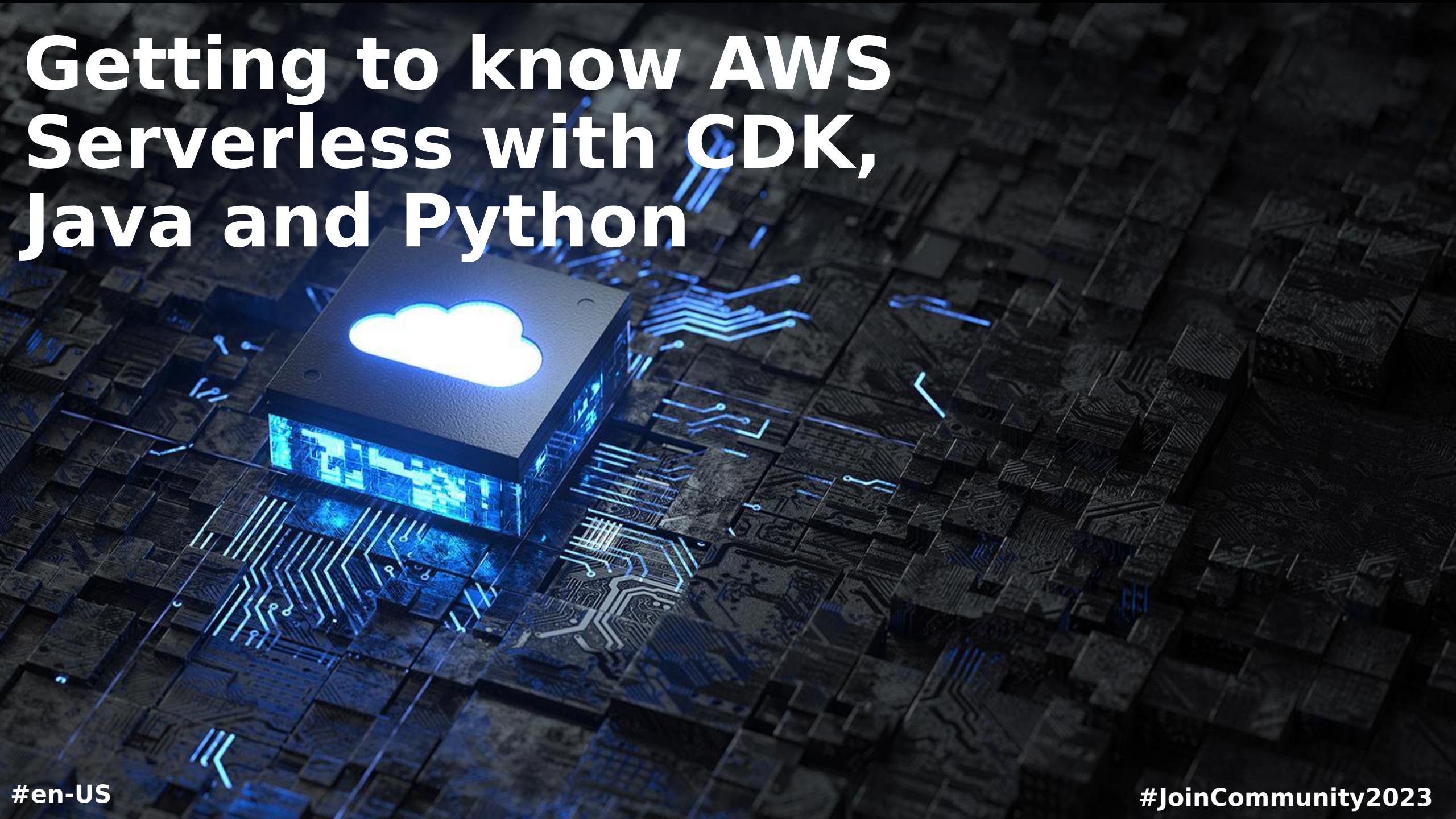


Conhecendo AWS Serverless com CDK, Java e Python



Getting to know AWS Serverless with CDK, Java and Python



About the Speaker

Weder Mariano de Sousa

Specialist Senior Java - GFT



AWS
community
builder

Technician **System Development**

Graduated **Computer Science**

Post Graduate in **Midias UFG**

Post Graduate in **Information Security**

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<https://github.com/weder96>

<https://twitter.com/weder96>

<https://dev.to/weder96>



GOJava

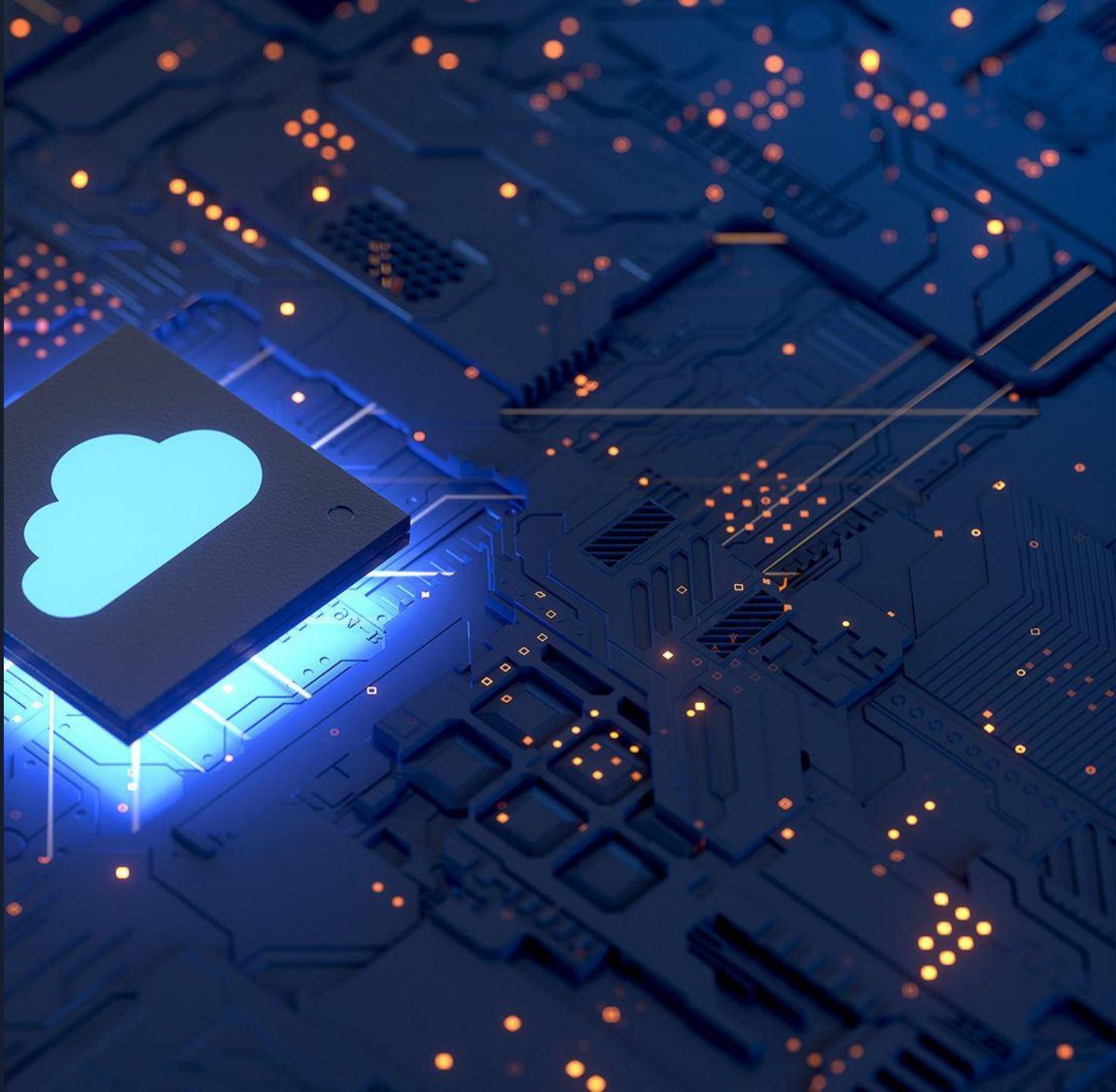


AWS User Group Goiânia



Agenda

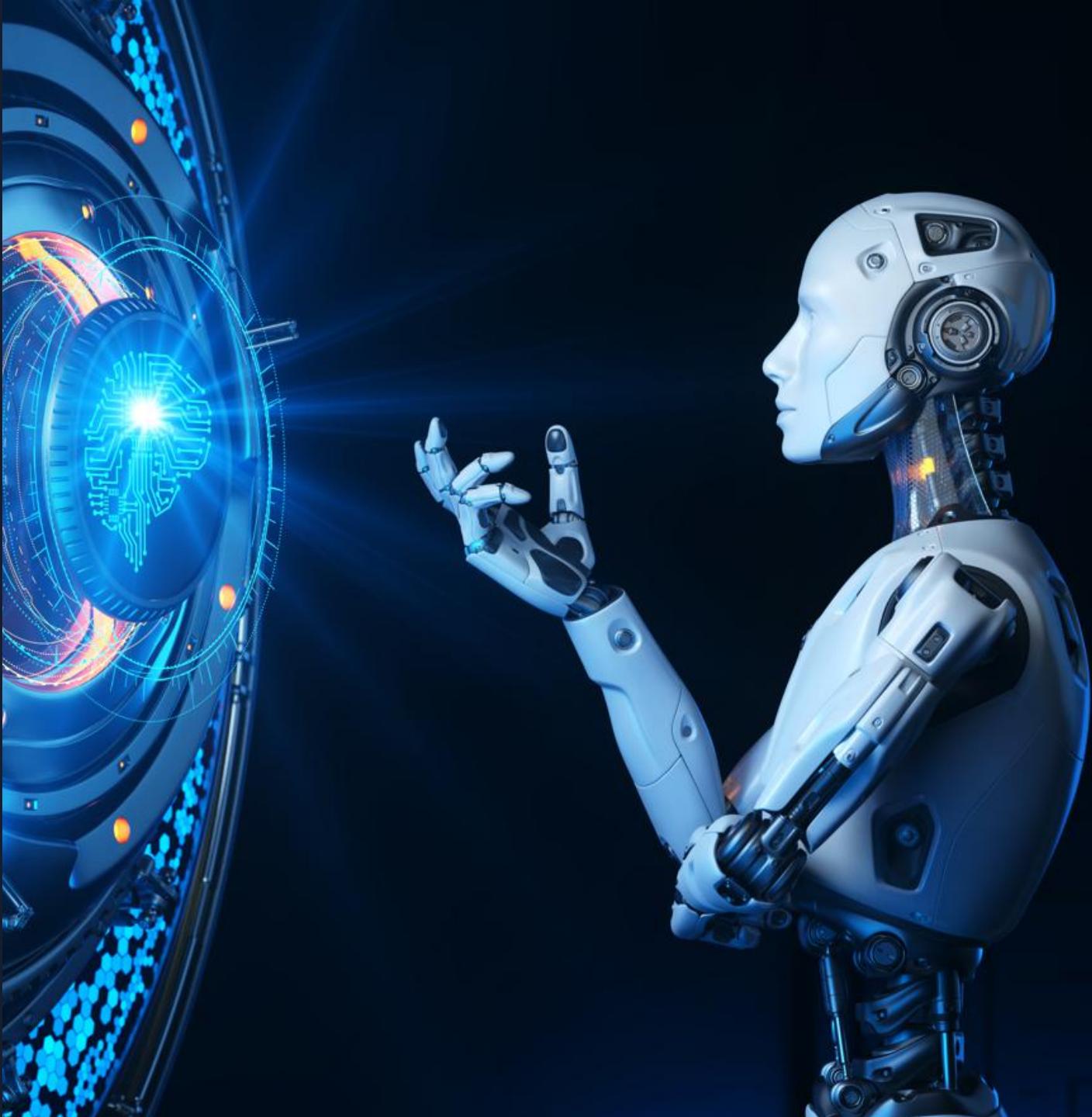
1. Question AI
2. Prerequisites and Tools
3. Install AWS Command Line Interface (AWS CLI) Linux
4. AWS IDE Toolkits
5. Serverless
6. AWS Storage
7. AWS Database
8. AWS API Gateway
9. AWS Application Integration
10. AWS Application Orchestration
11. AWS Lambda Overview
12. Architecture Serverless
13. AWS CDK For Java and Python
14. Next Steps





Question AI

Criar uma rotina de estudo focado na aprendizagem de Serverless AWS ?





Semana 1-2: Fundamentos da AWS

Semana 3-4: Conceitos Básicos de Serverless

Semana 5-6: Desenvolvimento Serverless

Semana 7-8: Arquitetura e Segurança Serverless

Semana 9-10: Monitoramento e Depuração

Semana 11-12: Serverless Avançado e Projetos

Nas últimas semanas, vá além dos conceitos básicos:

Serverless Framework: Familiarize-se com o Serverless Framework para facilitar o desenvolvimento e implantação de aplicações Serverless.

Projetos Práticos: Comece a criar projetos práticos para aplicar seus conhecimentos e construir aplicações Serverless reais.

Lembre-se de que a prática é fundamental para o aprendizado.

À medida que você avança na sua rotina de estudo, trabalhe em projetos reais para consolidar seus conhecimentos.

Serverless é uma abordagem poderosa, e dominá-la pode abrir muitas oportunidades no mundo da computação em nuvem.

ChatGPT

Além da Rotina de Estudo:

Participe de comunidades online relacionadas à AWS e Serverless para fazer perguntas, compartilhar conhecimentos e aprender com os outros.

Considere a certificação **AWS Certified Developer - Associate** para validar suas habilidades Serverless.

Mantenha-se atualizado lendo blogs, assistindo a webinars e participando de eventos relacionados à AWS e Serverless.



Bard

Semana 1-2: Introdução a Serverless AWS

Semana 3-4: AWS Cognito, AWS CloudWatch AWS CloudFormation

Semana 5-6: Avanços em Serverless AWS Casos de uso de Serverless AWS Projetos de Serverless

Projetos pessoais: Construção de aplicações Serverless AWS Recursos

Estudo autônomo: Leitura de documentação

Documentação da AWS Tutoriais da AWS

Esta rotina pode ser adaptada de acordo com as necessidades e objetivos do aluno.

Por exemplo, alunos com experiência em desenvolvimento de software podem avançar mais rapidamente no conteúdo.

Alunos com menos experiência podem dedicar mais tempo ao estudo dos conceitos básicos.

Encontre um grupo de estudo. Trabalhar com outras pessoas pode ajudá-lo a aprender e resolver problemas.

Não tenha medo de pedir ajuda. Se você ficar preso em um conceito, não tenha medo de procurar ajuda do seu instrutor, de um amigo ou de um grupo de discussão online.

Estabeleça metas realistas. Não tente aprender tudo de uma vez.

Comece com os conceitos básicos e avance gradualmente.

Crie um cronograma e cumpra-o. Ter um plano o ajudará a se manter motivado e no caminho certo.



Prerequisites and Tools



Prerequisites and Tools

6 main Prerequisites;

1. AWS Account and User
2. AWS CLI
3. Python 3.10
4. IDE for your programming language = Visual Studio Code
5. IDE for your programming language = IntelliJ IDE
6. Postman



Install AWS Command Line Interface (AWS CLI) Linux



Install AWS Linux

You must be able to extract or "unzip" the downloaded package. If your operating system doesn't have the built-in unzip command, use an equivalent.

The AWS CLI uses glibc, groff, and less. These are included by default in most major distributions of **Linux**.

We support the AWS CLI on 64-bit versions of recent distributions of **CentOS**, **Fedora**, **Ubuntu**, **Amazon Linux 1**, **Amazon Linux 2** and **Linux ARM**.

Install or update the AWS CLI

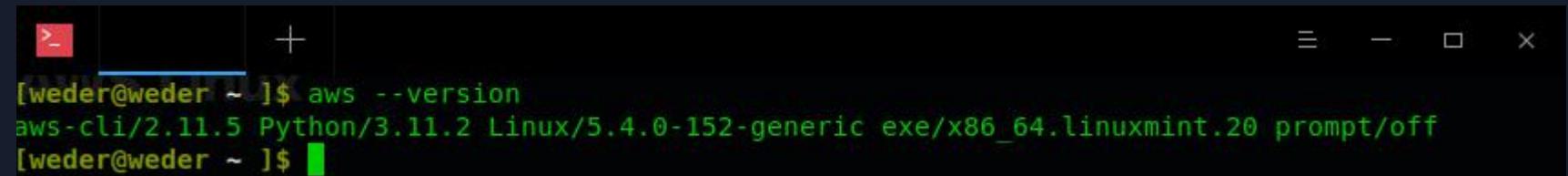
To update your current installation of AWS CLI, download a new installer each time you update to overwrite previous versions. Follow these steps from the command line to install the AWS CLI on Linux.

We provide the steps in one easy to copy and paste group based on whether you use 64-bit Linux or Linux ARM. See the descriptions of each line in the steps that follow.

Linux x86 (64-bit) Linux ARM

```
$ curl "https://awscli.amazonaws.com/awscli-exe-linux-x86_64.zip" -o "awscliv2.zip"
unzip awscliv2.zip
sudo ./aws/install
```

Because AWS doesn't maintain third-party repositories.
We can't guarantee that they contain the latest version of the AWS CLI.



A screenshot of a terminal window titled 'Terminal' showing the AWS CLI installed and running. The command 'aws --version' is entered, and the output shows the AWS CLI version 2.11.5, Python 3.11.2, and Linux 5.4.0-152-generic. The terminal has a dark background with light-colored text and a green cursor bar.

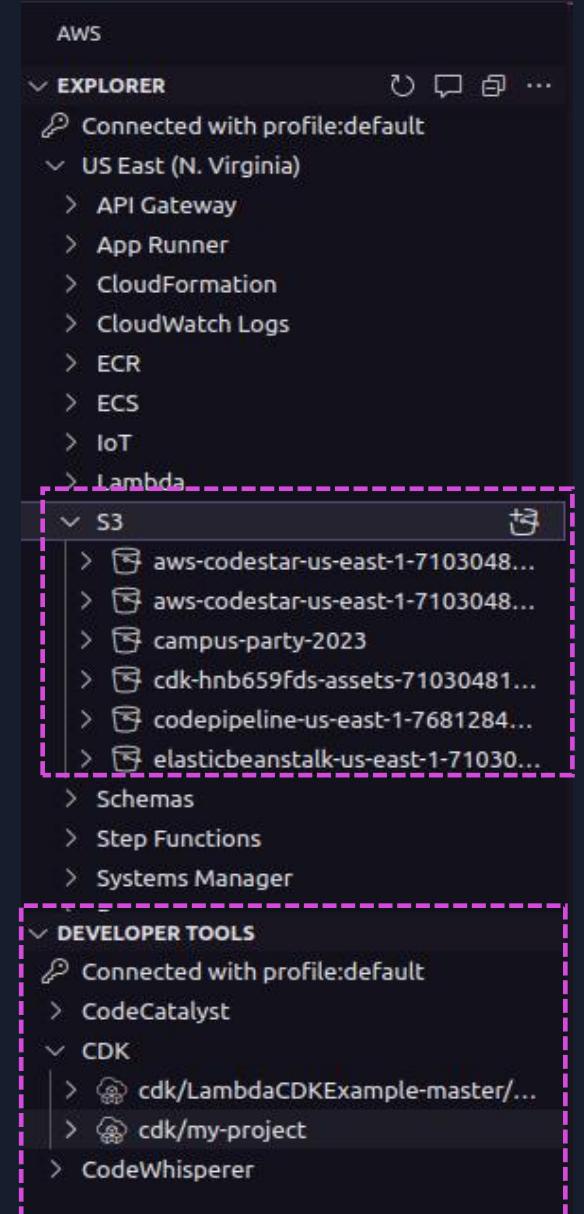
```
[weder@weder ~]$ aws --version
aws-cli/2.11.5 Python/3.11.2 Linux/5.4.0-152-generic exe/x86_64.linuxmint.20 prompt/off
[weder@weder ~]$
```



AWS IDE Toolkits



AWS Toolkit for Visual Studio Code



https://aws.amazon.com/serverless/?nc1=h_ls
<https://marketplace.visualstudio.com/items?itemName=AmazonWebServices.aws-toolkit-vscode>

What is Toolkits de IDE da AWS ?

Settings

Plugins Marketplace Installed

Cloud

AWS Toolkit

Amazon Web Services Plugin homepage ↗

Install 1.67-231

Overview What's New Reviews Additional Info

Search Results (17) Sort By: Relevance

aws AWS Toolkit 4.7M 3.05 Amazon Web Services

Big Data Tools Ultimate Install

Merloc - AWS Lambda Debugg... Install

AWS CodeArtifact + Maven Install

Elasticsearch Query - EDQL Install

DynamoDB Paid Install

Elasticsearch Paid Install

Ciclope Paid Install

Httpx Requests Ultimate Install

Vacuum Ultimate Install

The AWS Toolkit for JetBrains makes it easier to write applications built on [Amazon Web Services](#). If you come across bugs with the toolkit or have feature requests, please raise an [issue](#) on our GitHub repository.

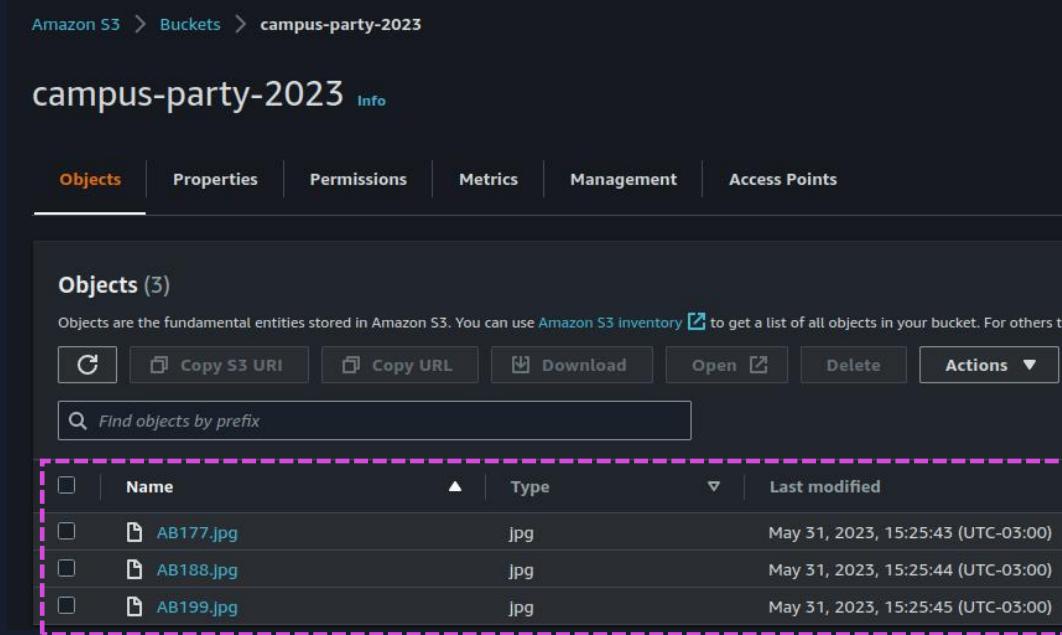
See the [user guide](#) for how to get started, along with what features/services are supported.

Features:

OK Cancel Apply



What is Toolkits de IDE da AWS ?



Amazon S3 > Buckets > campus-party-2023

campus-party-2023 [Info](#)

Objects Properties Permissions Metrics Management Access Points

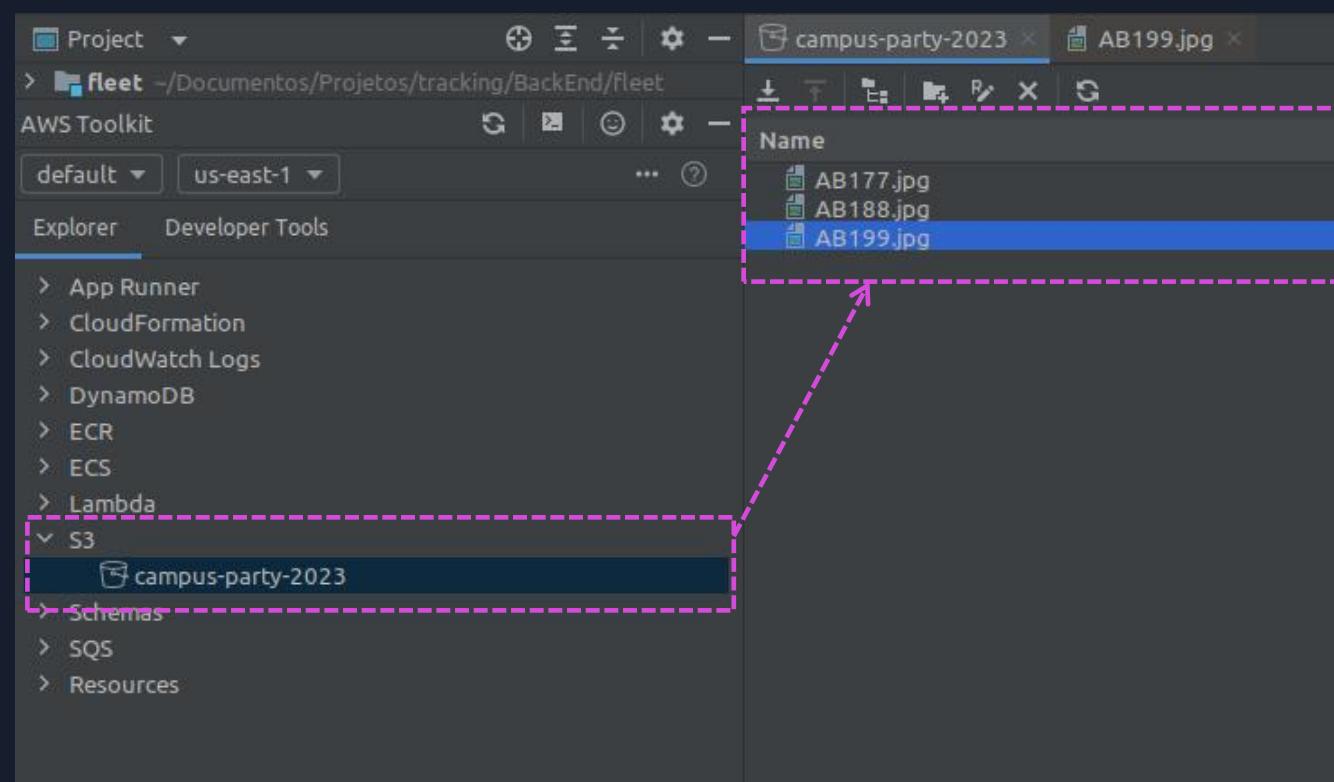
Objects (3)

Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to

C Copy S3 URI Copy URL Download Open Delete Actions ▾

Find objects by prefix

Name	Type	Last modified
AB177.jpg	jpg	May 31, 2023, 15:25:43 (UTC-03:00)
AB188.jpg	jpg	May 31, 2023, 15:25:44 (UTC-03:00)
AB199.jpg	jpg	May 31, 2023, 15:25:45 (UTC-03:00)



Project fleet /Documentos/Projetos/tracking/BackEnd/fleet

AWS Toolkit

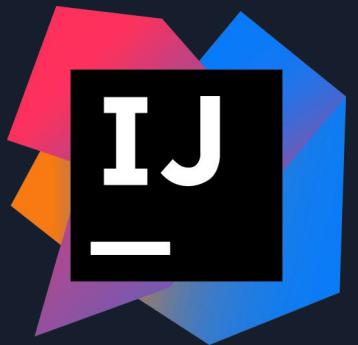
default us-east-1

Explorer Developer Tools

Name

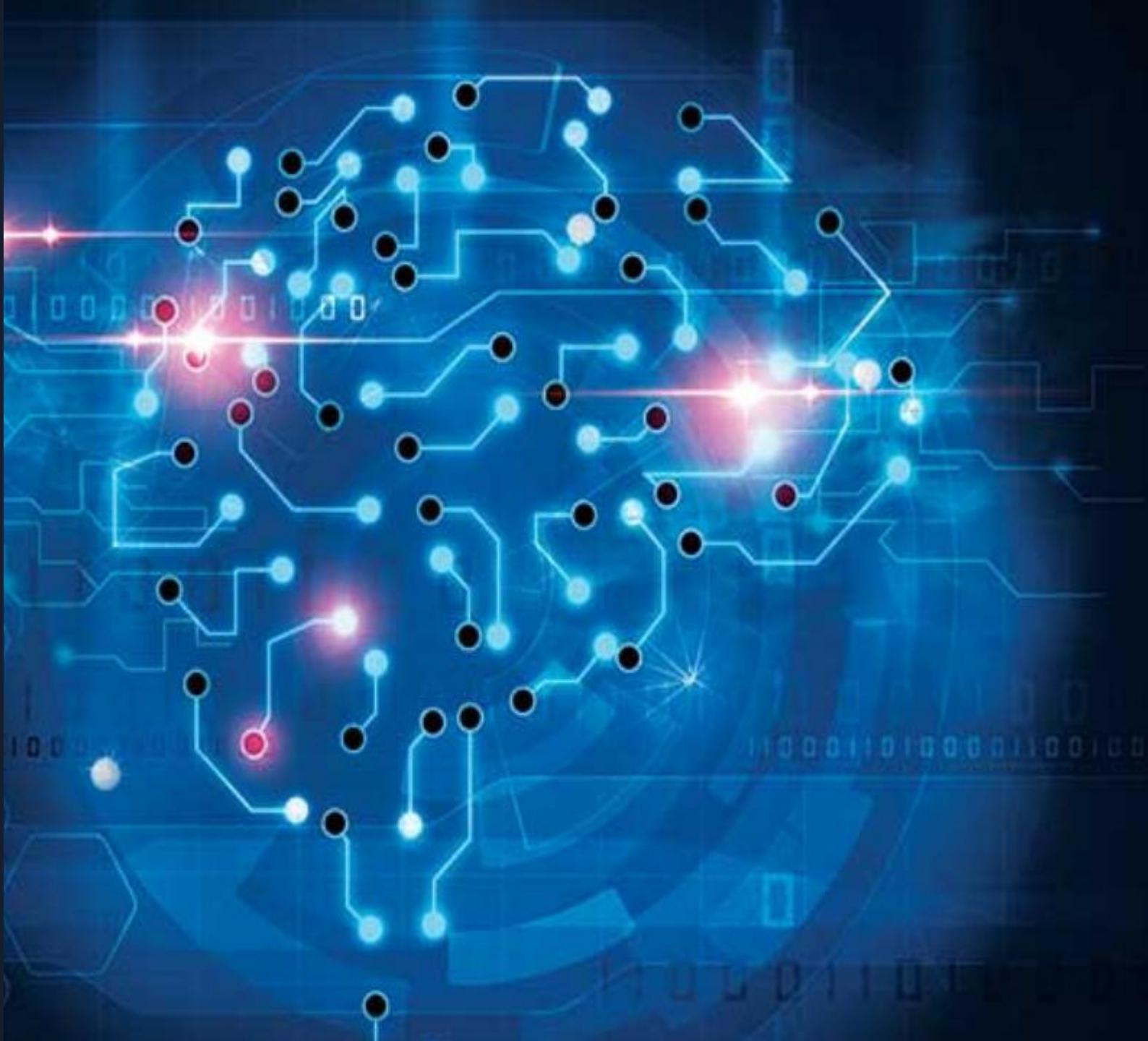
- AB177.jpg
- AB188.jpg
- AB199.jpg

App Runner CloudFormation CloudWatch Logs DynamoDB ECR ECS Lambda S3 campus-party-2023 Schemas SQS Resources





Serverless



What is Serverless ?

