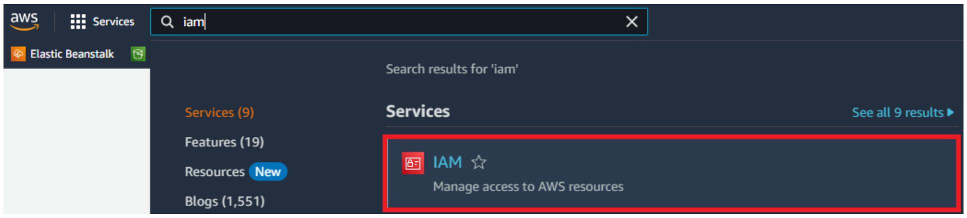
Step 1 Set up AWS IoT

Before using the btibAWS IoT you must first have an AWS account, follow this link to do so: https://aws.amazon.com/premiumsupport/knowledge-center/create-and-activate-aws-account/

Setup API Key

Niagara needs an **API key** to access AWS IoT Services and manage devices:

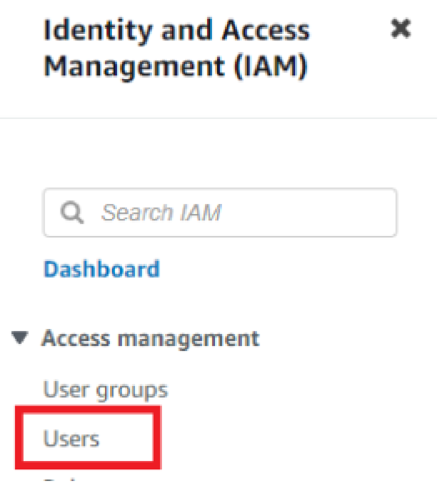
1. Go to the **IAM** service on the **AWS console**.



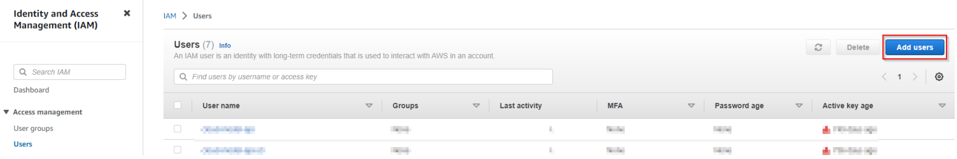
Search results for 'iam'

Manage access to AWS resources

2. Then **Users**



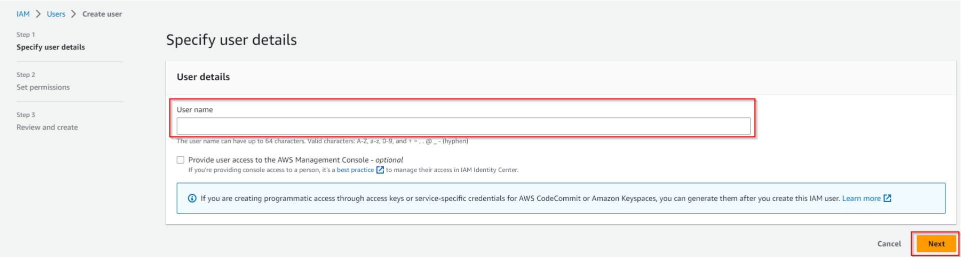
3. Click the **Add Users** button



An IAM user is an identity with long-term credentials that is used to interact with AWS in an account.

□	User name	Groups	Last activity	MFA	Password age	Active key age
□	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
□	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

4. Give a **username** to your user, then click next.



Specify user details

User details

User name

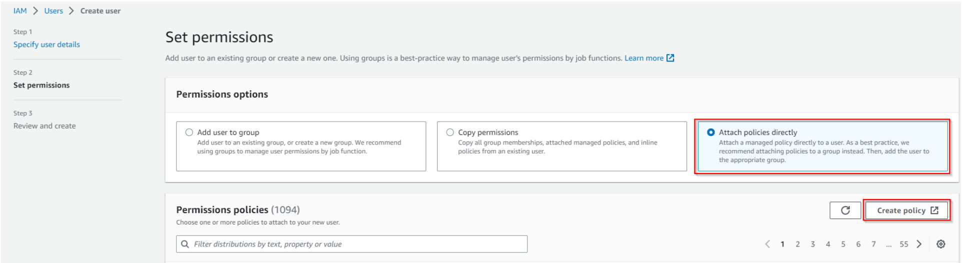
The user name can have up to 64 characters. Valid characters: A-Z, a-z, 0-9, and + = , . @ _ - (hyphen)

□ Provide user access to the AWS Management Console - *optional*

If you're providing console access to a person, it's a best practice to manage their access in IAM Identity Center.

ⓘ If you are creating programmatic access through access keys or service-specific credentials for AWS CodeCommit or Amazon Keyspaces, you can generate them after you create this IAM user. Learn more

5. Then **Attach policies directly,** Then hit **Create policy.** A new tab will open.


IAM > Users > Create user

Step 1
Specify user details

Step 2
Set permissions

Step 3
Review and create

Set permissions

Add user to an existing group or create a new one. Using groups is a best-practice way to manage user's permissions by job functions. Learn more

Permissions options

○ Add user to group
Add user to an existing group, or create a new group. We recommend using groups to manage user permissions by job function.

