Type1LD AWS IoT Core Quick Start Guide

Document Number: N1-5284
Version: 1.0
Release Date: 2020/6/1

Murata Manufacturing Co., Ltd.

Revision History

Revision Number	Release Date	Comments
Revision 1.0	2020/6/1	Initial

Contents

1. About this Document

1.1. Purpose and Scope

This document provides instructions to communicate with AWS IoT Core on Murata Type1LD EVB.

1.2. Prerequisites

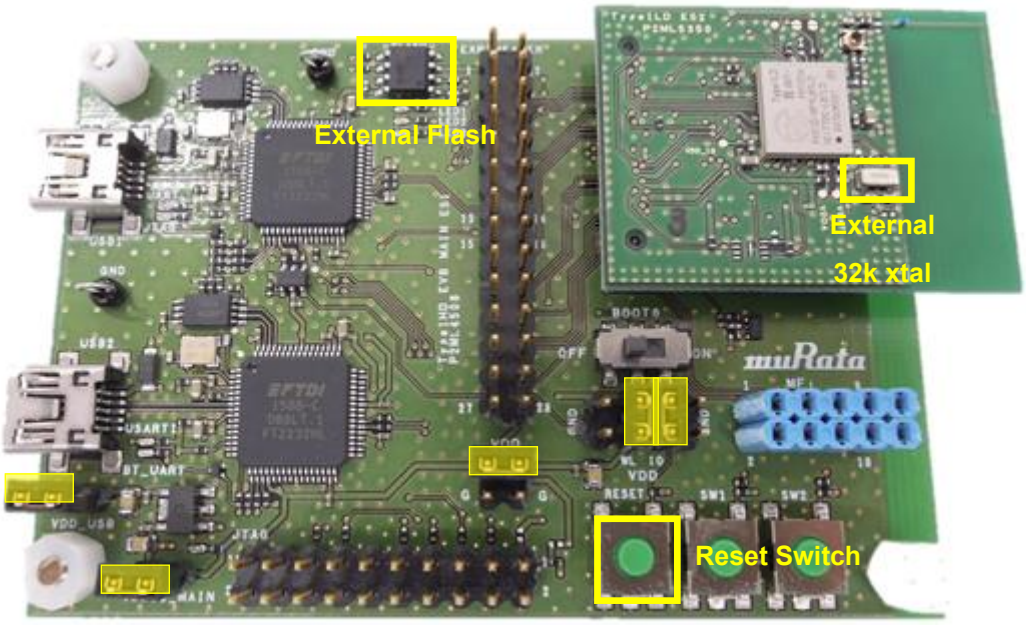
In this guide, it is assumed that you are familiar with WICED SDK. You do not need to be a WICED master, but if you do not know these things, please check Type1LD Evaluation Board Quick Start Guide before moving forward.

- How to create new MakeTarget on WICED SDK
- How to run snip.scan example application on Type1LD EVB
- How to see UART output from snip.scan example application onTera Term, Putty, etc.

It is also assumed that you have AWS account and you can access AWS IoT Console.

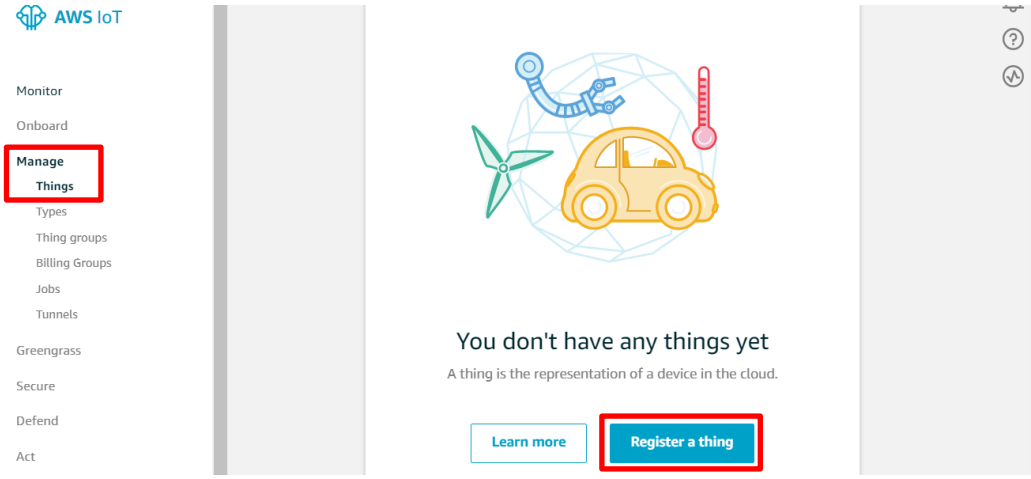
2. Evaluation Board

Verify pin setting for correct operation as below.

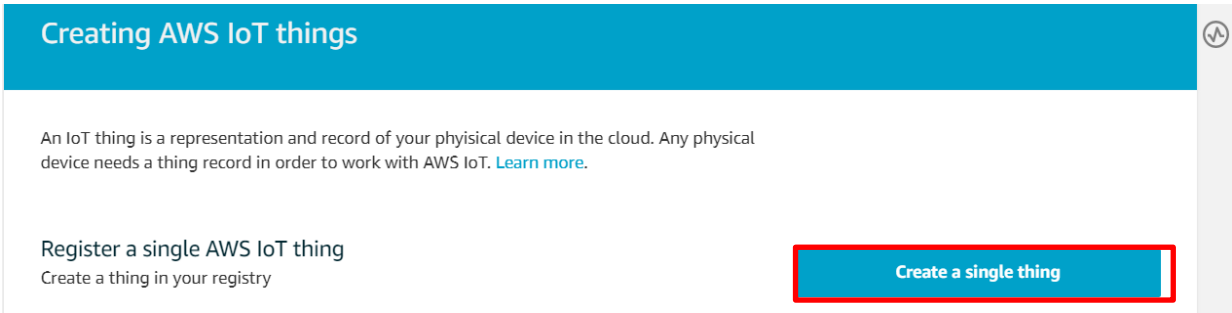


3. Setting up AWS IoT Core

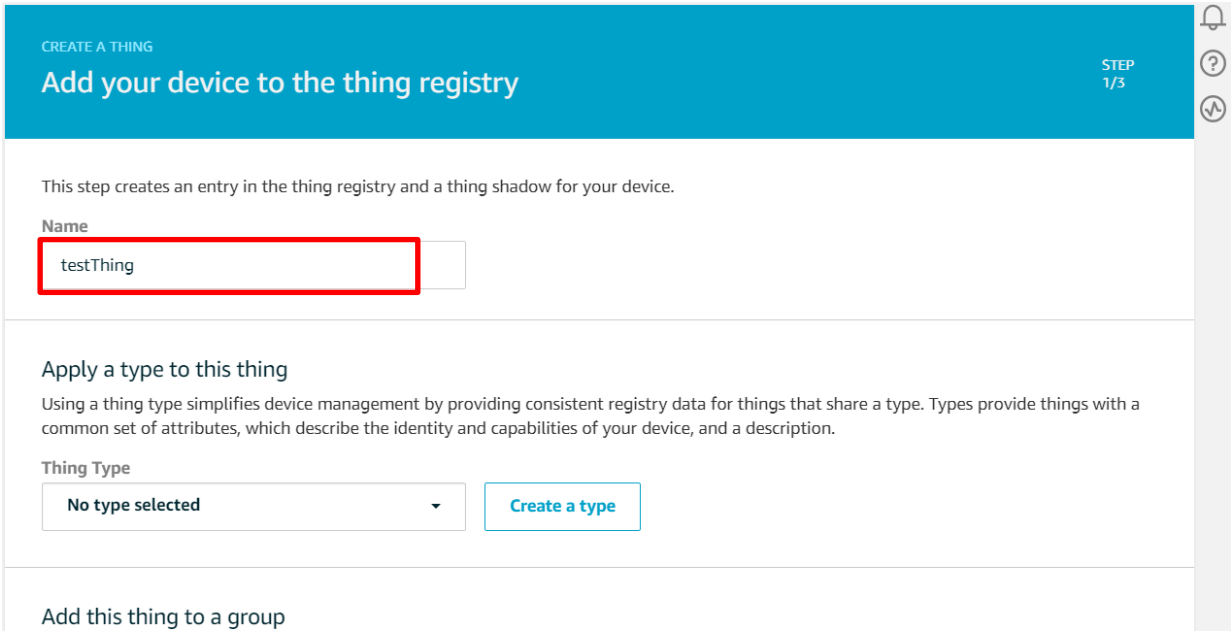
A. Visit AWS IoT Core Console and select Manage - Things from the left menu, then click Register a thing button.



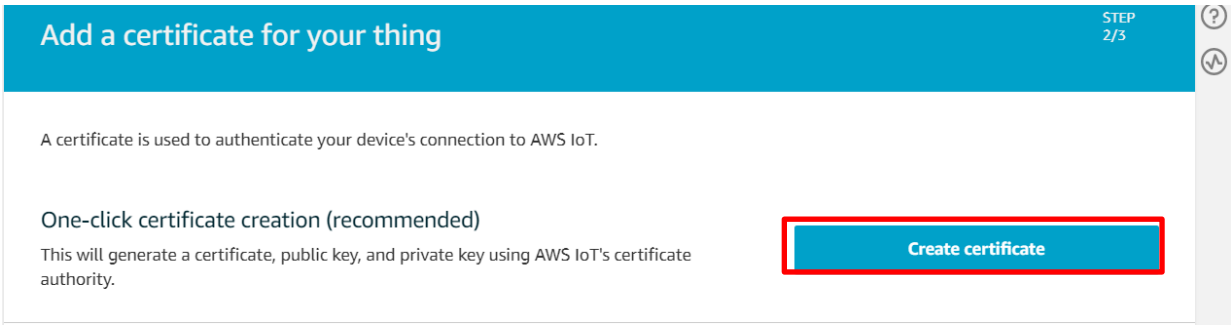
B. Click Create a single thing button.



