

# Cloud Computing and Virtualization

Lab. 4 - Introduction to AWS Lambda

# Login into AWS web console...

The screenshot shows the AWS Management Console interface. At the top, there's a navigation bar with the AWS logo, a 'Services' menu, a search bar, and a user profile dropdown. Below the navigation bar, a blue banner announces the upcoming new AWS Console Home. The main content area is divided into several sections: 'AWS services' with a list of recently visited services (Lambda, EC2, CloudWatch, S3, Elastic Container Service, IAM, AWS Organizations, Elastic Container Registry, Elastic Kubernetes Service) and a link to 'All services'; 'Build a solution' with four quick-start options (Launch a virtual machine, Build a web app, Build using virtual servers, Register a domain); 'New AWS Console Home' with a 'Switch now' button; 'Stay connected to your AWS resources on-the-go' with a link to the AWS Console Mobile App; and 'Explore AWS' with links to 'Free AWS Training' and 'AWS Training'.

aws Services Search for services, features, blogs, docs, and more [Alt+S]

Ohio rbruno

**The new AWS Console Home will replace your existing experience soon**  
Starting June 2022, the new AWS Console Home will replace your current experience. Switch now to customize your Console Home and view valuable insights. [Learn more](#) or [let us know what you think](#). [Switch now](#)

## AWS Management Console

### AWS services

▼ Recently visited services

- Lambda
- EC2
- CloudWatch
- S3
- Elastic Container Service
- IAM
- AWS Organizations
- Elastic Container Registry
- Elastic Kubernetes Service

► All services

### Build a solution

Get started with simple wizards and automated workflows.

- Launch a virtual machine**  
With EC2  
2-3 minutes
- Build a web app**  
With Elastic Beanstalk  
6 minutes
- Build using virtual servers**  
With Lightsail  
1-2 minutes
- Register a domain**  
With Route 53  
3 minutes
- Connect an IoT device**  
With AWS IoT  
5 minutes
- Start migrating to AWS**  
With AWS MGN  
1-2 minutes
- Start a development project**  
With CodeStar  
5 minutes
- Deploy a serverless microservice**  
With Lambda, API Gateway  
2 minutes

### New AWS Console Home

See valuable insights for your account and services with the new customizable Console Home experience. [Learn more](#) [Switch now](#)

### Stay connected to your AWS resources on-the-go

AWS Console Mobile App now supports four additional regions. Download the AWS Console Mobile App to your iOS or Android mobile device. [Learn more](#)

### Explore AWS

#### Free AWS Training

Advance your career with AWS Cloud Practitioner Essentials—a free, six-hour, foundational course. [Learn more](#)

#### AWS Training

Free digital courses to help you develop your skills. [Learn more](#)

# Use the search bar and type Lambda, click on Lambda...

The screenshot shows the AWS Management Console search results for 'Lambda'. The search bar at the top contains the text 'Lambda'. The results are displayed in a list format. The first result, 'Lambda', is highlighted with a red rectangle. It includes the AWS Lambda icon, the text 'Lambda', a star icon, and the description 'Run Code without Thinking about Servers'. Below this, other results are visible: 'CodeBuild' (Build and Test Code), 'AWS Signer' (Ensuring trust and integrity of your code), and 'Amazon Lex' (Build Voice and Text Chatbots). The left sidebar shows navigation links for Services, Features, Blogs, Documentation, Knowledge Articles, Tutorials, Events, and Marketplace. The right sidebar contains promotional cards for 'New AWS Console Home', 'Stay connected to your AWS resources on-the-go', 'Explore AWS', 'Free AWS Training', and 'AWS Certification'.

