

ADVANCE DEVOPS EXPERIMENT - 12

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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 Logs.

STEPS:-

1. Create an S3 bucket of the same location as that of the Lambda function.

Create bucket [Info](#)

Buckets are containers for data stored in S3.

General configuration

AWS Region
Asia Pacific (Mumbai) ap-south-1

Bucket name [Info](#)

Prajjbucket

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

Bucket Versioning

Versioning is a means of keeping multiple variants of an object in the same bucket. You can use versioning to preserve, retrieve, and restore every version of every object stored in your Amazon S3 bucket. With versioning, you can easily recover from both unintended user actions and application failures. [Learn more](#)

Bucket Versioning

☒ Disable

☐ Enable

Tags - *optional* (0)

You can use bucket tags to track storage costs and organize buckets. [Learn more](#)

No tags associated with this bucket.

Add tag

Default encryption [Info](#)

Server-side encryption is automatically applied to new objects stored in this bucket.

Encryption type [Info](#)

☒ Server-side encryption with Amazon S3 managed keys (SSE-S3)

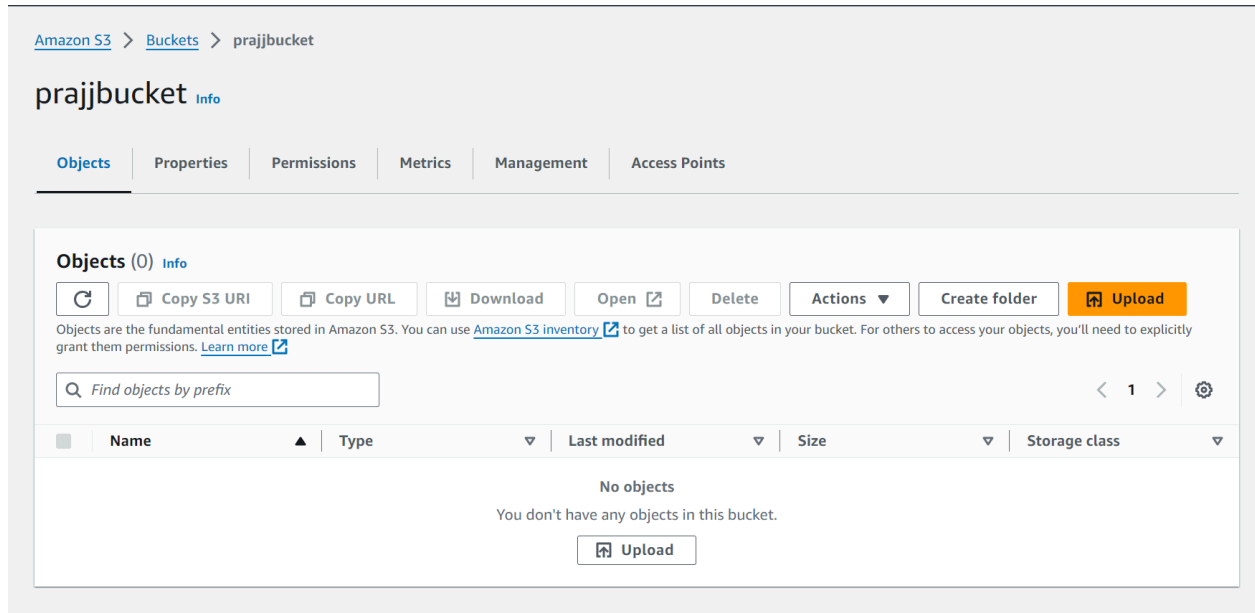
☐ Server-side encryption with AWS Key Management Service keys (SSE-KMS)

☐ Dual-layer server-side encryption with AWS Key Management Service keys (DSSE-KMS)

