

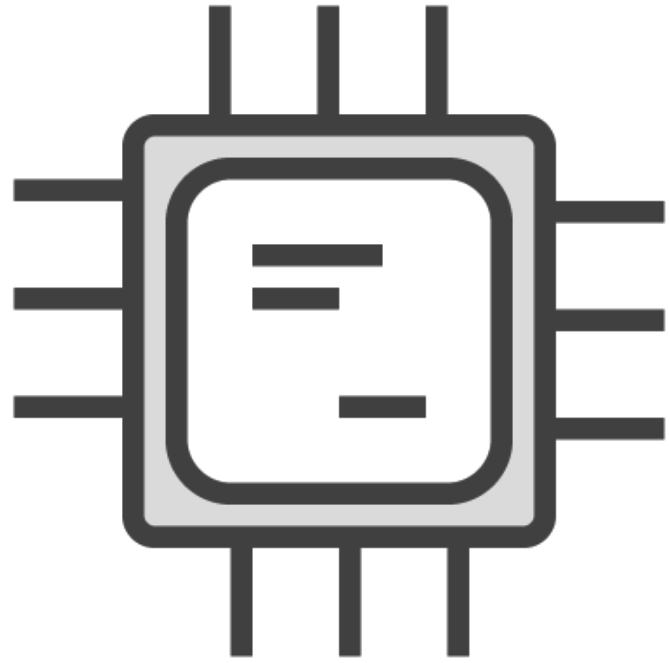
Going Serverless in AWS with Lambda



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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

