

Experiment 11

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

Theory:

AWS Lambda

A fully managed, serverless computing service where you run code without provisioning or managing servers. Lambda automatically scales your application based on the number of incoming requests or events, ensuring efficient resource utilization. You are only charged for the time your code is running, with no upfront cost, making it cost-effective for on-demand workloads.

Lambda Workflow

- **Create a Function:** Write the function code and define its handler (entry point). You can use the AWS Console, CLI, or upload a deployment package.
- **Set Event Sources:** Define how the function is triggered (e.g., when an object is uploaded to S3 or a DynamoDB table is updated).
- **Execution:** When triggered, Lambda runs your function, executes the logic, and automatically scales to handle the incoming event volume.
- **Scaling and Concurrency:** Lambda scales automatically by launching more instances of the function to handle simultaneous invocations. There are also options for configuring **reserved concurrency** to manage traffic.
- **Monitoring and Logging:** Lambda integrates with Amazon CloudWatch for logging and monitoring. Logs for each invocation are sent to CloudWatch, allowing you to track performance and troubleshoot errors.

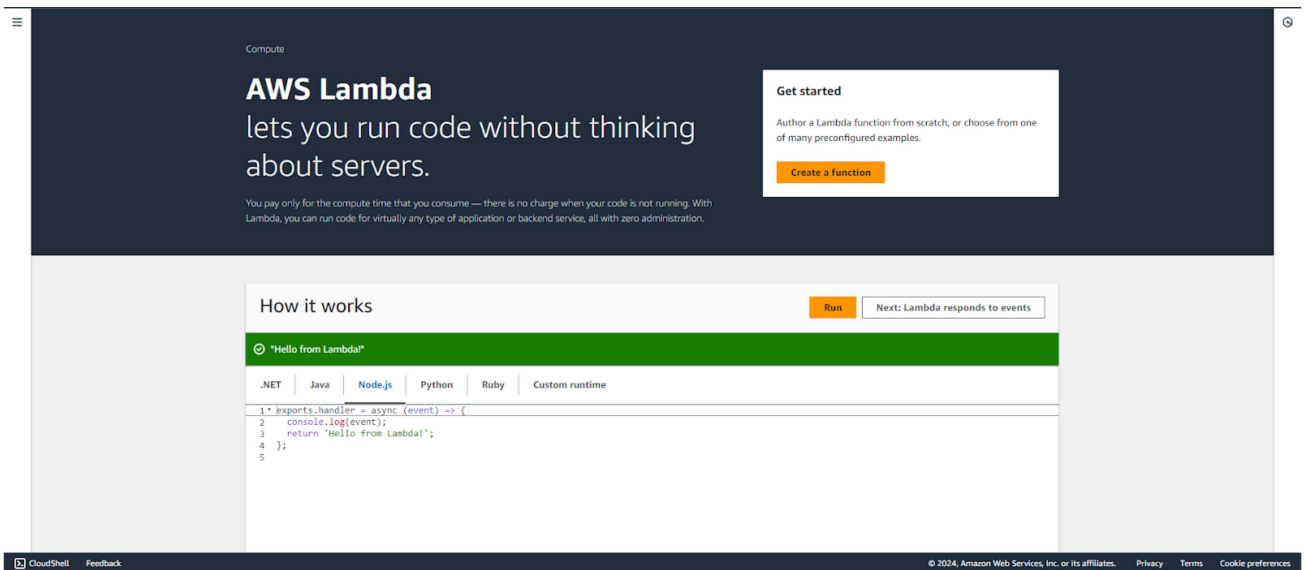
AWS Lambda Functions

- **Python:** Great for quick development with its rich standard library and support for lightweight tasks.
- **Java:** Typically used for more complex, compute-intensive tasks. While it's robust, cold start times can be higher.
- **Node.js:** Excellent for I/O-bound tasks like handling APIs or streaming data, with fast startup times and efficient memory usage.

Prerequisites: AWS Personal/Academy Account

Steps To create the lambda function:

Step 1: Login to your AWS Personal/Academy Account. Open lambda and click on create function button.



Step 2: Now Give a name to your Lambda function, Select the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby. So will select Python 3.12, Architecture as x86, and Execution role to Create a new role with basic Lambda permissions.

[Lambda](#) > [Functions](#) > Create function

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
Enter a name that describes the purpose of your function.

MyLambda

Use only letters, numbers, hyphens, or underscores with no spaces.

