
# AWS: Amazon Web Services

rev1.0 20/04/2020

# Introduction to AWS, create an account and generate certificates.

# PREREQUISITES

## Software needed:

- **Internet Browser**

## Hardware used in this example:

- **none**

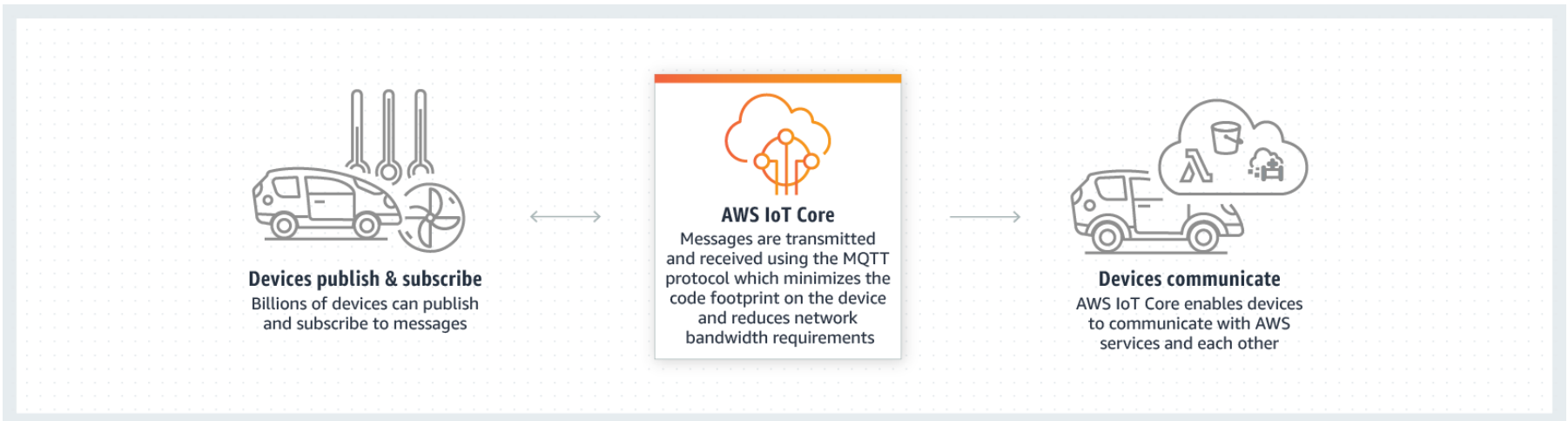
# What is it ?

**Amazon Web Services (AWS)** is a secure cloud services platform, offering compute power, database storage, content delivery and other functionality to help businesses scale and grow.

# IoT functionality

Among all the AWS there is the **AWS IoT Core** service: allows to run a broker on the cloud with ease, create and manage any number of devices since it support HTTP, WebSockets and, more important, MQTT.

**Aws IoT core** provides end-to-end cryptography for secure connections, it's very easy to create and manage certificates too.



# Create an account

In order use the AWS you need to create and activate an account. Creating an account is very easy, go here and create a new one.

You will be asked for a credit card: the AWS are not all free and some services offer a free plan for only 12 months, anyway we will use only the AWS IoT Core, that with the free plan allows 250.000 messages sent and received per month for the first 12 months.

# Register a new device

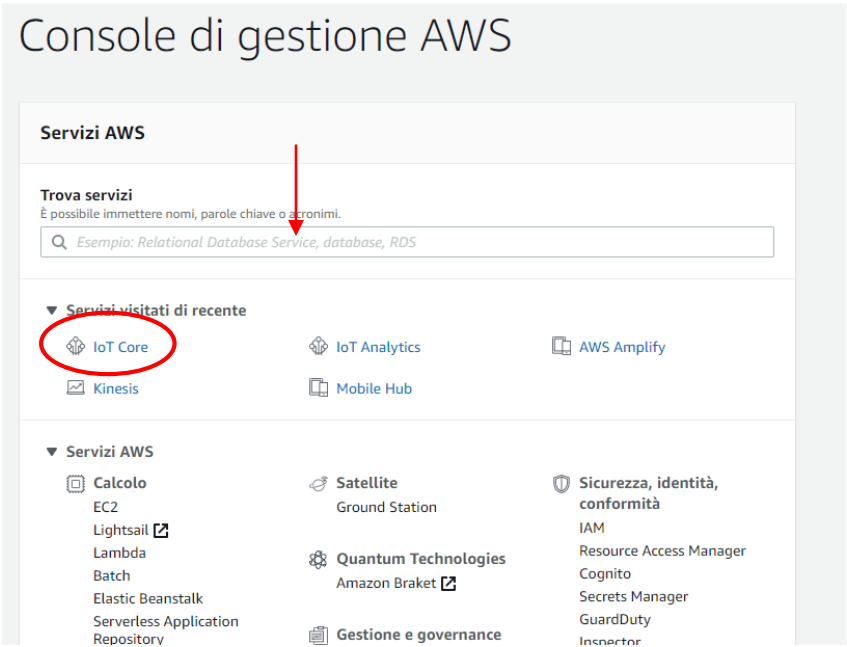
The registry allows you to keep a record of all of the devices that are registered to your AWS IoT Core account. The process of registering your device includes these steps:

- Create and Activate a Device Certificate
- Create an AWS IoT Core Policy
- Attach an AWS IoT Core Policy to a Device Certificate
- Attach a Certificate to a Thing

# Create and Activate a Device Certificate

First of all sign in as Root user (use your AWS email and password to log in ) then go to IoT core.

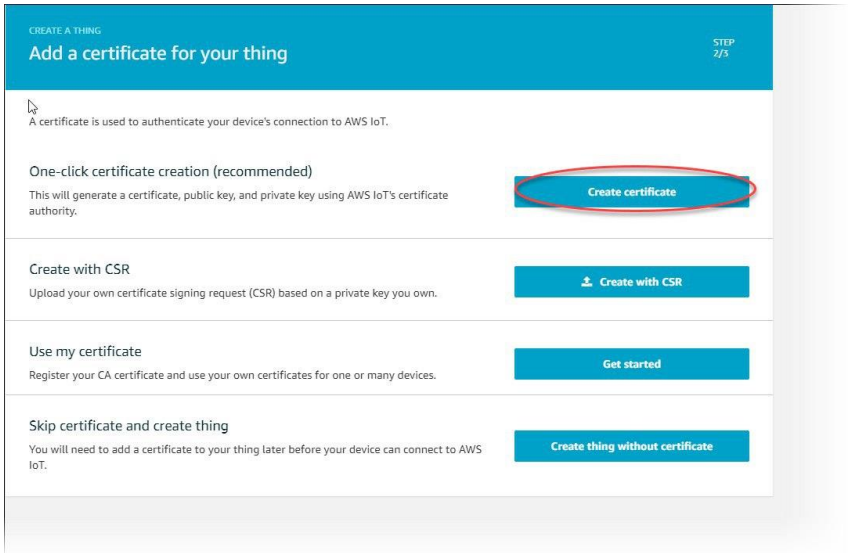
If you can’t find it in the recent services, simply search it in the bar.



# Create certificate

Then go to **Security → Certificates** and click on the create button.

Select *One-Click certificate creation* in order to create the certificates and the keys that we will need in the nexts steps.



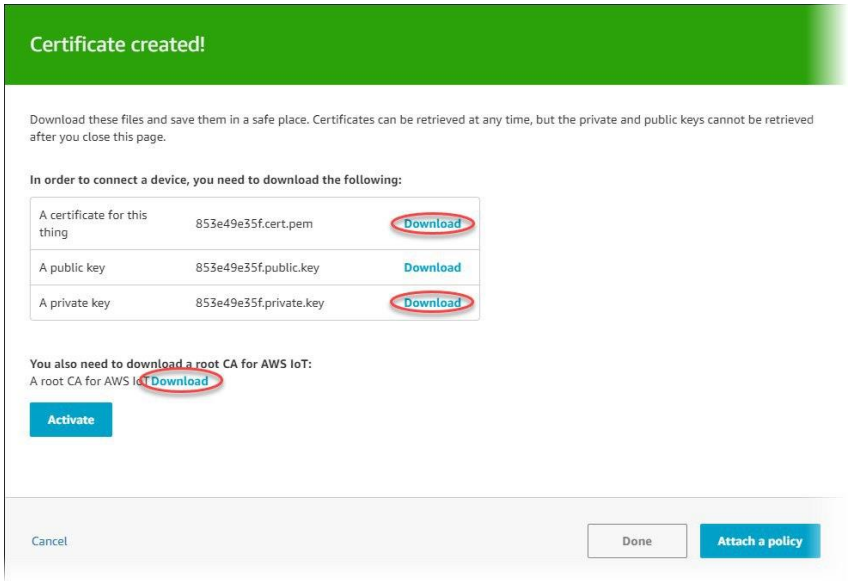
# Download

On the **Certificate created** page, choose the **Download** links to download the certificate, private key, and root CA for AWS IoT Core. (You do not need to download the public key).

