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## Connecting to the AWS Cloud using the RSL10 Sense and Control Mobile Application

### INTRODUCTION

RSL10 Sense and Control, the Bluetooth Low Energy (BLE) based mobile application from ON Semiconductor, enables users to publish and subscribe data from sensors and actuators connected to platforms that feature [RSL10](#), industry's lowest power Bluetooth 5 certified SoC. These platforms include the [IDK](#) (IoT Development Kit) and the [B-IDK](#) (Bluetooth Low Energy IoT Development Kit).

This document provides step-by-step instructions on setting up the AWS IoT Core and configuring the mobile app to connect to the AWS cloud.

### PREREQUISITES

Users need to download the appropriate platform-specific firmware to enable communication with the mobile app.

#### IoT Development Kit (IDK)

- Ensure that the [BLE-IOT-GEVB](#) board is connected to the IDK baseboard, [BB-GEVK](#)
- Download firmware found on [BLE-IOT-GEVB](#) web page to the [BLE-IOT-GEVB](#) board



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### APPLICATION NOTE

- Download the “BLE Custom Service Firmware” example to the IDK baseboard, [BB-GEVK](#)
  - ♦ Detailed instructions on compiling example code and downloading to the IDK baseboard, [BB-GEVK](#), can be found [Here](#)

#### Bluetooth Low Energy IoT Development Kit (B-IDK)

- Download the custom service firmware to the B-IDK baseboard, [BDK-GEVK](#)
  - ♦ Detailed instructions on compiling and downloading the custom service firmware to the B-IDK baseboard, [BDK-GEVK](#), can be found [Here](#)

Once the firmware is loaded, the mobile application can be used to read sensor values and set actuator values, publish sensor values to an MQTT broker and subscribe actuator settings from the MQTT broker.

## CONFIGURING AWS IOT CLOUD INSTANCE

1. Create a free AWS Cloud account: <https://docs.aws.amazon.com/iot/latest/developerguide/iot-console-signin.html>
2. Select *IoT Core* service from the Services dropdown listing
3. Click *Manage* on the left pane
4. Click *Create* as shown below

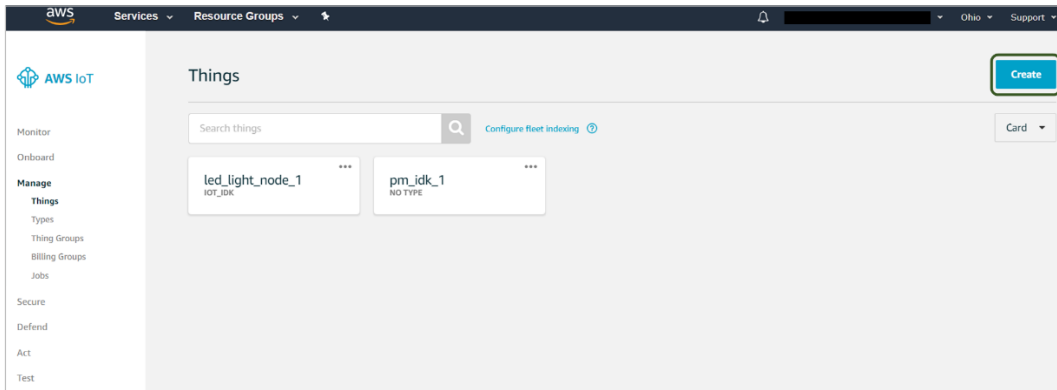


Figure 1.

5. Click *Create a Single Thing* as shown below

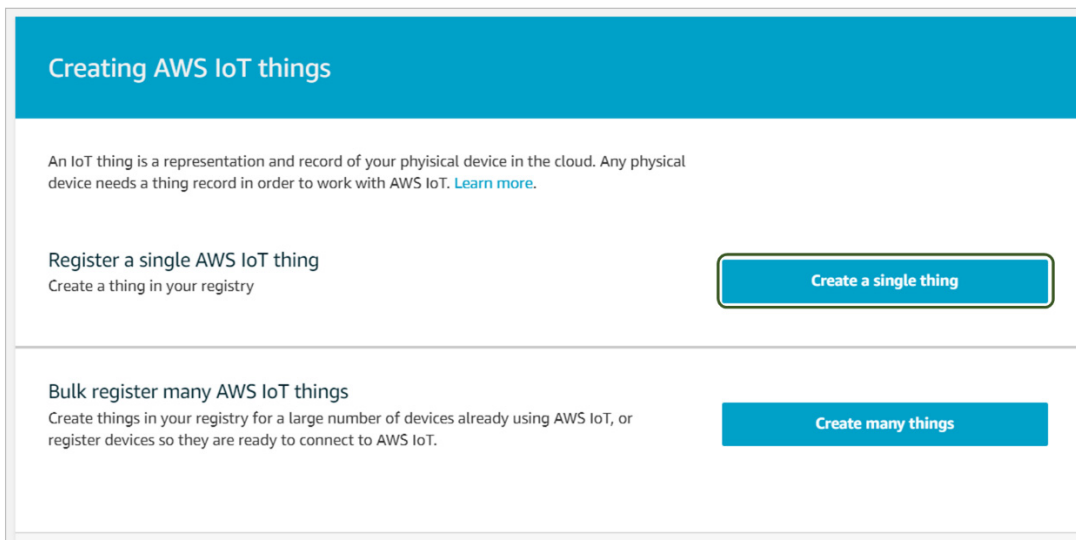


Figure 2.