Search results for 'Lambda'

- Lambda** ☆  
Run Code without Thinking about Servers
- CodeBuild** ☆  
Build and Test Code
- AWS Signer** ☆  
Ensuring trust and integrity of your code
- Amazon Lex** ☆  
Build Voice and Text Chatbots

**Features**

- Local processing**  
IoT Core feature
- Target groups**  
EC2 feature

**Blogs** [See all 840 results ▶](#)

- Handling Lambda functions idempotency with AWS Lambda Powertools** [↗](#)  
By: James Beswick | Date: April 20, 2022
- Introducing .NET Annotations Lambda Framework (Preview)** [↗](#)

**New AWS Console Home**  
See valuable insights for your account and services with the new customizable Console Home experience. [Learn more](#) [↗](#)  
[Switch now](#)

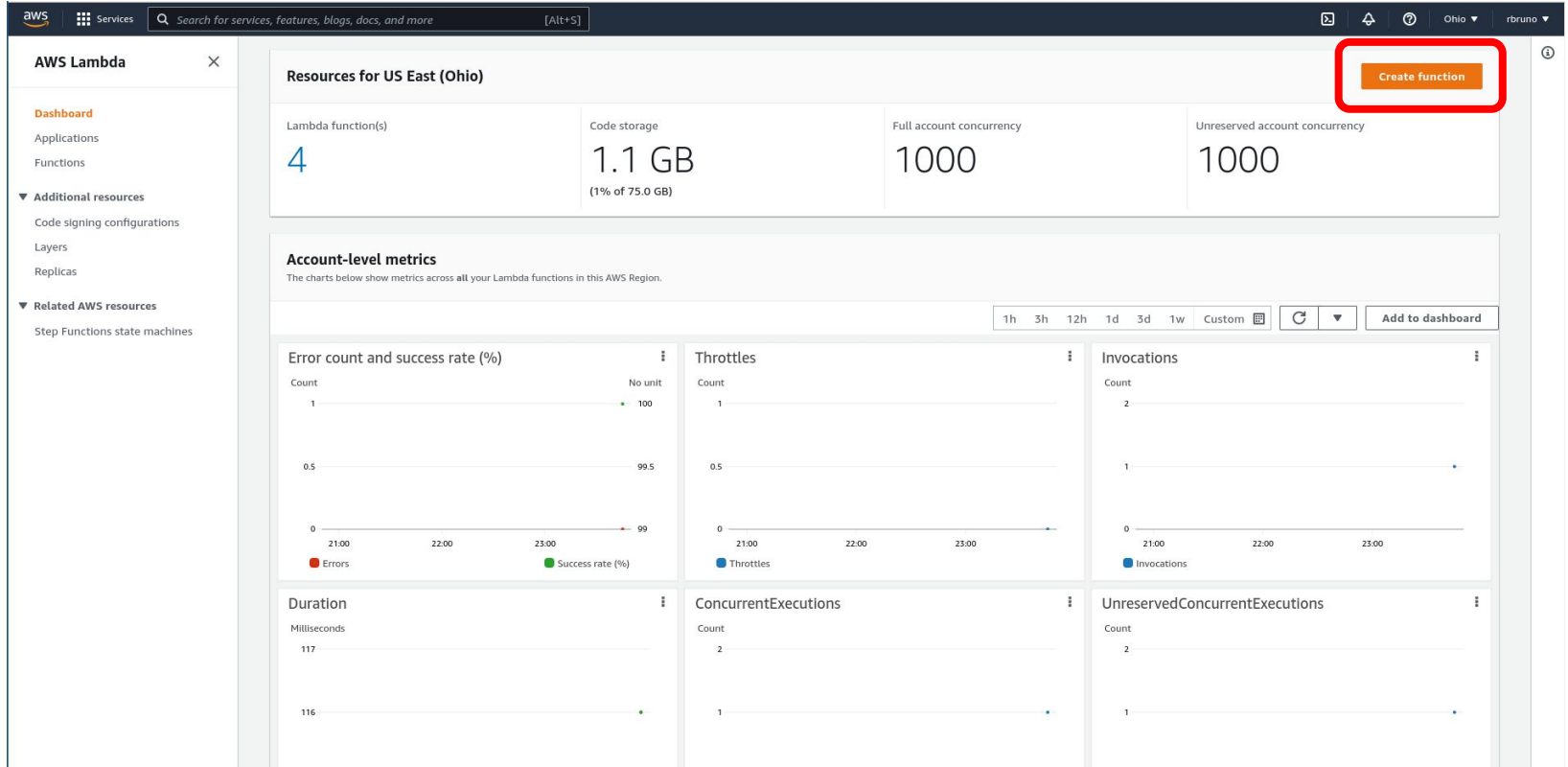
**Stay connected to your AWS resources on-the-go**  
 AWS Console Mobile App now supports four additional regions. Download the AWS Console Mobile App to your iOS or Android mobile device. [Learn more](#) [↗](#)

