

St. Francis Institute of Technology, Mumbai-400 103  
**Department Of Information Technology**

A.Y. 2023-2024

Class: TE-ITA/B, Semester: V

Subject: **Advanced DevOps Lab**

**Experiment – 11: To understand AWS Lambda, its workflow, and to create the first Lambda function using Python/Java.**

- 1. Aim:** To write first Lambda function using Python/Java/Node.js.
- 2. Objectives:** Aim of this experiment is that, the students will learn:
  - Serverless cloud concept and how to create Lambda function in various languages
  - Invoke Lambda function
  - Monitoring AWS Lambda
- 3. Lab objective mapped : ITL504.6:** To demonstrate a composition of nano services using AWS Lambda and Create Functions with the Serverless Framework.
- 4. Prerequisite:** Knowledge of Python/Java/Node.js , AWS console.
- 5. Requirements:** AWS account, browser, Personal Computer, Windows operating system, Internet Connection, Google Doc.
- 6. Pre-Experiment Exercise:**

Answer the following (write in hand)

Explain Serverless concept?

What are the applications of AWS Lambda?

**Brief Theory:**

AWS Lambda is a compute service that lets you run code without provisioning or managing servers.

Lambda runs your code on a high-availability compute infrastructure and performs all of the administration of the compute resources, including server and operating system maintenance, capacity provisioning and automatic scaling, and logging. With Lambda, all you need to do is supply your code in one of the language runtimes that Lambda supports.

When to use Lambda

Lambda is an ideal compute service for application scenarios that need to scale up rapidly, and scale down to zero when not in demand. For example, you can use Lambda for:

**File processing:** Use Amazon Simple Storage Service (Amazon S3) to trigger Lambda data processing in real time after an upload.

**Stream processing:** Use Lambda and Amazon Kinesis to process real-time streaming data for application activity tracking, transaction order processing, clickstream analysis, data cleansing, log filtering, indexing, social media analysis, Internet of Things (IoT) device data telemetry, and metering.

**Web applications:** Combine Lambda with other AWS services to build powerful

web applications that automatically scale up and down and run in a highly available configuration across multiple data centers.

**IoT backends:** Build serverless backends using Lambda to handle web, mobile, IoT, and third-party API requests.

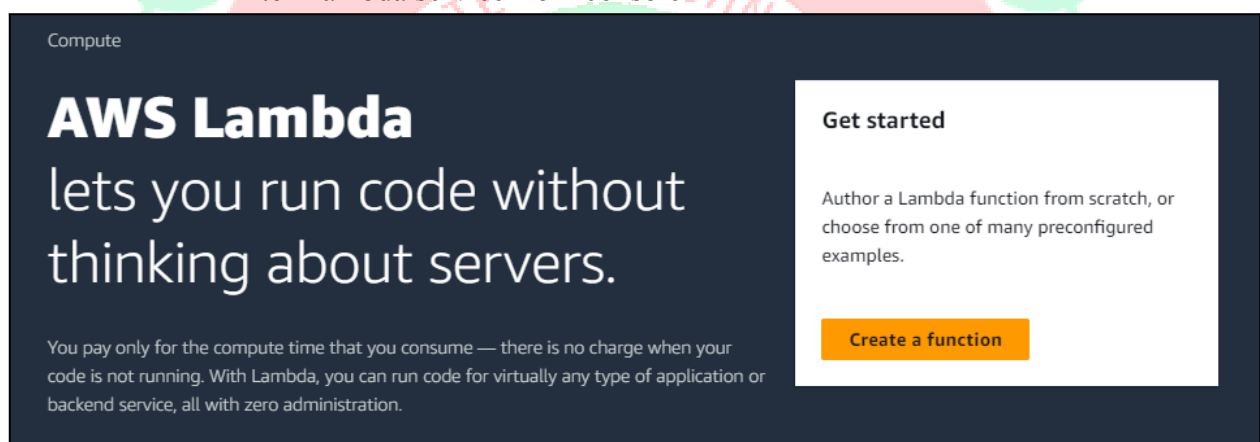
**Mobile backends:** Build backends using Lambda and Amazon API Gateway to authenticate and process API requests. Use AWS Amplify to easily integrate with your iOS, Android, Web, and React Native frontends.

