1 Demo – AWS IoT Platform

1.1 Modbus RTU Device Interface:

Device information:

RS485 interface setting:

Baud Rate	Word Length	Parity	Stop Bits
9600	8	none	1

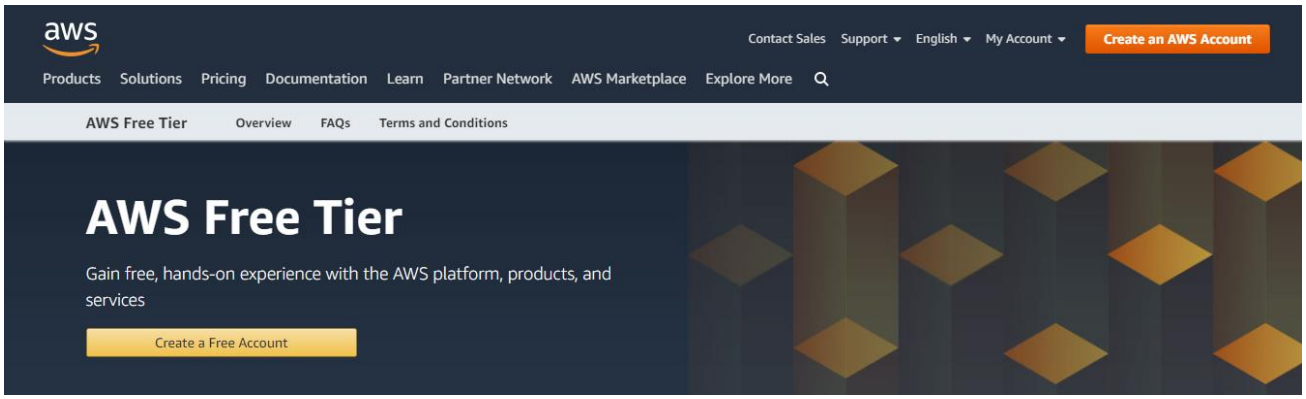
Modbus register information:

	Modbus ID	Modbus Fcode	Address Data	Length Data	Type
CO2	0x1	0x3	0x0000	0x0001	Decimal

1.2 Set up AWS IoT Platform Server

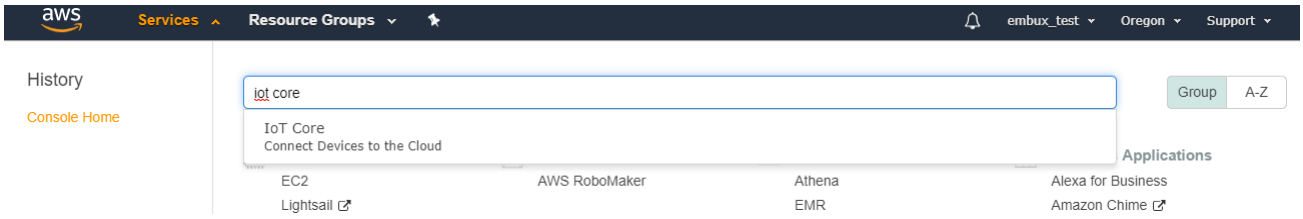
a. Create an Amazon account:

Get into https://aws.amazon.com/tw/ and create an account.

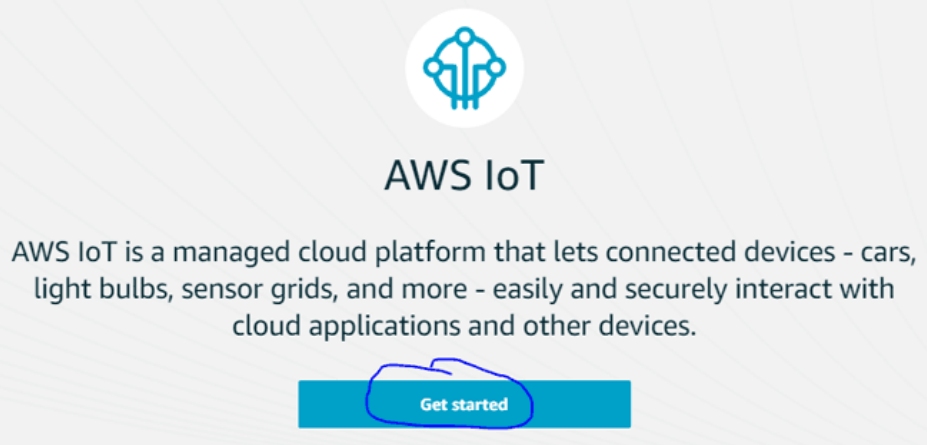


b. Create an AWS Thing with Certificate and Policy:

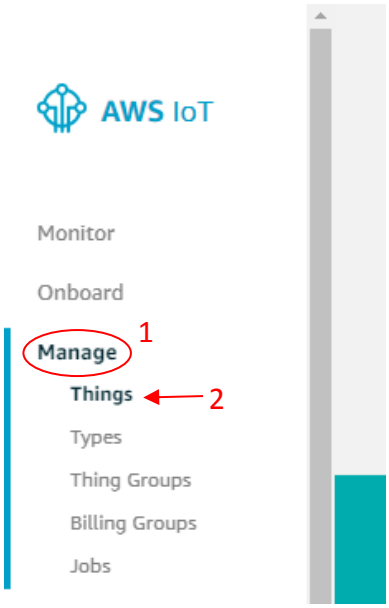
i. Use AWS services to search for “IoT Core”. It’s being listed as shown below. Click on it to open the AWS IOT console.



