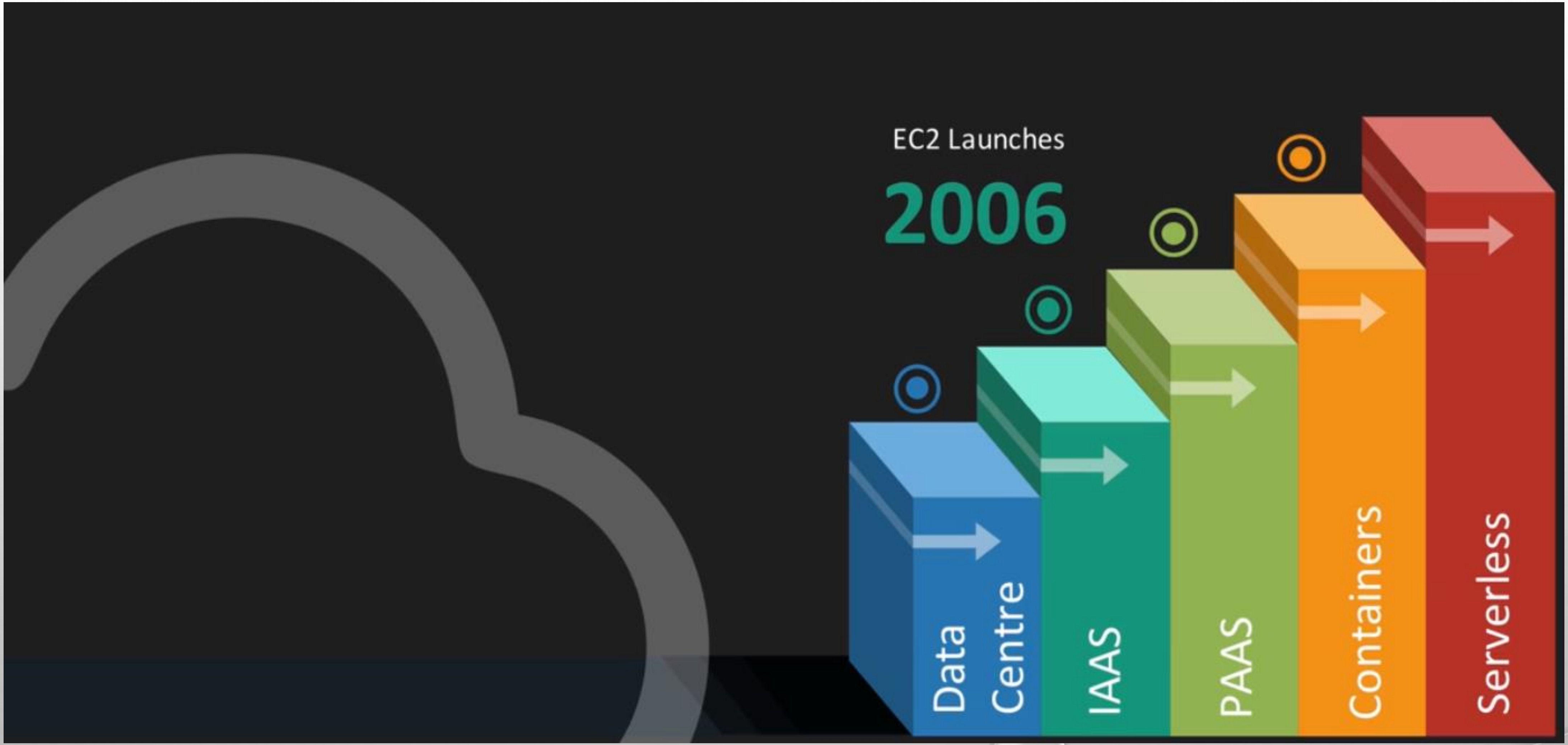
AWS - LAMBDA

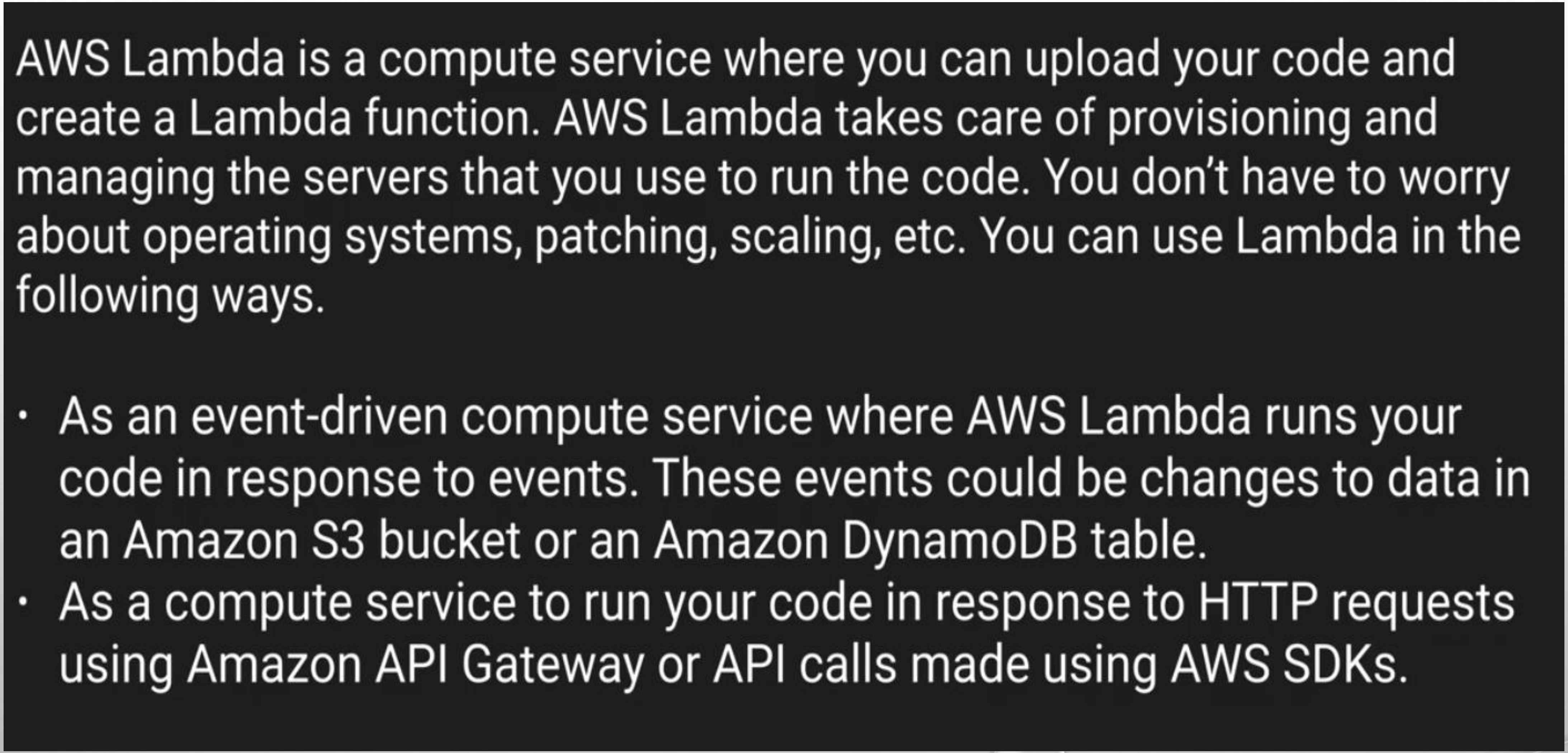
BY

KESHAV KUMMARI

ABOUT CLOUD


EC2 Launches
2006
Data Centre
IAAS
PAAS
Containers
Serverless

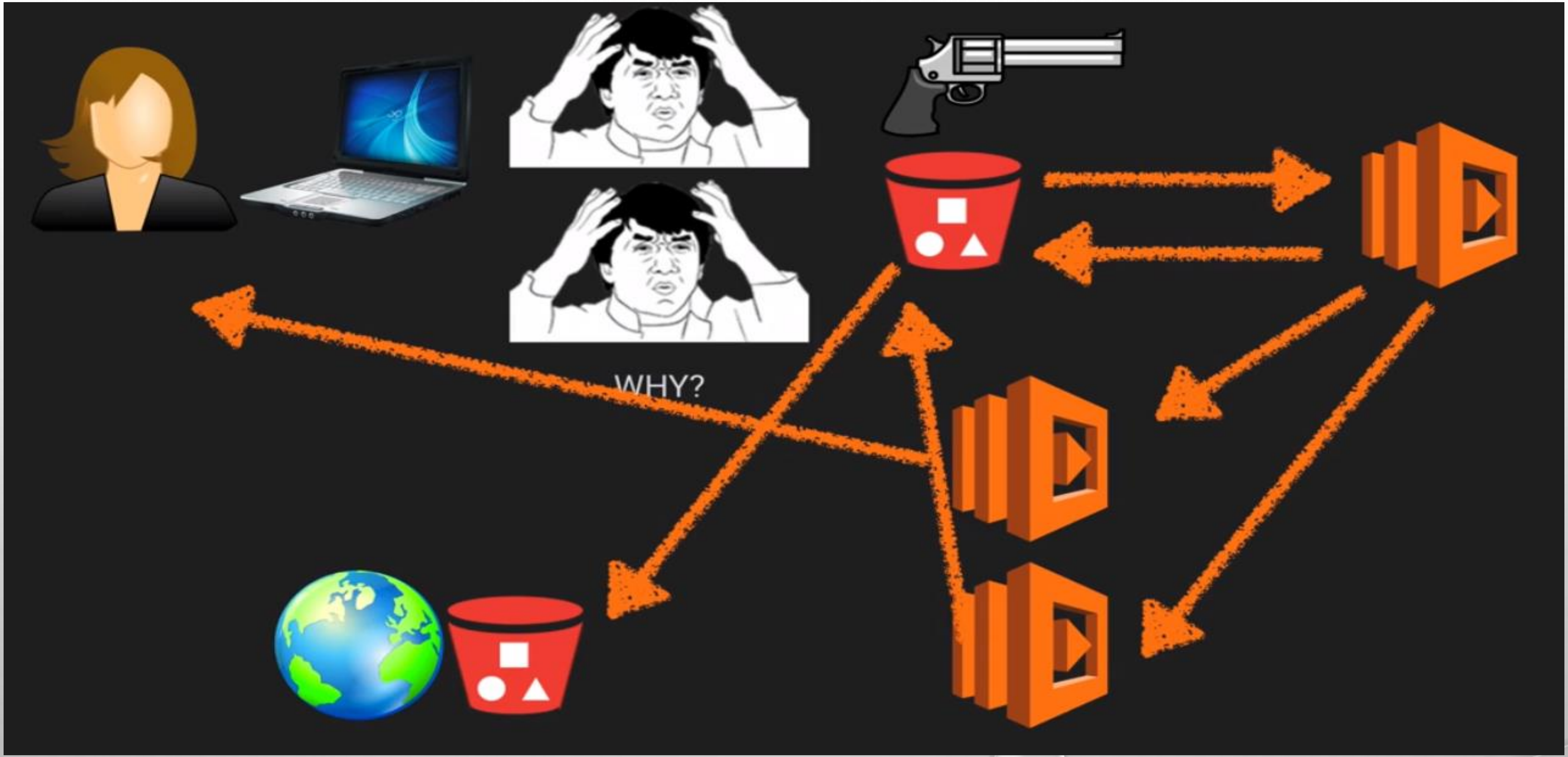
WHAT IS LAMBDA?



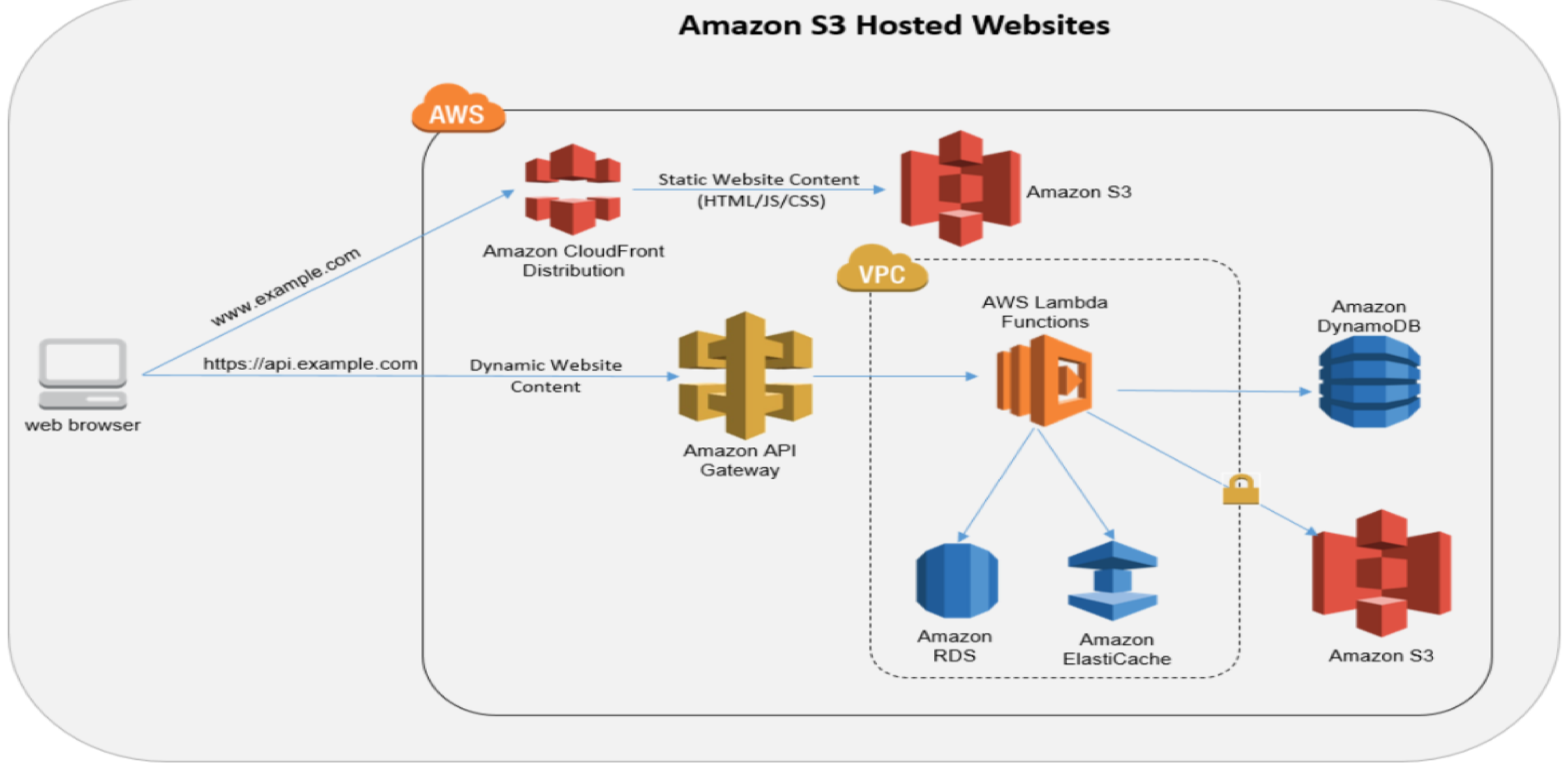
AWS Lambda is a compute service where you can upload your code and create a Lambda function. AWS Lambda takes care of provisioning and managing the servers that you use to run the code. You don't have to worry about operating systems, patching, scaling, etc. You can use Lambda in the following ways.

