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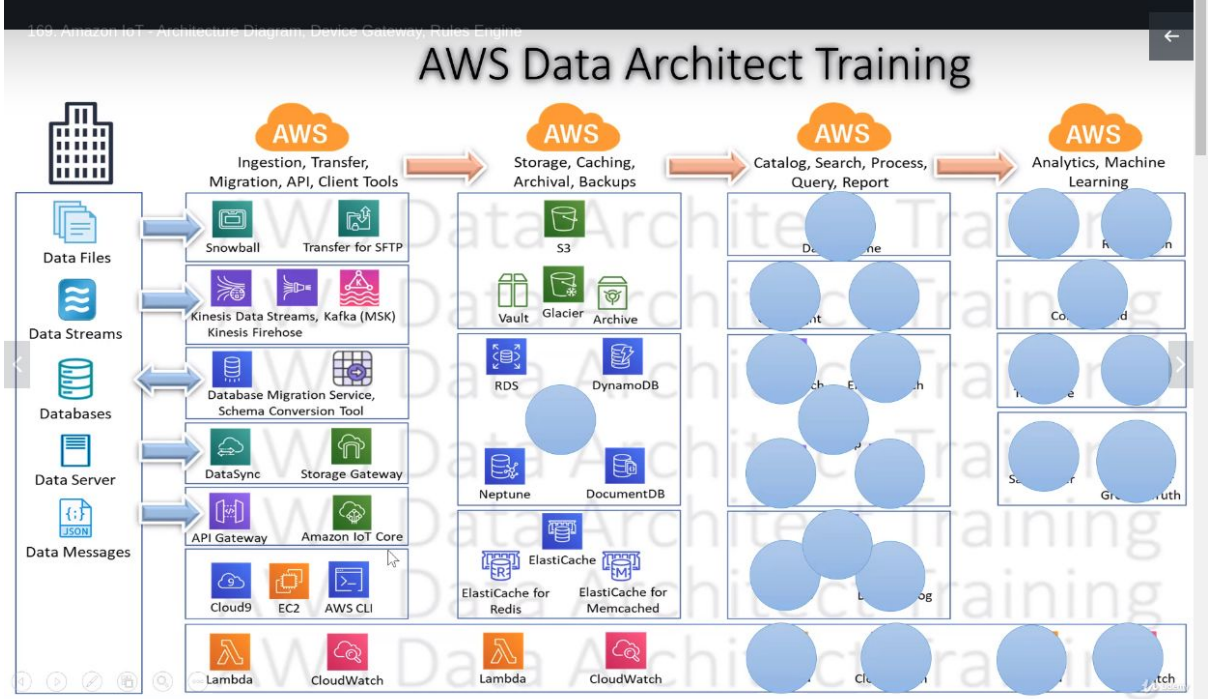

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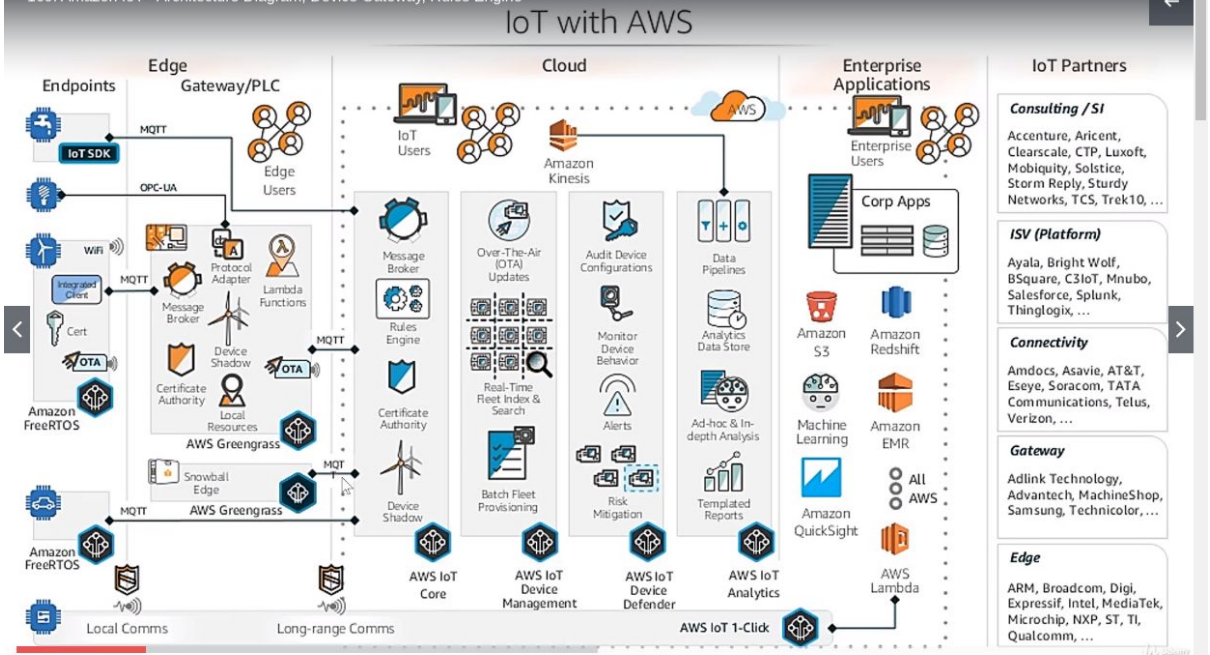

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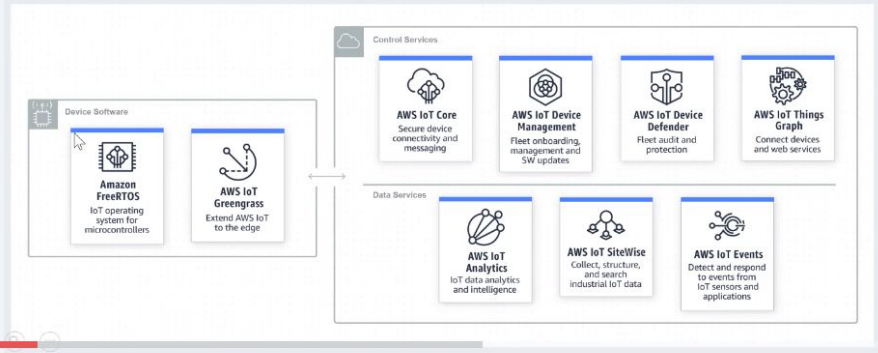
What We Offer

AWS IoT provides device software, control services, and data services. Device software enables you to securely connect devices, gather data, and take intelligent actions locally, even when Internet connectivity is not available. Control services allow you to control, manage, and secure large and diverse device fleets. Data services help you extract value from IoT data.



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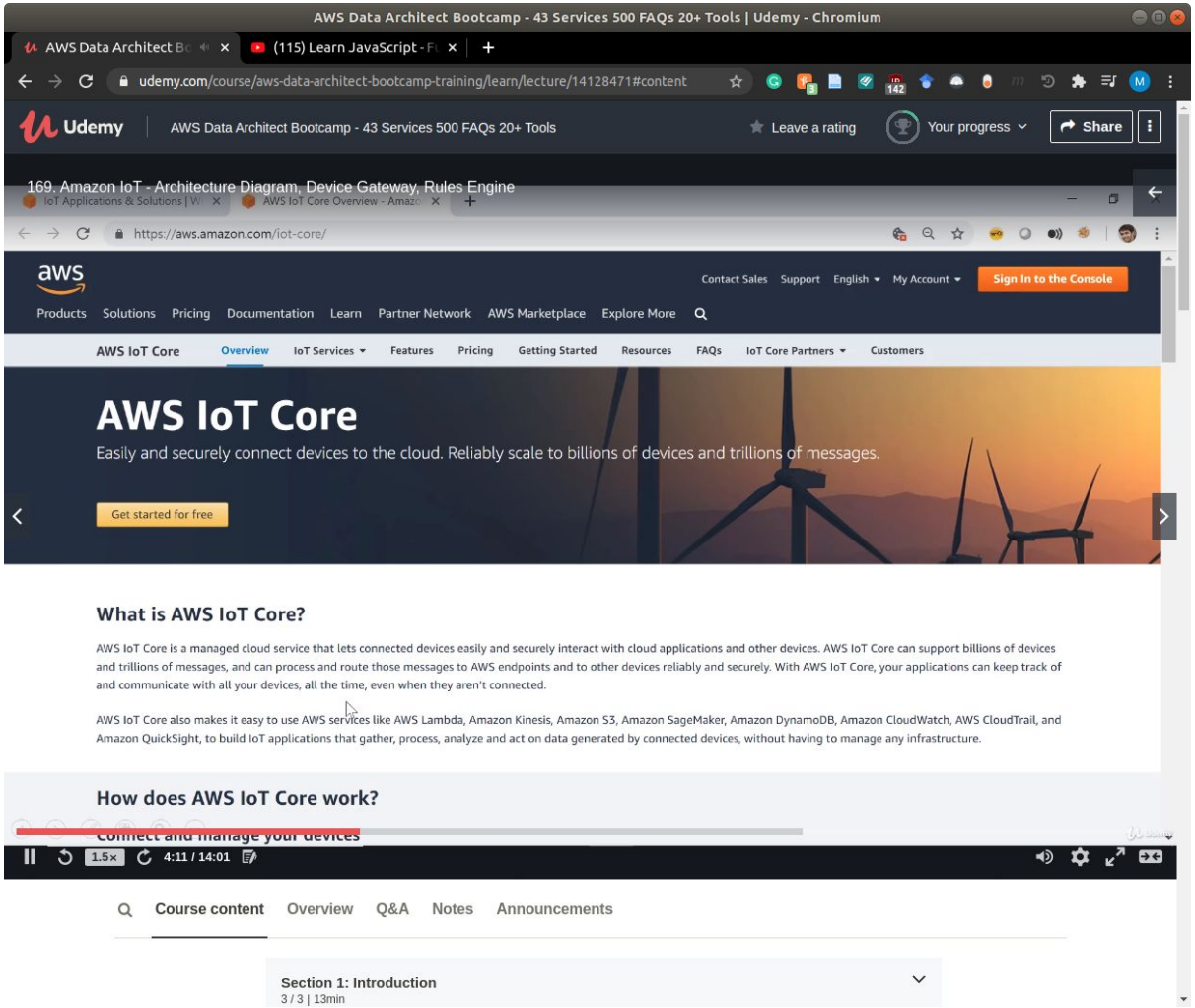
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AWS IoT Core
Easily and securely connect devices to the cloud. Reliably scale to billions of devices and trillions of messages.
Get started for free
What is AWS IoT Core?
AWS IoT Core is a managed cloud service that lets connected devices easily and securely interact with cloud applications and other devices. AWS IoT Core can support billions of devices and trillions of messages, and can process and route those messages to AWS endpoints and to other devices reliably and securely. With AWS IoT Core, your applications can keep track of and communicate with all your devices, all the time, even when they aren't connected.
AWS IoT Core also makes it easy to use AWS services like AWS Lambda, Amazon Kinesis, Amazon S3, Amazon SageMaker, Amazon DynamoDB, Amazon CloudWatch, AWS CloudTrail, and Amazon QuickSight, to build IoT applications that gather, process, analyze and act on data generated by connected devices, without having to manage any infrastructure.
How does AWS IoT Core work?
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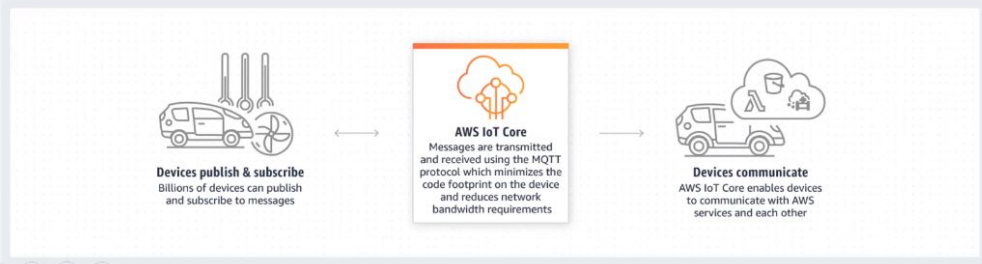
Amazon QuickSight, to build IoT applications that gather, process, analyze and act on data generated by connected devices, without having to manage any infrastructure.

How does AWS IoT Core work?

Connect and manage your devices

AWS IoT Core allows you to easily connect devices to the cloud and to other devices. AWS IoT Core supports HTTP, WebSockets, and MQTT, a lightweight communication protocol specifically designed to tolerate intermittent connections, minimize the code footprint on devices, and reduce network bandwidth requirements. AWS IoT Core also supports other industry-standard and custom protocols, and devices can communicate with each other even if they are using different protocols.



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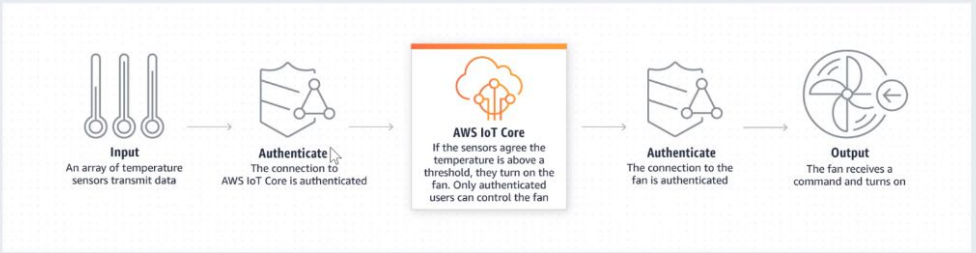
Secure device connections and data

AWS IoT Core provides authentication and end-to-end encryption throughout all points of connection, so that data is never exchanged between devices and AWS IoT Core without proven identity. In addition, you can secure access to your devices and applications by applying policies with granular permissions.



Process and act upon device data

With AWS IoT Core, you can filter, transform, and act upon device data on the fly, based on business rules you define. You can update your rules to implement new device and application

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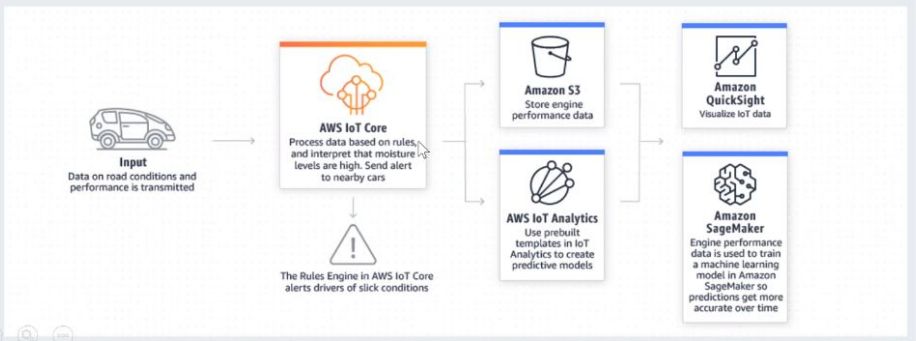
Process and act upon device data

With AWS IoT Core, you can filter, transform, and act upon device data on the fly, based on business rules you define. You can update your rules to implement new device and application features at any time. AWS IoT Core makes it easy to use AWS services like AWS Lambda, Amazon Kinesis, Amazon S3, Amazon Machine Learning, Amazon DynamoDB, Amazon CloudWatch, and Amazon Elasticsearch Service for even more powerful IoT applications.



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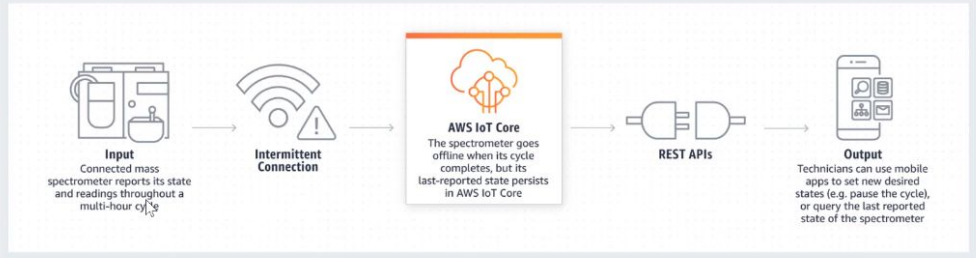
Read and set device state at any time

AWS IoT Core stores the latest state of a connected device so that it can be read or set at anytime, making the device appear to your applications as if it were online all the time. This means that your application can read a device's state even when it is disconnected, and also allows you to set a device state and have it implemented when the device reconnects.



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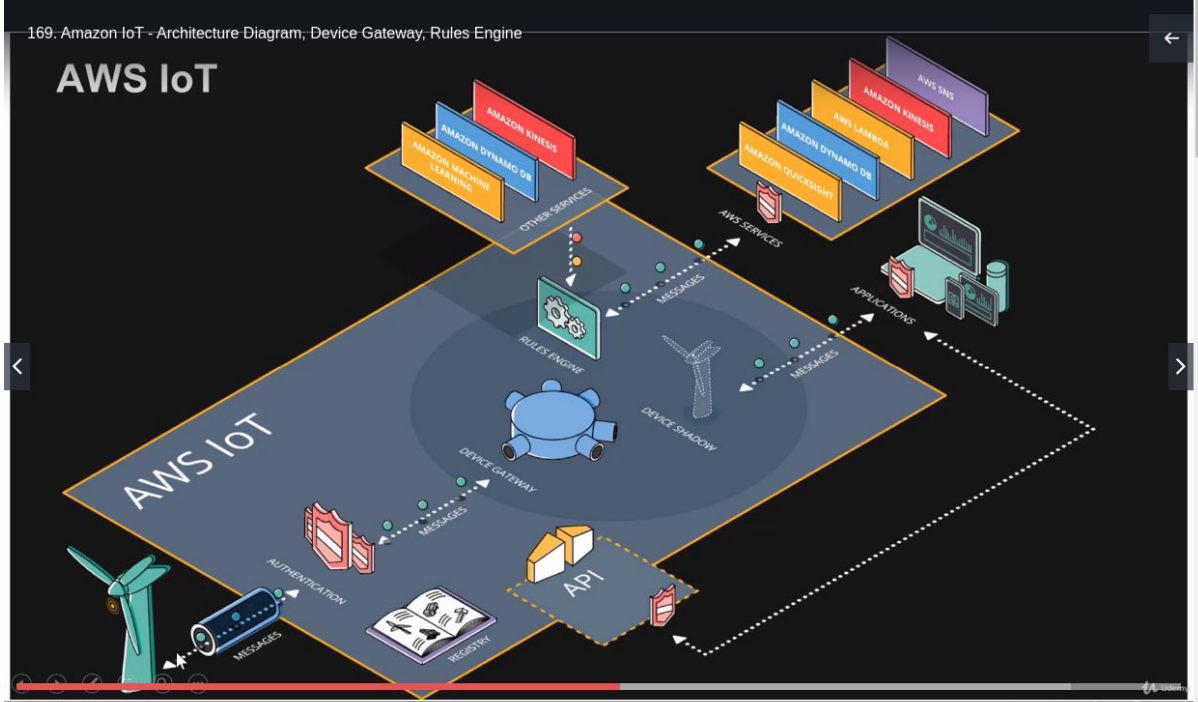

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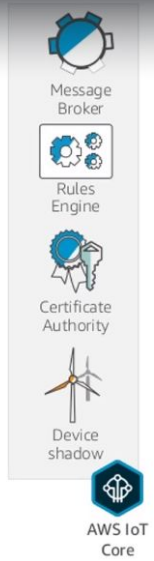
AWS IoT Core

All in one service

- Message Broker
- Rules Engine
- Certificate Authority
- Shadow
- Unbundles pricing by charging for these components independently

Managed service

- No installation
- Automatic scaling
- No pre-provisioning
- Redundant across AZ
- Pay as you go



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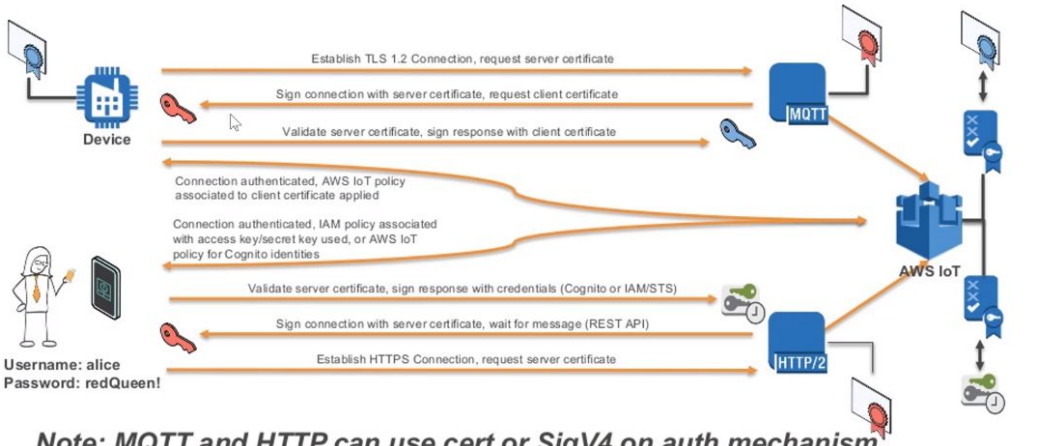
Authentication/Authorization Examples



Note: MQTT and HTTP can use cert or SigV4 on auth mechanism

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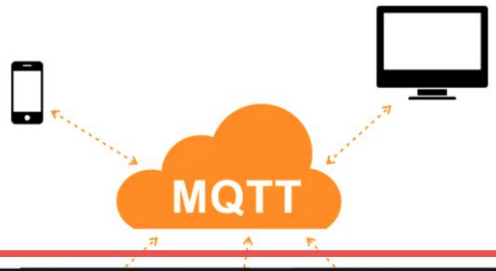
MQTT Protocol – How it Works

IoT

MQTT is one of the most commonly used protocols in IoT projects. It stands for Message Queuing Telemetry Transport.

In addition, it is designed as a lightweight messaging protocol that uses publish/subscribe operations to exchange data between clients and the server. Furthermore, its small size, low power usage, minimized data packets and ease of implementation make the protocol ideal of the "machine-to-machine" or "Internet of Things" world.



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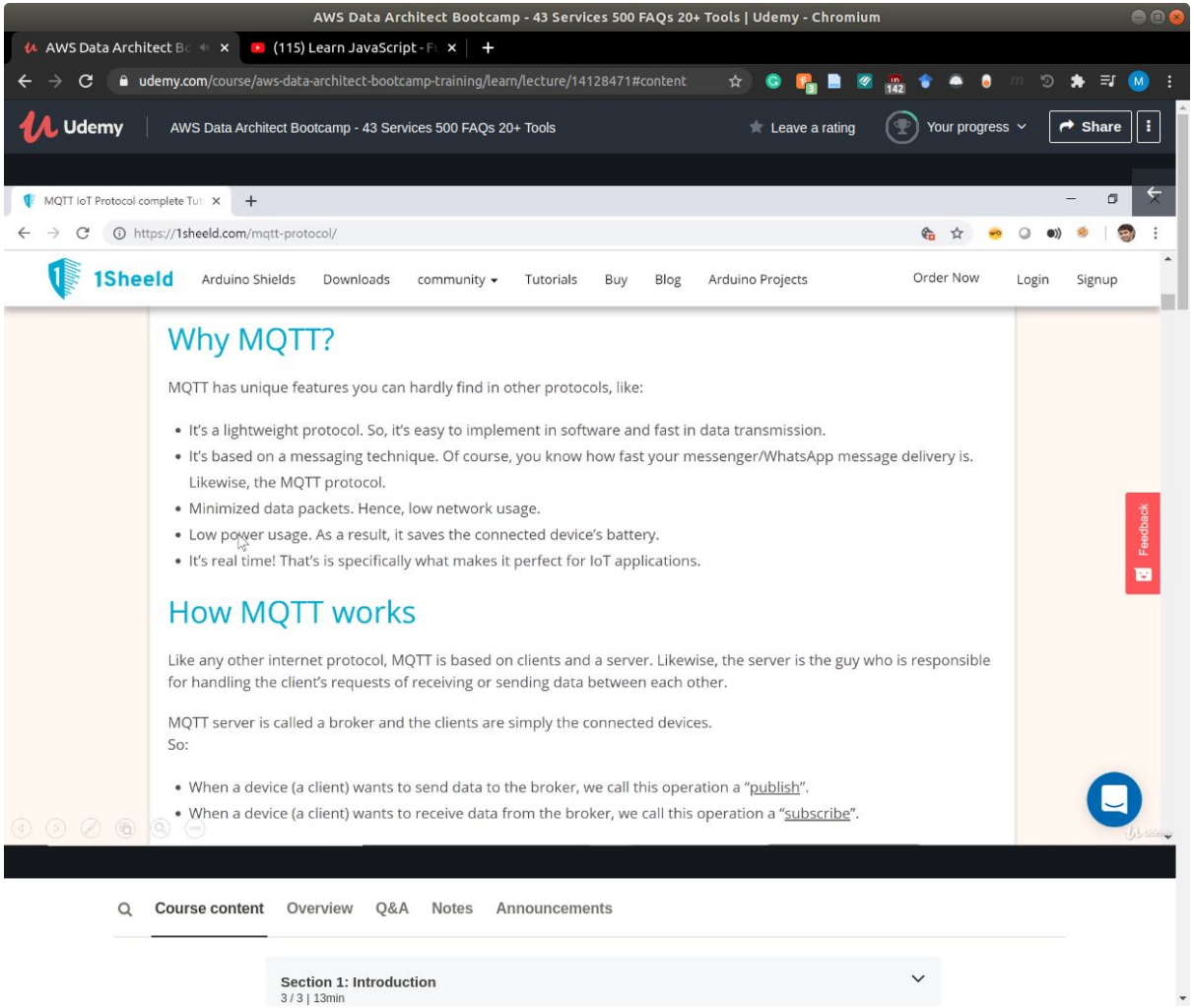
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Why MQTT?
MQTT has unique features you can hardly find in other protocols, like:
It's a lightweight protocol. So, it's easy to implement in software and fast in data transmission.
It's based on a messaging technique. Of course, you know how fast your messenger/WhatsApp message delivery is. Likewise, the MQTT protocol.
Minimized data packets. Hence, low network usage.
Low power usage. As a result, it saves the connected device's battery.
It's real time! That's is specifically what makes it perfect for IoT applications.
How MQTT works
Like any other internet protocol, MQTT is based on clients and a server. Likewise, the server is the guy who is responsible for handling the client's requests of receiving or sending data between each other.
MQTT server is called a broker and the clients are simply the connected devices.
So:
When a device (a client) wants to send data to the broker, we call this operation a "publish".
When a device (a client) wants to receive data from the broker, we call this operation a "subscribe".
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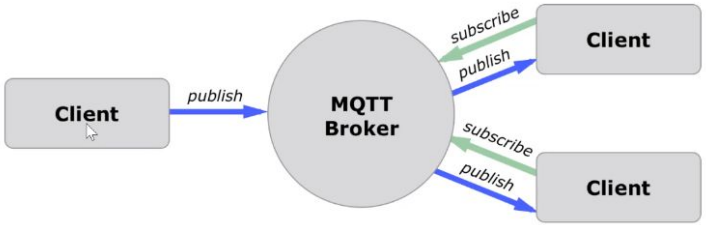
Like any other internet protocol, MQTT is based on clients and a server. Likewise, the server is the guy who is responsible for handling the client's requests of receiving or sending data between each other.

MQTT server is called a broker and the clients are simply the connected devices.
So:

- When a device (a client) wants to send data to the broker, we call this operation a "publish".
- When a device (a client) wants to receive data from the broker, we call this operation a "subscribe".



In addition, These clients are publishing and subscribing to topics. So, the broker here is the one that handles the

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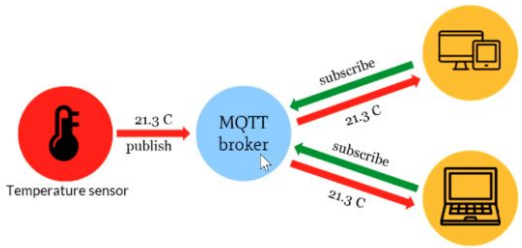
Example:

Let's say there is a device that has a temperature sensor. Certainly, it wants to send his readings to the broker. On the other side, a phone/desktop application wants to receive this temperature value. Therefore, 2 things will happen:

- The device defines the topic it wants to publish on, ex: "temp". Then, it publishes the message "temperature value".
- The phone/desktop application subscribes to the topic "temp". Then, it receives the message that the device has published, which is the temperature value.

Again, the broker role here is to take the message "temperature value" and deliver it to phone/desktop application.



Schematic data flow from sensor (machine) to devise (machine)

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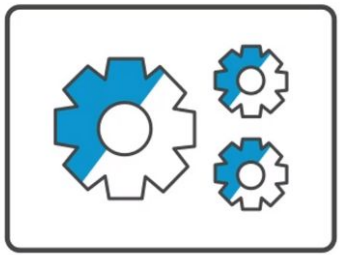
Rules Engine

Tasks

- SQL-like syntax to write rules
- Augment or filter data
- Save data to other services
- Send data to Amazon Machine Learning
- Make predictions based on ML model

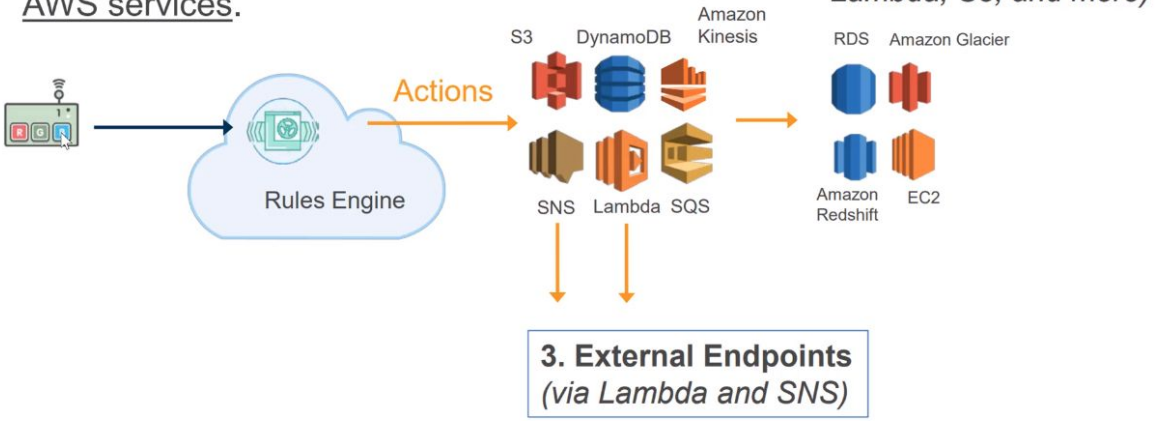


Services Supported

- Amazon DynamoDB
- Amazon S3
- Amazon SNS
- Amazon SQS
- Amazon Kinesis
- Amazon Elasticsearch
- AWS Lambda
- and more...

AWS IoT Rules Engine

Rules Engine connects AWS IoT to external endpoints and AWS services.



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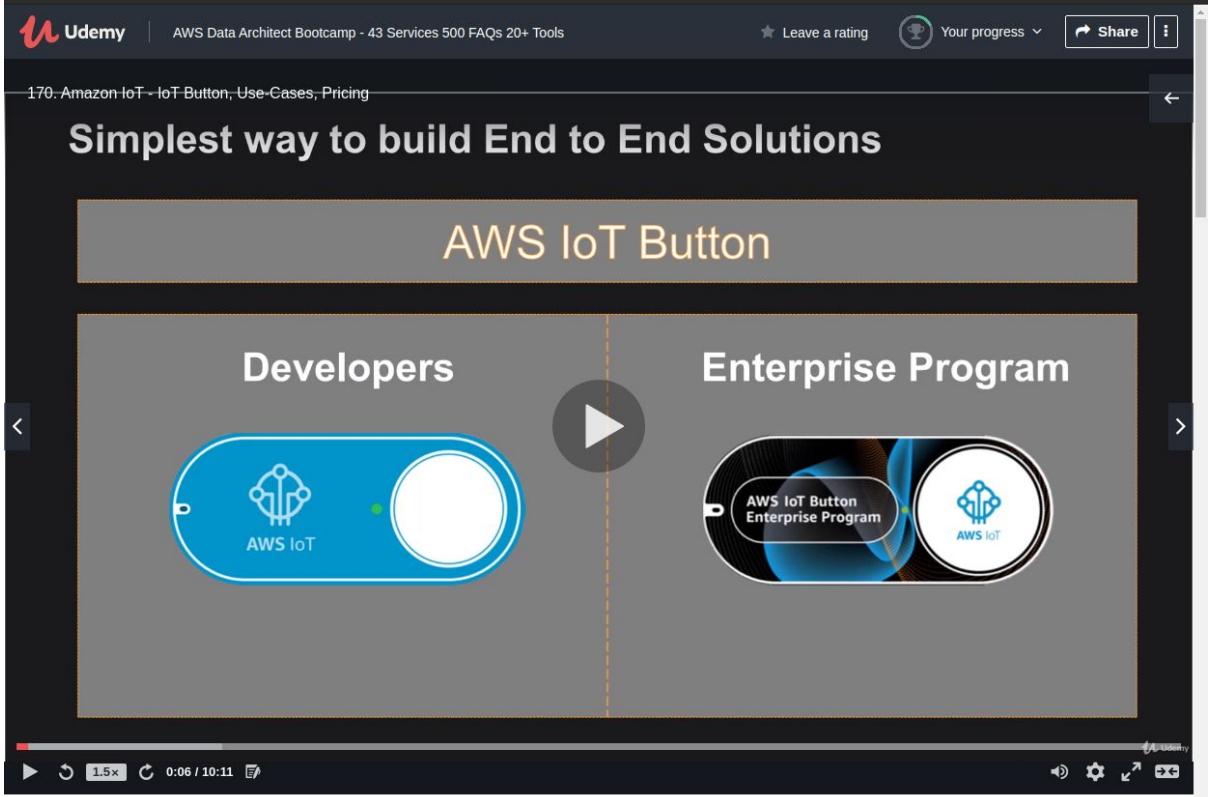

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AWS IoT Button – Limited Release Programmable Dash Button

- An easy way to get started with the **Internet of Things**
- A **programmable Wi-Fi button** for developers to learn how to use AWS IoT, Lambda, DynamoDB, SNS
- Use the button to **count items, track usage, initiate a call, send alerts or start and stop a process** or connected product
- Eliminate the hassle of writing device-specific code; **code in the cloud** to configure your button's single, double, and long clicks.

