ADVANCED DEVOPS EXP 11

Aim: To understand AWS Lambda, its workflow, various functions and create your first Lambda functions using Python / Java / Nodejs.

Theory:

AWS Lambda

- AWS Lambda is a serverless computing service provided by Amazon Web Services (AWS). Users of AWS Lambda create functions, self-contained applications written in one of the supported languages and runtimes, and upload them to AWS Lambda, which executes those functions in an efficient and flexible manner.
- The Lambda functions can perform any kind of computing task, from serving web pages and processing streams of data to calling APIs and integrating with other AWS services. The concept of "serverless" computing refers to not needing to maintain your own servers to run these functions.
- AWS Lambda is a fully managed service that takes care of all the infrastructure for you. And so "serverless" doesn't mean that there are no servers involved: it just means that the servers, the operating systems, the network layer and the rest of the infrastructure have already been taken care of so that you can focus on writing application code.

Features of AWS Lambda

● AWS Lambda easily scales the infrastructure without any additional configuration. It reduces the operational work involved.

● It offers multiple options like AWS S3, CloudWatch, DynamoDB, API Gateway, Kinesis, CodeCommit, and many more to trigger an event.

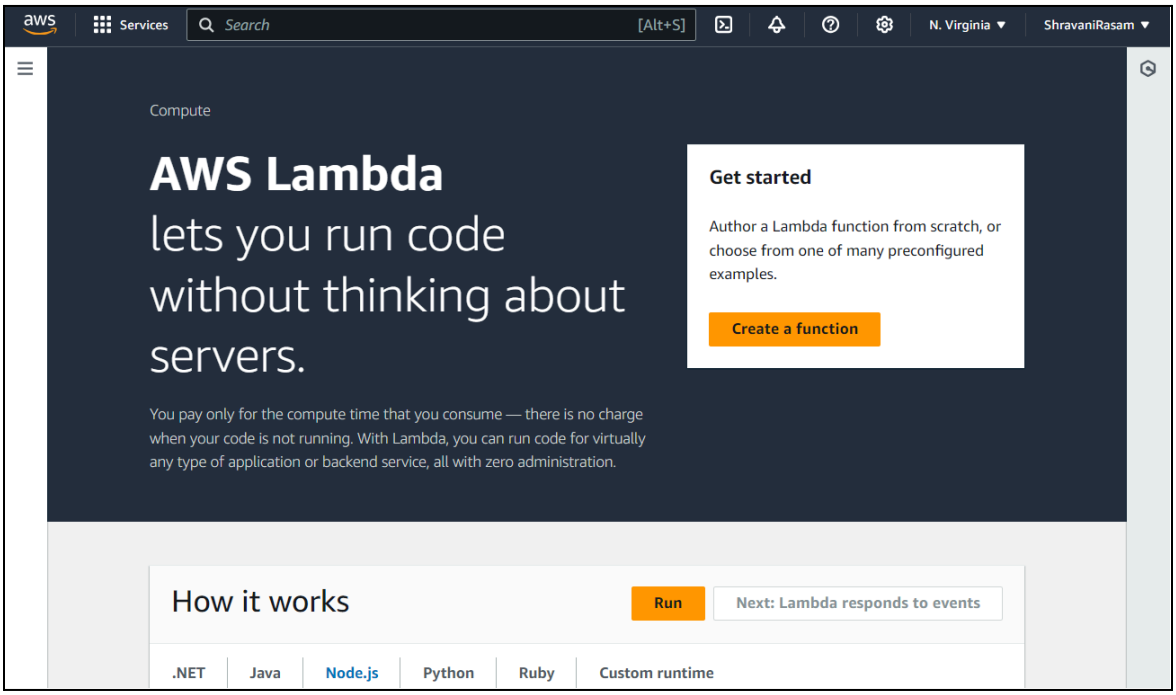
● You don't need to invest upfront. You pay only for the memory used by the lambda function and minimal cost on the number of requests hence cost-efficient.

● AWS Lambda is secure. It uses AWS IAM to define all the roles and security policies.

