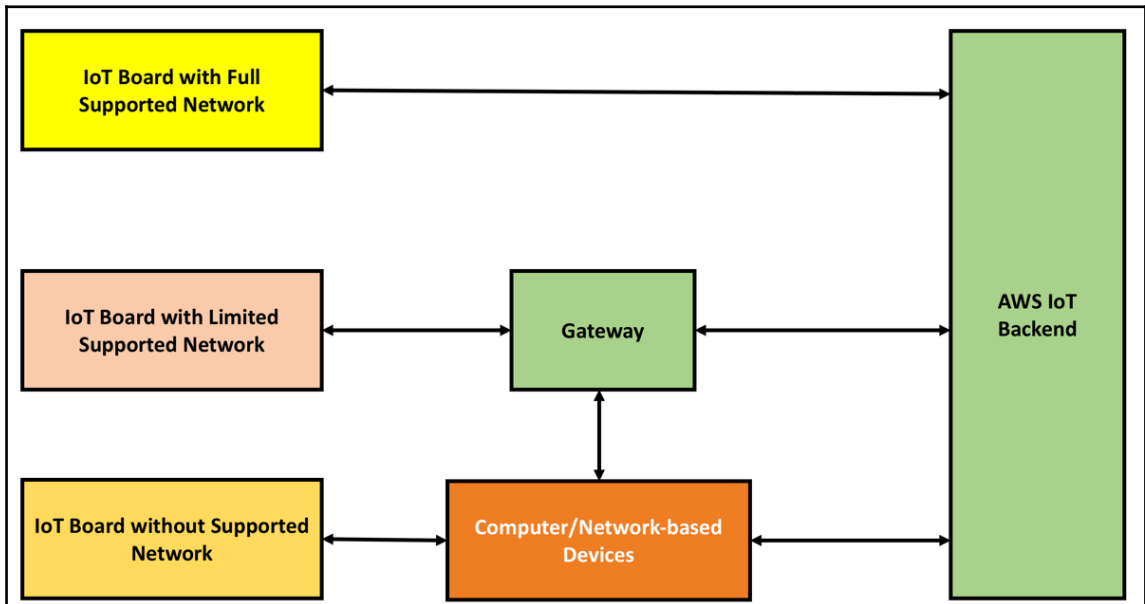
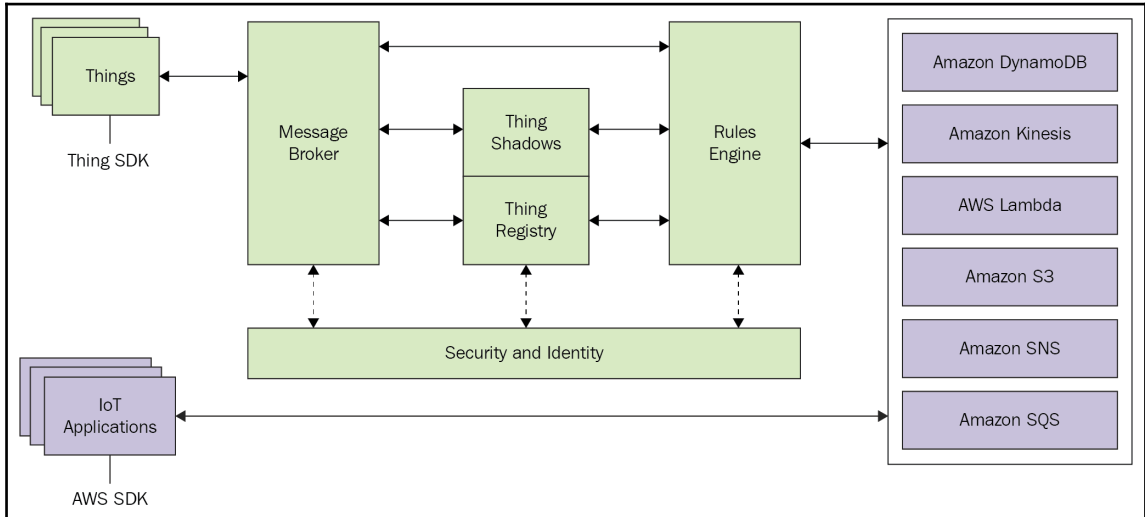
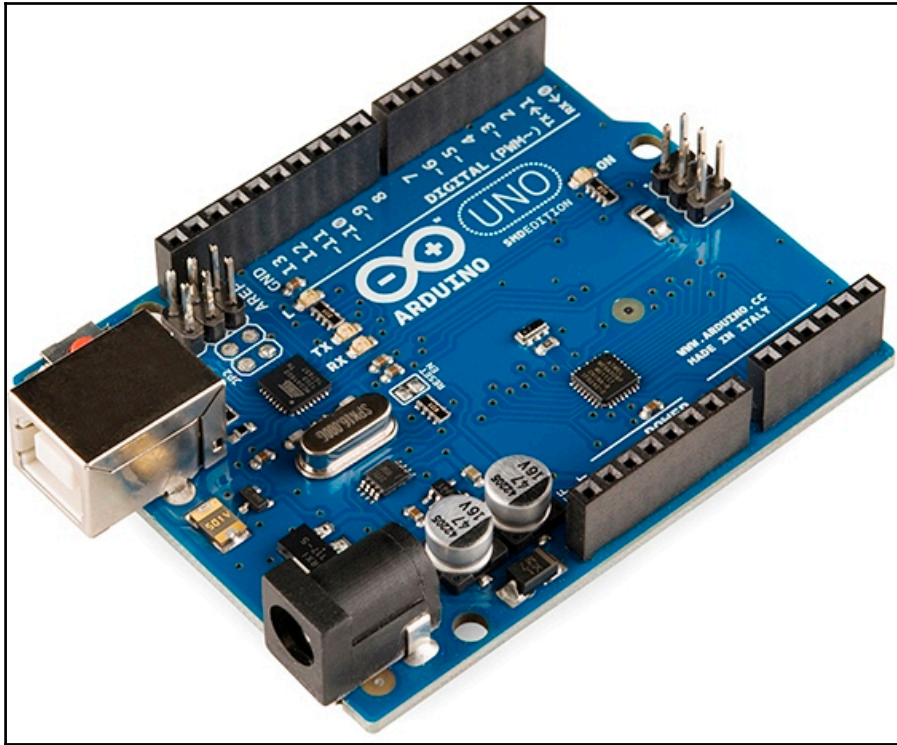
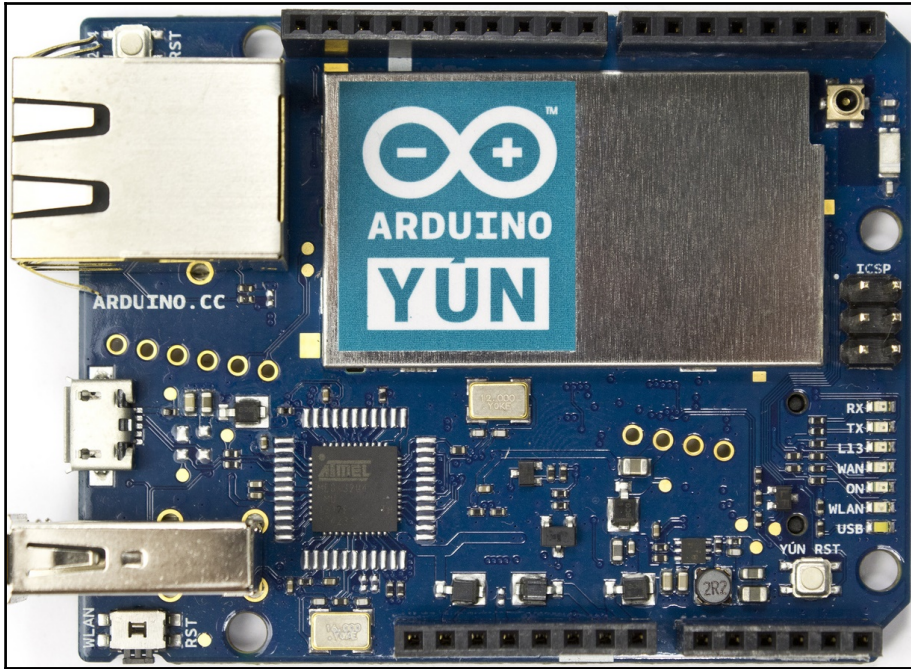
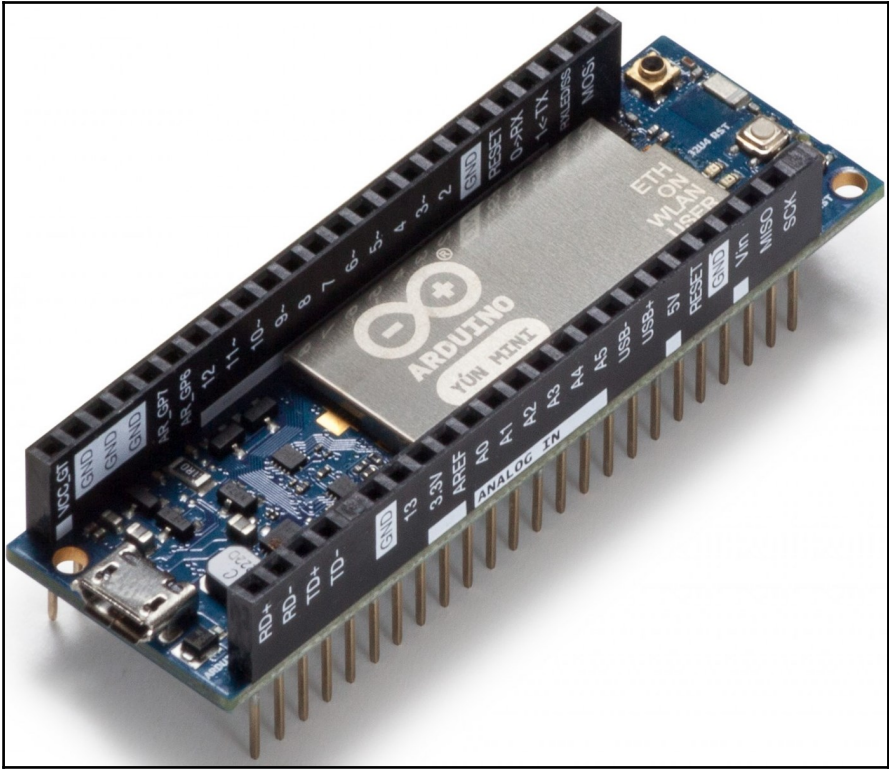


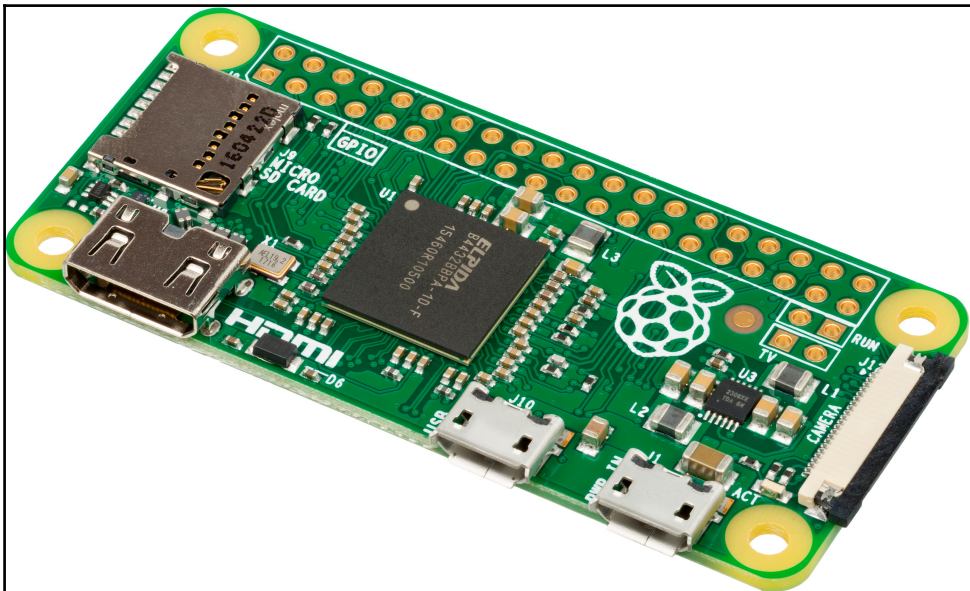
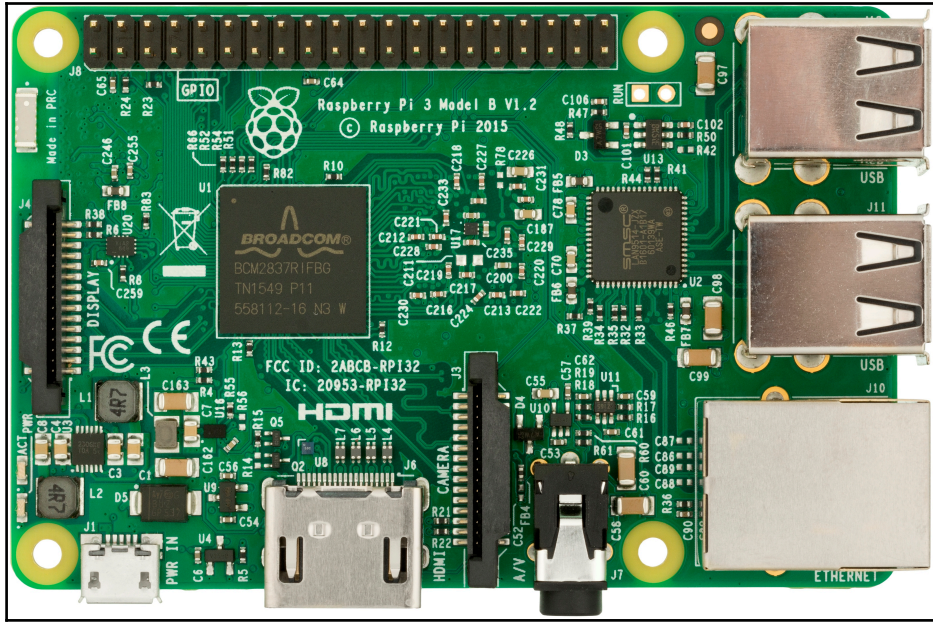
Chapter 1: Getting Started with AWS IoT

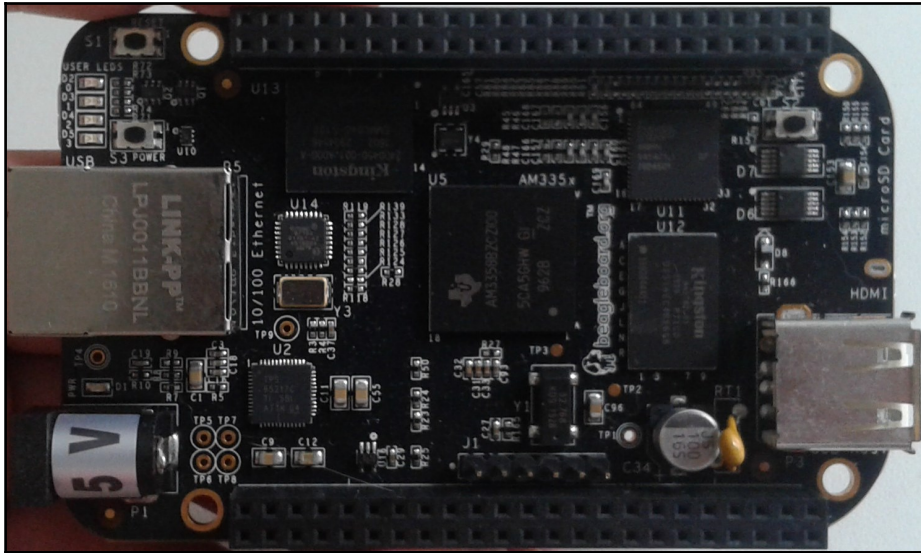


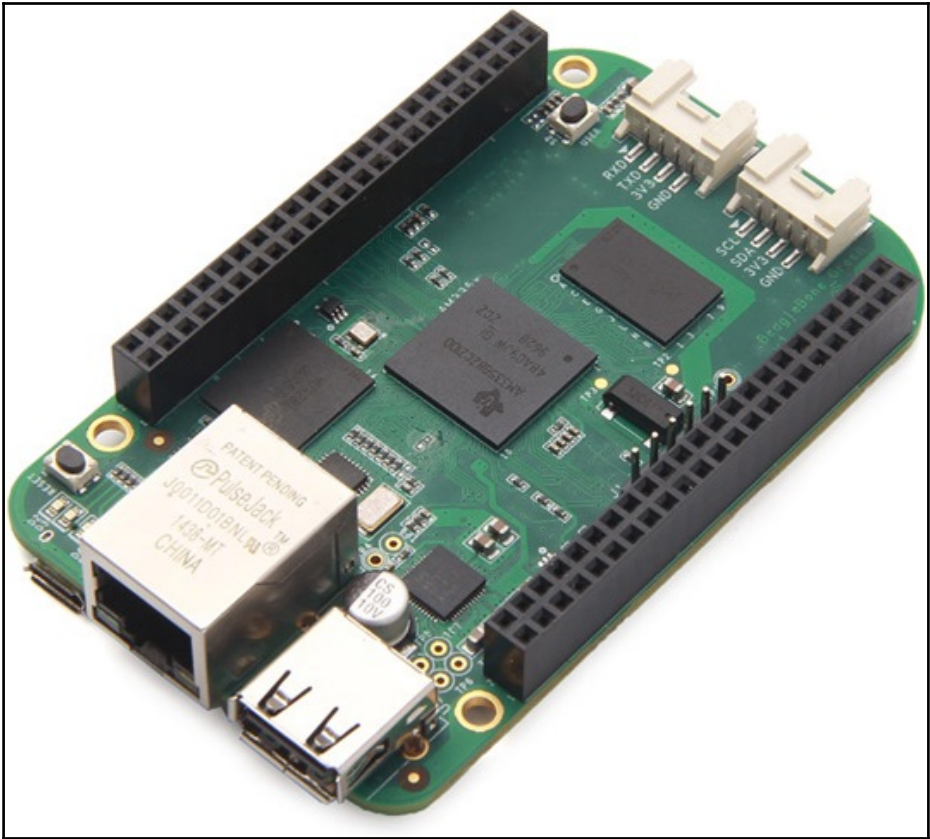


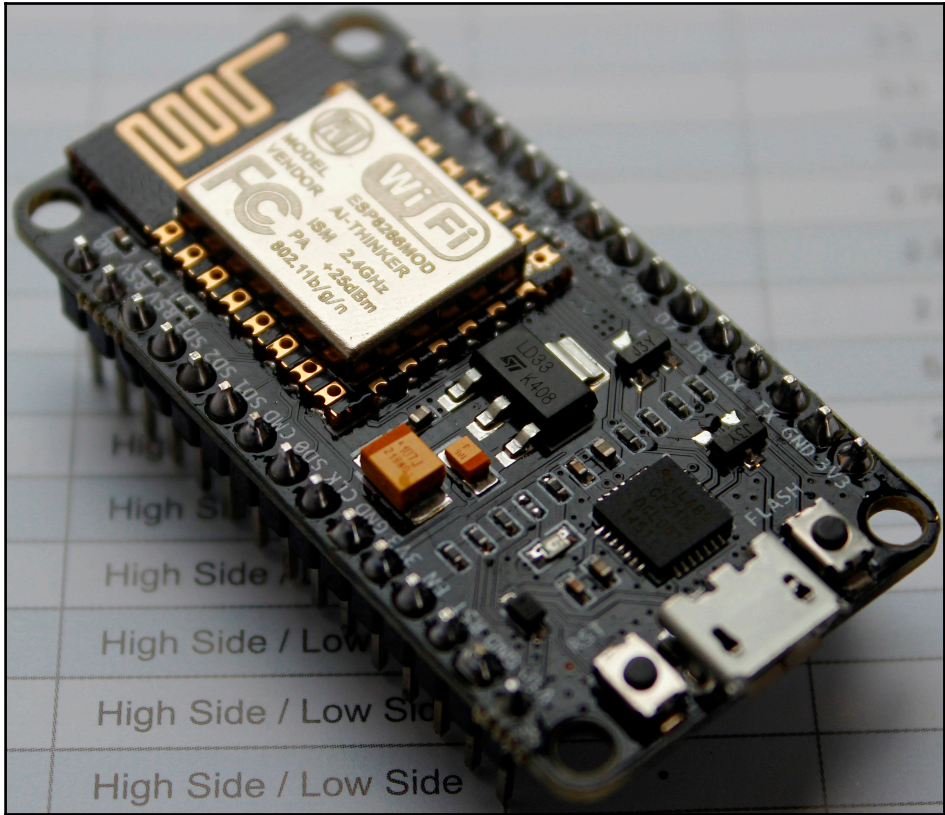


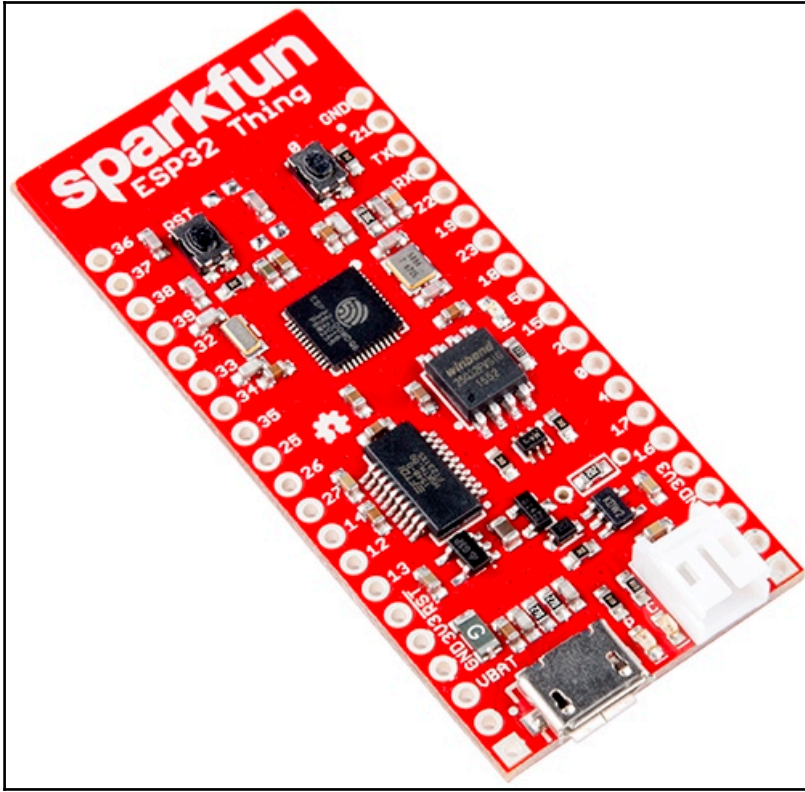












ap-southeast-1.console.aws.amazon.com

Services Resource Groups

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Welcome to the AWS IoT Console

To get started, you can jump into the recommended starting points below, or explore other learning resources as needed.

- Dashboard
- Connect
- Registry
- Security
- Rules
- Test
- Software
- Settings
- Learn

See how AWS IoT works

Explore an interactive tutorial through the components of AWS IoT.

[Start the tutorial](#)

It takes 5 minutes

Connect to AWS IoT

Connect a device, a mobile or web app to AWS IoT in a few easy steps!

[View connection options](#)

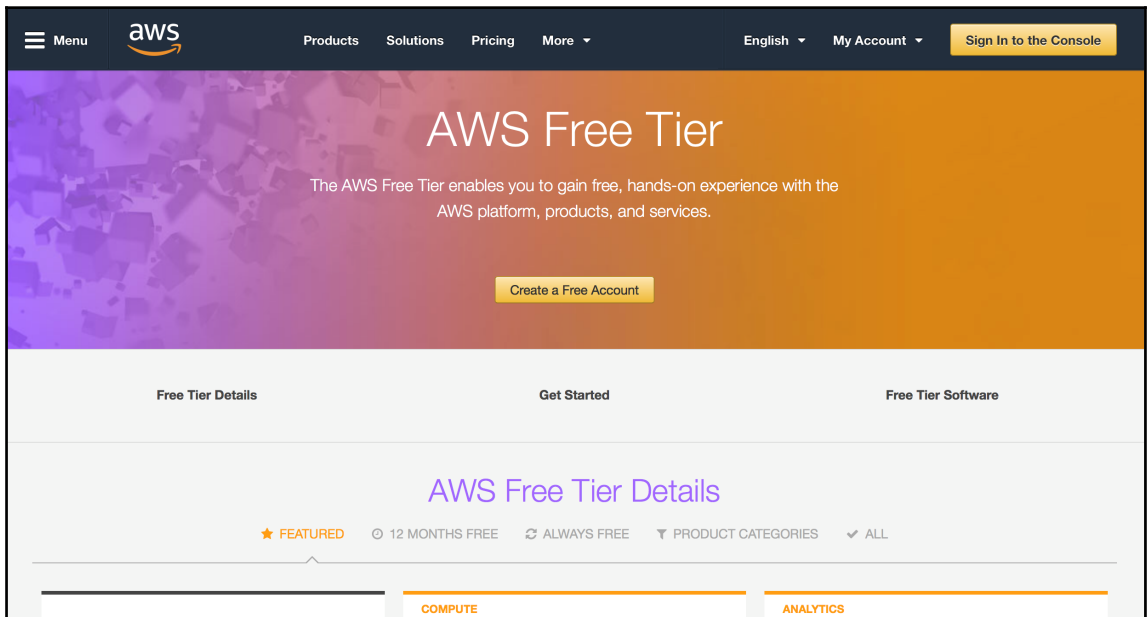
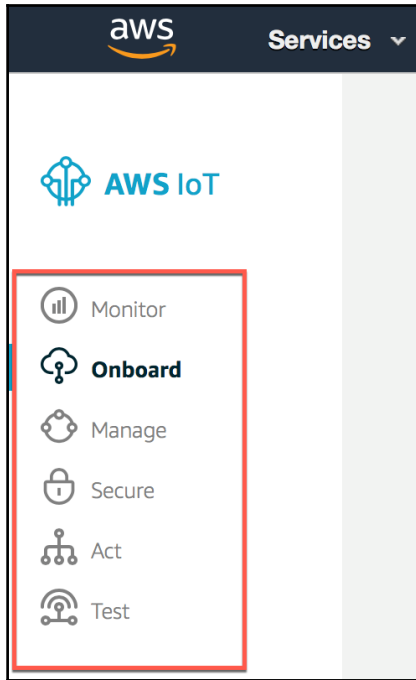
Explore documentation

The AWS IoT documentation is a great resource for more details.

[Go to documentation](#)

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Connect to AWS IoT

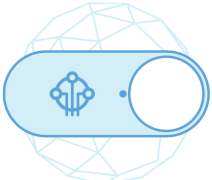
Monitor Onboard Manage Secure Act Test Software Settings Learn



Configuring a device

Connect a device or your computer to AWS IoT using the connection wizard for AWS IoT Device SDKs.


[Get started](#)



AWS IoT Button

The AWS IoT Button is a single-purpose device that sends a message to AWS IoT with a press of a button.

[Configure a button](#)



AWS IoT Starter Kit

Browse AWS IoT Starter Kits that were made for connecting to AWS IoT and getting started with the service.