## 7. Laboratory Exercise

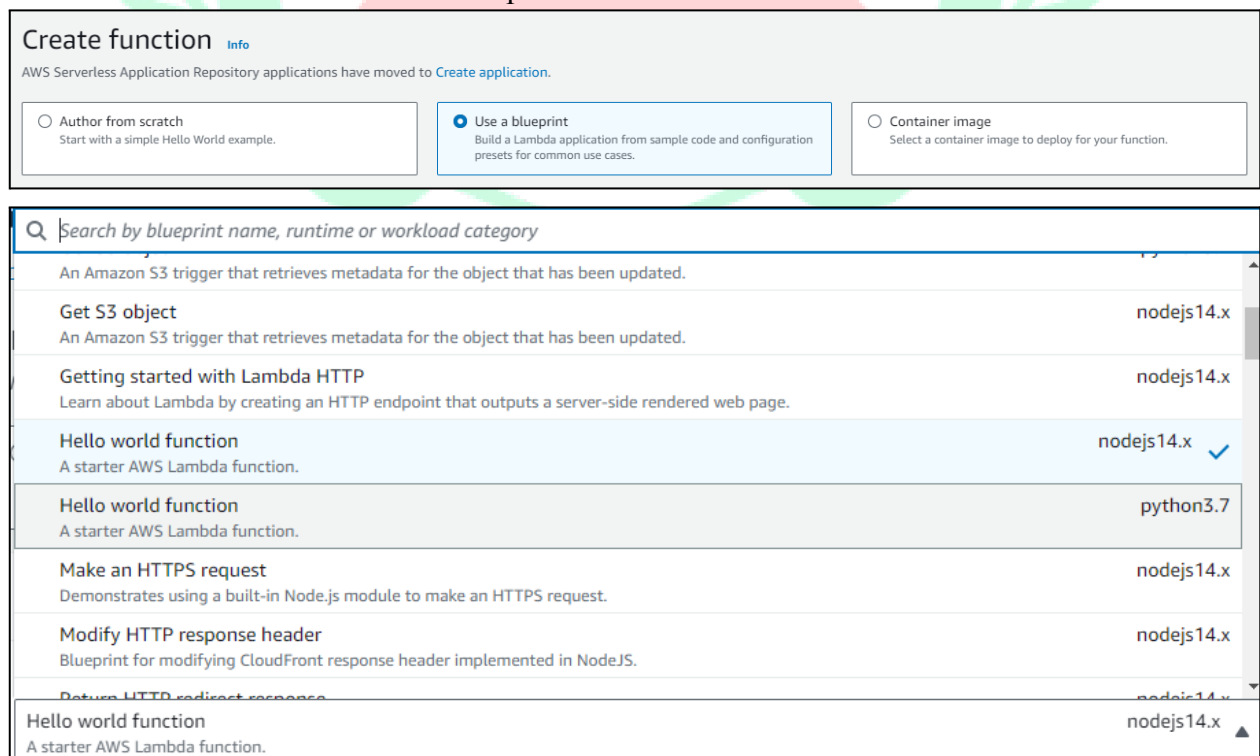
### A. Procedure:

#### a. Perform following steps (attach screenshots)

- Enter Lambda service from console



- Select a Lambda Blueprint



## ● Configure and create Lambda function

**Basic information** [Info](#)

Blueprint name

Hello world function python3.7 ▼  
A starter AWS Lambda function.

Function name

Enter a name that describes the purpose of your function.

exp11

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

Runtime

python3.7

Architecture

x86\_64

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

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

Role name

Enter a name for your new role.

exp11\_role

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

Policy templates - optional [Info](#)

Choose one or more policy templates.

⌂

**Lambda function code**

Code is preconfigured by the chosen blueprint. You can configure it after you create the function. [Learn more](#) about deploying Lambda functions.

**i** This function contains external libraries. ✕

```
1 import json
2
3 print('Loading function')
4
5
6 def lambda_handler(event, context):
7     #print("Received event: " + json.dumps(event, indent=2))
8     print("value1 = " + event['key1'])
9     print("value2 = " + event['key2'])
10    print("value3 = " + event['key3'])
11    return event['key1'] # Echo back the first key value
12    #raise Exception('Something went wrong')
13
```

Cancel **Create function**


Successfully created the function **exp11**. You can now change its code and configuration. To invoke your function with a test event, choose "Test".