● It offers fault tolerance for both services running the code and the function. You do not have to worry about the application down

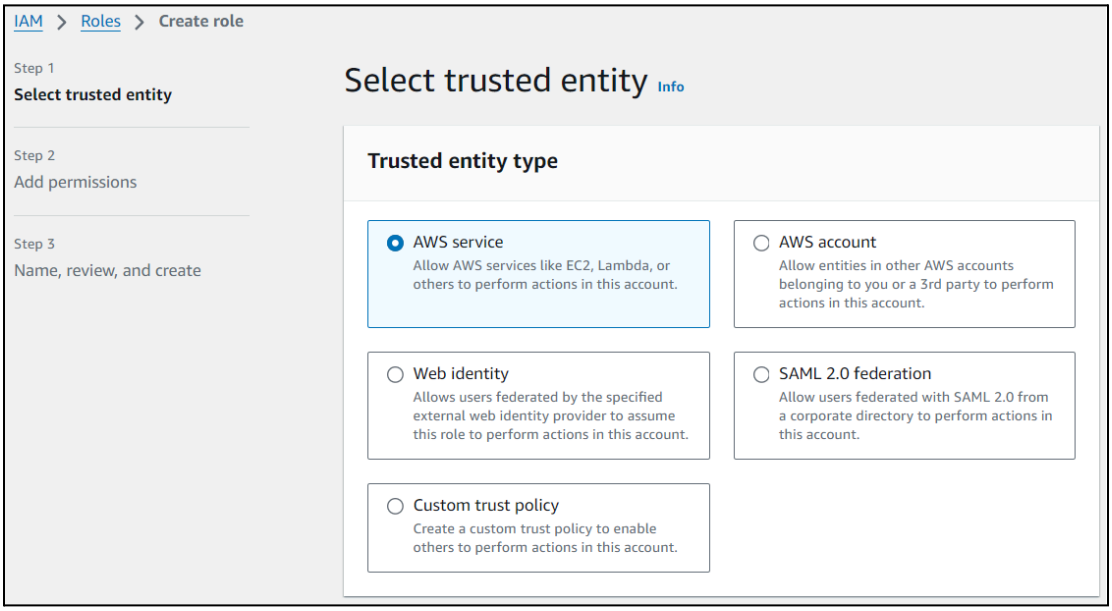
Steps to create an AWS Lambda function

1. Open up the Lambda Console and click on the Create button. Be mindful of where you create your functions since Lambda is region-dependent.



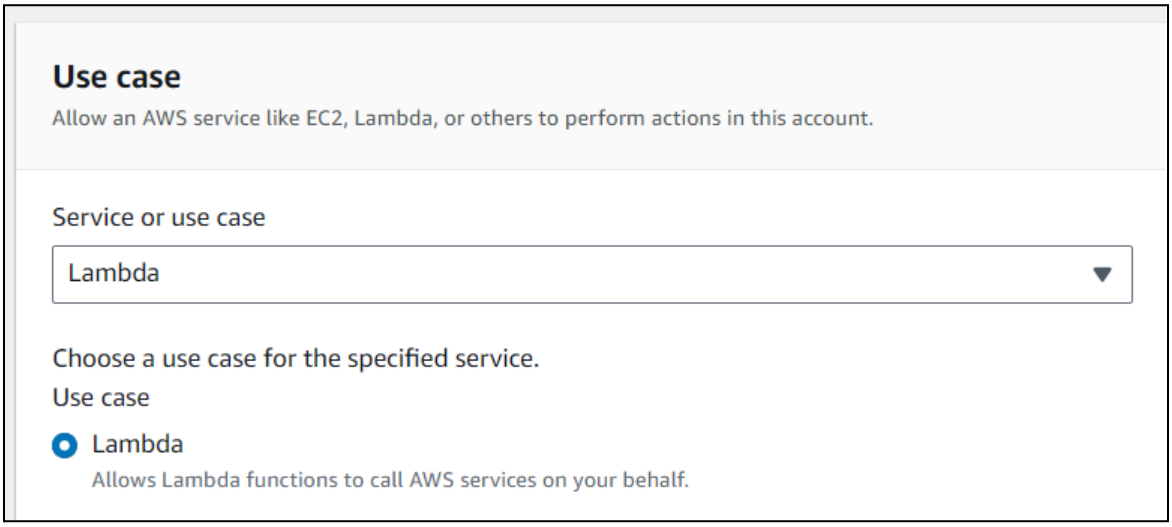
2.Choose the Lambda service:

