

NECTEC IoT Camp 2016

Day 1

- Overview the “Internet of things”
- Cloud Services
- ESP8266
- ESPresso Lite
- NETPIE.io
- ESPert Cloud

Day 2

- Mobile Application + IoT
- React Native
- Things & Things
- Labs

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

–David Beckham

แนะนำตัวเอง

ณัฐ วีระวรรณ

การศึกษา : ปริญญาตรีจากภาควิชาวิทยาการคอมพิวเตอร์ มหาวิทยาลัย
ธรรมศาสตร์



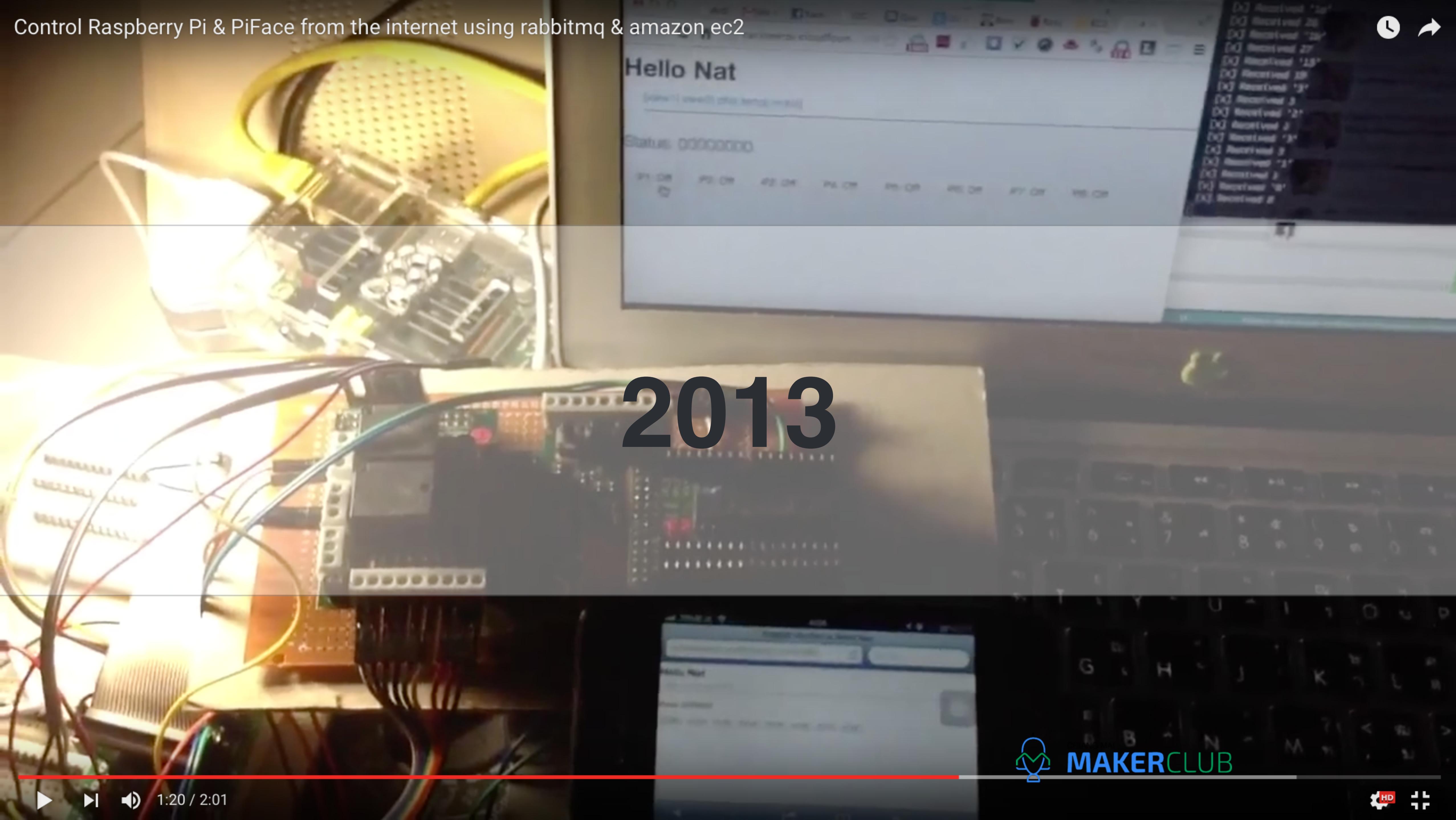
ประสบการณ์ : Web Development (front&back-end), Game
Development, Android development, IoT & Firmware Development.