**Explore AWS**

**Free AWS Training**  
Advance your career with AWS Cloud Practitioner Essentials—a free, six-hour, foundational course. [Learn more](#) [↗](#)

**AWS Certification**  
Propel your career forward with AWS Certification. [Learn more](#) [↗](#)

# Click on Create Function...



# Set the name and the runtime...

aws Services Search for services, features, blogs, docs, and more [Alt+S]

## Create function [info](#)

Choose one of the following options to create your function.

**Author from scratch** ☒  
Start with a simple Hello World example.

**Use a blueprint** ☐  
Build a Lambda application from sample code and configuration presets for common use cases.

**Container image** ☐  
Select a container image to deploy for your function.

**Browse serverless app repository** ☐  
Deploy a sample Lambda application from the AWS Serverless Application Repository.

### Basic information

**Function name** [info](#)  
Enter a name that describes the purpose of your function.  
  
Use alphanumeric characters and hyphens, or underscores with no spaces.

**Runtime** [info](#)  
Select a runtime for your function. Note that the console code editor supports only Node.js, Python, and Ruby.

**Architecture** [info](#)  
Choose the instruction set architecture you want for your function code.  
☒ x86\_64  
☐ arm64

**Permissions** [info](#)  
By default, Lambda will create an execution role with permissions to upload logs to Amazon CloudWatch Logs. You can customize this default role later when adding triggers.

► Change default execution role

► Advanced settings

Cancel Create function

# Upload source code from a .zip or .jar file...

The screenshot displays the AWS Lambda console interface for a function named 'testfunction'. At the top, a green banner indicates that the function was successfully created. Below this, the 'Function overview' section shows the function's icon, name, and a 'Layers' section with '(0)' layers. To the right, a sidebar provides details such as the function's description, last modified time (23 seconds ago), Function ARN, and Function URL. The main content area is divided into tabs: 'Code', 'Test', 'Monitor', 'Configuration', 'Aliases', and 'Versions'. The 'Code' tab is selected, showing the 'Code source' section. A red box highlights the 'Upload from' dropdown menu, which has two visible options: '.zip or .jar file' and 'Amazon S3 location'. Below this, a message states: 'The code editor does not support the Java 11 (Corretto) runtime.' The 'Code properties' section at the bottom shows details like package size, SHA256 hash, and last modified date.

Successfully created the function **testfunction**. You can now change its code and configuration. To invoke your function with a test event, choose "Test".

Lambda > Functions > testfunction

**testfunction** Throttle Copy ARN Actions

▼ **Function overview** [Info](#)

**testfunction**

Layers (0)