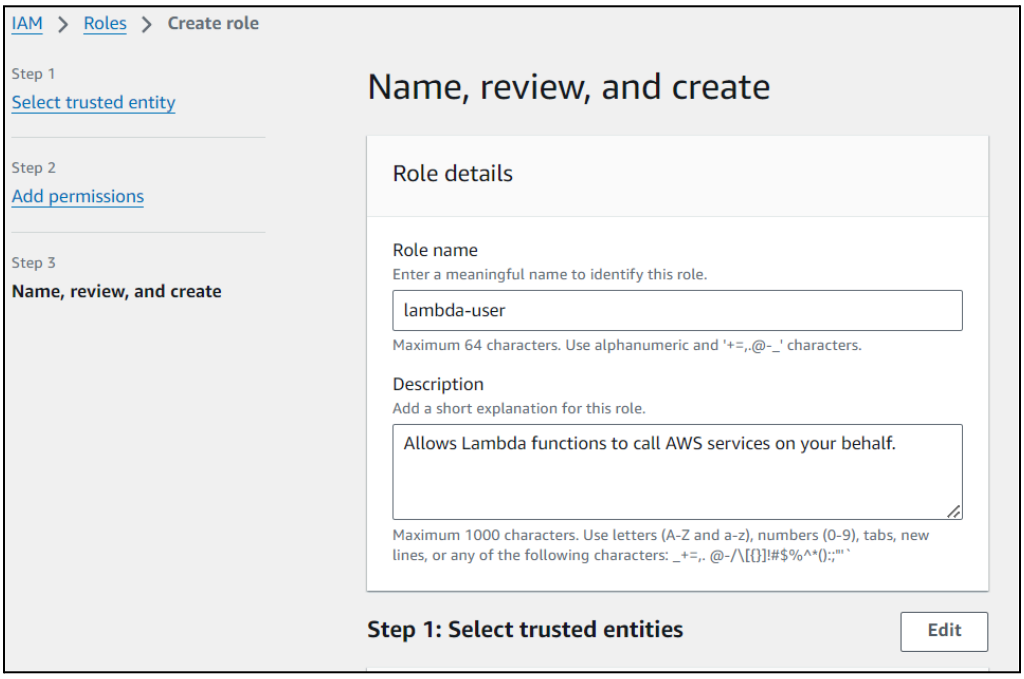
- Under "Trusted entity type," select **AWS service**.
- Choose **Lambda** from the list of services, and click **Next**.

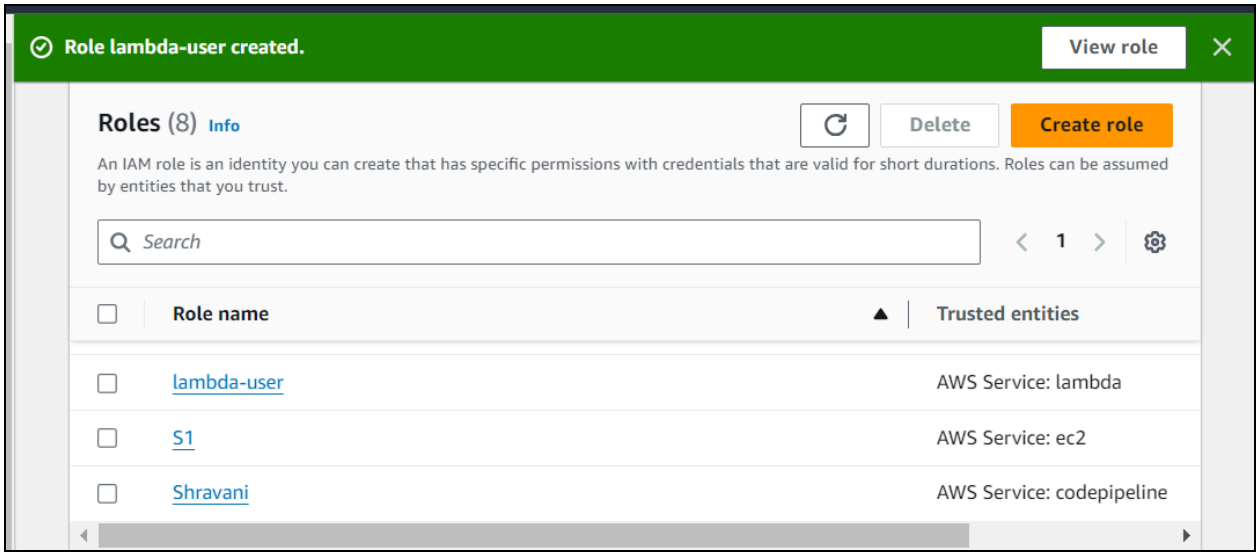


3. Attach CloudWatch Logs permissions:

- In the "Permissions" step, search for the policy called `AWSLambdaBasicExecutionRole`.
- Select this policy, which gives your Lambda function permission to write logs to CloudWatch.
- Click **Next**.