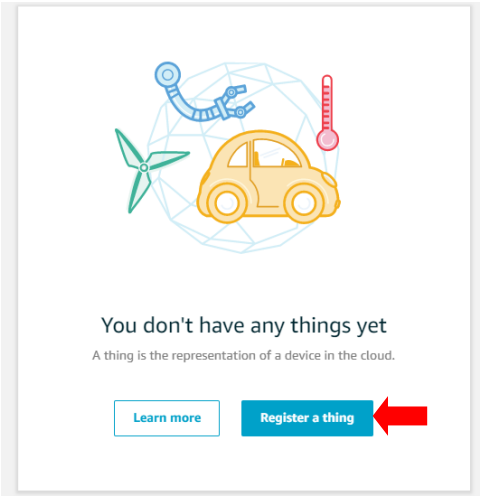
There's an introductory message from AWS IOT, just click on "get started".



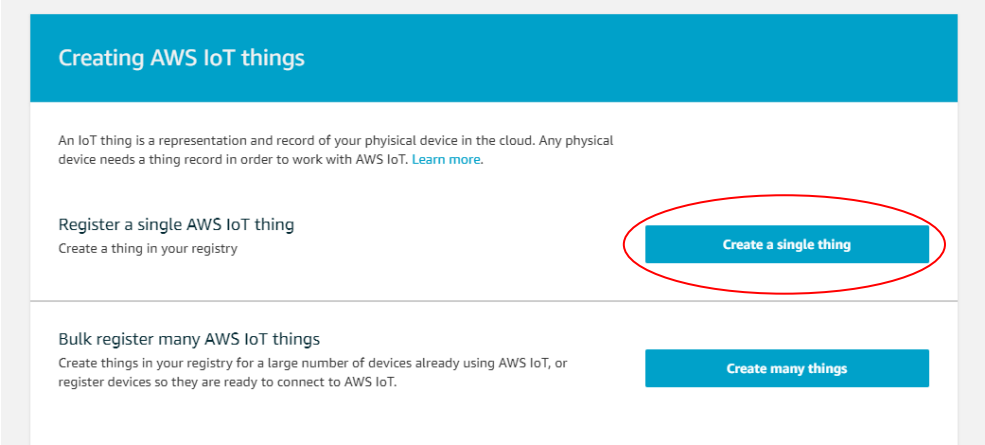
ii. Select "Manage" and "Things" at the left side of the screen.



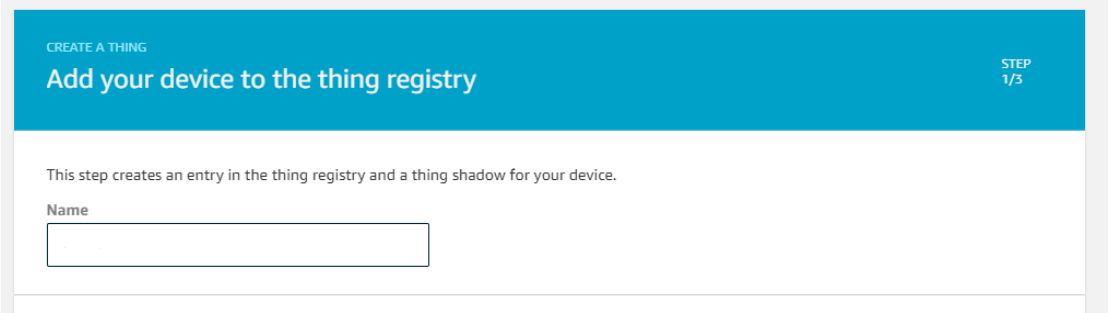
iii. To create the thing, just click on the "Register a thing".