[Browse starter kits](#)

Don't have a button? [Buy one](#)


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Connect to AWS IoT


Connecting a device (like a development kit or your computer) to AWS IoT requires the completion of the following steps. In this process you will:

- 

1 Register a device

A thing is the representation and record of your physical device in the cloud. Any physical device needs a thing record in order to work with AWS IoT.
- 

2 Download a connection kit

The connection kit includes some important components: security credentials, the SDK of your choice, and a sample project.
- 

3 Configure and test your device

Using the connection kit, you will configure your device by transferring files and running a script, and test that it is connected to AWS IoT correctly.

Want to learn more about the components of AWS IoT?
[Try the interactive overview](#)

[Get started](#)

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How are you connecting to AWS IoT?

Select the platform and SDK that best suits how you are connecting to AWS IoT.

Choose a platform

Linux/OSX Windows

Choose a AWS IoT Device SDK

Node.js Python

Java

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CONNECT TO AWS IOT

Register a thing

STEP 1/3

A thing is the representation and record of your physical device in the cloud. Any physical device needs a thing to work with AWS IoT. Creating a thing will also create a thing shadow. [Choose an existing thing instead?](#)

Name

Give your thing a name

Hide optional configuration

Choose a thing type

You can associate a thing type to your thing.

Choose a thing type

No type [Create a type](#)

Set searchable thing attributes

Next (optional), you can use thing attributes to describe the identity and capabilities of your device.

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Create a thing type

This will help you organize, categorize, and search for your things.

Name

Description

Set searchable thing attributes
You can define up to three attributes for a thing type. Things associated with this type can be searched by using these fields.

Attribute key

Attribute key

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Register a thing

This step creates an entry in the thing registry and a thing shadow for your device.

Name

Hide optional configuration ▲

Choose a thing type
You can associate a thing type to your thing.

Choose a thing type

Set searchable thing attributes
Enter a value for one or more of these attributes so that you can search for your things in the registry.

Attribute key	Value
<input type="text" value="name"/>	<input type="text" value="macos-home01"/>

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AWS IoT

Monitor
Onboard
Manage
Things
Types
Groups
Jobs
Secure
Act
Test
Software
Settings
Learn

Things

Card Search things Create

macos-computer
COMPUTER

aws Services Resource Groups


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←

THING
macos-computer
COMPUTER Actions

Details
Security
Shadow
Interact
Activity

Certificates



To securely connect to AWS IoT, your thing will need a certificate and policy.
Certificates help things establish a secure connection. AWS IoT policies give things permission to access AWS IoT resources (like other things, MQTT topics, or thing shadows).

Create certificate View other options

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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	66a811b87a.cert.pem	Download
A public key	66a811b87a.public.key	Download
A private key	66a811b87a.private.key	Download

You also need to download a root CA for AWS IoT from Symantec:
 A root CA for AWS IoT [Download](#)

[Activate](#)

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cert

examples html_js

- aws_comp_cert
- cert
- comp-demo.js
- connect_device_package
- connect_devi..._package.zip
- macos-computer.cert.pem
- macos-comp...r.private.key
- macos-computer.public.key
- root-CA.crt



- Monitor
- Onboard
- Manage
- Greengrass
- Secure**
 - Certificates
 - Policies**
 - CAs
 - Role Aliases
 - Authorizers
- Act
- Test
- Software
- Settings



You don't have any policies yet

AWS IoT policies give things permission to access AWS IoT resources (like other things, MQTT topics, or thing shadows).

[Learn more](#)

[Create a policy](#)

aws Services Resource Groups

Create a policy

Create a policy to define a set of authorized actions. You can authorize actions on one or more resources (things, topics, topic filters).

Name

Add statements

Policy statements define the types of actions that can be performed by a resource. **Advanced mode**

Action

Resource ARN

Effect Allow Deny Remove

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Policies

Search policies Create

MyIoTPolicy


Dashboard
Connect
Registry
Security
Certificates
Policies
CAs
Rules
Test
Software
Settings

Successfully created a policy. ×

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 **AWS IoT**

 Monitor

 Onboard

 Manage

 **Secure**
Certificates

Policies

CAs

Role Aliases

Authorizers

 Act

 Test

 Software

Certificates

887889752
ACTIVE

66a811
ACTIVE

Activate

Deactivate

Revoke

Accept transfer

Reject transfer

Revoke transfer

Start transfer

Attach policy

Attach thing

Download

Delete

aws Services Resource Groups Agus Kurniawan Singapore Support

Attach policies to certificate(s)

Policies will be attached to the following certificate(s):
66a811b87a339d8bd403cf16fad35c195d5e779733a40ec877ee43f82212f7df

Choose one or more policies

MyIoTPolicy [View](#)

1 policy selected

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AWS IoT

Monitor

Onboard

Manage

Secure
Certificates

Policies

CAs

Role Aliases

Authorizers

Act

Test

Software

Certificates

887889752
ACTIVE

66a811
ACTIVE

⋮
Activate

Deactivate

Revoke

Accept transfer

Reject transfer

Revoke transfer

Start transfer

Attach policy

Attach thing

Download

Delete

AWS Services Resource Groups Agus Kurniawan Singapore Support

Attach things to certificate(s)

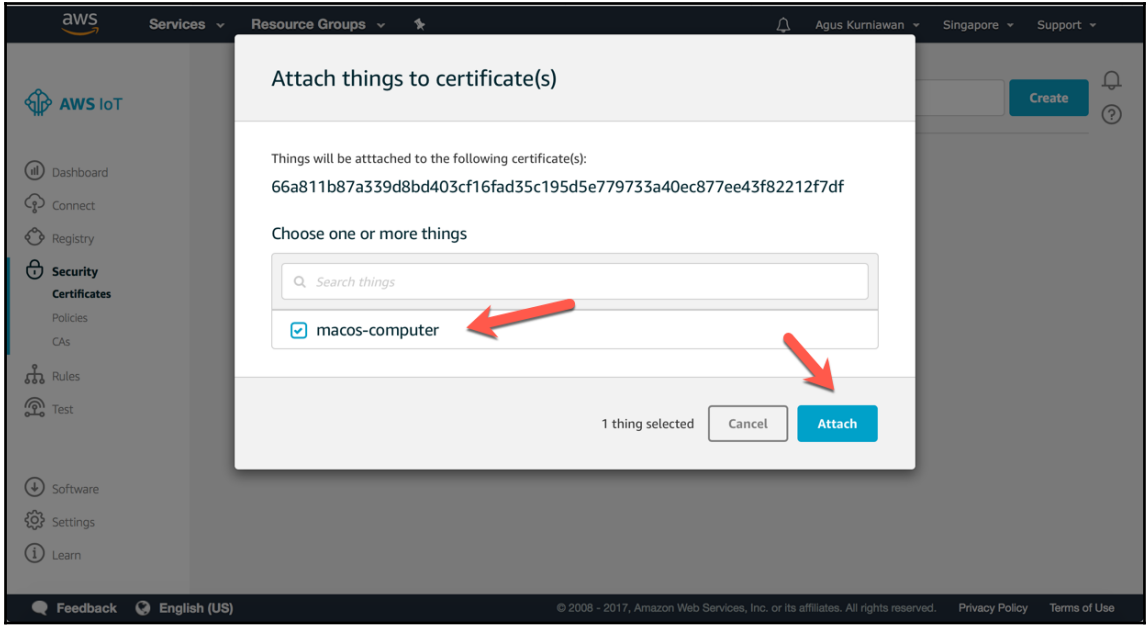
Things will be attached to the following certificate(s):
66a811b87a339d8bd403cf16fad35c195d5e779733a40ec877ee43f82212f7df

Choose one or more things

macos-computer

1 thing selected

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```
1 var awsIot = require('aws-iot-device-sdk');
2
3 var device = awsIot.device({
4   keyPath: 'cert/macros-computer.private.key',
5   certPath: 'cert/macros-computer.cert.pem',
6   caPath: 'cert/root-CA.crt',
7   host: 'xxxxxxxxx.iot.ap-southeast-1.amazonaws.com',
8   clientId: 'user-testing',
9   region: 'ap-southeast-'
10 });
11
12 device
13   .on('connect', function() {
14     console.log('connected');
15     device.subscribe('topic_1');
16     device.publish('topic_1', JSON.stringify({ test_data: 1}));
17   });
18
19 device
20   .on('message', function(topic, payload) {
21     console.log('message', topic, payload.toString());
22   });
```

EXPLORER

- OPEN EDITORS 1 UNSAVED
 - JS comp-demo.js
- CODES
 - aws_comp_cert
 - certificate.pem.crt
 - private.pem.key
 - public.pem.key
 - root-CA.crt
 - VeriSign-Class 3-Public-Primary-Ce..
 - cert
 - connect_device_package
 - macos-computer.cert.pem
 - macos-computer.private.key
 - macos-computer.public.key
 - root-CA.crt
 - start.sh
 - JS comp-demo.js
 - connect_device_package.zip
- DOCKER
 - Images
 - Containers

Ln 7, Col 22 Spaces: 4 UTF-8 LF JavaScript

```
codes — node comp-demo.js — 80x16
agusk$ node comp-demo.js
connected
message topic_1 {"test_data":1}
```



Dashboard

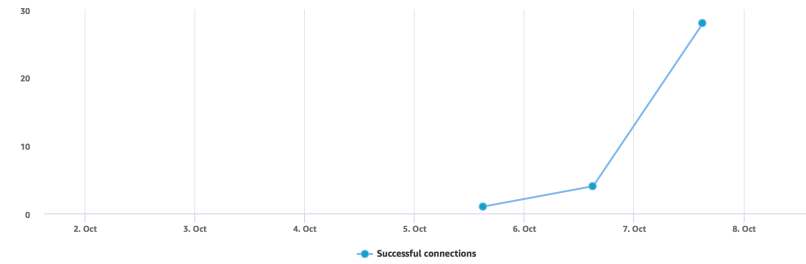
- Connect
- Registry
- Security
- Rules
- Test

- Software
- Settings
- Learn

Dashboard

Week ▾

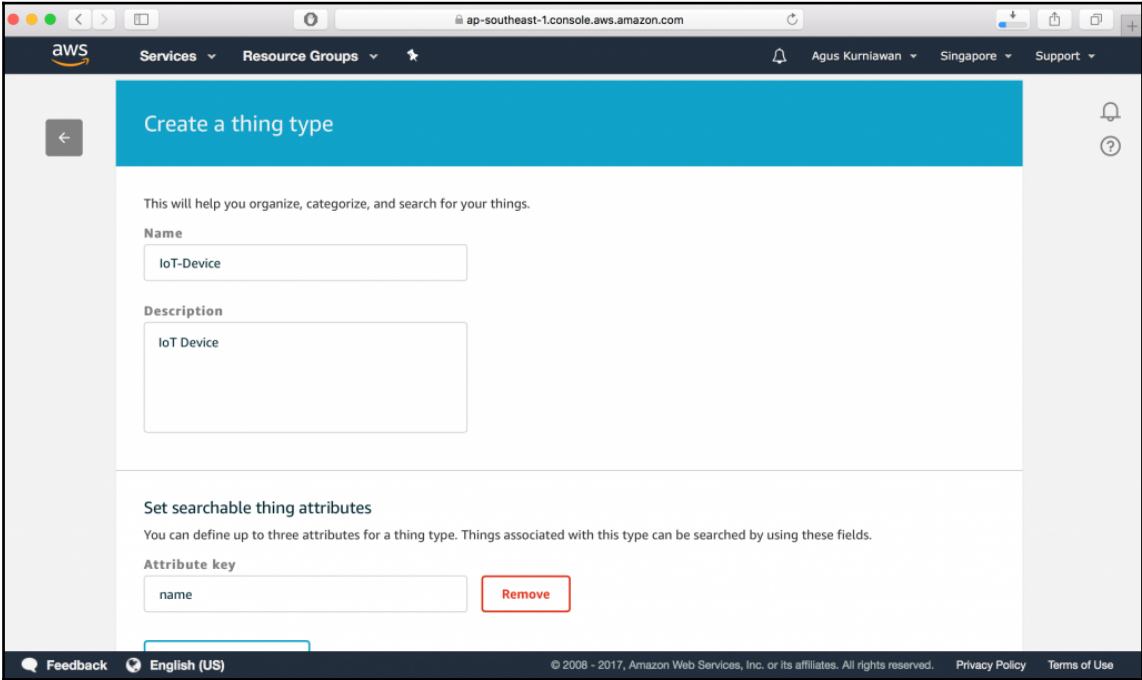
Successful connections



Messages



Chapter 2: Connecting IoT Devices to AWS IoT Platform



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Services Resource Groups

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AWS IoT

Monitor
Onboard
Manage
Things
Types
Secure
Act
Test

Software
Settings
Learn

Types

Search types [Create](#)

Computer ... IoT-Device ...

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Services Resource Groups Agus Kurniawan Singapore Support

Register a thing

This step creates an entry in the thing registry and a thing shadow for your device.

Name

Hide optional configuration ▾

Apply a type to this thing

Using a thing type simplifies device management by providing consistent registry data for things that share a type. Types provide things with a common set of attributes, which describe the identity and capabilities of your device, and a description.

Thing Type

Set searchable thing attributes (optional)

Enter a value for one or more of these attributes so that you can search for your things in the registry.

Attribute key	Value
<input type="text" value="name"/>	<input type="text" value="pi01"/>

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Services Resource Groups

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AWS IoT

- Monitor
- Onboard
- Manage**
 - Things**
 - Types
 - Secure
 - Act
 - Test
- Software
- Settings
- Learn

Things

Search things Create

- macos-computer
COMPUTER
- raspberry-pi
NO TYPE
- arduino-yun
NO TYPE
- esp32
NO TYPE

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AWS IoT

Monitor
Onboard
Manage
Secure
Certificates
Policies
CAs
Act
Test
Software
Settings
Learn

Certificates

Search certificates [Create](#)

88788975239c68508... ACTIVE	66a811b87... ACTIVE	*** Activate Deactivate Revoke Accept transfer Reject transfer Revoke transfer Start transfer Attach policy Attach thing Download Delete
--------------------------------	------------------------	--

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Attach things to certificate(s)

Things will be attached to the following certificate(s):
66a811b87a339d8bd403cf16fad35c195d5e779733a40ec877ee43f82212f7df

Choose one or more things

Search things

- macos-computer
- raspberry-pi
- arduino-yun
- esp32

3 things selected Cancel Attach

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The screenshot shows the AWS IoT console interface. At the top, the navigation bar includes the AWS logo, 'Services', 'Resource Groups', and user information for 'Agus Kurniawan' in 'Singapore'. The main content area displays a 'CERTIFICATE' with the ID '66a811b87a339d8bd403cf16fad35c195d5e779733a40ec877ee43f82212f7df' and a status of 'ACTIVE'. Below this, a 'Things' section lists four IoT devices: 'raspberry-pi', 'macos-computer', 'esp32', and 'arduino-yun'. Each device name is enclosed in a rounded rectangle with three dots to its right. The left sidebar contains navigation options: 'Details', 'Policies', and 'Things' (which is currently selected). The footer includes a 'Feedback' link, 'English (US)' language setting, and copyright information for Amazon Web Services, Inc. (© 2008 - 2017).

The screenshot shows a desktop environment on a Raspberry Pi. The top panel includes a 'Menu' icon, the terminal prompt 'pi@raspberrypi: ~', and system status icons for Wi-Fi, audio, and battery (0% at 07:03). On the desktop, there is a 'Wastebasket' icon. A terminal window is open in the center, displaying the output of the 'uname -a' command: 'Linux raspberrypi 4.1.19-v7+ #858 SMP Tue Mar 15 15:56:00 GMT 2016 armv7l GNU/Linux'. The terminal window has a title bar that reads 'pi@raspberrypi: ~' and menu options 'File Edit Tabs Help'.

```
agusk — pi@raspberrypi: ~ — ssh pi@192.168.0.21 — 80x24

root@raspberrypi:~# apt-get install nodejs -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  nodejs
0 upgraded, 1 newly installed, 0 to remove and 80 not upgraded.
Need to get 11.2 MB of archives.
After this operation, 53.6 MB of additional disk space will be used.
Get:1 https://deb.nodesource.com/node_8.x/ jessie/main nodejs armhf 8.7.0-1nodes
ource1 [11.2 MB]
Fetched 11.2 MB in 41s (269 kB/s)
Selecting previously unselected package nodejs.
(Reading database ... 178439 files and directories currently installed.)
Preparing to unpack ../nodejs_8.7.0-1nodesource1_armhf.deb ...
Unpacking nodejs (8.7.0-1nodesource1) ...
Processing triggers for man-db (2.7.5-1~bpo8+1) ...
Setting up nodejs (8.7.0-1nodesource1) ...
root@raspberrypi:~# node -v
v8.7.0
root@raspberrypi:~# npm -v
5.4.2
root@raspberrypi:~# █
```

```
agusk — pi@raspberrypi: ~/Documents/awsiot — ssh pi@192.168.0.21 — 80x24
GNU nano 2.2.6 File: pi-demo.js

var awsIot = require('aws-iot-device-sdk');

var device = awsIot.device({
  keyPath: 'cert/mac-os-computer.private.key',
  certPath: 'cert/mac-os-computer.cert.pem',
  caPath: 'cert/root-CA.pem',
  host: '██████████.iot.ap-southeast-1.amazonaws.com',
  clientId: 'user-testing',
  region: 'ap-southeast-'
});

device
  .on('connect', function() {
    console.log('connected');
    device.subscribe('topic_1');
    device.publish('topic_1', JSON.stringify({ test_data: 1}));
  });

device
  [ Read 22 lines ]
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell
```

```
agusk — pi@raspberrypi: ~/Documents/awsiot — ssh pi@192.168.0.21 — 80x24
pi@raspberrypi:~/Documents/awsiot $ node pi-demo.js
connected
message topic_1 {"test_data":1}
█
```

ap-southeast-1.console.aws.amazon.com

Services Resource Groups

Agus Kurniawan Singapore Support

AWS IoT

Monitor

- Onboard
- Manage
- Secure
- Act
- Test

Software Settings Learn

Monitor Week

Successful connections

Date	Successful connections
2017/10/21 08:45 UTC	3

Messages

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arduino.local

ARDUINO YUN

WELCOME TO ARDUINO, YOUR ARDUINO YÚN [CONFIGURE](#)

WIFI (WLAN0) CONNECTED

Address	192.168.0.23
Netmask	255.255.255.0
MAC Address	[REDACTED]
Received	12.92 KB
Trasmitted	14.97 KB

WIRED ETHERNET (ETH1) DISCONNECTED

MAC Address	[REDACTED]
Received	0.00 B
Trasmitted	0.00 B

```
AWS-IoT-Arduino-Yun-SDK — -bash — 80x24
/usr/lib/python2.7/site-packages/pip-9.0.1-py2.7.egg/pip/_vendor/requests/packages/urllib3/util/ssl_.py:122: InsecurePlatformWarning: A true SSLContext object is not available. This prevents urllib3 from configuring SSL appropriately and may cause certain SSL connections to fail. You can upgrade to a newer version of Python to solve this. For more information, see https://urllib3.readthedocs.io/en/latest/security.html#insecureplatformwarning.
  InsecurePlatformWarning
  Downloading AWSIoTPythonSDK-1.0.0.tar.gz (55kB)
    100% |#####| 61kB 70kB/s
Installing collected packages: AWSIoTPythonSDK
  Running setup.py install for AWSIoTPythonSDK ... done
Successfully installed AWSIoTPythonSDK-1.0.0
/usr/lib/python2.7/site-packages/pip-9.0.1-py2.7.egg/pip/_vendor/requests/packages/urllib3/util/ssl_.py:122: InsecurePlatformWarning: A true SSLContext object is not available. This prevents urllib3 from configuring SSL appropriately and may cause certain SSL connections to fail. You can upgrade to a newer version of Python to solve this. For more information, see https://urllib3.readthedocs.io/en/latest/security.html#insecureplatformwarning.
  InsecurePlatformWarning
root@Arduino:~# exit
Connection to 192.168.0.23 closed.
Done.
Execution completed!
agusk$
```

```
BasicPubSub | Arduino 1.8.5
aws_iot_config.h
#include "aws_iot_config.h"

ws_iot_mqtt_client myClient; // init iot_mqtt_client
char msg[32]; // read-write buffer
int cnt = 0; // loop counts
int rc = -100; // return value placeholder
bool success_connect = false; // whether it is connected

// Basic callback function that prints out the message
void msg_callback(char* src, unsigned int len, MessageInfo_t* info) {
    if(flag == STATUS_NORMAL) {
        Serial.println("CALLBACK:");
        int i;
        for(i = 0; i < (int)len; i++) {
            Serial.print(src[i]);
        }
        Serial.println("");
    }
}

void setup() {
    // Start Serial for print-out and wait until it's ready
    Serial.begin(115200);
}

Done compiling.

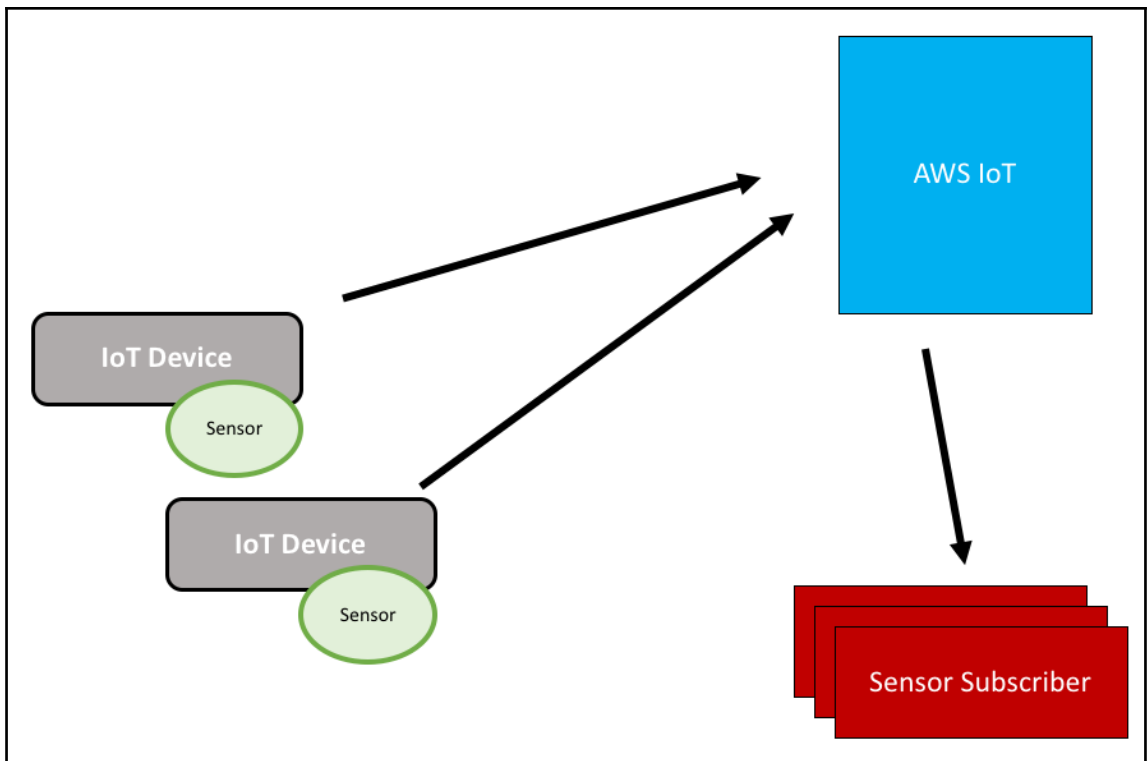
Archiving built core (caching) in: /var/folders/_4/ldn1...
Sketch uses 11082 bytes (28%) of program storage space.