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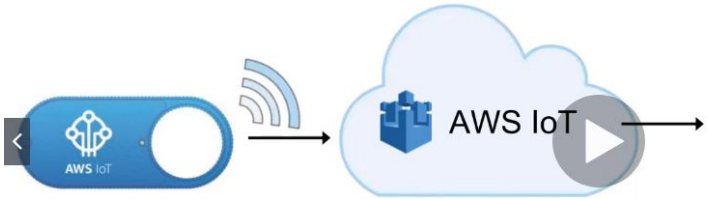
How does it work?



- Invoke a Lambda function
- Put object in an S3 bucket
- Insert, Update, Read from a DynamoDB table
- Publish to an SNS Topic or Endpoint
- Publish to a Kinesis stream
- Kinesis Firehose > Redshift
- Republish to AWS IoT

1.5× 4:23 / 10:11

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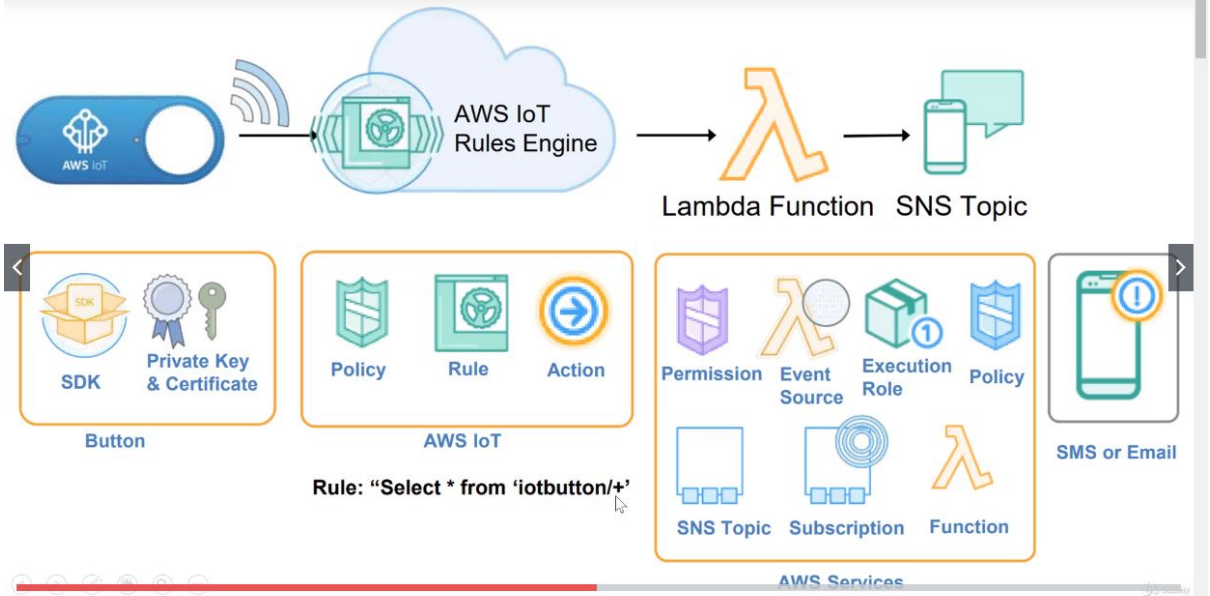
Alert Someone: AWS IoT to AWS Lambda to SNS



1.5× 5:04 / 10:11

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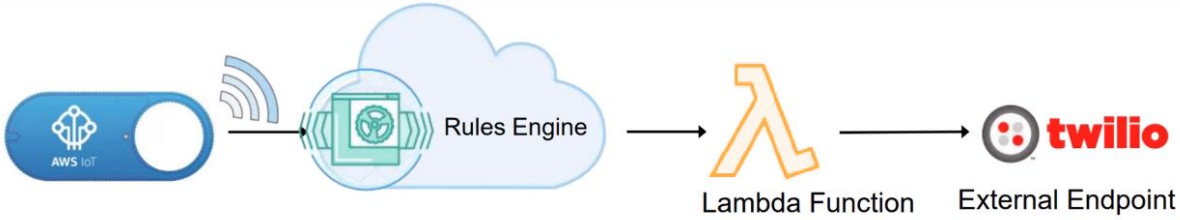
170. Amazon IoT - IoT Button, Use Cases, Pricing

Call Someone: AWS IoT to AWS Lambda to an External Endpoint



Rule: Select * from 'iotbutton/+'

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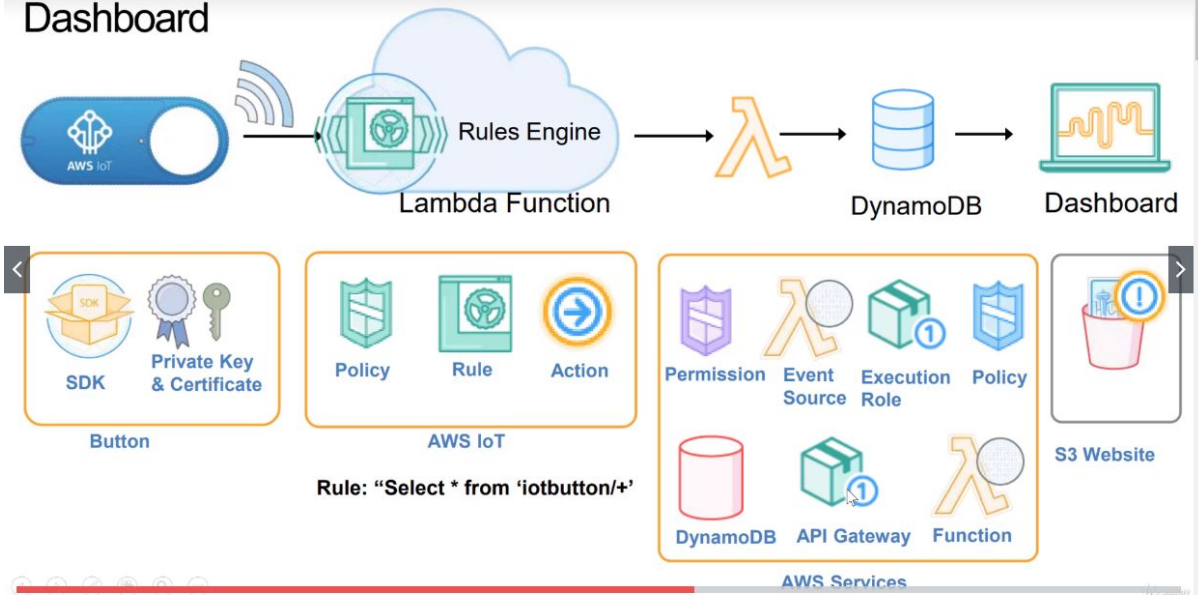
Count items or Track Usage: AWS IoT to DynamoDB to Dashboard



1.5× 5:56 / 10:11

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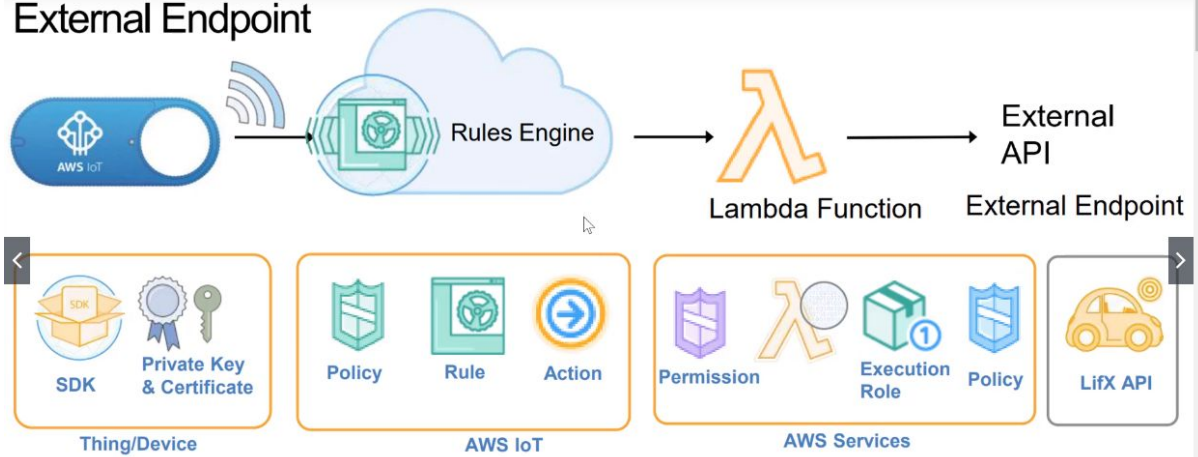
Start or Stop Something : AWS IoT to AWS Lambda to an External Endpoint



Rule: Select * from 'iotbutton/+'

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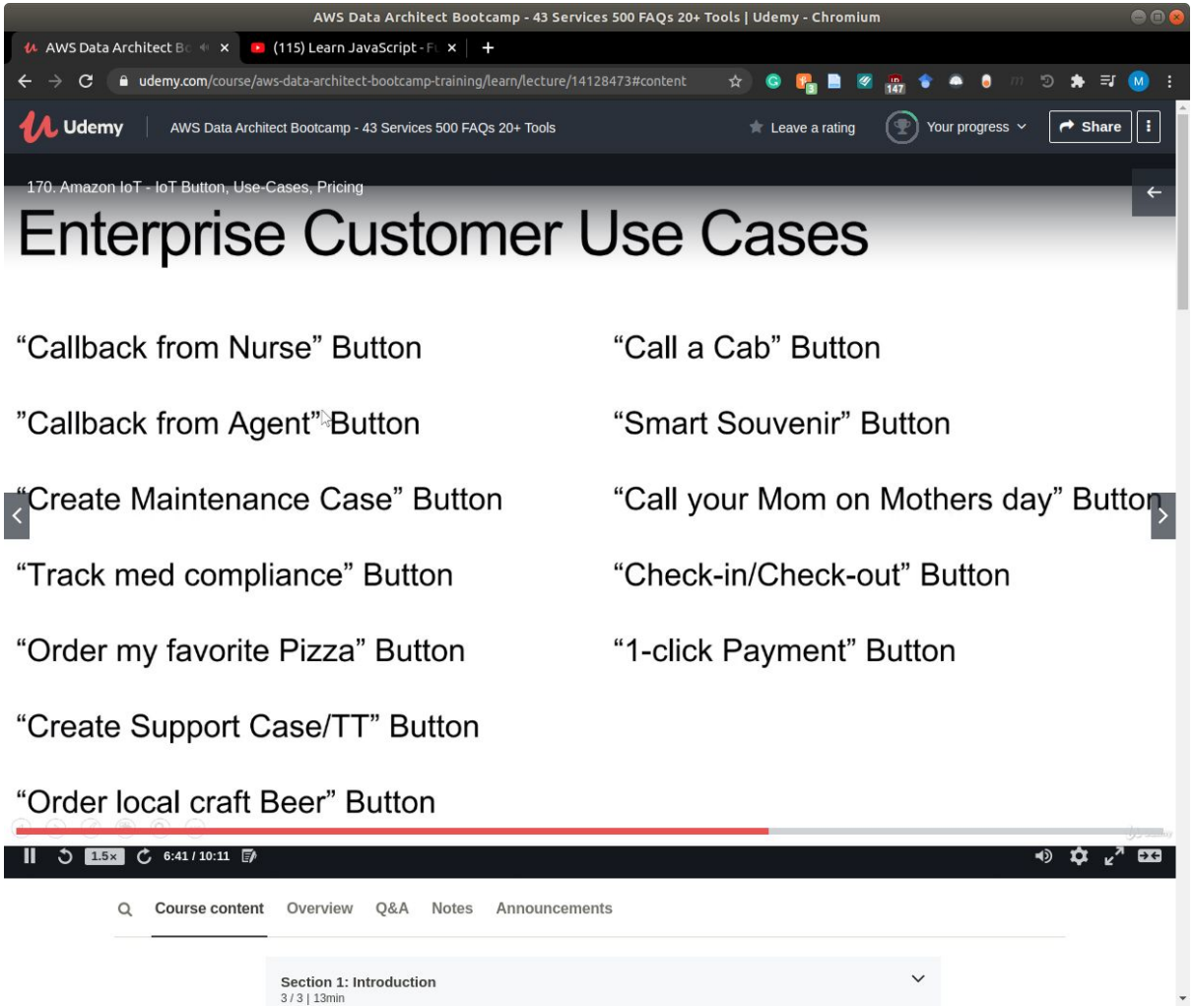
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Enterprise Customer Use Cases
“Callback from Nurse” Button
”Callback from Agent” Button
“Create Maintenance Case” Button
“Track med compliance” Button
“Order my favorite Pizza” Button
“Create Support Case/TT” Button
“Order local craft Beer” Button
“Call a Cab” Button
“Smart Souvenir” Button
“Call your Mom on Mothers day” Button
“Check-in/Check-out” Button
“1-click Payment” Button
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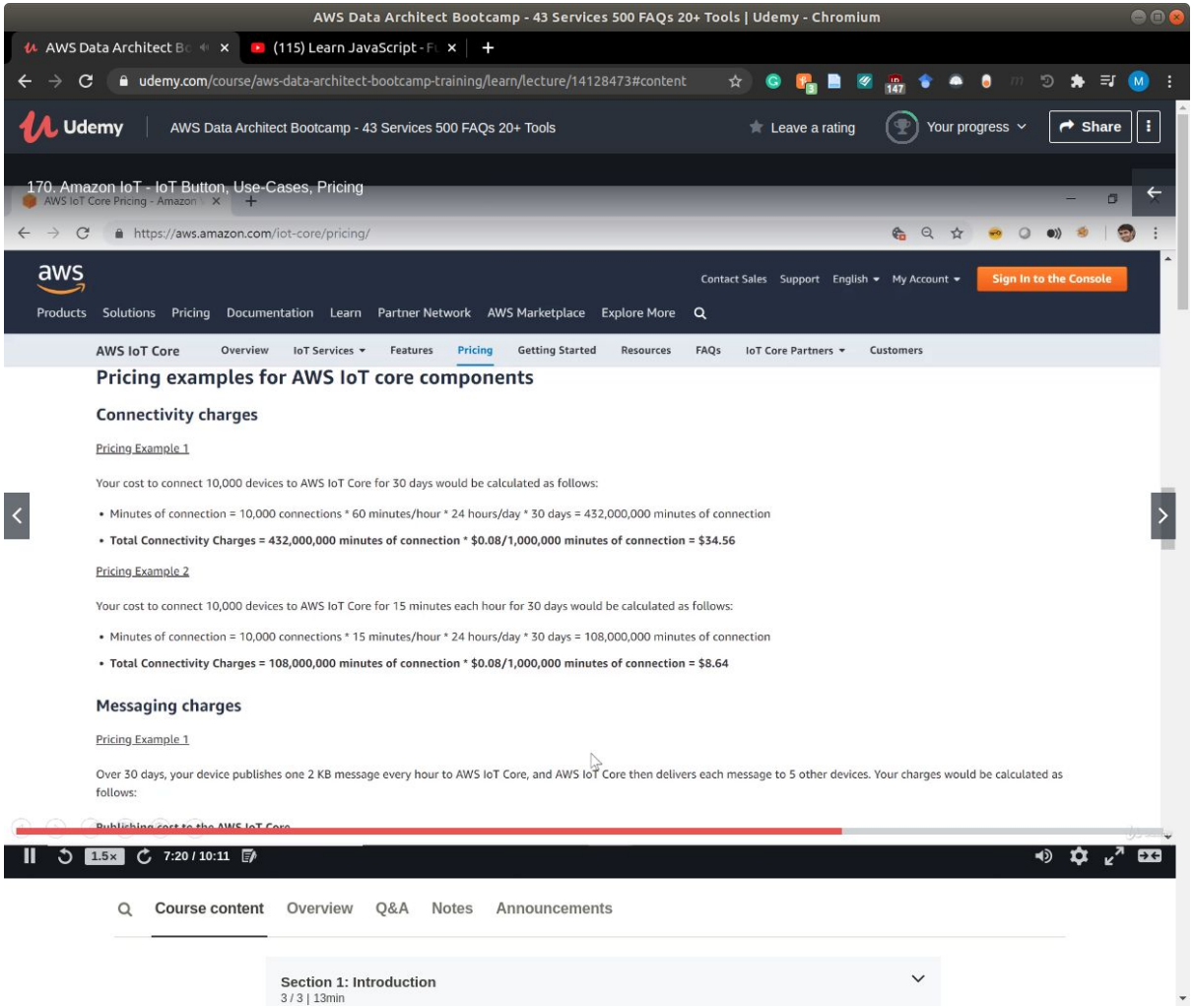
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Pricing examples for AWS IoT core components
Connectivity charges
Pricing Example 1
Your cost to connect 10,000 devices to AWS IoT Core for 30 days would be calculated as follows:
• Minutes of connection = 10,000 connections * 60 minutes/hour * 24 hours/day * 30 days = 432,000,000 minutes of connection
• Total Connectivity Charges = 432,000,000 minutes of connection * $0.08/1,000,000 minutes of connection = $34.56
Pricing Example 2
Your cost to connect 10,000 devices to AWS IoT Core for 15 minutes each hour for 30 days would be calculated as follows:
• Minutes of connection = 10,000 connections * 15 minutes/hour * 24 hours/day * 30 days = 108,000,000 minutes of connection
• Total Connectivity Charges = 108,000,000 minutes of connection * $0.08/1,000,000 minutes of connection = $8.64
Messaging charges
Pricing Example 1
Over 30 days, your device publishes one 2 KB message every hour to AWS IoT Core, and AWS IoT Core then delivers each message to 5 other devices. Your charges would be calculated as follows:
1.5×
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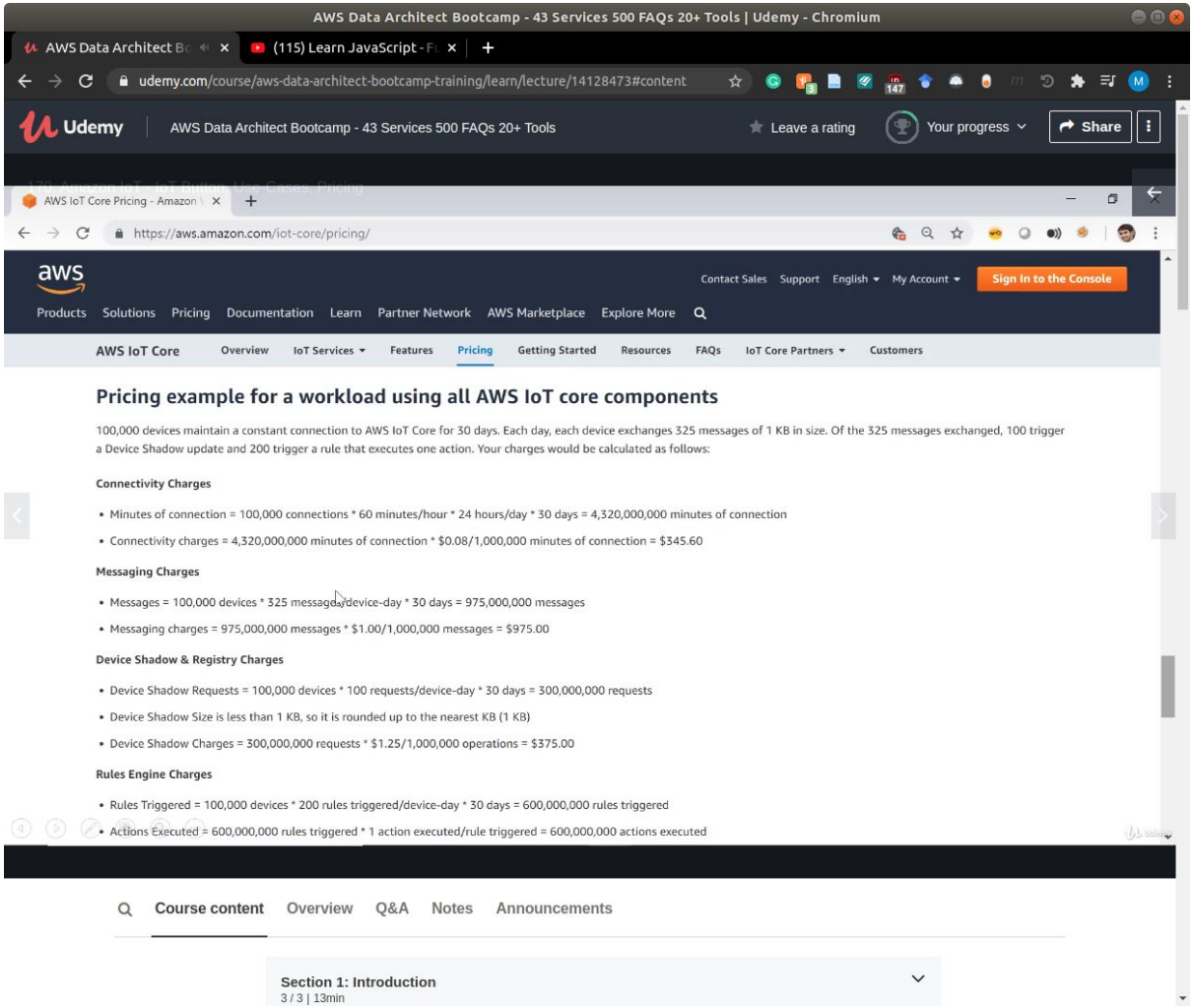
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Pricing example for a workload using all AWS IoT core components
100,000 devices maintain a constant connection to AWS IoT Core for 30 days. Each day, each device exchanges 325 messages of 1 KB in size. Of the 325 messages exchanged, 100 trigger a Device Shadow update and 200 trigger a rule that executes one action. Your charges would be calculated as follows:
Connectivity Charges
Minutes of connection = 100,000 connections * 60 minutes/hour * 24 hours/day * 30 days = 4,320,000,000 minutes of connection
Connectivity charges = 4,320,000,000 minutes of connection * $0.08/1,000,000 minutes of connection = $345.60
Messaging Charges
Messages = 100,000 devices * 325 messages/device-day * 30 days = 975,000,000 messages
Messaging charges = 975,000,000 messages * $1.00/1,000,000 messages = $975.00
Device Shadow & Registry Charges
Device Shadow Requests = 100,000 devices * 100 requests/device-day * 30 days = 300,000,000 requests
Device Shadow Size is less than 1 KB, so it is rounded up to the nearest KB (1 KB)
Device Shadow Charges = 300,000,000 requests * $1.25/1,000,000 operations = $375.00
Rules Engine Charges
Rules Triggered = 100,000 devices * 200 rules triggered/device-day * 30 days = 600,000,000 rules triggered
Actions Executed = 600,000,000 rules triggered * 1 action executed/rule triggered = 600,000,000 actions executed
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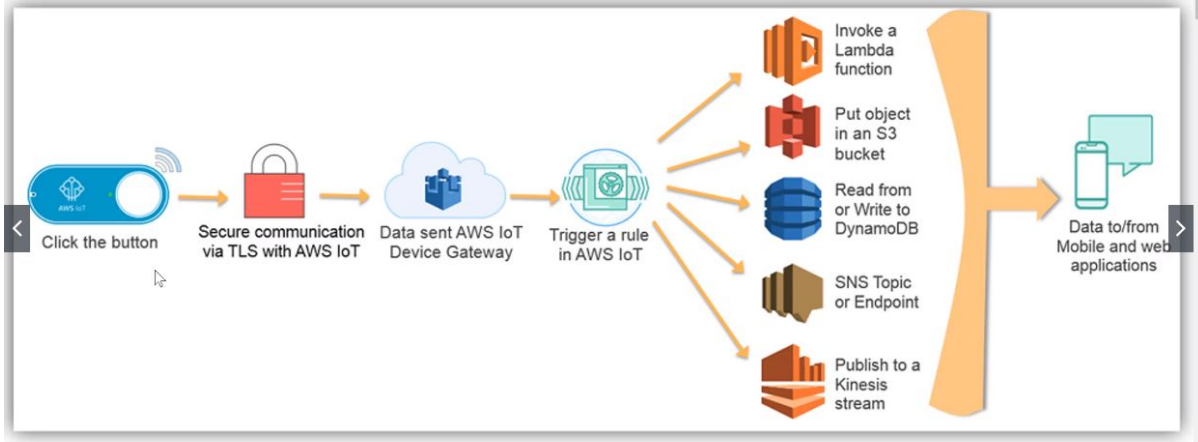
AWS IoT Labs