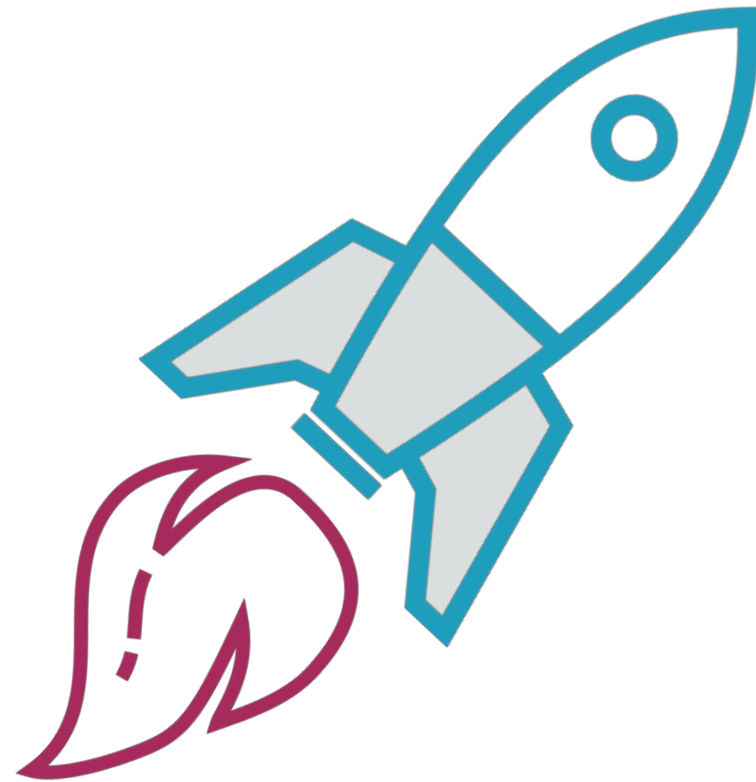
Designing metrical Lambda functions

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 your code in one function

Serverless Rules to Live By

Functions are cheap

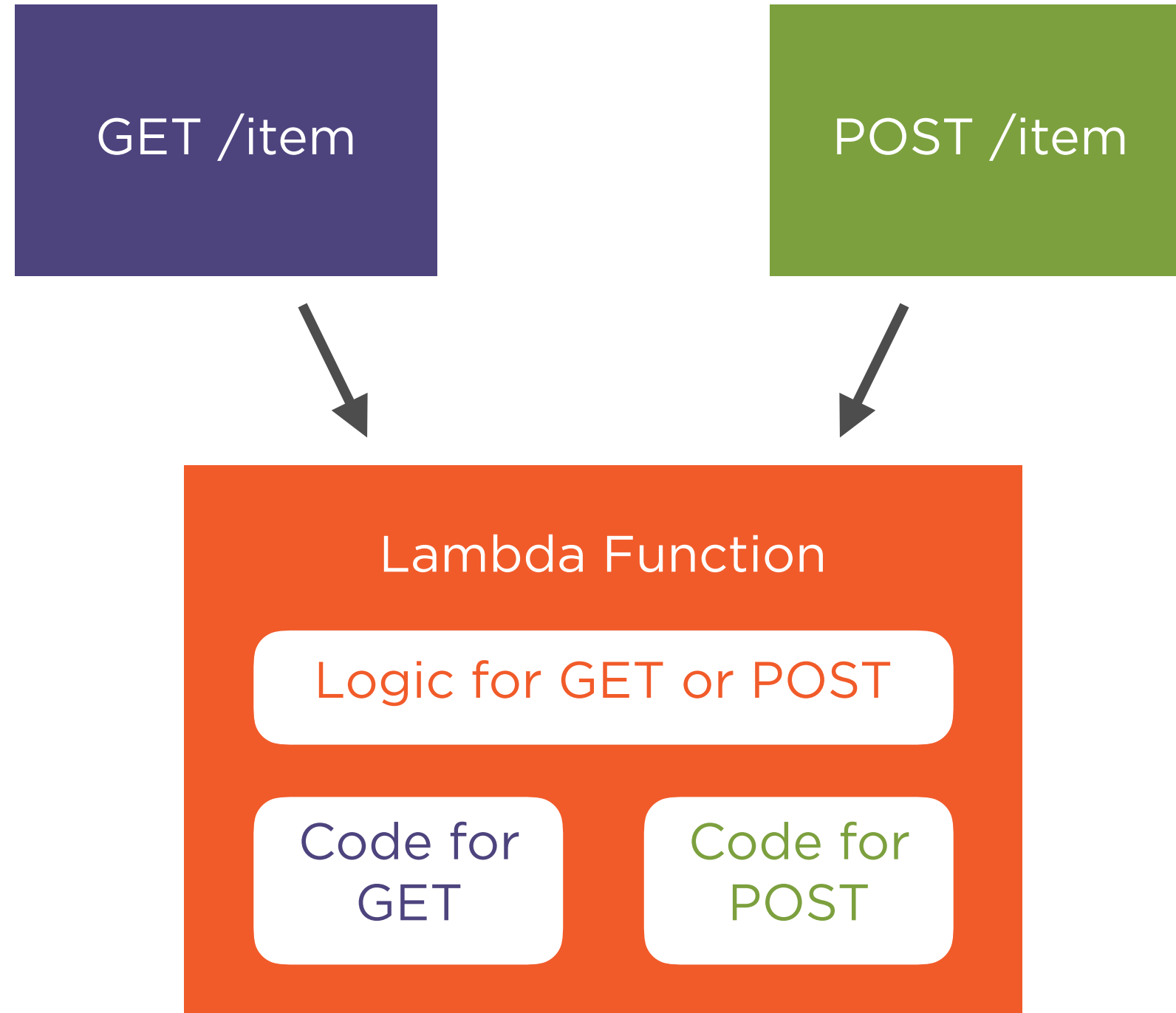
Distributed is ideal

Lambda Utopia



Functions separated by
business function

Maybe This Is the Right Way?