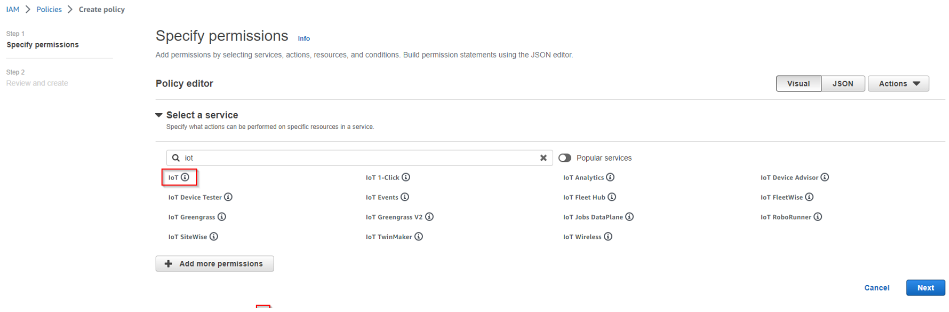
○ Copy permissions
Copy all group memberships, attached managed policies, and inline policies from an existing user.

● Attach policies directly
Attach a managed policy directly to a user. As a best practice, we recommend attaching policies to a group instead. Then, add the user to the appropriate group.

Permissions policies (1094)
Choose one or more policies to attach to your new user.

Filter distributions by text, property or value

6. Select the **Iot** service


IAM > Policies > Create policy

Step 1
Specify permissions

Step 2
Review and create

Specify permissions Info

Add permissions by selecting services, actions, resources, and conditions. Build permission statements using the JSON editor.

Policy editor

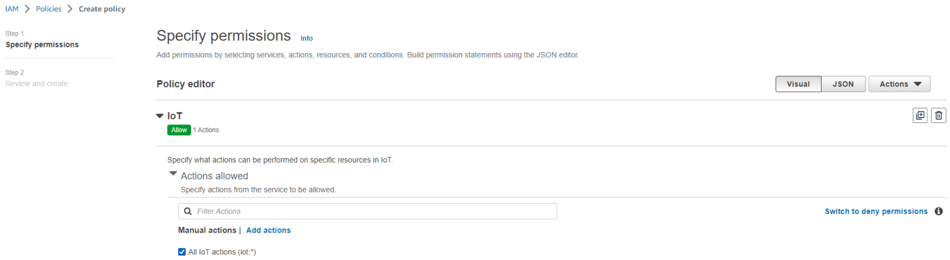
Select a service
Specify what actions can be performed on specific resources in a service.

iot

Popular services

IoT
IoT 1-Click
IoT Analytics
IoT Device Advisor
IoT Device Tester
IoT Events
IoT Fleet Hub
IoT FleetWise
IoT Greengrass
IoT Greengrass V2
IoT Jobs DataPlane
IoT RoboRunner
IoT SiteWise
IoT TwinMaker
IoT Wireless

7. Allow **All IoT actions**


IAM > Policies > Create policy

Step 1
Specify permissions

Step 2
Review and create

Specify permissions Info

Add permissions by selecting services, actions, resources, and conditions. Build permission statements using the JSON editor.

Policy editor

IoT
Allow 1 Actions

Specify what actions can be performed on specific resources in IoT.

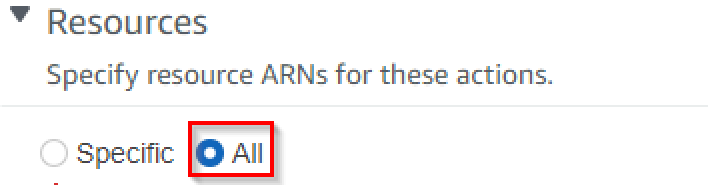
Actions allowed
Specify actions from the service to be allowed.

Filter Actions

Manual actions | Add actions

☑ All IoT actions (iot:*)

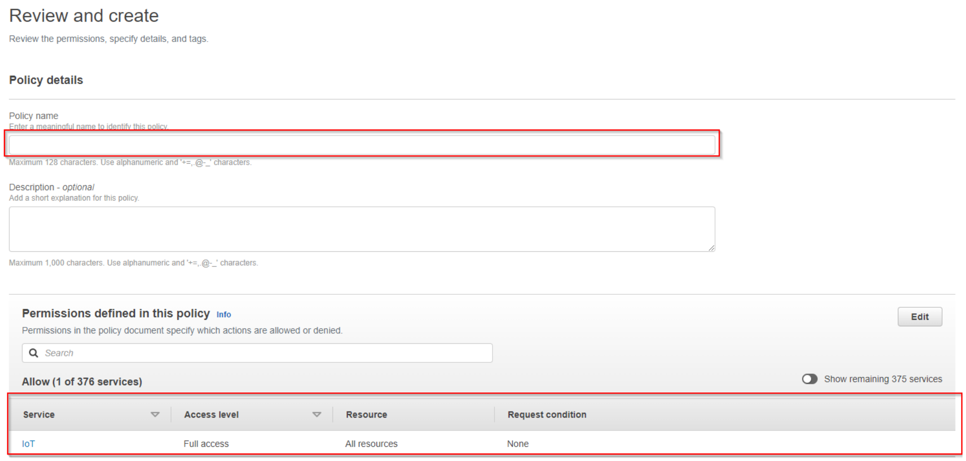
8. Allow **All** resources, then hit **Next**


Resources

Specify resource ARNs for these actions.

○ Specific ● All

9. Give your policy a **name**, make sure that you have **full access** on the summary. finally hit **Create policy**


Review and create

Review the permissions, specify details, and tags.

Policy details

Policy name
Enter a meaningful name to identify this policy.

Maximum 128 characters. Use alphanumeric and '+=,.@-_' characters.

Description - *optional*
Add a short explanation for this policy.

Maximum 1,000 characters. Use alphanumeric and '+=,.@-_' characters.

Permissions defined in this policy Info

Permissions in the policy document specify which actions are allowed or denied.

