

Advantech AE Technical Share Document

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Category	■FAQ □SOP	Related OS	N/A
Abstract	How to publish and subscribe topic to Amazon MQ in AWS by MQTT protocol		
Keyword	WISE, MQTT, AWS, Amazon, Amazon MQ, Apache ActiveMQ		
Related Product	WISE-4000/LAN, WISE-4000, WISE-4220, WISE-4210-AP, WISE-4471, WISE-4671		

■ Brief Description

This document shows that how to use WISE-4000 and WISE-4220 series publish and subscribe topic to Amazon MQ service of AWS in MQTT protocol.

Users will establish a **security group** in **virtual private cloud (VPC)** and then, in **Amazon MQ** service, create an **Apache Active MQ** broker.

Finally, WISE-4000 and WISE-4220 series can publish and subscribe topic to Amazon MQ like Figure 1.

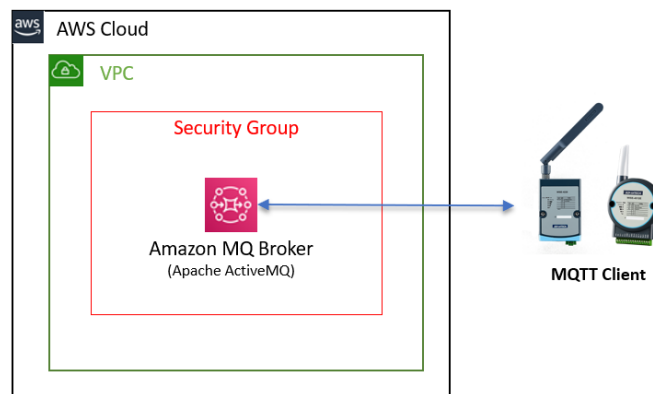


Figure 1. Architecture of WISE-4000/4220 communicating with Amazon MQ

※Please aware that **AWS will charge regional fee** since this solution needs to establish an Amazon MQ service.

Test Environment:

- ⇒ WISE-4220: A2.14 B00
- ⇒ Amazon MQ: ActiveMQ 5.16.4

■ Brief Solution

About AWS's VPC information, please refer to the user guide below.

- ⇒ <https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/concepts.html>

About AWS's Amazon MQ information, please refer to the developer guide below.

- ⇒ <https://docs.aws.amazon.com/amazon-mq/latest/developer-guide/welcome.html>

The step 1 to step 6 refer to below Developer Guide.

- ⇒ <https://docs.aws.amazon.com/amazon-mq/latest/developer-guide/getting-started->

[activemq.html#create-activemq-broker](#)

Step1: Search “Amazon MQ” → Click “Amazon MQ”. Just like Figure 2.

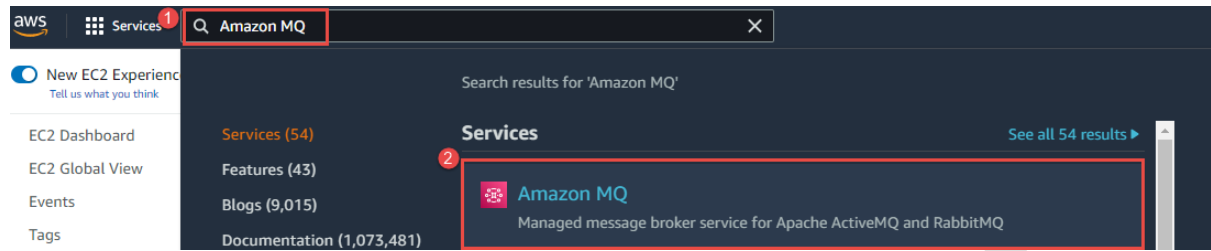


Figure 2. Searching Amazon MQ service of AWS

Step2: Click “Create brokers”. Just like Figure 3.

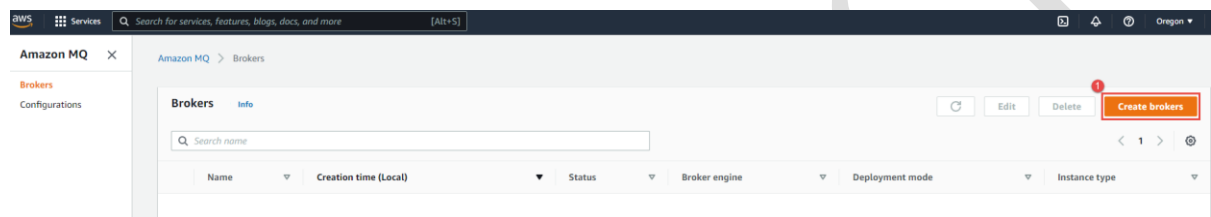


Figure 3. Creating a new broker

Step3: On the **Select broker engine** page, choose a broker type. In this case, **Apache ActiveMQ** was chosen. Just like Figure 4.

