



QUICK START GUIDE

VIA Mobile360 FSS

AWS IoT Core



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Revision History

Version	Date	Remarks
1.00	19/08/2022	Initial Release
1.0.1	20/09/2022	Remove Chapter1 Diagram
1.0.2	04/10/2022	Add Debug and Trobleshooting



Table of Contents

1.	Introduction.....	1
1.1	Directing Data from a VIA Mobile360 FSS Device to AWS IoT Core	1
1.2	VIA Mobile360 FSS Device	1
2.	Connecting to AWS IoT Core	2
2.1	Introduction	2
2.2	Setup your AWS account and Permissions.....	2
2.3	Create Resources in AWS IoT	3
2.4	Setup the VIA Mobile360 FSS device	9
2.5	Connecting to AWS IoT Core with the VIA Mobile360 FSS EVK.....	10
2.6	Debugging	13
2.7	Troubleshooting	13

1. Introduction

This document provides instructions on how to setup an AWS portal to connect with a VIA Mobile360 Forklift Safety System(FSS) device.

1.1 Directing Data from a VIA Mobile360 FSS Device to AWS IoT Core

To direct data from VIA Mobile360 FSS devices to your cloud implementation, the AWS IoT Core Web Service must be set up and configured to receive data coming from VIA Mobile360 FSS devices.

For a VIA Mobile360 Forklift Safety System(FSS) device to connect to your AWS backend, follow the steps listed below to set up your AWS services

- Follow the steps listed in Section 2.3 to register an AWS IoT Thing and to acquire AWS IoT certificate files for the VIA Mobile360 FSS devices.
 - Acquire the certificate (*-certificate.pem) and the private key (*-private.pem.key) files associated with the IoT thing you created, as displayed in [step 7](#) of Section 2.3..
 - Acquire the Device Shadow URL displayed in [step 9](#) of Section 2.3.

1.2 VIA Mobile360 FSS Device

The datasheet and installation guide of the VIA Mobile360 FSS device could be found on the VIA Mobile 360 forklift Safety System product page.

<https://www.viatech.com/en/products/systems/mobile360/mobile360-forklift-safety-system/>

- [Datasheet](#)
- [Installation Guide](#)



2. Connecting to AWS IoT Core

2.1 Introduction

This section provides instructions on how to establish a connection between VIA Mobile360 Forklift Safety System(FSS) devices and Amazon IoT Core web services, including how to add and manage the VIA Mobile360 FSS device as an IoT Core device on Amazon Web Services, setup the device, and configure the VIA IoT application.

2.2 Setup your AWS account and Permissions

Refer to the instructions at [Set up your AWS Account](#). Follow the steps outlined in these sections to create your account and a user and get started:

- Sign up for an AWS account and
- Create a user and grant permissions.
- Open the AWS IoT console



Sign in as IAM user

Account ID (12 digits) or account alias

IAM user name

Password

☐ Remember this account

Sign in

[Sign in using root user email](#)

[Forgot password?](#)



English

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Pay special attention to the Notes.

2.3 Create Resources in AWS IoT

Refer to the instructions at [Create AWS IoT Resources](#). Follow the steps outlined in these sections to provision resources for your device:

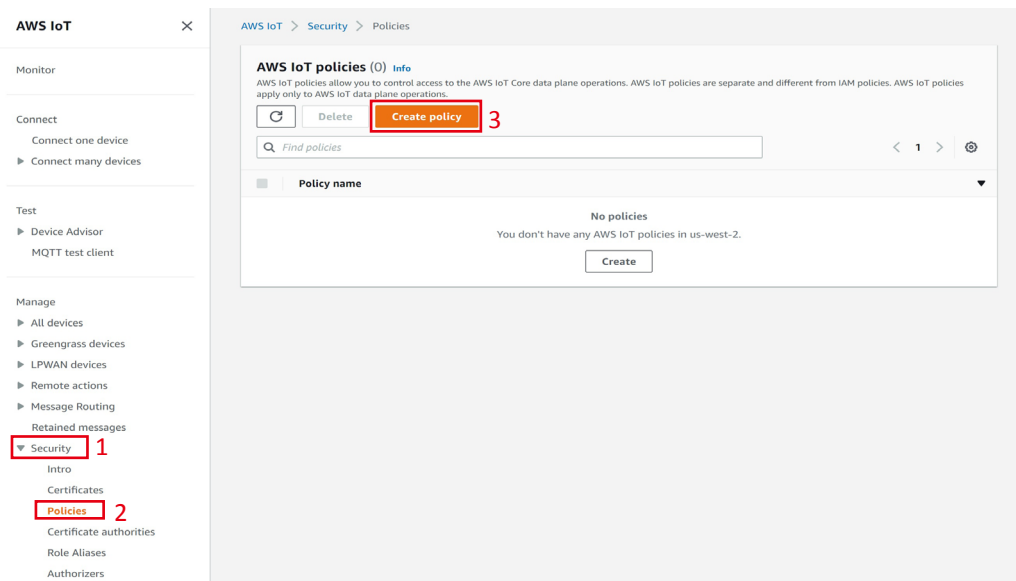
- Create an AWS IoT Policy
- Create a thing object