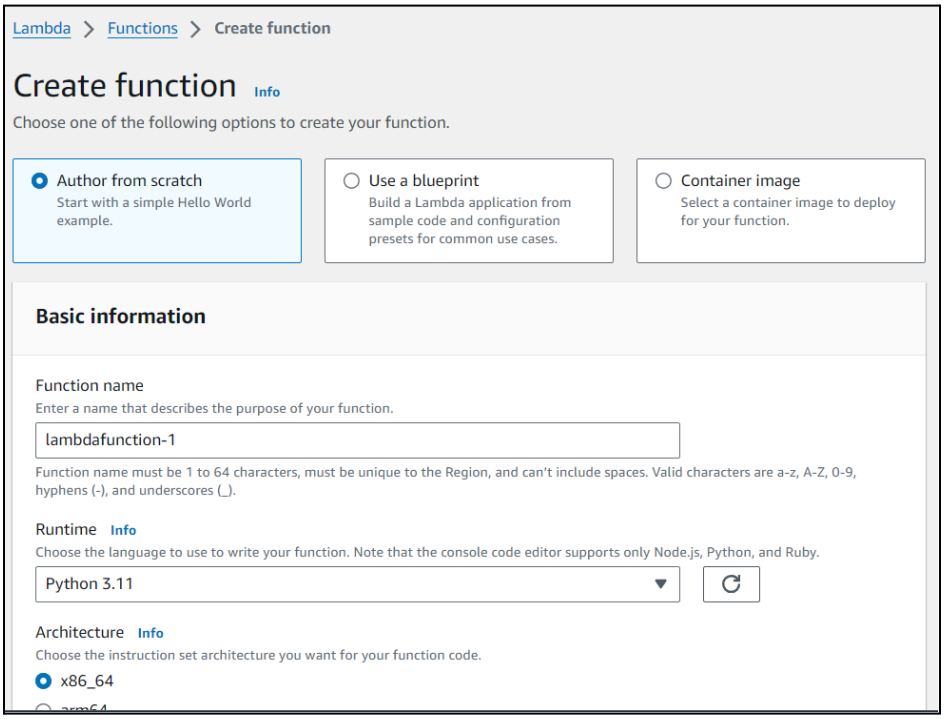






2. Choose to create a function from scratch or use a blueprint, i.e templates defined by AWS for you with all configuration presets required for the most common use cases.

Then, choose a runtime env for your function, under the dropdown, you can see all the options AWS supports, Python, Nodejs, .NET and Java being the most popular ones. After that, choose to create a new role with basic Lambda permissions if you don't have an existing one.



Lambda > Functions > lambdafunction-1 > Edit basic settings

Edit basic settings

Basic settings Info

Description - *optional*

Memory Info

Your function is allocated CPU proportional to the memory configured.

128 MB

Set memory to between 128 MB and 10240 MB

Ephemeral storage Info

You can configure up to 10 GB of ephemeral storage (/tmp) for your function. View pricing

512 MB

Set ephemeral storage (/tmp) to between 512 MB and 10240 MB.

SnapStart Info

Reduce startup time by having Lambda cache a snapshot of your function after the function has initialized. To evaluate whether your function code is resilient to snapshot operations, review the SnapStart compatibility considerations.

None

Supported runtimes: Java 11, Java 17, Java 21.

Successfully updated the function **lambdafunction-1**.

Code source Info

Upload from

File Edit Find View Go Tools Window Test Deploy

Go to Anything (Ctrl-P)

Environment

lambdafunction-1

lambda_function.py

lambda_function × Environment Var ×

```
1 import json
2
3 def lambda_handler(event, context):
4     # TODO implement
5     return {
6         'statusCode': 200,
7         'body': json.dumps('Hello from Lambda!')
8     }
9
```

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**

Execution role

Choose a role that defines the permissions of your function. To create a custom role, go to the IAM console.

- ○ Create a new role with basic Lambda permissions
- ◉ Use an existing role
- ○ Create a new role from AWS policy templates

Existing role

Choose an existing role that you've created to be used with this Lambda function. The role must have permission to upload logs to Amazon CloudWatch Logs.

lambda-user

View the lambda-user role on the IAM console.

▶ **Additional Configurations**

Use additional configurations to set up code signing, function URL, tags, and Amazon VPC access for your function.

Cancel | Create function

Successfully created the function **lambdafunction-1**. You can now change its code and configuration. To invoke your function with a test event, choose "Test".