When click for generating the CA certificate, you will be redirected to another page: right click on *Amazon Root CA 1* and “save as” the link as a .pem file.

Save each of them to your computer, and then choose **Activate** to continue.

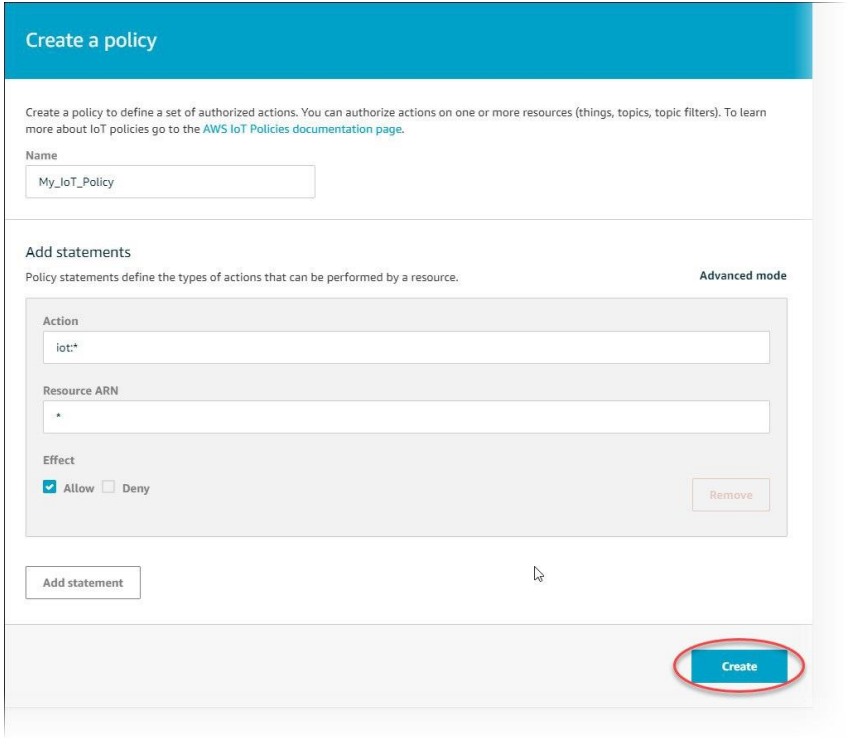
Choose **Done** to return to the main page of the AWS IoT console.



# Create an AWS IoT Core Policy

To create an AWS IoT Core policy:

- In the left navigation pane, choose **Secure**, and then choose **Policies**. On the You don't have a policy yet page, choose **Create a policy.**
- On the **Create a policy** page, in the **Name** field, enter a name for the policy (for example, MyIotPolicy). Do not use personally identifiable information in your policy names.



# Create an AWS IoT Core Policy

- In the **Action** field, enter iot:Connect. In the **Resource ARN** field, enter *. Select the **Allow** check box. This allows all clients to connect to AWS IoT Core.
- Choose the **Add Statement** button to add another policy statement. In the **Action** field, enter iot:Publish. In the **Resource ARN field**, enter the ARN of the topic to which your device publishes.
- Finally, select the **Allow** check box. This allows your device to publish messages to the specified topic.
- After you have entered the information for your policy, choose **Create**.

For more information, see Managing AWS IoT Core Policies.

**Note**

You can restrict which clients (devices) can connect by specifying a client ARN as the resource. The client ARNs follow this format:

```
arn:aws:iot:your-region:your-aws-account:client/<my-client-id>
```

**Note**

The topic ARN follows this format:

```
arn:aws:iot:your-region:your-aws-account:topic/<your/topic>
```

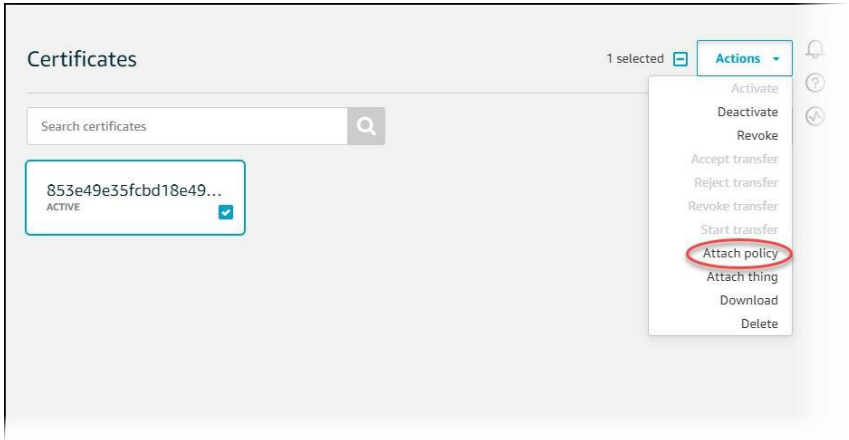
For example:

```
arn:aws:iot:us-east-1:123456789012:topic/my/topic
```

