ThingsPro Edge + Zero Touch Provisioning via Azure DPS

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Note: - This note is written for the audience who wants auto-provision of UC-8112A IIoT gateway at scale running **ThingsPro Edge V1.1.0** to Azure IoT Hub using Moxa Provision tool.

UC-8112A model default settings

- username/password: moxa/moxa
- IP LAN1 192.168.3.127
- IP LAN2 192.168.4.127

This document lists the following steps:

1. Preparation
2. Download and install ThingsPro Edge V1.1.0
3. Verifying Endorsement key on ThingsPro Edge RESTful Web API
4. Verifying TPM status on ThingsPro Edge command line
5. Discover and enroll IIoT devices on designated Azure IoT Hub using Moxa Provision Tool

1. Preparation

- Get the device with TPM capability (TPM written on the device)
- Get all tools (Console with UPort, network cable, Power supply 24vdc). Please follow the QIG on the link below.
  https://moxa.com/getmedia/e8a7cc08-cff3-49ce-b5d3-836e2c8e7fde/moxa-uc-8100a-me-t-series-qig-v2.0.pdf
- Login device via Serial (baud rate 115200) or SSH via LAN2 (ssh moxa@192.168.4.127)
- Reset to factory default (sudo mx-set-def)
  - **Note:** Reset not required if using it for first time.
- Enable dhcp LAN1 (cd /etc/network)
  - **Note:** Required only when install ThingsPro Edge from internet
- Reboot the device to get the IP address from DHCP server.
- Check the internet connection (e.g. ping google.com)

2. Download and Install ThingsPro Edge V1.1.0

- Download the debian package ThingsPro Edge software from the internet on UC-8112A.

```
wget https://thingspro.blob.core.windows.net/software/edge/V1.1.0/update_1.1.0-898-uc-8112a-me_armhf.deb

sudo dpkg -i update_1.1.0-898-uc-8112a-me_armhf.deb
```

