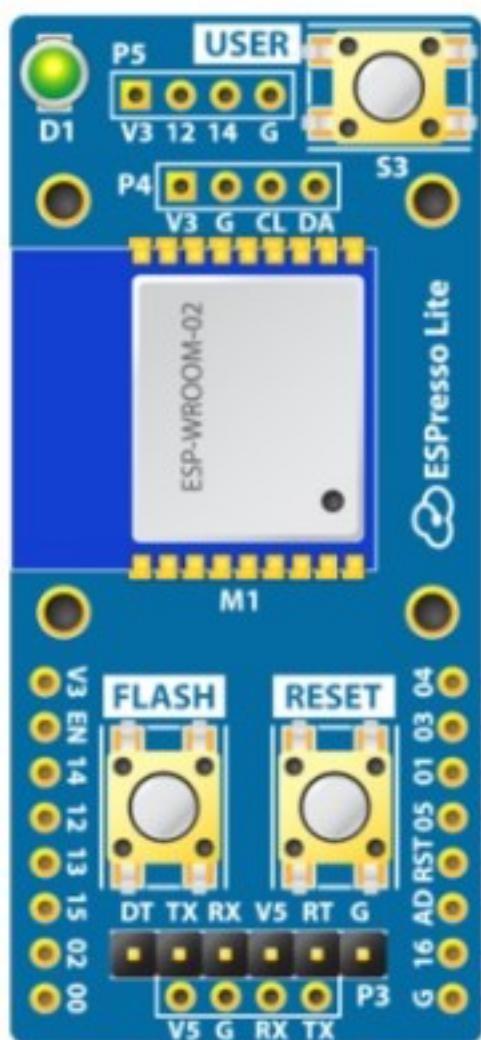
2014



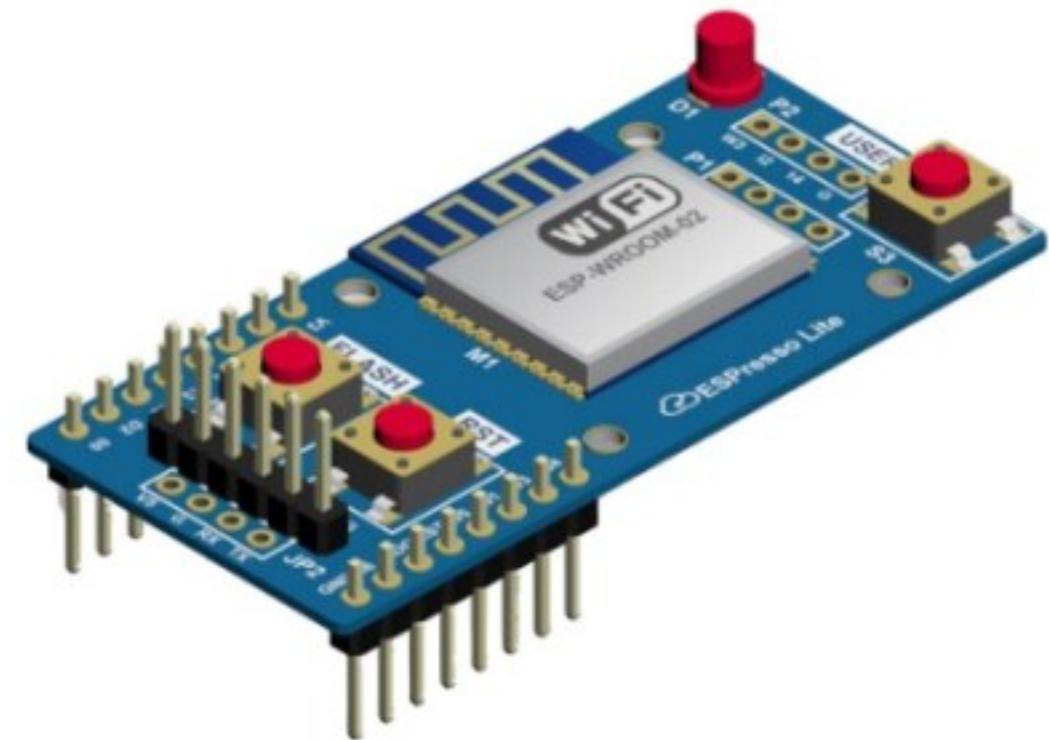


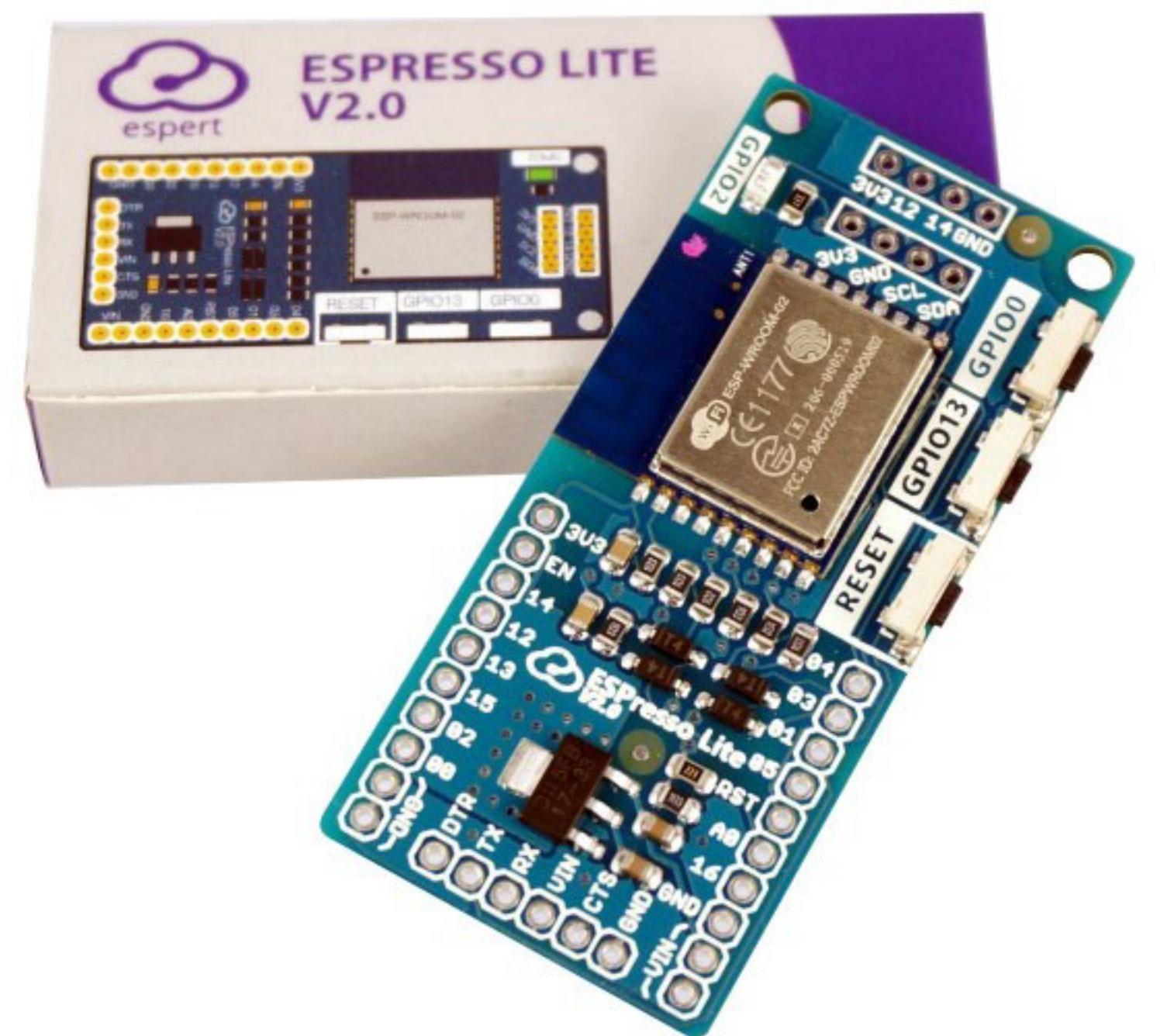


ESPresso Lite

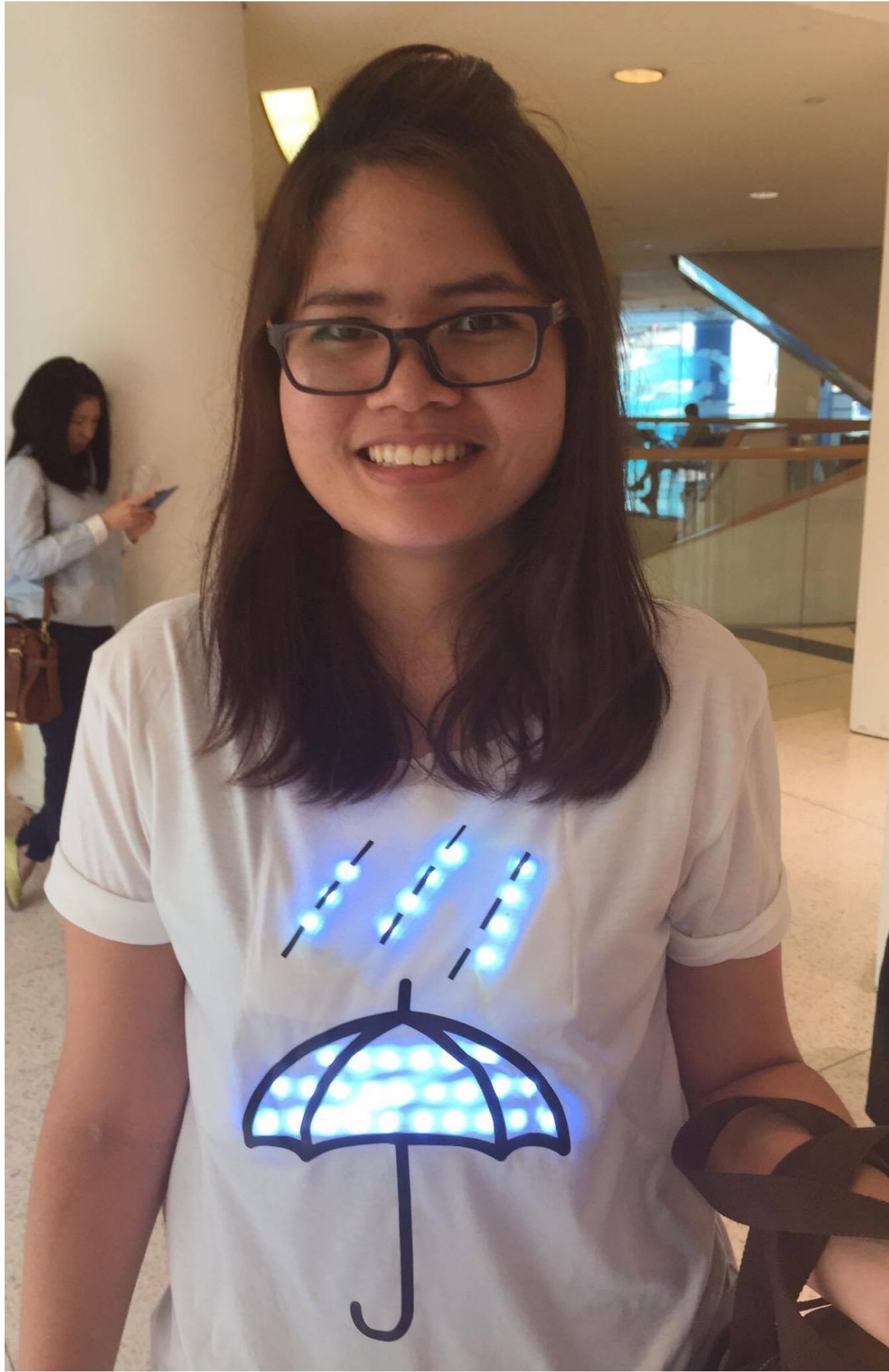


Latest Arduino-compatible,
WiFi-enabled (ESP8266)
development board

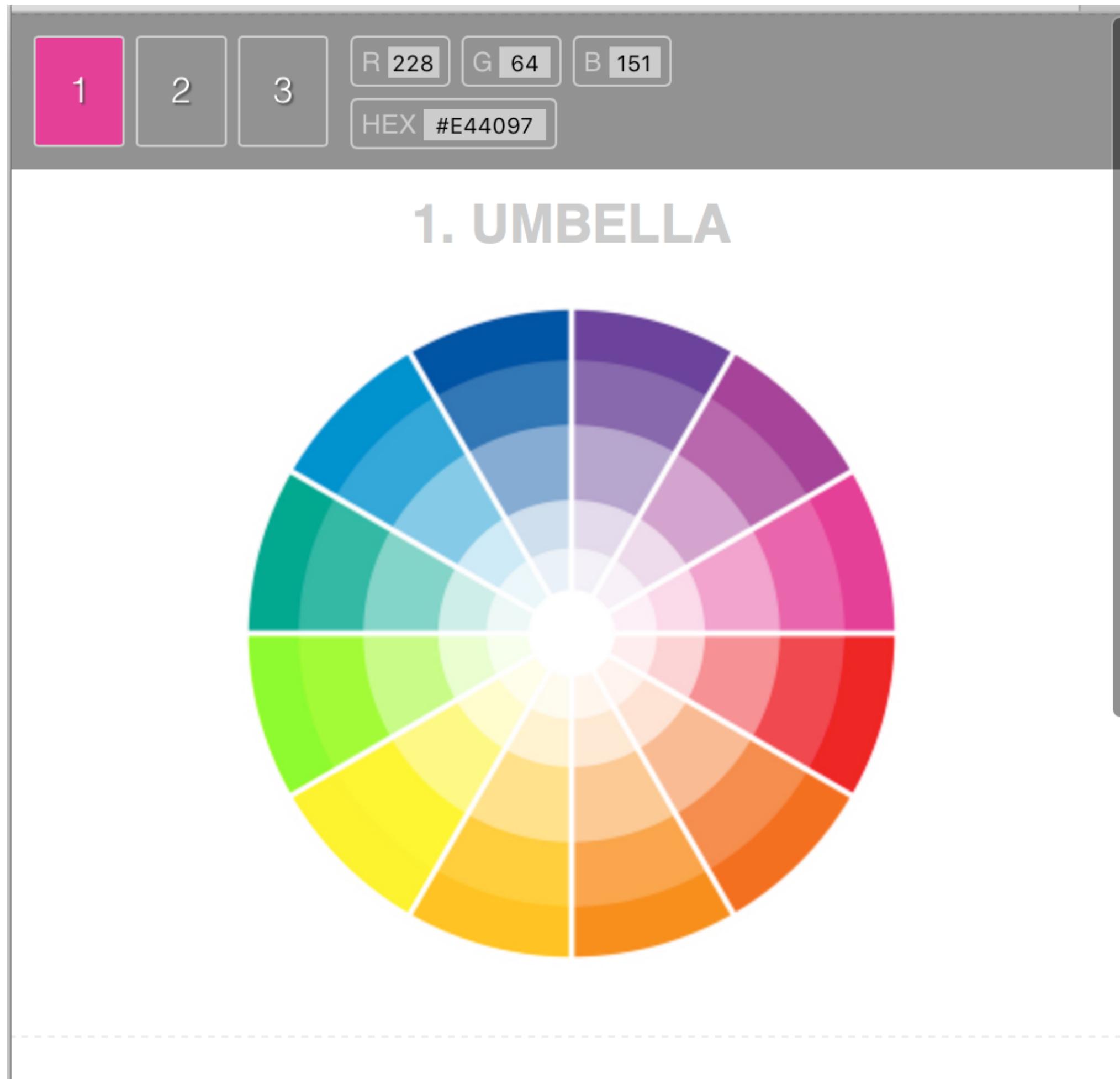




QRX



WoT: web of things





SEA Makerthon



Sustainable Living Lab (SL2) with Nat Weerawan at National Design Centre.

6 hrs ·

Like Page



3 Likes



Like

Comment

Share

· Hootlet

NSC 2016



DECTEC IoT Camp 2016

саmooth3





“We stay as a team. I might be England captain,
but that doesn't mean I get treated differently.”

–David Beckham



The internet of things

internet of things
Search term

+ Add term

Interest over time



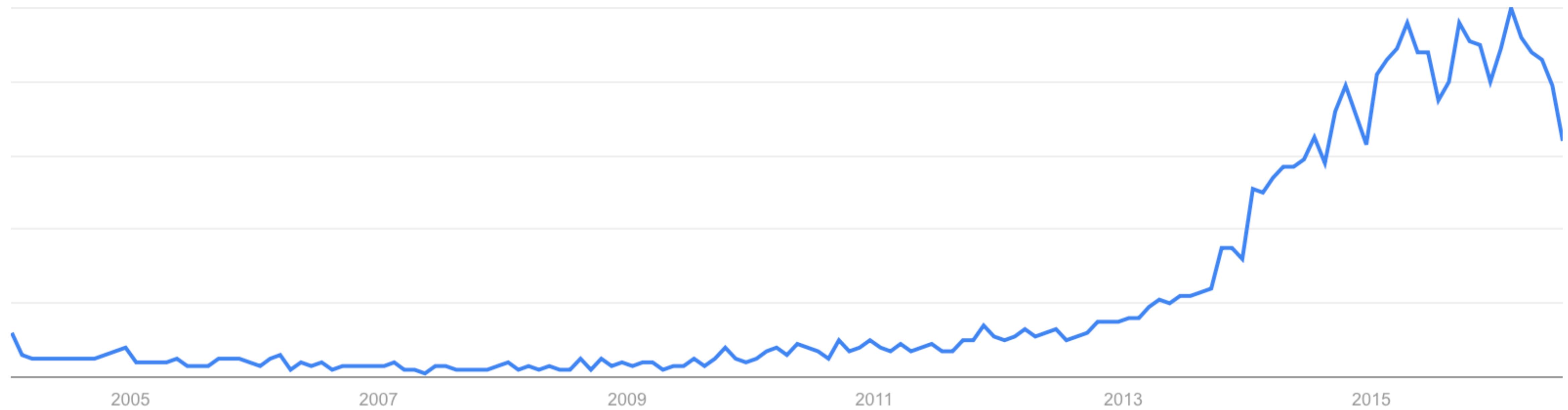
Compare to category



News headlines



Forecast



</>

1974: Beginnings of TCP/IP

1984: Domain Name System is introduced

1989: Tim Berners-Lee proposes the World Wide Web

1991: The first web page was created by Tim Berners-Lee

1998: Google is incorporated

1999: Kevin Ashton coined the term “Internet of things”

2008-2009: The Internet of Things was "Born"

2011: Arduino and other hardware platforms mature and make the IoT accessible to DIY'ers **taking interest** in the topic.

19xx-Present: A whole range of IoT platforms (Pachube, Thingspeak, etc), standards (6LoWPAN, Dash7, etc) hardware and software (Contiki, TinyOS, etc) have developed.

Kevin Ashton

Kevin Ashton (born 1968) is a British technology pioneer who cofounded the [Auto-ID Center](#) at the [Massachusetts Institute of Technology](#) (MIT), which created a global standard system for [RFID](#) and other sensors. He is known for inventing the term "the [Internet of Things](#)" to describe a system where the Internet is connected to the physical world via ubiquitous sensors.



I could be wrong, but I'm fairly sure the phrase "**Internet of Things**" started life as the title of a presentation **I made** at Procter & Gamble (P&G) **in 1999**. Linking the new idea of RFID in P&G's supply chain to the then-red-hot topic of the Internet was more than just a good way to get executive attention. It summed up an important insight—one that 10 years later, after the Internet of Things has become the title of everything from an article in Scientific American to the name of a European Union conference, is still often misunderstood.

—Kevin Ashton

Names

- The Internet of things