Lambda > Functions > lambdafunction-1

lambdafunction-1

Throttle | Copy ARN | Actions

▼ **Function overview** Info

Export to Application Composer | Download

Diagram | Template

lambdafunction-1

Layers (0)

+ Add trigger

+ Add destination

Description

-

Last modified

14 seconds ago

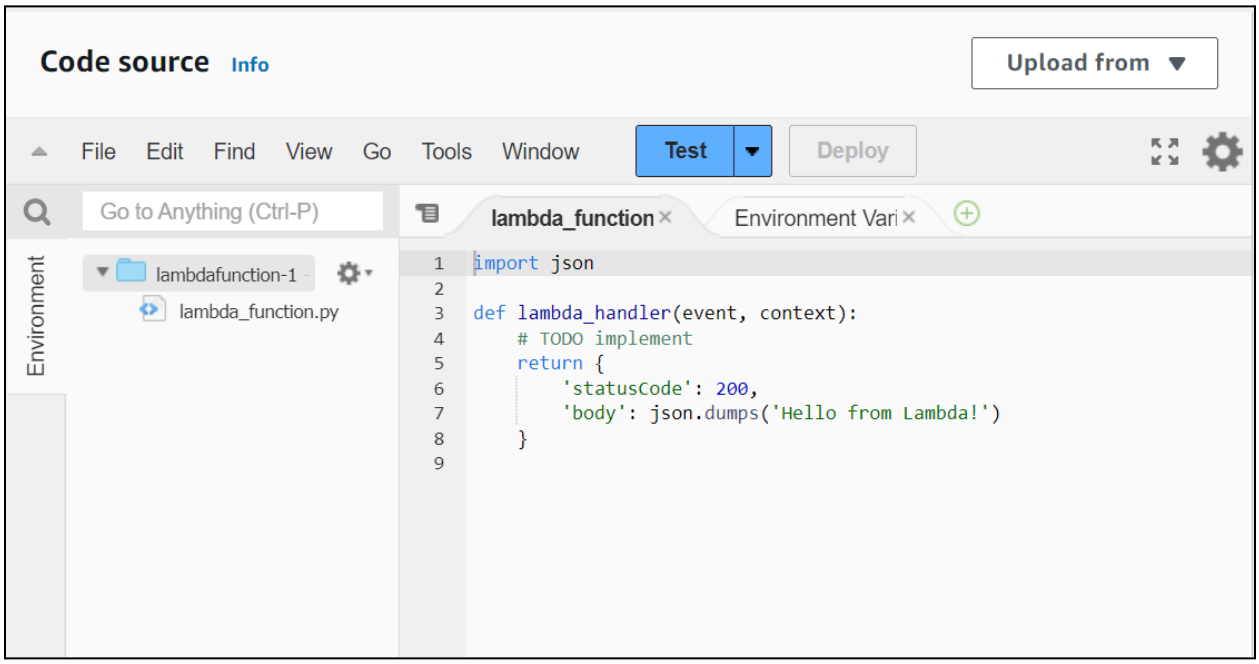
Function ARN

arn:aws:lambda:us-east-1:361769589277:function:lambdafunction-1

Function URL Info

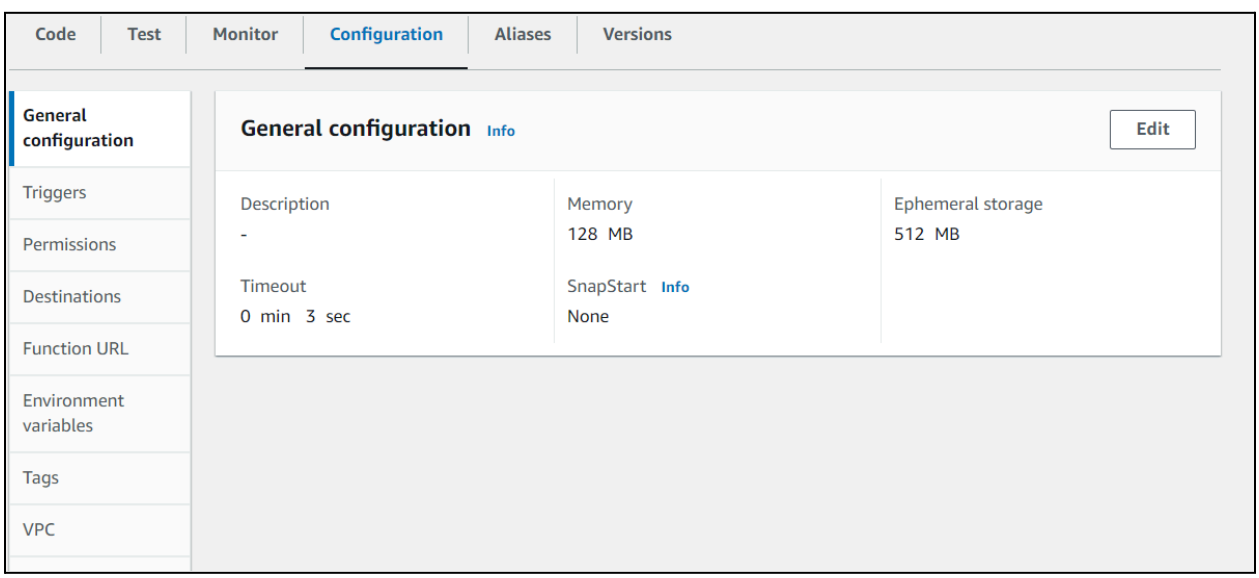
-

3. This process will take a while to finish and after that, you'll get a message that your function was successfully created

