AWS IoT

User Manual

Your industrial control solutions source

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Overview of AWS IoT

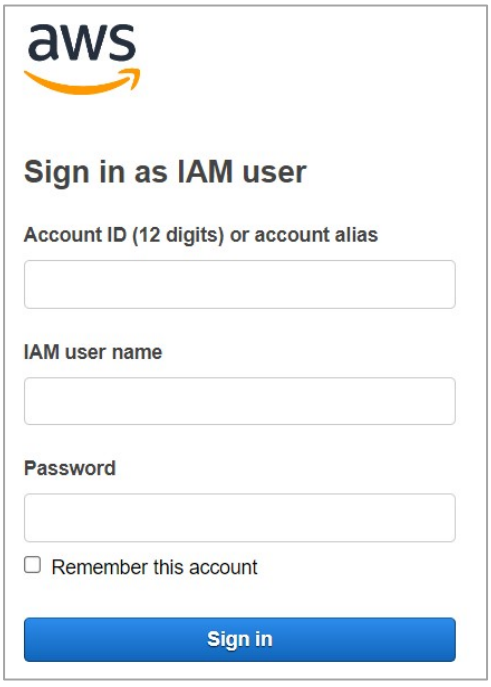
AWS (Amazon Web Service) is a cloud platform now widely used on the market, and AWS IoT (Internet of Things) supports MQTT protocol. Observing the market trend, from EBPro V6.00.01, Maple Systems has adopted AWS IoT service and integrated it with the MQTT feature released earlier. Apart from using AWS IoT as a broker in the publish-subscribe mode, users can also create Thing and Shadow offered by AWS IoT to make the most of MQTT.

This manual covers hosting a MQTT server, configuring EBPro, and establishing an IoT.

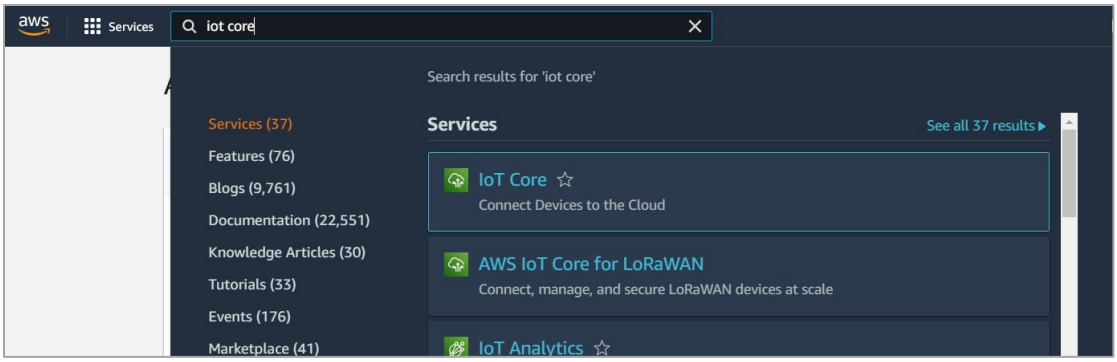
Hosting MQTT Server

AWS is a cloud platform; therefore, the settings are all configured on the web. Please sign up on the Amazon website before hosting an MQTT server.

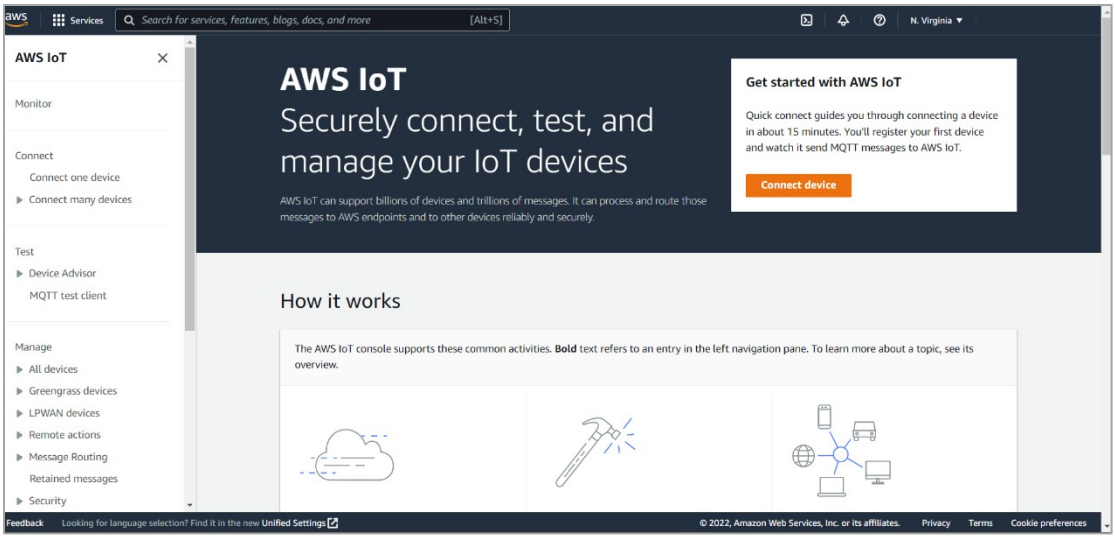
1. Visit Amazon Web Service at https://aws.amazon.com and sign up.



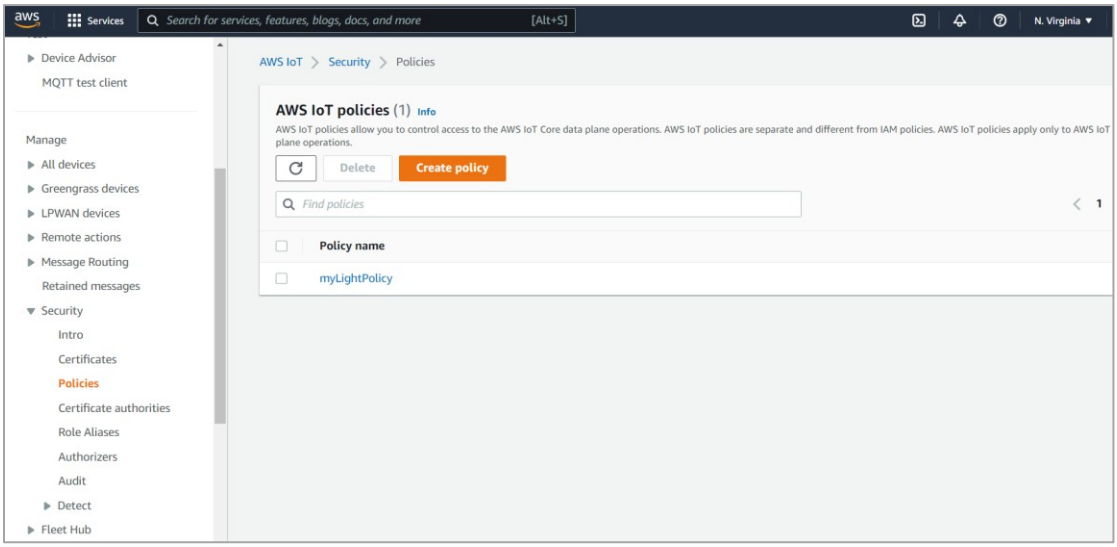
2. After signing in, browse for IoT Core.