ปัจจุบัน :

IoT Specialist บริษัทเมกเกอร์เวิร์ค
ประธานชมรม Chiang Mai Maker Club



2006



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



MAKERCLUB



1:20 / 2:01



Chiang Mai Maker Club

2014







A wide-angle photograph of a park or sports field. In the foreground, a person is walking away from the camera towards a distant soccer goal. The field is covered in green grass with a paved path running through it. In the background, there are trees, houses, and a church steeple under a hazy, overcast sky.

The internet of things

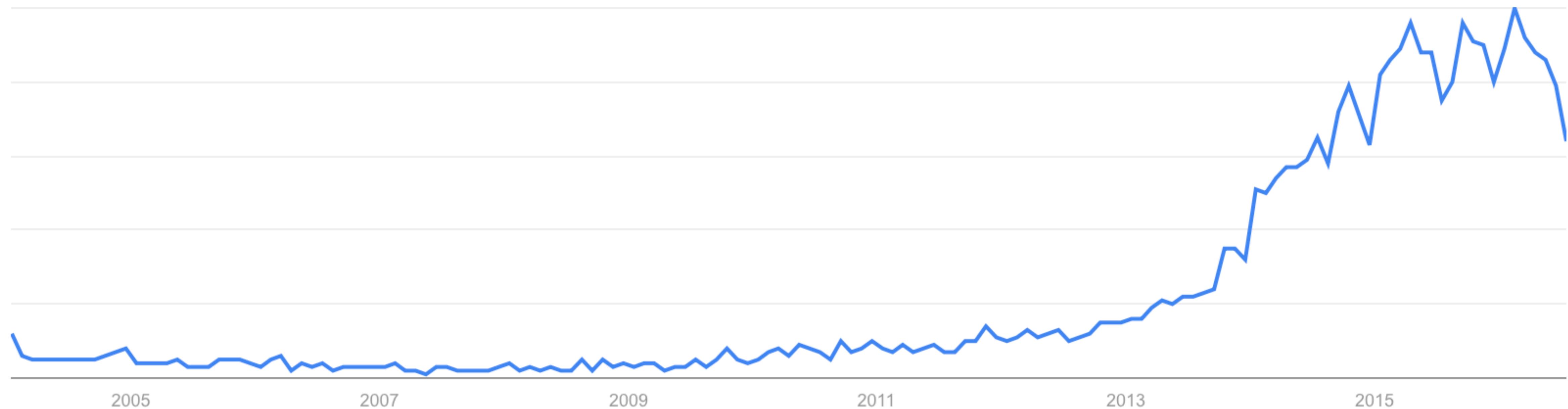
internet of things
Search term

+ Add term

Interest over time



Compare to category News headlines Forecast



Names

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

1974: Beginnings of TCP/IP

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

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

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]

