

**EXPERIMENT: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.

AWS Lambda is a serverless compute service that lets you run code without provisioning or managing servers. It automatically scales your application by running code in response to events. One of the most common use cases for Lambda is integrating it with Amazon S3, a scalable object storage service.

When an object is added to or modified in an S3 bucket, you can configure an S3 event notification to trigger a Lambda function. This event-driven architecture simplifies processing data in real time and reduces the need for manual intervention.

**Key Benefits****1. Serverless Architecture:**

- No need to manage servers or infrastructure. You focus solely on writing code.
- AWS handles scaling automatically based on the number of events.

**2. Cost Efficiency:**

- Pay only for the compute time you consume. You are charged based on the number of requests and the duration of execution.

**3. Real-time Processing:**

- Automatically process files as they are uploaded, allowing for instant reactions to events (e.g., generating thumbnails, analyzing data).

**4. Ease of Integration:**

- Lambda integrates easily with other AWS services, enabling seamless workflows and data processing pipelines.

## Implementation:

### 1. Created a lambda function by selecting runtime as python

**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.  
  
Function name must be 1 to 64 characters, must be unique to the Region, and can't include spaces. Valid characters are a-z, A-Z, 0-9, hyphens (-), and underscores (\_).

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

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

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### 2. Select execution role as lab role

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

**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

**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.  
 [Refresh](#)

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### 3. Create S3 bucket

☑️ Successfully created bucket "rujutabucketnew"

View details

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

General purpose buckets

Directory buckets

General purpose buckets (6) Info All AWS Regions

Refresh Copy ARN Empty Delete Create bucket

Find buckets by name

< 1 > ⚙️

Name	AWS Region	IAM Access Analyzer	Creation date
<input type="radio"/> <a href="#">rujuta-12</a>	US East (N. Virginia) us-east-1	<a href="#">View analyzer for us-east-1</a>	August 22, 2024, 20:49:37 (UTC+05:30)
<input type="radio"/> <a href="#">rujuta-123</a>	US East (N. Virginia) us-east-1	<a href="#">View analyzer for us-east-1</a>	August 22, 2024, 20:44:55 (UTC+05:30)
<input type="radio"/> <a href="#">rujuta-28</a>	US East (N. Virginia) us-east-1	<a href="#">View analyzer for us-east-1</a>	August 22, 2024, 21:00:20 (UTC+05:30)
<input type="radio"/> <a href="#">rujuta.aws</a>	US East (N. Virginia) us-east-1	<a href="#">View analyzer for us-east-1</a>	August 22, 2024, 20:09:18 (UTC+05:30)
<input type="radio"/> <a href="#">rujutabucketnew</a>	US East (N. Virginia) us-east-1	<a href="#">View analyzer for us-east-1</a>	October 10, 2024, 13:11:34 (UTC+05:30)

### 4. Select S3 in triggered configuration

aws

Services

Search

[Alt+S]

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⚙️

N. Virginia

voclabs/user3402844=M

☰

Add trigger

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/rujutabucketnew

×

↺

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/

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lambdanew

ThrottleCopy ARNActions

The trigger rujutabucketnew was successfully added to function lambdanew. The function is now receiving events from the trigger.

Function overviewInfo

Export to Application ComposerDownload

DiagramTemplate

lambdanew

Layers(0)

S3

+ Add trigger

+ Add destination

Description-

Last modified5 minutes ago

Function ARNarn:aws:lambda:us-east-1:665783270038:function:lambdanew

Function URLInfo

CodeTestMonitorConfigurationAliasesVersions

General configuration

TriggersPermissionsDestinationsFunction URLEnvironment variablesTagsVPCRDS databasesMonitoring and

Triggers(1)Info

Find triggers

Trigger

S3: rujutabucketnew

arn:aws:s3:::rujutabucketnew

Details

## 5. Upload image in S3 bucket

awsServicesSearch[Alt+S]

N. Virginiavoclabs/user3402844-MEDHI\_RUJUTA\_VINIT @ 6657-8327-0038

Upload succeededView details below.

Summary

Destination

s3://rujutabucketnew

Succeeded

1 file, 15.1 KB (100.00%)

Failed

0 files, 0 B (0%)

Files and foldersConfiguration

Files and folders(1 Total, 15.1 KB)

Find by name

Name	Folder	Type	Size	Status	Error
aadhar.png	-	image/png	15.1 KB	Succeeded	-

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## 6. Check log events in cloud watch

The screenshot displays the AWS CloudWatch console interface. The left-hand navigation pane includes sections for 'CloudWatch', 'Favorites and recents', 'Dashboards', 'Alarms', 'Logs', 'Metrics', 'X-Ray traces', 'Events', 'Application Signals', and 'Network monitoring'. The 'Logs' section is expanded, showing 'Log groups', 'Log Anomalies', 'Live Tail', 'Logs Insights', and 'Contributor Insights'. The main content area shows the 'Log events' page for the log group '/aws/lambda/lambdanew'. The breadcrumb trail is 'CloudWatch > Log groups > /aws/lambda/lambdanew > 2024/10/10/[LATEST]48263087b4ac46eeb69354d5bc5b5f59'. The page title is 'Log events'. Below the title, there is a search bar with the placeholder text 'Filter events - press enter to search', a time range selector set to '1m', a 'UTC timezone' dropdown, and a 'Display' dropdown. The log events are displayed in a table with two columns: 'Timestamp' and 'Message'. The table shows five log events, each with a timestamp and a message. The first event is 'INIT\_START Runtime Version: python:3.12.v36 Runtime Version ARN: arn:aws:lambda:us-east-1::runtime:188d9ca2e27...'. The second event is 'START RequestId: 737184a9-f8ec-4ede-9601-21c2c7a88c59 Version: \$LATEST'. The third event is 'An image has been added to the bucket rujutabucketnew: aadhar.png'. The fourth event is 'END RequestId: 737184a9-f8ec-4ede-9601-21c2c7a88c59'. The fifth event is 'REPORT RequestId: 737184a9-f8ec-4ede-9601-21c2c7a88c59 Duration: 2.07 ms Billed Duration: 3 ms Memory Size: 12...'. Below the table, there is a message 'No newer events at this moment. Auto retry paused. Resume'.

CloudWatch > Log groups > /aws/lambda/lambdanew > 2024/10/10/[LATEST]48263087b4ac46eeb69354d5bc5b5f59

**Log events**

You can use the filter bar below to search for and match terms, phrases, or values in your log events. [Learn more about filter patterns](#)

Filter events - press enter to search 1m 1h UTC timezone Display

Timestamp	Message
No older events at this moment. <a href="#">Retry</a>	
2024-10-10T07:47:32.068Z	INIT_START Runtime Version: python:3.12.v36 Runtime Version ARN: arn:aws:lambda:us-east-1::runtime:188d9ca2e27...
2024-10-10T07:47:32.165Z	START RequestId: 737184a9-f8ec-4ede-9601-21c2c7a88c59 Version: \$LATEST
2024-10-10T07:47:32.166Z	An image has been added to the bucket rujutabucketnew: aadhar.png
2024-10-10T07:47:32.168Z	END RequestId: 737184a9-f8ec-4ede-9601-21c2c7a88c59
2024-10-10T07:47:32.173Z	REPORT RequestId: 737184a9-f8ec-4ede-9601-21c2c7a88c59 Duration: 2.07 ms Billed Duration: 3 ms Memory Size: 12...
No newer events at this moment. Auto retry paused. <a href="#">Resume</a>	

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