Serverless is a way to describe the services that enable you to build and run applications without thinking about servers. AWS has serverless services for all layers of your stack.

In many public forums, like our marketing website, **we list these services under the Serverless heading** because it **improves discoverability**.

When it comes to building an architecture diagram, **it's more intuitive to use a functional categorization**. Please find the architecture icon for each serverless service in its functional category.

You can use the serverless category icon to describe serverless applications or architectures.

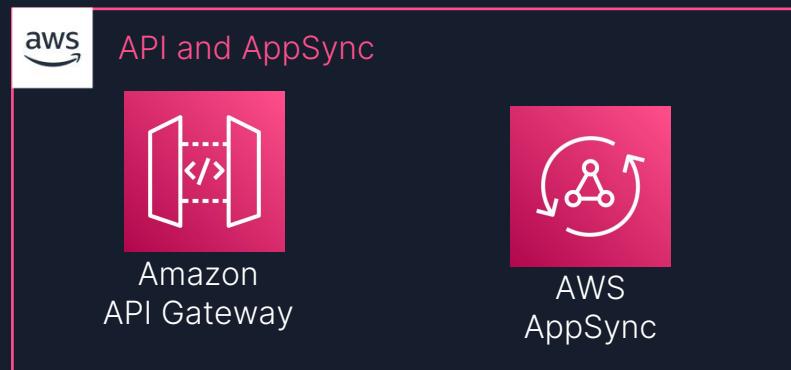
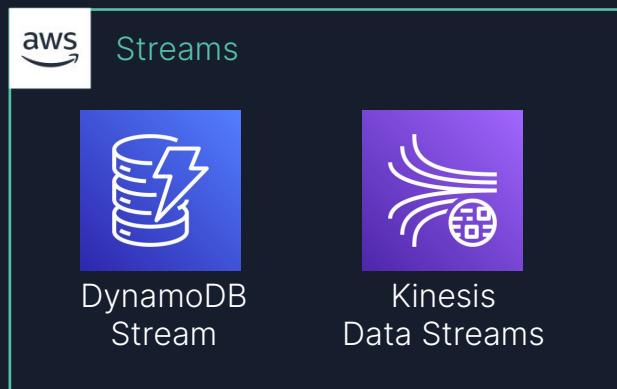
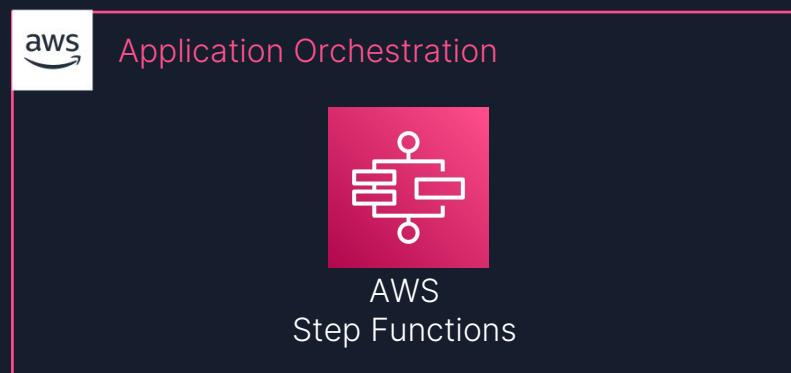
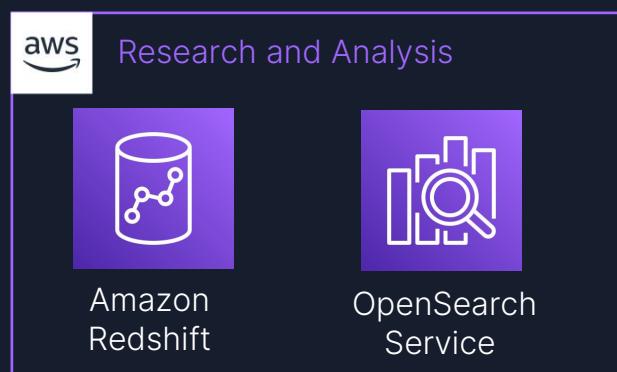
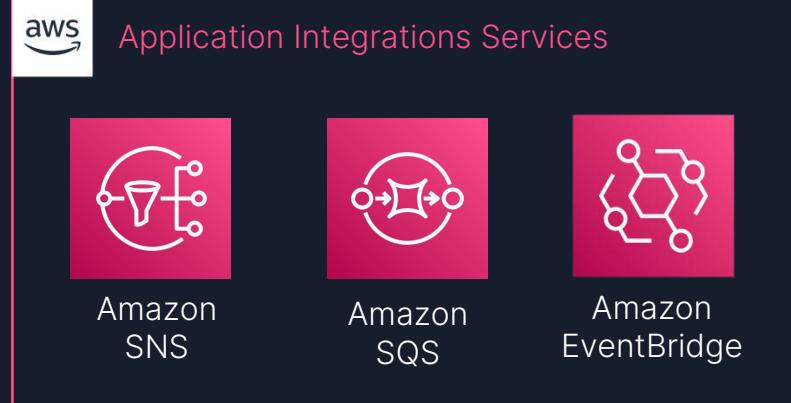
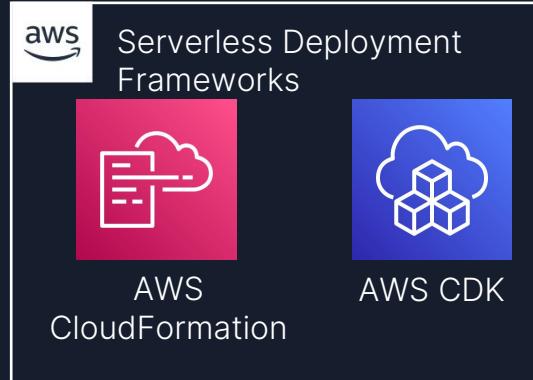


https://aws.amazon.com/serverless/?nc1=h_ls

Serverless Explained : AWS Operational Responsibility Model



AWS Services Serverless



How to build, run and deploy?



When starting designing, and building serverless function, you might wonder how to deploy your function into the cloud. With AWS, there are some ways we can deploy, test and invoke your function:



Using the AWS Console Management: we can create lambda function, upload code, add triggers, and test your Lambda function manually. You might use this way when first.



AWS CLI: you also can use AWS Lambda CLI to create, deploy, invoke, manage, monitor your Lambda function. You can use existing commands to deploy and test your Lambda function automatically without manual process. But this isn't good for production and large project.



AWS Serverless Application Model (AWS SAM) is an open-source framework for building serverless applications. It provides shorthand syntax to express functions, APIs, databases, and event source mappings.



AWS Cloud Development Kit (AWS CDK) is an open source software development framework to define your cloud application resources using familiar programming languages.

How to build, run and deploy?



[Serverless Framework](#) - The Serverless Framework consists of an open source CLI and a hosted dashboard. Together, they provide you with full serverless application lifecycle management.



[Chalice](#) is a framework for writing serverless apps in Python. It allows you to quickly create and deploy applications that use AWS Lambda.



[Arc.codes](#) provides everything you need to build massively scalable serverless apps with low code, clear and terse config, and zero ceremony.



[Claudia.js](#) makes it easy to deploy Node.js projects to AWS Lambda and API Gateway.



AWS Storage



Amazon S3 CLI Commands

joinCommunity2023 / learning / 09_S3 / README.md

Preview

Code

Blame

200 lines (144 loc) · 4.59 KB

Code 55% faster with GitHub Copilot

Create S3 Bucket

```
aws s3 mb s3://s3-join-community-2023-files
```



Create S3 bucket in specific AWS region

```
aws s3 mb s3://s3-join-community-2023-files-us-ea-2 --region us-east-2
```



put version at bucket

```
aws s3api put-bucket-versioning --bucket s3-join-community-2023-files-us-ea-2 --versioning-configuration Status=Enat
```



check bucket status version

```
aws s3api get-bucket-versioning --bucket s3-join-community-2023-files-us-ea-2
```



Suspending versioning

```
aws s3api put-bucket-versioning --bucket s3-join-community-2023-files-us-ea-2 --versioning-configuration Status=Susp
```



Copy files to S3 bucket

```
aws s3 cp images/ s3://s3-join-community-2023-files --recursive --include "*.jpg"
```



List S3 buckets

```
aws s3 ls
```



Amazon S3



AWS Database



DynamoDB Primary Key, Partition Key and Sort Key

A primary key **uniquely identifies** each item in the table, so no two items can have the same key. DynamoDB supports two different kinds of primary keys:

Partition key

Partition key and sort key

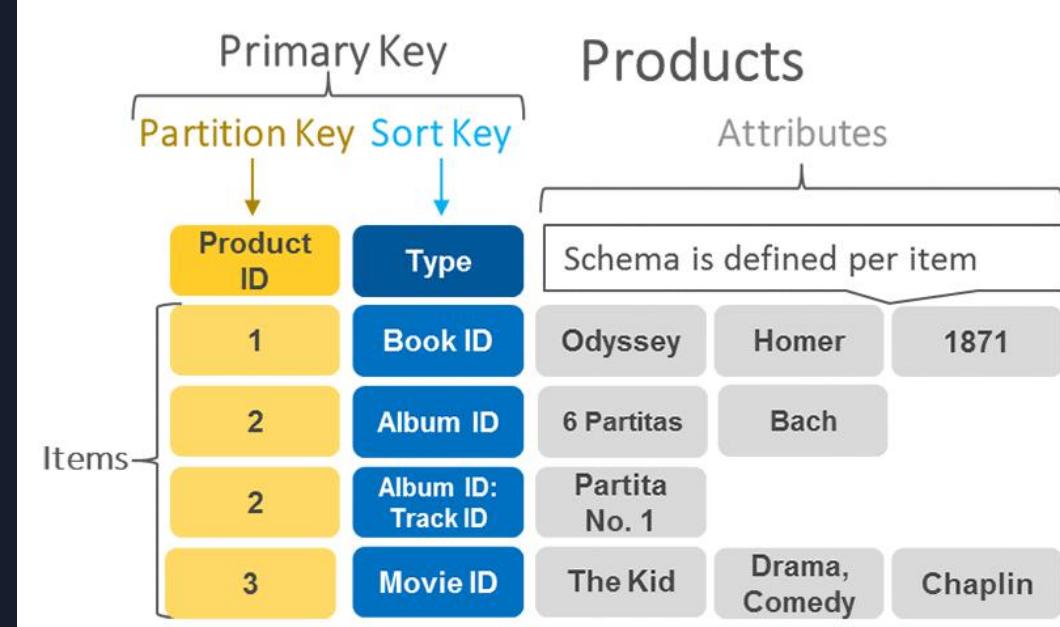
Partition key

A simple primary key, composed of one attribute known as the partition key.

Partition key and Sort Key

It is Referred to as a composite primary key, this type of key is composed of two attributes. The first attribute is the partition key, and the second attribute is the sort key.

DynamoDB uses the partition key value as input to an internal hash function. A composite primary key gives you additional flexibility when **querying data**



General information

Partition key
orderId (String)

Sort key
orderDate (String)

Alarms
 No active alarms

Point-in-time recovery (PITR) [Info](#)
 Off

► Additional info



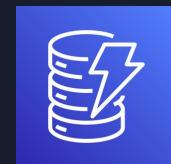
DynamoDB Python(Boto3)

Files

weder96 learning serverless with cli commands

Code Blame 39 lines (32 loc) · 1004 Bytes Code 55% faster with GitHub Copilot

```
1 import json
2 import boto3
3 import uuid
4
5 client = boto3.resource('dynamodb')
6
7 def lambda_handler(event, context):
8     print('Starting input lambda function call')
9     print(event['body'])
10    table = client.Table('orders')
11    myuuid = uuid.uuid4()
12
13    print('Your UUID is: ' + str(myuuid))
14
15    order=json.loads(event['body'])
16
17    data = table.put_item(
18        Item={
19            'orderId': str(myuuid),
20            'orderDate': order['orderDate'],
21            'status': order['status'],
22            'desc': order['desc'],
23            'updateOrderDate': order['updateOrderDate'],
24            'Name': order['Name'],
25            'Email': order['Email']
26        }
27    )
28
```



https://github.com/weder96/joinCommunity2023/tree/main/learning/08_dynamodb

DynamoDB CLI Commands

JoinCommunity2023 / learning / 08_dynamodb /

Name	Last commit message
...	
crud	🚀 add boto3 dynamodb with lambda
README.md	🚀 add boto3 dynamodb with lambda

README.md

Dynamodb

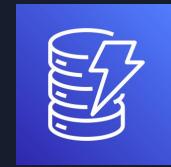
CLI

Create table DynamoDB

```
aws dynamodb create-table \
--table-name orders \
--attribute-definitions \
  AttributeName=id,AttributeType=S \
  AttributeName=status,AttributeType=S \
--key-schema \
  AttributeName=id,KeyType=HASH \
  AttributeName=status,KeyType=RANGE \
--provisioned-throughput \
  ReadCapacityUnits=5,WriteCapacityUnits=5 \
--table-class STANDARD
```

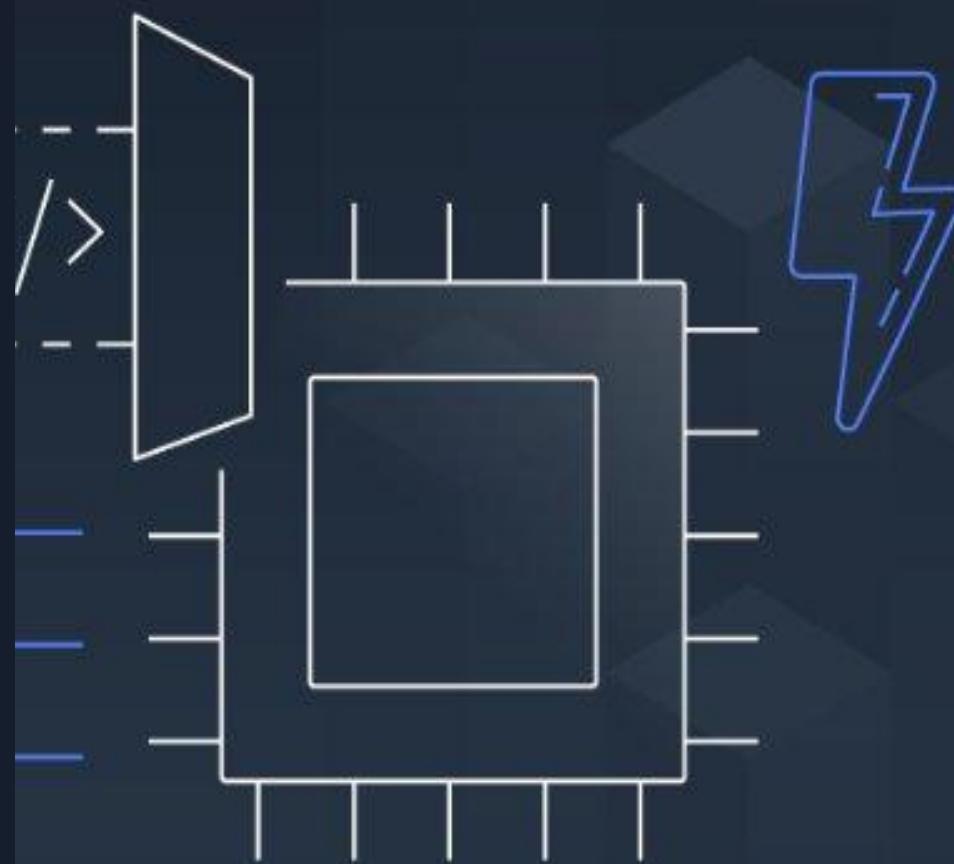
Describe table DynamoDB

```
aws dynamodb describe-table --table-name Order
```





AWS API Gateway



Amazon API Gateway Concepts

API Deployment - a point-in-time snapshot of your API Gateway API resources and methods. To be available for clients to use, the deployment must be associated with one or more API stages.

API endpoints - host names APIs in API Gateway, which are deployed to a specific region and of the format: rest-api-id.execute-api.region.amazonaws.com

API key - An alphanumeric string that API Gateway uses to identify an app developer who uses your API.

API stage - A logical reference to a lifecycle state of your API. API stages are identified by API ID and stage name.

Model - Data schema specifying the data structure of a request or response payload.

Private API - An API that is exposed through interface VPC endpoints and isolated from the public internet

Private integration - An API Gateway integration type for a client to access resources inside a customer's VPC through a private API endpoint without exposing the resources to the public internet.

Proxy integration - You can set up a proxy integration as an HTTP proxy integration type or a Lambda proxy integration type.

Usage plan - Provides selected API clients with access to one or more deployed APIs. You can use a usage plan to configure throttling and quota limits, which are enforced on individual client API keys.



Amazon
API Gateway

Amazon API Gateway CLI Commands

Files

main

Go to file

- assets
- finalPresentation
- learning
 - 01_start
 - 02_calc
 - 03_logStream
 - 04_Name
 - 05_Greeting
 - 06_function_with_url
 - 07_product
 - 08_dynamodb
 - 09_S3
 - 10_ApiGateway
- README.md
- app.py
- function.zip
- lambda-role-policy.json

joinCommunity2023 / learning / 10_ApiGateway /

Create a role

We use the [create-role](#) command :

create the lambda role

```
aws iam create-role --role-name apigw-lambda-role-py --assume-role-policy-document 'file://lambda-role-policy.json' -
```

Or

```
aws iam create-role --role-name apigw-lambda-role-py --assume-role-policy-document '{"Version": "2012-10-17", "Statement": {}}
```

Attach the execution policy to it

We use the [attach-role-policy](#) command :

attach the [AWSLambdaBasicExecutionRole](#) policy to the lambda role

attach-role AWSLambdaBasicExecutionRole managed policy:

```
aws iam attach-role-policy --role-name apigw-lambda-role-py --policy-arn arn:aws:iam::aws:policy/service-role/AWSLambdaBasicExecutionRole
```

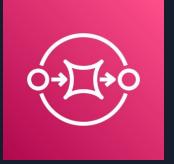
Zip file Linux



Amazon
API Gateway



SNS

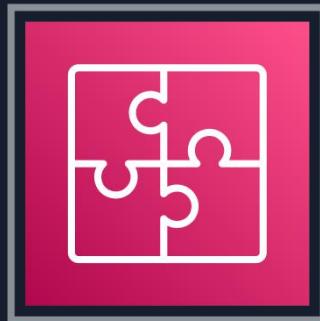


SQS



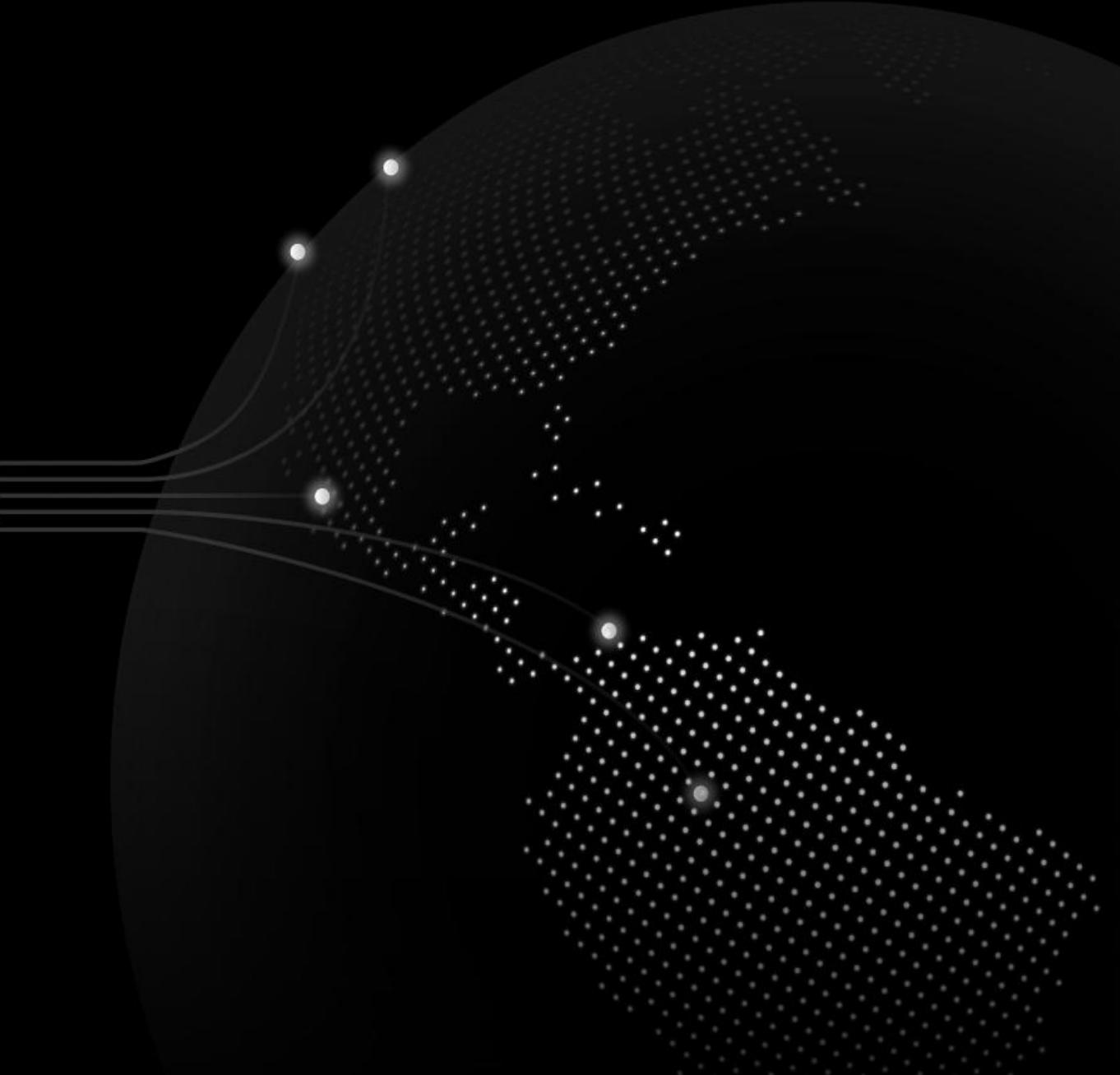
EVENTBRIDGE

AWS Application Integration





Amazon SNS



Amazon SNS: Fully Managed Pub/Sub Messaging



Application
Integration

Application integration

The Fanout scenario is when a message published to an SNS topic is replicated and pushed to multiple endpoints.

Application alerts

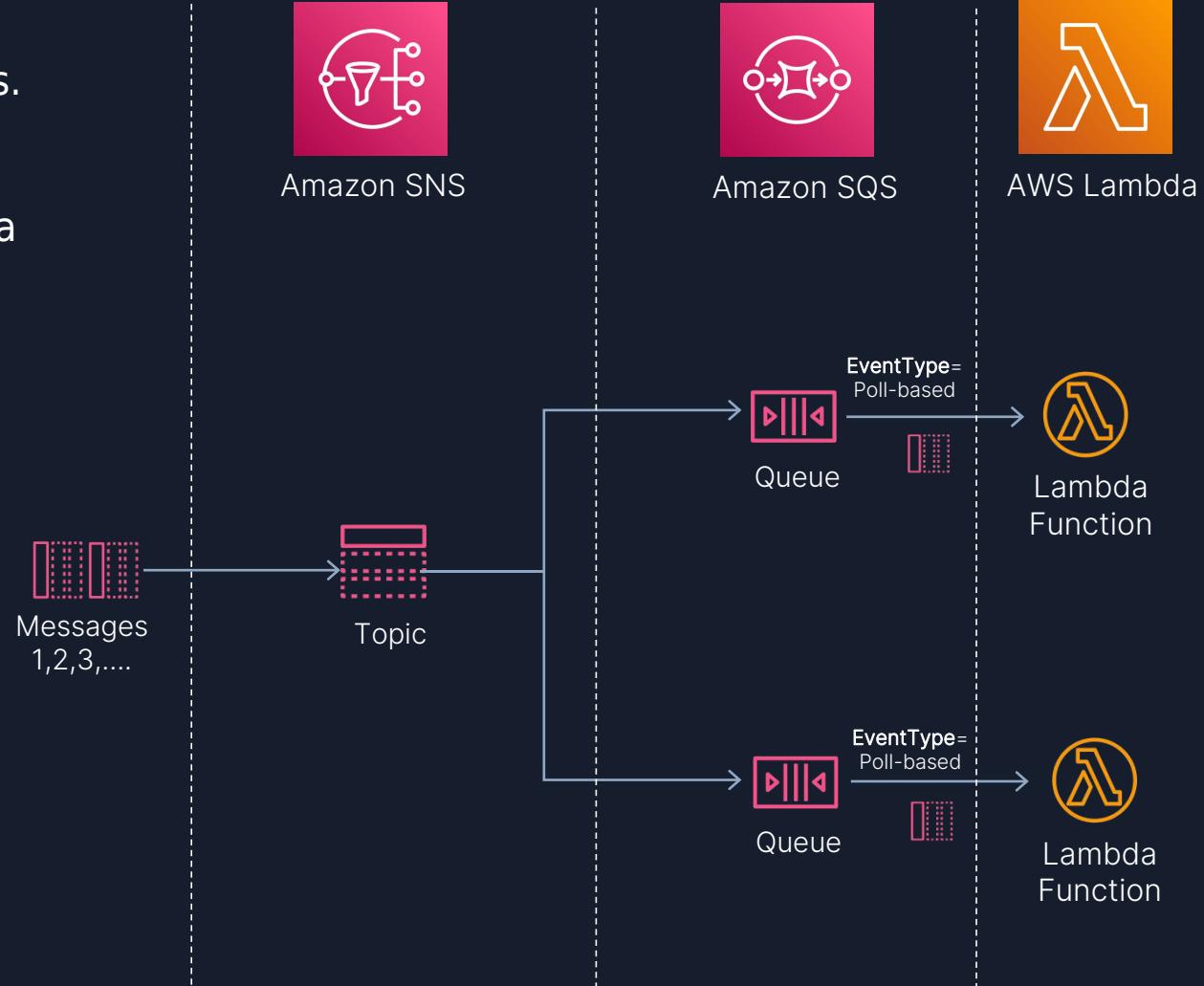
Amazon SNS can send notifications to specified users via SMS and email.

User notifications

Amazon SNS can send push email messages and text messages to individuals or groups.

Mobile push notifications

Mobile push notifications enable you to send messages directly to mobile apps.



Amazon SNS CLI Commands and (Python) Boto3

joinCommunity2023 / learning / 15_lambda sns / README.md 

 weder96 🚀 topics cli

Preview Code Blame 106 lines (75 loc) · 3.5 KB  Code 55% faster with GitHub Copilot

Lambda and SNS with Python

Zip file Linux

```
zip function.zip app.py
```



Create Lambda Function

```
aws lambda create-function \
--function-name snsTopic \
--runtime python3.10 \
--zip-file fileb://function.zip \
--handler app.lambda_handler \
--role arn:aws:iam::710304818543:role/lambda-role-py
```



Create a topic

To create a topic, use the sns create-topic command and specify the name to assign to the topic.

```
aws sns create-topic --name my-topic
```



Amazon SNS

https://github.com/weder96/joinCommunity2023/blob/main/learning/15_lambda sns/README.md





Amazon SQS



What is Amazon SQS ?



Application
Integration

Amazon SQS stands for **Simple Queue Service** is **fully managed message queues** for microservices, distributed systems, and serverless applications.

Enables you to **decouple** and **scale microservices**, distributed systems, and serverless applications.

Eliminates the **complexity** and overhead associated with managing and operating message-oriented middleware.

Send, store, and receive messages between software components at any volume.

Two types of message queues.

Standard queues offer maximum throughput, best-effort ordering, and at-least-once delivery.

FIFO queues are designed to guarantee that messages are processed exactly once, in the exact order that they are sent.

Integrate and **decouple** distributed software systems and components.

Provides a **generic web services API** that you can access using any programming language that the **AWS SDK** supports.



