Going Serverless in AWS with Lambda

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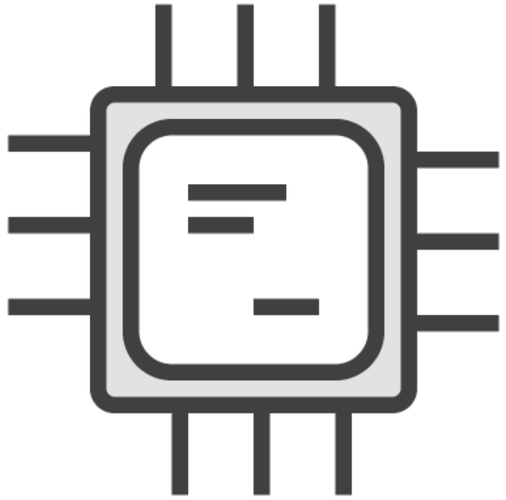


AWS Lambda Is for Computing

Pluralsight Courses on AWS Lambda

AWS Developer: Lambda Deep Dive

by Dror Helper

AWS Developer: An Introduction to AWS Lambda

by Fernando Medina Corey

Overview

Deploy the demo

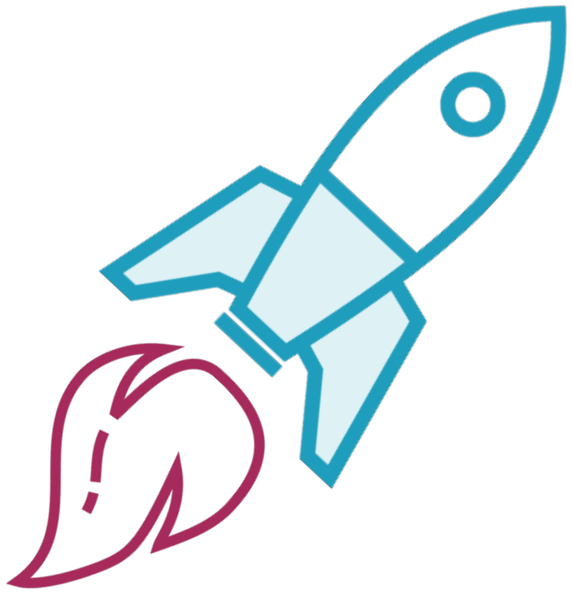
Designing metrical Lambda functions

Just the Lambda hits

A model for Serverless applications

Deploying the Demo Application

The Serverless Framework to the Rescue



Creating Lambda Functions

Lambda = Function

What’s the best way to write Serverless functions?