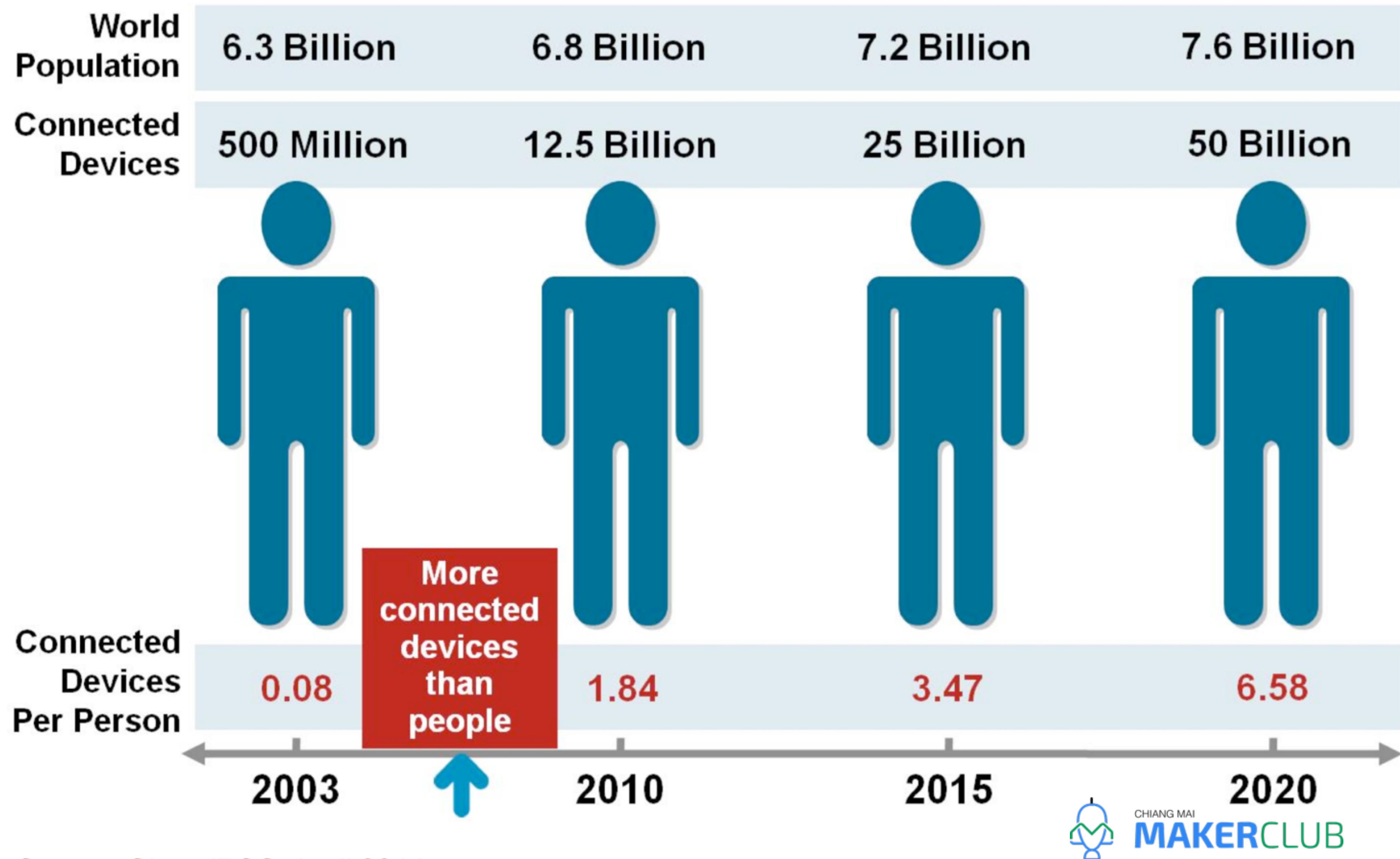
The **internet of things** (IoT) is the network of physical devices, vehicles, buildings and other items —[embedded with electronics, software, sensors, actuators, and network connectivity](#) that enable [1] these objects to collect and exchange data. In 2013 the Global Standards Initiative on Internet [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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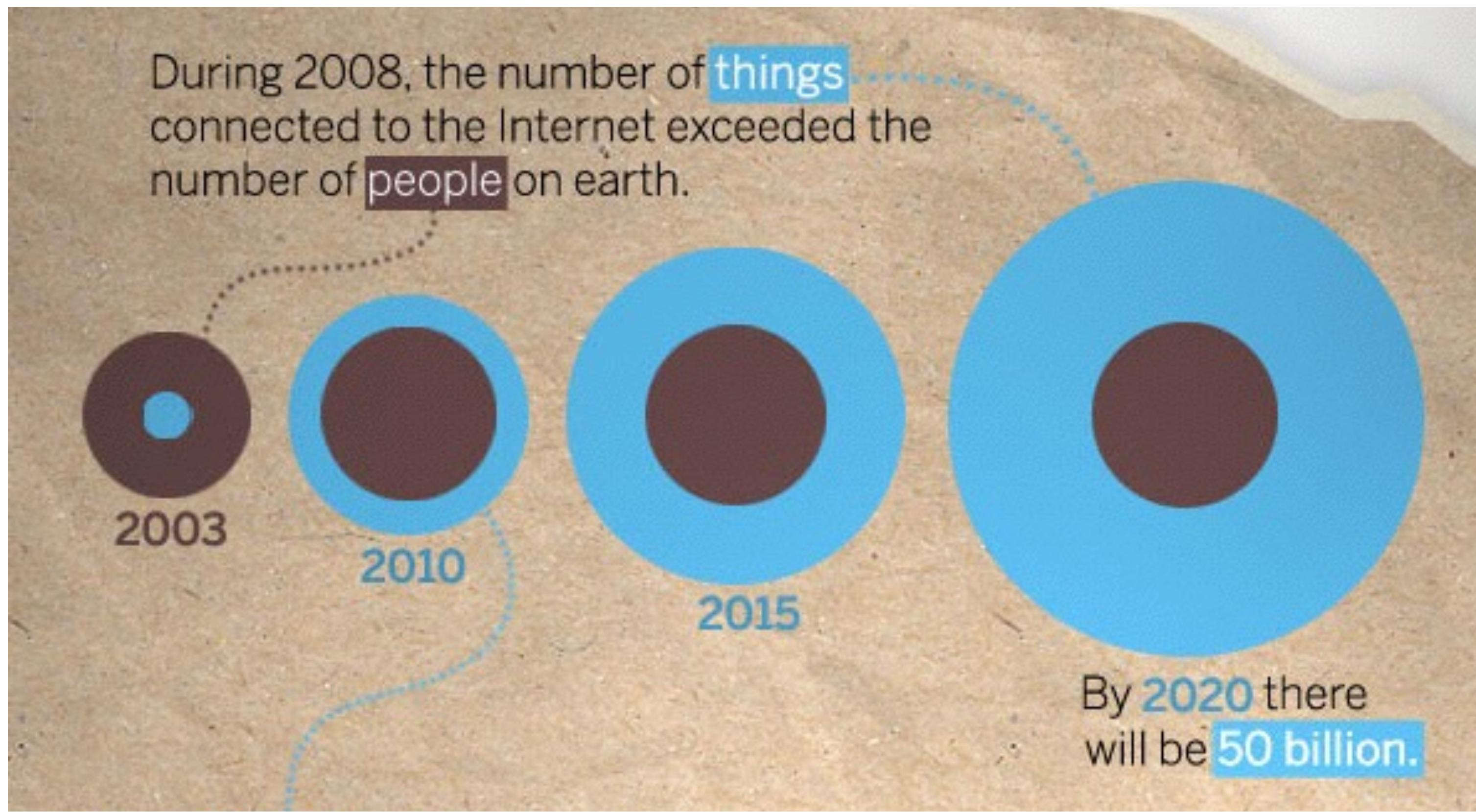
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2008-2009: The Internet of Things was "Born"