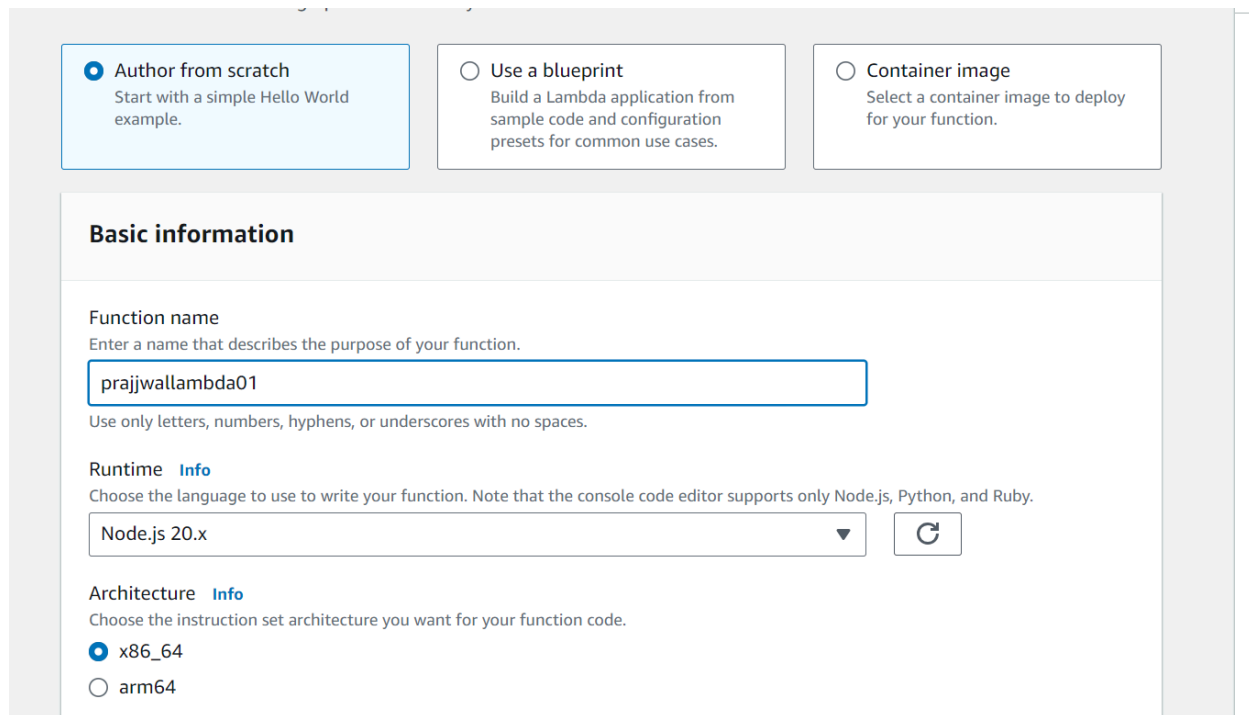
Secure your objects with two separate layers of encryption. For details on pricing, see [DSSE-KMS pricing](#) on the **Storage** tab of the [Amazon S3 pricing page](#).

Bucket Key

Using an S3 Bucket Key for SSE-KMS reduces encryption costs by lowering calls to AWS KMS. S3 Bucket Keys aren't supported for DSSE-KMS.



2. Add roles while creating the Lambda function and give permissions for accessing the S3 bucket.



▼ 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

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.

myroll

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

Policy templates - optional [Info](#)

Choose one or more policy templates.

Amazon S3 object read-only permissions **X**
S3

✓ Successfully created the function **prajjwallambda01**. You can now change its code and configuration. To invoke your function with a test event, choose "Test".

[Lambda](#) > [Functions](#) > prajjwallambda01

prajjwallambda01

Throttle

Copy ARN

Actions ▼

▼ Function overview [Info](#)

Export to Application Composer

Download ▼

Diagram

Template



prajjwalla
mbda01



Layers (0)

