

Advanced Devops Lab
Experiment No:12

Aim: To create a Lambda function which will log “An Image has been added” once you add an object to a specific bucket in S3

Theory:

AWS Lambda and S3 Integration: AWS Lambda allows you to execute code in response to various events, including those triggered by Amazon S3. When an object is added to an S3 bucket, it can trigger a Lambda function to execute, allowing for event-driven processing without managing servers.

Workflow:

1. Create an S3 Bucket:

- First, create an S3 bucket that will store the objects. This bucket will act as the trigger source for the Lambda function.

2. Create the Lambda Function:

- Set up a new Lambda function using AWS Lambda’s console. You can choose a runtime environment like Python, Node.js, or Java.
- Write code that logs a message like “An Image has been added” when triggered.

3. Set Up Permissions:

- Ensure that the Lambda function has the necessary permissions to access S3. You can do this by attaching an IAM role with policies that allow reading from the bucket and writing logs to CloudWatch.

4. Configure S3 Trigger:

- Link the S3 bucket to the Lambda function by setting up a trigger. Specify that the function should be triggered when an object is created in the bucket (e.g., when an image is uploaded).

5. Test the Setup:

- Upload an object (e.g., an image) to the S3 bucket to test the trigger. The Lambda function should execute and log the message “An Image has been added” in AWS CloudWatch

Create bucket Info

Buckets are containers for data stored in S3.

General configuration

AWS Region

US East (N. Virginia) us-east-1

Bucket type Info



General purpose

Recommended for most use cases and access patterns. General purpose buckets are the original S3 bucket type. They allow a mix of storage classes that redundantly store objects across multiple Availability Zones.



Directory

Recommended for low-latency use cases. These buckets use only the S3 Express One Zone storage class, which provides faster processing of data within a single Availability Zone.

Bucket name Info

snehallambdabuck

Bucket name must be unique within the global namespace and follow the bucket naming rules. [See rules for bucket naming](#)

Copy settings from existing bucket - optional

Only the bucket settings in the following configuration are copied.

Choose bucket

Format: s3://bucket/prefix

☑ Successfully created bucket "snehallambdabuck"

[View details](#)

To upload files and folders, or to configure additional bucket settings, choose [View details](#).

► **Account snapshot - updated every 24 hours** All AWS Regions

Storage lens provides visibility into storage usage and activity trends. [Learn more](#)

[View Storage Lens dashboard](#)

General purpose buckets

Directory buckets

General purpose buckets (2) Info All AWS Regions

Buckets are containers for data stored in S3.



Copy ARN

Empty

Delete

Create bucket

< 1 >

	Name ▲	AWS Region ▼	IAM Access Analyzer	Creation date ▼
<input type="radio"/>	elasticbeanstalk-us-east-1-608111999703	US East (N. Virginia) us-east-1	View analyzer for us-east-1	August 18, 2024, 16:04:27 (UTC+05:30)
<input type="radio"/>	snehallambdabuck	US East (N. Virginia) us-east-1	View analyzer for us-east-1	October 3, 2024, 14:54:58 (UTC+05:30)

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.

Basic information

Function name

Enter a name that describes the purpose of your function.

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.



Architecture Info

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

☒ x86_64

☐ arm64

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

Snehalimageloader

Throttle

Copy ARN

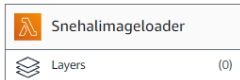
Actions

Function overview Info

Export to Application Composer

Download

Diagram Template



+ Add trigger

+ Add destination

Description

-

Last modified

3 seconds ago

Function ARN

arn:aws:lambda:us-east-1:608111999703:function:Snehalimageloader

Function URL Info

-

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

Code

Test

Monitor

Configuration

Aliases

Versions

Code source Info

File Edit Find View Go Tools Window Test Deploy Changes not deployed

Go to Anything (Ctrl-P)

Snehalimageloader
lambda_function.py

```

1  import json
2
3  def lambda_handler(event, context):
4      # Extract bucket name and object key from the event
5
6      bucket_name = event['Records'][0]['s3']['bucket']['name']
7      object_key = event['Records'][0]['s3']['object']['key']
8
9      # Log a message
10
11      print(f"An Image has been added to the bucket {bucket_name}: {object_key}")
12
13      return {
14          'statusCode': 200,
15          'body': json.dumps('Log entry created successfully')
16      }
17
18
19  
```

Trigger configuration [Info](#)



S3

aws

asynchronous

storage



Bucket

Choose or enter the ARN of an S3 bucket that serves as the event source. The bucket must be in the same region as the function.

Q s3/snehallambdabuck



Bucket region: us-east-1

Event types

Select the events that you want to have trigger the Lambda function. You can optionally set up a prefix or suffix for an event. However, for each bucket, individual events cannot have multiple configurations with overlapping prefixes or suffixes that could match the same object key.

All object create events

Prefix - optional

Enter a single optional prefix to limit the notifications to objects with keys that start with matching characters. Any [special characters](#) must be URL encoded.

e.g. images/

Suffix - optional

Enter a single optional suffix to limit the notifications to objects with keys that end with matching characters. Any [special characters](#) must be URL encoded.

e.g. .jpg

[Lambda](#) > [Functions](#) > Snehalimageloader

Snehalimageloader

Throttle

Copy ARN

Actions

The trigger snehallambdabuck was successfully added to function Snehalimageloader. The function is now receiving events from the trigger.