6. Provide a *Name* and click *Next*
  - a. Other fields are optional

CREATE A THING

STEP 1/3

### Add your device to the thing registry

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

Name

Test\_ON

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

No type selected

Create a type

Add this thing to a group

Adding your thing to a group allows you to manage devices remotely using jobs.

Thing Group

Groups /

Create group Change

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

Provide an attribute key, e.g. Manufacturer

Provide an attribute value, e.g. Acme-Corporation

Clear

Add another

Show thing shadow

Cancel

Back

Next

Figure 3.

7. Create a certificate for the device as shown below

CREATE A THING

STEP 2/3

### Add a certificate for your thing

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

One-click certificate creation (recommended)

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

Create certificate

Figure 4.

8. Click *Activate* and then download the certificate and key files  
(Stay on this page till step 12)

The certificates and keys are used during the configuration of the MQTT broker in the mobile application

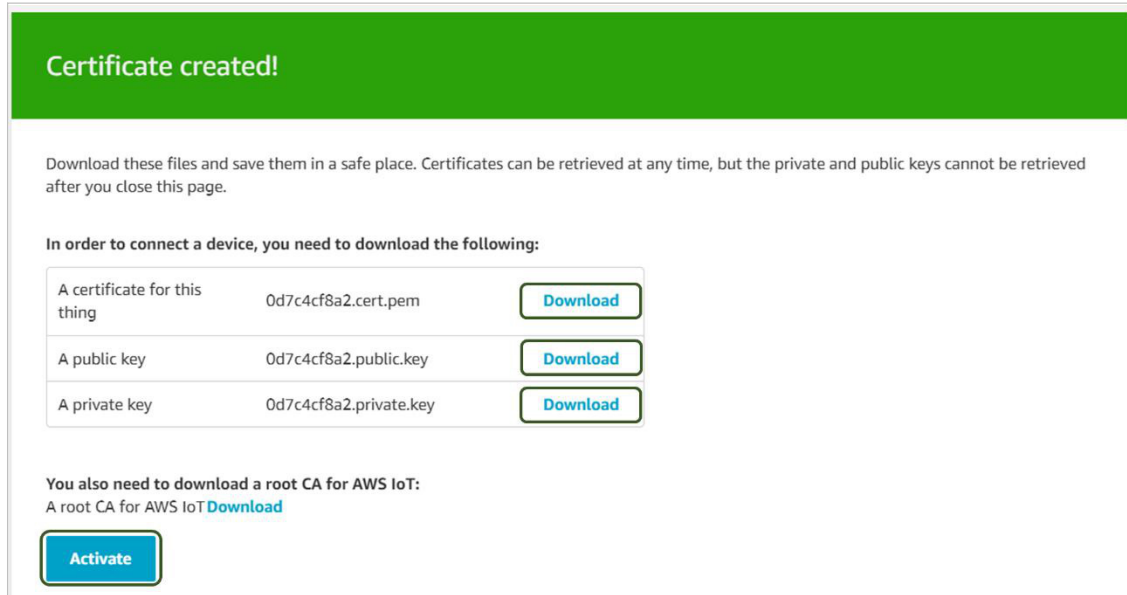


Figure 5.

9. Click *Download AWS root CA*. This will launch a new page

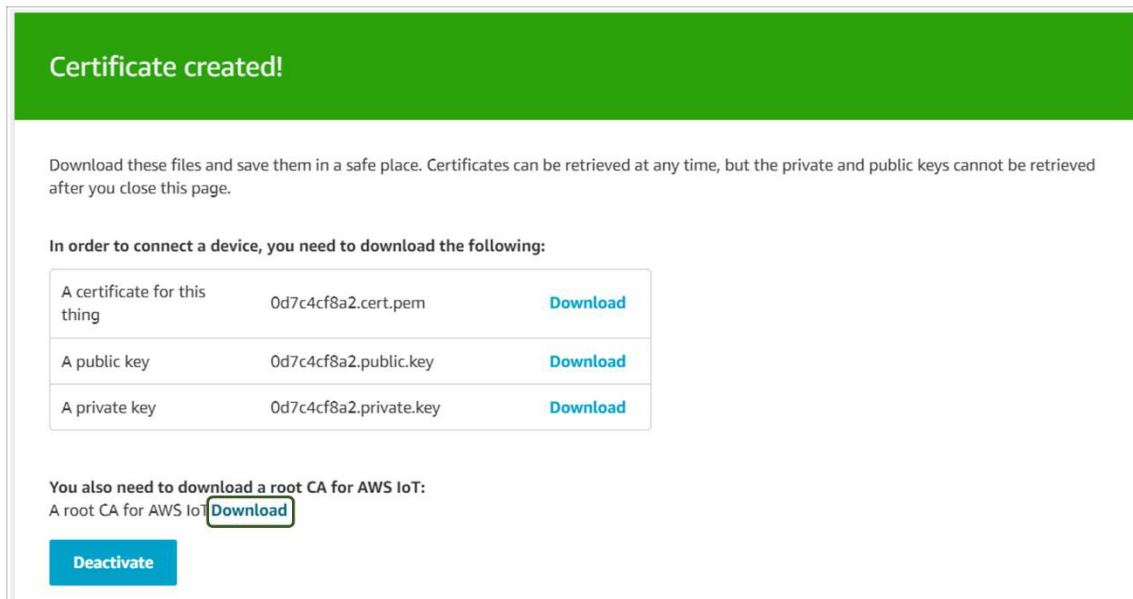


Figure 6.