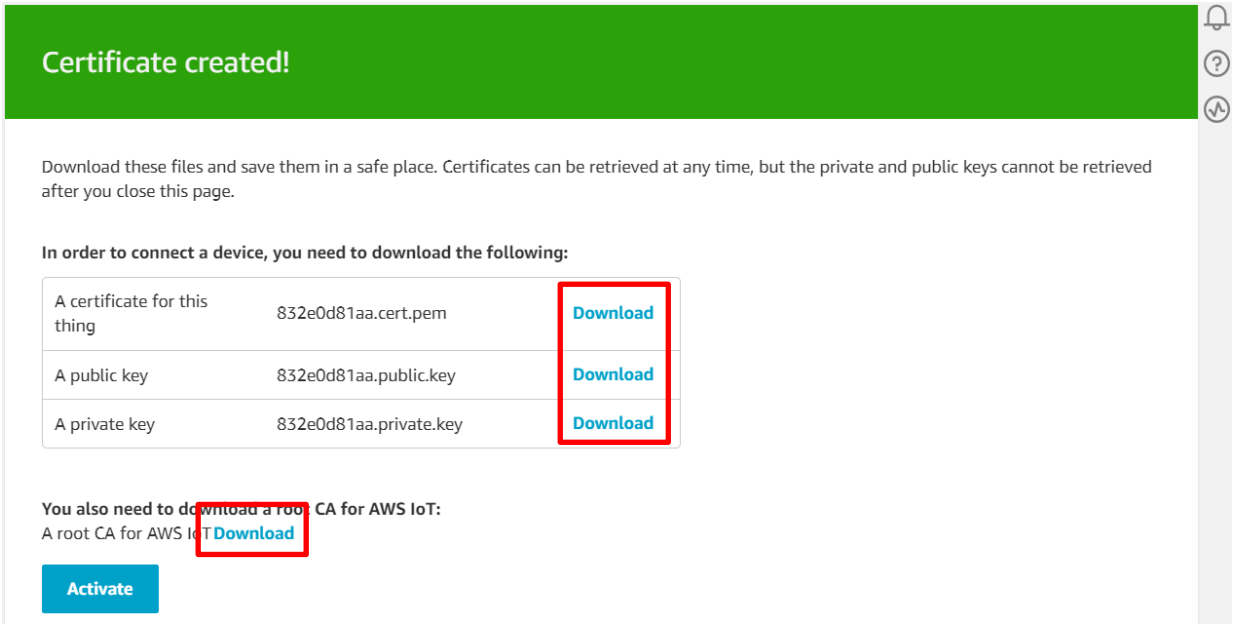
C. Type “testThing” in the Name filed, then scroll down and click Next button.



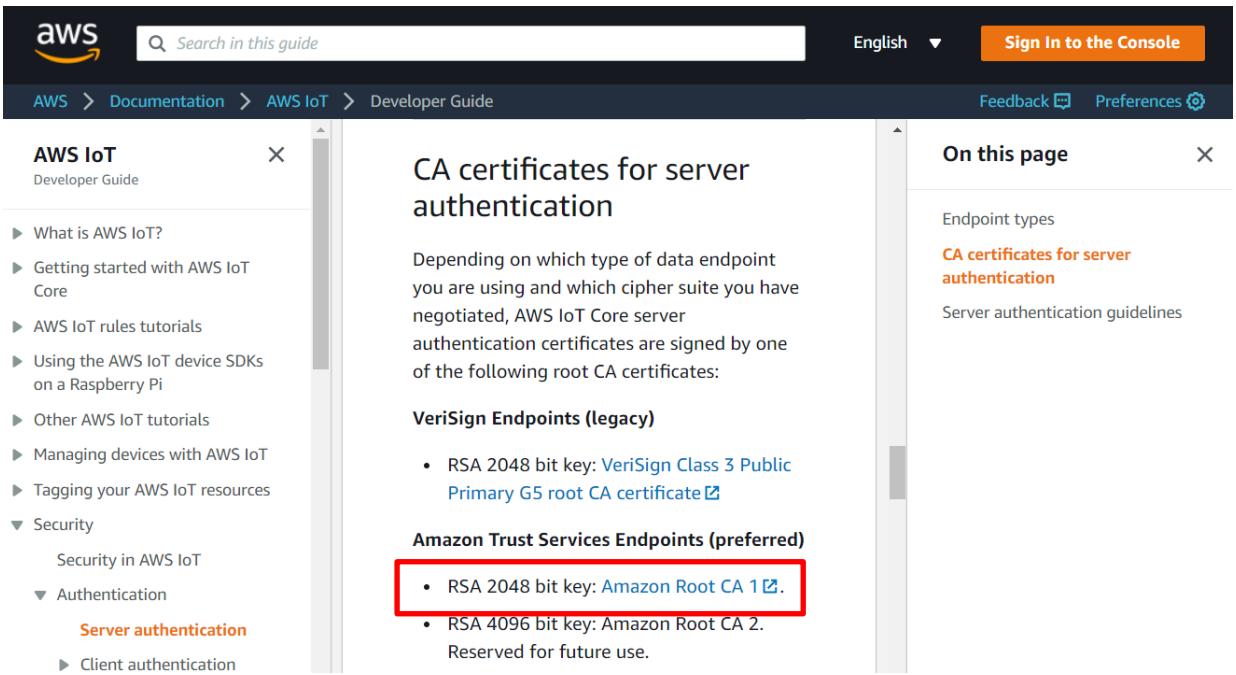
D. Click Create certificate button



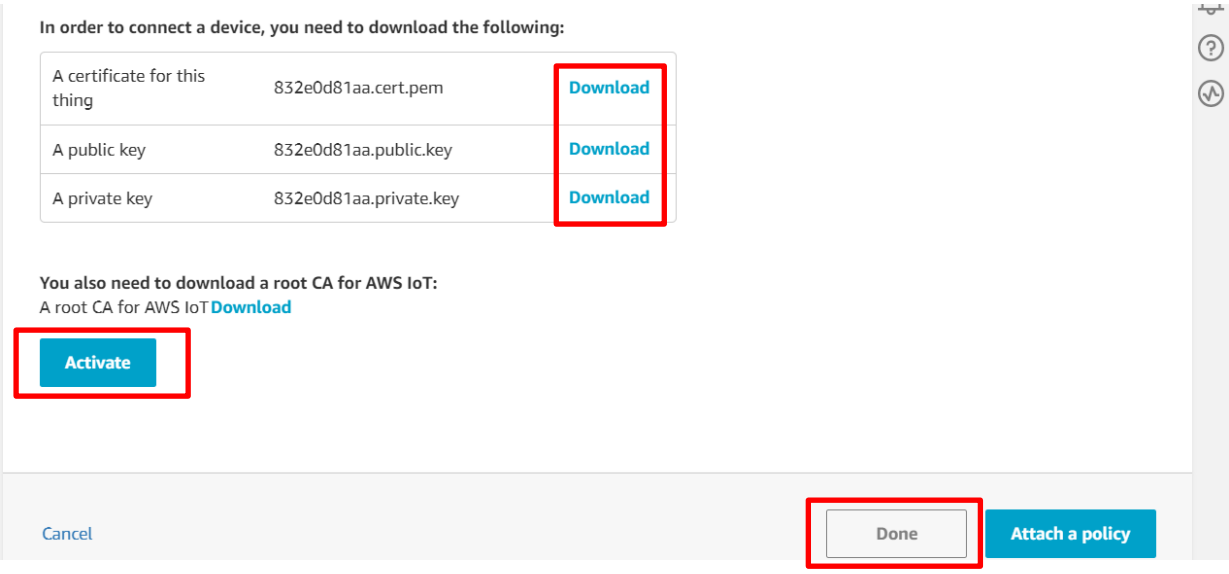
E. Download all of files and save them in a safe place. **Make sure that you download private key and public key** as they cannot be retrieved after you close this page.



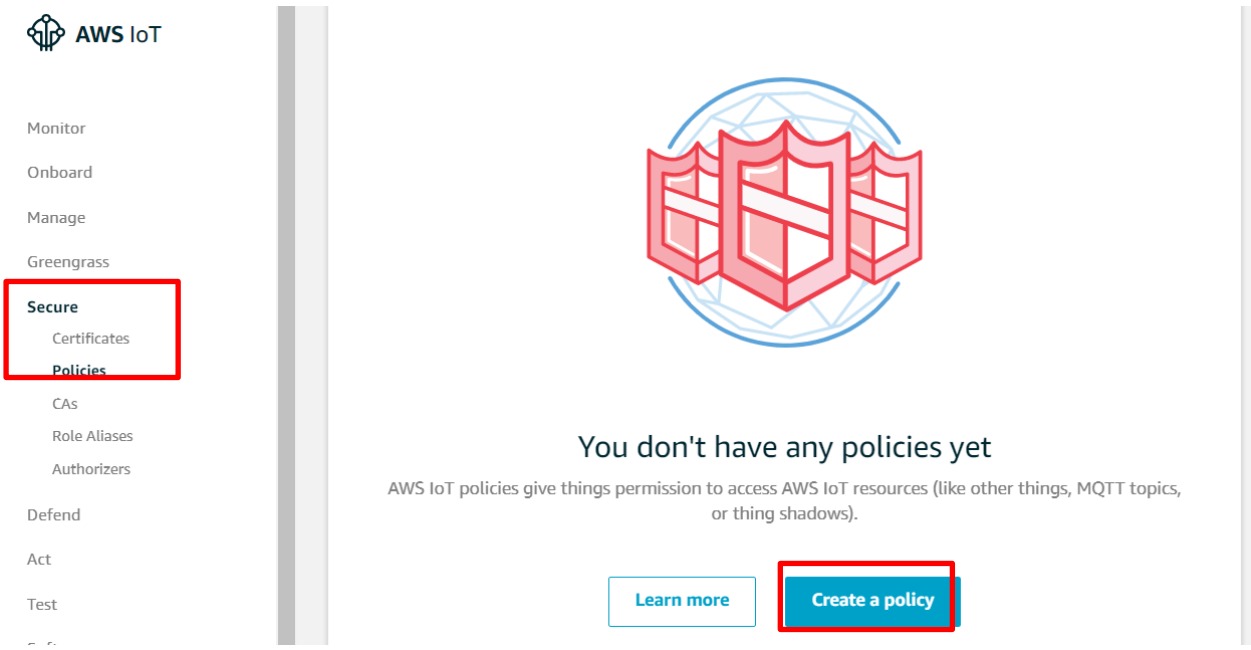
F. Regarding root CA for AWS IoT, download RSA 2048 bit key: Amazon Root CA 1.