- Update Installation process

```
sudo journalctl -u update -f
```

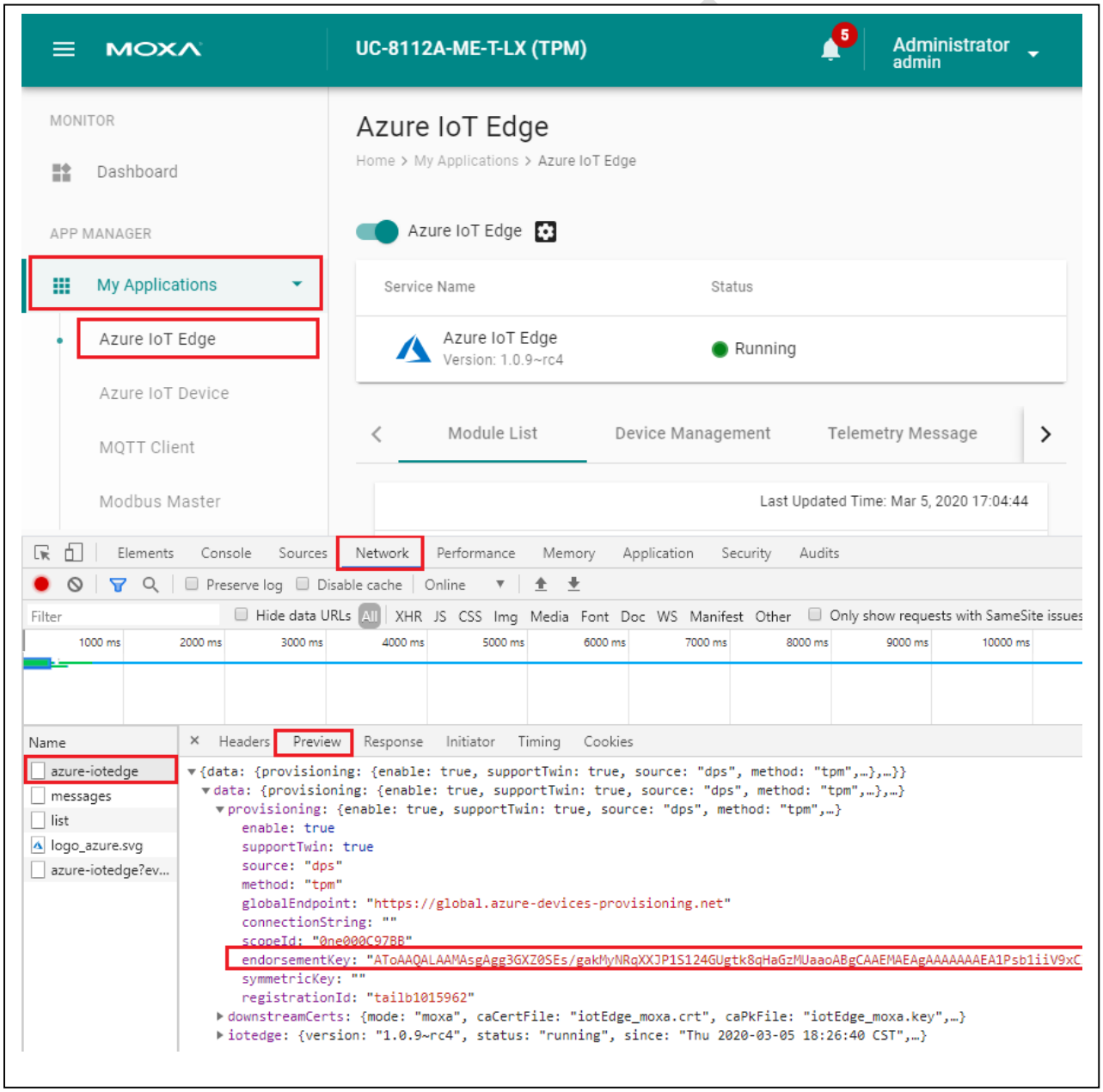
- Waiting for installation to end

```
journalctl -u update -f

Moxa update[1355]: level=info msg="device: 3/4 78%" origin=http
Moxa update[1355]: level=info msg="device: 3/4 81%" origin=http
Moxa update[1355]: level=info msg="device: 3/4 87%" origin=http
Moxa update[1355]: level=info msg="device: 4/4 0%" origin=http
Moxa update[1355]: level=info msg="device: 4/4 0%" origin=http
Moxa update[1355]: level=info msg="device: 4/4 0%" origin=http
Moxa update[1355]: level=info msg="device: 4/4 0%" origin=http
Moxa update[1355]: level=info msg="device: starting running" origin=http


Moxa update[1355]: level=info msg="stop appman" origin=http
Moxa update[1355]: level=info msg="stop update" origin=http
Moxa update[1355]: level=info msg="shutdown Server ..." origin=init
Moxa systemd[1]: Stopping MOXA ThingsPro Updater...
Moxa update[1355]: level=info msg="bye bye" origin=init
Moxa systemd[1]: Stopped MOXA ThingsPro Updater.
```

Note: The entire process will take about ~11 minutes (depends on the hardware/model). When it shows "**Stopped MOXA ThingsPro Updater**.", you can reboot the device by command sudo reboot

3. Verifying Endorsement key on ThingsPro Edge RESTful Web API

- Open the web browser https:192.168.4.127:8443 using LAN2 or login IIoT gateway via serial and get the IP address of LAN1 (eth0) assigned by DHCP server.
- Press F12 to enter in debug mode