# Attach an AWS IoT Core Policy to a Device Certificate

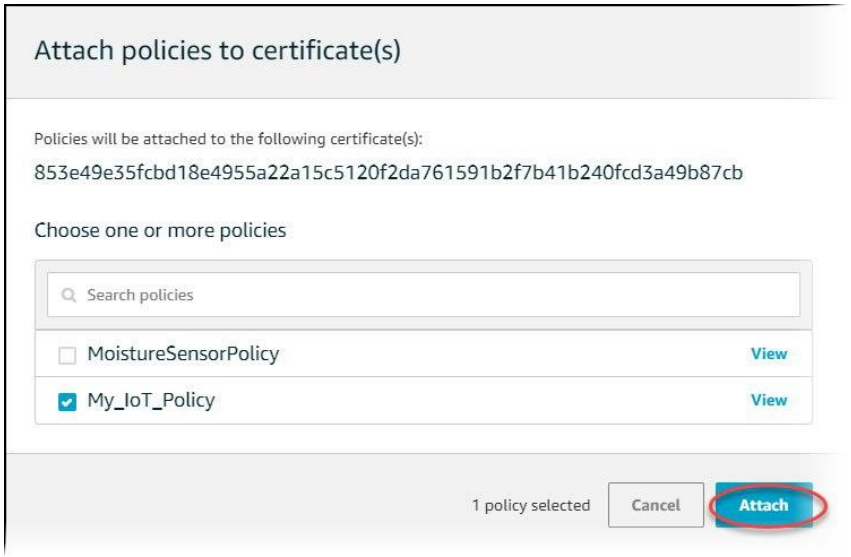
Now that you have created a policy, you must attach it to your device certificate. Attaching an AWS IoT Core policy to a certificate gives the device the permissions specified in the policy.

1. In the left navigation pane, choose **Secure**, and then choose **Certificates**.
2. In the box for the certificate you created, choose **...** to open a drop-down menu, and then choose **Attach policy**.



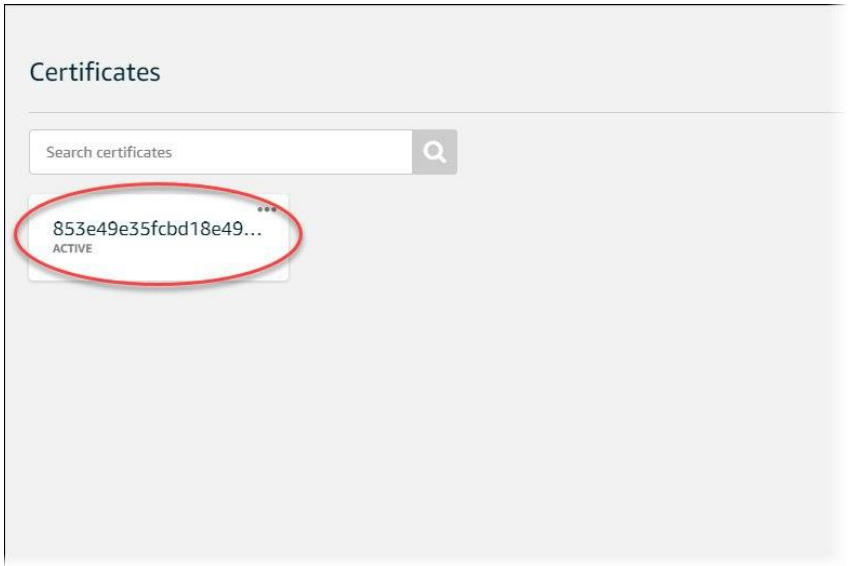
# Attach an AWS IoT Core Policy to a Device Certificate

3. In **Attach policies to certificate(s)**, select the check box next to the policy you created in the previous step, and then choose **Attach**.