Lambda Monolith

All of your code in one function

Serverless Rules to Live By

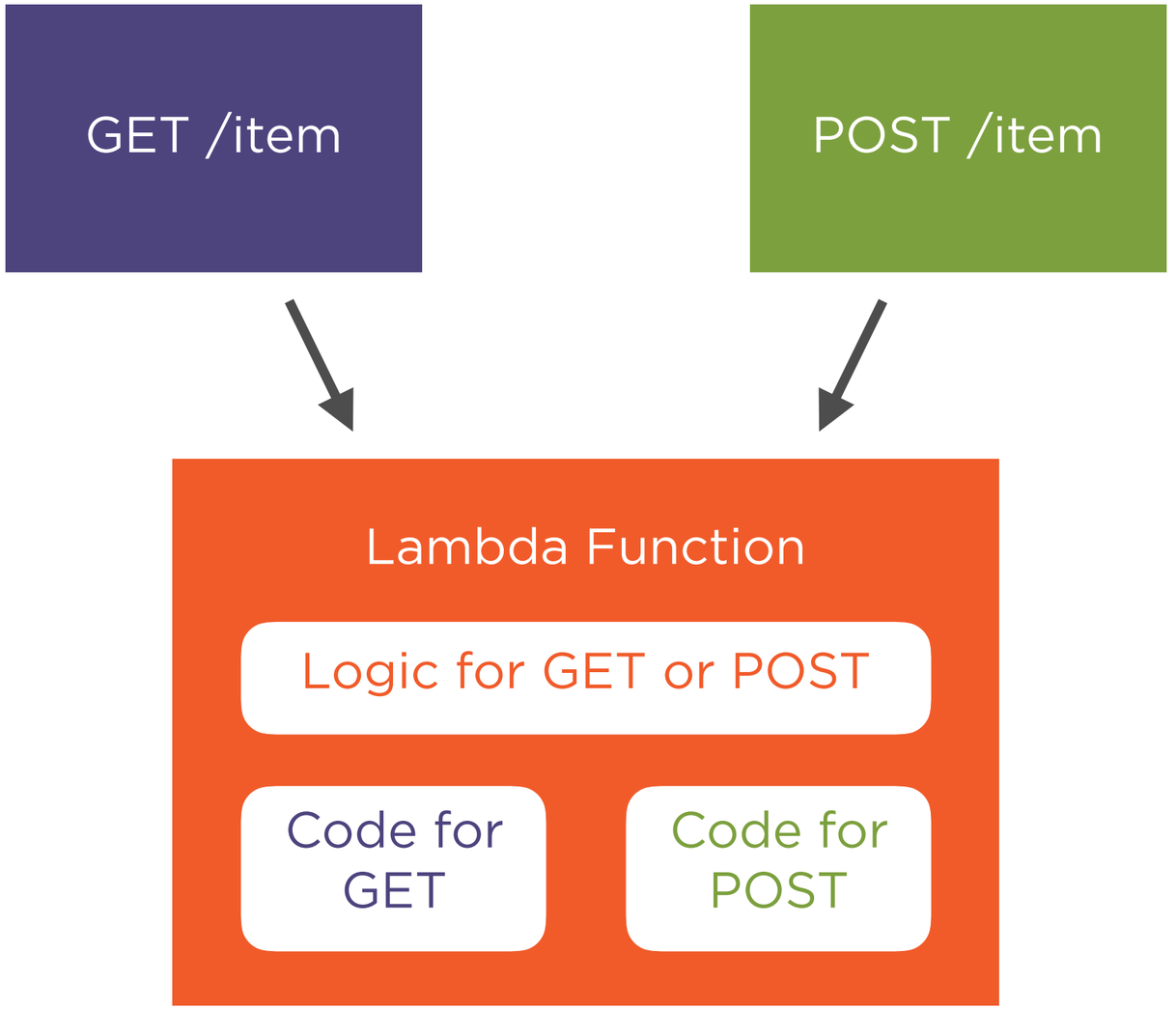
Functions are cheap