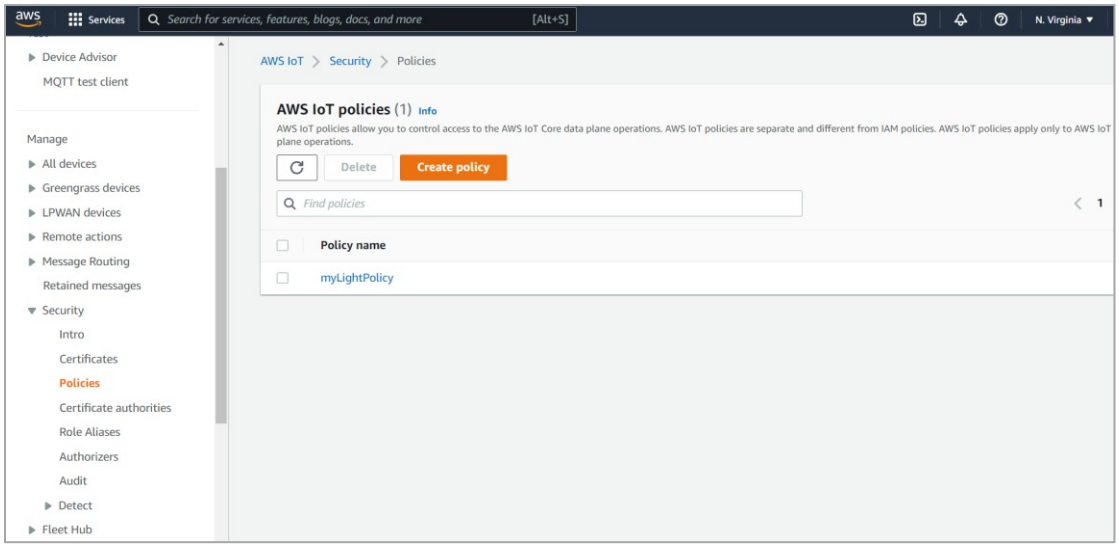


3. On the AWS IoT page, Policy and Certificate can be created.

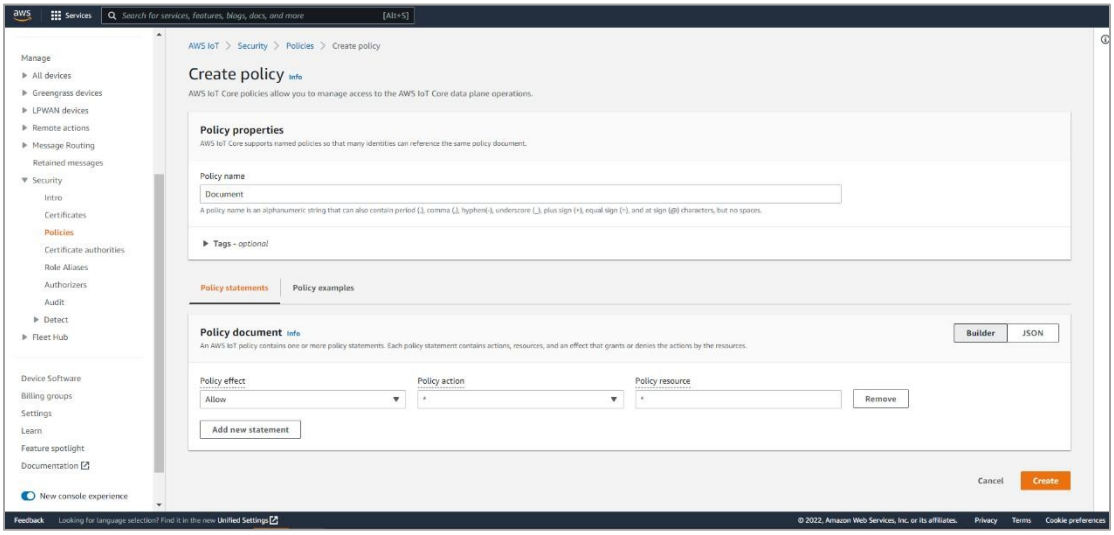


4. Open **Manage** > **Security** > **Policies** and then click **Create policy**.

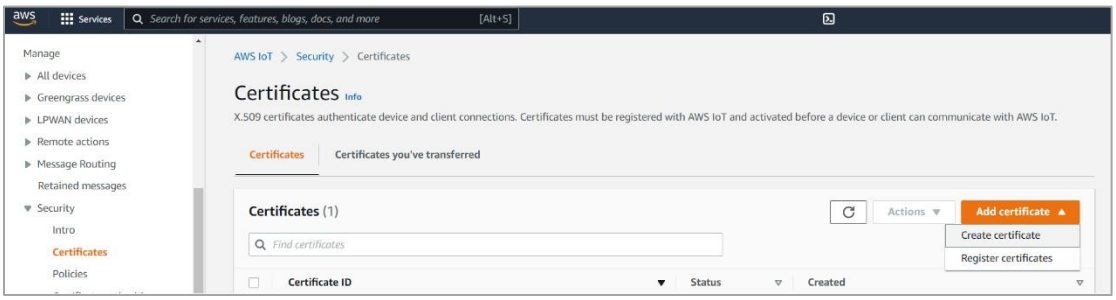




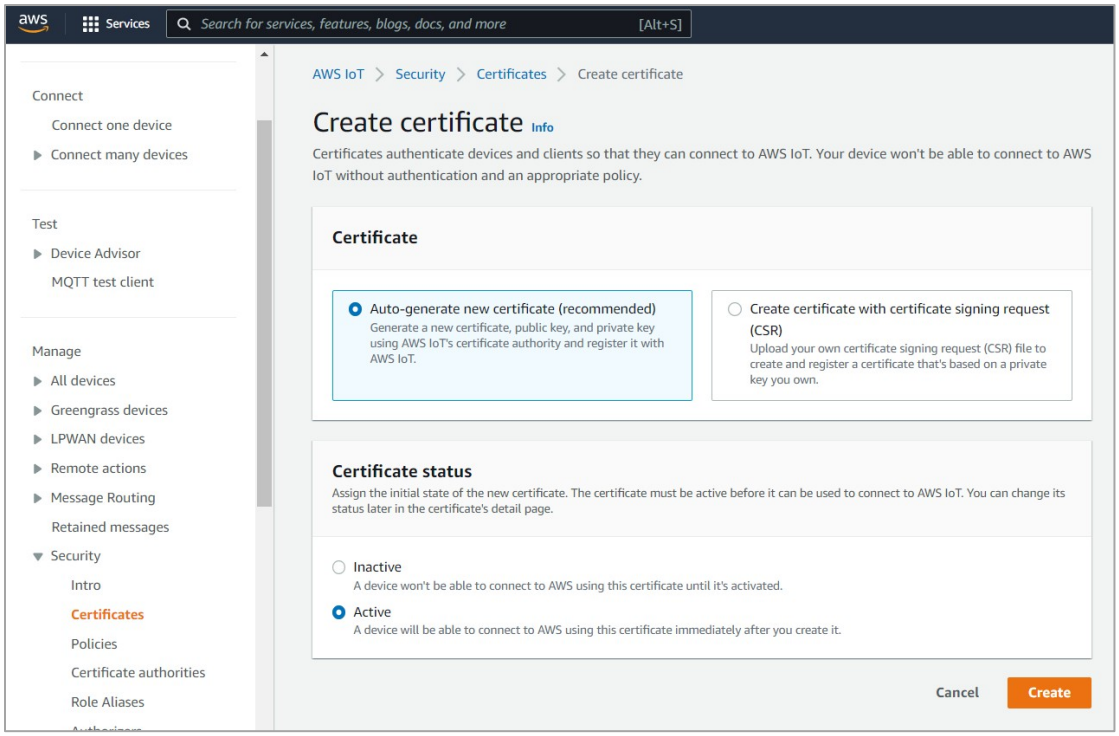
5. This page is for defining actions that can be performed by a resource. You may use the settings in the screenshot below or set your own. Click **Create** when finished.