# Attach a Certificate to a Thing

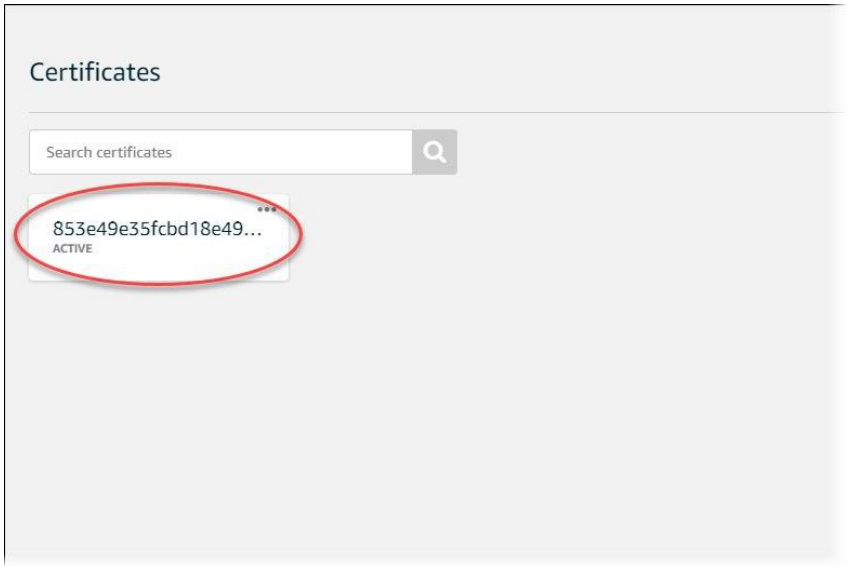
A device must have a certificate, private key, and root CA certificate to authenticate with AWS IoT Core. AWS recommend that you also attach the device certificate to the IoT thing that represents your device in AWS IoT Core.



# Attach a Certificate to a Thing

**To attach a certificate to the thing representing your device in the registry:**

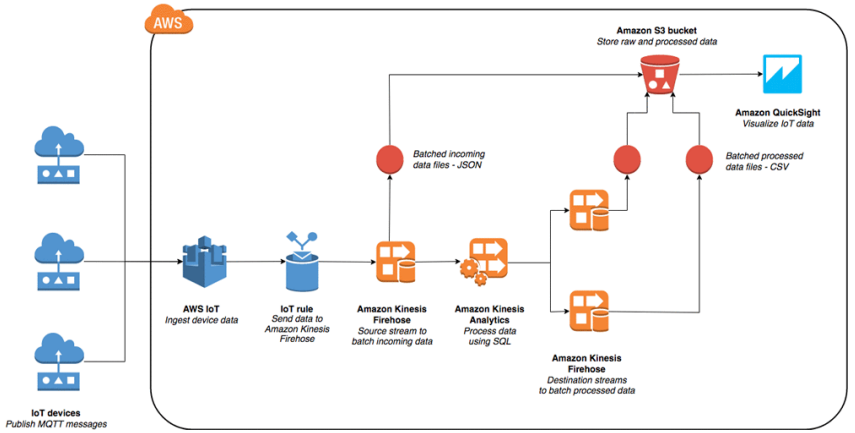
1. In the box for the certificate you created, choose **...** to open a drop-down menu, and then choose **Attach thing**.
2. In **Attach things to certificate(s)**, select the check box next to the thing you registered, and then choose **Attach**.
3. To verify the thing is attached, select the box for the certificate.
4. On the **Details** page for the certificate, in the left navigation pane, choose **Things**.
5. To verify the policy is attached, on the **Details** page for the certificate, in the left navigation pane, choose **Policies**.



# Connect with AWS

At this point is possible to connect your device to the AWS IoT Core Thing and manage your data inside the AWS world.

Consider that some services like AWS Kinesis, AWS QuickSight or other services are not all free, so a solution could be connect **NodeRed** to the broker hosted on AWS and manage all the data inside NodeRed as we will see.



# For more informations

**AWS IoT core : https://aws.amazon.com/it/iot-core/**

**Create an AWS Account : https://aws.amazon.com/it/premiumsupport/knowledge-center/create-and-activate-aws-account/**

**Register a Device AWS IoT core:**

**https://docs.aws.amazon.com/iot/latest/developerguide/register-device.html**

**Example of real-time data monitoring using AWS:**

**https://aws.amazon.com/it/blogs/big-data/build-a-visualization-and-monitoring-dashboard-for-iot-data-with-amazon-kinesis-analytics-and-amazon-quicksight/**