Distributed is ideal

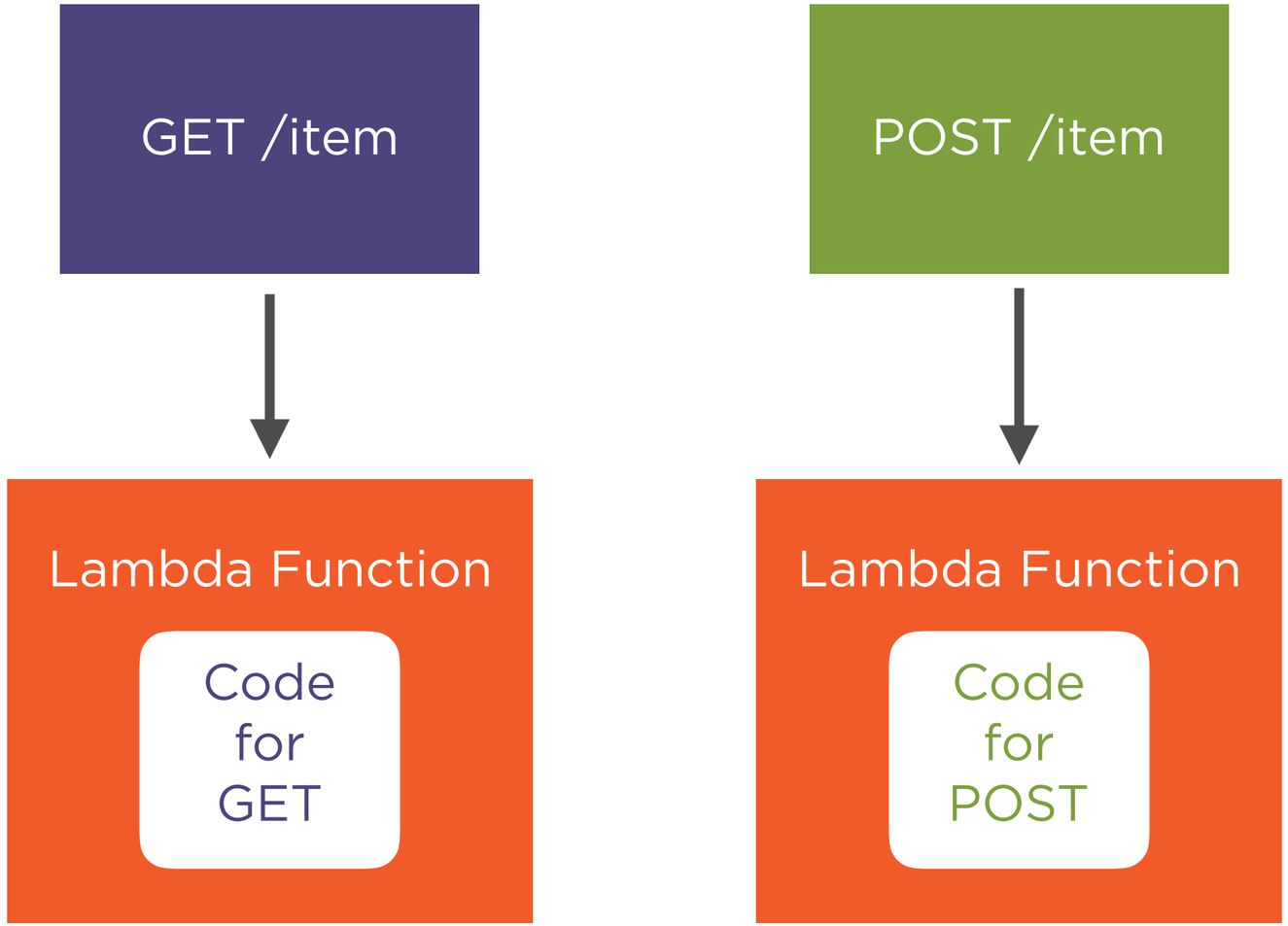
Lambda Utopia

Functions separated by business function

Maybe This Is the Right Way?