- Machine to Machine (M2M) Communication
- Ubiquitous computing
- Embedded Computing
- Fog Computing
- Internet of everything (Commercial name from Cisco)

Revolution

- Electronic Device
- Personal Computer
- Ubiquitous computing
- Machine-to-machine Computing
- The Internet of things (IoT)

Definition of IoT

IoT

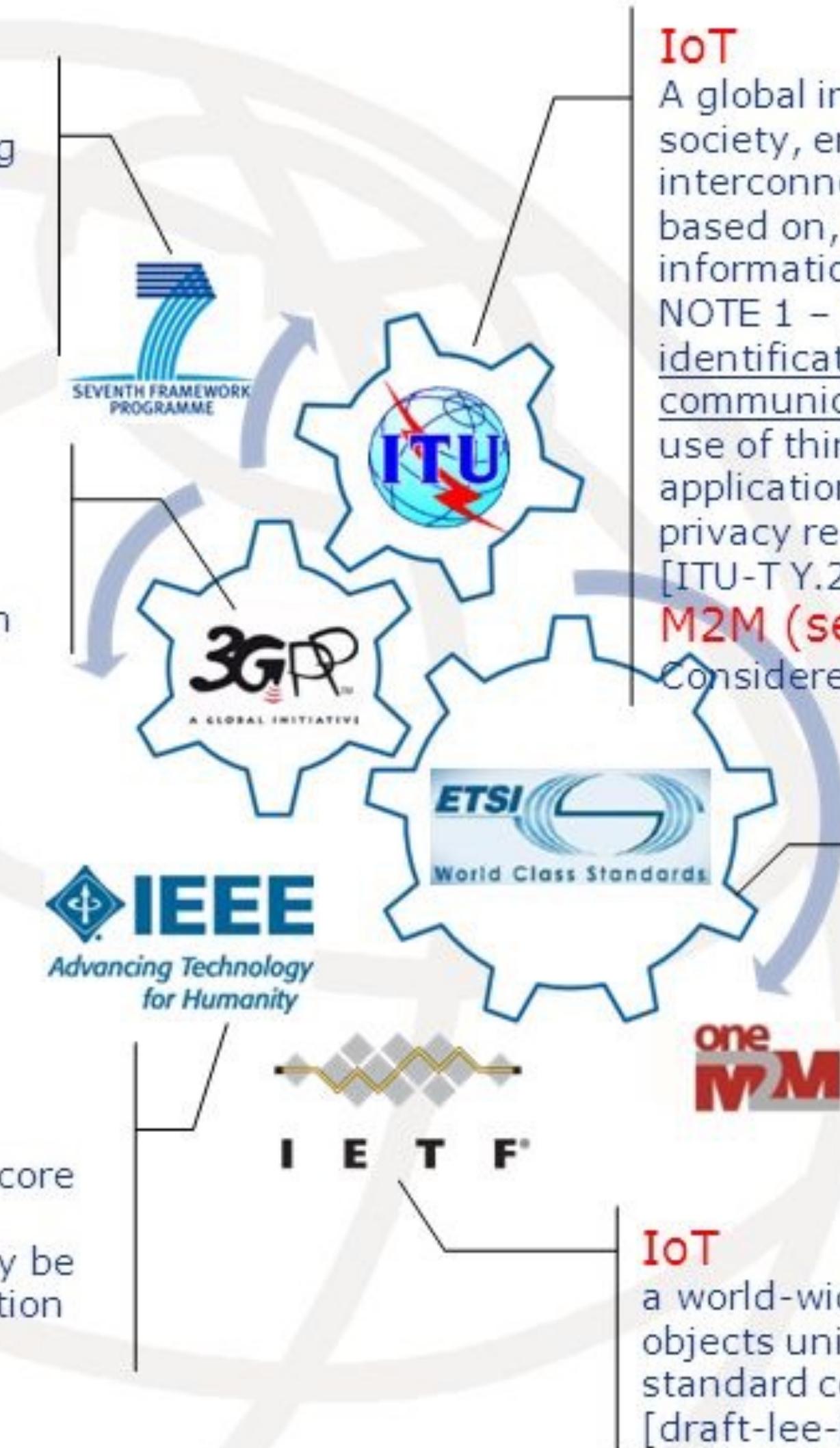
A global network infrastructure, linking physical and virtual objects through the exploitation of data capture and communication capabilities
[EU FP7 CASAGRAS]

MTC

A form of data communication which involves one or more entities that do not necessarily need human interaction

M2M

Information exchange between a Subscriber station and a Server in the core network (through a base station) or between Subscriber station, which may be carried out without any human interaction
[IEEE 802.16p]



IoT

A global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on, existing and evolving, interoperable information and communication technologies
NOTE 1 – Through the exploitation of identification, data capture, processing and communication capabilities, the IoT makes full use of things to offer services to all kinds of applications, whilst ensuring that security and privacy requirements are fulfilled.
[ITU-T Y.2060]

M2M (service layer)

Considered as a key enabler for IoT

M2M

Communication between two or more entities that do not necessarily need any direct human intervention

IoT

a world-wide network of interconnected objects uniquely addressable, based on standard communication protocols
[draft-lee-iot-problem-statement-05.txt]

The **internet of things** (IoT) is the network of physical devices, vehicles, buildings and other items —[embedded with electronics, software, sensors, actuators, and network connectivity](#) that enable [1] these objects to collect and exchange data. In 2013 the Global Standards Initiative on Internet [2] of Things (IoT-GSI) defined the IoT as "the infrastructure of the information society." The IoT [3] allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit; when IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of [cyber-physical systems](#), which also encompasses technologies such as [smart grids](#), [smart homes](#), [intelligent transportation](#) and [smart cities](#). Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing [Internet](#) [10] infrastructure. Experts estimate that the IoT will consist of almost 50 billion objects by 2020.