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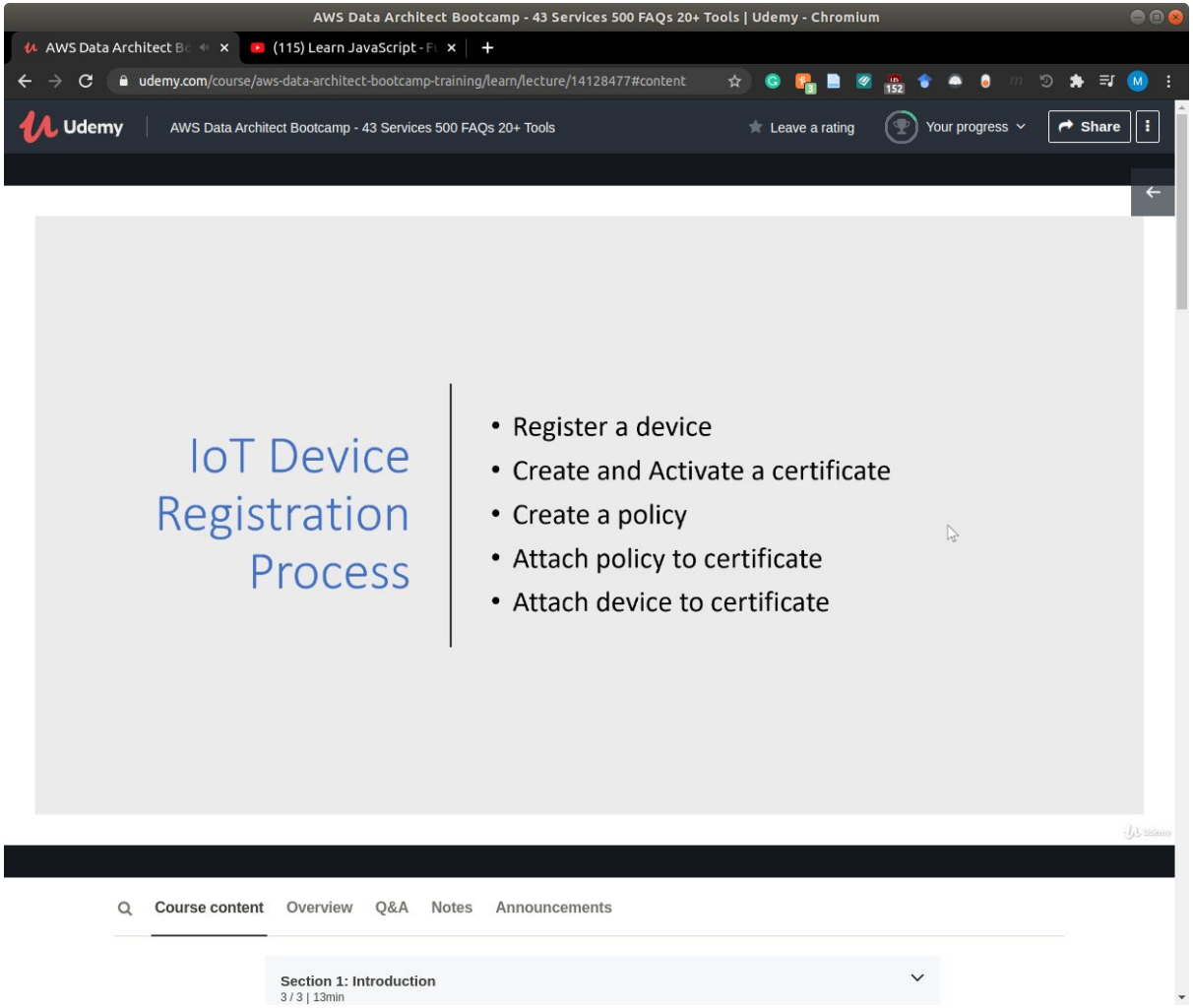
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IoT Device Registration Process
• Register a device
• Create and Activate a certificate
• Create a policy
• Attach policy to certificate
• Attach device to certificate
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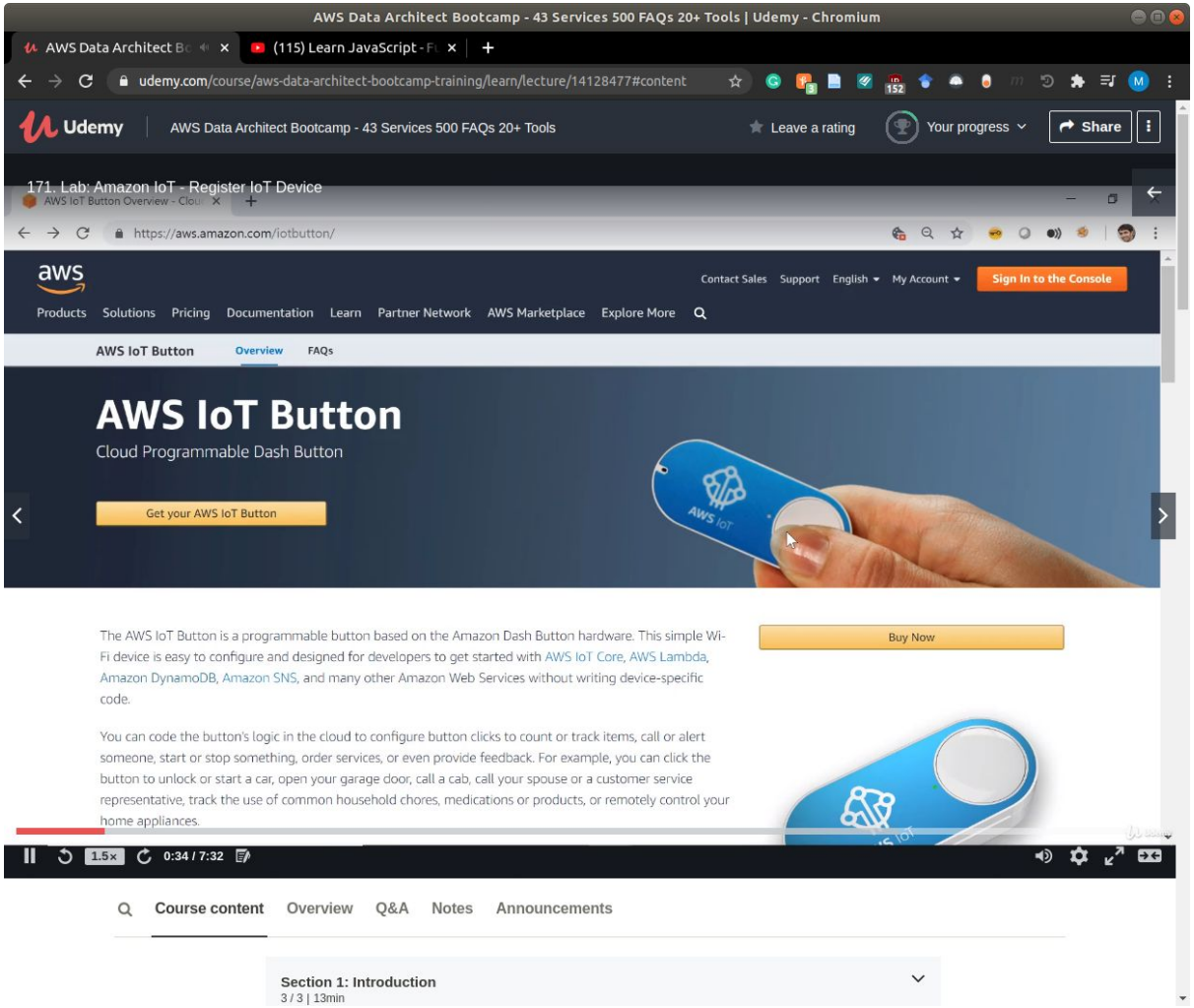
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Cloud Programmable Dash Button
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Buy Now
The AWS IoT Button is a programmable button based on the Amazon Dash Button hardware. This simple Wi-Fi device is easy to configure and designed for developers to get started with AWS IoT Core, AWS Lambda, Amazon DynamoDB, Amazon SNS, and many other Amazon Web Services without writing device-specific code.
You can code the button's logic in the cloud to configure button clicks to count or track items, call or alert someone, start or stop something, order services, or even provide feedback. For example, you can click the button to unlock or start a car, open your garage door, call a cab, call your spouse or a customer service representative, track the use of common household chores, medications or products, or remotely control your home appliances.
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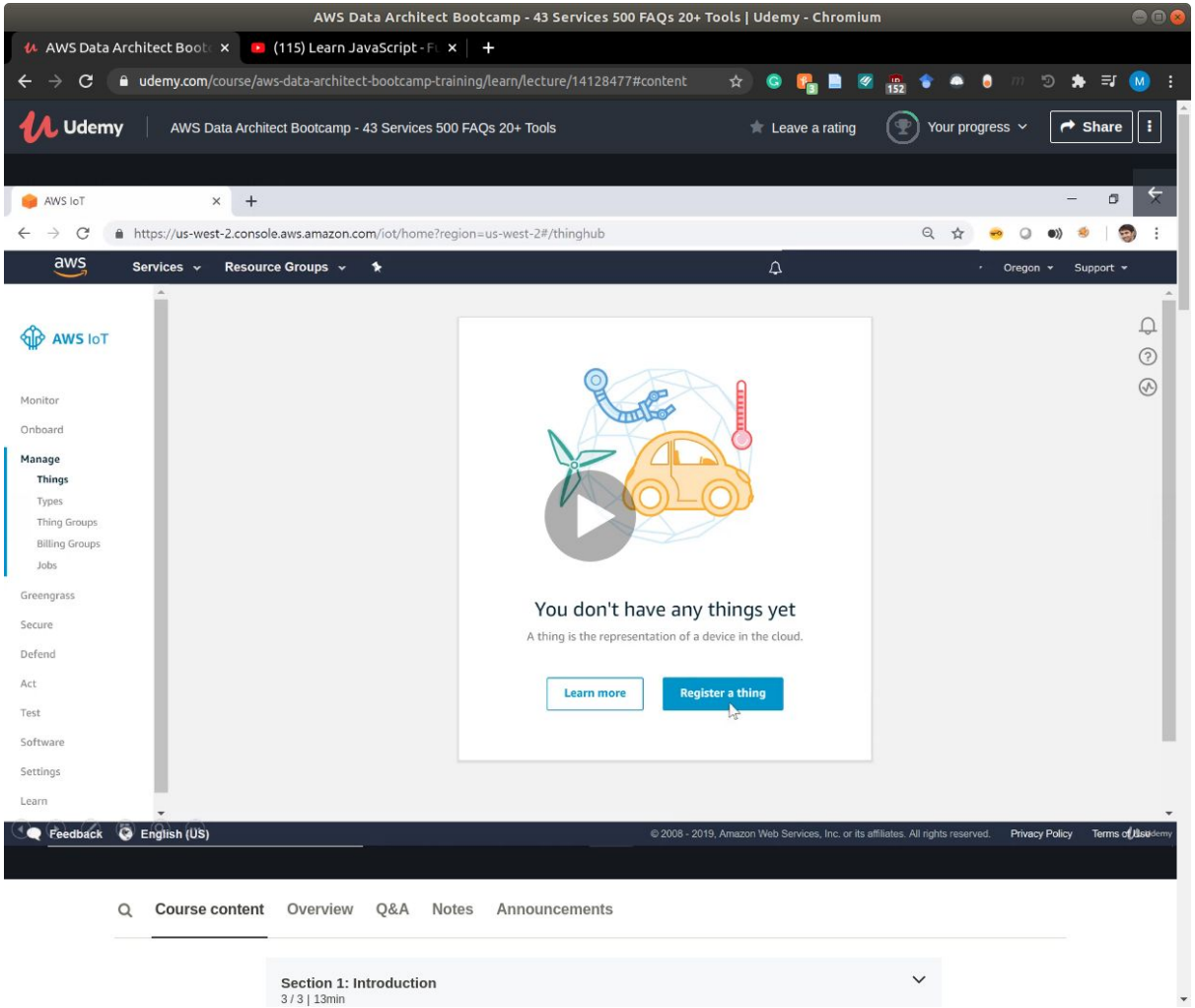
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Manage
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Types
Thing Groups
Billing Groups
Jobs
Greengrass
Secure
Defend
Act
Test
Software
Settings
Learn
You don't have any things yet
A thing is the representation of a device in the cloud.
Learn more
Register a thing
Feedback
English (US)
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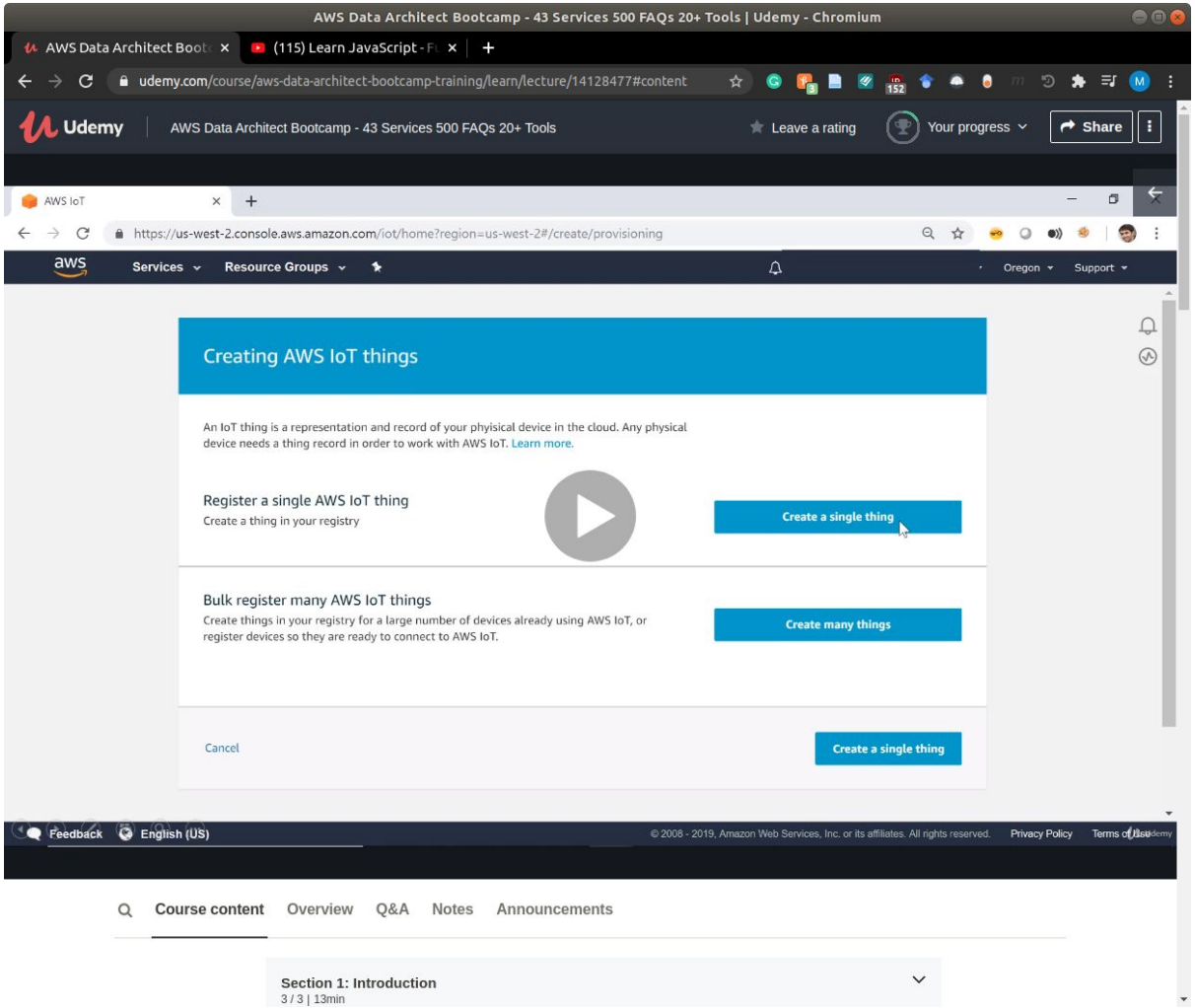
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https://us-west-2.console.aws.amazon.com/iot/home?region=us-west-2#/create/provisioning
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Creating AWS IoT things
An IoT thing is a representation and record of your phyisical device in the cloud. Any physical device needs a thing record in order to work with AWS IoT. Learn more.
Register a single AWS IoT thing
Create a thing in your registry
Create a single thing
Bulk register many AWS IoT things
Create things in your registry for a large number of devices already using AWS IoT, or register devices so they are ready to connect to AWS IoT.
Create many things
Cancel
Create a single thing
Feedback
English (US)
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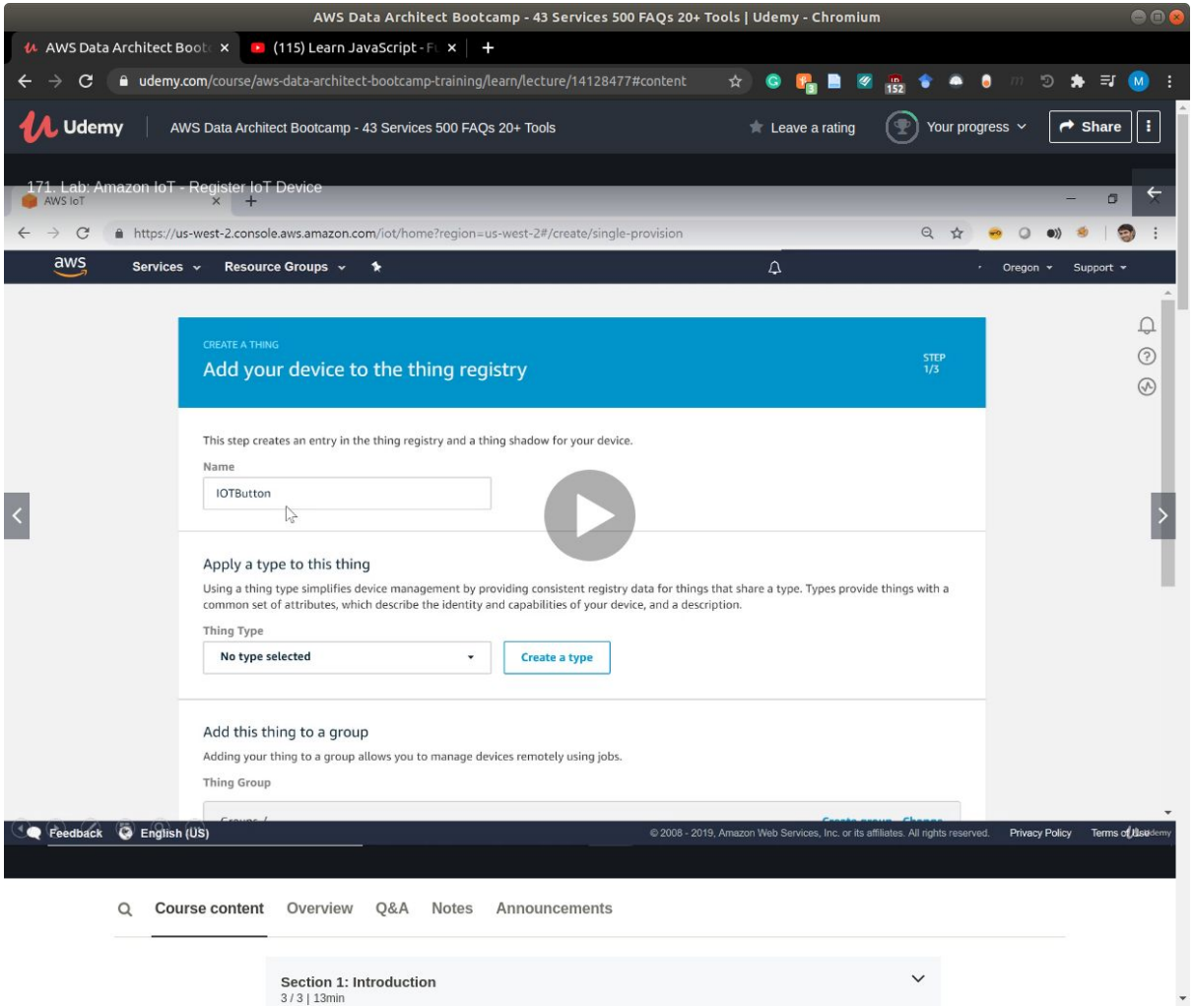
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https://us-west-2.console.aws.amazon.com/iot/home?region=us-west-2#/create/single-provision
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CREATE A THING
Add your device to the thing registry
STEP 1/3
This step creates an entry in the thing registry and a thing shadow for your device.
Name
IOTButton
Apply a type to this thing
Using a thing type simplifies device management by providing consistent registry data for things that share a type. Types provide things with a common set of attributes, which describe the identity and capabilities of your device, and a description.
Thing Type
No type selected
Create a type
Add this thing to a group
Adding your thing to a group allows you to manage devices remotely using jobs.
Thing Group
Feedback
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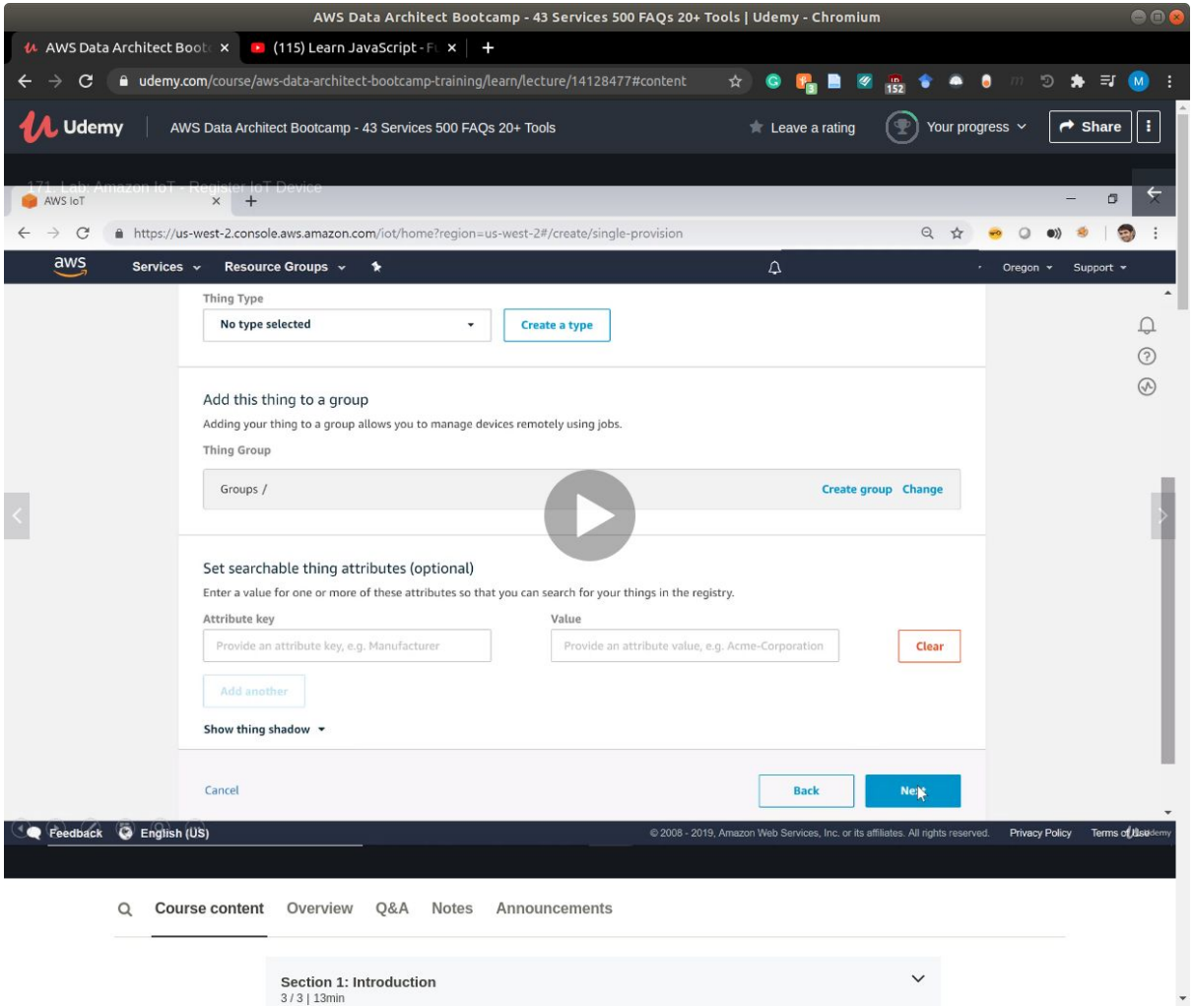

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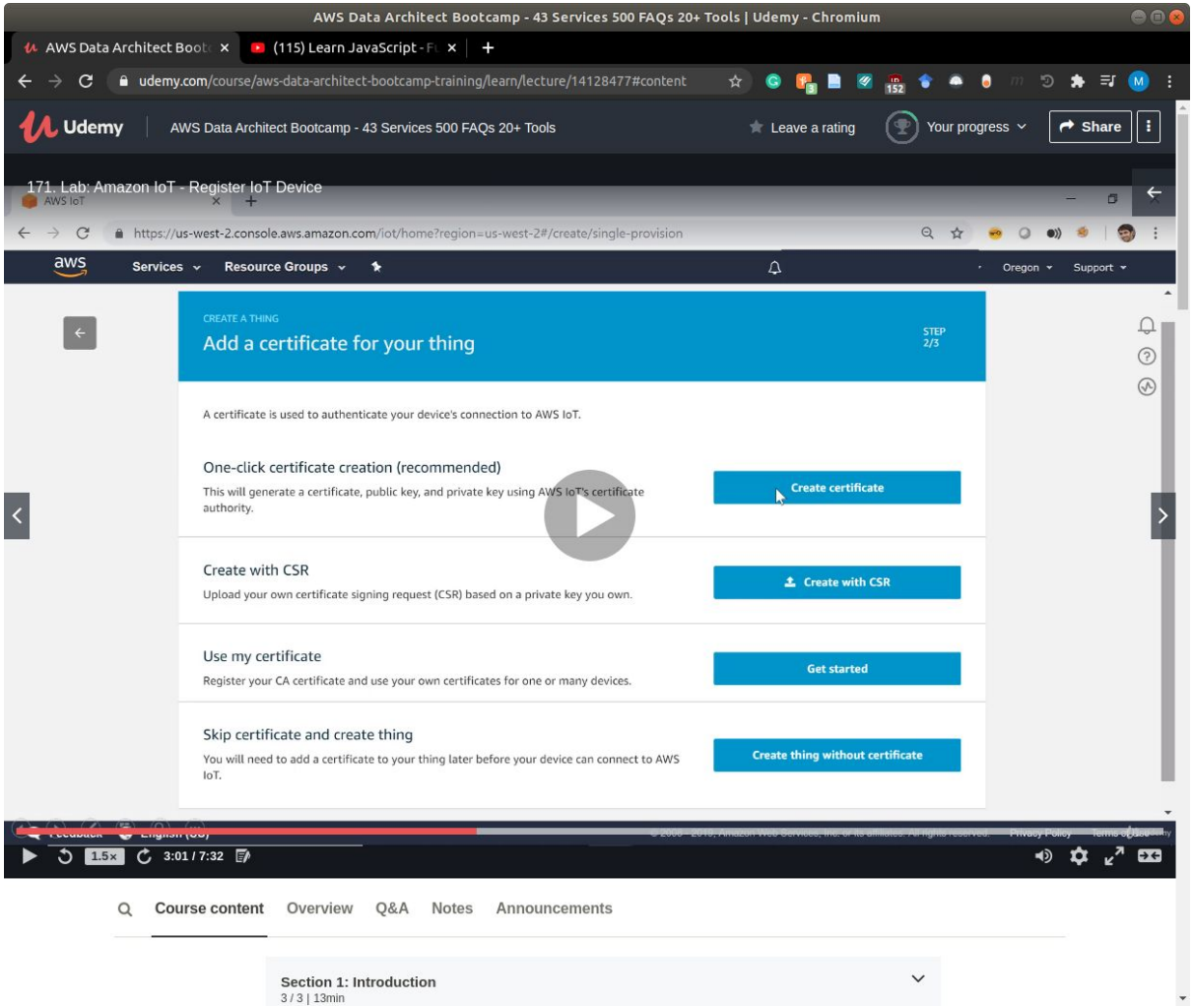
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CREATE A THING
Add a certificate for your thing
STEP 2/5
A certificate is used to authenticate your device's connection to AWS IoT.
One-click certificate creation (recommended)
This will generate a certificate, public key, and private key using AWS IoT's certificate authority.
Create certificate
Create with CSR
Upload your own certificate signing request (CSR) based on a private key you own.
Create with CSR
Use my certificate
Register your CA certificate and use your own certificates for one or many devices.
Get started
Skip certificate and create thing
You will need to add a certificate to your thing later before your device can connect to AWS IoT.
Create thing without certificate
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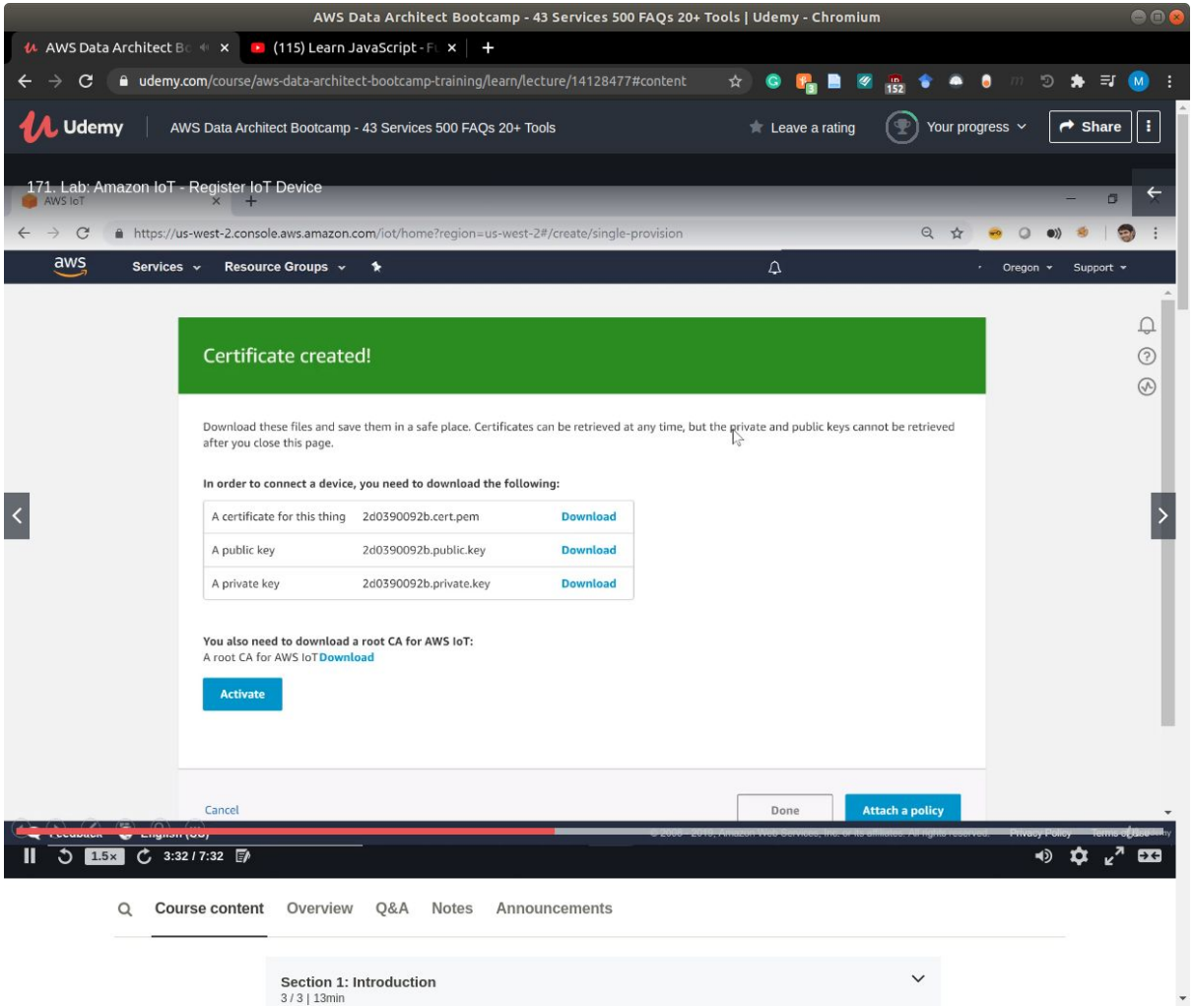
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Certificate created!
Download these files and save them in a safe place. Certificates can be retrieved at any time, but the private and public keys cannot be retrieved after you close this page.
In order to connect a device, you need to download the following:
A certificate for this thing
2d0390092b.cert.pem
Download
A public key
2d0390092b.public.key
Download
A private key
2d0390092b.private.key
Download
You also need to download a root CA for AWS IoT:
A root CA for AWS IoT Download
Activate
Cancel
Done
Attach a policy
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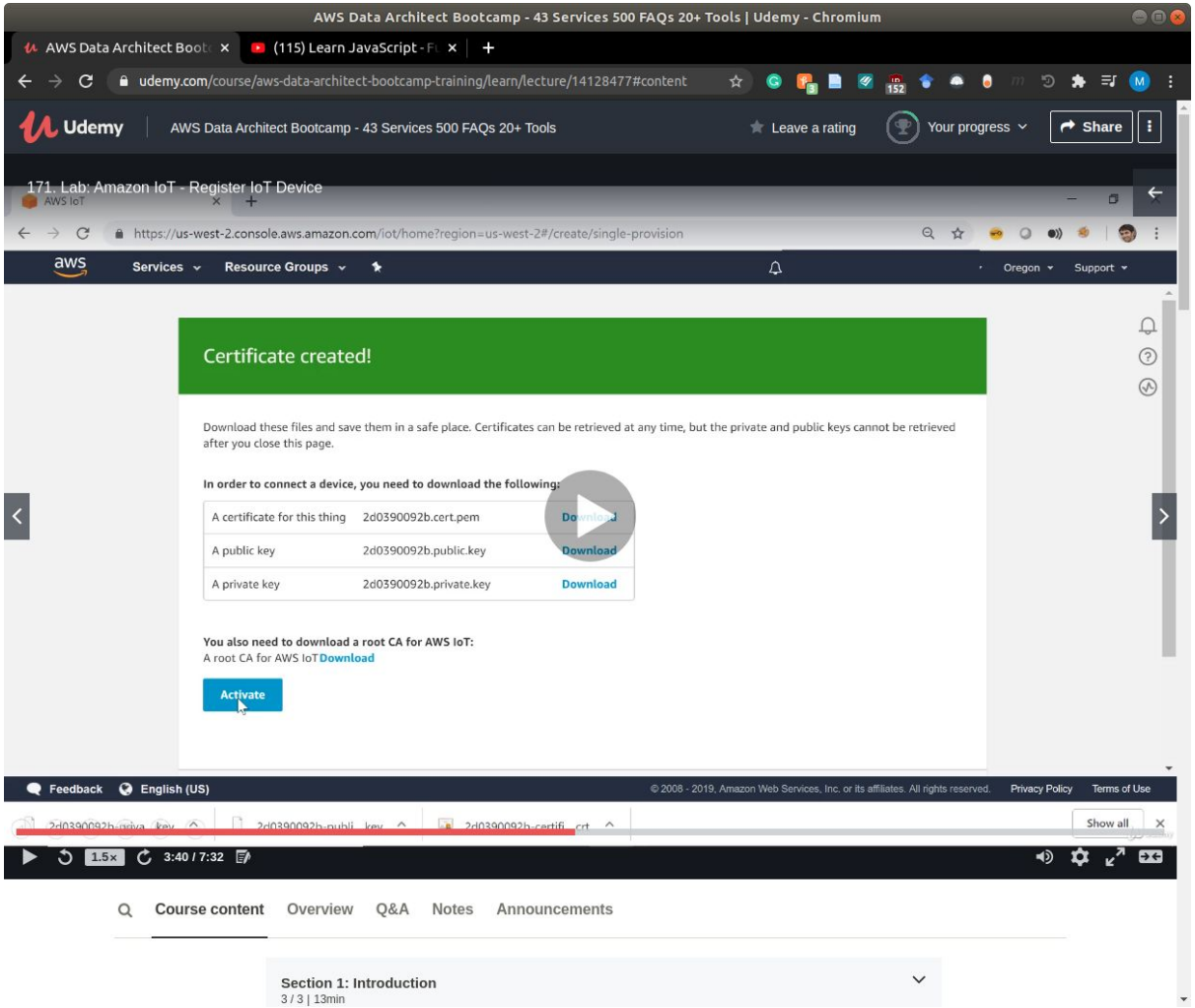
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Certificate created!
Download these files and save them in a safe place. Certificates can be retrieved at any time, but the private and public keys cannot be retrieved after you close this page.
In order to connect a device, you need to download the following:
A certificate for this thing
2d0390092b.cert.pem
Download
A public key
2d0390092b.public.key
Download
A private key
2d0390092b.private.key
Download
You also need to download a root CA for AWS IoT:
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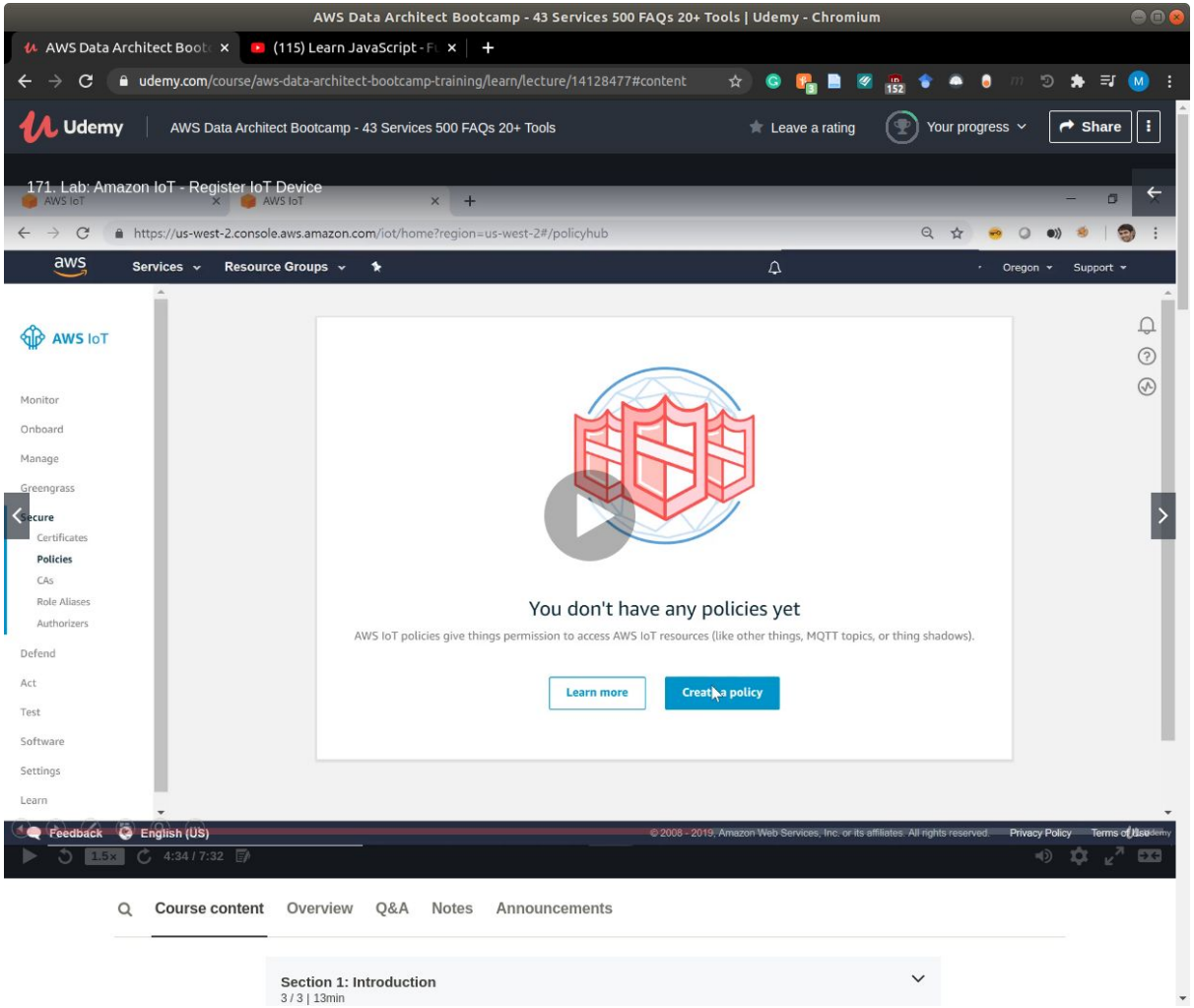
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Act
Test
Software
Settings
Learn
You don't have any policies yet
AWS IoT policies give things permission to access AWS IoT resources (like other things, MQTT topics, or thing shadows).
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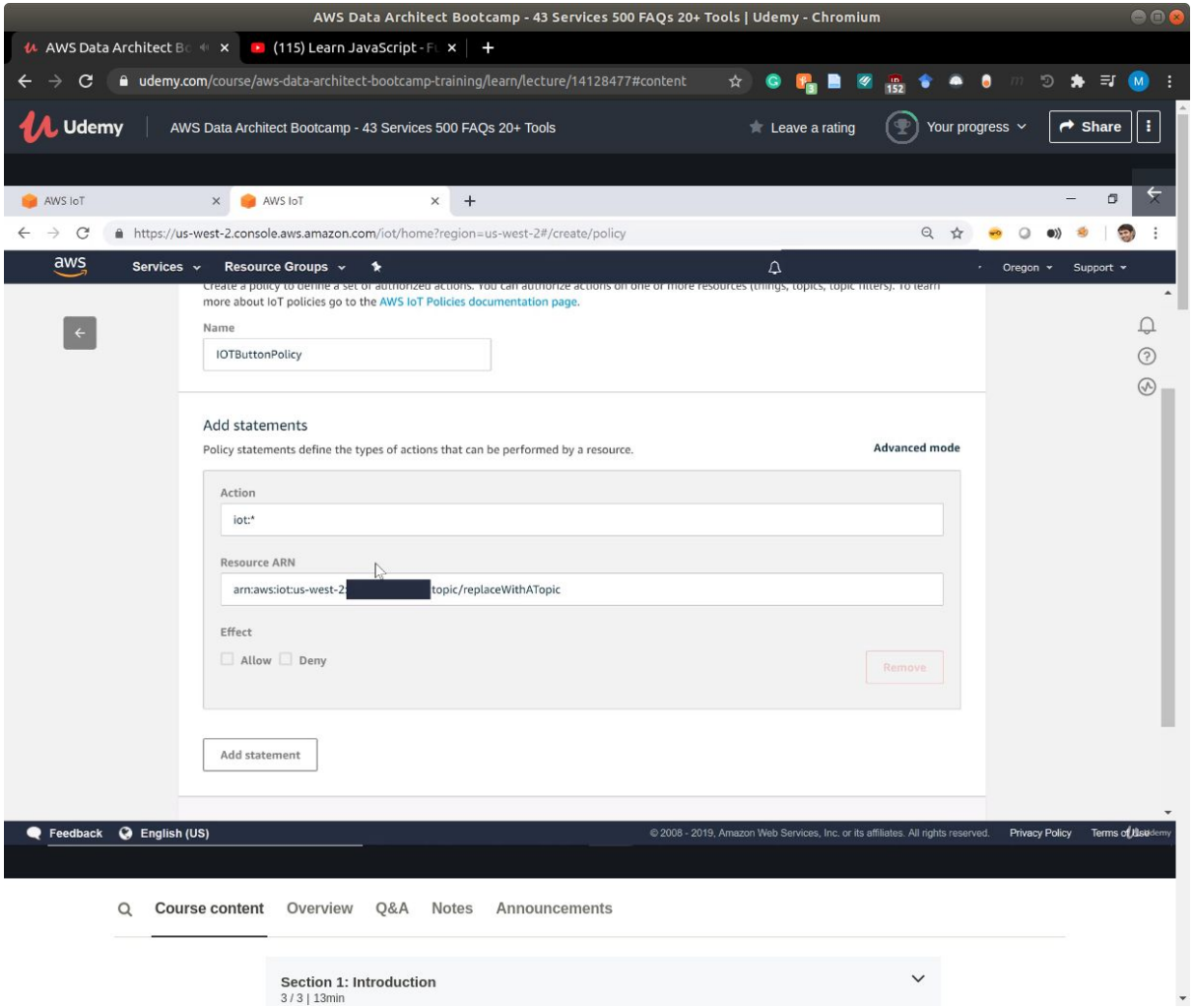