10. Click **RSA 2048 bit key: Amazon Root CA 1**. A new page with the certificate information is launched

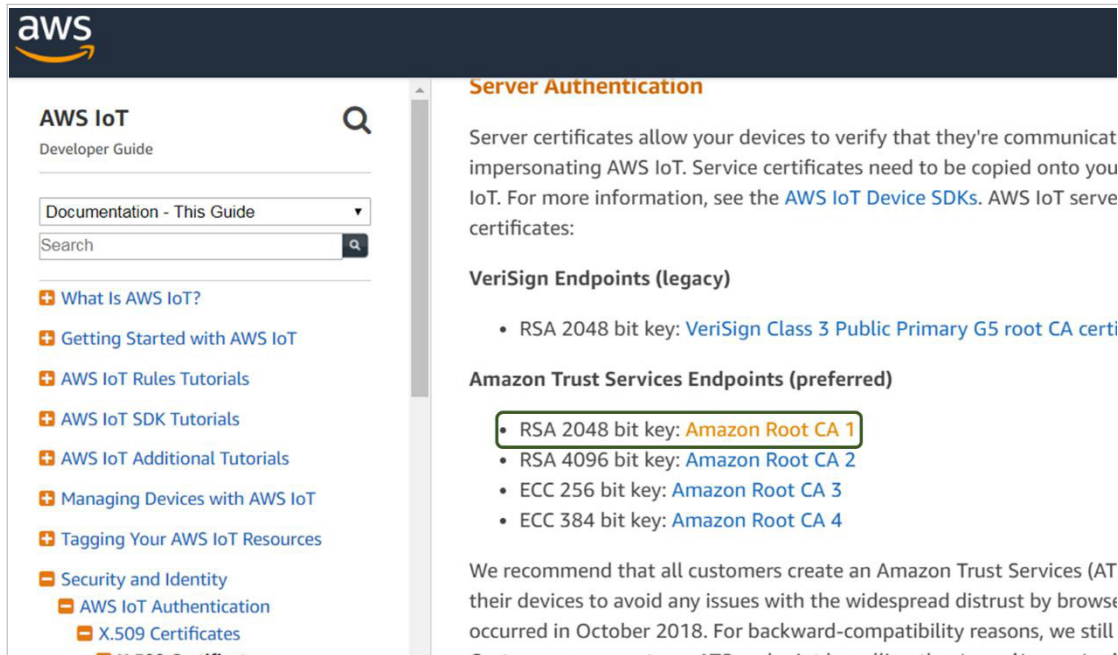


Figure 7.

11. Right click and save the certificate but with a “.cert” extension (Ex: certification shown below is saved as “AmazonRootCA1.cert”)

```
-----BEGIN CERTIFICATE-----
MIIDQTCCAimgAwIBAgITBmyfz5m/jAo54vB4ikPm1jZbyjANBgkqhkiG9w0BAQsF
ADA5MQswCQYDVQQGEwJVUzEPMA0GA1UEChMGQW1hem9uMRkwFwYDVQQDExBBbW
b24gUm9vdCBQSAxMB4XDTE1MDUyNjAwMDAwMFoXDTE4MDUyNjAwMDAwMFoTEl
MAkGA1UEBhMCVVMxDzANBgNVBAoTBkFtYXNjZXpjb250b3R5b250b3R5b250b3
b3QgQ0EgMTCCASIwDQYJKoZIhvcNAQEBBQADggEPADCCAQoCggEBALJ4gHHKEnXj
ca9HgFB0fW7Y14h29Jlo91ghYP10hAEvrAIThtOgQ3p0sqTQNr0Bvo3b5MgHFzZM
906II8c+6zf1tRn4SWiw3te5djdjgYZ6k/oI2peVKVuRF4fn9tBb6dNqcmzU5L/qw
IFAGbHrQgLKm+a/sRxmPUDgH3KKH0Vj4utWp+UhnMJbu1Hheb4mjUcAwmahRWa6
V0Ujw5H5SNz/0egwLX0tdHA114gk957EWW67c4cX8j3GKLhD+rCdqsq08p8kD1L
93FcXmn/6pUCyziKr1A4b9v7LWIbxcceV0F34GfID5yHI9Y/QCB/IIDEgEw+OyQm
jgSubJrIqg0CAwEAaANCMEEAwDwYDVR0TAQH/BAUwAwEB/zA0BgNVHQ8BAf8EBAMC
AYYwHQYDVR0OBBYEFiQYzIU07LwM1JQuCFmcx7IQTgoIMA0GCSqGSIb3DQEBCwUA
A4IBAQC8jdaQZChGsV2USggNiM0ruYou6r41K5IpDB/G/wkjUu0yKGX9rbxenDI
U5PMCCjjmCXPI6T53iHTfIUJrU6adTrCC2qJehZERxh1bI18jJt/msv0tadQ1wUs
N+gDS63pYaACbvXy8MwY7Vu33PqUXHeeE6V/Uq2V8viTO96LXFvKW1JbYK8U90vv
o/uFqJVtMVT8QtPHRh8jrdkPSHCa2XV4cdFyQzR1b1dZwgJcJmApzyMZFo6IQ6XU
5MsI+yMRQ+hDKXJioa1dXgJUKK642M4UwtBV8ob2xJNDd2ZhwLnoQdeXeGADbkpy
rQXRfboQnoZsG4q5WTP468SQvvG5
-----END CERTIFICATE-----
```