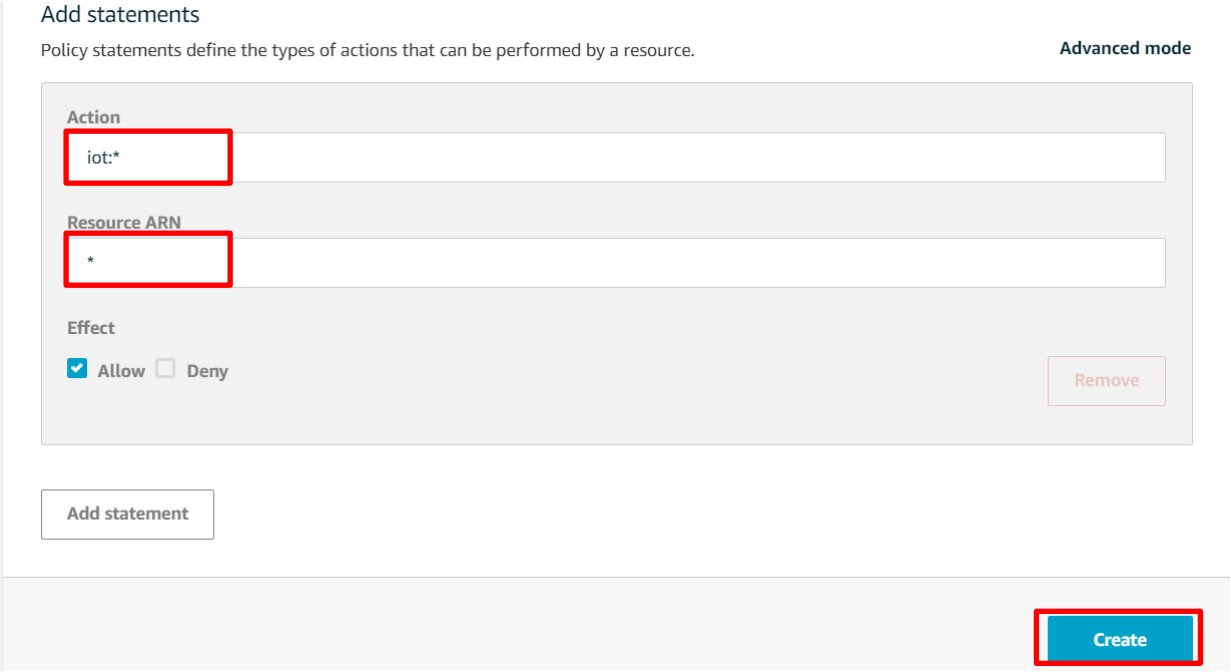
G. After making sure you have downloaded private key and public key (and certificate and Amazon root CA), scroll down and click Activate button, then click Done button.



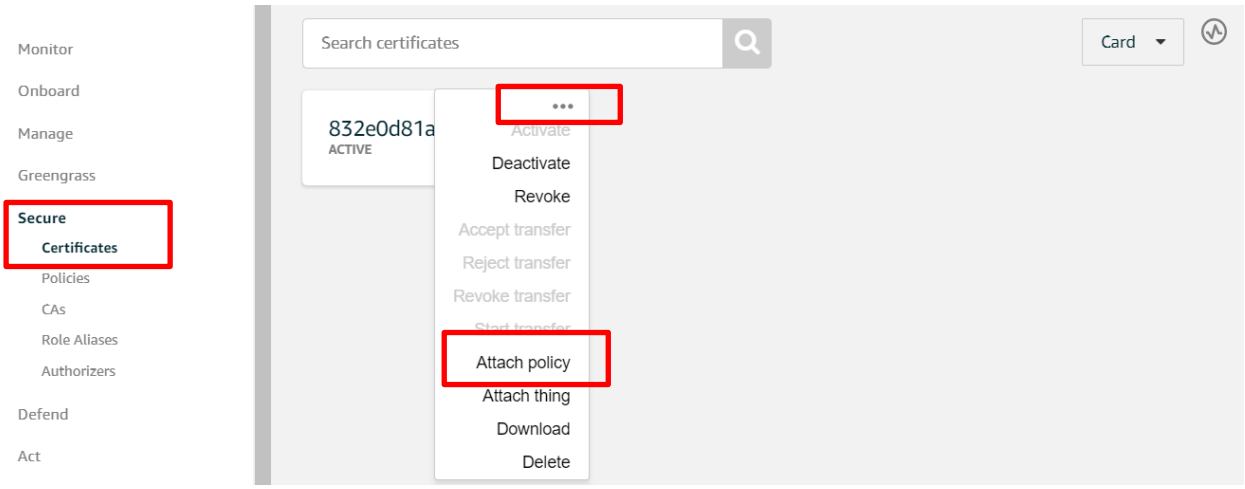
H. Select Secure - Policies from left menu and click Create policy button.



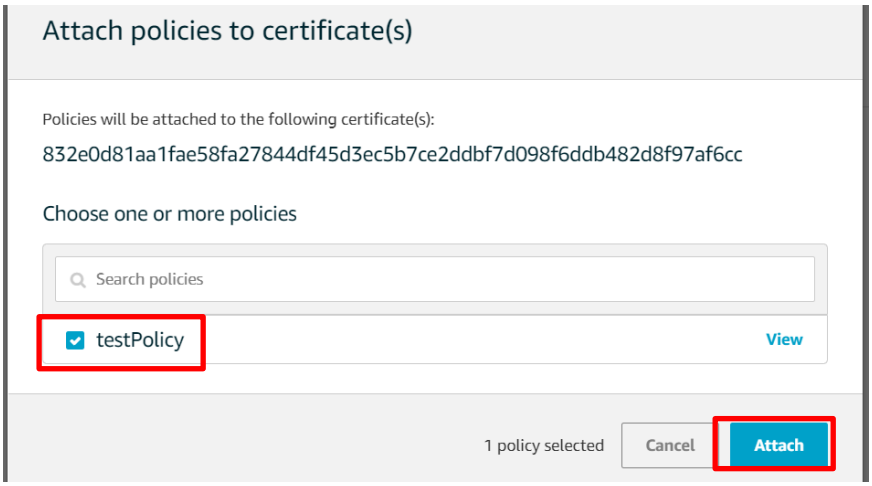
I. Type “iot:*” in the Action filed, “*” in the Resource ARN field, check Allow and click Create button.



J. Click Secure - Certificates from left menu then click three dots menu on your certificate, and then click Attach policy.



K. Check testPolicy you just created and click Attach button.



4. Setting up Certificate Files for WICED

You have module certificate and Amazon certificate in previous section "3. Setting up AWS IoT Core". Rename these files to fit with WICED configuration and place them in the appropriate folder as below.

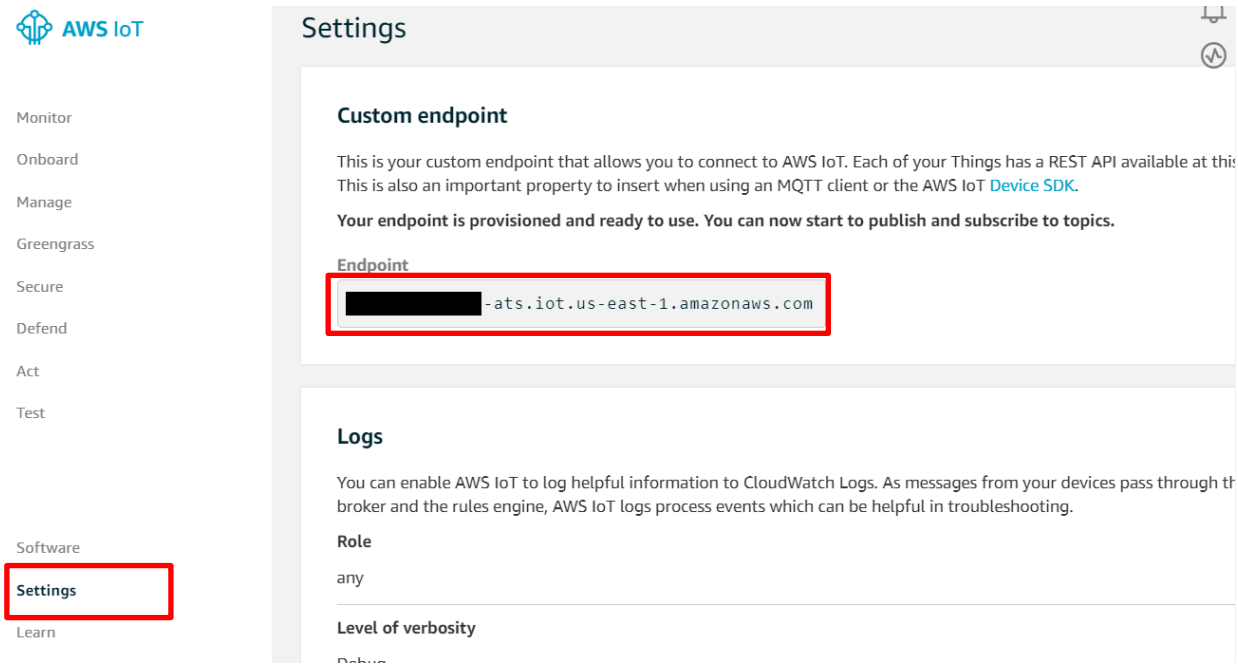
*You must have unique characters for xxxxxxxxxx.

File	Rename to	Location
AmazonRootCA1.pem	rootca.cer	• 43xxx_Wi-Fi\resources\apps\aws\iot
xxxxxxxxxx-private.pem.key	privkey.cer	• 43xxx_Wi-Fi\resources\apps\aws\iot\publisher • 43xxx_Wi-Fi\resources\apps\aws\iot\subscriber
xxxxxxxxxx-certificate.pem.crt	client.cer	• 43xxx_Wi-Fi\resources\apps\aws\iot\publisher • 43xxx_Wi-Fi\resources\apps\aws\iot\subscriber

Note: WICED folder is at "C:\Users\<user name>\Documents\WICED-Studio-<VERSION>" with default installation.

5. Checking Your AWS Endpoint

Visit AWS IoT Core Console and select Settings from the left menu, then copy the Endpoint. You need this in later sections.