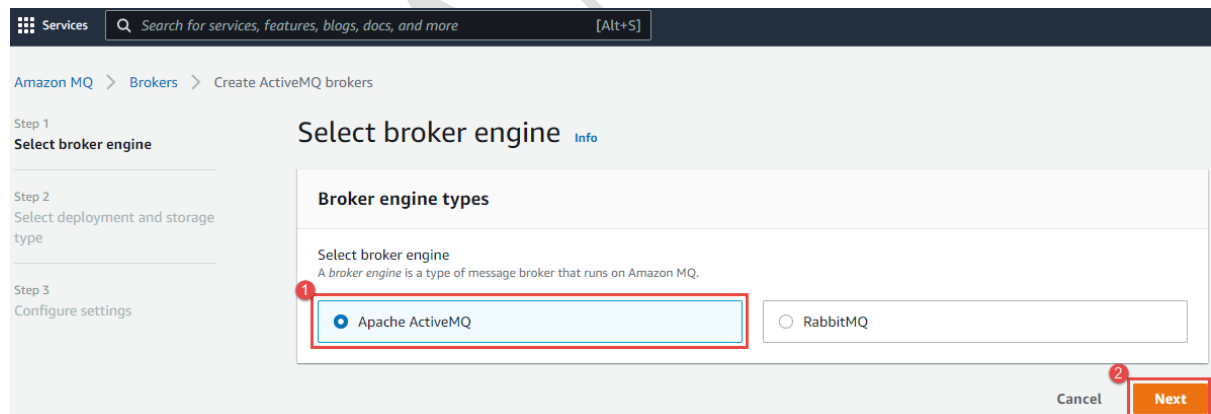


Figure 4. Choose a broker engine type

Step4: On the **Select deployment and storage** page, in the **Deployment mode** and **storage type** section, do the following:

- Choose the **Deployment mode** (in this case, **Active/standby broker**)
- Choose the **Storage type** (in this case, **Durability optimized**)

Just like Figure 5.

Step 1
Select broker engine

Step 2
Select deployment and storage type

Step 3
Configure settings

Select deployment and storage type

Clear Selections Reset to Defaults

Deployment mode [Info](#)

Single broker

☐ Single-instance broker
Creates a broker in a single Availability Zone (AZ). Suitable for development and testing individually or for production workloads when connected in a network of brokers.

☒ **Active/standby broker**
Provides high availability and automatic failover capability. Creates a single broker instance in one Availability Zone (AZ) and another standby broker instance in a different AZ. Suitable for production workloads.

Storage type [Info](#)

☒ **Durability optimized**
Backed by Amazon Elastic File System (Amazon EFS), it provides the highest durability. Data is stored redundantly across multiple Availability Zones and can be shared between active and standby brokers.

☐ Throughput optimized
Backed by Amazon Elastic Block Store (Amazon EBS), it provides lower latency and higher throughput. Data is replicated across multiple servers in an Availability Zone (AZ) and is accessible from a single broker.
Cannot be used with active/standby deployment mode.

Next

Figure 5. Select deployment and storage type

Step5: On the **Configure settings** page, in the **Details** and **ActiveMQ Web Console access** section, do the following. Just like Figure 6.

1. Enter the **Broker name**
2. Choose the **Broker instance type** (in this case, **mq.m5.large**)
3. Choose the **Simple Authentication and Authorization**
4. Determine **Username**
5. Determine **Password**

Step 1
Select broker engine

Step 2
Select deployment and storage type

Step 3
Configure settings

Configure settings

Details

1 **Broker name**
Active MQ
Must be 1-50 characters long. Limited to alphanumeric characters, dashes, and underscores.

2 **Broker instance type** [Info](#)
mq.m5.large
Use for regular development, testing, and production workloads.
2 vCPU 8Gb RAM High Network

Deployment mode [Info](#)
Active/standby broker

Estimated deployment time
25 minutes

Storage type [Info](#)
Amazon Elastic File System

Broker engine [Info](#)
Apache ActiveMQ

ActiveMQ Access

3 ☒ **Simple Authentication and Authorization**
Authenticate and authorize users using the credentials stored in a broker.