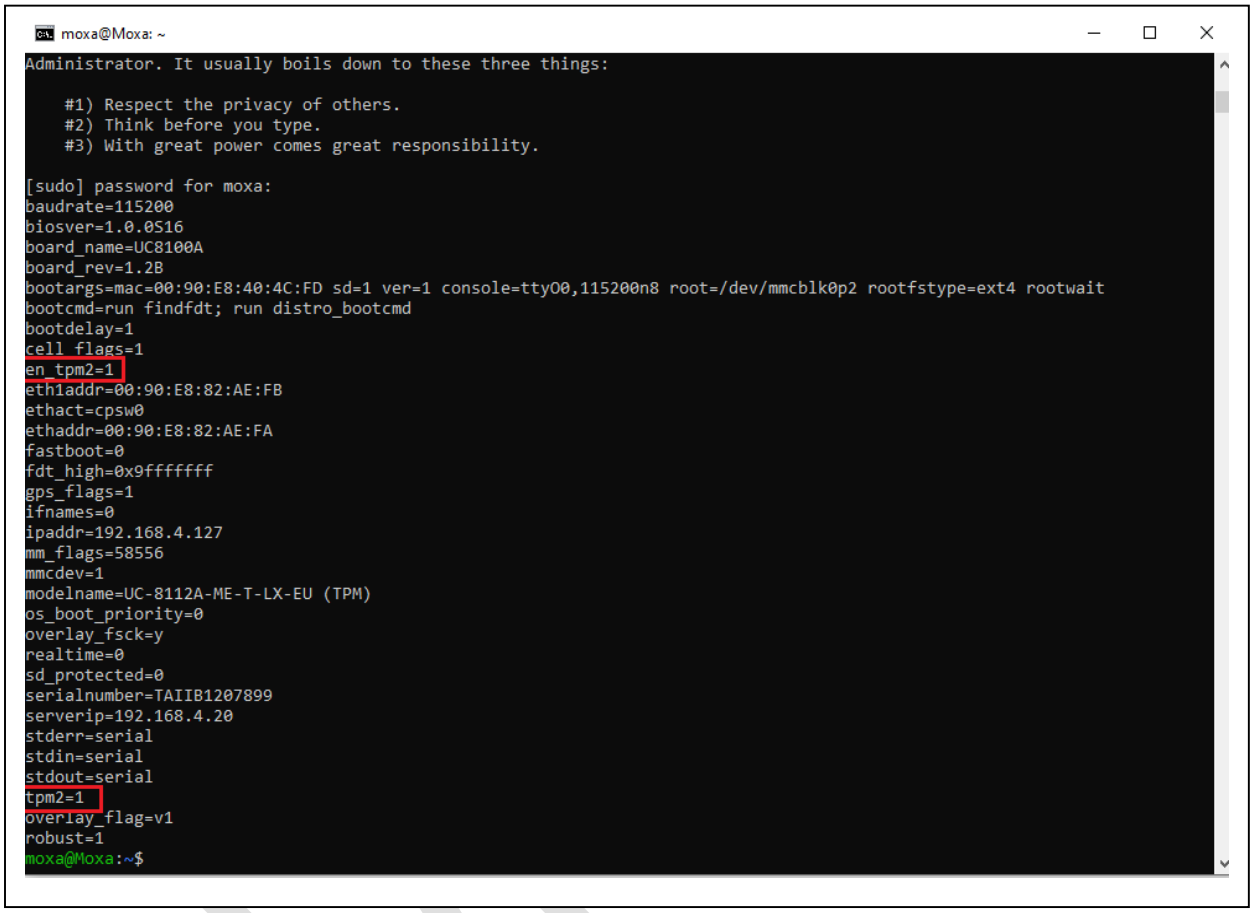


4. Verifying TPM status on ThingsPro Edge command line (optional)

- Check TPM status from command line

```
sudo fw_printenv
```

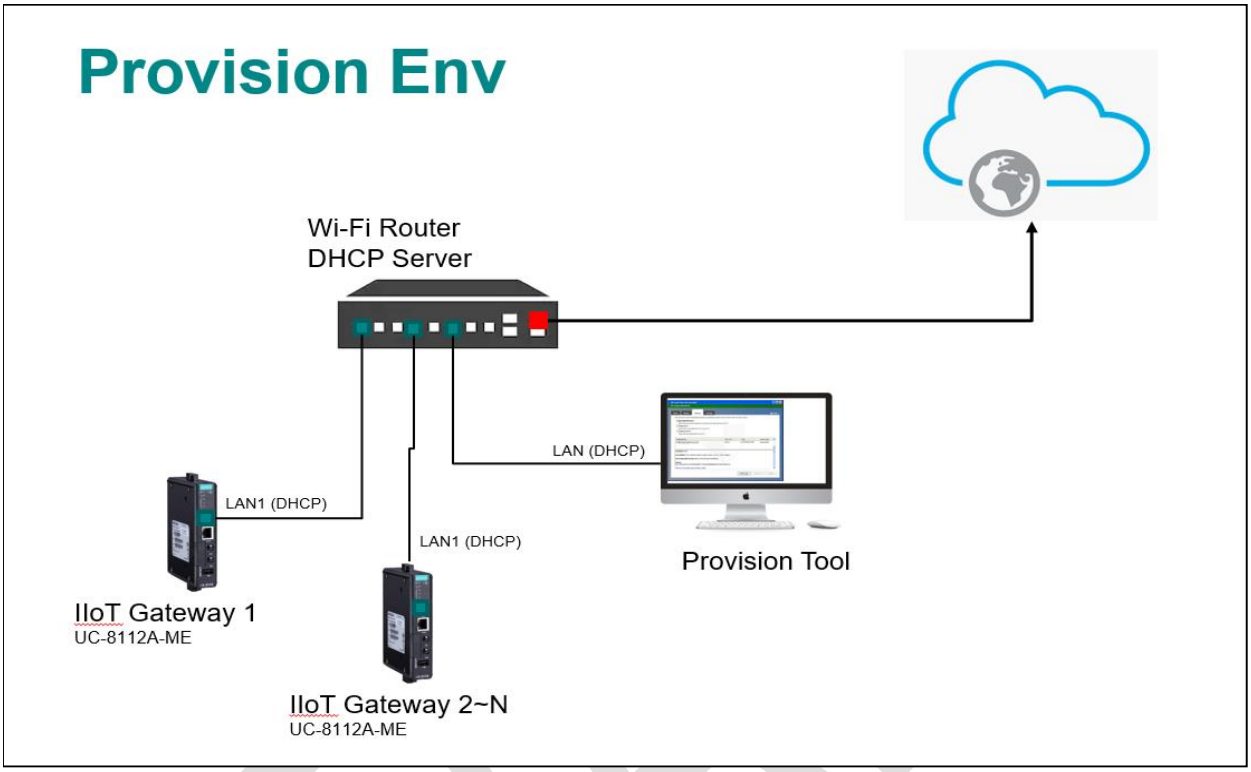
- Make sure both flags (en_tpm2=1 & tpm2=1)



Note: Enable TPM from bootloader if above conditions are not fulfilled.