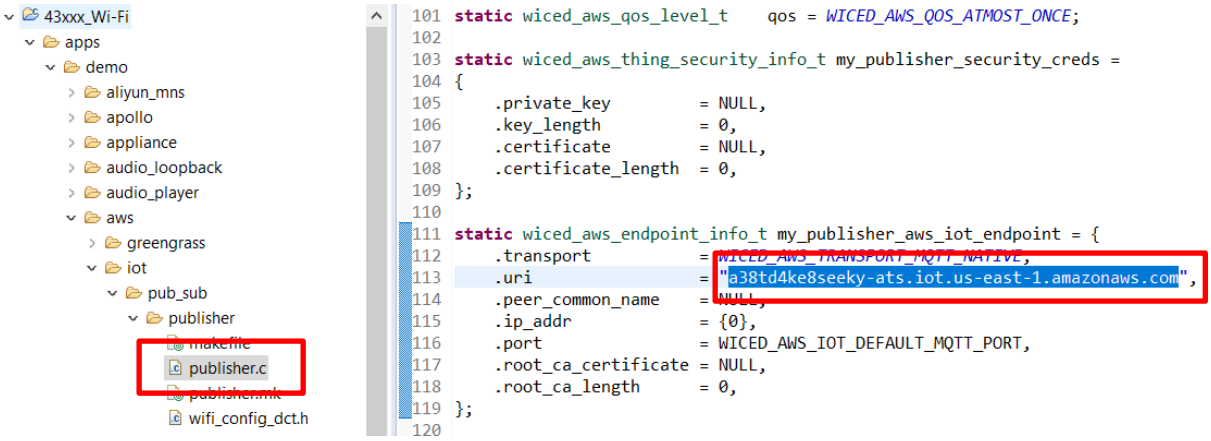
6. Running Applications

6.1. Running Publisher Application

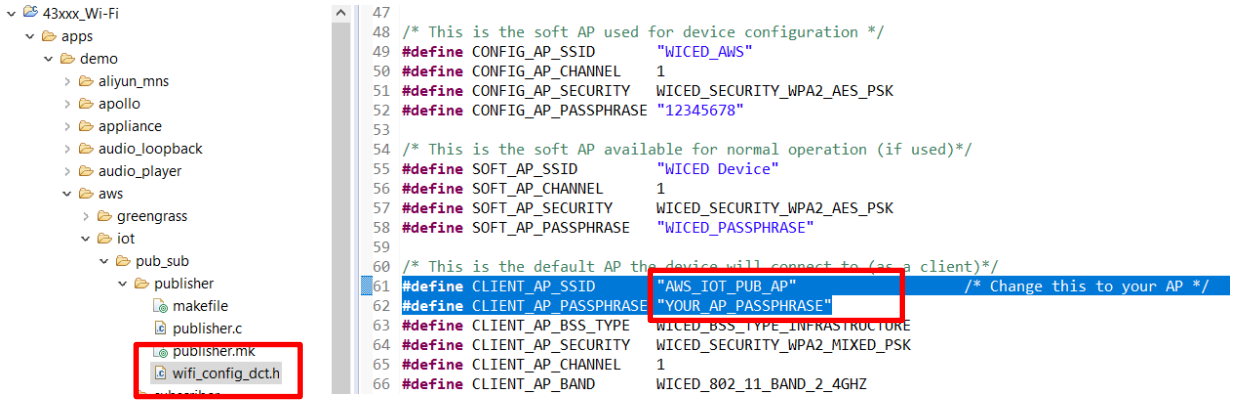
This is Wirelss Wall Switch example which publishes messages as “WICED_BULB” topic when you push SW1.

A) Open WICED IDE

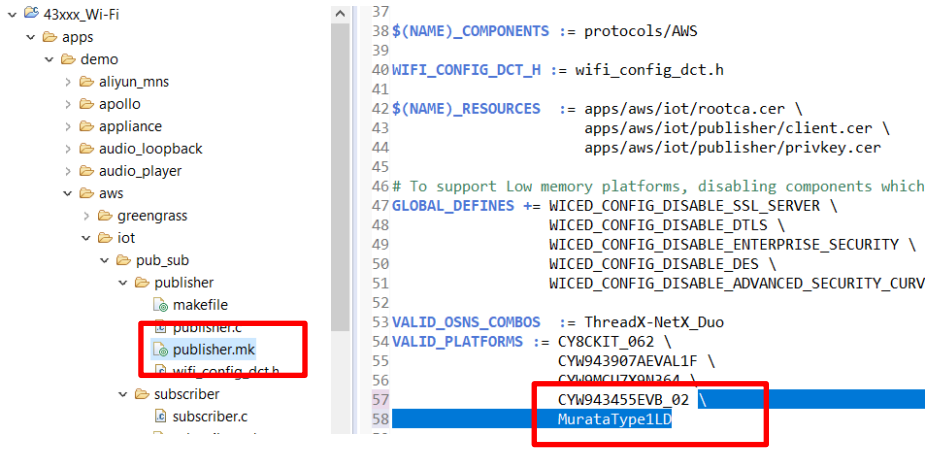
B) Open 43xxx_Wi-Fi\apps\demo\aws\iot\pub_sub\publisher\publisher.c and update the endpoint with yours. If you do not know your endpoint, please check “5. Checking Your AWS Endpoint”.



C) Open 43xxx_Wi-Fi\apps\demo\aws\iot\pub_sub\publisher\wifi_config_dct.h and update CLIENT_AP_SSID, CLIENT_AP_PASSPHRASE and CLIENT_AP_SECURITY to match with your access point you will use.

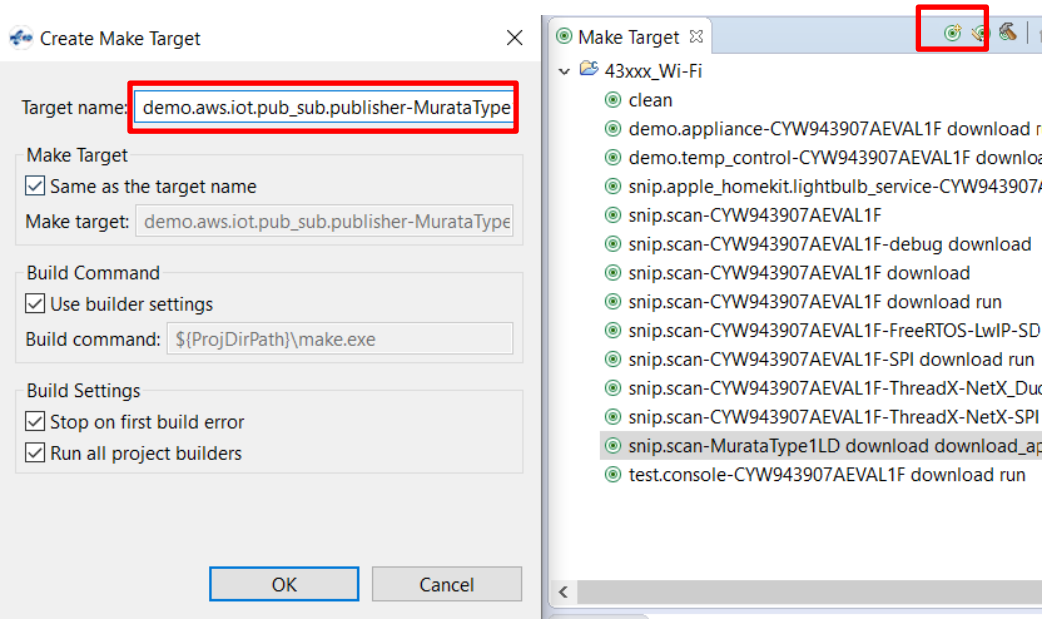


D) Open 43xxx_Wi-Fi\apps\demo\aws\iot\pub_sub\publisher\publisher.mk and add MurataType1LD as a VALID_PLATFORMS.



E) Click New Make Target button and create new Make Target as below

demo.aws.iot.pub_sub.publisher-MurataType1LD download download_apps run

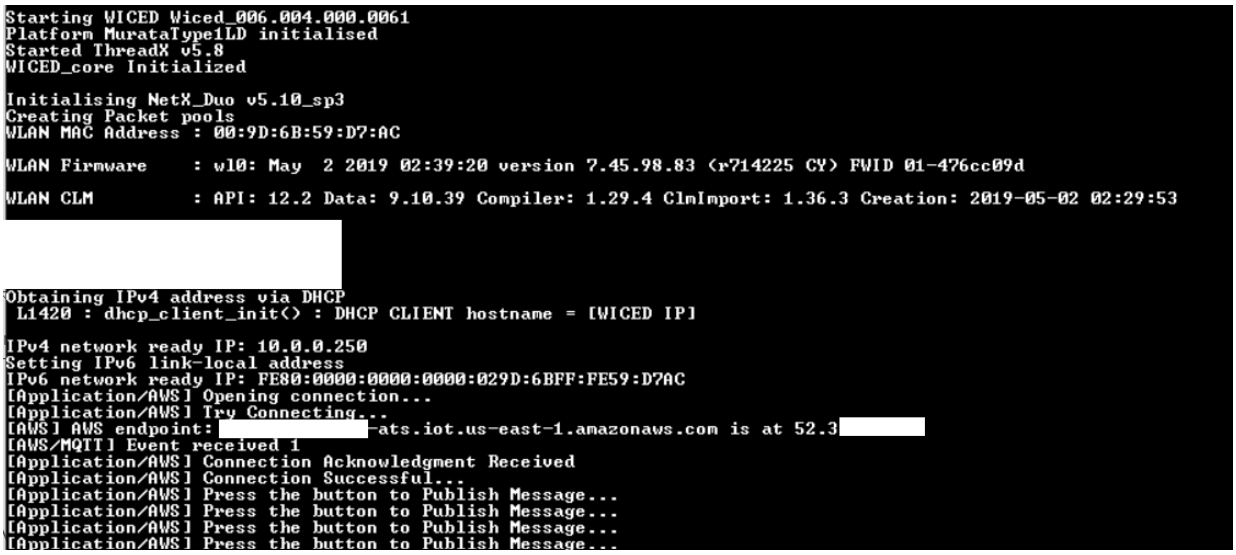


F) Double click “clean” from the Make Target to make sure you will have the latest files included.

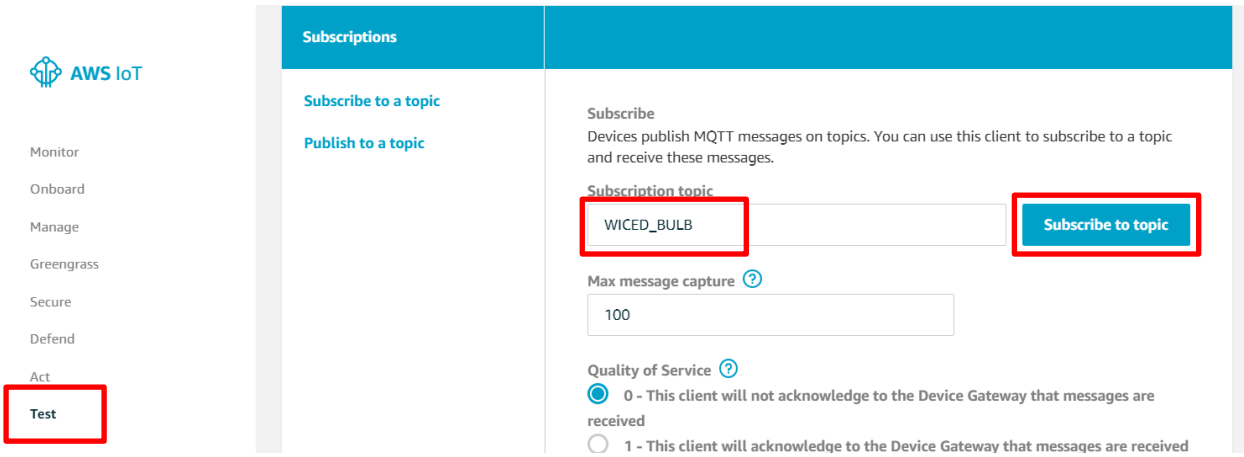
G) Double click the Make Target you just created.