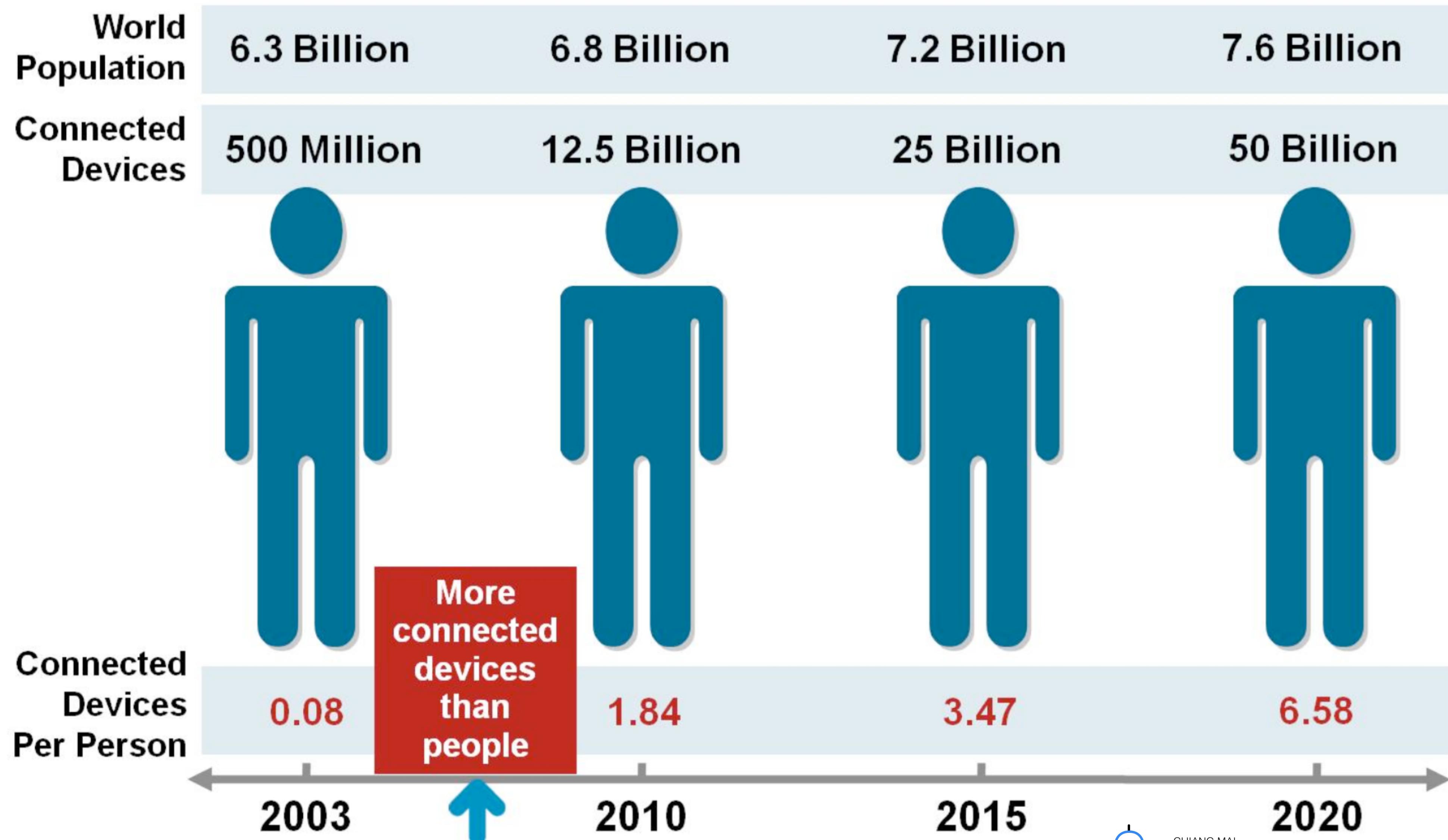
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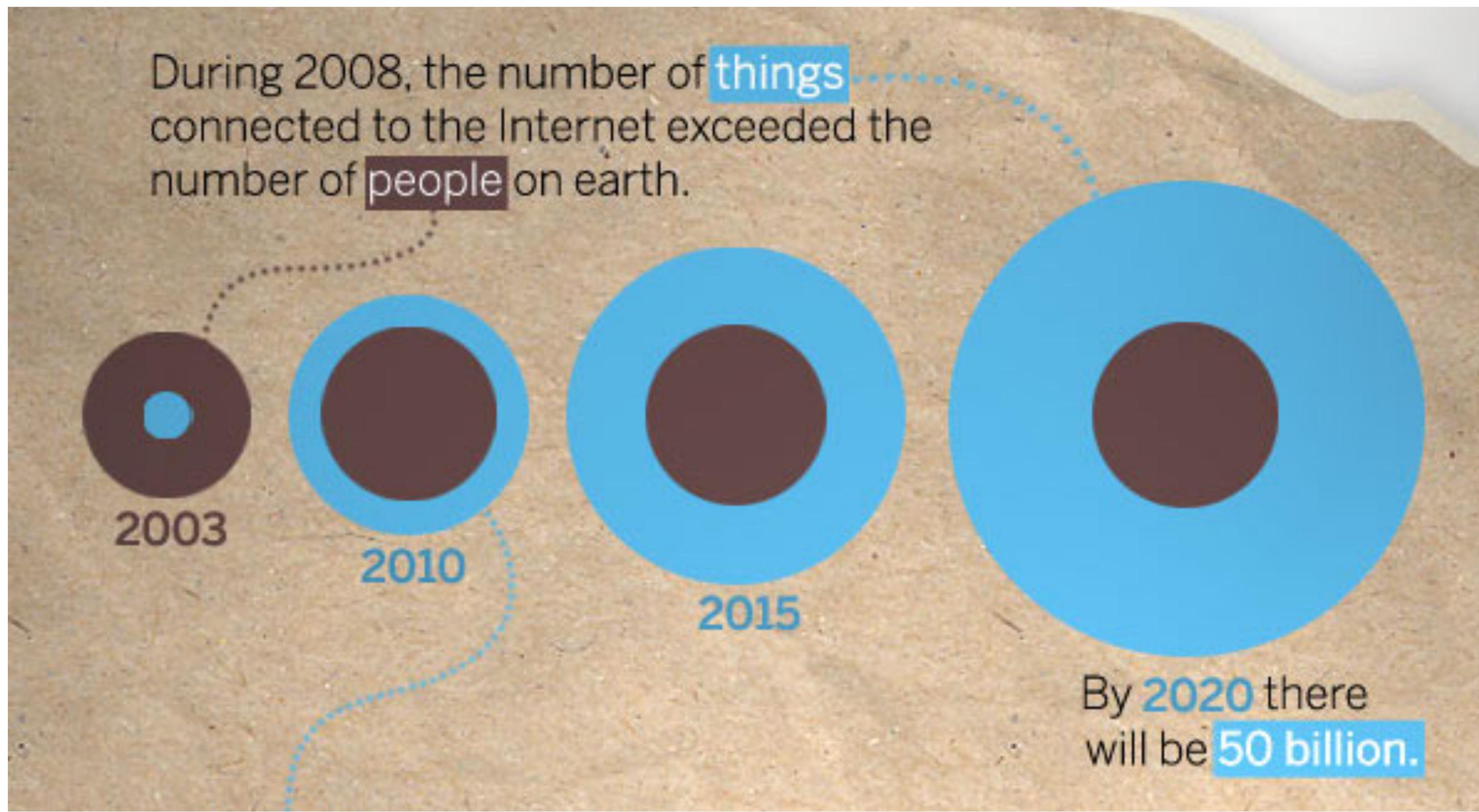
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2008-2009: The Internet of Things was "Born"

Figure 1. The Internet of Things Was “Born” Between 2008 and 2009



Source: Cisco IBSG, April 2011



Source: Cisco - <http://blogs.cisco.com/diversity/the-internet-of-things-infographic>

The “Internet of things” elements

- Things
- Small Computer (MCU) + Sensors
- Connectivity & Communication
- Data
- Intelligence (Cloud)



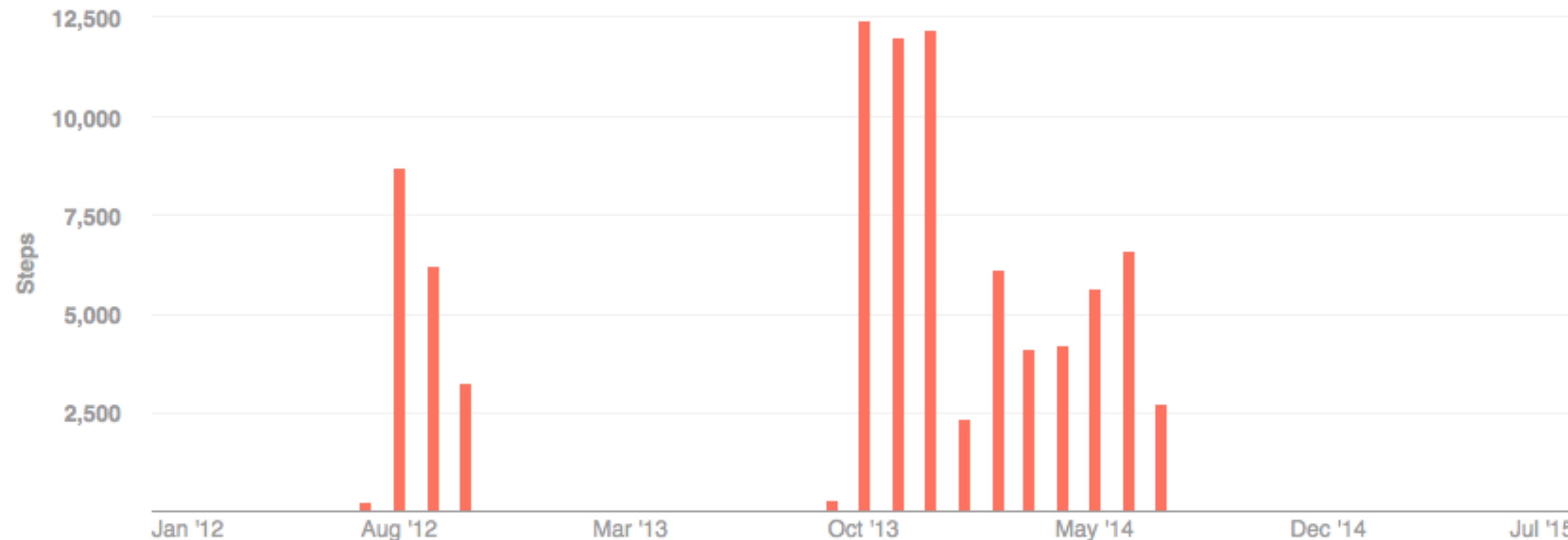
2013



Your Flex battery level is low.

[Food](#) [Activities](#) [Weight](#) [Sleep](#)[Today](#)[Week](#)[Month](#)[Year](#)

Jan 01, 2012 - Jul 07, 2015

[Steps](#) [Distance](#) [Floors](#) [Calories burned](#)

Totals

2,653,830 steps**1240** floors**1,822.58** km**1,422,466** calories



Weekly Stats



Hi Nat, here are your weekly stats.