Figure 8.

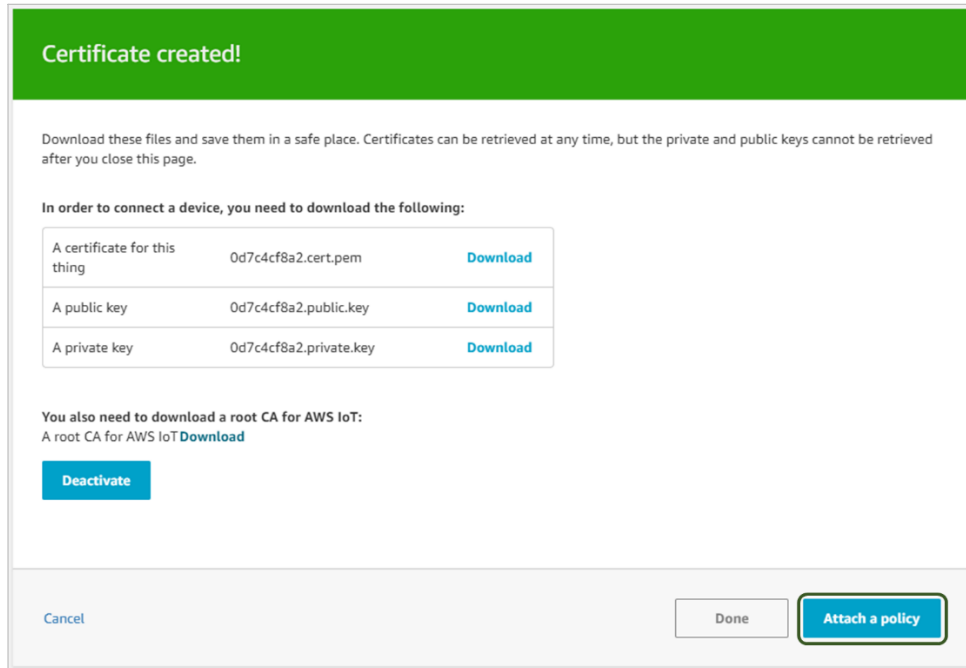
12. Click *Attach a policy*

Figure 9.

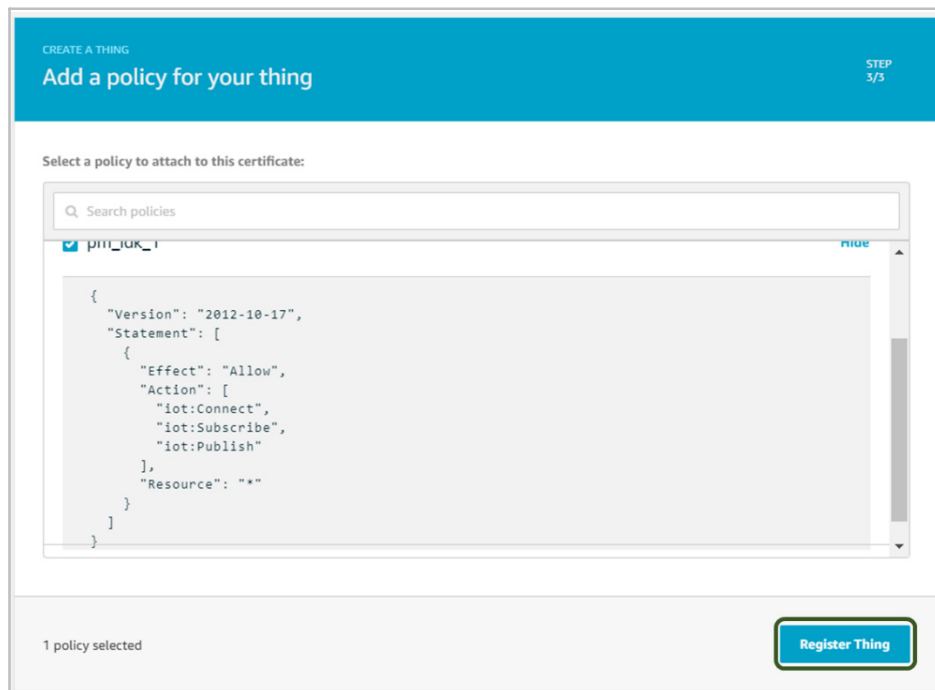
13. Select an existing policy that's applicable to this device and click *Register Thing*. If you don't have any existing policy, click *Register Thing*. (Policy can be added later and is covered below). The newly created thing will be shown on the AWS IoT page

Figure 10.