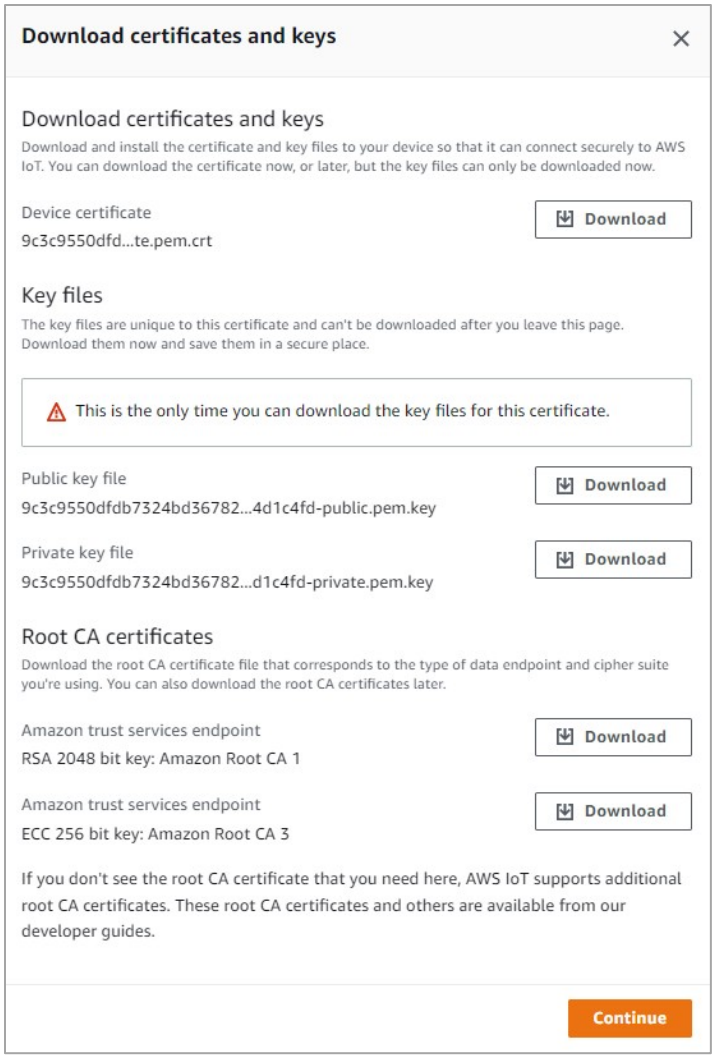
6. Click **Security** > **Certificates** and then click **Add certificate** > **Create certificate**.



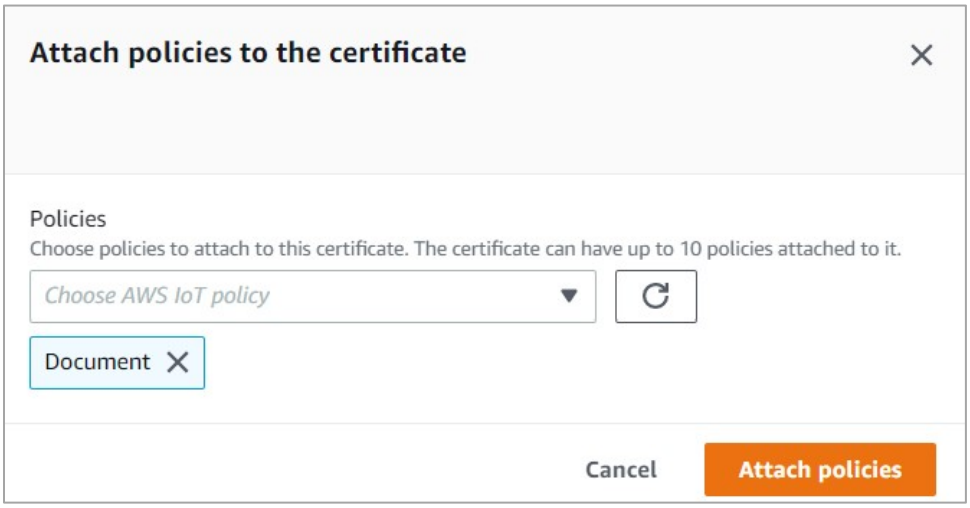
7. Select **Auto-generate new certificate (recommended)**, set Certificate Status to **Active**, and then click **Create**.



8. Download and save these files: **Device Certificate**, **Public Key File**, **Private Key File**, and **RSA 2048 bit key: Amazon Root CA 1**.