Much Better


GET /item
POST /item
Lambda Function
Code for GET
Lambda Function
Code for POST

Package Size Limits in AWS Lambda

Upload Package Size = 50MB Max

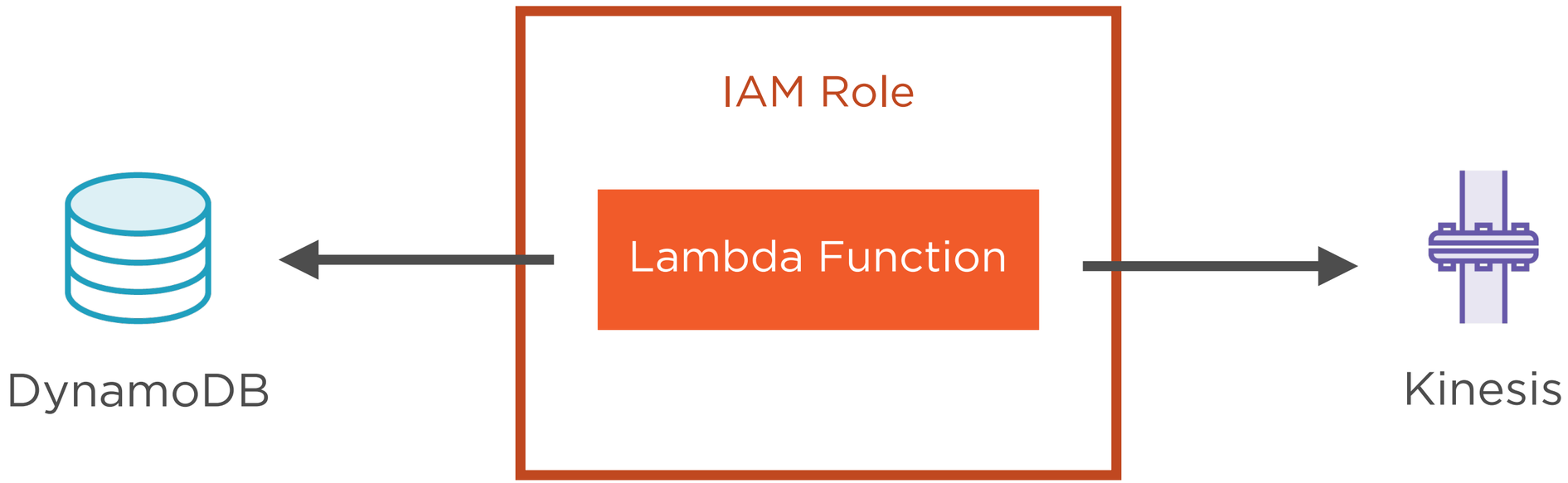
Unzipped Package Size = 250MB Max

AWS Lambda Metrics

Invocation Count	Execution Duration	Error Count
Throttle Count	Iterator Age	DLQ Errors

Securing Permissions in Lambda

Lambda Execution



Principle of Least Privilege

Only give a resource the necessary permissions it needs to execute.

Amazon recommends that each Lambda function has its own role

Securing Credentials in Lambda

Here are four approaches to storing credentials with AWS Lambda

Approach #1

Store Credentials in Your Code

Just no

Approach #2

Store Credentials in Environment Variables

Approach #3

Store Credentials in EC2 Parameter Store

Approach #4

Store Credentials in Secrets Manager

Stability with Lambda

Stability Concerns with Lambda

Monitoring for errors, long execution time

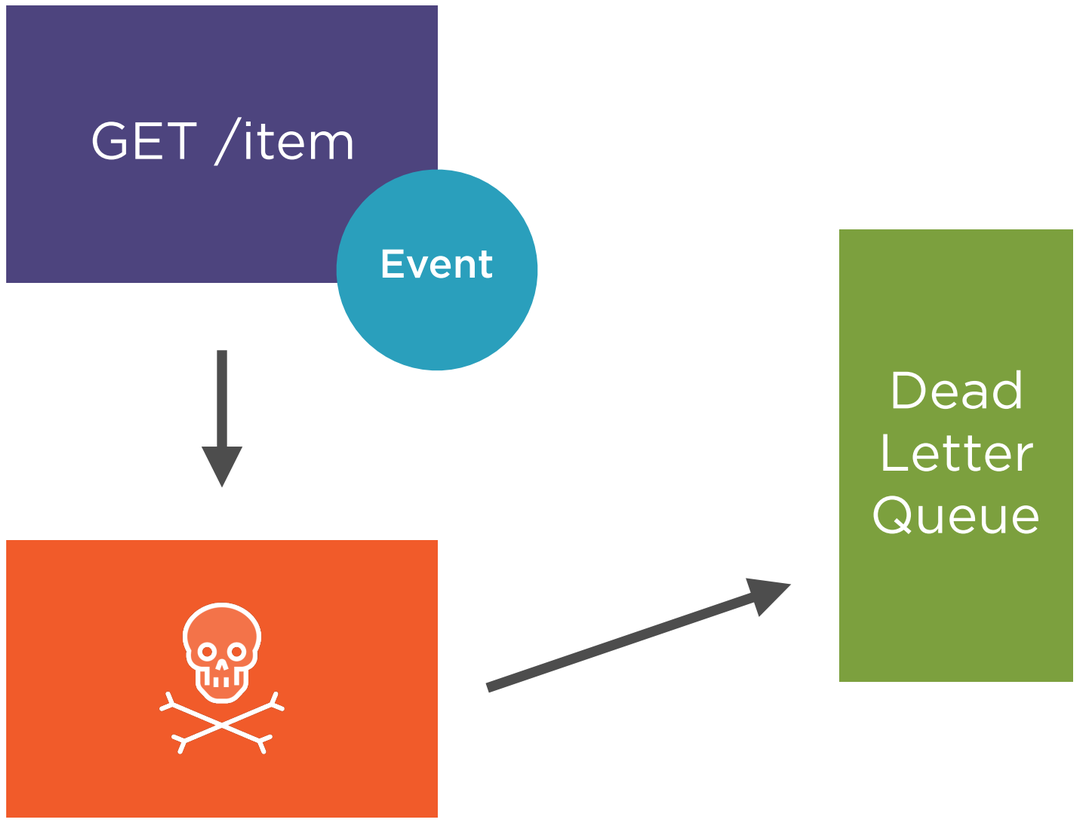
Ensuring Lambda invoking events are processed