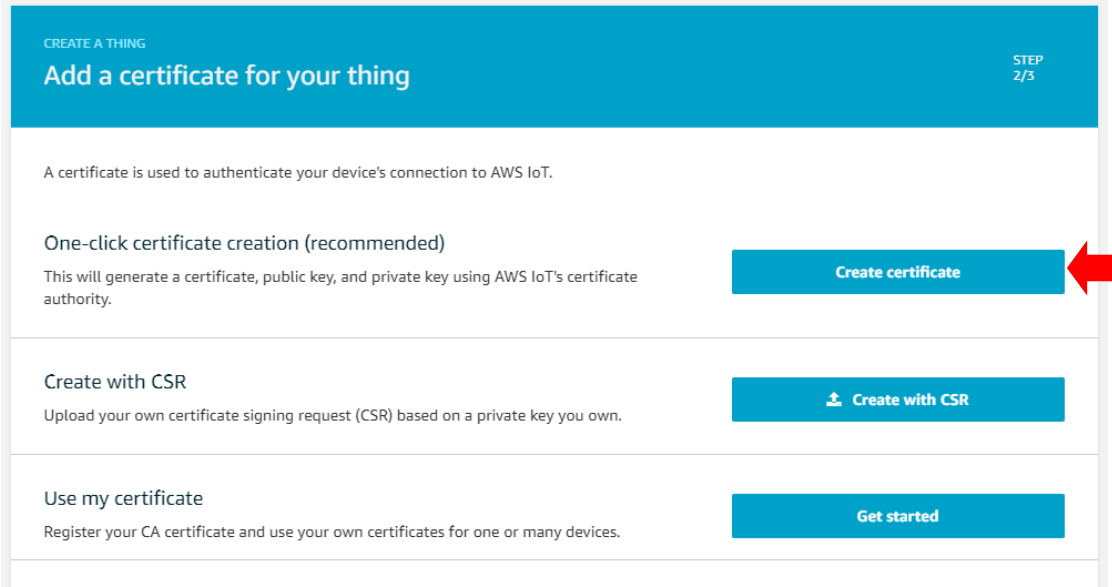
iv. Click on “create a single thing”.



v. Provide a name which can be anything. After naming, just scroll down and click on “next”.

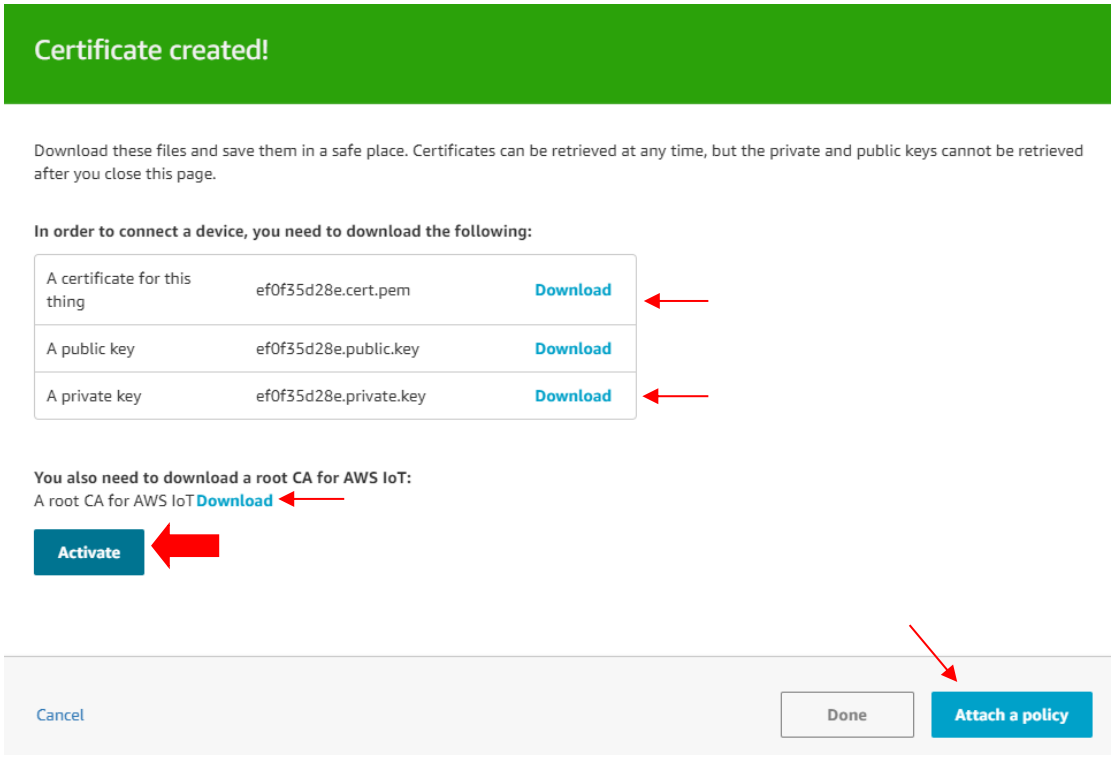


vi. Click “Create Certificate”.



vii. Download the three key files and save it on the computer somewhere secure, and click on “Attach a policy”.