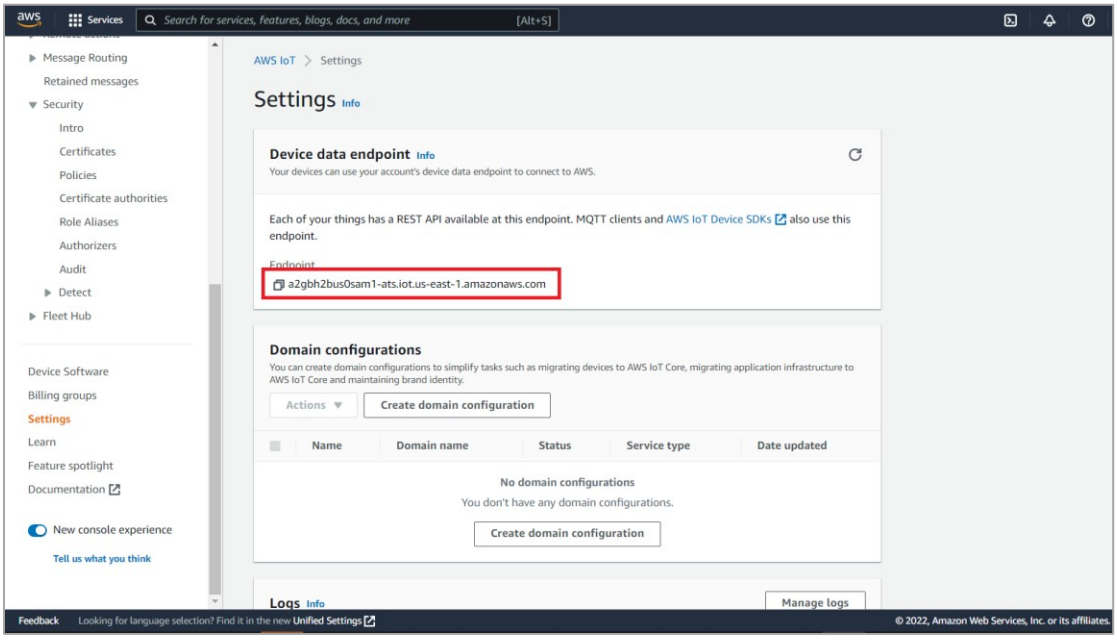


9. Click the certificate created previously and click **Attach policies** under Policies. In the window that follows, select the Policy created previously and then click **Attach policies**.



10. Security setting is done successfully when the following box shows:
    Successfully attached the policy Document to certificate

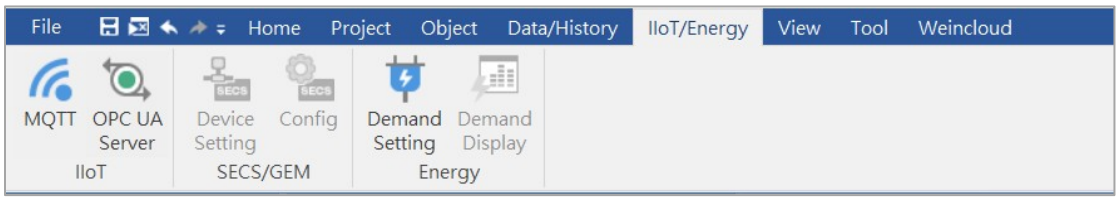
11. Click **Settings**. The URL marked in the red frame below is the domain name of the AWS IoT server and will be used when setting MQTT in EBPro; please remember it. AWS is gradually replacing servers using Symantec CA with Amazon Trust Service. As a result, please check whether the domain name contains "-ats", for example: a2xxxxxxx-ats.iot.xxxxxx.amazon.aws.com. The Amazon Root CA 1 certificate created in step 9 works only when the endpoint is in this format.



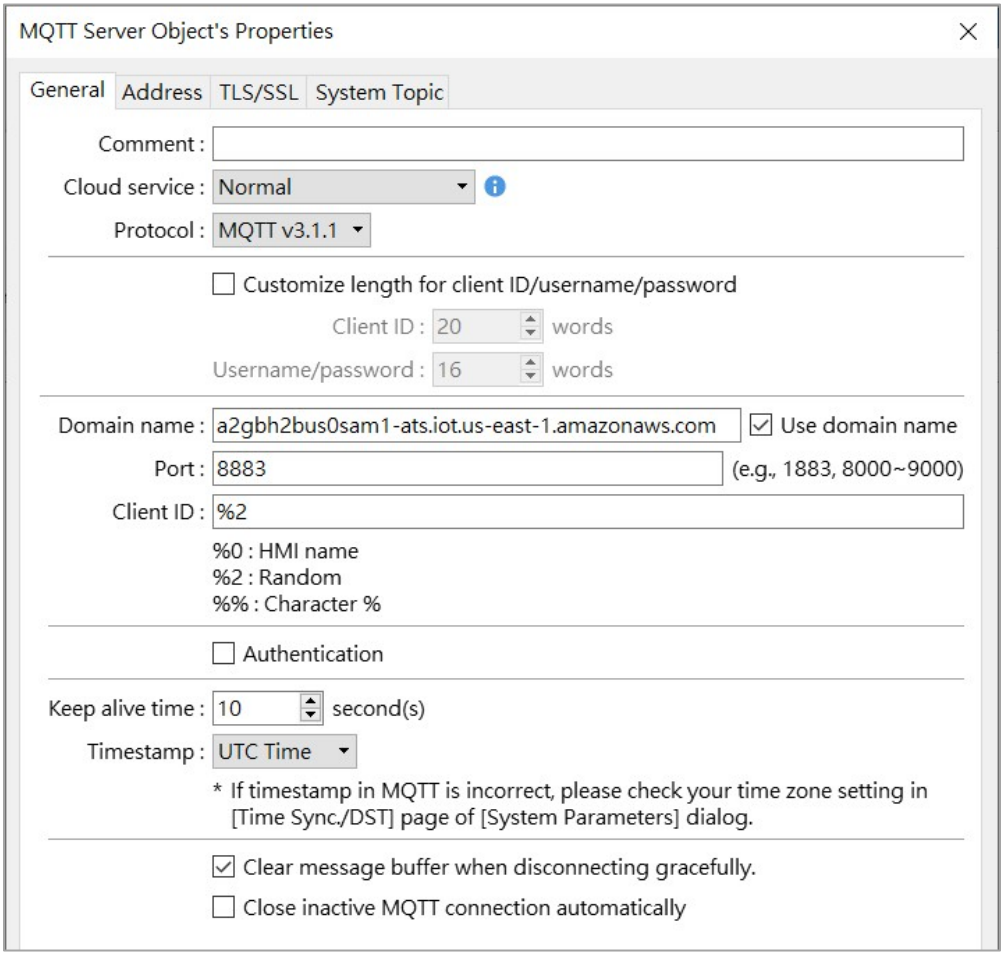
EBPro Settings

After hosting an MQTT server, launch EBPro.