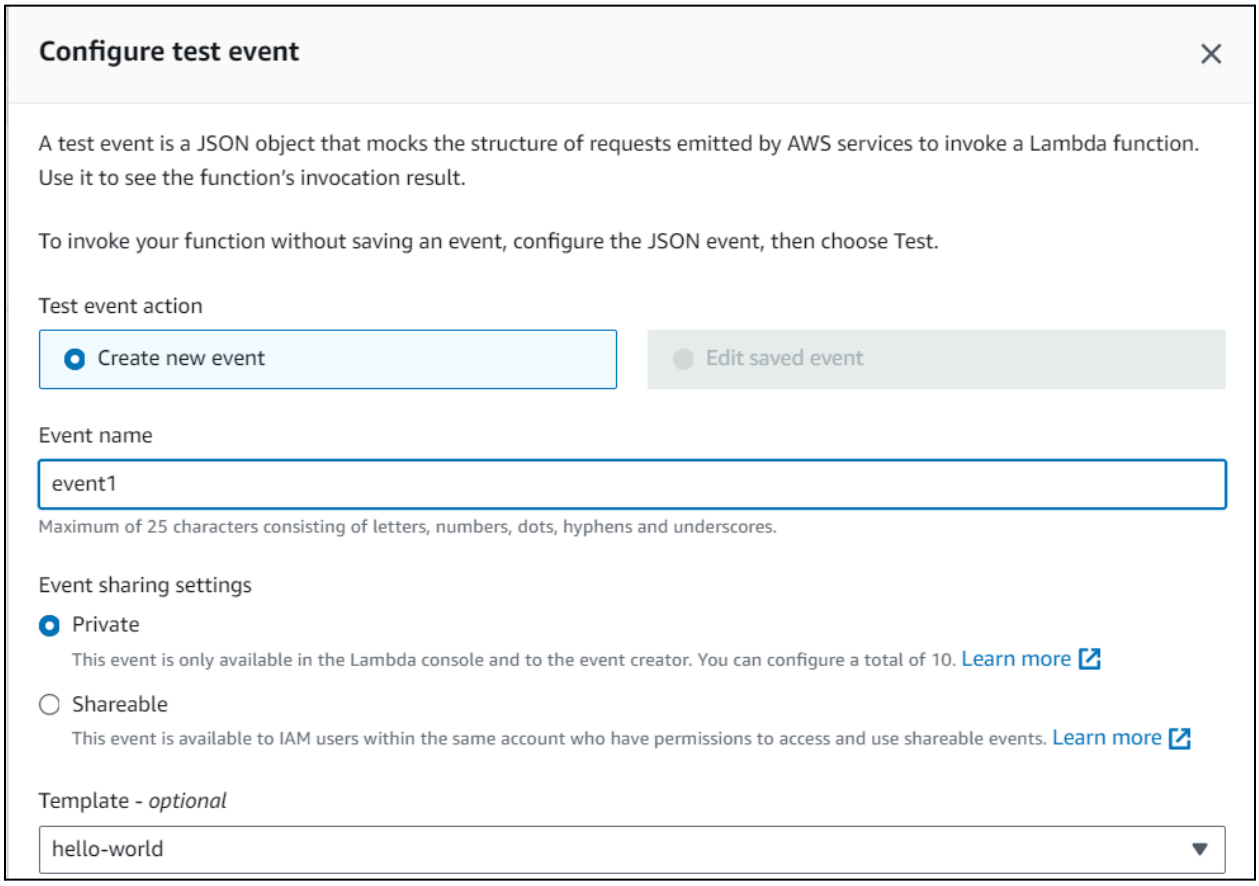


Edit Basic Settings:

- On the function's **Configuration** tab, locate the **Basic settings** section



Configuring test event which tiggers when the function is tested



The test event **event1** was successfully saved.