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
- Cloud Service (Intelligence)

“Software at the level above single device.”

– Dr. Jimmy Panutat Tejasen

Things



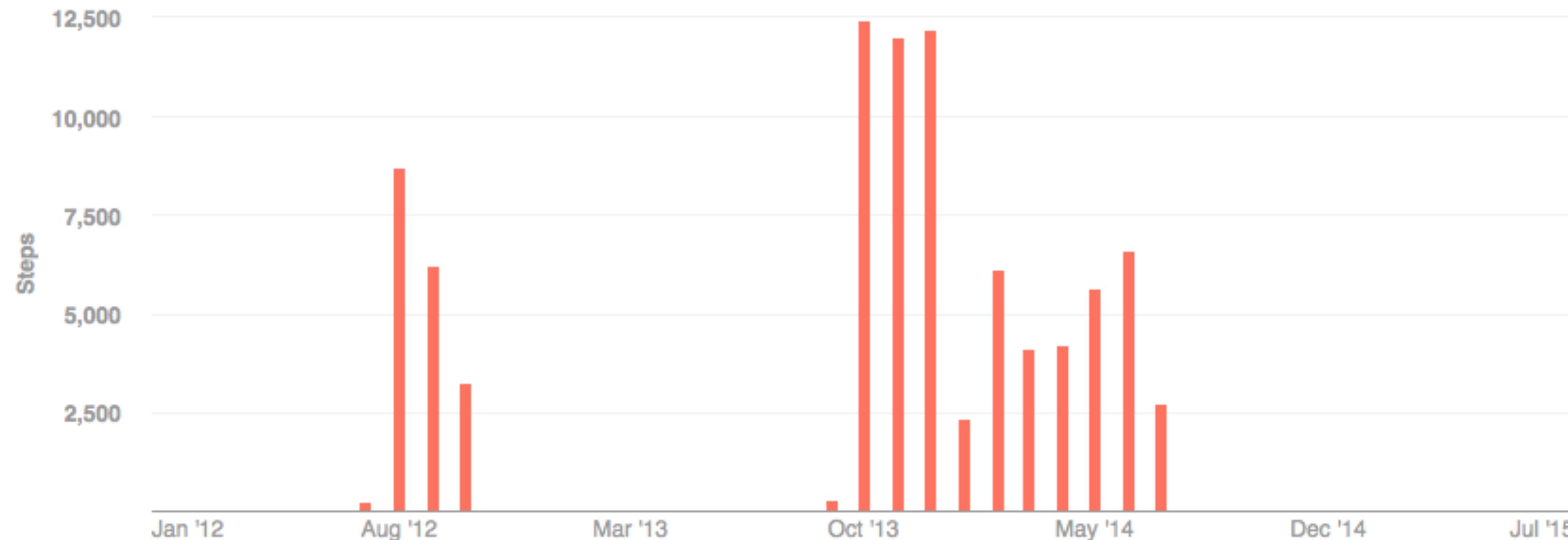
2013



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

94%

of users surveyed who made a resolution made one about health and fitness. And **more than half** who set out to exercise more achieved their goal.