12/23/2013 to 12/29/2013

WEEK'S MOST ACTIVE DAY
Sun, Dec 29

WEEK'S LEAST ACTIVE DAY
Sat, Dec 28

TOTAL STEPS

69,313

DAILY AVERAGE

9,902 steps

BEST DAY
18,561 steps

TOTAL DISTANCE

49.10 km

DAILY AVERAGE

7.01 km

BEST DAY
14.01 km

TOTAL CALS BURNED

10,686

DAILY AVERAGE

1,527 cals

BEST DAY
1,916 cals

WEIGHT CHANGE

0.0 kg

LIGHTEST

52.0 kg

HEAVIEST
52.0 kg

AVG SLEEP DURATION

4 hrs 59 min

Avg Times Awakened

12

Avg Time to Fall Asleep

0 hrs 18 min

Last week's step winners

1 Nat YOU
34,006 steps

2 keng
19,750 steps

3 Neung
5,017 steps

[See current leaderboard](#)

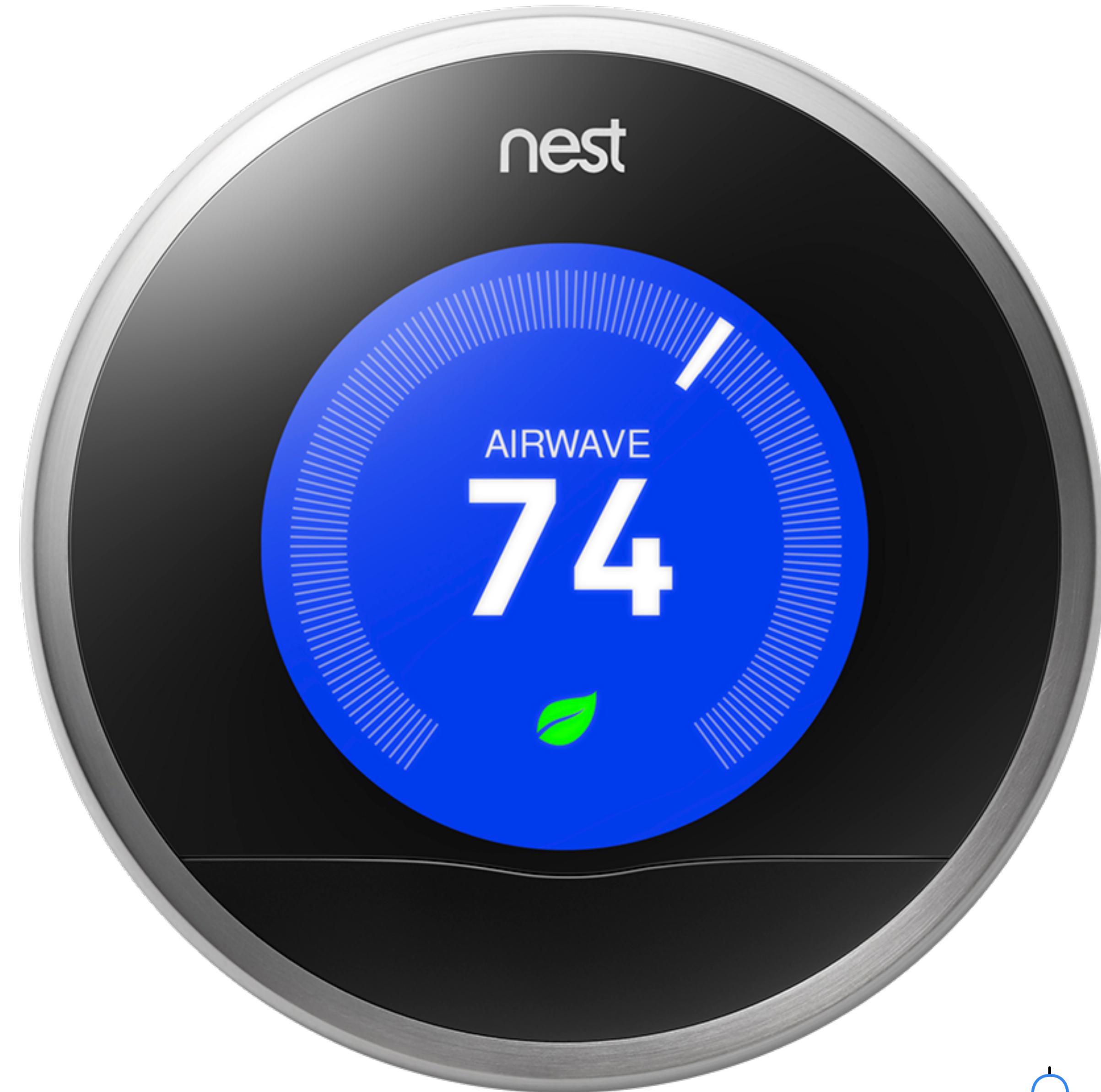
Last week's badges



[See all of my badges](#)



CHIANG MAI
MAKERCLUB





Enabling technologies

- RFID
- WiFi 802.11
- ZigBee 802.15.4
- IPv6

WiFi

- Very common
- Indoor & Outdoor used
- Low Cost
- Not good for some special conditions

RFID

- Widely used in Transport & Logistics
- Easy to deploy: tags & readers
- Communication range depends on the type of technology

ZigBee

- Low Cost
- very long battery life
- Easy to deploy
- Large number of nodes
- mesh networks

IPV6

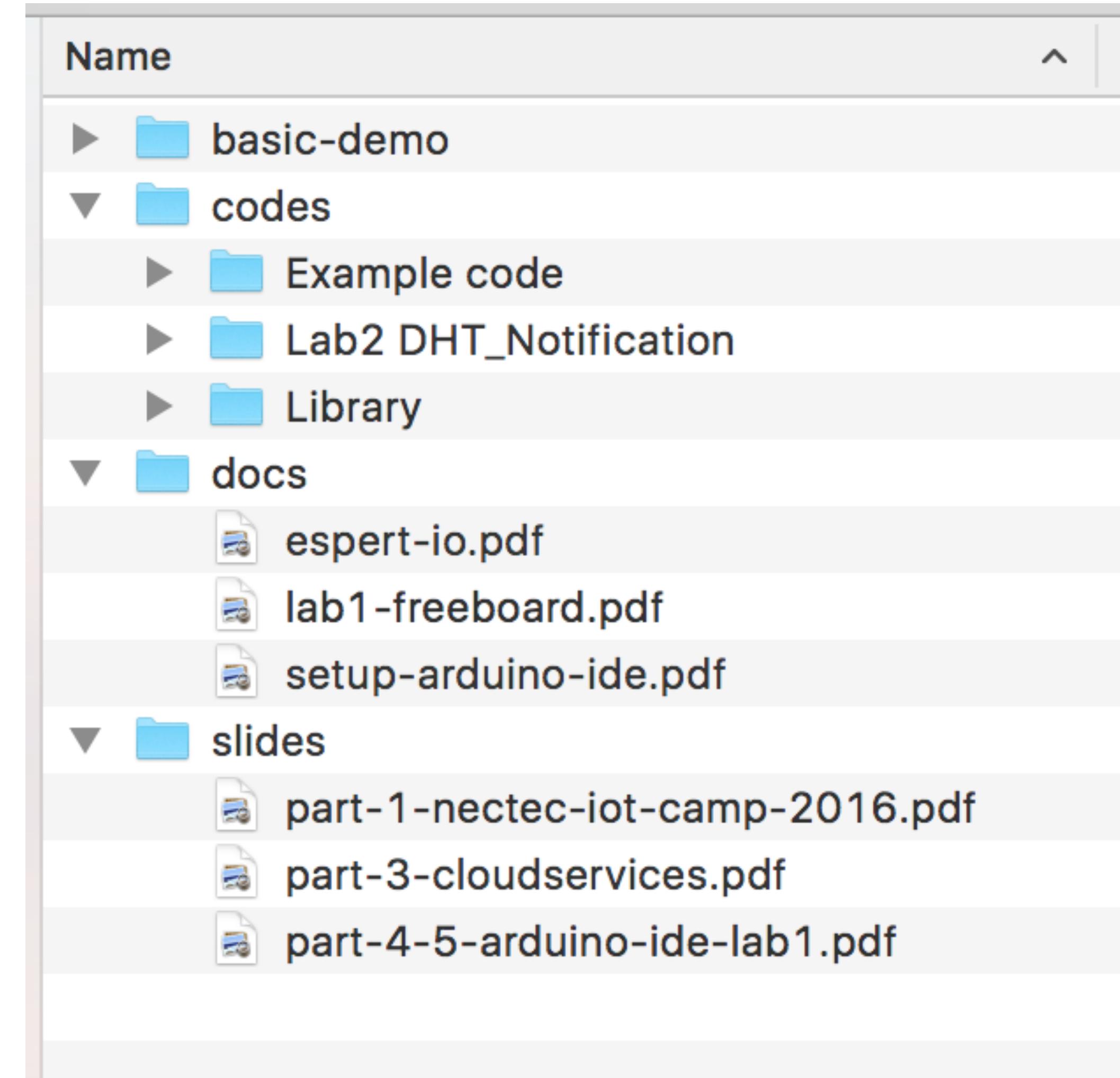
2011: IPV6 public launch - The new protocol allows for 2^{128}
(approximately 340×10^{36})

340,282,366,920,938,463,463,374,607,431,768,211,456)

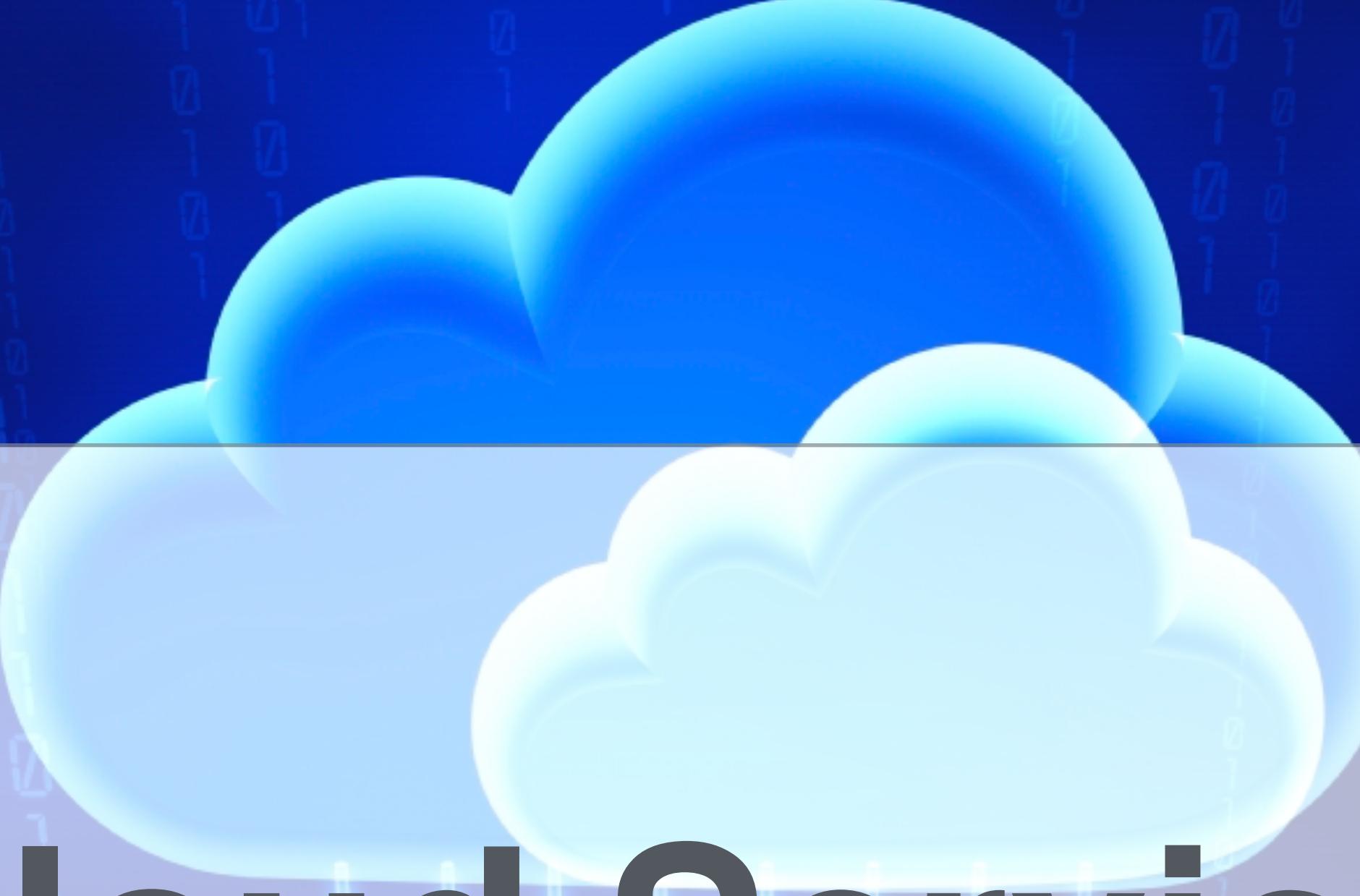
We could assign an IPV6 address to **every atom on the surface of the earth**, and still have enough addresses left to do another 100+ earths.