☐ LDAP Authentication and Authorization
Authenticate and authorize users using the credentials stored in an LDAP server.

4 **Username**
The username for ActiveMQ web console access.
root
Can't contain commas (,), colons (:), equals signs (=), or spaces.

5 **Password**
AETest123!@#%\$%
Minimum 12 characters, at least 4 unique characters.
☒ Show

Additional settings

Cancel Previous 6 **Create broker**

Figure 6. Configure setting page

Step6: While Amazon MQ is creating the broker, it will display the **Creation in progress** status. It takes about 15 minutes. When the broker is created successfully, Amazon MQ displays the **Running** status.

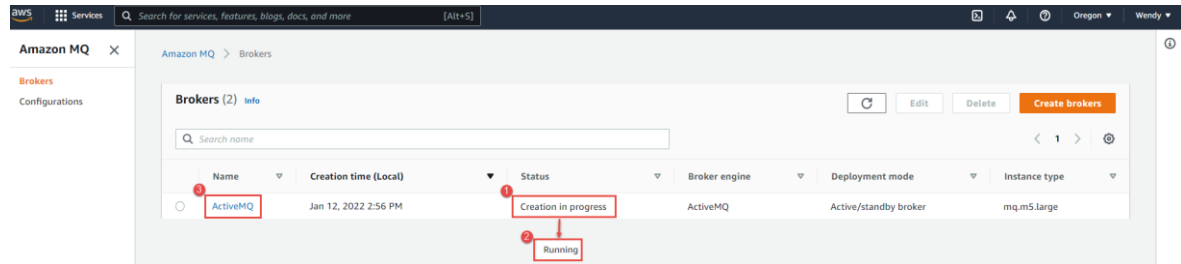


Figure 7. Process of creating a broker

Step7: When the broker is built successfully, please click into the {ActiveMQ} broker. After user finds out **IP Address** of the MQTT broker, user needs to click **Edit** button for more setting.

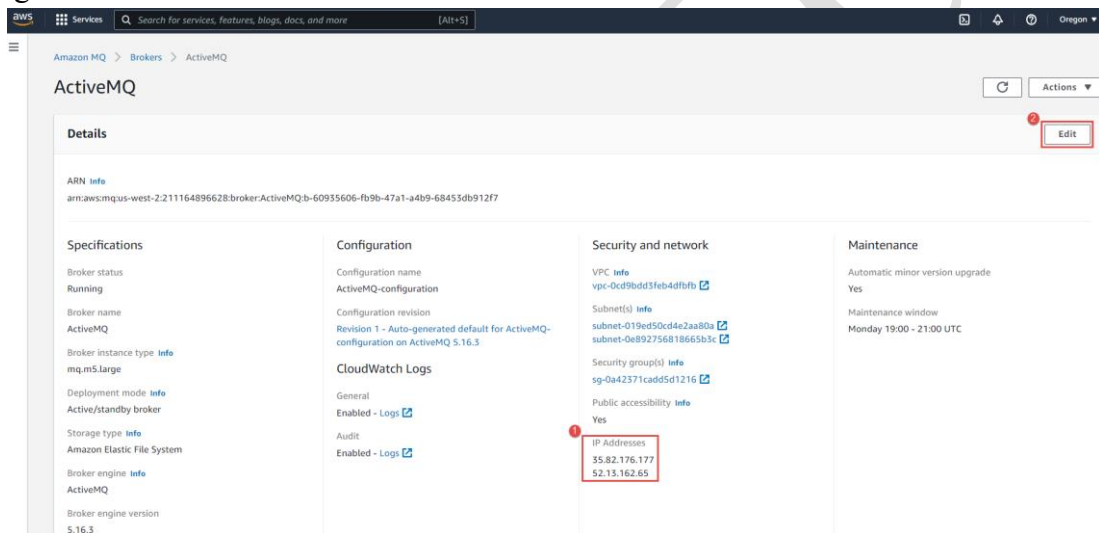


Figure 8. Detail page of the broker

Step8: On **Edit {ActiveMQ}** page, in the **Security and network** section, choose the security group, which open port 8883 and 61619. These 2 ports are set when creating a security group.