Lambda > Functions > exp11

## exp11

Throttle Copy ARN Actions

▼ Function overview Info

 **exp11**

Layers (0)

+ Add trigger + Add destination

Description  
A starter AWS Lambda function.

Last modified  
4 seconds ago

Function ARN  
arn:aws:lambda:us-east-1:236065583350:function:exp11

### • Invoke Lambda function and verify results

Successfully created the function **exp11**. You can now change its code and configuration. To invoke your function with a test event, choose "Test".

Code properties Info

Package size 443.0 byte	SHA256 hash N71jaLKYg6lnKElqS0LcYLBBLR5oHMwIOUTWRZBBnNU=	Last modified September 5, 2023 at 01:23 PM GMT+5:30
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Runtime settings Info

Runtime  
Python 3.7

Handler Info  
lambda\_function.lambda\_handler

Architecture Info  
x86\_64

▶ Runtime management configuration Edit Edit runtime management configuration

Test ▼ Deploy

Configure test event Ctrl-Shift-C

## Configure test event

A test event is a JSON object that mocks the structure of requests emitted by AWS services to invoke a Lambda function. Use it to see the function's invocation result.

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

exp11\_event

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

Template - optional

hello-world

**Event JSON** Format JSON

```

1 {
2   "key1": "darish",
3   "key2": "dias",
4   "key3": "sfit"
5 }

```

Cancel Invoke Save

✓ The test event **exp11\_event** was successfully saved.