Pay special attention to the Notes.

The followings are the step-by-step figures to demonstrate how to create an AWS IoT Policy, how to create a thing object and acquire the AWS IoT certificate files and Shadow URL for the VIA Mobile360 FSS device.

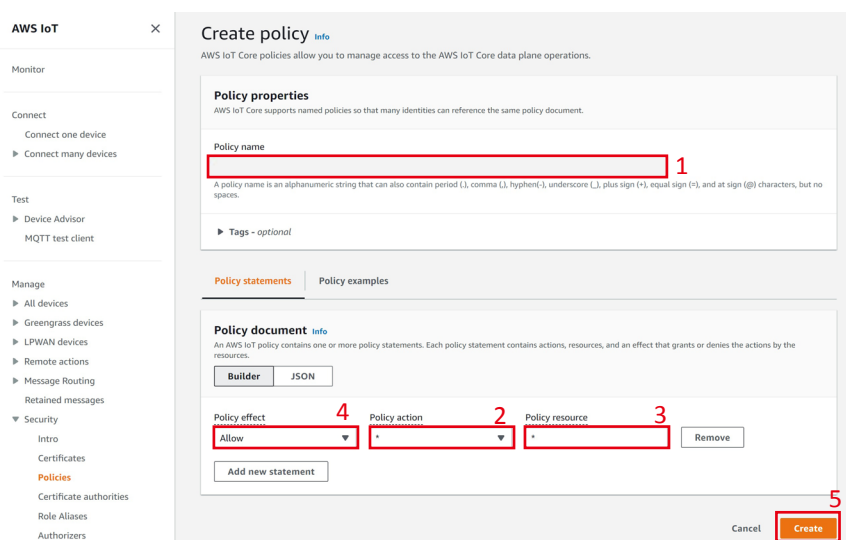
Step 1

Click on 'Secure/Policies' in the left panel and then click on the 'Create a policy' button in the right panel.

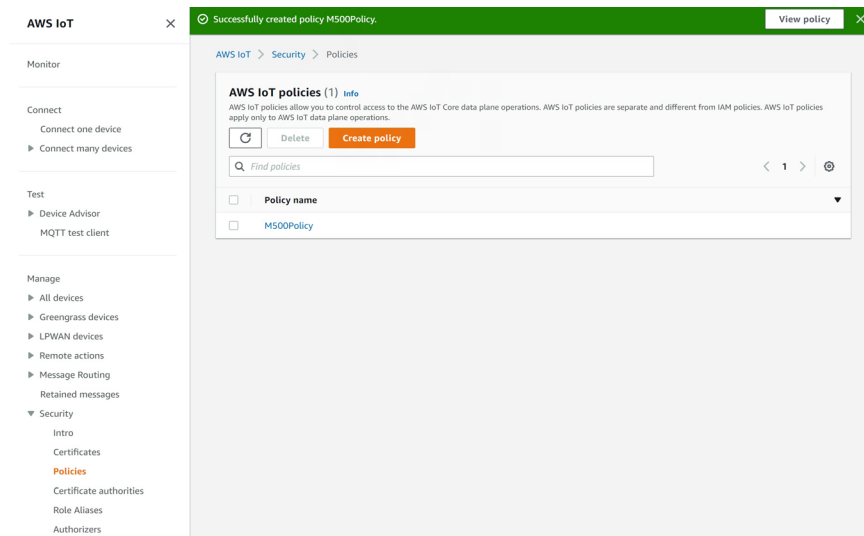


Step 2

On the policy form, fill out the IoT policy name, action and resource name, select the effect and click on the 'Create' button.