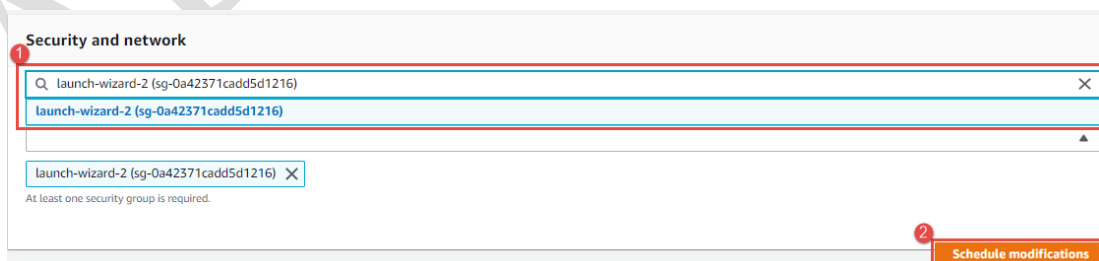


Figure 9. Choose a security group for the broker

Note: The below AWS User Guide describe how to **Create a security group**

https://docs.aws.amazon.com/vpc/latest/userguide/VPC_SecurityGroups.html#creating-security-groups

Step9: On **Amazon MQ console > Brokers > {ActiveMQ}** page, choose **Actions, Reboot broker**. When it reboots done, the setting in step 8 will occur.

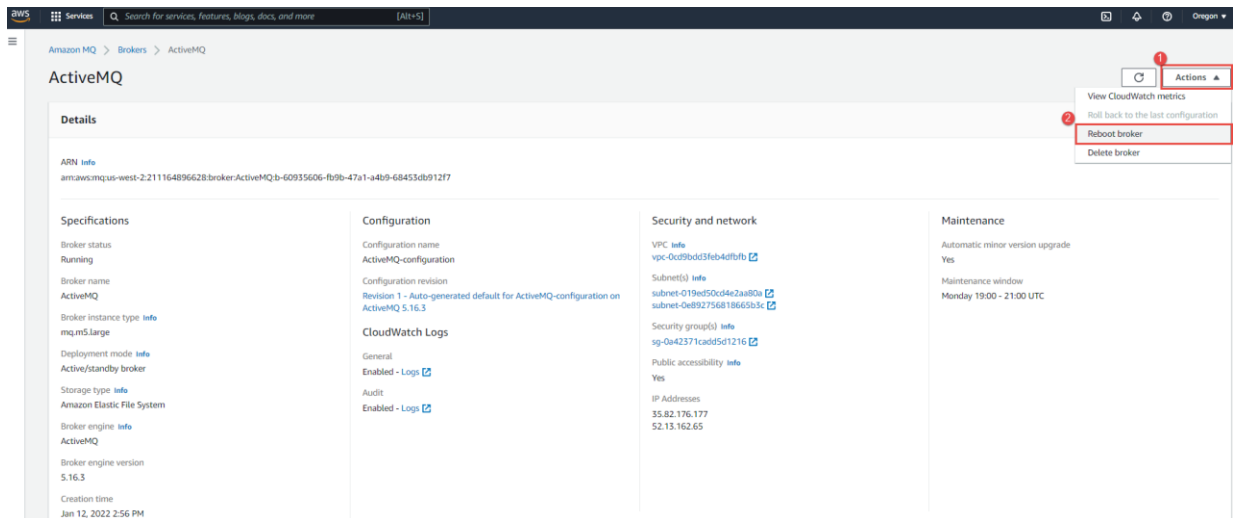


Figure 10. Rebooting the broker

Step10: On **Amazon MQ > Broker** page, please wait Amazon MQ rebooting the broker, it will display the **Rebooting** status. It takes about 5 minutes. When the broker reboot successfully, Amazon MQ displays the **Running** status.

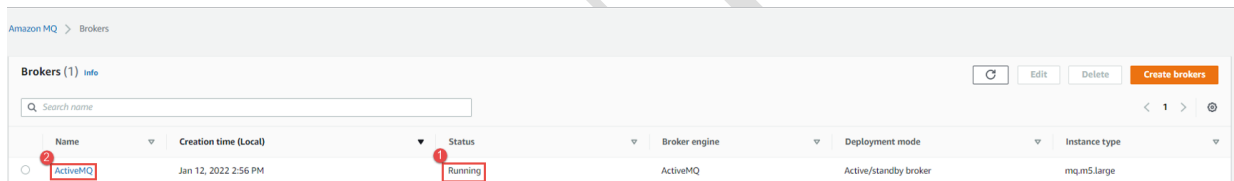


Figure 11. Process of rebooting the broker

Step11: On the **{ActiveMQ}** broker page, in **Connections** section, there are MQTT/SSL or WebSocket/SSL protocol **Endpoints**, just like Figure 12. Below Table 1 shows the example URL of the **{ActiveMQ}** broker.

