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Document Number	BQW_02_0020.003

MiniHub Pro

Quick Installation Guide

-with Basic Station & AWS IoT Core for LoRaWAN

Version 1.11

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Release History

Date	Version	Author	Comment
2020/01/21	1.1	Jason Andrew Lin Andrew Shiu Crux	• First release.
2020/04/16	1.2	Jason Andrew Lin Andrew Shiu Crux	• Add Web GUI for AWS IoT provision. • Add Web GUI for Basic Station provision. • Add writing station EUI command. • Add LED behavior.
2020/04/16	1.3	Jason Andrew Lin Andrew Shiu Crux	• Fix some typos.
2020/05/27	1.4	Jason Andrew Lin Andrew Shiu Crux	• Add Q&A.
2020/06/22	1.5	Jason Joey	• Add OTA flow.
2020/06/30	1.6	Jason	• Correct some wording • Browan Official Release, add Document Number
2020/07/15	1.7	Jason Andrew Shiu	• Modify OTA Flow. User no needs to power off and power on to trigger the OTA.
2020/08/24	1.8	Crux	• Add chapter ISM Band and LoRa MAC Troubleshooting. • Remove chapter Station EUI Writing.
2020/08/26	1.9	Jason	• Add more detailed steps of the OTA jobs.
2020/10/29	1.10	Jason	• Add AWS IoT Core for LoRaWAN(Sailboat)
2022/8/25	1.11	Jason	• Remove Breakout board

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About this Document

This document explains the configuration after powering up. The Web GUI usage for AWS IoT provision and Basic Station provision.

Required Equipment

- MiniHub Pro

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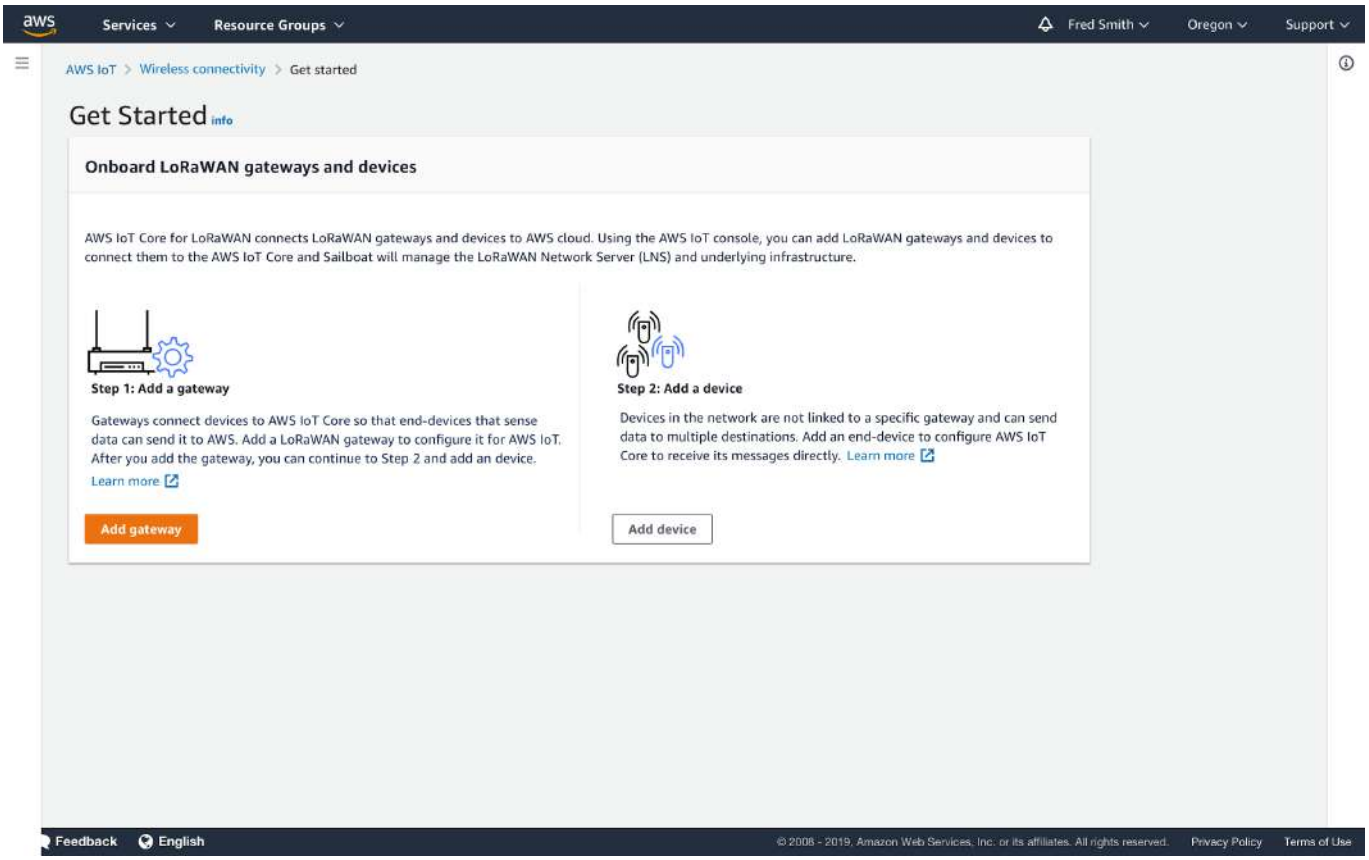
Onboard LoRaWAN Gateways

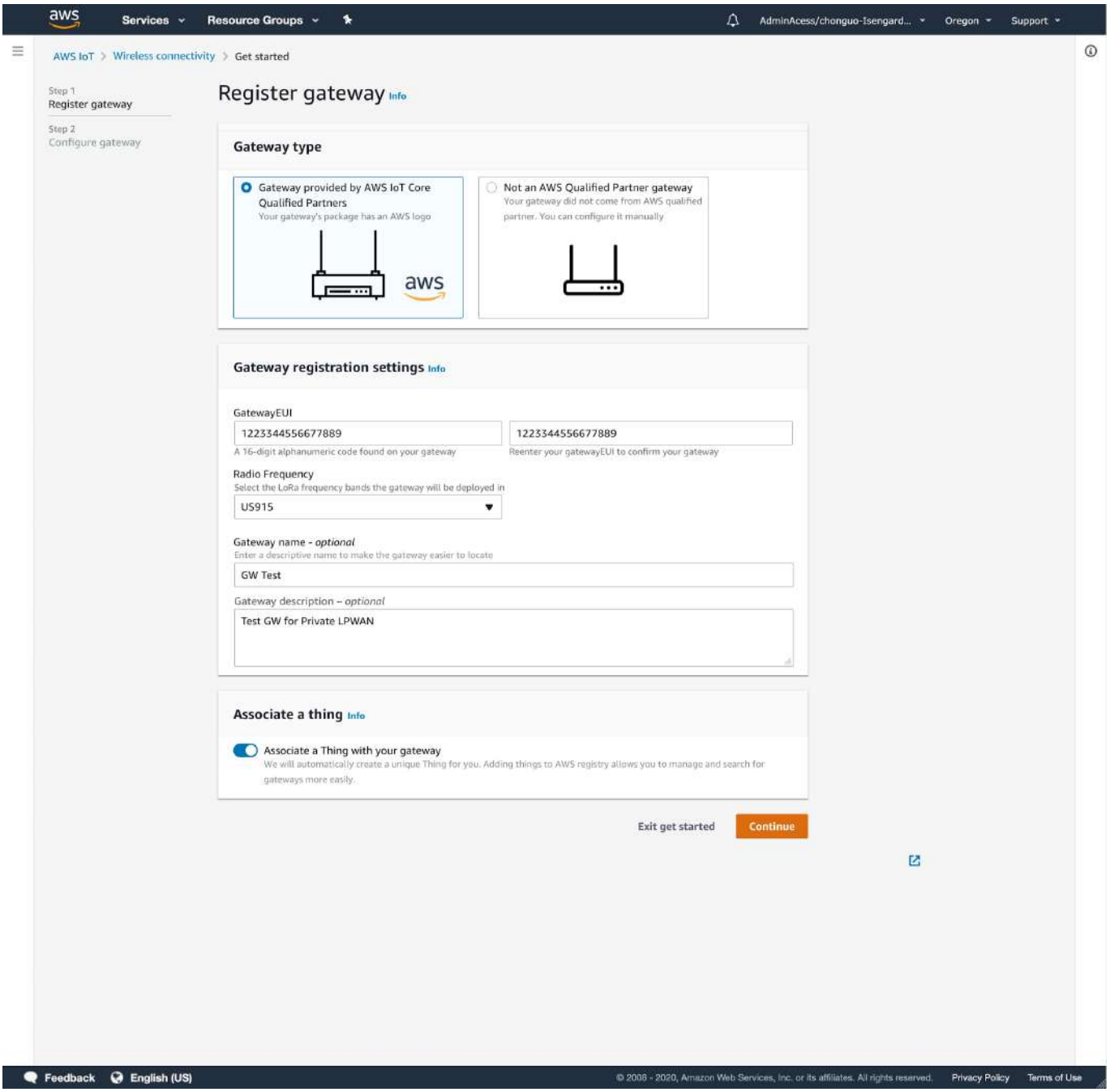
- Step1.

  Click “Add gateway”



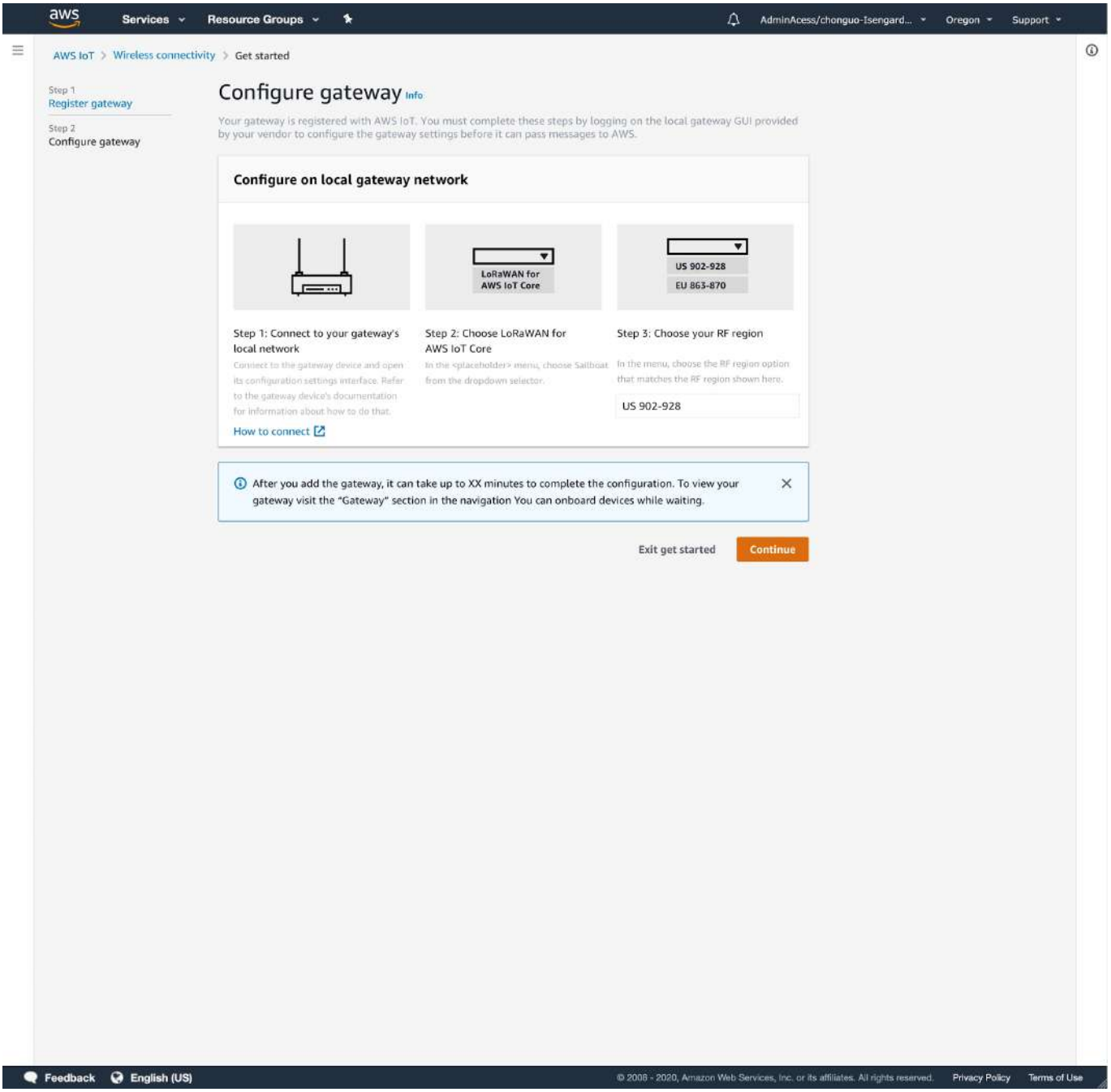
- Step2.

  Select “Gateway provided by AWS IoT Core Qualified Partners”. Input GatewayEUI, Radio Frequency, Gateway name(Optional), Gateway description(Optional) and click “Continue”



- Step3.

  Configure Gateway. Please refer to the next chapter. Click “Continue”



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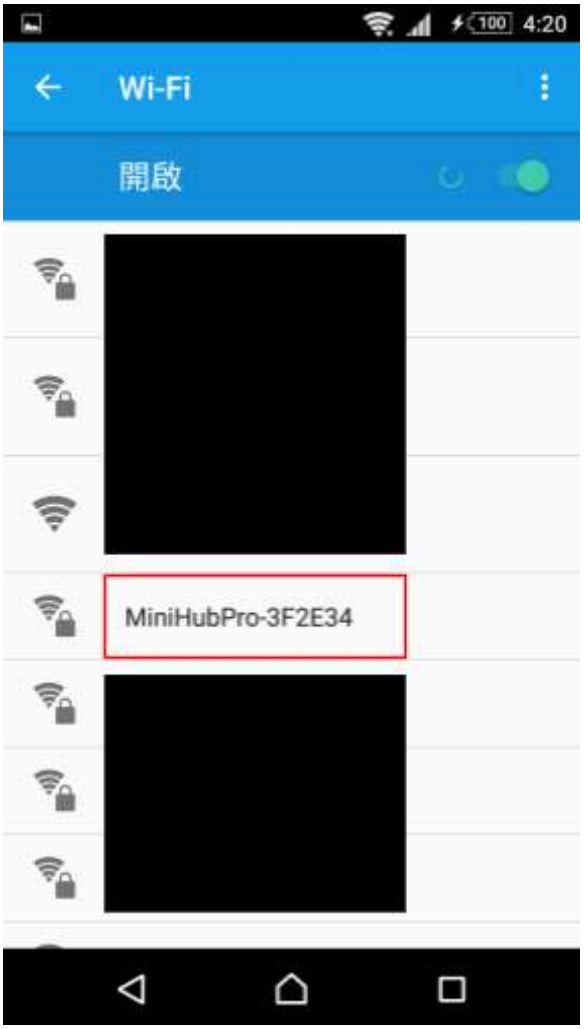
Configure the Gateway(Web Provision)

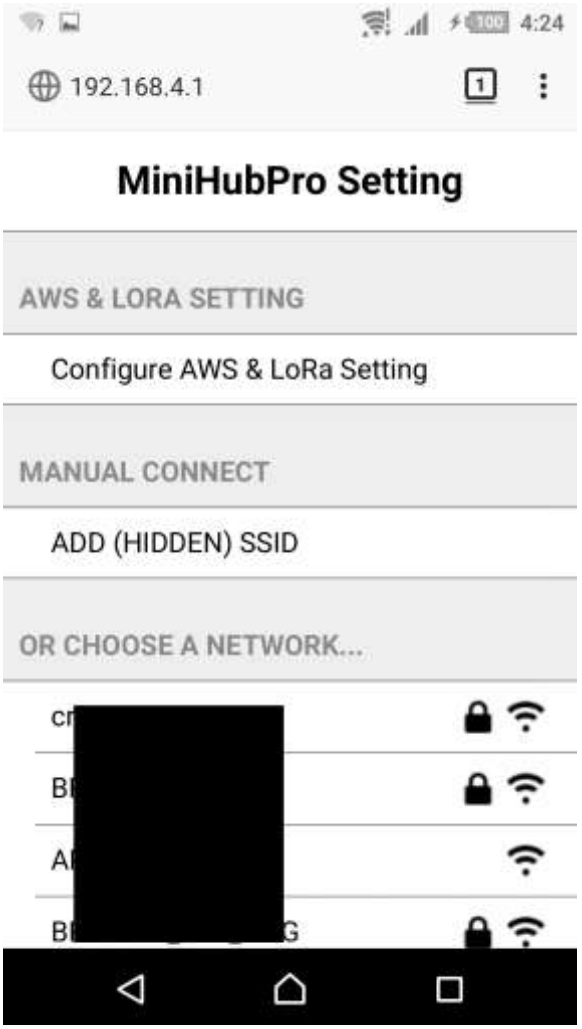
Connect to Web GUI

The device can run as WiFi AP mode or WiFi Station mode. When the device is in the initial state, such as first boot-up time or after reset-to-default. It will run with the WiFi AP mode. That means it accepts any WiFi client to connect to it.

You can find the SSID `MiniHubPro-XXXXXX` in the WiFi site-survey list. The suffix 6 characters are the last 6 hex string of WiFi MAC address. The password is `in the back label`.



After connecting to `MiniHubPro-XXXXXX` AP, it will open the setup page. If web page doesn't open automatically, please use **Firefox or Chrome** to open **192.168.4.1** manually.



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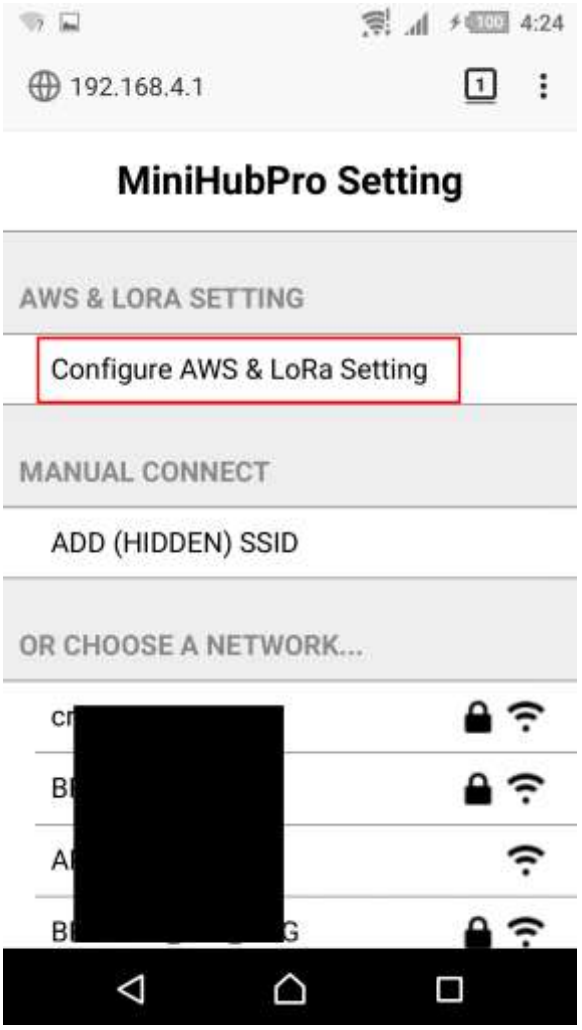
AWS & LoRa Setting

Click "Configure AWS & LoRa Setting" to open the setting page.



There are two parts, one is for AWS, and another one is for LoRa. Please configure your setting and click the "Save" button at the bottom. If you don't want to change any setting, please click the "Cancel" button at the bottom.

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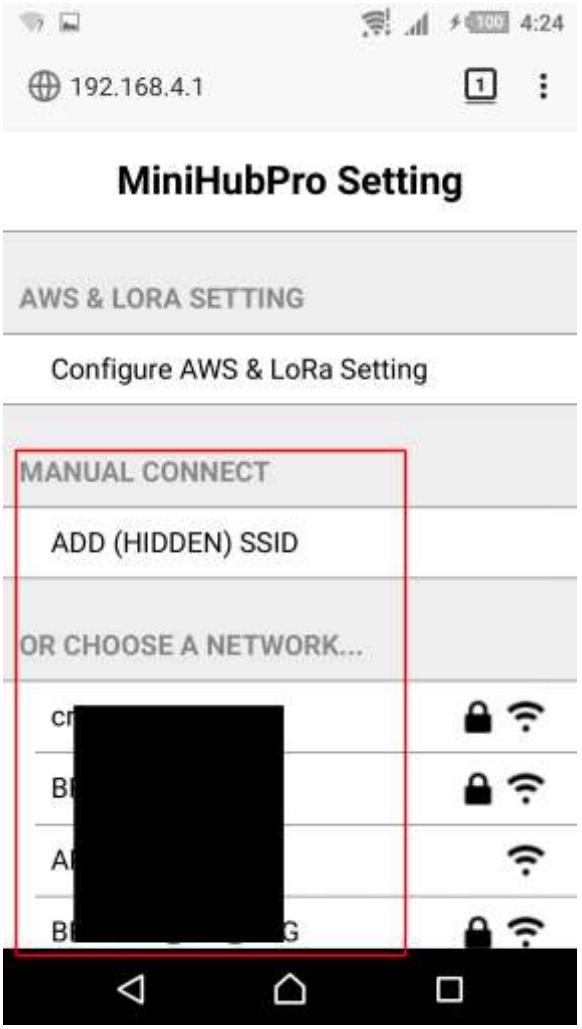
WiFi Setting

Choose one of the WiFi AP which you prefer to connect to the internet. You also can add SSID manually by yourself on this page. After that, the MiniHub Pro will store the connection information and switch to the WiFi Station mode.