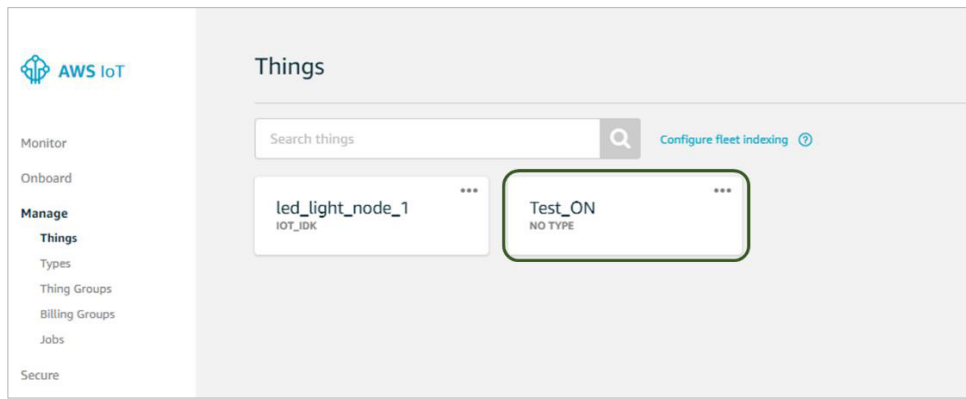


Figure 11.

14. Click the newly created Thing (Ex: Test\_ON) and navigate to the Interact tab and make a note of the API endpoint as shown below

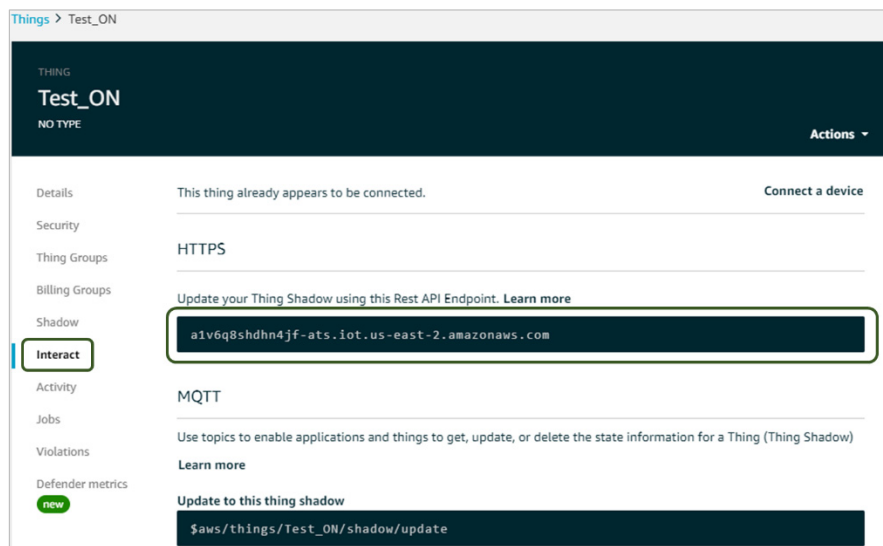


Figure 12.

The AWS IoT Core is now setup and in the next section, following the optional policy creation section, configuring the mobile app with the AWS credentials will be discussed.



### Policy Creation (Skip this Step if You've already Assigned a Policy)

- Select *Policies* under *Secure* on the left pane and create a new policy

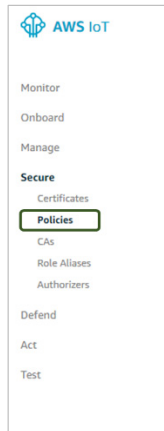


Figure 13.