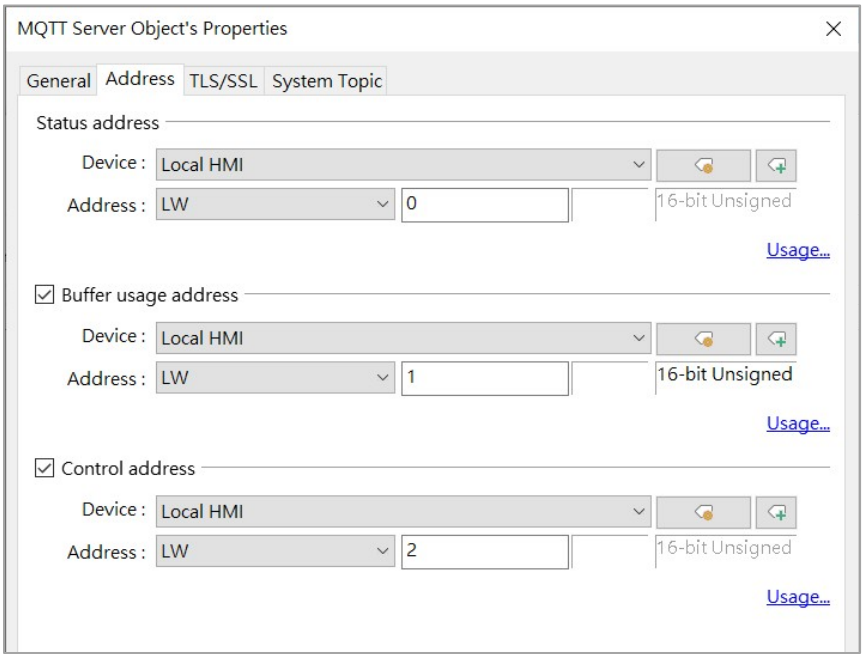
1. Click **IIoT/Energy** > **MQTT** to open the MQTT settings window.



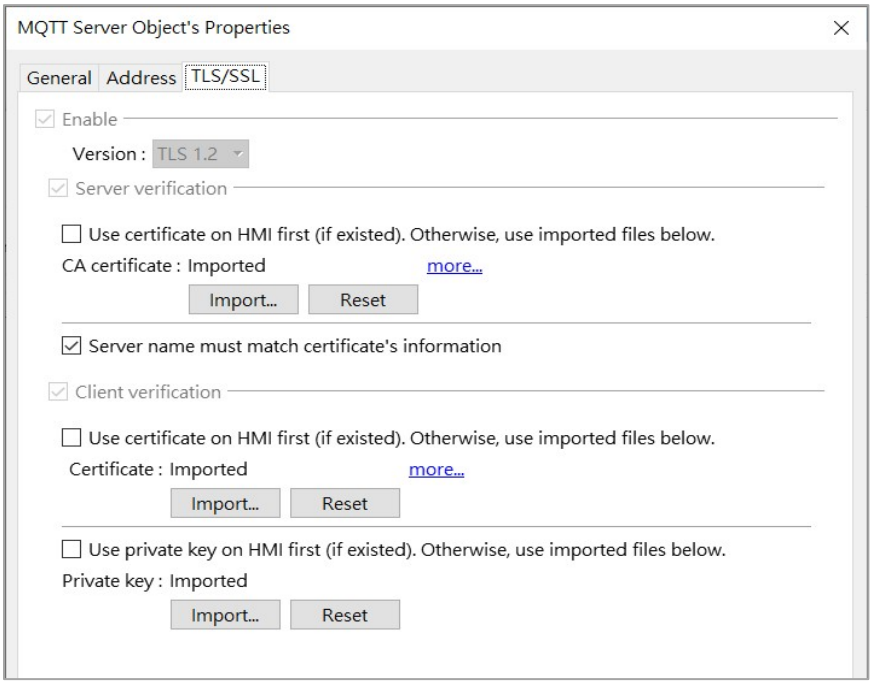
2. In the General tab, select **Normal** as cloud service to use publish-subscribe mode, or select **AWS IoT** to use Thing mode, and the rest will be introduced later. Use the URL obtained in Chapter 2 as domain name and use port 8883.



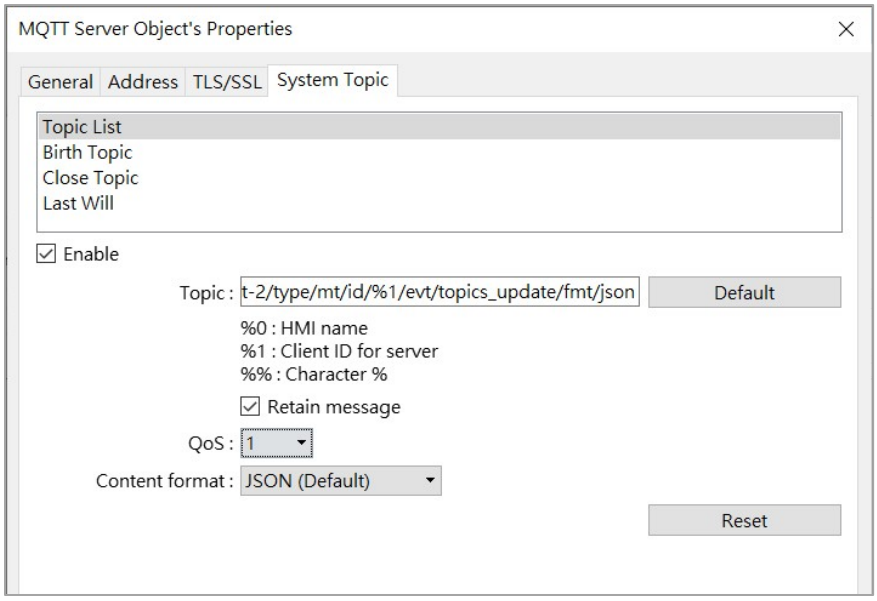
3. Configure addresses in the **Address** tab.



4. In the **TLS/SSL** tab, import the file generated when creating the certificate.
    - Server verification, CA certificate: Import a .pem file. (Amazon Root CA 1)
    - Client verification, Certificate: Import a .crt file. (certificate.pem.crt)
    - Client verification, Private key: Import a .key file (private.pem.key)



5. The System topic includes Topic List and Connection State that HMI will automatically send once it connects to server.



6. Restrictions of using AWS IoT as MQTT server:
    1. Only QoS 0 and QoS 1 are available.
    2. Retain message is not supported.
    3. The maximum number of layers is 8.

7. See EBPro user manual for more information for publish and subscribe settings.

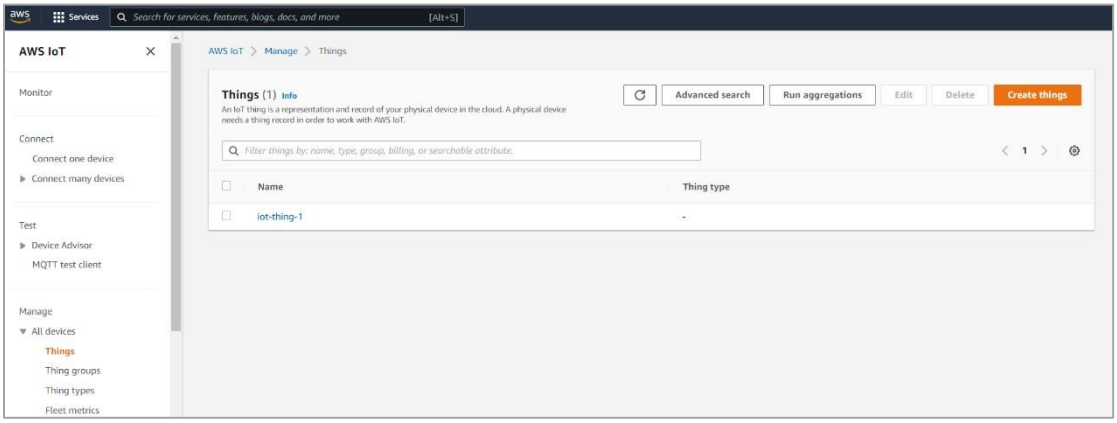
Thing and Shadow

With AWS IoT, Publisher->Broker->Subscribe is no longer the only path that data is accessed over MQTT. By introducing Thing Shadow service, a Thing (a device, app, etc.) can interact with cloud applications and other devices connected to AWS IoT. A Shadow can be maintained for each Thing connected to AWS IoT. The Shadow can be used to get/set the state of a Thing over MQTT, regardless of whether the Thing is connected to the Internet.