+ Add trigger + Add destination

Description  
-

Last modified  
23 seconds ago

Function ARN  
 `arn:aws:lambda:us-east-2:007893803878:function:testfunction`

Function URL [Info](#)  
-

**Code** | Test | Monitor | Configuration | Aliases | Versions

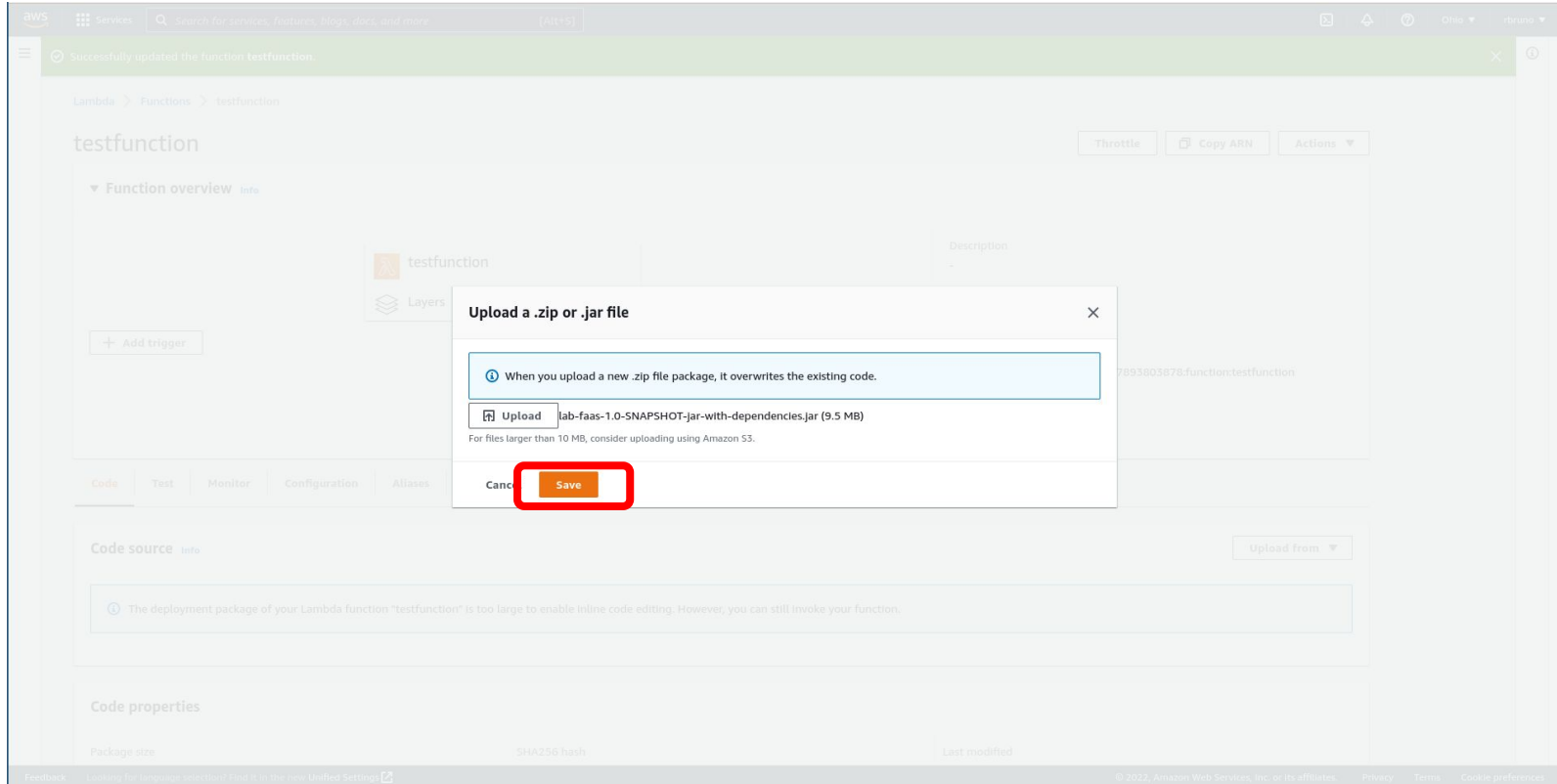
**Code source** [Info](#)

ⓘ The code editor does not support the Java 11 (Corretto) runtime.



**Code properties**

Package size 8.7 kB	SHA256 hash <code>1b91nlH7667Mer9i5Gul8Fmva56Nnc7DlVGDkT7lQn2</code>	Last modified May 29, 2022 12:55 AM GMT+1
------------------------	---	--

# Select the .jar resulting from building the lab project...



# Edit Runtime Settings...

 Successfully updated the function **testfunction**. 

Code

Test

Monitor


Configuration

Aliases


Versions

Code source [Info](#)

Upload from ▼

 The deployment package of your Lambda function "testfunction" is too large to enable inline code editing. However, you can still invoke your function.

Code properties

Package size 9.5 MB	SHA256 hash  dPTeUyvrGZpoc6+osBSHvAMVxd/TYFpAvpk1JZg1X4=	Last modified May 29, 2022, 12:55 AM GMT+1
------------------------	--	---

Runtime settings [Info](#)

Edit

Runtime Java 11 (Corretto)	Handler <a href="#">Info</a> example.Hello::handleRequest	Architecture <a href="#">Info</a> x86_64
-------------------------------	--	---

Layers [Info](#)

Edit

Add a layer

Merge order	Name	Layer version	Compatible runtimes	Compatible architectures	Version ARN
There is no data to display.					