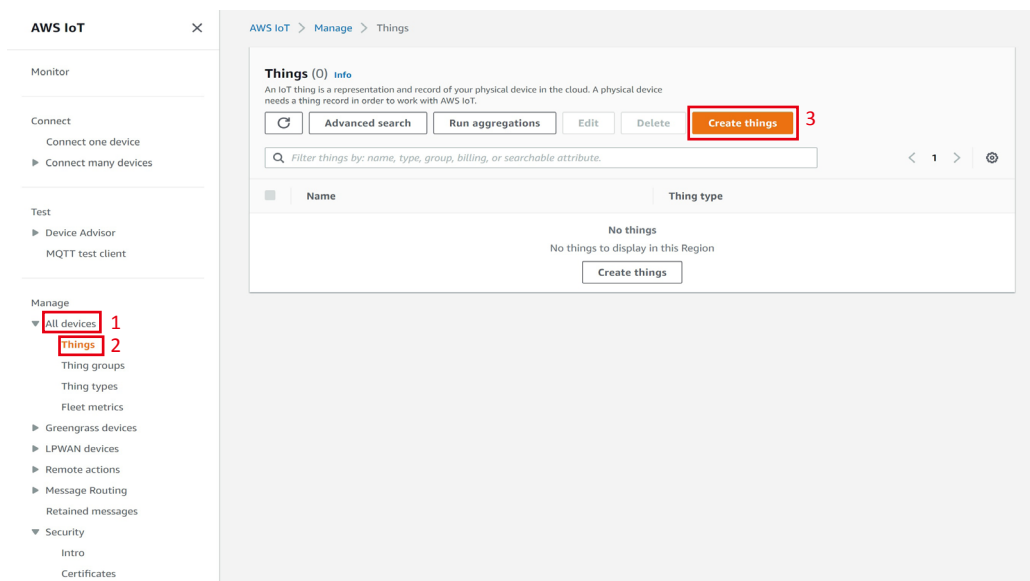


After clicking on the 'Create' button, the new policy's name will be listed in the right panel.



Step 3

To create a new 'IoT Thing' resource with the new policy and to create certification files for this resource, click on 'Manage/Things' in the left panel and then click on the 'Create things' button in the right panel.



Next, select 'Create a single thing' and click on "Next".

AWS IoT > Manage > Things > Create things

Create things [Info](#)

A thing resource is a digital representation of a physical device or logical entity in AWS IoT. Your device or entity needs a thing resource in the registry to use AWS IoT features such as Device Shadows, events, jobs, and device management features.

Number of things to create

☒ **Create single thing**
Create a thing resource to register a device. Provision the certificate and policy necessary to allow the device to connect to AWS IoT.

☐ **Create many things**
Create a task that creates multiple thing resources to register devices and provision the resources those devices require to connect to AWS IoT.

Cancel **Next**

Step 4

Under 'Thing properties' in the right panel, enter the 'Thing Name'. Under 'Device Shadow', select 'Unnamed shadow (classic)' and click on the 'Next' button to continue.

AWS IoT > Manage > Things > Create things > Create single thing

Step 1
Specify thing properties

Step 2 - optional
Configure device certificate

Step 3 - optional
Attach policies to certificate

Specify thing properties [Info](#)

A thing resource is a digital representation of a physical device or logical entity in AWS IoT. Your device or entity needs a thing resource in the registry to use AWS IoT features such as Device Shadows, events, jobs, and device management features.

Thing properties [Info](#)

Thing name
MS00-000001
Enter a unique name containing only: letters, numbers, hyphens, colons, or underscores. A thing name can't contain any spaces.

Additional configurations
You can use these configurations to add detail that can help you to organize, manage, and search your things.