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LED Behavior

Colors	Blink Pattern	Mode	Status
Green	Blinking 1 sec	WIFI_STA	WiFi station not connected
Green	Blinking 1/4 sec	WIFI_STA	WiFi station connected, establishing the connection to LNS, configuring radio
Green	Solid	WIFI_STA	WiFi station connected, Sta is connected to LNS, radio listening
Green/ Orange	Blinking 1/4 sec	WIFI_STA	WiFi station connected, CUPS transaction in progress ❊Note: Do not unplug device in this state
Orange	Blinking 1/4 sec	CONFIG	Scanning WiFi networks, setting up configuration AP
Orange	Blinking 1 sec	CONFIG	Configuration AP active

❊Note:

WIFI_STA is WiFi Station Mode
CONFIG is Configuration Mode

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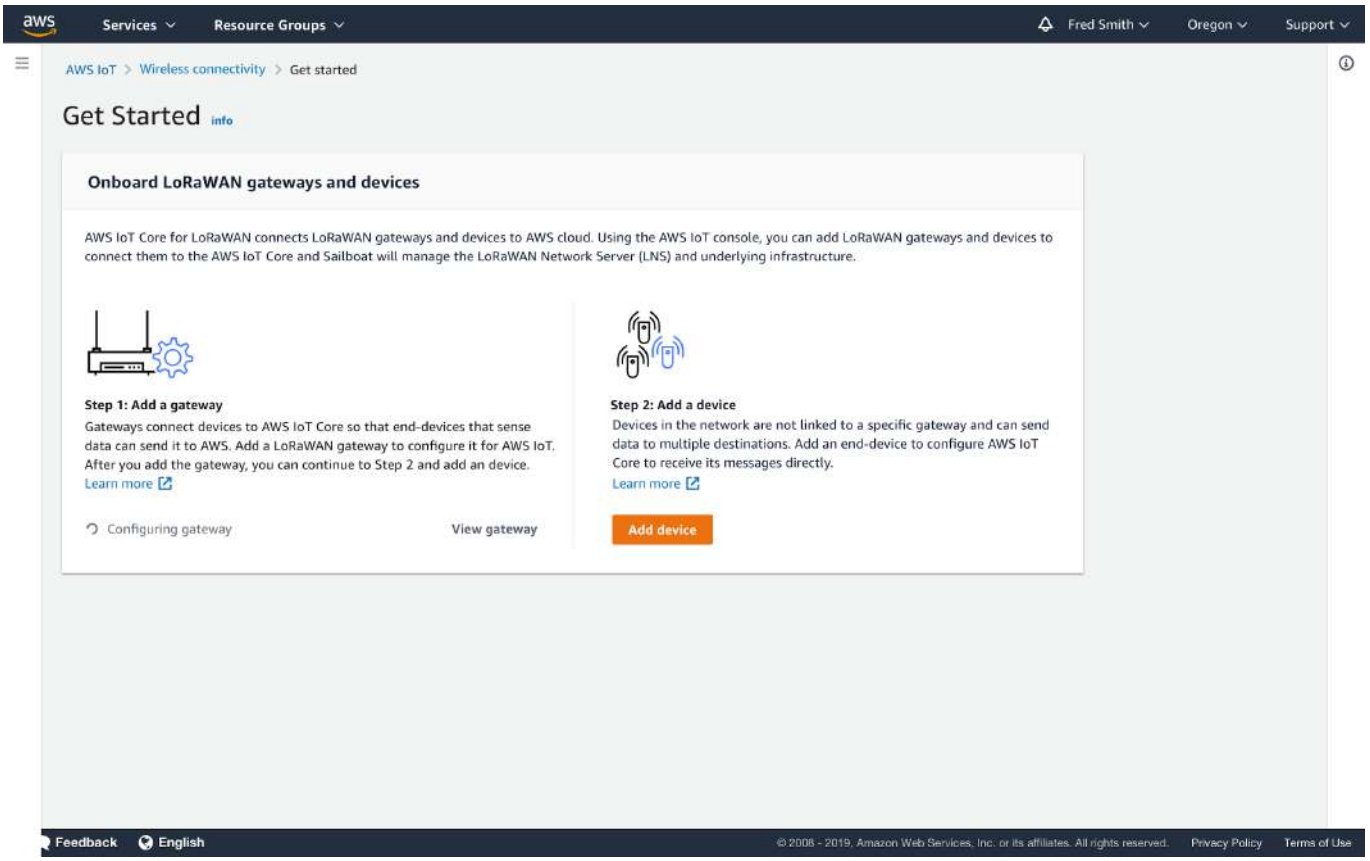
Onboard LoRaWAN Devices

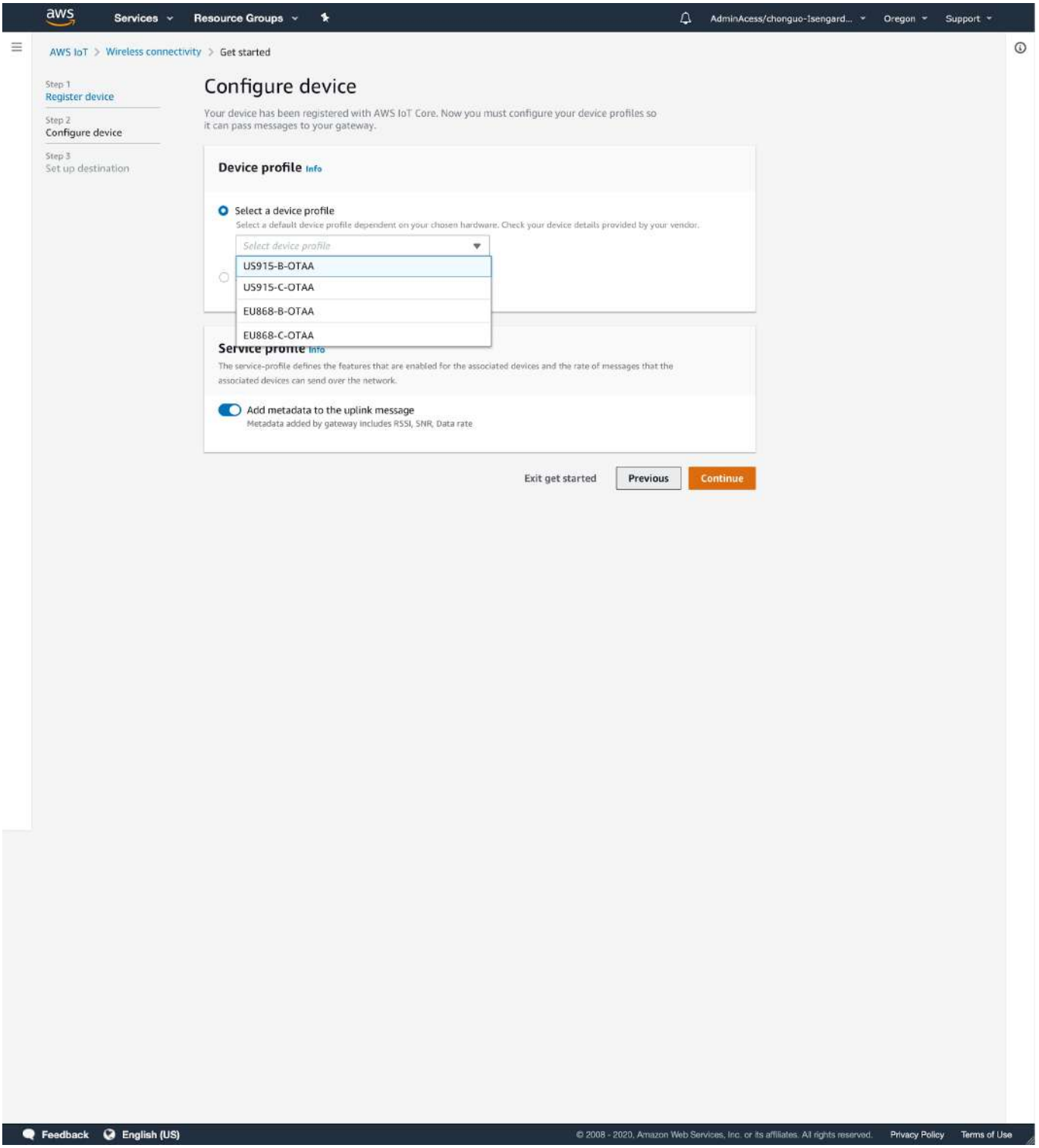
- Step 1.

  Click “Add device”



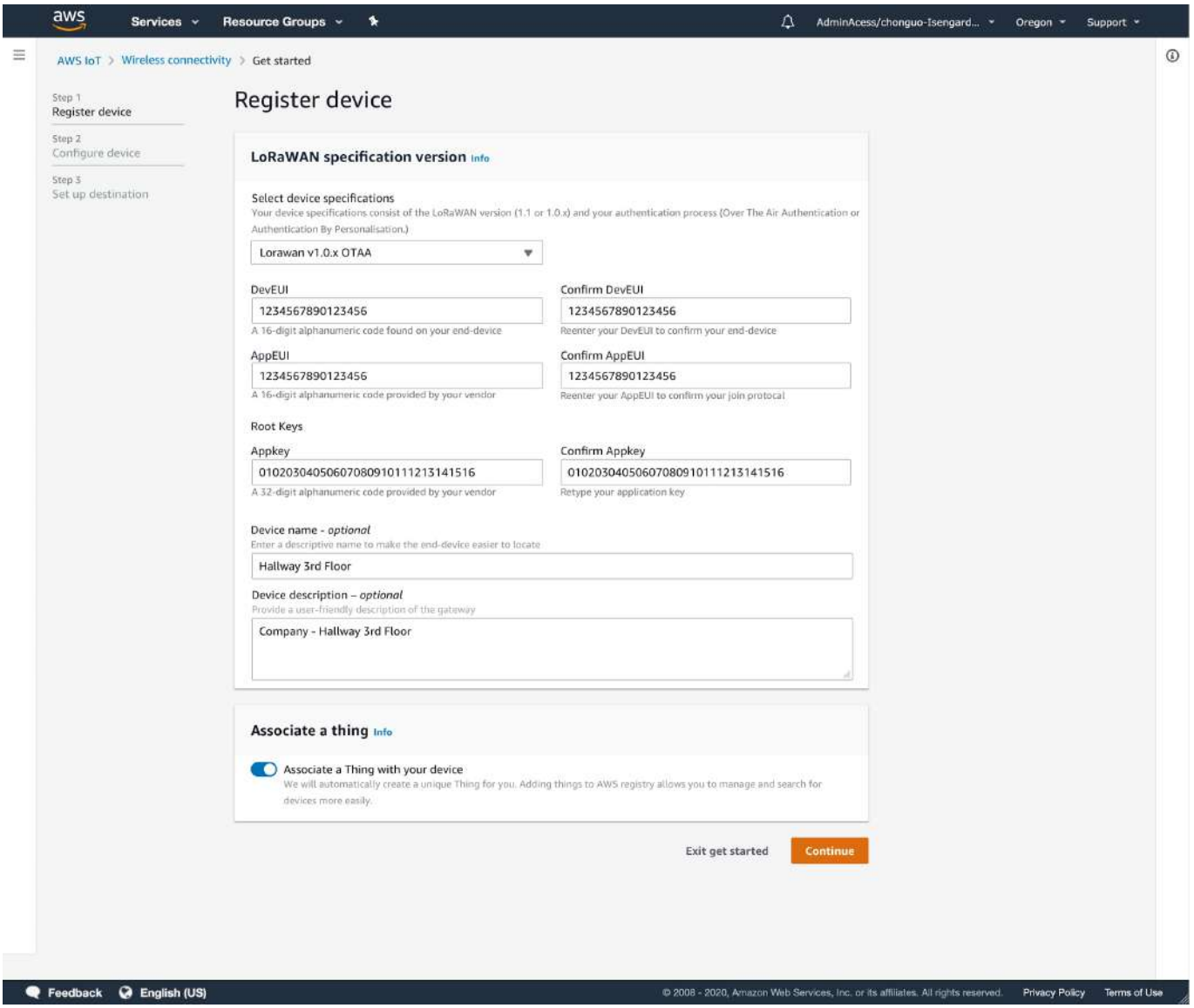
Step 2.

Register device - Select device specification. Click“Continue”



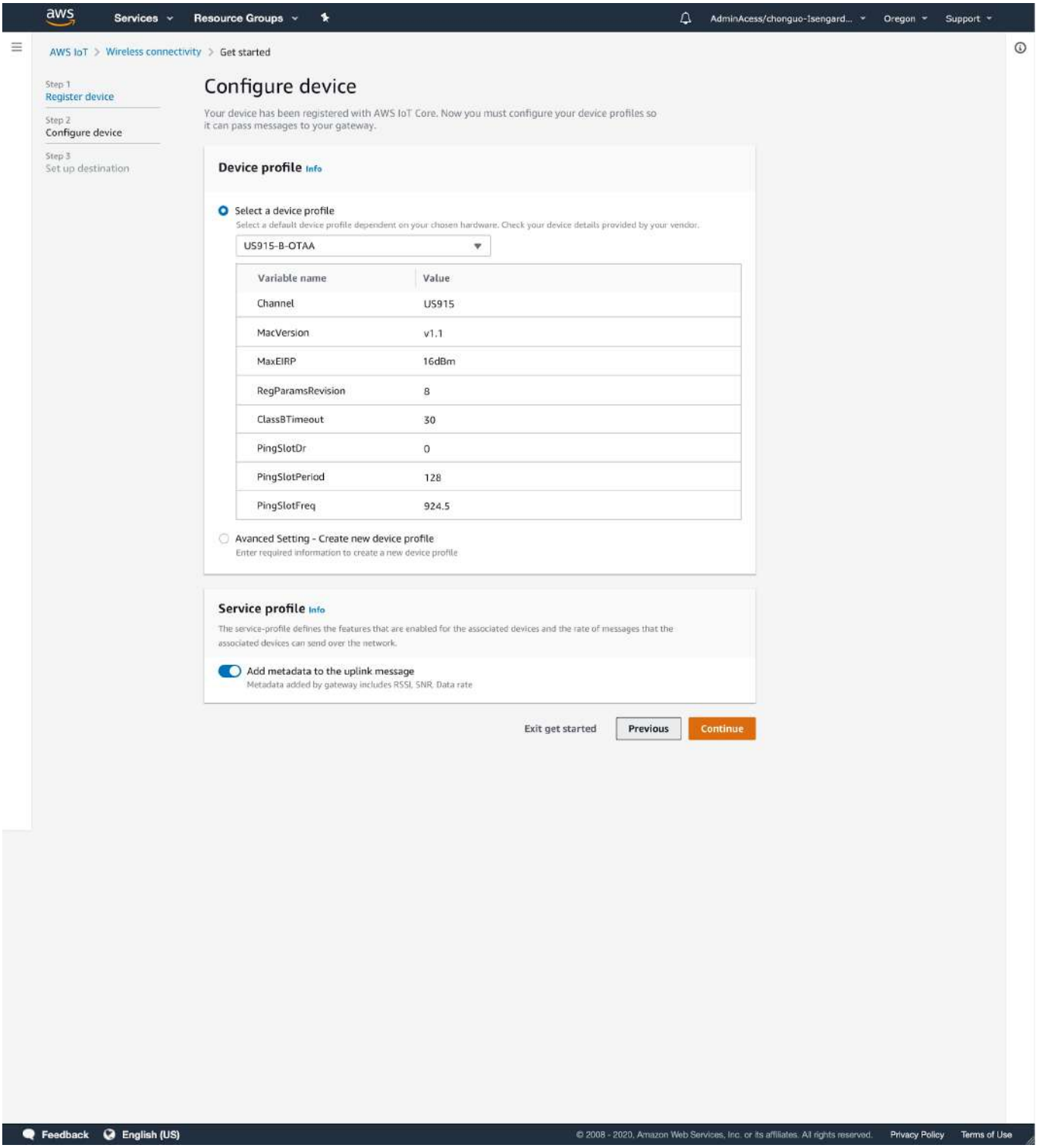
Step 3.

Register device - Input DevEUI, AppEUI, Appkwy, Device name(Optional) and Device description(Optional). Click“Continue”.



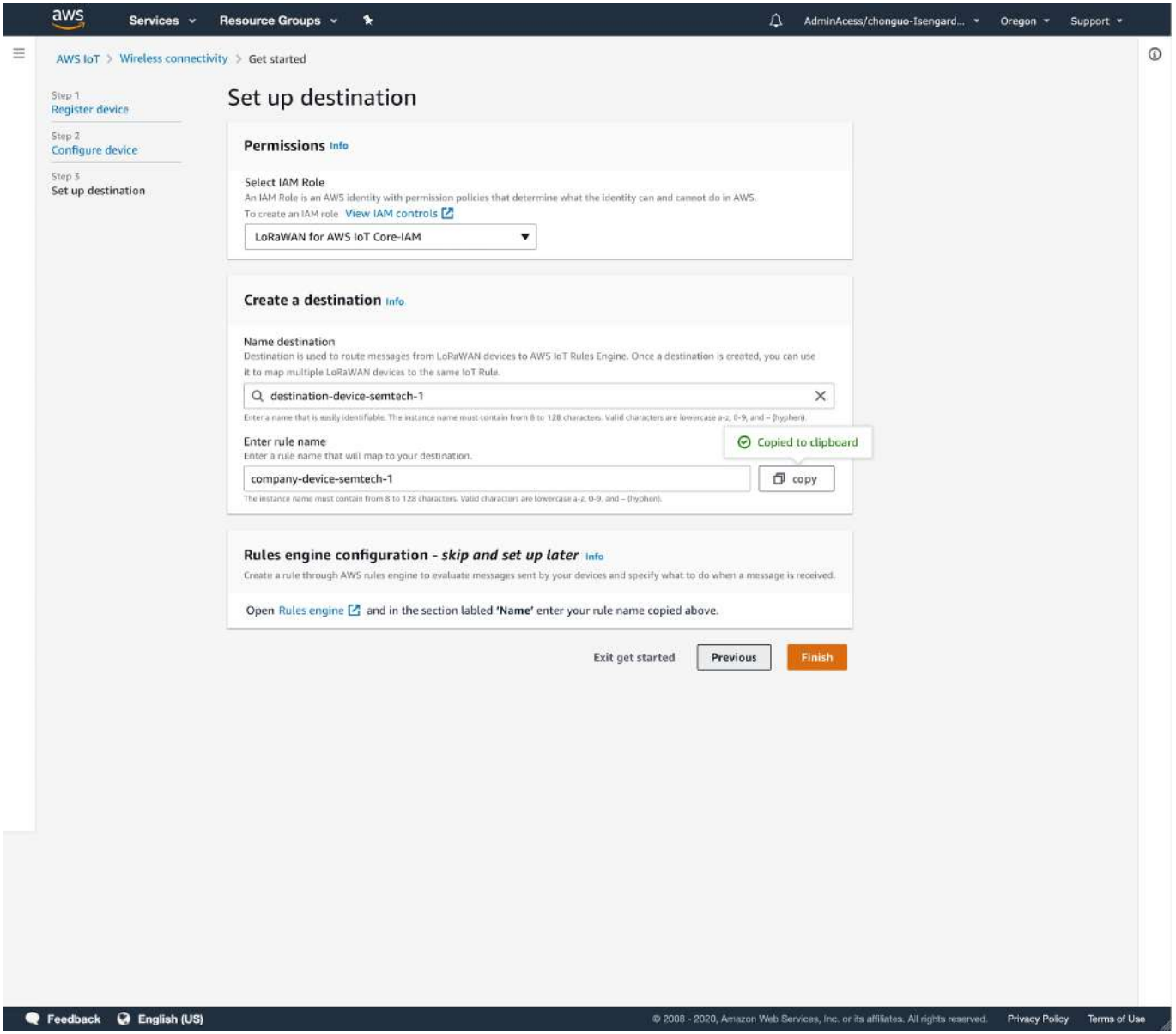
Step 4.

Configure devices - Select device profile. Click“Continue”



Step 5.

Set up destination- Select IAM role and input rule name. Click“Finish”



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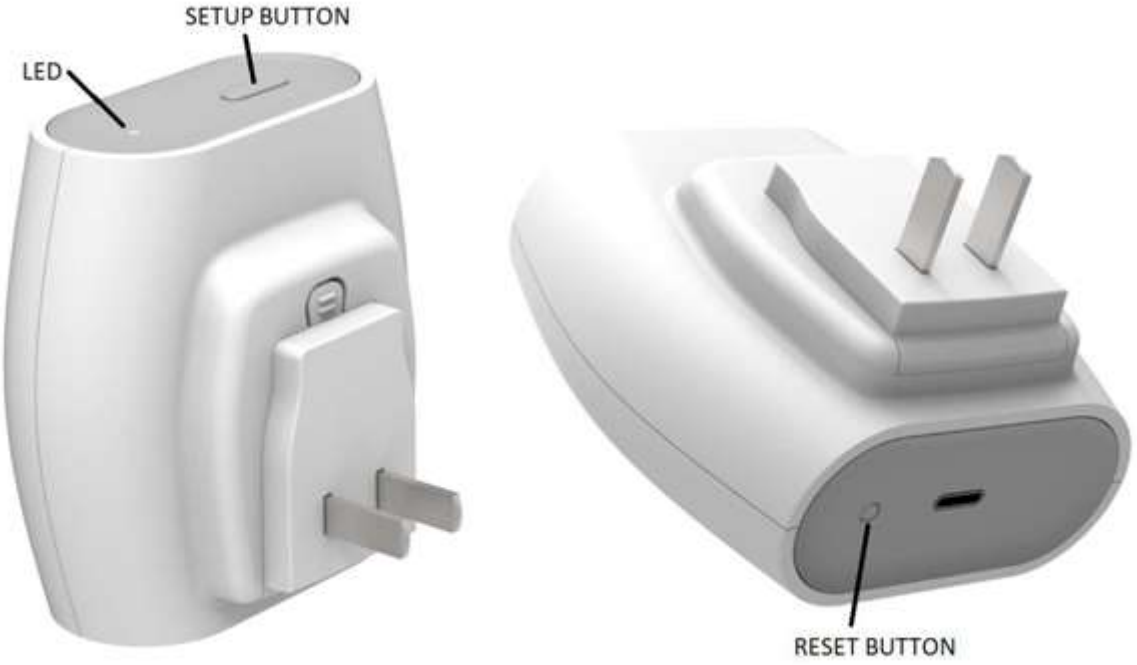
Reset to Default



Press the reset button over 5 seconds to reset the system to default status. After reset to default, the orange LED will blink every 1 second.

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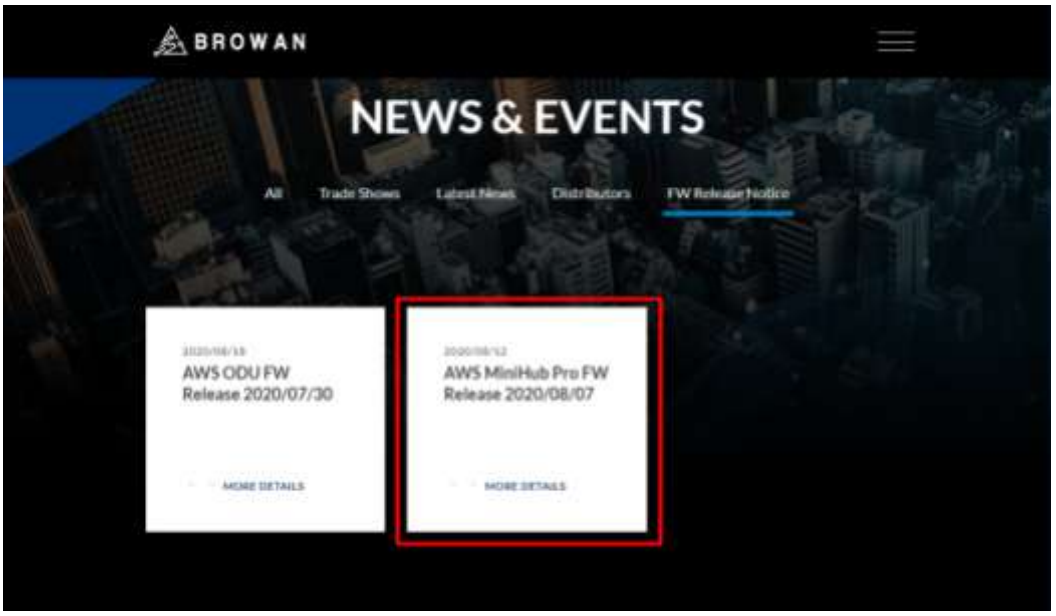
OTA

Get Firmware

1. Please visit Browan's website and click release note for MiniHub Pro.
   https://www.browan.com/news/9V



2. Download the latest MiniHub Pro's firmware.

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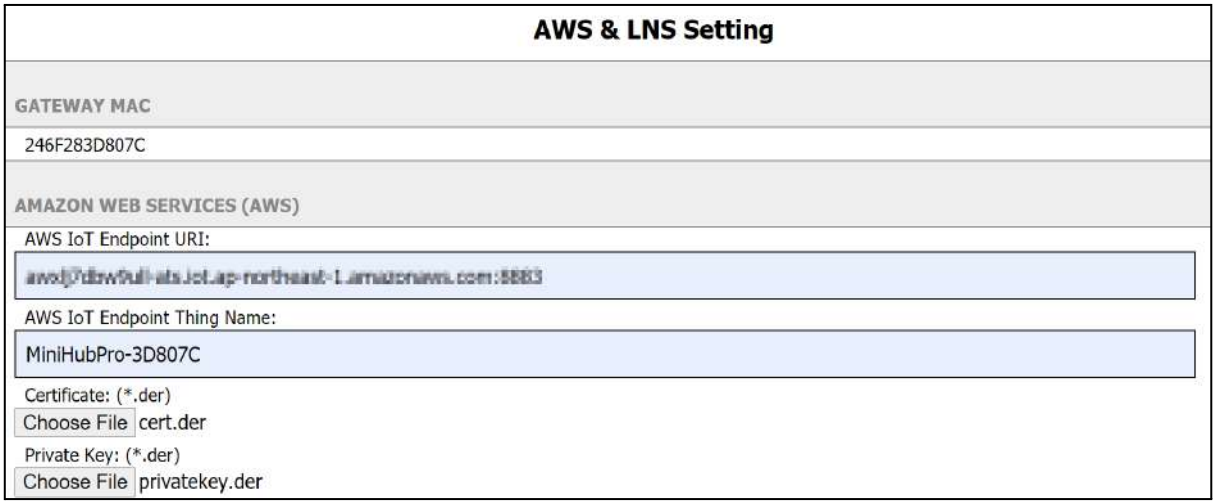
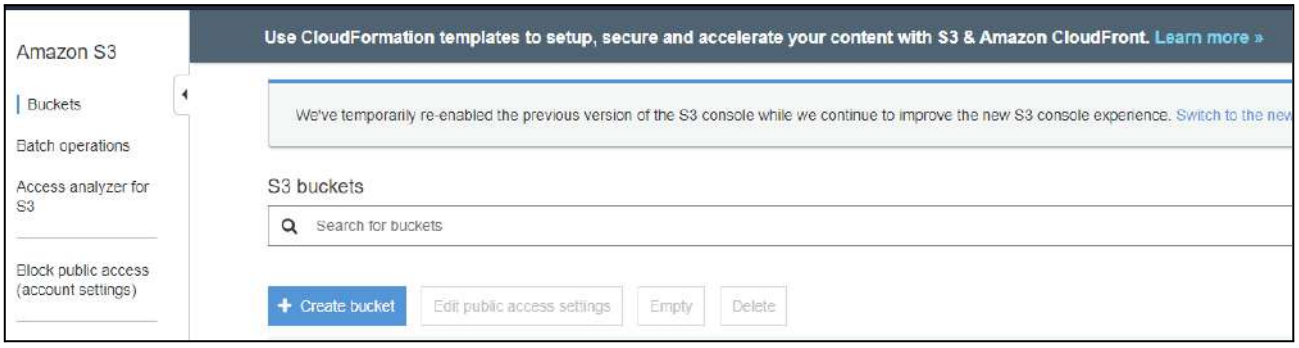
Configure MiniHub Pro

Please register things for MiniHub Pro on the AWS IoT and configure the AWS & LNS Setting.