Code | Test | Monitor | Configuration | Aliases | Versions

Code source Info

Upload from

File Edit Find View Go Tools Window **Test** Deploy

Go to Anything (Ctrl-P)

lambda_function × Environment Vari ×

Environment

lambdafunction-1

lambda_function.py

```
import json

def lambda_handler(event, context):
    # TODO implement
    return {
        'statusCode': 200,
        'body': json.dumps('Hello from Lambda!')
    }

```

Code | Test | Monitor | Configuration | Aliases | Versions

Code source Info

Upload from

File Edit Find View Go Tools Window **Test** Deploy

Go to Anything (Ctrl-P)

lambda_functi × Environment V × **Execution results** ×

Environment

lambdafunction-1

lambda_function.py

Execution results | Status: Succeeded | Max memory used: 33 MB | Time: 2.85 ms

Test Event Name

```
event1
```

Response

```
{
  "statusCode": 200,
  "body": "\"Hello from Lambda!\""
}
```

Function Logs

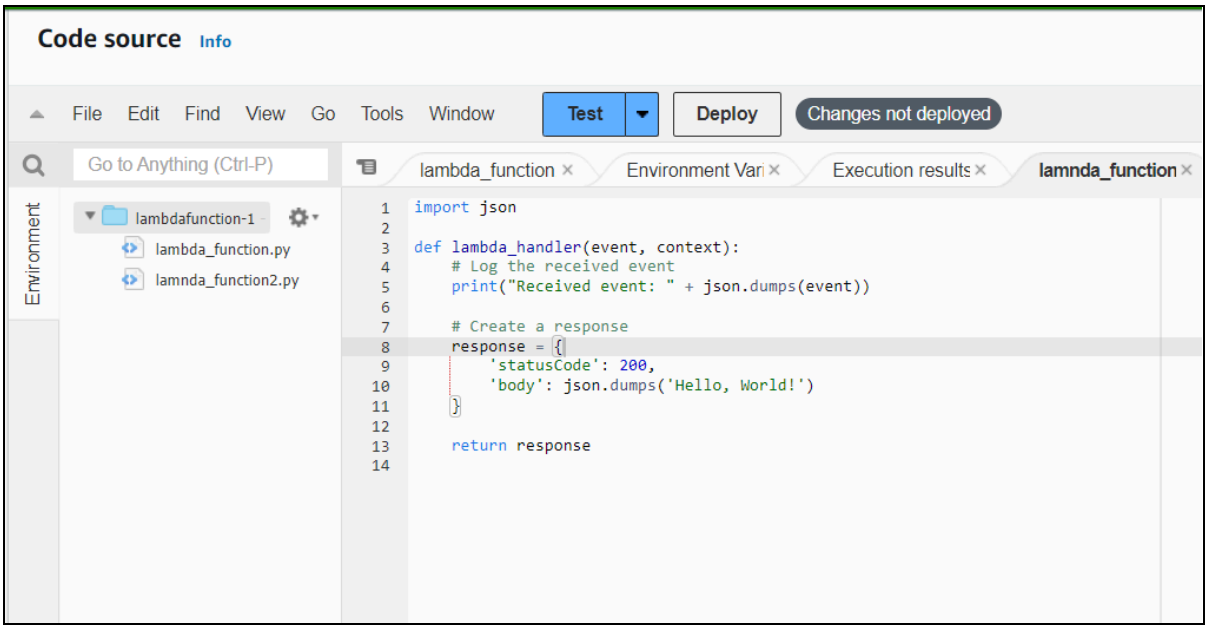
```
START RequestId: dee8d104-dcbf-4add-815a-f83158f5a87f Version: $LATEST
END RequestId: dee8d104-dcbf-4add-815a-f83158f5a87f
REPORT RequestId: dee8d104-dcbf-4add-815a-f83158f5a87f  Duration: 2.85 m
```

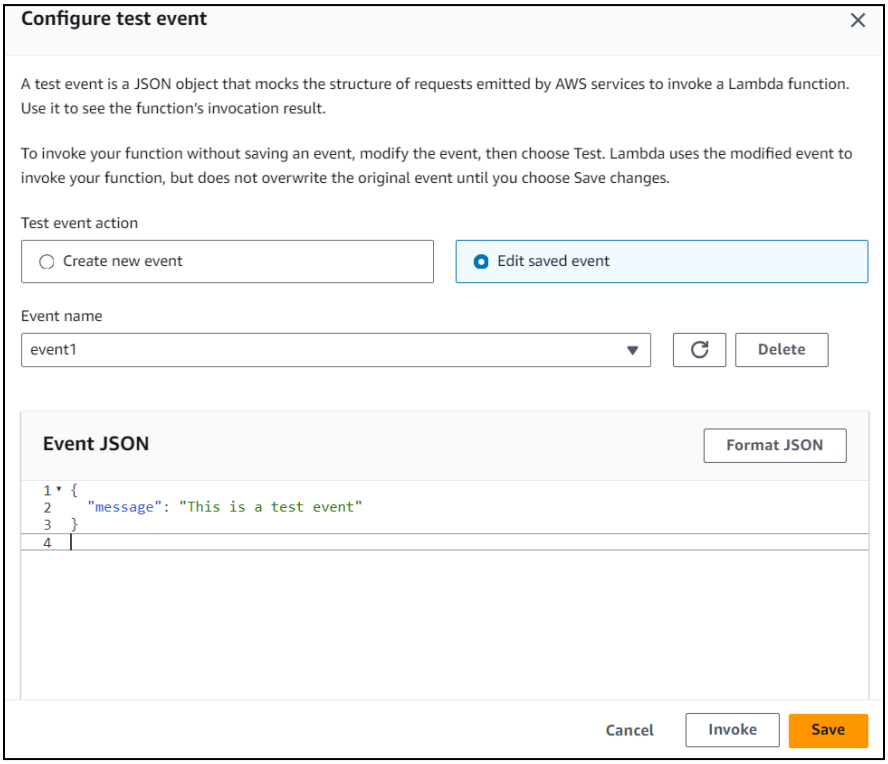
Request ID

```
dee8d104-dcbf-4add-815a-f83158f5a87f
```