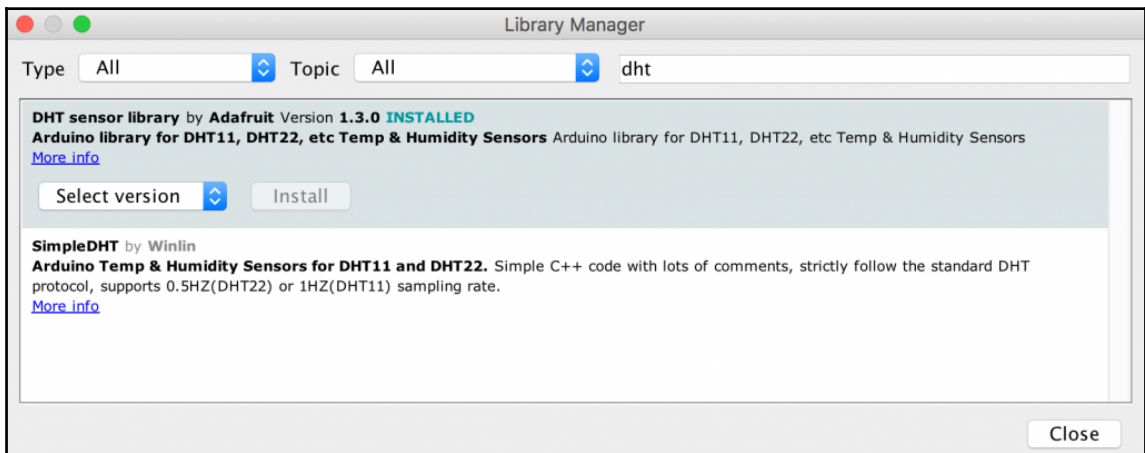
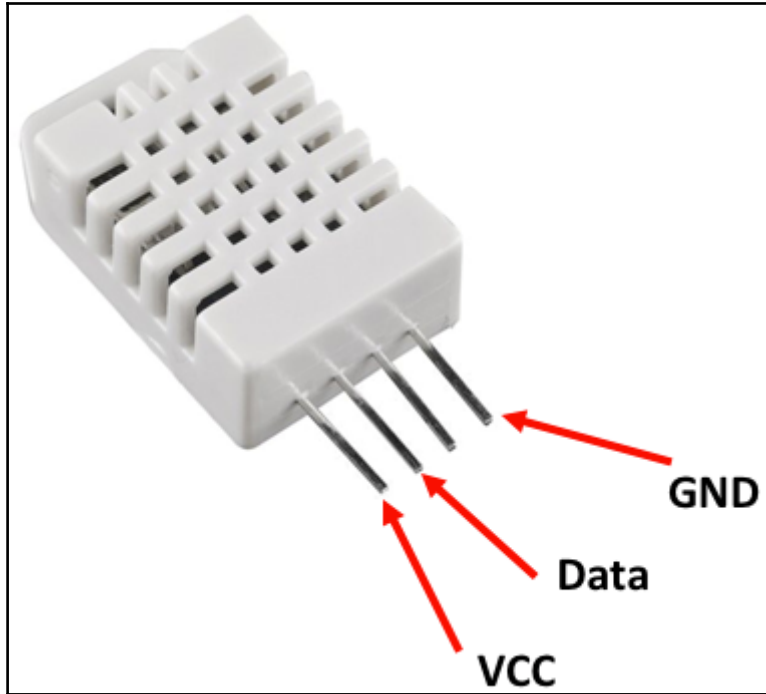
27 Arduino Yun on /dev/cu.usbmodem14111
```

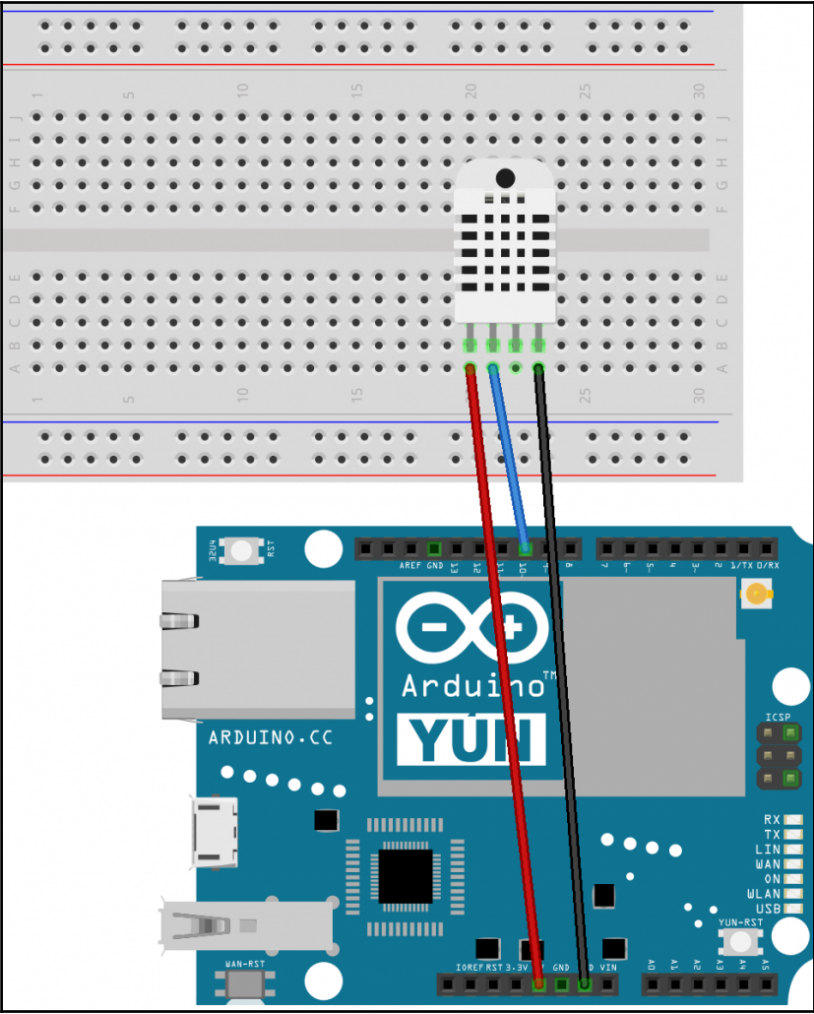
```
new message 4
Loop 5 done
CALLBACK:
new message 5
Loop 6 done
CALLBACK:
new message 6
Loop 7 done
CALLBACK:
new message 7
Loop 8 done
CALLBACK:
new message 8
Loop 9 done
```

Send

Autoscroll No line ending 115200 baud Clear output







The screenshot shows a serial terminal window titled "/dev/cu.usbmodem1411 (Arduino Yún)". At the top, there is a text input field and a "Send" button. The main area displays a series of messages: "Temperature: 29.60", "Sent: Temp: 29.60", "Temperature: 29.70", "CALLBACK:", "Temp: 29.60", "Sent: Temp: 29.70", "Temperature: 29.70", "CALLBACK:", "Temp: 29.70", "Sent: Temp: 29.70", "Temperature: 29.70", "CALLBACK:", "Temp: 29.70", and "Sent: Temp: 29.70". At the bottom, there are controls: a checked "Autoscroll" checkbox, a "No line ending" dropdown menu, a "115200 baud" dropdown menu, and a "Clear output" button.

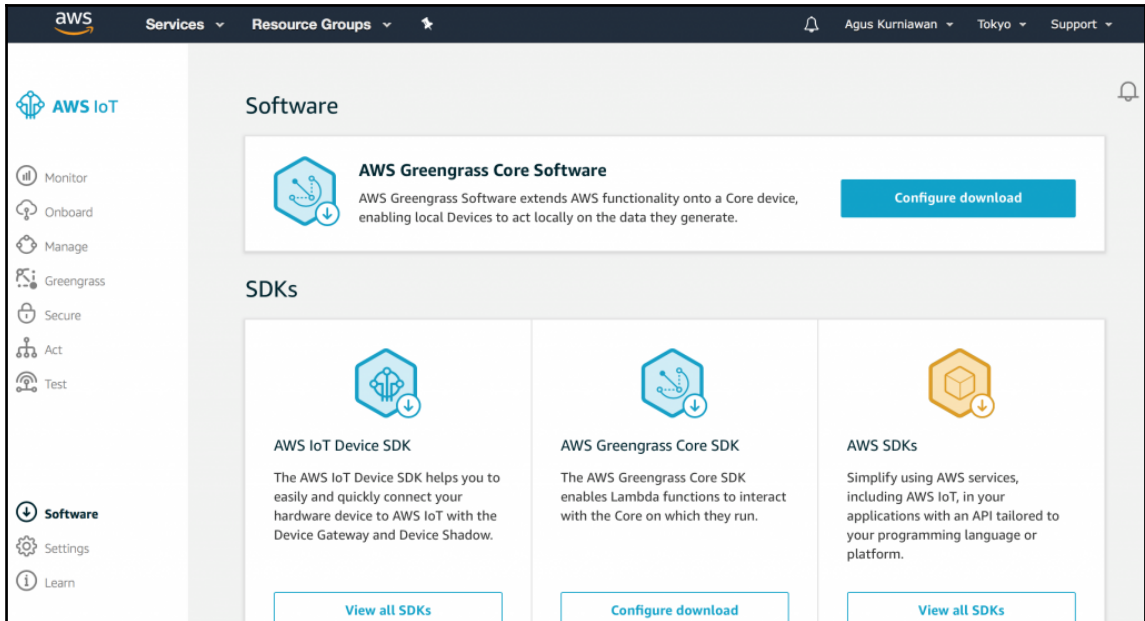
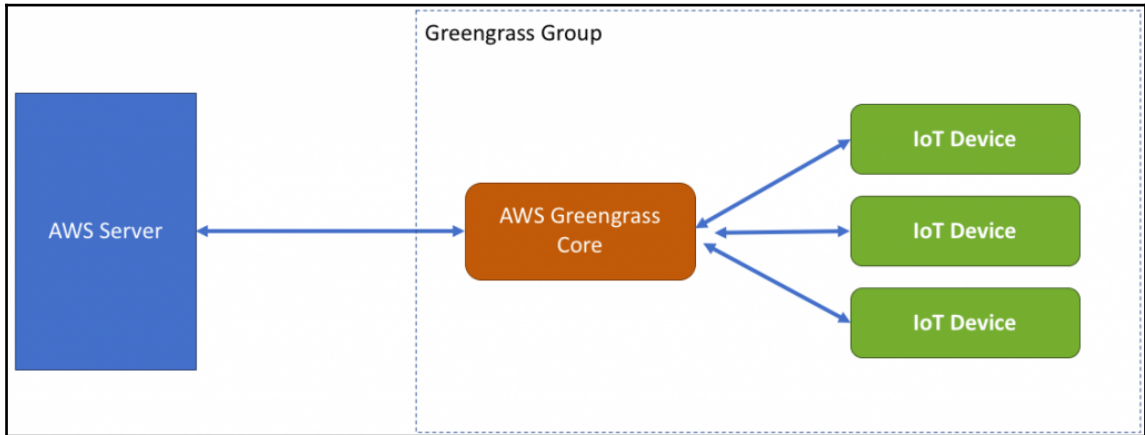
```
Temperature: 29.60
Sent: Temp: 29.60
Temperature: 29.70
CALLBACK:
Temp: 29.60
Sent: Temp: 29.70
Temperature: 29.70
CALLBACK:
Temp: 29.70
Sent: Temp: 29.70
Temperature: 29.70
CALLBACK:
Temp: 29.70
Sent: Temp: 29.70
```

Autoscroll No line ending 115200 baud Clear output

The screenshot shows a terminal window titled "codes — node sensor-subscriber.js — 80x24". The terminal output shows the execution of the command "node sensor-subscriber.js" and the subsequent output: "Sensor subscriber started.", "connected", and five lines of "rcv: sensorroom Temp: 29.60" and "rcv: sensorroom Temp: 29.70".

```
agusk$ node sensor-subscriber.js
Sensor subscriber started.
connected
rcv: sensorroom Temp: 29.60
rcv: sensorroom Temp: 29.70
rcv: sensorroom Temp: 29.70
rcv: sensorroom Temp: 29.70
rcv: sensorroom Temp: 29.70
```

Chapter 3: Optimizing IoT Computing Using AWS Greengrass



The screenshot shows the AWS IoT console interface. At the top, the user's name 'Agus Kurniawan' and the current region 'Tokyo' are displayed. A dropdown menu is open for the region, listing various AWS regions. A red arrow points to the 'Tokyo' option in the dropdown menu. The main content area features the AWS IoT logo and the text 'AWS IoT' followed by a description: 'Cloud platform that lets connected devices and more - easily and securely interact with applications and other devices.' A blue 'Get started' button is visible below the text.

- US East (N. Virginia)
- US East (Ohio)
- US West (N. California)
- US West (Oregon)
- Canada (Central)
- EU (Ireland)
- EU (Frankfurt)
- EU (London)
- Asia Pacific (Singapore)
- Asia Pacific (Sydney)
- Asia Pacific (Seoul)
- Asia Pacific (Tokyo)**
- Asia Pacific (Mumbai)
- South America (São Paulo)

```
agusk — pi@raspberrypi: ~ — ssh pi@192.168.0.21 — 80x19
pi@raspberrypi:~ $ uname -a
Linux raspberrypi 4.9.41-v7+ #1023 SMP Tue Aug 8 16:00:15 BST 2017 armv7l GNU/Linux
pi@raspberrypi:~ $ █
```

```
agusk — pi@raspberrypi: ~ — ssh pi@192.168.0.73 — 80x19
pi@raspberrypi:~ $ sudo adduser --system ggc_user
Adding system user `ggc_user' (UID 111) ...
Adding new user `ggc_user' (UID 111) with group `nogroup' ...
Creating home directory `/home/ggc_user' ...
pi@raspberrypi:~ $ sudo addgroup --system ggc_group
Adding group `ggc_group' (GID 116) ...
Done.
pi@raspberrypi:~ $ █
```

```
GNU nano 2.7.4      File: /etc/sysctl.d/98-rpi.conf      Modified
kernel.printk = 3 4 1 3
vm.min_free_kbytes = 16384

fs.protected_hardlinks = 1
fs.protected_symlinks = 1█

^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text   ^J Justify    ^C Cur Pos
^X Exit      ^R Read File  ^_ Replace   ^U Uncut Text ^T To Spell   ^_ Go To Line
```

```
fs.nfs.nlm_udpport = 0
fs.nfs.nsm_local_state = 0
fs.nfs.nsm_use_hostnames = 0
fs.nr_open = 1048576
fs.overflowgid = 65534
fs.overflowuid = 65534
fs.pipe-max-size = 1048576
fs.pipe-user-pages-hard = 0
fs.pipe-user-pages-soft = 16384
fs.protected_hardlinks = 1
fs.protected_symlinks = 1
fs.quota.allocated_dquots = 0
fs.quota.cache_hits = 0
fs.quota.drops = 0
fs.quota.free_dquots = 0
fs.quota.lookups = 0
fs.quota.reads = 0
fs.quota.syncs = 0
fs.quota.warnings = 1
```

aws Services Resource Groups

Welcome to AWS Greengrass

AWS Greengrass lets your devices process the data they generate locally, while still taking advantage of AWS services when an internet connection is available.

Get started now or explore our [learning resources](#).

Define a Greengrass Group
A Group is a set of a Core and Devices that can work together locally.

Add a Greengrass Core
A Core processes data from your devices and securely routes messages.

Add Devices to a Group
A Group contains up to 200 local IoT Devices, which can securely exchange messages.

Get Started Add a Core to new Group Add Devices to a Group

aws Services Resource Groups

Connect your Core device

The final steps are to load the Greengrass software and then connect your Core device to the cloud. You can defer connecting your device at this time, but **you must download your public and private keys now as these cannot be retrieved later.**

Download and store your Core's security resources

A certificate for this Core	0f471ea83f.cert.pem	Download
A public key	0f471ea83f.public.key	Download
A private key	0f471ea83f.private.key	Download

Download the current Greengrass Core software

Greengrass daemon	greengrassd
License information	LICENSE
Version release notes	version

aws Services Resource Groups

Agus Kurniawan Tokyo Support

AWS IoT

- Monitor
- Onboard
- Manage
- Greengrass**
 - Groups**
 - Cores
 - Devices
- Secure
- Act
- Test
- Software
- Settings
- Learn

Greengrass Groups

Create Group

group01
GREENGRASS GROUP

aws Services Resource Groups

Agus Kurniawan Tokyo Support

group01

Not deployed Actions

Deployments

- Subscriptions
- Cores
- Devices
- Lambdas
- Settings

Group history overview

By deployment

There are no deployments for this Greengrass Group yet

aws Services Resource Groups

Search IAM

Roles

Dashboard
Groups
Users
Roles
Policies
Identity providers
Account settings
Credential report

Encryption keys

What are IAM roles?

IAM roles are a secure way to grant permissions to entities that you trust. Examples of entities include the following:

- IAM user in another account
- Application code running on an EC2 instance that needs to perform actions on AWS resources
- An AWS service that needs to act on resources in your account to provide its features
- Users from a corporate directory who use identity federation with SAML

IAM roles issue keys that are valid for short durations, making them a more secure way to grant access.

Additional resources:

- [IAM Roles FAQ](#)
- [IAM Roles Documentation](#)
- [Tutorial: Setting Up Cross Account Access](#)
- [Common Scenarios for Roles](#)

Create role Delete role

Showing 0 results

Role name	Description	Trusted entities
Showing 0 results		

aws Services Resource Groups

Agus Kurniawan Global Support

Create role

1 Trust 2 Permissions 3 Review

Choose the service that will use this role

API Gateway	Data Pipeline	IoT	SWF
Auto Scaling	Directory Service	Lambda	Service Catalog
Batch	DynamoDB	Lex	Storage Gateway
CloudFormation	EC2	Machine Learning	
CloudHSM	EC2 Container Service	OpsWorks	
CloudWatch Events	EMR	RDS	
CodeBuild	Elastic Beanstalk	Redshift	
CodeDeploy	Elastic Transcoder	S3	
Config	Glue	SMS	
DMS	Greengrass	SNS	

Select your use case

Greengrass
Allows Greengrass to call AWS services on your behalf.

* Required

Cancel **Next: Permissions**

aws Services Resource Groups

Agus Kurniawan Global Support

Create role

1 Trust — 2 Permissions — 3 Review


Review

Provide the required information below and review this role before you create it.

Role name*
 Maximum 64 characters. Use alphanumeric and '+=,@-_' characters.

Role description
 Maximum 1000 characters. Use alphanumeric and '+=,@-_' characters.

Trusted entities AWS service: greengrass.amazonaws.com

Policies  [AWSGreengrassResourceAccessRolePolicy](#)

* Required Cancel Previous Create role

aws Services Resource Groups

Agus Kurniawan Global Support

Search IAM

Dashboard
Groups
Users
Roles
Policies
Identity providers
Account settings
Credential report
Encryption keys

✓ The role **awsgreengrassrole** has been created.

Create role Delete role Refresh Settings Help

Q Search Showing 1 result

Role name	Description	Trusted entities
<input type="checkbox"/> awsgreengrassrole	AWS Greengrass Role Policy	AWS service: greengrass

```
GNU nano 2.7.4 File: /etc/fstab Modified
proc /proc proc defaults 0 0
PARTUUID=43434a97-01 /boot vfat defaults 0 2
PARTUUID=43434a97-02 / ext4 defaults,noatime 0 1
# a swapfile is not a swap partition, no line here
# use dphys-swapfile swap[on|off] for that

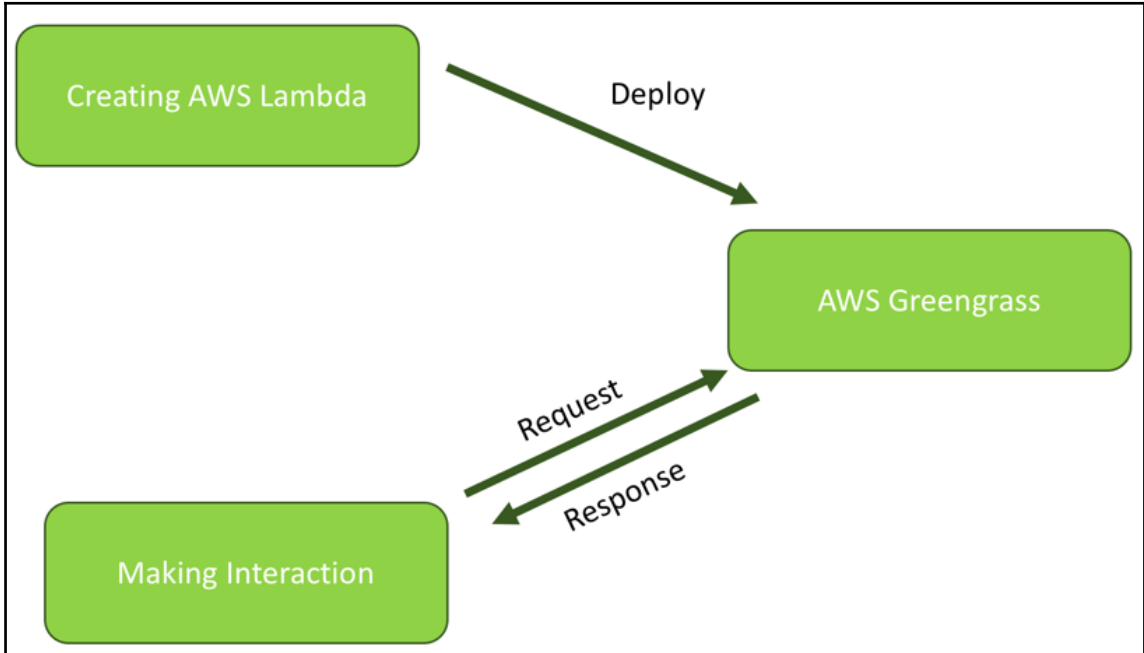
cgroup /sys/fs/cgroup cgroup defaults 0 0

^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify ^C Cur Pos
^X Exit ^R Read File ^\ Replace ^U Uncut Text ^T To Spell ^_ Go To Line
```

```
GNU nano 2.7.4 File: config.json
{
  "coreThing": {
    "caPath": "[ROOT_CA_PEM_HERE]",
    "certPath": "[CLOUD_PEM_CERT_HERE]",
    "keyPath": "[CLOUD_PEM_KEY_HERE]",
    "thingArn": "[THING_ARN_HERE]",
    "iotHost": "[HOST_PREFIX_HERE].iot.[AWS_REGION_HERE].amazonaws.com",
    "ggHost": "greengrass.iot.[AWS_REGION_HERE].amazonaws.com"
  },
  "runtime": {
    "cgroup": {
      "useSystemd": "[yes|no]"
    }
  }
}
```

```
pi@raspberrypi:~/greengrass/ggc/packages/1.1.0 $ sudo ./greengrassd start
Setting up greengrass daemon
Validating execution environment
Found cgroup subsystem: cpu
Found cgroup subsystem: cpuacct
Found cgroup subsystem: blkio
Found cgroup subsystem: memory
Found cgroup subsystem: devices
Found cgroup subsystem: freezer
Found cgroup subsystem: net_cls

Starting greengrass daemon
Greengrass successfully started with PID: 801
pi@raspberrypi:~/greengrass/ggc/packages/1.1.0 $ █
```

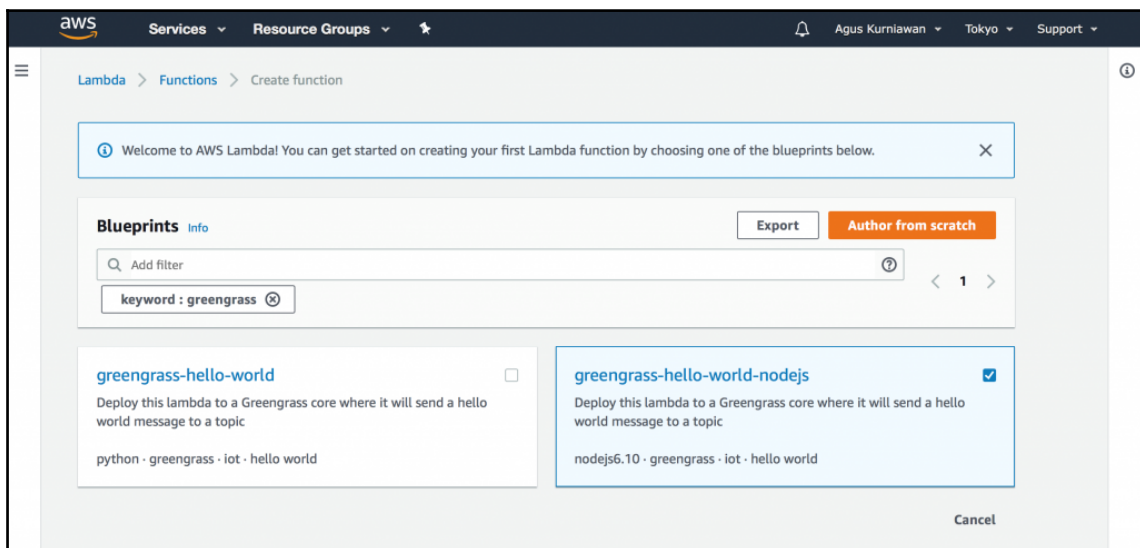
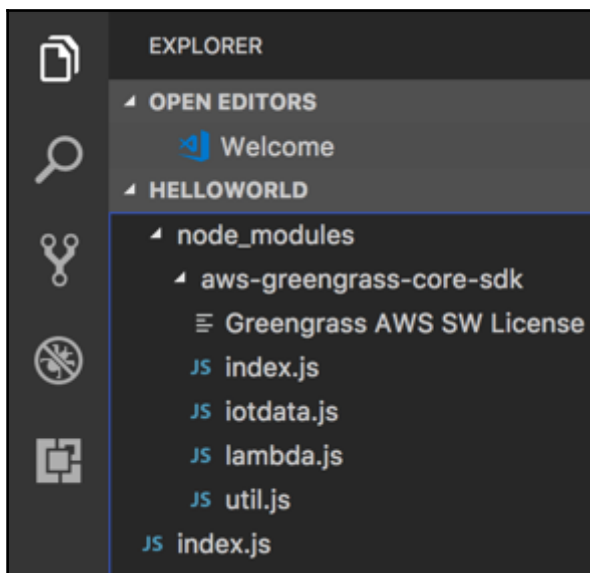


The screenshot shows the AWS IoT console interface. At the top, there's a navigation bar with 'AWS', 'Services', 'Resource Groups', and user information 'Agus Kurniawan', 'Tokyo', and 'Support'. On the left, a sidebar contains the 'AWS IoT' logo and a list of actions: Monitor, Onboard, Manage, Greengrass, Secure, Act, and Test. Below this is a 'Software' section with 'Settings' and 'Learn' options. The main content area is titled 'SDKs' and features three cards:

- AWS IoT Device SDK**: The AWS IoT Device SDK helps you to easily and quickly connect your hardware device to AWS IoT with the Device Gateway and Device Shadow. A button labeled 'View all SDKs' is at the bottom.
- AWS Greengrass Core SDK**: The AWS Greengrass Core SDK enables Lambda functions to interact with the Core on which they run. A button labeled 'Configure download' is at the bottom.
- AWS SDKs**: Simplify using AWS services, including AWS IoT, in your applications with an API tailored to your programming language or platform. A button labeled 'View all SDKs' is at the bottom.

At the bottom of the SDKs section, there is a link: 'Looking for a guided way to connect a device to AWS IoT? [Connect a device](#)'.