—Steven Leibson

cmmc.io/docs



cmmc.io/docs



Cloud Services

Cloud Services

- DigitalOcean
- Heroku
- IBM BlueMix
- CloudMQTT
- ThingSpeak
- NETPIE.io
- ESPert.io

Cloud Services



DigitalOcean

Cloud Services



Cloud Services



IBM Bluemix

Cloud Services

CloudMQTT Plans

[Home](#) [Plans](#) [Documentation](#) [Support](#) [Control Panel](#)



Cute Cat

- 10 connections
- 10 Kbit/s

[Try now for Free](#)



Keen Koala

- 100 connections
- 100 Kbit/s
- Support by e-mail
- Support by chat

[Try now for \\$19/month](#)



Loud Leopard

- 1 000 connections
- 1 Mbit/s
- Support by e-mail
- Support by chat

[Try now for \\$99/month](#)



Power Pug

- 10 000 connections
- 10 Mbit/s
- Support by e-mail
- Support by chat
- 24/7 phone support

[Try now for \\$299/month](#)



CHIANG MAI
MAKERCLUB

Cloud Services

- ThingSpeak
- NETPIE.io
- ESPert.io

Ability	ThingSpeak	<u>NETPIE.io</u>	<u>ESPert.io</u>
สามารถสร้าง Graph	✓	✗	✗
Push Notification	✗	✗	✓
ส่งค่าแบบ Real Time	✗	✓	✓
MQTT	✗	✓	✓



NETPIE (Network Platform for Internet of Everything) เป็นแพลตฟอร์มบริการสำหรับการพัฒนา IoT Solution ซึ่งสามารถทำให้คุณสามารถเชื่อมต่อสิ่งต่างๆ ได้อย่างง่ายดาย และไร้ความกังวลในเรื่องต่างๆ ดังนั้นคุณสามารถทุ่มเทเวลาที่เหลือเพื่อสร้างสรรค์ผลิตภัณฑ์ IoT ได้อย่างเต็มที่

-ทีมงาน NETPIE



REST API

REST API is lightweight and universal. It allows legacy systems to have real-time interaction over HTTP protocol.



PUBLISH-SUBSCRIBE PATTERN

We create our own publish-subscribe communication model to allow instant messaging among things.



COORDINATION

Coordination service lets things discover one another and detect presence and absence of one another.



STORAGE

We provide a simple storage service through the POSTBOX space. Store any data you wish in the POSTBOX and retrieve it later.



[HOME](#)[DEVELOPERS](#)[BLOG](#)[APPLICATIONS](#)[LOG OUT](#)

APPLICATION MANAGEMENT

[Home](#) » [Application](#)

0

APPLICATIONS

0/100

THINGS

APPLICATION



Please create application.

CHIANG MAI
MAKERCLUB



HOME

DEVELOPER

BLOG

APPLICATIONS



LOG OUT

HelloNETPIE

CREATE

CANCEL

APPLICATION MANAGEMENT

Home > Application

0

APPLICATIONS

0/100

THINGS

APPLICATION



Please create application.





HOME

DEVELOPERS

BLOG

APPLICATIONS



LOG OUT

HelloNETPIE

[Home](#) » [Application](#) » [HelloNETPIE](#)

APPLICATION



HelloNETPIE

[DELETE](#)

1

[APPLICATION KEY](#) [Device Key](#), [Session Key](#)

APPLICATION KEY

 [NETPIE_01 \[online:0\]](#)CHIANG MAI
MAKERCLUB

[HOME](#)[DEVELOPER](#)[BLOG](#)[APPLICATIONS](#)[LOG OUT](#)

NETPIE_01

Key : KRL2Xxm0h619YnW

Secret : LQOIMrgiKpKakvAEBMuEqGpq8

REST API auth :
[RENAME](#)[CANCEL](#)

APPLICATION



HelloNETPIE

[DELETE](#)

1

APPLICATION KEY

Device Key, Session Key

APPLICATION KEY

CHIANG MAI
MAKERCLUB

NETPIE_01 [online:0]



MQTT

MQTT-Broker

temperature
sensor

subscribe to
topic: "temperature"

2 publish to
topic: "temperature"



laptop



mobile device



Panita Pongpalboon จากหน้า FAQ

NETPIE ใช้พอร์ตคอล MQTT ใน การสื่อสารกับอุปกรณ์ และ MQTT เรียกใช้งาน TCP port 1883 ถ้าเป็นการเรียกใช้ Microgear สำหรับ HTML5 จะใช้ MQTT over websocket ซึ่งใช้ TCP port 8083 นอกจากนี้ NETPIE ยังใช้พอร์ตคอล OAuth ผ่าน TCP port 8080 ในขั้นตอน Authorization ดังนั้น กรุณาตรวจสอบว่าเครือข่ายของท่าน ไม่ได้บล็อกพอร์ต 1883 8083 และ 8080

MQTT

- Lightweight message queueing and transport protocol
- Sensor and Actuator nodes communicate with application through the **MQTT message broker**

MQTT

MQTT

designed for minimal [network traffic](#)
and [constrained devices](#)

[small header size](#)

PUBLISH 2-4 bytes
CONNECT 14 bytes

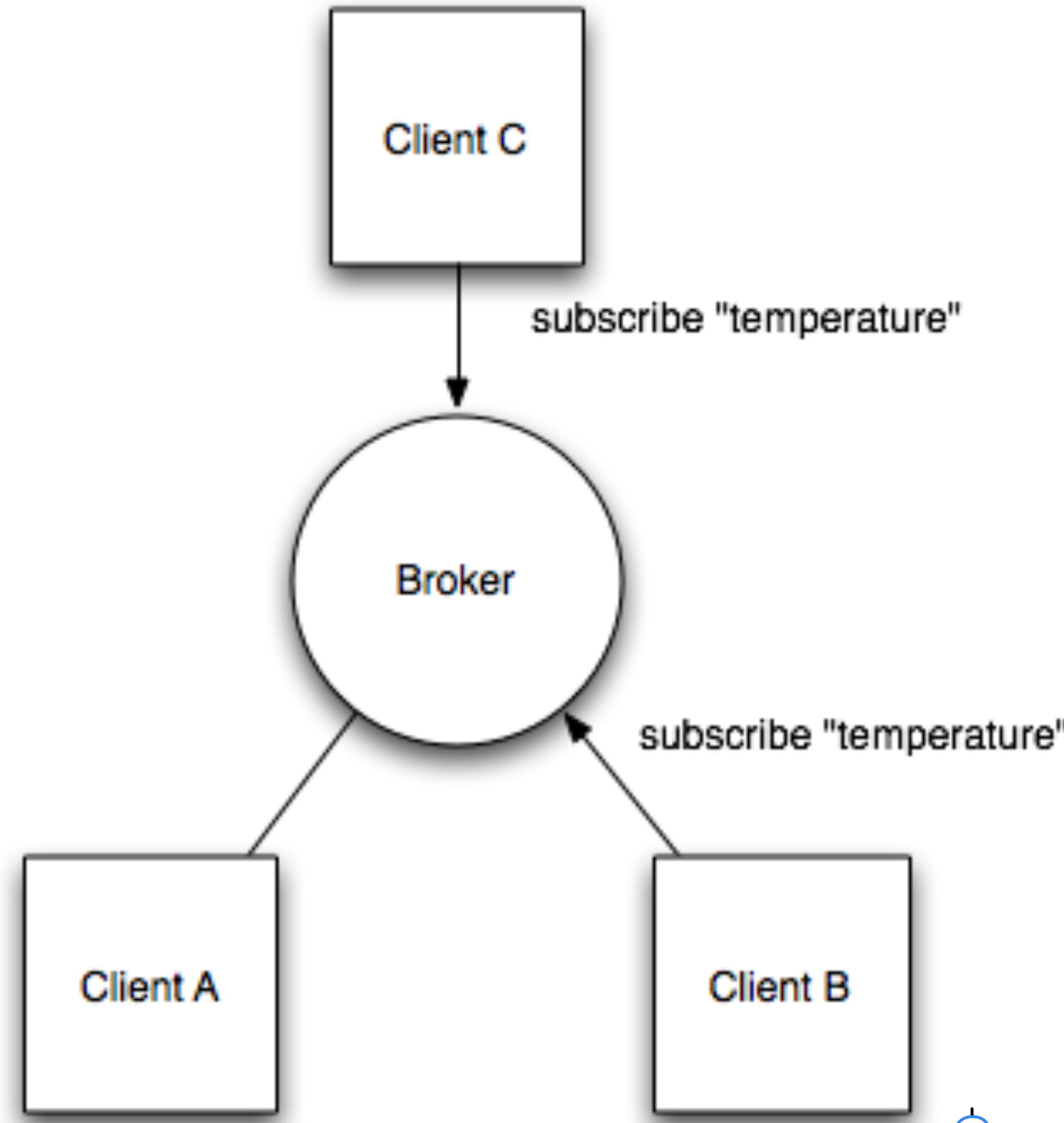
HTTP 0.1-1 KB

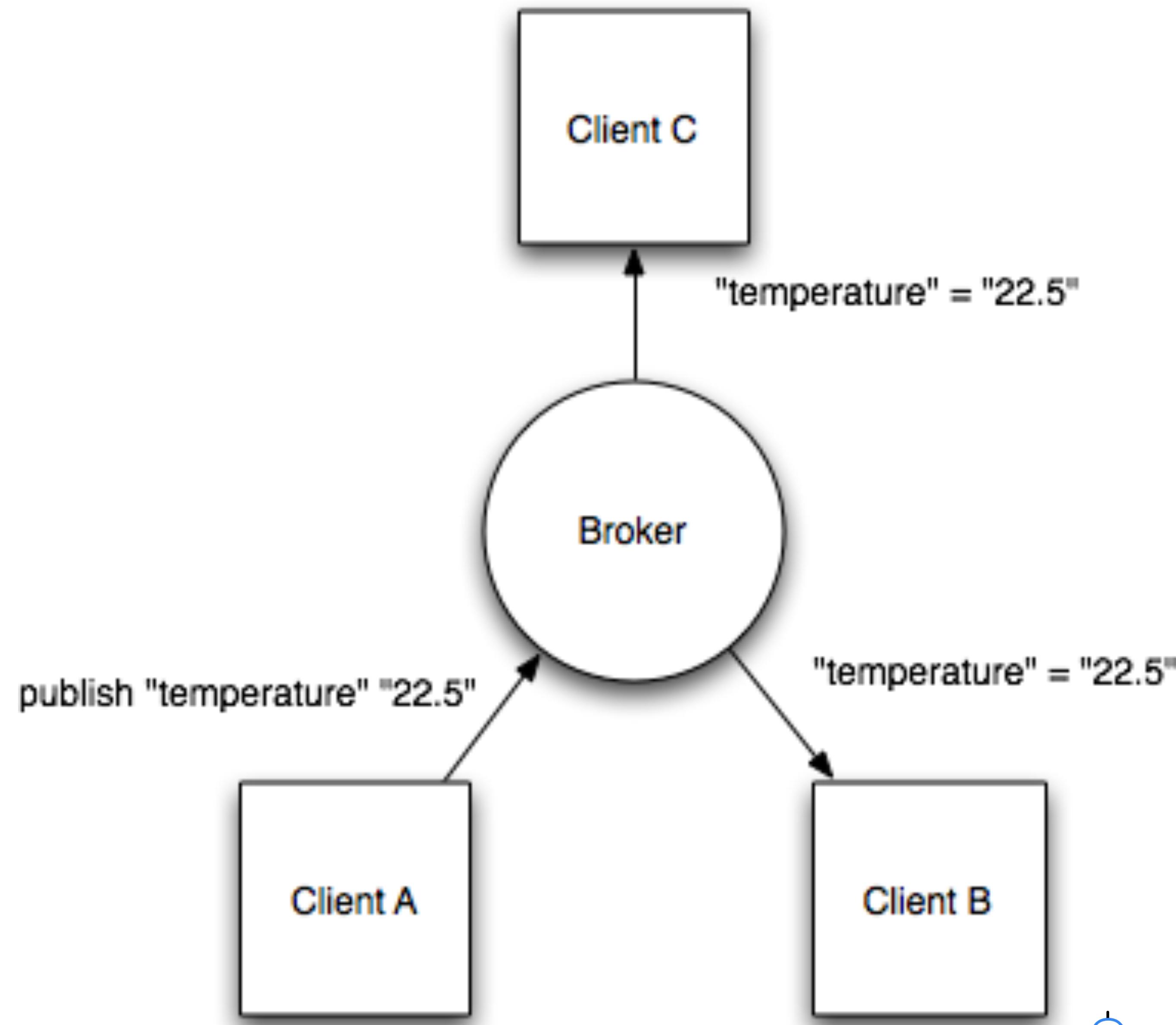
[binary payload \(not text\)](#)