- As an event-driven compute service where AWS Lambda runs your code in response to events. These events could be changes to data in an Amazon S3 bucket or an Amazon DynamoDB table.
- As a compute service to run your code in response to HTTP requests using Amazon API Gateway or API calls made using AWS SDKs.

LAMBDA - EXAMPLE

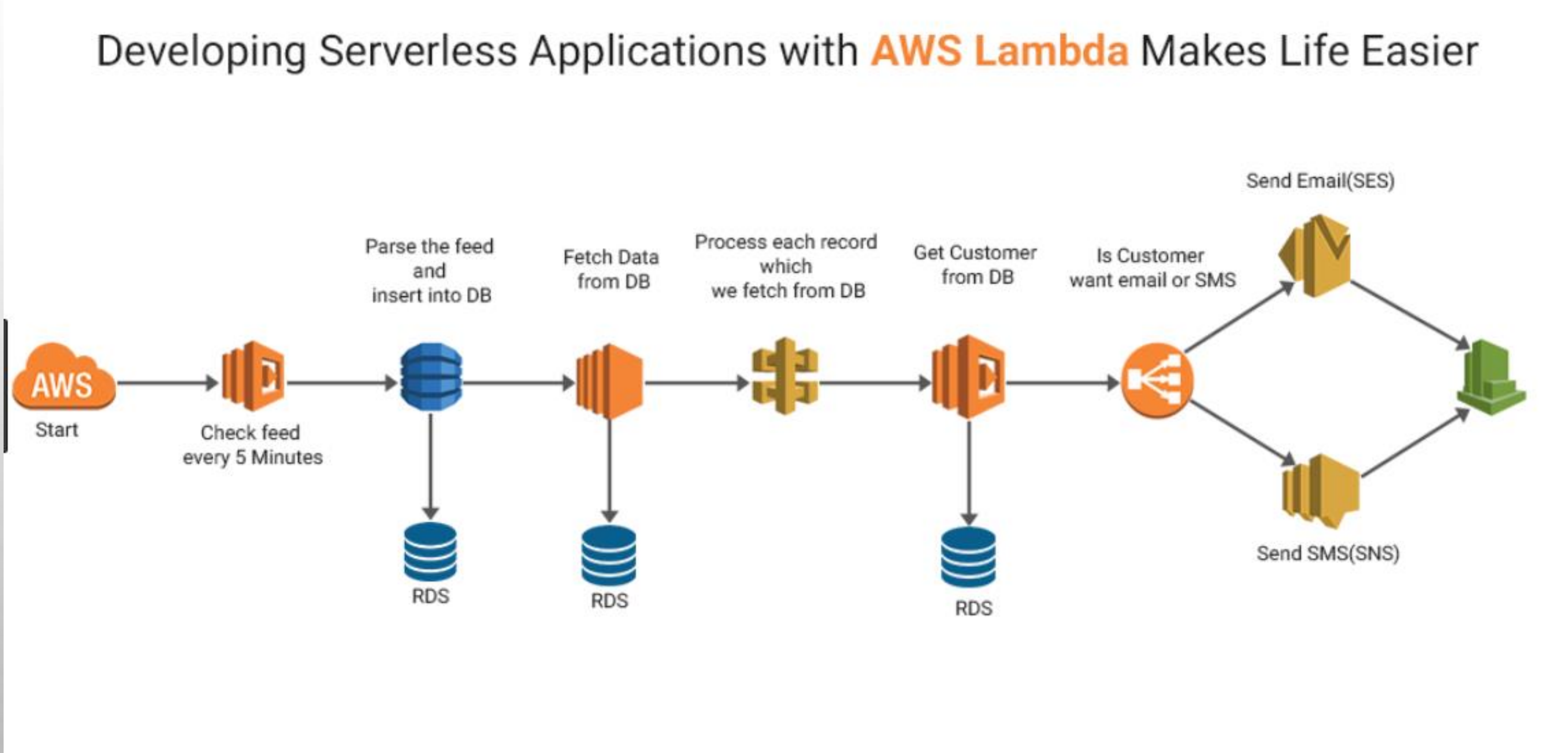


LAMBDA



Amazon S3 Hosted Websites
AWS
Amazon CloudFront Distribution
Static Website Content (HTML/JS/CSS)
Amazon S3
VPC
www.example.com
https://api.example.com
web browser
Dynamic Website Content
Amazon API Gateway
AWS Lambda Functions
Amazon DynamoDB
Amazon RDS
Amazon ElastiCache
Amazon S3

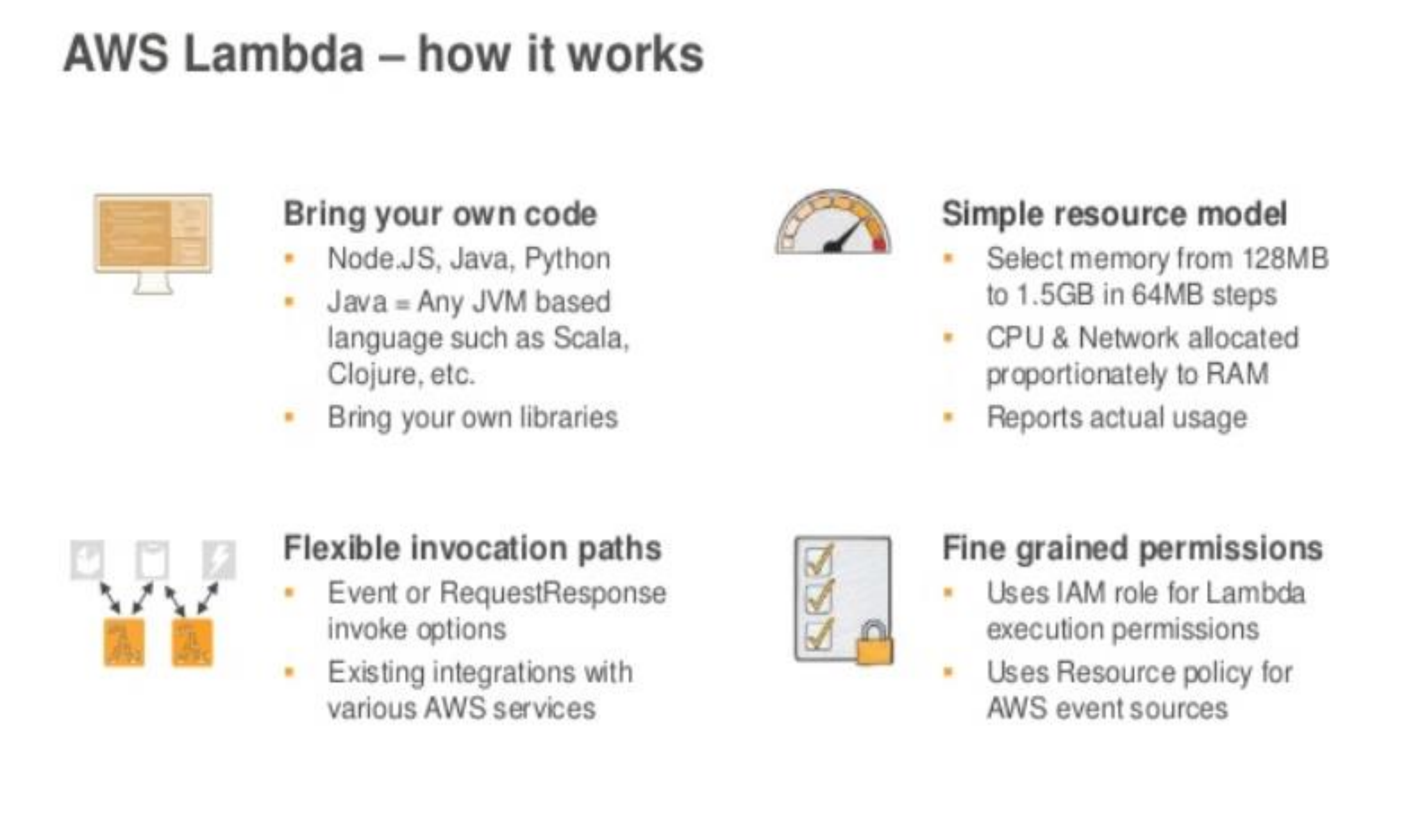
AWS - LAMBDA



Developing Serverless Applications with AWS Lambda Makes Life Easier

WHAT LANGUAGES ARE SUPPORTED WITH LAMBDA?

- NODE.JS
- JAVA
- PYTHON
- C#



AWS Lambda – how it works

Bring your own code

- Node.JS, Java, Python
- Java = Any JVM based language such as Scala, Clojure, etc.
- Bring your own libraries

Simple resource model

- Select memory from 128MB to 1.5GB in 64MB steps
- CPU & Network allocated proportionately to RAM
- Reports actual usage

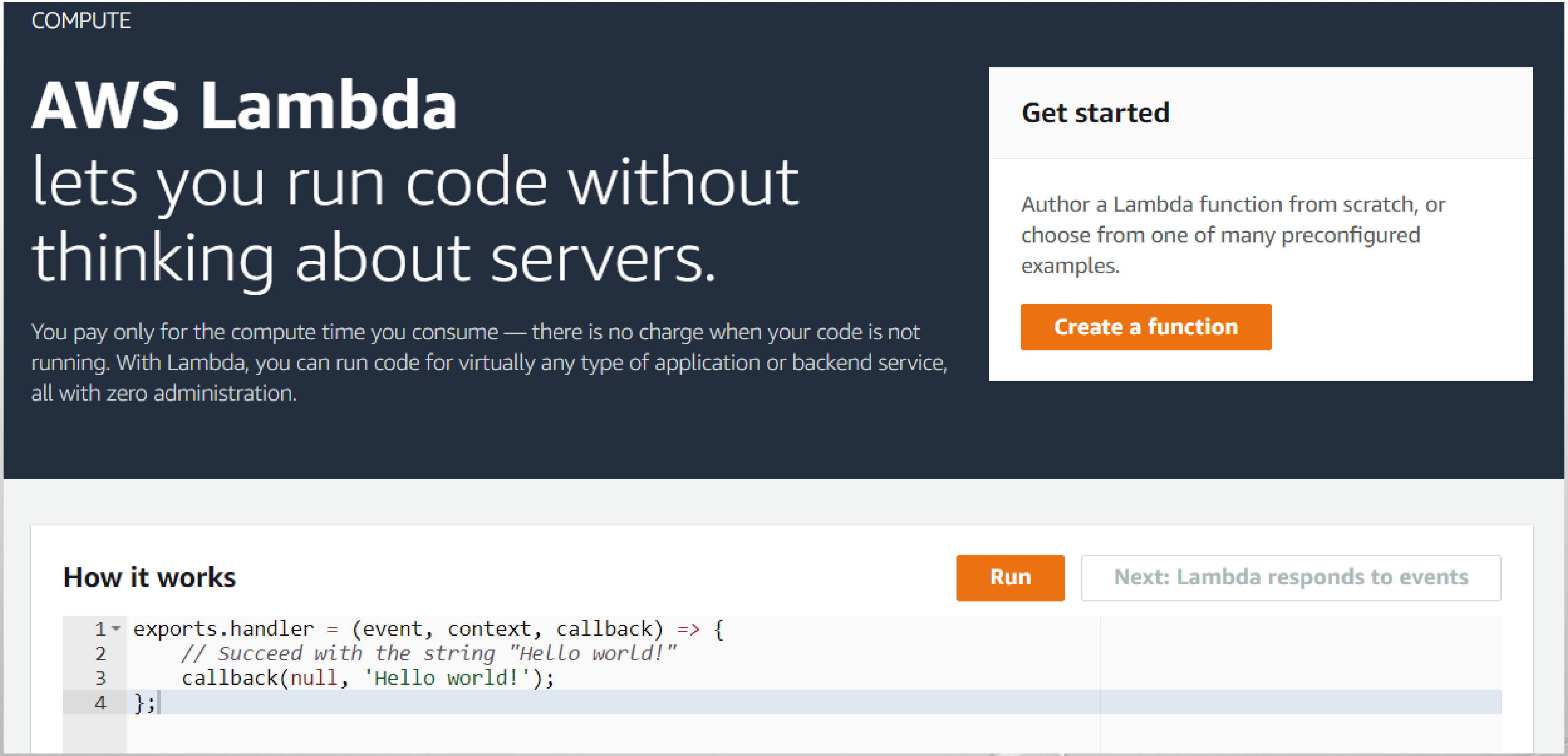
Flexible invocation paths

- Event or RequestResponse invoke options
- Existing integrations with various AWS services

Fine grained permissions

- Uses IAM role for Lambda execution permissions
- Uses Resource policy for AWS event sources

LAMBDA - LAB



COMPUTE

AWS Lambda
lets you run code without thinking about servers.

You pay only for the compute time you consume — there is no charge when your code is not running. With Lambda, you can run code for virtually any type of application or backend service, all with zero administration.

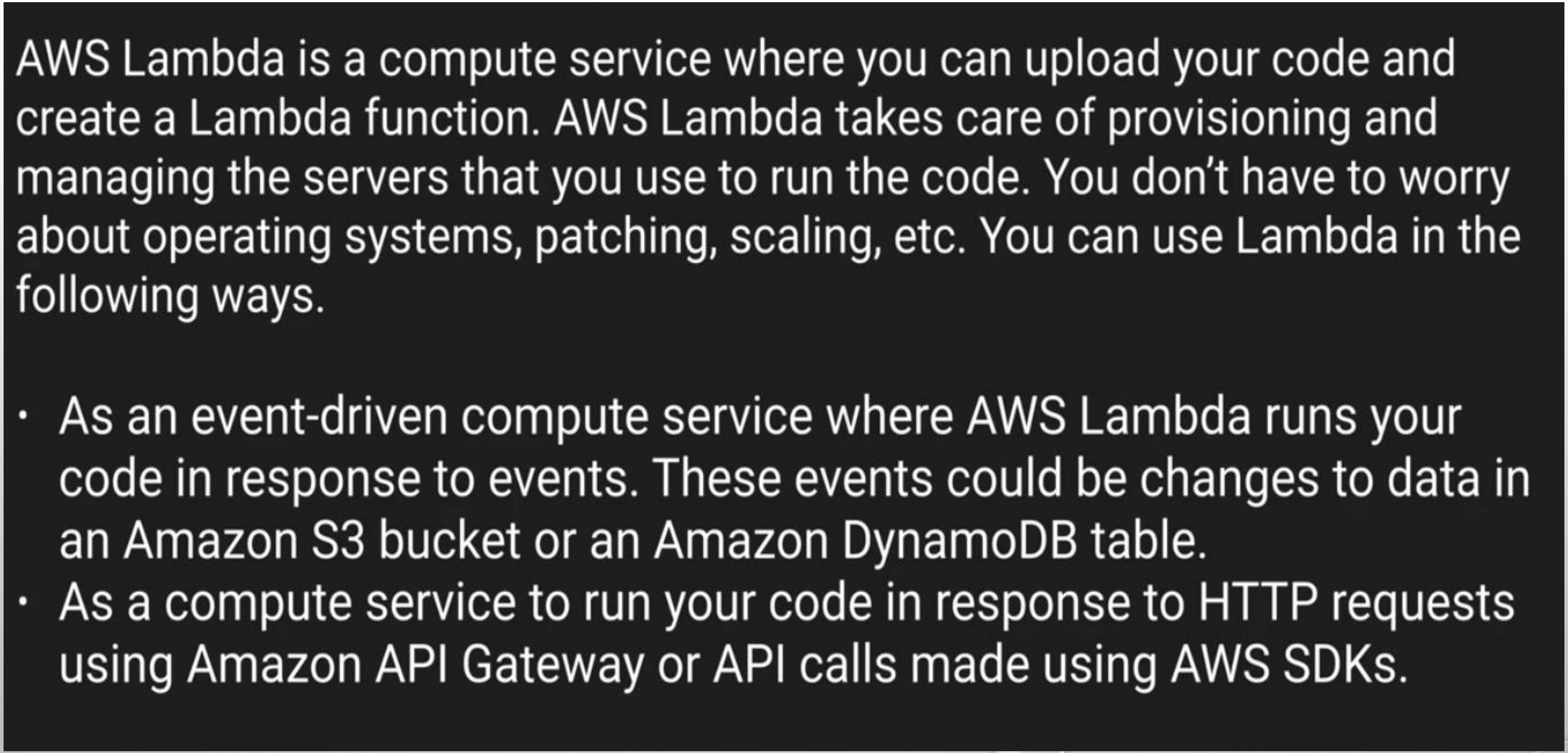
Get started

Author a Lambda function from scratch, or choose from one of many preconfigured examples.