Much Better

GET /item



Lambda Function

Code
for
GET

POST /item



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

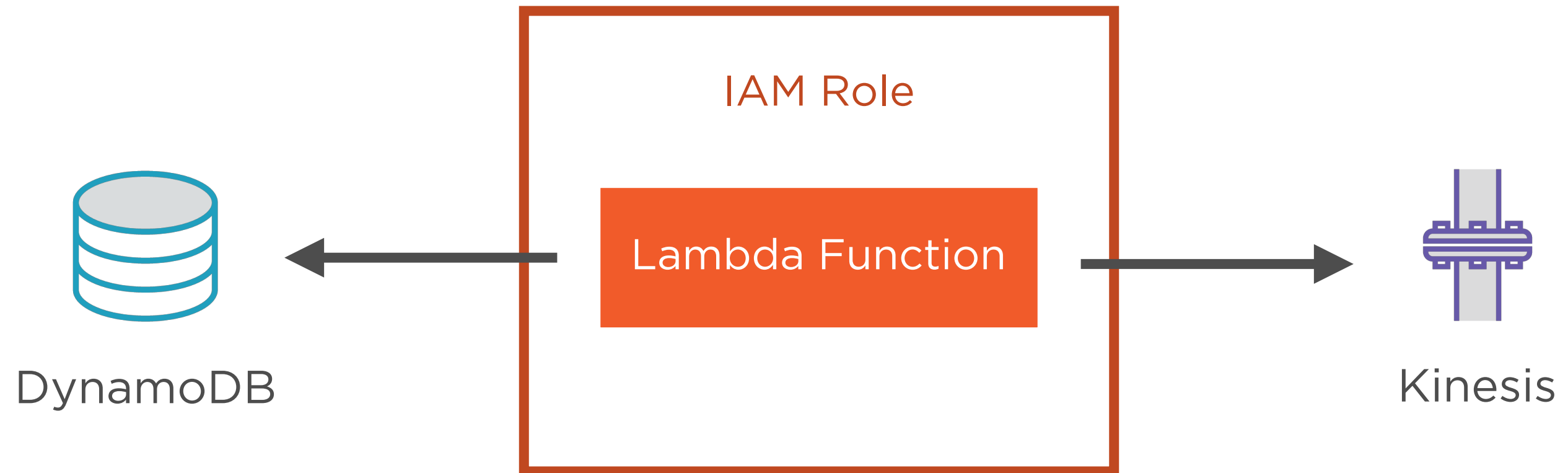
Throttle Count

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**

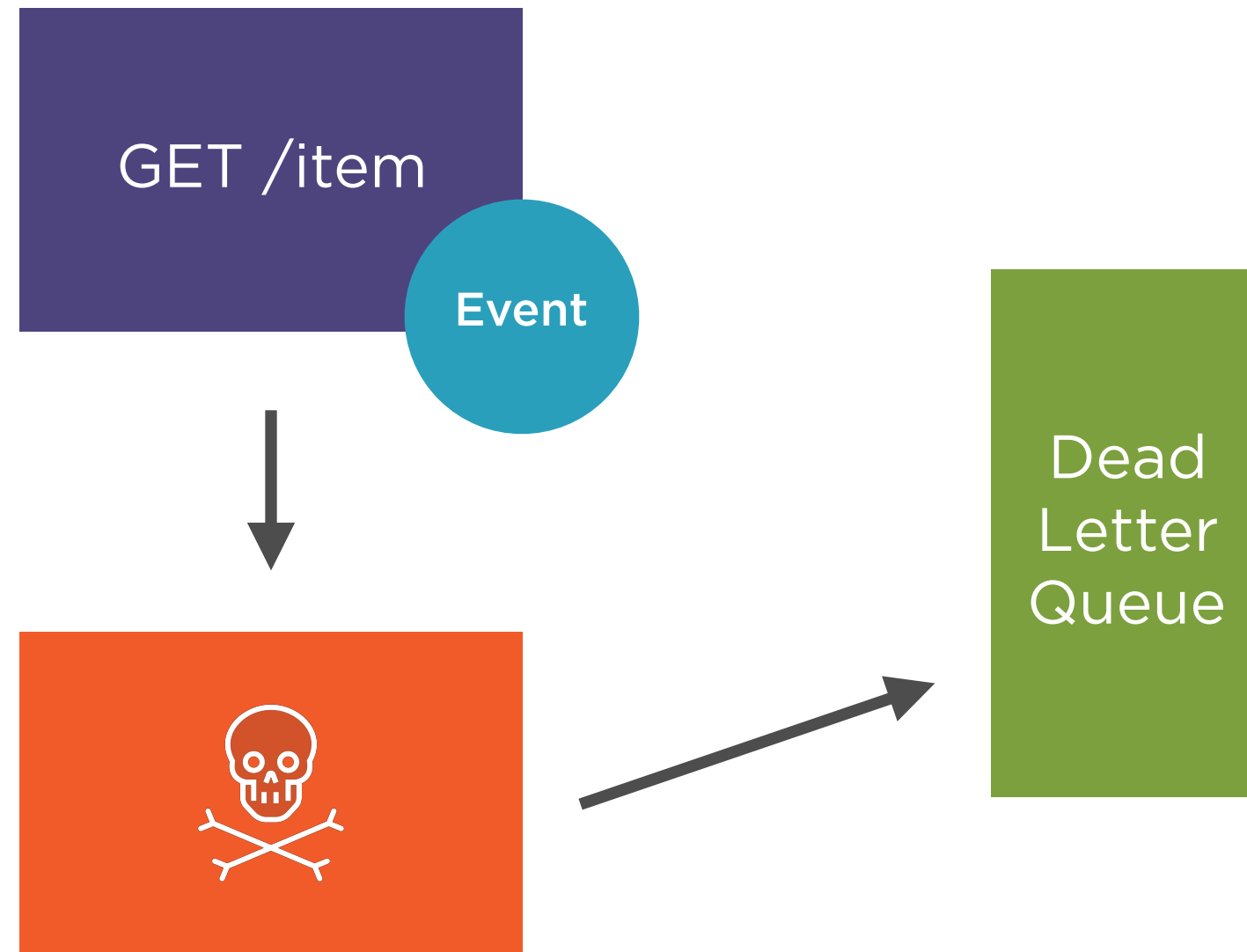
**Ensuring Lambda
invoking events
are processed**