- Enable TPM from bootloader (login via serial console press DEL or Backspace)

5. Discover and enroll IIoT devices on designated Azure IoT Hub using Moxa Provision Tool



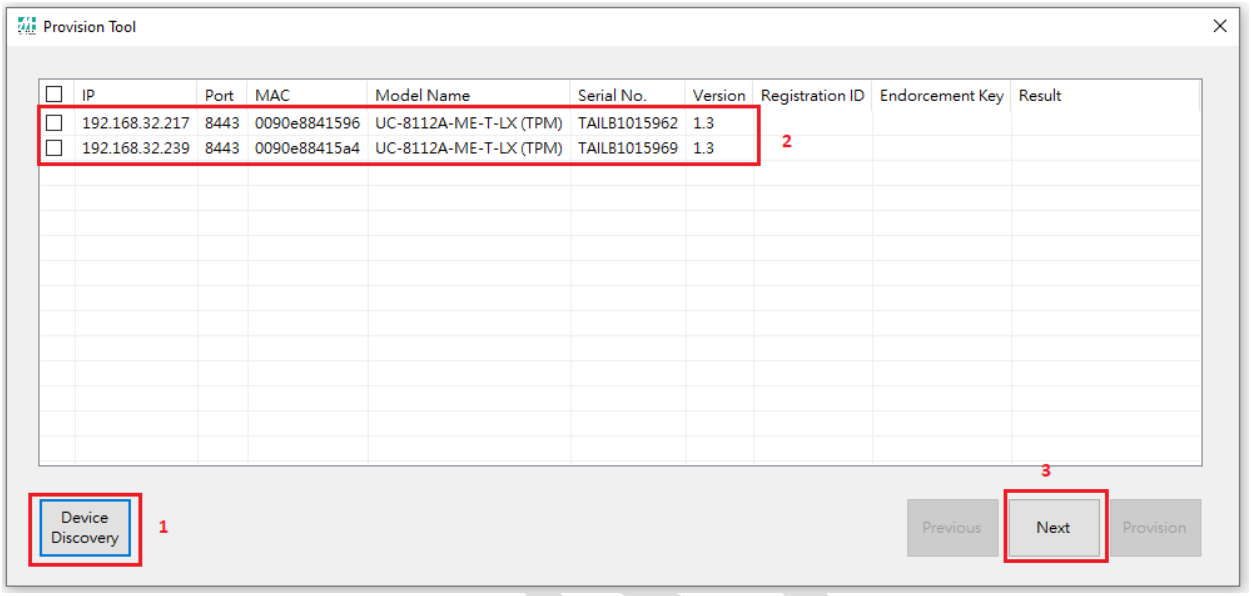
Step 1: Modified the config file with your IoT Hub and DPS information