```
pi@raspberrypi:~ $ node -v
v8.9.1
pi@raspberrypi:~ $ which node
/usr/bin/node
pi@raspberrypi:~ $ sudo cp /usr/bin/node /usr/bin/nodejs6.10
pi@raspberrypi:~ $ █
```



aws Services Resource Groups Agus Kurniawan Tokyo Support

AWS Lambda Lambda > Functions > hello-world ARN - arn:aws:lambda:ap-northeast-1:573816999534:function:hello-world

hello-world Qualifiers Actions Save test Save and test

Configuration Triggers Monitoring

Function code

Code entry type: Upload a .ZIP file Runtime: Node.js 6.10 Handler: index.handler

Function package*: Upload HelloWorld.zip (17.5 kB)
For files larger than 10 MB, consider uploading via S3.

Environment variables

You can define Environment Variables as key-value pairs that are accessible from your function code. These are useful to store configuration settings without the need to change function code. [Learn more.](#)

aws Services Resource Groups Agus Kurniawan Tokyo Support

AWS Lambda Configuration Triggers Monitoring

Function code

⚠ This function contains external libraries. Uploading a new file will override these libraries. ×

Code entry type: Edit code inline Runtime: Node.js 6.10 Handler: index.handler

```
index.js
1- /*
2  * Copyright 2010-2017 Amazon.com, Inc. or its affiliates. All Rights Reserved.
3  */
4 |
5- /*
6  * Demonstrates a simple publish to a topic using Greengrass Core NodeJS SDK
7  * This lambda function will retrieve underlying platform information and send
8  * a hello world message along with the platform information to the topic
9  * 'hello/world'. The function will sleep for five seconds, then repeat.
10 * Since the function is long-lived it will run forever when deployed to a
11 * Greengrass core.
12 */
13
```

Publish new version from \$LATEST



Publishing a new version will save a "snapshot" of the code and configuration of the \$LATEST version. You will be unable to edit the new version's code. Please click to confirm.

Version description

Cancel

Publish

aws Services Resource Groups

group01
Not deployed

Deployments Lambdas Add Lambda

Subscriptions

Cores

Devices

Lambdas

Settings

Bring Lambda functions to the Edge

Greengrass allows you to extend Lambda functions to the edge. Lambda functions are small applications that can run on-demand or indefinitely. You can use local Lambda functions to respond to offline devices as you would with a connection to the Cloud.

Learn about local Lambda Add your first Lambda

Agus Kurniawan Tokyo Support

aws Services Resource Groups

Add a Lambda to your Greengrass Group

Local Lambdas are hosted on your Greengrass Core and connected to each other and devices by Subscriptions, but they can also be deployed individually to your Group.

Create a new Lambda function
You will be taken to the AWS Lambda Console and can author a new Lambda function.

Use an existing Lambda function
You will choose from a list of existing Lambda functions.

Back Use existing Lambda

aws Services Resource Groups

Use existing Lambda

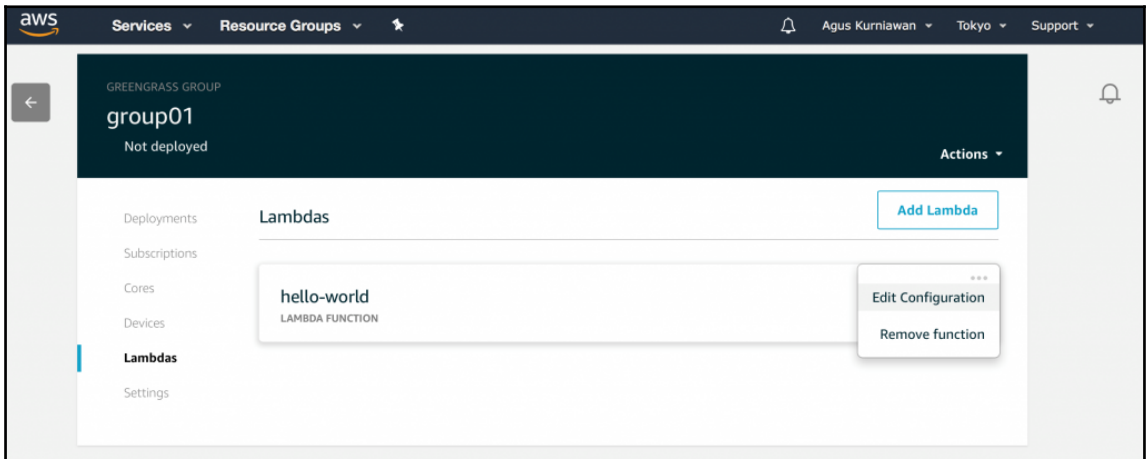
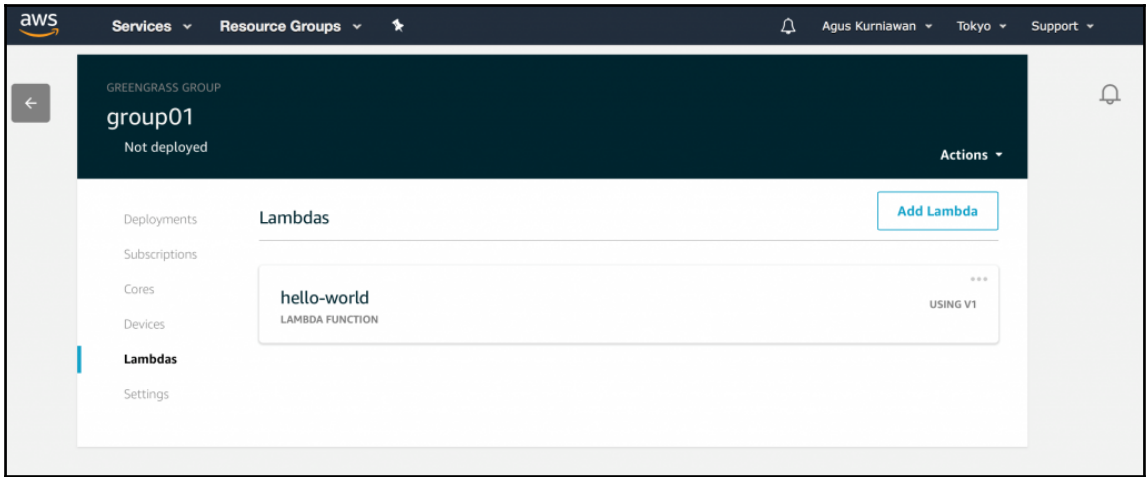
ADD A LAMBDA TO YOUR GREENGRASS GROUP

Select a Lambda

Search all Lambda functions and tags

hello-world Node.js 6.10

Back Next



aws Services Resource Groups

hello-world
[View function in AWS Lambda](#)

Version 1

Memory limit

16 MB

Timeout

3 Sec...

Lambda lifecycle

On-demand function

Make this function long-lived and keep it running indefinitely

Remove

Add another version of this Lambda function

You can add individual historical versions of a Lambda function to your Group, each with their own set of Group-specific configuration, and your Group will treat them as individual and distinct Lambda functions.

aws Services Resource Groups

GREENGRASS GROUP

group01
Not deployed

Actions

Deployments Subscriptions [Add Subscription](#)


Subscriptions

Cores

Devices

Lambdas

Settings



Want to connect assets in your Group?

Greengrass Cores can pass messages between Devices, Lambda functions and even AWS using the MQTT Protocol. These components can interact using Subscriptions, which are pre-defined to enable greater security and predictable interactions.

[Learn about Subscriptions](#) [Add your first Subscription](#)

aws Services Resource Groups

CREATE A SUBSCRIPTION

Select your source and target

A Subscription consists of a source, target, and topic. The source is the originator of the message. The target is the destination of the message. The first step is selecting your source and target.

Select a source

No objects selected [Select](#)

Select a target

No objects selected [Select](#)

[Back](#) [Next](#)

aws Services Resource Groups

Select your source and target

A Subscription consists of a source, target, and topic. The source is the originator of the message. The target is the destination of the message. The first step is selecting your source and target.

Select a source

hello-world LAMBDA [Clear](#) [Close](#)

Services Devices **Lambdas**

Search

hello-world

Select a target

No objects selected [Select](#)

aws Services Resource Groups

Agus Kurniawan Tokyo Support

A Subscription consists of a source, target, and topic. The source is the originator of the message. The target is the destination of the message. The first step is selecting your source and target.

Select a source

hello-world LAMBDA Edit

Select a target

IoT Cloud SERVICE Clear Close

Services Devices Lambdas

Search

IoT Cloud

Local Shadow Service

Back Next

aws Services Resource Groups

Agus Kurniawan Tokyo Support

CREATE A SUBSCRIPTION

Filter your data with a topic

Your Source publishes data to your Target Asset. A topic filter can be used to constrain or control what data is sent to the Target. If you do not include a topic filter, all messages from the Source will be passed to the Target.

Source

hello-world LAMBDA

Optional topic filter [How do I enter a topic filter?](#)

hello/world

Target

IoT Cloud SERVICE

Back Next

aws Services Resource Groups

Agus Kurniawan Tokyo Support

GREENGRASS GROUP
group01
Not deployed

Actions

Deployments Subscriptions [Add Subscription](#)

Source	Target	Topic
hello-world:1	IoT Cloud	hello/world

Subscriptions

Cores

Devices

Lambdas

Settings

aws Services Resource Groups

Agus Kurniawan Tokyo Support

GREENGRASS GROUP
group01
Not deployed

Actions

Deployments [By deployment](#)

Subscriptions

Cores

Devices

Lambdas

Settings

Group history overview

There are no deployments for this Greengrass Group yet

- Deploy
- Delete Group
- Reset Deployments

aws Services Resource Groups

YOUR FIRST DEPLOYMENT

Configure how Devices discover your Core

In order for your Group's Devices to discover and communicate with your Core they must be able to acquire connectivity information (e.g. IP address, DNS, port, etc.) before connecting.

Automatically detect Core endpoints (recommended)
Greengrass will detect and override connection information as it changes.

Manually configure Core endpoints
Manually manage connection information. This can be accessed via your Core device's settings.

Automatic detection

Manually configure

Back Automatic detection

aws Services Resource Groups

YOUR FIRST DEPLOYMENT

Grant permission to access other services

Why does Greengrass require a service-level role permission to function?
AWS Greengrass service works with other services like AWS IoT and AWS Lambda. In order to function properly Greengrass needs your permission to access these other services and read and write data on your behalf. You can also see [the specifics of this managed policy](#)

You only need to complete this step once for all Groups. You can modify the service-level role permission in the IoT settings.

Back Grant permission

aws Services Resource Groups

Agus Kurniawan Tokyo Support

GREENGRASS GROUP

group01

Failed: GreenGrass is not authorized to assume the Service Role associated with this acc...

Actions

Deployments

Subscriptions

Cores

Devices

Lambdas

Settings

Group history overview

By deployment

Deployed	Version	Status
Nov 13, 2017 6:24:10 AM +0700	2ac384aa-48c1-41f9-a08f-eb8636f22689	Failed

aws Services Resource Groups

Agus Kurniawan Tokyo Support

GREENGRASS GROUP

group01

Successfully completed

Actions

Deployments

Subscriptions

Cores

Devices

Lambdas

Settings

Group history overview

By deployment

Deployed	Version	Status
Nov 13, 2017 6:25:26 AM +0700	2ac384aa-48c1-41f9-a08f-eb8636f22689	Successfully completed
Nov 13, 2017 6:24:10 AM +0700	2ac384aa-48c1-41f9-a08f-eb8636f22689	Failed

aws Services Resource Groups Agus Kurniawan Tokyo Support

Subscriptions

Subscribe to a topic
Publish to a topic

Subscribe
Devices publish MQTT messages on topics. You can use this client to subscribe to a topic and receive these messages.

Subscription topic
hello/world Subscribe to topic

Max message capture ?
100

Quality of Service ?
 0 - This client will not acknowledge to the Device Gateway that messages are received
 1 - This client will acknowledge to the Device Gateway that messages are received

MQTT payload display
 Auto-format JSON payloads (improves readability)
 Display payloads as strings (more accurate)
 Display raw payloads (in hexadecimal)

aws Services Resource Groups Agus Kurniawan Tokyo Support

Publish to a topic

hello/world x

Specify a topic and a message to publish with a QoS of 0.
 hello/world Publish to topic

```

1 {
2   "message": "Hello from AWS IoT console"
3 }

```

hello/world	Nov 22, 2017 7:46:00 AM +0700	Export Hide
{ "message": "Hello world! Sent from Greengrass Core running on platform: linux-4.9.41-v7+ using NodeJS" }		
hello/world	Nov 22, 2017 7:45:55 AM +0700	Export Hide
{ "message": "Hello world! Sent from Greengrass Core running on platform: linux-4.9.41-v7+ using NodeJS" }		
hello/world	Nov 22, 2017 7:45:50 AM +0700	Export Hide

Chapter 4: Building Local AWS Lambda with AWS Greengrass

Author from scratch [Info](#)

Name*

Runtime*

Role*
Defines the permissions of your function. Note that new roles may not be available for a few minutes after creation. [Learn more](#) about Lambda execution roles.

Existing role*
You may use an existing role with this function. Note that the role must be assumable by Lambda and must have Cloudwatch Logs permissions.

aws Services Resource Groups Agus Kurniawan Tokyo Support

echo-lambda Qualifiers Actions test1 Test Save

Function code [Info](#)

Code entry type: Runtime: Handler:

```
File Edit Find View Goto Tools Window
Environment
  echo-lambda
    lambda_function.py
1 def lambda_handler(event, context):
2   data = event['msg']
3   return { 'msg': data }
```

Configure test event



A function can have up to 10 test events. The events are persisted so you can switch to another computer or web browser and test your function with the same events.

Create new test event

Edit saved test events

Event template

Hello World

Event name

test1

```
1 - {  
2   "msg": "this is testing"  
3 }
```

The screenshot shows the AWS Lambda console interface. At the top, there's a navigation bar with the AWS logo, 'Services', 'Resource Groups', and user information 'Agus Kurniawan' in 'Tokyo'. The main header shows 'AWS Lambda' and the breadcrumb 'Lambda > Functions > echo-lambda'. The ARN is 'arn:aws:lambda:ap-northeast-1:57381699534:function:echo-lambda'. Below the header, there are 'Qualifiers', 'Actions', and a dropdown menu set to 'test1' with a 'Test' button. The main content area displays 'Execution result: succeeded (logs)'. Under 'Details', it says 'The area below shows the result returned by your function execution.' and shows a JSON object: `{ "msg": "this is testing" }`. There are two sections: 'Summary' and 'Log output'. The 'Summary' section lists 'Code SHA-256' as 'Ox3G2KMb1+whxd8 WUvRA6L6NF0PCde 3qcAFnymJSg5I=' and 'Request ID' as 'af6669bb-d1c0-11e7-af88-17eea0df0200'. The 'Log output' section shows a log entry: 'START RequestId: af6669bb-d1c0-11e7-af88-17eea0df0200 Version: \$LATEST', 'END RequestId: af6669bb-d1c0-11e7-af88-17eea0df0200', 'REPORT RequestId: af6669bb-d1c0-11e7-af88-17eea0df0200 Duration: 18.29 ms', 'Billed Duration: 100 ms Memory Size: 128 MB Max Memory Used: 18 MB'.

Publish new version from \$LATEST ✕

Publishing a new version will save a "snapshot" of the code and configuration of the \$LATEST version. You will be unable to edit the new version's code. Please click to confirm.

Version description

Cancel Publish

The screenshot shows the AWS IAM console interface. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', and user information 'Agus Kurniawan'. The left sidebar contains navigation options like 'Dashboard', 'Groups', 'Users', 'Roles', 'Policies', 'Identity providers', 'Account settings', 'Credential report', and 'Encryption keys'. The main content area is titled 'Users > agusk' and shows a 'Summary' tab. Key details include: User ARN (redacted), Path '/', and Creation time '2017-11-12 13:01 UTC+0700'. Below this are tabs for 'Permissions', 'Groups (0)', 'Security credentials', and 'Access Advisor'. The 'Permissions' tab is active, showing 'Attached policies: 2'. A table lists the attached policies:

Policy name	Policy type	
Attached directly		
AWSLambdaExecute	AWS managed policy	✕
AWSLambdaRole	AWS managed policy	✕

[Add inline policy](#)

```
agusk$ aws lambda invoke --invocation-type RequestResponse --function-name echo-  
lambda --payload '{"msg": "this is testing"}' output.txt  
{  
  "StatusCode": 200  
}  
agusk$ nano output.txt  
agusk$ █
```

GNU nano 2.0.6

File: output.txt

```
{ "msg": "this is testing" }
```

[Read 1 line]

^G Get Help

^O WriteOut

^R Read File

^Y Prev Page

^K Cut Text

^C Cur Pos

^X Exit

^J Justify

^W Where Is

^V Next Page

^U UnCut Text

^T To Spell

ADD A LAMBDA TO YOUR GREENGRASS GROUP

Use existing Lambda

Select a Lambda

Search all Lambda functions and tags

- | | | |
|----------------------------------|-------------|--------------|
| <input type="radio"/> | hello-world | Node.js 6.10 |
| <input type="radio"/> | py-hello1 | Python 2.7 |
| <input type="radio"/> | py-hello2 | Python 2.7 |
| <input checked="" type="radio"/> | echo-lambda | Python 2.7 |
| <input type="radio"/> | py-hello | Python 2.7 |

Back

Next

GREENGRASS GROUP

group01

Successfully completed

Actions

Deployments

Subscriptions

Add Subscription

Subscriptions









Cores

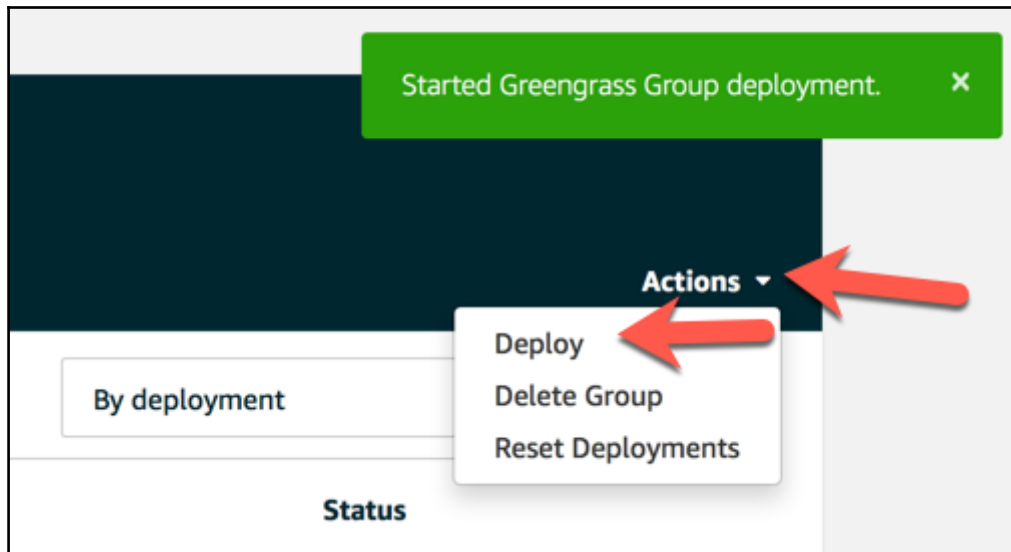
Devices

Lambdas

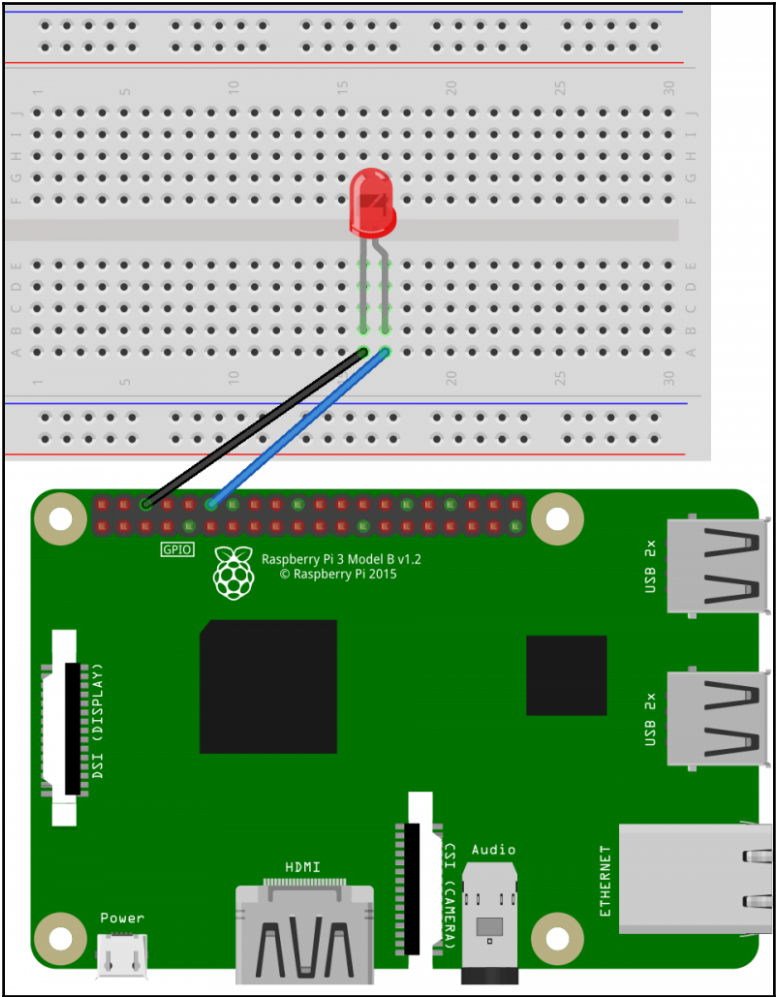
Resources

Settings

Source	Target	Topic	
 hello-world:5	 IoT Cloud	hello/world	...
 py-hello2:1	 IoT Cloud	test/test	...
 computer-macos	 echo-lambda:1	test1/test2	...
 py-hello1:1	 IoT Cloud	test/hello	...



```
agusk$ node lambda_invoker.js
{ StatusCode: 200,
  ExecutedVersion: '$LATEST',
  Payload: '{"msg": "this is testing"}' }
agusk$ █
```

Local resource

Local resources can be used with Greengrass to make filesystem volumes or physical devices accessible to Greengrass Lambdas while offline.

Name this resource

Local resource type

- Device
 Volume

Device path

Specify the OS group used to access this resource

- No OS group (default)
 Automatically add OS group
 Specify another OS group

Version 3fec6d4b-0274-490b-a1d5-338a8dee6b9c

Actions ▾

Deployments

Subscriptions

Cores

Devices

Lambdas

Resources

Settings

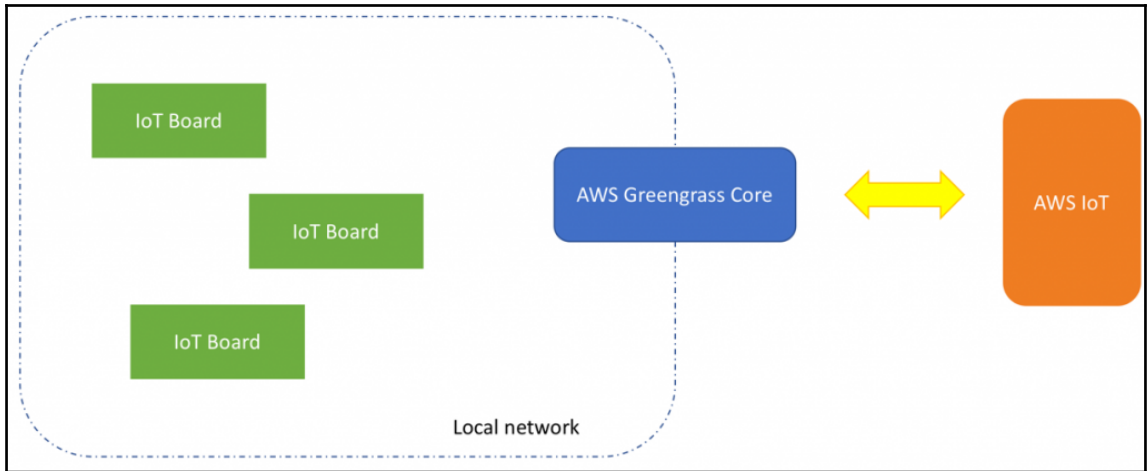
Group history overview

Created
Dec 9, 2017 7:38:34 AM +0700

Deployment and errors

Deployment ID	Time ▾	Status
▼ 5048eb7a-c773-4055-a63d-eaaaaa482...	Dec 9, 2017 7:38:47 AM +0700	● Failed



```
Deployment 5048eb7a-c773-4055-a63d-eaaaaa482800 of type NewDeployment for group 417fcb59-379c-40fc-a0c8-84b77784ffbc failed error: Error while processing. group config is invalid: ggc_user or [ggc_group] don't have rw permission on the file: /dev/gpiomem
```



CREATE A SUBSCRIPTION











Confirm and save your Subscription

Your Subscription is complete and your objects are connected in this Group. You can now save, and then deploy your new Group definition to have this change take effect.

 sensorNode	GREENGRASS DEVICE
sensor/hello	
 computer-macos	GREENGRASS DEVICE

[Back](#) [Finish](#)

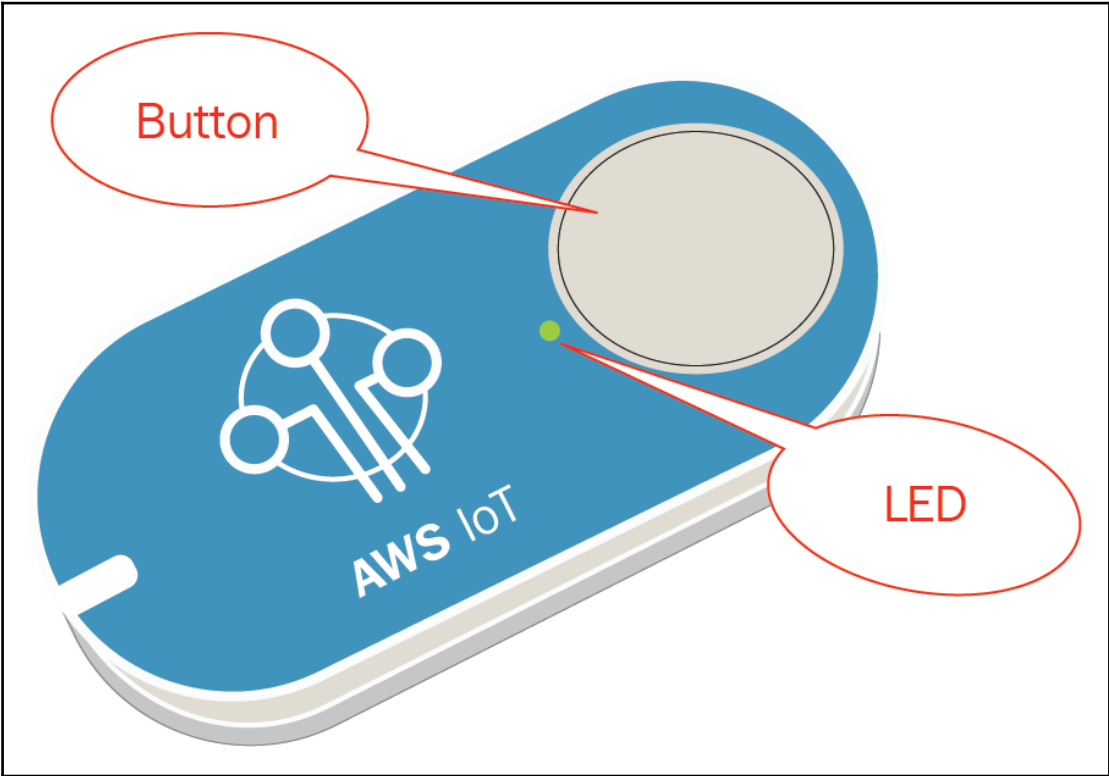
contiki-ng

-  8a033c9ff6-...icate.pem.crt
-  8a033c9ff6-...ivate.pem.key
-  8a033c9ff6-public.pem.key
-  basicDiscovery.py
-  fb076f672b...ificate.pem.crt
-  fb076f672b...ivate.pem.key
-  fb076f672b...ublic.pem.key
-  groupCA
-  root-CA.crt
-  root-CA.pem

```
2017-12-10 18:52:27,746 - AWSIoTPythonSDK.core.protocol.internal.workers - DEBUG - Produced [puback] event
2017-12-10 18:52:27,749 - AWSIoTPythonSDK.core.protocol.internal.workers - DEBUG - Dispatching [puback] event
2017-12-10 18:52:28,750 - AWSIoTPythonSDK.core.protocol.mqtt_core - INFO - Performing sync publish...
Published topic sensor/hello: {"message": "This message from sensorNode", "sequence": 25}
2017-12-10 18:52:28,751 - AWSIoTPythonSDK.core.protocol.internal.workers - DEBUG - Produced [puback] event
2017-12-10 18:52:28,755 - AWSIoTPythonSDK.core.protocol.internal.workers - DEBUG - Dispatching [puback] event
2017-12-10 18:52:29,756 - AWSIoTPythonSDK.core.protocol.mqtt_core - INFO - Performing sync publish...
Published topic sensor/hello: {"message": "This message from sensorNode", "sequence": 26}
2017-12-10 18:52:29,756 - AWSIoTPythonSDK.core.protocol.internal.workers - DEBUG - Produced [puback] event
2017-12-10 18:52:29,757 - AWSIoTPythonSDK.core.protocol.internal.workers - DEBUG - Dispatching [puback] event