Runtime [Info](#)
Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.

Python 3.12

Architecture [Info](#)
Choose the instruction set architecture you want for your function code.

☒ x86_64

☐ arm64

Python 3.12

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

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

Role creation might take a few minutes. Please do not delete the role or edit the trust or permissions policies in this role.

Lambda will create an execution role named `Bhushan_Lambda-role-pbjr1991`, with permission to upload logs to Amazon CloudWatch Logs.

► Advanced settings

Cancel

Create function

CloudShell

Feedback

Lambda > Functions > myLambda

myLambda

Throttle

Copy ARN

Actions

▼ Function overview

Info

Export to Application Composer

Download

Diagram

Template

myLambda

Layers (0)

+ Add trigger

+ Add destination

Description

-

Last modified

4 minutes ago

Function ARN

[arn:aws:lambda:eu-north-1:860015268757:function:myLambda](#)

Function URL

[Info](#)

-

Code

Test

Monitor

Configuration

Aliases

Versions

Code source

Info

Upload from

File

Edit

Find

View

Go

Tools

Window

Test

Deploy

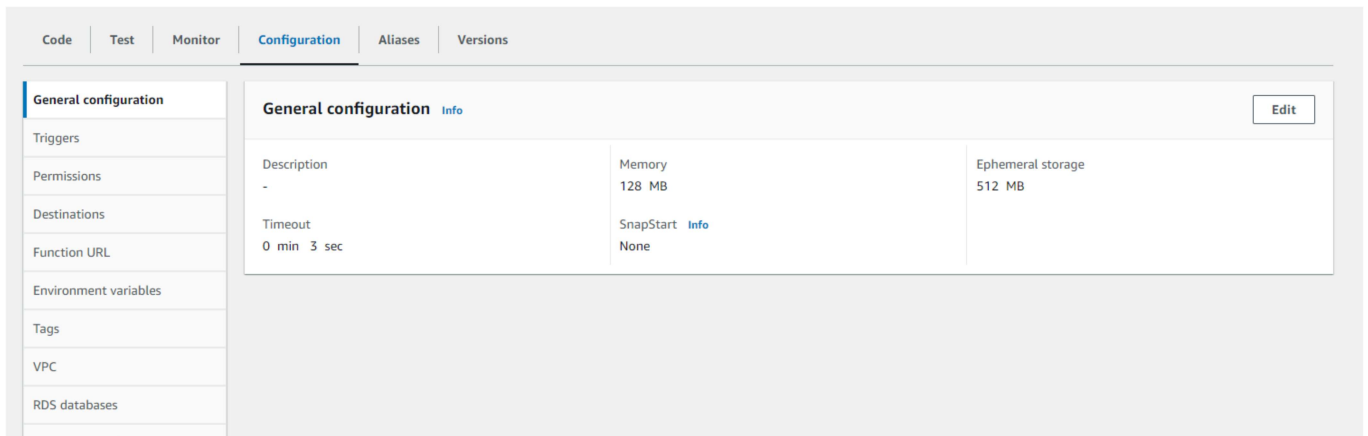
Go to Anything (Ctrl-P)

myLambda

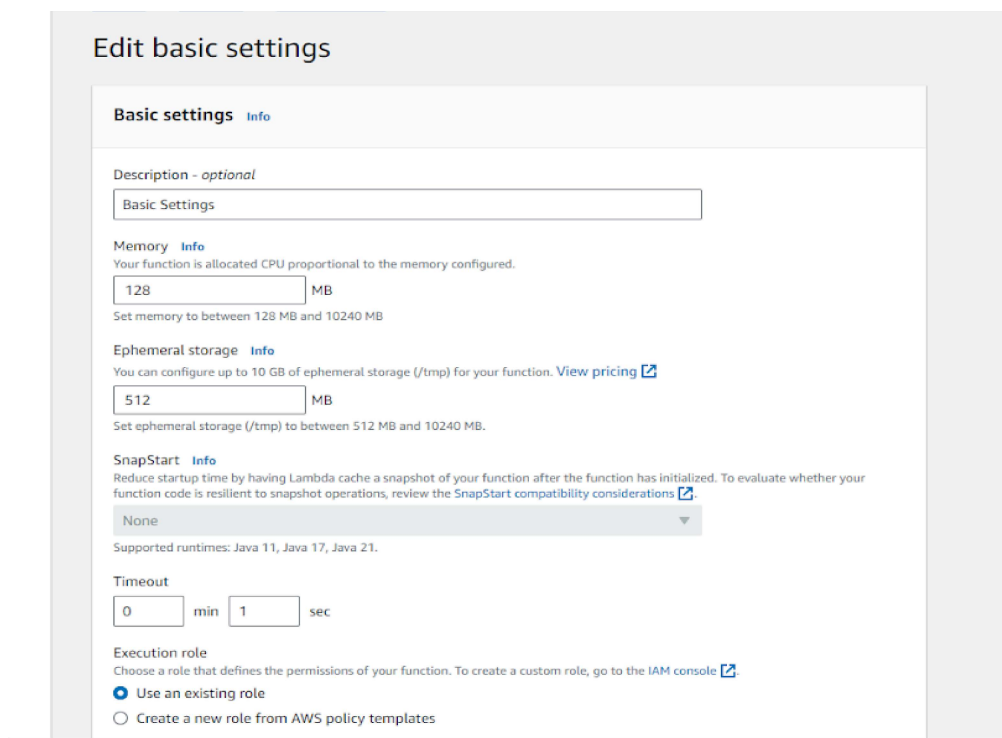
lambda_function.py

```
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
```