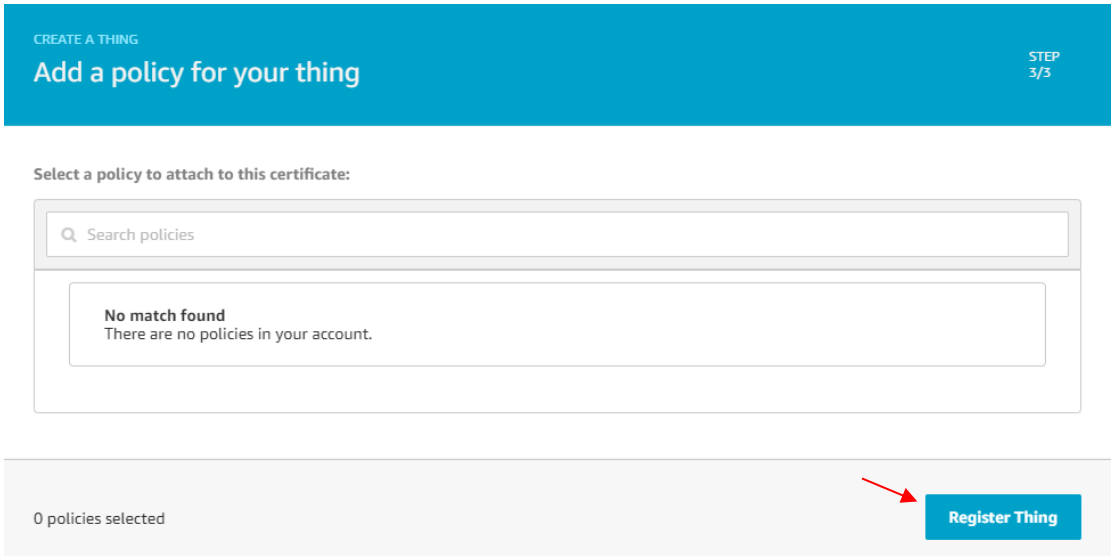
Make sure you click on the Activate button first.



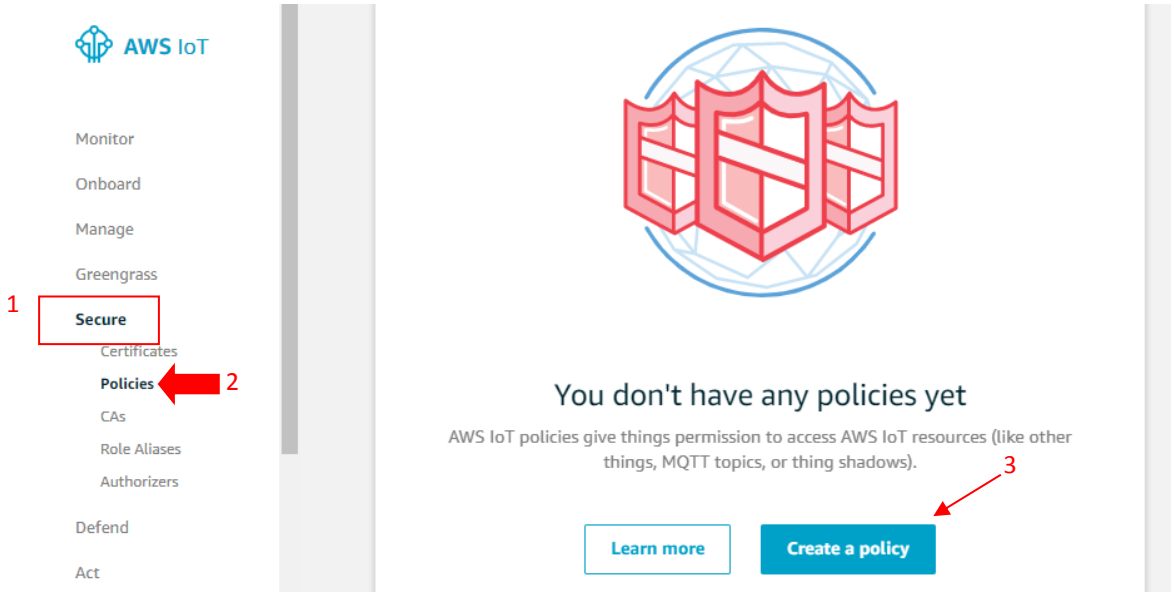
For some users the CA file might open as a stream of code on chrome. In that case, just save it. Make sure of changing the extension of the file to .pem if it ends with .text.

viii. Click “Register Thing”.