2017-12-10 18:52:27,763 - AWSIoTPythonSDK.core.protocol.internal.clients - DEBUG - Invoking custom event callback...
Received message on topic sensor/hello: {"message": "This message from sensorNode", "sequence": 24}
2017-12-10 18:52:28,850 - AWSIoTPythonSDK.core.protocol.internal.workers - DEBUG - Produced [message] event
2017-12-10 18:52:28,851 - AWSIoTPythonSDK.core.protocol.internal.workers - DEBUG - Dispatching [message] event
2017-12-10 18:52:28,851 - AWSIoTPythonSDK.core.protocol.internal.clients - DEBUG - Invoking custom event callback...
Received message on topic sensor/hello: {"message": "This message from sensorNode", "sequence": 25}
2017-12-10 18:52:29,777 - AWSIoTPythonSDK.core.protocol.internal.workers - DEBUG - Produced [message] event
2017-12-10 18:52:29,778 - AWSIoTPythonSDK.core.protocol.internal.workers - DEBUG - Dispatching [message] event
2017-12-10 18:52:29,778 - AWSIoTPythonSDK.core.protocol.internal.clients - DEBUG - Invoking custom event callback...
Received message on topic sensor/hello: {"message": "This message from sensorNode", "sequence": 26}
```

Chapter 5: Expanding IoT Capabilities with AWS IoT Button





All-New AWS IoT Button (2nd Generation)

by Amazon

\$19⁹⁵ ✓prime

FREE Shipping on eligible orders

★★★★☆ ▾ 28

Product Features

... Things, based on the Amazon Dash button hardware, the AWS IoT button ...



Cascade Dash Button

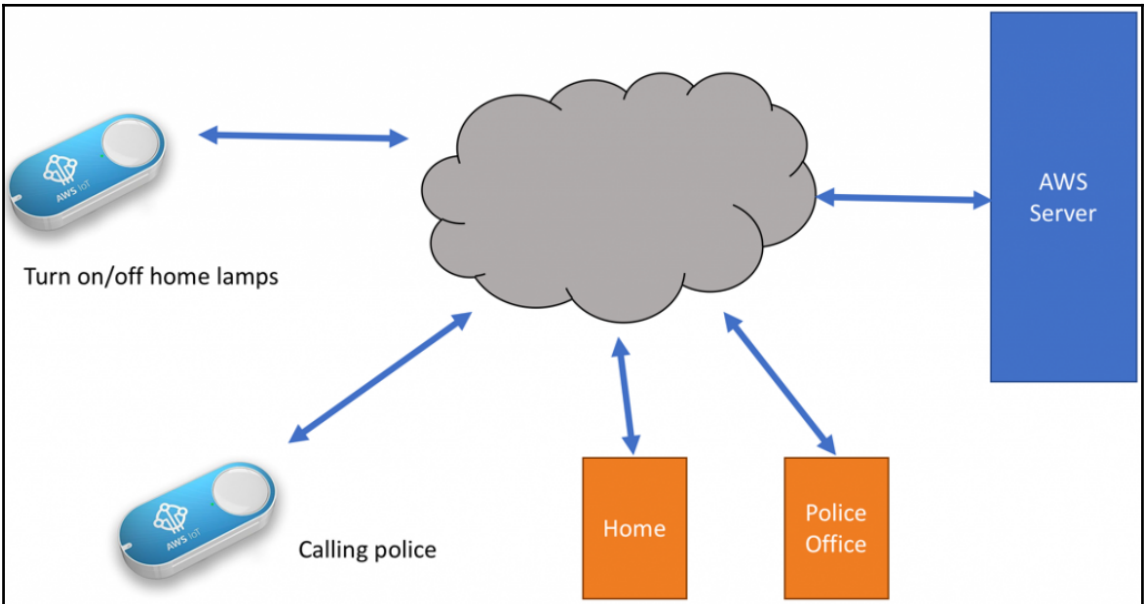
by Amazon

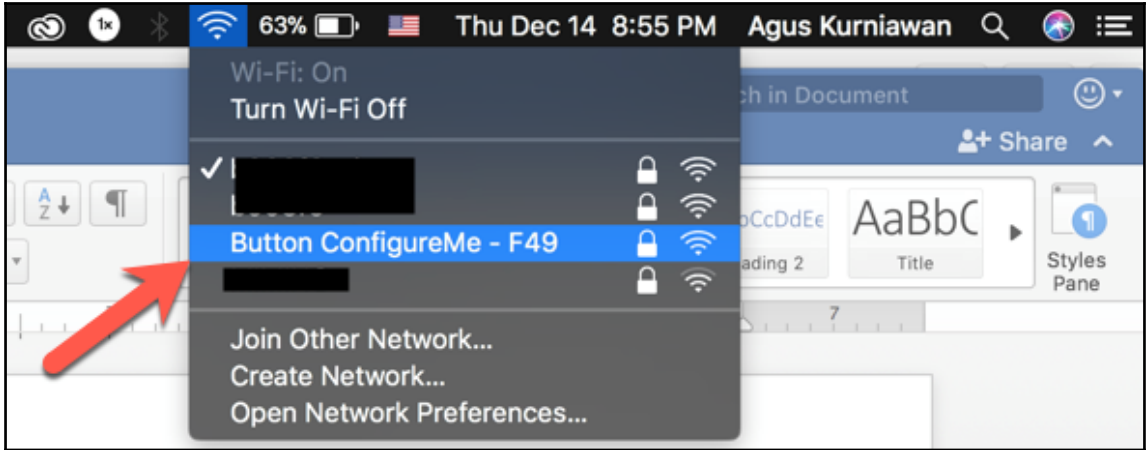
\$4⁹⁹ ✓prime

Exclusively for Prime Members

Product Features

... Amazon Dash Button is a Wi-Fi connected device that reorders your ...








Button ConfigureMe

Enter the value for any field that you wish to change for device:
G030PT020437PKCK



Wi-Fi Configuration:



SSID  

Security Open Network (No Password)


Password 

AWS IoT Configuration:

Certificate  2ebff44fd3-...ate.pem.crt 

Private Key  2ebff44fd3-...ate.pem.key 

Endpoint Subdomain

Endpoint Region 

Final Endpoint

By clicking this box, you agree to the [AWS IoT Button Terms and Conditions](#).

aws Services Resource Groups

Subscribe to a topic

Publish to a topic

iotbutton/+

Publish

Specify a topic and a message to publish with a QoS of 0.

iotbutton/+ Publish t...

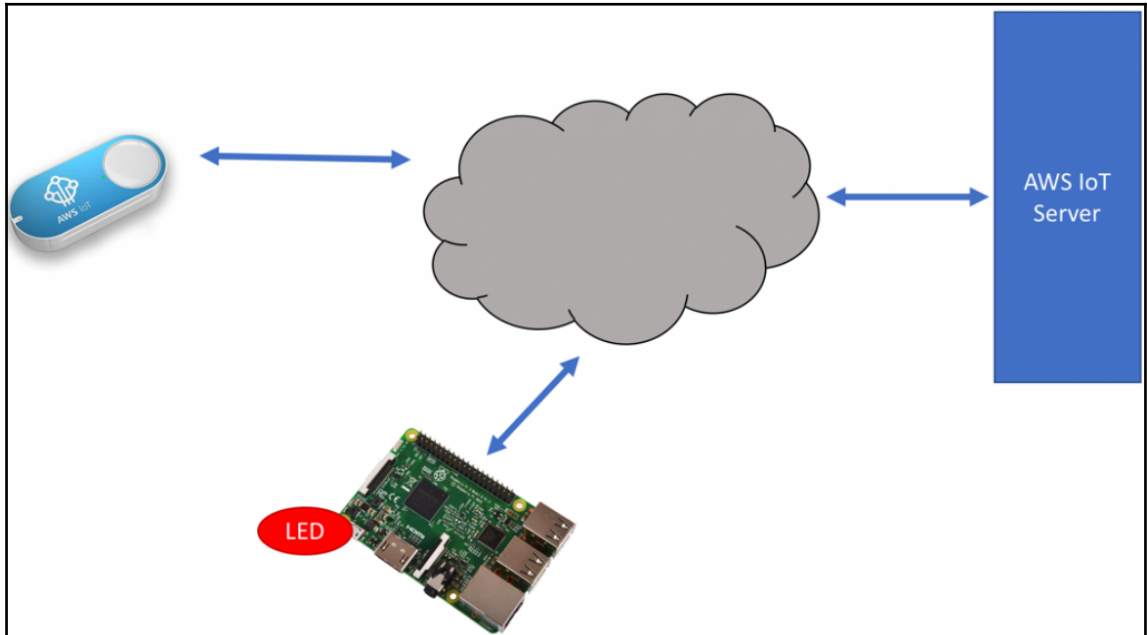
```
1 {
2   "message": "Hello from AWS IoT console"
3 }
```

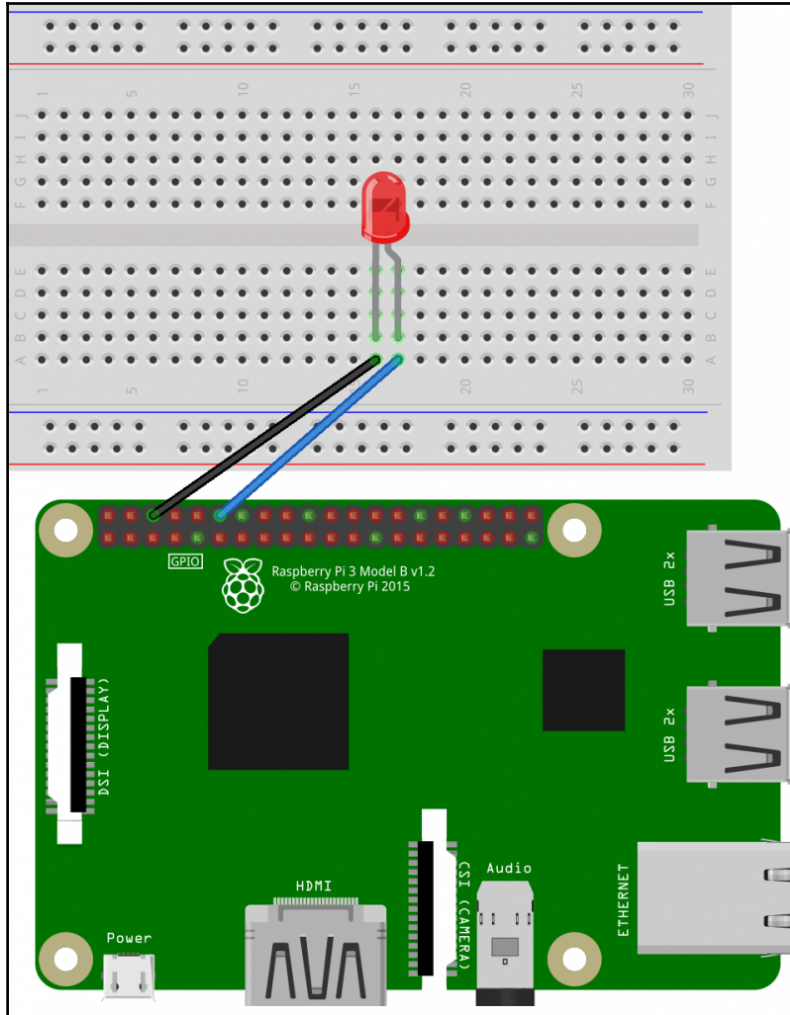
iotbutton/G... Dec 14, 2017 9:11:34 PM +0700 Exp... Hi...

```
{
  "serialNumber": "G...",
  "batteryVoltage": "1551mV",
  "clickType": "DOUBLE"
}
```

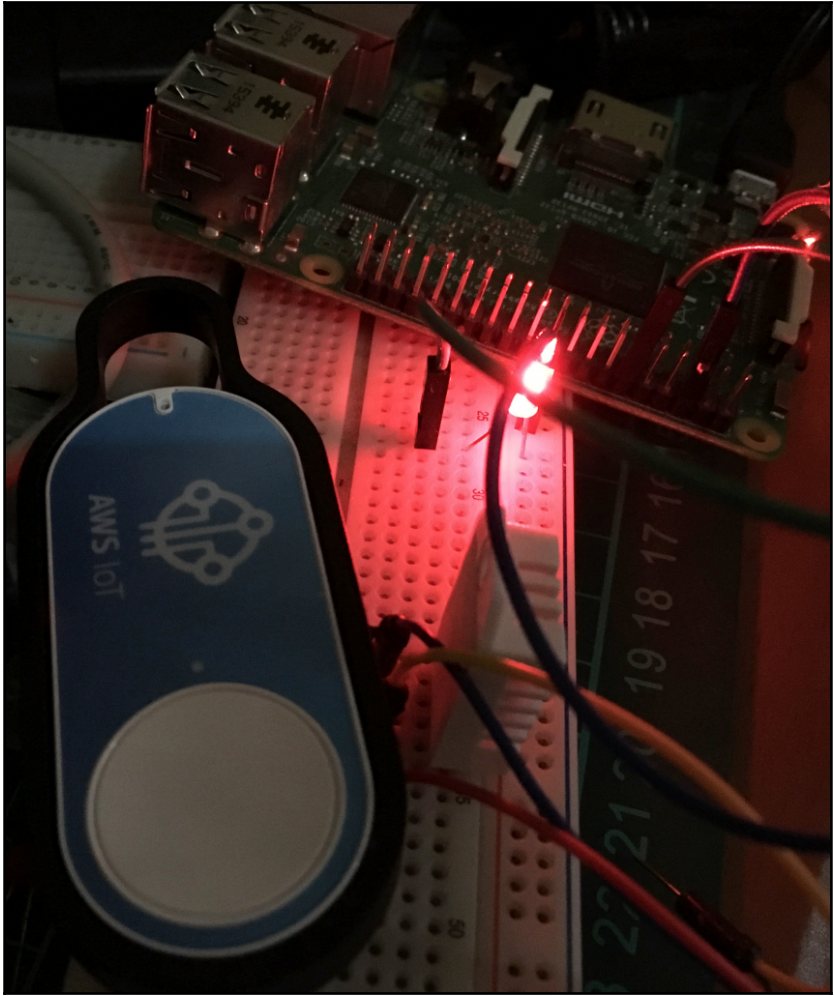
iotbutton/G030PT020437P... Dec 14, 2017 9:10:58 PM +0700 Exp... Hi...

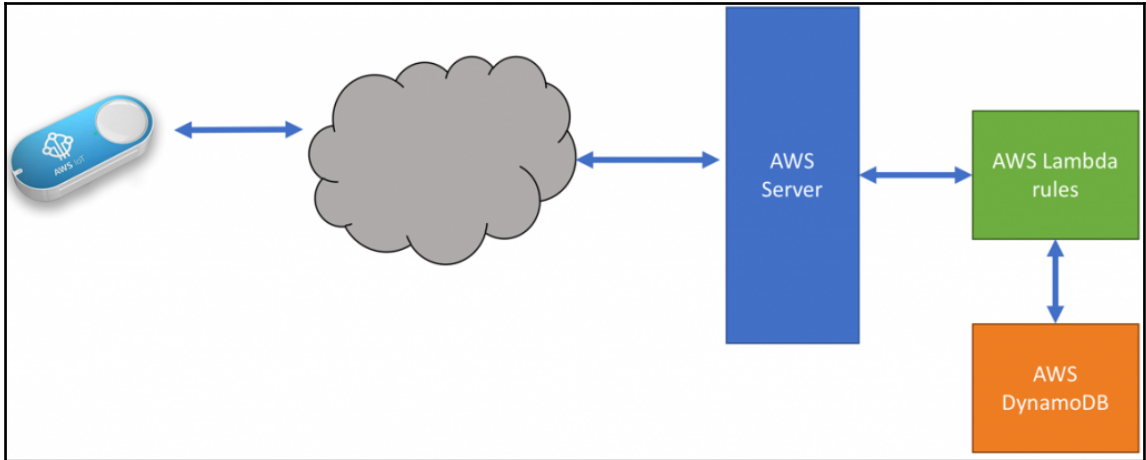
```
{
  "serialNumber": "G030PT020437P...",
  "batteryVoltage": "1579mV",
  "clickType": "SINGLE"
}
```