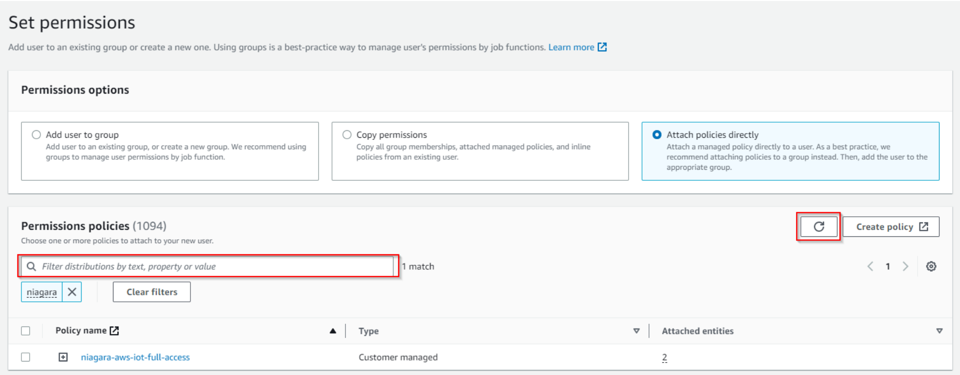
Search

Allow (1 of 376 services)

Show remaining 375 services

Service	Access level	Resource	Request condition
IoT	Full access	All resources	None

10. Now go back to the "Add user" page hit **refresh** (top right), look for your policy on the search field, select it and click **Next**.



Set permissions

Add user to an existing group or create a new one. Using groups is a best-practice way to manage user's permissions by job functions. Learn more

Permissions options

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Attach a managed policy directly to a user. As a best practice, we recommend attaching policies to a group instead. Then, add the user to the appropriate group.

Permissions policies (1094)

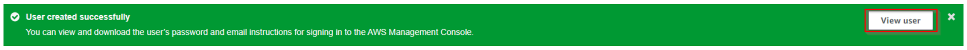
Choose one or more policies to attach to your new user.

Filter distributions by text, property or value — 1 match

niagara ✕ | Clear filters

□	Policy name	Type	Attached entities
□	niagara-aws-iot-full-access	Customer managed	2

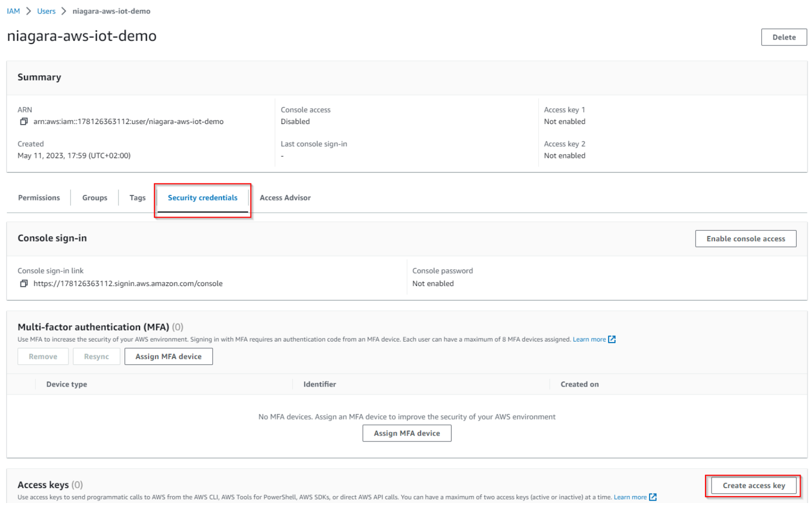
11. Add tags (optional). Then hit **Next**
12. Finally hit **Create User**.
13. Your User was successfully created. Click on **View user**



User created successfully

You can view and download the user's password and email instructions for signing in to the AWS Management Console.

14. Go in the **Security credentials** Tab and create an access key



IAM > Users > niagara-aws-iot-demo

niagara-aws-iot-demo

Summary

ARN	Console access	Access key 1
arn:aws:iam::178126363112:user/niagara-aws-iot-demo	Disabled	Not enabled
Created	Last console sign-in	Access key 2
May 11, 2023, 17:59 (UTC+02:00)	-	Not enabled

Console sign-in

Console sign-in link	Console password
https://178126363112.signin.aws.amazon.com/console	Not enabled

Multi-factor authentication (MFA) (0)

Use MFA to increase the security of your AWS environment. Signing in with MFA requires an authentication code from an MFA device. Each user can have a maximum of 8 MFA devices assigned. Learn more

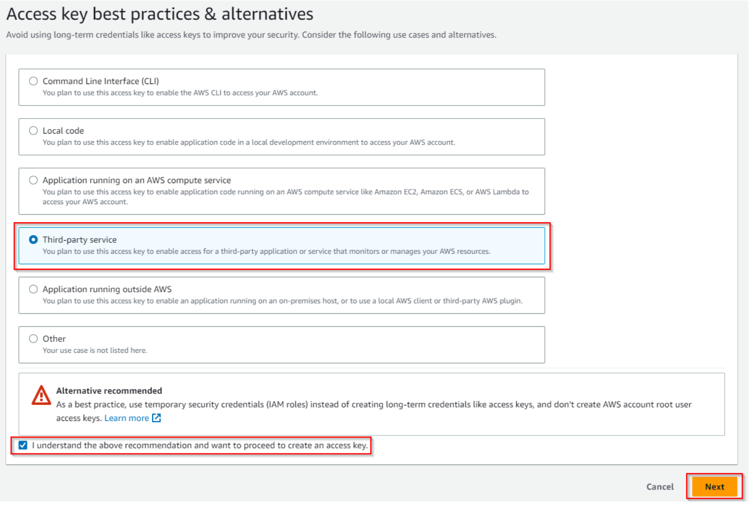
Device type	Identifier	Created on

No MFA devices. Assign an MFA device to improve the security of your AWS environment

Access keys (0)

Use access keys to send programmatic calls to AWS from the AWS CLI, AWS Tools for PowerShell, AWS SDKs, or direct AWS API calls. You can have a maximum of two access keys (active or inactive) at a time. Learn more

15. Select **Third-party service**, check the "I understand..." **checkbox** and click **Next**



Access key best practices & alternatives

Avoid using long-term credentials like access keys to improve your security. Consider the following use cases and alternatives.