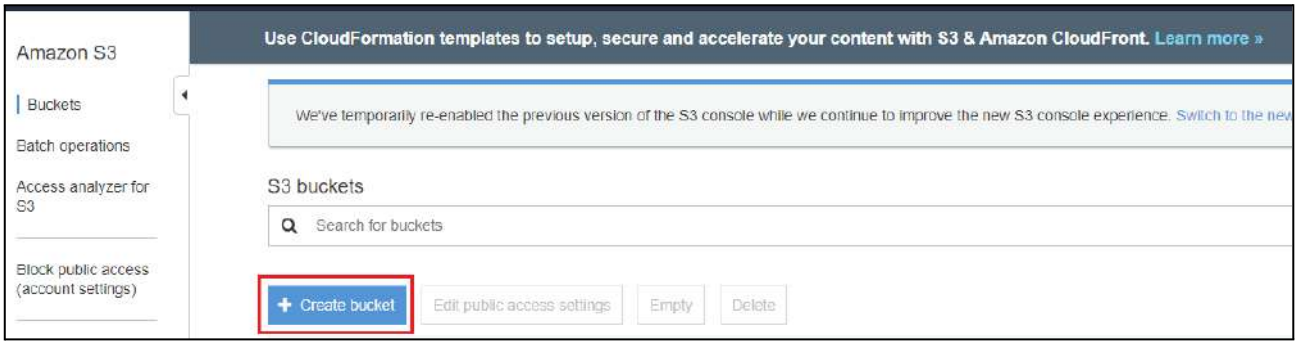


Create an Amazon S3 bucket to store your update

1. Sign in to the Amazon S3 console at https://console.aws.amazon.com/s3/.



2. Choose **Create bucket**.



3. Enter a **bucket name**.

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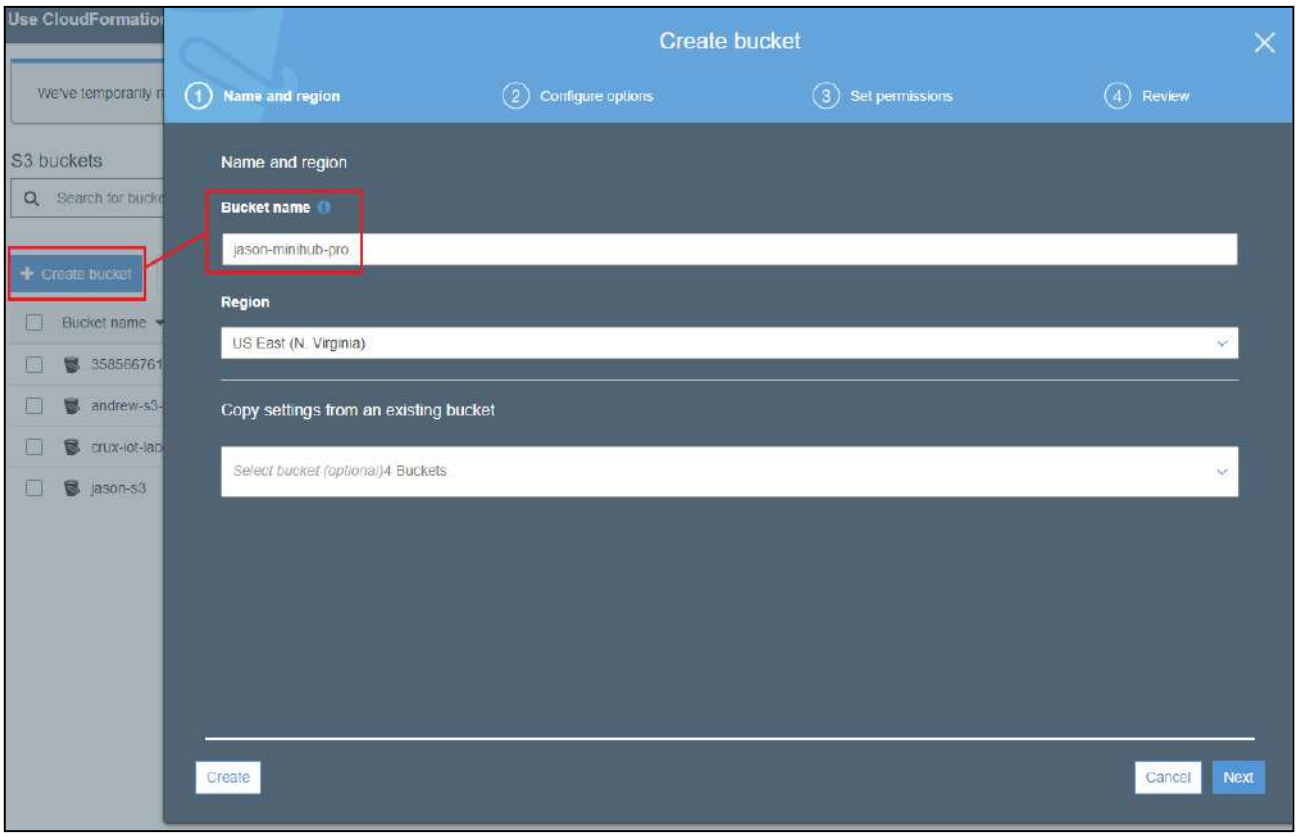
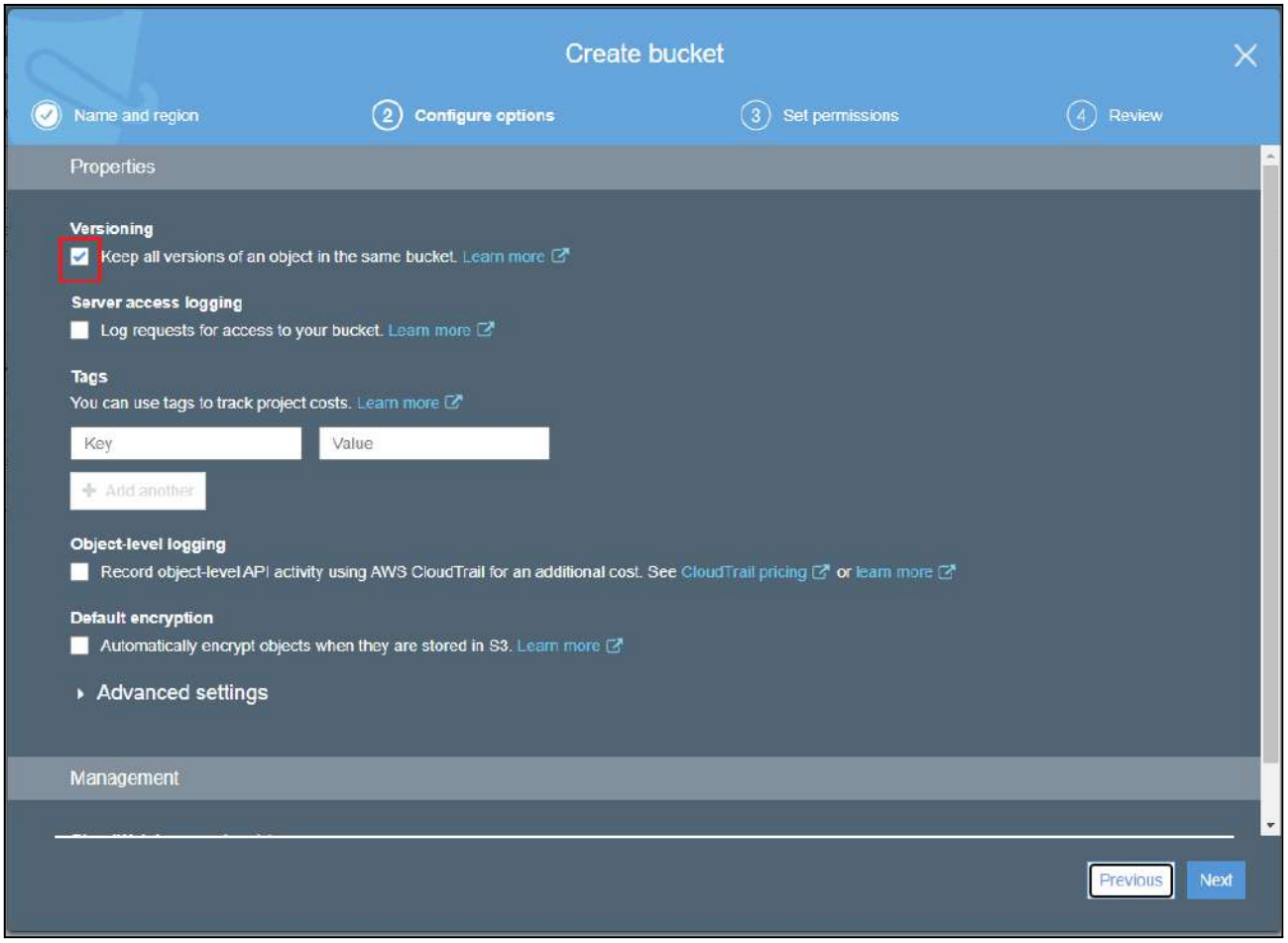
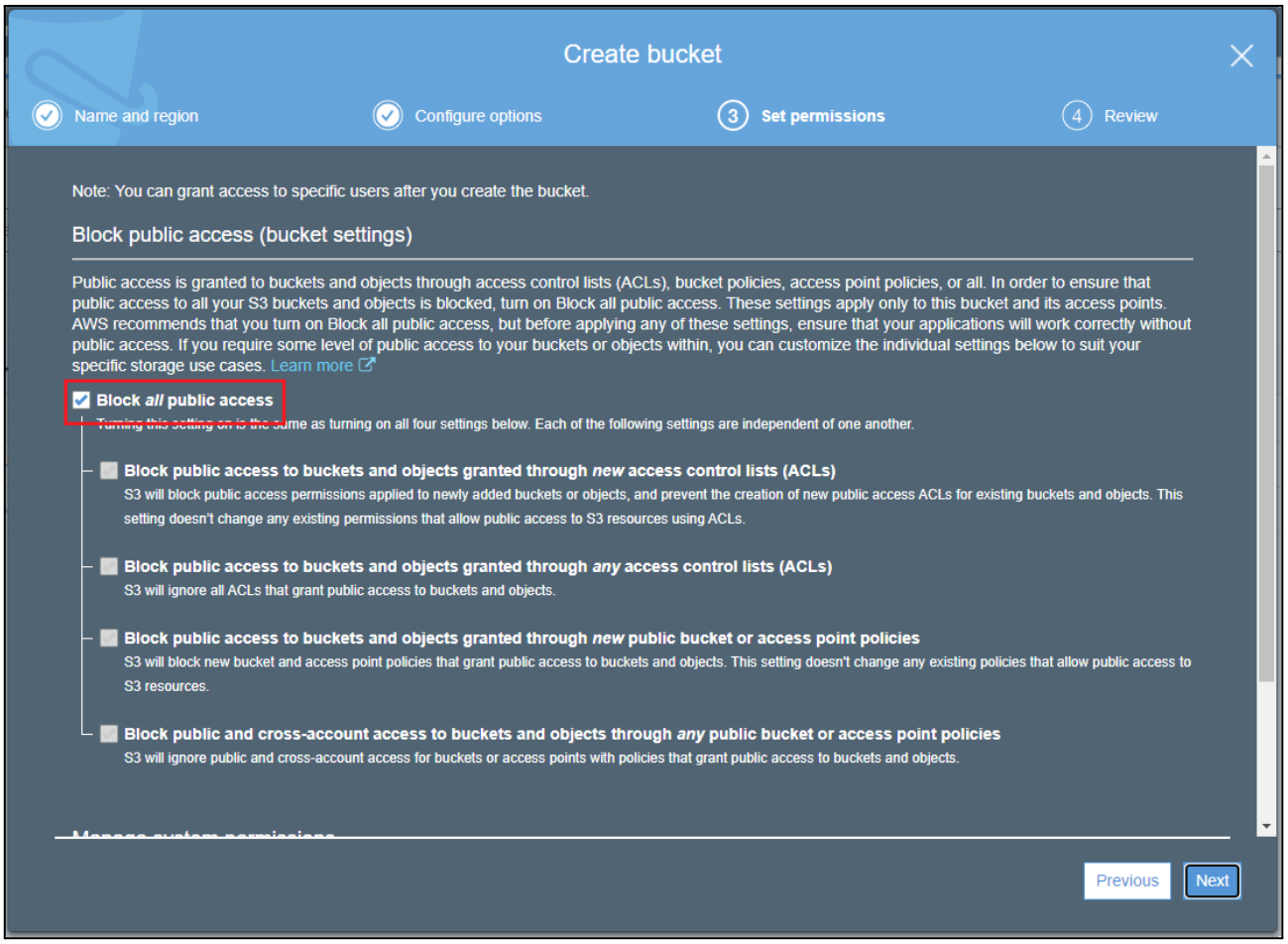


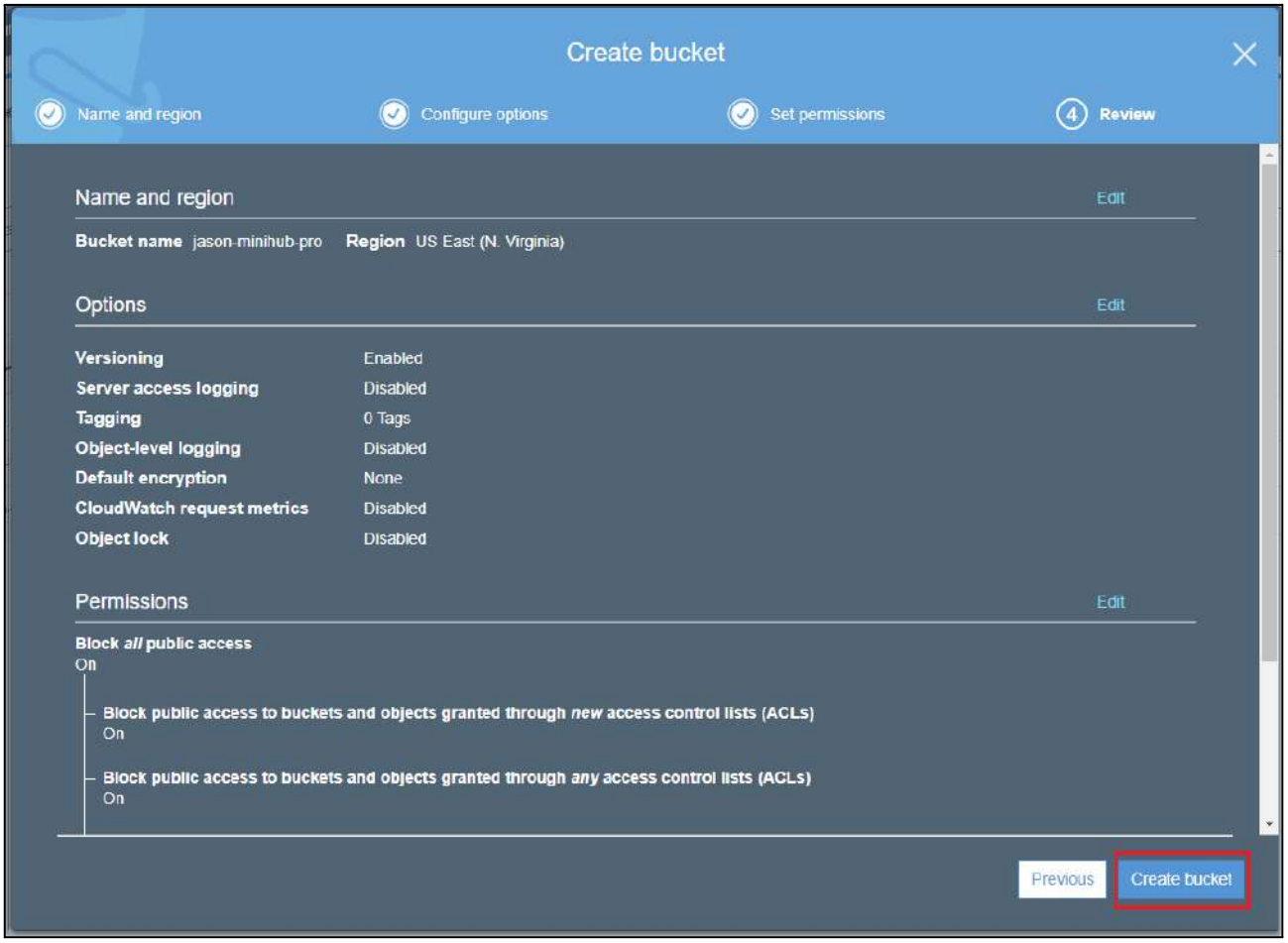
4. Under **Bucket Versioning**, select **Enable** to keep all versions in the same bucket.



5. Under **Bucket settings for Block Public Access** keep **Block all public access** selected to accept the default permissions.



6. Choose **Create bucket**.



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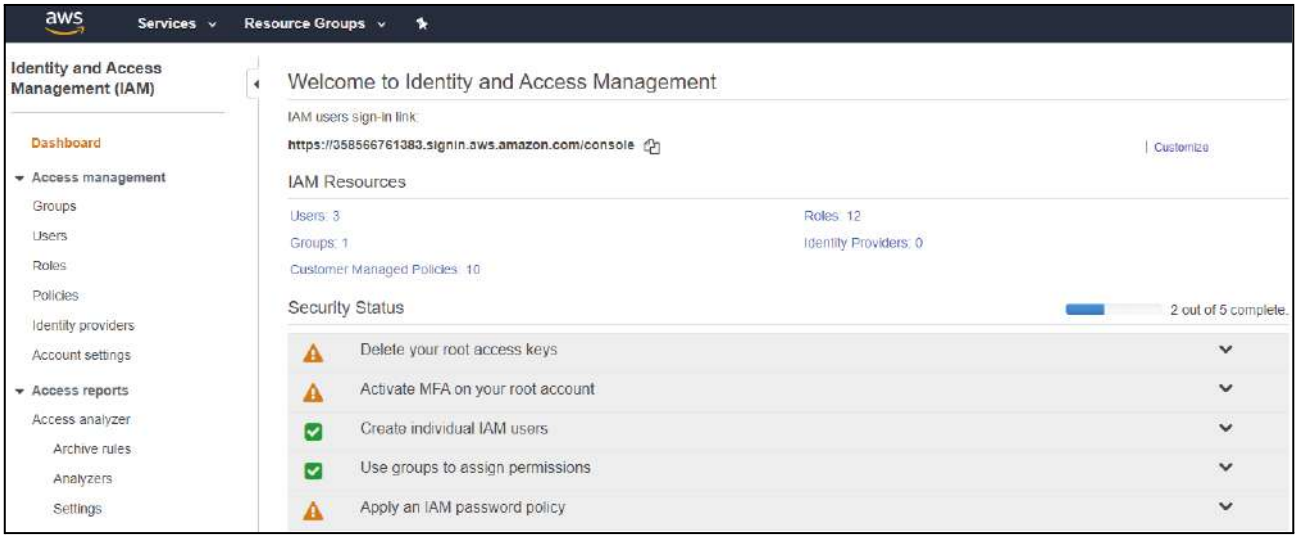
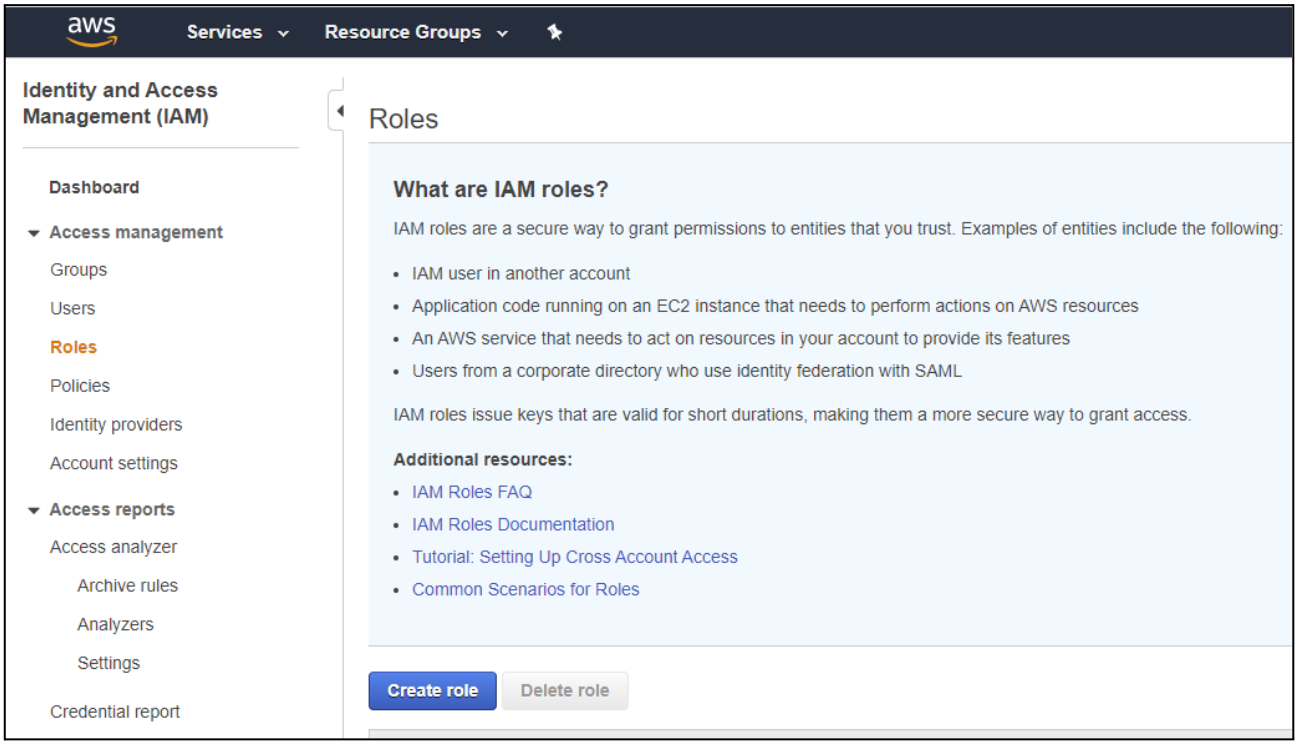
Create an OTA Update service role

To create an OTA service role

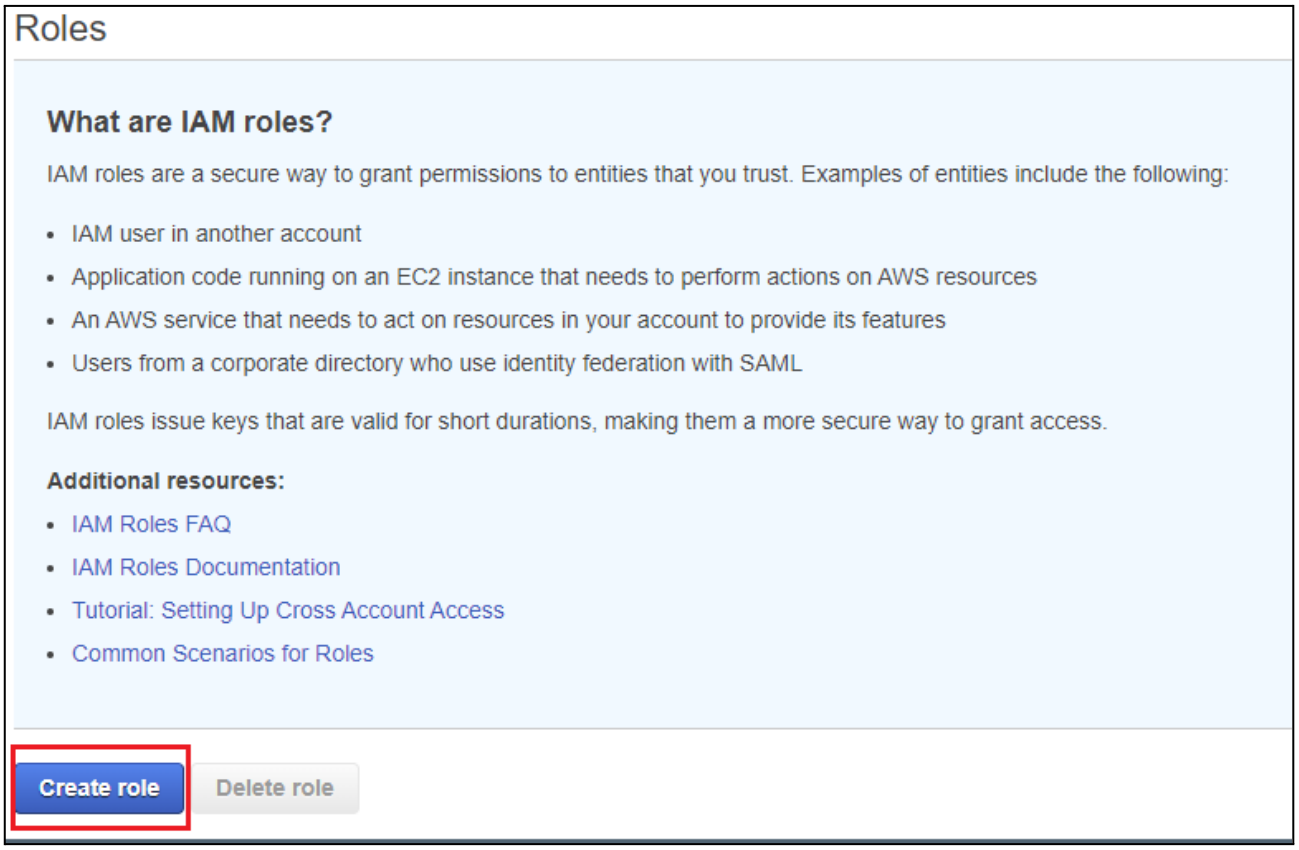
1. Sign in to the https://console.aws.amazon.com/iam/.