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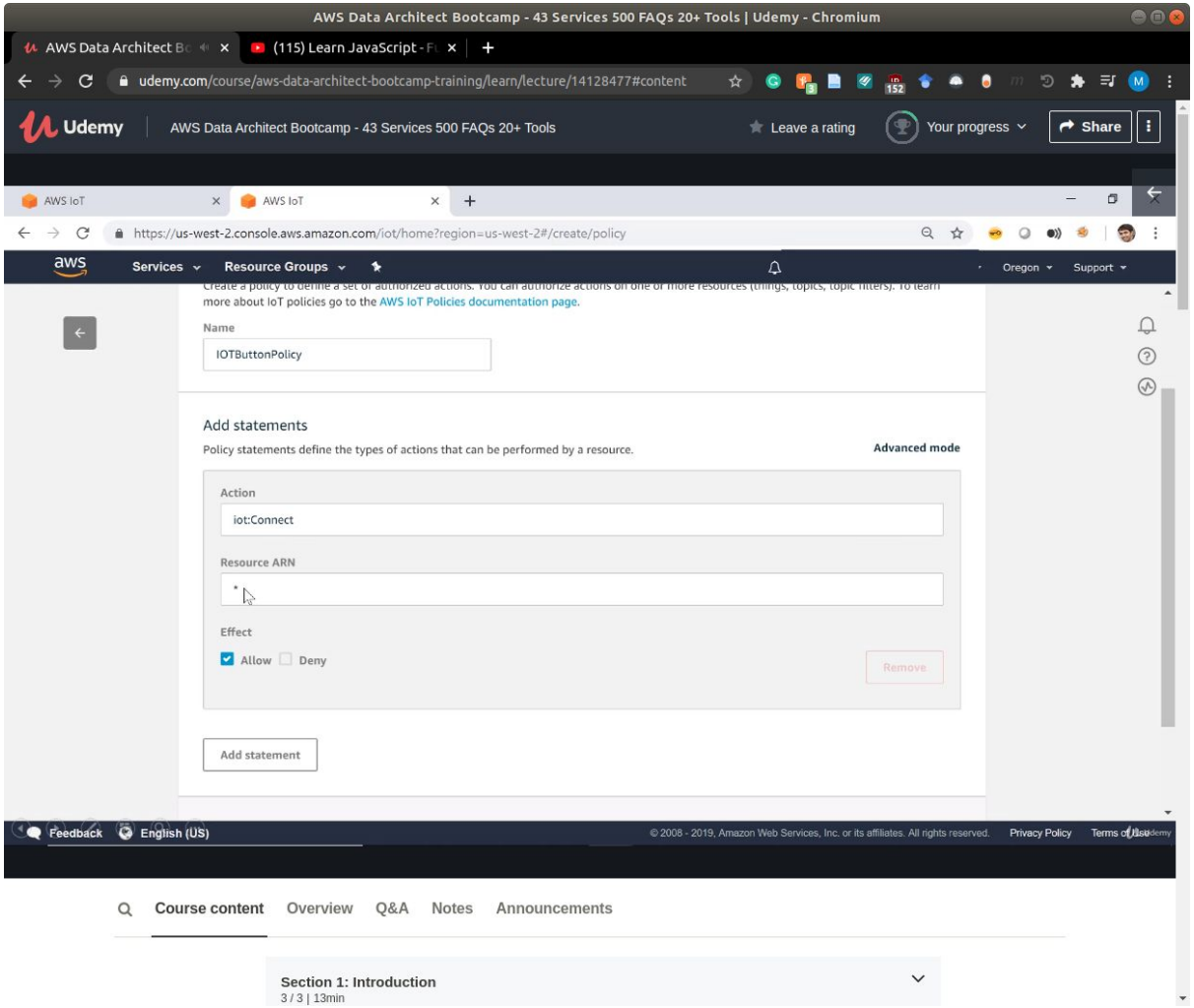

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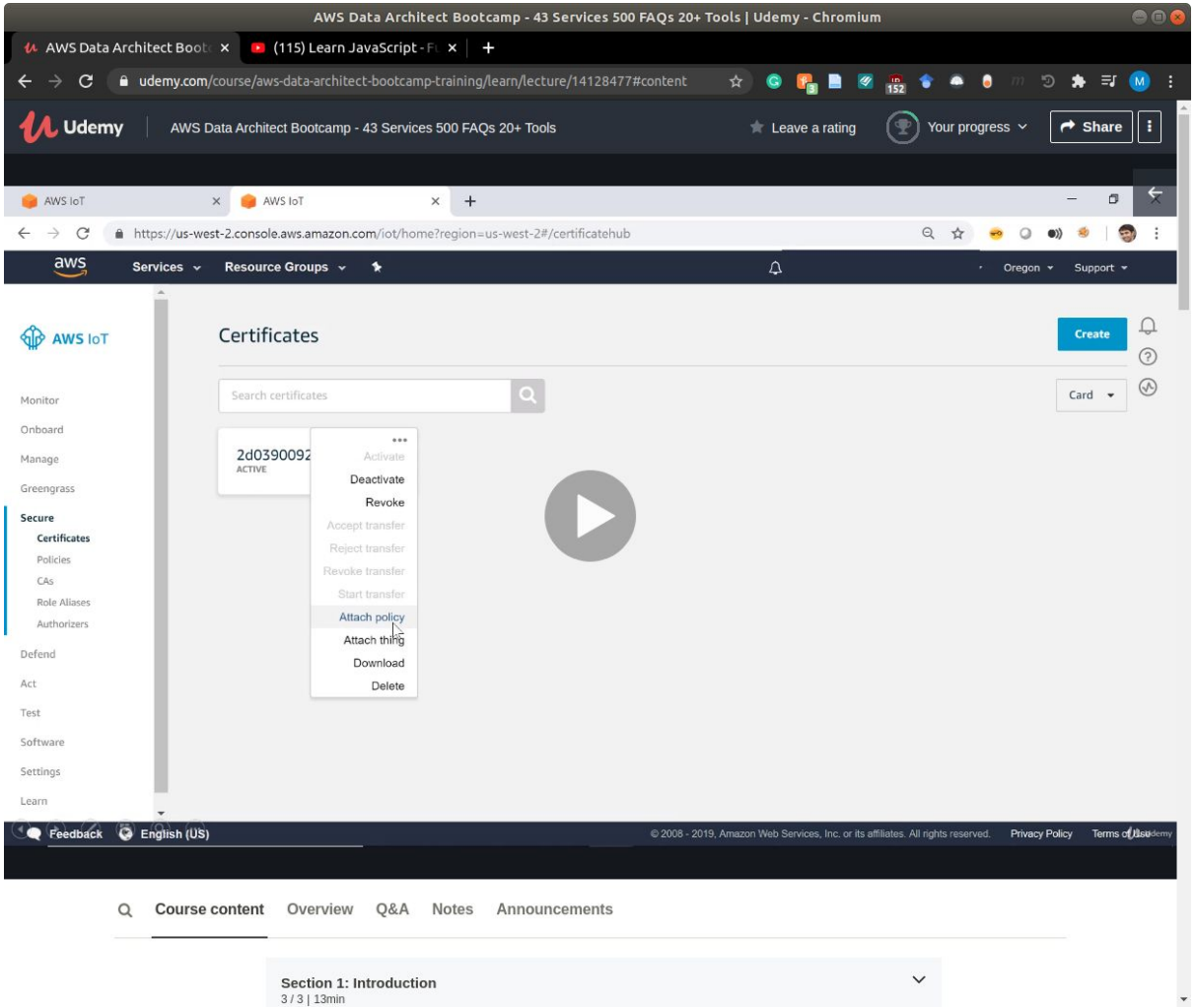
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https://us-west-2.console.aws.amazon.com/iot/home?region=us-west-2#/certificatehub
Services
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Oregon
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AWS IoT
Certificates
Create
Search certificates
Card
Monitor
Onboard
Manage
Greengrass
Secure
Certificates
Policies
CAs
Role Aliases
Authorizers
Defend
Act
Test
Software
Settings
Learn
2d0390092
ACTIVE
Activate
Deactivate
Revoke
Accept transfer
Reject transfer
Revoke transfer
Start transfer
Attach policy
Attach thing
Download
Delete
Feedback
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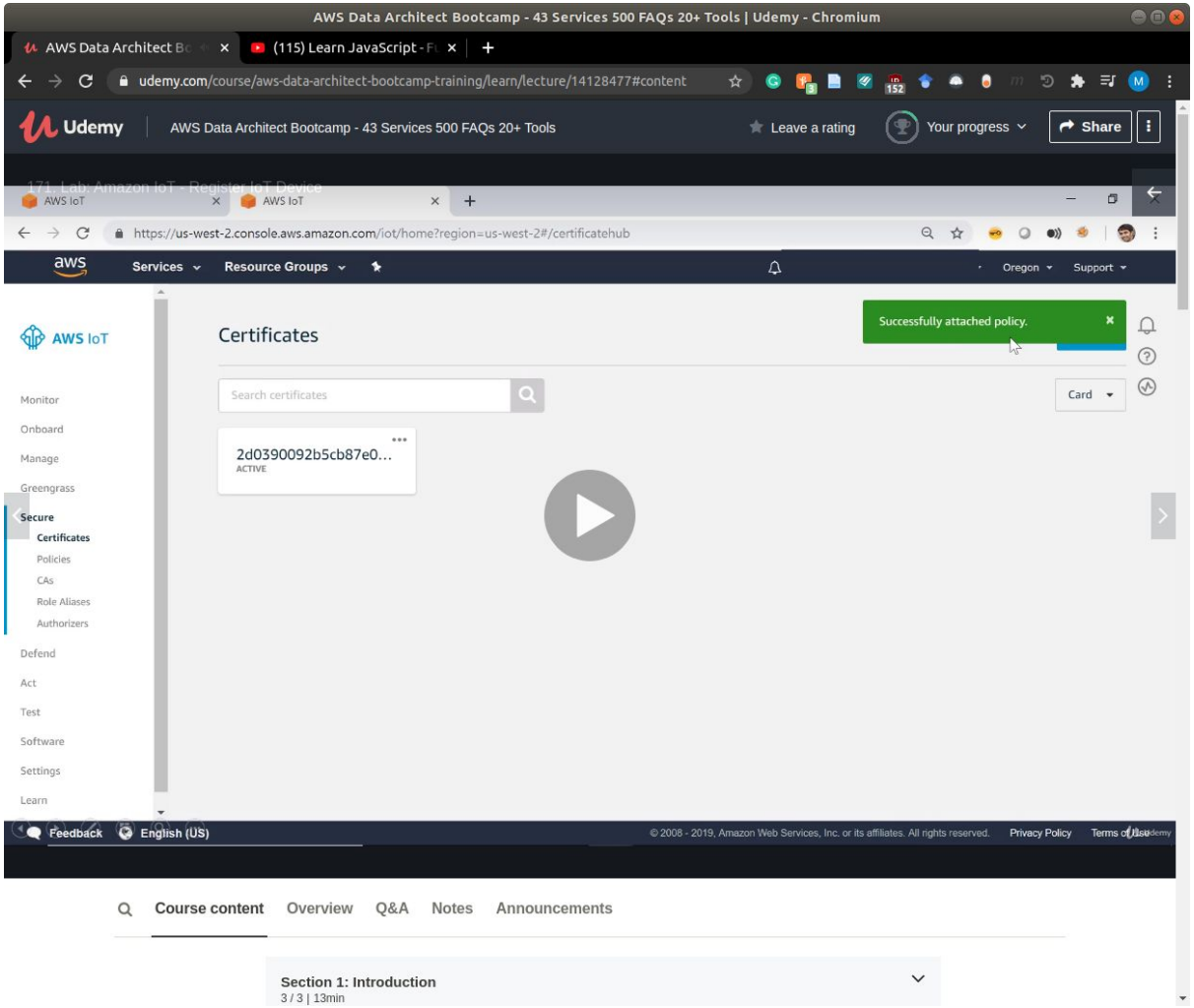
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171. Lab: Amazon IoT - Register IoT Device
https://us-west-2.console.aws.amazon.com/iot/home?region=us-west-2#/certificatehub
Services
Resource Groups
Oregon
Support
AWS IoT
Certificates
Successfully attached policy.
Search certificates
Card
2d0390092b5cb87e0...
ACTIVE
Monitor
Onboard
Manage
Greengrass
Secure
Certificates
Policies
CAs
Role Aliases
Authorizers
Defend
Act
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Software
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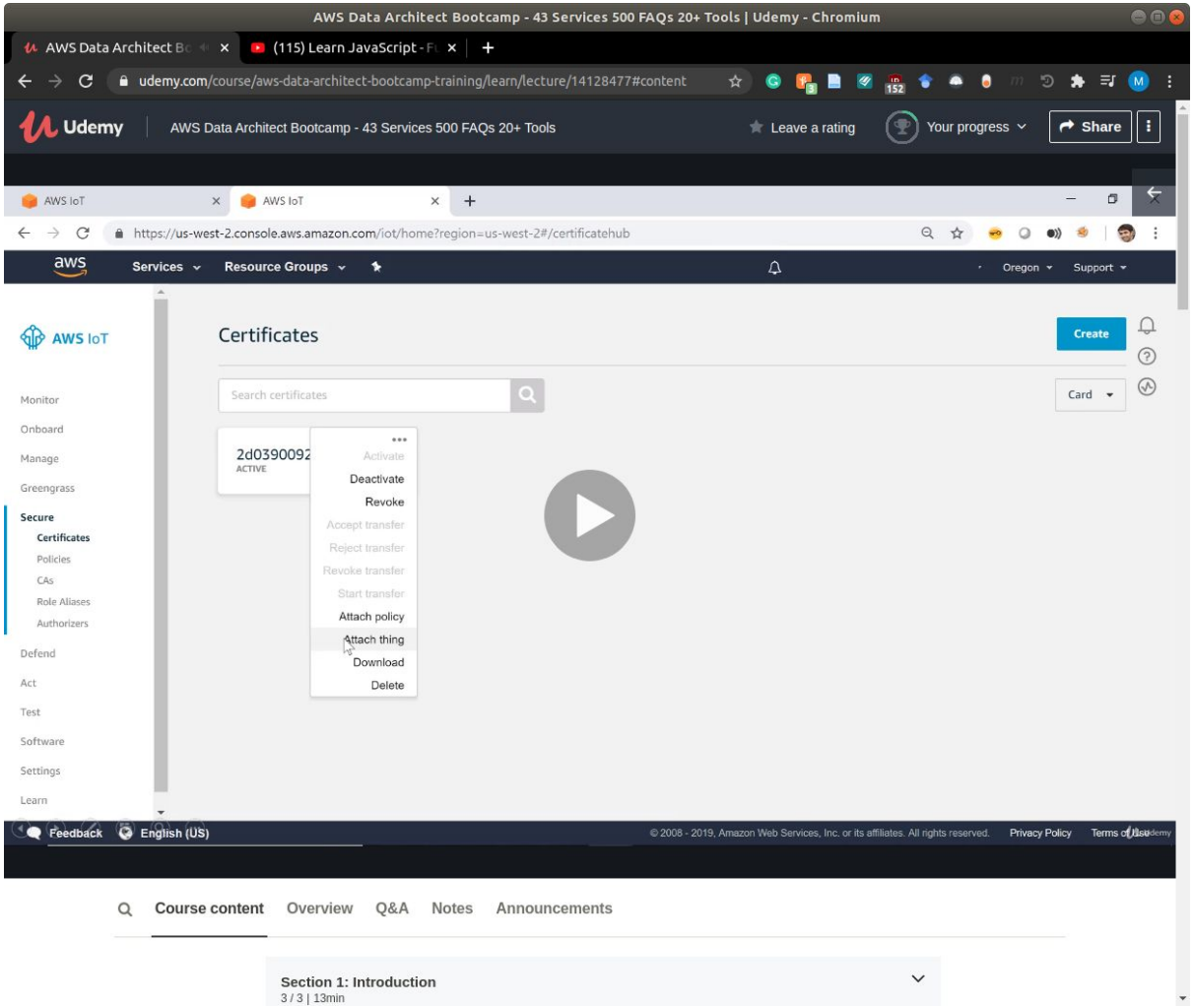
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Support
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Certificates
Create
Search certificates
Card
Monitor
Onboard
Manage
Greengrass
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Certificates
Policies
CAs
Role Aliases
Authorizers
Defend
Act
Test
Software
Settings
Learn
2d0390092
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Activate
Deactivate
Revoke
Accept transfer
Reject transfer
Revoke transfer
Start transfer
Attach policy
Attach thing
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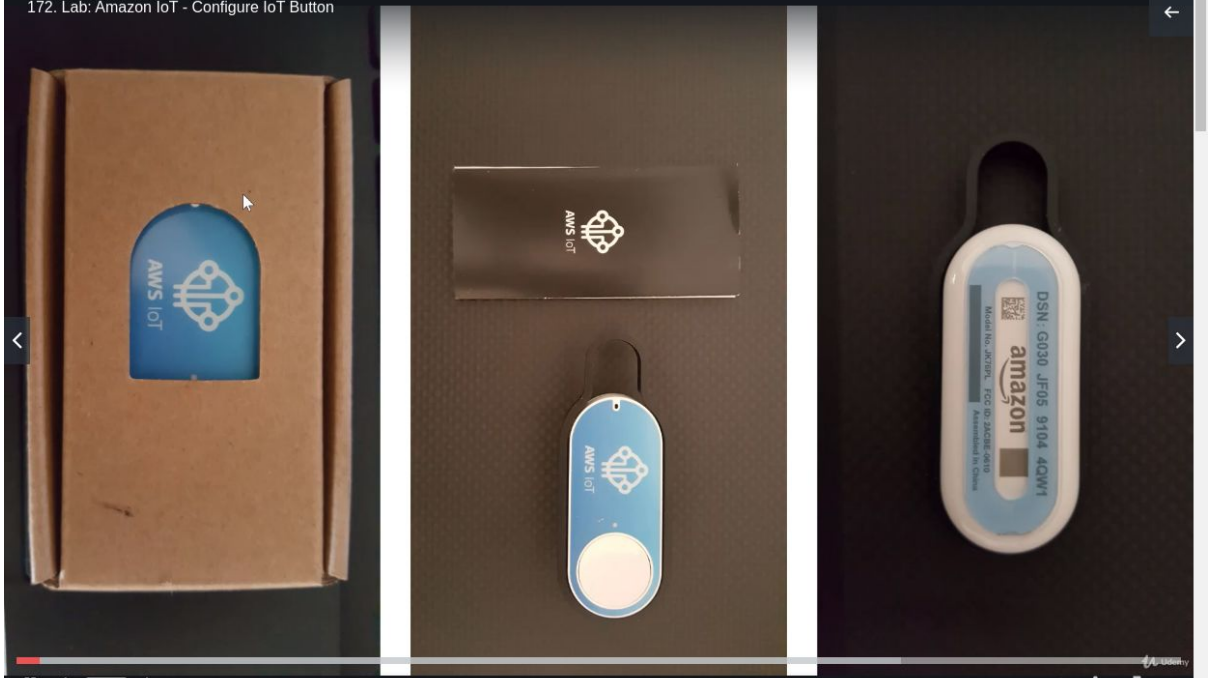
172. Lab: Amazon IoT - Configure IoT Button



1.5× 0:11 / 9:20

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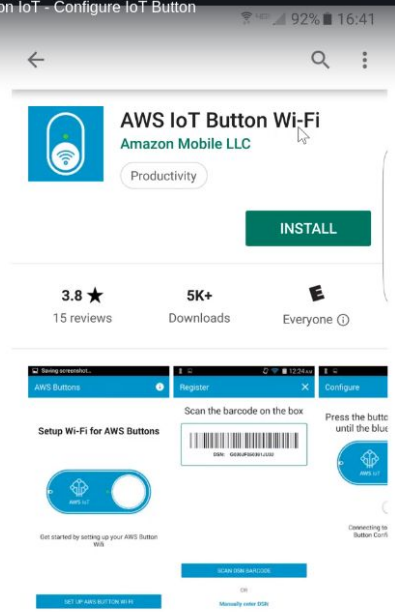