+ Add trigger

+ Add destination

Description

-

Last modified

3 seconds ago

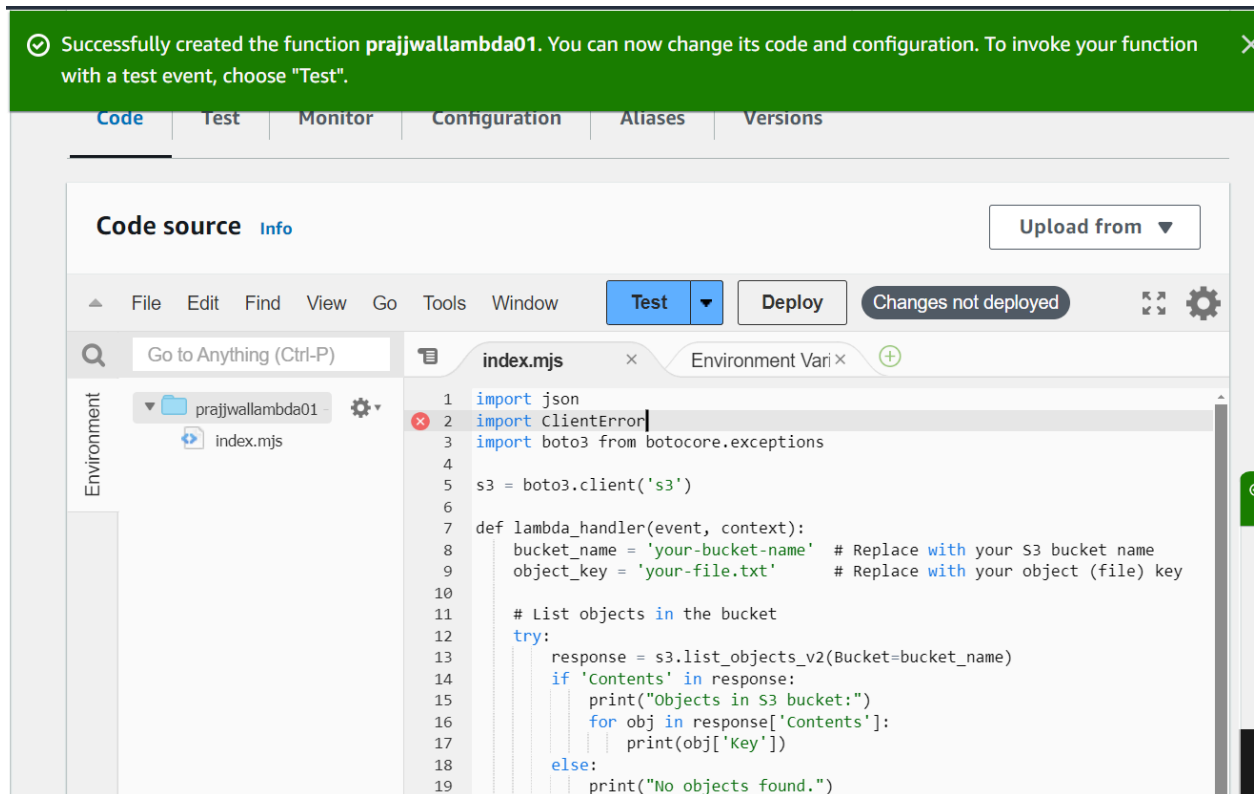
Function ARN

arn:aws:lambda:ap-south-1:183631330334:function:prajjwallambda01

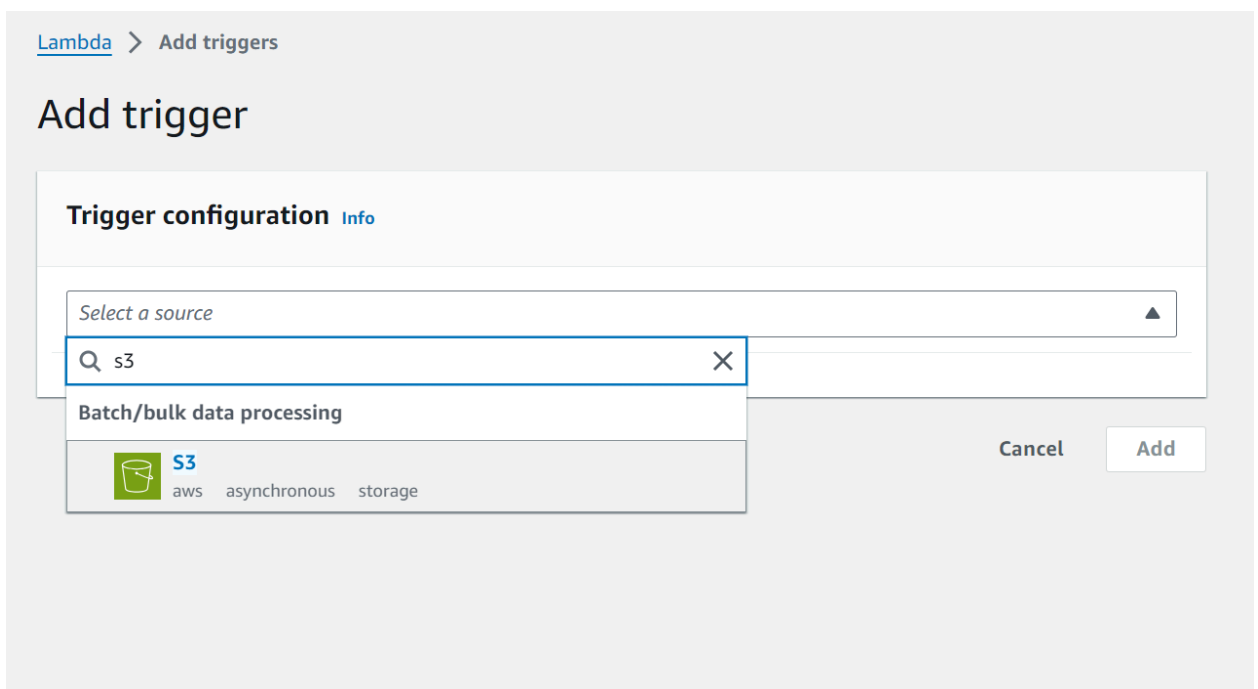
Function URL [Info](#)


-

- After creating the Lambda function copy a code available on the internet which allows the Lambda function to access the S3 bucket contents.



- Add a trigger to the Lambda function so any changes in the S3 bucket will be first visible to the user.





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.

×
↺

Bucket region: ap-south-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.

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.

- In the event notification of the S3 bucket we can see that it has been connected to the Lambda function .

Event notifications (1)					Edit	Delete	Create event notification
Send a notification when specific events occur in your bucket. Learn more							
Name	Event types	Filters	Destination type	Destination			
a9e8e939-9989-4f83-804c-142405582ad4	All object create events	-	Lambda function	prajjwallambda01			

6. Upload a photo to the S3 bucket

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, 964.6 KB)

[Remove](#) [Add files](#) [Add folder](#)

All files and folders in this table will be uploaded.


< 1 >

<input type="checkbox"/>	Name	Folder	Type
<input type="checkbox"/>	Screenshot 2023-12-21 194914.p...	-	image/png



Destination [Info](#)