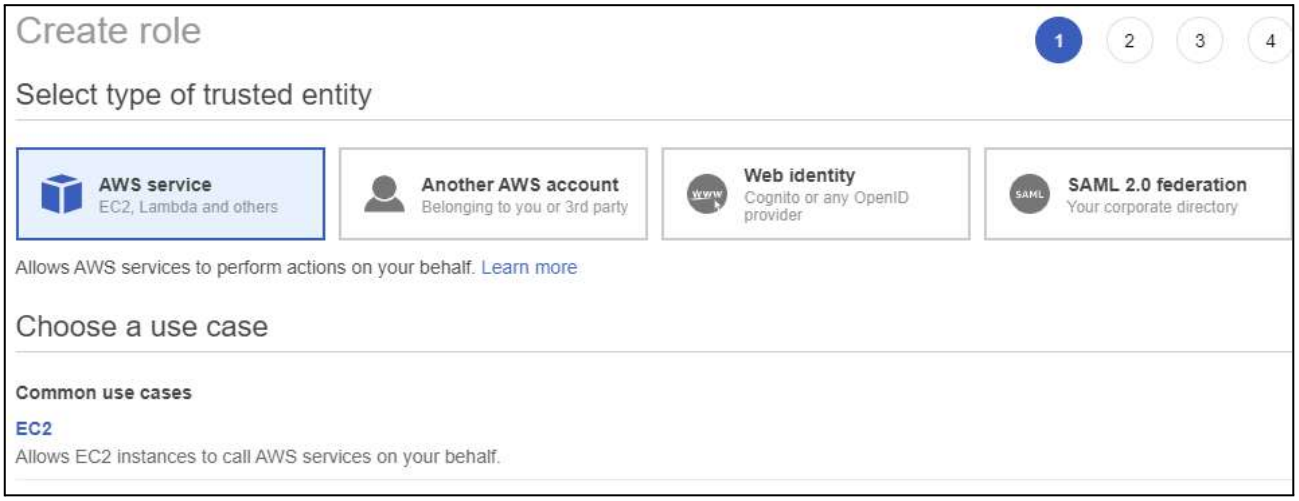
2. From the navigation pane, choose **Roles**.



3. Choose **Create role**.

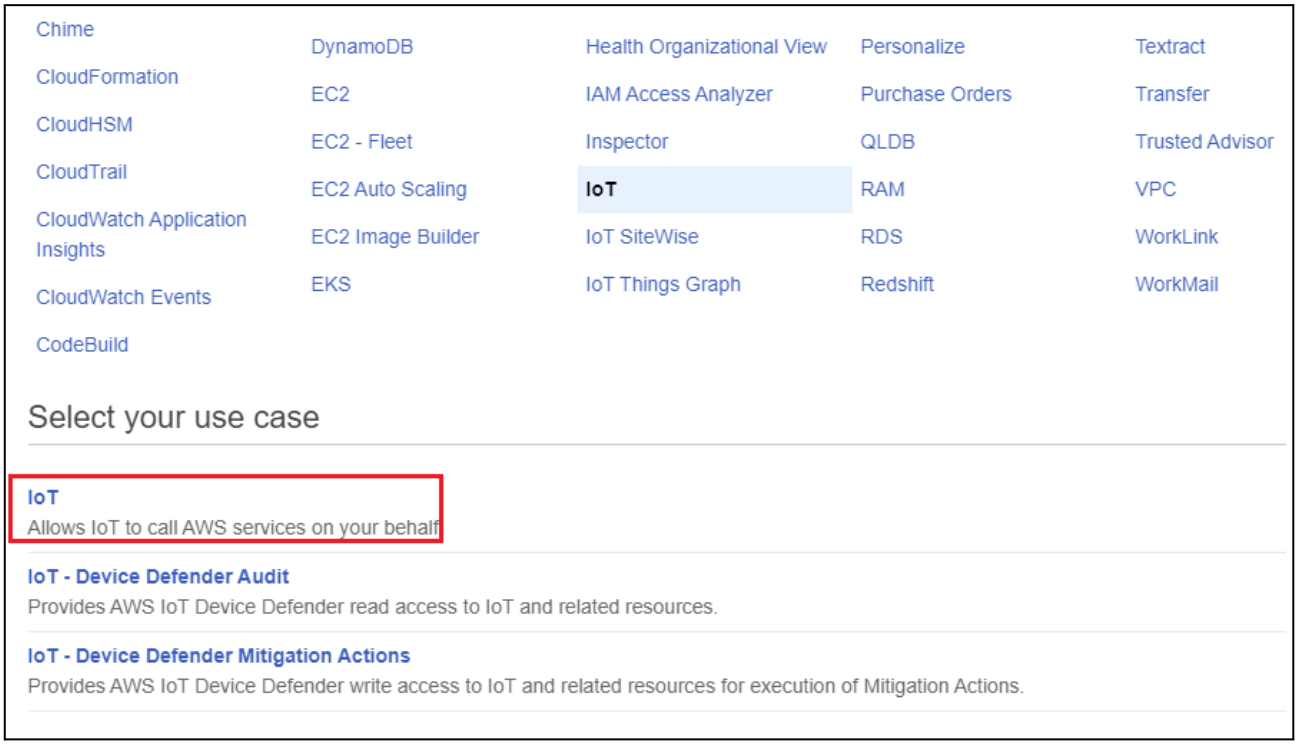


4. Under **Select type of trusted entity**, choose **AWS Service**.



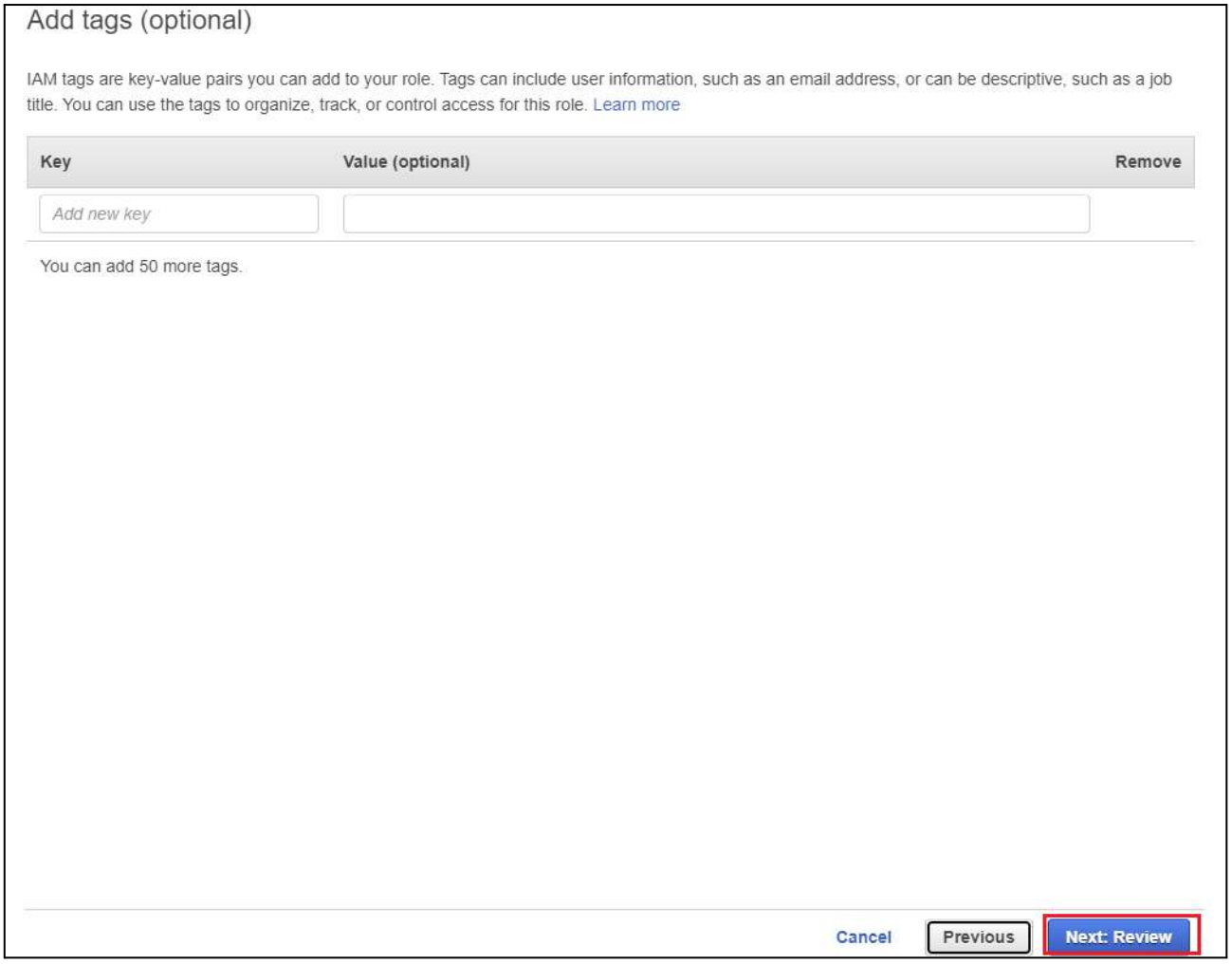
5. Choose **IoT** from the list of AWS services.

6. Under **Select your use case**, choose **IoT**.

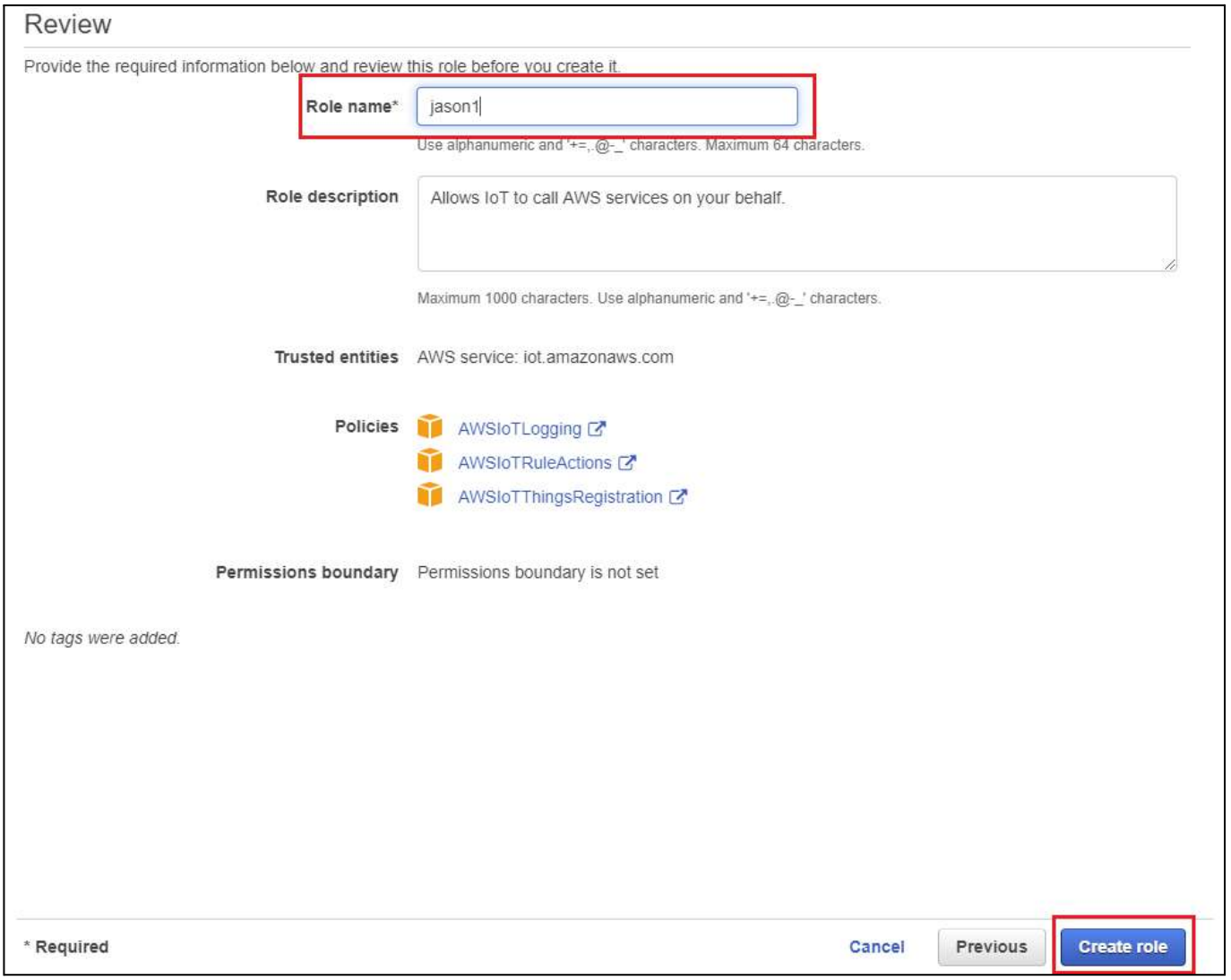


7. Choose **Next: Tags**.

8. Choose **Next: Review**.

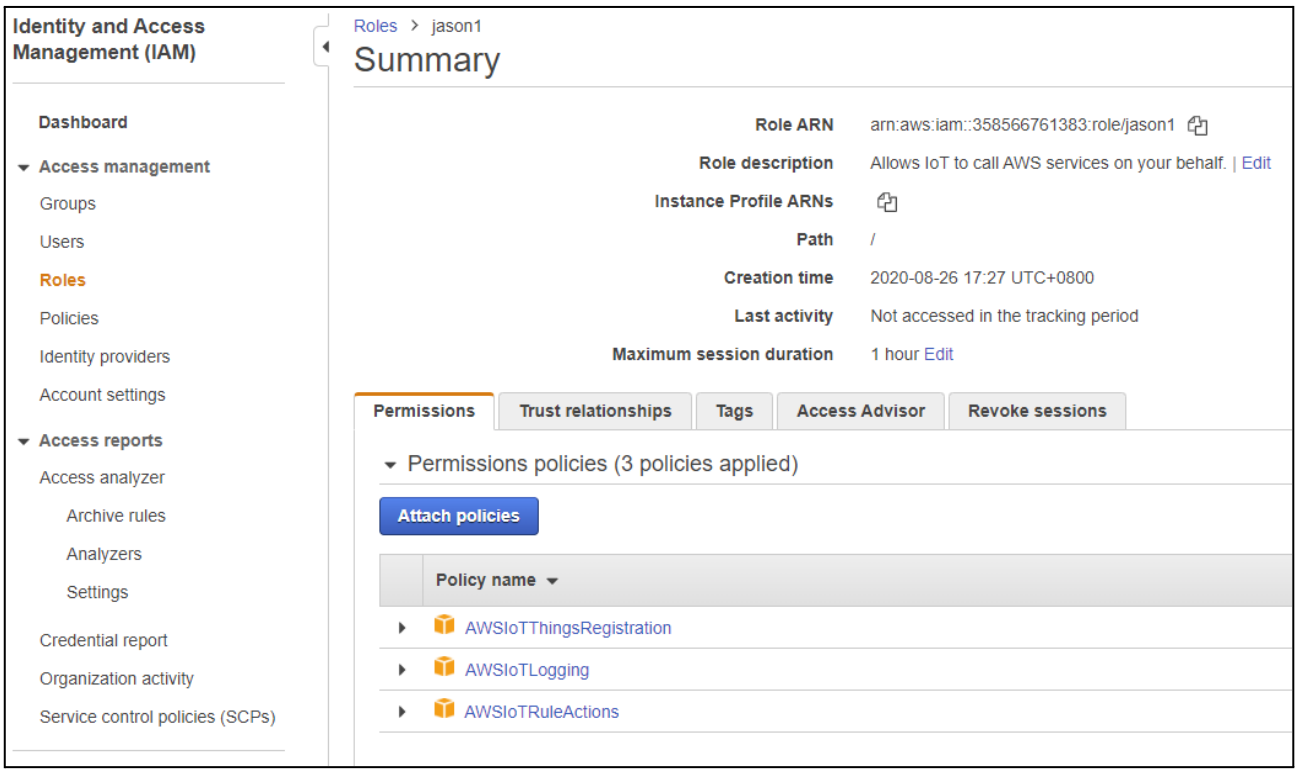


9. Enter a role name and description, and then choose **Create role**.

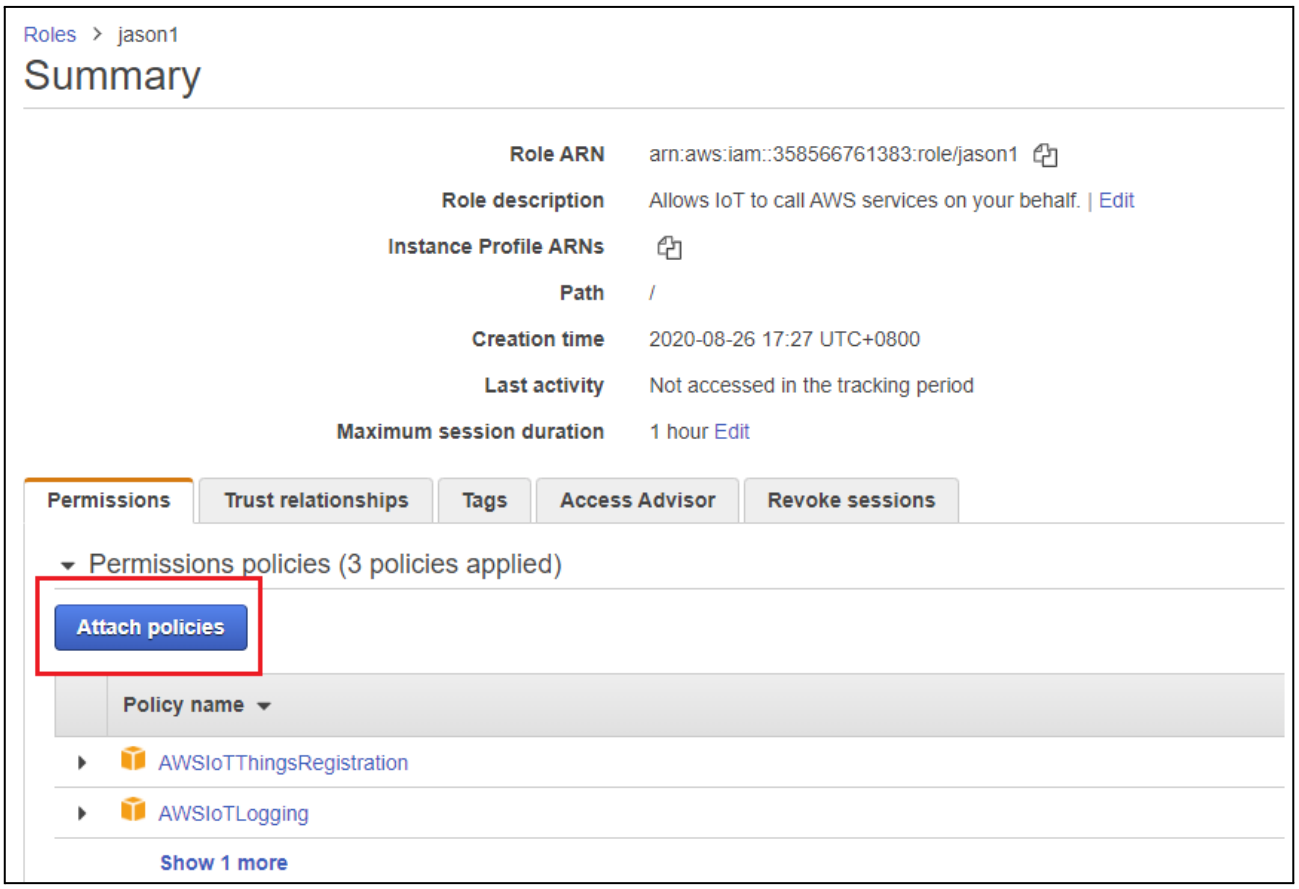


5To add OTA update permissions to your OTA service role

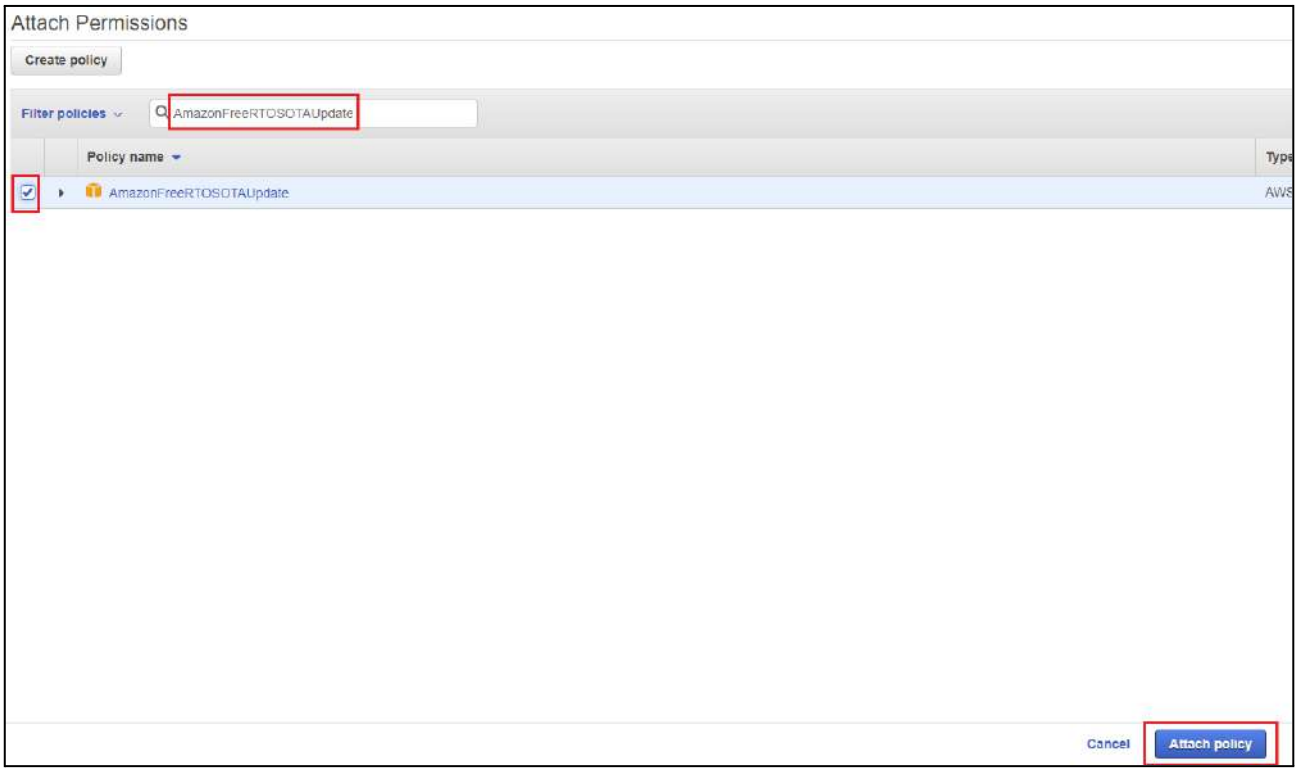
1. In the search box on the IAM console page, enter the name of your role, and then choose it from the list.