○ Command Line Interface (CLI)
You plan to use this access key to enable the AWS CLI to access your AWS account.

○ Local code
You plan to use this access key to enable application code in a local development environment to access your AWS account.

○ Application running on an AWS compute service
You plan to use this access key to enable application code running on an AWS compute service like Amazon EC2, Amazon ECS, or AWS Lambda to access your AWS account.

● Third-party service
You plan to use this access key to enable access for a third-party application or service that monitors or manages your AWS resources.

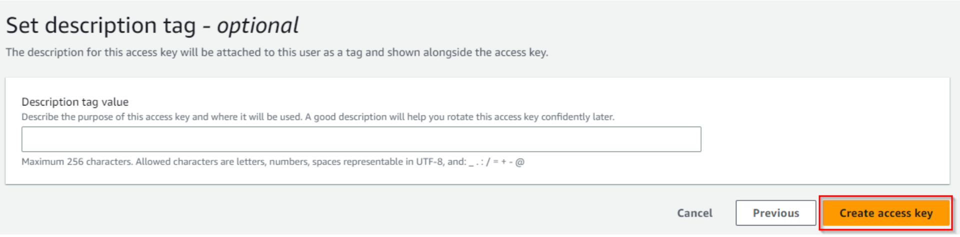
○ Application running outside AWS
You plan to use this access key to enable an application running on an on-premises host, or to use a local AWS client or third-party AWS plugin.

○ Other
Your use case is not listed here.

Alternative recommended
As a best practice, use temporary security credentials (IAM roles) instead of creating long-term credentials like access keys, and don't create AWS account root user access keys. Learn more

☑ I understand the above recommendation and want to proceed to create an access key.

16. Click on **Create access key**



Set description tag - *optional*

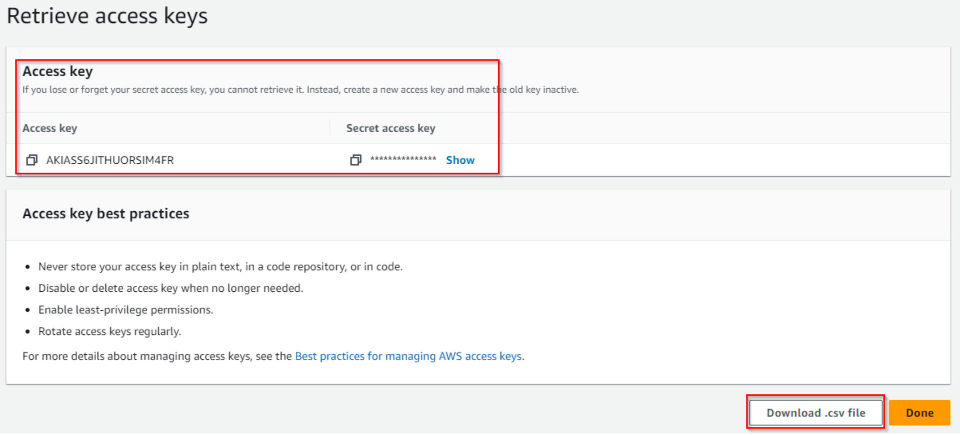
The description for this access key will be attached to this user as a tag and shown alongside the access key.

Description tag value

Describe the purpose of this access key and where it will be used. A good description will help you rotate this access key confidently later.

Maximum 256 characters. Allowed characters are letters, numbers, spaces representable in UTF-8, and: _ . : / = + - @

17. Retrieve you **Access keys** (either copy paste your values or download the .csv file). Keep them they will be needed to setup the connector in your workbench



Retrieve access keys

Access key

If you lose or forget your secret access key, you cannot retrieve it. Instead, create a new access key and make the old key inactive.

Access key	Secret access key
AKIASS6JITHUORSIM4FR	*************** Show

Access key best practices

- Never store your access key in plain text, in a code repository, or in code.
- Disable or delete access key when no longer needed.
- Enable least-privilege permissions.
- Rotate access keys regularly.

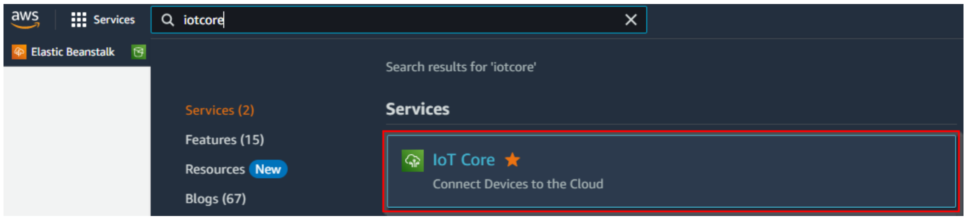
For more details about managing access keys, see the Best practices for managing AWS access keys.

Setup Devices certificates

AWS uses Asymmetric keys for device authentication and authorization.