H) While you are waiting the build to complete, open your appropriate COM port with terminal tool such as TeraTerm and set baud rate as 115200bps

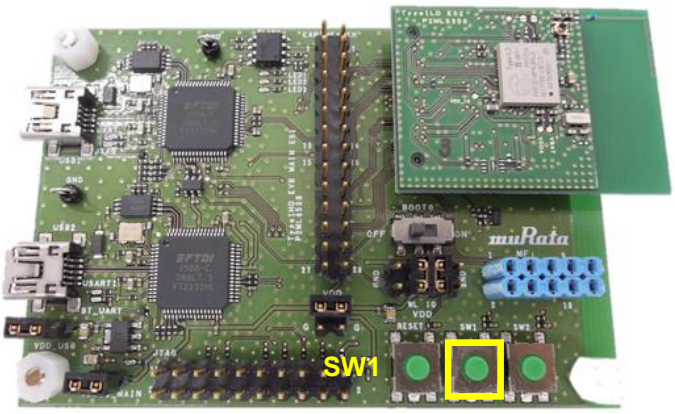
I) Wait for a while to complete the build, then you will see Connection Successful message as below.



J) Visit AWS IoT Core Console and select Test from the left menu, then type "WICED_BULB" in the Subscripton topic field, then click Subscribe to topic button.



K) Push SW1 on 1LD EVB.



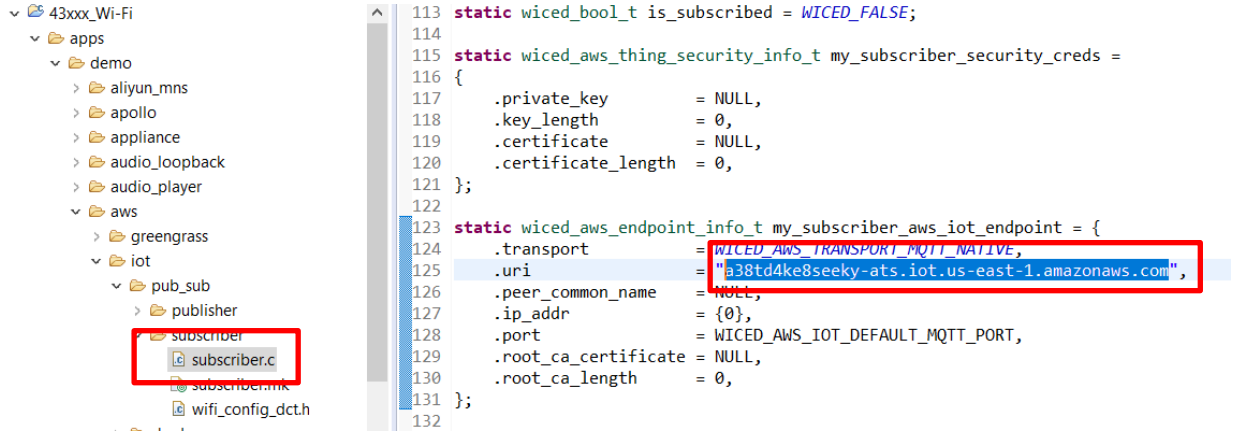
L) You will see "LIGHT ON"/"LIGHT OFF" messages on your browser.

6.2. Running Subscriber Application

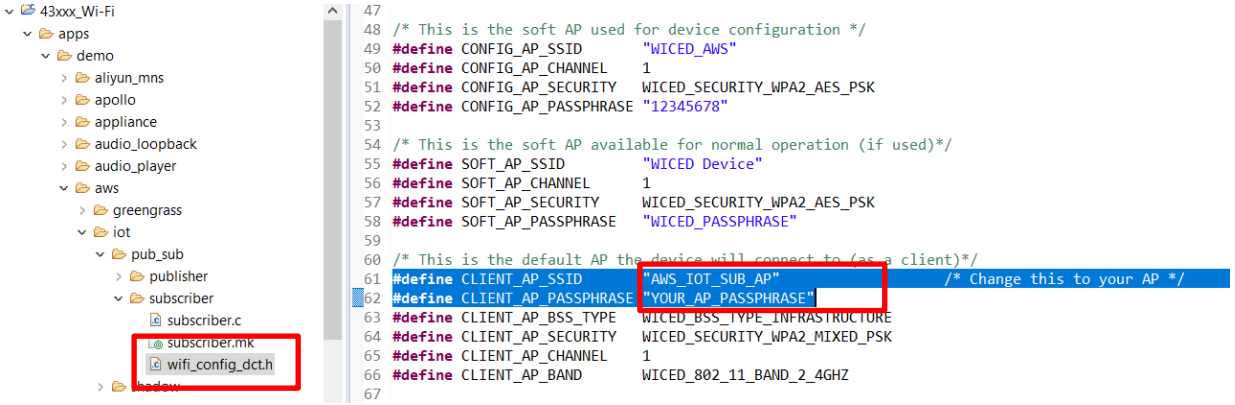
This is Wirelss Light Buld example which subscribes “WICED_BULB” topic and turn on/off LED1.

A) Open WICED IDE

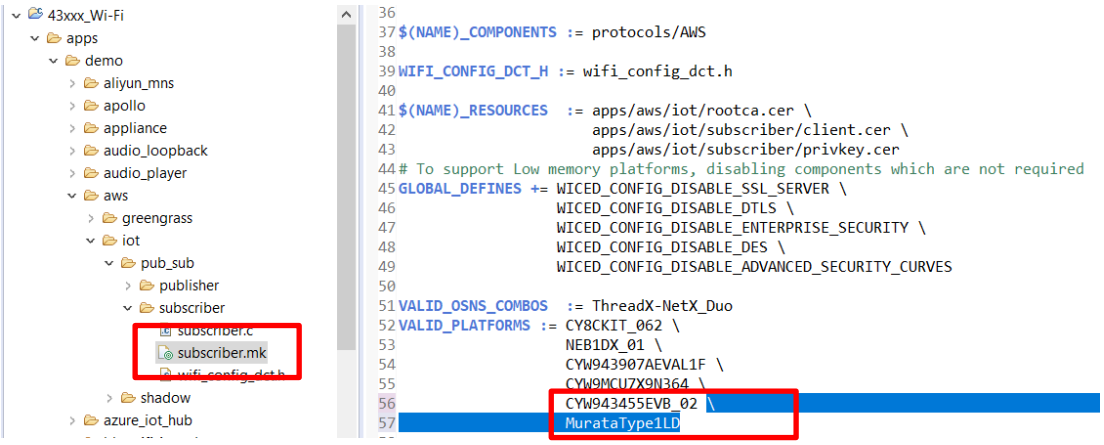
Open 43xxx_Wi-Fi\apps\demo\aws\iot\pub_sub\subscriber\subscriber.c and update the endpoint with yours. If you do not know your endpoint, please check “5. Checking Your AWS Endpoint”.



B) Open 43xxx_Wi-Fi\apps\demo\aws\iot\pub_sub\subscriber\wifi_config_dct.h and update CLIENT_AP_SSID, CLIENT_AP_PASSPHRASE and CLIENT_AP_SECURITY to match with your access point you will use.

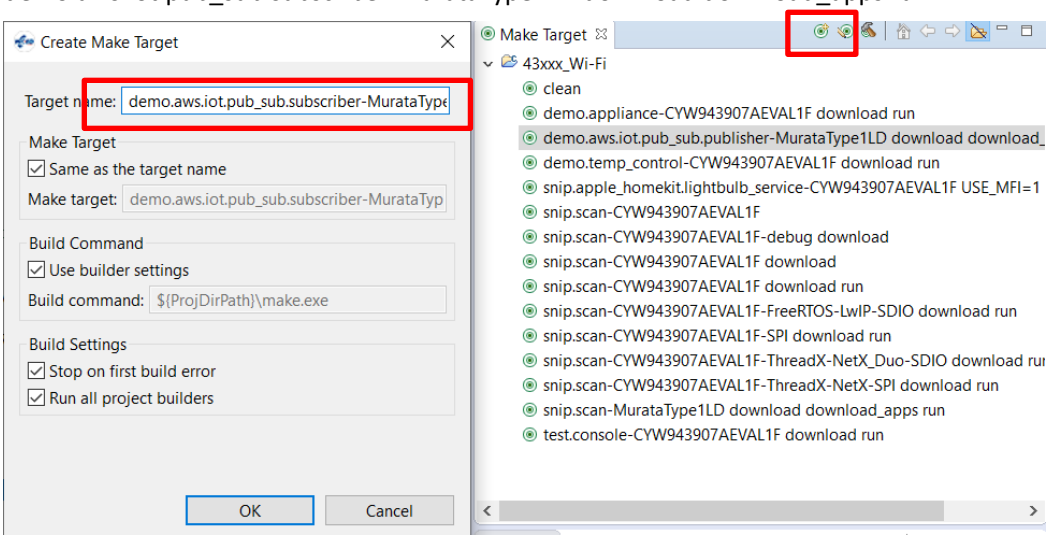


C) Open 43xxx_Wi-Fi\apps\demo\aws\iot\pub_sub\subscriber\subscriber.mk and add MurataType1LD as a VALID_PLATFORMS.



D) Click New Make Target button and create new Make Target as below

demo.aws.iot.pub_sub.subscriber-MurataType1LD download download_apps run

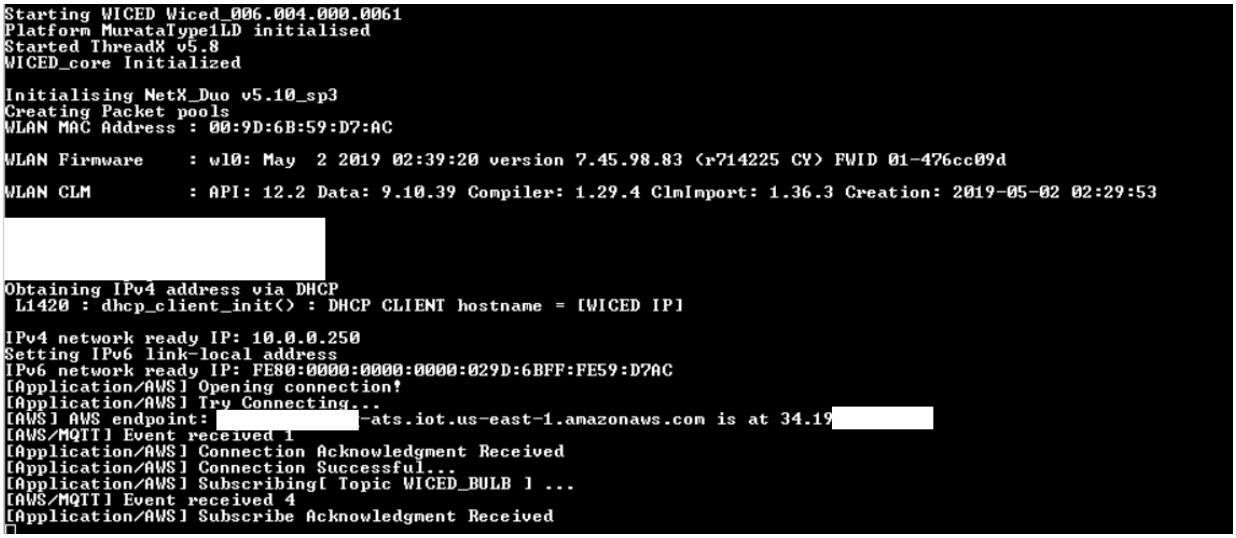


E) Double click “clean” from the Make Target to make sure you will have the latest files included.