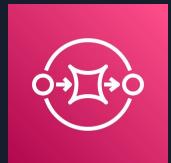
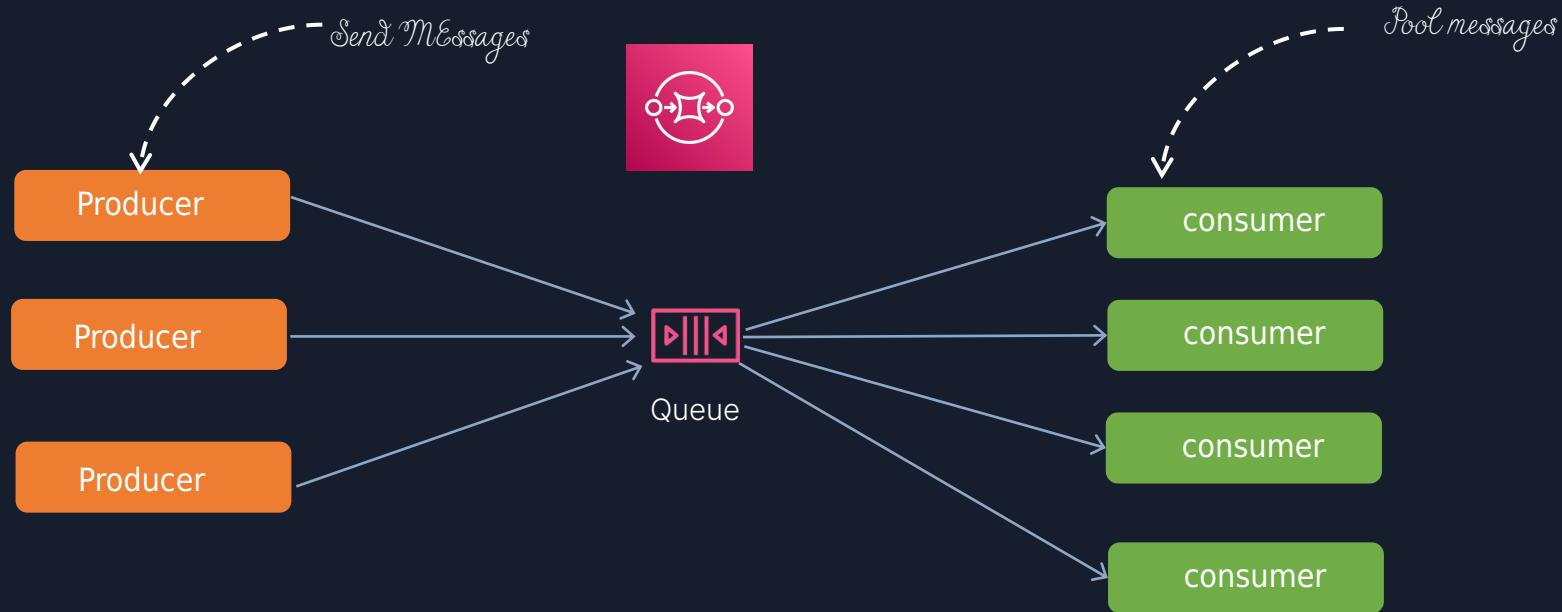
Amazon SQS

https://aws.amazon.com/sns/?nc1=h_ls

Amazon SQS What's a queue?



Application
Integration



Amazon SQS

https://aws.amazon.com/sns/?nc1=h_ls

Amazon SQS CLI Commands and (Python) Boto3



Application
Integration

joinCommunity2023 / learning / 16_lambda_sqs / README.md

Preview | Code | Blame 237 Lines (170 loc) · 6.14 KB ⚡ Code 55% faster with GitHub Copilot

Command Line Interface

```
aws sqs create-queue --queue-name cli-queue-attr --attributes file://q-attributes.json
```

```
aws sqs get-queue-attributes --queue-url https://sqs.us-east-1.amazonaws.com/710304818543/cli-queue-attr --attribute-
```

Sending Messages to our AWS SQS Queue

```
aws sqs send-message --queue-url https://sqs.us-east-1.amazonaws.com/710304818543/cli-queue-attr --message-body "IOT-"
```

Reading Messages from the AWS SQS Queue

```
aws sqs --region us-east-1 receive-message --queue-url https://sqs.us-east-1.amazonaws.com/710304818543/cli-queue-attr
```

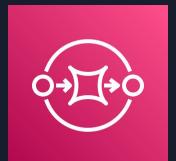
Deletion of a Processed Message from the AWS SQS Queue

```
aws sqs --region us-east-1 delete-message --queue-url https://sqs.us-east-1.amazonaws.com/710304818543/cli-queue-attr
```

Cleaning Up

```
aws sqs --region us-east-1 delete-queue --queue-url https://sqs.us-east-1.amazonaws.com/710304818543/cli-queue-attr
```

Get message with long polling



Amazon SQS

https://github.com/weder96/joinCommunity2023/blob/main/learning/16_lambda_sqs/README.md



Amazon EventBridge



What is Amazon EventBridge ?

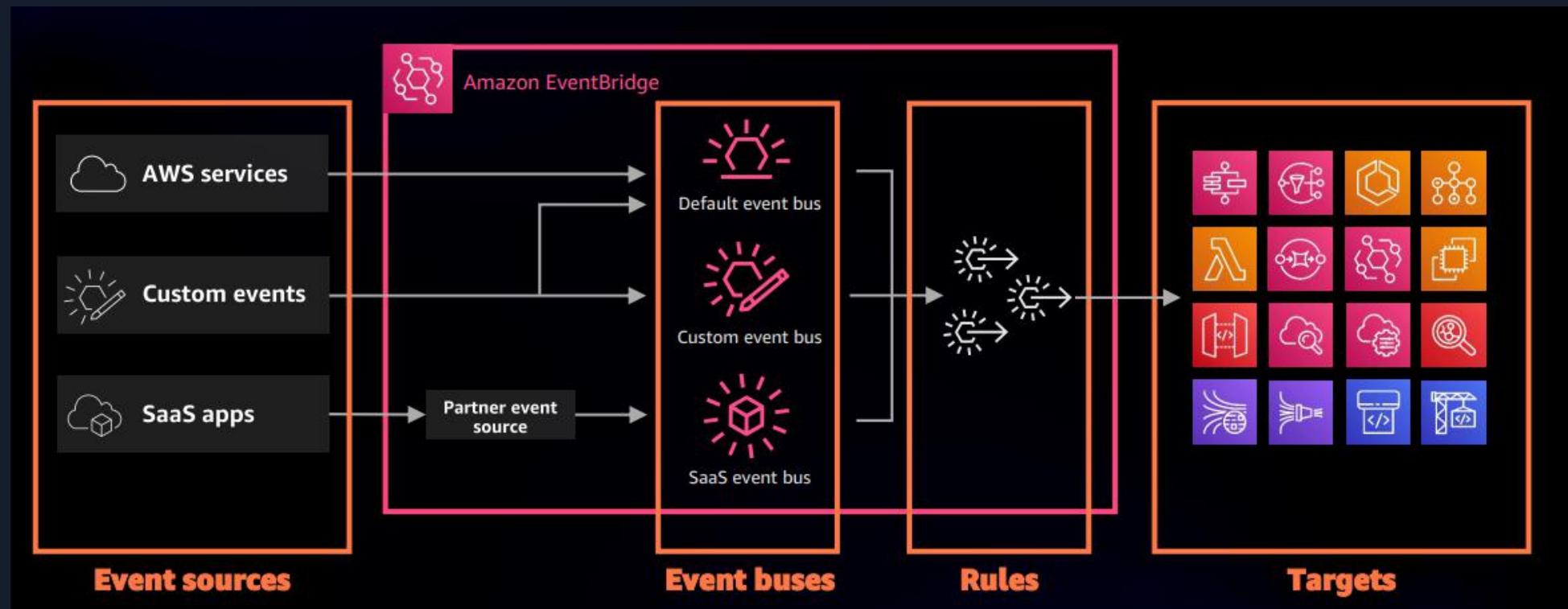
Serverless **event bus** service for AWS services

Build **event-driven** applications at scale using events generated from your apps

Use to connect your applications with data from a variety of sources, **integrated SaaS applications**

AWS services to targets such as AWS Lambda functions

Formerly **called Amazon CloudWatch Events**

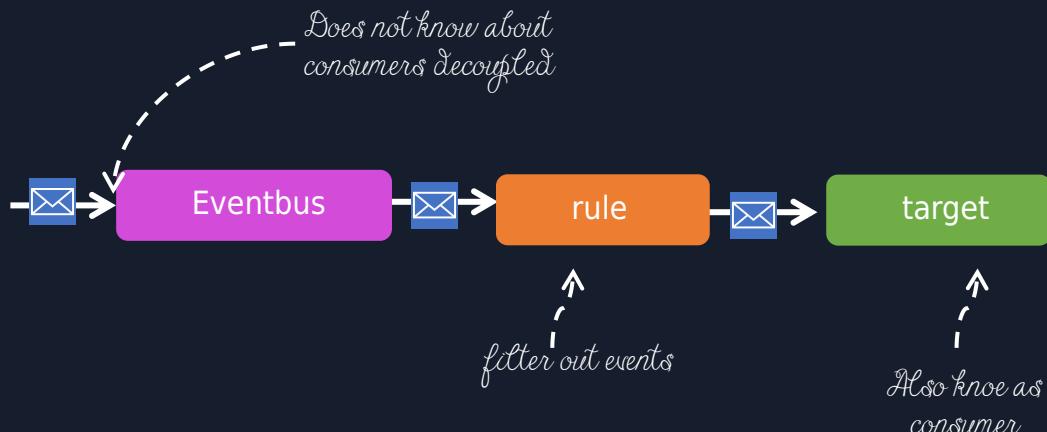


What are events?

1. An event is defined in JSON
2. "Detail" is application specific
3. Envelope attributes are provided by
4. Amazon EventBridge
5. Producers create events
6. Consumers choose which events to
7. Listen to by using rules

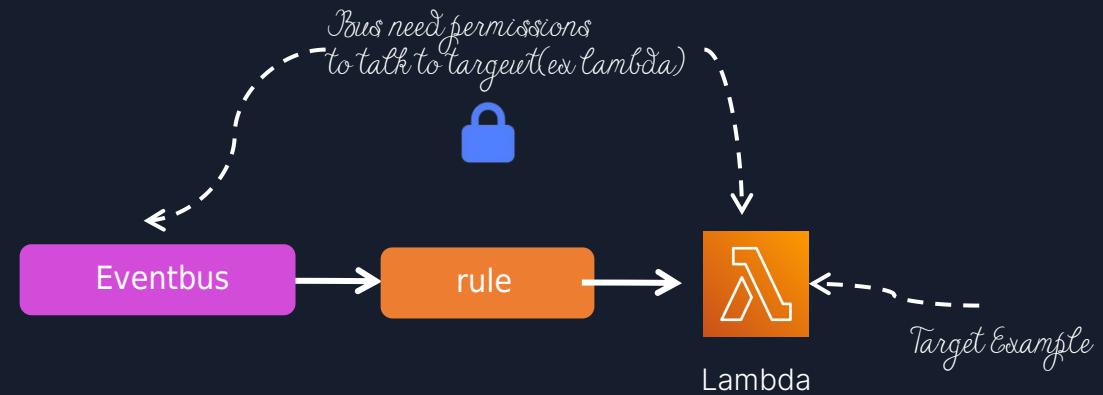
```
{  
    "version": "0",  
    "id": "6ac4e27b-1234-1234-1234-5fb02c880319",  
    "detail-type": "OrderProcessor.OrderStarted",  
    "source": "awsserverlessda.serverlesspresso",  
    "account": "123456789012",  
    "time": "2021-11-28T13:12:30Z",  
    "region": "us-west-2",  
    "detail": {  
        "userId": "jbesw",  
        "orderId": "eYmAfqLD67v1bdUVile_D",  
        "drinkOrder": {  
            "icon": "barista-icons_cafe-latte",  
            "modifiers": [],  
            "drink": "Latte"  
        }  
    }  
}
```

Understanding EventBridge target



What are target ?

Targets are consumer of your events
use rules to process events before reaching targets



Target Permissions

Your eventBridge bus need permissions to send events to targets

Amazon EventBridge CLI Commands and (Python) Boto3

joinCommunity2023 / learning / 19_eventbridge / README.md

weder96 learning serverless with cli commands

Preview Code Blame 201 lines (145 loc) · 4.4 KB Code 55% faster with GitHub Copilot

EventBridge

CLI

Amazon EventBridge

Amazon EventBridge - Developing with AWS SDK

EventBridge Client - AWS SDK for Python Boto3

<https://boto3.amazonaws.com/v1/documentation/api/latest/reference/services/events.html>

Commands : PutEventsCommand PutRuleCommand PutTargetsCommand

Event Bridge CLI Commands

Create an event bus

```
aws events create-event-bus --name "event-bridge-demo"
```

Create Role for EventBridge Event

Create Execution Role for AWS Lambda functions with AWS CLI

```
aws iam create-role --role-name eventbridge-role-py --assume-role-policy-document '{"Version": "2012-10-17", "Statement": [{"Action": "sts:AssumeRole", "Effect": "Allow", "Principal": "events.amazonaws.com"}]}
```



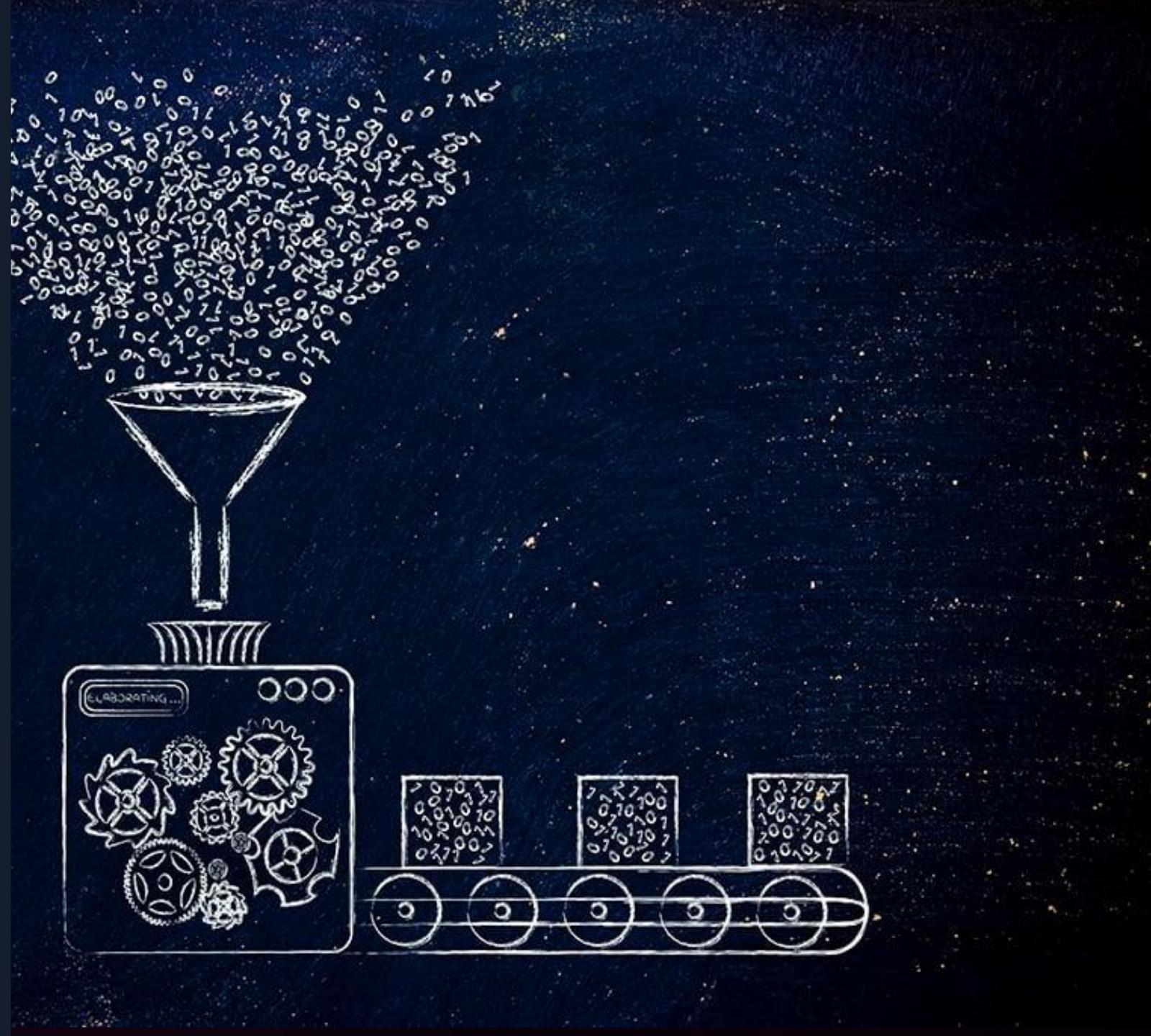
Amazon EventBridge

https://github.com/weder96/joinCommunity2023/blob/main/learning/19_eventbridge/README.md



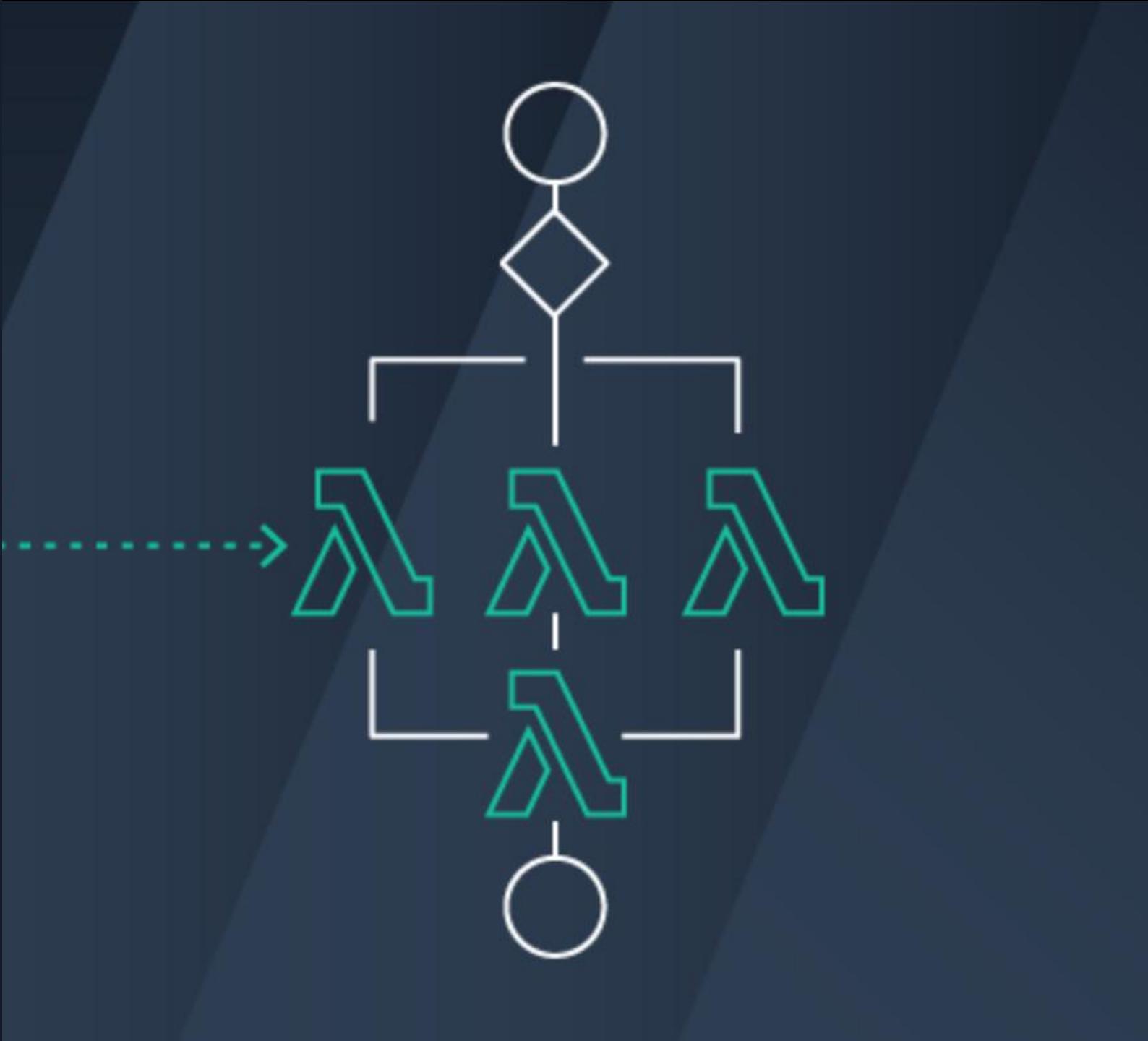
STEP FUNCTIONS

AWS Application Orchestration





AWS Step Functions



State types

Task	A single unit of work	 AWS Lambda Invoke  Amazon SNS Publish  Amazon ECS RunTask  AWS Step Functions StartExecution  AWS Glue StartJobRun
Choice	Adds branching logic	 Choice Adds if-then-else logic.
Parallel	Fork and join the data across tasks	 Parallel Adds parallel branches.
Wait	Delay for a specified time	 Wait Delays for a specified time.
Fail	Stops an execution and marks it as a failure	 Fail Stops and marks as failure.
Succeed	Stops an execution successfully	 Success Stops and marks as success.
Pass	Passes its input to its output	 Pass Transforms data or acts as placeholder.
Map	Loop and Foreach	 Map Adds a for-each loop.



Create a Serverless Workflow with AWS Step Functions and AWS Lambda



Step Functions > State machines > CallCenterStateMachine > Edit

Edit CallCenterStateMachine

Cancel **Start execution** Save

Definition
Define your workflow using [Amazon States Language](#). Test your data flow with the new [Data Flow Simulator](#).

Generate code snippet ▾ Format JSON

```
23  {
24      "Variable": "$.Status",
25      "NumericEquals": 1,
26      "Next": "Close Case"
27  },
28  {
29      "Variable": "$.Status",
30      "NumericEquals": 0,
31      "Next": "Escalate Case"
32  }
33  ],
34 },
35 "Close Case": {
36     "Type": "Task",
37     "Resource": "arn:aws:lambda:us-east-
1:         :function:CloseCaseFunction",
38     "End": true
39 },
40 "Escalate Case": {
41     "Type": "Task",
42     "Resource": "arn:aws:lambda:us-east-
1:         :function:EscalateCaseFunction",
43     "Next": "Fail"
44 },
45 "Fail": {
46     "Type": "Fail",
```

Workflow Studio **New**

```
graph TD
    Start((Start)) --> OpenCase[Open Case]
    OpenCase --> AssignCase[Assign Case]
    AssignCase --> WorkOnCase[Work on Case]
    WorkOnCase --> IsCaseResolved{Is Case Resolved}
    IsCaseResolved --> EscalateCase[Escalate Case]
    IsCaseResolved --> CloseCase[Close Case]
    EscalateCase --> Fail[Fail]
    EscalateCase --> CloseCase
    CloseCase --> End((End))
    Fail --> End
```

Amazon Step Functions CLI Commands and (Python) Boto3

joinCommunity2023 / learning / 21_step_function / README.md

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Preview Code Blame 123 lines (85 loc) · 3.23 KB Code 55% faster with GitHub Copilot

Step Functions

CLI

create-state-machine

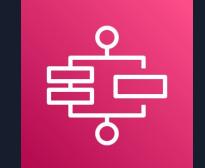
```
aws stepfunctions create-state-machine \
--name HasCreateCliStateMachine \
--definition "file://stateMachineDefinition.json" \
--role-arn arn:aws:iam::710304818543:role/service-role/StepFunctions-HelloWorld-role-6df6dc83
```

list state machines

```
aws stepfunctions list-state-machines
```

Execute state machines

```
aws stepfunctions start-execution --state-machine-arn arn:aws:states:us-east-1:710304818543:stateMachine:HasCreateCli
```



AWS Step Functions



AWS Lambda Overview



AWS Lambda Overview

Serverless on AWS, Build and run applications without thinking about servers

The **most popular serverless** compute platform that is using millions of customer

Running billions of invocations all over the world

Compute service that runs code without thinking any servers or underlying services

Serverless function that you only **responsible for your actual code**.



https://aws.amazon.com/serverless/?nc1=h_ls
<https://aws.amazon.com/blogs/compute/serverless-icymi-q2-2023/>

AWS Lambda Invocation Types

Triggered lambda functions with different AWS Lambda Invocation Types

AWS Lambda has 3 Invocation Types;

Lambda Synchronous invocation

Lambda Asynchronous invocation

Lambda Event Source Mapping with polling invocation



Lambda Function Code

AWS Lambda runs instances of **your function to process events**.

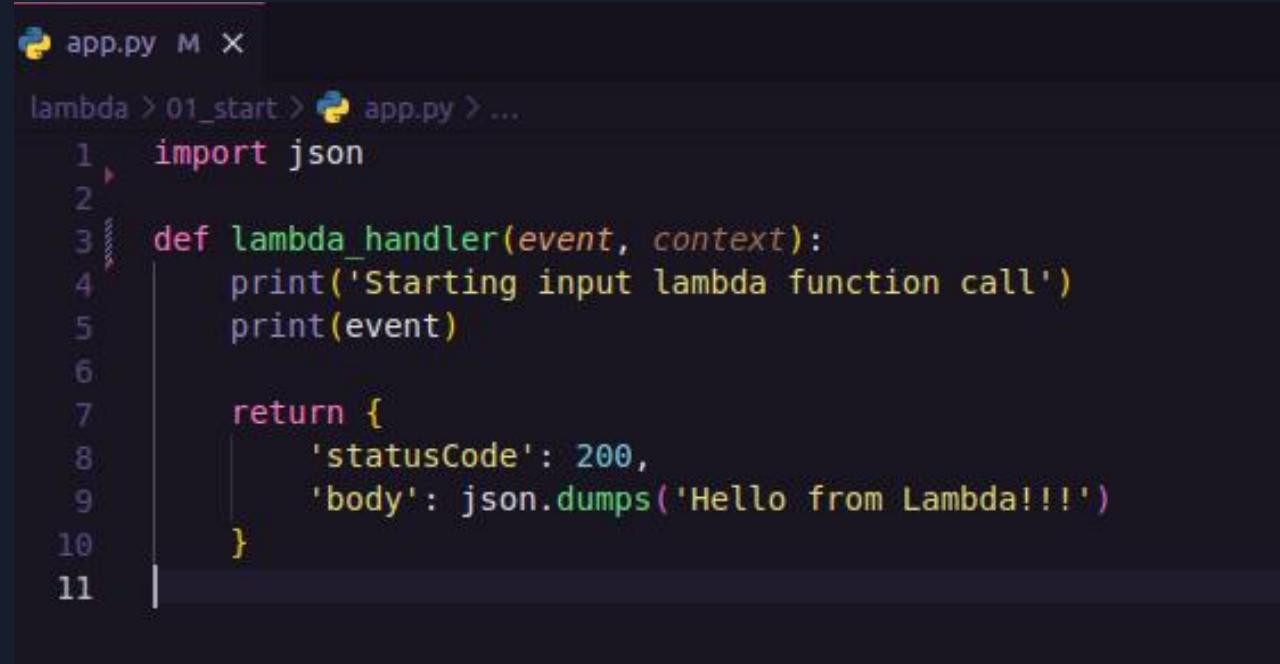
Invoke function directly **using the Lambda API**, or configure an AWS service or resource to invoke your function.

Lambda function **has code to process the events that you pass** into the function or that other AWS services send to the function with event json object.

The event object contains all the information about the **event that triggered this Lambda**.

The **context object contains info about** the runtime our Lambda function

Return the function **with the results**



```
app.py M X
lambda > 01_start > app.py > ...
1 import json
2
3 def lambda_handler(event, context):
4     print('Starting input lambda function call')
5     print(event)
6
7     return {
8         'statusCode': 200,
9         'body': json.dumps('Hello from Lambda!!!')
10    }
11
```



AWS Lambda Execution Role

AWS Lambda Permissions

Lambda Execution Role
Resource-based policy

Lambda Execution Role

IAM role that Lambda has permissions to assume when invoking lambda function.

Create an execution role when creating a new lambda function, and after that we can also modify the policies **associated with the IAM role**.

if you have additional targets from your lambda function
performing crud operations on DynamoDB table
sending notification to SNS
retrieve messages from queue or streams

Lambda function's execution role required permissions to interact with those AWS services

Grant least privilege access to your Lambda execution role



```
{  
  "Version": "2012-10-17",  
  "Statement": [  
    {  
      "Effect": "Allow",  
      "Principal": {  
        "Service": "lambda.amazonaws.com"  
      },  
      "Action": "sts:AssumeRole"  
    }  
  ]  
}
```

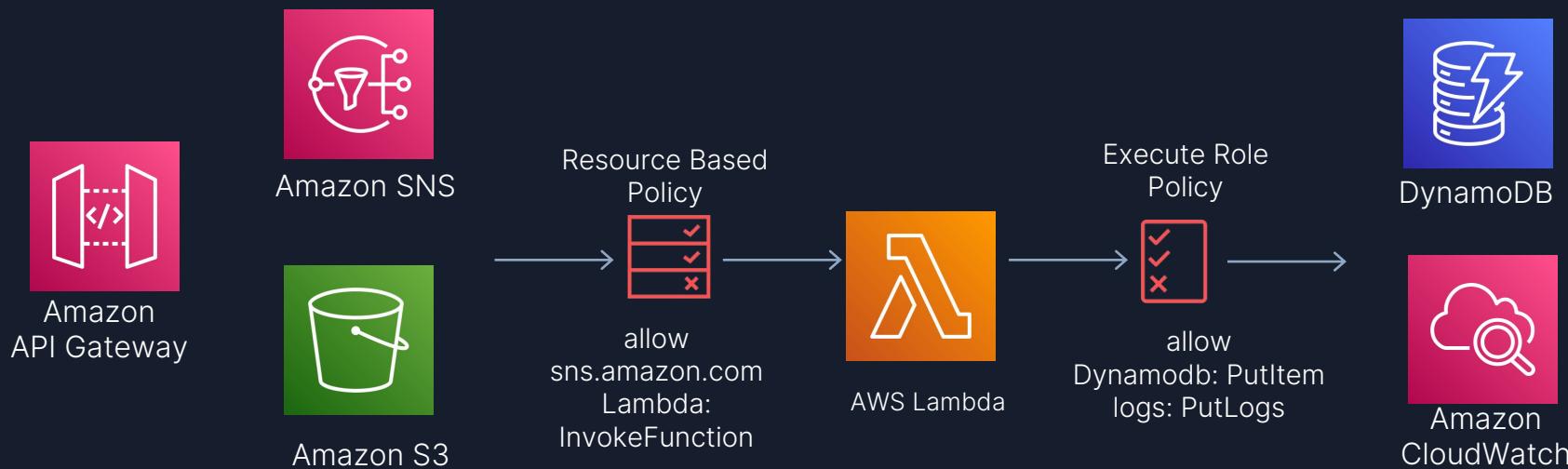
AWS Lambda Resource-based Policy

Lambda Resource-based policy

When any AWS service invokes Lambda function sync or async way. It lets you grant usage permission to other AWS accounts or organizations on a per-resource basis. Also use a resource-based policy to allow an AWS service to invoke your function on your behalf.