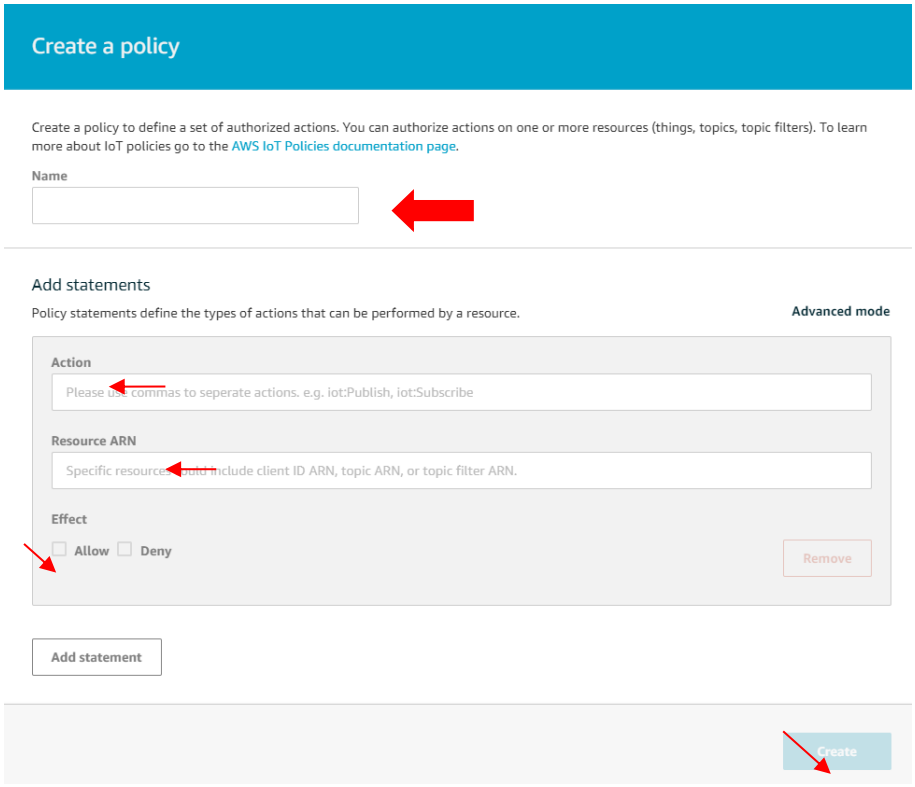
The policy will be created in next step and then attach it.



ix. Click “Secure” → “Policies” on the left side menu, then create a policy.



x. Fill out the form, then click “Create” on the end of the page.

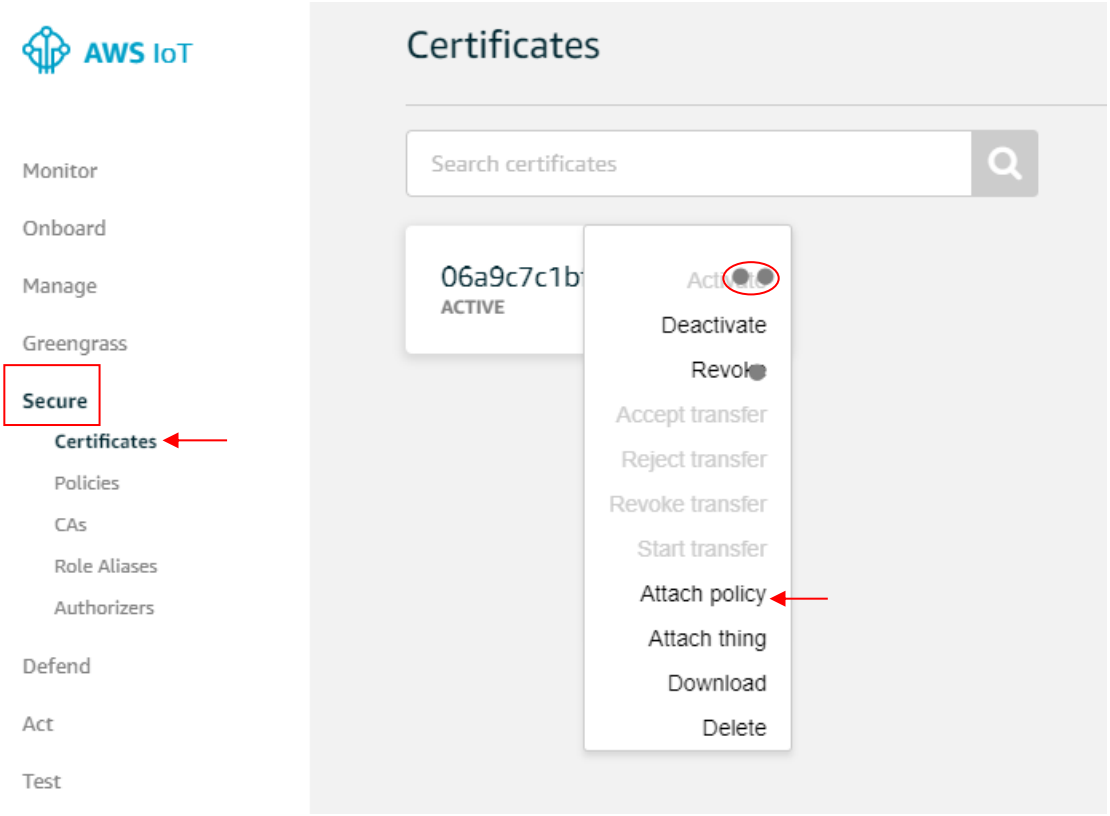


Action	iot:Publish, iot:Subscribe, iot:Connect, iot:Receive, iot:GetThingShadow, iot:UpdateThinsShadow
Resources ARN	`arn:aws:iot:region:AWS account ID:resource type/resource name`