2. Choose **Attach policies**.

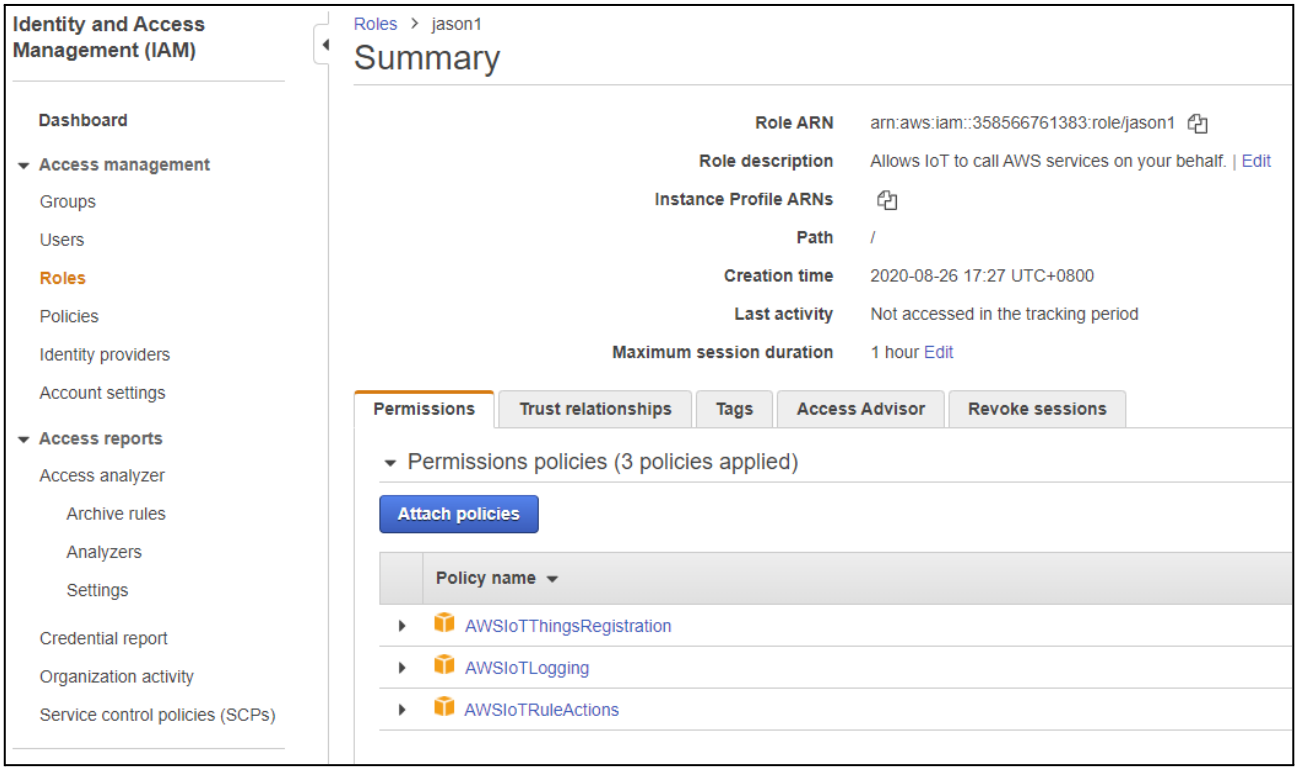


3. In the **Search** box, enter "AmazonFreeRTOSOTAUpdate", select **AmazonFreeRTOSOTAUpdate** from the list of filtered policies, and then choose **Attach policy** to attach the policy to your service role.

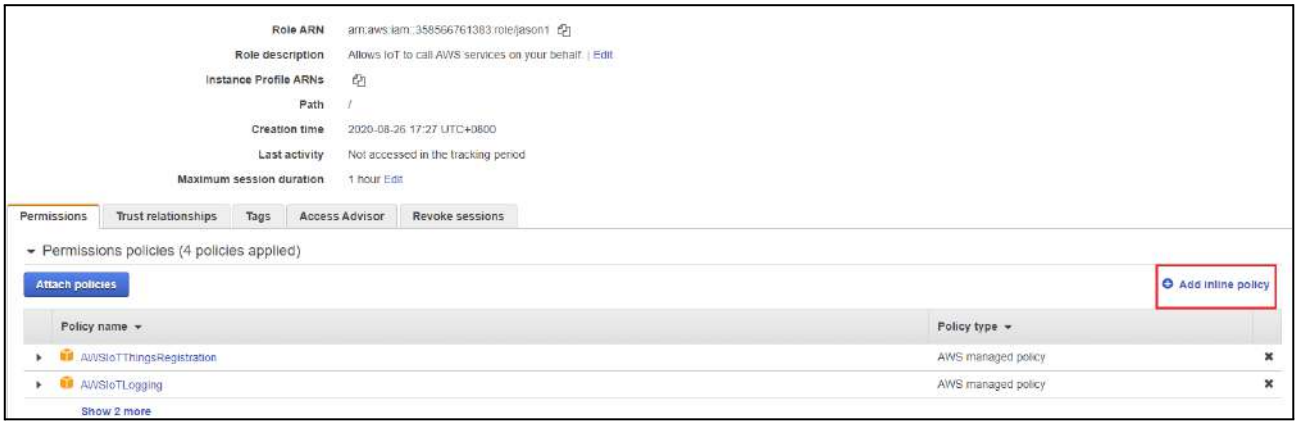


To add the required IAM permissions to your OTA service role

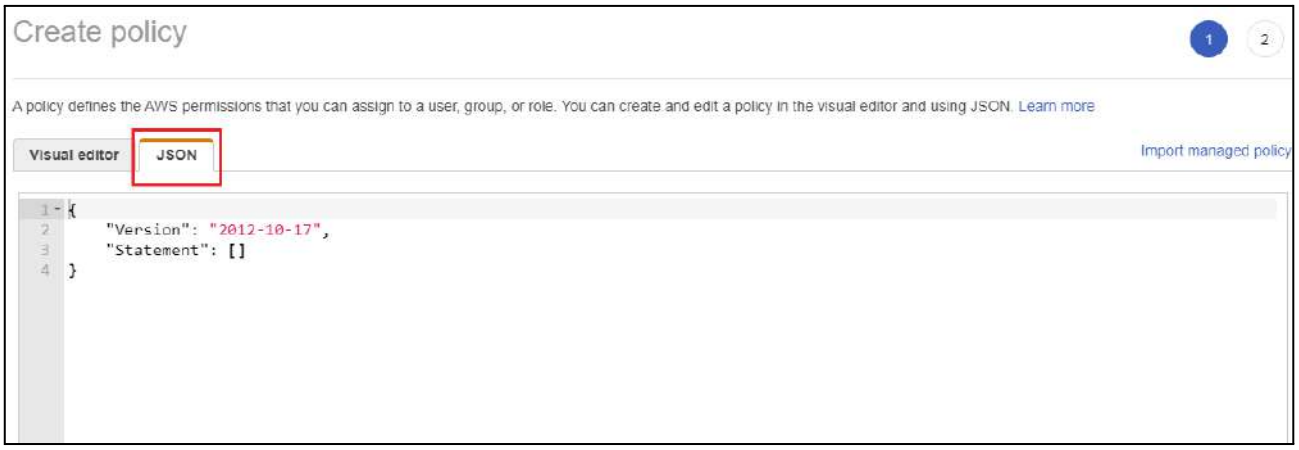
1. In the search box on the IAM console page, enter the name of your role, and then choose it from the list.



2. Choose **Add inline policy**.



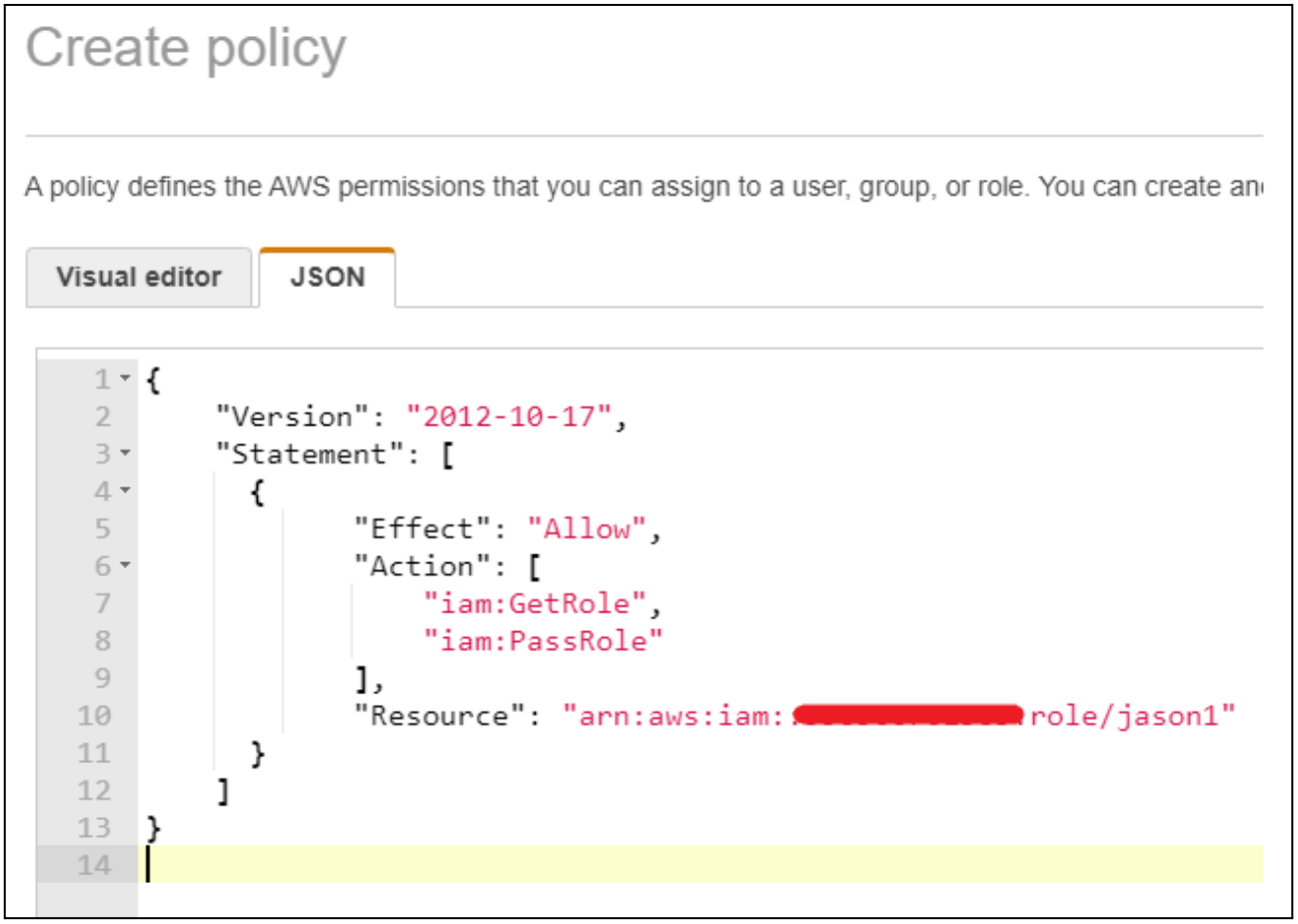
3. Choose the **JSON** tab.



4. Copy and paste the following policy document into the text box:

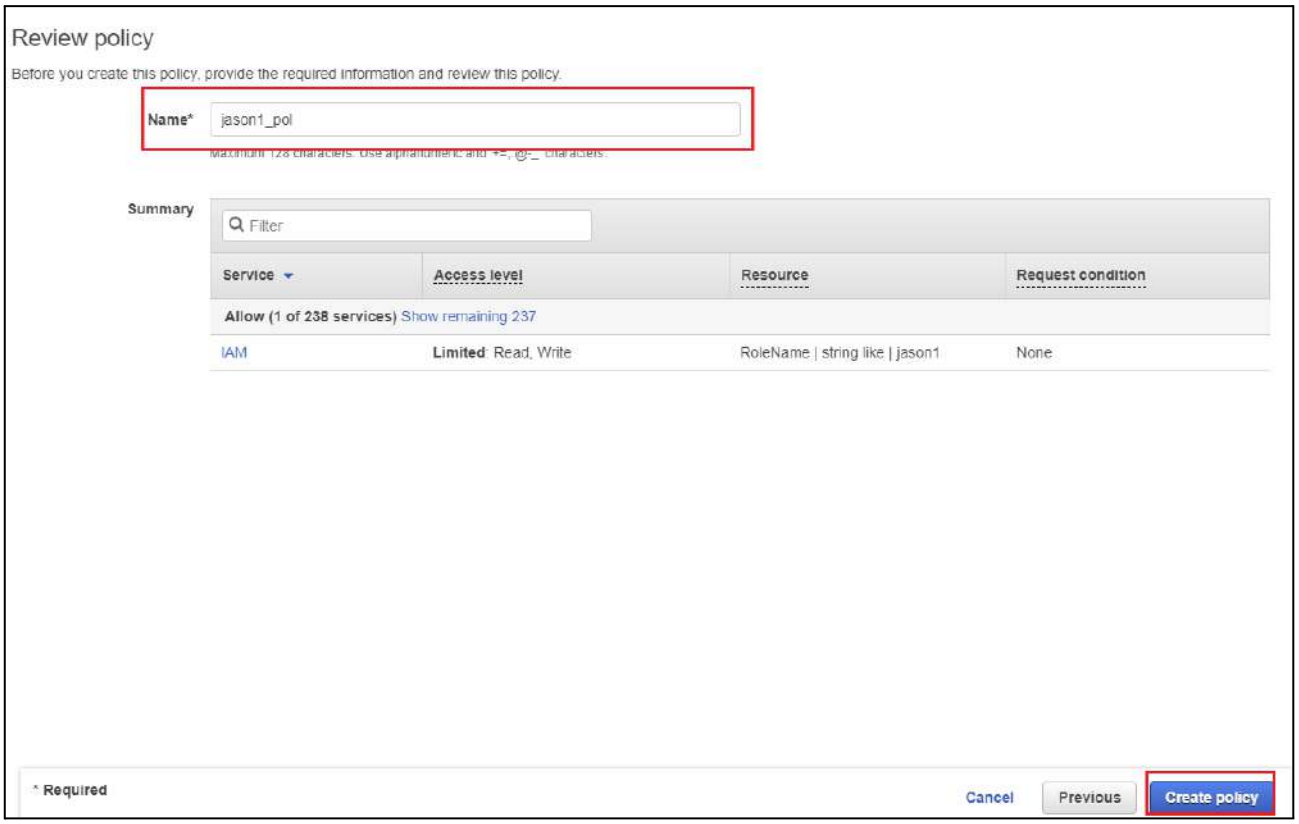
```
{
    "Version": "2012-10-17",
    "Statement": [
      {
            "Effect": "Allow",
            "Action": [
                "iam:GetRole",
                "iam:PassRole"
            ],
            "Resource": "arn:aws:iam::your_account_id:role/your_role_name"
      }
    ]
}
```

Make sure that you replace `your_account_id` with your AWS account ID, and `your_role_name` with the name of the OTA service role.



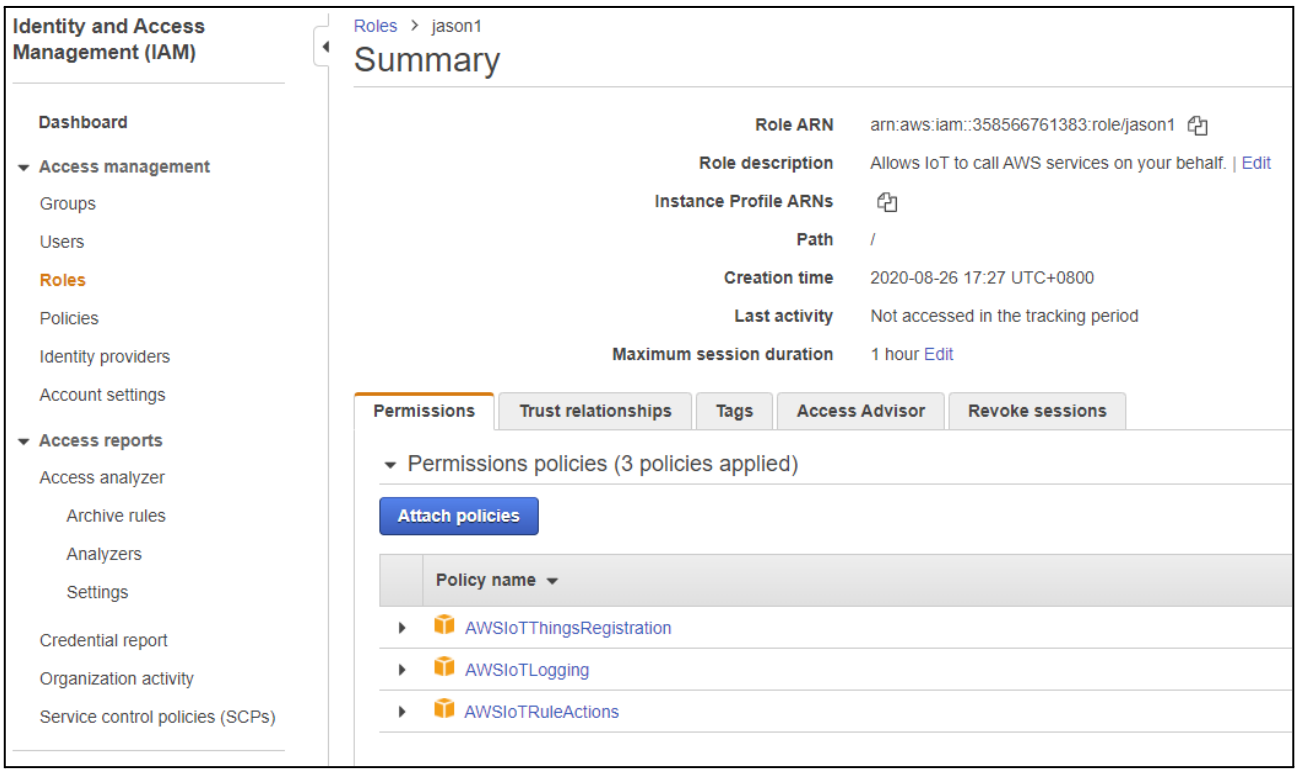
5. Choose **Review policy**.

6. Enter a name for the policy, and then choose **Create policy**.

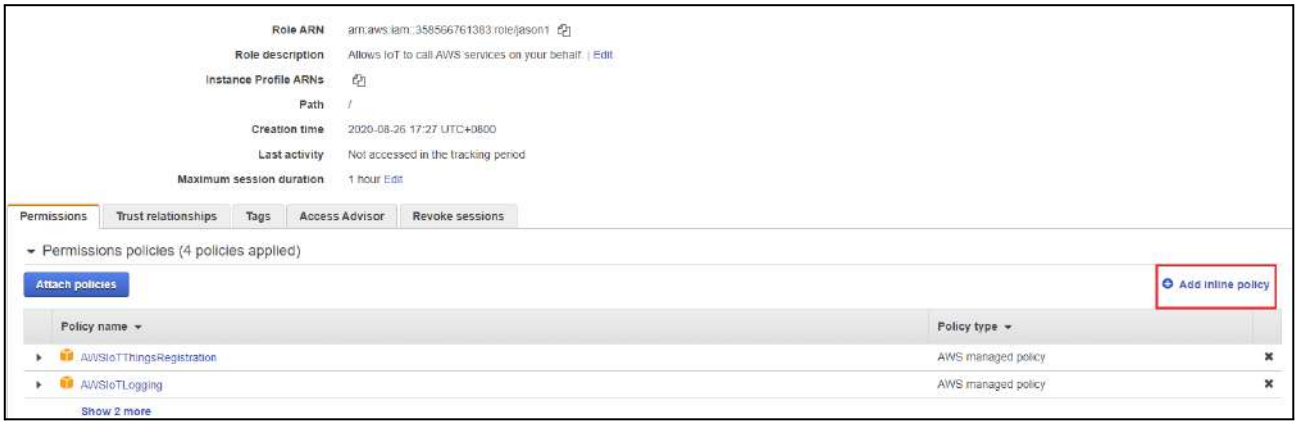


To add the required Amazon S3 permissions to your OTA service role

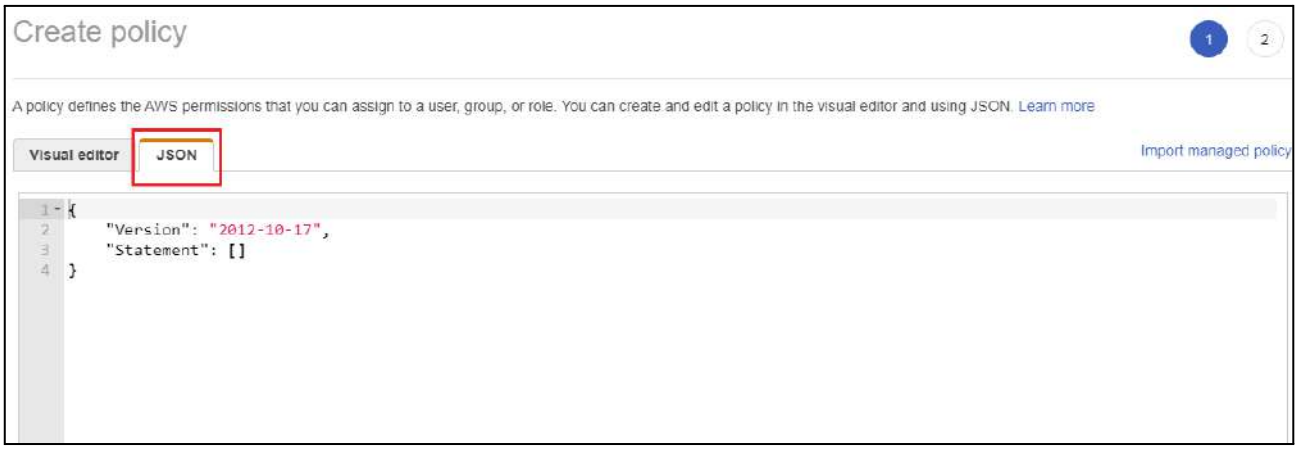
1. In the search box on the IAM console page, enter the name of your role, and then choose it from the list.