```
pi@raspberrypi:~/Documents/iot-button $ node aws-iot-pi.js
connected
Waiting commands..
message iotbutton/██████████ {"serialNumber": "██████████", "battery
Voltage": "1656mV", "clickType": "SINGLE"}
SINGLE clicked --> TURN ON LED
message iotbutton/██████████ {"serialNumber": "██████████", "battery
Voltage": "1619mV", "clickType": "DOUBLE"}
DOUBLE clicked --> TURN OFF LED
█
```





aws Services Resource Groups Agus Kurniawan Tokyo Support

Create DynamoDB table Tutorial ?

DynamoDB is a schema-less database that only requires a table name and primary key. The table's primary key is made up of one or two attributes that uniquely identify items, partition the data, and sort data within each partition.

Table name* ⓘ

Primary key* Partition key

ⓘ

Add sort key

Table settings

Default settings provide the fastest way to get started with your table. You can modify these default settings now or after your table has been created.

Use default settings

- No secondary indexes.
- Provisioned capacity set to 5 reads and 5 writes.
- Basic alarms with 80% upper threshold using SNS topic "dynamodb".

ⓘ You do not have the required role to enable Auto Scaling by default. Please refer to [documentation](#).

Create function

Author from scratch

Start with a simple "hello world" example.



Blueprints

Choose a preconfigured template as a starting point for your Lambda function.



Author from scratch [Info](#)

Name*

aws-iot-button

Runtime*

Node.js 6.10

Role*

Defines the permissions of your function. Note that new roles may not be available for a few minutes after creation. [Learn more](#) about Lambda execution roles.

Choose an existing role

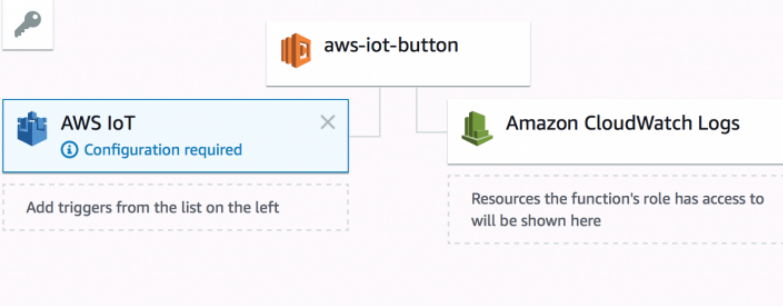
aws-iot-button

Qualifiers ▾ Actions ▾ Test Save

✓ Congratulations! Your Lambda function, aws-iot-button, has been successfully created. You can now change its code and configuration. Click on the "Test" button to input a test event when you are ready to test your function.

Configuration Monitoring

- CloudWatch Events
- CloudWatch Logs
- CodeCommit
- Cognito Sync Trigger
- DynamoDB
- Kinesis
- S3
- SNS



Configure triggers

IoT type

aws **Services** **Resource Groups** Agus Kurniawan Tokyo Support

aws-iot-button

Qualifiers Actions Select a test event.. Test Save

Configure triggers

IoT type
Configure a custom IoT rule, or set up an IoT button.

Custom IoT rule
 IoT Button

Device Serial Number
The device serial number (DSN) of your button. This can be found on the back of the button. The DSN is 16 characters long, often starting with "G03".

G [REDACTED] K

This will generate a certificate and keys for your button, which will be made available for you to download.

Generate certificate and keys

Lambda will add the necessary permissions for AWS IoT to invoke your Lambda function from this trigger. [Learn more](#) about the Lambda permissions model.

Enable trigger
Enable the trigger now, or create it in a disabled state for testing (recommended).

Cancel Add

aws **Services** **Resource Groups** Agus Kurniawan Global Support

Search IAM

Dashboard
Groups
Users
Roles
Policies
Identity providers
Account settings
Credential report
Encryption keys

Roles > lambda_basic_execution

Summary

Delete role

Role ARN arn:aws:iam::[REDACTED]:role/lambda_basic_execution

Role description [Edit](#)

Instance Profile ARNs

Path /

Creation time 2017-11-25 15:54 UTC+0700

Permissions Trust relationships Access Advisor Revoke sessions

Attach policy Attached policies: 3

Policy name	Policy type
AmazonDynamoDBFullAccess	AWS managed policy
oneClick_lambda_basic_execution_...	Inline policy
oneClick_lambda_basic_execution_...	Inline policy

[Add inline policy](#)

aws Services Resource Groups Agus Kurniawan Tokyo Support

DynamoDB
Dashboard
Tables
Reserved capacity
DAX
Dashboard
Clusters
Subnet groups
Parameter groups
Events

Create table Delete table

Filter by table name

Name
aws-iot-button-db

aws-iot-button-db Close

Overview Items Metrics Alarms Capacity Indexes More

Create item Actions

Scan: [Table] aws-iot-button-db: msg-id Viewing 1 to 3 items

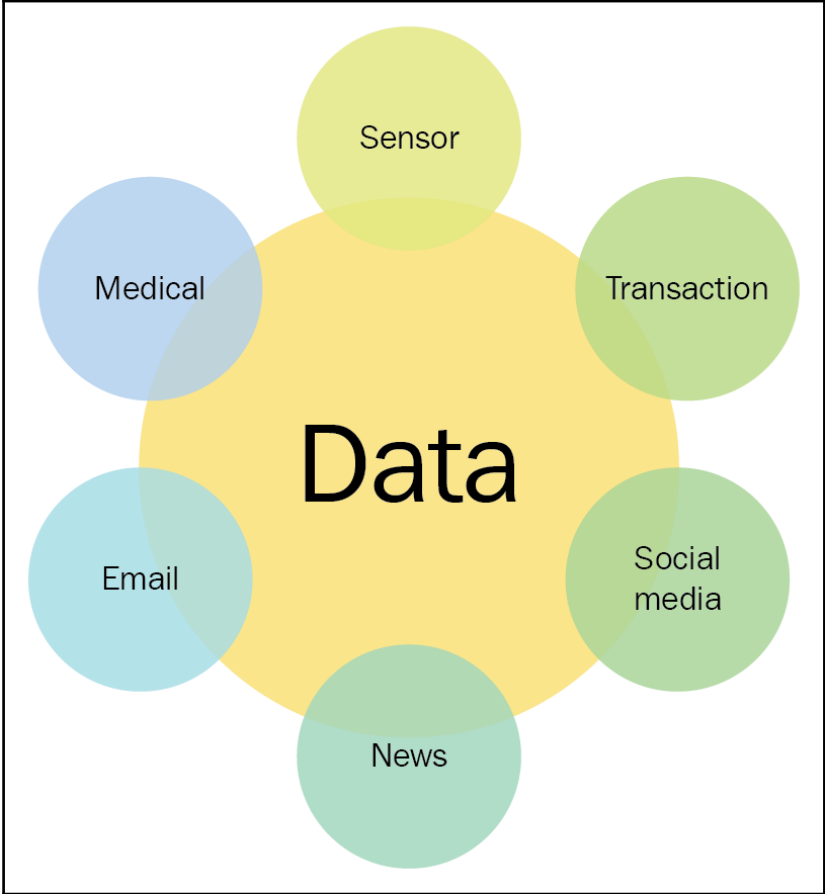
Scan [Table] aws-iot-button-db: msg-id

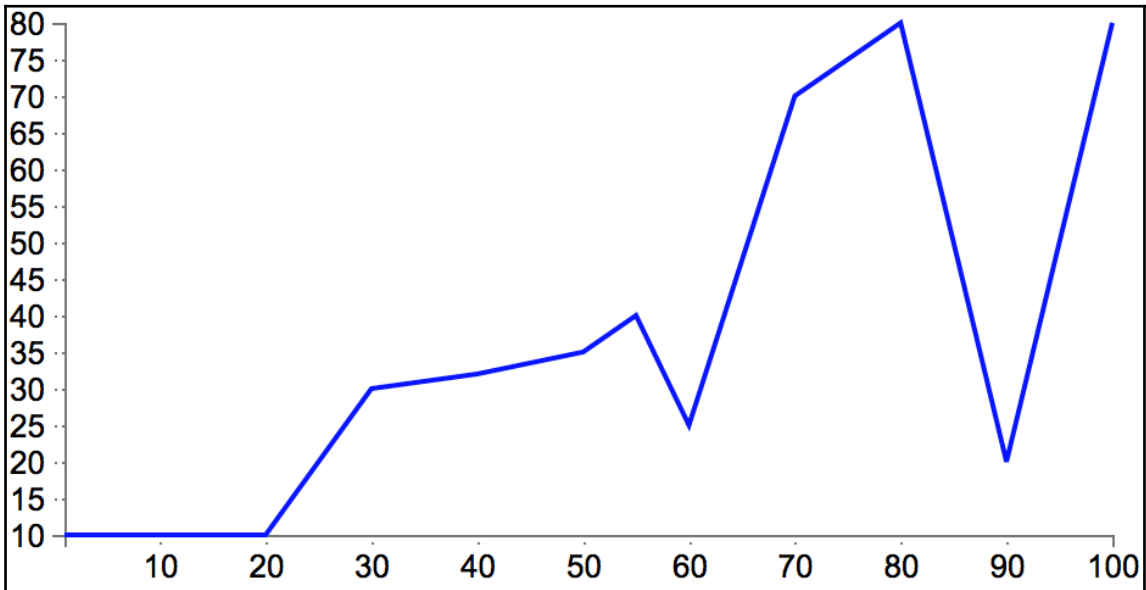
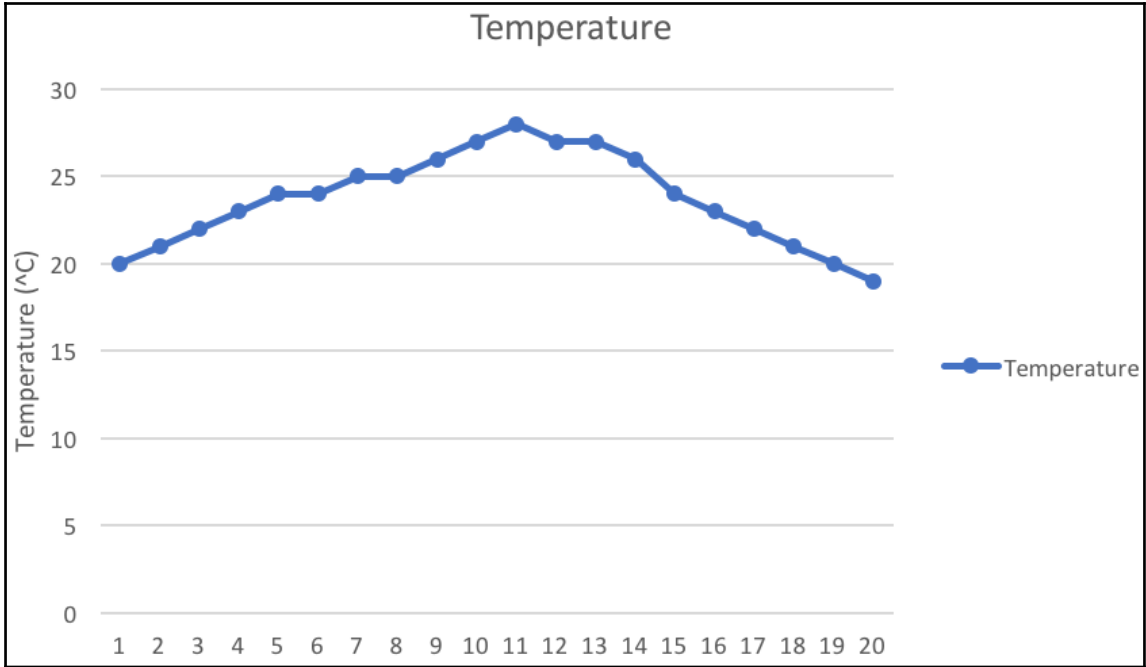
Add filter

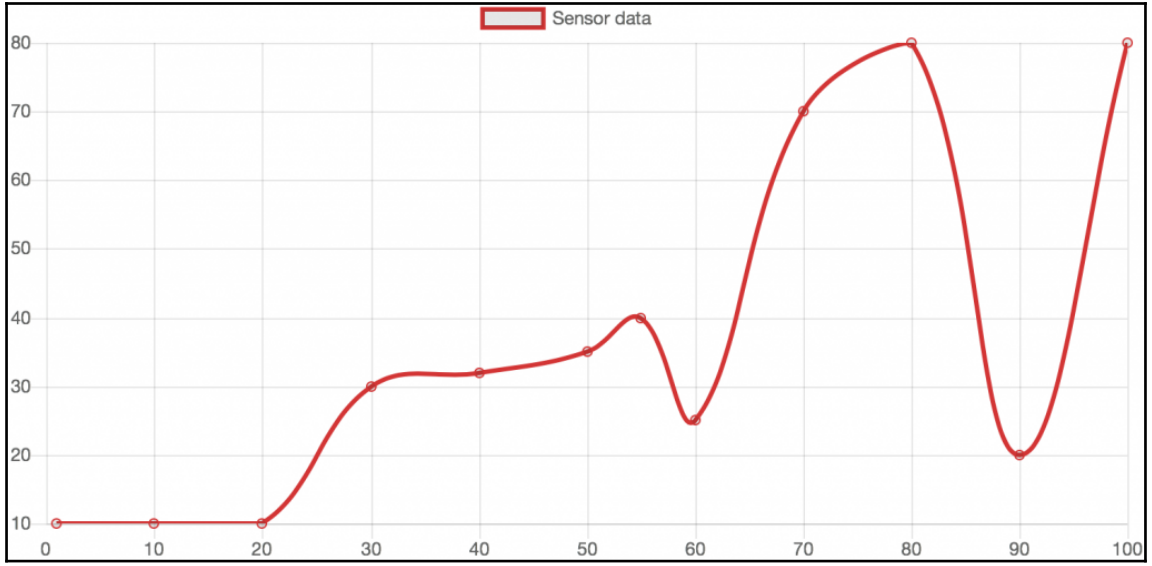
Start search

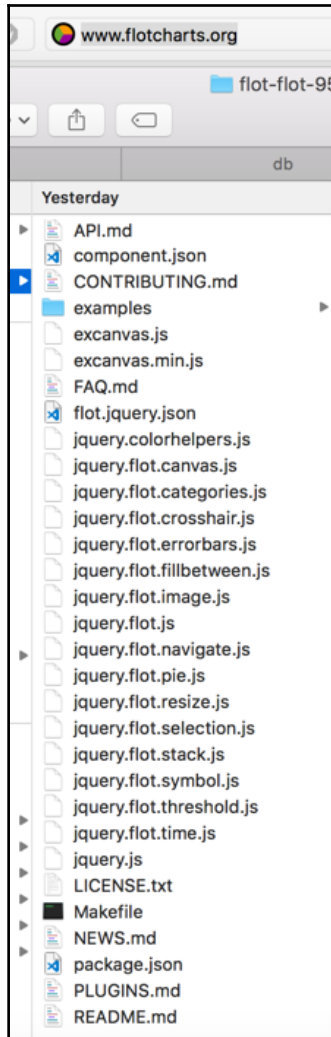
<input type="checkbox"/>	msg-id	BUTTON_ID	CLICKED
<input type="checkbox"/>	1513298740408	...	DOUBLE
<input type="checkbox"/>	1513298312448	...	DOUBLE
<input type="checkbox"/>	1513298685988	...	SINGLE

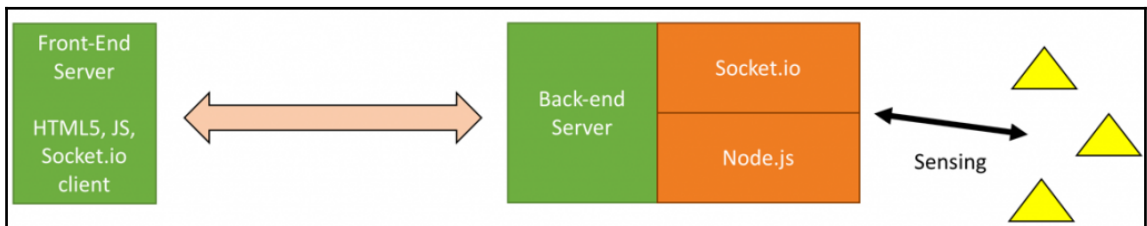
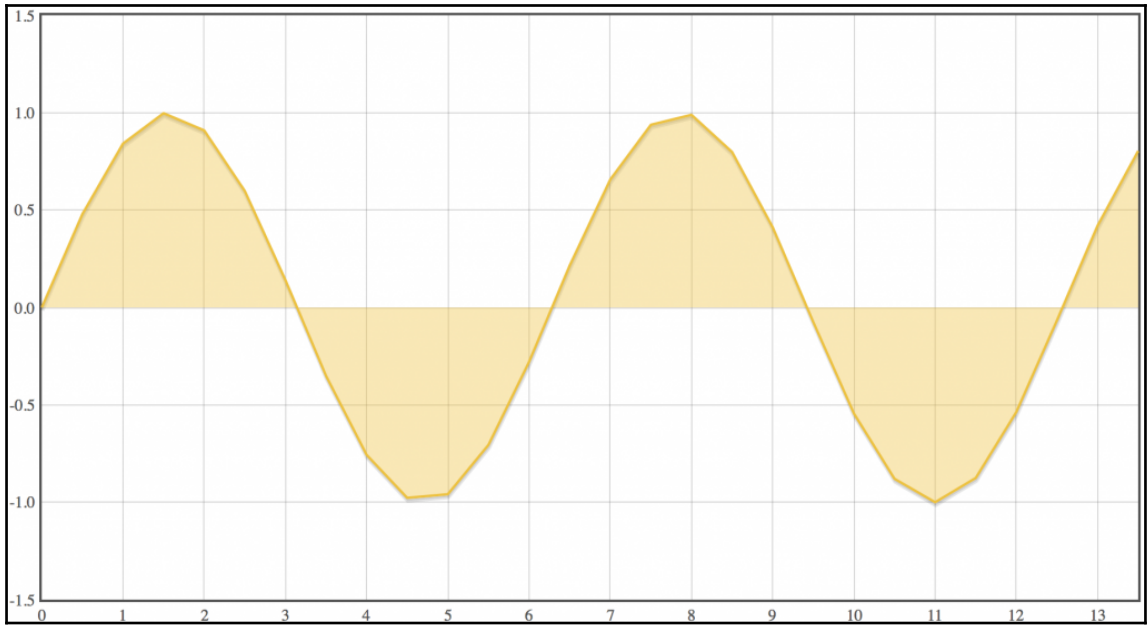
Chapter 6: Visualizing AWS IoT Data

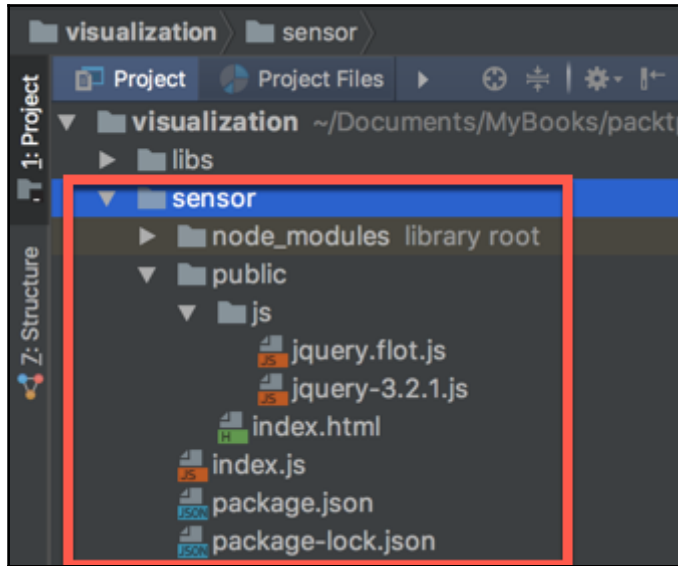




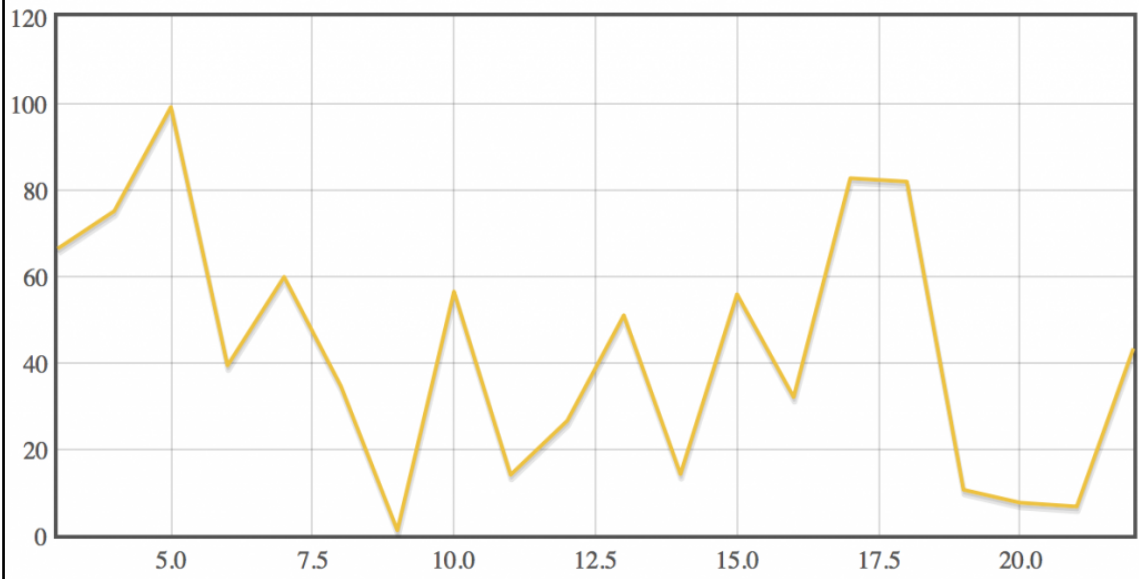


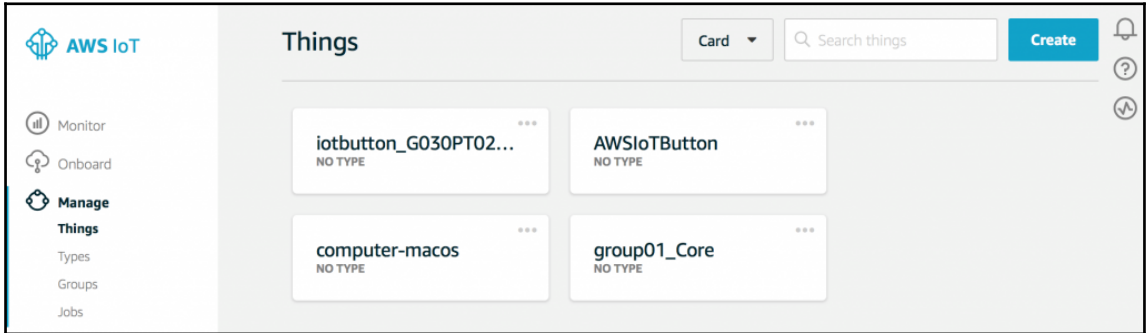
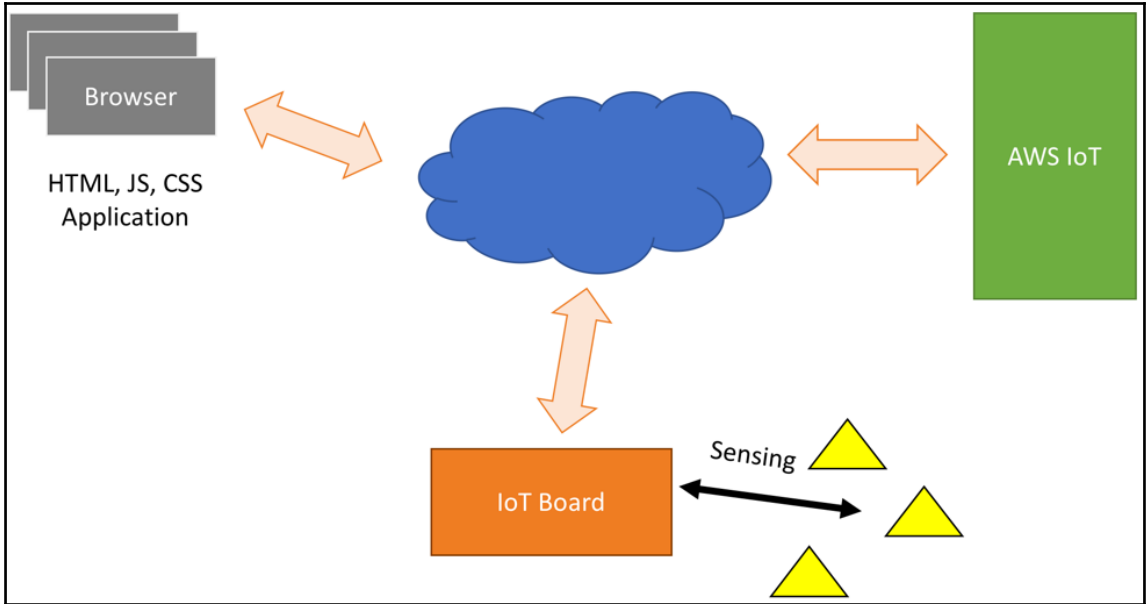






Real-Time Sensor Data Visualization







Amazon Cognito

Amazon Cognito makes it easy for you to have users sign up and sign in to your apps, federate identities from social identity providers, secure access to AWS resources and synchronize data across multiple devices, platforms, and applications.

[Manage your User Pools](#)

[Manage Federated Identities](#)



Add Sign-up and Sign-in



Federate User Identities



Synchronize Data Across Devices

Getting started wizard

Step 1: Create identity pool

Step 2: Set permissions

Create new identity pool

Identity pools are used to store end user identities. To declare a new identity pool, enter a unique name.

Identity pool name* ✓

Example: My App Name

▼ Unauthenticated identities ⓘ

Amazon Cognito can support unauthenticated identities by providing a unique identifier and AWS credentials for users who do not authenticate with an identity provider. If your application allows customers to use the application without logging in, you can enable access for unauthenticated identities. [Learn more about unauthenticated identities.](#)

Enable access to unauthenticated identities

▶ Authentication providers ⓘ

* Required

[Cancel](#)

[Create Pool](#)



Your Cognito identities require access to your resources

Assigning a role to your application end users helps you restrict access to your AWS resources. Amazon Cognito integrates with Identity and Access Management (IAM) and lets you select specific roles for both your authenticated and unauthenticated identities. [Learn more about IAM.](#)

By default, Amazon Cognito creates a new role with limited permissions - end users only have access to Cognito Sync and Mobile Analytics. You can modify the roles if your application needs access to other AWS resources, such as S3 or DynamoDB.

▸ View Details

Cancel

Allow

Your Cognito identities require access to your resources

Assigning a role to your application end users helps you restrict access to your AWS resources. Amazon Cognito integrates with Identity and Access Management (IAM) and lets you select specific roles for both your authenticated and unauthenticated identities. [Learn more about IAM.](#)

By default, Amazon Cognito creates a new role with limited permissions - end users only have access to Cognito Sync and Mobile Analytics. You can modify the roles if your application needs access to other AWS resources, such as S3 or DynamoDB.

▾ Hide Details

Role Summary ⓘ**Role Description** Your authenticated identities would like access to Cognito.**IAM Role** Create a new IAM Role ▾**Role Name**

▶ View Policy Document

Role Summary ⓘ**Role Description** Your unauthenticated identities would like access to Cognito.**IAM Role** Create a new IAM Role ▾

Cancel

Allow

aws Services Resource Groups Agus Kurniawan Tokyo Support

Federated Identities **iotpool** Edit identity pool

Identity pool

- Dashboard
- Sample code
- Identity browser

Identities this month **0**

Total identities **0**

Cognito Sync helps you sync user data across devices. Get started using the Mobile SDK: [Android](#), [iOS](#)

Authentication methods

Unauthenticated **0.0%** 0

Filters: Total identities Past 14 days

Date	Total identities
Dec 17	0
Dec 19	0
Dec 21	0
Dec 23	0
Dec 25	0
Dec 27	0
Dec 29	0

Resources

- Getting started with Amazon Cognito
User authentication is just the beginning.
- Learn about the AWS Mobile SDKs
Amazon Cognito is one of the services
- Connect with the community
[Cognito community forum](#)
[AWS Mobile Blog](#)

aws Services Resource Groups Agus Kurniawan Tokyo Support

Federated Identities lotpool

Identity pool

- Dashboard
- Sample code
- Identity browser

Edit identity pool

From this page you can modify the details of your identity pool. An identity pool must have a set of authenticated and unauthenticated roles. The roles are saved with your identity pool and whenever we receive a user we will automatically utilize the roles you specify here. You will be required to specify the identity roles in initializing the Amazon Cognito client SDK. [Learn more about using IAM roles with Amazon Cognito.](#)

Identity pool name* **Identity Pool**

Identity pool ID (Show ARN)

Unauthenticated role [Create new role](#) **Unauthenticated role**

Authenticated role [Create new role](#)

- Unauthenticated identities
- Authentication providers
- Push synchronization

Attach policy

Filter: Policy type Showing 9 results

	Policy name	Type	Attachments	Description
<input type="checkbox"/>	AWSIoTConfigAccess	AWS managed	0	This policy gives full access to the AWS IoT configuration actions
<input type="checkbox"/>	AWSIoTConfigReadOnlyAcc...	AWS managed	0	This policy gives read only access to the AWS IoT configuration acti...
<input checked="" type="checkbox"/>	AWSIoTDataAccess	AWS managed	0	This policy gives full access to the AWS IoT messaging actions
<input type="checkbox"/>	AWSIoTFullAccess	AWS managed	0	This policy gives full access to the AWS IoT configuration and mess...
<input type="checkbox"/>	AWSIoTLogging	AWS managed	0	Allows creation of Amazon CloudWatch Log groups and streaming l...
<input type="checkbox"/>	AWSIoTOTAUpdate	AWS managed	0	Allows access to create AWS IoT Job and describe the AWS code si...
<input type="checkbox"/>	AWSIoTRuleActions	AWS managed	0	Allows access to all AWS services supported in AWS IoT Rule Actions
<input type="checkbox"/>	AWSIoTThingsRegistration	AWS managed	0	This policy allows users to register things at bulk using AWS IoT Sta...
<input type="checkbox"/>	AWSQuickSightIoTAnalytics...	AWS managed	0	Give QuickSight read-only access to IoT Analytics datasets

[Cancel](#) [Attach policy](#)

Search IAM

Roles > Cognito_iotpoolUnauth_Role

Summary

Role ARN `arn:aws:iam::574[REDACTED]`

Role description [Edit](#)


Instance Profile ARNs

Path /

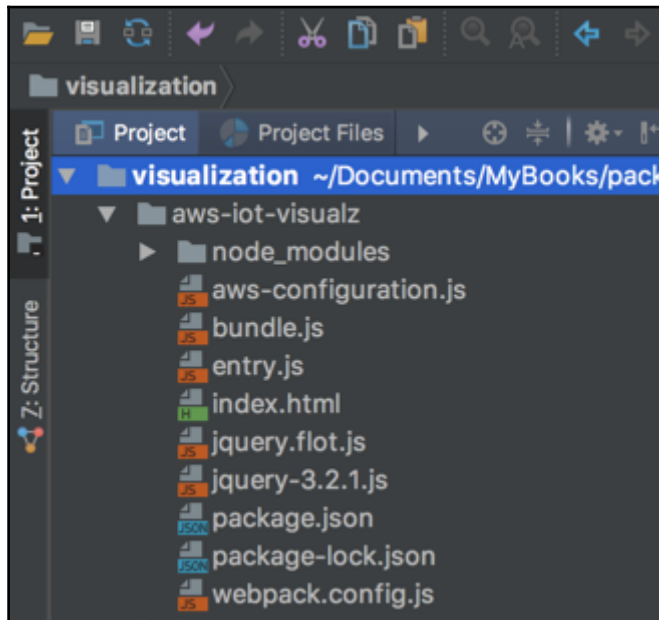
Creation time 2017-12-29 15:11 UTC+0700

Permissions | Trust relationships | Access Advisor | Revoke sessions

[Attach policy](#) Attached policies: 2

Policy name	Policy type	
 AWSIoTDataAccess	AWS managed policy	✕
oneClick_Cognito_iotpoolUnauth_Role_1514534848073	Inline policy	✕

[Add inline policy](#)



visualization

Project | Project Files

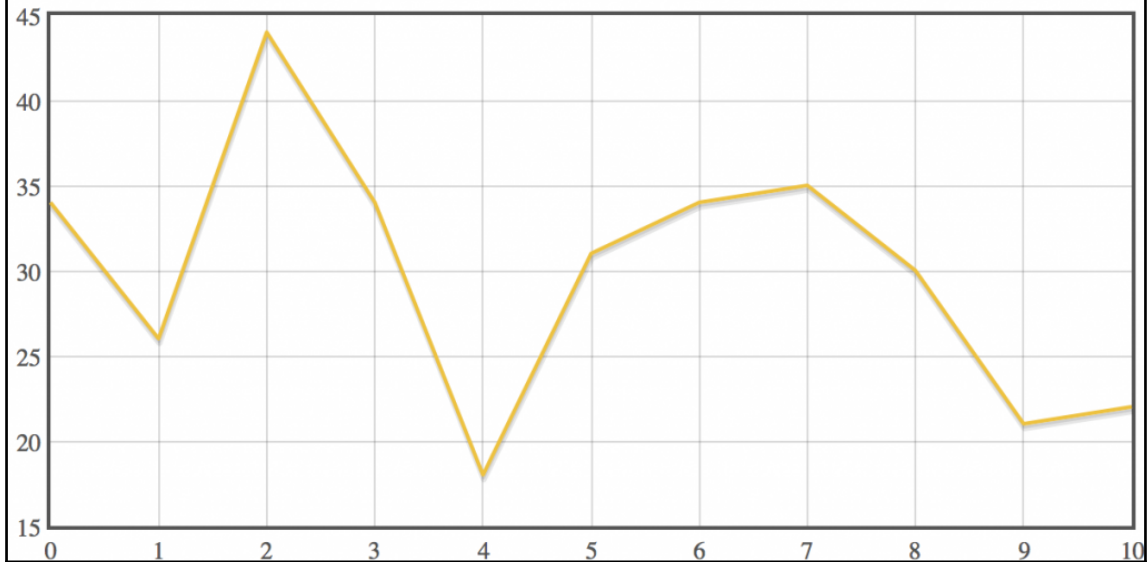
1: Project

- visualization ~/Documents/MyBooks/pack
 - aws-iot-visualz
 - node_modules
 - aws-configuration.js
 - bundle.js
 - entry.js
 - index.html
 - jquery.flot.js
 - jquery-3.2.1.js
 - package.json
 - package-lock.json
 - webpack.config.js

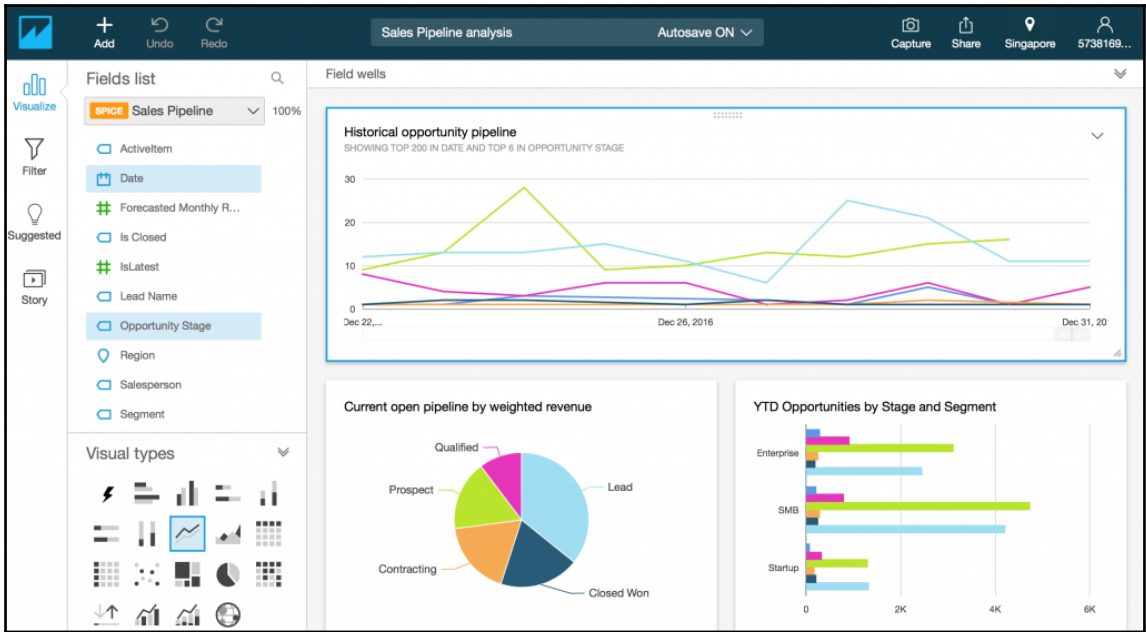
Z: Structure

Data Visualization for AWS IoT

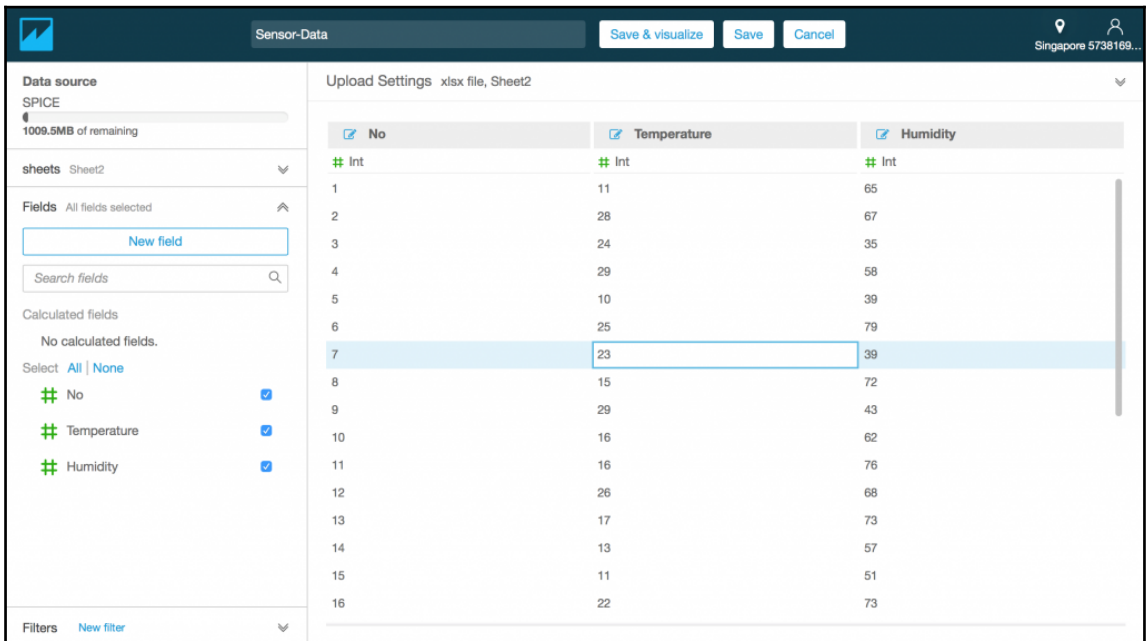
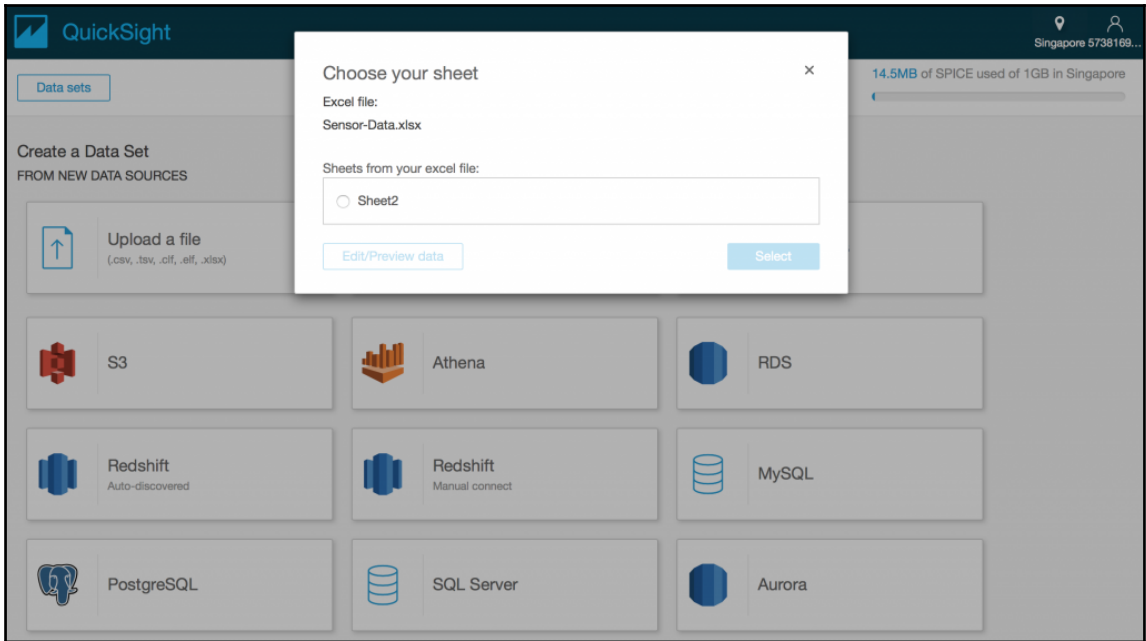
Connected to AWS IoT.

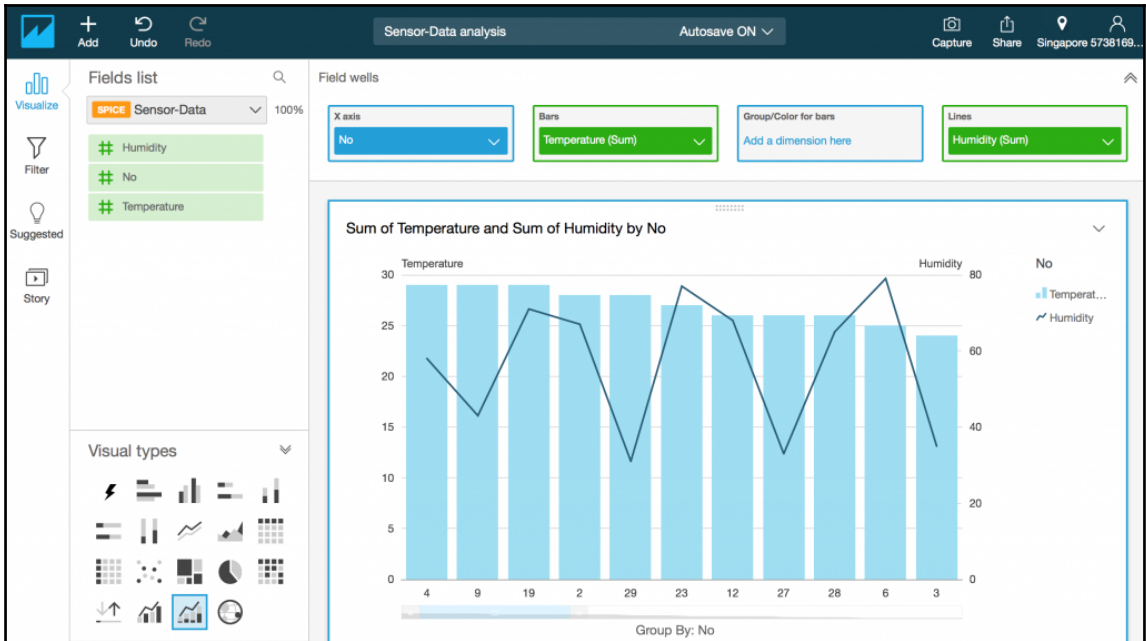
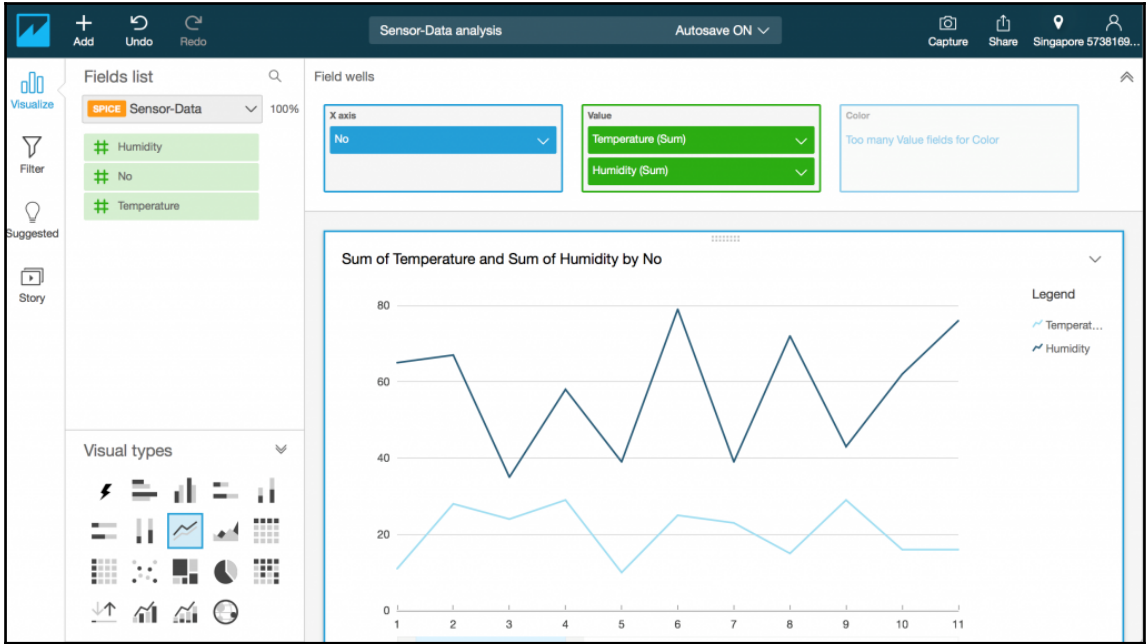


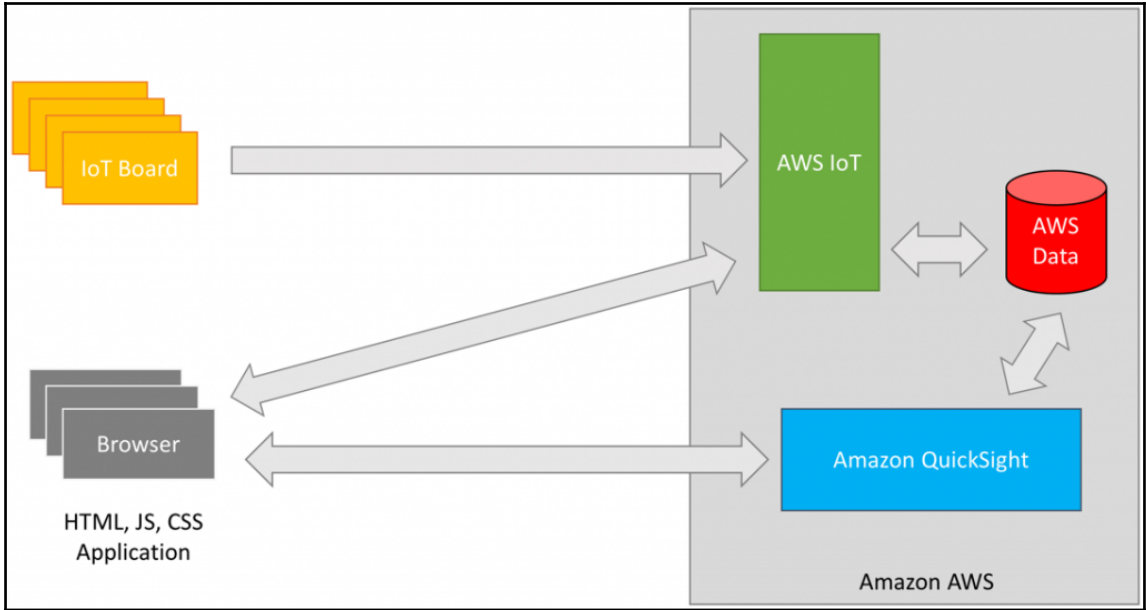
```
agusk$ node sensor-publisher.js
Sensor publisher started.
connected to AWS IoT.
sent: {"temperature":34}
sent: {"temperature":26}
sent: {"temperature":44}
sent: {"temperature":34}
sent: {"temperature":18}
sent: {"temperature":31}
sent: {"temperature":34}
sent: {"temperature":35}
sent: {"temperature":30}
sent: {"temperature":21}
sent: {"temperature":22}
sent: {"temperature":13}
```



	A	B	C
1	No	Temperature	Humidity
2	1	11	65
3	2	28	67
4	3	24	35
5	4	29	58
6	5	10	39
7	6	25	79
8	7	23	39
9	8	15	72
10	9	29	43
11	10	16	62
12	11	16	76
13	12	26	68
14	13	17	73
15	14	13	57
16	15	11	51
17	16	22	73
18	17	24	75
19	18	15	51
20	19	29	71
21	20	11	43
22	21	18	34
23	22	19	74
24	23	27	77
25	24	11	39
26	25	11	33
27	26	14	51
28	27	26	33
29	28	26	65
30	29	28	31
31	30	22	46







Chapter 7: Building Predictive Analytics for AWS IoT

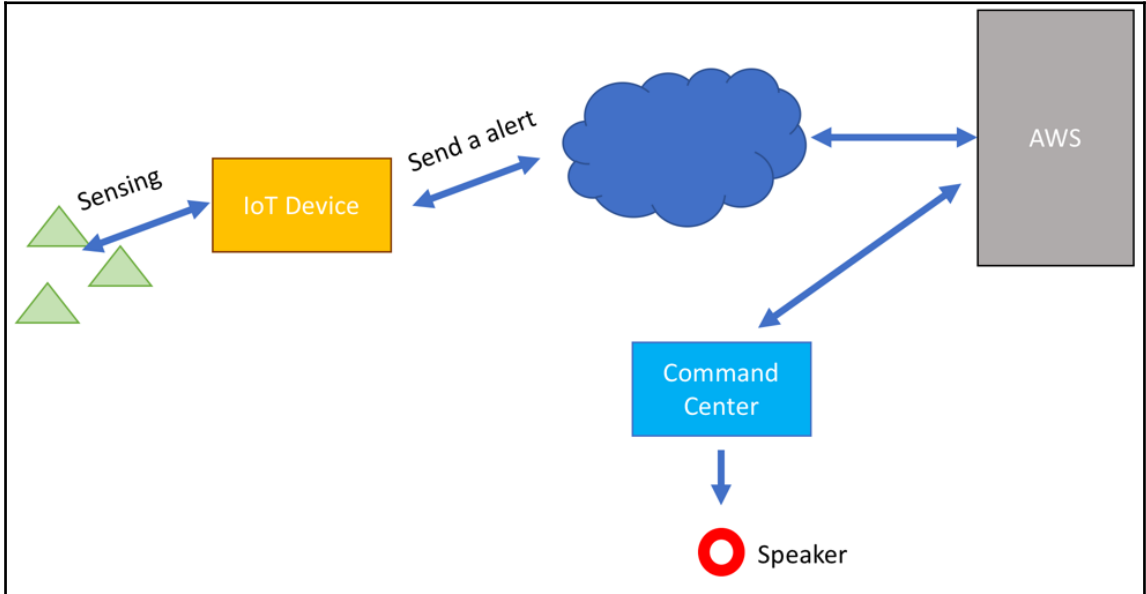
Machine Learning on AWS Overview ML Application Services ML Platform Services Deep Learning on AWS ML Topics AI Blog Partners

Machine Learning on AWS

Machine learning in the hands of every developer and data scientist

Get started with machine learning on AWS

At Amazon, we've been investing deeply in artificial intelligence for over 20 years. Machine learning (ML) algorithms drive many of our internal systems. It's also core to the capabilities our customers experience – from the path optimization in our fulfillment centers, and Amazon.com's recommendations engine, to Echo powered by Alexa, our drone initiative Prime Air, and our new retail experience Amazon Go. This is just the beginning. Our mission is to share our learnings and ML capabilities as fully managed services, and put them into the hands of every developer and data scientist.





Amazon Polly

Amazon Polly converts text to lifelike speech in the cloud. You can download the generated audio from the console, or stream it directly to your applications and services through the API.

[Get started](#)

[Getting started guide](#)



Amazon Polly

Text-to-Speech

Lexicons

Text-to-Speech

Listen, customize, and download speech. Integrate when you're ready.

Type or paste your text in the window, choose your language and region, choose a voice, choose Listen to speech, and then integrate it into your applications and services.

Plain text

SSML



Hi! My name is Joanna. I will read any text you type here.

1442 characters remaining (1500 maximum)

Show default text

Clear text

Language and Region

English, US

Voice

- Joanna, Female
- Salli, Female
- Kimberly, Female
- Kendra, Female
- Ivy, Female
- Matthew, Male
- Justin, Male
- Joey, Male

Select voice

▶ Listen to speech

Download MP3

Change file format

Search IAM

Users > agusk

Summary

User ARN: `arn:aws:iam::[REDACTED]:user/agusk`
Path: `/`
Creation time: 2017-11-12 13:01 UTC+0700

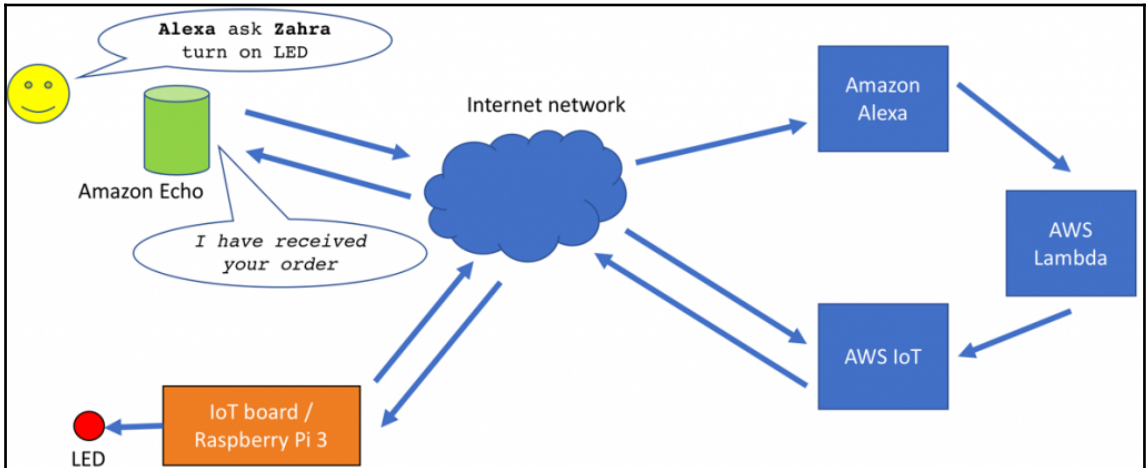
Permissions | Groups (0) | Security credentials | Access Advisor

[Add permissions](#) Attached policies: 3

Policy name	Policy type	
Attached directly		
AWSLambdaExecute	AWS managed policy	✕
AmazonPollyFullAccess	AWS managed policy	✕
AWSLambdaRole	AWS managed policy	✕

[Add inline policy](#)