[small clients:](#) 30 KB (C), 100 KB (Java)

[minimal protocol exchanges](#)

MQTT has configurable keep alive
(2 byte PINGREQ / PINGRES)



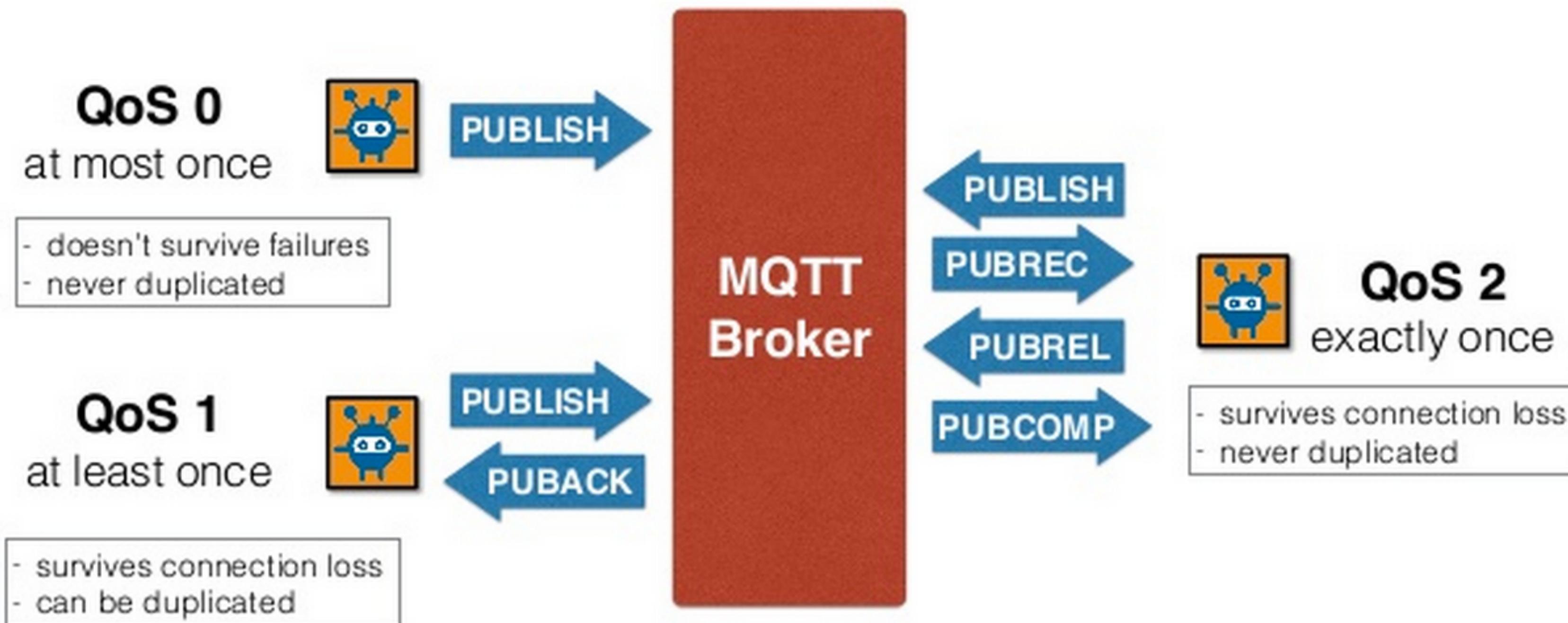


Valid MQTT topic

- /HelloCMMC/gearname/plug001/status
- /HelloCMMC/gearname/+status
- /HelloCMMC/gearname/#
- /HelloCMMC/+/+
- #

MQTT

Quality of Service for **reliable messaging**



Connection

APP ID

HelloCMMC

APP KEY

5wkMkidFHuoZkMS

APP SECRET

9oJIBQsTh5BCDX6sQ1mFFD

Connect**microgear.chat****Subscriptions****Messages**

<http://cmmc.io/netpie/client/basic>

Connection

connected



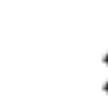
microgear.chat

gearnname

test

chat

Message

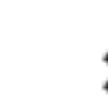


Subscriptions

Add New Topic Subscription



Messages



Connection

microgear.chat

gearname

test

chat

connected



Message



Subscriptions

Add New Topic Subscription



Messages

Color



Subscribe

Topic

#



Message

Qos: 2

/gearnname/#

X

Messages

2016-09-14 19:45:40

Topic: /HelloNETPIE/gearnname/mygear

HELLO WORLD

2016-09-14 19:45:09

Topic: /HelloNETPIE/gearnname/plug001

OFF

2016-09-14 19:45:09

Topic:

The screenshot shows a developer tools interface with a timeline at the top. Below the timeline are several buttons: close (X), copy (square with C), paste (square with P), refresh (arrow), download (down arrow), file count (30), folder icon, message count (0), error count (9), search (magnifying glass), and resources (file icon). The main area has tabs for Elements, Network, Timelines, Console, Search, Resources, and a plus sign. Below the tabs are buttons for navigation, search, and filtering. The status bar at the bottom shows 'Errors' is selected, along with 'Warnings' and 'Logs'.

Selected Element

```
< ▶ <div class="large-6 columns">...</div> = $1
```

```
> microgear.publish
```

```
< function (_topic,_msg,_retained) {
  var message = new Paho.MQTT.Message(_msg);
  message.destinationName = '/'+self.appid+_topic;

  if (_retained) message.retained = true;
  self.client.send(message);
} = $2
```

microgear.js:3102

```
> microgear.publish("/gearnname/mygear", "HELLO WORLD", false);
```

```
< undefined
```

```
> |
```



Connection

microgear.chat

gearnname

test

chat

Message

Hello

Subscriptions

Add New Topic Subscription

Qos: 2

/gearnname/#

Messages

2016-08-18 00:08:34 Topic: /HelloNETPIE/gearnname/test

Hello

2016-08-18 00:08:33 Topic:
/HelloNETPIE/gearnname/plug002/humid

45.90

2016-08-18 00:08:33 Topic:
/HelloNETPIE/gearnname/plug002/temp

27.40

microgear.chat

gearnname

test

chat

Message

Messages

2016-08-09 17:59:37 Topic: /HelloCMMC/gearnname/mygear

hello

2016-08-09 17:58:38 Topic:
/HelloCMMC/gearnname/plug002/humid

46.50

2016-08-09 17:58:38 Topic:
/HelloCMMC/gearnname/plug002/temp

28.00

2016-08-09 17:58:38 Topic:

Back
Forward
Reload

Save As...
Print...
Cast...
Translate to English

1Password
Inspect with Firebug Lite
JSONView

View Page Source
Inspect

Console Elements Sources Network Timeline Profiles Resources Security Audits

top

▼ Preserve log

jQuery Everywhere Ready

> microgear

< ► _microgear {securemode: true, gearkey: "5wkMkidFHuoZkMS", gearsecret: "9oJlBQsTh5BCDX6sQ1mFFDppA", gearalias: "nat_html5", client: Client...}

> microgear.chat("mygear", "hello")

< undefined

>

microgear.chat

gearnname

test

chat

Message

Messages

2016-08-09 17:59:37 Topic: /HelloCMMC/gearnname/mygear

hello

2016-08-09 17:58:38 Topic:
/HelloCMMC/gearnname/plug002/humid

46.50

2016-08-09 17:58:38 Topic:
/HelloCMMC/gearnname/plug002/temp

28.00

2016-08-09 17:58:38 Topic:

Console Elements Sources Network Timeline Profiles Resources Security Audits

top

▼ Preserve log

jQuery Everywhere Ready

> microgear

< ► _microgear {securemode: true, gearkey: "5wkMkidFHuoZkMS", gearsecret: "9oJlBQsTh5BCDX6sQ1mFFDppA", gearalias: "nat_html5", client: Client...}

> microgear.chat("mygear", "hello")

< undefined

>

Subscriptions

Add New Topic Subscription

Qos: 2

/gearnname/#



X

Back

Forward

Reload

Save As...

Print...

Cast...