2. Choose **Add inline policy**.



3. Choose the **JSON** tab.



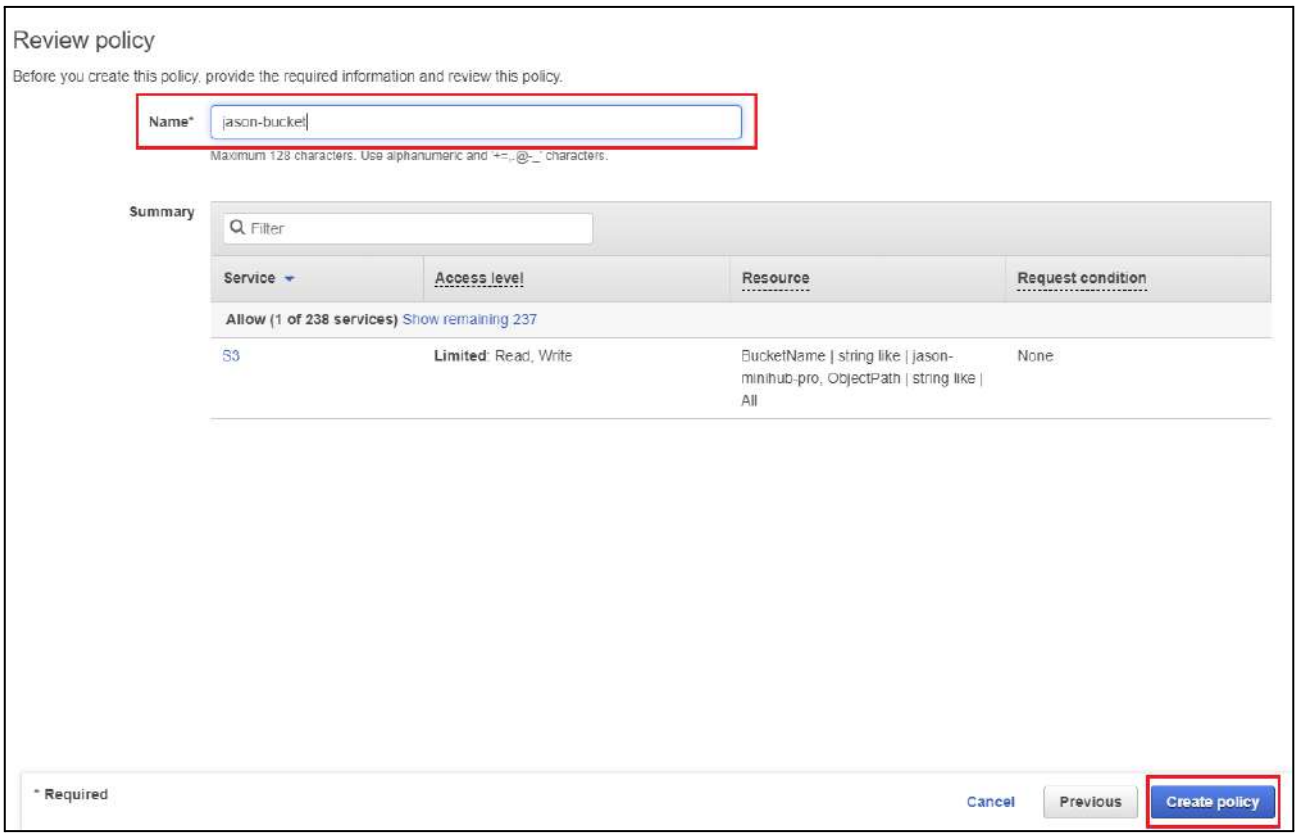
4. Copy and paste the following policy document into the box.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "s3:GetObjectVersion",
                "s3:GetObject",
                "s3:PutObject"
            ],
            "Resource": [
                "arn:aws:s3:::example-bucket/*"
            ]
        }
    ]
}
```

This policy grants your OTA service role permission to read Amazon S3 objects. Make sure that you replace example-bucket with the name of your bucket.

5. Choose **Review policy**.

6. Enter a name for the policy, and then choose **Create policy**.



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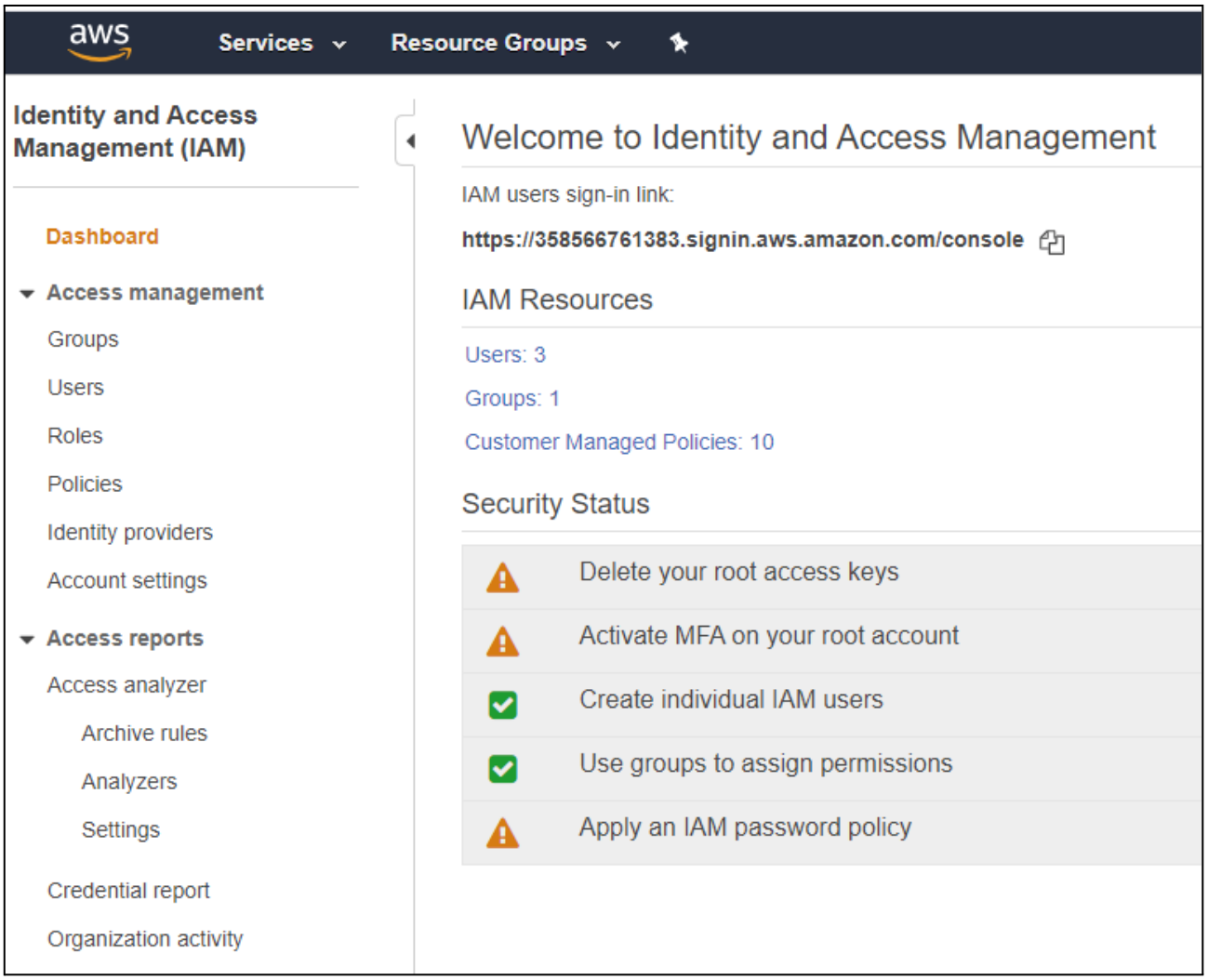
Create an OTA user policy

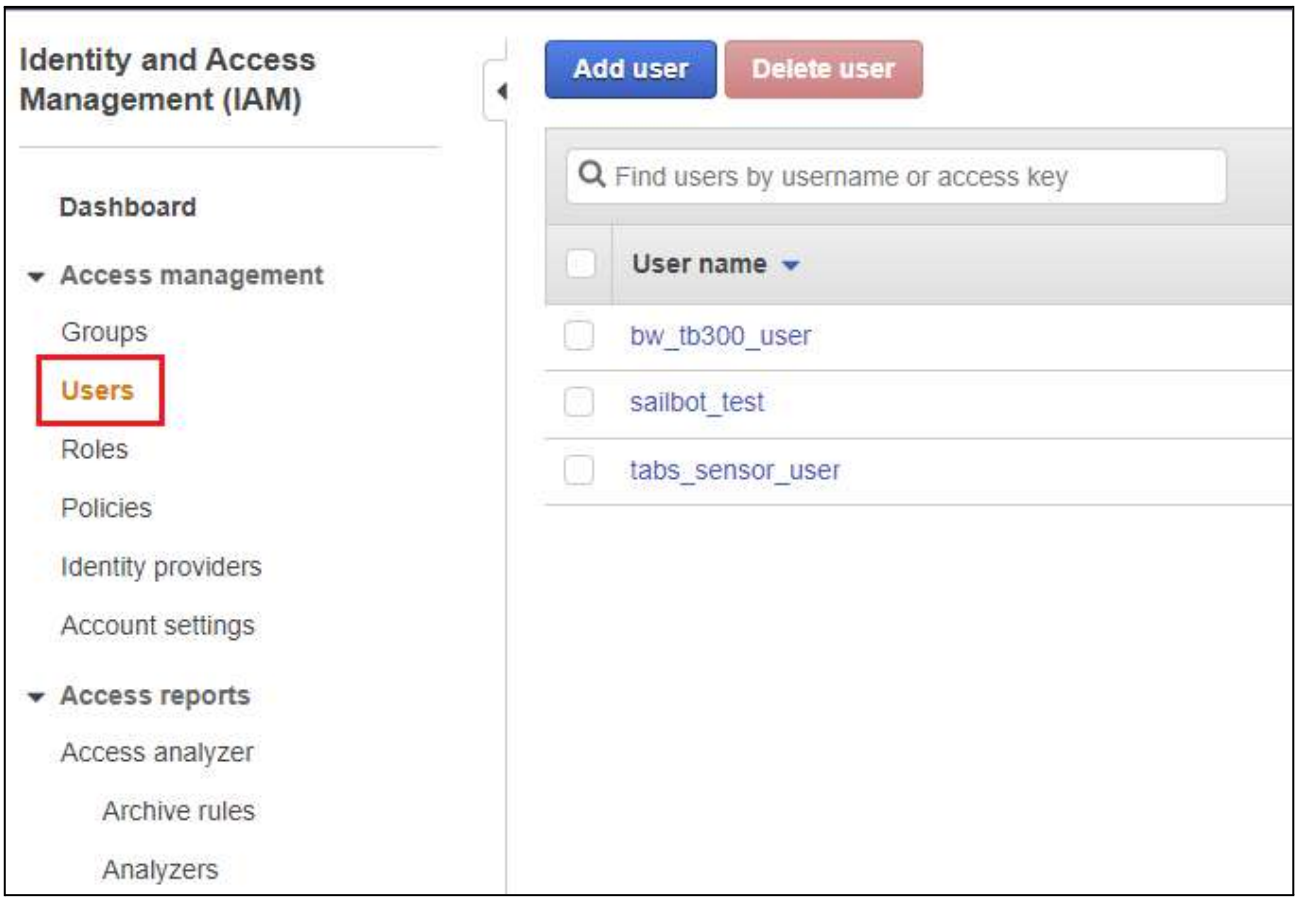
*If you use the "Administrator" user, you can skip this step.

To create an OTA user policy

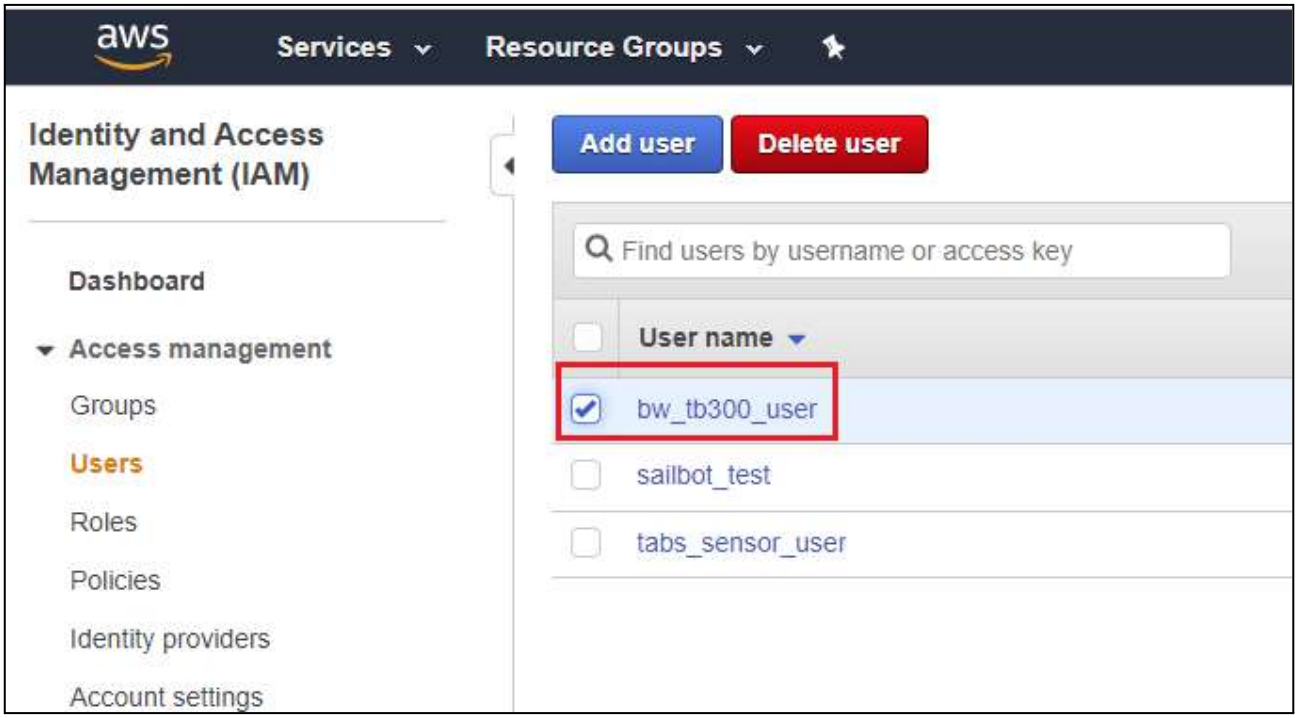
1. Open the https://console.aws.amazon.com/iam/ console.



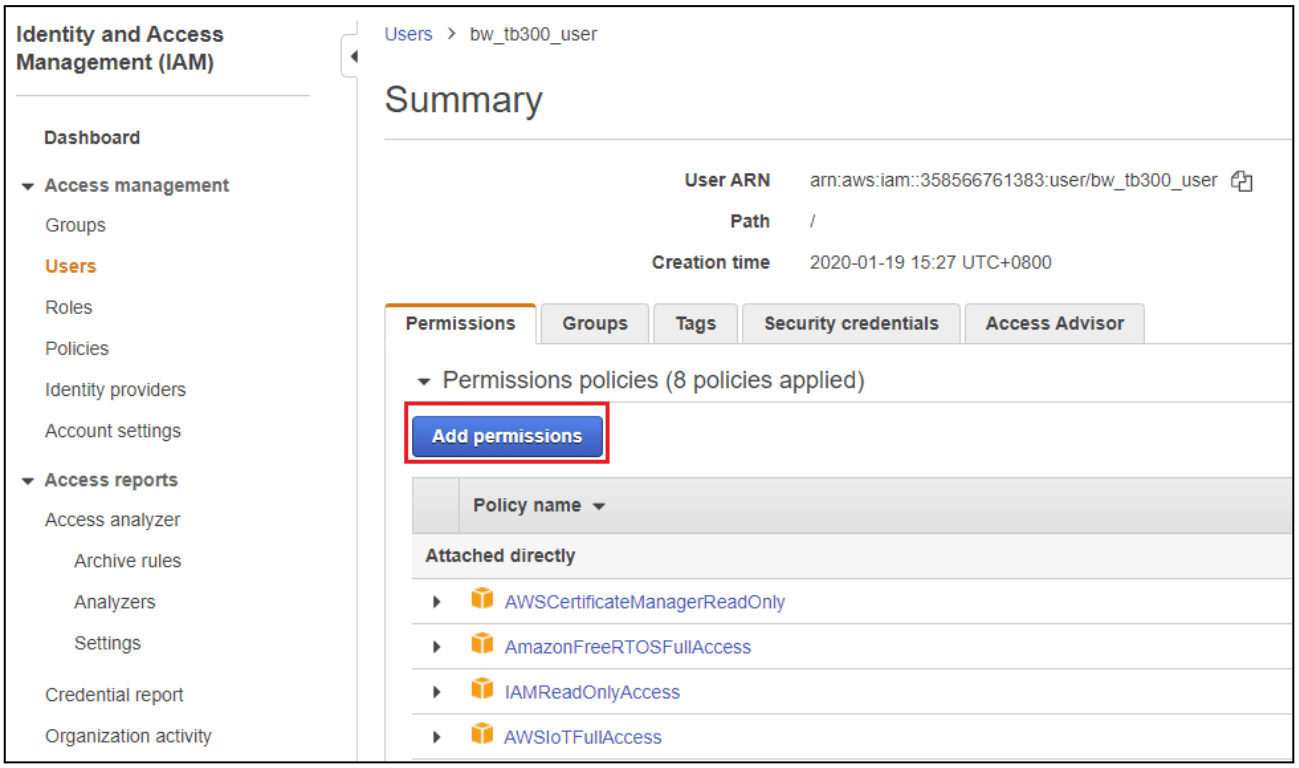
2. In the navigation pane, choose **Users**.



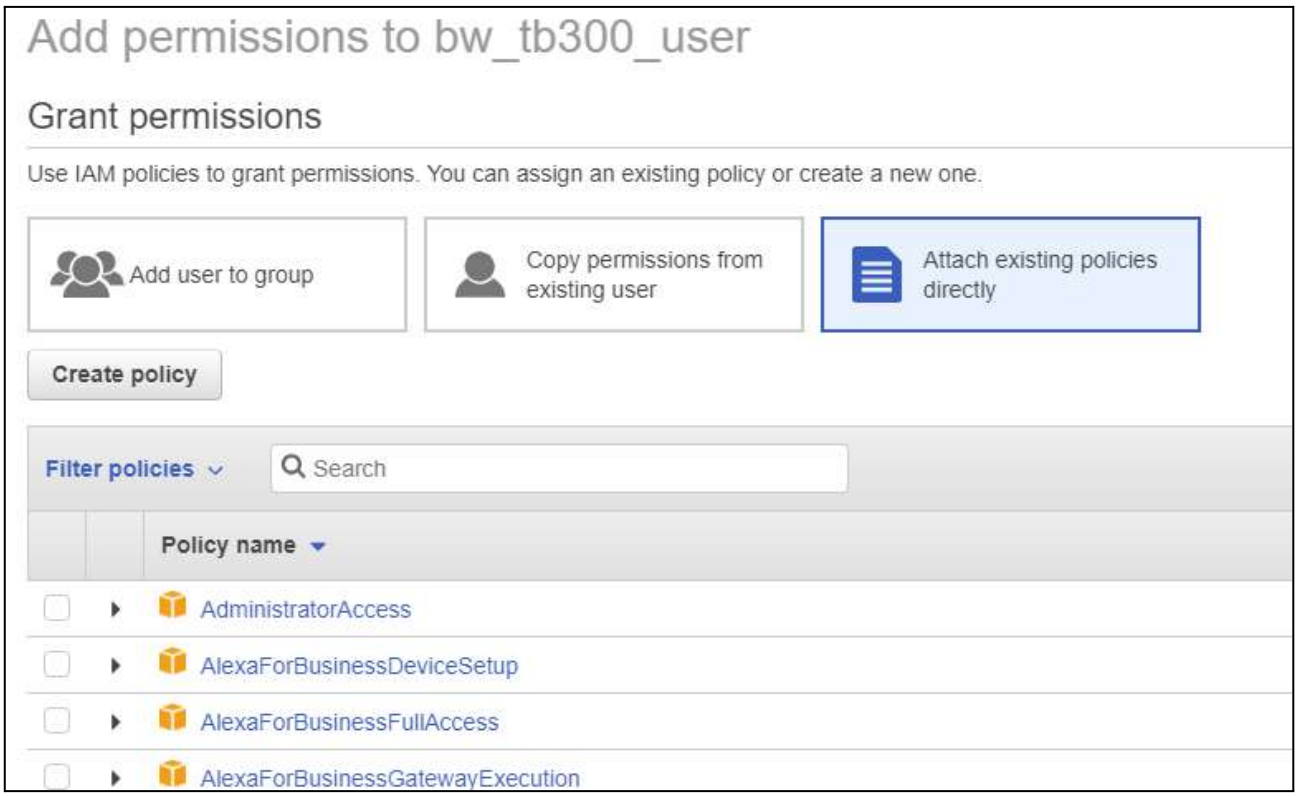
3. Choose your IAM user from the list.



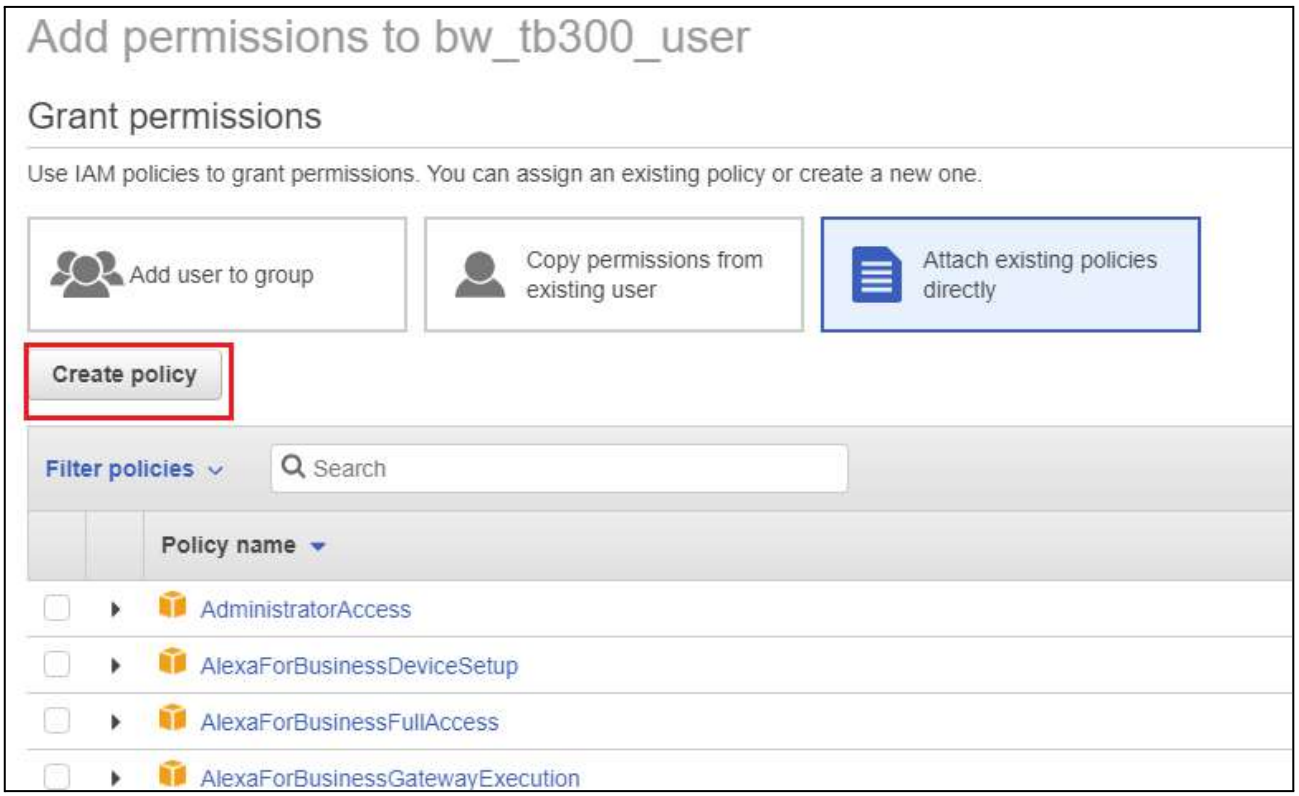
4. Choose **Add permissions**.



5. Choose **Attach existing policies directly**.



6. Choose **Create policy**.



7. Choose the **JSON** tab, and copy and paste the following policy document into the policy editor:

```
{
    "Version":"2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "s3:ListBucket",
                "s3:ListAllMyBuckets",
                "s3:CreateBucket",
                "s3:PutBucketVersioning",
                "s3:GetBucketLocation",
                "s3:GetObjectVersion",
                "acm:ImportCertificate",
                "acm:ListCertificates",
                "iot:*",
                "iam:ListRoles",
                "freertos:ListHardwarePlatforms",
                "freertos:DescribeHardwarePlatform"
```

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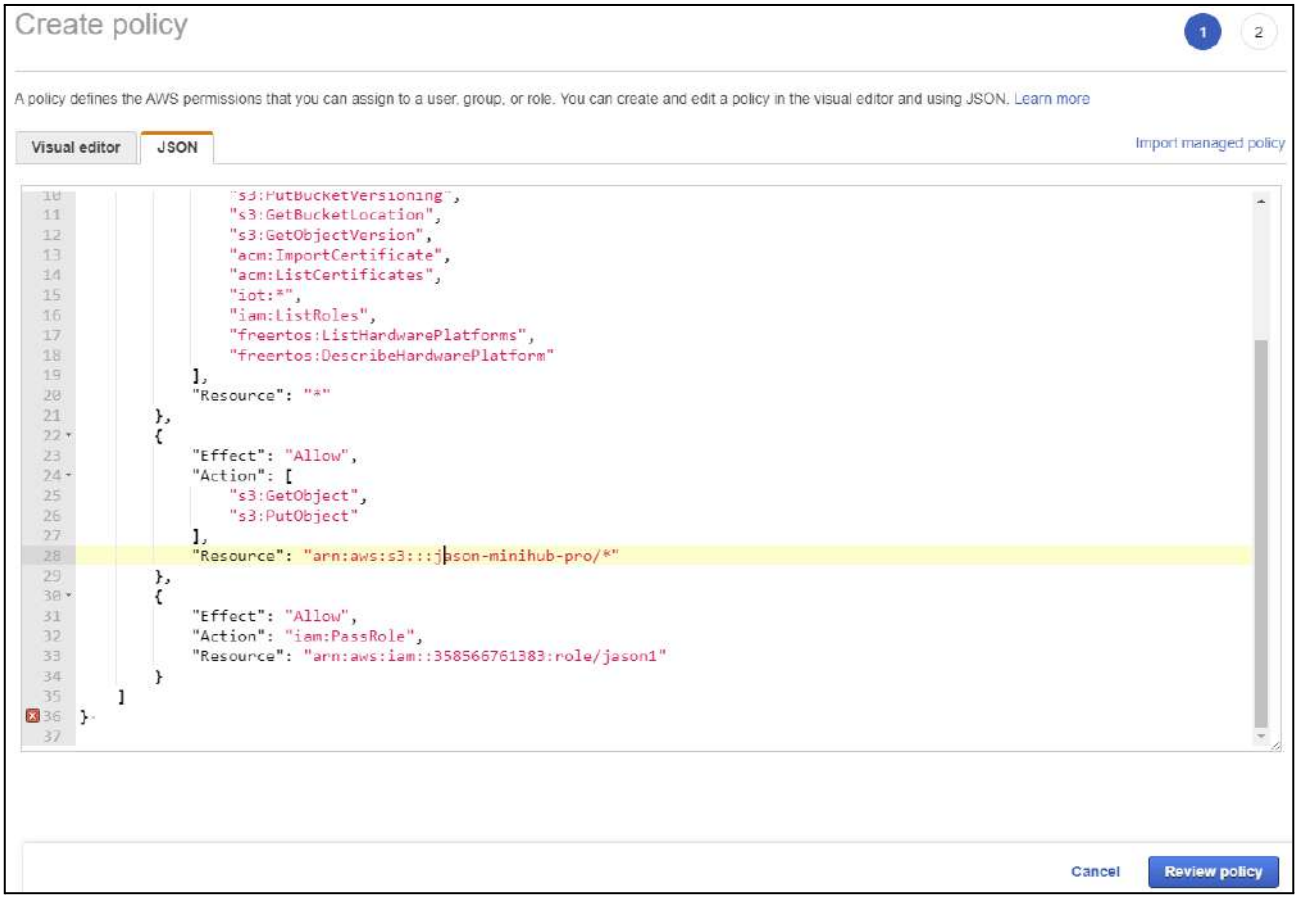
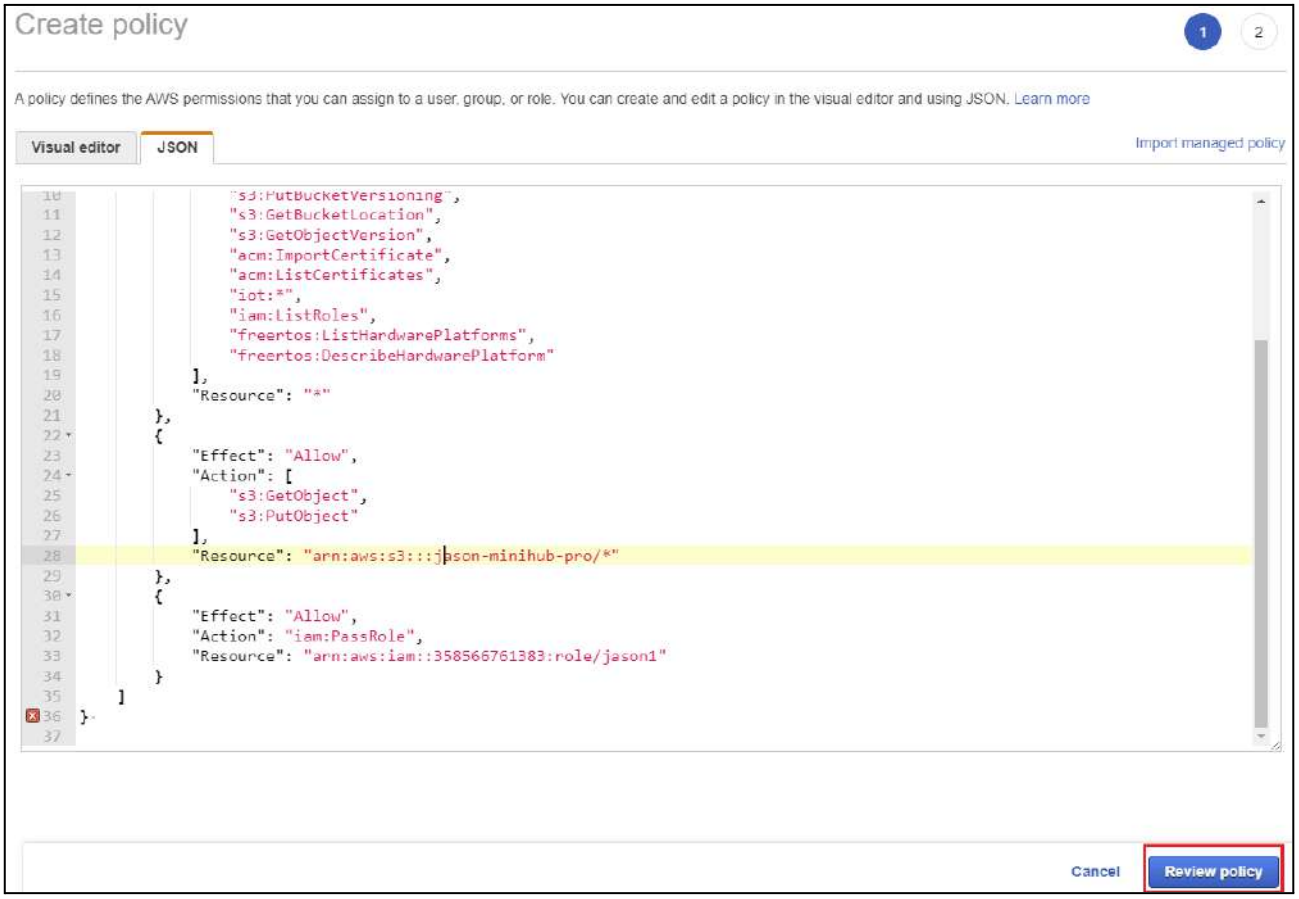
```
            ],
            "Resource": "*"
        },
        {
            "Effect": "Allow",
            "Action": [
                "s3:GetObject",
                "s3:PutObject"
            ],
            "Resource": "arn:aws:s3:::example-bucket/*"
        },
        {
            "Effect": "Allow",
            "Action": "iam:PassRole",
            "Resource": "arn:aws:iam::your-account-id:role/role-name"
        }
    ]
}
```

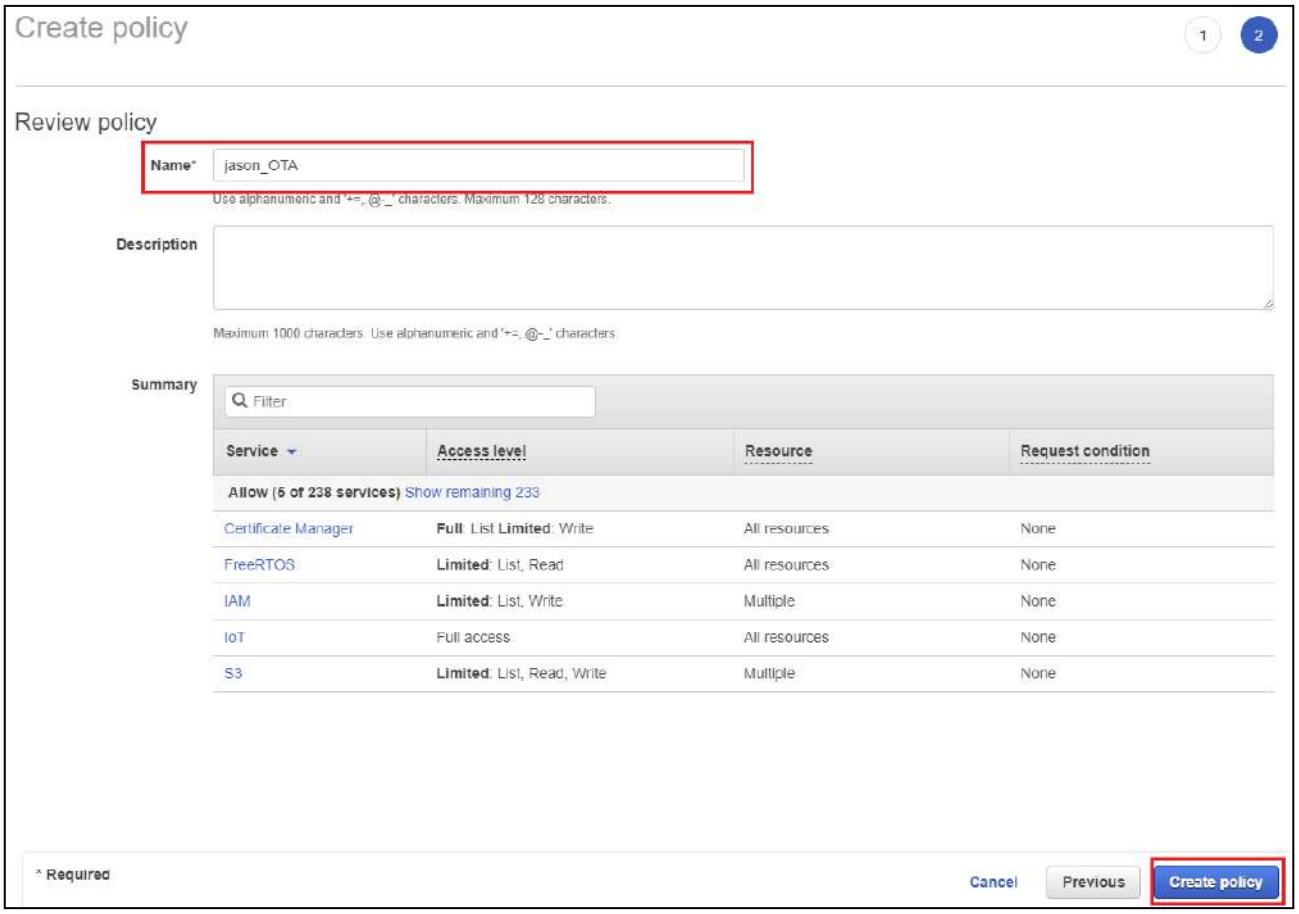
Replace `example-bucket` with the name of the Amazon S3 bucket where your OTA update firmware image is stored. Replace `your-account-id` with your AWS account ID. You can find your AWS account ID in the upper right of the console. When you enter your account ID, remove any dashes (-). Replace `role-name` with the name of the IAM service role you just created.



8. Choose **Review policy**.



9. Enter a name for your new OTA user policy, and then choose **Create policy**.



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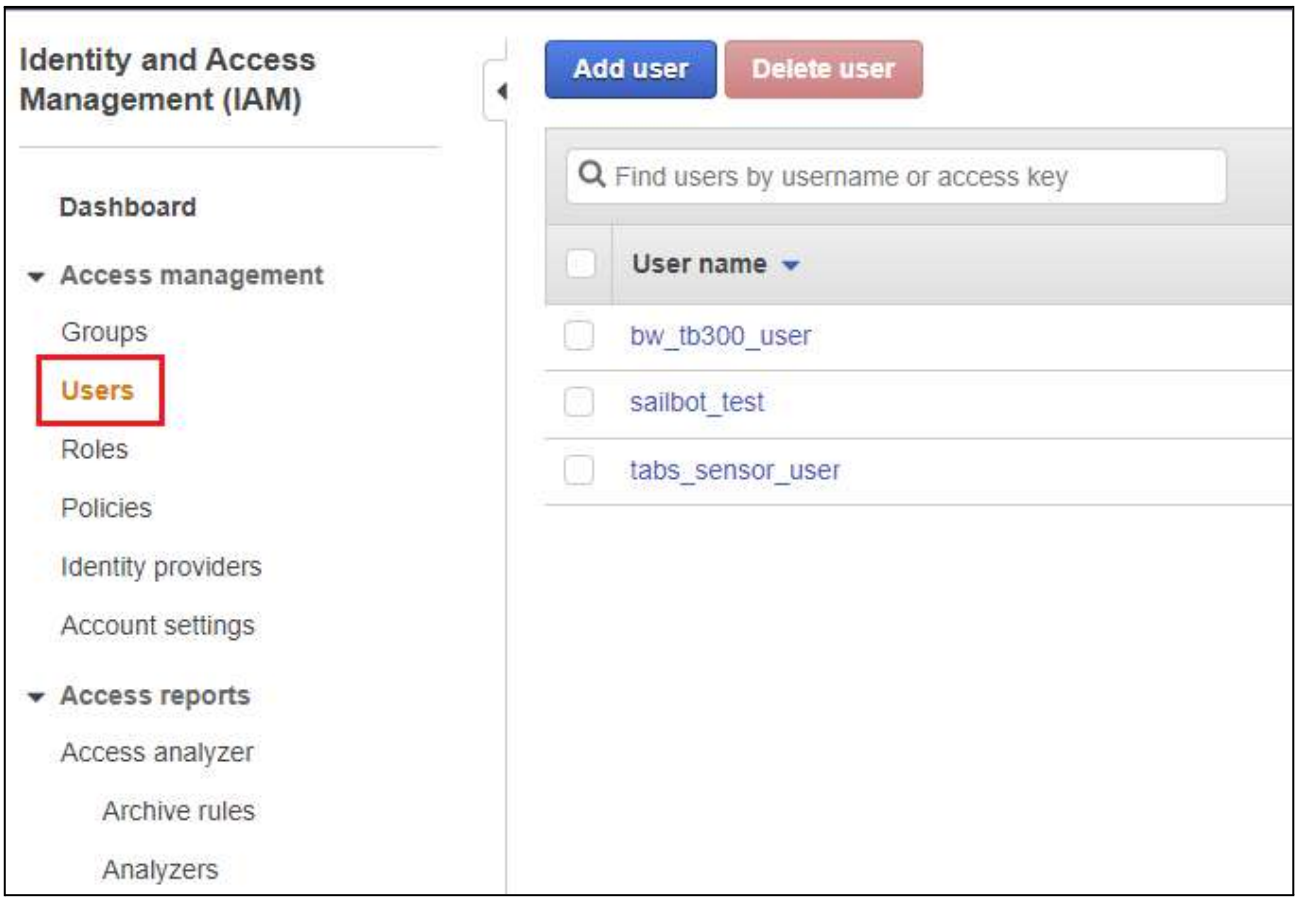
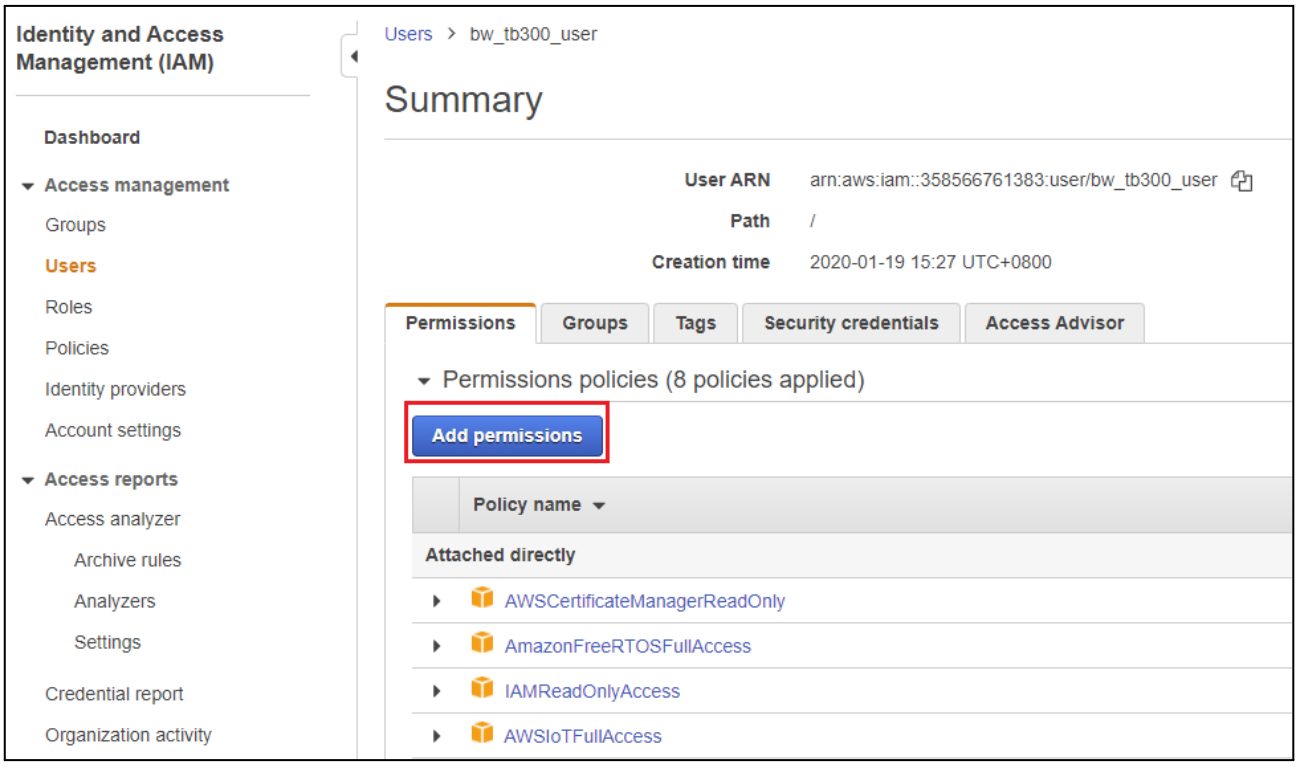
To attach the OTA user policy to your IAM user

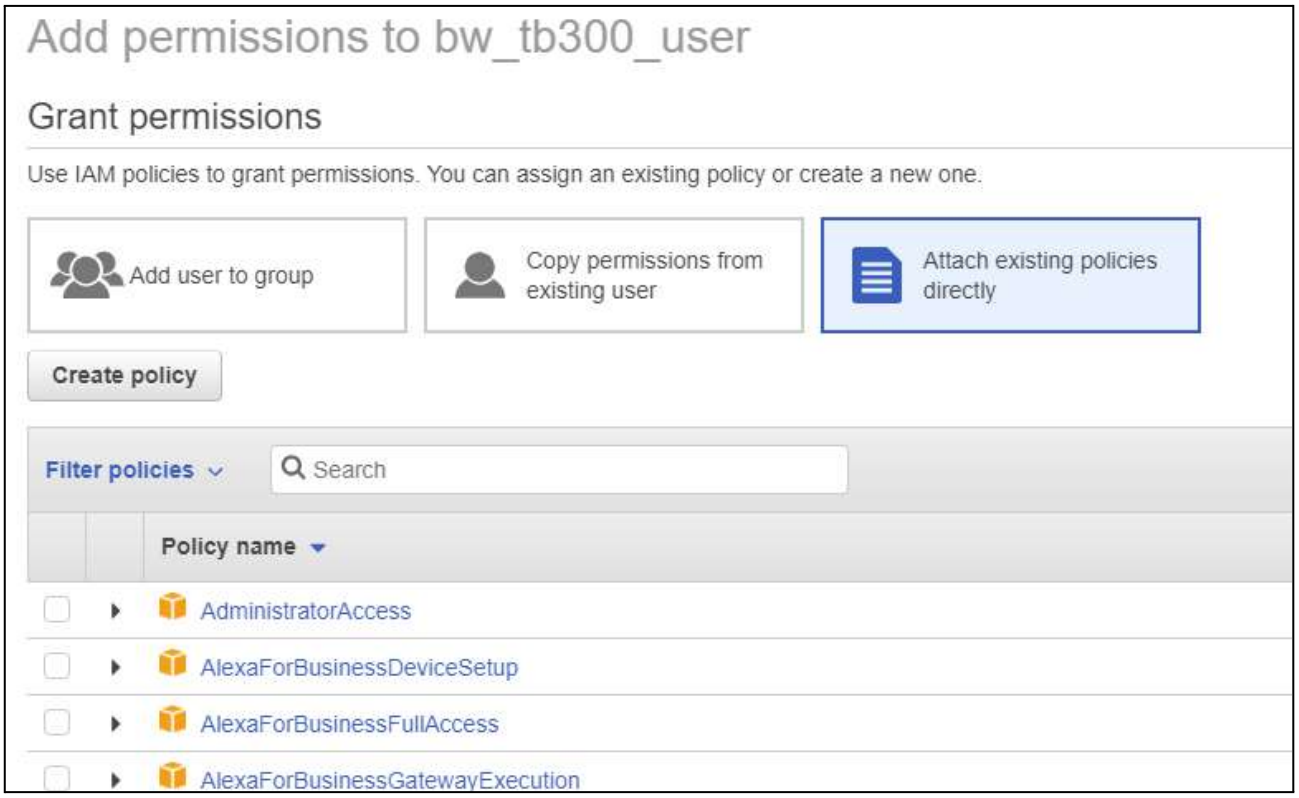
1. In the IAM console, in the navigation pane, choose **Users**, and then choose your user.



2. Choose **Add permissions**.



3. Choose **Attach existing policies directly**.



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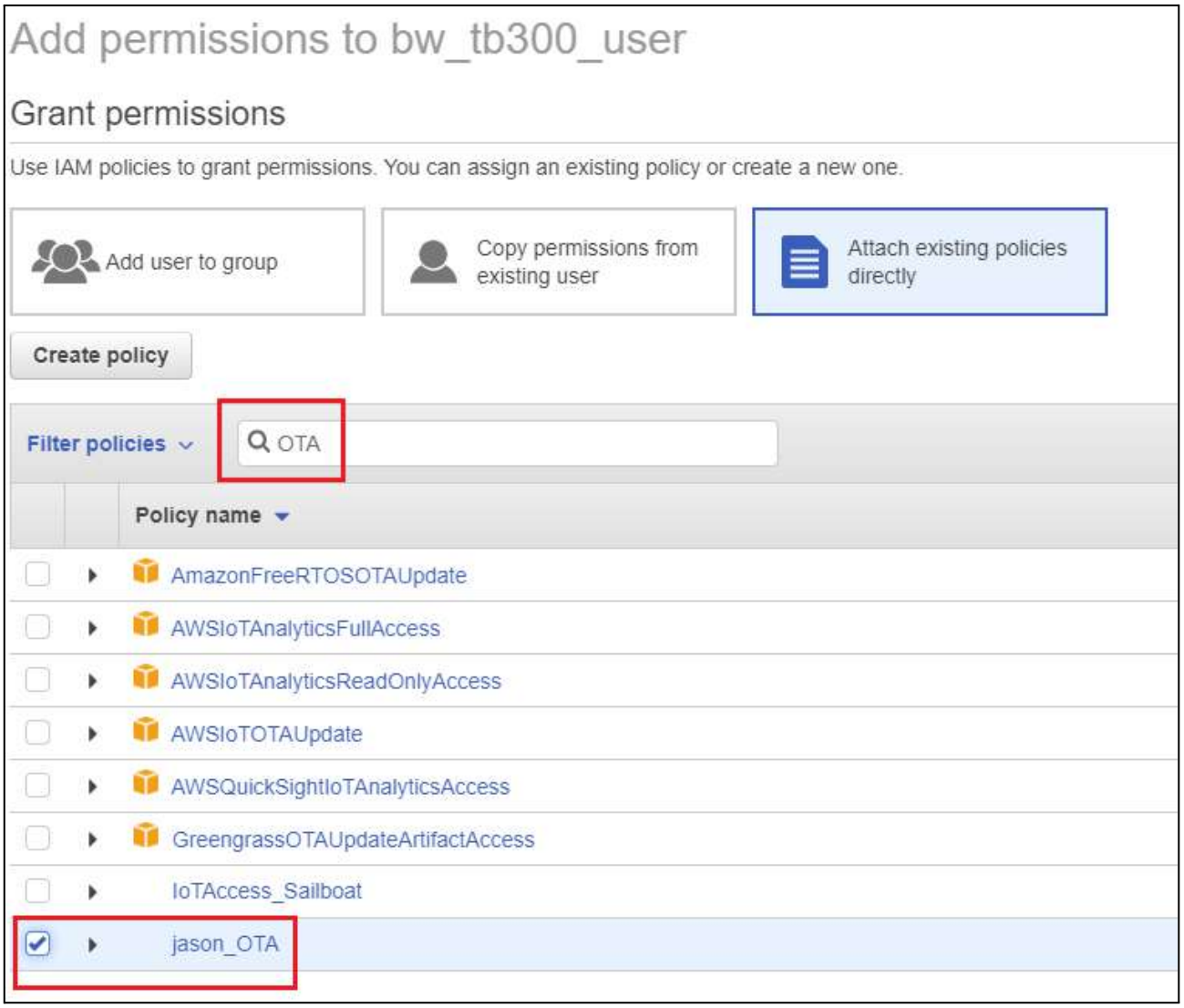