00000
00000

92% of users surveyed who made a health and fitness resolution for 2015 believe their Fitbit tracker helped with their efforts.

THE TOP 3 IN 2015

 **Lose weight**

 **Exercise more**

 **Eat healthier**

say their Fitbit tracker motivated them to be more active



say their Fitbit tracker encouraged them to reach their daily step goal

say their Fitbit tracker inspired them to walk more



Connectivity

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})

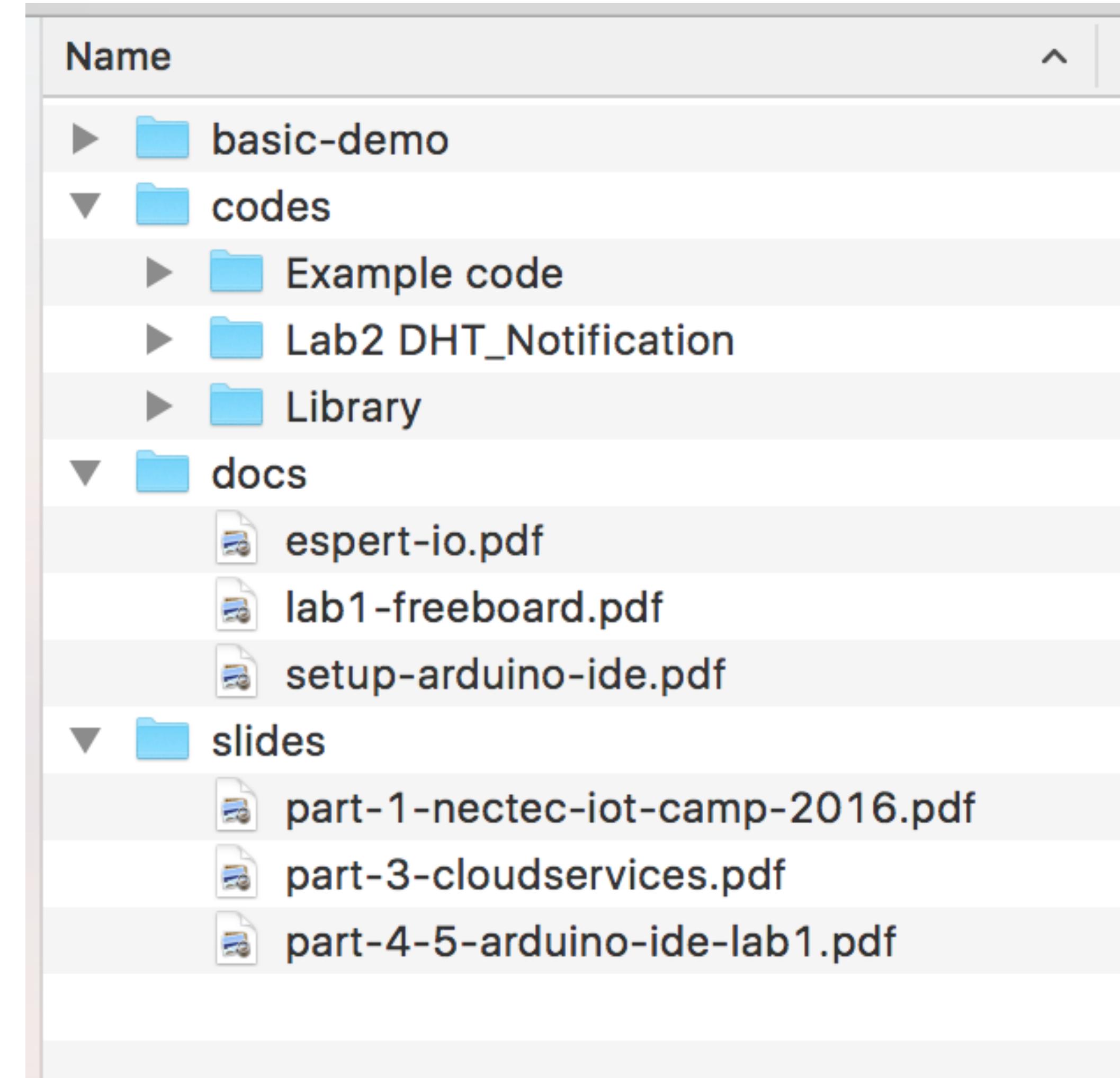
340,282,366,920,938,463,463,374,607,431,768,211,456)

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

Q&A

cmmc.io/docs



cmmc.io/docs