Function overview [Info](#)

Export to Application Composer

Download

Diagram

Template



Snehalimageloader



Layers (0)



S3

+ Add trigger

+ Add destination

Description

-

Last modified

8 minutes ago

Function ARN

arn:aws:lambda:us-east-1:608111999703:function:Snehalimageloader

Function URL [Info](#)

-

Code Test Monitor **Configuration** Aliases Versions

General configuration

Triggers

Permissions

Destinations

Function URL

Environment variables

Tags

VPC

RDS databases

Monitoring and operations tools

Concurrency and recursion detection

Triggers (1) [Info](#)



Fix errors

Edit

Delete

Add trigger

Q Find triggers

< 1 >

☐ Trigger



S3: snehallambdabuck

arn:aws:s3::snehallambdabuck

► Details

RDS databases

Monitoring and operations tools

Concurrency and recursion detection

Asynchronous invocation

Code signing

File systems

State machines

Resource-based policy statements (1) Info

View policyEditDeleteAdd permissions

Find policy statements

Statement ID	Principal	PrincipalOrgID	Conditions	Action
lambda-b9cc7374-337f-...	s3.amazonaws.com	-	StringEquals, ArnLike	lambda:InvokeFunction

Auditing and compliance

AWS CloudTrail can log this function's invocations for operational and risk auditing, governance, and compliance. [Get started](#) on the CloudTrail console.

[Amazon S3](#) > [Buckets](#) > [snehallambdabuck](#) > Upload

Upload Info

Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDK or Amazon S3 REST API. [Learn more](#)

Drag and drop files and folders you want to upload here, or choose [Add files](#) or [Add folder](#).

Files and folders (1 Total, 16.7 KB)

RemoveAdd filesAdd folder

Find by name

Name	Folder	Type
image.png	-	image/png

Destination Info

Destination

[s3://snehallambdabuck](#)

Upload succeededView details below.

The information below will no longer be available after you navigate away from this page.

Summary

Destination

[s3://snehallambdabuck](#)

Succeeded

1 file, 16.7 KB (100.00%)

Failed

0 files, 0 B (0%)

Files and folders

Configuration

Files and folders (1 Total, 16.7 KB)

Find by name

Name	Folder	Type	Size	Status	Error
image.png	-	image/png	16.7 KB	Succeeded	-

CloudWatch

Favorites and recents

Dashboards

Alarms

▼ Logs

Log groups

Log Anomalies

Live Tail

Logs Insights

Contributor Insights

Metrics

X-Ray traces

Events

Application Signals

Network monitoring

Insights

Settings

CloudWatch > Log groups

Log groups (5)

By default, we only load up to 10000 log groups.

Filter log groups or try prefix search

Exact match

< 1 >

Log group

Log class

Anomaly d...

Data p...

Sensit...

Retenti...

Metr

☐

/aws/lambda/RedshiftEventSubscription

Standard

Configure

-

-

Never expire

-

☐

/aws/lambda/RedshiftOverwatch

Standard

Configure

-

-

Never expire

-

☐

/aws/lambda/RoleCreationFunction

Standard

Configure

-

-

Never expire

-

☐

/aws/lambda/Snehalimageloader

Standard

Configure

-

-

Never expire

-

☐

/aws/lambda/lambdaasnehal

Standard

Configure

-

-

Never expire

-

CloudWatch

Favorites and recents

Dashboards

Alarms

▼ Logs

Log groups

Log Anomalies

Live Tail

Logs Insights

Contributor Insights

Metrics

X-Ray traces

Events

Application Signals

Network monitoring

Insights

Settings

CloudWatch > Log groups > /aws/lambda/Snehalimageloader > 2024/10/03/[\$LATEST]6c46989ade5b497a9916f6ff53079c3e

Log events

You can use the filter bar below to search for and match terms, phrases, or values in your log events.

Filter events - press enter to search

Clear

1m

30m

1h

12h

Custom

UTC timezone

Display

Timestamp

Message

No older events at this moment.

2024-10-03T09:39:42.976Z

INIT_START Runtime Version: python:3.12.v36 Runtime Version ARN: arn:aws:lambda:us-east-1::runtime:188d9ca2e2714ff5637bd2bbe...

2024-10-03T09:39:43.065Z

START RequestId: c63cef65-02b0-4076-87ac-0618119d36ef Version: \$LATEST

2024-10-03T09:39:43.067Z

END RequestId: c63cef65-02b0-4076-87ac-0618119d36ef

2024-10-03T09:39:43.067Z

REPORT RequestId: c63cef65-02b0-4076-87ac-0618119d36ef Duration: 2.03 ms Billed Duration: 3 ms Memory Size: 128 MB Max Memor...

No newer events at this moment. Auto retry paused.

Conclusion:

Integrating AWS Lambda with S3 allows for real-time, automated processing of events such as file uploads. In this example, a Lambda function is configured to log a message whenever an image is added to a specific S3 bucket. This setup demonstrates the power and flexibility of serverless computing by automating tasks without requiring manual intervention or server management. By leveraging AWS Lambda, developers can efficiently handle event-driven workflows, reduce operational overhead, and quickly deploy scalable solutions that respond to specific actions within cloud environments.