Table 1. Example URL of sample broker

Domain Name	MQTT/SSL	WebSocket/SSL
b-60935606-fb9b-47a1-a4b9-68453db912f7-1.Mq.us-west-2.amazonaws.com:8883	35.82.176.177:8883	35.82.176.177:61619
b-60935606-fb9b-47a1-a4b9-68453db912f7-2.Mq.us-west-2.amazonaws.com:8883	52.13.162.65:8883	52.13.162.65:61619

Connections
Access your queues and topics and connect your application to the broker. If you disable public accessibility for your broker, your endpoints are reachable only within a VPC.

Enable connections to your broker
To be able to access your broker's ActiveMQ Web Console URL or wire-level protocol endpoints, you must configure one of your security groups to allow inbound traffic.

ActiveMQ Web Console
In an active/standby deployment, only one of the ActiveMQ Web Console URLs is active at a time.
<https://b-60935606-fb9b-47a1-a4b9-68453db912f7-1.mq.us-west-2.amazonaws.com:8162>
<https://b-60935606-fb9b-47a1-a4b9-68453db912f7-2.mq.us-west-2.amazonaws.com:8162>

Endpoints
In an active/standby deployment, only one of the endpoints in each pair is active at a time. You can allow your application to establish connection to either endpoint by using the ActiveMQ Failover Transport.

Protocol	Endpoint URL
OpenWire	ssl://b-60935606-fb9b-47a1-a4b9-68453db912f7-1.mq.us-west-2.amazonaws.com:61617 ssl://b-60935606-fb9b-47a1-a4b9-68453db912f7-2.mq.us-west-2.amazonaws.com:61617
AMQP	amqp+ssl://b-60935606-fb9b-47a1-a4b9-68453db912f7-1.mq.us-west-2.amazonaws.com:5671 amqp+ssl://b-60935606-fb9b-47a1-a4b9-68453db912f7-2.mq.us-west-2.amazonaws.com:5671
STOMP	stomp+ssl://b-60935606-fb9b-47a1-a4b9-68453db912f7-1.mq.us-west-2.amazonaws.com:61614 stomp+ssl://b-60935606-fb9b-47a1-a4b9-68453db912f7-2.mq.us-west-2.amazonaws.com:61614
MQTT	mqtt+ssl://b-60935606-fb9b-47a1-a4b9-68453db912f7-1.mq.us-west-2.amazonaws.com:8883 mqtt+ssl://b-60935606-fb9b-47a1-a4b9-68453db912f7-2.mq.us-west-2.amazonaws.com:8883
WSS	wss://b-60935606-fb9b-47a1-a4b9-68453db912f7-1.mq.us-west-2.amazonaws.com:81619 wss://b-60935606-fb9b-47a1-a4b9-68453db912f7-2.mq.us-west-2.amazonaws.com:81619

Figure 12. Endpoints of the sample broker

Step12: Open Web GUI of WISE-4000/4220 series and go to **Configuration > Cloud** to set on **Cloud Configuration** page. Just like right side of Figure 13. The following is the field introduction in config setting of WISE-4000/4220.

- Select Service:** Select a cloud service of WISE-4000/4200. In this case, the field is set as **"iSensing MQTT."**
- MQTT Host Name:** Input broker's IP or URL into this field. In this case, the field is set as **"52.13.162.65"** (refer to step 11)
- Port Number:** Input broker's port number. In this case, the field is set as **"8883"** (refer to Step 11)
- SSL Secure:** the function will make data transferred more securely. In this case, the field is set as **"Enable"** due to AWS only support via MQTT or WebSocket.
- WebSocket:** If user uses MQTT, click **Disable**. If WebSocket, click **Enable**. In this case, the field is set as **"Enable."**
- User Name:** Input broker's username. In this case, the field is set as **"root"** (refer to Step 5)
- Password:** Input broker's password corresponding to the username. In this case, the field is set as **"Aetest123@#\$%"** (refer to Step 5)