API Gateway that targets to Lambda function, we should add resource-based policy permission to invoke lambda function from API gateway.

Amazon S3 upload event triggers to lambda function asynchronously, so we should also add Resource-based policy into our Lambda function grants S3 invocation.

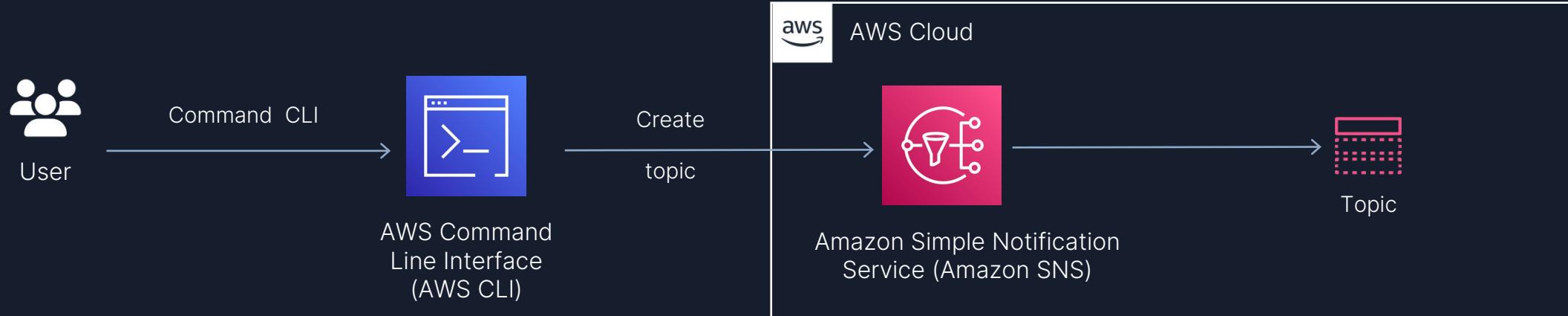




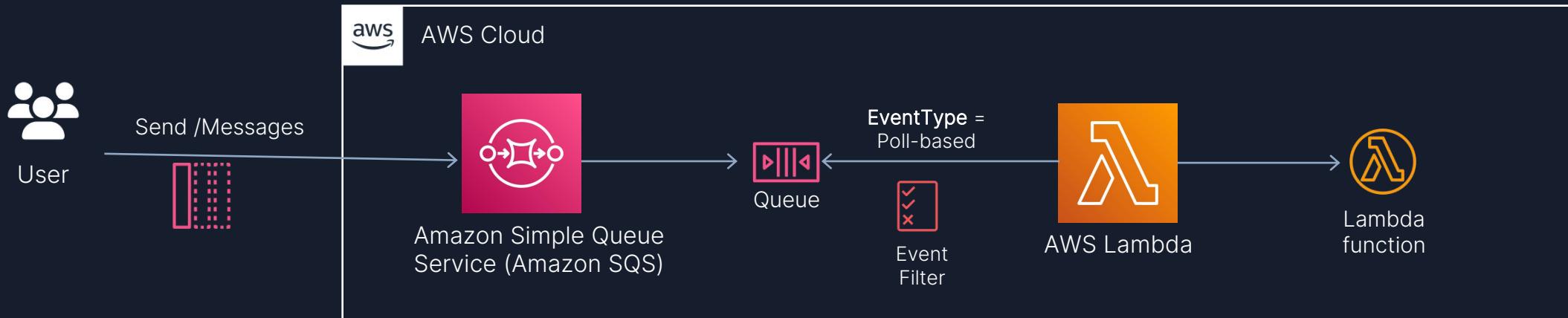
Architecture Serverless



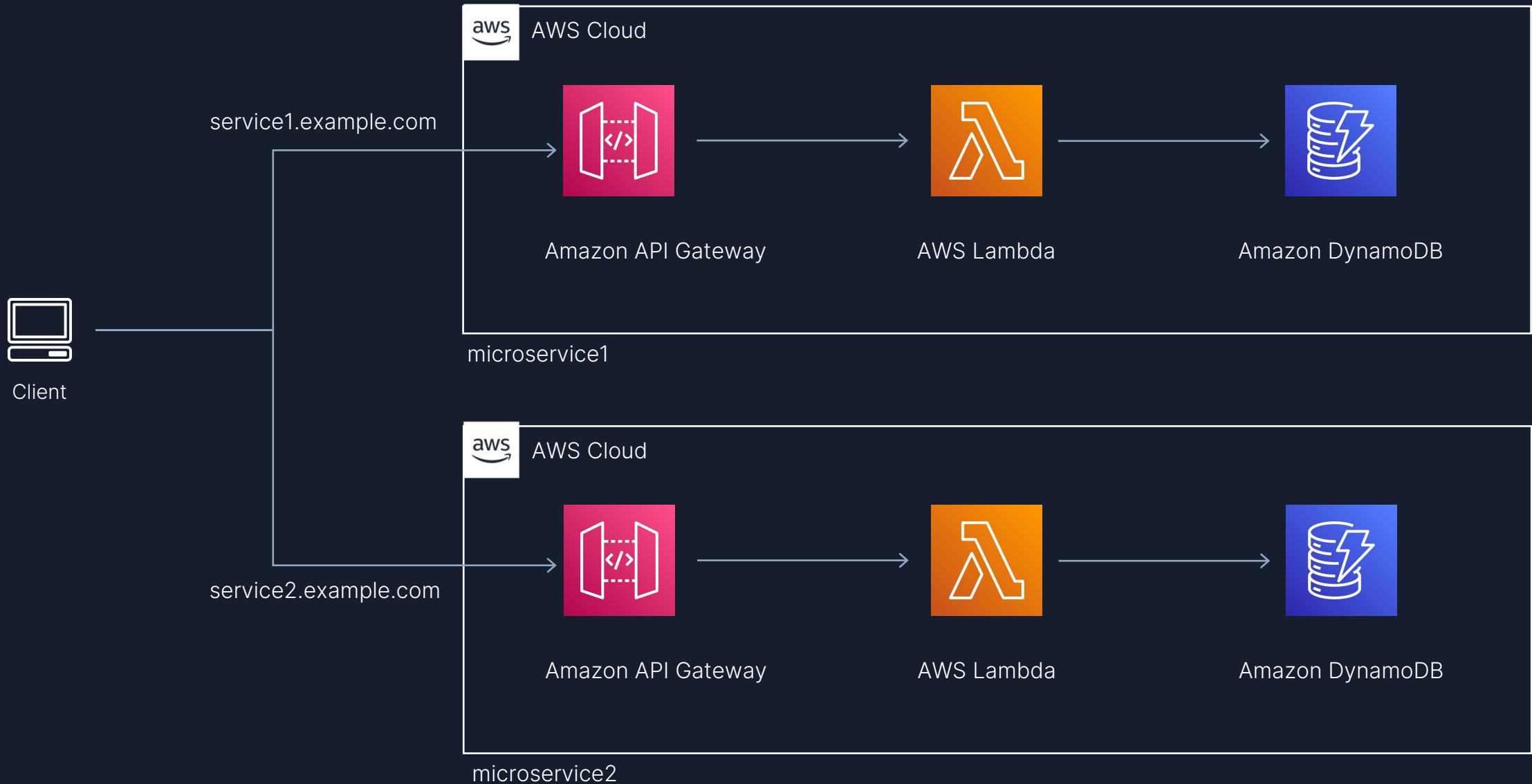
Amazon SNS with AWS Management Console



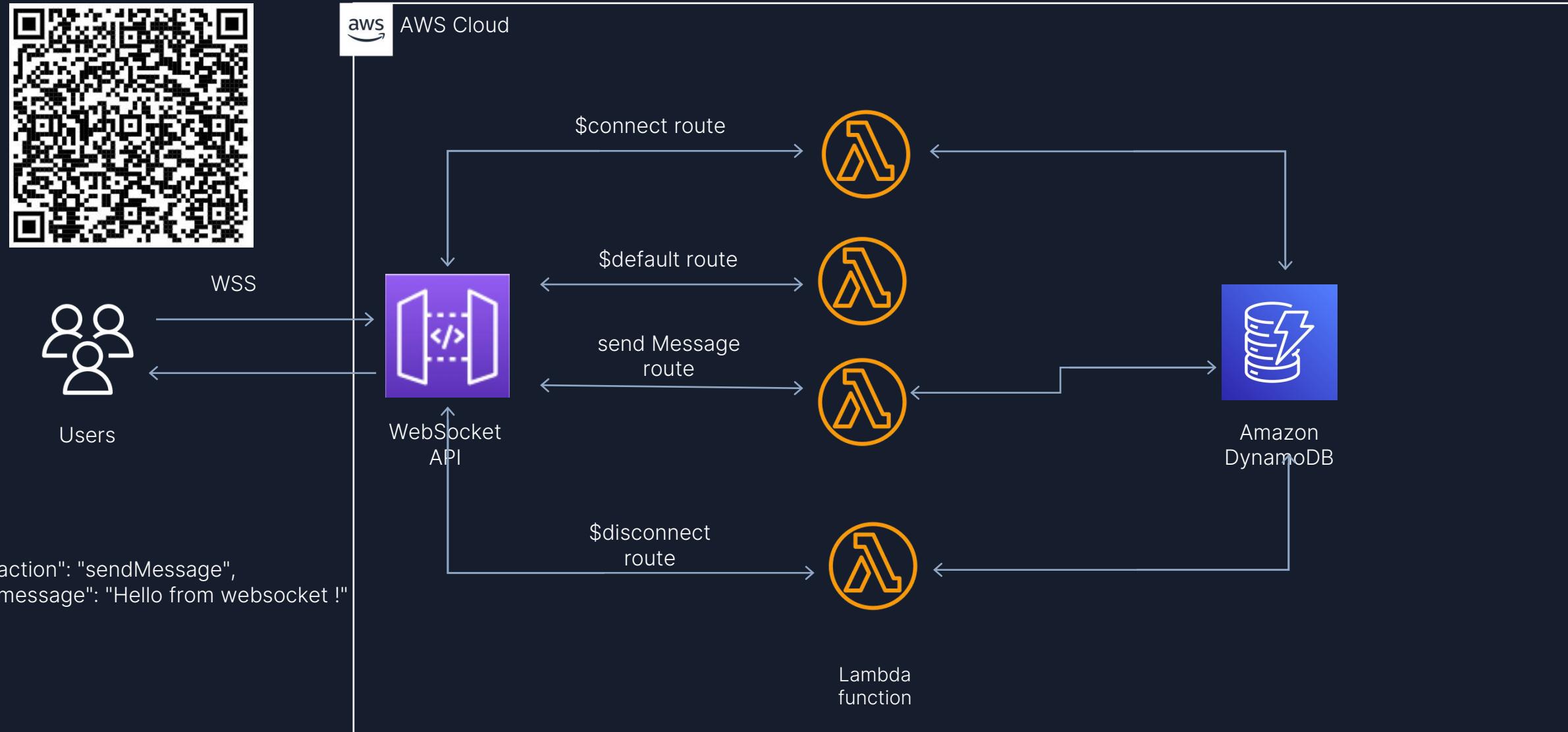
Amazon SQS Queue Polling From AWS Lambda



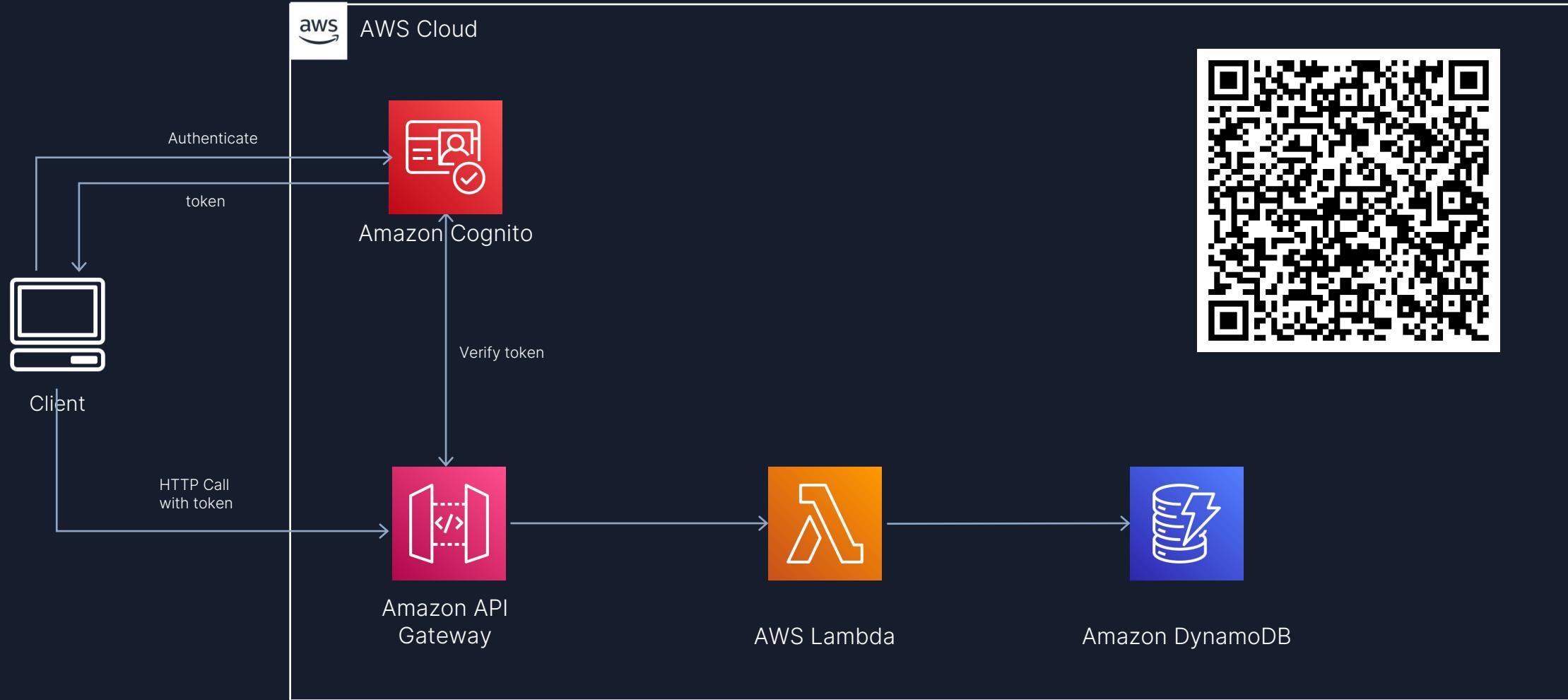
Microservices “REST”



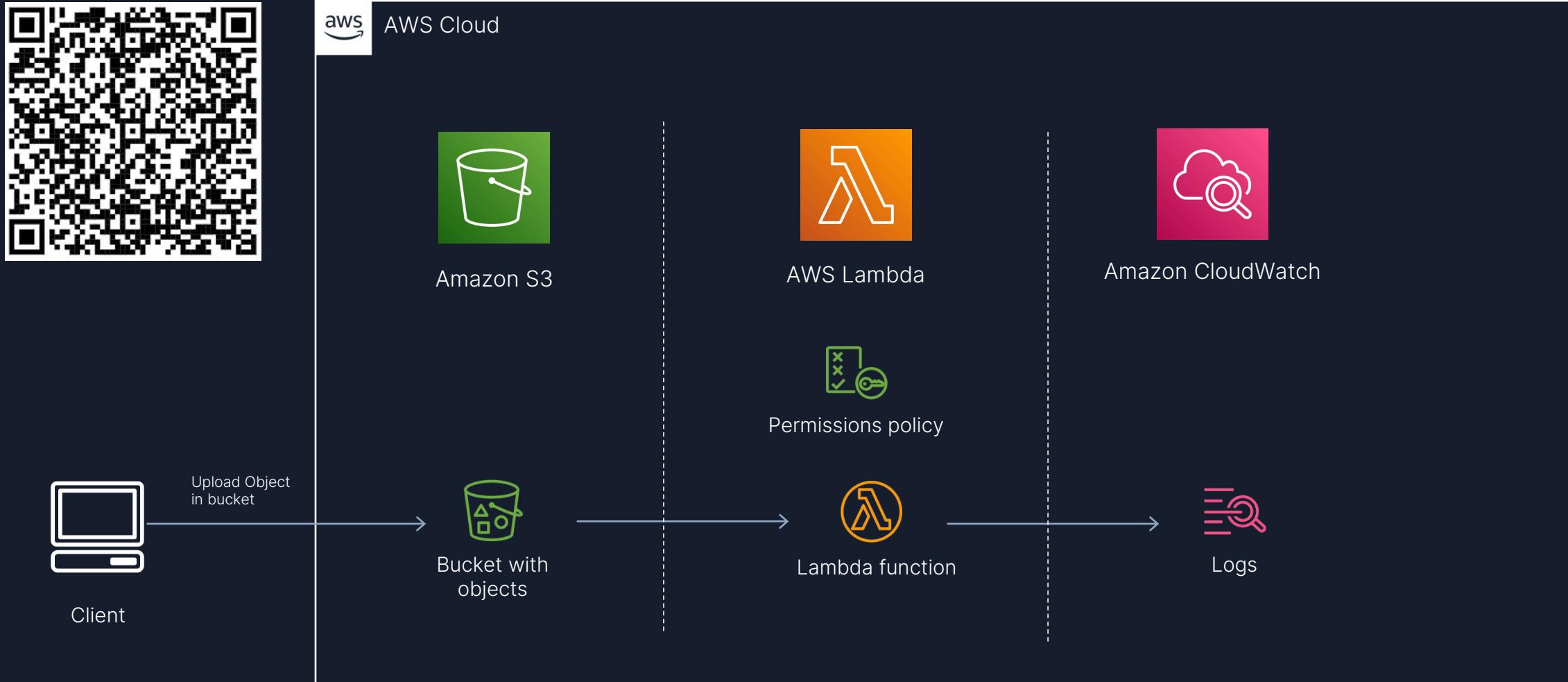
Build Serverless Chat App with a WebSocket API and Lambda



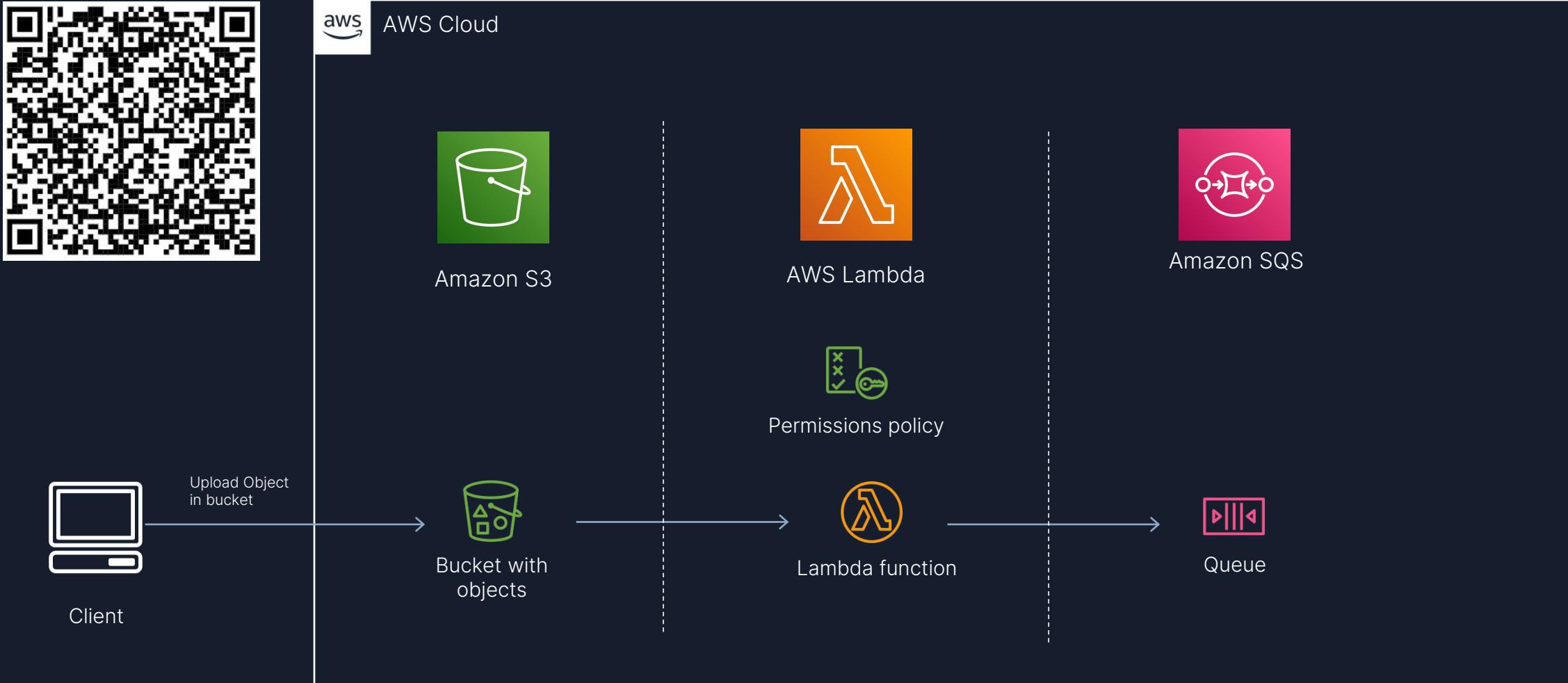
Secure your API Gateway with Amazon Cognito User Pools



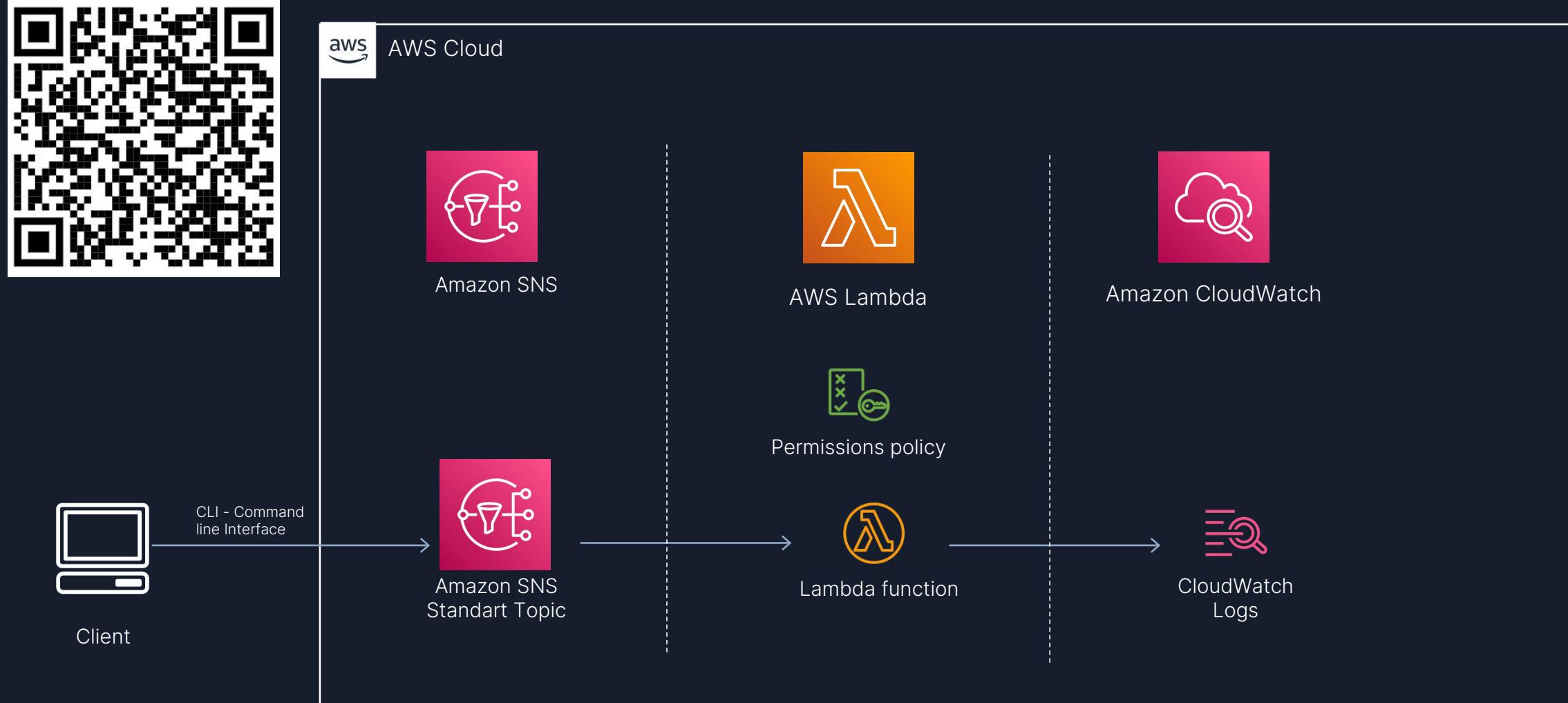
Using an Amazon S3 trigger to invoke a Lambda function



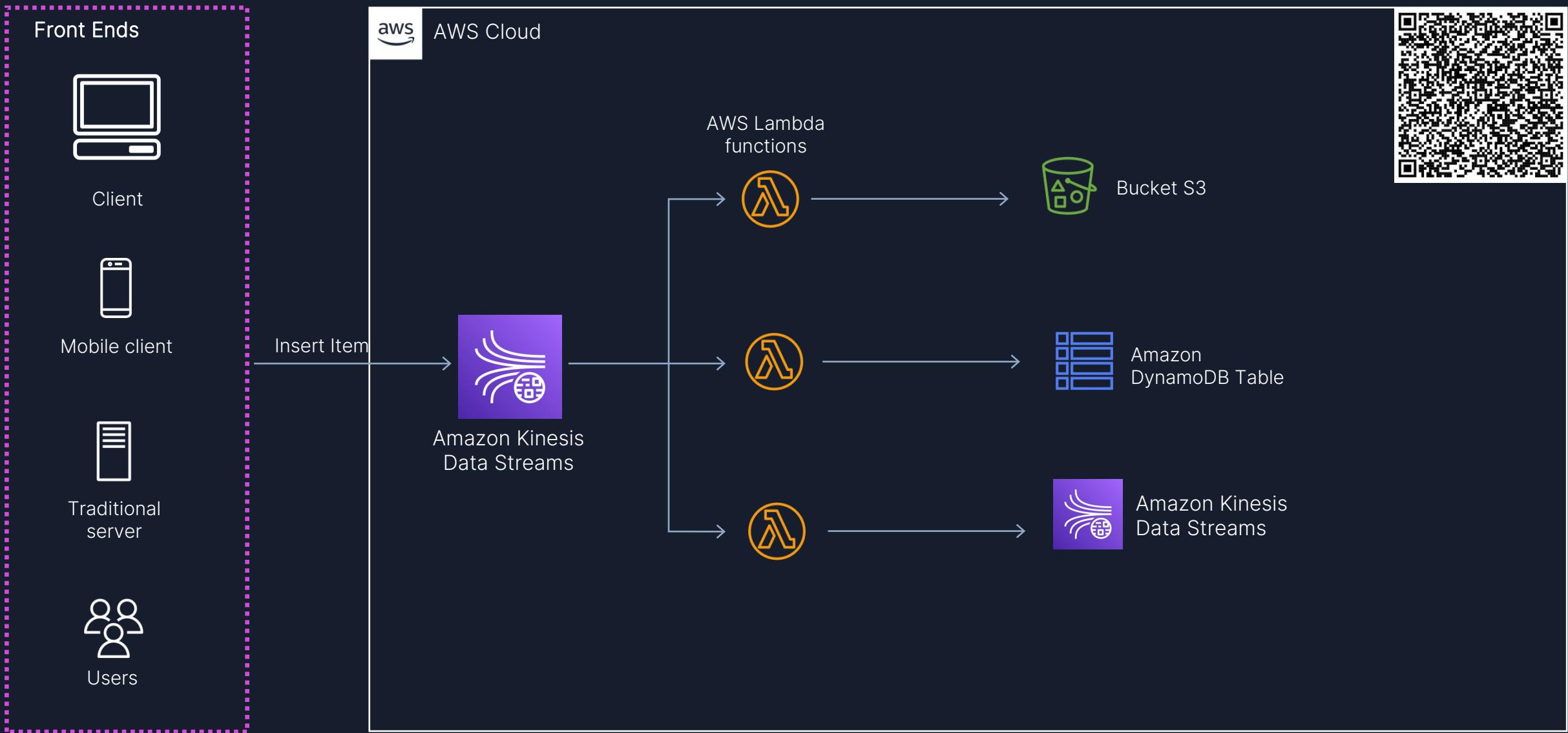
AWS Lambda Destination to SQS - DLQ Case