To create a key pair and a certificate follow these steps:

1. Go to the **IoT Core** service on the **AWS console**.



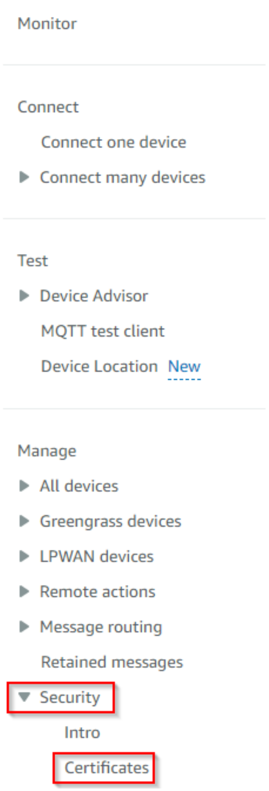
Search results for 'iotcore'

Services

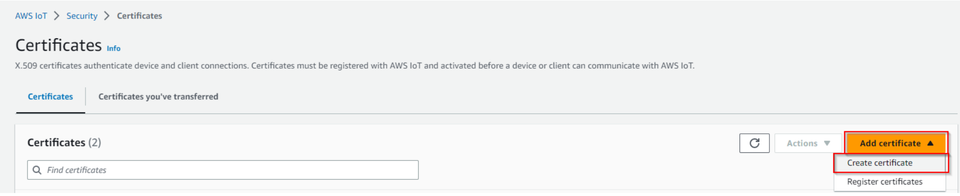
IoT Core

Connect Devices to the Cloud

2. Then security Certificates



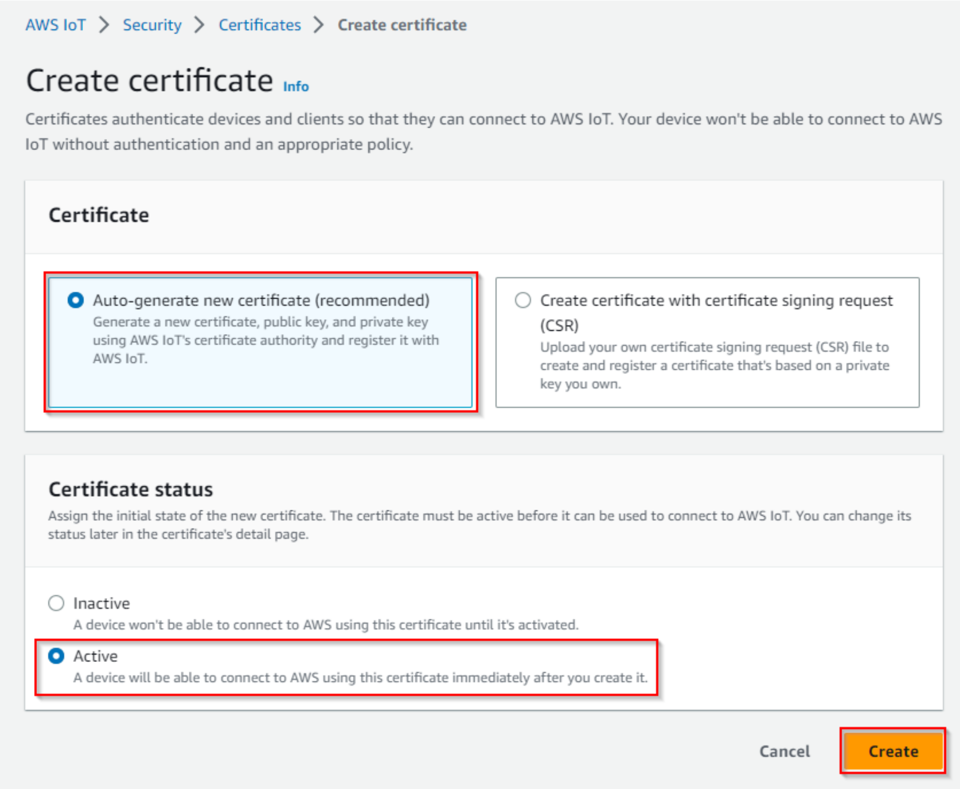
3. On the top right corner hit **Add certificate**.



Certificates Info

X.509 certificates authenticate device and client connections. Certificates must be registered with AWS IoT and activated before a device or client can communicate with AWS IoT.

4. Then Select **Auto-generate new certificate**, select **Active** and hit **Create**



AWS IoT > Security > Certificates > Create certificate

Create certificate Info

Certificates authenticate devices and clients so that they can connect to AWS IoT. Your device won't be able to connect to AWS IoT without authentication and an appropriate policy.

Certificate

● Auto-generate new certificate (recommended)
Generate a new certificate, public key, and private key using AWS IoT's certificate authority and register it with AWS IoT.

○ Create certificate with certificate signing request (CSR)
Upload your own certificate signing request (CSR) file to create and register a certificate that's based on a private key you own.