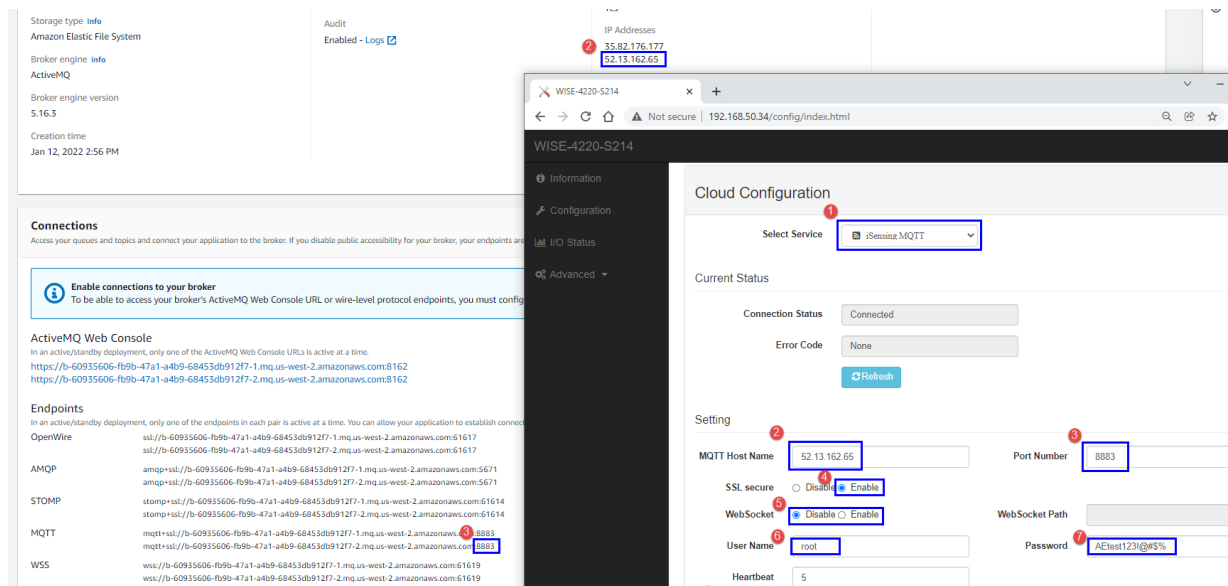


Figure 13. Setting of WISE connecting the broker

Step13: Go to **Advanced > Data Logger > Logger Configuration** page and turn on **I/O Log** switch in **Push Notification** section. Please notice that click **submit** button to save the setting. Just like Figure 14.