- ▶ Thing type - optional
- ▶ Searchable thing attributes - optional
- ▶ Thing groups - optional
- ▶ Billing group - optional

Device Shadow [Info](#)
Device Shadows allow connected devices to sync states with AWS. You can also get, update, or delete the state information of this thing's shadow using either HTTPs or MQTT topics.

☐ No shadow

☐ Named shadow
Create multiple shadows with different names to manage access to properties, and logically group your devices properties.

☒ **Unnamed shadow (classic)**
A thing can have only one unnamed shadow.

▶ Edit shadow statement - optional

Cancel **Next**

Step 5

Under 'Device certificate', select 'Auto-generate a new certificate (recommended)' and click on the 'Next' button to configure a device certificate for your VIA Mobile360 FSS device.

Step 6

Click on the new policy's name and click on the 'Create Thing' button to attach policies to the device certificate for your VIA Mobile360 FSS device and to complete creating a new 'IoT Thing'.

Step 7

Download the device certificate (CertFile), the private key file (PvkFile) and the 2048 bit Amazon Root CA 1 certificate (CAFile) to a local folder and click on 'Done' to complete the certificate creation process for your VIA Mobile360 FSS device.

Download certificates and keys

Download certificate and key files to install on your device so that it can connect to AWS.

Device certificate
You can activate the certificate now, or later. The certificate must be active for a device to connect to AWS IoT.

Device certificate
cc2396f6c36...te.pem.crt

Deactivate certificate

Download ¹

Key files
The key files are unique to this certificate and can't be downloaded after you leave this page. Download them now and save them in a secure place.

This is the only time you can download the key files for this certificate.

Public key file
cc2396f6c369de255840ade...628f43f-public.pem.key

Download

Private key file
cc2396f6c369de255840ade...28f43f-private.pem.key

Download ²

Root CA certificates
Download the root CA certificate file that corresponds to the type of data endpoint and cipher suite you're using. You can also download the root CA certificates later.

Amazon trust services endpoint
RSA 2048 bit key: Amazon Root CA 1

Download ³

Amazon trust services endpoint
ECC 256 bit key: Amazon Root CA 3

Download

If you don't see the root CA certificate that you need here, AWS IoT supports additional root CA certificates. These root CA certificates and others are available in our developer guides. [Learn more](#)

Done

Step 8

Click on the created IoT thing's name under 'Things' to view your VIA Mobile360 FSS device's thing and device shadow details.



Note:

The MQTT topic prefix is for binding your VIA Mobile360 FSS device with AWS IoT Core Web services. The VIA Mobile360 FSS device will use the MQTT topic prefix of Device Shadows to interact with AWS IoT Core Web services.

AWS IoT

Monitor

Connect

Test

Manage

You successfully created thing M500-000001.

You successfully created certificate cc2396f6c369de255840ade40a1f43c4aad4db7295b8792d8f489e6b2628f43f.

AWS IoT > Manage > Things

Things (1) Info

Advanced search

Run aggregations

Edit

Delete

Create things

Filter things by: name, type, group, billing, or searchable attribute.

< 1 >

<input type="checkbox"/>	Name	Thing type
<input type="checkbox"/>	M500-000001	-

AWS IoT > Manage > Things > M500-000001

M500-000001 Info

Edit

Delete

Thing details

Name

M500-000001

Type

-

ARN

arn:aws:iotus-west-2:444128012201:thing/M500-000001

Billing group

-

Attributes

Certificates

Thing groups

Device Shadows

Interact

Activity

Jobs

Alarms

Defender metrics

Device Shadows (1) Info

Filter Device Shadows

< 1 >

<input type="checkbox"/>	Name	MQTT topic prefix	Fleet indexing status	Last updated date
<input type="checkbox"/>	Classic Shadow	\$aws/things/M500-000001/shadow	Not indexed	August 12, 2022, 18:12:07 (UTC+0)