So See or Edit the basic settings go to configuration then click on edit general setting.



Here, you can enter a description and change Memory and Timeout. I've changed the Timeout period to 1 sec since that is sufficient for now.



Step 3: Now Click on the Test tab then select Create a new event, give a name to the event and select Event Sharing to private, and select hello-world template.

Test event [Info](#) 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

MyEvent

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](#)

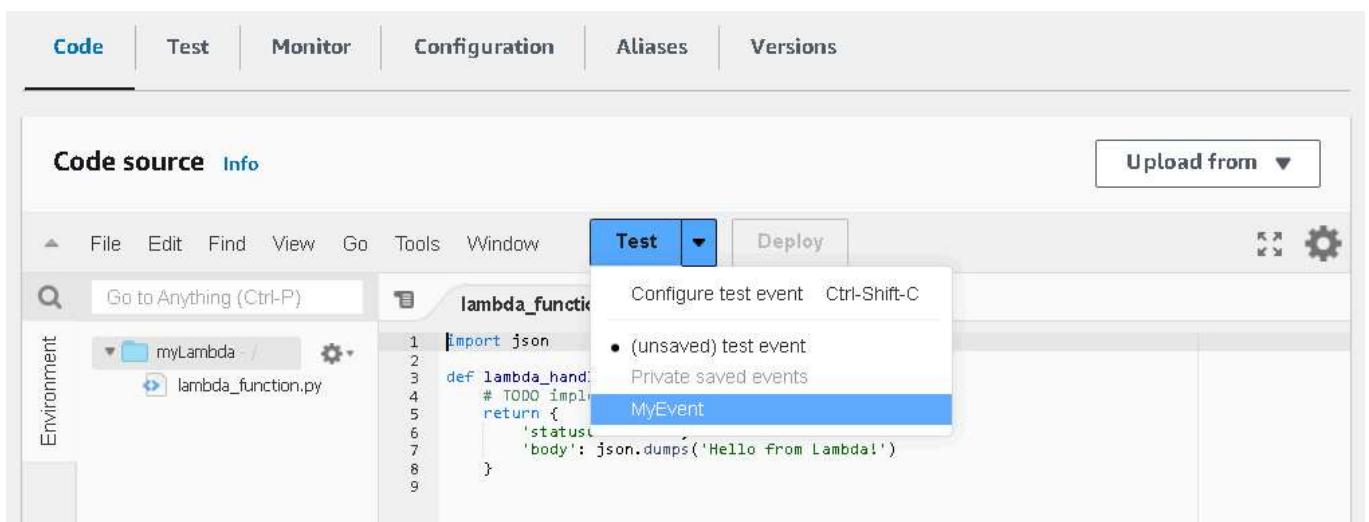
Template - optional

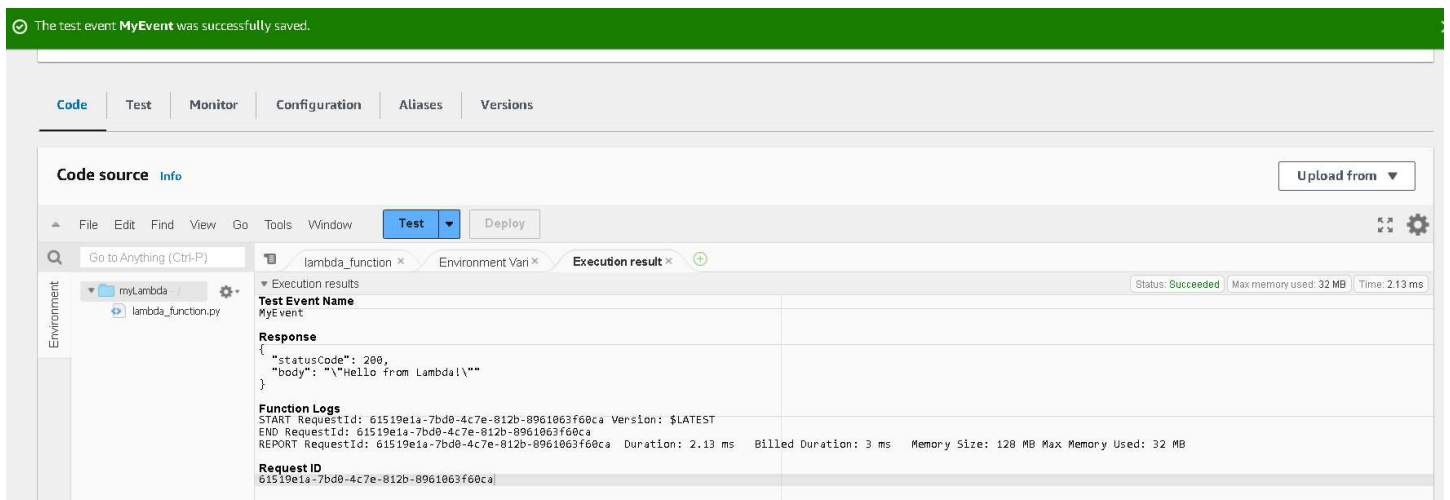
hello-world

Event JSON Format JSON

```
1 {
2   "key1": "value1",
3   "key2": "value2",
4 }
```

Step 4: Now In the Code section select the created event from the dropdown of test then click on test . You will see the below output.

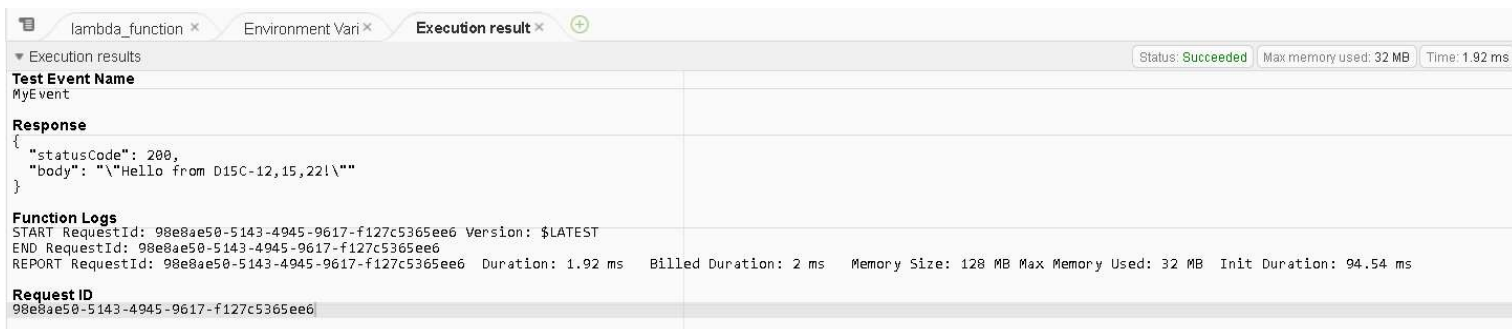




Step 5: You can edit your lambda function code. I have changed the code to display the new String.



Step 6: Now click on the test and observe the output. We can see the status code 200 and your string output and function logs. On successful deployment.



Conclusion:

In this experiment, we successfully implemented an AWS Lambda function, covering all the key steps involved. Starting with the function's setup in Python, we configured essential settings such as adjusting the timeout to 1 second. A test event was then created, followed by deploying the function and verifying its output. We also made code modifications to the Lambda function, redeployed it, and observed the real-time effects of these changes. This hands-on experience highlighted the ease and adaptability of AWS Lambda for building serverless applications, enabling developers to concentrate on writing code while AWS handles infrastructure and scalability.