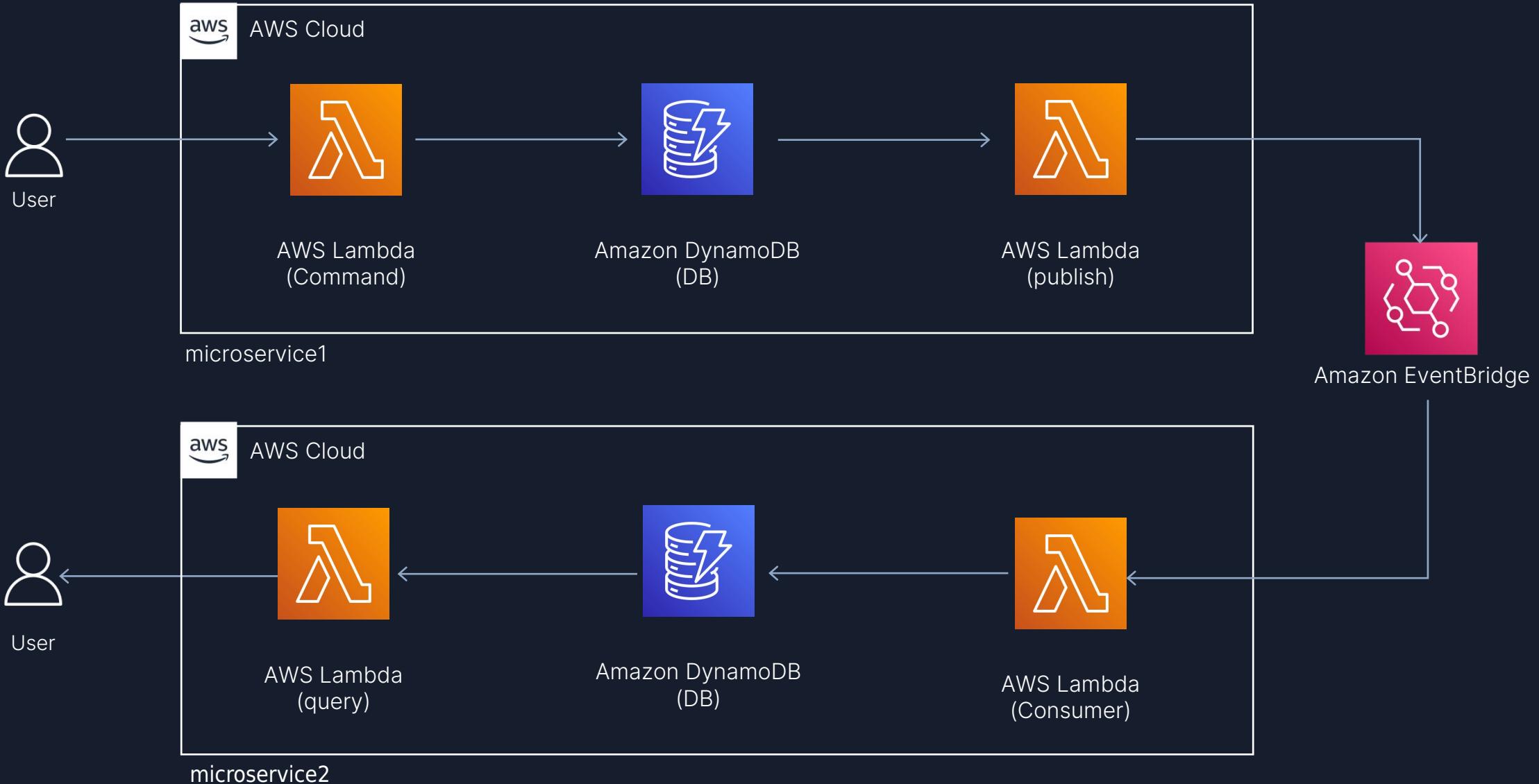
Using an Amazon SNS to send message to Lambda function



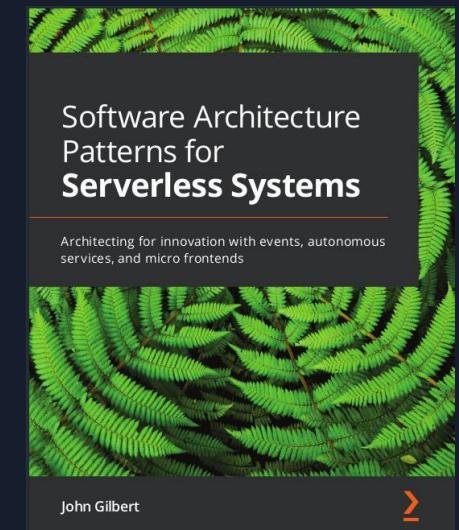
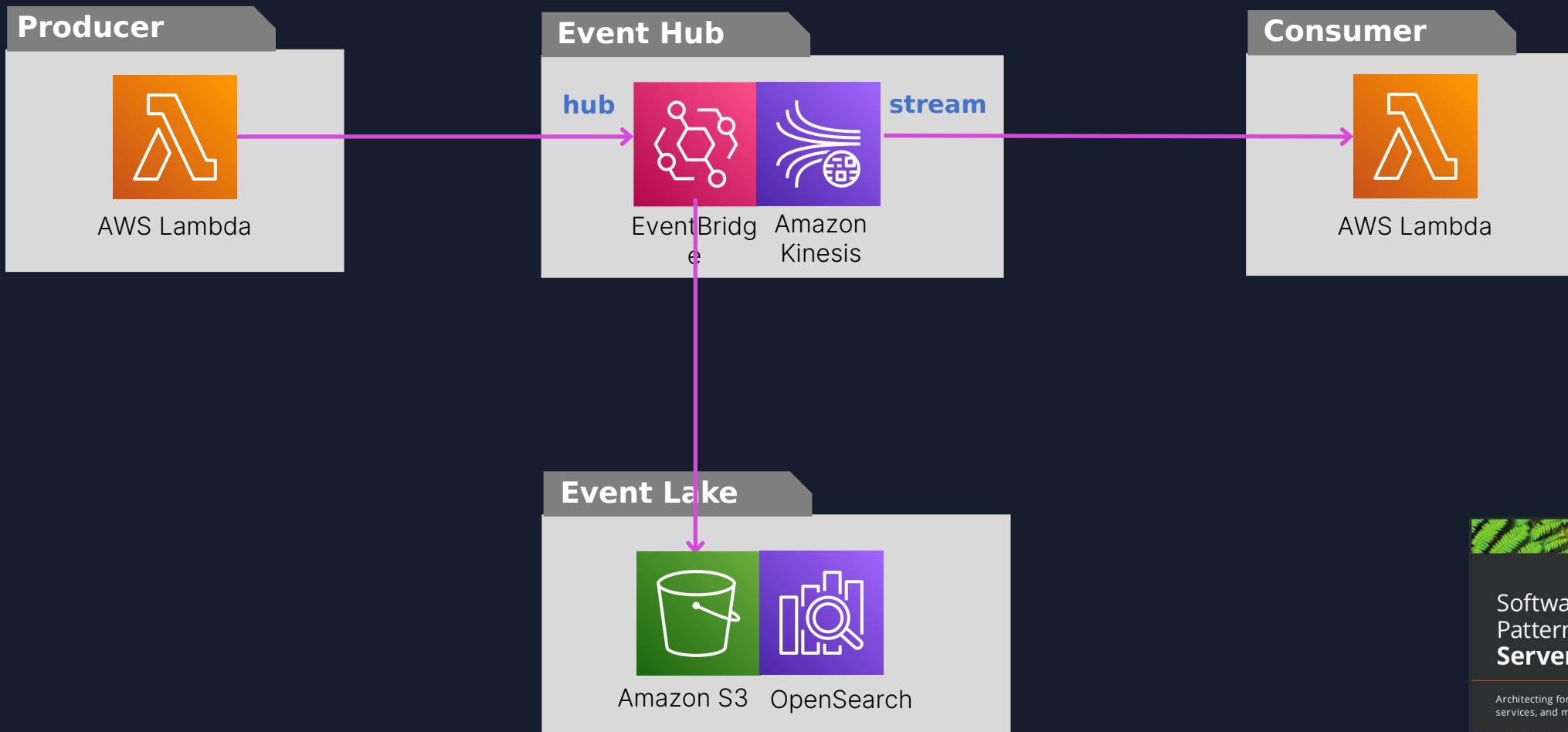
Processing performance with Amazon Kinesis Data Streams and AWS Lambda



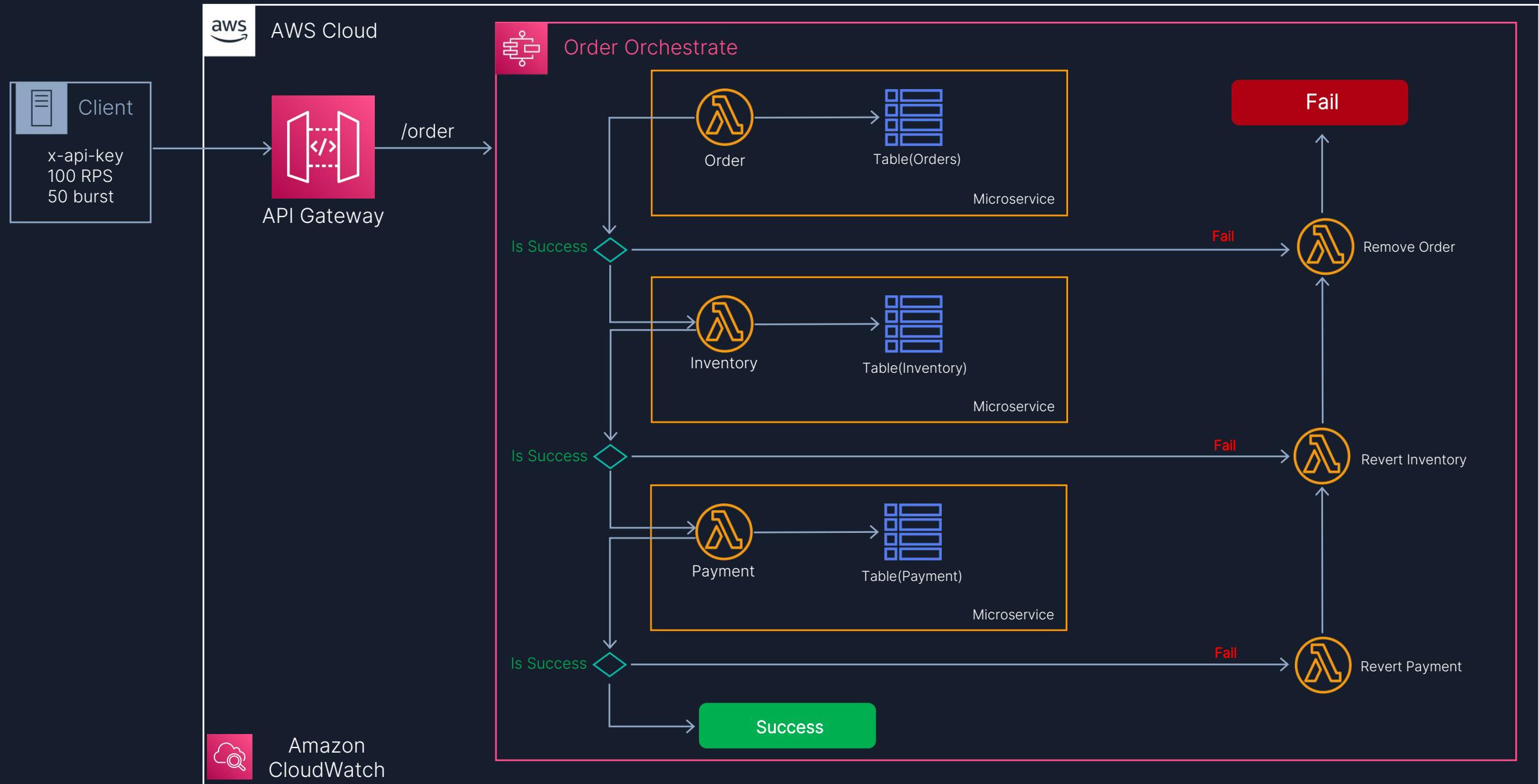
Command, Publish, Consume, Query (CPCQ)



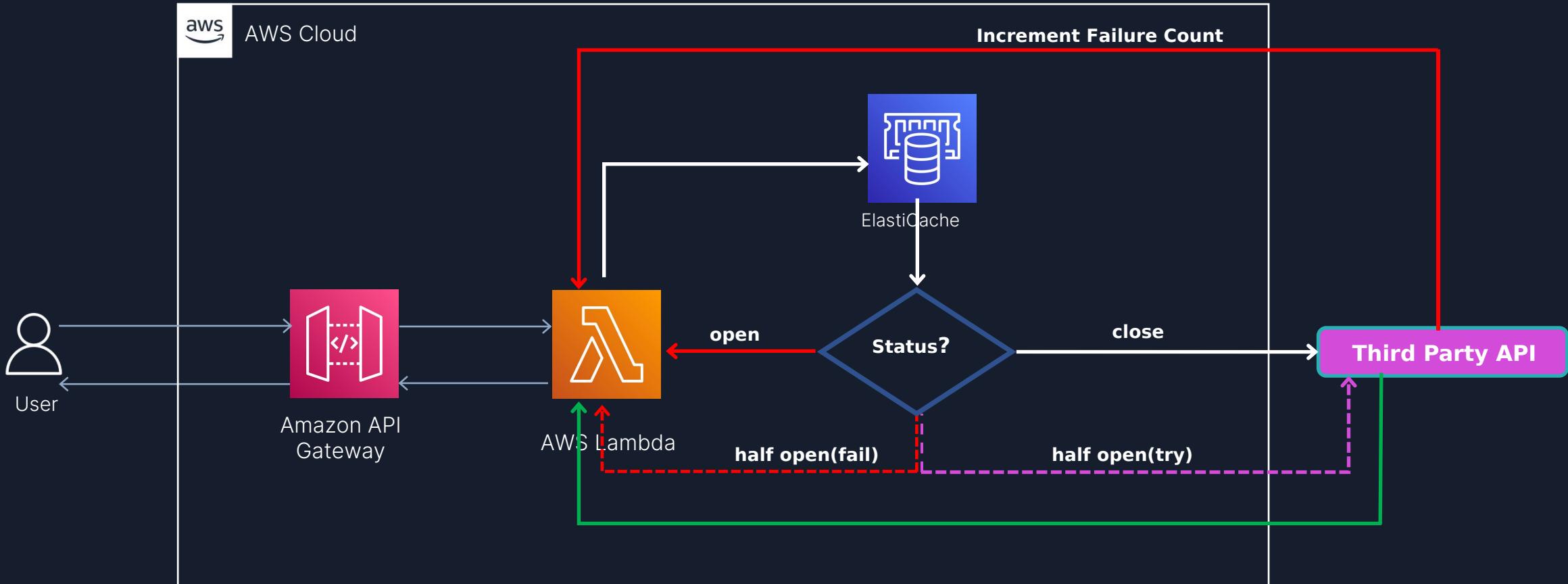
Event hub



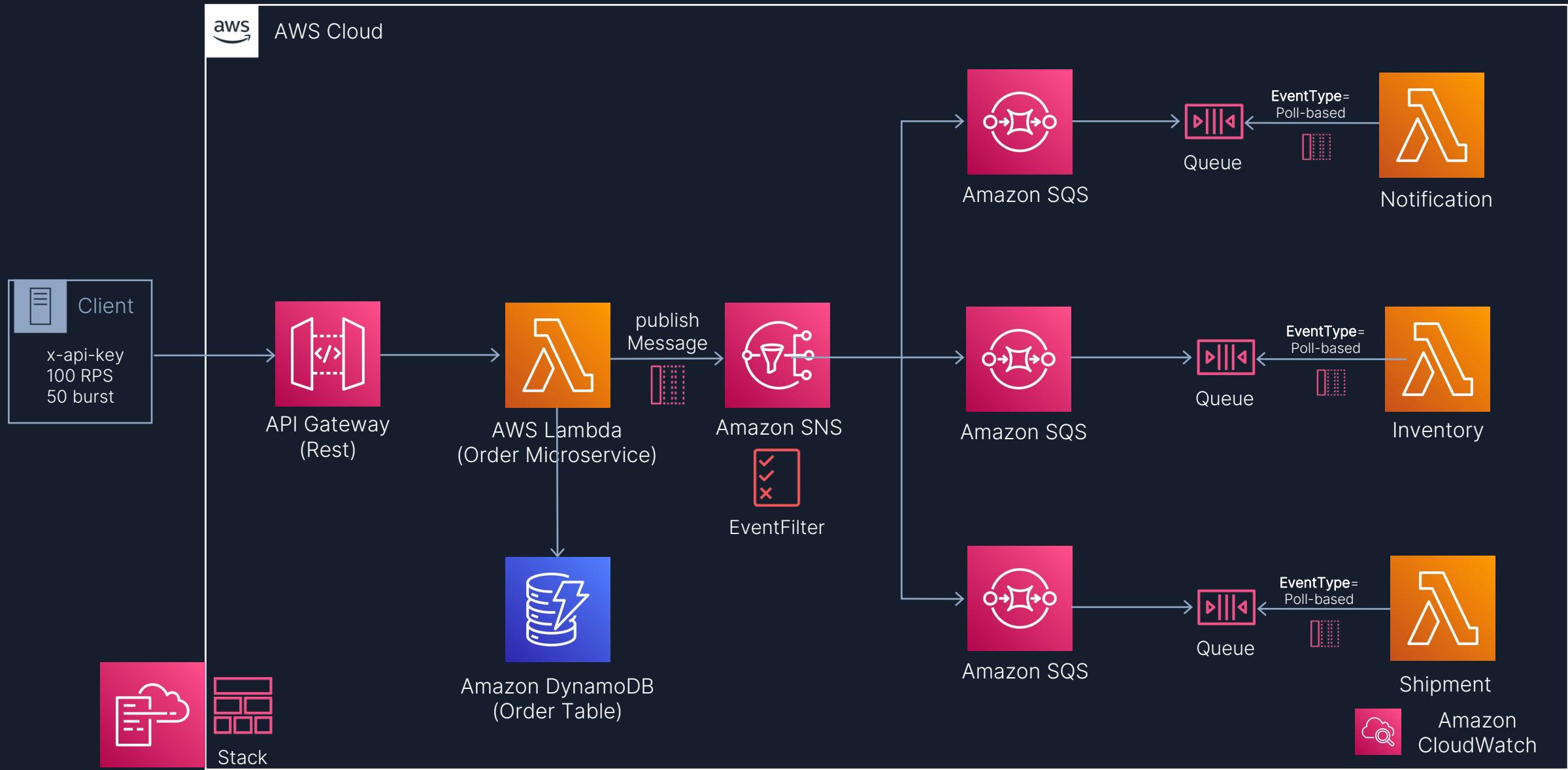
Saga Pattern For Orchestrate Distributed Transaction (AWS StepFunctions)



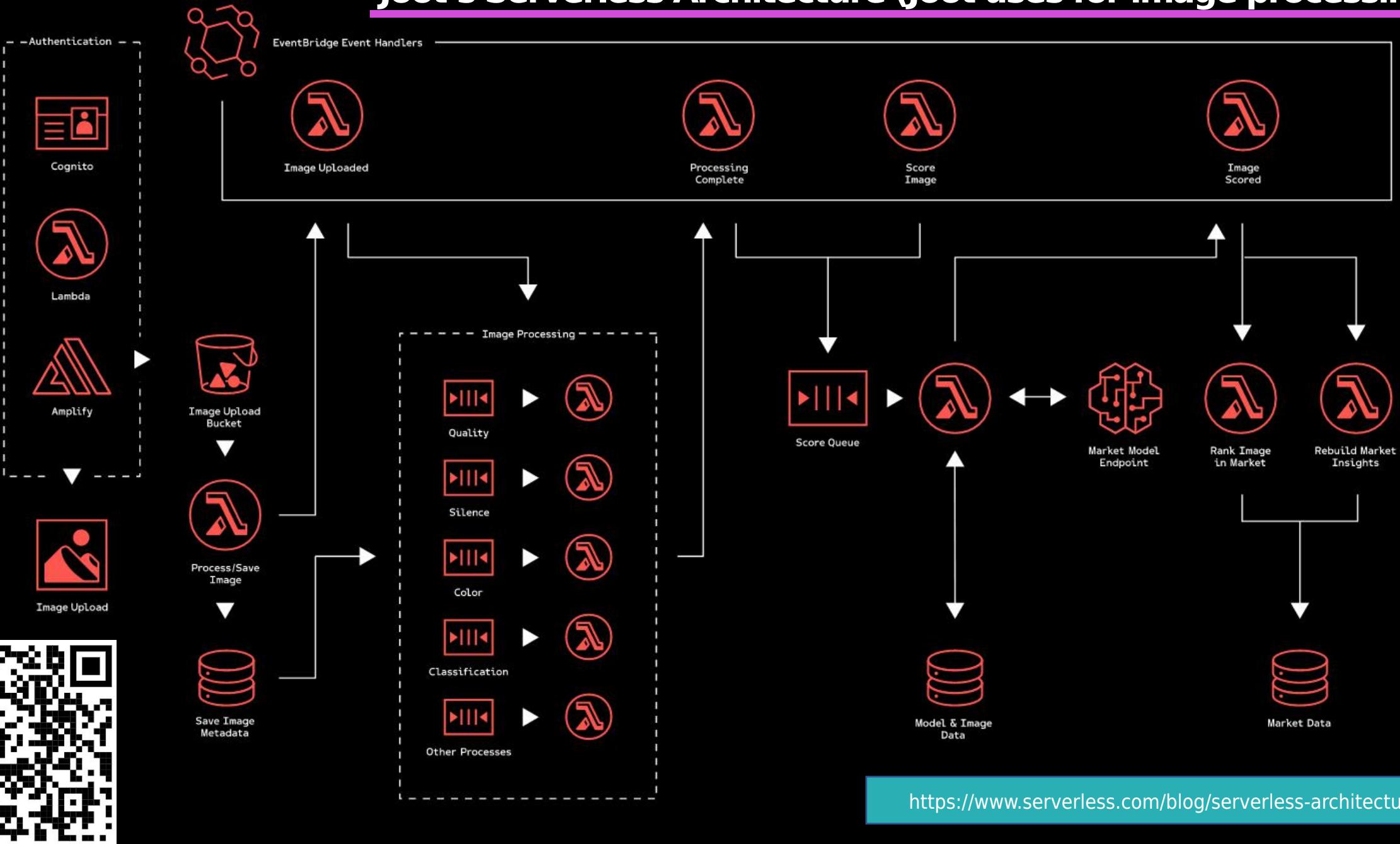
Circuit Breaker and Many More by Jeremy Daly



Fan-Out Serverless Architectures Using SNS, SQS and Lambda



Joot's Serverless Architecture (Joot uses for image processing)



<https://www.serverless.com/blog/serverless-architecture>

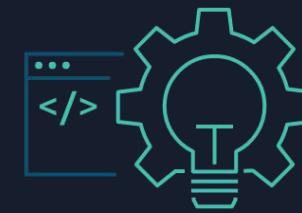


AWS CDK for Java and Python



What is AWS CDK?

The **AWS Cloud Development Kit (AWS CDK)** is an **open-source** software development framework for defining **cloud infrastructure as code(IAC)** with **modern programming languages** and deploying it through AWS CloudFormation.



<https://aws.amazon.com/cdk/faqs/>

https://aws.amazon.com/cdk/?nc1=h_ls

Demo CDK

Clone S3 AWS with CDK

Campus Party 2022

Home / Buckets

Buckets (4) Info Buckets are containers for data stored in S3. Learn more

Name	AWS Region	Access	Owner	Creation Date
data-lake-crime-results	US East (N. Virginia) us-east-1	Não informado	wmarians	27-04-2022 09:54:41
data-lake-crimes	US East (N. Virginia) us-east-1	Não informado	wmarians	27-04-2022 09:51:08
heroes-marvel	US East (N. Virginia) us-east-1	Não informado	wmarians	10-06-2022 15:36:53
heroes-marvel-iron-men	US East (N. Virginia) us-east-1	Não informado	wmarians	16-06-2022 15:17:48

<< < 1 > >> Showing 1 to 4 of 4 buckets 10 ▾

Upload About: Seja Bem Vindo!!!

Message Plain Success Message Plain Info Message Plain Warn Message Plain Error

aws-image-upload-wsousa / src / main / resources / application.properties



weder96 🚀 download e upload de arquivos

Code

Blame

7 lines (6 loc) · 168 Bytes

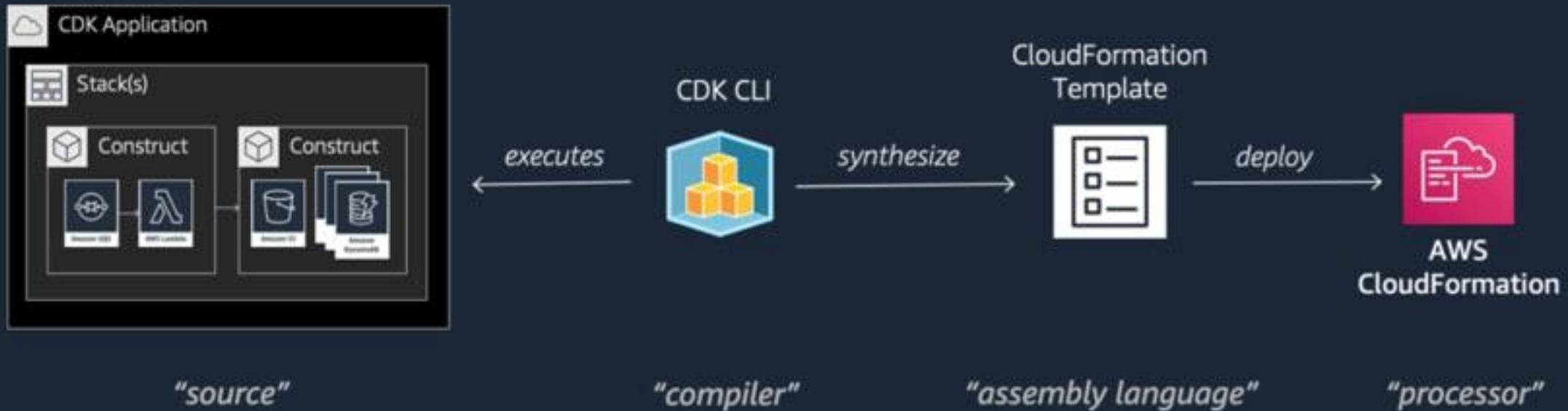
```
1 aws.access_key = ${value}
2 aws.secret_key = ${value}
3 aws.test = ${value}
4 spring.servlet.multipart.max-file-size=10MB
5
6 server.port=9090
7 springdoc.api-docs.path=/api-docs
```



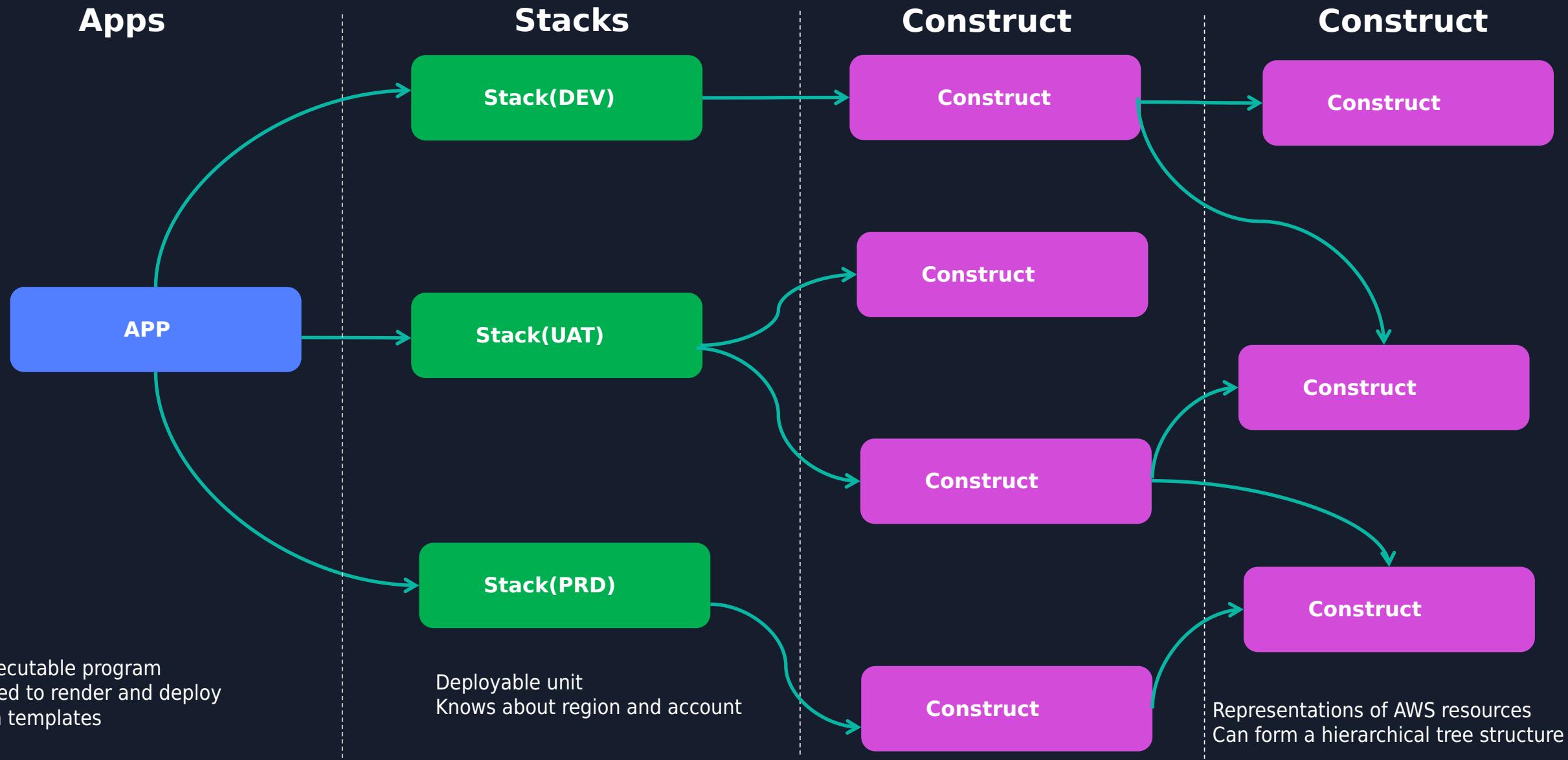
<https://github.com/weder96/aws-image-upload-wsousa>

<https://github.com/weder96/presentationCampusParty2022>

CDK Lifecycle

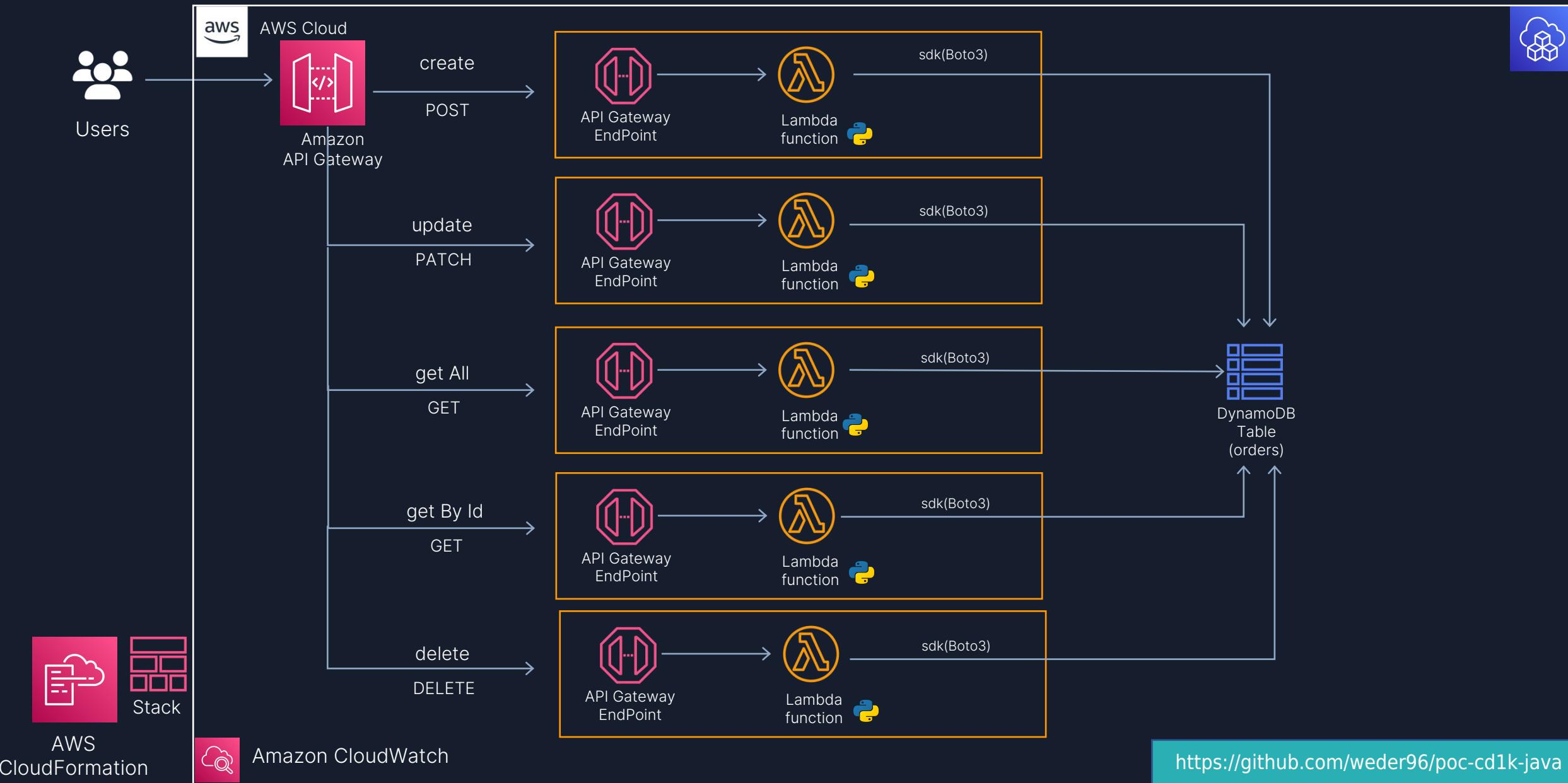


CDK Code Structure





Proof of Concepts AWS CDK - CRUD



Proof of Concepts AWS CDK



The purpose of this PoC is to understand how to use the CDK **to generate the infra(JAVA)** of a **CRUD(Create, Read, Update, Delete)** using , **API Gateway, lambdas(Python) and DynamoDB**, its advantages and limitations of traditional use with the creation of a Cloudformation(SAM) template.