config - Notepad

File Edit Format View Help

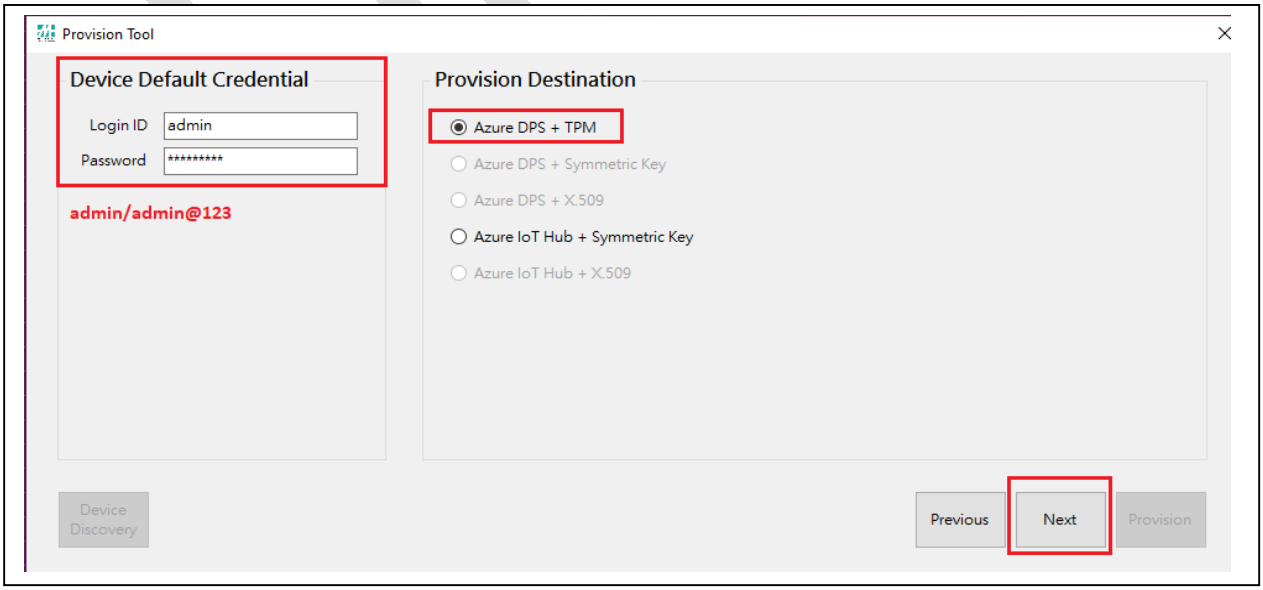
```
// dev, stage, production
Environment: stage
// Azure, dlm, all
Target: Azure
// Azure DPS settings
ScopeID: 0ne000C97BB
DPSHostName: DPS-West-EU.azure-devices-provisioning.net
DPSKeyName: provisioningserviceowner
DPSKey: rbYks9RseYadtMhNXYesZg6UbOZavEcXA0fdYArmddw=
// Azure IoT Hub Settings
IoTHubHostName: IoT-Hub-West-EU.azure-devices.net
IoTHubKeyName: iothubowner
IoTHubKey: apq7FqgKobQ/Oe5oRW6atz87OLXpdzTuqAtQ1nyAHZg=
```