### Execution results:

Tools Window Test Deploy

lambda\_function x Environment Var x Execution result: x

Execution results Status: Succeeded Max memory used: 36 MB Time: 17.04 ms

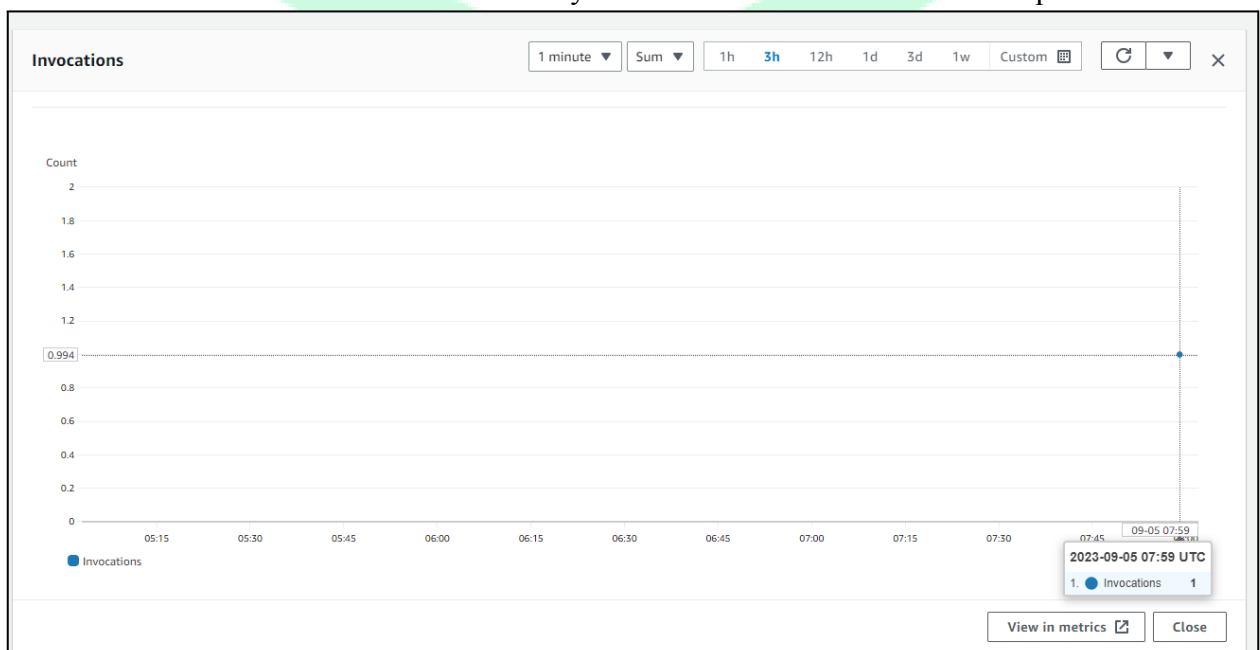
**Test Event Name**  
exp11\_event

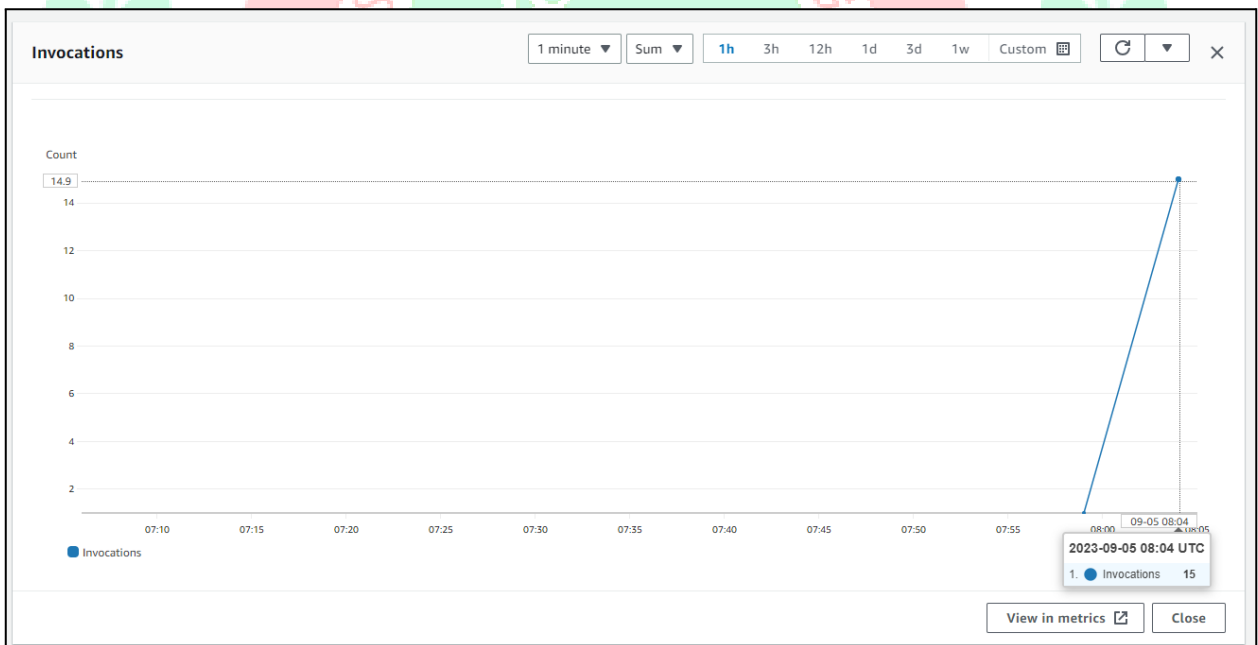
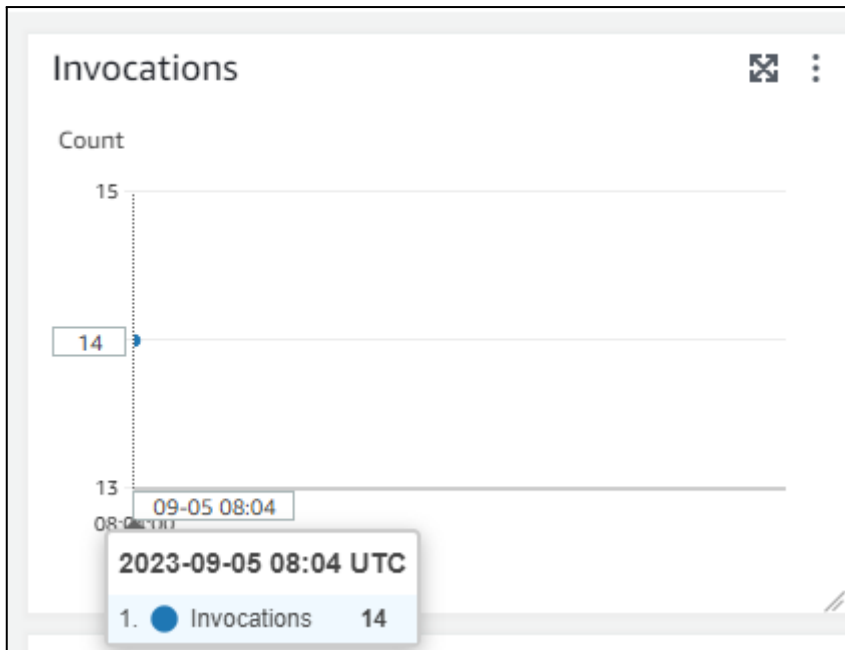
**Response**  
"darish"