Files

main my-cdk Lambda node_modules postman src test

my-cdk

Lambda

- app.py
- createItem.py
- deleteItem.py
- getAllItems.py
- getOneItem.py
- updateItem.py

src

main/java/com/myorg

- CreateDynamoDb.java
- CreateLambdaCron.java
- MyCdkApp.java
- MyStack.java

Java

poc-cdk-java / my-cdk / src / main / java / com / myorg / CreateDynamoDb.java

Code

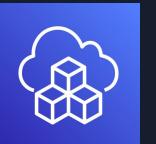
Blame

171 lines (142 loc) · 8.25 KB

Code 55% faster with GitHub Copilot

Raw

```
15 import java.nio.file.Files;
16 import java.nio.file.Paths;
17 import java.util.*;
18
19 public class CreateDynamoDb {
20     public CreateDynamoDb(MyStack myStack) {
21         cdkDynamodb(myStack);
22     }
23
24     public void cdkDynamodb(MyStack myStack){
25         TableProps tableProps = createTablePropsDynamoDB(myStack);
26         Table dynamodbTable = new Table(myStack, "orders", tableProps);
27         Map<String, String> lambdaEnvMap = createLambdaEnvMap(dynamodbTable);
28
29         Role role = createLambdaRole(myStack);
30
31         Function createItemFunction = new Function(myStack, "createItemFunction", getLambdaFunctionProps(role, "createItem","py"));
32         Function updateItemFunction = new Function(myStack, "updateItemFunction", getLambdaFunctionProps(role, "updateItem","py"));
33         Function deleteItemFunction = new Function(myStack, "deleteItemFunction", getLambdaFunctionProps(role, "deleteItem","py"));
34         Function getOneItemFunction = new Function(myStack, "getOneItemFunction", getLambdaFunctionProps(role, "getOneItem","py"));
35         Function getAllItemsFunction = new Function(myStack, "getAllItemsFunction", getLambdaFunctionProps(role, "getAllItems","py"));
36
37         dynamodbTable.grantReadWriteData(createItemFunction);
38         dynamodbTable.grantReadWriteData(updateItemFunction);
39         dynamodbTable.grantReadWriteData(deleteItemFunction);
40         dynamodbTable.grantReadWriteData(getOneItemFunction);
41         dynamodbTable.grantReadWriteData(getAllItemsFunction);
42
43         RestApi api = new RestApi(myStack, "itemsApi", RestApiProps.builder().restApiName("Items Service").build());
44     }
45 }
```



<https://github.com/weder96/poc-cdk-java>

Prerequisites for Installing AWS CDK



Before you can dive into the world of AWS CDK, you need to take care of a couple of prerequisites. First, ensure you have Node.js version 18.0.0 or later installed on your system.

```
> [weder@weder ~ ]$ node --version  
v18.17.1  
[weder@weder ~ ]$
```

Installing AWS CDK

Installing the AWS CDK is a breeze. Run the following command in your terminal or command prompt to install AWS CDK:

```
● ● ●  
1 npm install -g aws-cdk
```

Verifying AWS CDK Installation

```
> [weder@weder ~ ]$ cdk --version  
2.93.0 (build 724bd01)  
[weder@weder ~ ]$
```

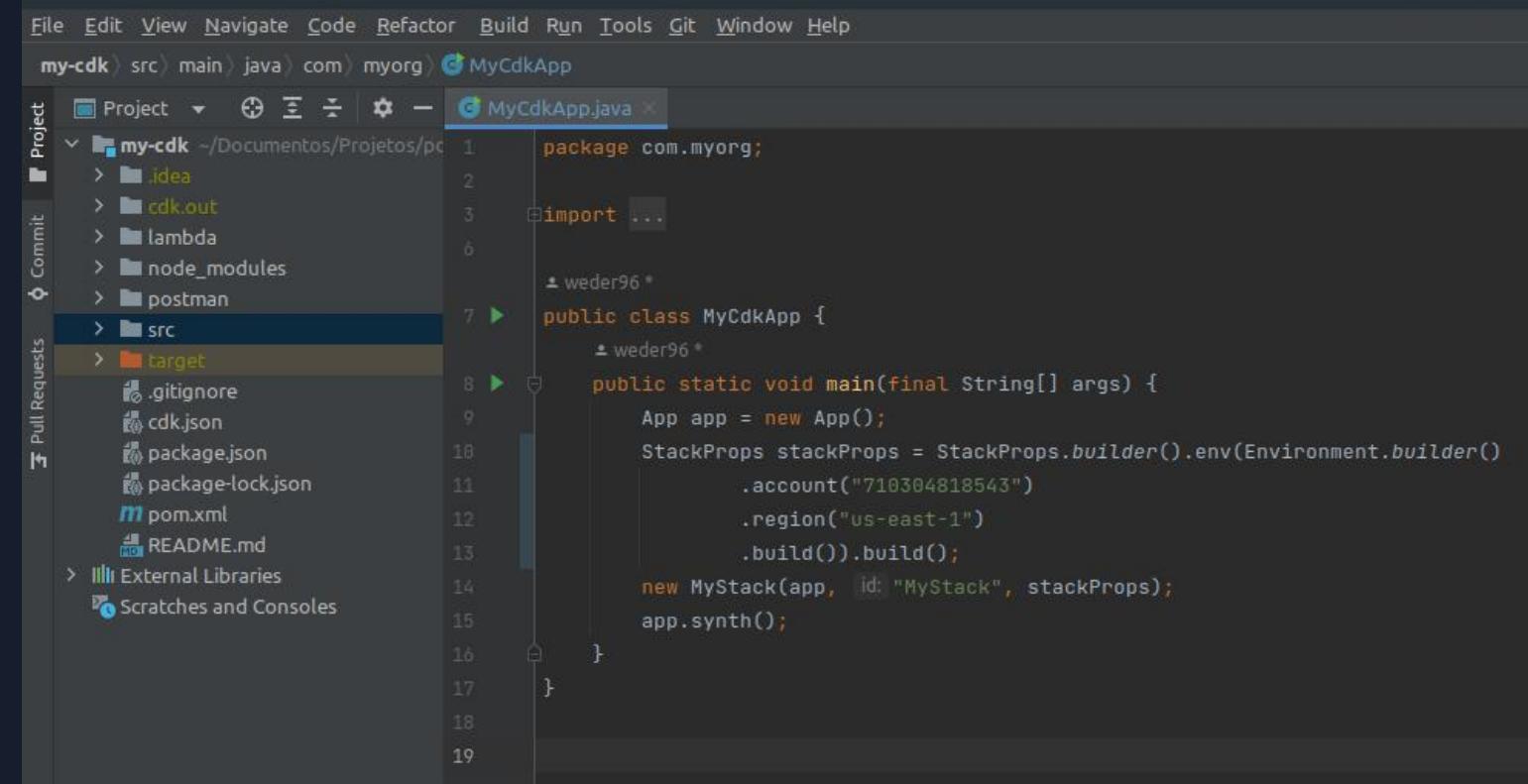
<https://hands-on.cloud/install-aws-cdk-guide/>

Initializing a CDK Project



To initialize a new CDK project, navigate to the desired directory in your terminal or command prompt and run the `cdk init` command with the appropriate template and programming language. For example, to create a Java-based CDK project, you would run the following command:

```
1 mkdir my-cdk
2 cd my-cdk
3 cdk init app --language java
```



```
File Edit View Navigate Code Refactor Build Run Tools Git Window Help
my-cdk src main java com myorg MyCdkApp
Project Commit Pull Requests External Libraries Scratches and Consoles
my-cdk ~/Documentos/Projetos/pc
> .idea
> cdk.out
> lambda
> node_modules
> postman
> src
> target
> .gitignore
> cdk.json
> package.json
> package-lock.json
> pom.xml
> README.md
> External Libraries
> Scratches and Consoles
MyCdkApp.java
package com.myorg;
import ...
public class MyCdkApp {
    public static void main(final String[] args) {
        App app = new App();
        StackProps stackProps = StackProps.builder().env(Environment.builder()
            .account("710304818543")
            .region("us-east-1")
            .build()).build();
        new MyStack(app, id: "MyStack", stackProps);
        app.synth();
    }
}
```

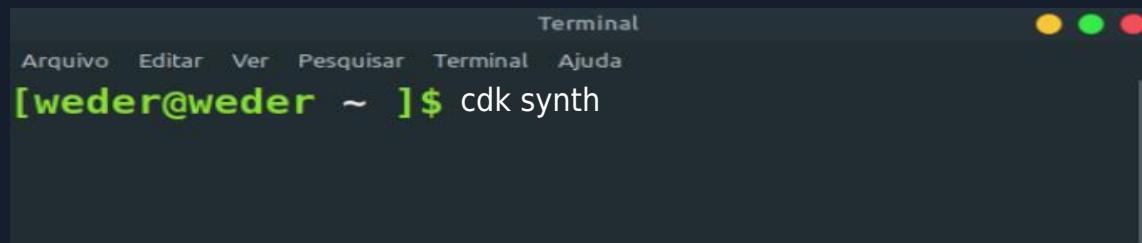
<https://hands-on.cloud/install-aws-cdk-guide/>

Building and Deploying Your AWS CDK App



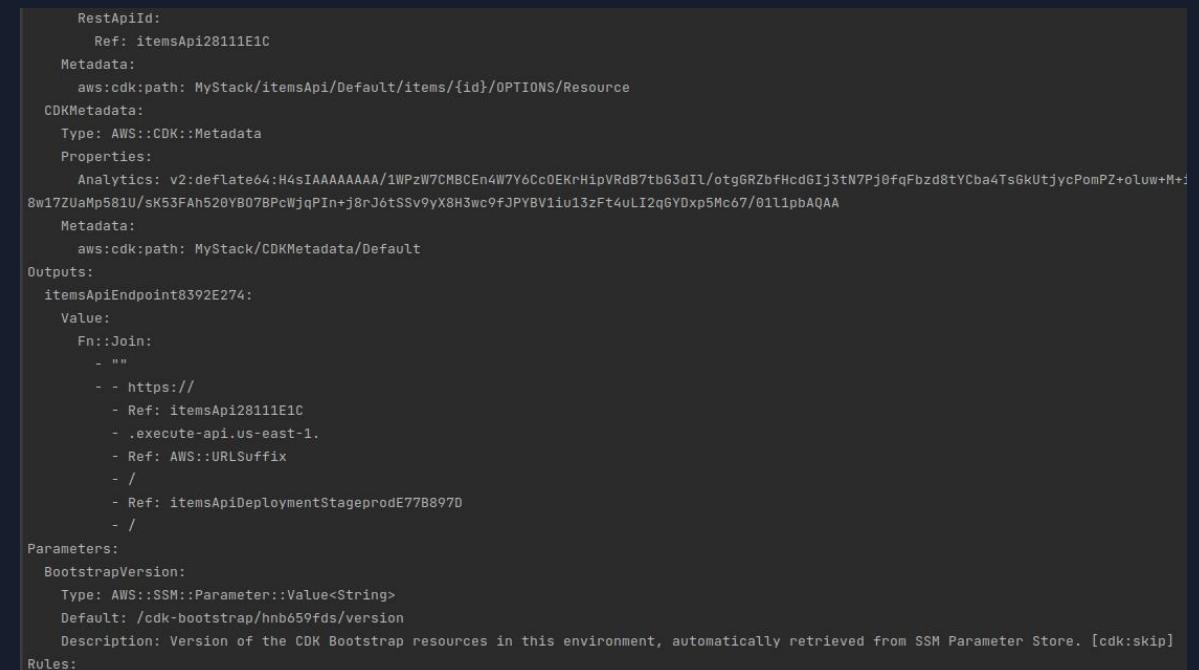
Once your CDK project is set up, the next step is to build and deploy your AWS CDK app. This process involves **synthesizing CloudFormation templates** in **YAML format**, saving them in the **cdk.out** folder as JSON, bootstrapping your stack, and deploying your app to your AWS account.

By following these steps, you can create and manage your **AWS infrastructure** using the power of AWS CDK and **your preferred programming language**.



A screenshot of a terminal window on a Mac OS X desktop. The window title is "Terminal". The menu bar shows "Arquivo", "Editar", "Ver", "Pesquisar", "Terminal", and "Ajuda". The command prompt shows "[weder@weder ~]\$". Below the prompt, the command "cdk synth" is typed. The terminal window has a dark background with light-colored text.

To synthesize **CloudFormation templates for your AWS CDK app**, run the `cdk synth` command in your terminal or command prompt. This command generates **YAML-formatted CloudFormation templates** for each stack in your app, encompassing all the **resources you've defined in your CDK code**.



A screenshot of a YAML-formatted CloudFormation template. The template defines a REST API endpoint named "itemsApi" with a specific ID. It includes properties like "Metadata" and "Properties" (including "Analytics" and "aws:cdk:path"), and outputs like "itemsApiEndpoint". It also defines parameters such as "BootstrapVersion" and "Rules". The template is highly nested and uses AWS-specific constructs like Fn::Join and Ref.

```
RestApiId: itemsApi28111E1C
  Ref: itemsApi28111E1C
Metadata:
  aws:cdk:path: MyStack/itemsApi/Default/items/{id}/OPTIONS/Resource
CDKMetadata:
  Type: AWS::CDK::Metadata
Properties:
  Analytics: v2:deflate64:H4sIAAAAAAAAWPzW7CMBCEn4W7Y6CcOEKrHipVRd8tbG3dIL/otgGRZbfHcdGIj3tN7Pj0fqFbzd8tYCba4TsGkUtJycPomPZ+oluw+M+8w17ZUaMp581U/sK53FAh520YB078PcWjqPiN+j8rJ6tSSv9yX8H3wc9fJPYBViiu13zFt4uLI2qGYDxp5Mc67/01l1pbAQAA
  Metadata:
    aws:cdk:path: MyStack/CDKMetadata/Default
Outputs:
  itemsApiEndpoint8392E274:
    Value:
      Fn::Join:
        - ""
        - https://
        - Ref: itemsApi28111E1C
        - .execute-api.us-east-1.
        - Ref: AWS::URLSuffix
        - /
        - Ref: itemsApiDeploymentStageprodE77B8970
        - /
Parameters:
  BootstrapVersion:
    Type: AWS::SSM::Parameter::Value<String>
    Default: /cdk-bootstrap/hnb659fds/version
    Description: Version of the CDK Bootstrap resources in this environment, automatically retrieved from SSM Parameter Store. [cdk:skip]
  Rules:
```

Bootstrapping AWS CDK



Before deploying your AWS CDK app, **you'll need to bootstrap your stack**. Bootstrapping involves creating dedicated Amazon S3 buckets and other containers required for deploying your app using AWS CloudFormation.

To bootstrap your stack, run the `cdk bootstrap` command in your terminal or command prompt. This command deploys a CDKToolkit CloudFormation stack into the specified environment, provisioning the necessary resources for your AWS CDK app.



```
✖ Bootstrapping environment aws://710304818543/us-east-1...
Trusted accounts for deployment: (none)
Trusted accounts for lookup: (none)
Using default execution policy of 'arn:aws:iam::aws:policy/AdministratorAccess'. Pass '--cloudformation-execution-policies' to customize.

✖ hotswap deployment skipped - no changes were detected (use --force to override)

Environment aws://710304818543/us-east-1 bootstrapped (no changes).
```

Deploying the App

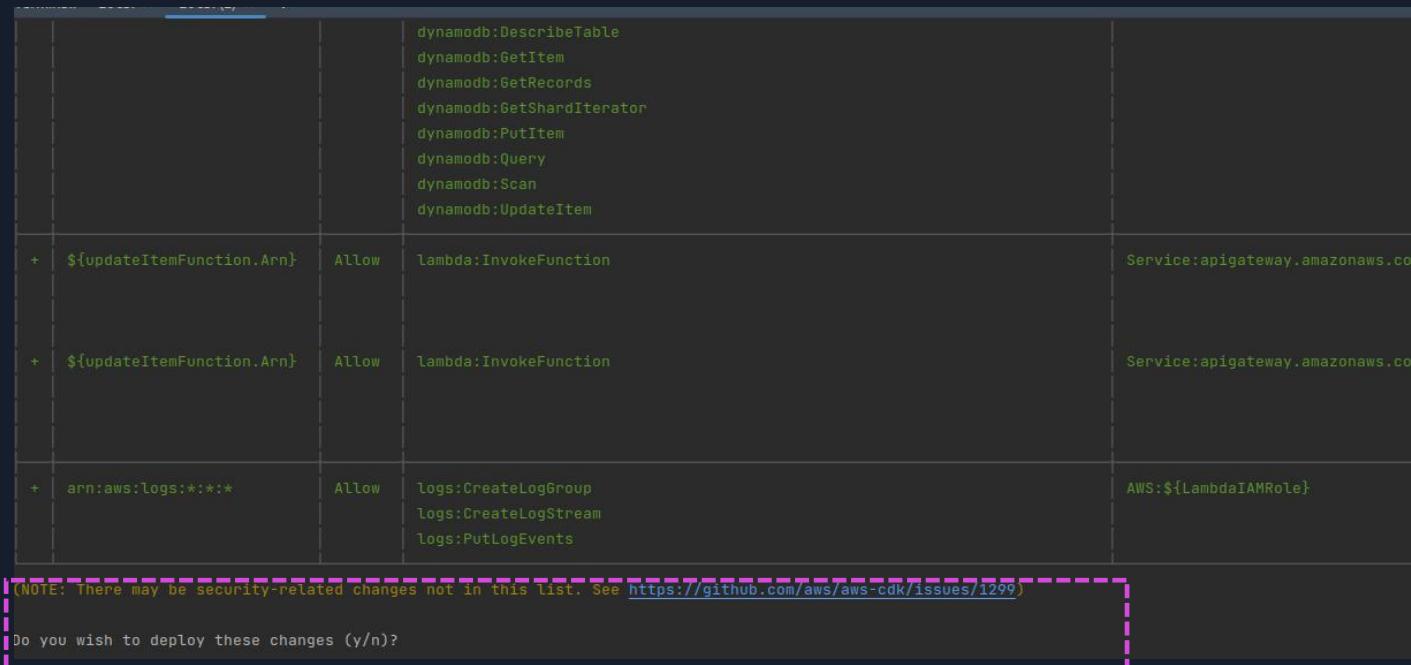


You're ready to deploy your AWS CDK app with your synthesized CloudFormation templates and bootstrapped stack. To do this, run the **cdk deploy** command in your terminal or command prompt.



```
Terminal
Arquivo Editar Ver Pesquisar Terminal Ajuda
[weder@weder ~ ]$ cdk deploy
```

This command deploys your CDK app to your AWS account, **creating and updating the necessary AWS resources** as defined in your CloudFormation templates. Once the deployment is complete, you can monitor and manage your deployed resources using the **AWS Management Console or AWS CLI**.



```
dynamodb:DescribeTable
dynamodb:GetItem
dynamodb:GetRecords
dynamodb:GetShardIterator
dynamodb:PutItem
dynamodb:Query
dynamodb:Scan
dynamodb:UpdateItem

+ ${updateItemFunction.Arn} Allow lambda:InvokeFunction Service:apigateway.amazonaws.com

+ ${updateItemFunction.Arn} Allow lambda:InvokeFunction Service:apigateway.amazonaws.com

+ arn:aws:logs:*** Allow logs>CreateLogGroup
logs>CreateLogStream
logs>PutLogEvents AWS:${LambdaIAMRole}

[NOTE: There may be security-related changes not in this list. See https://github.com/aws/aws-cdk/issues/1299]

Do you wish to deploy these changes (y/n)?
```

Deploying the App



aws resources being created by the **deploy** command, using the template created in the **synth** command

```
MyStack: deploying... [1/1]
MyStack: creating CloudFormation changeset...
[██████████ .....] (3/33)

18:21:16 | CREATE_IN_PROGRESS | AWS::CloudFormation::Stack | MyStack
18:21:21 | CREATE_IN_PROGRESS | AWS::S3::Bucket           | MyBucket
18:21:21 | CREATE_IN_PROGRESS | AWS::IAM::Role            | LambdaIAMRole
18:21:21 | CREATE_IN_PROGRESS | AWS::DynamoDB::Table      | orders
18:21:24 | CREATE_IN_PROGRESS | AWS::ApiGateway::Resource | itemsApi/Default/items/{id}
18:21:25 | CREATE_IN_PROGRESS | AWS::ApiGateway::Method   | itemsApi/Default/items/OPTIONS
```

After creating it, it shows the time it was created and whether it managed to **create all the necessary resources**

```
Do you wish to deploy these changes (y/n)? y
MyStack: deploying... [1/1]
MyStack: creating CloudFormation changeset...

MyStack
  Deployment time: 88.96s

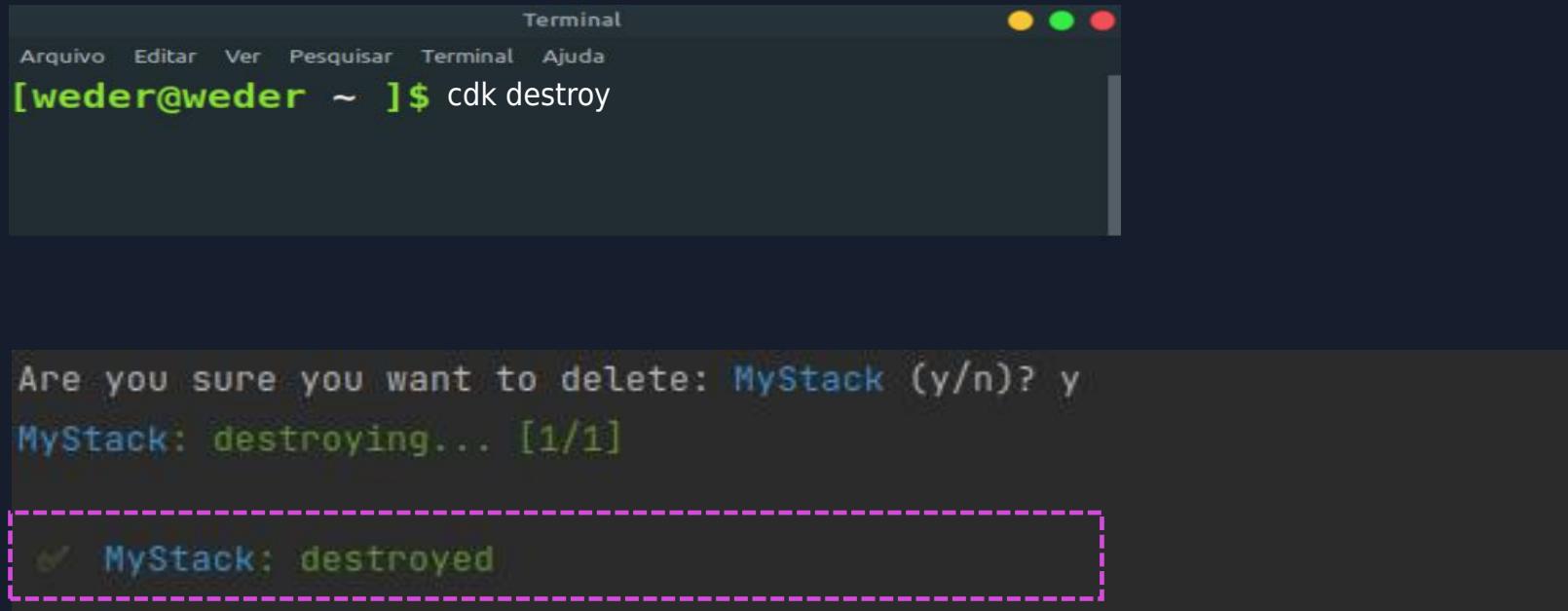
Outputs:
MyStack.itemsApiEndpoint8392E274 = https://41v8x3mpkd.execute-api.us-east-1.amazonaws.com/prod/
Stack ARN:
arn:aws:cloudformation:us-east-1:710304818543:stack/MyStack/9ce51c40-4e8d-11ee-b5aa-0a53f035b84d

Total time: 93.57s
```

Destroy the App



When you no longer need certain resources in your AWS CDK app, **you can destroy them using the cdk destroy command**. This command deletes the specified stack and all its associated resources unless they have been marked with a Deletion Policy to be retained.



The screenshot shows a terminal window with a dark background and light-colored text. At the top, there's a menu bar with options: Arquivo, Editar, Ver, Pesquisar, Terminal, and Ajuda. Below the menu, the terminal prompt is [weder@weder ~]\$, followed by the command \$ cdk destroy. The terminal then displays a confirmation message: Are you sure you want to delete: MyStack (y/n)? followed by the response y. It then shows the progress of the destruction: MyStack: destroying... [1/1]. Finally, it shows a success message with a green checkmark: ✓ MyStack: destroyed. A dashed red box highlights the success message.

```
Are you sure you want to delete: MyStack (y/n)? y
MyStack: destroying... [1/1]
✓ MyStack: destroyed
```

Diff the App



When you have **made changes to your infrastructure code** by **adding** or **removing** certain **resources** in your AWS CDK application, you can use the **cdk diff** command. This **command** will show what has been **modified** and which resources will be created and will be **listed** for **monitoring**.