F) Double click the Make Target you just created.

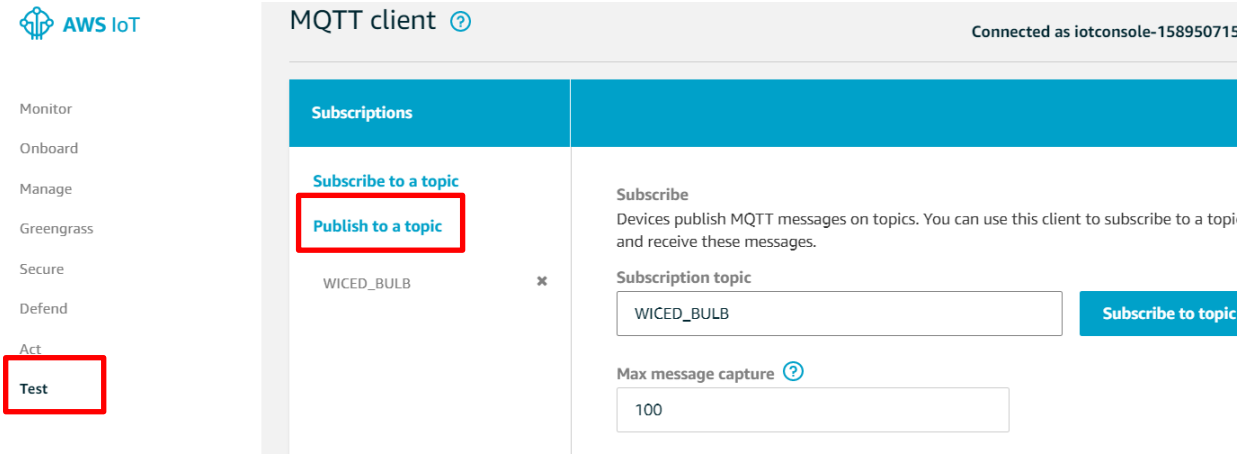
G) While you are waiting the build to complete, open your appropriate COM port with terminal tool such as TeraTerm and set baud rate as 115200bps

H) Wait for a while to complete the build, then you will see Connection Successful message as below.

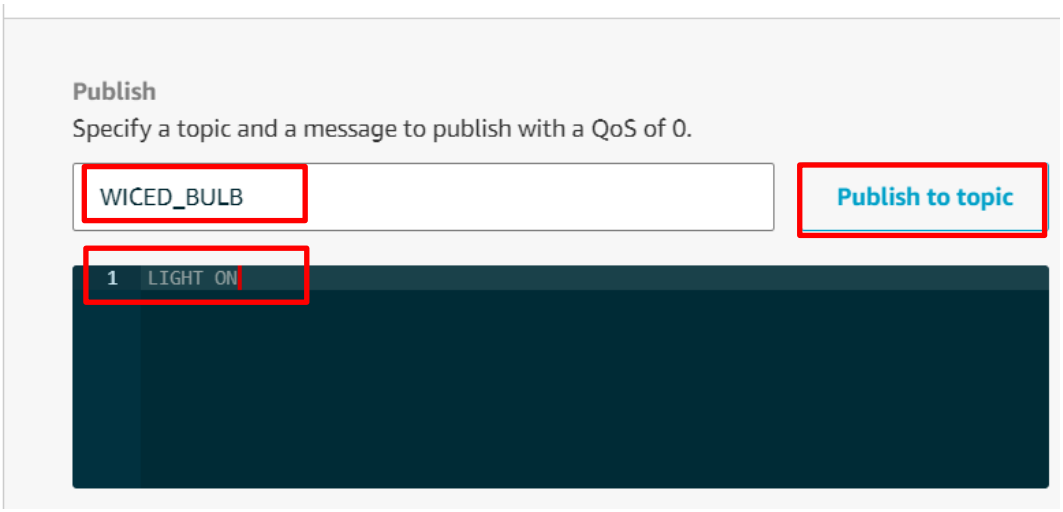


```
Starting WICED Wiced_006.004.000.0061
Platform MurataType1LD initialised
Started ThreadX v5.8
WICED_core Initialized

Initialising NetX_Duo v5.10_sp3
Creating Packet pools
WLAN MAC Address : 00:9D:6B:59:D7:AC

WLAN Firmware    : wl0: May  2 2019 02:39:20 version 7.45.98.83 (r714225 CY) FWID 01-476cc09d

WLAN CLM         : API: 12.2 Data: 9.10.39 Compiler: 1.29.4 ClmImport: 1.36.3 Creation: 2019-05-02 02:29:53

Obtaining IPv4 address via DHCP
 L1420 : dhcp_client_init() : DHCP CLIENT hostname = [WICED IP]

IPv4 network ready IP: 10.0.0.250
Setting IPv6 link-local address
IPv6 network ready IP: FE80:0000:0000:0000:029D:6BFF:FE59:D7AC
[Application/AWS] Opening connection!
[Application/AWS] Try Connecting...
[AWS] AWS endpoint: [redacted]-ats.iot.us-east-1.amazonaws.com is at 34.19[redacted]
[AWS/MQTT] Event received 1
[Application/AWS] Connection Acknowledgment Received
[Application/AWS] Connection Successful...
[Application/AWS] Subscribing[ Topic WICED_BULB ] ...
[AWS/MQTT] Event received 4
[Application/AWS] Subscribe Acknowledgment Received
```

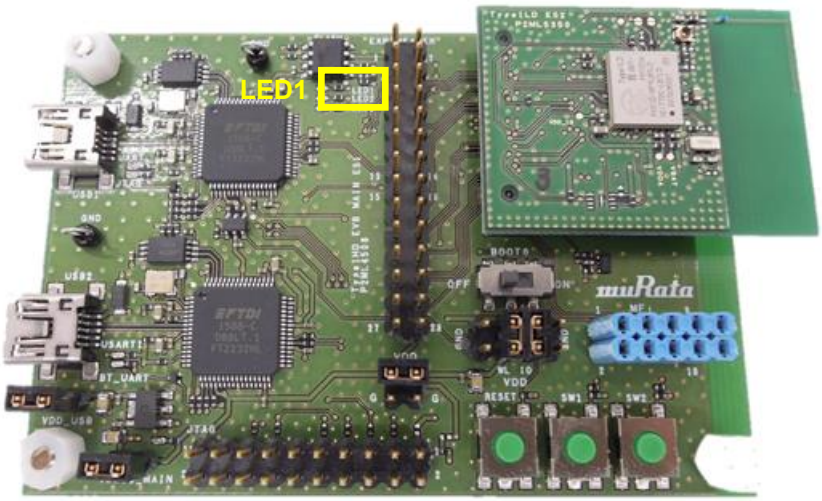
I) Visit AWS IoT Core Console and select Test from the left menu, then click Publish to a topic.



J) Type “WICED_BULB” in the topic field and “LIGHT ON” in the message field, then click Publish to topic button.



K) You will see “light on” on your Tera Term and LED1 on EVB turned on. You can send “LIGHT OFF” message to turn of the LED.

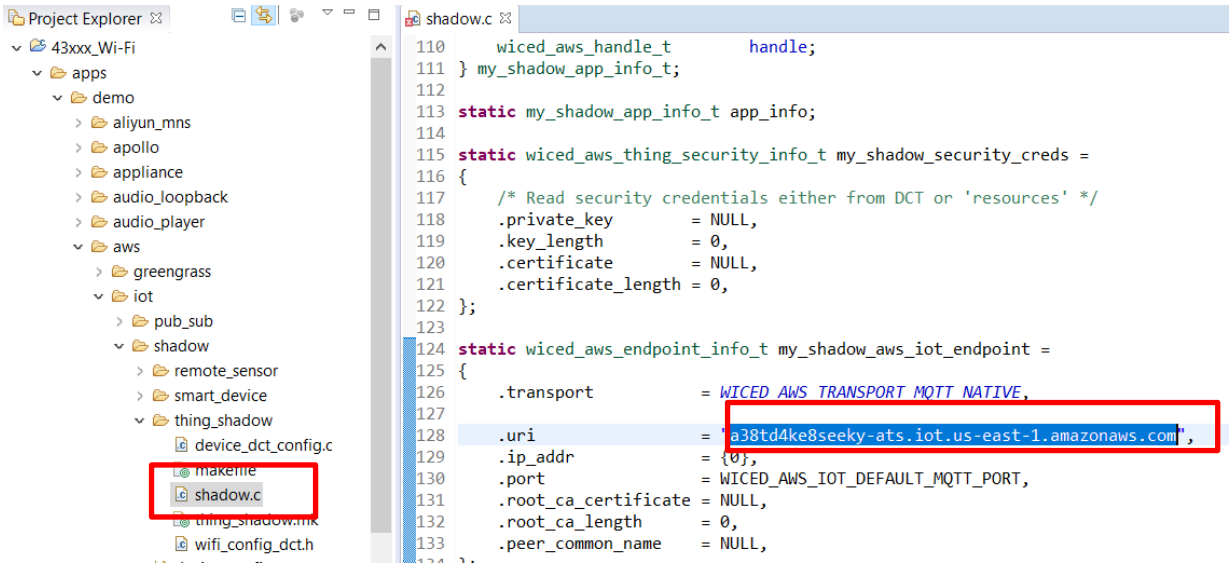


6.3. Running AWS Shadow Application

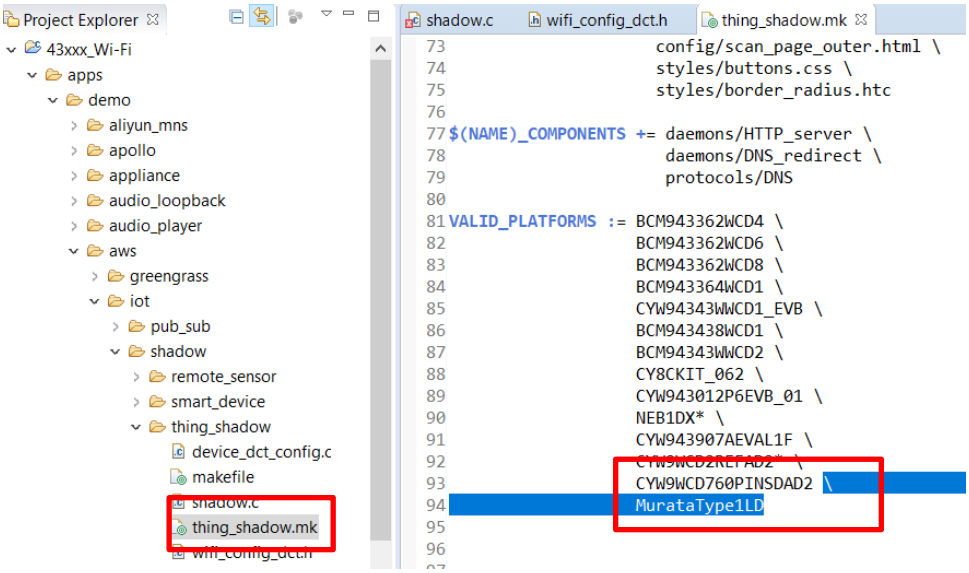
This is Wirelss Light Buld example which has Shadow on AWS IoT and turn on/off LED1 with WiFi initialization steps as SoftAP.