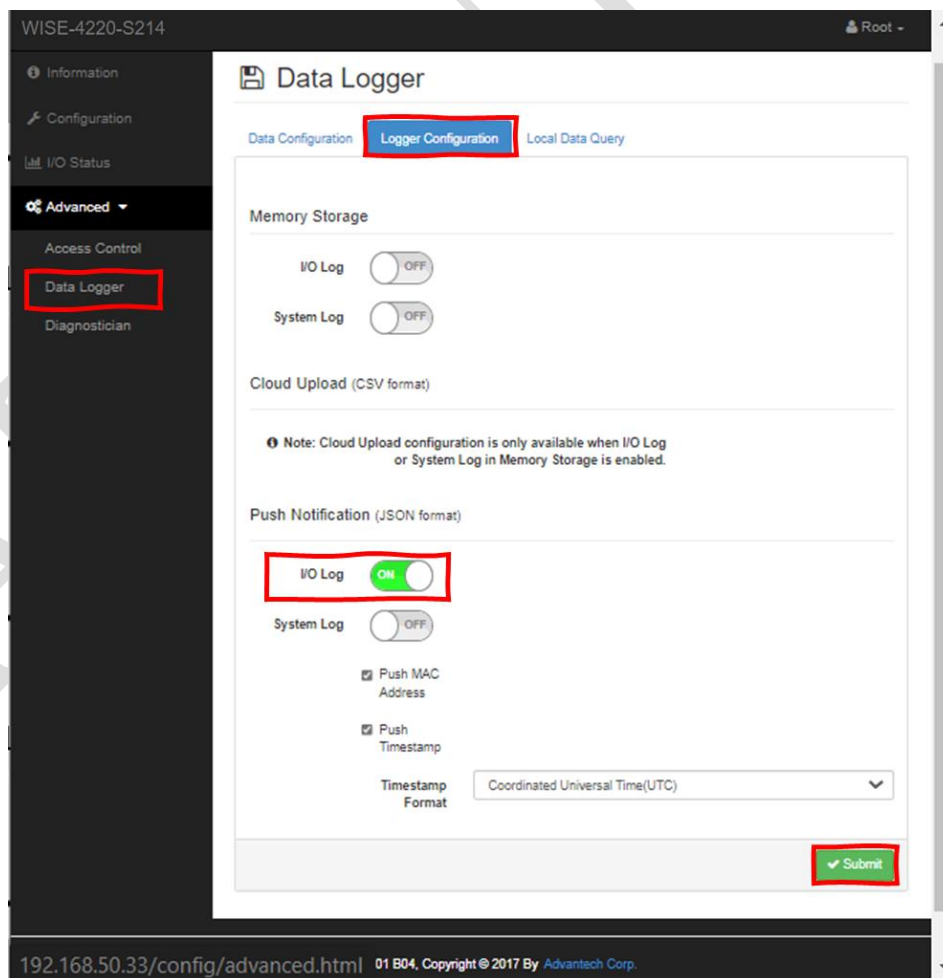


Figure 14. Turn on push IO log setting

Result: Please use any MQTT Client, such as MQTTBox, to subscribe the {ActiveMQ} broker with Advantech/{74FE4858ED09}/data topic. And the user will receive WISE-4000/4220's data from Amazon MQ. Just like Figure 15.

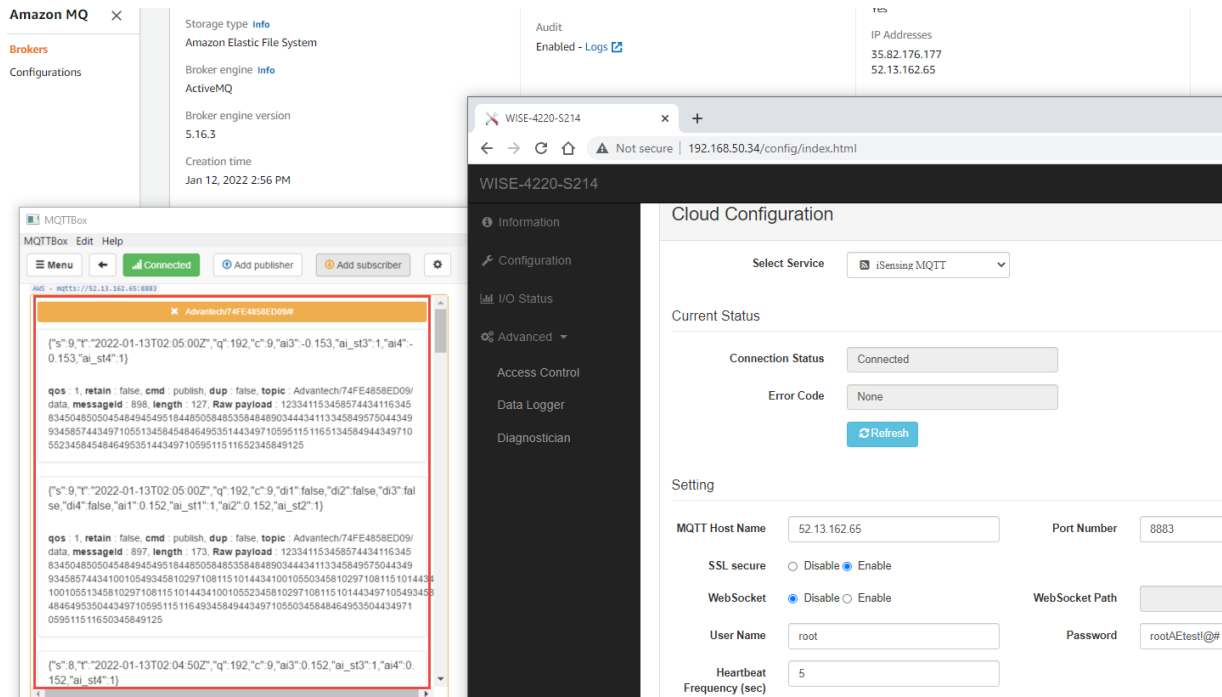


Figure 15. Subscribe topic of WISE-4000/4220