The screenshot shows a terminal window with two tabs: "Terminal" and "Local (2)". The "Local (2)" tab is active and displays the output of the "cdk diff" command. The output lists numerous AWS resources and their modifications, such as API Gateway stages, Lambda functions, and permissions. A pink dashed box highlights the "Outputs" section at the bottom of the terminal window, which shows an output resource named "itemsApi/Endpoint". The status bar at the bottom of the terminal indicates "Number of stacks with differences: 1".

```
[weder@weder ~] $ cdk diff
[+] AWS::ApiGateway::Stage itemsApi/DeploymentStage.prod itemsApiDeploymentStageprodE77B897D
[+] AWS::ApiGateway::Resource itemsApi/Default/items itemsApiitems9015DBED
[+] AWS::Lambda::Permission itemsApi/Default/items/GET/ApiPermission.MyStackitemsApiA38DACFB.GET..items itemsApiitemsGETApiPe
[+] AWS::Lambda::Permission itemsApi/Default/items/GET/ApiPermission.Test.MyStackitemsApiA38DACFB.GET..items itemsApiitemsGET
[+] AWS::ApiGateway::Method itemsApi/Default/items/GET itemsApiitemsGET59B0F78A
[+] AWS::Lambda::Permission itemsApi/Default/items/POST/ApiPermission.MyStackitemsApiA38DACFB.POST..items itemsApiitemsPOSTAp
[+] AWS::Lambda::Permission itemsApi/Default/items/POST/ApiPermission.Test.MyStackitemsApiA38DACFB.POST..items itemsApiitemsP
[+] AWS::ApiGateway::Method itemsApi/Default/items/POST itemsApiitemsPOSTDD3E83D0
[+] AWS::ApiGateway::Method itemsApi/Default/items/OPTIONS itemsApiitemsOPTIONSB46B4D53
[+] AWS::ApiGateway::Resource itemsApi/Default/items/{id} itemsApiitemsidA29927C2
[+] AWS::Lambda::Permission itemsApi/Default/items/{id}/GET/ApiPermission.MyStackitemsApiA38DACFB.GET..items.{id} itemsApiite
[+] AWS::Lambda::Permission itemsApi/Default/items/{id}/GET/ApiPermission.Test.MyStackitemsApiA38DACFB.GET..items.{id} itemsA
[+] AWS::ApiGateway::Method itemsApi/Default/items/{id}/GET itemsApiitemsidGET38A333A8
[+] AWS::Lambda::Permission itemsApi/Default/items/{id}/PATCH/ApiPermission.MyStackitemsApiA38DACFB.PATCH..items.{id} itemsAp
[+] AWS::Lambda::Permission itemsApi/Default/items/{id}/PATCH/ApiPermission.Test.MyStackitemsApiA38DACFB.PATCH..items.{id} it
[+] AWS::ApiGateway::Method itemsApi/Default/items/{id}/PATCH itemsApiitemsidPATCH0548CB6A
[+] AWS::Lambda::Permission itemsApi/Default/items/{id}/DELETE/ApiPermission.MyStackitemsApiA38DACFB.DELETE..items.{id} items
[+] AWS::Lambda::Permission itemsApi/Default/items/{id}/DELETE/ApiPermission.Test.MyStackitemsApiA38DACFB.DELETE..items.{id}
[+] AWS::ApiGateway::Method itemsApi/Default/items/{id}/DELETE itemsApiitemsidDELETE21550005
[+] AWS::ApiGateway::Method itemsApi/Default/items/{id}/OPTIONS itemsApiitemsidOPTIONS62809100

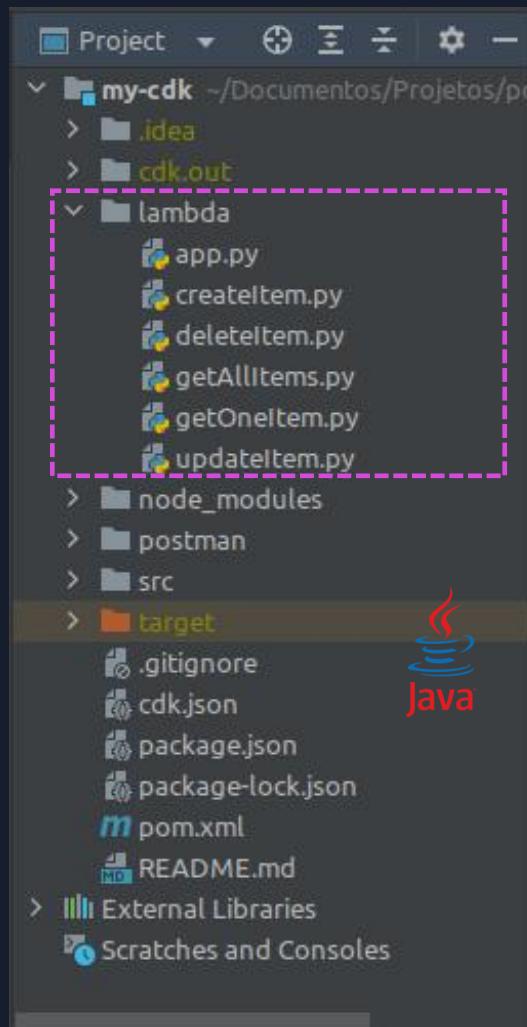
Outputs
[+] Output itemsApi/Endpoint itemsApiEndpoint8392E274: {"Value": {"Fn::Join": "", ["https://", {"Ref": "itemsApi28111E1C"}]}, ".exec
```

* Number of stacks with differences: 1

Code Lambda with Python



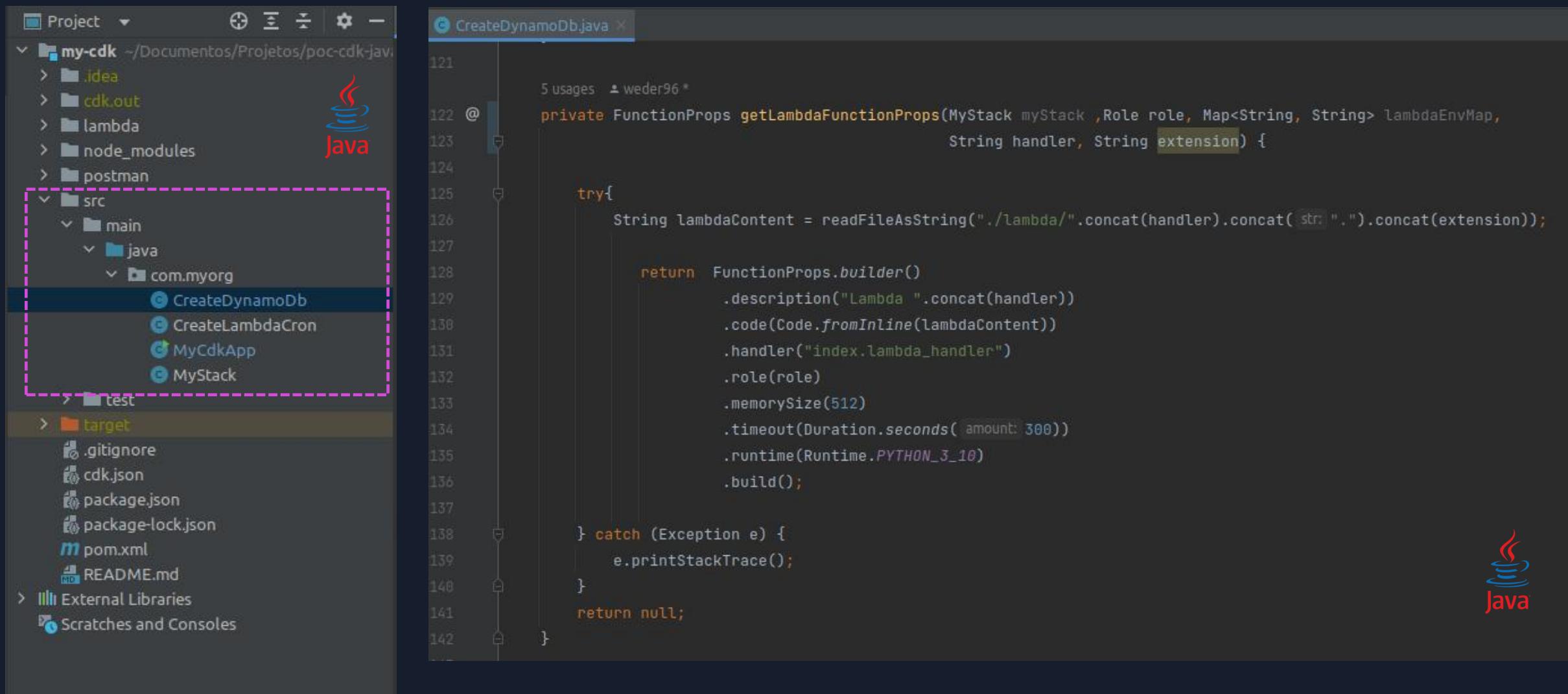
The **AWS SDK for Python (Boto3)** provides a **Python API for AWS infrastructure services**. Using the **SDK for Python**, you can build applications on top of **Amazon S3, Amazon EC2, Amazon DynamoDB**, and more.



```
1 import json
2 import boto3
3 import uuid
4
5 client = boto3.resource('dynamodb')
6
7 def lambda_handler(event, context):
8     print('Starting input lambda function call')
9     table = client.Table('orders')
10    myuuid = uuid.uuid4()
11
12    print('Your UUID is: ' + str(myuuid))
13
14    order=json.loads(event['body'])
15
16    data = table.put_item(
17        Item={
18            'orderId': str(myuuid),
19            'orderDate': order['orderDate'],
20            'status': order['status'],
21            'desc': order['desc'],
22            'updateOrderDate': order['updateOrderDate'],
23            'Name': order['Name'],
24            'Email': order['Email']
25        }
26    )
27
28    response = {
29        'statusCode': 200,
30        'body': json.dumps('successfully created item!'),
31        'headers': { 'Content-Type': 'application/json', 'Access-Control-Allow-Origin': '*'}
32    }
33
34
35    return response
```

Code IAC(infrastructure as Code)

In this case we **are generating the infrastructure** using the AWS SDK, however the code controller is **written in Java**, using the **CDK** it generates the Cloudformation template, which is then deployed creating the services automatically in **AWS in your account** configured in your machine via **credentials**.



The screenshot shows an IDE interface with a Java project structure on the left and a code editor on the right.

Project Structure:

- Project: my-cdk (~/Documentos/Projetos/poc-cdk-java)
- Files: .idea, cdk.out, lambda, node_modules, postman, src/main/java/com.myorg (highlighted with a dashed purple border), test, target, .gitignore, cdk.json, package.json, package-lock.json, pom.xml, README.md, External Libraries, Scratches and Consoles.

Code Editor (CreateDynamoDb.java):

```
121
122 @Private
123 private FunctionProps getLambdaFunctionProps(MyStack myStack, Role role, Map<String, String> lambdaEnvMap,
124                                                 String handler, String extension) {
125
126     try{
127         String lambdaContent = readFileAsString("./lambda/.concat(handler).concat(str).concat(extension));
128
129         return FunctionProps.builder()
130             .description("Lambda ".concat(handler))
131             .code(Code.fromInline(lambdaContent))
132             .handler("index.lambda_handler")
133             .role(role)
134             .memorySize(512)
135             .timeout(Duration.seconds(amount: 300))
136             .runtime(Runtime.PYTHON_3_10)
137             .build();
138     } catch (Exception e) {
139         e.printStackTrace();
140     }
141
142 }
```

A Java icon is visible next to the project structure and code editor.

Code IAC (infrastructure as Code)

Create Lambda Role

```
1 usage  ▲ weder96
public Role createLambdaRole(MyStack myStack){
    PolicyStatement statement2 = PolicyStatement.Builder.create()
        .effect(Effect.ALLOW)
        .actions(Arrays.asList(new String[] {"logs:CreateLogGroup", "logs:CreateLogStream", "logs:PutLogEvents"}))
        .resources(Arrays.asList(new String[] {"arn:aws:logs:*:*:*"})).build();

    PolicyDocument policyDocument = PolicyDocument.Builder.create()
        .statements(Arrays.asList(new PolicyStatement[]{statement2})).build();

    return Role.Builder.create(myStack, id: "LambdaIAMRole")
        .roleName("LambdaIAMRole")
        .inlinePolicies(Collections.singletonMap("key", policyDocument))
        .path("/")
        .assumedBy(new ServicePrincipal("lambda.amazonaws.com")).build();
}
```



Code IAC (infrastructure as Code)

Create DynamoDB and Grant Permissions Lambda Functions

```
private TableProps createTablePropsDynamoDB(MyStack myStack) {  
    TableProps tableProps;  
    Attribute partitionKey = Attribute.builder().name("orderId").type(AttributeType.STRING).build();  
    Attribute sortKey = Attribute.builder().name("orderDate").type(AttributeType.STRING).build();  
    tableProps = TableProps.builder().tableName("orders")  
        .partitionKey(partitionKey)  
        .sortKey(sortKey).removalPolicy(RemovalPolicy.DESTROY).build();  
  
    return tableProps;  
}
```

```
private static Map<String, String> createLambdaEnvMap(Table dynamodbTable) {  
    Map<String, String> lambdaEnvMap = new HashMap<>();  
    lambdaEnvMap.put("TABLE_NAME", dynamodbTable.getTableName());  
    lambdaEnvMap.put("PRIMARY_KEY", "orderId");  
    return lambdaEnvMap;  
}
```

```
public void cdkDynamodb(MyStack myStack){  
    TableProps tableProps = createTablePropsDynamoDB(myStack);  
    Table dynamodbTable = new Table(myStack, id: "orders", tableProps);  
    Map<String, String> lambdaEnvMap = createLambdaEnvMap(dynamodbTable);  
  
    Role role = createLambdaRole(myStack);
```

```
    Function createItemFunction = new Function(myStack, id: "createItemFunction", getLambdaFunctionProps(myStack, role, lambdaEnvMap, handler: "createItem", extension: "py"));  
    Function updateItemFunction = new Function(myStack, id: "updateItemFunction", getLambdaFunctionProps(myStack, role, lambdaEnvMap, handler: "updateItem", extension: "py"));  
    Function deleteItemFunction = new Function(myStack, id: "deleteItemFunction", getLambdaFunctionProps(myStack, role, lambdaEnvMap, handler: "deleteItem", extension: "py"));  
    Function getOneItemFunction = new Function(myStack, id: "getOneItemFunction", getLambdaFunctionProps(myStack, role, lambdaEnvMap, handler: "getOneItem", extension: "py"));  
    Function getAllItemsFunction = new Function(myStack, id: "getAllItemsFunction", getLambdaFunctionProps(myStack, role, lambdaEnvMap, handler: "getAllItems", extension: "py"));
```

```
dynamodbTable.grantReadWriteData(createItemFunction);  
dynamodbTable.grantReadWriteData(updateItemFunction);  
dynamodbTable.grantReadWriteData(deleteItemFunction);  
dynamodbTable.grantReadWriteData(getOneItemFunction);  
dynamodbTable.grantReadWriteData(getAllItemsFunction);
```

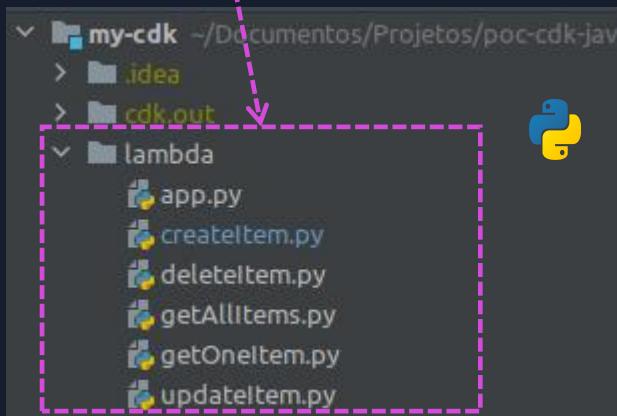


Code IAC (infrastructure as Code)



Reading Lambda Functions

```
public String readFileSync(String fileName) throws Exception {  
    String data = "";  
    try {  
        data = new String(Files.readAllBytes(Paths.get(fileName)), charsetName: "UTF-8");  
    } catch (Exception e) {  
        e.printStackTrace();  
    }  
    return data;  
}
```



```
Function createItemFunction = new Function(myStack, id: "createItemFunction",  
Function updateItemFunction = new Function(myStack, id: "updateItemFunction",  
Function deleteItemFunction = new Function(myStack, id: "deleteItemFunction",  
Function getOneItemFunction = new Function(myStack, id: "getOneItemFunction",  
Function getAllItemsFunction = new Function(myStack, id: "getAllItemsFunction",  
                                         getLambdaFunctionProps(role,  
                                         getLambdaFunctionProps(role,  
                                         getLambdaFunctionProps(role,  
                                         getLambdaFunctionProps(role,  
                                         getLambdaFunctionProps(role,  
                                         nameFunction: "createItem", extension: "py"));  
                                         nameFunction: "updateItem", extension: "py");  
                                         nameFunction: "deleteItem", extension: "py");  
                                         nameFunction: "getOneItem", extension: "py");  
                                         nameFunction: "getAllItems", extension: "py");
```

```
private FunctionProps getLambdaFunctionProps(Role role, String nameFunction, String extension) {  
    try{  
        String lambdaContent = readFileSync("./lambda/.concat(nameFunction).concat(str: ".).concat(extension));  
        return FunctionProps.builder()  
            .description("Lambda ".concat(nameFunction))  
            .code(Code.fromInline(lambdaContent))  
            .handler("index.lambda_handler")  
            .role(role)  
            .memorySize(512)  
            .timeout(Duration.seconds(amount: 300))  
            .runtime(Runtime.PYTHON_3_10)  
            .build();  
    } catch (Exception e) {  
        e.printStackTrace();  
    }  
    return null;  
}
```

Code IAC (infrastructure as Code) - Create API Gateway



```
RestApi api = new RestApi(myStack, id: "itemsApi", RestApiProps.builder().restApiName("Items Service").build());

IResource items = api.getRoot().addResource(s: "items");

Integration getAllIntegration = new LambdaIntegration(getAllItemsFunction);
items.addMethod(s: "GET", getAllIntegration);

Integration createOneIntegration = new LambdaIntegration(createItemFunction);
items.addMethod(s: "POST", createOneIntegration);
addCorsOptions(items);

IResource singleItem = items.addResource(s: "{id}");
Integration getOneIntegration = new LambdaIntegration(getOneItemFunction);
singleItem.addMethod(s: "GET", getOneIntegration);

Integration updateOneIntegration = new LambdaIntegration(updateItemFunction);
singleItem.addMethod(s: "PATCH", updateOneIntegration);

Integration deleteOneIntegration = new LambdaIntegration(deleteItemFunction);
singleItem.addMethod(s: "DELETE", deleteOneIntegration);
addCorsOptions(singleItem);
```

```
private void addCorsOptions(IResource item) {
    List<MethodResponse> methodResponses = new ArrayList<>();

    Map<String, Boolean> responseParameters = new HashMap<>();
    responseParameters.put("method.response.header.Access-Control-Allow-Headers", Boolean.TRUE);
    responseParameters.put("method.response.header.Access-Control-Allow-Methods", Boolean.TRUE);
    responseParameters.put("method.response.header.Access-Control-Allow-Credentials", Boolean.TRUE);
    responseParameters.put("method.response.header.Access-Control-Allow-Origin", Boolean.TRUE);
    methodResponses.add(MethodResponse.builder()
        .responseParameters(responseParameters)
        .statusCode("200")
        .build());
    MethodOptions methodOptions = MethodOptions.builder()
        .methodResponses(methodResponses)
        .build();

    Map<String, String> requestTemplate = new HashMap<>();
    requestTemplate.put("application/json", "{\"statusCode\": 200}");
    List<IntegrationResponse> integrationResponses = new ArrayList<>();
```

Postman Call API Gateway

The screenshot shows the Postman application interface. On the left, a sidebar lists API endpoints under the category 'CDK_API_GATEWAY_ORDERS'. The 'CREATE ITEM' endpoint is selected and highlighted with a pink dashed box. Below the sidebar, the main workspace displays a POST request configuration for the 'CREATE ITEM' endpoint.

Request Details:

- Method:** POST (highlighted with a pink dashed box)
- URL:** https://kp90ktq1qb.execute-api.us-east-1.amazonaws.com/prod/items

Body (raw JSON):

```
1 [ {  
2     "orderDate": "2023-09-07",  
3     "status": "IN_PROGRESS",  
4     "desc": "Xiomai readmi 12C",  
5     "updateOrderDate": "2023-09-07",  
6     "Name": "Weder Sousa2",  
7     "Email": "weder.sousa96@handson.cloud"  
8 } ]
```

Postman Call API Gateway

The screenshot shows the Postman interface with a dark theme. On the left, a sidebar lists a collection named "CDK_API_GATEWAY_ORDERS" containing several API endpoints: "CREATE ITEM" (POST), "GET ALL ITEMS" (GET), "GET ITEM BY ID" (GET), "DELETE ITEM BY ID" (DEL), and "UPDATE ITEM" (PATCH). The "UPDATE ITEM" endpoint is highlighted with a pink dashed box. The main workspace shows a "PATCH UPDATE ITEM" request for the "CDK_API_GATEWAY_ORDERS / UPDATE ITEM" endpoint. The URL is set to <https://kp90ktq1qb.execute-api.us-east-1.amazonaws.com/prod/items/c0fe2aa0-a1d0-4d86-8091-ff76dda73086>. The "Body" tab is selected, showing a JSON payload:

```
1 {  
2   "status": "CANCELED",  
3   "updateOrderDate": "2023-09-08"  
4 }
```

Postman Call API Gateway

The screenshot shows the Postman application interface. On the left, a sidebar lists several API endpoints under the category "CDK_API_GATEWAY_ORDERS". The endpoints are:

- POST CREATE ITEM
- GET GET ALL ITEMS (highlighted with a purple dashed box)
- GET GET ITEM BY ID
- DEL DELETE ITEM BY ID
- PATCH UPDATE ITEM

The main panel displays the details for the "GET GET ALL ITEMS" request. The request method is "GET" and the URL is "https://41v8x3mpkd.execute-api.us-east-1.amazonaws.com/prod/items".

The "Params" tab is selected, showing a table with one row:

KEY	VALUE	DESCRIPTION

The "Body" tab is selected, showing a JSON response. The response is a single-element array containing one object with the following properties:

```
1  []
2  [
3  {
4    "orderDate": "2023-09-07",
5    "orderId": "0d16a630-c89c-4b1f-b03d-aa179c737d76",
6    "status": "IN_PROGRESS",
7    "updateOrderDate": "2023-09-07",
8    "Email": "weder.sousa96@handson.cloud",
9    "desc": "Xiomi readmi 12C",
10   "Name": "Weder Sousa2"
11 }
```

Postman Call API Gateway

The screenshot shows the Postman application interface. On the left, a sidebar lists several API endpoints under the category "CDK_API_GATEWAY_ORDERS". The endpoints include:

- POST CREATE ITEM
- GET GET ALL ITEMS
- GET GET ITEM BY ID** (highlighted with a dashed red box)
- DEL DELETE ITEM BY ID
- PATCH UPDATE ITEM

The main workspace displays a "GET ITEM BY ID" request. The method is set to "GET", and the URL is "https://41v8x3mpkd.execute-api.us-east-1.amazonaws.com/prod/items/0d16a630-c89c-4b1f-b03d-aa179c737d76". The "Headers" tab shows 6 headers. The "Body" tab is selected and displays a JSON response with line numbers:

```
1 {  
2   "Items": [  
3     {  
4       "orderDate": {  
5         "S": "2023-09-07"  
6       },  
7       "orderId": {  
8         "S": "0d16a630-c89c-4b1f-b03d-aa179c737d76"  
9       },  
10      "status": {  
11        "S": "IN_PROGRESS"  
12      },  
13      "updateOrderDate": {  
14        "S": "2023-09-07"  
15      },  
16      "Email": {  
17        "S": "weder.sousa96@handson.cloud"  
18      },  
19      "desc": {  
20        "S": "Xiomi readmi 12C"  
21      },  
22      "Name": {  
23        "S": "Weder Sousa2"  
24      }  
25    }  
26  ]  
27}
```

Postman Call API Gateway

The screenshot shows the Postman interface with a request to a CDK API Gateway endpoint.

Left Sidebar: Shows the collection tree with a node for "CDK_API_GATEWAY_ORDERS". Under it are several methods: POST CREATE ITEM, GET GET ALL ITEMS, GET GET ITEM BY ID, and the selected method, DELETE DELETE ITEM BY ID, which is highlighted with a dashed purple box.

Request Details: The main area shows a DELETE request titled "DELETE ITEM BY ID". The URL is https://41v8x3mpkd.execute-api.us-east-1.amazonaws.com/prod/items/0d16a630-c89c-4b1f-b03d-aa179c737d76. The "Headers (6)" tab is selected.

Body: The response body is displayed in JSON format, starting with "Item delete with SuccessFully :".

```
1 Item delete with SuccessFully : []
2   "ResponseMetadata": {
3     "RequestId": "2M1885SIFULQH3HU404EJ82R2BVV4KQNS05AEMVJF6609ASUAAJG",
4     "HTTPStatusCode": 200,
5     "HTTPHeaders": {
6       "server": "Server",
7       "date": "Mon, 11 Sep 2023 21:17:00 GMT",
8       "content-type": "application/x-amz-json-1.0",
9       "content-length": "2",
10      "connection": "keep-alive",
11      "x-amzn-requestid": "2M1885SIFULQH3HU404EJ82R2BVV4KQNS05AEMVJF6609ASUAAJG",
12      "x-amz-crc32": "2745614147"
13    },
14    "RetryAttempts": 0
15  }
16 }
```

Lambda Function Python(Boto3) - Create Item

The image shows a terminal window with a file tree on the left and a code editor on the right.

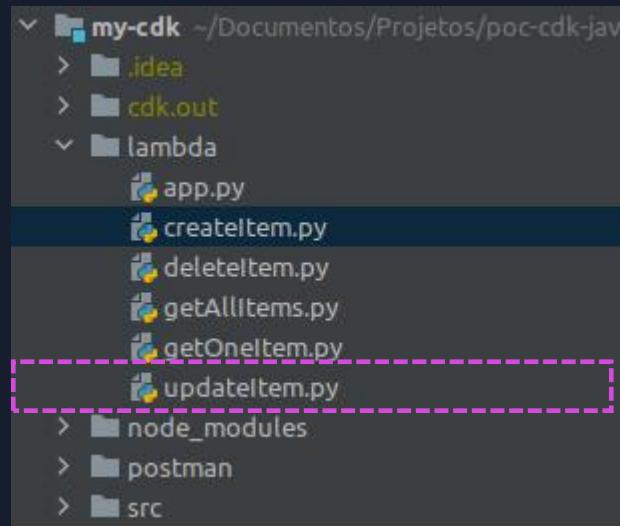
File Tree:

- my-cdk ~/Documentos/Projetos/poc-cdk-jav
 - .idea
 - cdk.out
 - lambda
 - app.py
 - createItem.py
 - deleteItem.py
 - getAllItems.py
 - getOneItem.py
 - updateItem.py
 - node_modules
 - postman
 - src

Code Editor (createItem.py):

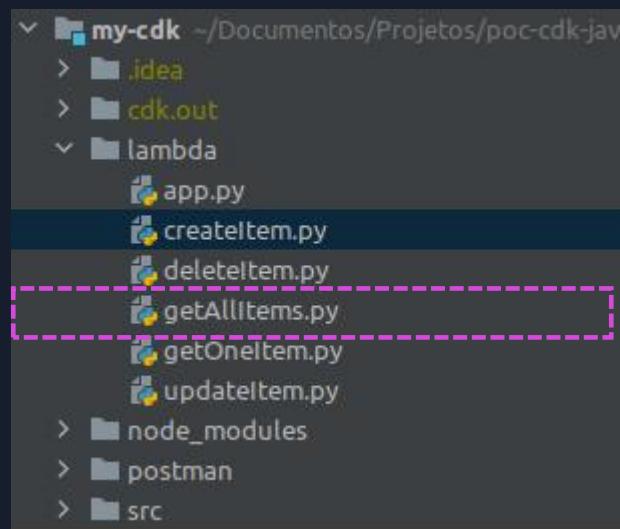
```
1 import json
2 import boto3
3 import uuid
4
5 client = boto3.resource('dynamodb')
6
7 def lambda_handler(event, context):
8     print('Starting input lambda function call')
9     table = client.Table('orders')
10    myuuid = str(uuid.uuid4())
11
12    print('Your UUID is: ' + str(myuuid))
13
14    order=json.loads(event['body'])
15
16    data = table.put_item(
17        Item={
18            'orderId': str(myuuid),
19            'orderDate': order['orderDate'],
20            'status': order['status'],
21            'desc': order['desc'],
22            'updateOrderDate': order['updateOrderDate'],
23            'Name': order['Name'],
24            'Email': order['Email']
25        }
26    )
27
28    response = {
29        'statusCode': 200,
30        'body': json.dumps('successfully created item!'),
31        'headers': { 'Content-Type': 'application/json', 'Access-Control-Allow-Origin': '*'}
32    }
33
34    return response
```

Lambda Function Python(Boto3) - Update Item



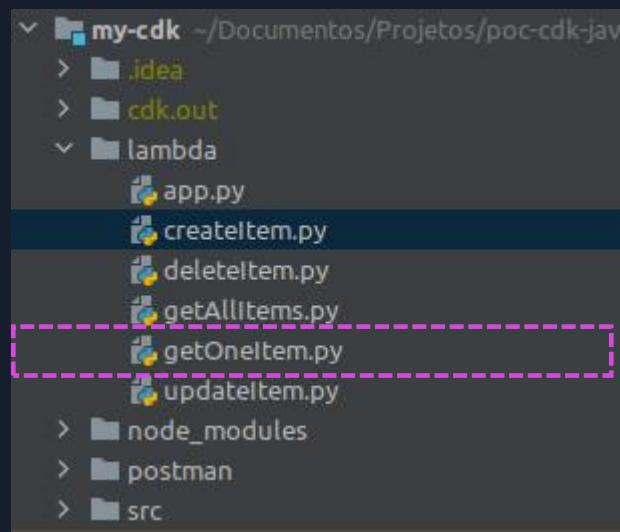
```
1 import json
2 import boto3
3 from boto3.dynamodb.conditions import Key
4
5 def lambda_handler(event, context):
6     print('Starting input lambda function call')
7
8     client = boto3.client('dynamodb')
9
10    print(event['pathParameters']['id'])
11    idParam = event['pathParameters']['id']
12
13    order=json.loads(event['body'])
14
15    # put (idempotent)
16    data = client.update_item(
17        TableName="orders",
18        Key={
19            "orderId": {"S": str(idParam)},
20        },
21        ExpressionAttributeValues={
22            ":val1": {"S": order['status']},
23            ":val2": {"S": order['updateOrderDate']},
24        },
25        ExpressionAttributeNames={
26            "#updateOrderDate": "updateOrderDate",
27            "#status": "status"
28        },
29        UpdateExpression="set #status = :val1, #updateOrderDate = :val2 ",
30        ReturnValues="ALL_NEW"
31    )
32
33    print(data)
34
```

Lambda Function Python(Boto3) - Get All Item



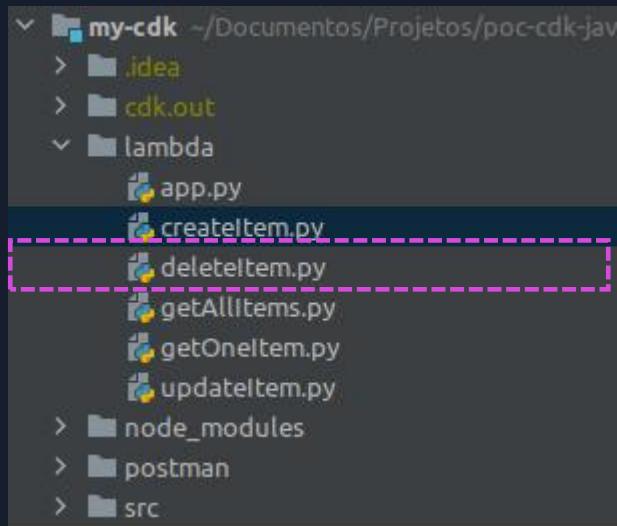
```
1 import json
2 import boto3
3 from boto3.dynamodb.conditions import Key, Attr
4
5 client = boto3.resource('dynamodb')
6
7 def lambda_handler(event, context):
8     print('Starting input lambda function call')
9     print(event)
10
11     table = client.Table('orders')
12     #responseScan = table.scan(FilterExpression=Attr('Name').eq('Weder Sousa'))
13     responseScan = table.scan()
14
15     print("The query returned the following items:")
16     for item in responseScan['Items']:
17         print(item)
18
19     response = {
20         'statusCode': 200,
21         'body': json.dumps(responseScan['Items']),
22         'headers': {
23             'Content-Type': 'application/json',
24             'Access-Control-Allow-Origin': '*'
25         },
26     }
27
28     return response
```