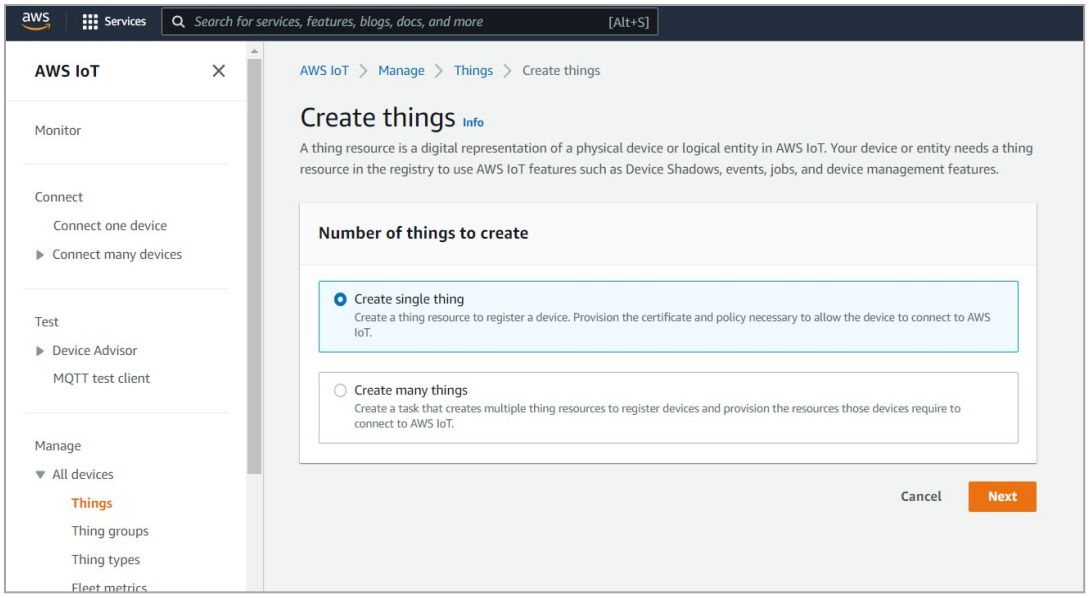
This chapter explains the configuration of AWS IoT and EBPro.

AWS IoT

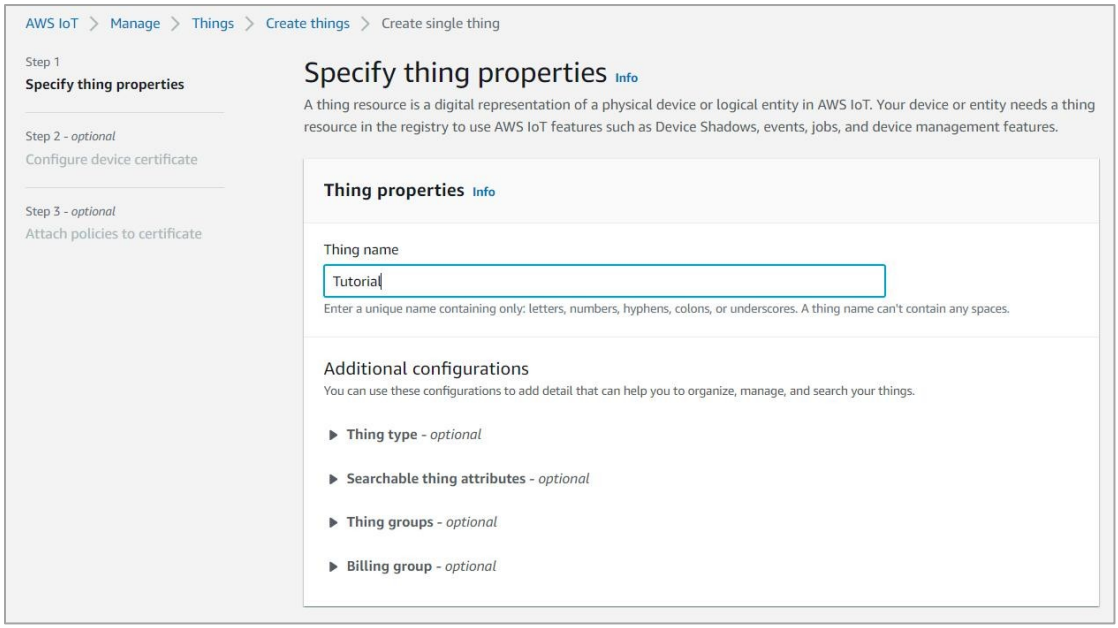
1. Click **Manage** > **All devices** > **Things** > **Create things**.



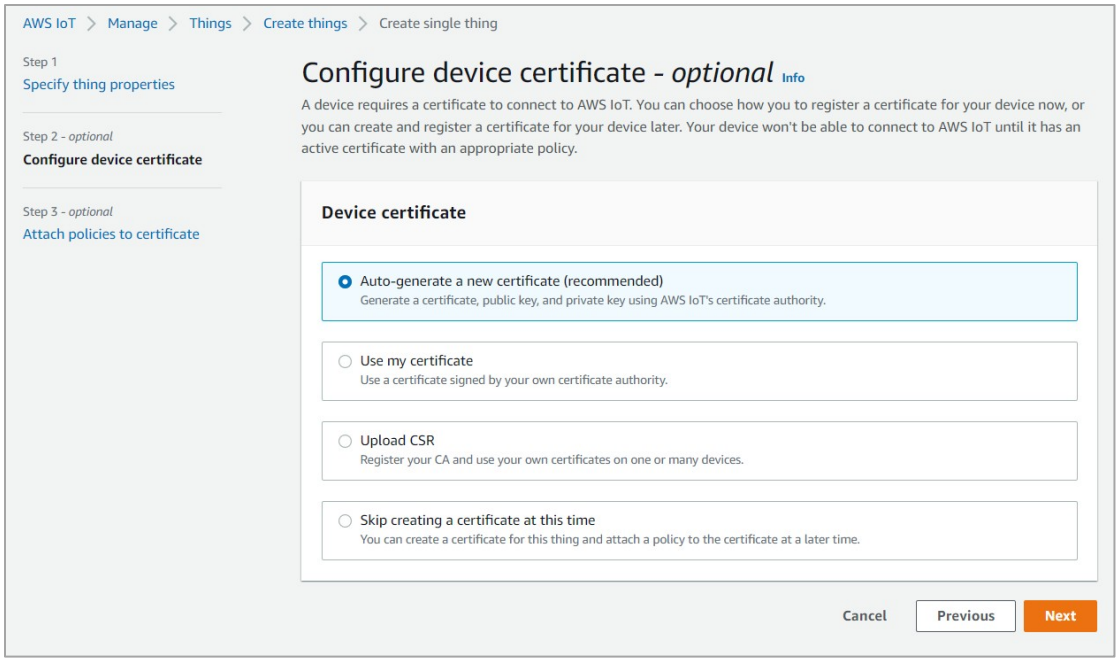
2. Select **Create single thing** and then click **Next**.