How it works

```
exports.handler = (event, context, callback) => {
    // Succeed with the string "Hello world!"
    callback(null, 'Hello world!');
};
```

WHAT IS LAMBDA?



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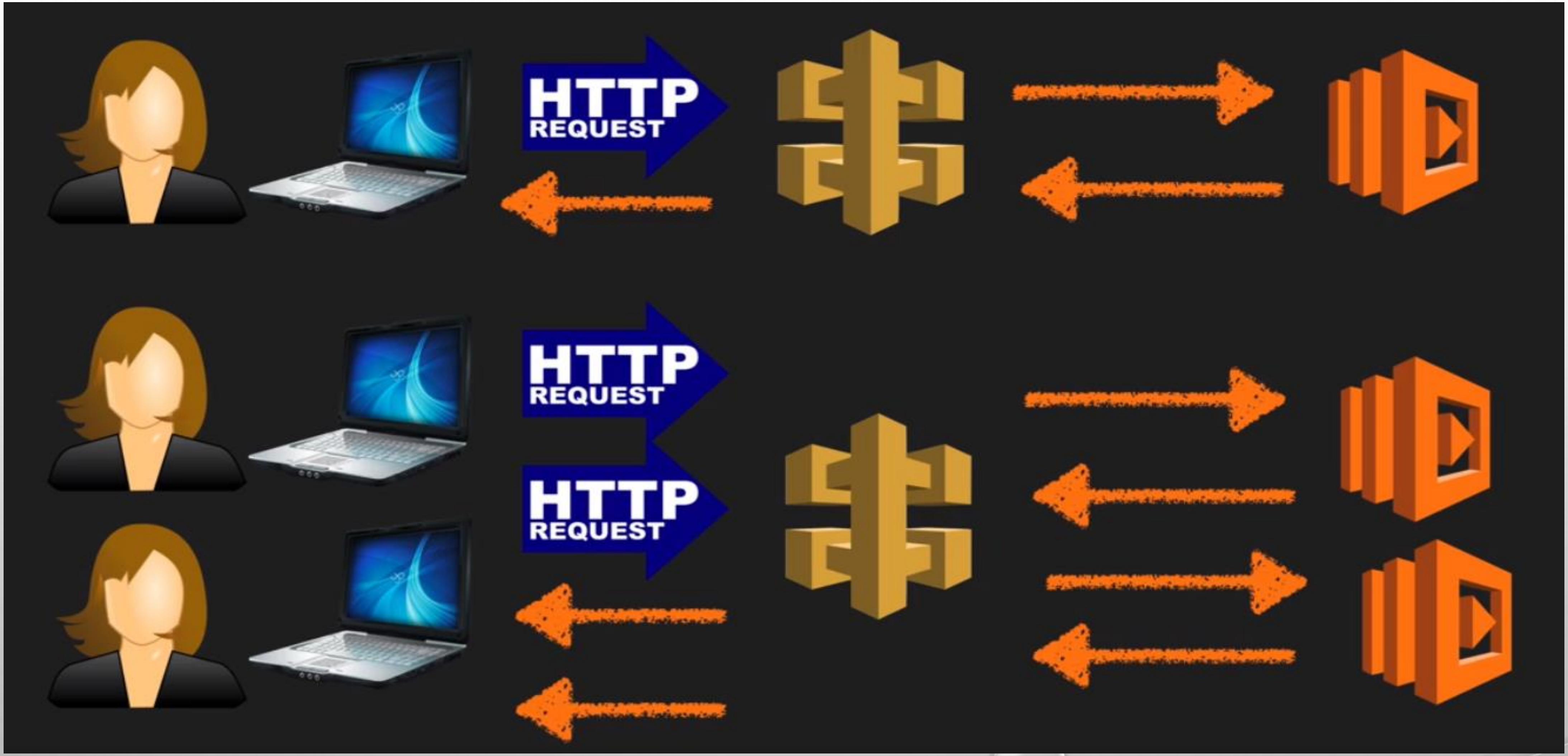
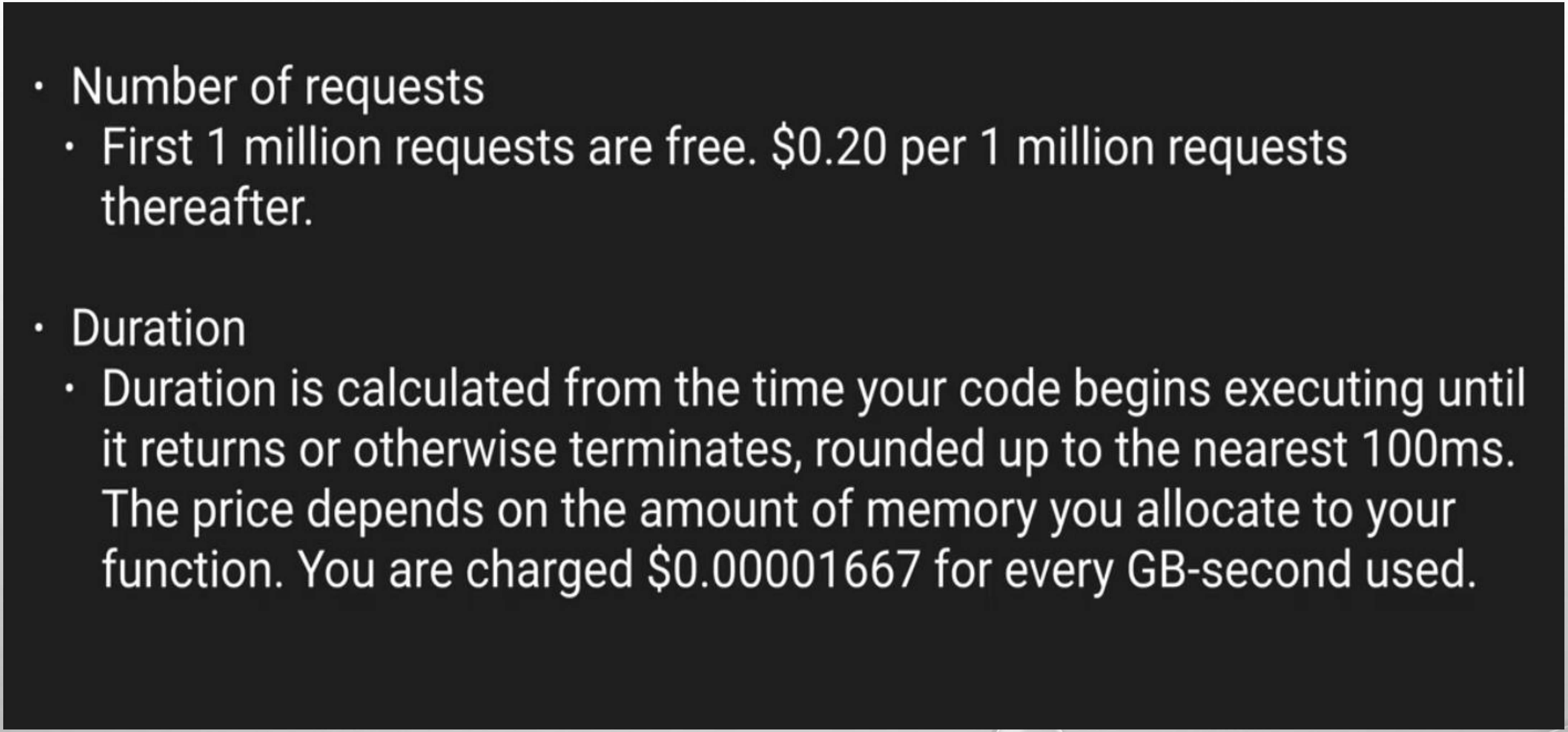
EXAMPLE HTTP REQUEST & RESPONSE

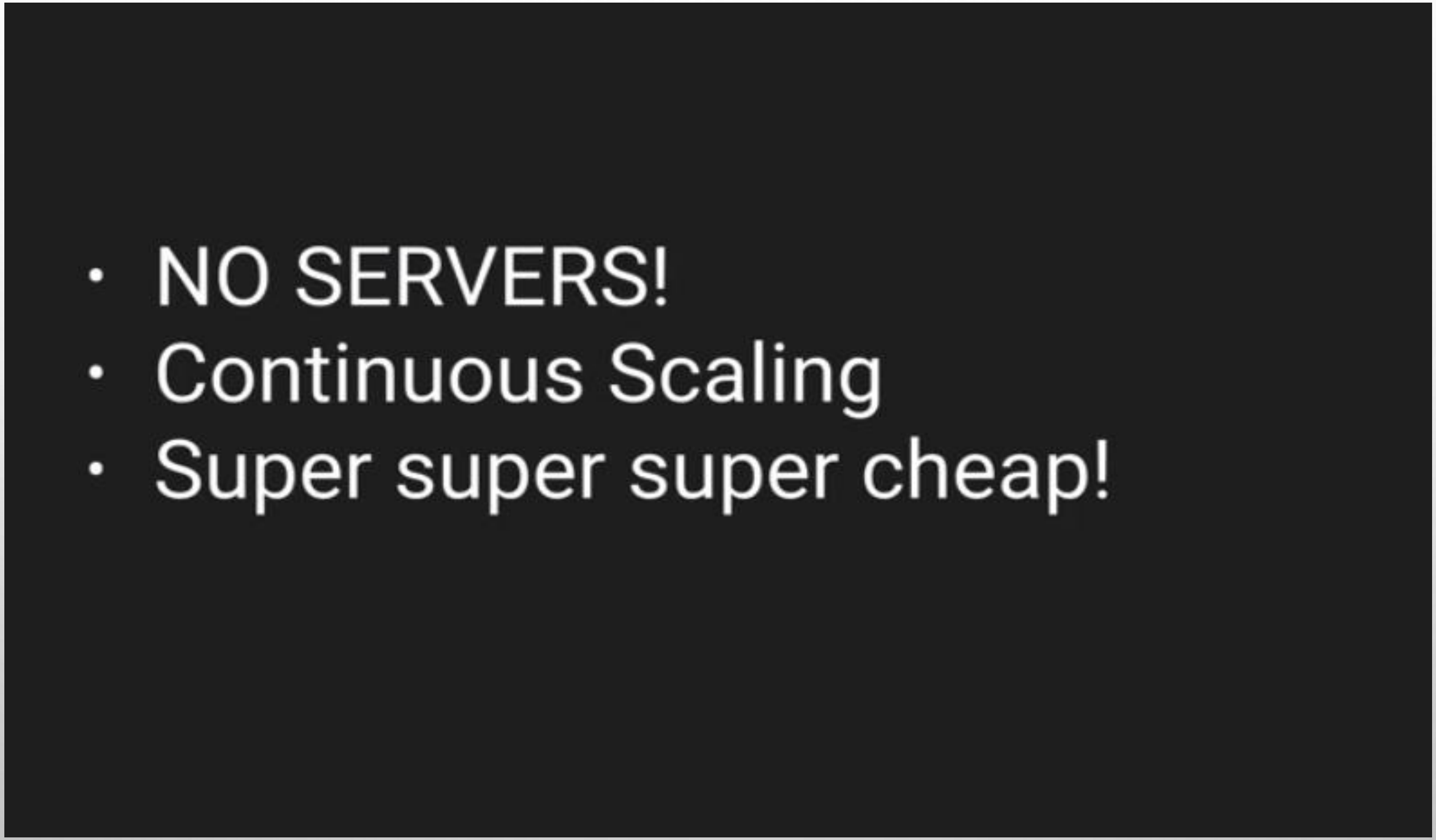


AWS – LAMBDA PRICING



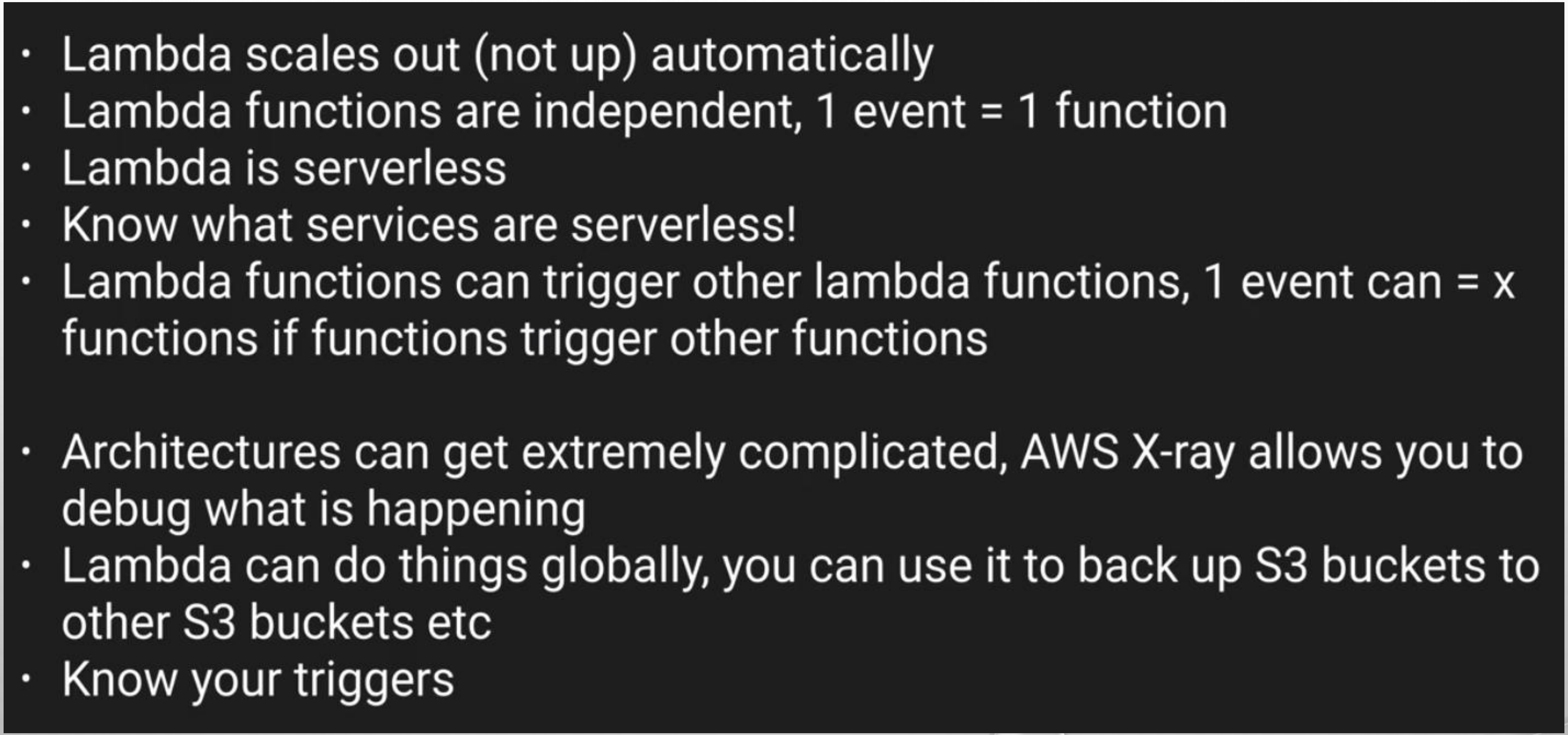
- Number of requests
  - First 1 million requests are free. $0.20 per 1 million requests thereafter.
- Duration
  - Duration is calculated from the time your code begins executing until it returns or otherwise terminates, rounded up to the nearest 100ms. The price depends on the amount of memory you allocate to your function. You are charged $0.00001667 for every GB-second used.