# Set the Handler class (check Handler.java)

The screenshot shows the AWS Lambda console interface for editing the runtime settings of a function named 'testfunction'. The breadcrumb navigation at the top indicates the path: Lambda > Functions > testfunction > Edit runtime settings. The main heading is 'Edit runtime settings'. Below this, there are three sections: 'Runtime settings', 'Handler', and 'Architecture'. The 'Runtime' section shows 'Java 11 (Corretto)' selected in a dropdown menu. The 'Handler' section has a text input field containing 'pt.ulisboa.tecnico.crv.faas.Handler::handleRequest', which is highlighted with a red rectangular box. The 'Architecture' section shows 'x86\_64' selected. At the bottom right, there are 'Cancel' and 'Save' buttons, with the 'Save' button highlighted by a red rectangular box. A blue information box at the bottom of the settings panel states: 'You can change either the function's runtime or the instruction set architecture in one update. To update both, you must repeat the update process.'

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Lambda > Functions > testfunction > Edit runtime settings

## Edit runtime settings

**Runtime settings** Info

**Runtime**  
Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.

Java 11 (Corretto)

**Handler** Info

pt.ulisboa.tecnico.crv.faas.Handler::handleRequest

**Architecture** Info  
Choose the instruction set architecture you want for your function code.

☒ x86\_64  
☐ arm64

**Info** You can change either the function's runtime or the instruction set architecture in one update. To update both, you must repeat the update process.

Cancel Save

# Let's test the new function!

The screenshot shows the AWS Lambda console interface. At the top, a green banner indicates 'Successfully updated the function testfunction.' Below this, the 'Test' tab is selected and highlighted with a red box. The 'Test event' section is visible, with a red '1' next to its title. A 'Test' button is highlighted with a red box and a red '3' next to it. The 'Test event action' section shows 'Create new event' as the selected option. The 'Event name' field contains 'MyEventName'. The 'Event sharing settings' section shows 'Private' as the selected option. The 'Template - optional' dropdown is set to 'hello-world'. The 'Event JSON' section is visible, with a red box highlighting the JSON content and a red '2' next to it. The JSON content is: 

```
{  "number": "10"}
```

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Successfully updated the function testfunction.

Code **Test** Monitor Configuration Aliases Versions

**Test event** Save Test

To invoke your function without saving an event, configure the JSON event, then choose Test.

Test event action

Create new event Edit saved event

Event name

MyEventName

Maximum of 25 characters consisting of letters, numbers, dots, hyphens and underscores.

Event sharing settings

Private This event is only available in the Lambda console and to the event creator. You can configure a total of 10. [Learn more](#)

Shareable This event is available to IAM users within the same account who have permissions to access and use shareable events. [Learn more](#)