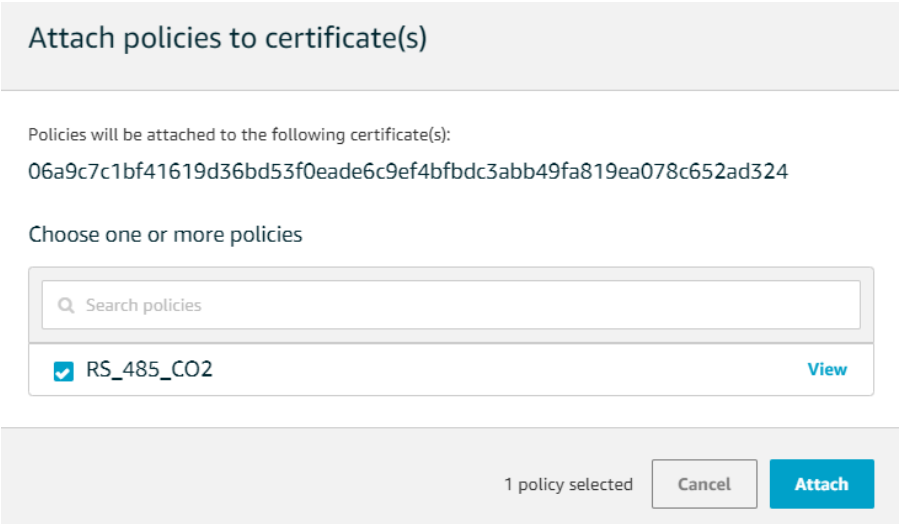
For more information, please refer to:
https://docs.aws.amazon.com/iot/latest/developerguide/iot-policies.html

Make sure the allow button is checked.

xi. Select secure and certificates, clicking on options and choosing “Attach policy”.

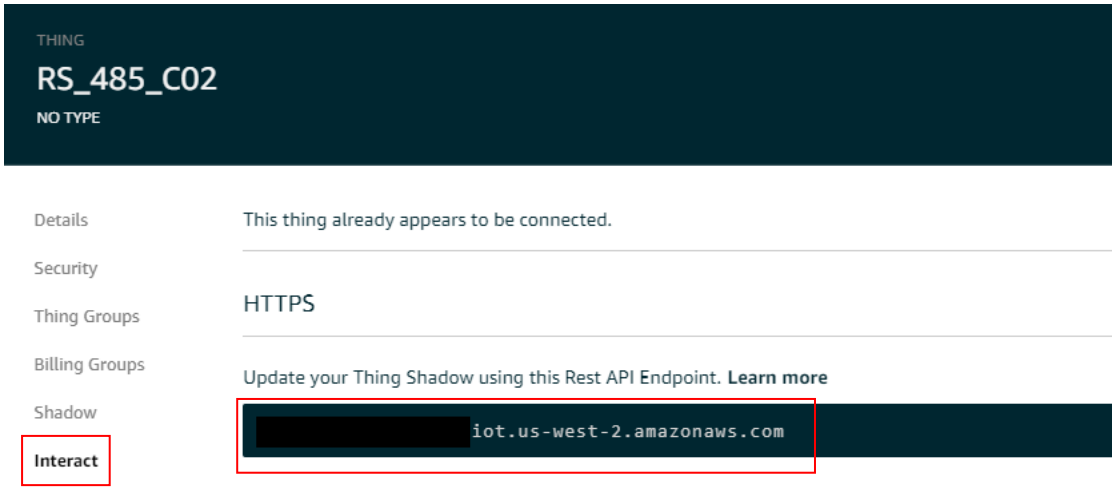


xii. Select the policy which was just created and then click on the attach button.



c. Getting your AWS thing Details:

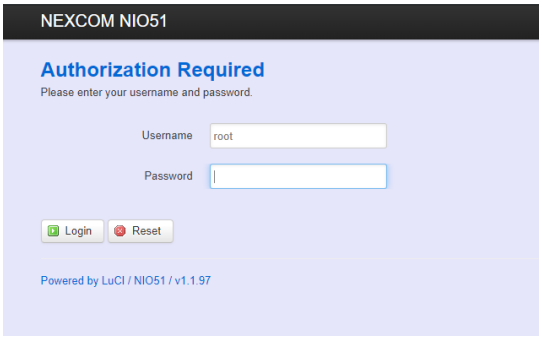
Broker address can be found by clicking on the name of the thing in manage option.