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

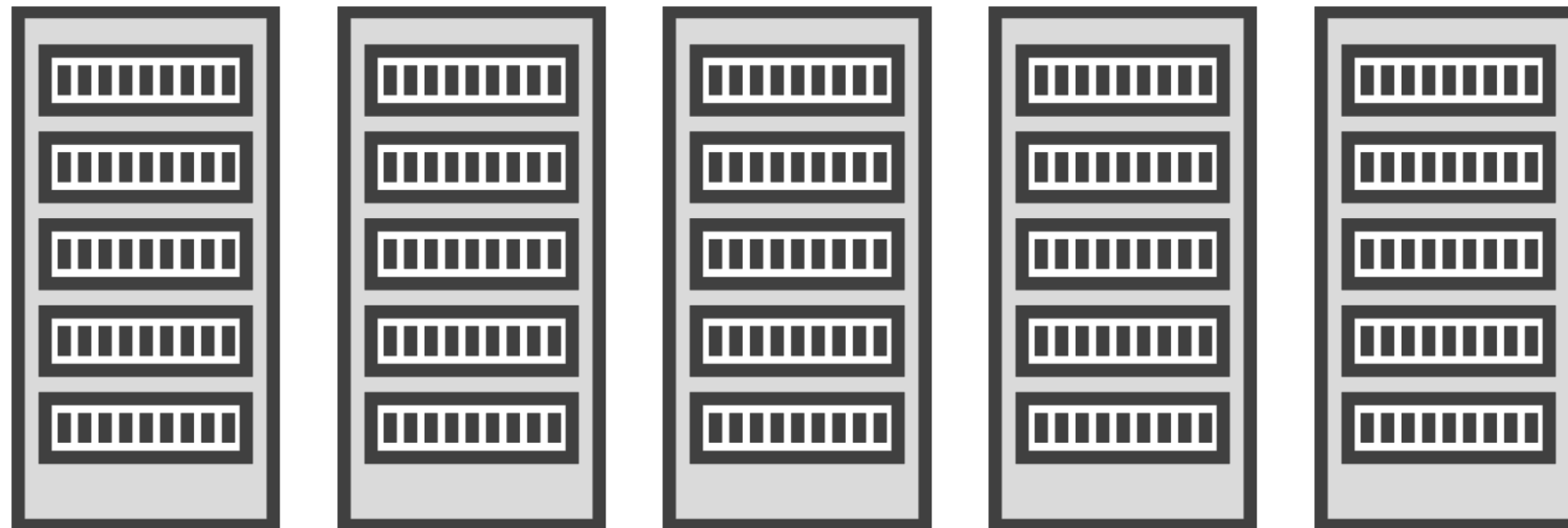
An Event Meets an Error



Performance and Concurrency with Lambda

Serverless Isn't without Servers

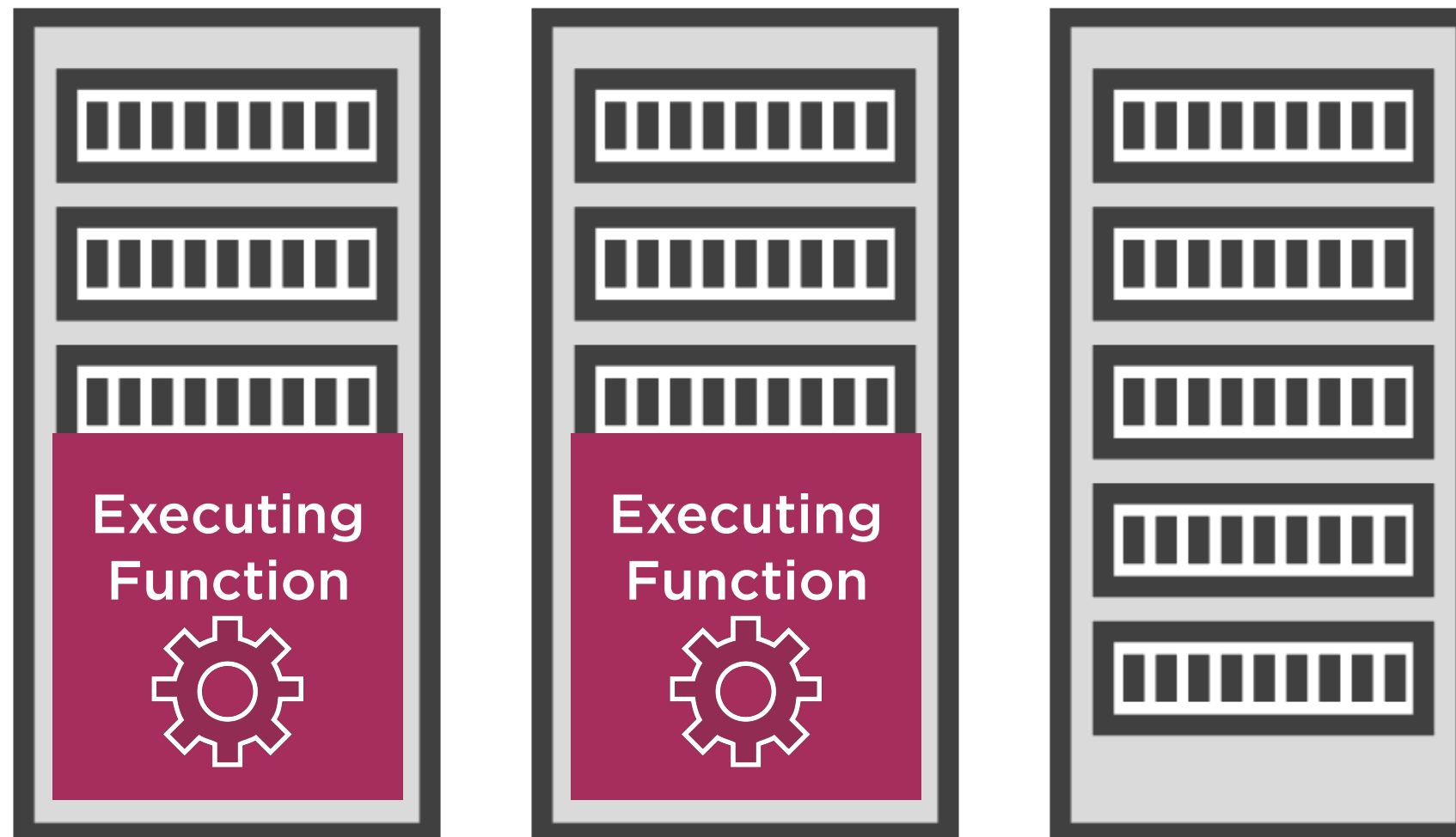
Serverless Infrastructure



Increase Lambda function
memory to increase CPU

Concurrent Invocations of Lambda Functions

Serverless Infrastructure

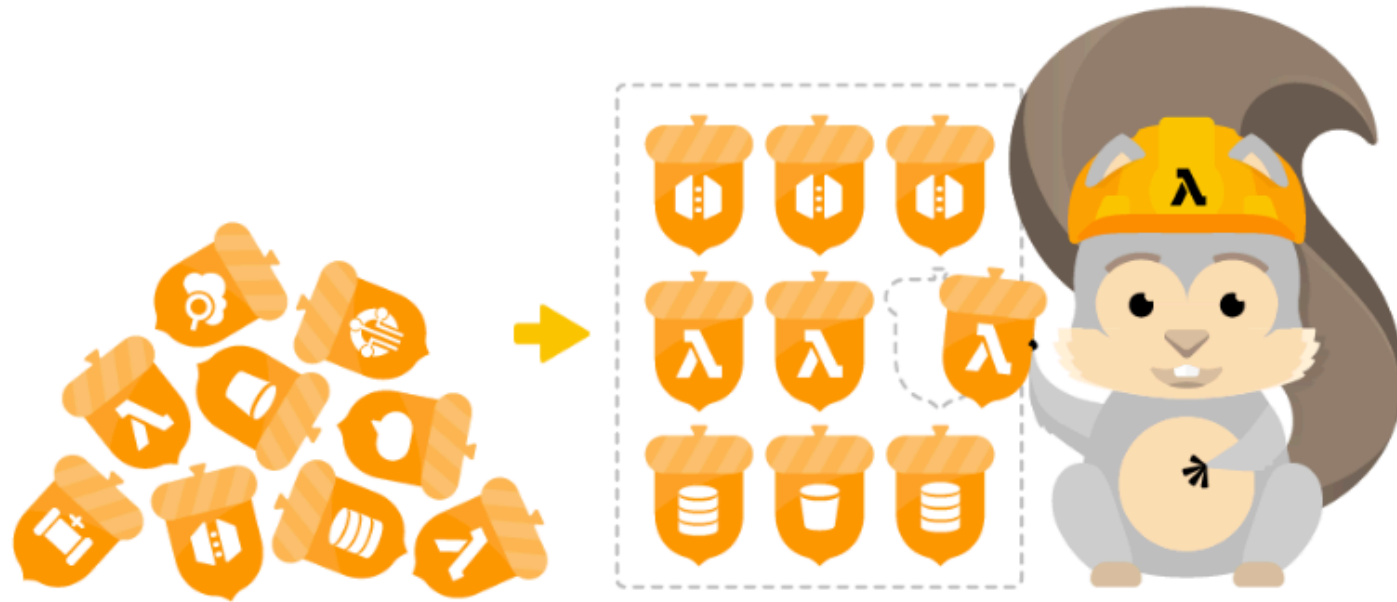


AWS has a limit on the
number of concurrently
running Lambda functions
for your account

The Serverless Application Model



MEET SAM.



USE SAM TO BUILD TEMPLATES THAT DEFINE
YOUR SERVERLESS APPLICATIONS.