Don’t let your Lambda functions drop the ball

Dead Letter Queue

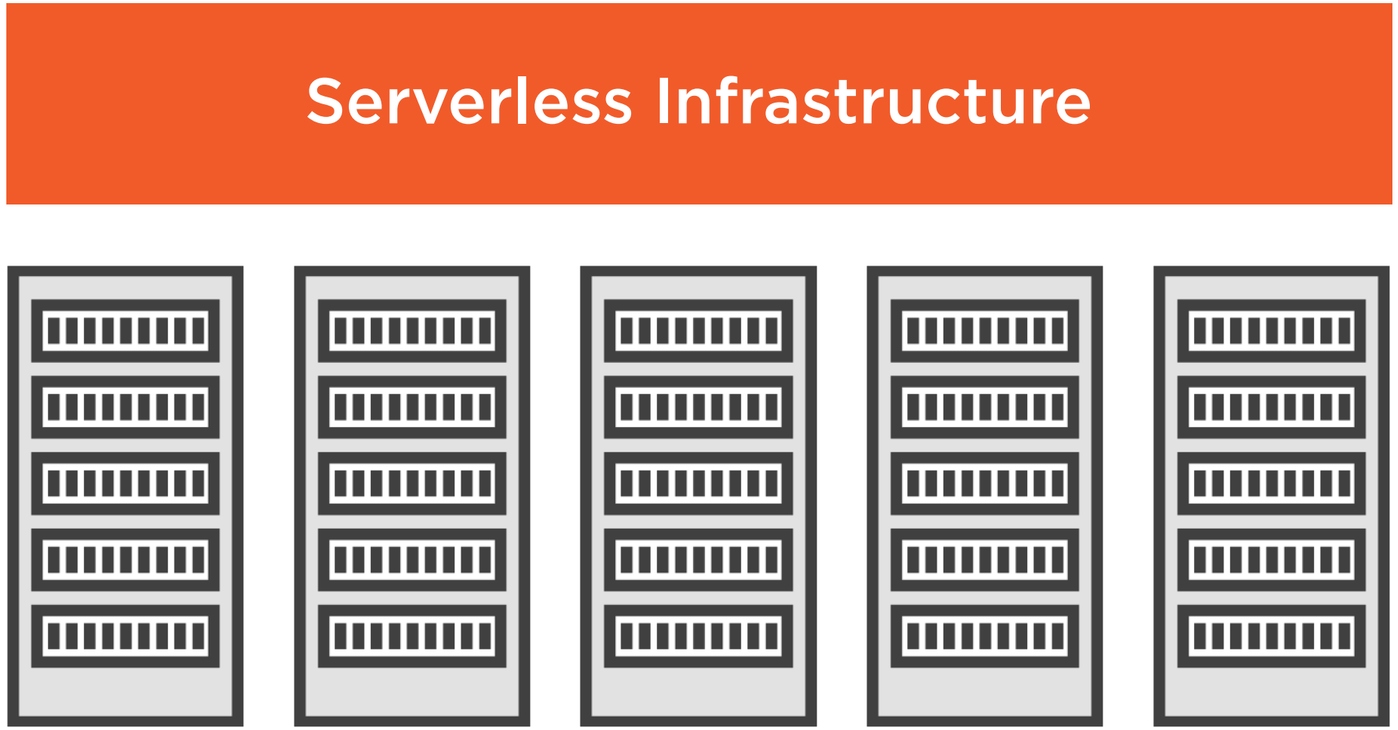
SNS topic or SQS queue where triggering events are sent if the Lambda function errors.

