

**Description:** This document shows how to publish the data from local device to Amazon Cloud via MQTT Protocol using IoTWorX.

**OS Requirement:**

- IoT Gateway: Windows 10 IoT or Windows 10 Enterprise

**General Requirement:** Basic knowledge of MQTT and IoTWorX architecture, IoTWorX license.

## Introduction

IoTWorX bridges the gap between an on-premises communications networks and cloud-based deployment platforms like Amazon Cloud. The IoT Gateway, which can be considered an “Edge Device”, provides data connectivity between on-premises end devices and the cloud. Targeting process, factory, and building automation as well as other industries, IoTWorX installs with on-premises communications includes BACnet, SNMP, Modbus, and OPC. The Amazon cloud communication path is highly secure and is based on Message Queuing Telemetry Transport (MQTT) and a publish/subscribe (“pub/sub”) mechanism.

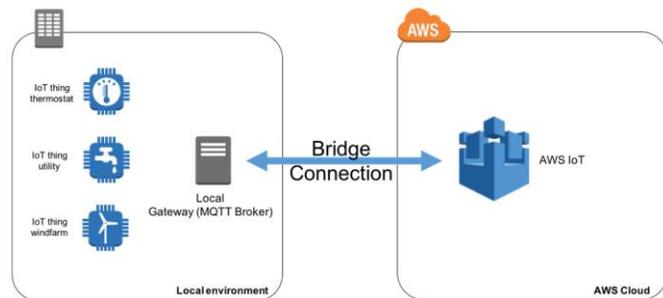


Figure 1 - IoT Gateway Architecture

One feature of local MQTT broker is called ‘Bridge’ and will enable you to connect your local MQTT broker to AWS IoT so they can exchange MQTT messages. This will enable your objects to communicate in a bi-directional fashion with AWS IoT and benefit from the power of the AWS Cloud.

## Benefits

The IoT Gateway Suite provides manufacturers and facility managers with a flexible platform to create Internet of Things applications. ICONICS offers several key IoT technologies, including rich connectivity to things (OPC, OPC UA, BACnet, SNMP, Modbus), secure cloud communications and built-in real-

time visualization and analytics. With simple setup and configuration, users can easily create remote monitoring and analytics solutions that meet their innovative business requirements for collaboration and shared insight across geographies.

## Prerequisites and use

Before beginning IoT Gateway Suite Setup, please ensure you have procured the necessary software & license (ICONICS IoT Gateway Suite Software and IoTWorX license) and optional hardware (IoT Gateway Device). Once these prerequisites are prepared, you can begin provisioning and configuring your IoT Gateway Suite solution. Use the instructions below to begin:

### Initial Resource Setup

1. In the Amazon portal, click Onboard then Get Started.

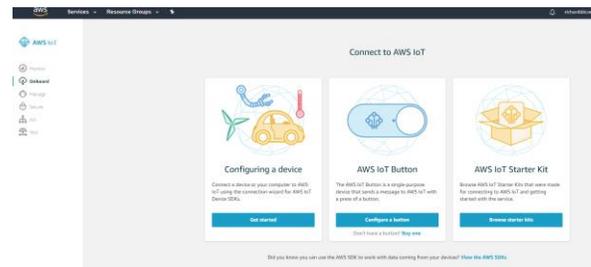


Figure 2 - AWS IoT on Amazon

2. There will be wizard that walks you through creating a “Thing” (device). Generally, the default settings are fine.

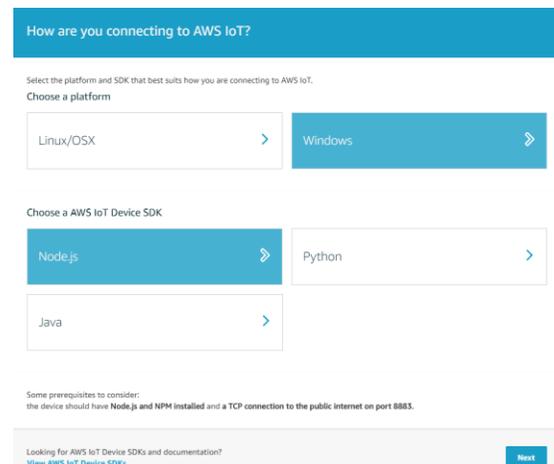


Figure 3 - Using wizard to create a Thing (device)