Step 2: Discover IIOT devices on LAN1 and select the device from the given list to be enrolled on the designated IoT Hub

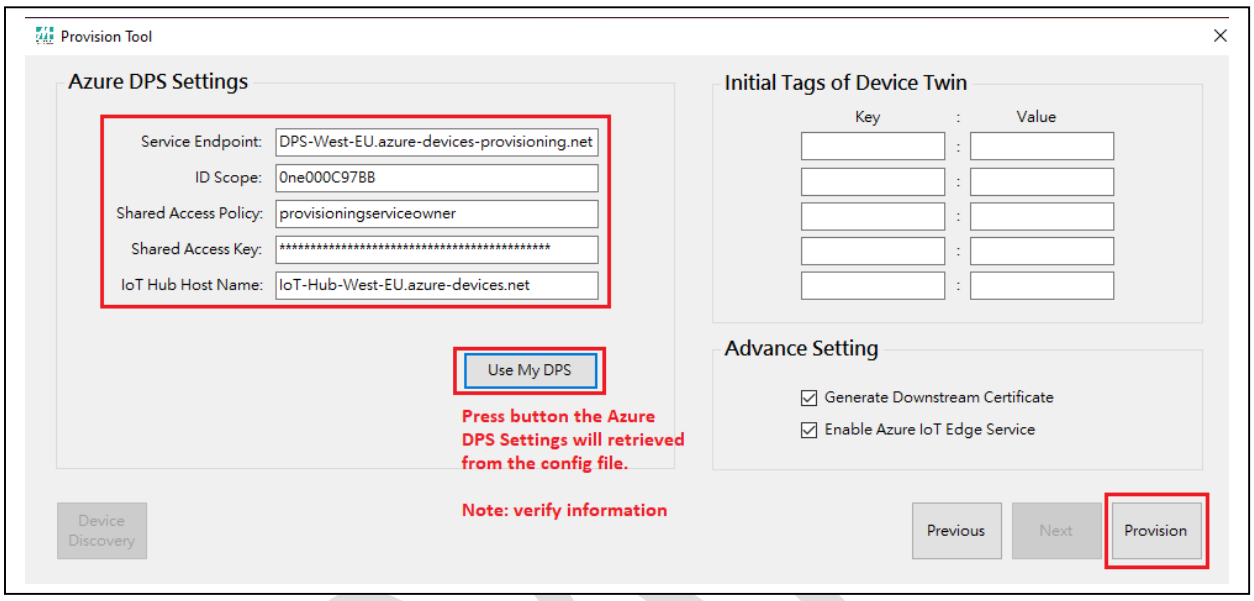


Note: Make sure that notebook is on same the local network. The discovery service works only on LAN1 on UC-8112A IIoT gateway