A) Open WICED IDE

B) Open 43xxx_Wi-Fi\apps\demo\aws\iot\shadow\thing_shadow\shadow.c and update the endpoint with yours. If you do not know your endpoint, please check “5. Checking Your AWS Endpoint”.

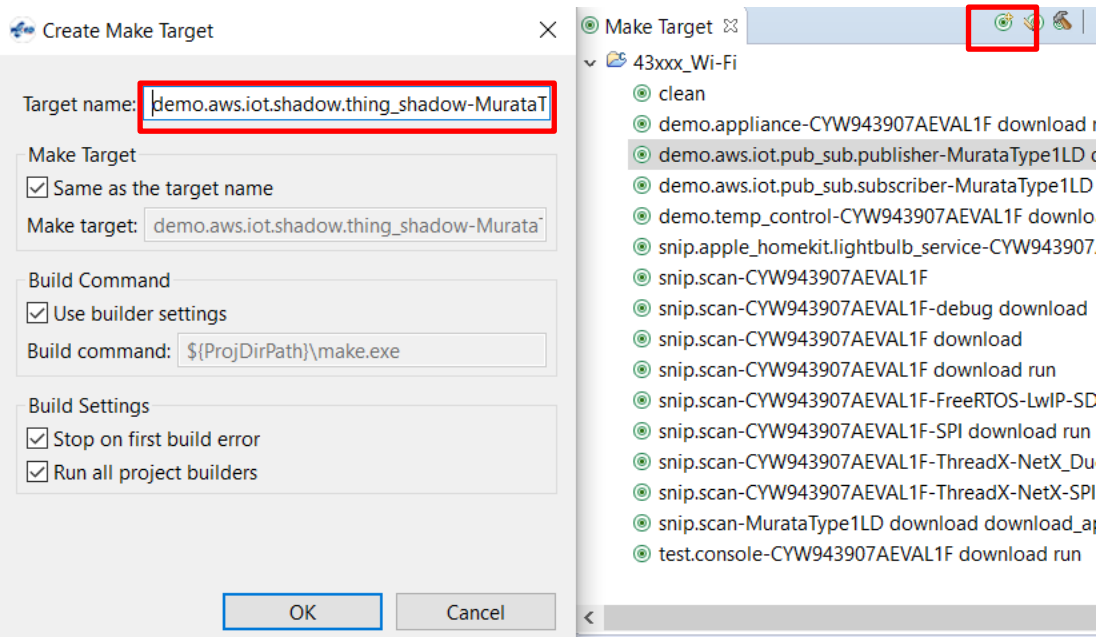


C) Open 43xxx_Wi-Fi\apps\demo\aws\iot\shadow\thing_shadow\thing_shadow.mk and add MurataType1LD as a VALID_PLATFORMS.



D) Click New Make Target button and create new Make Target as below

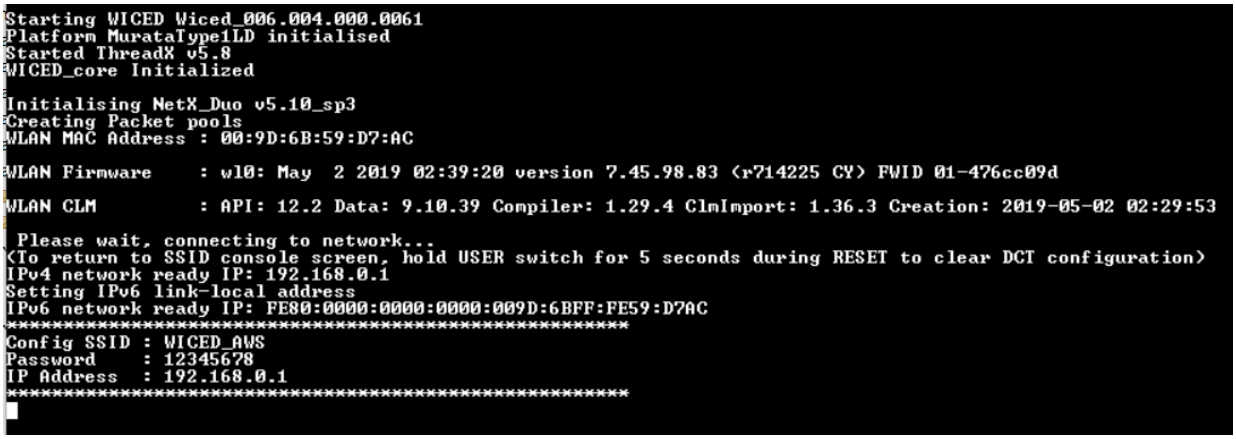
demo.aws.iot.shadow.thing_shadow-MurataType1LD download download_apps run



M) Double click the Make Target you just created.

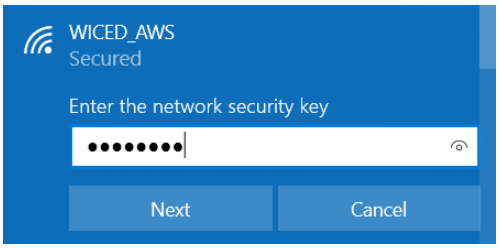
N) While you are waiting the build to complete, open your appropriate COM port with terminal tool such as TeraTerm and set baud rate as 115200bps

E) Wait for a while to complete the build, then you will see below.

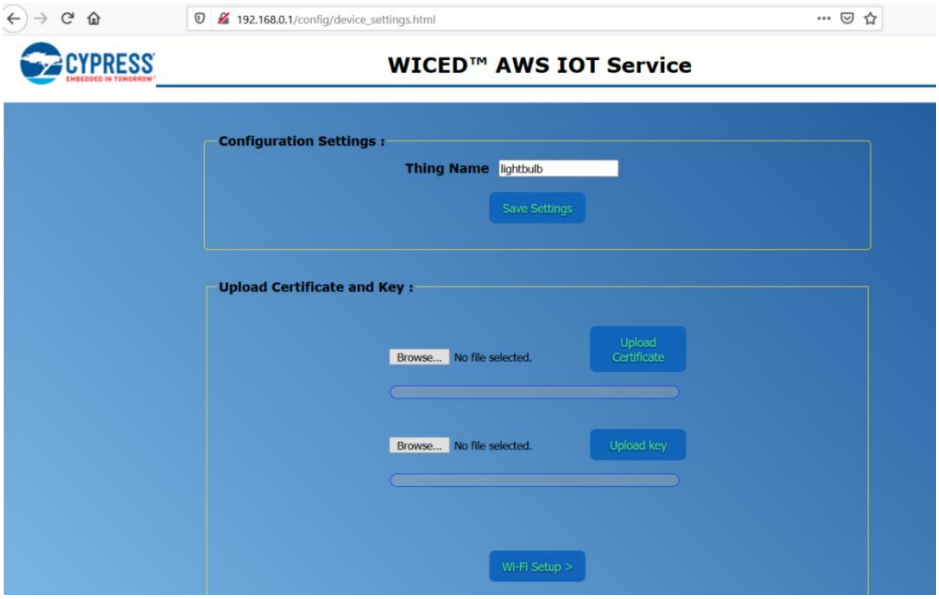


```
Starting WICED Wiced_006.004.000.0061
Platform MurataType1LD initialised
Started ThreadX v5.8
WICED_core Initialized

Initialising NetX_Duo v5.10_sp3
Creating Packet pools
WLAN MAC Address : 00:9D:6B:59:D7:AC

WLAN Firmware    : wl0: May  2 2019 02:39:20 version 7.45.98.83 (r714225 CY) FWID 01-476cc09d

WLAN CLM         : API: 12.2 Data: 9.10.39 Compiler: 1.29.4 ClmImport: 1.36.3 Creation: 2019-05-02 02:29:53

 Please wait, connecting to network...
(To return to SSID console screen, hold USER switch for 5 seconds during RESET to clear DCT configuration)
IPv4 network ready IP: 192.168.0.1
Setting IPv6 link-local address
IPv6 network ready IP: FE80:0000:0000:0000:009D:6BFF:FE59:D7AC
*****************************************************
Config SSID : WICED_AWS
Password    : 12345678
IP Address  : 192.168.0.1
*****************************************************
```

F) 1LD is now configured in soft-AP mode. Connect to the SSID WICED_AWS, from your laptop using the Password in the terminal.



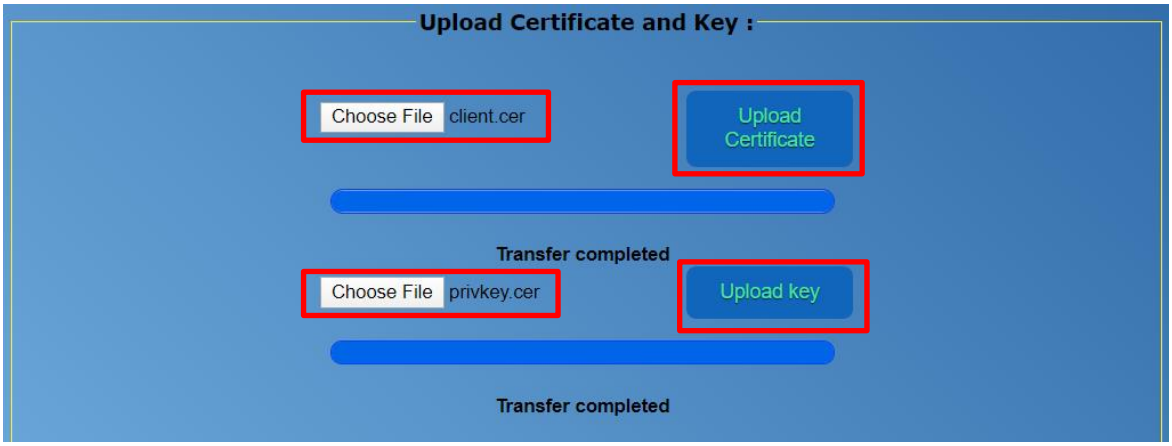
G) Open the web browser and access the URL http://192.168.0.1



H) Type "testThing" in the Thing Name filed and click Save Settings button. Thing Name must match with the name you created on AWS IoT Core Console.