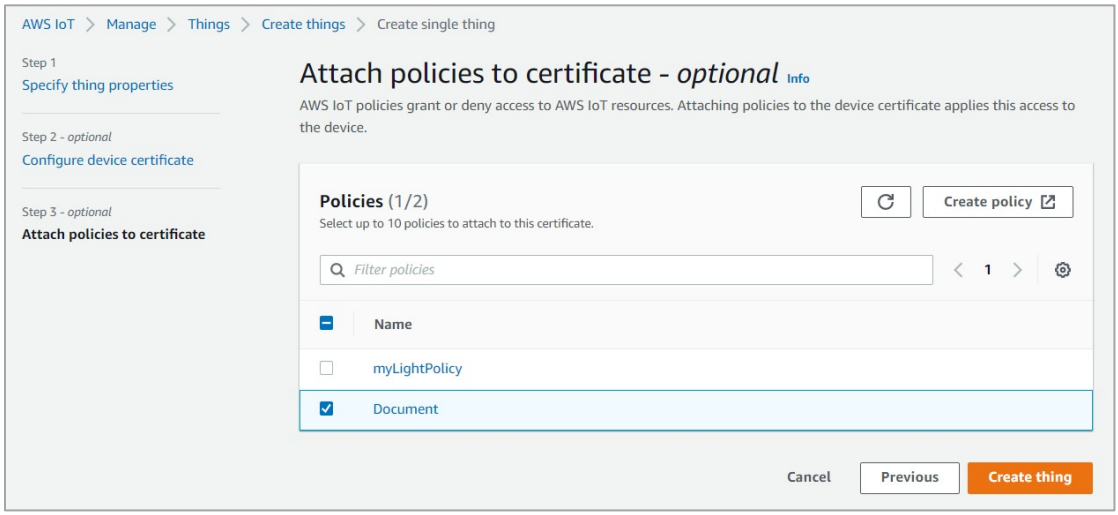
3. Enter the Thing name.