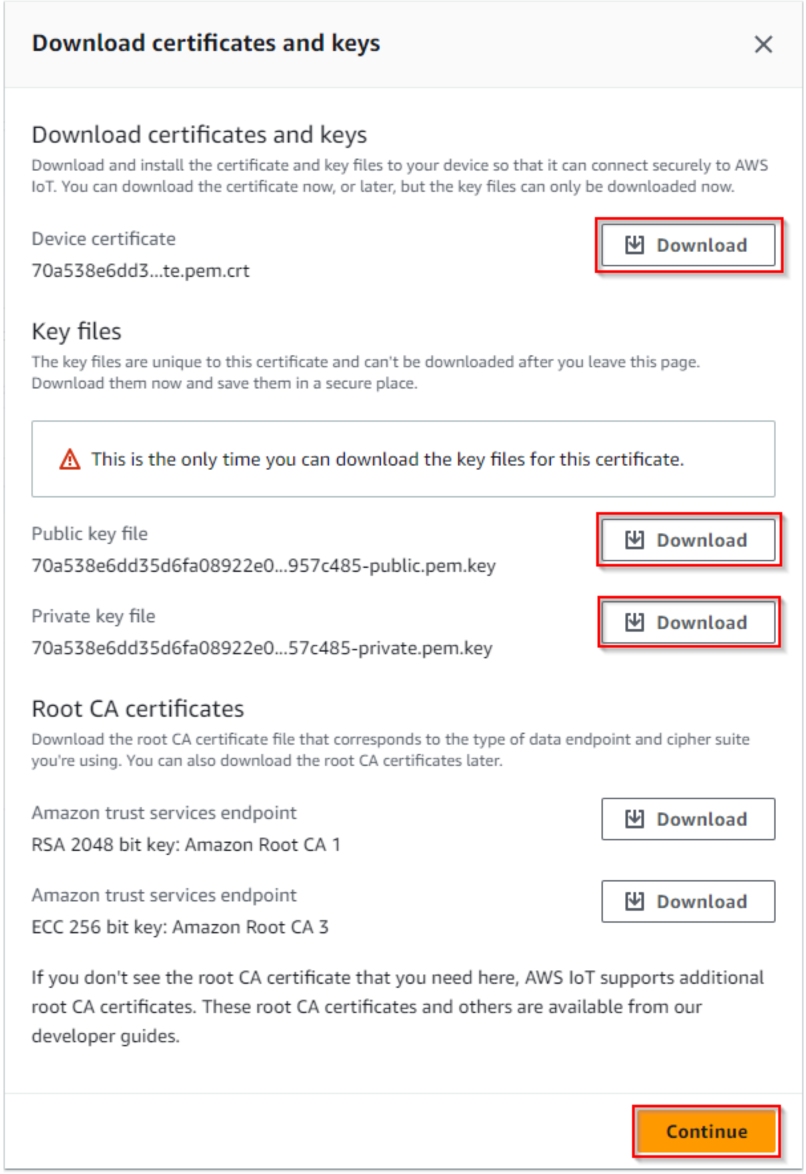
Certificate status

Assign the initial state of the new certificate. The certificate must be active before it can be used to connect to AWS IoT. You can change its status later in the certificate's detail page.

○ Inactive
A device won't be able to connect to AWS using this certificate until it's activated.

● Active
A device will be able to connect to AWS using this certificate immediately after you create it.

5. Download the certificate, the public key (optional) and the private key



Download certificates and keys

Download certificates and keys

Download and install the certificate and key files to your device so that it can connect securely to AWS IoT. You can download the certificate now, or later, but the key files can only be downloaded now.

Device certificate
70a538e6dd3...te.pem.crt

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
70a538e6dd35d6fa08922e0...957c485-public.pem.key

Private key file
70a538e6dd35d6fa08922e0...57c485-private.pem.key

Root CA certificates

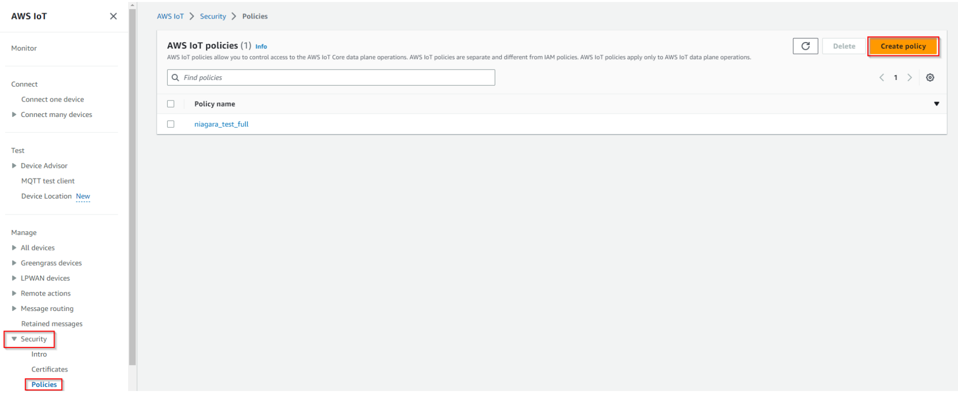
Download the root CA certificate file that corresponds to the type of data endpoint and cipher suite you're using. You can also download the root CA certificates later.

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

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

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 from our developer guides.

6. You will also need the **AWS CA key file**, you can download it here: VeriSign-Class 3-Public-Primary-Certification-Authority-G5.pem.
7. Now go to **Security** > **Policies** and hit **Create Policy**



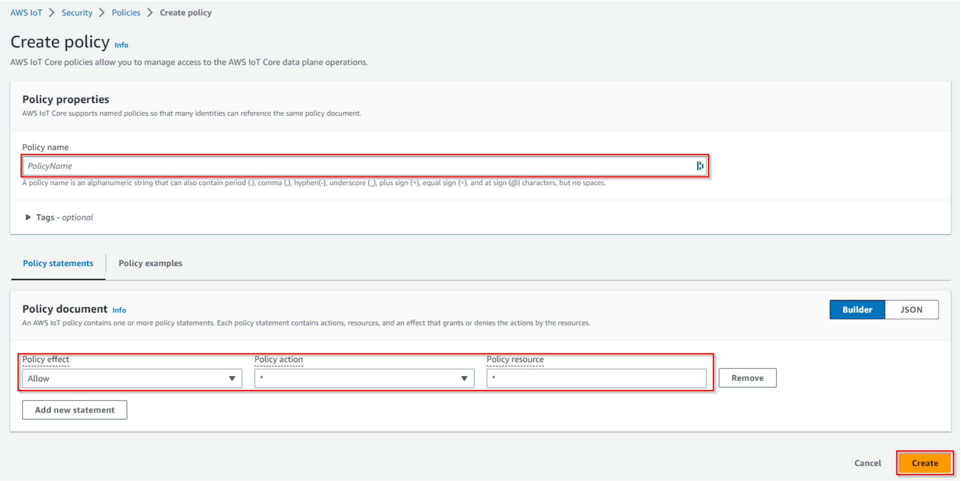
AWS IoT > Security > Policies

AWS IoT policies (1) Info

AWS IoT policies allow you to control access to the AWS IoT Core data plane operations. AWS IoT policies are separate and different from IAM policies. AWS IoT policies apply only to AWS IoT data plane operations.