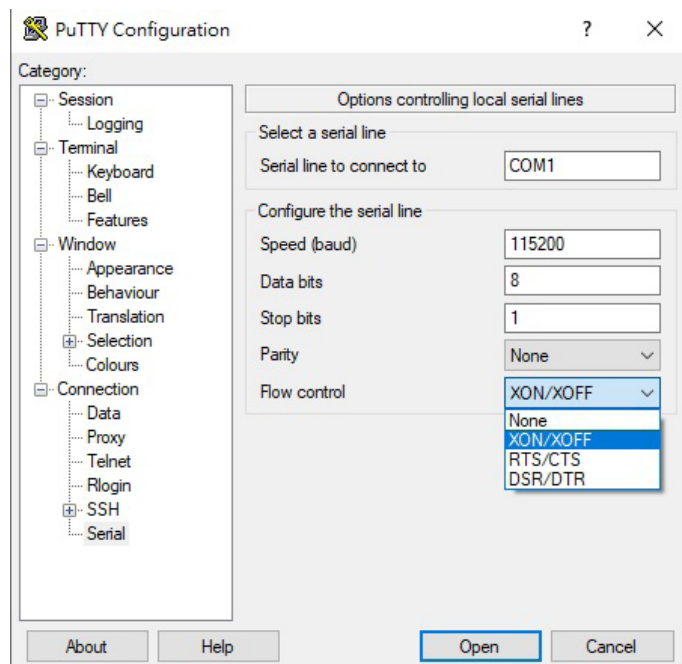
Step 9

Click on 'Things' in the left panel to view your AWS IoT Core account's Device Shadow URL, which can be used by your VIA Mobile360 FSS device to connect to AWS IoT Core Web services.

The screenshot shows the AWS IoT console interface. On the left, the 'Manage' section is expanded, and 'Things' is selected. The main panel displays the 'Classic Shadow' page for a device with ID M500-000001. A red box highlights the 'Device Shadow URL' field, which contains the URL: `https://awhqldbew6ryb-ats.iot.us-west-2.amazonaws.com/things/M500-000001/shadow`. Other details visible include the ARN, MQTT topic prefix, and the 'Device Shadow document' section.

2.4 Setup the VIA Mobile360 FSS device

Follow the installation guide described in Section 1.2. The development kit of VIA Mobile360 FSS device is plug-and-play compatible on any Windows, Linux system via a USB to Micro USB cable and the terminal program such as PuTTY or TeraTerm.



2.5 Connecting to AWS IoT Core with the VIA Mobile360 FSS EVK

The VIA Mobile360 FSS EVK includes an “IoTSDKSample” application to help establish a connection between the physical sensors/actuators on the VIA Mobile360 FSS device and the AWS IoT Core web service.

This section guides developers on how to enable and run the “IoTSDKSample” application.

Step 1

```
$ mount -o remount,rw
```



Step 2

Copy the device certificate (CertFile), private key file (PvkFile) and the Amazon Root CA certificate (CAFile) created in [Step 7 of section 2.3](#) to “/etc/aws/certs”.

Open the settings file “/etc/aws/iot.xml” and modify the following values based on AWS IoT Core setup:

- **Host URL:** Input the domain name from the Device Shadow URL obtained in [Step 9 of section 2.3](#) as Host URL in line 4.
- **CAFile:** Input the name of the Amazon Root CA certificate in line 8.
- **CertFile:** Input the name of the Certificate file in line 9.
- **PvkFile:** Input the name of the Private Key file in line 10.
- **ThingName:** Insert the defined "ThingName" in line 14.

Save the changes made to the settings file.

```
<?xml version="1.0" encoding="UTF-8"?>
<VIAIoTHub>
  <AWS>
    <Host>awhqldbew6ryb-ats.iot.us-west-2.amazonaws.com</Host>
    <Port>443</Port>
    <Certs>
      <FolderFullName>/etc/aws/certs</FolderFullName>
      <CAFile>AmazonRootCA1.pem</CAFile>
      <CertFile>cc2396f6c369de255840ade40a1f43c4aad4db7295b8792d8f489e6b2628f43f-certificate.pem.crt</CertFile>
      <PvkFile>cc2396f6c369de255840ade40a1f43c4aad4db7295b8792d8f489e6b2628f43f-private.pem</PvkFile>
    </Certs>
    <Thing>
      <ClientID>c-sdk-client-id</ClientID>
      <ThingName>M500-000001</ThingName>
    </Thing>
  </AWS>
</VIAIoTHub>
```