- An example policy is shown below:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "iot:Connect",
        "iot:Subscribe",
        "iot:Publish"
      ],
      "Resource": "*"
    }
  ]
}
```

Figure 14.

- For additional information on policies, refer to <https://docs.aws.amazon.com/iot/latest/developerguide/iot-policies.html>
- Click the newly created device (Test\_ON in this case) and follow the below steps to attach the newly created policy

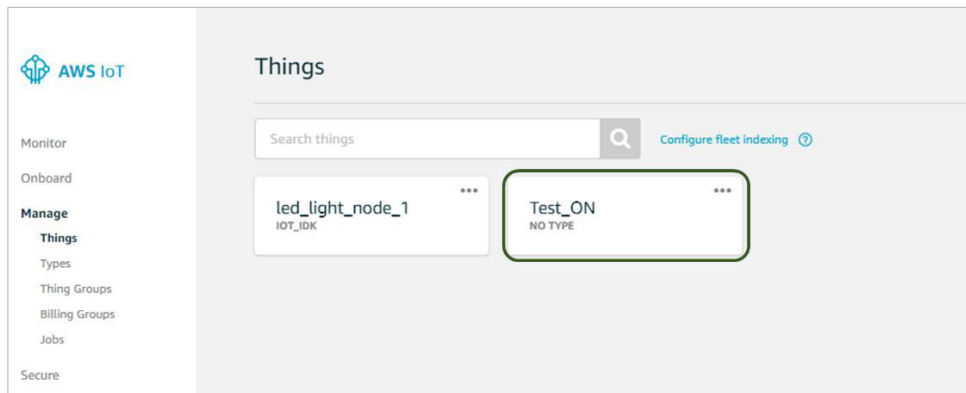


Figure 15.

- Click the certificate

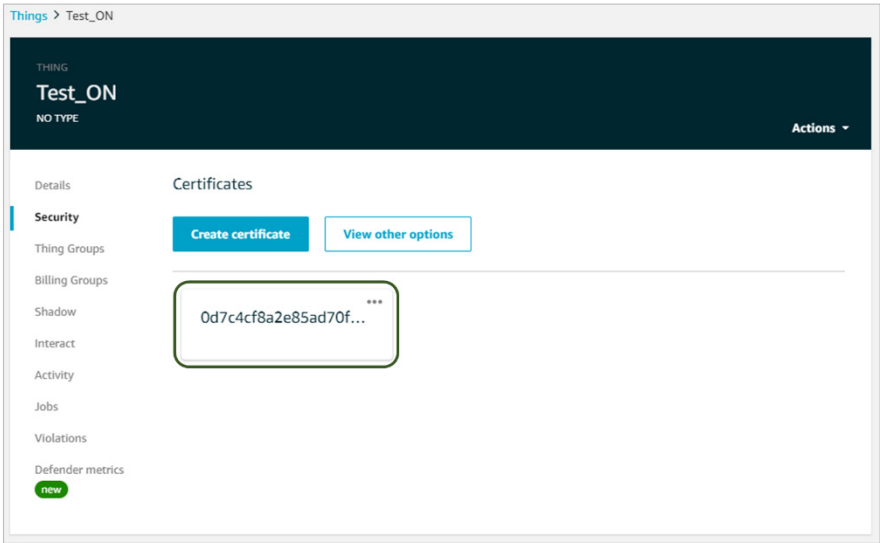


Figure 16.

- Attach the newly created policy as shown below

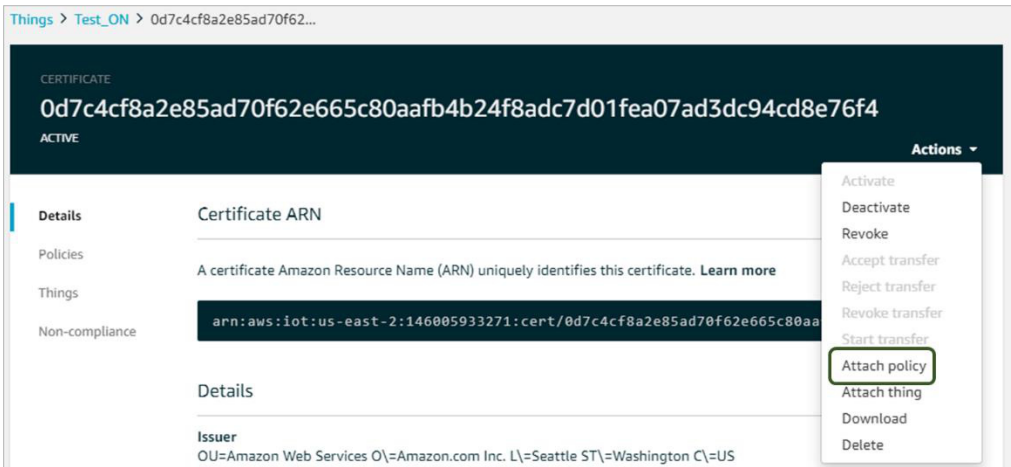


Figure 17.

## ANDROID APPLICATION CONFIGURATION

## 15. Start the Android App

- On the main page of the App, tap on the Settings icon as shown below
- On the settings page tap on the Manage Brokers settings
- Tap on the '+' symbol on the bottom of the screen
- Tap on the add broker setting denoted by '+'
- Select Generic Broker and tap Next

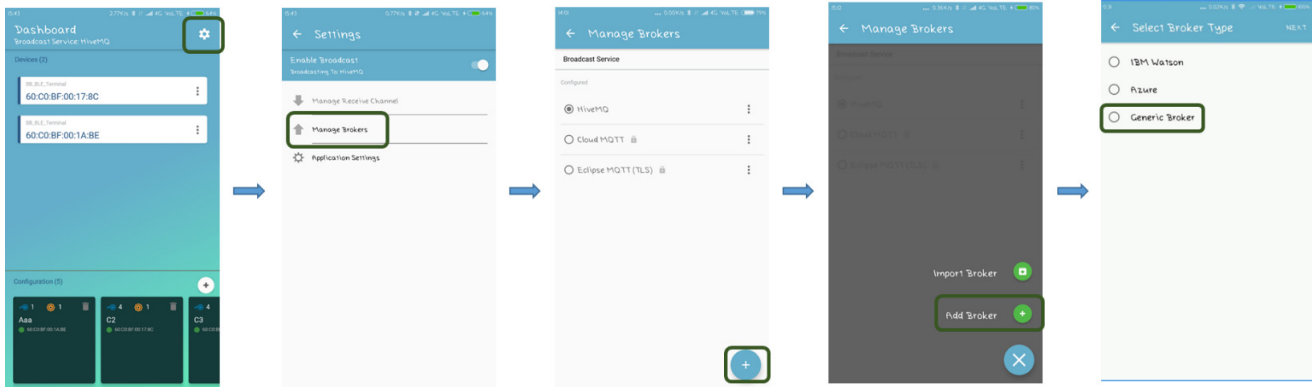


Figure 18.

16. Populate the Fields with the values shown below

- Client name: Any text string
- Device ID: *Enter the Name of the Thing* (generated in step 6)