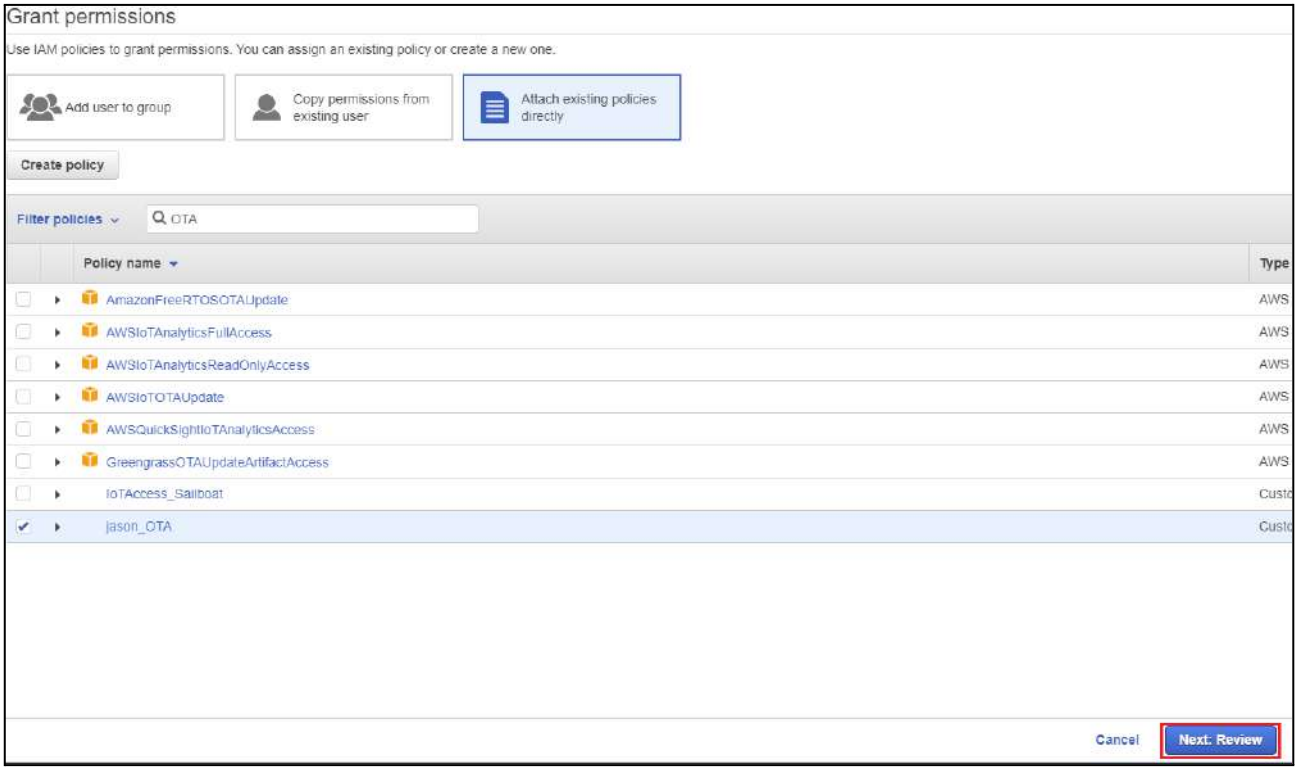
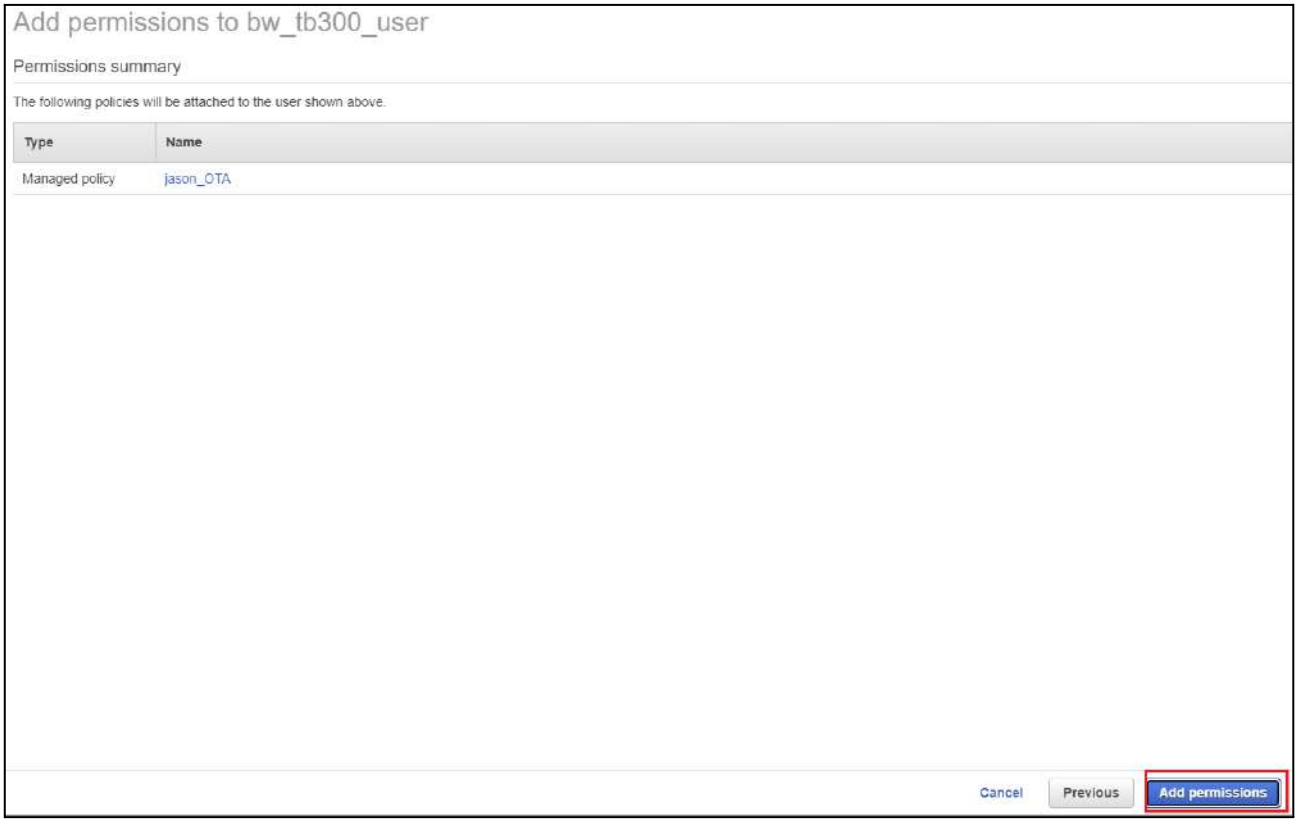
4. Search for the OTA user policy you just created and select the check box next to it.



5. Choose **Next: Review**.



6. Choose **Add permissions**.



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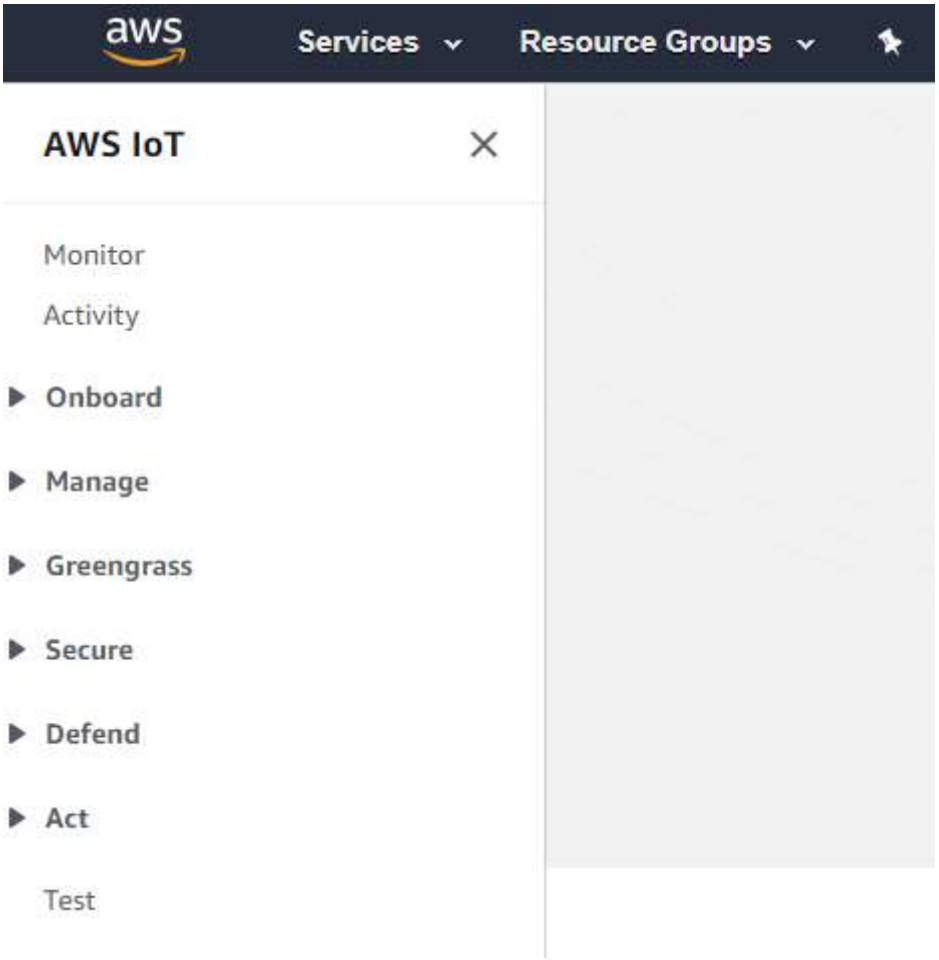
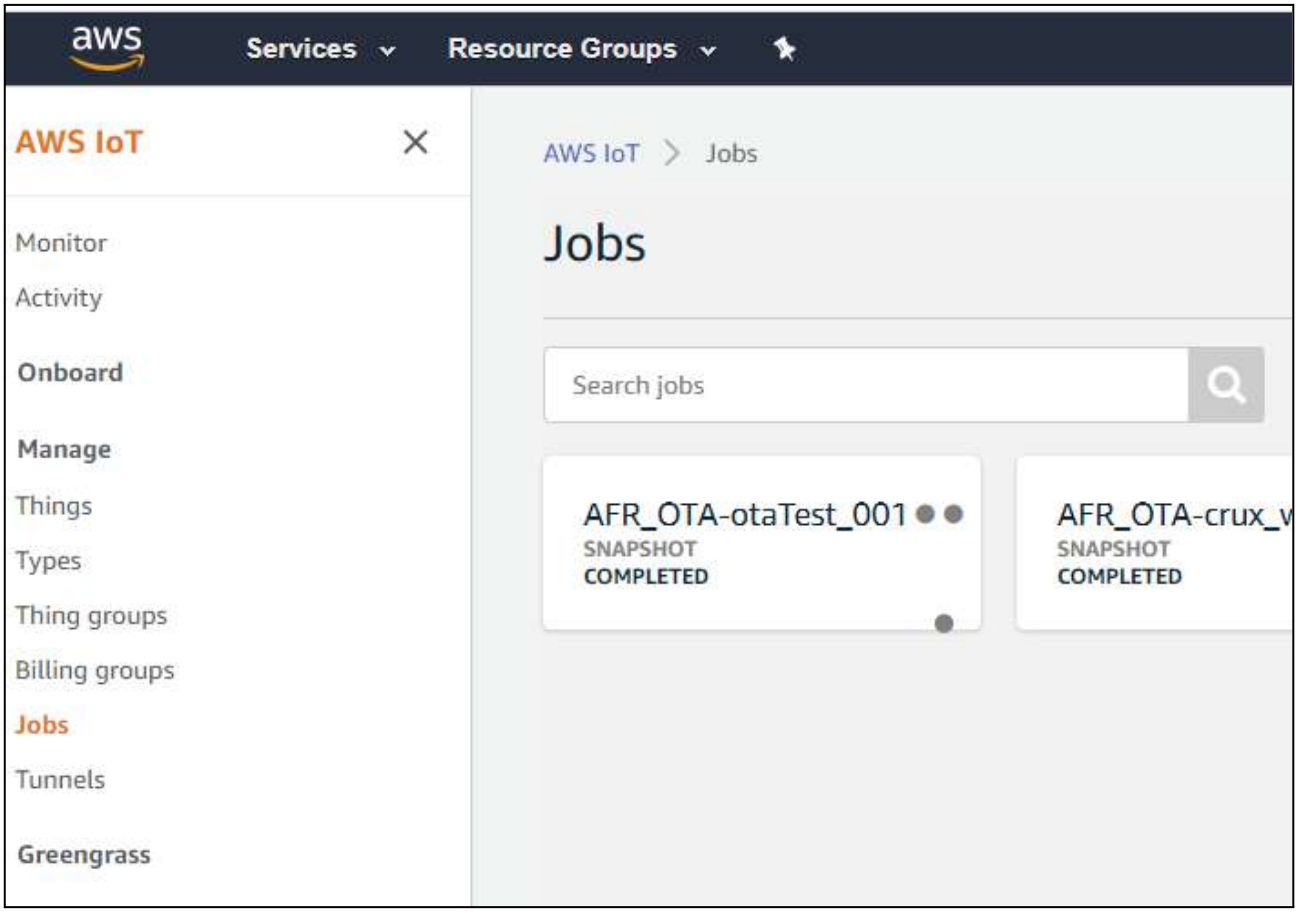
Create a FreeRTOS OTA update job

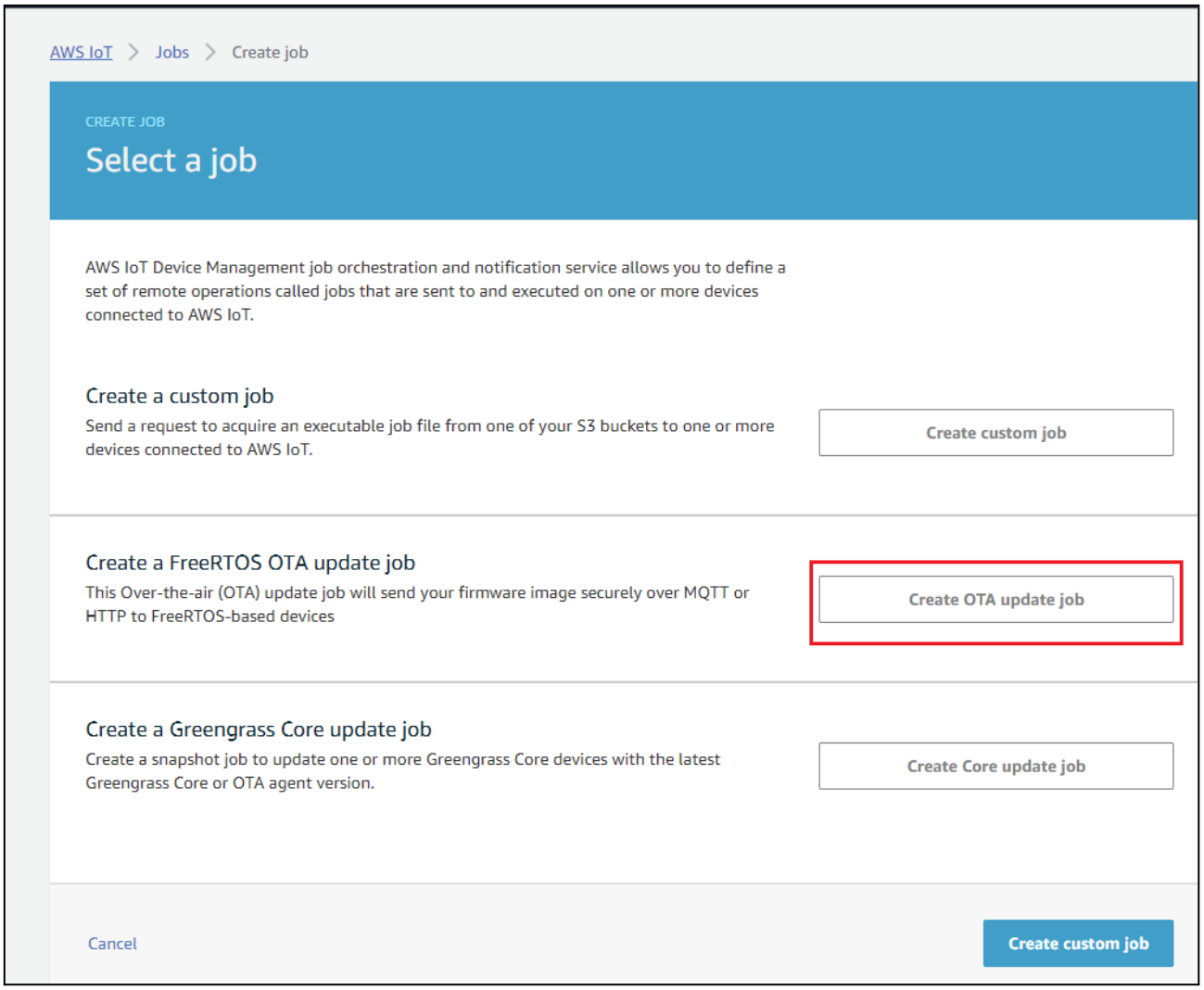
1. Go to "IoT Core" service.



2. Go to "Manage Jobs" and click the "Create" button.



3. Select "Create OTA update job"

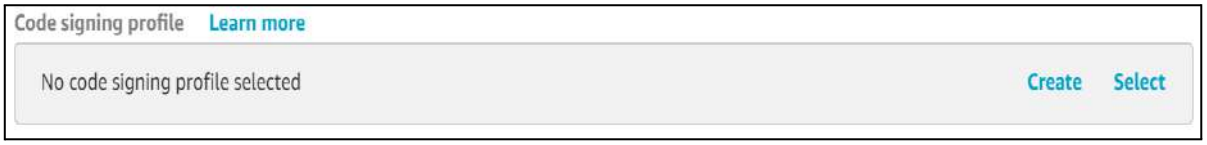


4. Select the things name which configured to MiniHub Pro. And click "Next".

5. Select the "MQTT" protocol

6. Select the "Sign a new firmware image for me."

7. Create a new Code signing profile



- Click "Create"
- Input the "Profile name"
- Select hardware platform: **ESP-WROVER-KIT**
- Import the "Certificate"

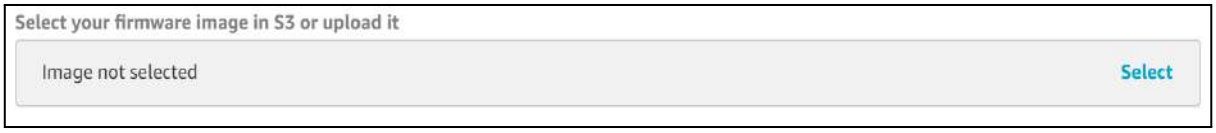
Certificate:
https://drive.google.com/file/d/1SFUXl1uqm3OWOhDs5TyDo62jlqlksmGO/view?usp=sharing

Certificate private key:
https://drive.google.com/file/d/1EavG36gmL3cdkQxqTrTZIWTjDPm4Mmz4/view?usp=sharing

- Input the Pathname of code signing certificate on device: P11_CSK
- Click "Create"

*Next time you can select this profile directly.

8. Upload the firmware



- Click "Select"
- Choose the bucket which store the firmware image.
- Click "Upload an image" Upload the image file: aws_demos.bin

Input the pathname of firmware image on the device: P11_CSK

Select "IAM role for OTA update job" (Created at step.2)

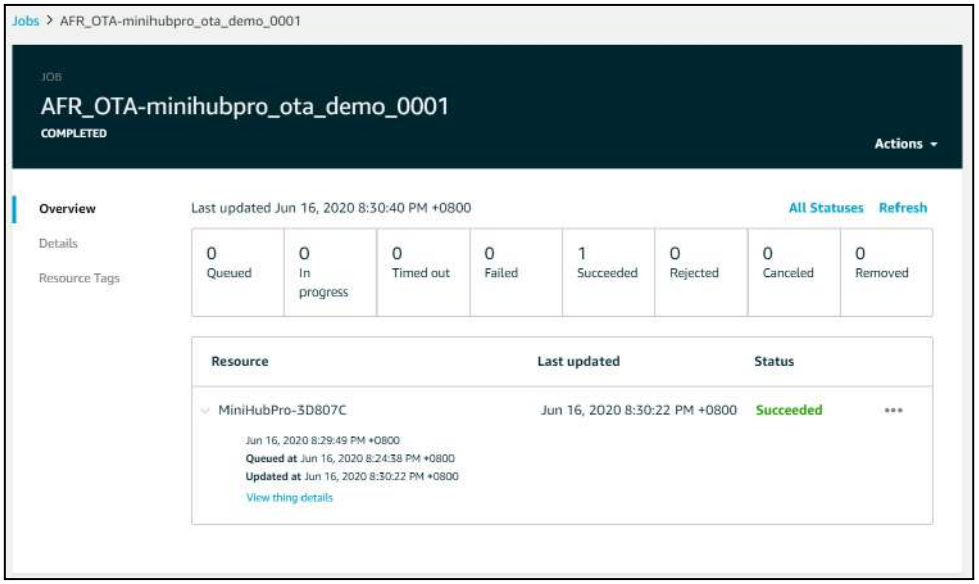
Input the OTA job unique ID and click the "Create" button.

You can find the successfully created job message.

The OTA job status is "Queued"

Now please power on the MiniHub Pro. To trigger the OTA job process.

Go to AWS IoT to check the status. The status is "Succeeded"



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❊Note:

OTA polling feature will be supported from the firmware `AWS APP Version 0.9.20` or latest so MiniHub Pro doesn't need power on again to trigger the OTA job process.