3. Give your Thing a name.

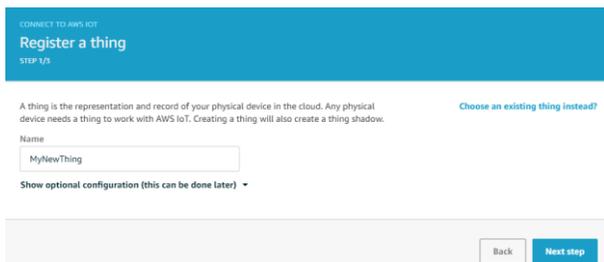


Figure 4 - Giving name to your device

4. Download the connection kit.

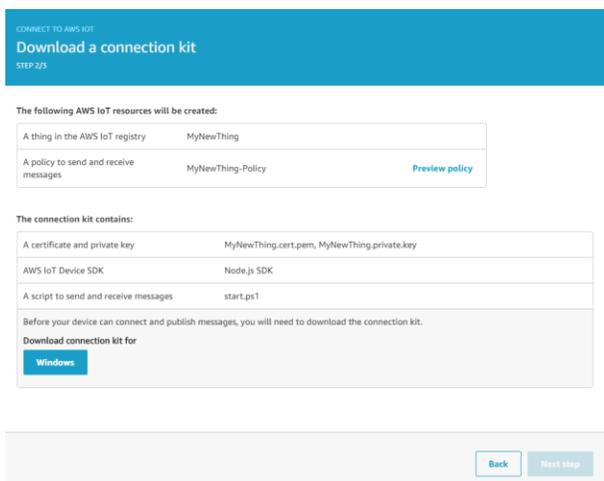


Figure 5 - Downloading connecting kit

5. Extract connects of the package
6. On a machine with OpenSSL (<https://slproweb.com/products/Win32OpenSSL.html>) run following command:

```
"openssl pkcs12 -export -inkey
MyNewThing.private.key -in MyNewThing.cert.pem -
out MyNewThing.p12"
```

Replace "MyNewThing" with the name of your Thing. You will be prompted to create a password, after which, a <yourThingName>.p12 file will be created.

7. Use Local UI to import the certificate to the Local Machine - Personal store.

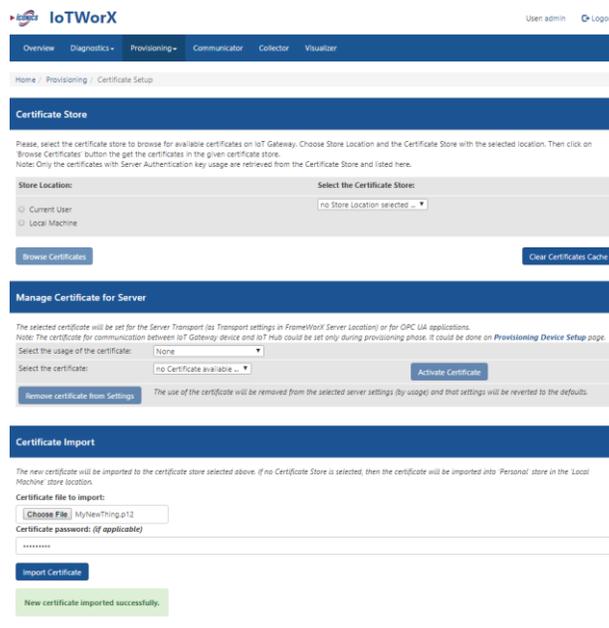
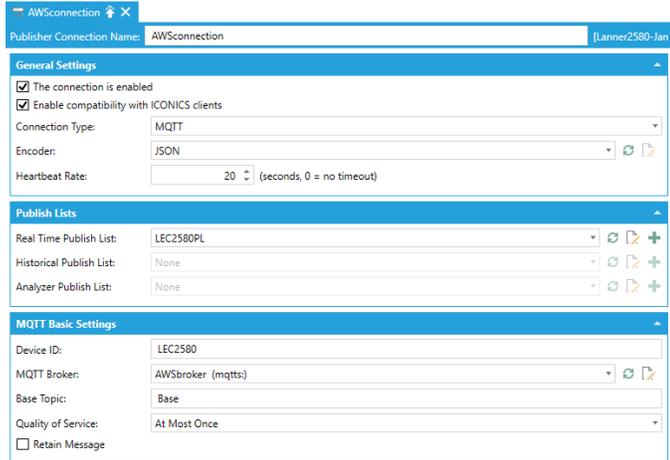