□	Policy name
□	niagara_test_full

8. Give your policy a **name**. select the "**Allow"** policy effect, and put "*****" in the policy action and policy resource. Then hit **Create**


AWS IoT > Security > Policies > Create policy

Create policy Info

AWS IoT Core policies allow you to manage access to the AWS IoT Core data plane operations.

Policy properties

AWS IoT Core supports named policies so that many identities can reference the same policy document.

Policy name

PolicyName

A policy name is an alphanumeric string that can also contain period (.), comma (,), hyphen(-), underscore (_), plus sign (+), equal sign (=), and at sign (@) characters, but no spaces.

▶ Tags - *optional*

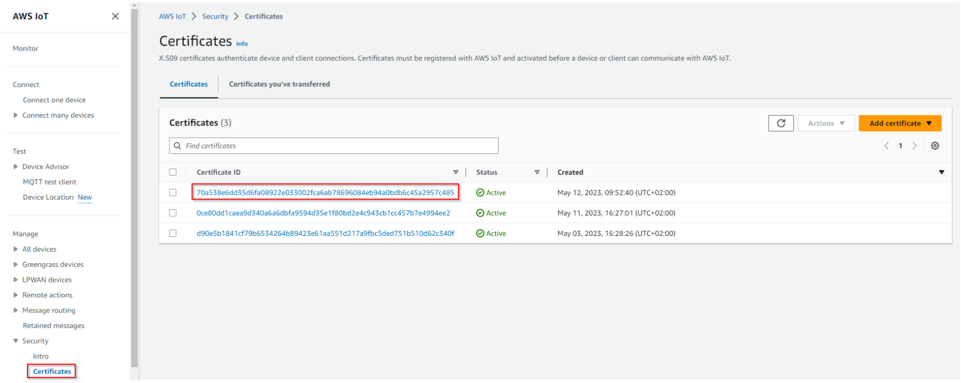
Policy statements | Policy examples

Policy document Info

An AWS IoT policy contains one or more policy statements. Each policy statement contains actions, resources, and an effect that grants or denies the actions by the resources.

Policy effect	Policy action	Policy resource
Allow	*	*

9. Go back to certificates. Choose the certificate you created earlier (check the date).



AWS IoT > Security > Certificates

Certificates Info

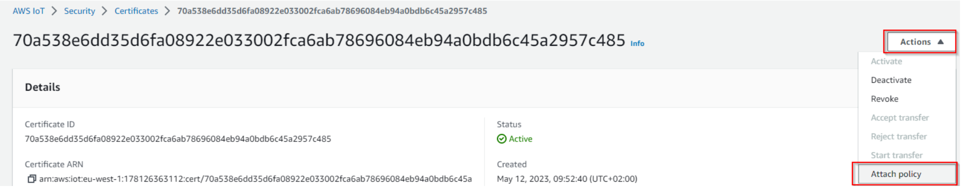
X.509 certificates authenticate device and client connections. Certificates must be registered with AWS IoT and activated before a device or client can communicate with AWS IoT.

Certificates | Certificates you've transferred

Certificates (3)

Certificate ID	Status	Created
70a538e6dd35d6fa08922e033002fca6ab78696084eb94a0bdb6c45a2957c485	Active	May 12, 2023, 09:52:40 (UTC+02:00)
0ce80dd1caea9d340a6a6dbfa9594d35e1f80bd2e4c943cb1cc457b7e4994ee2	Active	May 11, 2023, 16:27:01 (UTC+02:00)
d90e5b1841cf79b6534264b89423e61aa551d217a9fbc5ded751b510d62c340f	Active	May 03, 2023, 16:28:26 (UTC+02:00)

10. Under Actions select **Attach policy**


AWS IoT > Security > Certificates > 70a538e6dd35d6fa08922e033002fca6ab78696084eb94a0bdb6c45a2957c485

70a538e6dd35d6fa08922e033002fca6ab78696084eb94a0bdb6c45a2957c485 Info

Details

Certificate ID

70a538e6dd35d6fa08922e033002fca6ab78696084eb94a0bdb6c45a2957c485

Certificate ARN

arn:aws:iot:eu-west-1:178126363112:cert/70a538e6dd35d6fa08922e033002fca6ab78696084eb94a0bdb6c45a

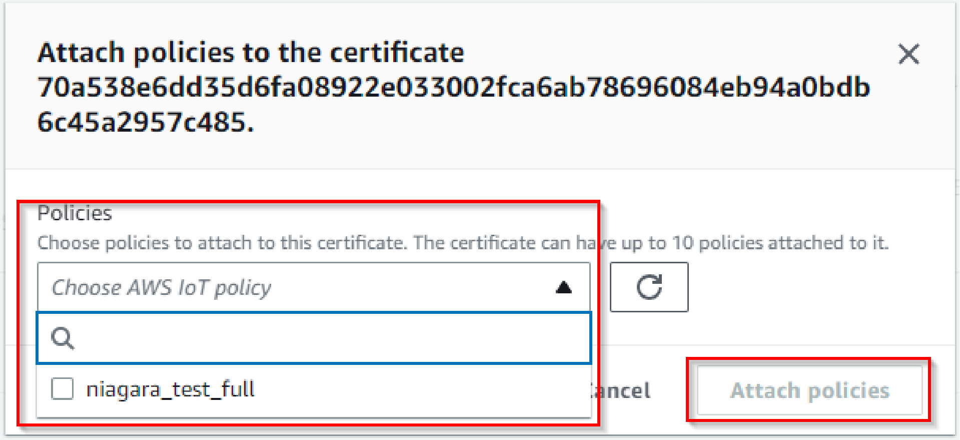
Status

Active

Created

May 12, 2023, 09:52:40 (UTC+02:00)

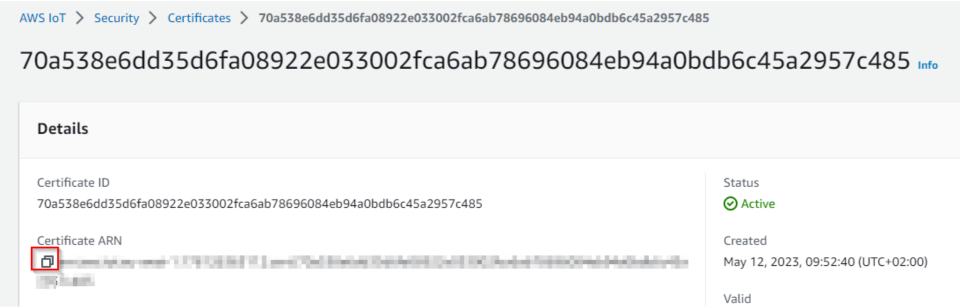
11. Select your policy then hit **Attach**.