- Protocol: *Choose SSL*
- URL: *Enter the URL from Step 14*  
(Ex: a1v6q8shdhn4jf-ats.iot.us-east-2.amazonaws.com)
- Port No: 8883
- Username: Leave it blank
- Password: Leave it blank
- Select SSL Certificate
- Select Self Signed Certificates

Figure 19.

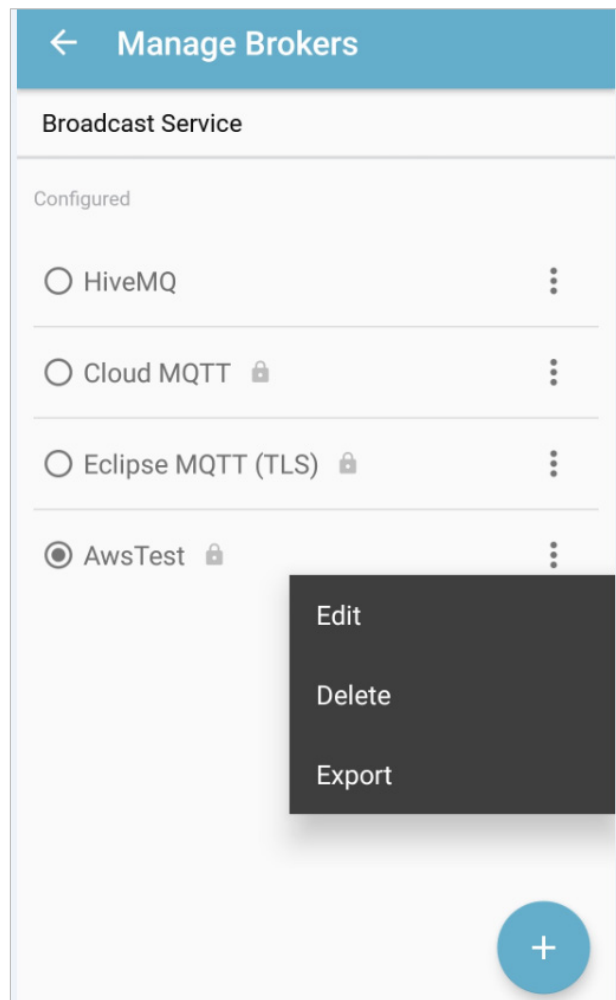
- **IMPORT CA CERTIFICATE:** From Step 11 (Amazon's Root CA)
- **IMPORT CLIENT CERTIFICATE:** The certificate for this thing (from step 8, \*certificate.pem.crt)
- **IMPORT CLIENT KEY:** Private key for the thing (from step 8, \*private.pem.key)
- Click **SAVE** to Validate the connection

Figure 20.

Once the broker is successfully verified, the app is ready to communicate with the AWS IoT core.

**Editing an Existing Broker**

17. In order to edit a previously saved broker, click edit on the broker entry as shown below.



**Figure 21.**

## IOS APPLICATION CONFIGURATION

18. Start the iOS App
  - a. On the main page of the App, tap on the Settings icon and then on Manage Broker
  - b. Tap on the '+' symbol on the bottom of the screen
  - c. Tap on the add broker setting denoted by '+'
  - d. Select Generic Broker and tap Next