Translate to English

1Password

Inspect with Firebug Lite

JSONView



rywhere.js:21

View Page Source

Inspect

netpie-client

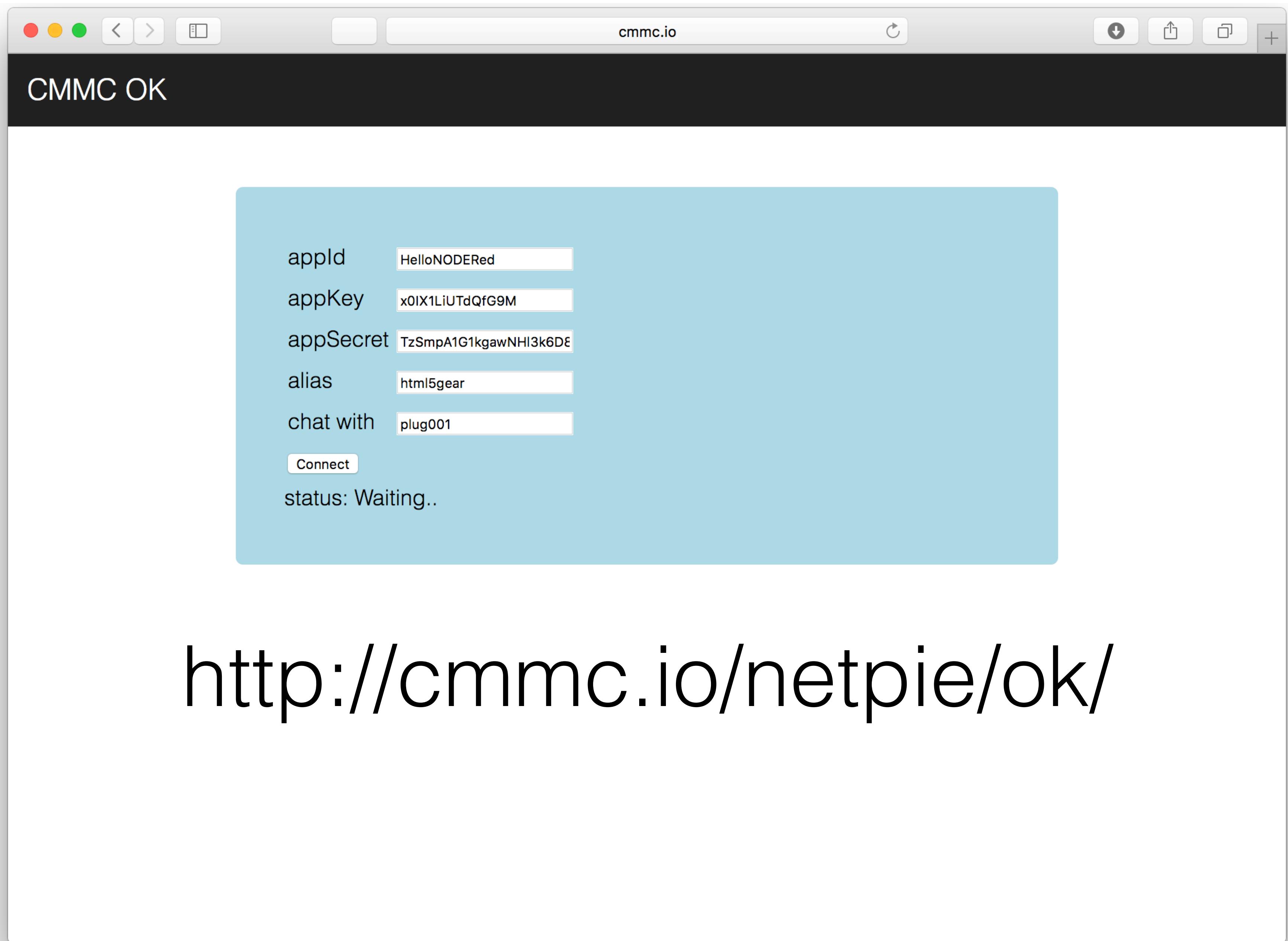
APPID : HelloNETPIE

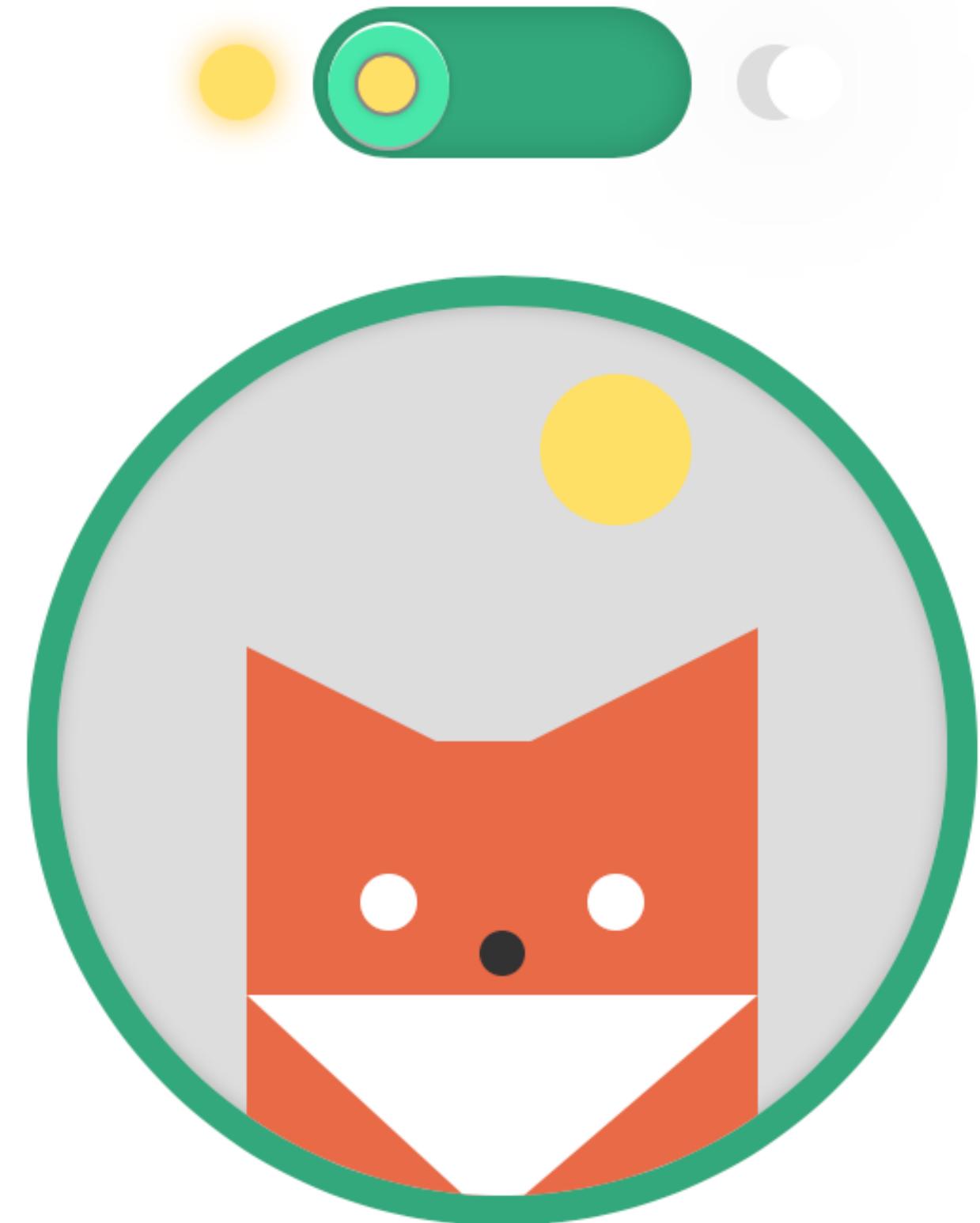
Key : ux7QmHgKEaWx7rt

Secret : CfvpYcTIHKWAs4I3PWINHIdN

YOUR TURN :)

<http://cmmc.io/netpie/client/basic>





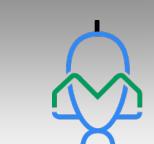
```
15
16 #define APPID      "HelloNETPIE"
17 #define KEY        "IIHqbqzgkgy2jkQ"
18 #define SECRET    "XQUOQIk4KBLAKCP2gUReixMId"
19 #define ALIAS      "light001"
20
21 WiFiClient client;
22 AuthClient *authclient;
23
24 #define DHTPIN 12
25 #define DHTTYPE DHT22 // DHT 22 (AM2302), AM2321
26 DHT dht(DHTPIN, DHTTYPE);
27 CMMC_Interval timer001;
28
29 int timer = 0;
30 int relayPin = 15; //control relay pin
31
32 MicroGear microgear(client);
33
34 /* If a new message arrives, do this */
35 void onMsghandler(char *topic, uint8_t* msg, unsigned int msglen) {
36     Serial.print("Incoming message --> ");
37     msg[msglen] = '\0';
38     Serial.println((char *)msg);
39     String msg2 = String((char*)msg);
40
41     if (msg2 == "ON") {
42         digitalWrite(relayPin, HIGH);
43         digitalWrite(LED_BUILTIN, LOW);
44     }
45     else if (msg2 == "OFF") {
46         digitalWrite(relayPin, LOW);
47         digitalWrite(LED_BUILTIN, HIGH);
48     }
49 }
50
51 void onFoundgear(char *attribute, uint8_t* msg, unsigned int msglen) {
52     Serial.print("Found new member --> ");
53     for (int i = 0; i < msglen; i++)
54         Serial.print((char)msg[i]);
}
Done uploading.
espcomm_send_command: sending command header.
espcomm_send_command: sending command payload
espcomm_send_command: receiving 2 bytes of data
closing bootloader
```

plug001 | Arduino 1.6.9

plug001 § CMMC_Blink.hpp CMMC_Interval.hpp

```
142     Serial.print(h);
143     Serial.print(" %\t");
144     Serial.print("Temperature: ");
145     Serial.print(t);
146     Serial.println(" *C ");
147
148     /* Chat with the microgear named ALIAS which is myself */
149     microgear.chat("plug001/temp", (String)t);
150     microgear.chat("plug001/humid", (String)h);
151
152     char topic_temp[MAXTOPICSIZE];
153     char topic_humid[MAXTOPICSIZE];
154     sprintf(topic_temp, "/gearnname/%s/temp", ALIAS);
155     sprintf(topic_humid, "/gearnname/%s/humid", ALIAS);
156     //retain message
157     microgear.publish(topic_temp, String(t), true);
158     microgear.publish(topic_humid, String(h), true);
159   }
160 };
161 }
162 else {
163   Serial.println("DIS CONNECTED");
164   microgear.connect(APPID);
```

51 ESPresso Lite 2.0, 80 MHz, 230400, 4M (3M SPIFFS), ck, Serial, All on /dev/cu.usbserial-A703X2S3

 CHIANG MAI MAKERCLUB

<http://cmmc.io/netpie/ok>

ESPert.io

- **Free** Cloud from **ESPert**
- MQTT broker and monitor panel
- Freeboard
- **Push Notification**
- Geo-fencing and Beacon Proximity



We provide **integrated** hardware, mobile & cloud
infrastructure for anyone to **build & develop** IoT
products, solution and services

www.esperf.co

<http://espert.io/app>

The screenshot shows a web browser window with the URL www.espert.io/user/login. The page title is "User Login" and the sub-page title is "Login to access ESPert.io". The main content area contains fields for "E-mail" and "Password", each with a placeholder text "E-mail" and "Password" respectively. Below these fields is a "Reset Password" link. At the bottom of the form are two buttons: a blue "Login" button with a checkmark icon and a grey "Reset" button with a circular arrow icon. To the right of the "Login" button is a "Click here to register" link. Below the registration link is an "Or" link, followed by a blue "Login using Facebook" button.

ESpert.io

Home Home > Login

User Login

» Login to access ESPert.io

E-mail

Password

[Reset Password](#)

[Click here to register](#)

Or

The screenshot shows a web browser window for the ESPert.io platform. The URL in the address bar is www.espert.io/MySmartphone. The page title is "APN Tokens". On the left, there's a sidebar with icons for Home, My Smartphone (selected), My Geofencing, and My Freeboard. The main content area displays a table with one row of data. The table columns are E-mail, Location, App, Version, Device, and Actions. The data row shows: jimmy@espert.io, Phra Sing, Chiang Mai, Thailand, ESPert, Build 98, iPhone7,1, and a green lightning bolt icon in the Actions column, which is highlighted with a red box. At the bottom, it says "Copyright © 2015 Espert Pte. Ltd., All rights reserved."

E-mail	Location	App	Version	Device	Actions
jimmy@espert.io	Phra Sing, Chiang Mai, Thailand	ESPert	Build 98	iPhone7,1	

The screenshot shows a web browser window for the ESPert.io platform. The URL in the address bar is www.espert.io/MySmartphone/send?key=56951599. The browser's toolbar includes standard icons for back, forward, search, and bookmarks. The main content area has a blue header with the ESPert.io logo and a user profile for "Welcome, Jim". On the left is a sidebar with links for Home, My Smartphone, My Geofencing, and My Freeboard. The main content area shows the "Send Push Notification" screen, which includes fields for Message, Deals, and Commands, each with a dropdown menu. Below these fields are two buttons: a blue "Send!" button with a checkmark icon and a grey "Reset" button with a circular arrow icon. At the bottom of the page, there is a copyright notice: "Copyright © 2015 Espert Pte. Ltd., All rights reserved." and a footer for "CHIANG MAI MAKERCLUB" featuring a green robot head icon.

http://www.espert.io/MySmartphone/send?key=56951599&message>Hello

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CHIANG MAI MAKERCLUB



ESPert IoT Mobile App

Hello From ESPert.io [00:08:43]

[My Channels](#)[Watched Channels](#)[Public Channels](#)

Billions and Billions

Thingspeak

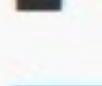
[Get Started](#)[Contact Us](#)



ThingSpeak.com

My Channels

[New Channel](#)

Name	Created
 Myroom330	2015-10-08
 Espresso_CMMC	2015-10-10
	2015-11-19

Private Public Settings API Key Data Import / Export

Private Public Settings API Key Data Import / Export

Private Public Settings API Key Data Import / Export

Help

Collect data in a ThingSpeak channel from a device, from another channel, or from the web. Click [New Channel](#) to create a new ThingSpeak channel.

Learn to [create channels](#), explore and transform data.

Learn more about [ThingSpeak Channels](#).

Examples

- [Arduino Tutorial](#)
- [Netduino Plus Tutorial](#)

New Channel

Name

Description

Help



ThingSpeak Channel

Channels store all the data that a ThingSpeak application collects. Each channel includes eight fields that can hold any type of data, plus three fields for location data and one field for status data. Once you collect data in a channel, you can use ThingSpeak apps to an

Test

Channel ID:

59536



Test new upload something

Author:

bavensky

Access:

Public

Private View

Public View

Channel Settings

API Keys

Data Import / Export

+ Add Visualizations

Data Export

MATLAB Analysis

MATLAB Visualization

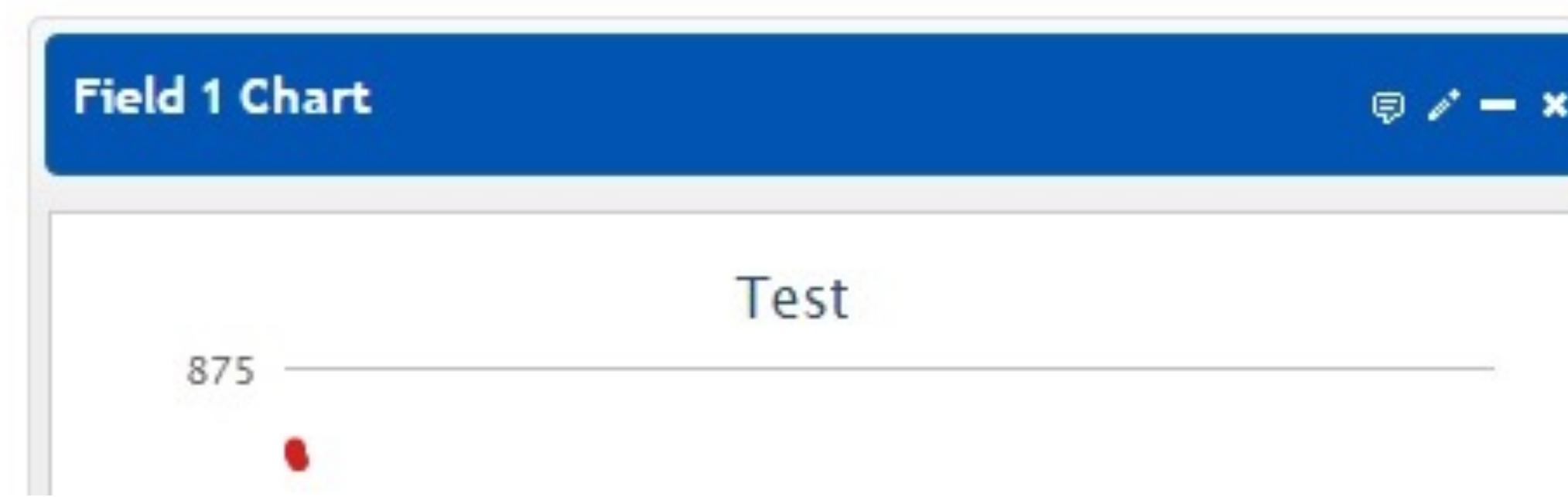
More ▾

Channel Stats

Created 4 months ago

Updated 13 days ago

2047 Entries



Test

Channel ID:

59536

Author:

bavensky

Access:

Public

Test new upload something

Private View

Public View

Channel Settings

API Keys

Data Import / Export

Write API Key

Key

5T4WXGZFE1P|

[Generate New Write API Key](#)

Help

API keys enable you to write data to a channel or read data from a private channel. Keys are auto-generated when you create a new channel.