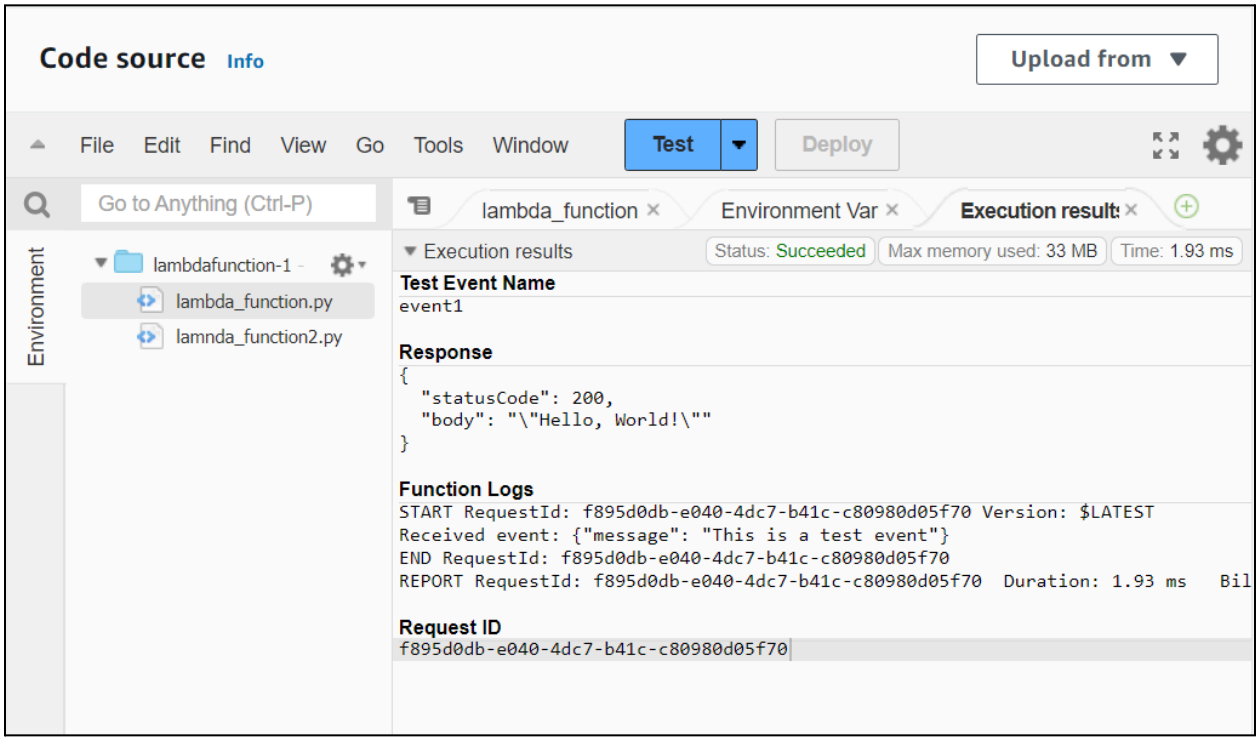
Basic "Hello, World!" Lambda Function (Python)

1. Open the AWS Lambda Console.
2. Create a new function.
3. Use the following code to test the Lambda function.





- The `lambda_handler` function is the entry point for Lambda execution.
- The function logs the received event, processes it (in this case, just returns "Hello, World!"), and sends a response with HTTP status code `200`.



Conclusion:

AWS Lambda is a serverless computing service that allows you to run code without managing servers, making it highly scalable, cost-effective, and easy to use. It automatically manages the compute resources, executes your code in response to specific events such as API calls, file uploads, or database updates, and scales based on the demand