```
agusk$ node aws-polly-demo.js  
temperature.mp3 file was saved!  
agusk$
```



Search IAM

Dashboard
Groups
Users
Roles
Policies
Identity providers
Account settings
Credential report

Encryption keys

Roles > alexarole

Summary

Role ARN `arn:aws:iam: [REDACTED]`

Role description

Instance Profile ARNs

Path `/service-role/`

Creation time 2018-01-14 17:35 UTC+0700

Permissions Trust relationships Access Advisor Revoke sessions

Attach policy Attached policies: 4

Policy name
AlexaForBusinessFullAccess
AWSLambdaBasicExecutionRole-484b1cb8-9685-41b7-8ff4-fab0e64d...
AWSIoTDataAccess
AWSIoTFullAccess

Author from scratch

Start with a simple "hello world" example.



Blueprints

Choose a preconfigured template as a starting point for your Lambda function.



Blueprints [Info](#)

Export

🔍 Add filter



keyword : alexa

< 1 >

alexa-skill-kit-sdk-factskill

Demonstrate a basic fact skill built with the ASK NodeJS SDK

nodejs6.10 · alexa

alexa-skill-kit-sdk-triviaskill

Demonstrate a basic trivia skill built with the ASK NodeJS SDK

nodejs6.10 · alexa

alexa-smart-home-skill-adapter

Provides the basic framework for a skill adapter for a smart home skill.

nodejs · iot · smart-home · alexa · light

alexa-skills-kit-color-expert

Demonstrates a basic skill built with the Amazon Alexa Skills Kit.

alexa-skill-kit-sdk-howtoskill

Demonstrate a basic How-to skill built with the ASK NodeJS SDK

alexa-skills-kit-color-expert-python

Demonstrates a basic skill built with the

Basic information [Info](#)

Name*

Role*

Defines the permissions of your function. Note that new roles may not be available for a few minutes after creation. [Learn more](#) about Lambda execution roles.

Lambda will automatically create a role with permissions from the selected policy templates. Note that basic Lambda permissions (logging to CloudWatch) will automatically be added. If your function accesses a VPC, the required permissions will also be added.

Role name*

Enter a name for your new role.

Policy templates

Choose one or more policy templates. A role will be generated for you before your function is created. [Learn more](#) about the permissions that each policy template will add to your role.

Lambda > Functions > fxalexa > 1

ARN - arn:aws:lambda:us-east-1:██████████:function:fxalexa:1

Version: 1 | Actions | Select a test event... | Test | Save

fxalexa:1

Configuration | Monitoring

▼ Designer

Add triggers

Click on a trigger from the list below to add it to your function.

API Gateway

AWS IoT

Alexa Skills Kit

Alexa Smart Home

CloudFront

CloudWatch Events

fxalexa:1

Alexa Skills Kit
Configuration required

Add triggers from the list on the left

Alexa for Business

Amazon CloudWatch Logs


Resources the function's role has access to will be shown here

AWS Lambda ARN

DASHBOARD | APPS & SERVICES | **ALEXA** | REPORTING | SUPPORT | DOCUMENTATION | SETTINGS

Get started with Alexa


Add new voice-enabled capabilities using the Alexa Skills Kit, or add voice-powered experiences to your connected devices with the Alexa Voice Service.



Alexa Skills Kit

Easily add new skills to Alexa

[Get Started >](#)



Alexa Voice Service

Bring voice capabilities to your connected device

[Get Started >](#)

Building Alexa Skills with the Alexa Skills Kit

Add a New Skill

To learn more about building Alexa skills, see [Getting Started with the Alexa Skills Kit](#). To start building an Alexa skill for free using AWS Lambda, see [Creating an AWS Lambda Function for a Custom Skill](#). We encourage you to visit the [Alexa Developer Forum](#) to collaborate with Alexa team members and fellow Alexa developers.

Good news! Developers can earn money for the most engaging skills

We're rewarding developers who design Alexa skills that customers love most! Developers can earn money each month for eligible skills that have the highest customer engagement in eligible skill categories. What's your next big idea? [Learn more](#).

Name	Language	Type	Modified	Status	Actions
------	----------	------	----------	--------	---------

[Back to All Skills](#)

Create a New Alexa Skill

<ul style="list-style-type: none"> Skill Information ✓ Interaction Model ✓ Configuration ✓ SSL Certificate ✓ Test ✓ Publishing Information ✓ Privacy & Compliance ✓ 	<p>Skill Type Define a custom interaction model or use one of the predefined skill APIs. Learn more</p> <p> <input checked="" type="radio"/> Custom Interaction Model <input type="radio"/> Smart Home Skill API <input type="radio"/> Flash Briefing Skill API <input type="radio"/> Video Skill API </p> <hr/> <p>Language Language of your skill</p> <p>English (U.S.) ⌵</p> <hr/> <p>Name Name of the skill that is displayed to customers in the Alexa app. Must be between 2-50 characters.</p> <p>Smart LED</p> <hr/> <p>Invocation Name The name customers use to activate the skill. For example, "Alexa ask Tide Pooler...".</p> <p>Zahra</p>
--	---

i For successful Alexa Skills Certification, please review and follow our [Invocation Name Guidelines](#) as well as our [Certification Requirements](#).

Global Fields

These fields apply to all languages supported by the skill.

Audio Player
Does this skill use the audio player directives? Yes No [Learn more](#)

Video App
Does this skill use the video app directives? [Learn](#) Yes No

English (U.S.) ✓

Add a New Language

Skill Information ✓

Interaction Model ✓

Configuration ✓

Test ✓

Publishing Information ✓

Privacy & Compliance ✓

Skills Beta Testing ^{NEW}

Status Not yet eligible ⓘ



Try the skill builder (beta), an intuitive interface for building your interaction model and creating dialog prompts

Launch Skill Builder ^{BETA}

Intent Schema

The schema of user intents in JSON format. For more information, see [Intent Schema](#). Also see [built-in slots](#) and [built-in intents](#).

```
2  "intents": [
3    {
4      "intent": "SmartLED",
5      "slots": [
6        {
7          "name": "LEDState",
8          "type": "LED_STATE"
9        }
10     ]
11   }
12 ]
```

Custom Slot Types (Optional)

Custom slot types to be referenced by the Intent Schema and Sample Utterances. For general information about custom slots, see [Custom Slot Types](#).

Enter Type

LED_STATE

Enter Values

Values must be line-separated

1 on
2 off

[Back to All Skills](#)



Smart LED

Custom

ID: amzn1.ask.skill.50d77b8c-██████████

English (U.S.)

[Add a New Language](#)

- Skill Information
- Interaction Model
- Configuration
- Test
- Publishing Information
- Privacy & Compliance

Skills Beta Testing NEW

Status Not yet eligible ?

Global Fields

These fields apply to all languages supported by the skill.

Endpoint

Service Endpoint Type:

AWS Lambda ARN (Amazon Resource Name) ?

HTTPS

Recommended

AWS Lambda is a server-less compute service that runs your code in response to events and automatically manages the underlying compute resources for you.

[More info about AWS Lambda](#)

[How to integrate AWS Lambda with Alexa](#)

Default

arn:aws:lambda:us-east-1-██████████:function:fxalexa

Provide geographical region endpoints?

(Optional) ?

Yes No

Find in your skills

4 0 0
ENABLED SKILLS JUST UPDATED NEED ATTENTION

FIND MORE SKILLS (+)

RECENTLY ADDED ALL SKILLS DEV



Smart LED




Tagesschau in 100 Sekunden

Voice Simulator

Hear how Alexa will speak a response entered in plain text or SSML. [Learn more about supported SSML tags.](#)

For example: Here is a word spelled out: <say-as interpret-as="spell-out">hello</say-as>.

Listen 

Service Simulator

Use Service Simulator to test your HTTPS endpoint: 

Note: Service Simulator does not currently support testing audio player directives, dialog model, customer permissions and customer account linking. Text mode does not support launch intents and single interaction phrases.

Text

JSON

Enter Utterance



Ask Smart LED

Reset

Service Request

```
1 {
2   "session": {
3     "new": false,
4     "sessionId": "SessionId.83980554-1f71-4fb7-
5     "application": {
6       "applicationId": "amzn1.ask.skill.50d77b8
7     },
8     "attributes": {},
9     "user": {
10      "userId": "amzn1.ask.account.AE3D5IDVVRSK
11    }
12  },
```

Service Response

```
1 {
2   "version": "1.0",
3   "response": {
4     "outputSpeech": {
5       "text": "I have received your order.",
6       "type": "PlainText"
7     },
8     "card": {
9       "content": "SessionSpeechlet - I have r
10      "title": "SessionSpeechlet - SmartLED"
11    },
12    "reprompt": {
```


The screenshot shows the AWS IoT console interface. On the left is a navigation menu with options: Monitor, Onboard, Manage, Greengrass, Secure, Act, Test, Software, Settings, and Learn. The main area is titled 'Subscriptions' and shows a subscription for the topic 'alexa/led'. There are buttons for 'Subscribe to a topic' and 'Publish to a topic'. The 'Publish' section includes a text input field containing 'alexa/led' and a 'Publish to topic' button. Below this is a code editor showing a JSON message:

```
1 {
2   "message": "Hello from AWS IoT console"
3 }
```

 Underneath the code editor, a message is displayed: 'alexa/led Jan 15, 2018 5:40:21 AM +0700' with 'Export' and 'Hide' buttons. A green warning banner states: 'We cannot display the message as JSON, and are instead displaying it as UTF-8 String.' Below the banner, the message content is shown as 'on'.