WHY LAMBDA?



- NO SERVERS!
- Continuous Scaling
- Super super super cheap!

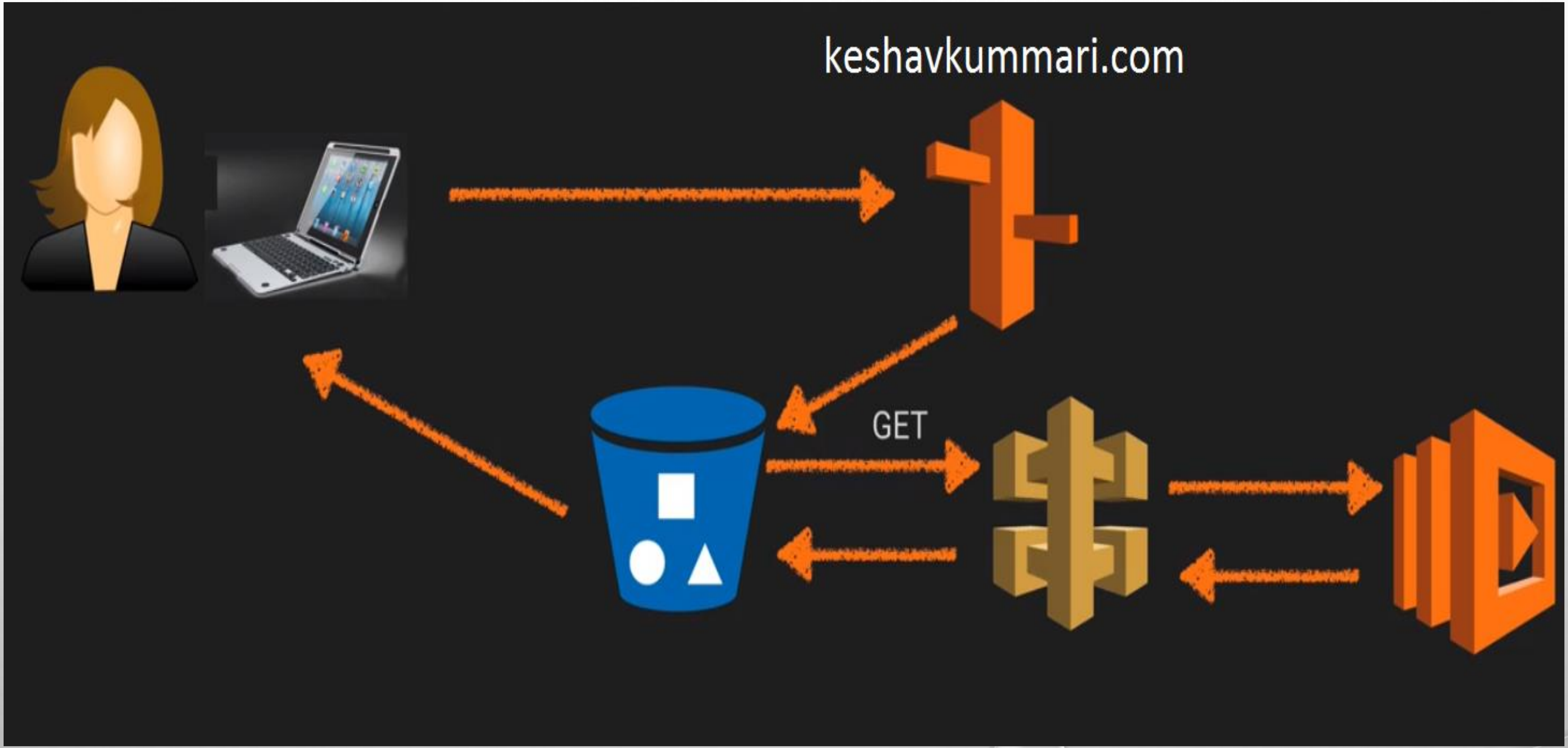
OVERVIEW



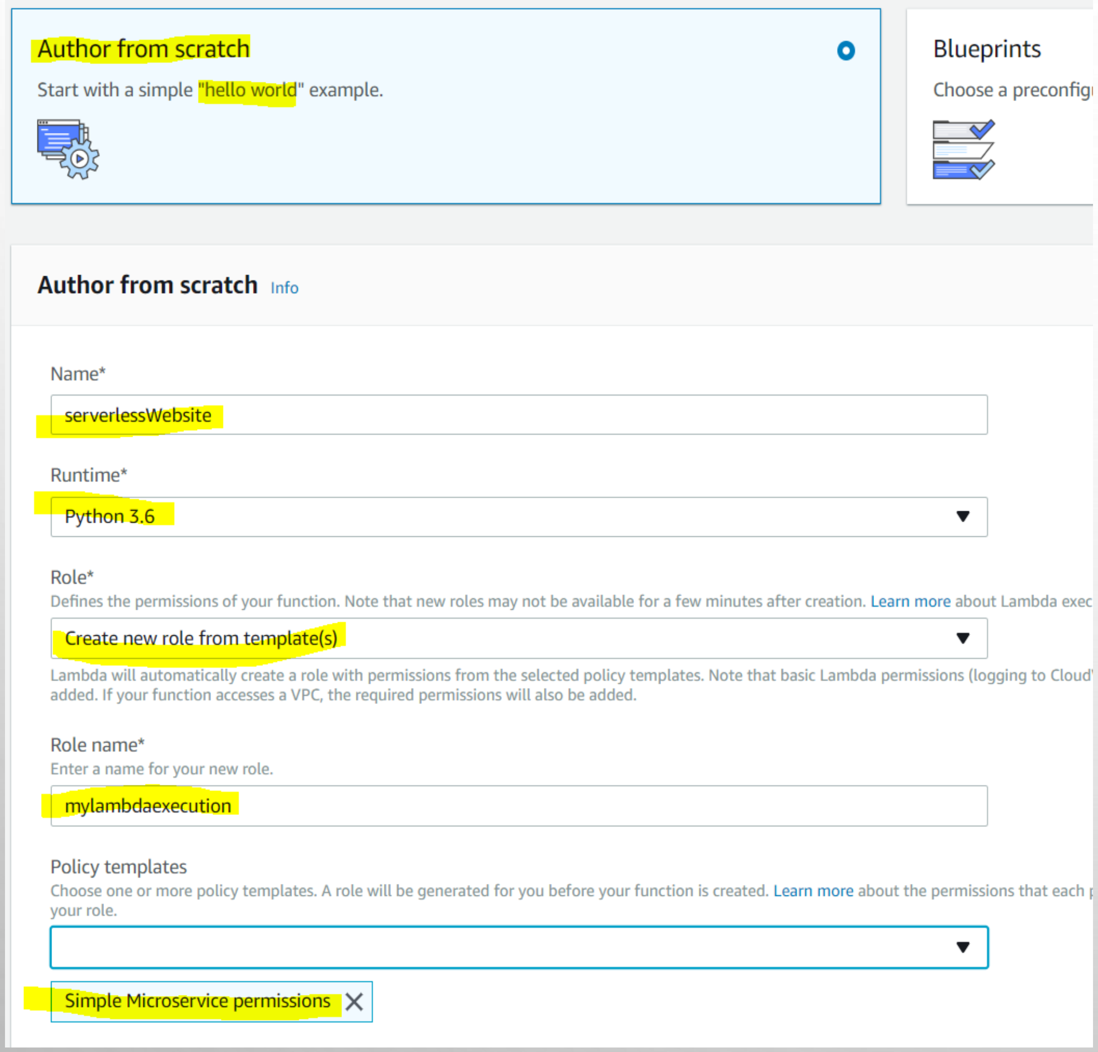
- Lambda scales out (not up) automatically
- Lambda functions are independent, 1 event = 1 function
- Lambda is serverless
- Know what services are serverless!
- Lambda functions can trigger other lambda functions, 1 event can = x functions if functions trigger other functions

- Architectures can get extremely complicated, AWS X-ray allows you to debug what is happening
- Lambda can do things globally, you can use it to back up S3 buckets to other S3 buckets etc
- Know your triggers

BUILD A SERVERLESS WEBPAGE WITH API GATEWAY & LAMBDA



CREATE LAMBDA FUNCTION



Author from scratch ●

Start with a simple "hello world" example.

Blueprints

Choose a preconfig

Author from scratch Info

Name*

serverlessWebsite

Runtime*

Python 3.6 ▼

Role*

Defines the permissions of your function. Note that new roles may not be available for a few minutes after creation. Learn more about Lambda exec

Create new role from template(s) ▼

Lambda will automatically create a role with permissions from the selected policy templates. Note that basic Lambda permissions (logging to Cloud added. If your function accesses a VPC, the required permissions will also be added.

Role name*

Enter a name for your new role.

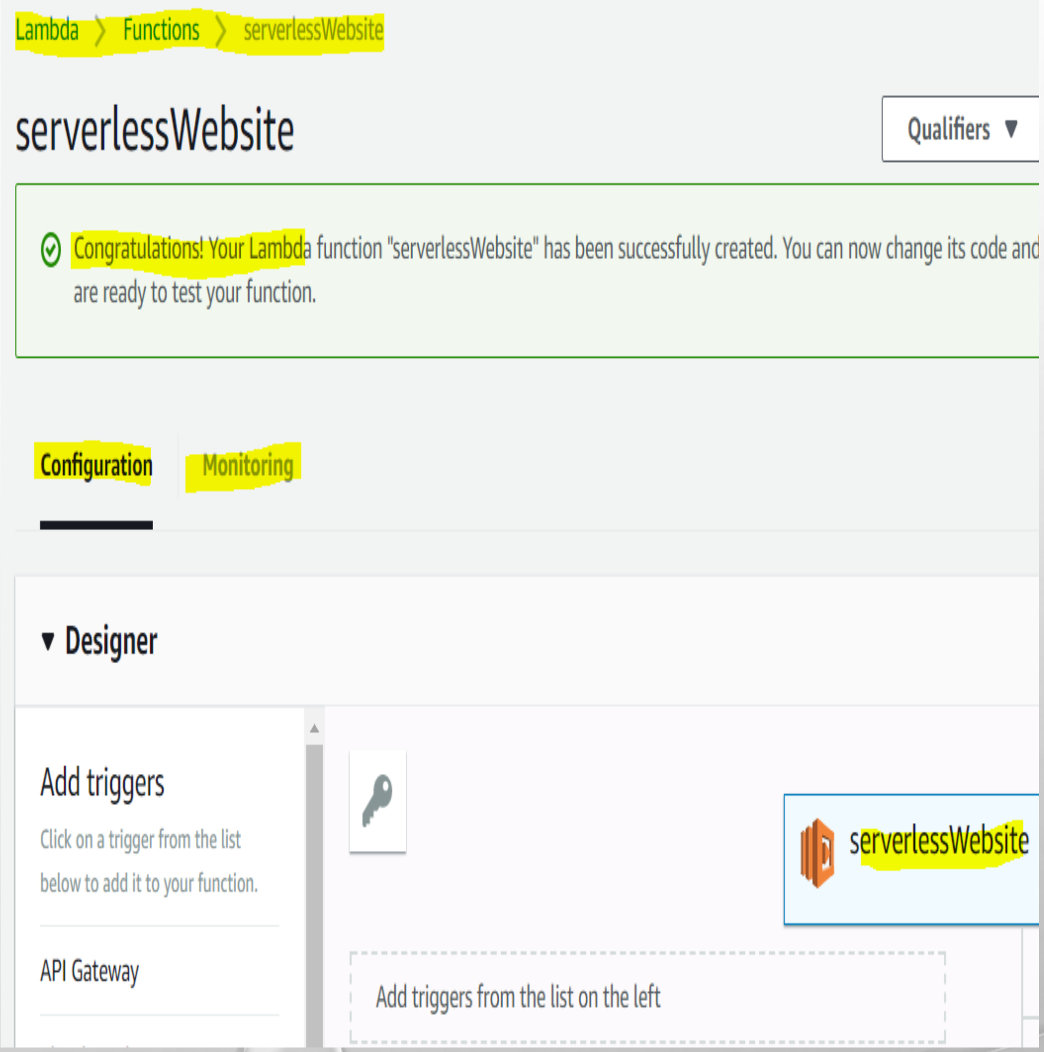
mylambdaexecution

Policy templates

Choose one or more policy templates. A role will be generated for you before your function is created. Learn more about the permissions that each your role.

▼

Simple Microservice permissions ✕



Lambda 〉 Functions 〉 serverlessWebsite

serverlessWebsite

Qualifiers ▼

✓ Congratulations! Your Lambda function "serverlessWebsite" has been successfully created. You can now change its code and are ready to test your function.