An Event Meets an Error



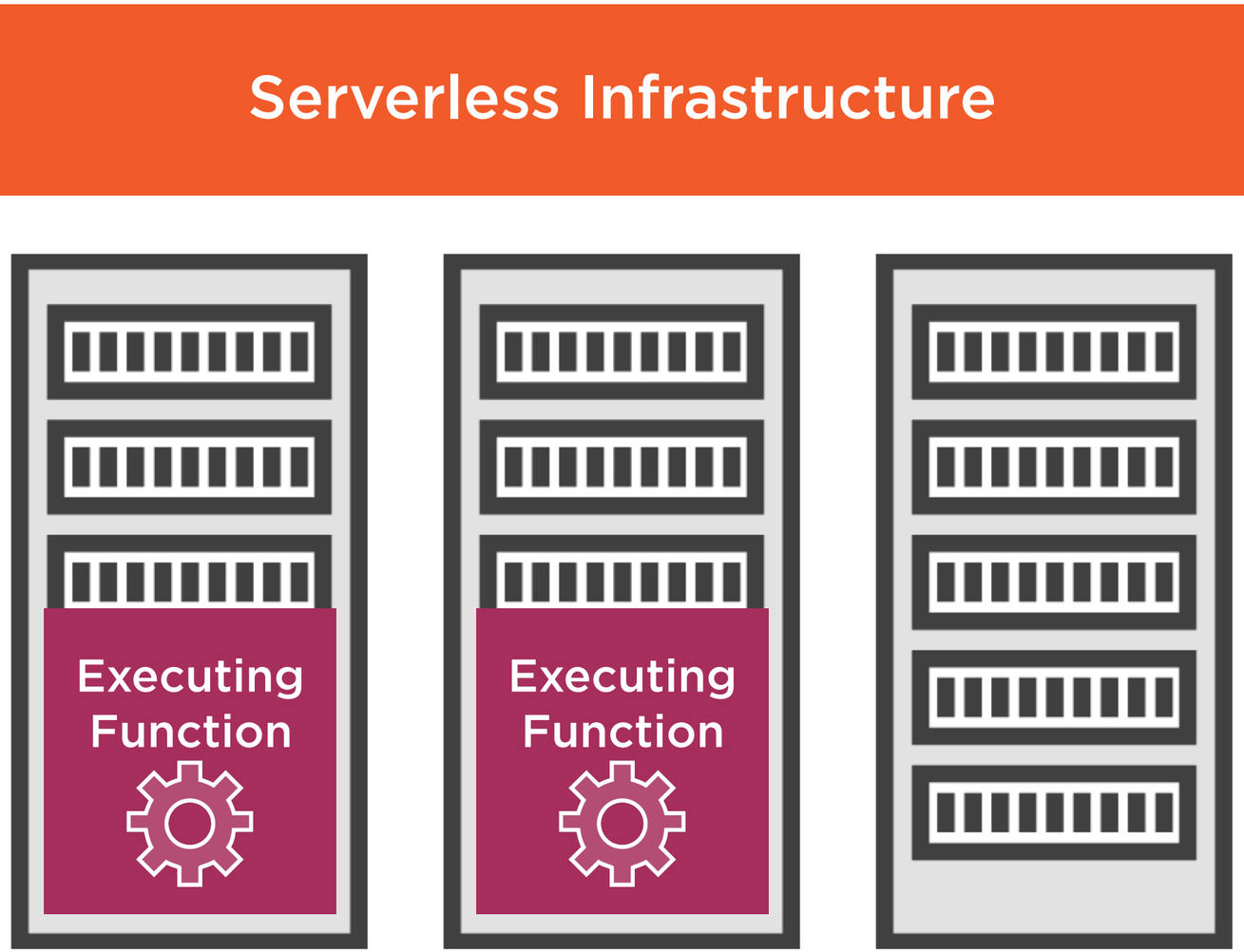
Performance and Concurrency with Lambda

Serverless Isn't without Servers



Increase Lambda function memory to increase CPU

Concurrent Invocations of Lambda Functions

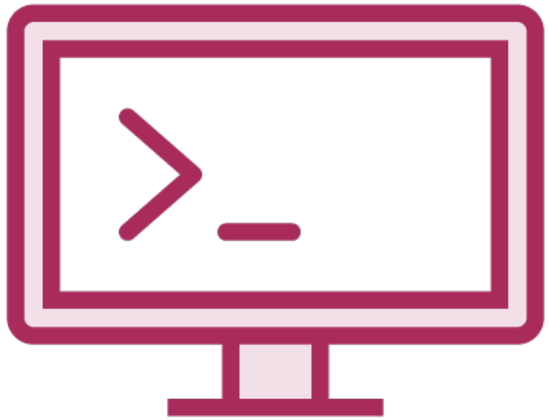


AWS has a limit on the number of concurrently running Lambda functions for your account