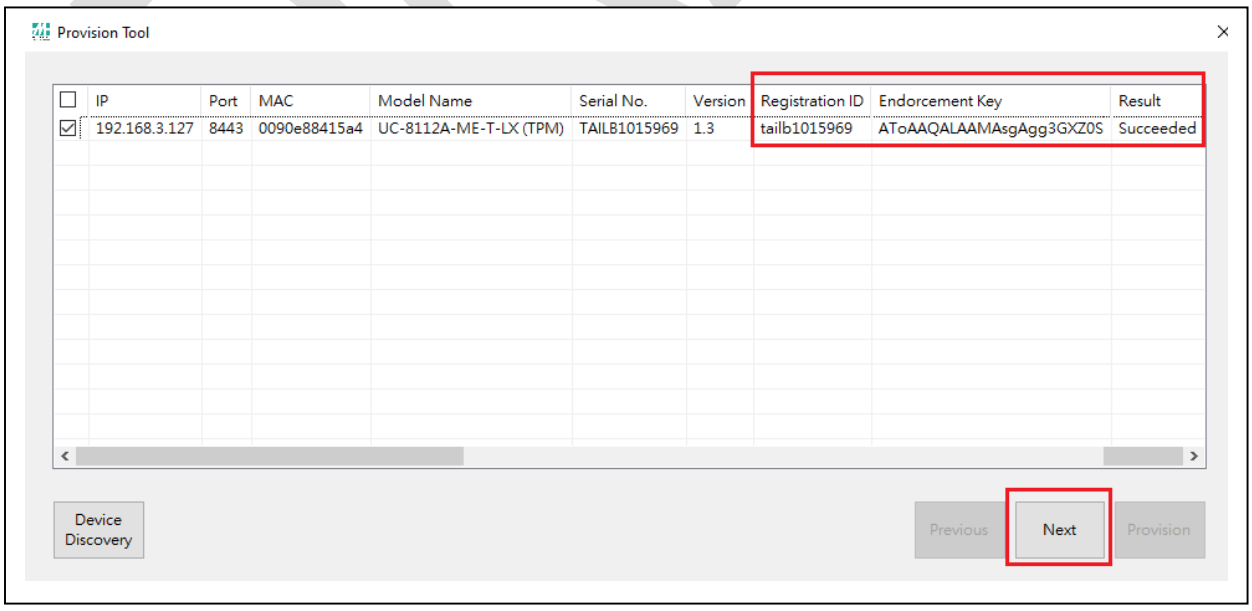
Step 3: Select the provision method (Default: Azure DPS + TPM)



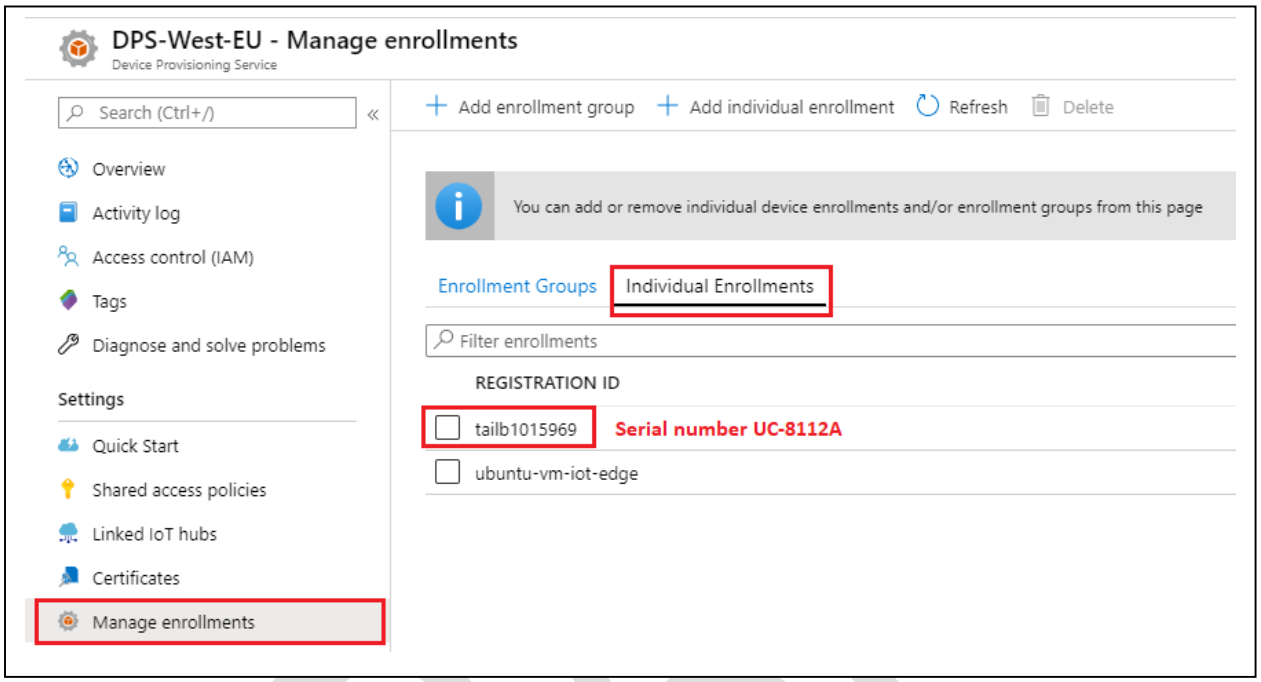
Step 4: The provision tool retrieves the DPS and IoT Hub information from the config file