  - e. Alternatively users can tap on import broker and load compatible saved configuration in the phone

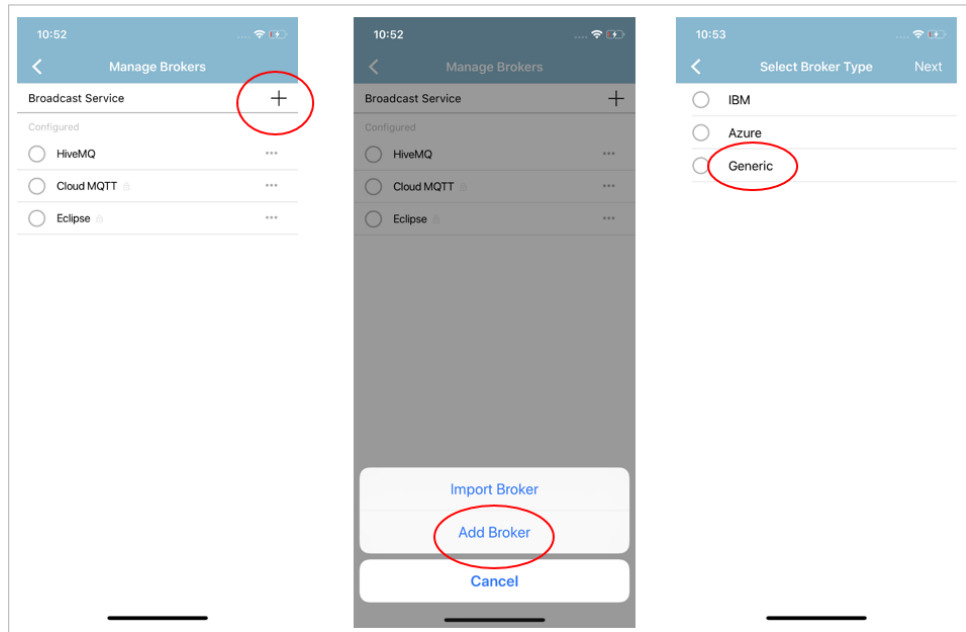


Figure 22.

19. Populate the Fields with the values shown below

- Client name: Any text string
- Device ID: *Enter the Name of the Thing* (generated in step 6)
- Protocol: *Choose SSL*
- URL: *Enter the URL from Step 14*  
(Ex: a1v6q8shdhn4jf-ats.iot.us-east-2.amazonaws.com)
- Port No: 8883
- Username: Leave it blank
- Password: Leave it blank
- Select SSL Certificate
- Select Self Signed Certificates

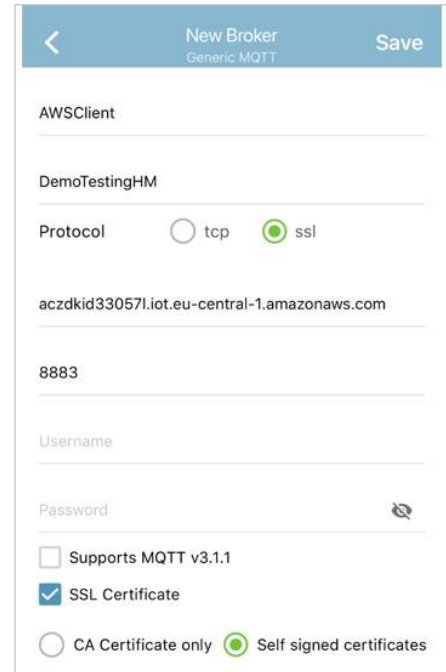


Figure 23.

- **IMPORT CA CERTIFICATE:** From Step 11 (Amazon's Root CA)
- **IMPORT CLIENT CERTIFICATE:** The certificate for this thing (from step 8, \*certificate.pem.crt)
- **IMPORT CLIENT KEY:** Private key for the thing (from step 8, \*private.pem.key)
- Click **SAVE** to Validate the connection



Figure 24.

Once the broker is successfully verified, the app is ready to communicate with the AWS IoT core.

## Editing an Existing Broker

20. In order to edit a previously saved broker, click edit on the broker entry as shown below

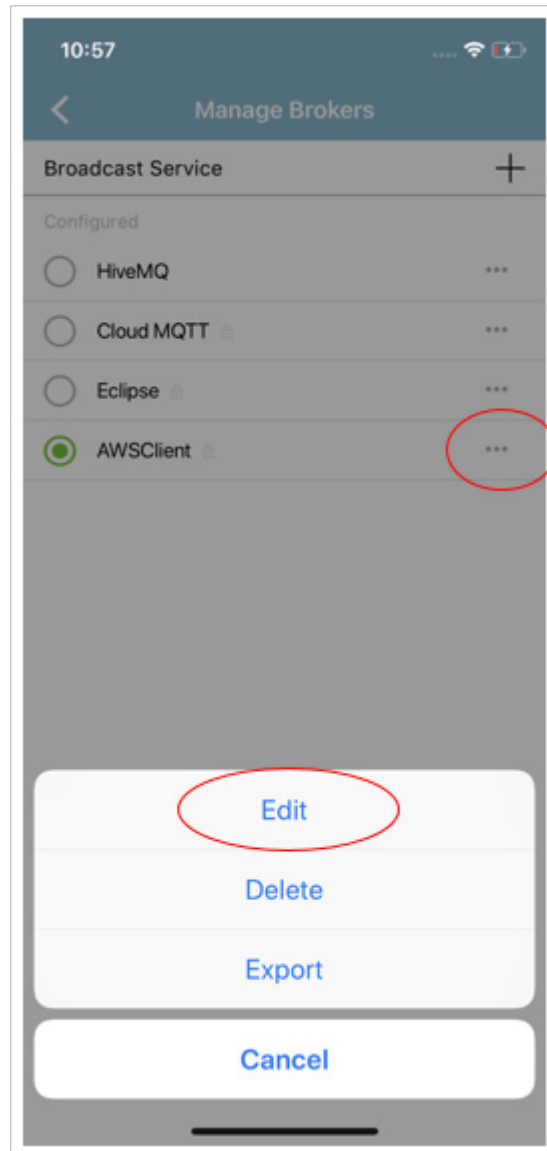



Figure 25.

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