Step 3

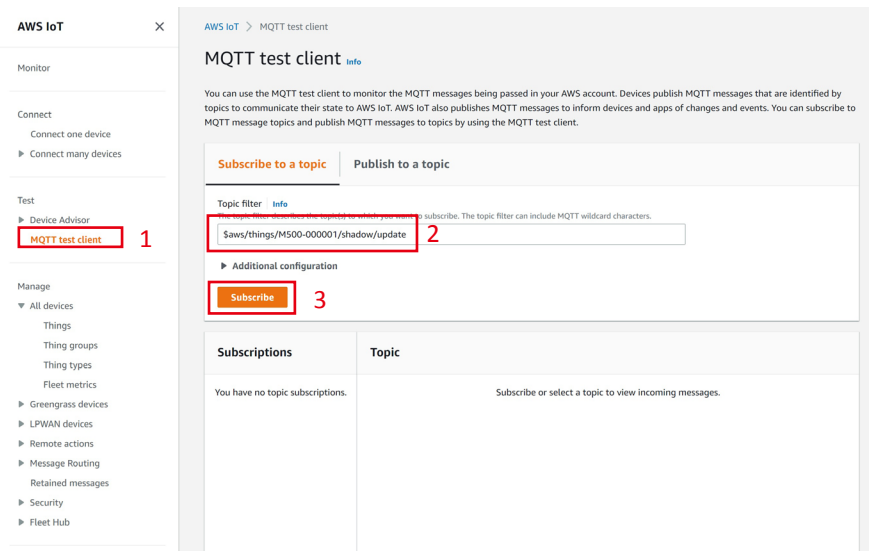
Run the "IoTSDKSample" application as shown below.

```
$ IoTSDKSample
```

Step 4

If no error log is shown, verify the "IoTSDKSample" application by using the AWS IoT Core web service console. Click on the 'MQTT test client' tab.

To subscribe to interaction topic "\$aws/things/**thingName**/shadow/update", under the 'Subscribe to a topic' tab in the right panel, enter a topic filter name and click on the 'Subscribe' button.



To publish to interaction topic "\$aws/things/**thingName**/shadow/update", click on the 'Publish to a topic' tab in the right panel, enter the topic name and click on the 'Publish' button.

The last updated message will be shown in the AWS IoT MQTT test client.

2.6 Debugging

Open a console (e.g. Putty) and configure as Section 2.4. And the boot up messages will be presented with a command line interface as well as debug output. You could use busybox commands in /bin to setup and debug the VIA Mobile360 FSS device.

```
COM34 - PuTTY

/bin # ls
addgroup      dmesg          ipcalc         mountpoint     scriptreplay
adduser       dnsdomainname  iplink         mpstat         sed
ash           dumpkmap       iproute        mt             setarch
base64        echo           iprule         mv             setserial
busybox       ed             iptunnel       netstat        sh
cat           egrep          kill           nice           sleep
catv          false          lfs            pidof          stat
chattr        fdflush        linux32        ping           stty
chgrp         fgrep          linux64        ping6          su
chmod         fsync          ln             pipe_progress  sync
chown         getopt         login          powertop       tar
conspy        grep           ls             printenv       touch
cp            gunzip         lsattr         ps             true
cpio          gzip           lzop           pwd            uenv
cttyhack      hostname       makemime       reformime      umount
date          hush           mkdir          rev            uname
dd            ionice         mknod          rm             usleep
delgroup      iostat         mktemp         rmdir          vi
deluser       ip             more           rpm            watch
df            ipaddr         mount          run-parts     zcat

/bin #
```

“dmesg” is the command to display all messages from the Linux kernel ring buffer.

```
$ dmesg
```

2.7 Troubleshooting

As you go through development, some common problems may arise. The common problems and their solutions are listed as follows.

1. Device could not connect to internet.
 - Ensure that your SIM card is inserted properly
 - Validate that the SIM card is active with your provider.
 - Verify that the APN setting is correct.
2. Device could not connect to AWS
 - Check if date and time is out of synchronized.
 - Verify that the AWS endpoint (host value in iot.xml) is set correctly.
 - Verify that the proper certificates and keys are loaded to the device.
 - Validate that the correct IoT Core thing and policies are set on AWS IoT Core.



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