Configuration Monitoring

▾ Designer

Add triggers

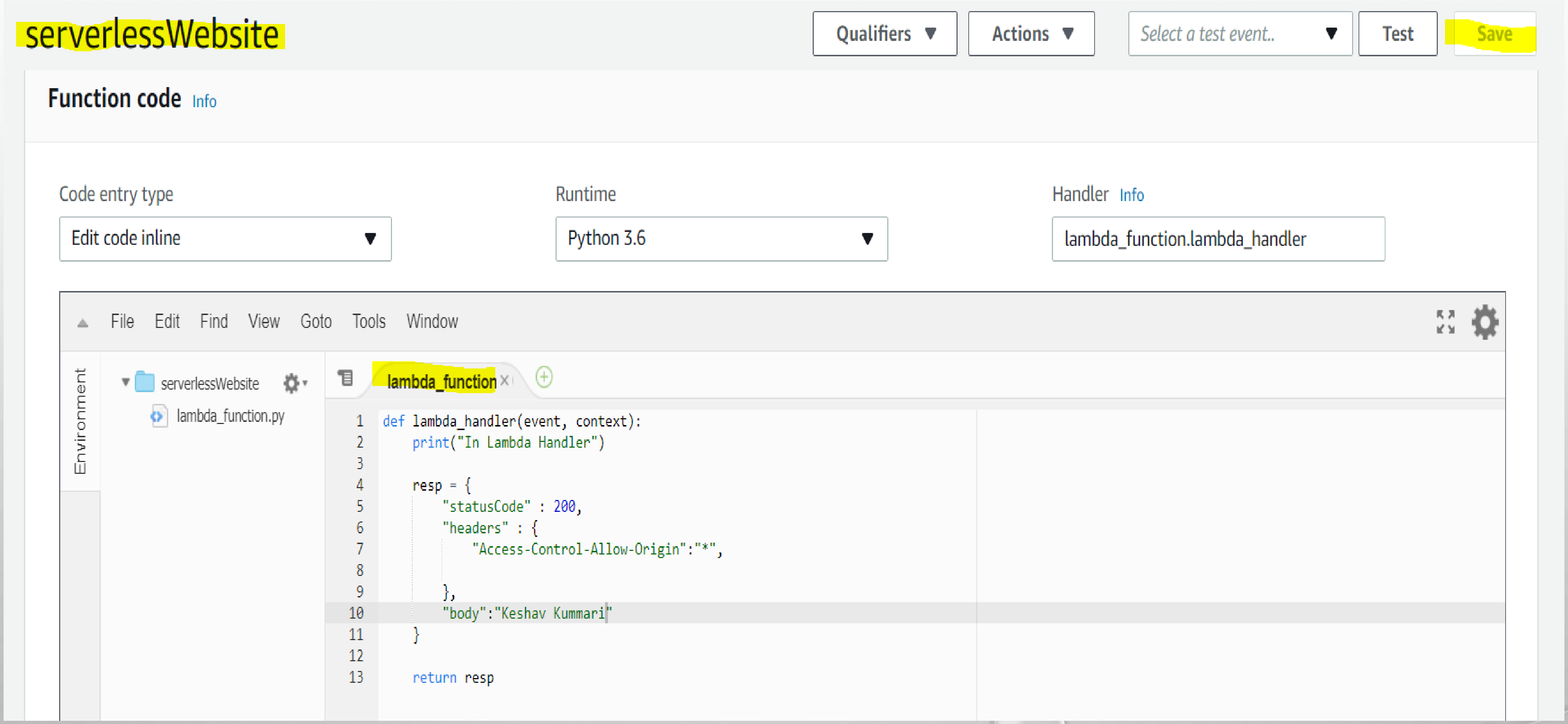
Click on a trigger from the list below to add it to your function.

API Gateway

serverlessWebsite

Add triggers from the list on the left

CREATE A FUNCTION AND SAVE



serverlessWebsite

Function code

Code entry type: Edit code inline

Runtime: Python 3.6

Handler: lambda_function.lambda_handler

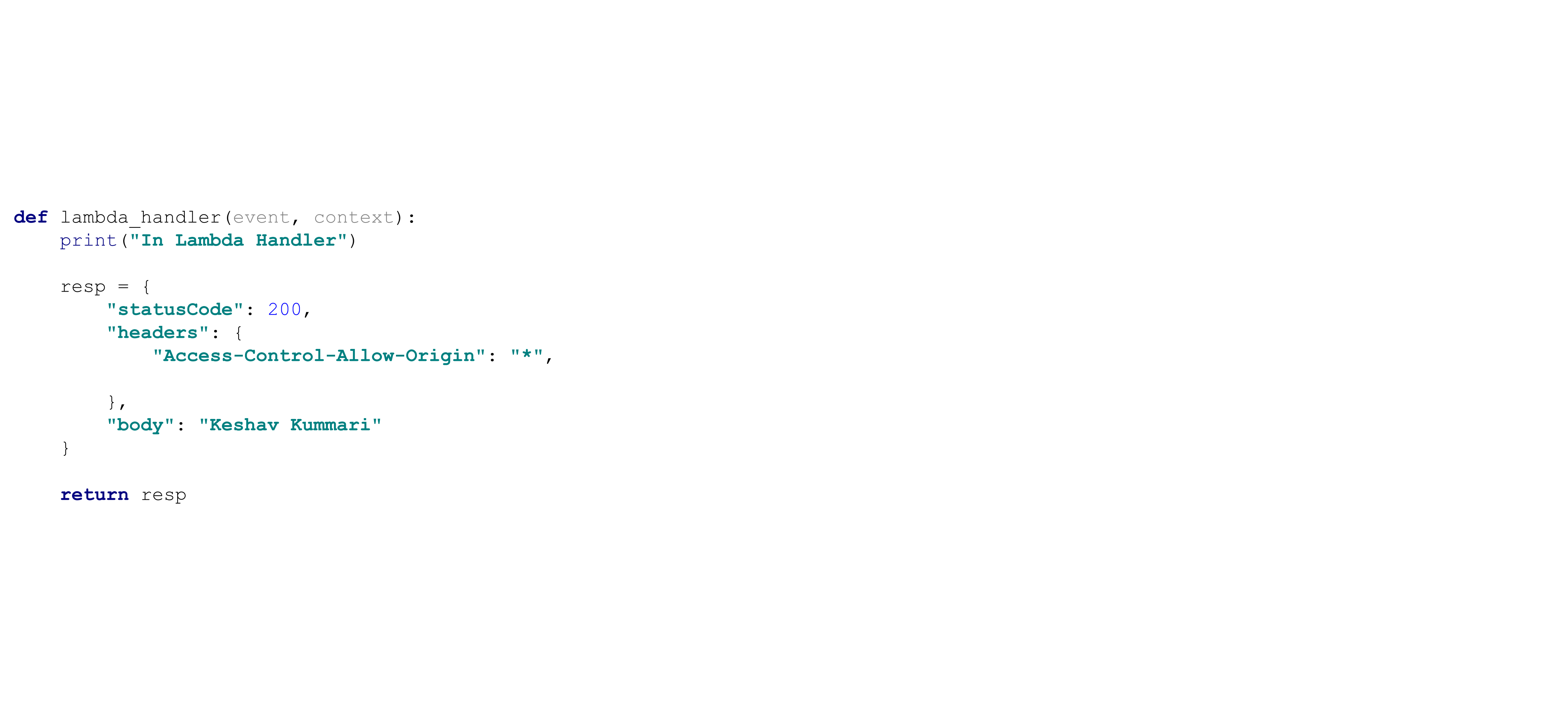
```
def lambda_handler(event, context):
    print("In Lambda Handler")

    resp = {
        "statusCode" : 200,
        "headers" : {
            "Access-Control-Allow-Origin":"*",

        },
        "body":"Keshav Kummari"
    }

    return resp
```

LAMBDA FUNCTION



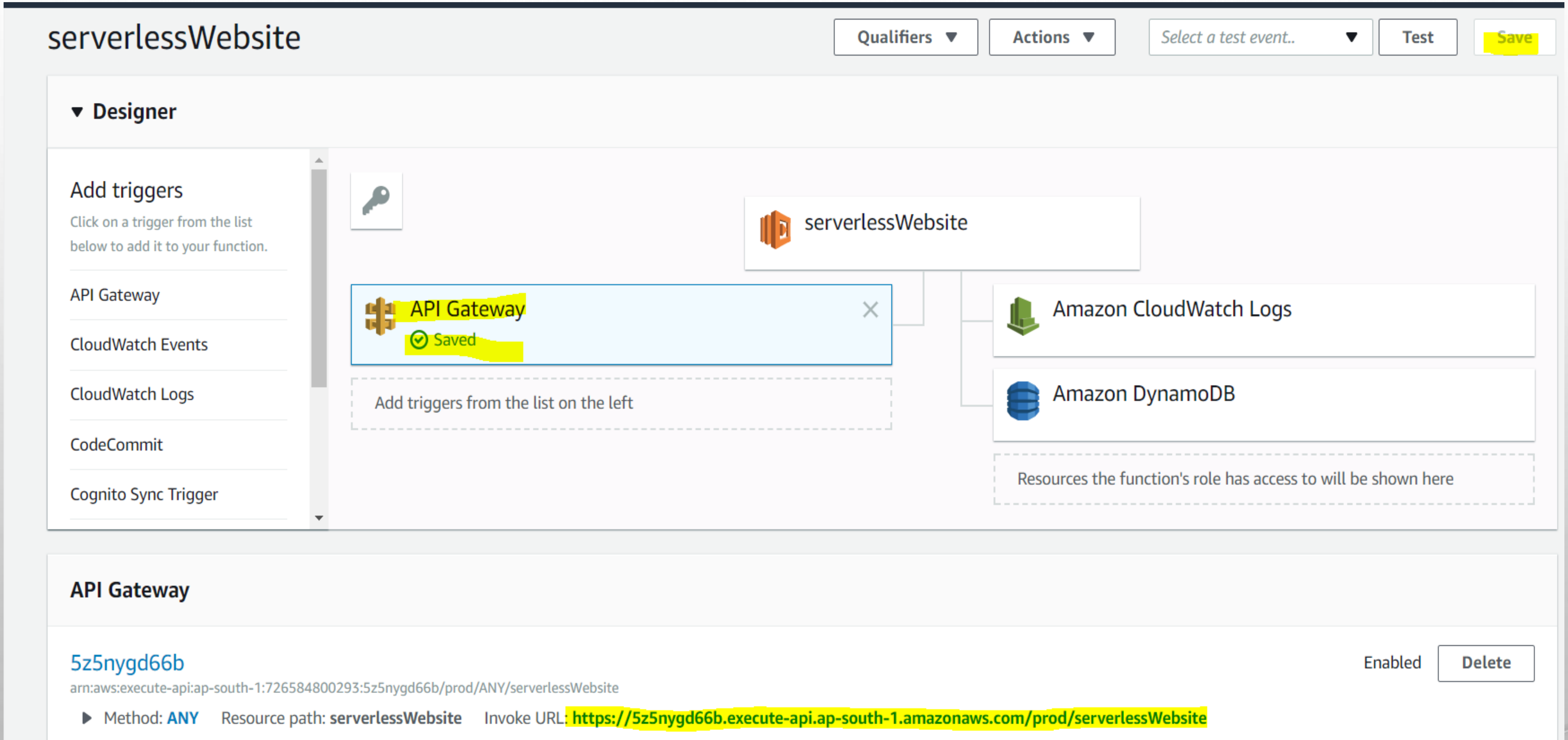
```
def lambda_handler(event, context):
    print("In Lambda Handler")

    resp = {
        "statusCode": 200,
        "headers": {
            "Access-Control-Allow-Origin": "*",

        },
        "body": "Keshav Kummari"
    }

    return resp
```

ADD A API GATEWAY



serverlessWebsite

▼ Designer

Add triggers

Click on a trigger from the list below to add it to your function.

- API Gateway
- CloudWatch Events
- CloudWatch Logs
- CodeCommit
- Cognito Sync Trigger

serverlessWebsite
API Gateway
Saved
Add triggers from the list on the left
Amazon CloudWatch Logs
Amazon DynamoDB
Resources the function's role has access to will be shown here

API Gateway

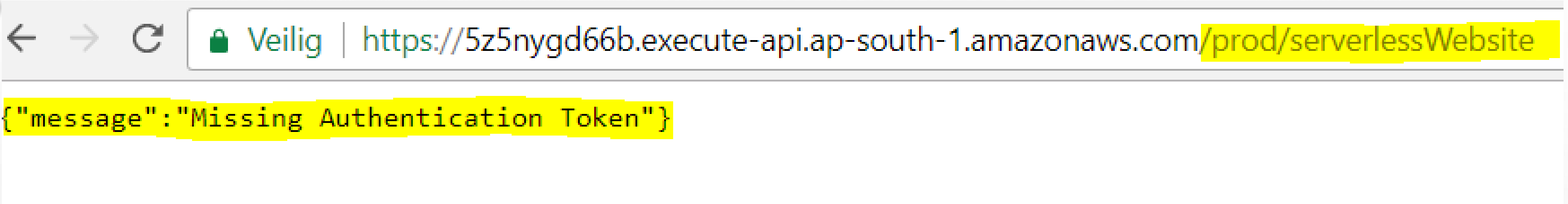
5z5nygd66b

arn:aws:execute-api:ap-south-1:726584800293:5z5nygd66b/prod/ANY/serverlessWebsite

Enabled Delete

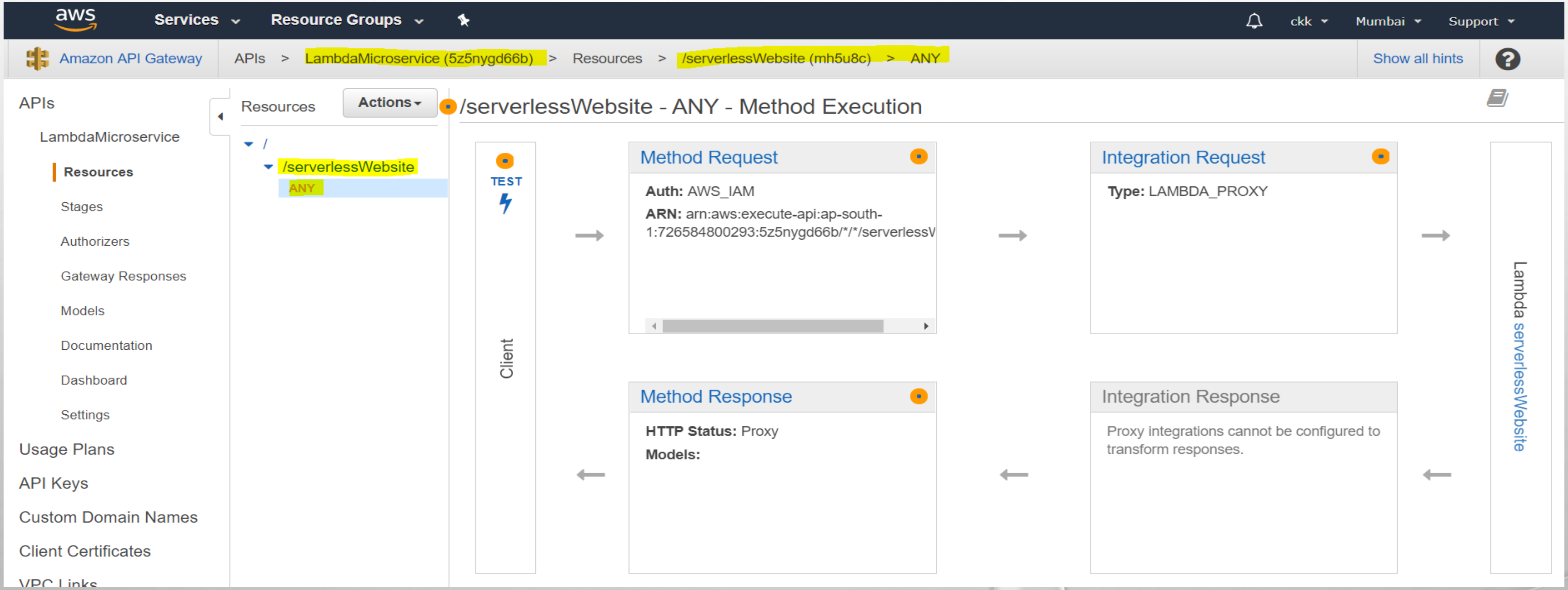
▶ Method: ANY Resource path: serverlessWebsite Invoke URL: https://5z5nygd66b.execute-api.ap-south-1.amazonaws.com/prod/serverlessWebsite