Lambda Function Python(Boto3) - Get One Item By Id



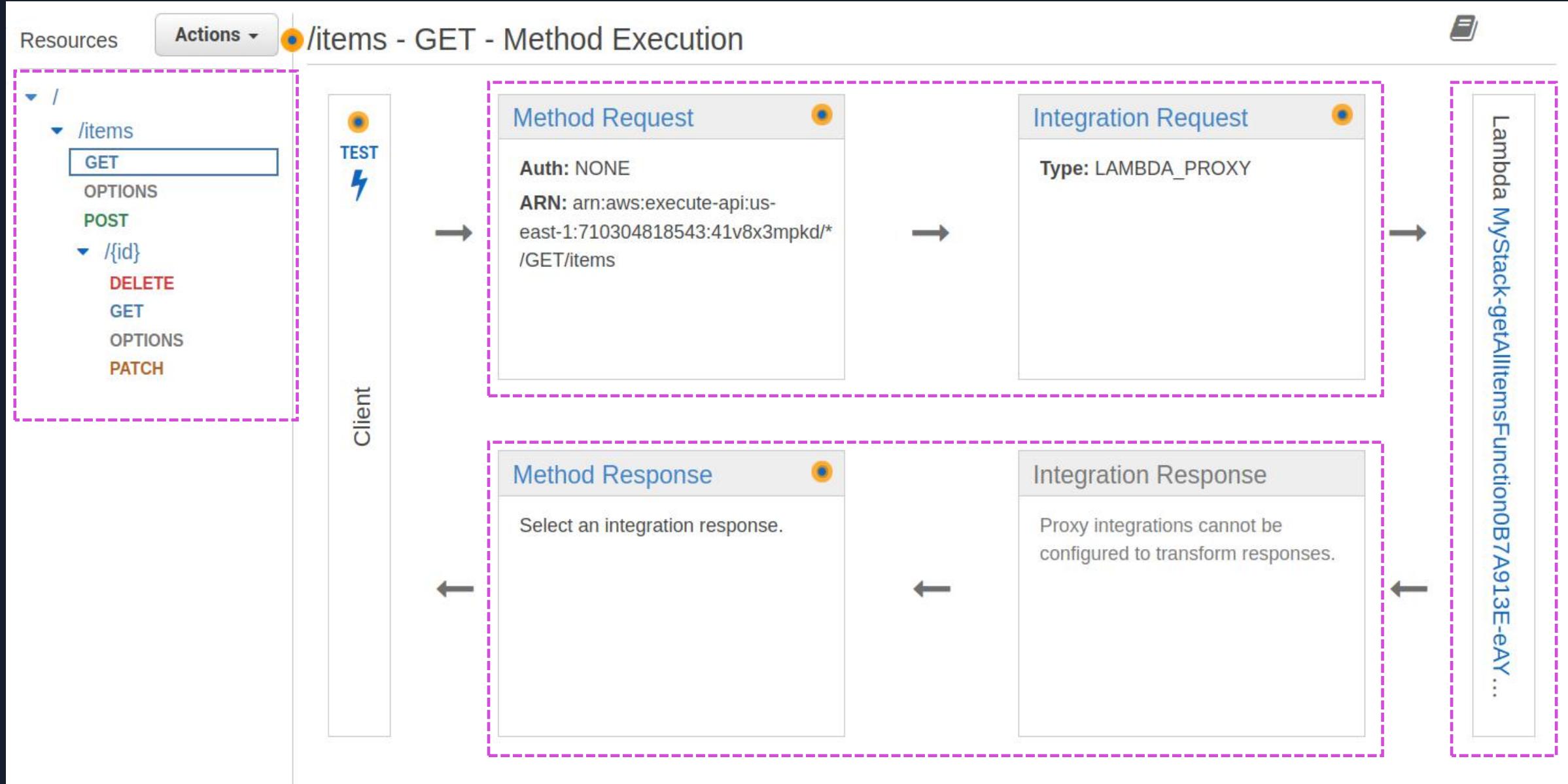
```
1 import json
2
3 import boto3
4 from boto3 import dynamodb
5 from boto3.dynamodb.conditions import Key, Attr
6
7
8 def lambda_handler(event, context):
9     print('Starting input lambda function call')
10    print(event)
11    print(event['pathParameters']['id'])
12
13    idParam = event['pathParameters']['id']
14    client = boto3.client('dynamodb')
15    # item = client.get_item(TableName='orders', Key={'orderId': { 'S' : str(idParam)}})
16
17    item = client.query(
18        ExpressionAttributeValues={
19            ':vId': {
20                'S': str(idParam)
21            },
22        },
23        KeyConditionExpression='orderId = :vId',
24        TableName='orders'
25    )
26
27
28    print("The query returned the following item:")
29    print(item)
30
```

Lambda Function Python(Boto3) - Delete Item By Id

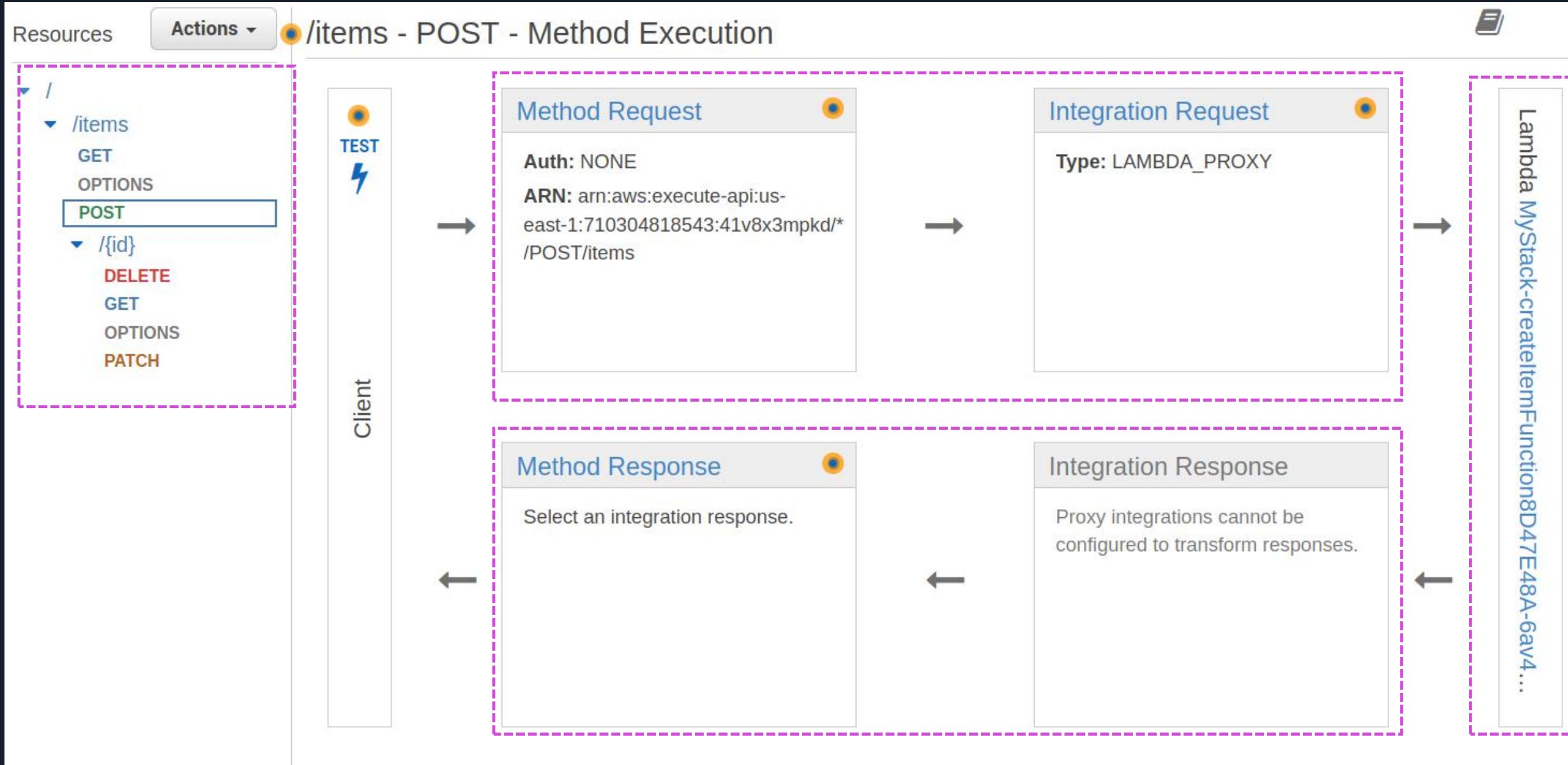


```
1 import json
2 import boto3
3 from boto3 import dynamodb
4 from boto3.dynamodb.conditions import Key, Attr
5
6
7 def lambda_handler(event, context):
8     print(event['pathParameters']['id'])
9
10    idParam = event['pathParameters']['id']
11    client = boto3.client('dynamodb')
12
13    item = client.query(
14        ExpressionAttributeValues={':vId': { 'S': str(idParam)}},
15        KeyConditionExpression='orderId = :vId',
16        TableName='orders'
17    )
18
19    if len(item["Items"]) > 0:
20        print(item["Items"][0]["orderDate"]["S"])
21        deleteItem = client.delete_item(
22            TableName='orders' ,
23            Key={
24                'orderId': { 'S' : str(idParam)},
25                'orderDate': { 'S' : str(item["Items"][0]["orderDate"]["S"])}
26            }
27        )
28
29        print("The query returned the following item:")
30        print(deleteItem)
```

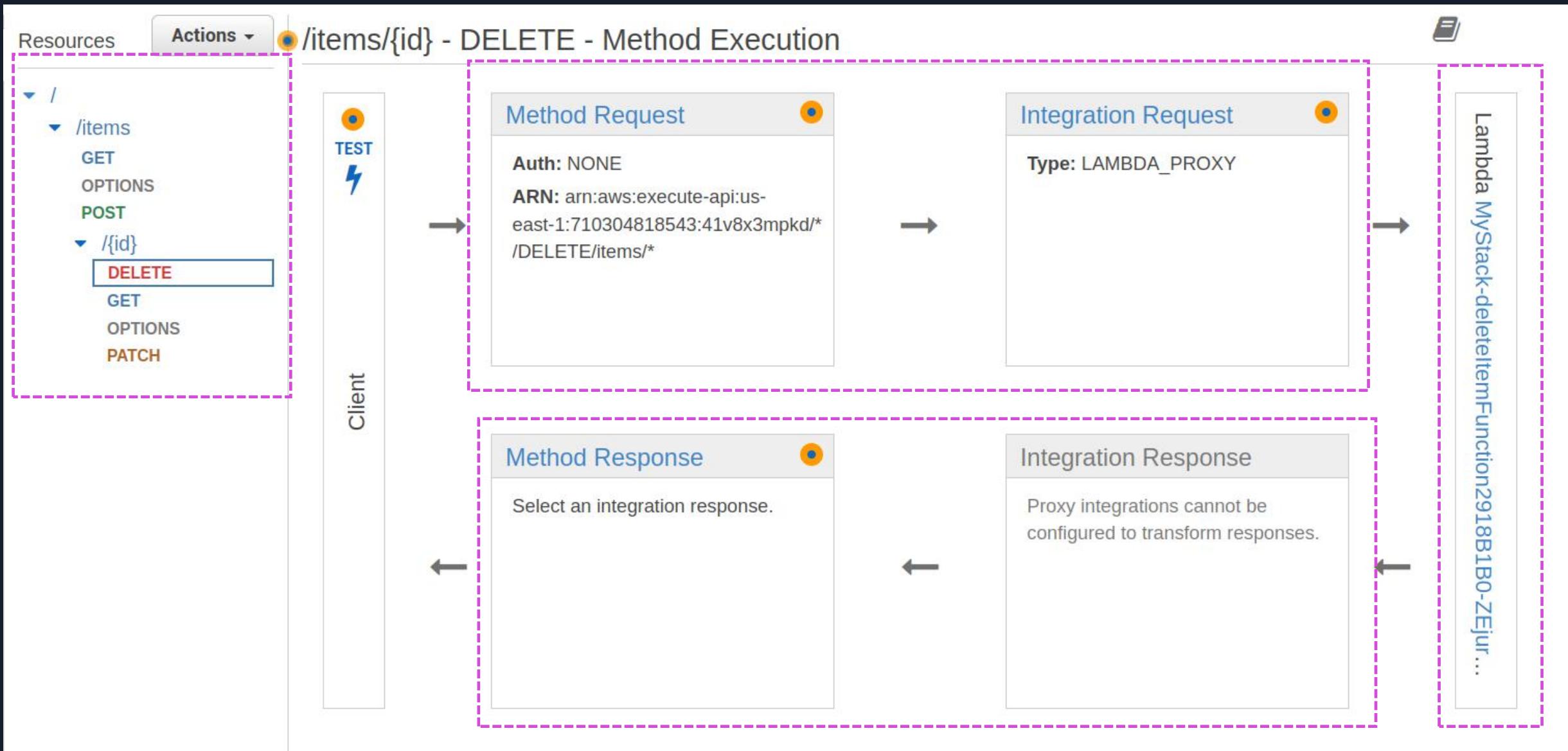
AWS Resources (API Gateway) create(GET)



AWS Resources (API Gateway) create (POST)



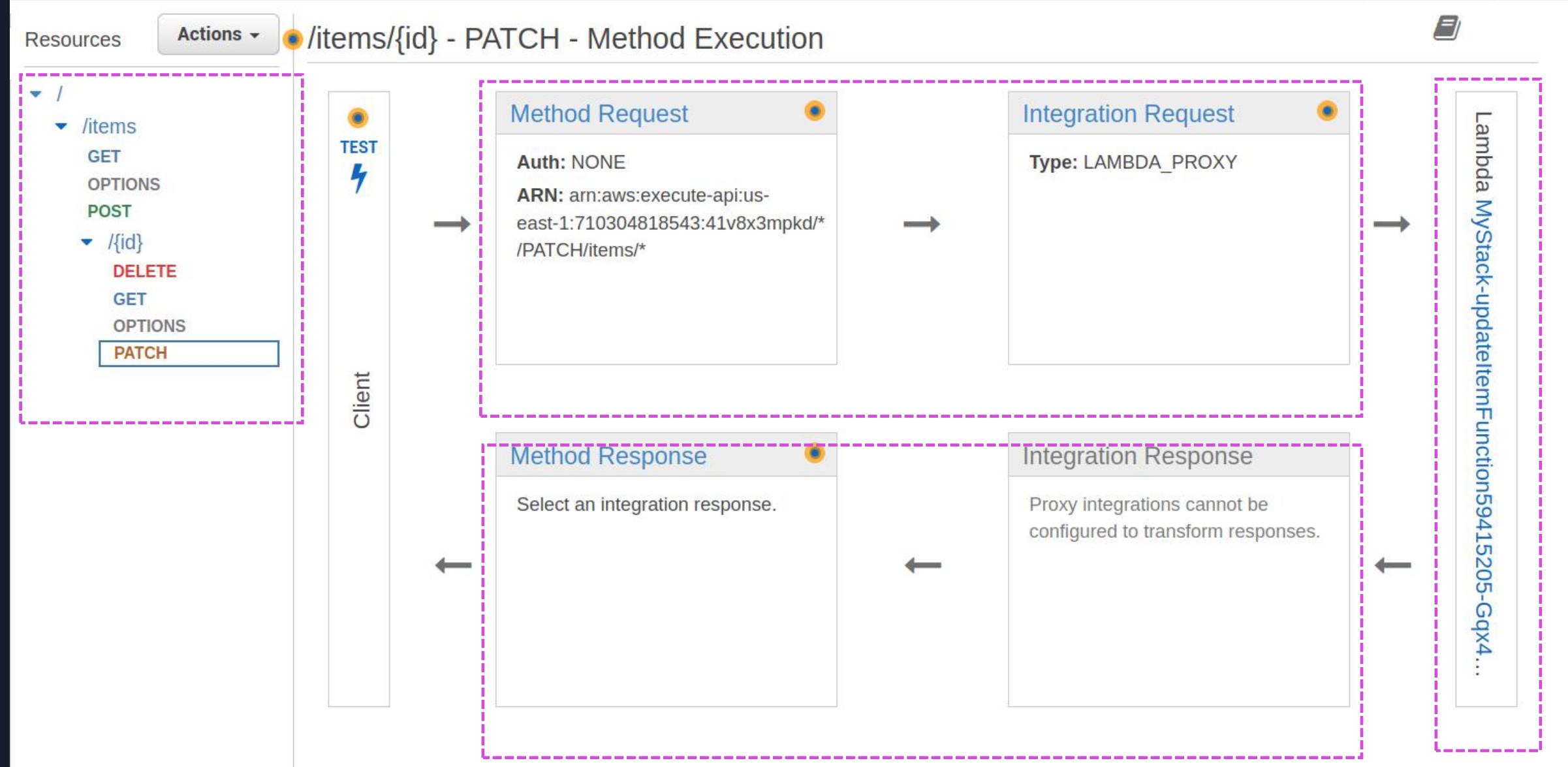
AWS Resources (API Gateway) create /id (DELETE)



AWS Resources (API Gateway) create /id (GET)



AWS Resources (API Gateway) create /id (PATCH)



AWS Resources create (Lambdas)

Lambda > Functions

Functions (30)					Last fetched 23 seconds ago	C	Actions ▾	Create function
<input type="text"/> Filter by tags and attributes or search by keyword					< 1 >			
Function name	Description	Package type	Runtime	Last modified				
MyStack-deleteItemFunction2918B1B0-ZEjurzRhyTEP	Lambda deleteItem	Zip	Python 3.10	16 hours ago				
MyStack-getOneItemFunctionE3257B22-7vhvfNEQGTxk	Lambda getOneItem	Zip	Python 3.10	20 hours ago				
MyStack-updateItemFunction59415205-Gqx4MKt4wOxX	Lambda updateItem	Zip	Python 3.10	4 days ago				
MyStack-createItemFunction8D47E48A-6av4PrReEqoU	Lambda createItem	Zip	Python 3.10	4 days ago				
MyStack-getAllItemsFunction0B7A913E-eAYHHix0qcMN	Lambda getAllItems	Zip	Python 3.10	4 days ago				

AWS Resources create (DynamoDB)

DynamoDB > Tables

Tables (1) [Info](#)

C Actions ▾ Delete Create table

Find tables by table name Any tag key Any tag value < 1 > ⚙

Na...	Status	Partition key	Sort key	Indexes	Deletion protection	Read capacity mode	Write capacity mode
<input type="checkbox"/> orders	<input checked="" type="checkbox"/> Active	orderId (S)	orderDate (S)	0	<input type="checkbox"/> Off	Provisioned (5)	Provisioned (5)

DynamoDB > Explore items > orders

Tables (1) X orders Autopreview View table details

Any tag key Any tag value Find tables by table name < 1 > ⚙

Scan or query items Expand to query or scan items.

Completed. Read capacity units consumed: 0.5

Items returned (1)

C Actions ▾ Create item < 1 > ⚙

orderId (String)	orderDate (String)	desc	Email	Name
db9f81d5-fcfe-4bc4-a201-9051175dc256	2023-09-12	Xiomi read...	weder.sous...	Weder So...

AWS Resources create (IAM Role)

Roles (37) <small>Info</small>			
<small>An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.</small>			
<input type="button"/> C	Delete	Create role	
<input type="text"/> Search			<small>< 1 2 > </small>
<input type="checkbox"/>	Role name	Trusted entities	Last activity
<input type="checkbox"/>	AWSServiceRoleForSupport	AWS Service: support (Service-Linke	-
<input type="checkbox"/>	AWSServiceRoleForTrustedAdvisor	AWS Service: trustedadvisor (Service	-
<input type="checkbox"/>	cdk-hnb659fds-cfn-exec-role-710304818543-us-east-1	AWS Service: cloudformation	3 days ago
<input type="checkbox"/>	cdk-hnb659fds-deploy-role-710304818543-us-east-1	Account: 710304818543	3 days ago
<input type="checkbox"/>	cdk-hnb659fds-file-publishing-role-710304818543-us-east-1	Account: 710304818543	3 days ago
<input type="checkbox"/>	cdk-hnb659fds-image-publishing-role-710304818543-us-east-1	Account: 710304818543	-



Next Steps



The AWS Step Functions Workshop



The AWS Step Functions Workshop

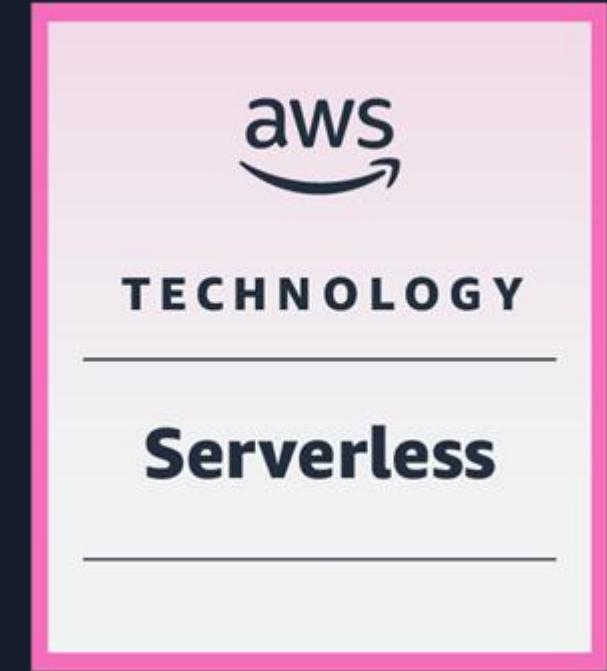


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<https://catalog.workshops.aws/stepfunctions/en-US>

AWS Serverless Digital Learning Badges

[AWS Skill Builder](#)



<https://aws.amazon.com/blogs/compute/introducing-new-aws-serverless-digital-learning-badges/>

Want to Try?

Serverless Security Workshop



Serverless Security Workshop

Serverless Security Workshop



Important

The purpose of the workshop is to provide a starter API which **does NOT follow many security best practices** on purpose. The tutorial modules guide you to identify security gaps in the starter app, and implement protection measures for them. Furthermore, the modules **do not cover ALL** the security measures that should be applied. After completing all modules, we recommend you to explore additional protections, such as ensuring the principle of least privilege. See the **Extra Credit** section for more details.

In this workshop, you will learn techniques to secure a serverless application built with AWS Lambda, Amazon API Gateway and RDS Aurora. We will cover AWS services and features you can leverage to improve the security of a serverless applications in 5 domains:

1. identity & access management
2. code
3. data
4. infrastructure
5. logging & monitoring

You'll start by deploying a simple serverless application that allows third party companies to submit unicorn customizations. This will help Wild Rydes receive ad revenue and allow third party companies to market their brand leveraging Wild Rydes's popularity.

<https://catalog.us-east-1.prod.workshops.aws/workshops/026f84fd-f589-4a59-a4d1-81dc543fc30/en-US>

Want to Try?

Serverland AWS Lambda Fundamentals



AWS Lambda Fundamentals



s12d.com/lambda-fundamentals

<https://s12d.com/lambda-fundamentals>

Want to Try?

Serverless airline - Multiple patterns/practices



The image displays four sequential screenshots of a mobile application interface for a flight booking service:

- Screenshot 1: Search Screen**
Title: Flight App
Text: "Where next?"
Fields: "Departure airport: LGW", "Arrival airport: MAD", "Pick a date: Wed, 24 Apr 2019".
Button: "SEARCH FLIGHTS >"
- Screenshot 2: Flight Selection Screen**
Title: Flight App
Text: "Select your flight"
List:
 - DEPARTURE LGW London Gatwick → 16 JAN 2019 MAD Madrid Barajas
Time: 08:00 Duration: 2h15m Arrival: 11:15
Price: 400 EUR Flight No: #1812
 - DEPARTURE LGW London Gatwick → 16 JAN 2019 MAD Madrid Barajas
Time: 10:30 Duration: 2h15m Arrival: 13:45
Price: 200 EUR Flight No: #1813
 - DEPARTURE LGW London Gatwick → 16 JAN 2019 MAD Madrid Barajas
Time: 12:00 Duration: 2h15m Arrival: 15:15
Price: 1000 EUR Flight No: #1814
- Screenshot 3: Review Selection Screen**
Title: Flight App
Text: "Review your selection"
List:
 - DEPARTURE LGW London Gatwick → 16 JAN 2019 MAD Madrid Barajas
Time: 08:00 Duration: 2h15m Arrival: 11:15
Price: 400 EUR Flight No: #1812
- Screenshot 4: User Profile Screen**
Title: Flight App
Text:
 - Heitor F. Lessa (purple 4,554,234)
 - 50,241 Points
 - 10% Next Tier Progress

Payment details:
Name: Name on card
Country:
Postcode: Postcode
Card number: 1234 1234 1234 1234
Expiry date: MM / YY
CVC: CVC

Preferences:
Dietary requirements
Luggage

Buttons: "SIGN OUT"

<https://github.com/aws-samples/aws-serverless-airline-booking>

Want to Try? CDK - Workshop



AWS CDK
Workshop

Search

English

Prerequisites

- TypeScript Workshop
- Python Workshop
- .NET Workshop
- Java Workshop
- Go Workshop
- Construct Hub
- Congrats!

Submit a correction

CDK on GitHub

CDK on StackOverflow

CDK on Gitter

Welcome Developers!

Hey there, and thanks for joining us! Hope you can't wait to play with this new thing we call the "AWS Cloud Development Kit" or in short, the AWS CDK.

The AWS CDK is a new software development framework from AWS with the sole purpose of making it fun and easy to define cloud infrastructure in your favorite programming language and deploy it using AWS CloudFormation.

So what are we going to build? Nothing too fancy...

We'll spend some time setting up your development environment and learning a little about how to work with the CDK Toolkit to deploy your app to an AWS environment.

Then, you'll write a little "Hello, world" Lambda function and front it with an API Gateway endpoint so users can call it via an HTTP request.

Next, we'll introduce the powerful concept of **CDK constructs**. Constructs allow you to bundle up a bunch of infrastructure into reusable components which anyone can compose into their apps. We'll walk you through writing your own construct.



<https://cdkworkshop.com/>

Want to Try?

CDK Patterns



aws
CDK Patterns

[About](#)[Find A Pattern](#)

CDK Patterns is more than "just AWS CDK examples"

Check Out Our 4 Content Distribution Platforms:

[Star 2,130](#)[Follow](#)[YouTube](#)[The Practical Dev](#)

<https://cdkpatterns.com/>

Want to Try?

hands-on.cloud

The screenshot shows the homepage of hands-on.cloud. At the top, there's a dark header with social media links (Facebook, YouTube, Twitter) and the site's logo, "hands-on.cloud". Below the header is a navigation bar with links: "Python Boto3 Tutorials", "Courses (In progress)", "AWS Certifications", "How-To Articles", "Write For Us", and a "serverless" dropdown menu. The main content area features a large, semi-transparent background image of a hand typing on a keyboard. Overlaid on this image is the site's title "Hands-On.Cloud" in a large, bold, dark blue serif font, followed by the subtitle "Tutorials, How-Tos for Cloud Engineers" in a smaller, lighter font. Below the title is the word "serverless" in a large, bold, dark blue sans-serif font. A search bar at the bottom has the word "SERVERLESS" in its placeholder text and a magnifying glass icon. In the bottom right corner, there's a teal button with the URL "https://hands-on.cloud/".

serverless

hands-on.cloud

Python Boto3 Tutorials Courses (In progress) AWS Certifications How-To Articles Write For Us

Hands-On.Cloud

Tutorials, How-Tos for Cloud Engineers

serverless

SEARCH

https://hands-on.cloud/

Resources

<https://cdkworkshop.com>

<https://github.com/aws-samples/aws-cdk-examples>

<https://docs.aws.amazon.com/cli/latest/userguide/getting-started-install.html>

<https://aws.amazon.com/pt/developer/language/java/>

<https://docs.aws.amazon.com/toolkit-for-jetbrains/latest/userguide/setup-toolkit.html>

<https://aws.amazon.com/pt/intellij/>

https://docs.aws.amazon.com/code-library/latest/ug/java_2_code_examples.html

https://docs.aws.amazon.com/pt_br/prescriptive-guidance/latest/patterns/deploy-a-ci-cd-pipeline-for-java-microservices-on-amazon-ecs.html

<https://docs.aws.amazon.com/lambda/latest/dg/lambda-java.html>

<https://aws.amazon.com/pt/blogs/compute/java-17-runtime-now-available-on-aws-lambda/>

<https://www.slideshare.net/AmazonWebServices/java-on-aws>

<https://www.jrebel.com/blog/aws-java-application-setup>

<https://www.slideshare.net/VadymKazulkin/adopting-java-for-the-serverless-world-at-jax-2022>

<https://towardsaws.com/deploy-spring-boot-application-to-aws-ec2-using-docker-f359e7ad2026>

<https://aws.amazon.com/pt/blogs/developer/stepfunctions-fluent-api/>

<https://aws.amazon.com/blogs/compute/java-17-runtime-now-available-on-aws-lambda/>

<https://docs.aws.amazon.com/lambda/latest/dg/snapstart.html>

About the Speaker

Weder Mariano de Sousa

Specialist Senior Java - GFT

Q & A



Technician **System Development**

Graduated **Computer Science**

Post Graduate in **Midias UFG**

Post Graduate in **Information Security**

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<https://twitter.com/weder96>

<https://dev.to/weder96>



GOJava



AWS User Group Goiânia



THANK YOU