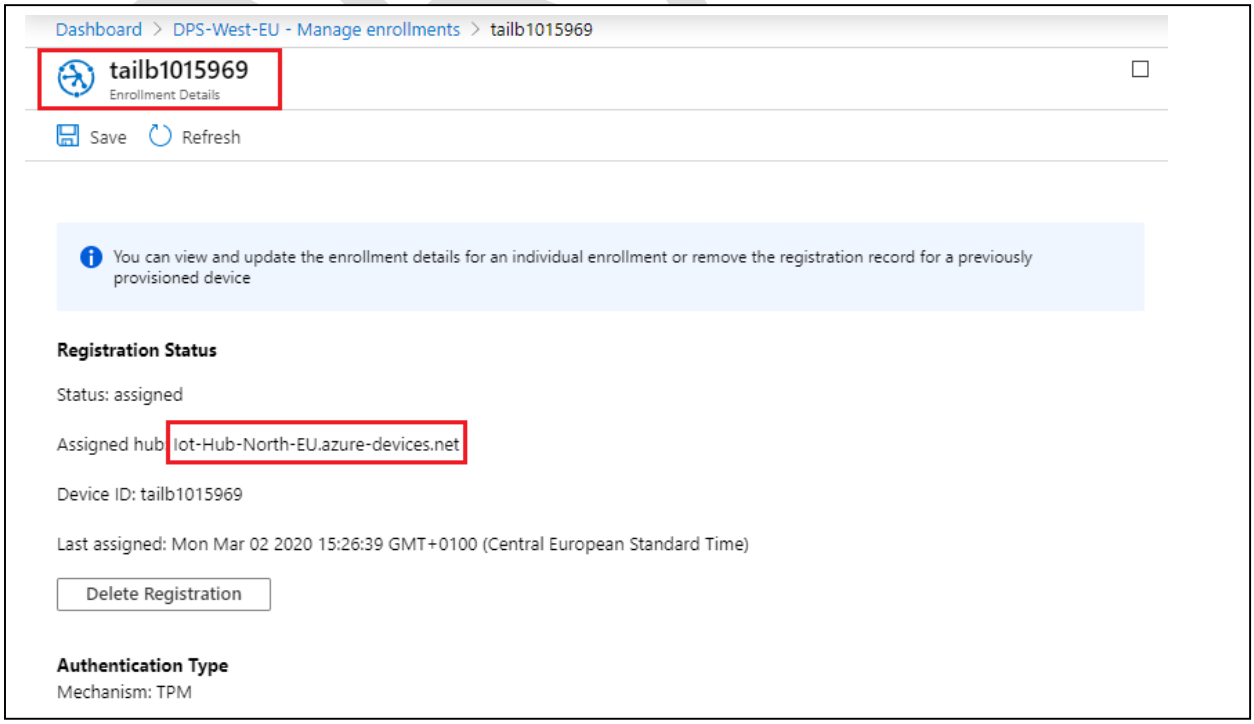
Step 5: The provision tool automatically retrieves the **Registration ID** (SN of the device) and **Endorsement key** of UC-8112A gateway.



Step6: Verifying the device enrollment on Azure DPS on your Microsoft subscription.



Step7: Verifying the registration status of the device (takes 4-5 minutes) on Azure DPS Web GUI



Step8: Verifying the device registration on Azure IoT Hub (Device ID is the serial number of the IIoT gateway)