CROSS CHECK THE URL IN THE BROWSER



https://5z5nygd66b.execute-api.ap-south-1.amazonaws.com/prod/serverlessWebsite

```
{"message":"Missing Authentication Token"}
```



/serverlessWebsite - ANY - Method Execution

Method Request

Auth: AWS_IAM

ARN: arn:aws:execute-api:ap-south-1:726584800293:5z5nygd66b/*/*/serverlessV

Integration Request

Type: LAMBDA_PROXY

Method Response

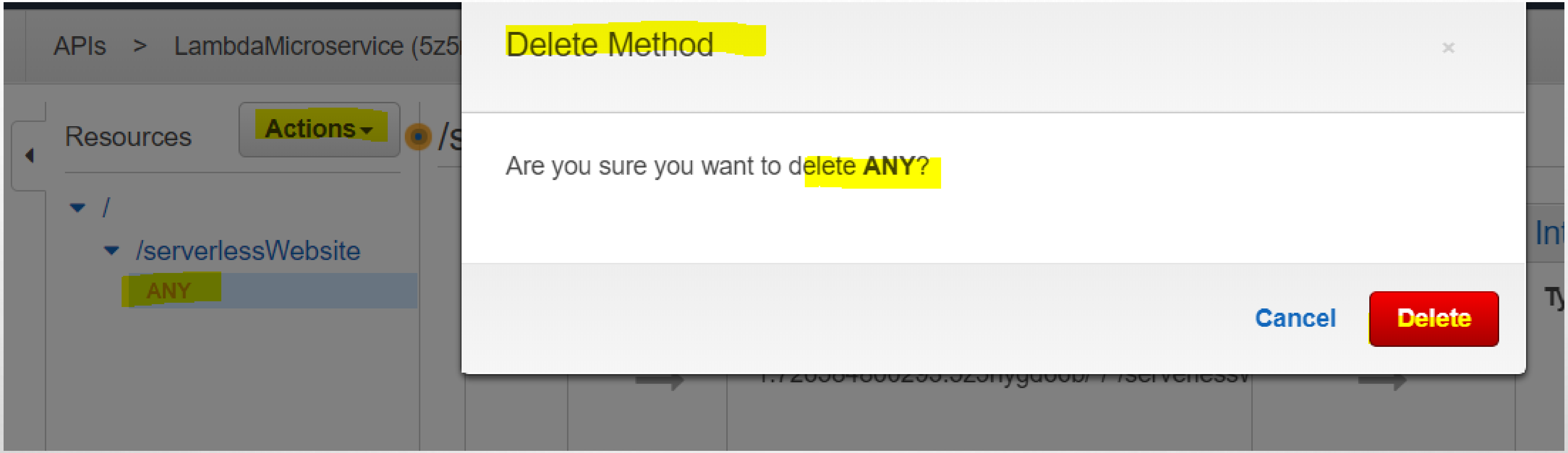
HTTP Status: Proxy

Models:

Integration Response

Proxy integrations cannot be configured to transform responses.

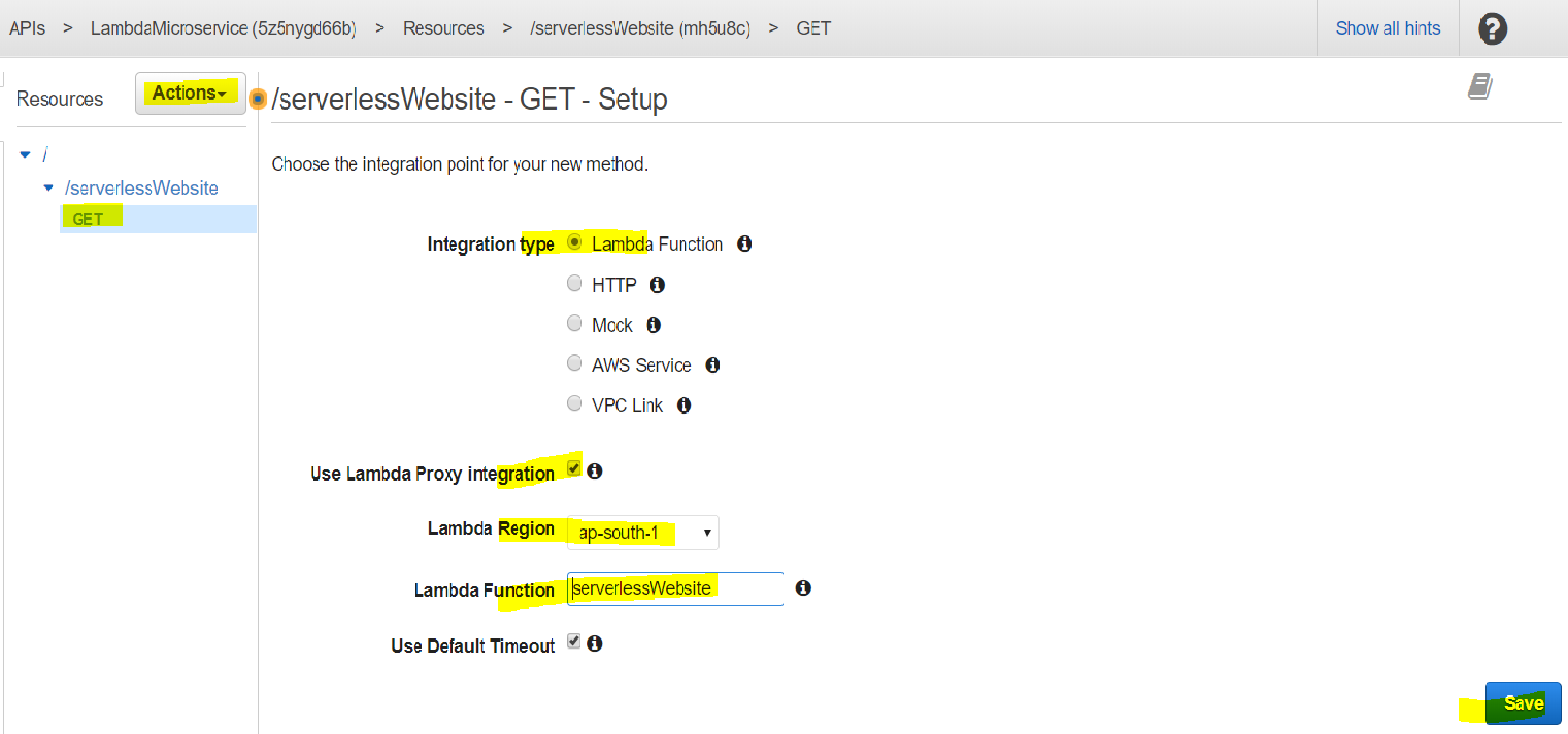
DELETE ANY METHOD



Delete Method

Are you sure you want to delete **ANY**?

GO TO ACTIONS AND ADD "GET" METHOD FILL DETAILS & SAVE



APIs > LambdaMicroservice (5z5nygd66b) > Resources > /serverlessWebsite (mh5u8c) > GET
Show all hints
Resources
Actions ▾
/
/serverlessWebsite
GET

/serverlessWebsite - GET - Setup

Choose the integration point for your new method.

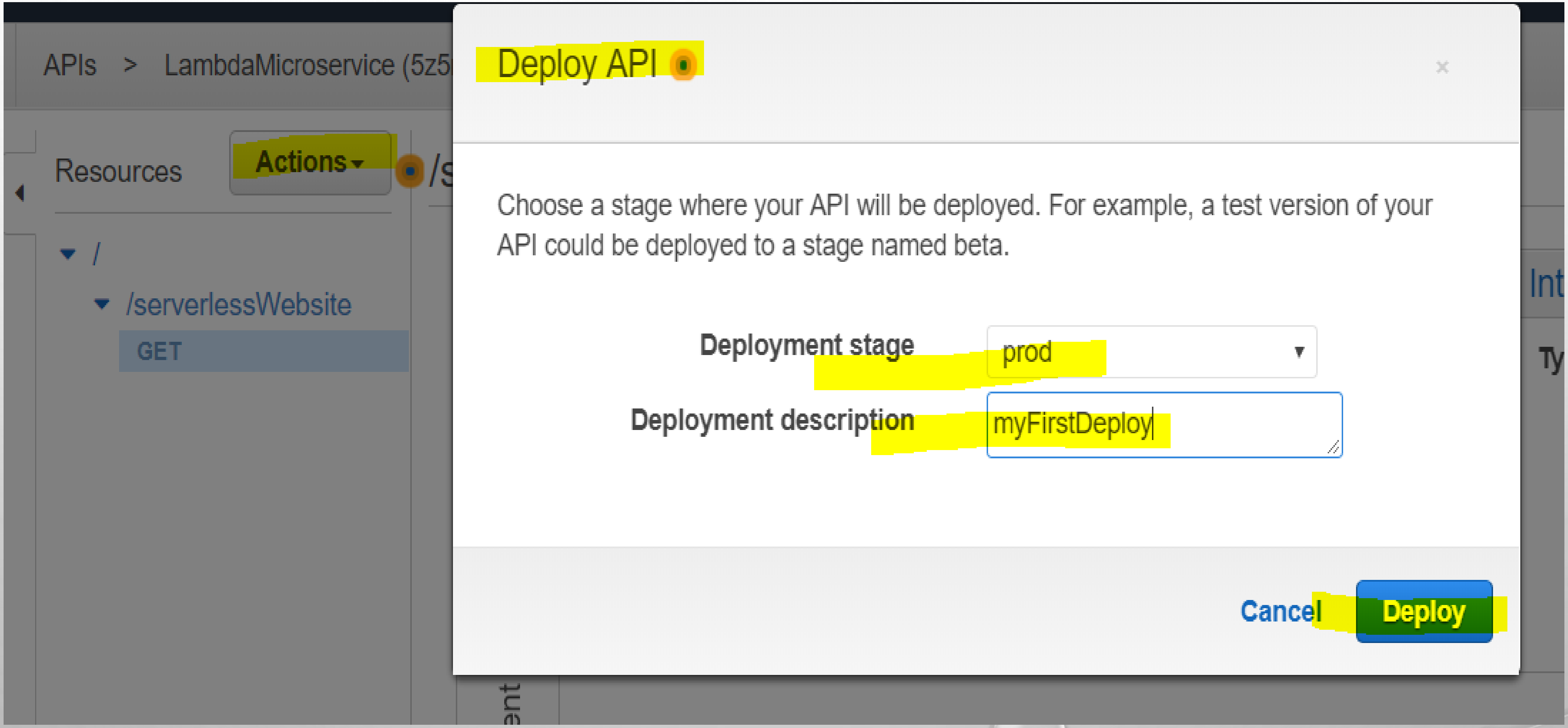
Integration type ● Lambda Function
○ HTTP
○ Mock
○ AWS Service
○ VPC Link

Use Lambda Proxy integration ☑

Lambda Region ap-south-1

Lambda Function serverlessWebsite

Use Default Timeout ☑



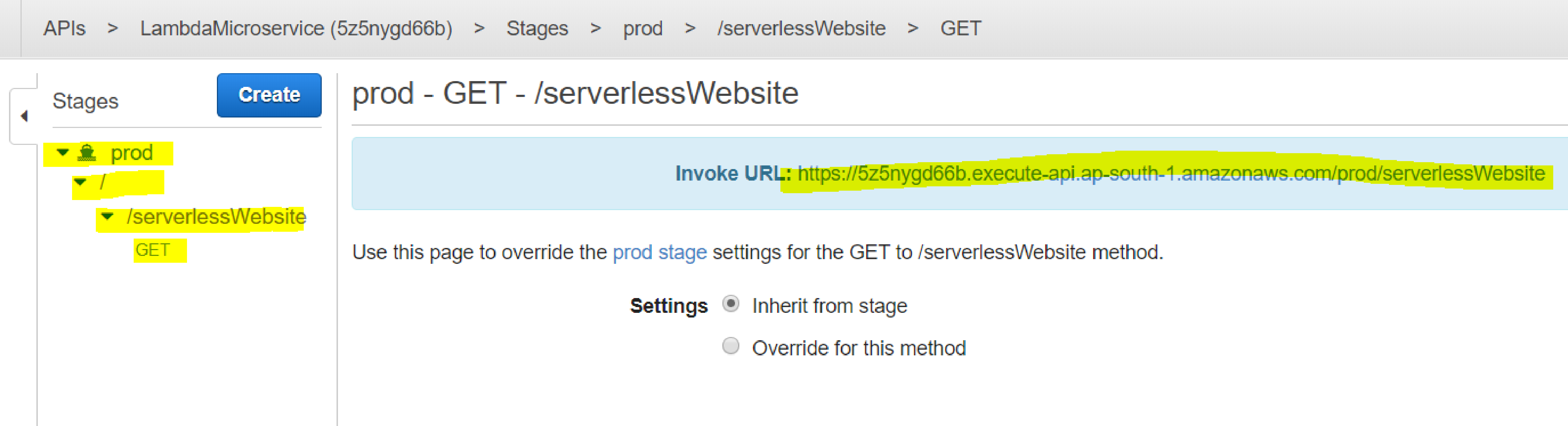
Deploy API

Choose a stage where your API will be deployed. For example, a test version of your API could be deployed to a stage named beta.

Deployment stage prod ▾

Deployment description myFirstDeploy

COPY THE URL AND CHECK IN THE BROWSER



APIs > LambdaMicroservice (5z5nygd66b) > Stages > prod > /serverlessWebsite > GET

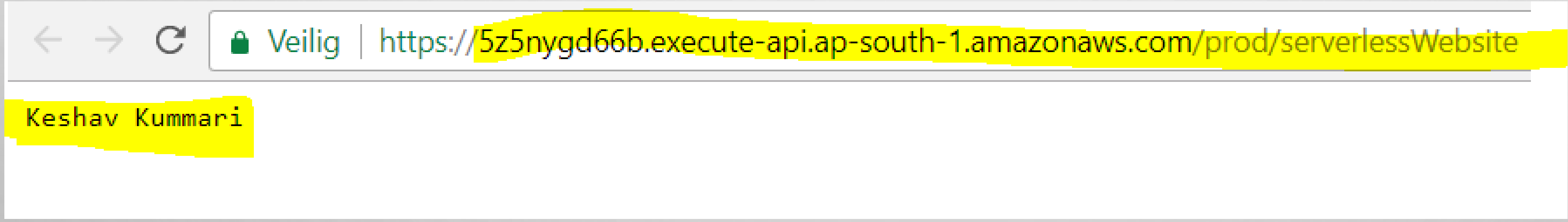
prod - GET - /serverlessWebsite

Invoke URL: https://5z5nygd66b.execute-api.ap-south-1.amazonaws.com/prod/serverlessWebsite

Use this page to override the prod stage settings for the GET to /serverlessWebsite method.