```
agusk$ node alexa-demo.js
AWS IoT - Alexa program started.
connected
turn on LED
turn off LED
█
```

Object and scene detection

Rekognition automatically labels objects, concepts and scenes in your images, and provides a confidence score.



Done with the demo?

[Learn more](#)

▼ Results

Human	99.3 %
People	99.3 %
Person	99.3 %
Brick	74.1 %
Clothing	66.7 %
Coat	66.7 %
Arch	65.7 %
Arched	65.7 %
Architecture	65.7 %

Amazon Rekognition

Metrics

Demos

Object and scene detection

Image moderation

Facial analysis

Celebrity recognition

Face comparison

Text in image

Video Demos

Video analysis

Additional Resources

Getting started guide


Download SDKs

Developer resources

Pricing

Object and scene detection

Rekognition automatically labels objects, concepts and scenes in your images, and provides a confidence score.



Done with the demo?
[Learn more](#)

▼ Results



Skateboard	99.2 %
Sport	99.2 %
Sports	99.2 %
Human	99.2 %
People	99.2 %
Person	99.2 %

Show more

► Request

► Response

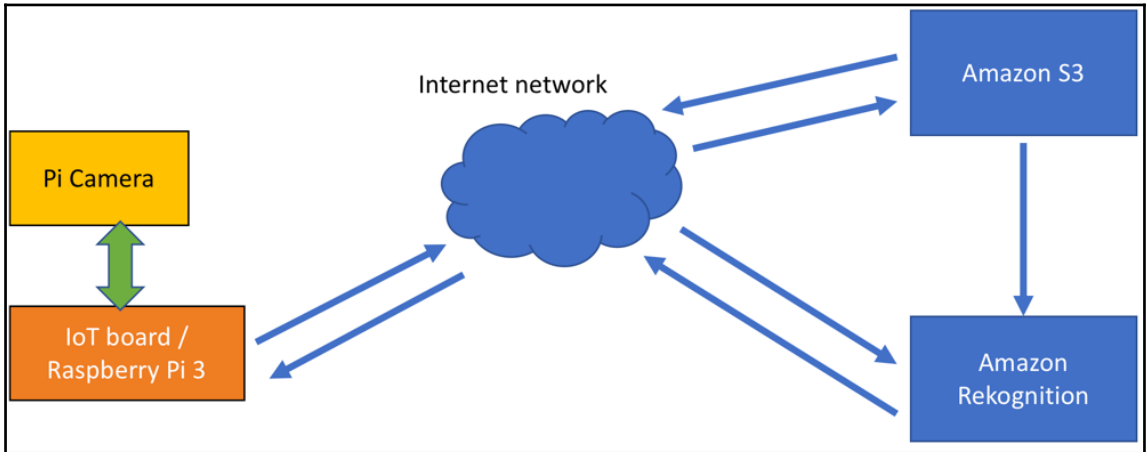
Choose a sample image

Use your own image
Image must be .jpeg or .png format and no larger than 5MB. Your image isn't stored.

[Upload](#) or drag and drop

Use image URL [Go](#)







Identify optimal storage classes with S3 Analytics - Storage Class Analysis. [Learn More »](#) [Documentation](#)

Amazon S3 [Discover the new console](#) [Quick tips](#)

Q Search for buckets

[+ Create bucket](#) [Delete bucket](#) [Empty bucket](#) 1 Buckets 0 **Public** 1 Regions [Refresh](#)

Bucket name ↑ ☰	Access i ↑ ☰	Region ↑ ☰	Date created ↑ ☰
akurs3	Not public *	Asia Pacific (Tokyo)	Jan 15, 2018 5:12:08 PM GMT+0700

* Objects might still be publicly accessible due to object ACLs. [Learn more](#)

```
agusk$ node upload-s3.js
Demo uploading a file to Amazon S3.
Uploading IMG_2222.JPG to Amazon S3.
IMG_2222.JPG
uploading...
File successfully uploaded.
agusk$
```

Search IAM

Users > agusk

Summary

User ARN: `arn:aws:iam::[REDACTED]:user/agusk`
Path: `/`
Creation time: 2017-11-12 13:01 UTC+0700

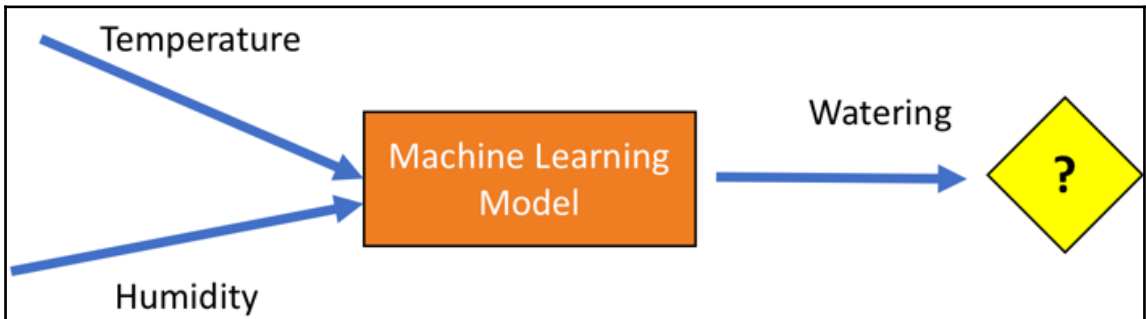
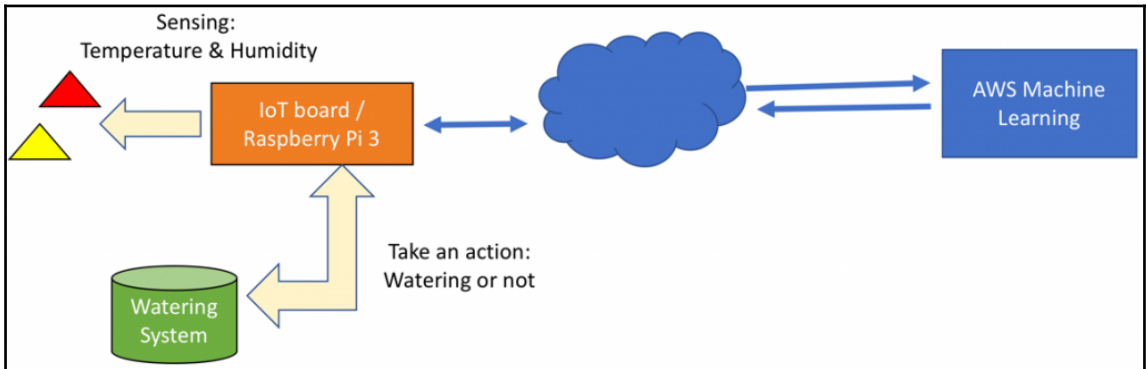
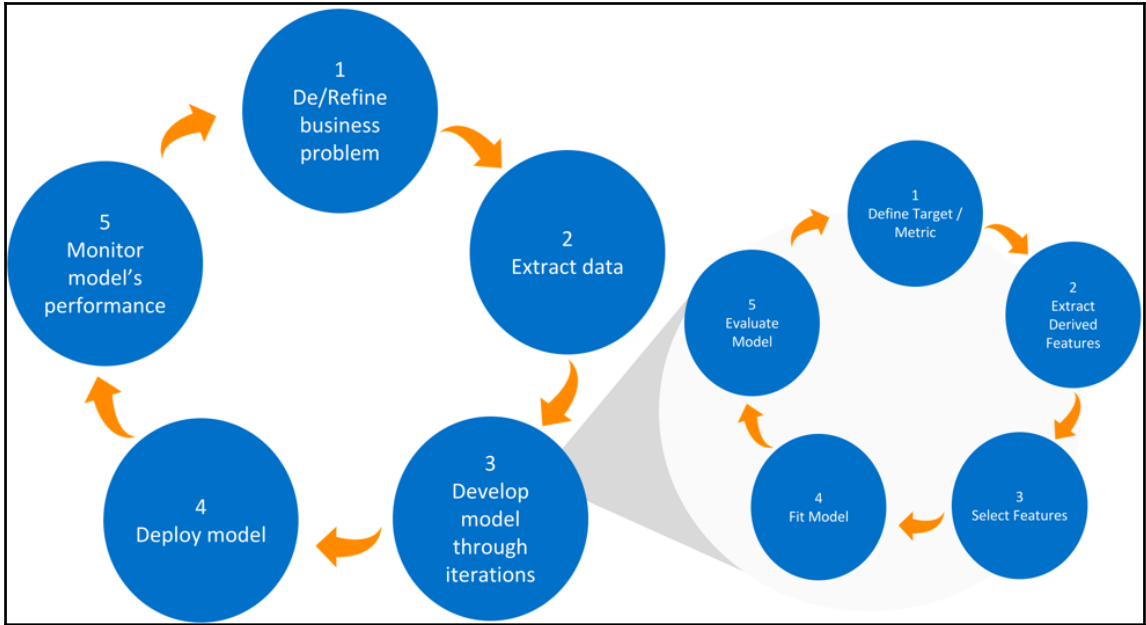
Permissions | Groups (0) | Security credentials | Access Advisor

[Add permissions](#) Attached policies: 4

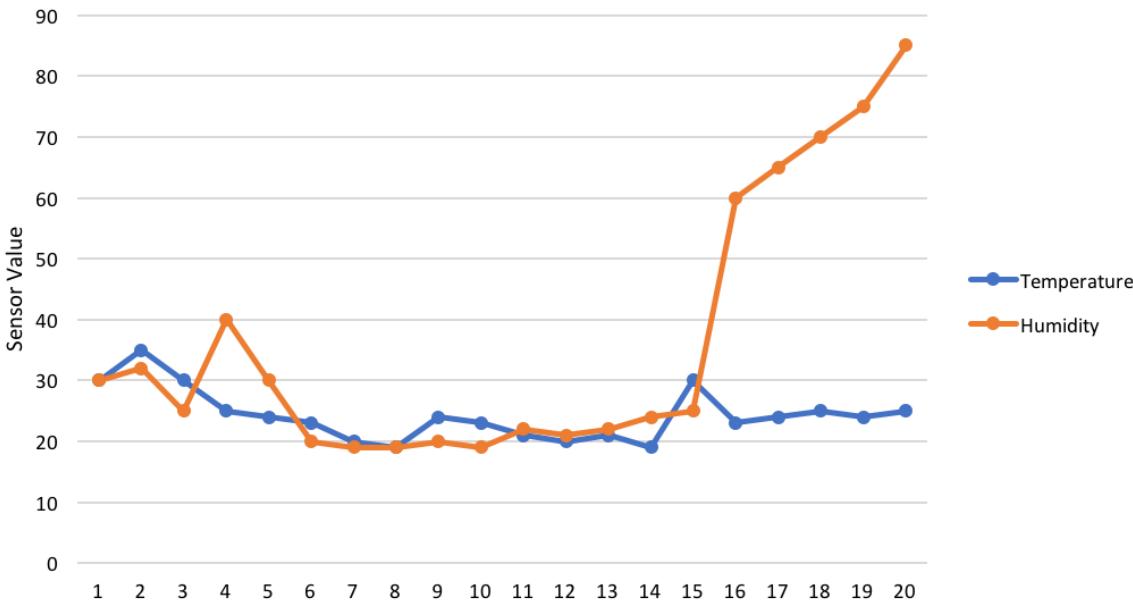
Policy name	Policy type	
Attached directly		
AmazonRekognitionFullAccess	AWS managed policy	✕
AWSLambdaExecute	AWS managed policy	✕
AmazonPollyFullAccess	AWS managed policy	✕
AWSLambdaRole	AWS managed policy	✕

[Add inline policy](#)

```
agusks$ node object-rekognition.js
Demo AWS Rekognition.
Analyzing...
Performing AWS Rekognition is success.
Result:
{ Labels:
  [ { Name: 'Electronics', Confidence: 97.94730377197266 },
    { Name: 'Monitor', Confidence: 97.94730377197266 },
    { Name: 'Screen', Confidence: 97.94730377197266 },
    { Name: 'TV', Confidence: 97.94730377197266 },
    { Name: 'Television', Confidence: 97.94730377197266 },
    { Name: 'Apartment', Confidence: 79.5370101928711 },
    { Name: 'Building', Confidence: 79.5370101928711 },
    { Name: 'Housing', Confidence: 79.5370101928711 },
    { Name: 'Indoors', Confidence: 79.5370101928711 },
    { Name: 'Room', Confidence: 64.24443054199219 },
    { Name: 'Chair', Confidence: 61.131507873535156 },
    { Name: 'Furniture', Confidence: 61.131507873535156 },
    { Name: 'Hostel', Confidence: 53.38637161254883 },
    { Name: 'Bedroom', Confidence: 52.97583770751953 },
    { Name: 'Interior Design', Confidence: 52.97583770751953 },
    { Name: 'Couch', Confidence: 51.81147003173828 },
    { Name: 'Living Room', Confidence: 51.68221664428711 },
    { Name: 'Entertainment Center', Confidence: 50.694297790527344 },
    { Name: 'Basement', Confidence: 50.66577911376953 } ] }
agusks$ █
```



Temperature and Humidity



Temperature	Humidity	Watering
30	30	WATERING
35	32	WATERING
30	25	WATERING
25	40	WATERING
24	30	WATERING
23	20	WATERING
20	19	WATERING
19	19	WATERING
24	20	WATERING
23	19	WATERING
21	22	NOTWATERING
20	21	NOTWATERING
21	22	NOTWATERING
19	24	NOTWATERING
30	25	NOTWATERING
23	60	NOTWATERING
24	65	NOTWATERING
25	70	NOTWATERING
24	75	NOTWATERING
25	85	NOTWATERING

Overview	Properties	Permissions
Management		

🔍 Type a prefix and press Enter to search. Press ESC to clear.

[Upload](#) [+ Create folder](#) [More](#) US East (N. Virginia)

Viewing 1 to 2

<input type="checkbox"/>	Name	Last modified	Size	Storage class
<input type="checkbox"/>	Temp-Hum-Water.csv	Jan 19, 2018 6:49:02 AM GMT+0100	193.0 B	Standard
<input type="checkbox"/>	Temp-Hum-Water.csv.schema	Jan 19, 2018 6:49:02 AM GMT+0100	470.0 B	Standard

Viewing 1 to 2



Get started with Amazon Machine Learning



Standard setup

Start creating your first ML model. If you don't have your data ready, you can use our sample dataset.

[Amazon Machine Learning Tutorial](#)

Launch



Dashboard

Skip straight to the Amazon Machine Learning dashboard.

View Dashboard

[Cancel](#)

Just trying out Amazon ML and don't have your data ready? Use `s3://aml-sample-data/banking.csv` This dataset contains information about customers as well as descriptions of their behavior in response to previous marketing contacts. You use this data to identify which customers are most likely to subscribe to your new product.

You can preview the file here [banking.csv](#)

Want a more guided experience? [Start with the Amazon Machine Learning Tutorial.](#)

Import your data to create an Amazon ML datasource. Amazon ML can use your datasource to create and evaluate an ML model, and you can use the datasource to review your data.

Where is your data?



Amazon Redshift

S3 data access

Tell Amazon ML how to access your data and give it permission to access it.

S3 location *

s3://

Enter the path to a single file or folder in Amazon S3. You need to grant Amazon ML permission to read this data. [Learn more.](#)

If you already have a schema for this data, provide it in a file at `s3://<path-of-input-data>.schema`. If you don't have a schema, Amazon ML will help you create one on the next page.

Datasource name

* Required

Reset

Cancel

Verify

Import your data to create an Amazon ML datasource. Amazon ML can use your datasource to create and evaluate an ML model, and you can use the datasource to review your data.

Where is your data?



Amazon Redshift

S3 data access

Tell Amazon ML how to access your data and give it permission to access it.

S3 location *

s3://akurml/Temp-Hum-Water.csv

Enter the path to a single file or folder in Amazon S3. You need to grant Amazon ML permission to read this data. [Learn more](#).

If you already have a schema for this data, provide it in a file at s3://<path-of-input-data>.schema. If you don't have a schema, Amazon ML will help you create one on the next page. ⓘ

Datasource name

Temp-Hum-Water.csv

The validation is successful. To go to the next step, choose Continue

Datasource name Temp-Hum-Water.csv

Data location s3://akurml/Temp-Hum-Water.csv

Data format CSV

Schema source s3://akurml/Temp-Hum-Water.csv.schema

Number of files 1

Total size 193 bytes

* Required

Reset

Cancel

Continue

Amazon Machine Learning - Datasources > Create datasource

1. Input Data **2. Schema** 3. Target 4. Row ID 5. Review

Schema ?

Amazon ML scanned your input data and inferred the column names and data type for each of the columns in your dataset. Review and edit the data type for each column to ensure that it accurately represents the data. This enables Amazon ML to read the input data correctly and to produce accurate predictions. [Learn more.](#)

ACTION: Change type ▾

Q Search by attribute name Items per page: 10 ▾ << < 1 - 3 of 3 > >>

<input type="checkbox"/>	▲	Name	Data type	Sample field value 1	Sample field value 2	Sample field value 3
<input type="checkbox"/>	1	Temperature	Numeric ▾	Temperature	30	35
<input type="checkbox"/>	2	Humidity	Numeric ▾	Humidity	30	32
<input type="checkbox"/>	3	Watering	Categorical ▾	Watering	WATERING	WATERING

<< < 1 - 3 of 3 > >>

[Cancel](#) [Previous](#) [Continue](#)

Amazon Machine Learning - Datasources > Create datasource

1. Input Data 2. Schema 3. Target 4. Row ID **5. Review**

Review

Review and make any changes, and then click Finish.

Input data Edit

Datasource name Temp-Hum-Water.csv
S3 location s3://akurml/Temp-Hum-Water.csv
Data format CSV
Number of files 1
Total size 403 bytes

Schema Edit

Schema source Schema file in S3.
Data types 2 Numeric Attributes
 1 Categorical Attribute

Target Edit

Target Watering (Multiclass Classification)



1. Input data **2. ML model settings** 3. Recipe 4. Advanced settings 5. Evaluation 6. Review

ML model settings



You can use the automatically suggested ML model settings, or you can choose to customize.

ML model type MULTICLASS ⓘ

ML model target Watering

ML model name
(Optional)

Select training and evaluation settings

Recipes and training parameters control the ML model training process. You can select these settings for your ML model or use the defaults provided by Amazon ML. In either case, you can choose to have Amazon ML reserve a portion of the input data for evaluation. [Learn more.](#)

Default (Recommended)

- Generate a default recipe
- Use default training parameters
- Set aside 30% of your training data to evaluate the training
- Split the evaluation data

Custom

- Modify the recipe Amazon ML generates
- Modify training parameters
- Randomly or sequentially split your evaluation data ⓘ



1. Input data
2. ML model settings
3. Recipe
4. Advanced settings
5. Evaluation
- 6. Review**

Review

Review and make any changes, and then click Finish.

Input data

[Edit](#)

Datasource ID	ds-OeXtAsES5iy
Datasource name	Temp-Hum-Water.csv
Creation time	Jan 19, 2018 10:17:35 AM
Status	Completed

ML model settings

[Edit](#)

ML model Name	ML model: Temp-Hum-Water
ML model parameters	Default (includes the ML model evaluation) - See Advanced settings below.
Evaluation name	Evaluation: ML model: Temp-Hum-Water
Evaluation data	Amazon ML will split your training datasource into 70% for training and will reserve the remaining 30% for evaluation.

Recipe

Recipe

Recipes help Amazon Machine Learning find patterns in your data. If you

Objects



Create new...

Actions

Refresh

Filter: All types

Items per page: 10

<< < 1 - 5 of 5 Objects > >>

	Name	Type	ID	Status	Creation time	Completion time
<input type="checkbox"/>	▶ Evaluation: ML model: Temp-Hum-Water	Evaluation	ev-WaZoTNkUGXh	Completed	Jan 19, 2018 10:18:02 AM	3 mins.
<input type="checkbox"/>	▶ ML model: Temp-Hum-Water	ML model	ml-MF4aJKDaFXP	Completed	Jan 19, 2018 10:18:01 AM	1 min.
<input type="checkbox"/>	▶ Temp-Hum-Water.csv_percentBegin=7...	Datasource	ds-CHWNSKiOgeU	Completed	Jan 19, 2018 10:18:01 AM	4 mins.
<input type="checkbox"/>	▶ Temp-Hum-Water.csv_percentBegin=0...	Datasource	ds-puCiHx8PLvp	Completed	Jan 19, 2018 10:18:01 AM	3 mins.
<input type="checkbox"/>	▶ Temp-Hum-Water.csv	Datasource	ds-OeXtAsES5iy	Completed	Jan 19, 2018 10:17:35 AM	4 mins.

<< < 1 - 5 of 5 Objects > >>

Machine Learning Concepts

Amazon Machine Learning (Amazon ML) can solve business problems by finding and learning the patterns in your historical data and using the patterns to generate predictions. To get started, you provide Amazon ML with your data. Next, you use Amazon ML to train your ML model, and then you evaluate the model's performance. Finally, you use the model to generate predictions on new data.



ML model report

Summary

Settings

Monitoring

Tools

Try real-time predictions

Evaluations

▼ Evaluation: ML mod

Summary

Alerts (0)

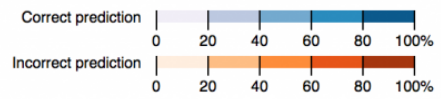
Explore performar

ML model performance

This chart shows the F1 scores and prediction distributions of your ML model. [Learn more.](#)

Download the complete matrix

		Predicted values			F1
		NOTWATERI...	WATERING	Total	
True values	NOTWATERI...			100.00% (6)	0.00
	WATERING			0.00% (0)	0.00
Total		0.00% (0)	100.00% (6)	100.00% (6)	0.00



Datasource ID [ds-puCiHx8PLvp](#)
Target Watering
Input schema [View input schema](#)

Evaluations

Evaluations created 1
Latest evaluation result [3.333333333333111e-14 \(F1\)](#)

[Perform another Evaluation](#)

Predictions

CloudWatch metrics [View in CloudWatch](#)

A single dataset

Generate one-time predictions for a single dataset.

[Generate batch predictions](#)

Try real-time predictions

Generate real-time predictions in your browser.

[Try real-time predictions](#)

Enable real-time predictions

To enable real-time predictions now, create a real-time prediction endpoint.

[Create endpoint](#)

ML model report

- Summary
- Settings
- Monitoring
- Tools

Try real-time predictions

Evaluations

► Evaluation: ML mod

Try real-time predictions

You submitted 2 out of 2 data values for this prediction. ✕

Try generating real-time predictions for free using the web browser on this page. To request a real-time prediction, complete the following form or provide a single data record in CSV format. To provide a data record, choose the **Paste a record** button.

Paste a record

Q *Attribute name*

Items per page: 10 << < 1 - 3 of 3 > >>

▲	Name	Type	Value
1	Temperature	Numeric	<input type="text" value="28"/>
2	Humidity	Numeric	<input type="text" value="45"/>
3	Watering	Categorical	Target

<< < 1 - 3 of 3 > >>

Clear data

Create prediction

Prediction results

Target name Watering
ML model type CATEGORICAL
Predicted class WATERING

```
{
  "Prediction": {
    "details": {
      "Algorithm": "SGD",
      "PredictiveModelType":
        "MULTICLASS"
    },
    "predictedLabel": "WATERING",
    "predictedScores": {
      "NOTWATERING":
        0.017990635707974434,
      "WATERING":
        0.9820093512535095
    }
  }
}
```

Chapter 8: Securing AWS IoT



Things Card Create

- iotbutton_G030PT02... NO TYPE
- AWSIoTButton NO TYPE
- computer-macos NO TYPE
- group01_Core NO TYPE

Create a certificate

A certificate is used to authenticate your device's connection to AWS IoT.

One-click certificate creation (recommended) Create certificate

This will generate a certificate, public key, and private key using AWS IoT's certificate authority.

Create with CSR ↑ Create with CSR

Upload your own certificate signing request (CSR) based on a private key you own.

Use my certificate Get started

Register your CA certificate and use your own certificates for one or many devices.

Select a CA

In order to use your own certificates for one or many devices, you must use a registered CA certificate.

Registered CAs

No match found
There is no CA certificate in your account.

Register CA

Register a CA certificate

To use your own X.509 certificates, you must register a CA certificate with AWS IoT. You must prove you own the private key associated with the CA certificate by creating a private key verification certificate. The CA certificate can then be used to sign device certificates. You can register up to 10 CA certificates with the same subject field and public key per AWS account. This allows you to have more than one CA sign your device certificates.

Step 1: Generate a key pair for the private key verification certificate

```
openssl genrsa -out verificationCert.key 2048
```

Step 2: Copy this registration code

```
270ad94efce6212d13ca37a5c46780ddf3b54188360d2c01c273717e522497eb
```

Step 3: Create a CSR with this registration code

```
openssl req -new -key verificationCert.key -out verificationCert.csr
```

Put the registration code in the **Common Name** field

```
Country Name (2 letter code) [AU]:  
State or Province Name (full name) [Some-State]:  
Locality Name (eg, city) []:
```

Policies

sensorNode-Policy iotbutton_G030PT02... group01_Core-policy

computer-macos-policy

Card Search policies Create

Create a policy to define a set of authorized actions. You can authorize actions on one or more resources (things, topics, topic filters). To learn more about IoT policies go to the [AWS IoT Policies documentation page](#).

Name

my-iot-policy

Add statements **Advanced mode**

Policy statements define the types of actions that can be performed by a resource.

Action

iot/sensor

- iot:Connect
- iot:Publish
- iot:Subscribe
- iot/sensor
- iotbutton/+
- iot:UpdateThingShadow
- iot:GetThingShadow
- iot>DeleteThingShadow

Users > agusk

Summary

User ARN: arn:aws:iam::[redacted]:user/agusk
 Path: /
 Creation time: 2017-11-12 07:01 UTC+0100

Permissions | Groups (0) | Security credentials | Access Advisor

[Add permissions](#) Attached policies: 4

Policy name	Policy type	
Attached directly		
▶ AmazonRekognitionFullAccess	AWS managed policy	✕
▶ AWSLambdaExecute	AWS managed policy	✕
▶ AmazonPollyFullAccess	AWS managed policy	✕
▶ AWSLambdaRole	AWS managed policy	✕

[+ Add inline policy](#)

Permissions | Groups (0) | Security credentials | Access Advisor

Sign-in credentials

Console password: Enabled [Manage password](#)
 Console login link: [https://\[redacted\].signin.aws.amazon.com/console](https://[redacted].signin.aws.amazon.com/console)
 Last login: Never
 Assigned MFA device: No [✎](#)
 Signing certificates: None [✎](#)

Access keys

Use access keys to make secure REST or HTTP Query protocol requests to AWS service APIs. For your protection, you should never share your secret keys with anyone. As a best practice, we recommend frequent key rotation. [Learn more](#)

[Create access key](#)

Access key ID	Created	Last used	Status	
[redacted]	2017-11-12 07:01 UTC+0100	2018-01-15 12:4...	Active	Make inactive ✕
[redacted]	2017-12-04 16:41 UTC+0100	2017-12-09 01:1...	Active	Make inactive ✕

SSH keys for AWS CodeCommit

Use SSH public keys to authenticate access to AWS CodeCommit repositories. [Learn more](#)

Roles > lambda_basic_execution

Search IAM

Dashboard
Groups
Users
Roles
Policies
Identity providers
Account settings
Credential report

Encryption keys

Summary

Delete role

Role ARN arn:aws:iam::[REDACTED]:role/lambda_basic_execution

Role description [Edit](#)

Instance Profile ARNs

Path /

Creation time 2017-11-25 09:54 UTC+0100

Permissions | Trust relationships | Access Advisor | Revoke sessions

Attach policy Attached policies: 3

Policy name	Policy type	
▶ AmazonDynamoDBFullAccess	AWS managed policy	✕
▶ oneClick_lambda_basic_execution_1511599!	Inline policy	✕
▶ oneClick_lambda_basic_execution_1511600-	Inline policy	✕

[+ Add inline policy](#)

Create policy

1 Editor — **2** Review

A policy defines the AWS permissions that can be assigned to a user, group, role, or resource. You can construct a policy using the visual editor or create a policy document using the JSON editor.

Visual editor | **JSON** [Import managed policy](#)

Use the visual editor to create and edit a policy by choosing services, actions, resources, and request conditions to add permissions to your policy. You can add multiple permission blocks to define complex permissions or to grant access to more than one service. [Learn more](#)

[Expand all](#) | [Collapse all](#)

▼ Select a service [Clone](#) | [Remove](#)

Service Select a service below [Enter service manually](#)

close

[IoT](#) ? [IoT Analytics](#) ?

Actions Choose a service before defining actions