The Serverless Application Model

Serverless Application Model Parts

Configuration File



CLI Tool

awslabs / serverless-application-model

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AWS Serverless Application Model (SAM) is an open-source framework for building serverless applications https://aws.amazon.com/serverless/sam/

serverless aws lambda aws-sam sam sam-specification serverless-applications serverless-application-model

522 commits 27 branches 0 packages 26 releases 175 contributors Apache-2.0

Branch: develop New pull request Find file Clone or download

patrickgreenwell and keetonian fix: fix issue when referencing RestApiId by Ref (#1396) ... Latest commit 66e3d70 2 days ago

.github	chore: typo in 2016-10-31.md (#979)	8 months ago
bin	chore: update black version (#1419)	2 days ago
docs	feat: introduce AutoPublishCodeSha256 to allow overriding the publish...	2 days ago
examples	docs: add README pointing to example apps (#1420)	2 days ago
requirements	chore: V1.14.0 release patch (#1081)	6 months ago
samtranslator	fix: fix issue when referencing RestApiId by Ref (#1396)	2 days ago
tests	chore: update black version (#1419)	2 days ago
versions	docs: add EventBusName for CloudWatchEvent and EventBridgeRule	2 days ago

SAM vs. Serverless Framework

Serverless Application Model

Maintained by AWS

Deploys Serverless applications

Requires multiple commands to deploy

Can only do what CloudFormation can

Rough, hacked together experience

Serverless Framework

Maintained by Serverless, Inc.

Deploys Serverless applications

Deploys with a single command

Robust plugin architecture

Smooth experience

SAM Config File Example

```
AWSTemplateFormatVersion: '2010-09-09'
Transform: AWS::Serverless-2016-10-31
Description: A basic example.

Resources:
 ExampleFunction:
  Type: AWS::Serverless::Function
  Properties:
   Handler: index.handler
   Runtime: nodejs8.10
   CodeUri: src/
```

SAM Template Specific Resource Types

`AWS::Serverless::Function`

`AWS::Serverless::API`

`AWS::Serverless::SimpleTable`

AWS::Serverless::Function

Creates a Lambda function

Creates an IAM execution role

Creates event source mappings

SAM Serverless Function Example

```
ExampleFunction:
 Type: AWS::Serverless::Function
 Properties:
  Handler: index.handler
  Runtime: nodejs8.10
  CodeUri: src/
  Events:
   GetItemApi:
    Type: Api
    Properties:
     Path: /item/{itemId}
     Method: get
```

AWS::Serverless::API

Creates a Rest API

Creates Resources & Methods

Uses a Swagger configuration

AWS::Serverless::SimpleTable

Creates a DynamoDB Table

Can’t create Secondary Indexes

Use normal DynamoDB type if more config needed

SAM config files can also contain regular CloudFormation resources

How to Deploy a SAM Configuration Template

```
$ aws cloudformation package \
    --template-file /path_to_template/template.yaml \
    --s3-bucket bucket-name \
    --output-template-file packaged-template.yaml
```

```
$ aws cloudformation deploy \
    --template-file /path_to_template/packaged-template.yaml \
    --stack-name my-new-stack \
    --capabilities CAPABILITY_IAM
```

SAM will be on the AWS Developer Certification Exam

Conclusion

Summary

Serverless is a smooth criminal

Becoming a Lambda function designer

A tour of the Lambda monitoring center

IAM is everywhere, even in Lambda

Where are the live letter queues?

Pumping up those Lambda functions

A limit to concurrency

SAM will be on the test

Up Next

Serverless Event Configuration

with API Gateway and Kinesis