Attach policies to the certificate 70a538e6dd35d6fa08922e033002fca6ab78696084eb94a0bdb6c45a2957c485.

Policies

Choose policies to attach to this certificate. The certificate can have up to 10 policies attached to it.

12. Now note down your **certificate ARN**, we will need it later.


AWS IoT > Security > Certificates > 70a538e6dd35d6fa08922e033002fca6ab78696084eb94a0bdb6c45a2957c485

70a538e6dd35d6fa08922e033002fca6ab78696084eb94a0bdb6c45a2957c485 Info

Details

Certificate ID
70a538e6dd35d6fa08922e033002fca6ab78696084eb94a0bdb6c45a2957c485

Certificate ARN
[redacted]

Status
Active

Created
May 12, 2023, 09:52:40 (UTC+02:00)

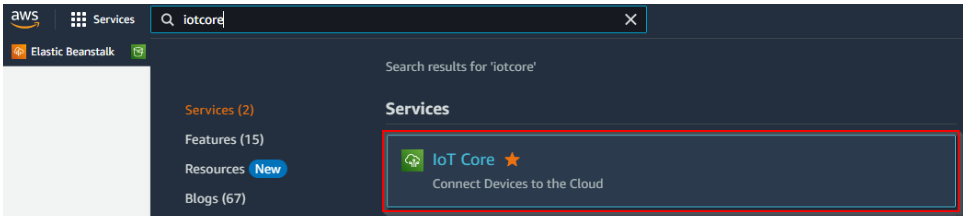
Valid

API endpoint

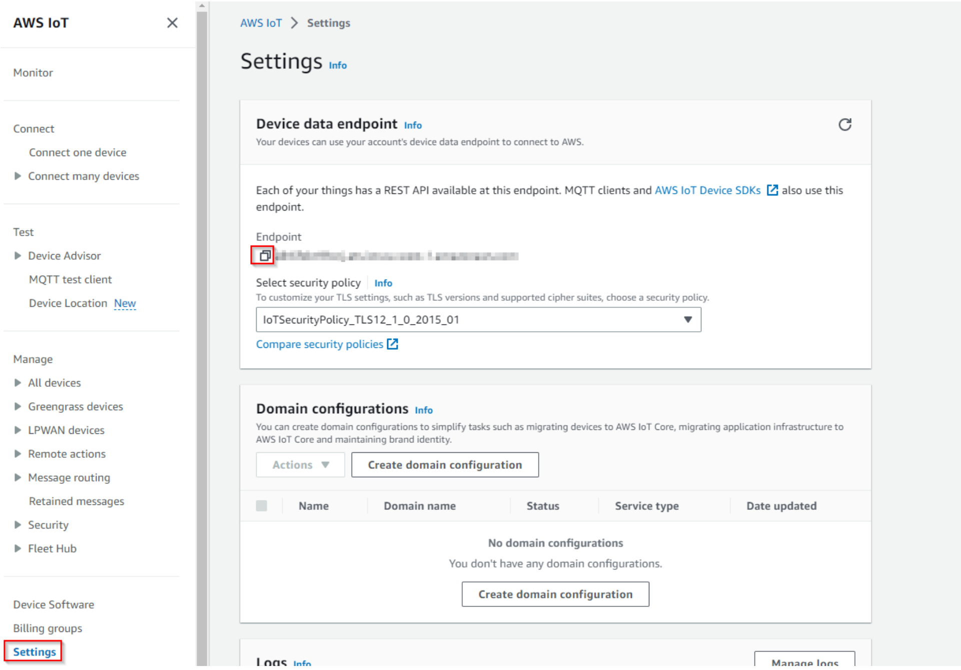
Finally you will need your **API endpoint**

To find it follow these steps:

1. Go to the **IoT Core** service on the **AWS console**.



2. Go to **Settings,** and copy paste your endpoint



Settings Info

Device data endpoint Info
Your devices can use your account's device data endpoint to connect to AWS.

Each of your things has a REST API available at this endpoint. MQTT clients and AWS IoT Device SDKs also use this endpoint.

Endpoint
[redacted]

Select security policy Info
To customize your TLS settings, such as TLS versions and supported cipher suites, choose a security policy.
IoTSecurityPolicy_TLS12_1_0_2015_01
Compare security policies

Domain configurations Info
You can create domain configurations to simplify tasks such as migrating devices to AWS IoT Core, migrating application infrastructure to AWS IoT Core and maintaining brand identity.

Actions ▼ | Create domain configuration

Name	Domain name	Status	Service type	Date updated

No domain configurations
You don't have any domain configurations.
Create domain configuration

Logs Info | Manage logs

Recap

Let's recap, after all theses steps you should have 6 things:

- The credentials csv file for AWS user that contains the client access id and secret.
- The certificate file.
- The private key file.

- The public key file (optional).
- The AWS CA key file.
- The ARN certificate
- And last but not least the API Endpoint

Congrats !!! You finished the AWS setup go to next step:

Next Step

Step 2 Set up AWS connector for devices points and references