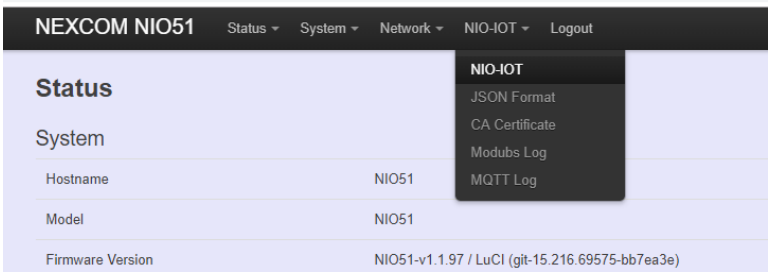
1.3 Setup NIO51

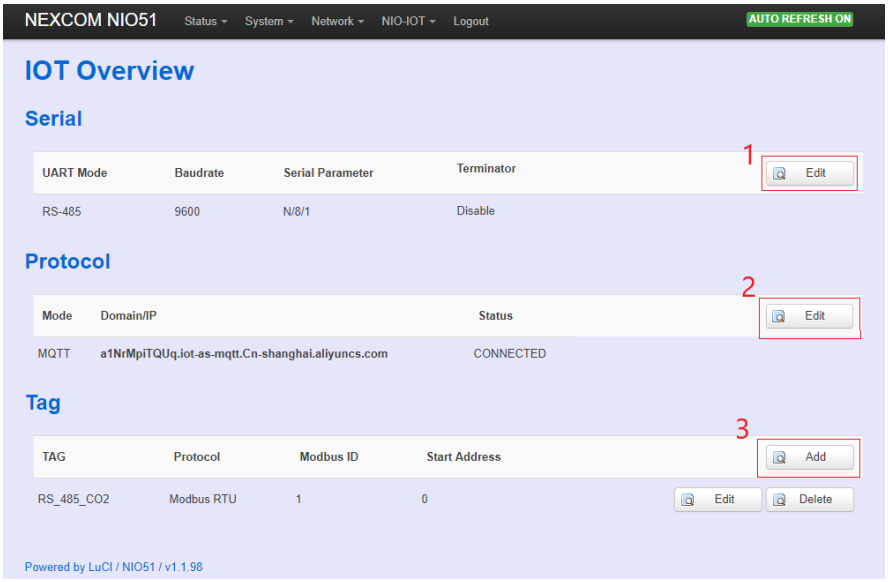
a. Setup Modbus to MQTT

Open NIO51 web, default IP is http://192.168.1.1, and go to NIO-IOT applcation setting page. (*username: root, password: admin*)



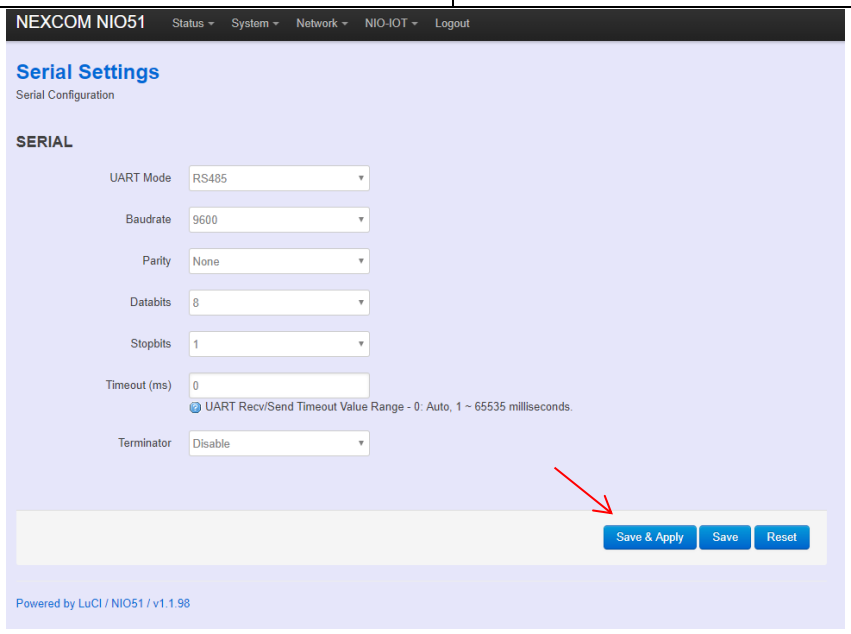
Click NIO-IOT, then step by step to setup Modbus to MQTT.





i. Edit “serial” setup to follow the target device spec.

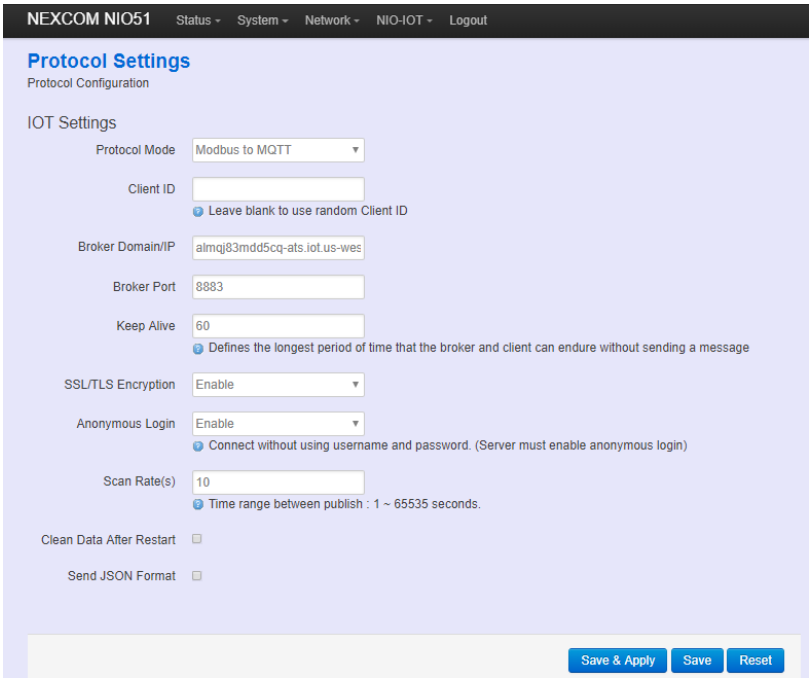
UART Mode	**RS485**
Baudrate	**9600**
Parity	**None**
Databits	**8**
Stopbits	**1**



Please click “Save&Apply”after every editing.

ii. Edit Protocol.