**Function Logs**  
 Loading function  
 START RequestId: 05d30824-2005-4343-90b0-37bc213a6442 Version: \$LATEST  
 value1 = darish  
 value2 = dias  
 value3 = sfit  
 END RequestId: 05d30824-2005-4343-90b0-37bc213a6442  
 REPORT RequestId: 05d30824-2005-4343-90b0-37bc213a6442 Duration: 17.04 ms Billed Duration: 18 ms Memory Size: 128 MB Max Memory Used: 36 MB Init Durati

**Request ID**  
05d30824-2005-4343-90b0-37bc213a6442

- AWS Lambda automatically monitors Lambda functions and reports metrics





### ● Clean up Lambda function

Lambda > Functions

Functions (1) Last fetched 1 second ago Actions Create function

Filter by tags and attributes or search by keyword

	Function name	Description	Package type	Runtime	Last modified
<input type="checkbox"/>	exp11	A starter AWS Lambda function.	Zip	Python 3.7	15 minutes ago

### Delete 1 functions

**⚠** Deleting a function permanently removes the function code. The related logs, roles, test event schemas, and triggers are retained in your account.

✔ exp11

To confirm deletion, type **delete** in the field.

Cancel Close

Lambda > Functions

Functions (0) Last fetched 44 seconds ago Actions Create function

Filter by tags and attributes or search by keyword

< 1 >

Function name	Description	Package type	Runtime	Last modified
There is no data to display.				

Role deletion:

**IAM resources**

Resources in this AWS Account

User groups	Users	Roles	Policies	Identity providers
0	0	3	1	0

IAM > Roles

**Roles (Selected 1/3)**

An IAM role is used to grant permissions to an AWS service or user. Roles are typically used for short duration tasks.

Search

☐ AWS

☐ AWS

☒ exp11\_role

**Roles Any**

Authenticate y

**Delete exp11\_role?**

Delete **exp11\_role** permanently? This will also delete all its inline policies and any attached instance profiles.

Role name	Last activity
exp11_role	-

Note: Recent activity usually appears within 4 hours. Data is stored for a maximum of 365 days, depending when your region began supporting this feature. [Learn more](#)

This action cannot be undone.

To confirm deletion, enter the role name in the text input field.

Cancel Delete

✓ Role deleted exp11\_role.

## 8. Post-Experiments Exercise

### A. Extended Theory:(attach SS)

Create the Lambda function using Node.js

### B. Questions:(write in hand)

- What is an AWS Lambda function?
- EC2 vs Lambda vs Elastic Beanstalk
- Technical Limitations of AWS Lambda :
  - a. The maximum time a function can run is \_\_\_\_minutes.
  - b. The default timeout is \_\_\_\_.
  - c. Lambda is unsuitable for \_\_\_\_\_ (long-running workloads / short-running workloads).
  - d. The payload for each invocation of a Lambda function is limited to \_\_MB.
  - e. \_\_\_\_\_ is limited to just under 3GB.

### C. Conclusion:(write in hand)

1. Write what was performed in the experiment
2. Mention few applications of what was studied.
3. Write the significance of the studied topic

### D. References:

1. <https://aws.amazon.com/getting-started/hands-on>
  2. <https://www.scalyr.com/blog/aws-lambda-tutorial/>
  3. <https://docs.aws.amazon.com/lambda/latest/dg/welcome.html>
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