Configure Wi-Fi for AWS IoT Buttons

1.5× 1:53 / 9:20

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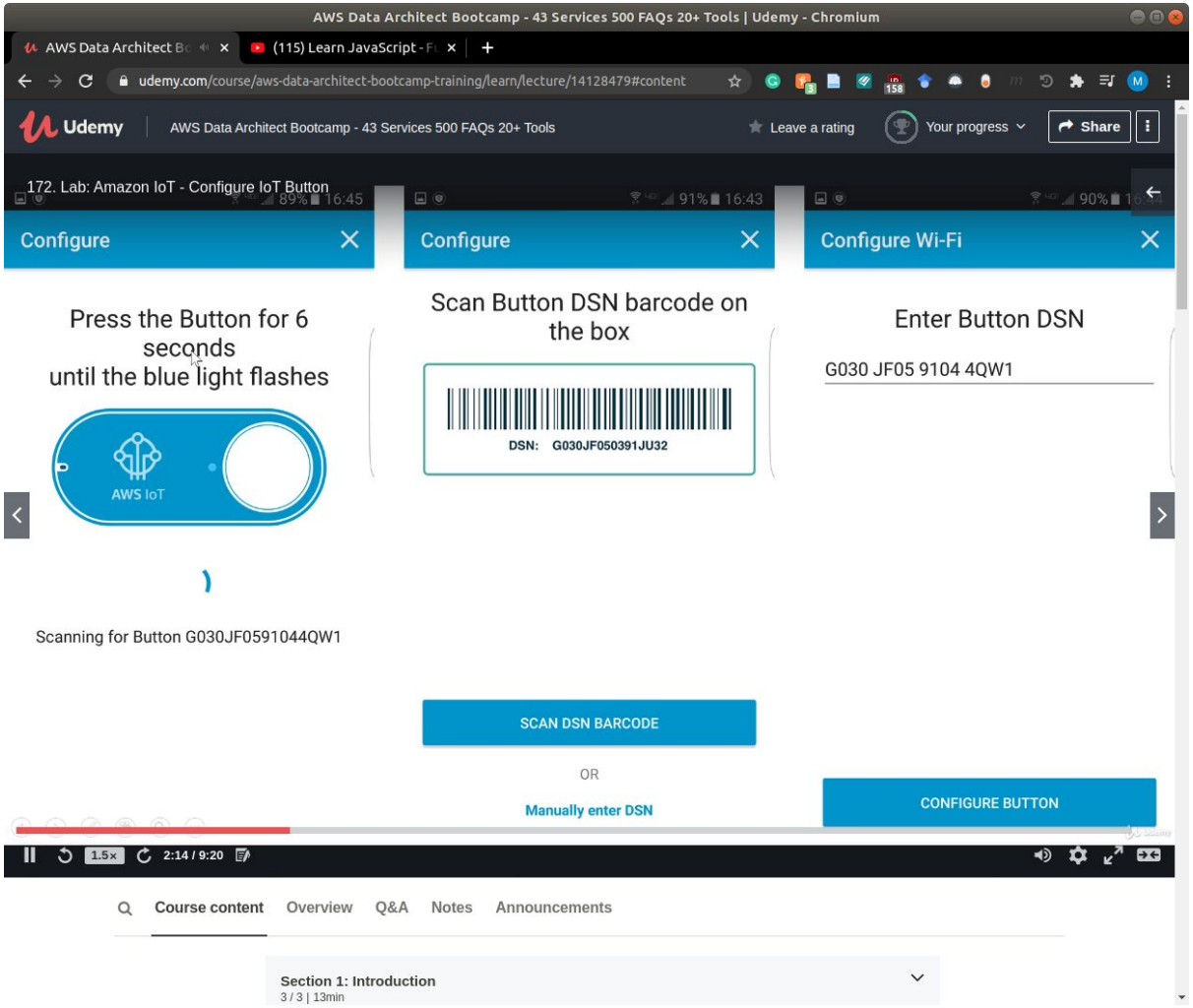
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172. Lab: Amazon IoT - Configure IoT Button
Configure
Press the Button for 6 seconds until the blue light flashes
AWS IoT
Scanning for Button G030JF0591044QW1
Configure
Scan Button DSN barcode on the box
DSN: G030JF050391JU32
SCAN DSN BARCODE
OR
Manually enter DSN
Configure Wi-Fi
Enter Button DSN
G030 JF05 9104 4QW1
CONFIGURE BUTTON
1.5×
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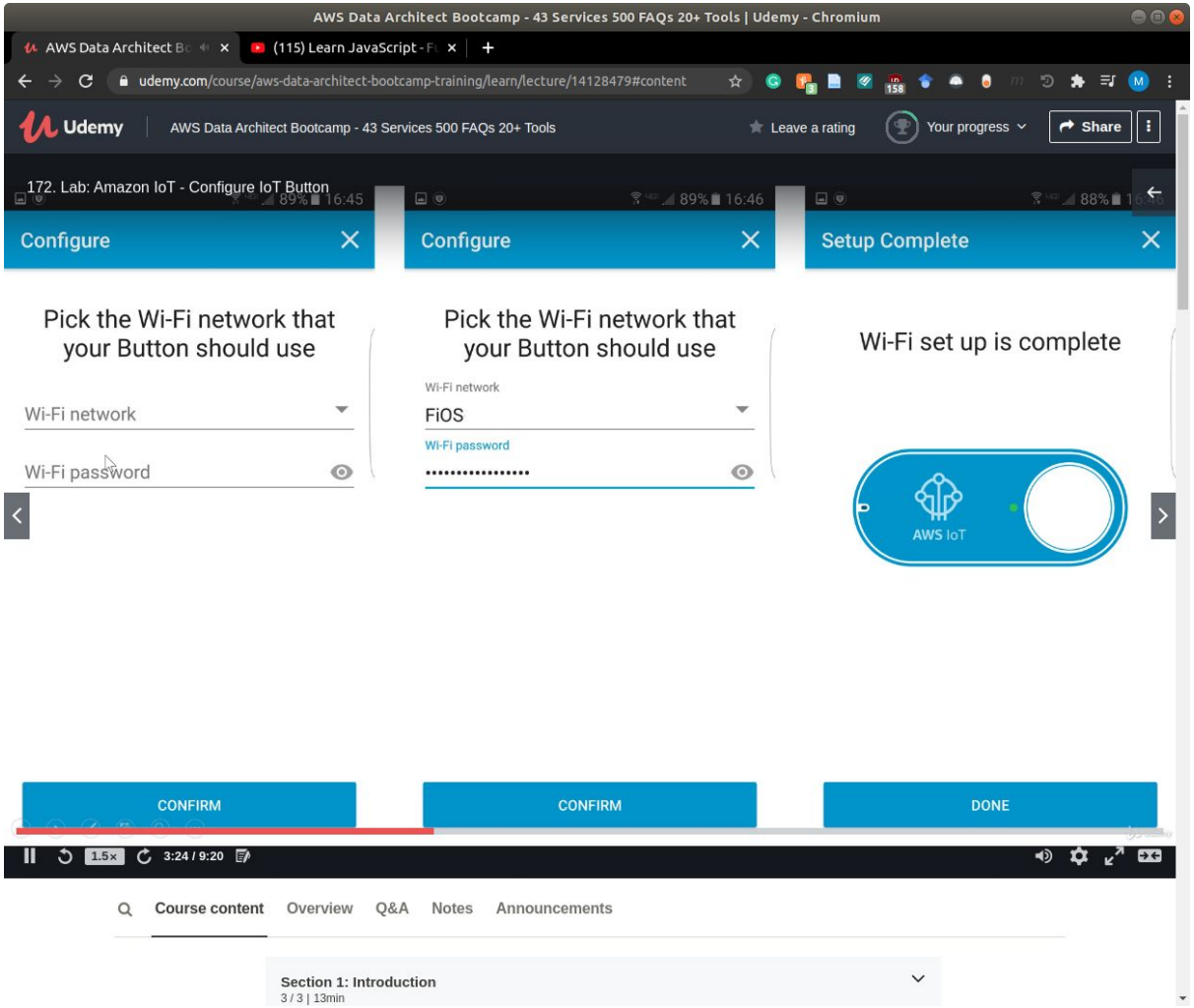
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172. Lab: Amazon IoT - Configure IoT Button
Configure
Pick the Wi-Fi network that your Button should use
Wi-Fi network
Wi-Fi password
CONFIRM
Configure
Pick the Wi-Fi network that your Button should use
Wi-Fi network
FiOS
Wi-Fi password
CONFIRM
Setup Complete
Wi-Fi set up is complete
AWS IoT
DONE
1.5×
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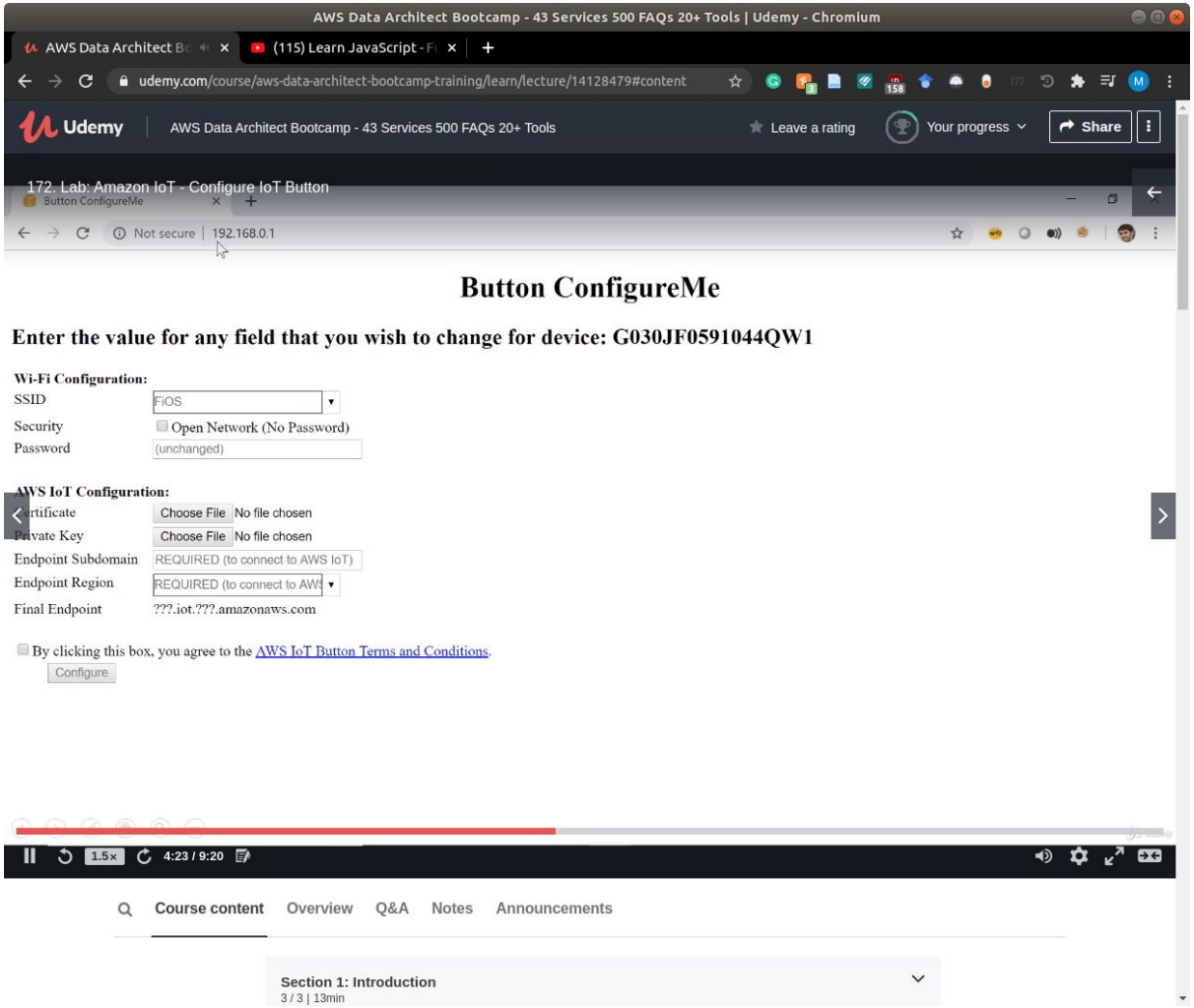
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172. Lab: Amazon IoT - Configure IoT Button
Not secure | 192.168.0.1
Button ConfigureMe
Enter the value for any field that you wish to change for device: G030JF0591044QW1
Wi-Fi Configuration:
SSID
FiOS
Security
Open Network (No Password)
Password
(unchanged)
AWS IoT Configuration:
Choose File
No file chosen
Private Key
Endpoint Subdomain
REQUIRED (to connect to AWS IoT)
Endpoint Region
Final Endpoint
???.iot.???.amazonaws.com
By clicking this box, you agree to the AWS IoT Button Terms and Conditions.
Configure
1.5×
4:23 / 9:20
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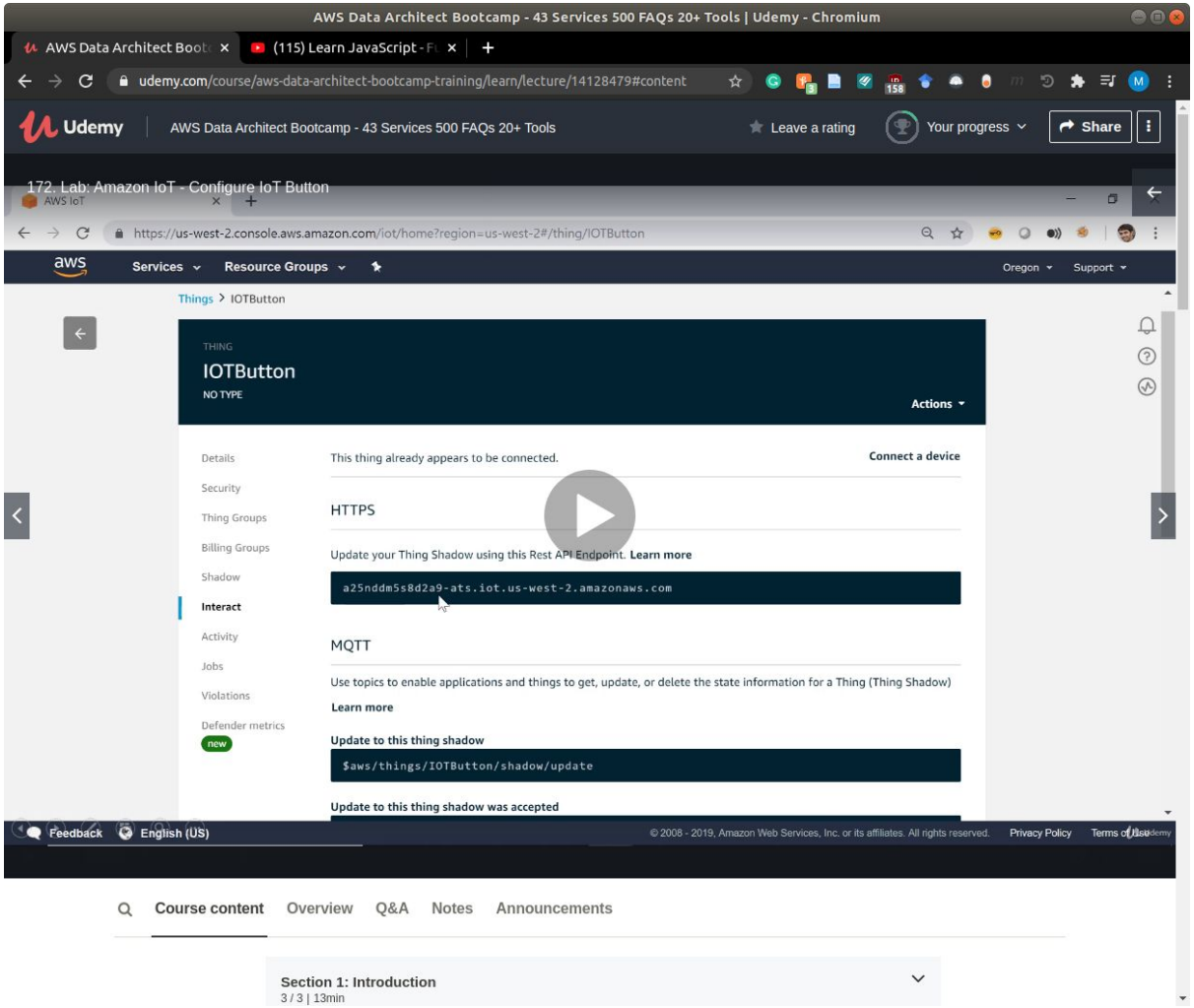
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172. Lab: Amazon IoT - Configure IoT Button
https://us-west-2.console.aws.amazon.com/iot/home?region=us-west-2#/thing/IOTButton
Services
Resource Groups
Oregon
Support
Things > IOTButton
THING
IOTButton
NO TYPE
Actions
Details
Security
Thing Groups
Billing Groups
Shadow
Interact
Activity
Jobs
Violations
Defender metrics
new
This thing already appears to be connected.
Connect a device
HTTPS
Update your Thing Shadow using this Rest API Endpoint. Learn more
a25nddm5s8d2a9-ats.iot.us-west-2.amazonaws.com
MQTT
Use topics to enable applications and things to get, update, or delete the state information for a Thing (Thing Shadow)
Learn more
Update to this thing shadow
$aws/things/IOTButton/shadow/update
Update to this thing shadow was accepted
Feedback
English (US)
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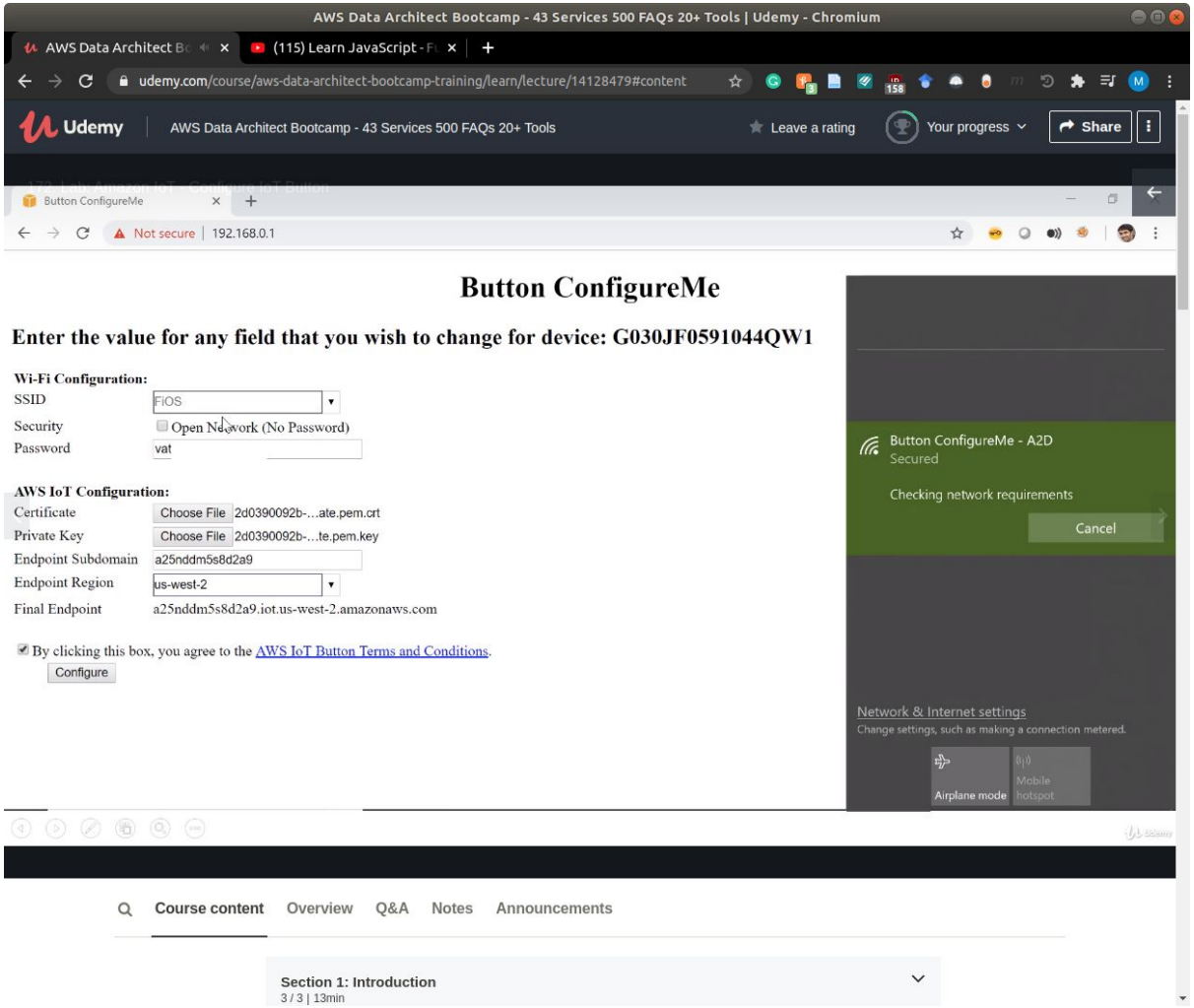
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Button ConfigureMe
Not secure | 192.168.0.1
Button ConfigureMe
Enter the value for any field that you wish to change for device: G030JF0591044QW1
Wi-Fi Configuration:
SSID
FiOS
Security
Open Network (No Password)
Password
vat
AWS IoT Configuration:
Certificate
Choose File
2d0390092b-…ate.pem.crt
Private Key
Choose File
2d0390092b-…te.pem.key
Endpoint Subdomain
a25nddm5s8d2a9
Endpoint Region
us-west-2
Final Endpoint
a25nddm5s8d2a9.iot.us-west-2.amazonaws.com
By clicking this box, you agree to the AWS IoT Button Terms and Conditions.
Configure
Button ConfigureMe - A2D
Secured
Checking network requirements
Cancel
Network & Internet settings
Change settings, such as making a connection metered.
Airplane mode
Mobile hotspot
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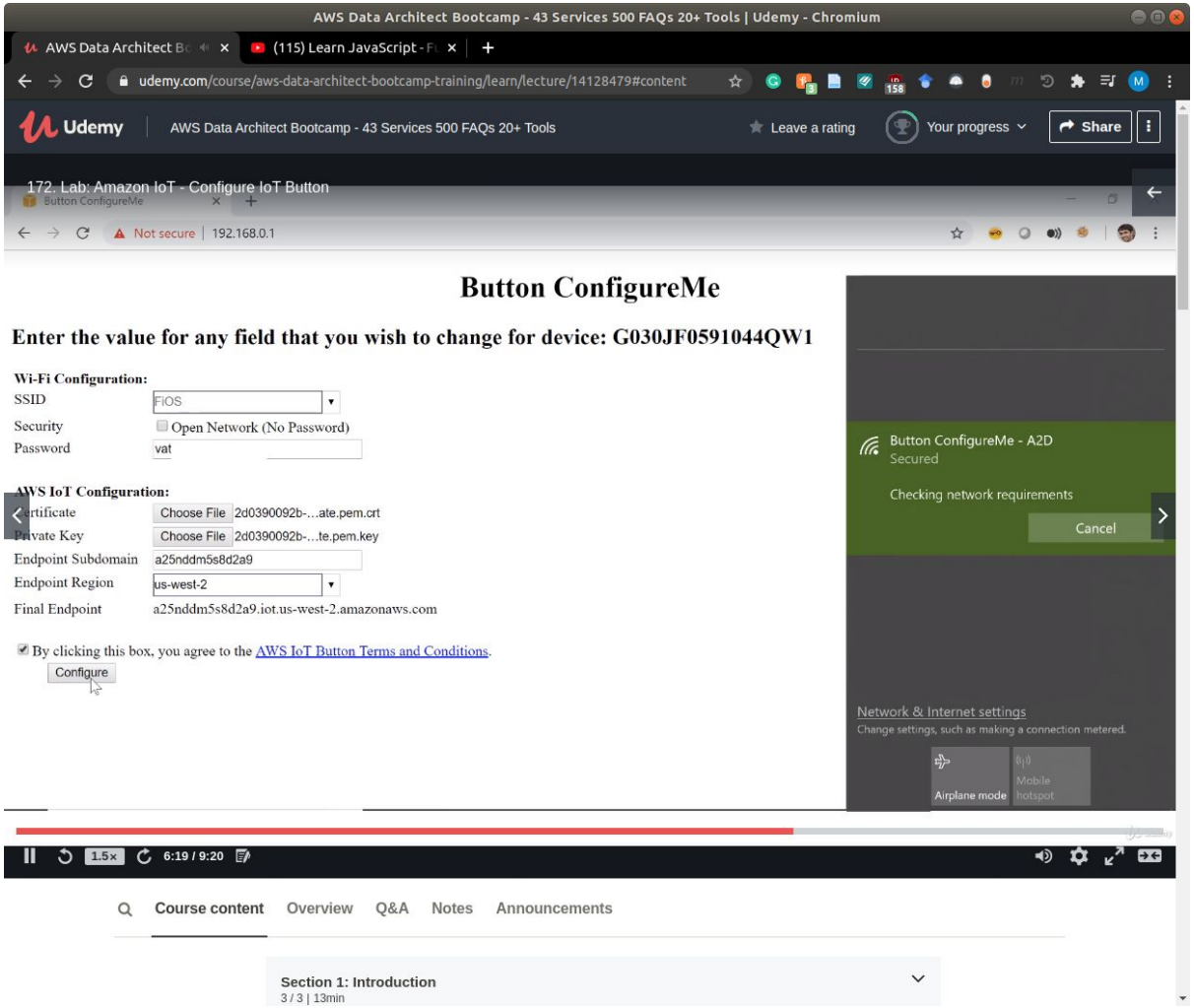
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172. Lab: Amazon IoT - Configure IoT Button
Not secure | 192.168.0.1
Button ConfigureMe
Enter the value for any field that you wish to change for device: G030JF0591044QW1
Wi-Fi Configuration:
SSID
FiOS
Security
Open Network (No Password)
Password
vat
AWS IoT Configuration:
Choose File
Choose File
Endpoint Subdomain
a25nddm5s8d2a9
Endpoint Region
us-west-2
Final Endpoint
a25nddm5s8d2a9.iot.us-west-2.amazonaws.com
By clicking this box, you agree to the AWS IoT Button Terms and Conditions.
Configure
Button ConfigureMe - A2D
Secured
Checking network requirements
Cancel
Network & Internet settings
Change settings, such as making a connection metered.
Airplane mode
Mobile hotspot
1.5×
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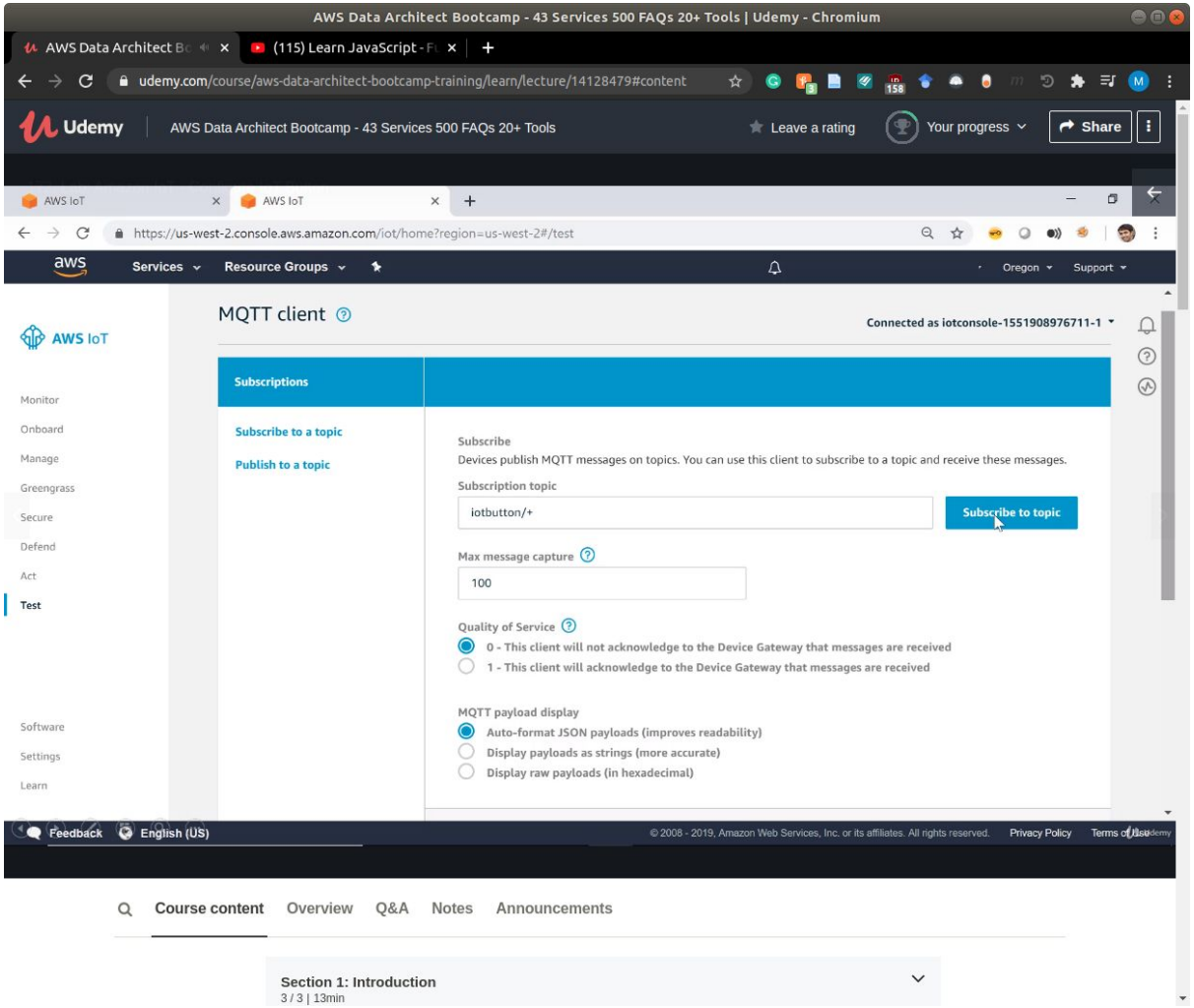
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Share
https://us-west-2.console.aws.amazon.com/iot/home?region=us-west-2#/test
Services
Resource Groups
Oregon
Support
AWS IoT
MQTT client
Connected as iotconsole-1551908976711-1
Monitor
Onboard
Manage
Greengrass
Secure
Defend
Act
Test
Software
Settings
Learn
Subscriptions
Subscribe to a topic
Publish to a topic
Subscribe
Devices publish MQTT messages on topics. You can use this client to subscribe to a topic and receive these messages.
Subscription topic
iotbutton/+
Subscribe to topic
Max message capture
100
Quality of Service
0 - This client will not acknowledge to the Device Gateway that messages are received
1 - This client will acknowledge to the Device Gateway that messages are received
MQTT payload display
Auto-format JSON payloads (improves readability)
Display payloads as strings (more accurate)
Display raw payloads (in hexadecimal)
Feedback
English (US)
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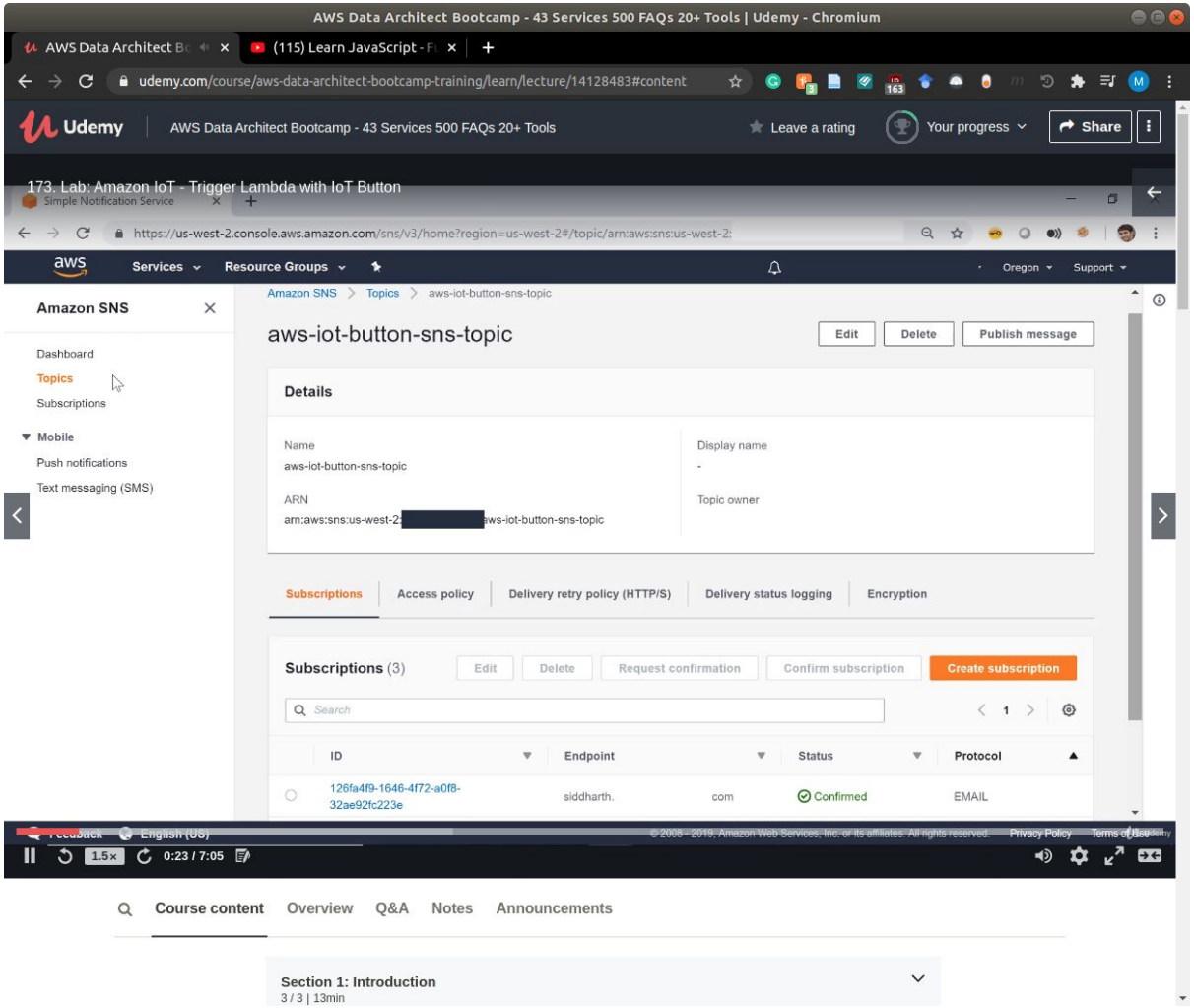
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173. Lab: Amazon IoT - Trigger Lambda with IoT Button
Simple Notification Service
https://us-west-2.console.aws.amazon.com/sns/v3/home?region=us-west-2#/topic/arn:aws:sns:us-west-2:
aws
Services
Resource Groups
Oregon
Support
Amazon SNS
Dashboard
Topics
Subscriptions
Mobile
Push notifications
Text messaging (SMS)
Amazon SNS > Topics > aws-iot-button-sns-topic
aws-iot-button-sns-topic
Edit
Delete
Publish message
Details
Name
aws-iot-button-sns-topic
Display name
-
ARN
arn:aws:sns:us-west-2:[redacted]:aws-iot-button-sns-topic
Topic owner
Subscriptions
Access policy
Delivery retry policy (HTTP/S)
Delivery status logging
Encryption
Subscriptions (3)
Edit
Delete
Request confirmation
Confirm subscription
Create subscription
Search
1
ID
Endpoint
Status
Protocol
126fa4f9-1646-4f72-a0f8-32ae92fc223e
siddharth. com
Confirmed
EMAIL
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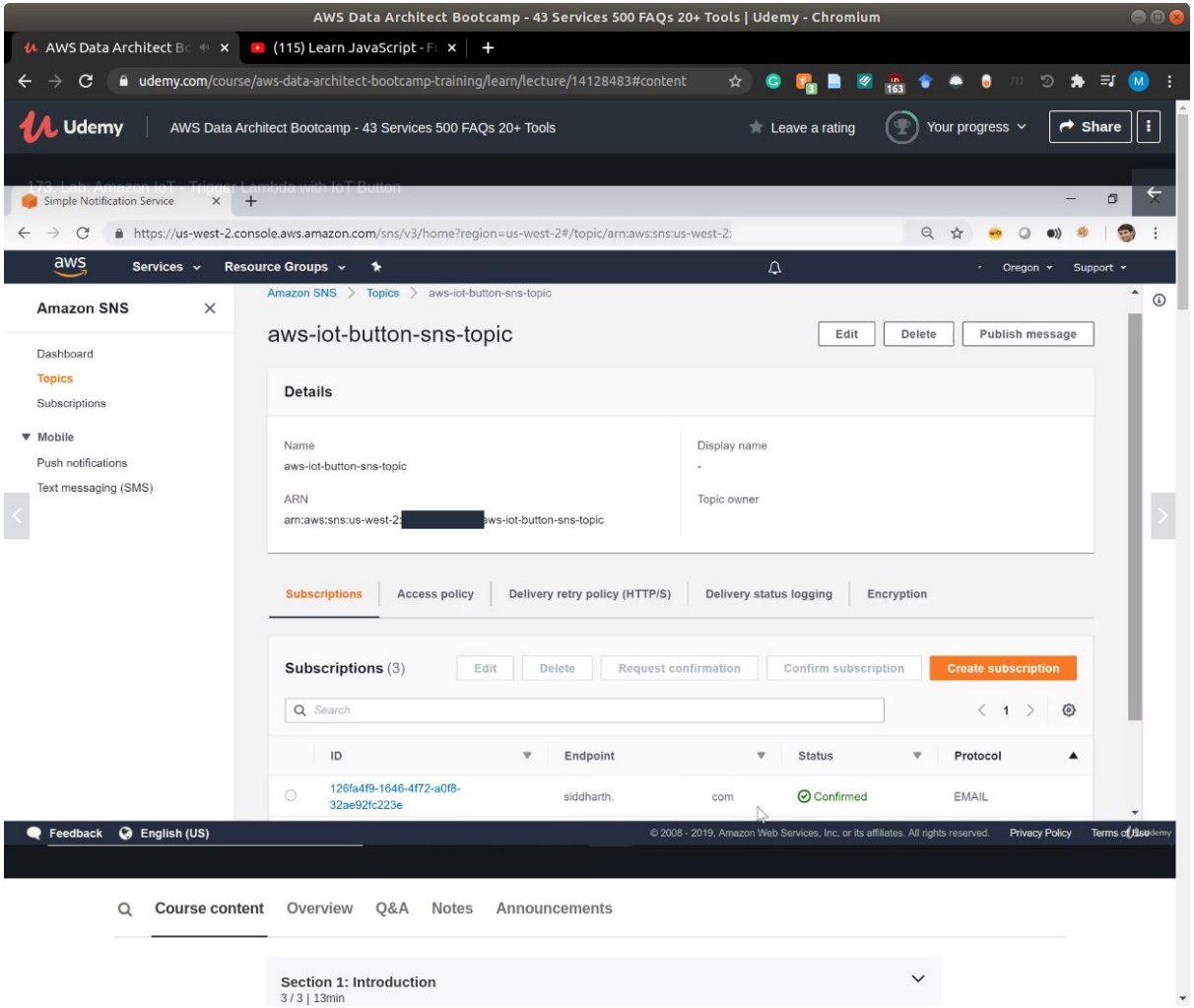
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https://us-west-2.console.aws.amazon.com/sns/v3/home?region=us-west-2#/topic/arn:aws:sns:us-west-2:
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Resource Groups
Oregon
Support
Amazon SNS
Dashboard
Topics
Subscriptions
Mobile
Push notifications
Text messaging (SMS)
Amazon SNS > Topics > aws-iot-button-sns-topic
aws-iot-button-sns-topic
Edit
Delete
Publish message
Details
Name
aws-iot-button-sns-topic
Display name
-
ARN
arn:aws:sns:us-west-2:[redacted]:aws-iot-button-sns-topic
Topic owner
Subscriptions
Access policy
Delivery retry policy (HTTP/S)
Delivery status logging
Encryption
Subscriptions (3)
Edit
Delete
Request confirmation
Confirm subscription
Create subscription
Search
1
ID
Endpoint
Status
Protocol
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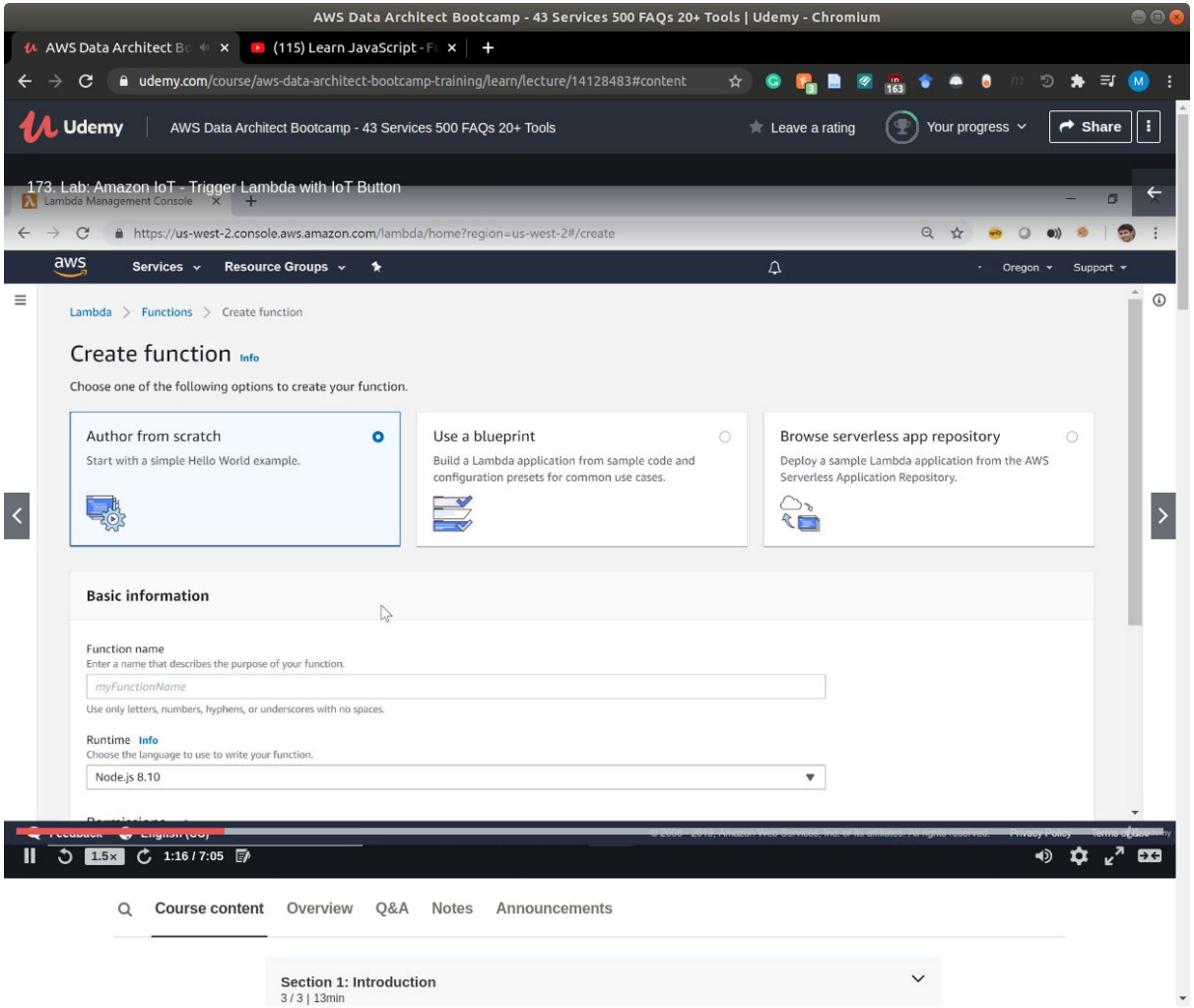
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173. Lab: Amazon IoT - Trigger Lambda with IoT Button
https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/create
Services
Resource Groups
Oregon
Support
Lambda > Functions > Create function
Create function Info
Choose one of the following options to create your function.
Author from scratch
Start with a simple Hello World example.
Use a blueprint
Build a Lambda application from sample code and configuration presets for common use cases.
Browse serverless app repository
Deploy a sample Lambda application from the AWS Serverless Application Repository.
Basic information
Function name
Enter a name that describes the purpose of your function.
myFunctionName
Use only letters, numbers, hyphens, or underscores with no spaces.
Runtime Info
Choose the language to use to write your function.
Node.js 8.10
1.5×
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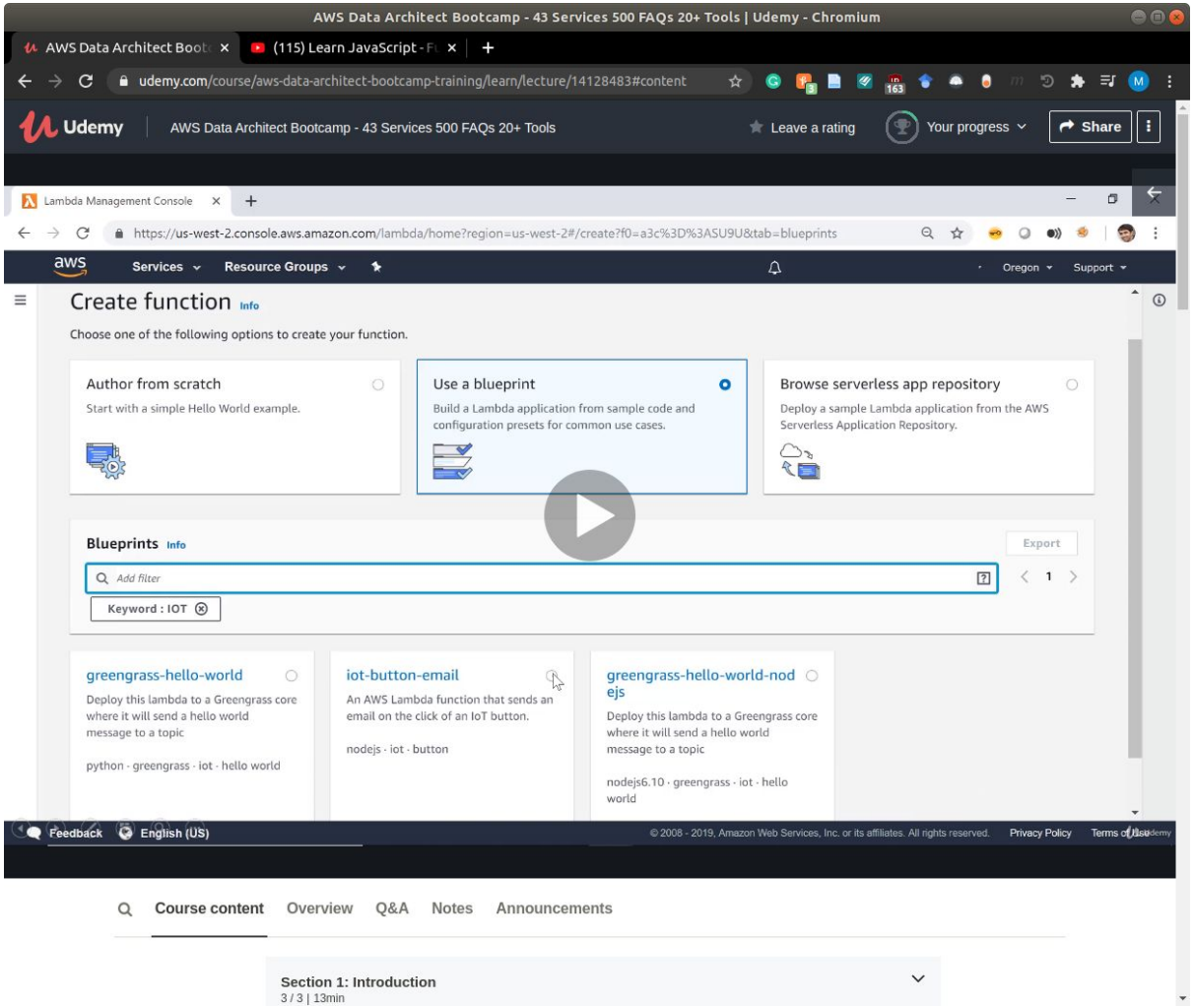
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Share
Lambda Management Console
https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/create?f0=a3c%3D%3ASU9U&tab=blueprints
Services
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Support
Create function Info
Choose one of the following options to create your function.
Author from scratch
Start with a simple Hello World example.
Use a blueprint
Build a Lambda application from sample code and configuration presets for common use cases.
Browse serverless app repository
Deploy a sample Lambda application from the AWS Serverless Application Repository.
Blueprints Info
Export
Add filter
Keyword : IOT
greengrass-hello-world
Deploy this lambda to a Greengrass core where it will send a hello world message to a topic
python · greengrass · iot · hello world
iot-button-email
An AWS Lambda function that sends an email on the click of an IoT button.
nodejs · iot · button
greengrass-hello-world-nodejs
Deploy this lambda to a Greengrass core where it will send a hello world message to a topic
nodejs6.10 · greengrass · iot · hello world
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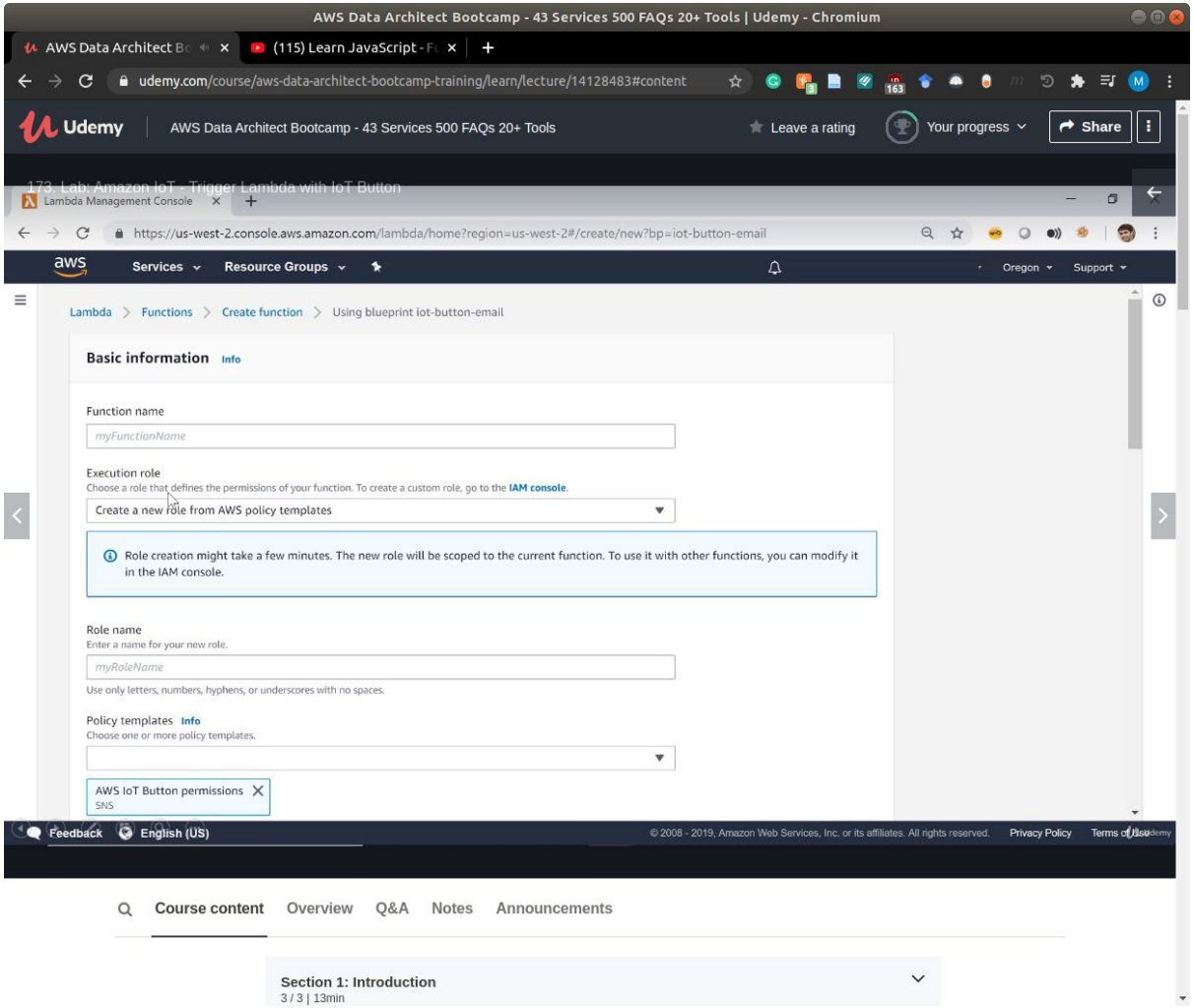
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https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/create/new?bp=iot-button-email
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Resource Groups
Oregon
Support
Lambda > Functions > Create function > Using blueprint iot-button-email
Basic information Info
Function name
myFunctionName
Execution role
Choose a role that defines the permissions of your function. To create a custom role, go to the IAM console.
Create a new role from AWS policy templates
Role creation might take a few minutes. The new role will be scoped to the current function. To use it with other functions, you can modify it in the IAM console.
Role name
Enter a name for your new role.
myRoleName
Use only letters, numbers, hyphens, or underscores with no spaces.
Policy templates Info
Choose one or more policy templates.
AWS IoT Button permissions
SNS
Feedback
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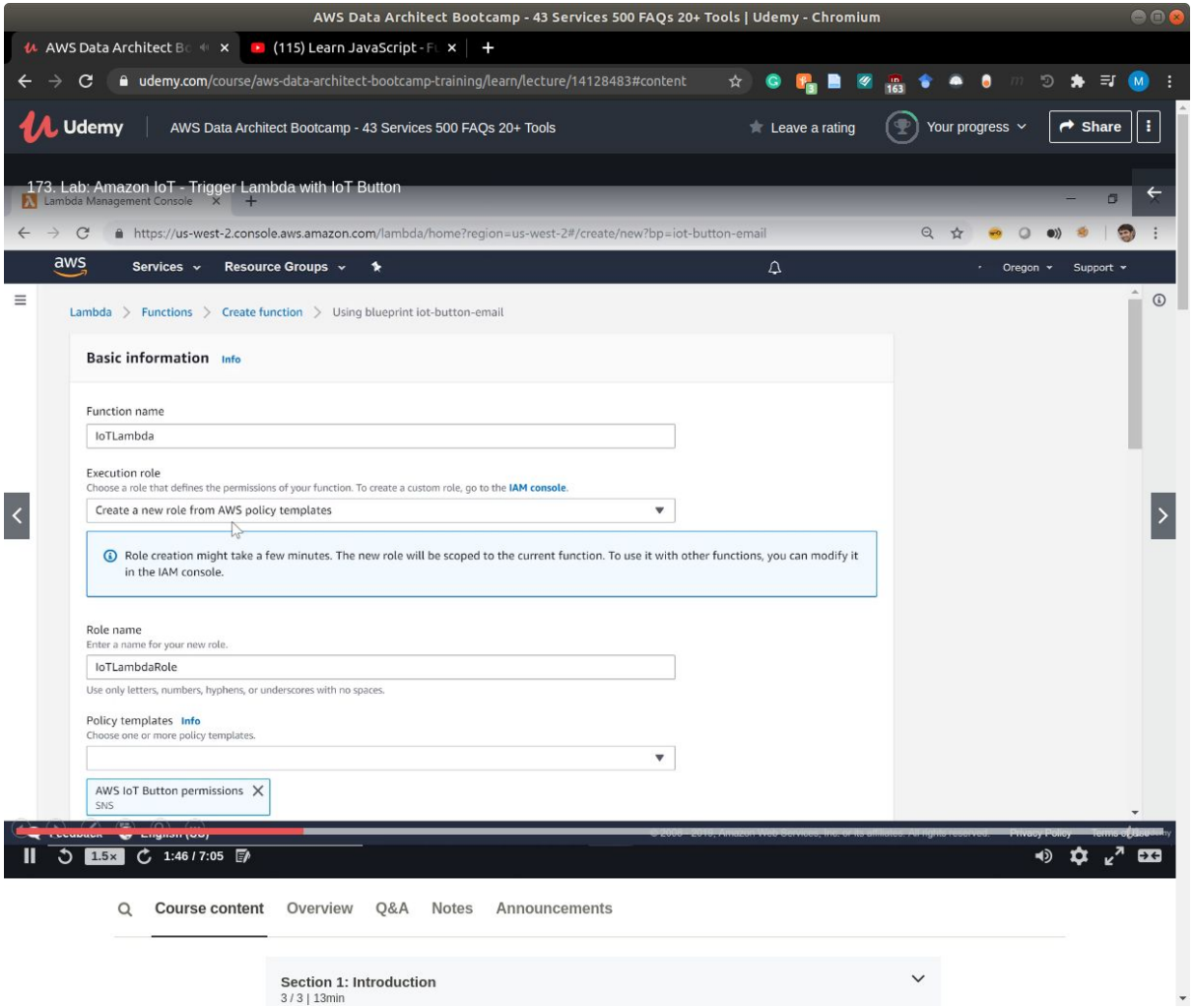
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Support
Lambda > Functions > Create function > Using blueprint iot-button-email
Basic information Info
Function name
IoTLambda
Execution role
Choose a role that defines the permissions of your function. To create a custom role, go to the IAM console.
Create a new role from AWS policy templates
Role creation might take a few minutes. The new role will be scoped to the current function. To use it with other functions, you can modify it in the IAM console.
Role name
Enter a name for your new role.
IoTLambdaRole
Use only letters, numbers, hyphens, or underscores with no spaces.
Policy templates Info
Choose one or more policy templates.
AWS IoT Button permissions
SNS
1.5×
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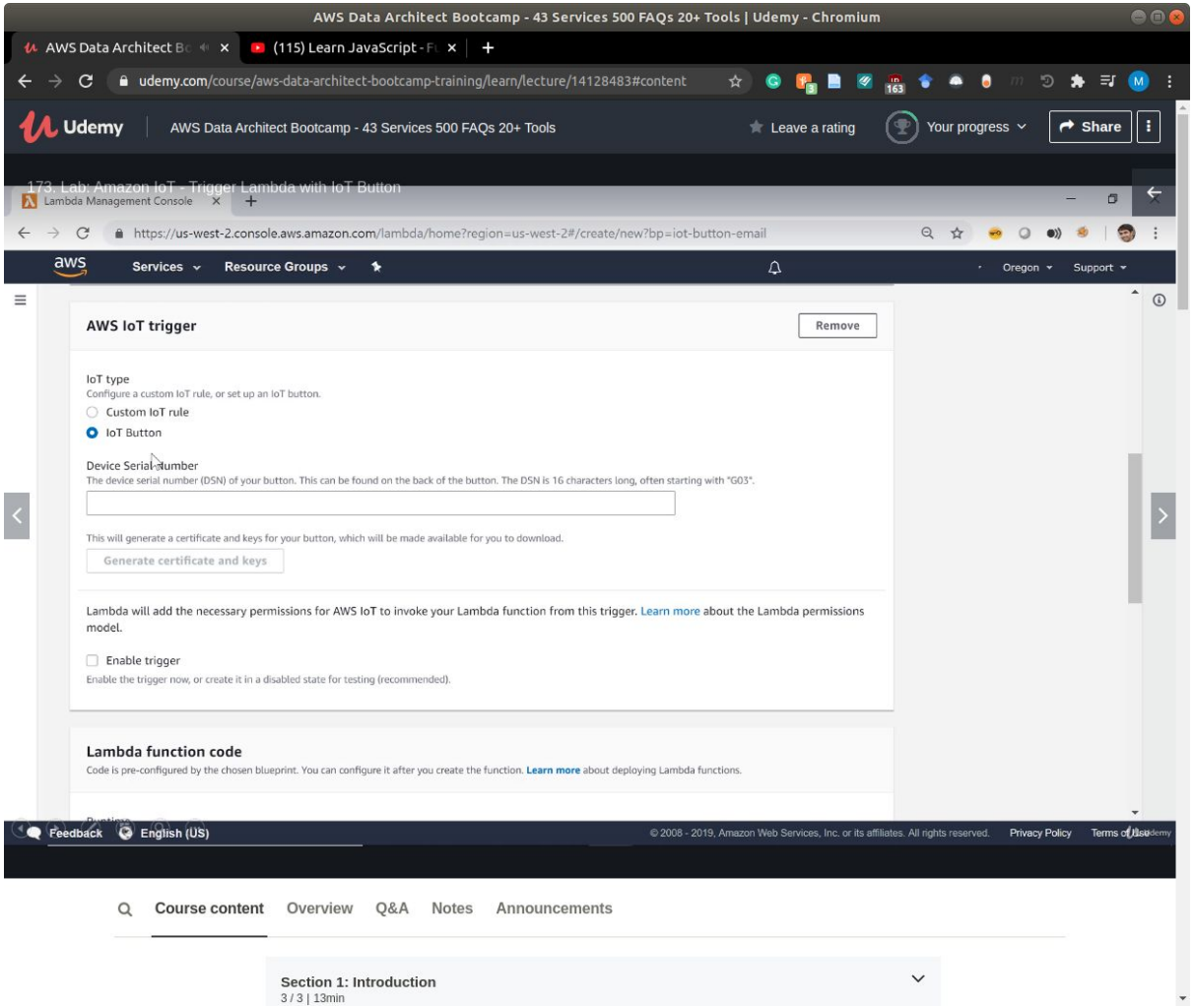
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AWS IoT trigger
Remove
IoT type
Configure a custom IoT rule, or set up an IoT button.
Custom IoT rule
IoT Button
Device Serial number
The device serial number (DSN) of your button. This can be found on the back of the button. The DSN is 16 characters long, often starting with "G03".
This will generate a certificate and keys for your button, which will be made available for you to download.
Generate certificate and keys
Lambda will add the necessary permissions for AWS IoT to invoke your Lambda function from this trigger. Learn more about the Lambda permissions model.
Enable trigger
Enable the trigger now, or create it in a disabled state for testing (recommended).
Lambda function code
Code is pre-configured by the chosen blueprint. You can configure it after you create the function. Learn more about deploying Lambda functions.
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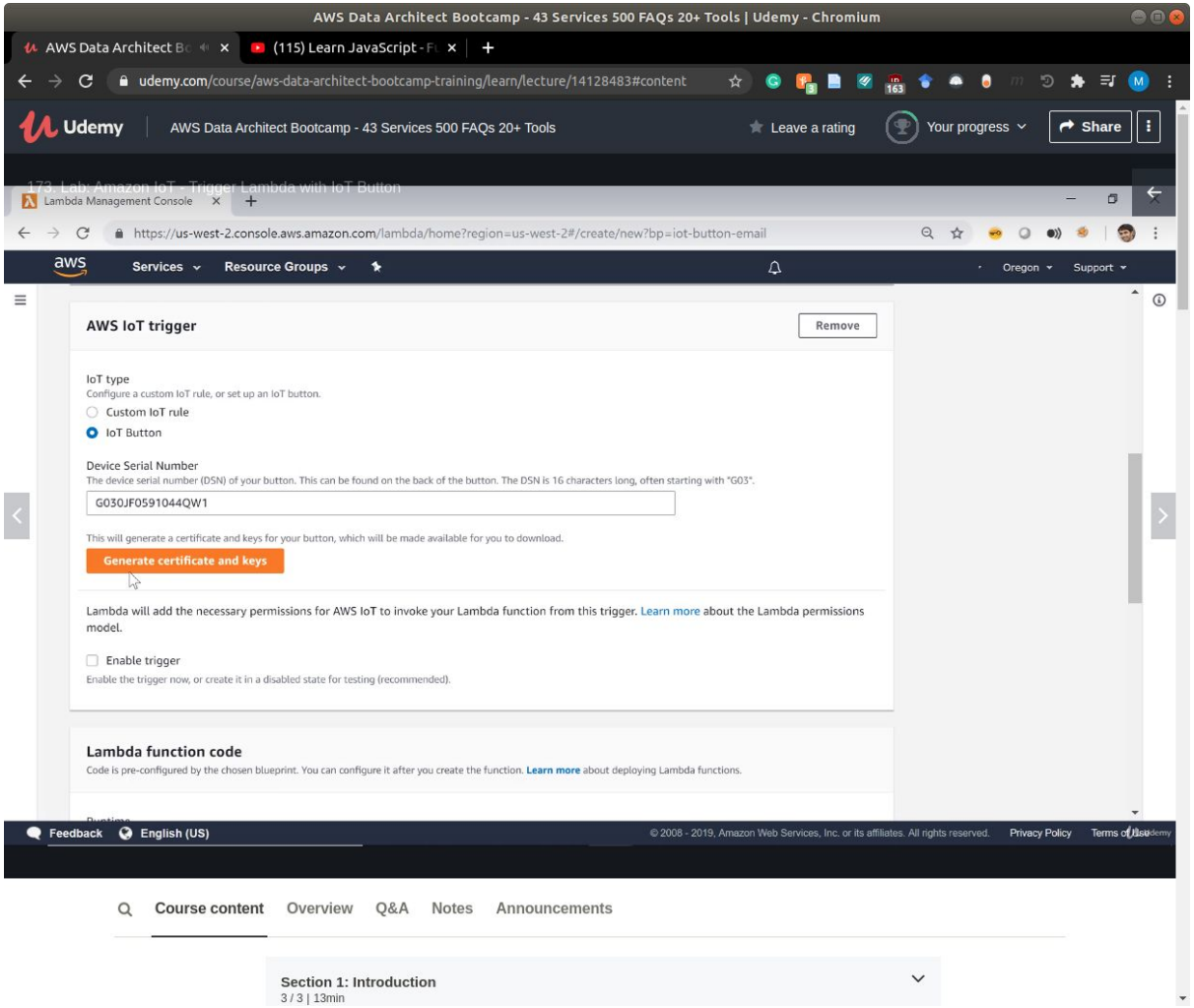
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Remove
IoT type
Configure a custom IoT rule, or set up an IoT button.
Custom IoT rule
IoT Button
Device Serial Number
The device serial number (DSN) of your button. This can be found on the back of the button. The DSN is 16 characters long, often starting with "G03".
G030JF0591044QW1
This will generate a certificate and keys for your button, which will be made available for you to download.
Generate certificate and keys
Lambda will add the necessary permissions for AWS IoT to invoke your Lambda function from this trigger. Learn more about the Lambda permissions model.
Enable trigger
Enable the trigger now, or create it in a disabled state for testing (recommended).
Lambda function code
Code is pre-configured by the chosen blueprint. You can configure it after you create the function. Learn more about deploying Lambda functions.
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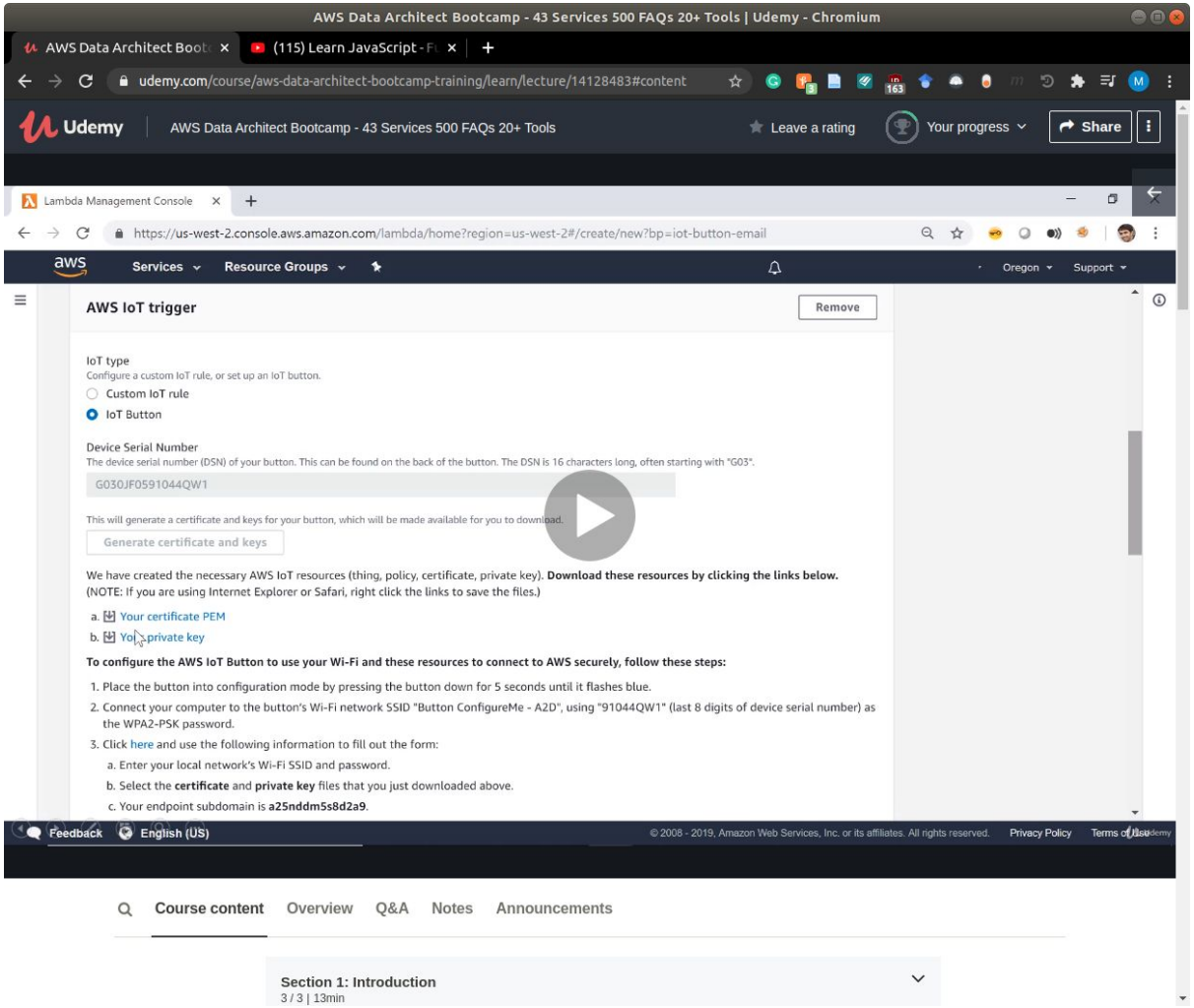
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Configure a custom IoT rule, or set up an IoT button.
Custom IoT rule
IoT Button
Device Serial Number
The device serial number (DSN) of your button. This can be found on the back of the button. The DSN is 16 characters long, often starting with "G03".
G030JF0591044QW1
This will generate a certificate and keys for your button, which will be made available for you to download.
Generate certificate and keys
We have created the necessary AWS IoT resources (thing, policy, certificate, private key). Download these resources by clicking the links below.
(NOTE: If you are using Internet Explorer or Safari, right click the links to save the files.)
a. Your certificate PEM
b. Your private key
To configure the AWS IoT Button to use your Wi-Fi and these resources to connect to AWS securely, follow these steps:
1. Place the button into configuration mode by pressing the button down for 5 seconds until it flashes blue.
2. Connect your computer to the button's Wi-Fi network SSID "Button ConfigureMe - A2D", using "91044QW1" (last 8 digits of device serial number) as the WPA2-PSK password.
3. Click here and use the following information to fill out the form:
a. Enter your local network's Wi-Fi SSID and password.
b. Select the certificate and private key files that you just downloaded above.
c. Your endpoint subdomain is a25nddm5s8d2a9.
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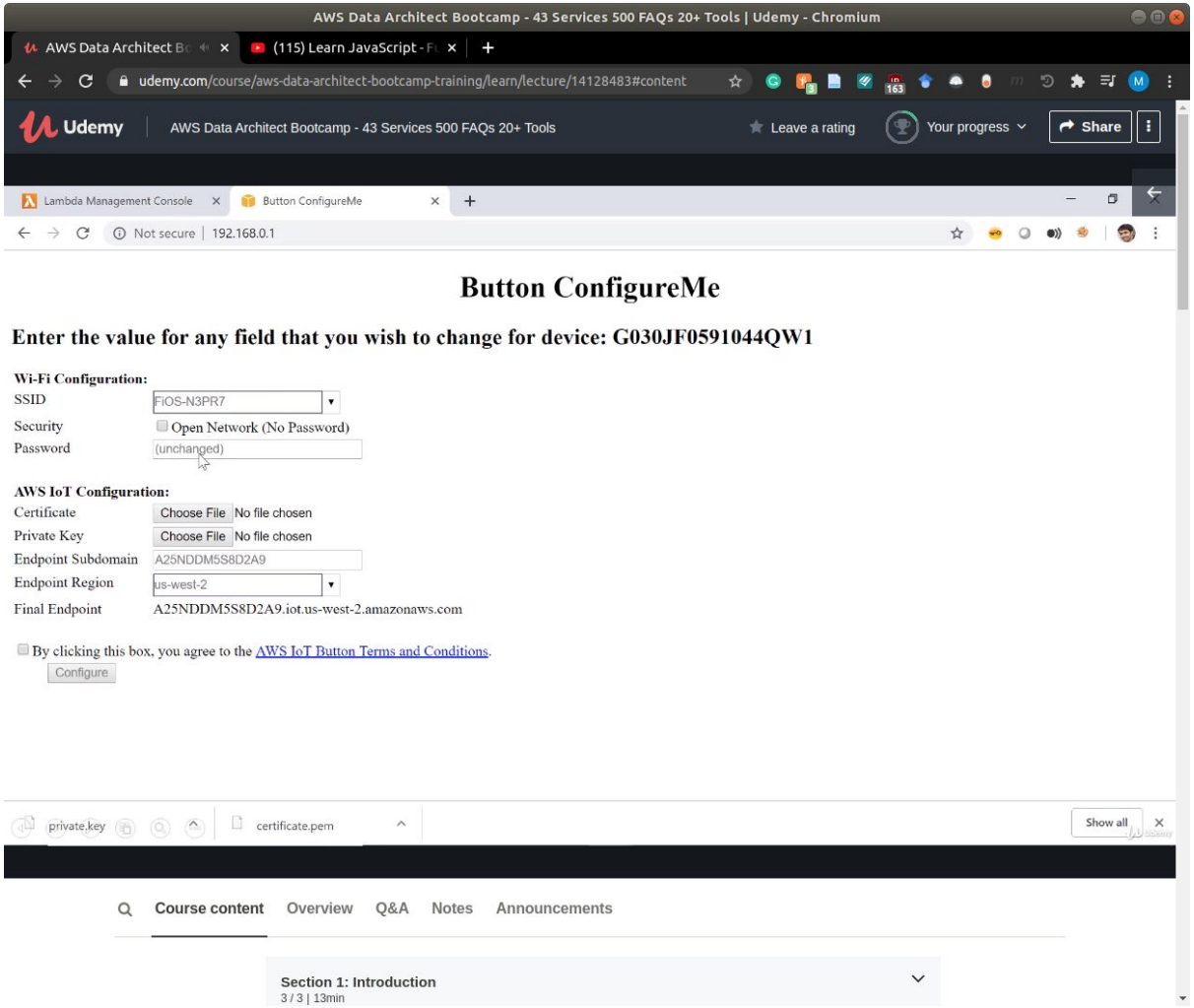
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Lambda Management Console
Button ConfigureMe
Not secure | 192.168.0.1
Button ConfigureMe
Enter the value for any field that you wish to change for device: G030JF0591044QW1
Wi-Fi Configuration:
SSID
FiOS-N3PR7
Security
Open Network (No Password)
Password
(unchanged)
AWS IoT Configuration:
Certificate
Choose File
No file chosen
Private Key
Choose File
No file chosen
Endpoint Subdomain
A25NDDM5S8D2A9
Endpoint Region
us-west-2
Final Endpoint
A25NDDM5S8D2A9.iot.us-west-2.amazonaws.com
By clicking this box, you agree to the AWS IoT Button Terms and Conditions.
Configure
private.key
certificate.pem
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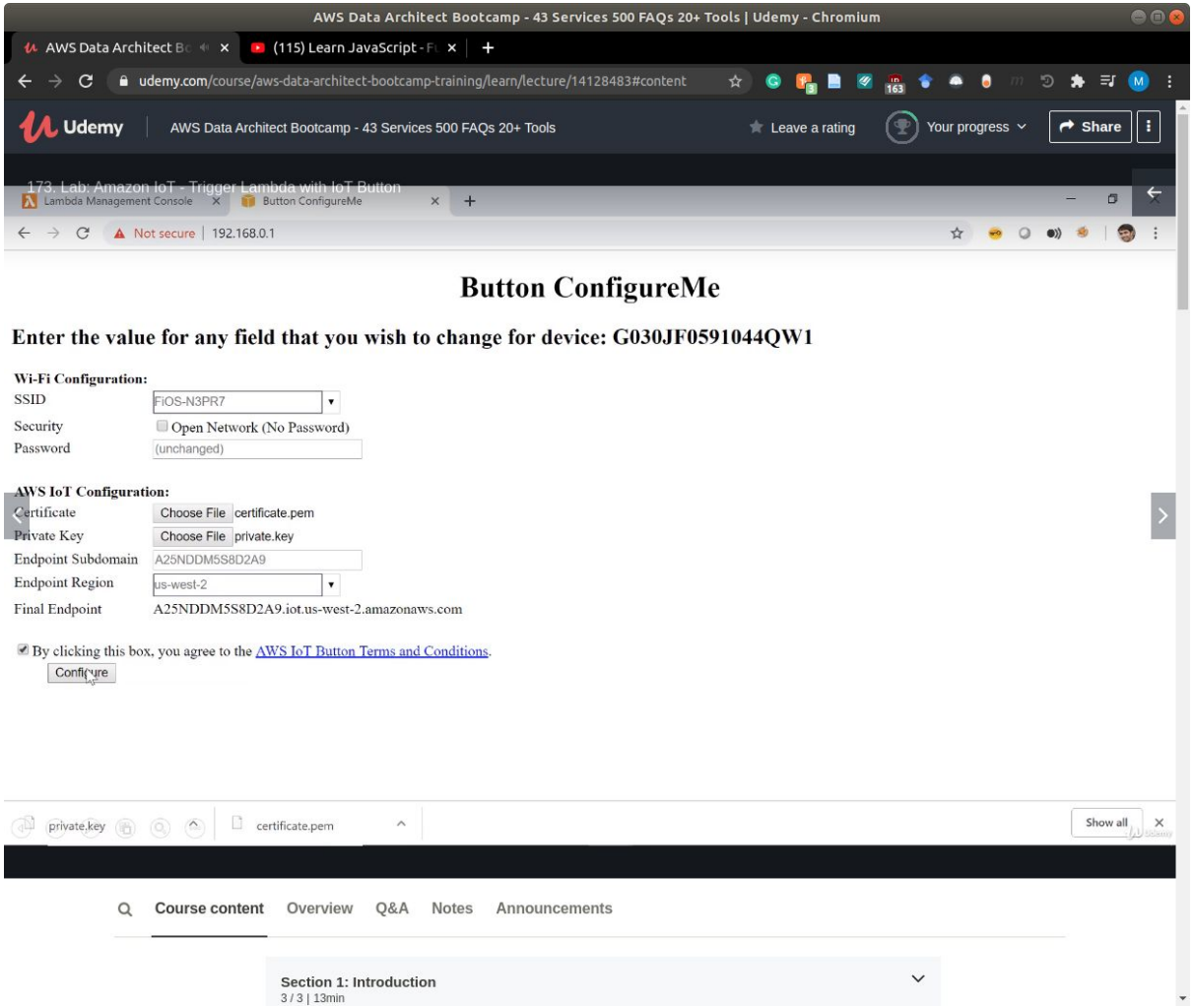
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Button ConfigureMe
Not secure | 192.168.0.1
Button ConfigureMe
Enter the value for any field that you wish to change for device: G030JF0591044QW1
Wi-Fi Configuration:
SSID
FiOS-N3PR7
Security
Open Network (No Password)
Password
(unchanged)
AWS IoT Configuration:
Certificate
Choose File
certificate.pem
Private Key
Choose File
private.key
Endpoint Subdomain
A25NDDM5S8D2A9
Endpoint Region
us-west-2
Final Endpoint
A25NDDM5S8D2A9.iot.us-west-2.amazonaws.com
By clicking this box, you agree to the AWS IoT Button Terms and Conditions.
Configure
private.key
certificate.pem
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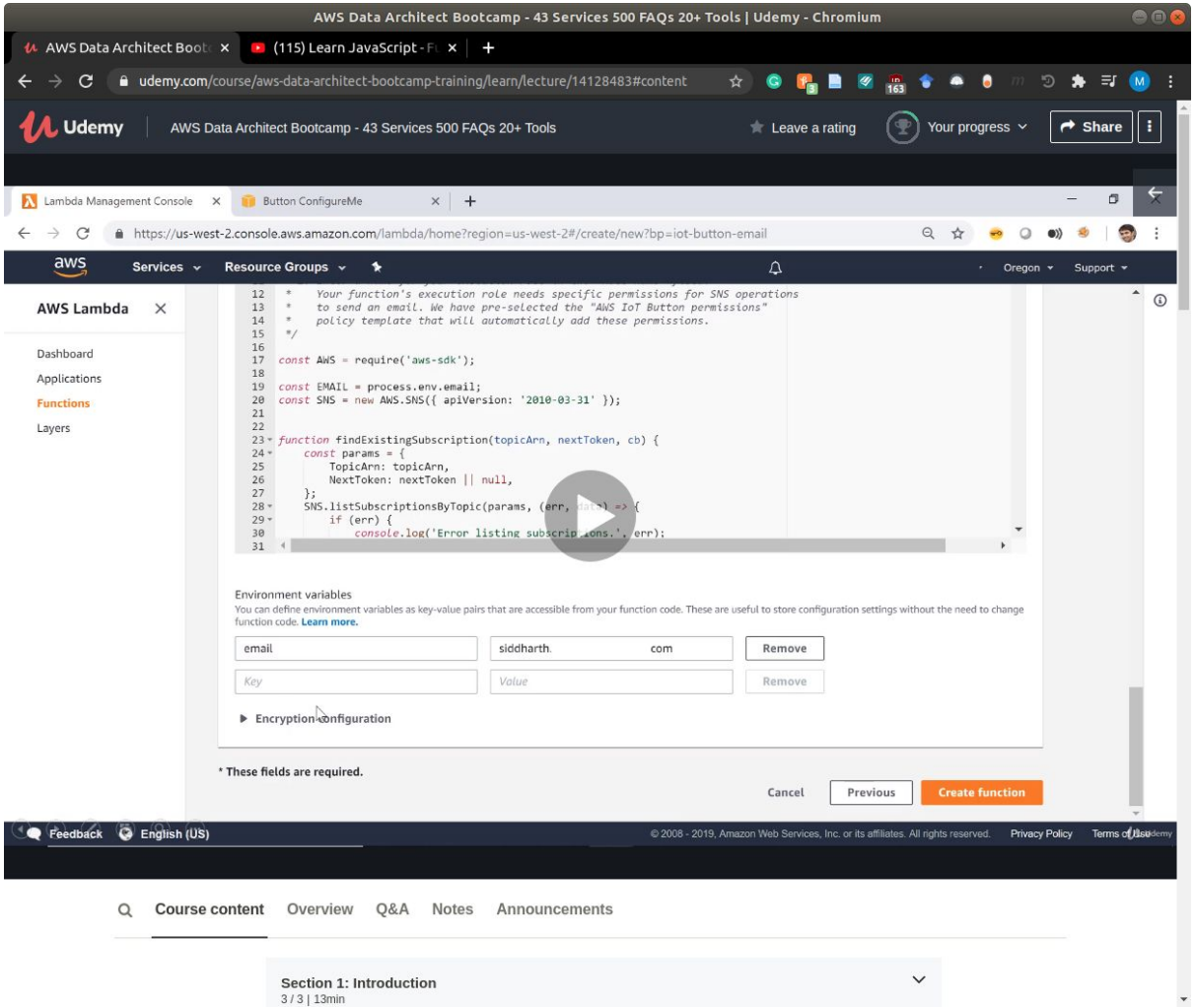
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Environment variables
You can define environment variables as key-value pairs that are accessible from your function code. These are useful to store configuration settings without the need to change function code. Learn more.
email
siddharth. com
Remove
Key
Value
Remove
Encryption configuration
* These fields are required.
Cancel
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Create function
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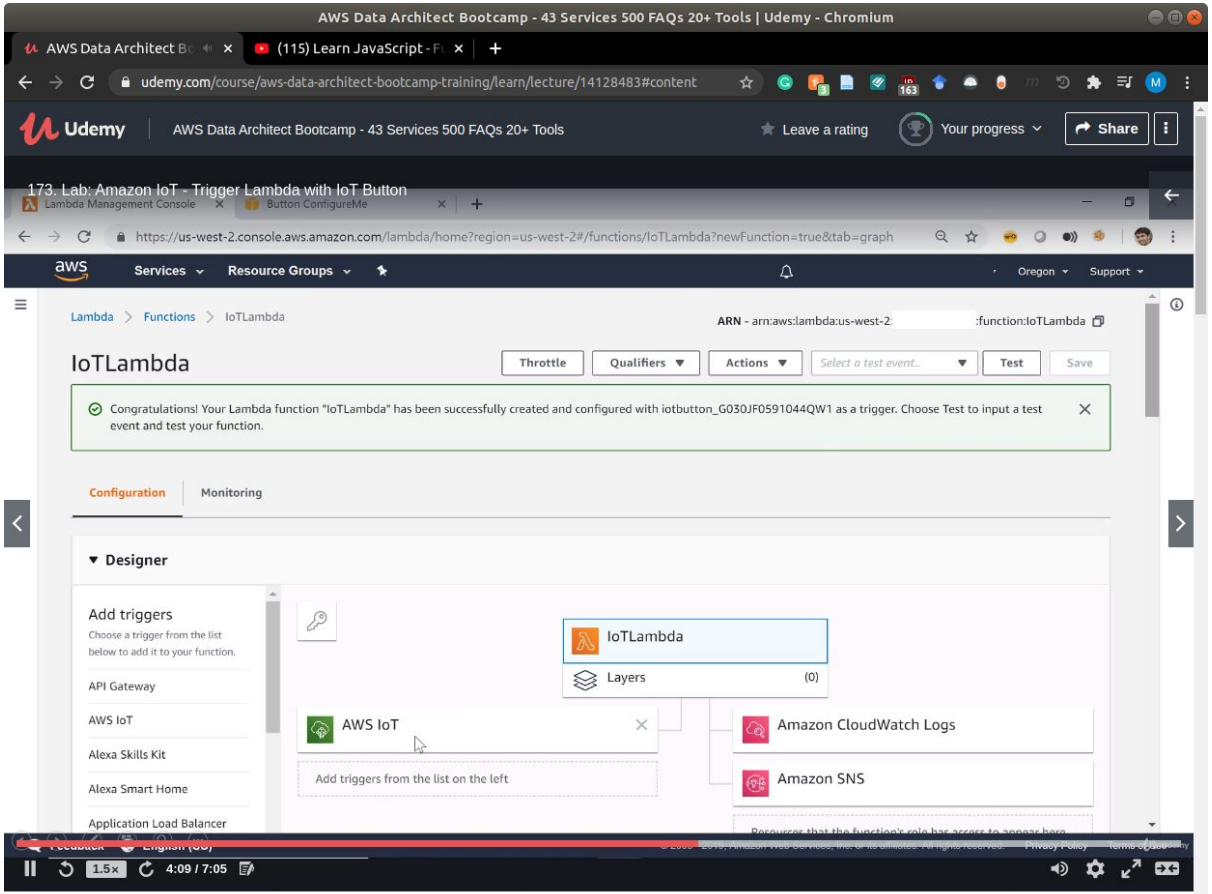