4. Create a certificate.

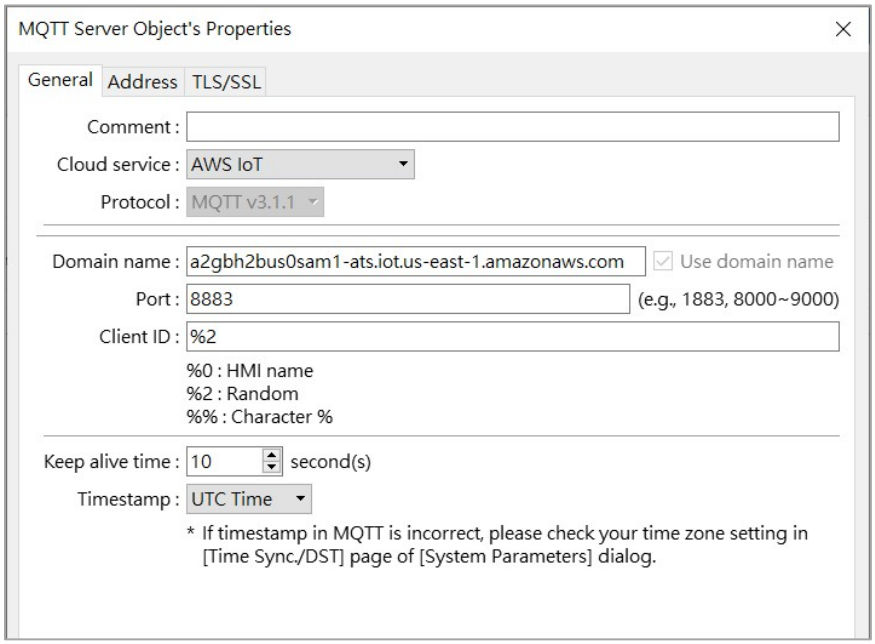


5. Select the corresponding Policy and then click **Create thing**.

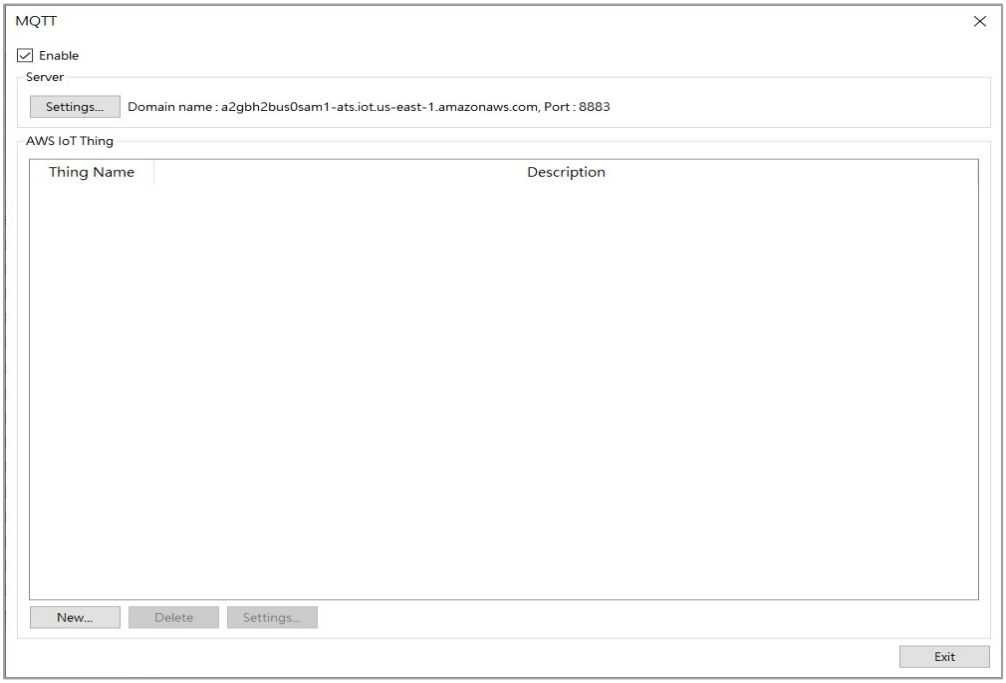


EBPro

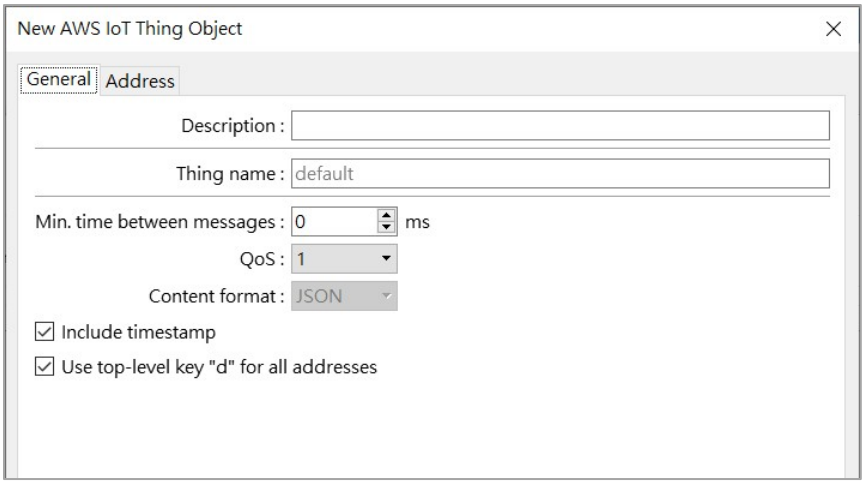
1. Select AWS IoT as cloud service in the MQTT Server settings window and follow the settings in Chapter 3 in this manual.



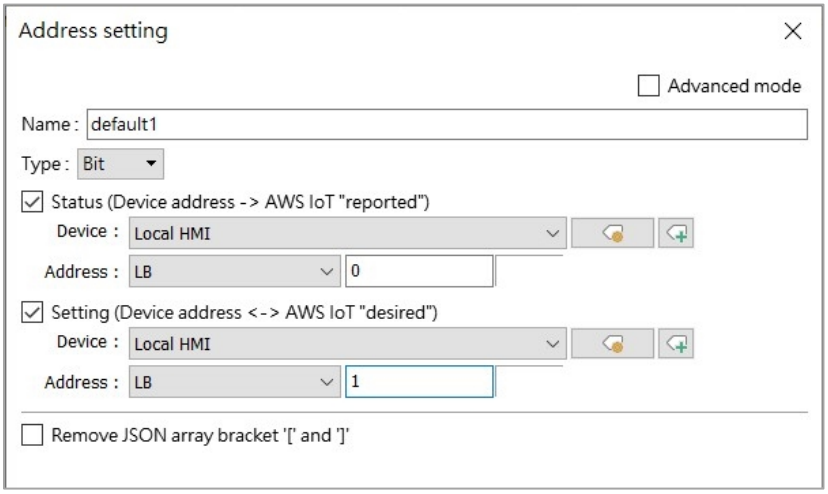
2. Click New to add a device.



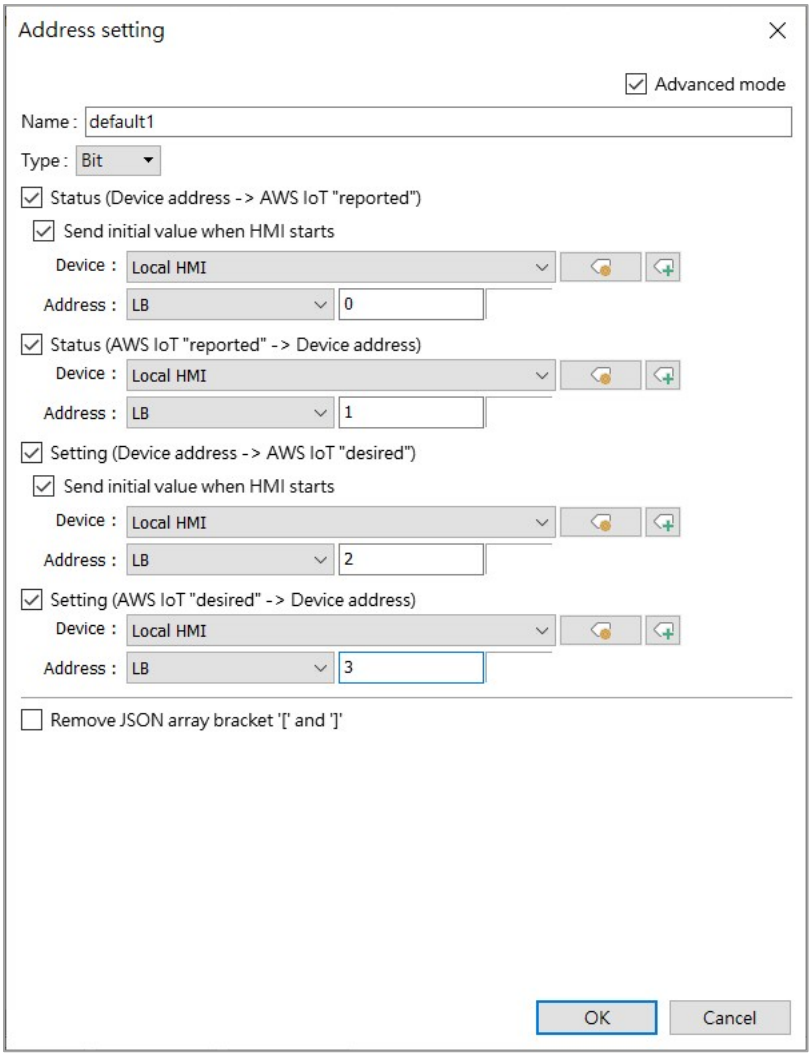
3. Enter Thing name and set minimal time between messages. Only QoS 0 and QoS 1 are available.



4. Go to the Address tab and set the addresses for reported status (LB-0) and desired setting (LB-1). ->, <-> stands for the direction in which data is transmitted.



5. In the Advanced Mode settings window, Status (reported) and Setting (desired) can use different addresses, and data is transmitted to/from AWS IoT/device.


Address setting
Advanced mode
Name : default1
Type : Bit
Status (Device address -> AWS IoT "reported")
Send initial value when HMI starts
Device : Local HMI
Address : LB 0
Status (AWS IoT "reported" -> Device address)
Device : Local HMI
Address : LB 1
Setting (Device address -> AWS IoT "desired")
Send initial value when HMI starts
Device : Local HMI
Address : LB 2
Setting (AWS IoT "desired" -> Device address)
Device : Local HMI
Address : LB 3
Remove JSON array bracket '[' and ']'
OK
Cancel

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