Settings ● Inherit from stage

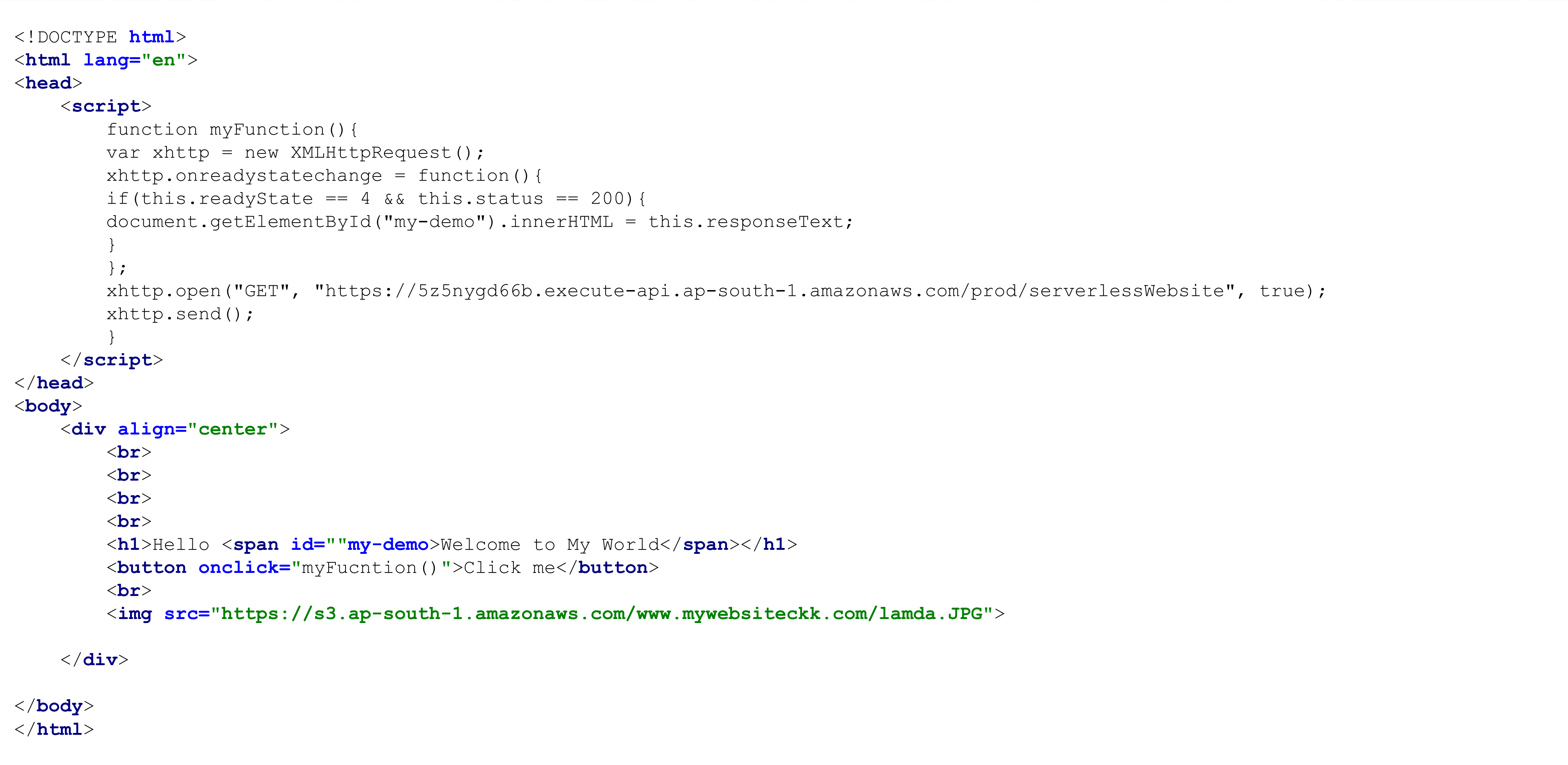
○ Override for this method



Veilig | https://5z5nygd66b.execute-api.ap-south-1.amazonaws.com/prod/serverlessWebsite

```
Keshav Kummari
```

INDEX.HTML

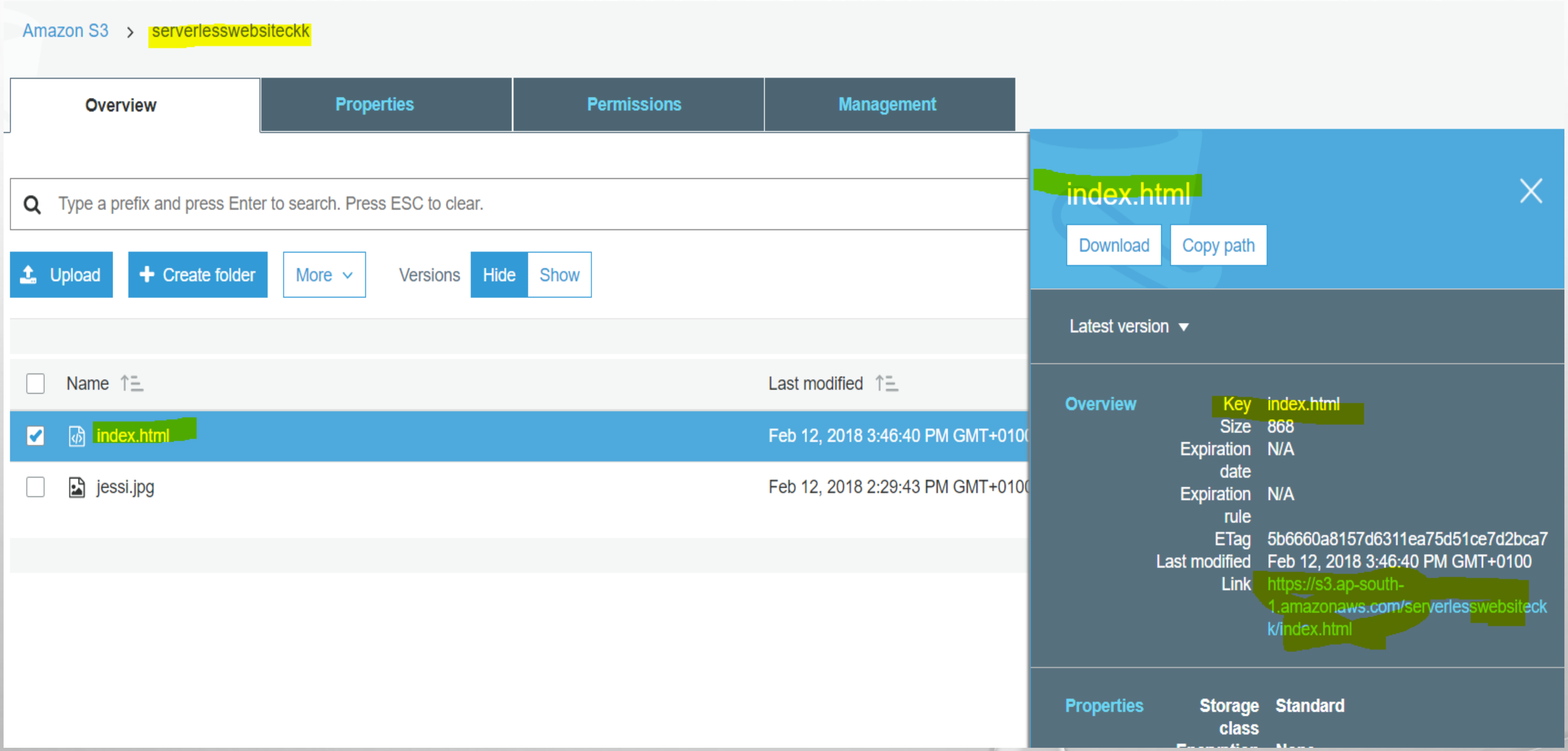


```
<!DOCTYPE html>
<html lang="en">
<head>
    <script>
        function myFunction(){
        var xhttp = new XMLHttpRequest();
        xhttp.onreadystatechange = function(){
        if(this.readyState == 4 && this.status == 200){
        document.getElementById("my-demo").innerHTML = this.responseText;
        }
        };
        xhttp.open("GET", "https://5z5nygd66b.execute-api.ap-south-1.amazonaws.com/prod/serverlessWebsite", true);
        xhttp.send();
        }
    </script>
</head>
<body>
    <div align="center">
        <br>
        <br>
        <br>
        <br>
        <h1>Hello <span id=""my-demo>Welcome to My World</span></h1>
        <button onclick="myFucntion()">Click me</button>
        <br>
        <img src="https://s3.ap-south-1.amazonaws.com/www.mywebsiteckk.com/lamda.JPG">

    </div>

</body>
</html>
```

LET'S CREATE S3 BUCKET



Amazon S3 › serverlesswebsiteckk

	Name	Last modified
☑	index.html	Feb 12, 2018 3:46:40 PM GMT+010
□	jessi.jpg	Feb 12, 2018 2:29:43 PM GMT+010

index.html

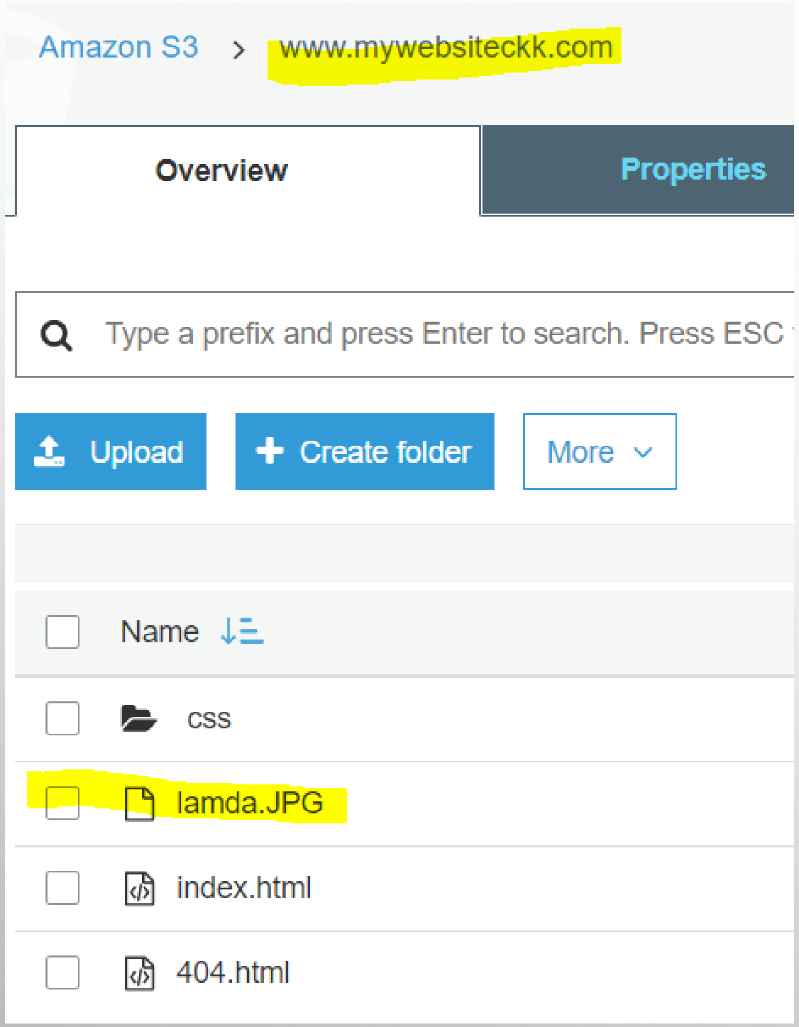
Overview

Key	index.html
Size	868
Expiration date	N/A
Expiration rule	N/A
ETag	5b6660a8157d6311ea75d51ce7d2bca7
Last modified	Feb 12, 2018 3:46:40 PM GMT+0100
Link	https://s3.ap-south-1.amazonaws.com/serverlesswebsiteckk/index.html