I) Click the first Choose File button and select 43xxx_Wi-Fi\resources\apps\aws\iot\subscriber\client.cer, then click Upload Certificate button.

Then click the second Choose File button and select 43xxx_Wi-Fi\resources\apps\aws\iot\subscriber\privkey.cer, then click Upload key button.



Note) In some environment, Chrome doesn't work fine. Please try Firefox instead if you see this error message in later step: [Shadow] Failed to Initialize Wiced AWS library

J) Click Wi-Fi Setup > button, then select SSID of your access point and type the password. Click Connect button.

✓Scan Complete

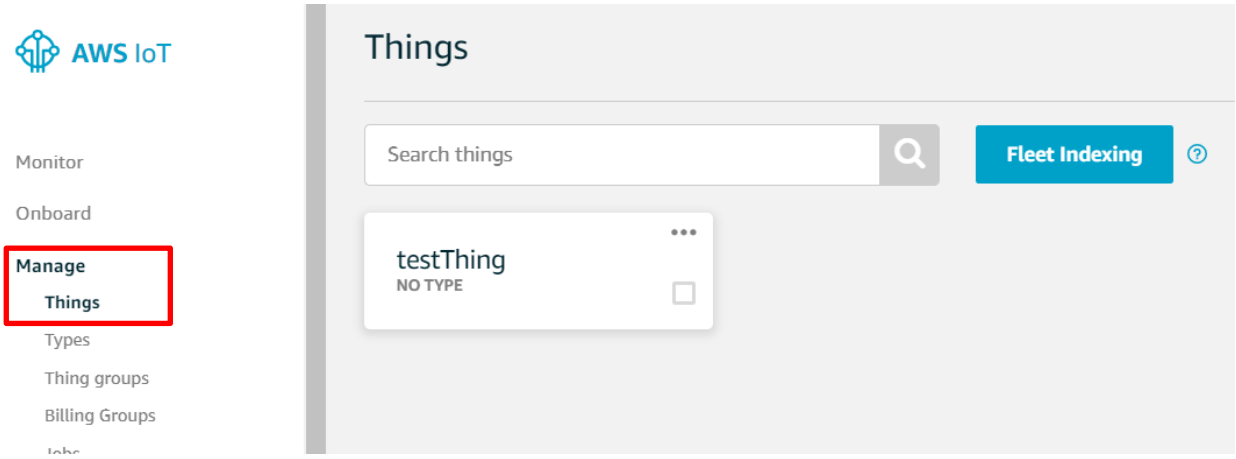
K) 1LD will restart.

L) Once 1LD is restarted, you shall see the below

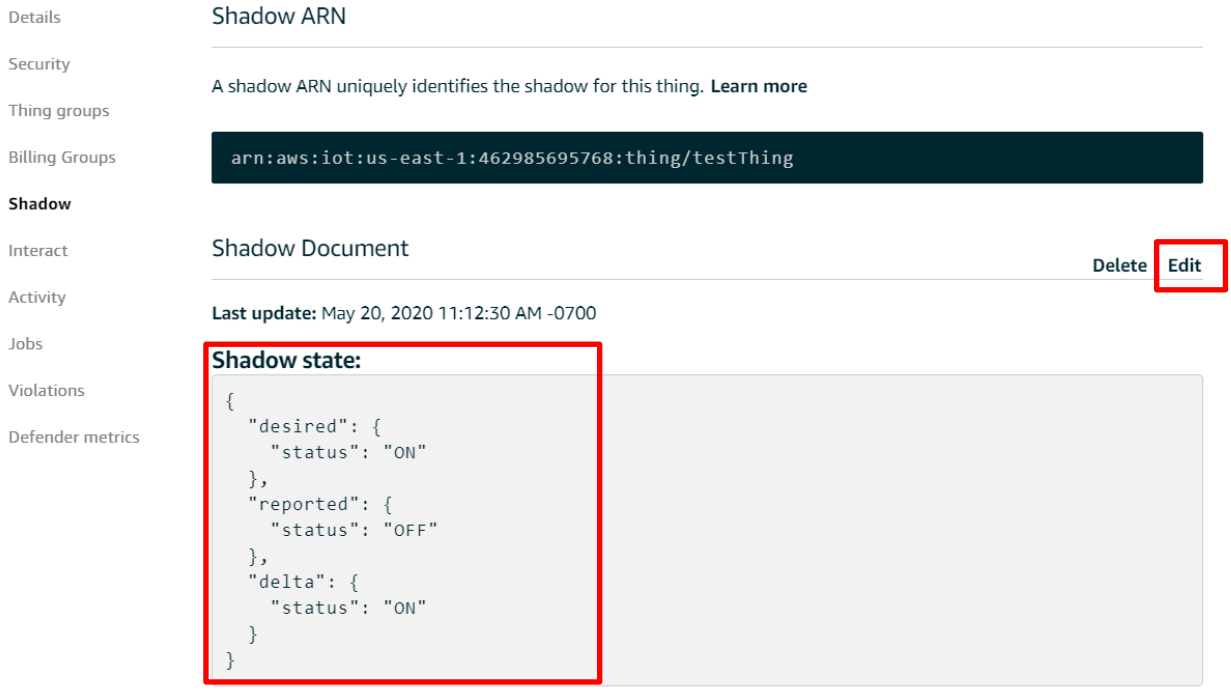
```
Starting WICED Wiced_006.004.000.0061
Platform MurataType1LD initialised
Started ThreadX v5.8
WICED_core Initialized

Initialising NetX_Duo v5.10_sp3
Creating Packet pools
WLAN MAC Address : 00:9D:6B:59:D7:AC

WLAN Firmware    : wl0: May  2 2019 02:39:20 version 7.45.98.83 (r714225 CY) FWID 01-476cc09d

WLAN CLM         : API: 12.2 Data: 9.10.39 Compiler: 1.29.4 ClmImport: 1.36.3 Creation: 2019-05-02 02:29:53

 Please wait, connecting to network...
(To return to SSID console screen, hold USER switch for 5 seconds during RESET to clear DCT configuration)
Joining :
Successfu
Obtaining IPv4 address via DHCP
 L1420 : dhcp_client_init() : DHCP CLIENT hostname = [WICED IP]

IPv4 network ready IP: 10.0.0.251
Setting IPv6 link-local address
IPv6 network ready IP: FE80:0000:0000:0000:029D:6BFF:FE59:D7AC
[Shadow] Reading Device's certificate and private key from DCT...
[Shadow] Thing Name: testThing
[Shadow] Shadow State Topic: $aws/things/testThing/shadow/update
[Shadow] Shadow Delta Topic: $aws/things/testThing/shadow/update/delta
[AWS] AWS endpoint:  -ats.iot.us-east-1.amazonaws.com is at 35.
[AWS/MQTT] Event received 1
[AWS/MQTT] Event received 3
[AWS/MQTT] Event received 3
[AWS/MQTT] Event received 4
```

Note) In some environment, Chrome fails uploading certificate and private key in step I). If you see this error message, please try Firefox instead: [Shadow] Failed to Initialize Wiced AWS library

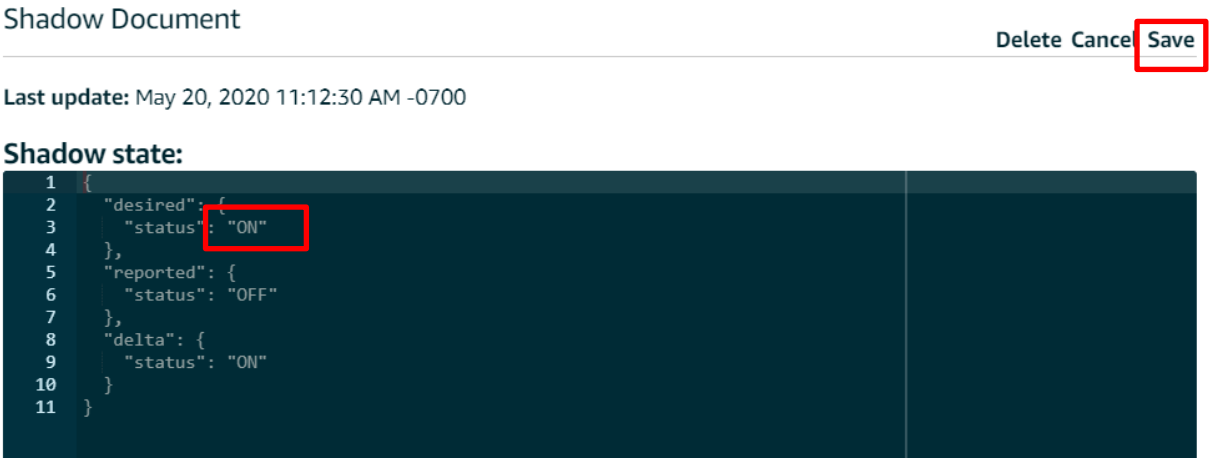
M) Visit AWS IoT Core Console and select Manage - Things from the left menu, then click testThing.



N) You will see below if everything is going well. Click Edit to update 1LD status.

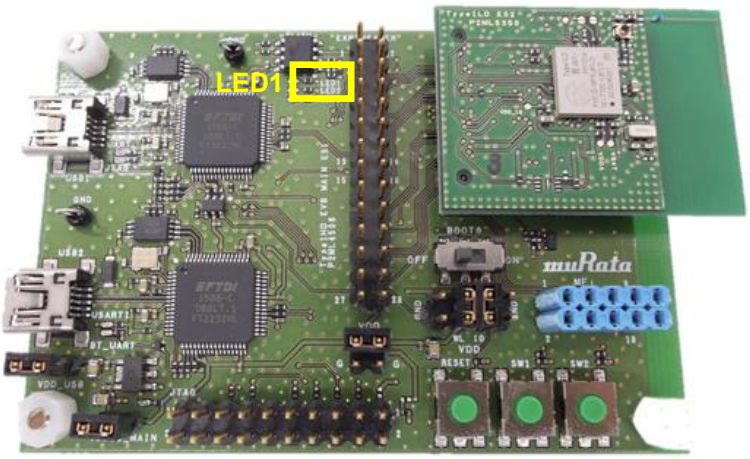


O) Confirm the desired status is ON, then click Save.



P) You will see Received Payload message on your Tera Term and LED1 on EVB turned on. You can send OFF as desired status to turn off the LED.

```
[Shadow] Received Payload [ Topic: $aws/things/testThing/shadow/update/delta ] :
====
{"version":5,"timestamp":1589998544,"state":{"status":"ON"},"metadata":{"status":{"timestamp":1589998544}}}
====
[Shadow] LED State OFF[current] ---> ON[requested]
[AWS/MQTT] Event received 3
```



(END)