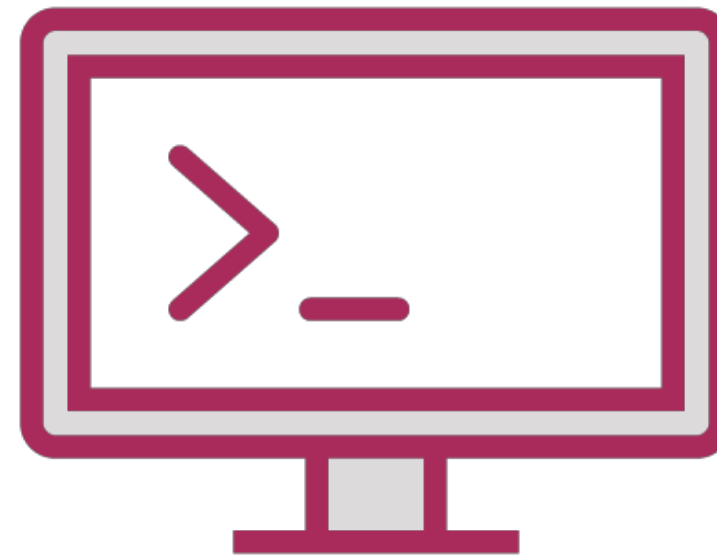


DEPLOY YOUR SAM TEMPLATE
WITH AWS CLOUDFORMATION.

Serverless Application Model Parts





Configuration
File









CLI Tool

 [awslabs](#) / [serverless-application-model](#)

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-  Code
-  Issues 107
-  Pull requests 12
-  Projects 0
-  Insights

AWS Serverless Application Model (AWS SAM) prescribes rules for expressing Serverless applications on AWS.

[serverless](#) [aws](#) [lambda](#) [aws-sam](#)

 157 commits

 8 branches

 8 releases

 70 contributors

 Apache-2.0

Branch: master ▾








New pull request

Create new file

Upload files

Find file

Clone or download ▾

 keetonian chore: update version number to 1.7.0 (#596)	Latest commit a2c6954 18 days ago
 .github	Adding dotfiles for Travis, Flake, Coverage and Pylint (#359) 6 months ago
 bin	feat(plugins): added DefaultDefinitionBody plugin (#541) 2 months ago
 docs	docs: fix grammar in globals.rst (#542) 2 months ago
 examples	Added RekognitionDetectOnlyPolicy to SAM (#571) a month ago
 requirements	fix: conditionally install enum34 based on python version (#582) 18 days ago
 samtranslator	chore: update version number to 1.7.0 (#596) 18 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 likely 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