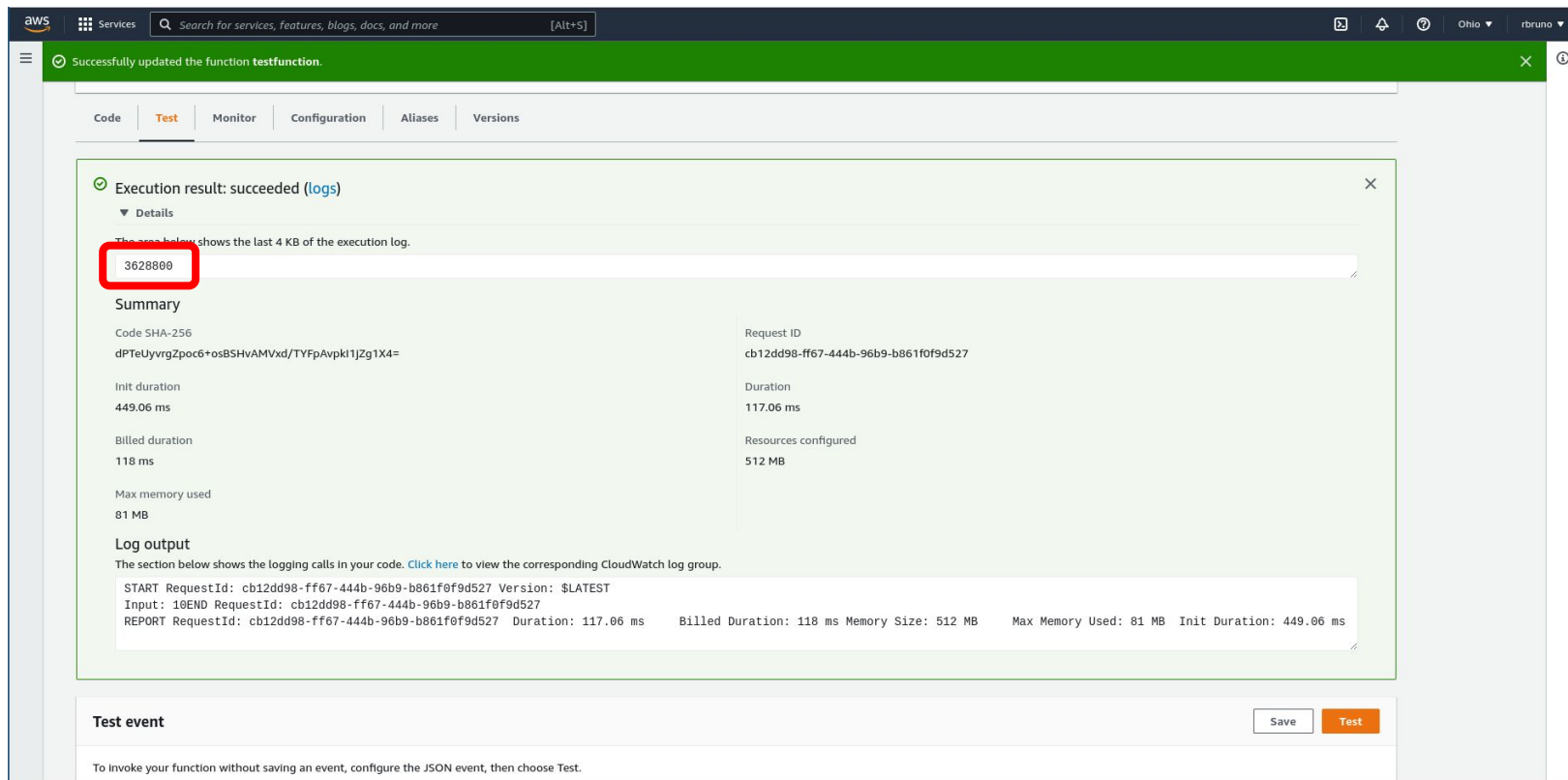
Template - optional

hello-world

**Event JSON** Format JSON

```
{  "number": "10"}
```

# Factorial of 10 is 3628800!



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Successfully updated the function **testfunction**.

Code Test Monitor Configuration Aliases Versions

Execution result: succeeded (logs)

Details

The area below shows the last 4 KB of the execution log.

3628800

Summary

Code SHA-256	Request ID
dPTeUyvgZpoc6+osBSHvAMVxd/TYFpAvpkl1Jzg1X4=	cb12dd98-ff67-444b-96b9-b861f0f9d527
Init duration	Duration
449.06 ms	117.06 ms
Billed duration	Resources configured
118 ms	512 MB
Max memory used	
81 MB	

Log output

The section below shows the logging calls in your code. [Click here](#) to view the corresponding CloudWatch log group.

```
START RequestId: cb12dd98-ff67-444b-96b9-b861f0f9d527 Version: $LATEST
Input: 10END RequestId: cb12dd98-ff67-444b-96b9-b861f0f9d527
REPORT RequestId: cb12dd98-ff67-444b-96b9-b861f0f9d527  Duration: 117.06 ms    Billed Duration: 118 ms Memory Size: 512 MB    Max Memory Used: 81 MB    Init Duration: 449.06 ms
```

Test event

Save Test

To invoke your function without saving an event, configure the JSON event, then choose Test.