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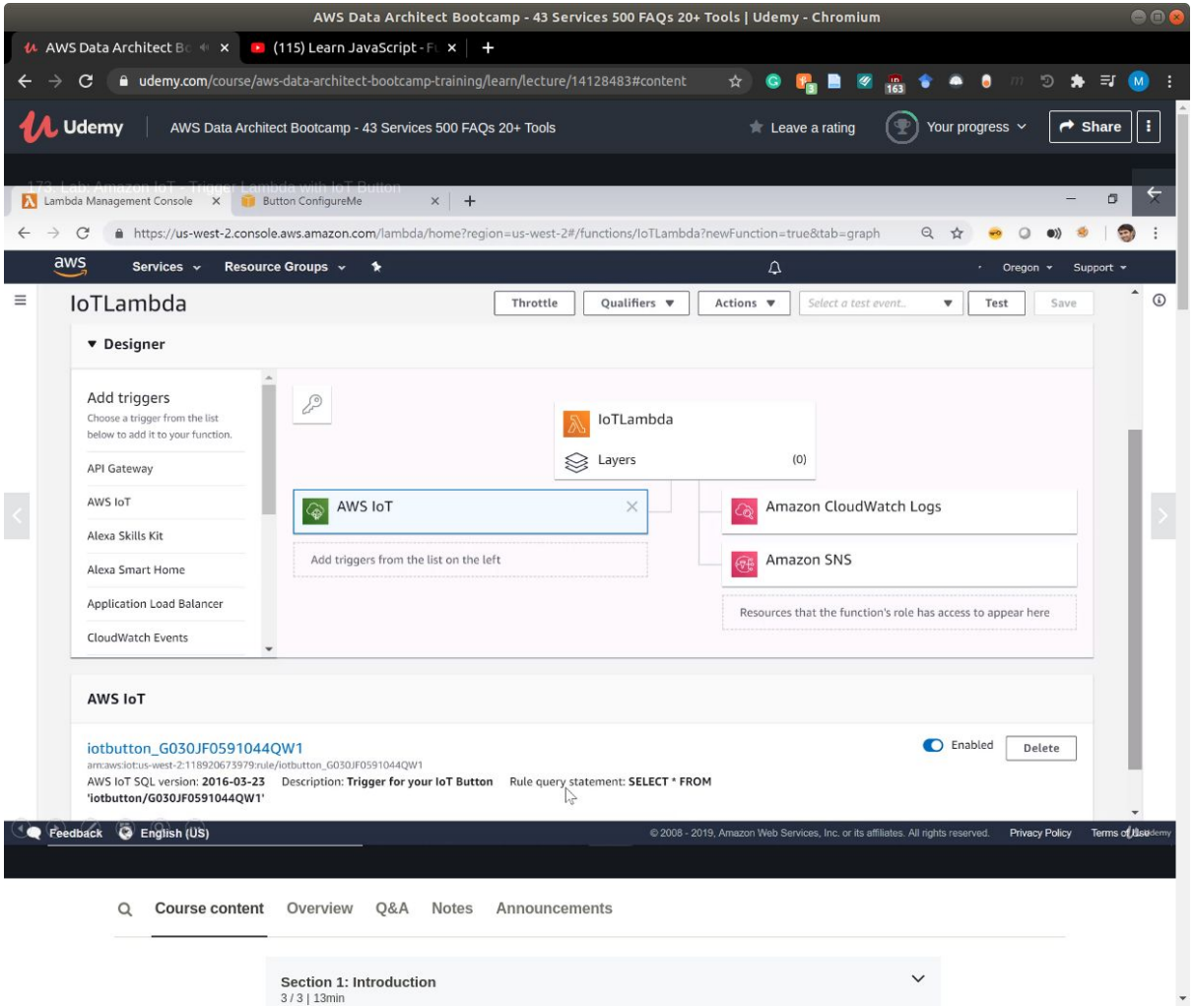
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https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/IoTLambda?newFunction=true&tab=graph
Services
Resource Groups
Oregon
Support
IoTLambda
Throttle
Qualifiers
Actions
Select a test event...
Test
Save
Designer
Add triggers
Choose a trigger from the list below to add it to your function.
API Gateway
AWS IoT
Alexa Skills Kit
Alexa Smart Home
Application Load Balancer
CloudWatch Events
IoTLambda
Layers
(0)
AWS IoT
Add triggers from the list on the left
Amazon CloudWatch Logs
Amazon SNS
Resources that the function's role has access to appear here
AWS IoT
iotbutton_G030JF0591044QW1
arn:aws:iot:us-west-2:118920673979:rule/iotbutton_G030JF0591044QW1
Enabled
Delete
AWS IoT SQL version: 2016-03-23
Description: Trigger for your IoT Button
Rule query statement: SELECT * FROM 'iotbutton/G030JF0591044QW1'
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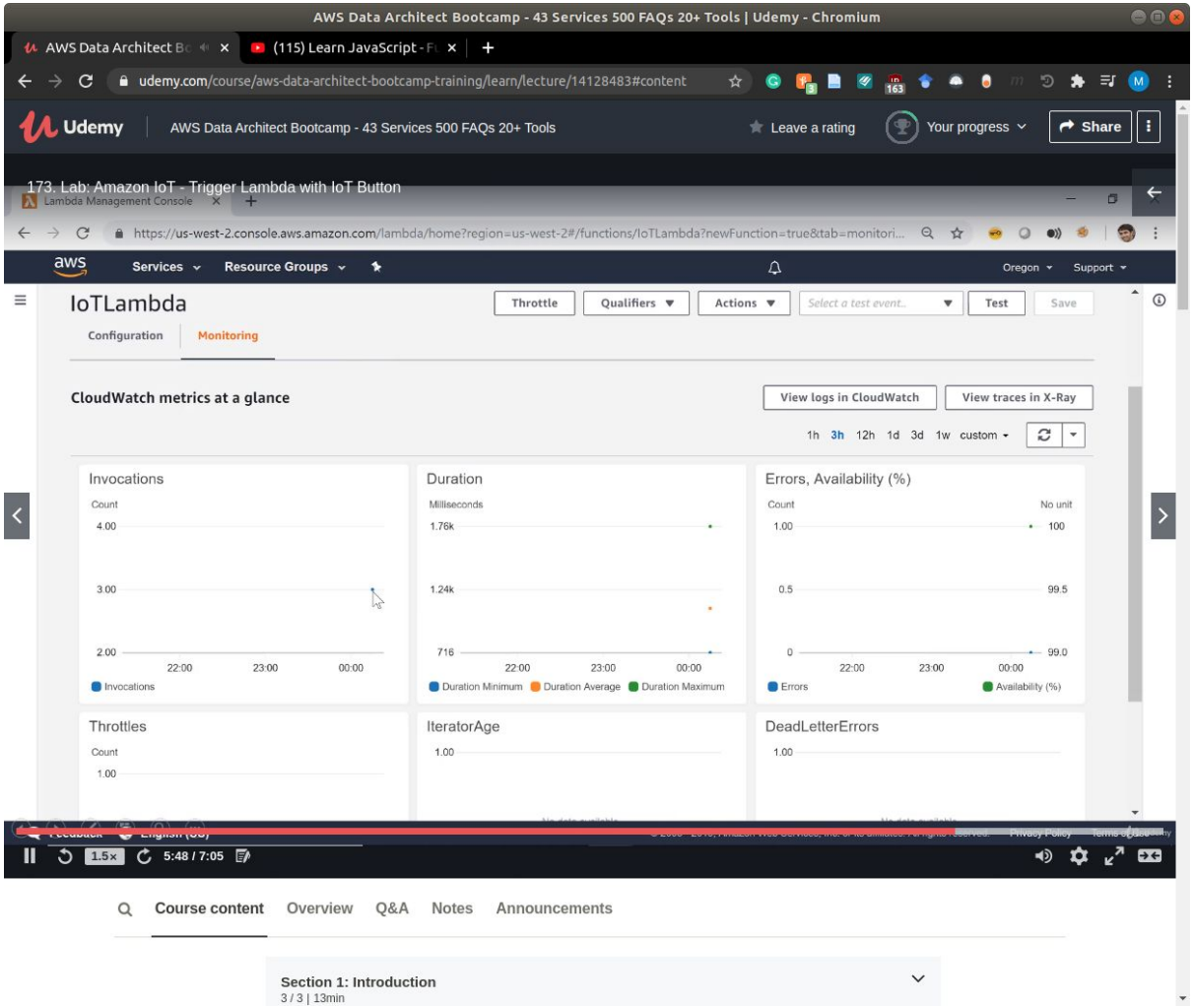
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Support
IoTLambda
Throttle
Qualifiers
Actions
Select a test event...
Test
Save
Configuration
Monitoring
CloudWatch metrics at a glance
View logs in CloudWatch
View traces in X-Ray
1h 3h 12h 1d 3d 1w custom
Invocations
Count
4.00
3.00
2.00
22:00
23:00
00:00
Invocations
Duration
Milliseconds
1.76k
1.24k
716
Duration Minimum
Duration Average
Duration Maximum
Errors, Availability (%)
Count
No unit
1.00
0.5
100
99.5
99.0
Errors
Availability (%)
Throttles
IteratorAge
DeadLetterErrors
1.5×
5:48 / 7:05
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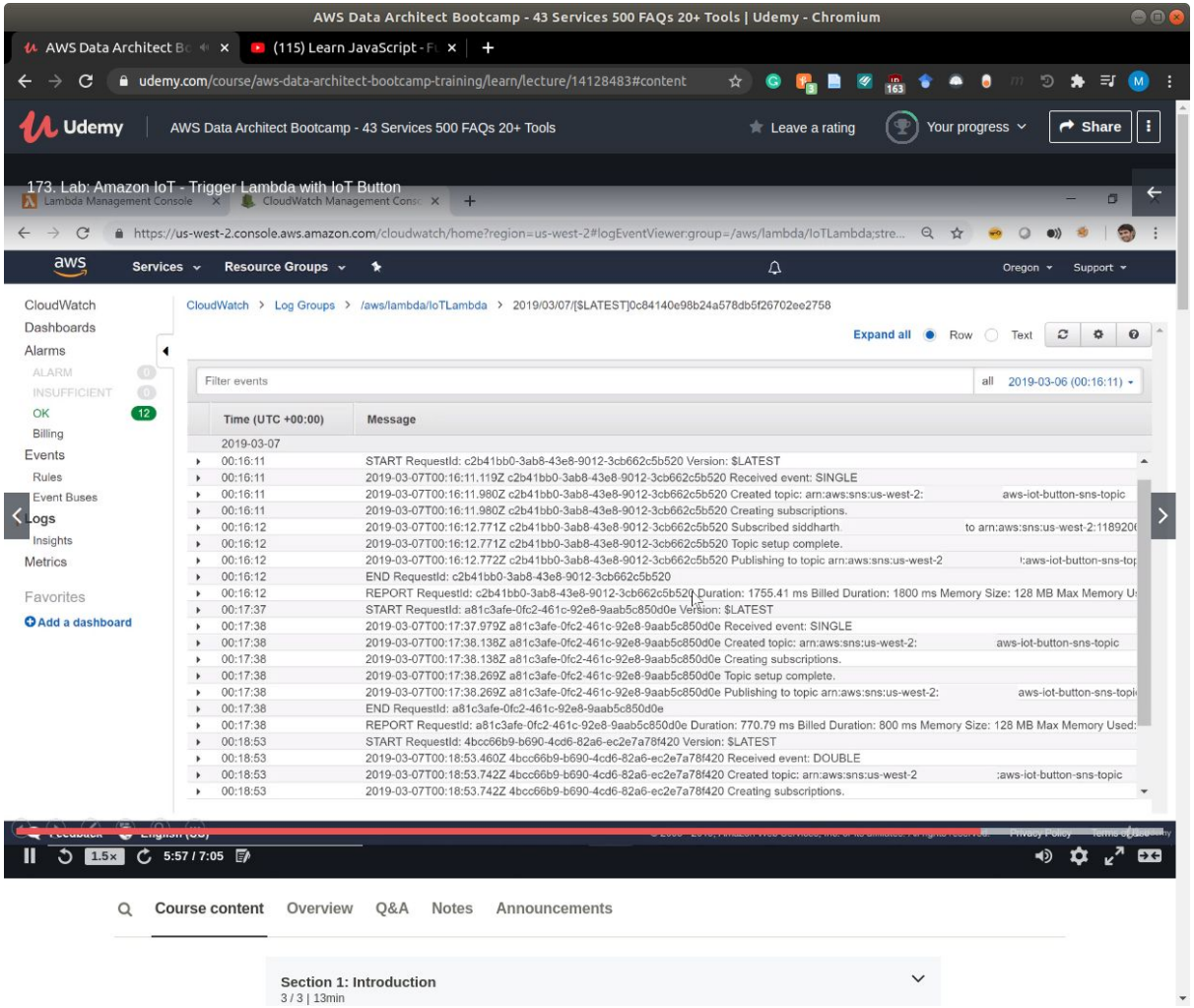
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173. Lab: Amazon IoT - Trigger Lambda with IoT Button
https://us-west-2.console.aws.amazon.com/cloudwatch/home?region=us-west-2#logEventViewer:group=/aws/lambda/IoTLambda;stre...
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CloudWatch
Dashboards
Alarms
ALARM
INSUFFICIENT
OK
Billing
Events
Rules
Event Buses
Logs
Insights
Metrics
Favorites
Add a dashboard
CloudWatch > Log Groups > /aws/lambda/IoTLambda > 2019/03/07/[$LATEST]0c84140e98b24a578db5f26702ee2758
Expand all
Row
Text
Filter events
all
2019-03-06 (00:16:11)
Time (UTC +00:00)
Message
2019-03-07
00:16:11 START RequestId: c2b41bb0-3ab8-43e8-9012-3cb662c5b520 Version: $LATEST
00:16:11 2019-03-07T00:16:11.119Z c2b41bb0-3ab8-43e8-9012-3cb662c5b520 Received event: SINGLE
00:16:11 2019-03-07T00:16:11.980Z c2b41bb0-3ab8-43e8-9012-3cb662c5b520 Created topic: arn:aws:sns:us-west-2: aws-iot-button-sns-topic
00:16:11 2019-03-07T00:16:11.980Z c2b41bb0-3ab8-43e8-9012-3cb662c5b520 Creating subscriptions.
00:16:12 2019-03-07T00:16:12.771Z c2b41bb0-3ab8-43e8-9012-3cb662c5b520 Subscribed siddharth to arn:aws:sns:us-west-2:1189200
00:16:12 2019-03-07T00:16:12.771Z c2b41bb0-3ab8-43e8-9012-3cb662c5b520 Topic setup complete.
00:16:12 2019-03-07T00:16:12.772Z c2b41bb0-3ab8-43e8-9012-3cb662c5b520 Publishing to topic arn:aws:sns:us-west-2 :aws-iot-button-sns-top
00:16:12 END RequestId: c2b41bb0-3ab8-43e8-9012-3cb662c5b520
00:16:12 REPORT RequestId: c2b41bb0-3ab8-43e8-9012-3cb662c5b520 Duration: 1755.41 ms Billed Duration: 1800 ms Memory Size: 128 MB Max Memory U
00:17:37 START RequestId: a81c3afe-0fc2-461c-92e8-9aab5c850d0e Version: $LATEST
00:17:38 2019-03-07T00:17:37.979Z a81c3afe-0fc2-461c-92e8-9aab5c850d0e Received event: SINGLE
00:17:38 2019-03-07T00:17:38.138Z a81c3afe-0fc2-461c-92e8-9aab5c850d0e Created topic: arn:aws:sns:us-west-2: aws-iot-button-sns-topic
00:17:38 2019-03-07T00:17:38.138Z a81c3afe-0fc2-461c-92e8-9aab5c850d0e Creating subscriptions.
00:17:38 2019-03-07T00:17:38.269Z a81c3afe-0fc2-461c-92e8-9aab5c850d0e Topic setup complete.
00:17:38 2019-03-07T00:17:38.269Z a81c3afe-0fc2-461c-92e8-9aab5c850d0e Publishing to topic arn:aws:sns:us-west-2: aws-iot-button-sns-topi
00:17:38 END RequestId: a81c3afe-0fc2-461c-92e8-9aab5c850d0e
00:17:38 REPORT RequestId: a81c3afe-0fc2-461c-92e8-9aab5c850d0e Duration: 770.79 ms Billed Duration: 800 ms Memory Size: 128 MB Max Memory Used:
00:18:53 START RequestId: 4bcc66b9-b690-4cd6-82a6-ec2e7a78f420 Version: $LATEST
00:18:53 2019-03-07T00:18:53.460Z 4bcc66b9-b690-4cd6-82a6-ec2e7a78f420 Received event: DOUBLE
00:18:53 2019-03-07T00:18:53.742Z 4bcc66b9-b690-4cd6-82a6-ec2e7a78f420 Created topic: arn:aws:sns:us-west-2 :aws-iot-button-sns-topic
00:18:53 2019-03-07T00:18:53.742Z 4bcc66b9-b690-4cd6-82a6-ec2e7a78f420 Creating subscriptions.
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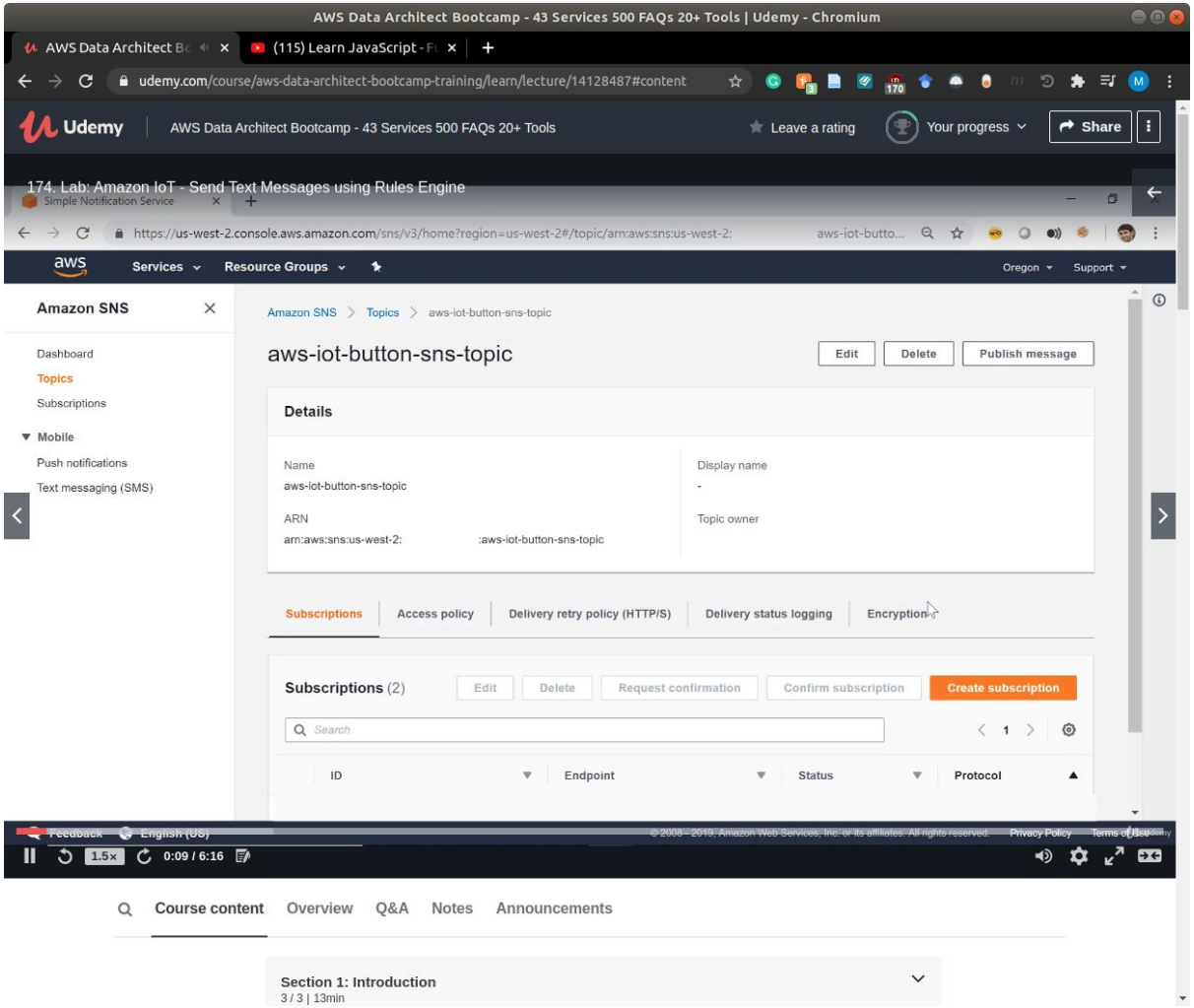