Properties

Storage class	Standard

INDEX.HTML AND LAMD.JPG FILE

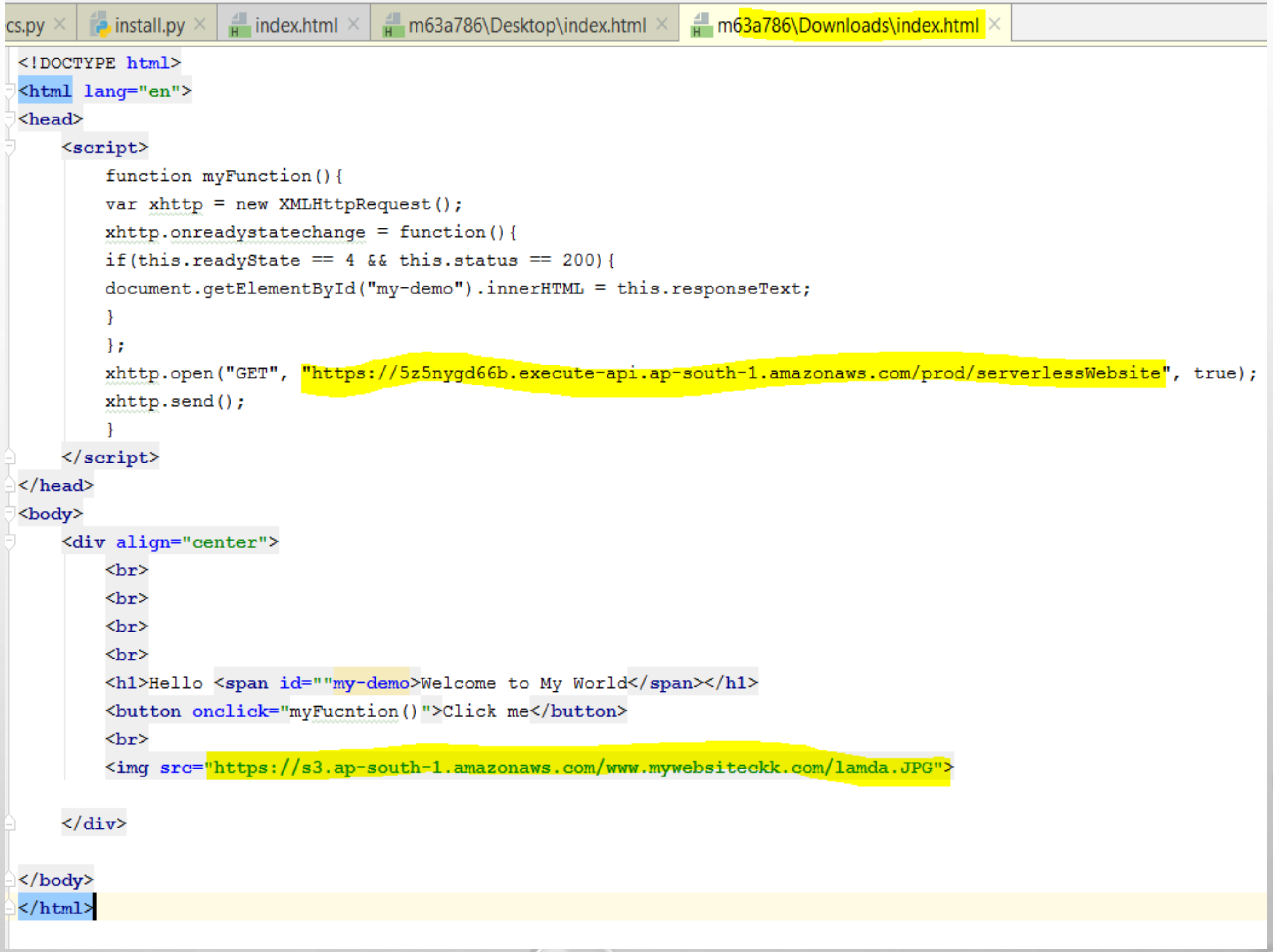

Amazon S3 > www.mywebsiteckk.com

Overview | Properties

Type a prefix and press Enter to search. Press ESC

Upload | Create folder | More

□	Name
□	css
□	lamda.JPG
□	index.html
□	404.html



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        <br>
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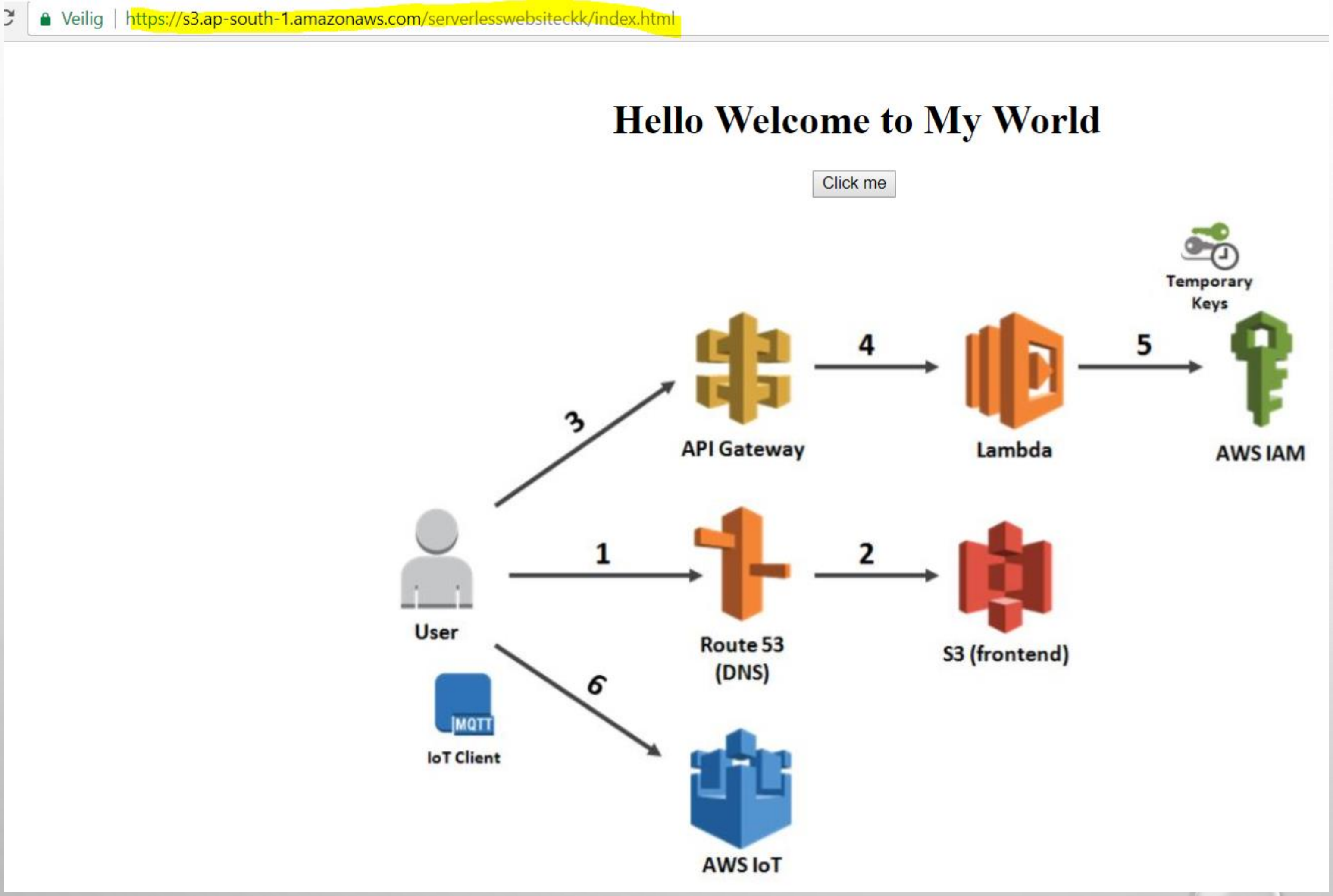
        <img src="https://s3.ap-south-1.amazonaws.com/www.mywebsiteckk.com/lamda.JPG">

    </div>

</body>
</html>
```

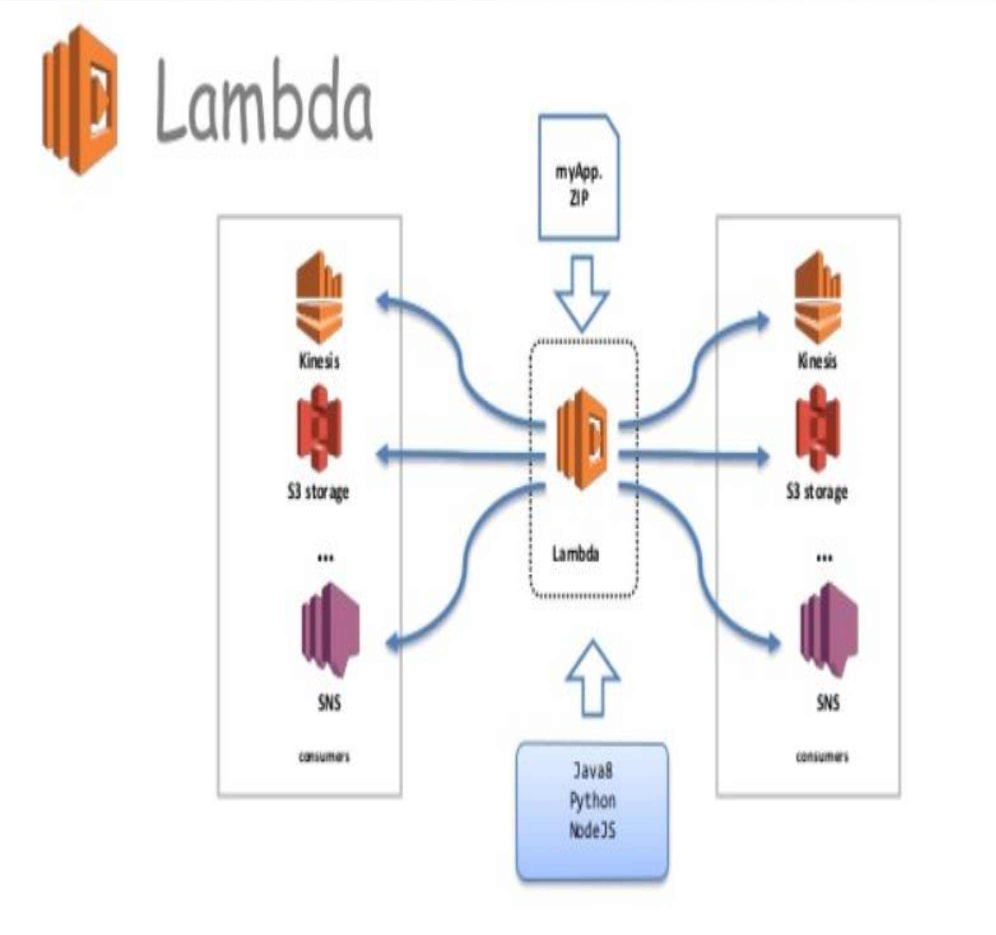
CROSS CHECK THE WEBSITE IN THE BROWSER

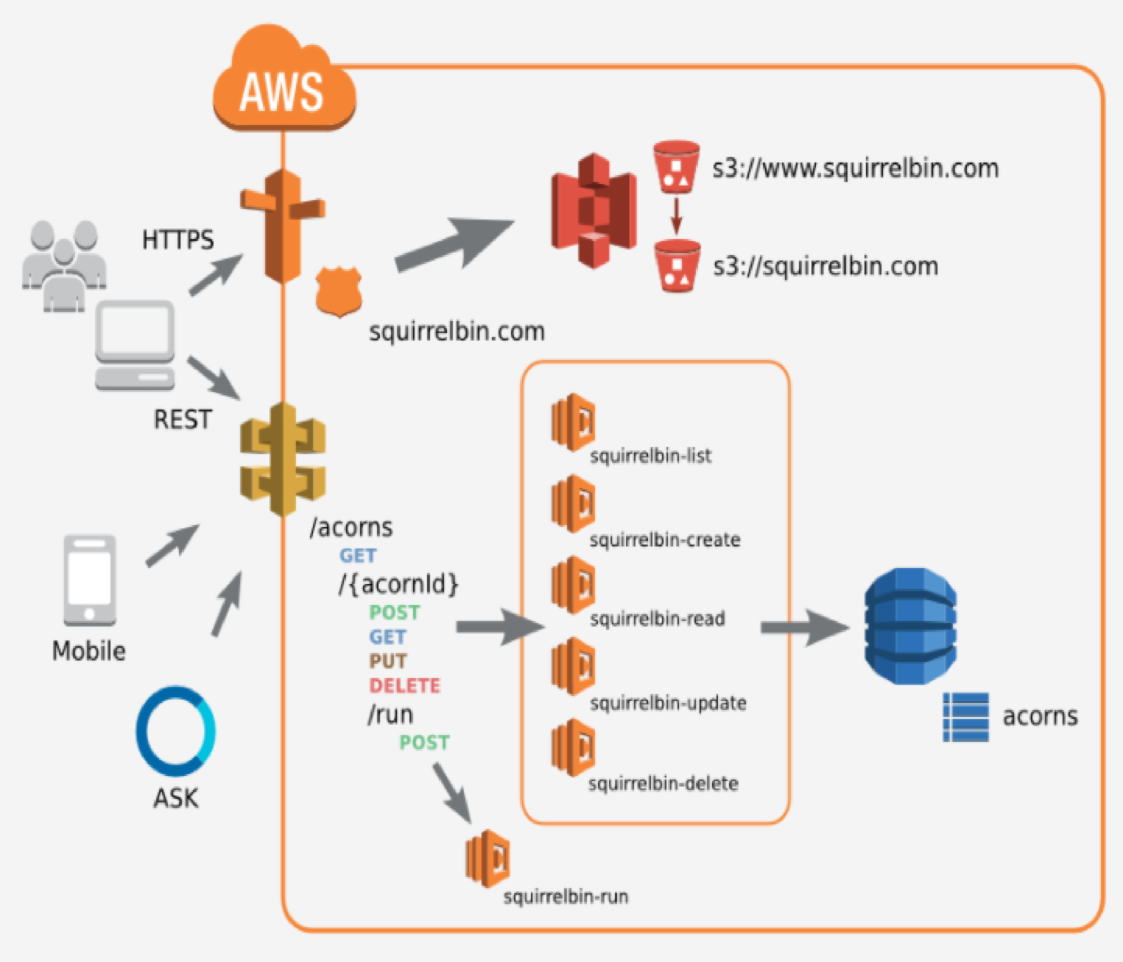


Veilig | https://s3.ap-south-1.amazonaws.com/serverlesswebsiteckk/index.html

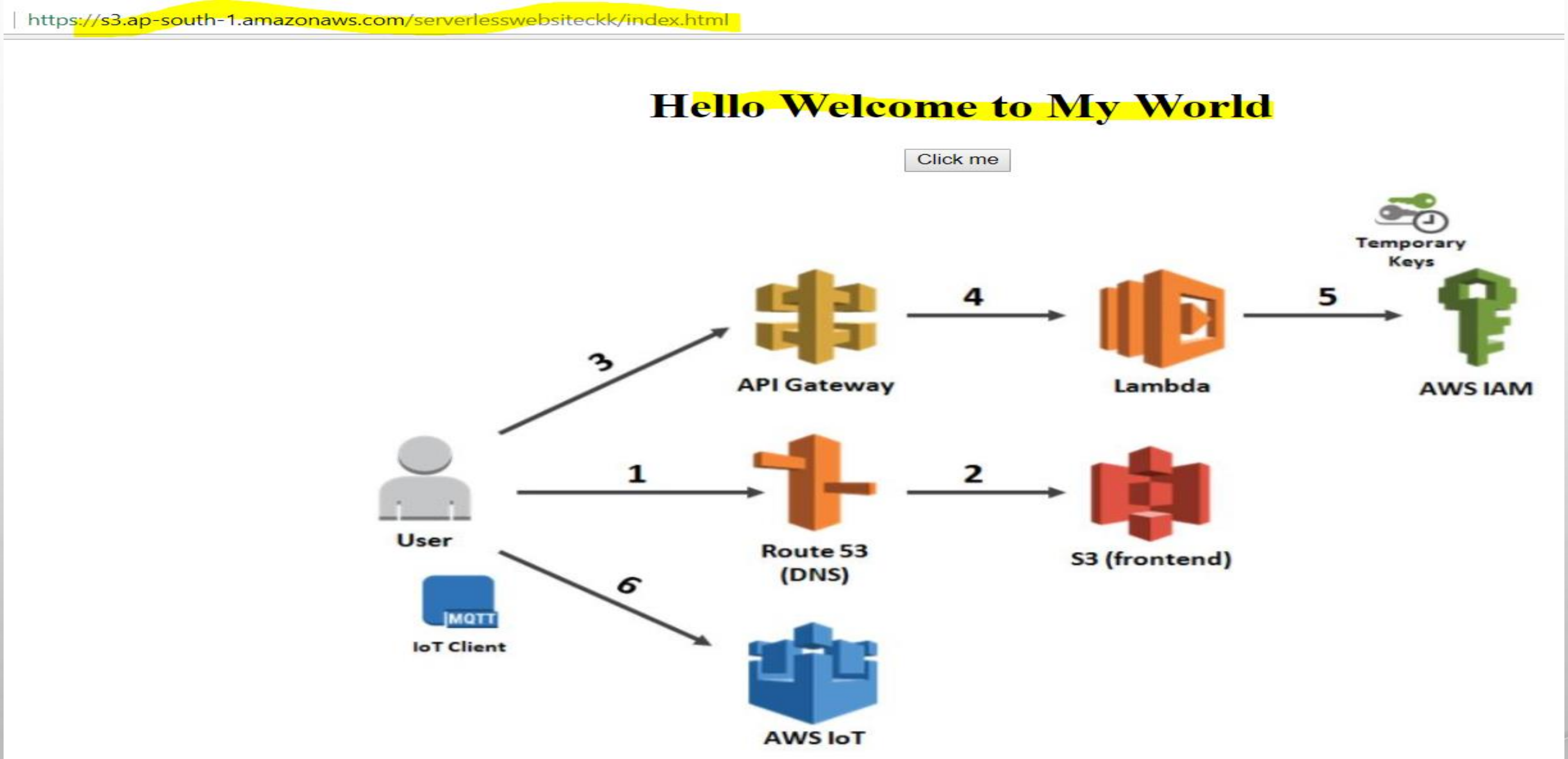
Hello Welcome to My World

LAMBDA


Lambda
myApp.
ZIP
Kinesis
S3 storage
...
SNS
consumers
Lambda
Kinesis
S3 storage
...
SNS
consumers
Java8
Python
NodeJS


AWS
HTTPS
s3://www.squirrelbin.com
s3://squirrelbin.com
squirrelbin.com
REST
squirrelbin-list
squirrelbin-create
squirrelbin-read
squirrelbin-update
squirrelbin-delete
/acorns
GET
/{acornId}
POST
GET
PUT
DELETE
/run
POST
Mobile
ASK
acorns
squirrelbin-run

CROSS CHECK THE URL IN THE BROWSER



https://s3.ap-south-1.amazonaws.com/serverlesswebsiteckk/index.html

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