API Keys Settings

- **Write API Key:** Use this key to write data to a channel. If you feel your key has been compromised, click [Generate New Write API Key](#).
- **Read API Keys:** Use this key to allow other people to view your private channel's feeds and charts. Click [Generate New Read API Key](#) to generate an additional read key for the channel.
- **Note:** Use this field to enter information about channel read keys. For example, add notes to keep track of users with access to your channel.

Read API Keys

Key

5T4WXGZFE1P|

[Create a Channel](#)

[Private View](#)[Public View](#)[Channel Settings](#)[API Keys](#)[Data Import / Export](#)

Import

Upload a CSV file to import data into this channel

 no file selected

Time Zone

Export

Download all of this Channel's feeds in CSV format.

Help

Select a CSV file on your hard drive and import all of its data

Update Channel Feed - GET

```
GET https://api.thingspeak.com/update?api_key=DNK0IV7ETG0878JD&field1=0
```

Update Channel Feed - POST

```
POST https://api.thingspeak.com/update.json  
api_key=DNK0IV7ETG0878JD  
field1=73
```

Get a Channel Feed

```
GET https://api.thingspeak.com/channels/127482/feed.json?results=2
```

Get a Channel Field Feed

```
GET https://api.thingspeak.com/channels/127482/fields/1.json?results=2
```

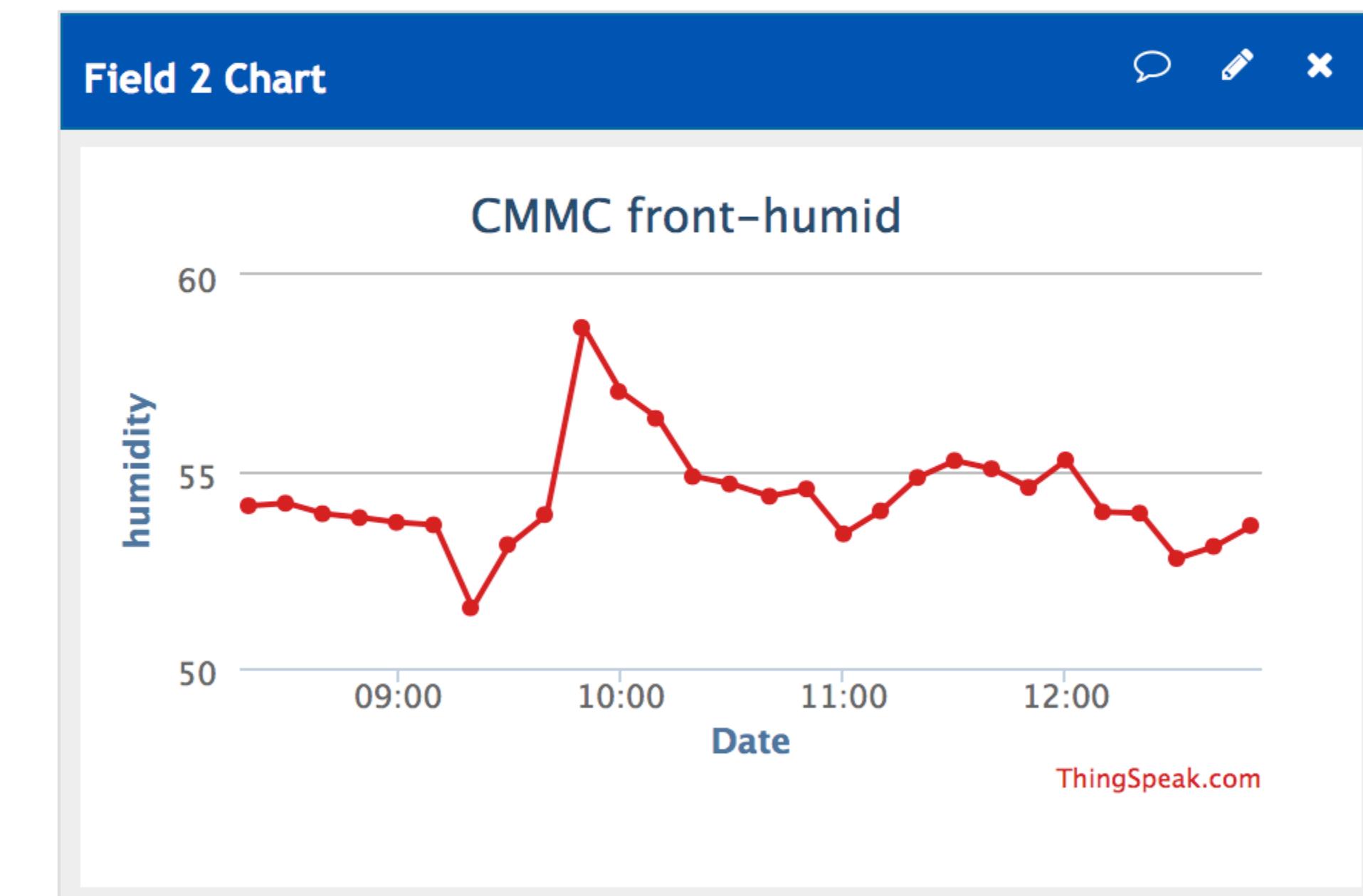
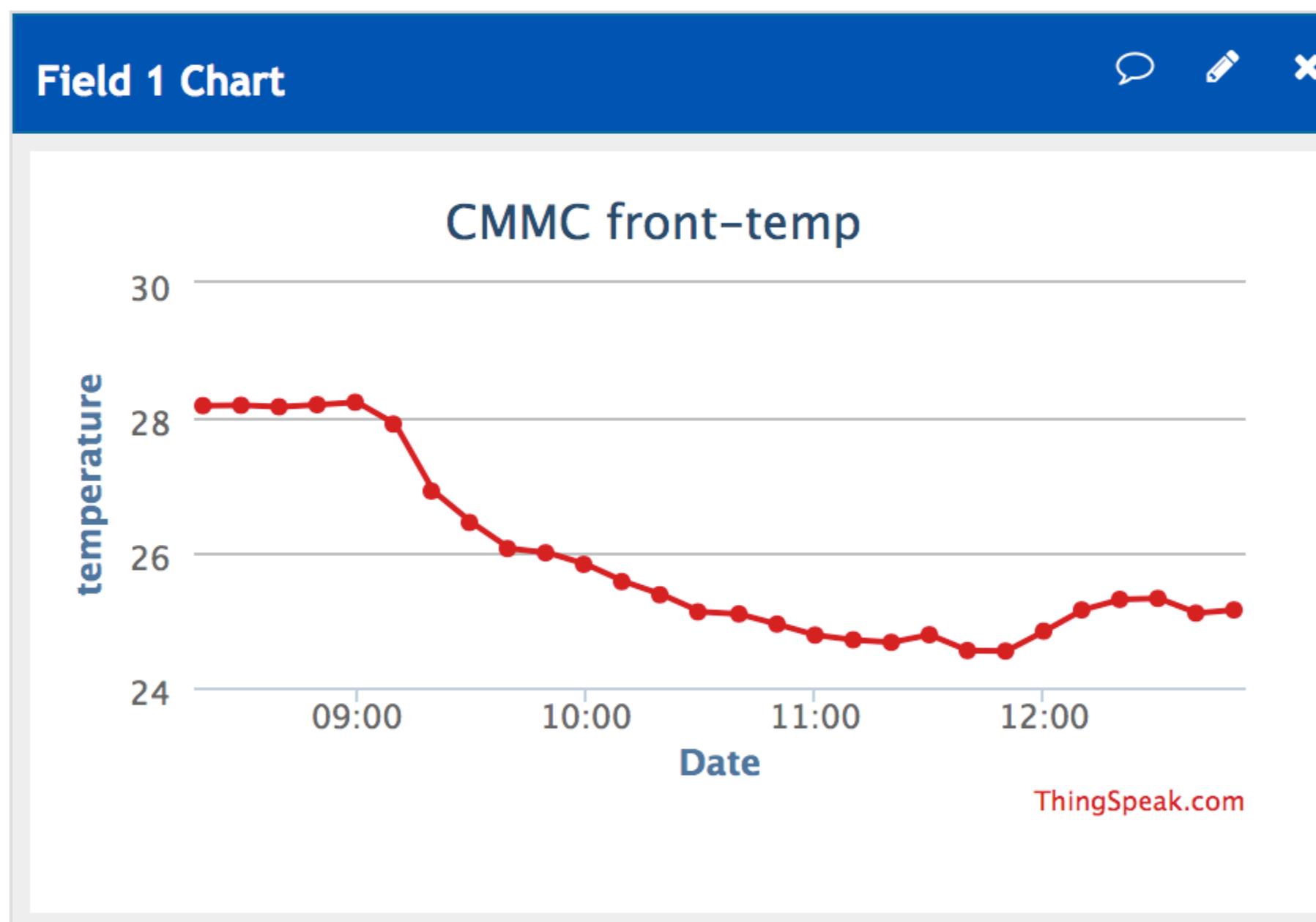
Get Status Updates

```
GET https://api.thingspeak.com/channels/127482/status.json
```

[+ Add Visualizations](#)[Data Export](#)[MATLAB Analysis](#)[MATLAB Visualization](#)

Channel Stats

Created 2 months ago
Updated less than a minute ago
Last Entry less than a minute ago
9079 Entries



Q&A

NETPIE.IO

behind the scene

```
var verifier = require('hat')(32);
var oauth = new OAuth.OAuth(
  GEARAUTHREQUESTTOKENENDPOINT,
  GEARAUTHACCESSTOKENENDPOINT,
  this.gearkey,
  this.gearsecret,
  '1.0',
  'scope='+this.scope+'&appid='+this.appid+'&verifier='+verifier,
  'HMAC-SHA1'
);
```

```
accesstoken = {  
    token:oauth_token,  
    secret: oauth_token_secret,  
    appkey: results.appkey,  
    endpoint: results.endpoint  
}
```

```
● 334 microgear.prototype.brokerconnect = function(callback) {  
335     var hkey = this.accesstoken.secret+'&'+this.gearsecret;  
336     var mqttuser = this.gearkey+'%'+Math.floor(Date.now()/1000);  
337     var mqttpassword = crypto.createHmac('sha1', hkey).  
338         update(this.accesstoken.token+'%'+mqttuser).digest('base64');  
339     var mqttclientid = this.accesstoken.token;  
340     console.log("hkey: ", hkey);  
341     console.log("user: ", mqttuser);  
342     console.log("pass: ", mqttpassword);  
343     console.log("clientId: ", mqttclientid);
```

```
accesstoken = {  
    token:oauth_token,  
    secret: oauth_token_secret,  
    appkey: results.appkey,  
    endpoint: results.endpoint  
}
```

```
334 microgear.prototype.brokerconnect = function(callback) {  
335     var hkey = this.accesstoken.secret+'&'+this.gearsecret;  
336     var mqttuser = this.gearkey+'%'+Math.floor(Date.now()/1000);  
337     var mqttpassword = crypto.createHmac('sha1', hkey).  
338         update(this.accesstoken.token+'%'+mqttuser).digest('base64');  
339     var mqttclientid = this.accesstoken.token;  
340     console.log("hkey: ", hkey);  
341     console.log("user: ", mqttuser);  
342     console.log("pass: ", mqttpassword);  
343     console.log("clientId: ", mqttclientid);
```

```
mosquitto_sub -u "2syAvlZPSExXY3M  
%1442404551" -P "A5OG2UMebYMSmdmbf/  
9ULCdLPJE=" -h "gearbroker.netpie.io" -t "/"  
HelloChiangMaiMakerClub/#" -i  
JEGUYG3eGP5BWnN -d
```