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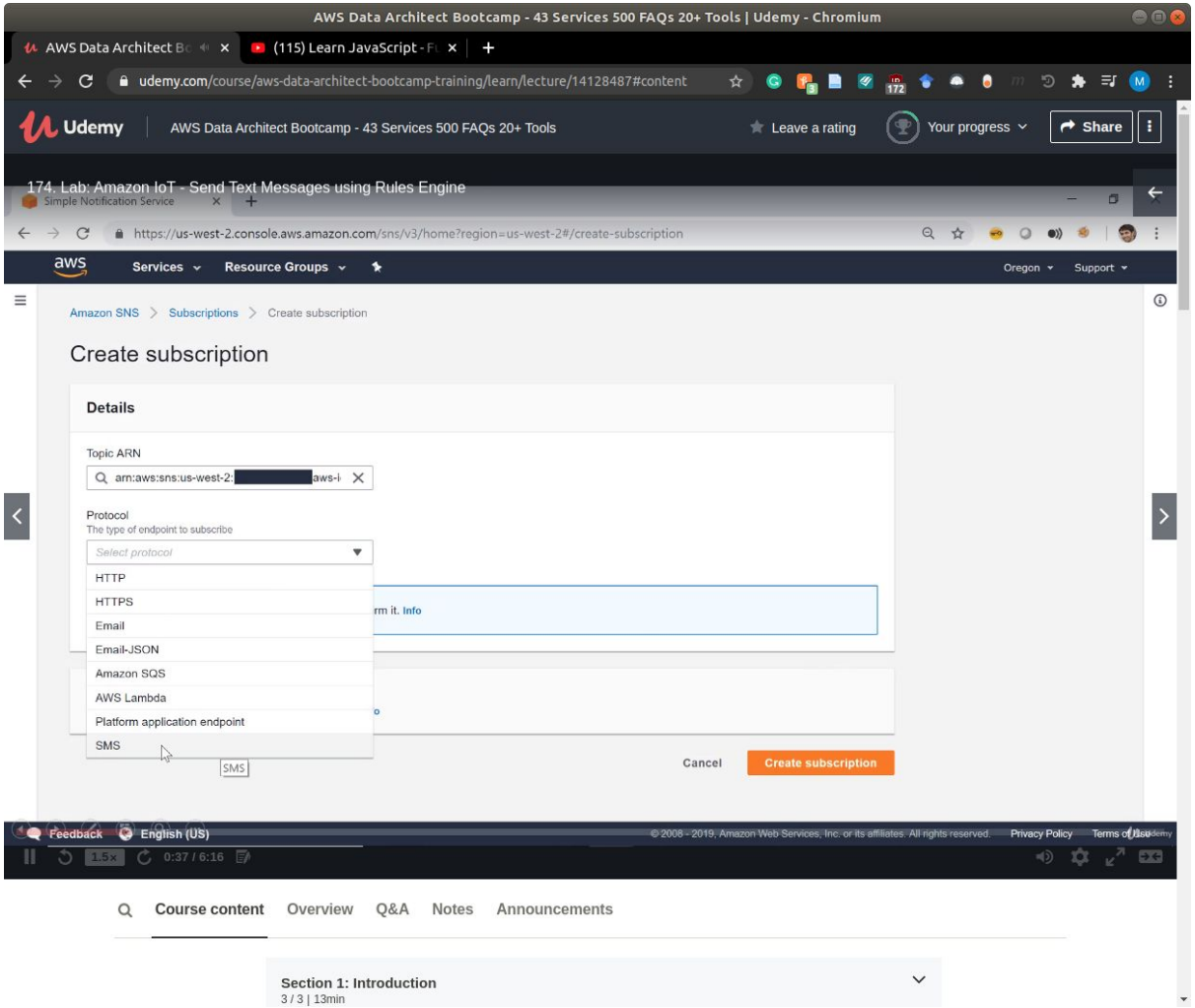
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Services
Resource Groups
Oregon
Support
Amazon SNS > Subscriptions > Create subscription
Create subscription
Details
Topic ARN
Protocol
The type of endpoint to subscribe
Select protocol
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HTTPS
Email
Email-JSON
Amazon SQS
AWS Lambda
Platform application endpoint
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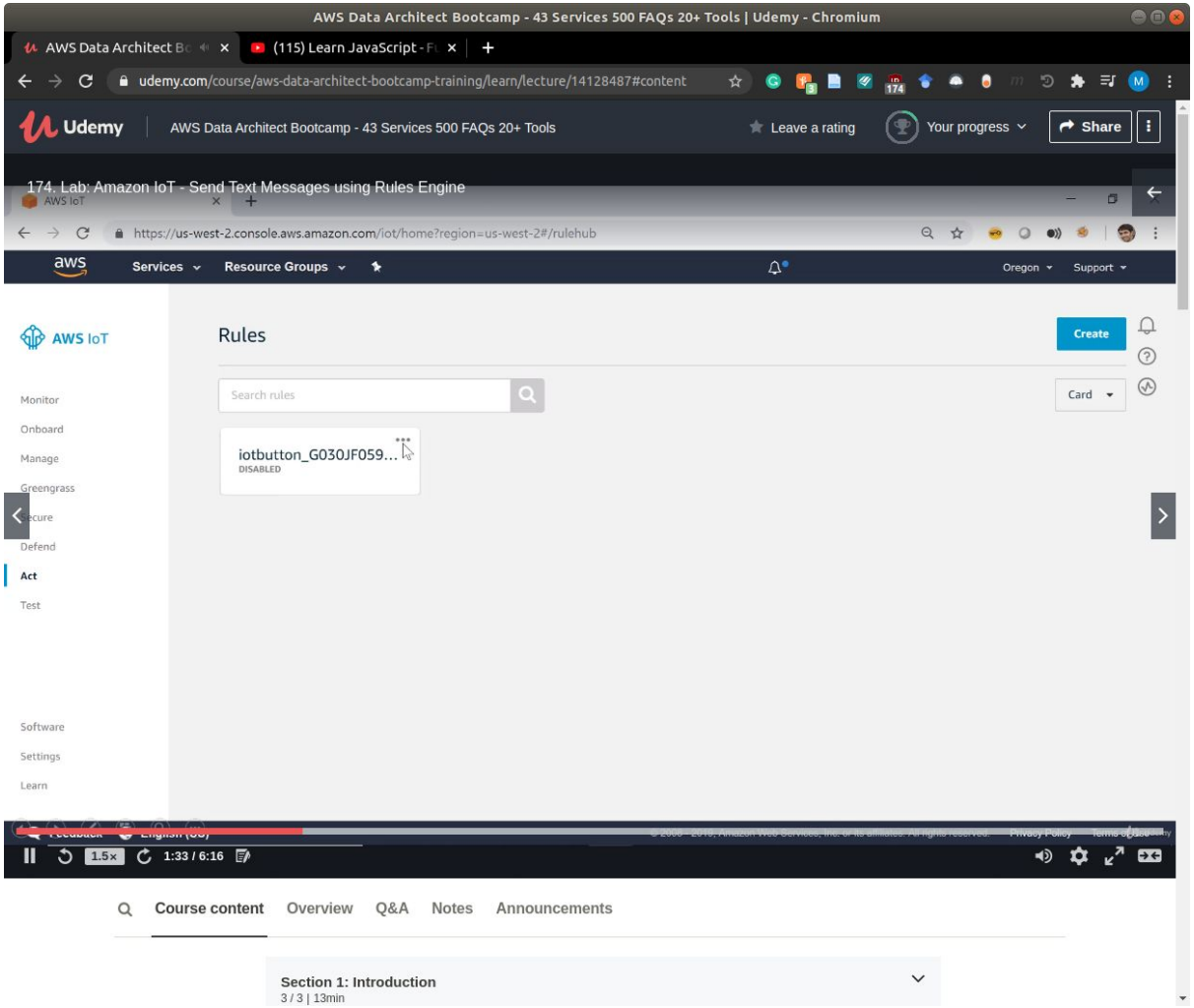
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Create
Search rules
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Act
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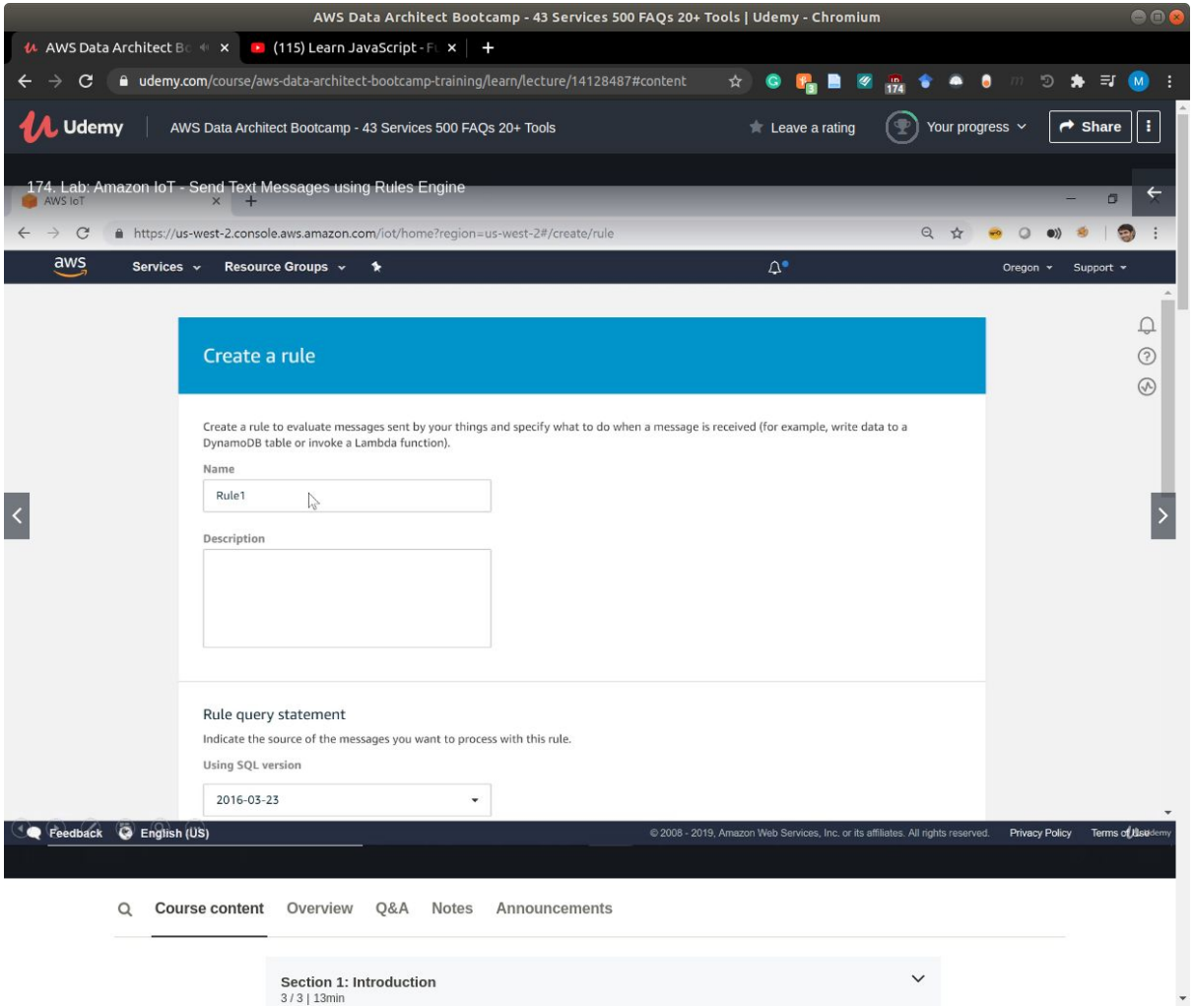
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174. Lab: Amazon IoT - Send Text Messages using Rules Engine
https://us-west-2.console.aws.amazon.com/iot/home?region=us-west-2#/create/rule
Services
Resource Groups
Oregon
Support
Create a rule
Create a rule to evaluate messages sent by your things and specify what to do when a message is received (for example, write data to a DynamoDB table or invoke a Lambda function).
Name
Rule1
Description
Rule query statement
Indicate the source of the messages you want to process with this rule.
Using SQL version
2016-03-23
Feedback
English (US)
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AWS IoT