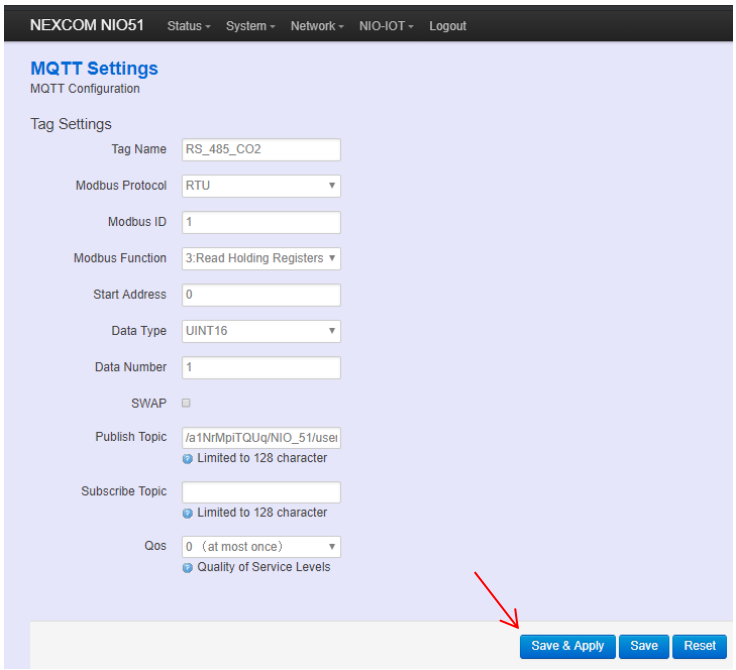
Protocol Mode	Modbus to MQTT
Broker Domain/IP	almqj83mdd5cq-ats.iot.us-west-2.amazonaws.com
Broker Port	8883
SSL/TLS Encryption	Enable



iii. Edit Tag

Tag Name	RS_485_CO2
Modbus Protocol	RTU
Modbus ID	1
Modbus Function	3
Start Address	0
Data Type	UNIT 16
Data Number	1

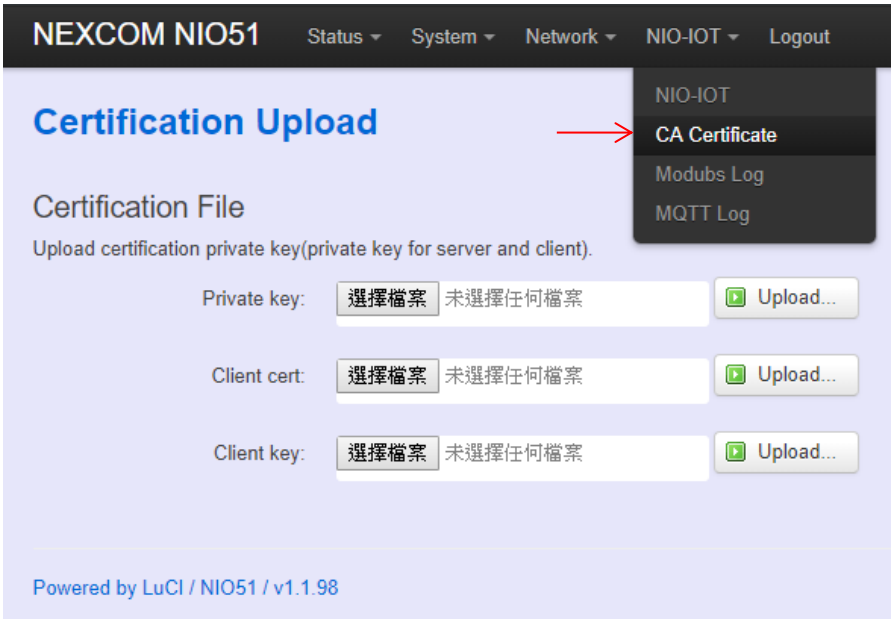
Publish topic is a user decision.



iv. Upload Certification.

Upload certification private key.

Click NIO-IOT, then click CA Certificate.



Private key	AmazonRootCA1.pem
Client cert	XXXXXXXXX -certificate.pem.crt
Client key	XXXXXXXXX -private.pem.key

According to 1.2-a-vii, the Certification File should be saved somewhere in the computer by user.

1.4 Verification