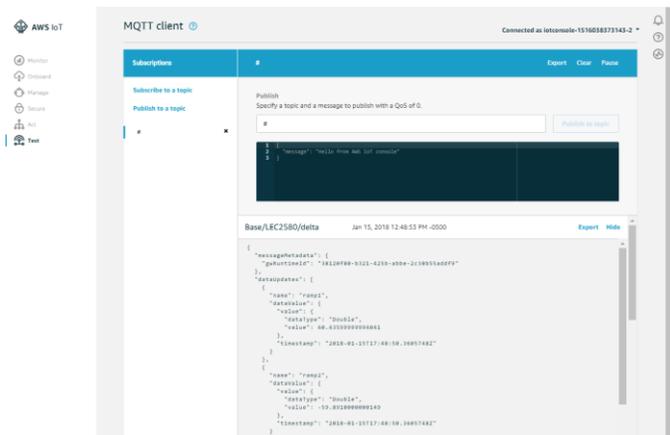
Figure 6 - Importing certificate to the local machine

8. In Workbench where you have an IoT project with your device, you will create a new MQTT broker under that device:
  - Change Protocol to Secured MQTT ("mqtts:")
  - Enter the appropriate server URL (such as somestring.iot.us-east-2.amazonaws.com )
  - Specify a client ID for your device
  - Change Security Mode to TLS ver. 1.2 (recommended)
  - Check the Enable Client Certificate Button
  - Click the Browse Certificate button next to the Client Certificate field
  - Select the AWS IoT Certificate in the Local Machine Personal store (that you recently imported)
  - Apply the changes
9. Next create a new Publisher Connection for your device that uses this MQTT broker and the JSON encoder. Specify some Real Time Publish List.



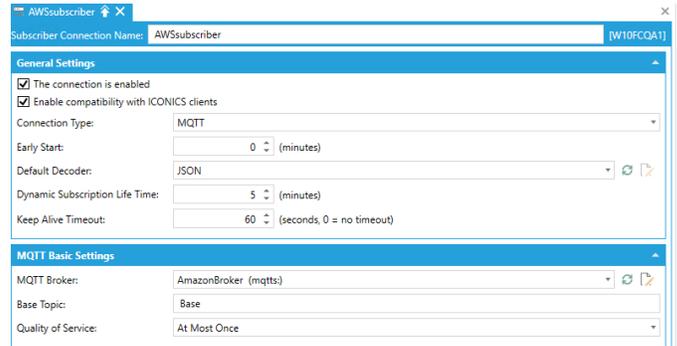
**Figure 7 - Publisher Connection with MQTT Broker & JSON Encoder**

10. Now your IoTWorX device should be publishing to AWS IoT. To test it, go to the Test page in the AWS IoT portal and subscribe to the “#” (all) topic. You should see messages received from your device at your specified publish rate.



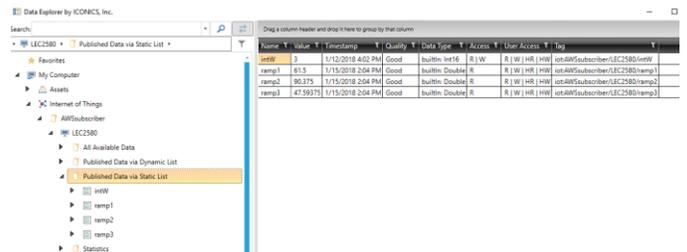
**Figure 8 - Testing IoTWorX device publishing with AWX IoT**

11. To receive these messages into GENESIS64, you can create a subscriber connection. You can create a new broker on the subscriber node with similar settings as the one created before, but specifying a different client ID. Then you would associate that broker with a new subscriber connection that uses a matching decoder.



**Figure 9 - Subscriber Connection with MQTT Broker & JSON Decoder**

After the subscriber connection is completed, you should be ready to see your data. You can verify it with the Data Explorer:



**Figure 10 - Browsing published data in Data Explorer**