https://us-west-2.console.aws.amazon.com/iot/home?region=us-west-2#/create/rule

aws | Services | Resource Groups | Oregon | Support

Rule query statement

Indicate the source of the messages you want to process with this rule.

Using SQL version

2016-03-23

Rule query statement

SELECT <Attribute> FROM <Topic Filter> WHERE <Condition>. For example: SELECT temperature FROM 'iot/topic' WHERE temperature > 50. To learn more, see AWS IoT SQL Reference.

```
1  SELECT * FROM 'iotbutton/G030JF0591044QN1'
```

Set one or more actions

Select one or more actions to happen when the above rule is matched by an inbound message. Actions define additional activities that occur when messages arrive, like storing them in a database, invoking cloud functions, or sending notifications. (*.required)

Add action

1.5× 1:58 / 6:16

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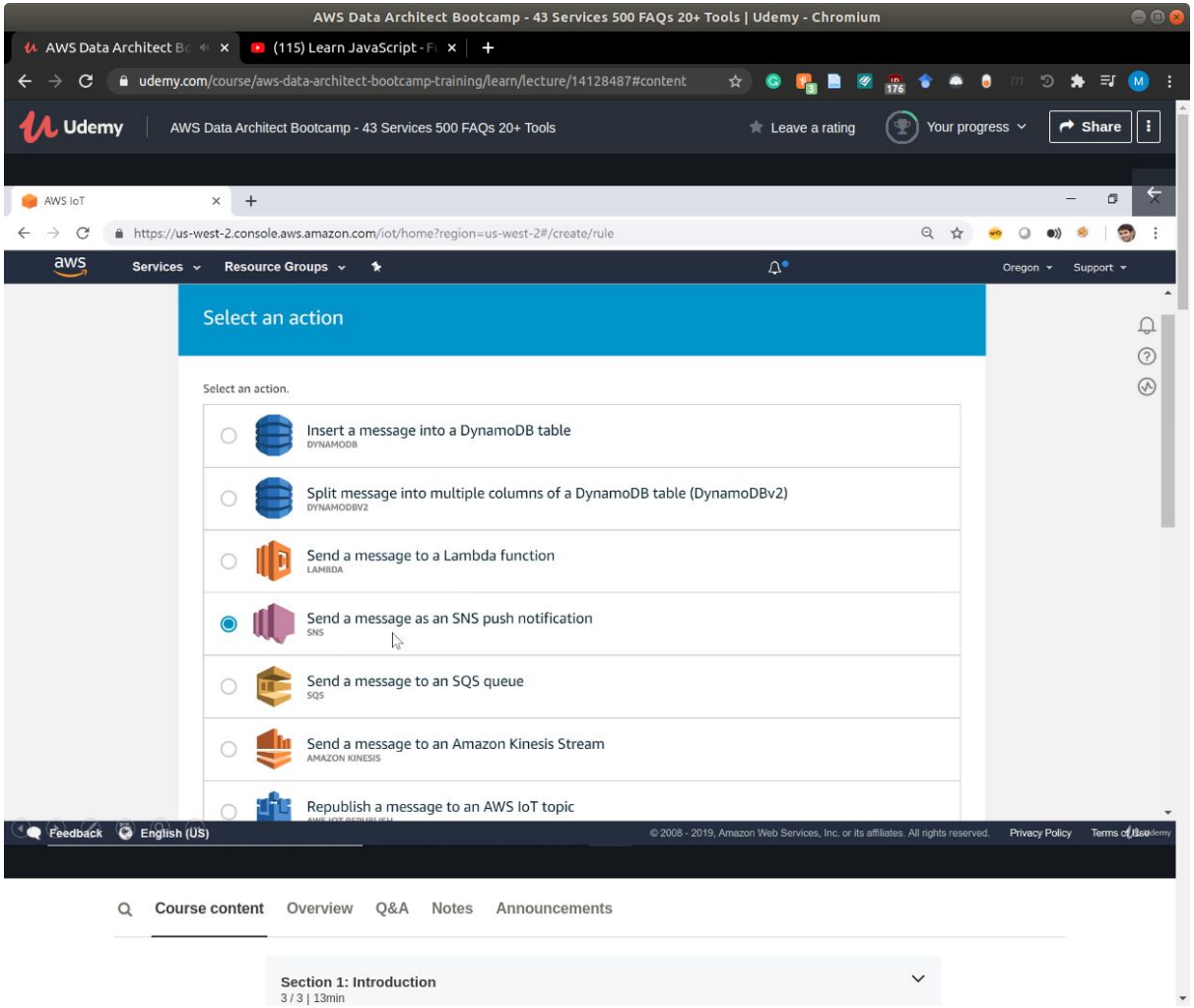
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Share
https://us-west-2.console.aws.amazon.com/iot/home?region=us-west-2#/create/rule
Services
Resource Groups
Oregon
Support
Select an action
Select an action.
Insert a message into a DynamoDB table
DYNAMODB
Split message into multiple columns of a DynamoDB table (DynamoDBv2)
DYNAMODBV2
Send a message to a Lambda function
LAMBDA
Send a message as an SNS push notification
SNS
Send a message to an SQS queue
SQS
Send a message to an Amazon Kinesis Stream
AMAZON KINESIS
Republish a message to an AWS IoT topic
Feedback
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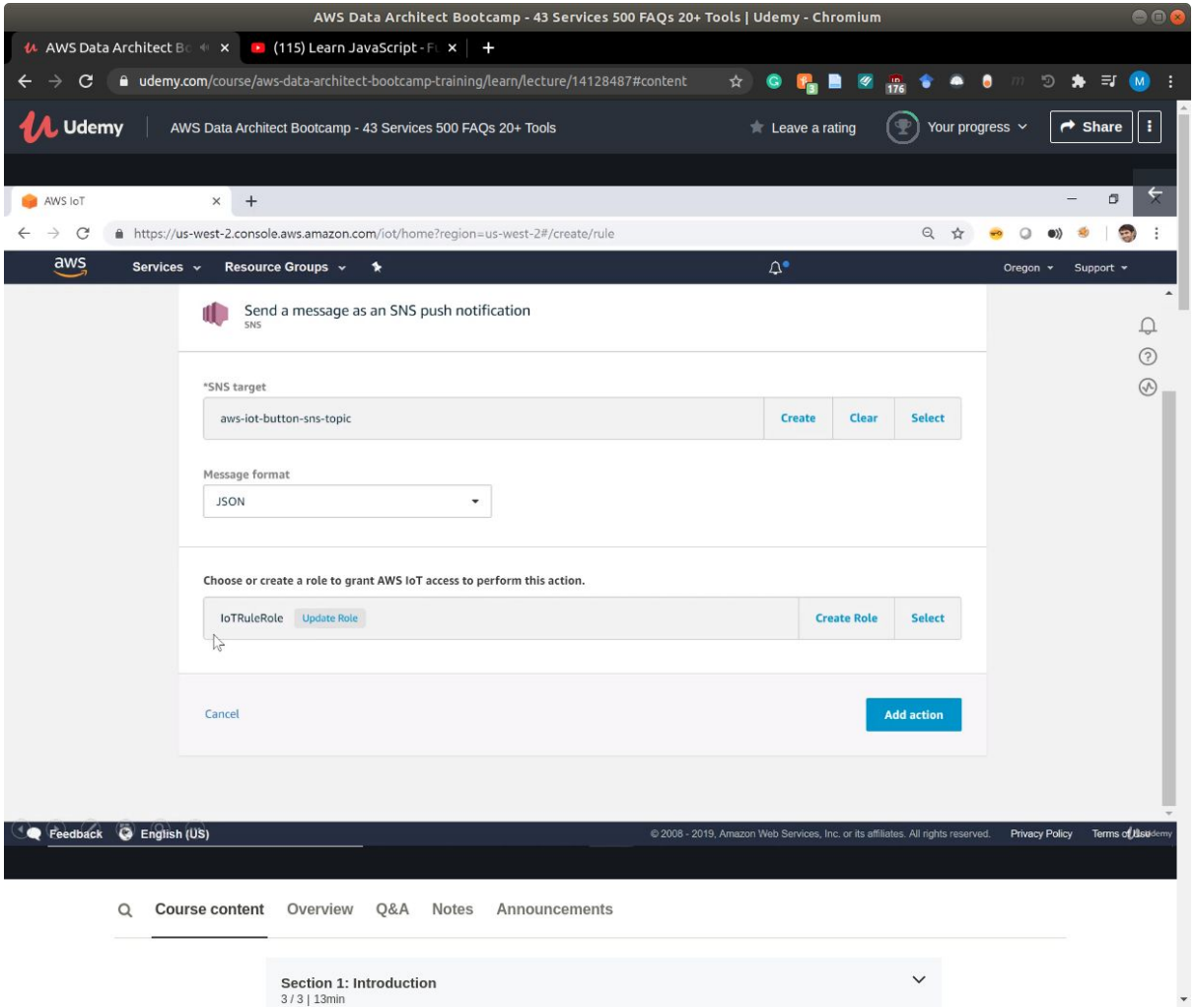
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Share
https://us-west-2.console.aws.amazon.com/iot/home?region=us-west-2#/create/rule
Services
Resource Groups
Oregon
Support
Send a message as an SNS push notification
SNS
*SNS target
aws-iot-button-sns-topic
Create
Clear
Select
Message format
JSON
Choose or create a role to grant AWS IoT access to perform this action.
IoTRuleRole
Update Role
Create Role
Select
Cancel
Add action
Feedback
English (US)
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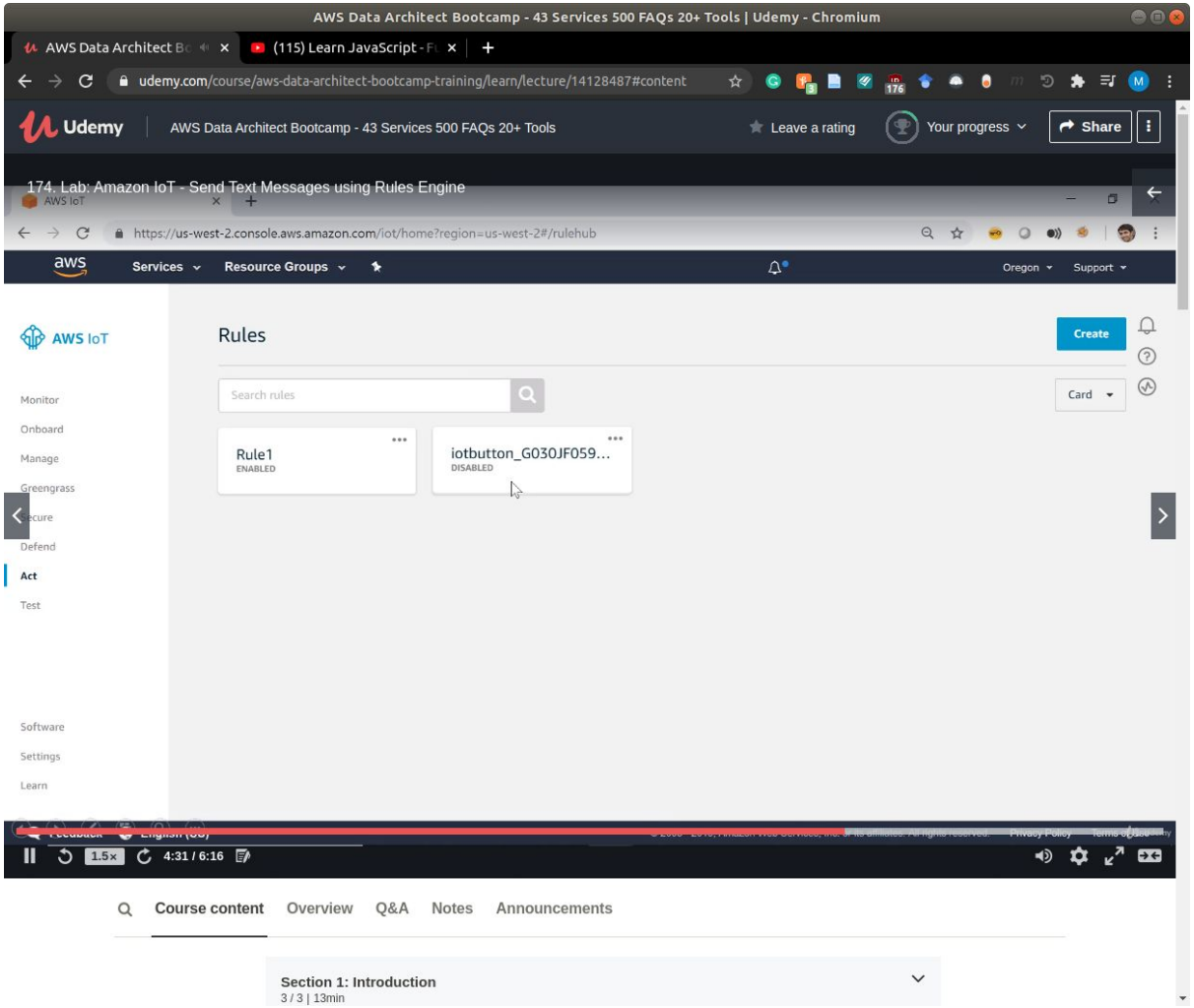
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https://us-west-2.console.aws.amazon.com/iot/home?region=us-west-2#/rulehub
Services
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Oregon
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AWS IoT
Rules
Create
Search rules
Card
Rule1
ENABLED
iotbutton_G030JF059...
DISABLED
Monitor
Onboard
Manage
Greengrass
Defend
Act
Test
Software
Settings
Learn
1.5×
4:31 / 6:16
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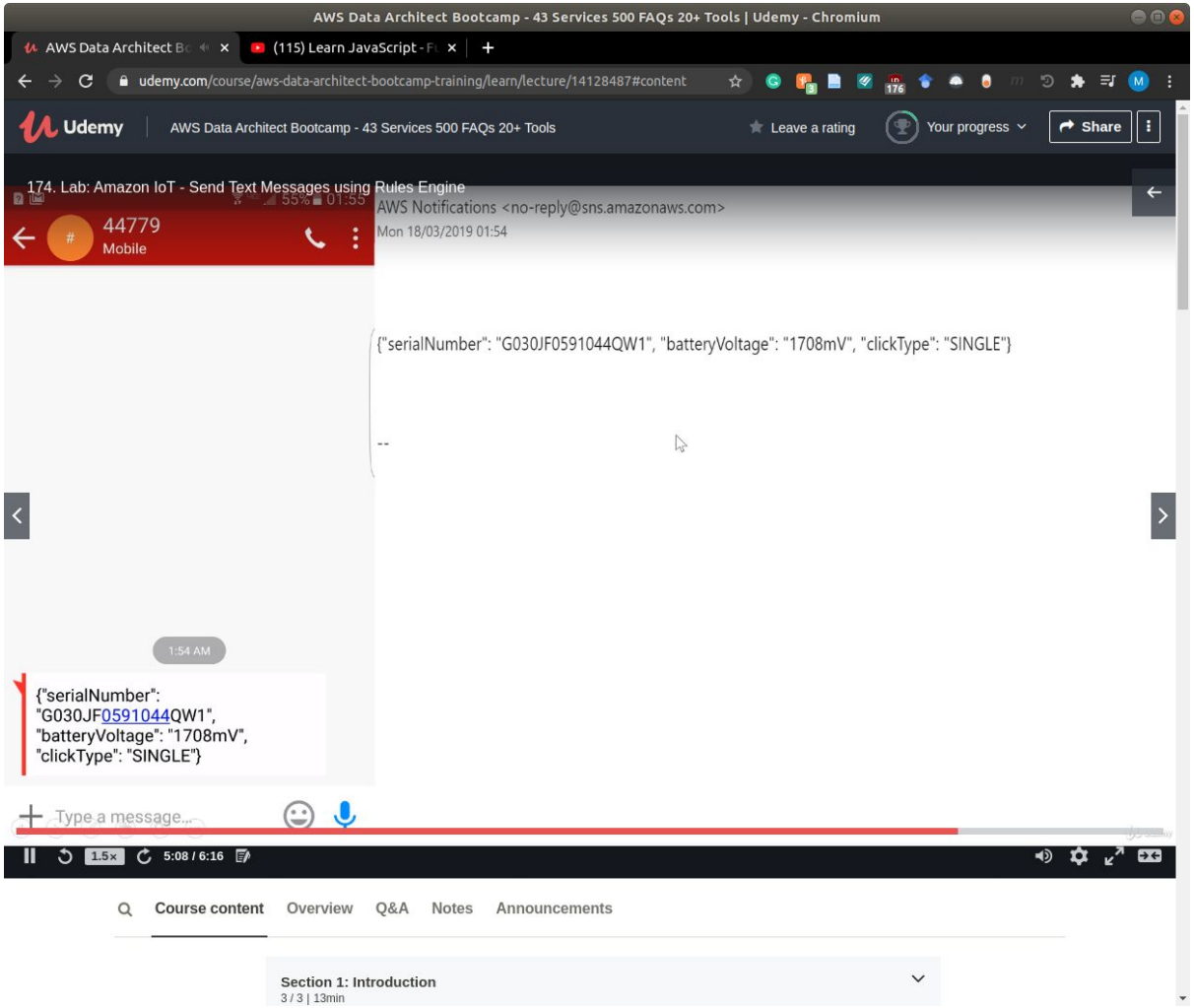
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44779
Mobile
AWS Notifications <no-reply@sns.amazonaws.com>
Mon 18/03/2019 01:54
{"serialNumber": "G030JF0591044QW1", "batteryVoltage": "1708mV", "clickType": "SINGLE"}
--
1:54 AM
{"serialNumber": "G030JF0591044QW1", "batteryVoltage": "1708mV", "clickType": "SINGLE"}
Type a message...
1.5×
5:08 / 6:16
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Q. What does AWS IoT Core offer?

Connectivity between devices and the AWS cloud. First, with AWS IoT Core you can communicate with connected devices securely, with low latency and with low overhead. The communication can scale to as many devices as you want. AWS IoT Core supports standard communication protocols (HTTP, MQTT, and WebSockets are supported currently). Communication is secured using TLS.

Connectivity between devices and the AWS cloud. First, with AWS IoT Core you can communicate with connected devices securely, with low latency and with low overhead. The communication can scale to as many devices as you want. AWS IoT Core supports standard communication protocols (HTTP, MQTT, and WebSockets are supported currently). Communication is secured using TLS.

Processing data sent from connected devices. Secondly, with AWS IoT Core you can continuously ingest, filter, transform, and route the data streamed from connected devices. You can take actions based on the data and route it for further processing and analytics.

Application interaction with connected devices. Finally, AWS IoT Core accelerates IoT application development. It serves as an easy to use interface for applications running in the cloud and on mobile devices to access data sent from connected devices, and send data and commands back to the devices.

Q. What is 2lemetry and how does it relate to AWS IoT?

2lemetry was acquired by AWS in 2015, and their capabilities provided foundational elements such as the MQTT Message Broker and the Rules Engine for AWS IoT Core.

Q. What are the ways for accessing AWS IoT Core?

You can use the AWS Management Console, the AWS SDKs, the AWS CLI, and the AWS IoT Core APIs. Connected devices can use the AWS IoT Device SDKs to simplify the communication with AWS IoT Core.

The AWS IoT Core APIs and commands are largely divided into control plane operations and data plane operations. The control plane operations enable you to do tasks such as configuring security, registering devices, configuring rules for routing data, and setting up logging. The data plane operations enable you to ingest data from connected devices into AWS IoT Core with low latency and high throughput rate at a large scale.

Q. How does AWS IoT Core work?

Connected devices, such as sensors, actuators, embedded devices, smart appliances, and wearable devices, connect to AWS IoT Core over HTTPS, WebSockets, or secure MQTT. Included in AWS IoT Core is a **Device Gateway** that allows secure, low-latency, low-overhead, bi-directional communication between connected devices and your cloud and mobile applications.

AWS IoT Core also contains a **Rules Engine** which enables continuous processing of data sent by connected devices. You can configure rules to filter and transform the data. You also configure rules to route the data to other AWS services such as DynamoDB, Kinesis, Lambda, SNS, SQS, CloudWatch, Elasticsearch Service with built-in Kibana integration, as well as to non-AWS services, via Lambda for further processing, storage, or analytics.

There is also a **Registry** where you can register and keep track of devices connected to AWS IoT Core, or devices that may connect in the future. The **Device Shadow** in AWS IoT Core enables cloud and mobile applications to query data sent from devices and send commands to devices, using a simple REST API, while letting AWS IoT Core handle the underlying communication with the devices. The Device Shadow accelerates application development by providing a uniform interface to devices, even when they use one of the several IoT communication and security protocols with which the applications may not be compatible. The Device Shadow also accelerates application development by providing an always available interface to devices even when the connected devices are constrained by intermittent connectivity, limited bandwidth, limited computing ability or limited power.

Communication with AWS IoT Core is secure. The service requires all of its clients (connected devices, server applications, mobile applications, or human users) to use strong authentication (X.509 certificates, AWS IAM credentials, or 3rd party authentication via AWS Cognito). All communication is encrypted. AWS IoT Core also offers fine-grained authorization to isolate and secure communication among authenticated clients.

Q. What communication and authentication protocols does AWS IoT Core support?

For control plane operations, AWS IoT Core supports HTTPS. For data plane operations, AWS IoT Core supports HTTPS, WebSockets, and secure MQTT – a protocol often used in IoT scenarios.

HTTPS and WebSockets requests sent to AWS IoT Core are authenticated using AWS IAM or AWS Cognito, both of which support the AWS SigV4 authentication. If you are using the AWS SDKs or the AWS CLI, the SigV4 authentication is taken care of for you under the hood. HTTPS requests can also be authenticated using X.509 certificates. MQTT messages to AWS IoT Core are authenticated using X.509 certificates.

With AWS IoT Core you can use AWS IoT Core generated certificates, as well as those signed by your preferred Certificate Authority (CA).

Q. Can devices that are NOT directly connected to the Internet access AWS IoT Core?

Yes, via a physical hub. Devices connected to a private IP network and devices using non-IP radio protocols such as ZigBee or Bluetooth LE can access AWS IoT Core as long as they have a physical hub as an intermediary between them and AWS IoT Core for communication and security.

Q: What is the Device Gateway?

The Device Gateway forms the backbone of communication between connected devices and the cloud capabilities such as the Rules Engine, Device Shadow, and other AWS and 3rd-party services.

The Device Gateway supports the pub/sub messaging pattern, which enables scalable, low-latency, and low-overhead communication. It is particularly useful for IoT scenarios where billions of devices are expected to communicate frequently and with minimal delay. Pub/sub involves clients publishing messages on logical communication channels called 'topics' and clients subscribing to topics to receive messages. The device gateway enables the communication between publishers and subscribers. Traditionally, organizations have had to provision, operate, scale, and maintain their own servers as device gateways to take advantage of pub/sub. AWS IoT Core has eliminated this barrier by providing the Device Gateway.

The Device Gateway scales automatically with your usage, without any operational overhead for you. AWS IoT Core supports secure communication with the device gateway, AWS-account level isolation, as well as fine-grained authorization within an AWS account. The device gateway currently supports publish and subscribe over secure MQTT and WebSockets, as well as publish over HTTPS.

Q. What is MQTT?

MQTT is a lightweight pub/sub protocol, designed to minimize network bandwidth and device resource requirements. MQTT also supports secure communication using TLS. MQTT is often used in IoT use cases. MQTT v3.1.1 is an OASIS standard, and the Device Gateway supports most of the MQTT specification.

Q. What is the Rules Engine?

The Rules Engine enables continuous processing of inbound data from devices connected to AWS IoT Core. You can configure rules in the Rules Engine in an intuitive, SQL-like syntax to automatically filter and transform inbound data. You can further configure rules to route data from AWS IoT Core to several other AWS services as well as your own or 3rd party services.

Here are just a few example use cases of rules:

- Filtering and transforming incoming messages and storing them as time series data in DynamoDB.
- Sending a push notification via SNS when the data from a sensor crosses a certain threshold.
- Saving a firmware file to S3
- Processing messages simultaneously from a multitude of devices using Kinesis
- Invoke Lambda to do custom processing on incoming data
- Sending a command to a group of devices with an automated republish

Q. What is the Registry and what should I use it for?

IoT scenarios can range from a small number of mission-critical devices to large fleets of devices. The Registry allows you to organize and track those devices. You can maintain a logical handle in the Registry for every device you are connecting to AWS IoT Core. Each device in the Registry can be uniquely identified and can have metadata such as model numbers, support contact, and certificates associated with it. You can search for connected devices in the Registry based on the metadata.

Q. What is the Device Shadow?

The Device Shadow enables cloud and mobile applications to easily interact with the connected devices registered in AWS IoT Core. The Device Shadow in AWS IoT Core contains properties of a connected device. You can define any set of properties applicable to your use case. For example, for a smart light bulb, you might define 'on-or-off', 'color', and 'brightness' as the properties. The connected device is expected to report the actual values of those properties, which are stored in the Device Shadow. Applications get and update the properties simply by using a RESTful API provided by AWS IoT Core. AWS IoT Core and the Device SDKs take care of synchronizing property values between the connected device and its Device Shadow in AWS IoT Core.

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Q. What is the lifecycle of a device and its Device Shadow in AWS IoT Core?

- You register a device (such as a light bulb) in the Registry.
- You program connected device to publish a set of its property values or 'state ("I am ON and my color is RED") to the AWS IoT Core service.
- The last reported state is stored in the Device Shadow in AWS IoT Core.
- An application (such as a mobile app controlling the light bulb) uses a RESTful API to query AWS IoT Core for the last reported state of the light bulb, without the complexity of communicating directly with the light bulb.
- When a user wants to change the state (such as turning the light bulb from ON to OFF), the application uses a RESTful API to request an update, i.e. sets a 'desired' state for the device in AWS IoT Core. AWS IoT Core takes care of synchronizing the desired state to the device.
- The application gets notified when the connected device updates its state to the desired state.

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