Destination

[s3://prajjibucket](#)

 **Upload succeeded**
View details below.


Summary

Destination s3://prajjibucket	Succeeded  1 file, 964.6 KB (100.00%)	Failed  0 files, 0 B (0%)
--------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------

[Files and folders](#) | [Configuration](#)

Files and folders (1 Total, 964.6 KB)

< 1 >

Name	Folder	Type	Size	Status	Error
Screenshot 2...	-	image/png	964.6 KB	 Succeeded	-

7. Now run the function and in the cloud watch logs of AWS you can see the message printed and all the other details of the working of the Lambda function.

✓ Successfully updated the function **prajjwallambda01**.

Monitor [Info](#)

[View CloudWatch logs](#)[View X-Ray traces](#)[View Lambda Insights](#)Filter metrics by **Function** ▼☐ Alarm recommendations [?](#)**3h** 1d 1w **3h** [📅](#)

UTC timezone ▼



CloudWatch metrics

Lambda sends runtime metrics for your functions to Amazon CloudWatch. The metrics shown are an aggregate view of all function runtime activity. To view metrics for the unqualified or \$LATEST resource, choose **Filter by**. To view metrics

Invocations [?](#) [⋮](#)

Count

2

1

0

16:36

19:35

Invocations

Duration [📏](#) [?](#) [⋮](#)

Milliseconds

1.41k

708

2.61

16:36

19:35

 Duration minimum
 Duration average
 Duration maximum

Error count and succe... [?](#) [⋮](#)

Count

1

0.5

0

16:36

19:35

Errors

No unit

100

50

0

success rate (%)

[CloudWatch](#) > [Log groups](#) > /aws/lambda/prajjwallambda01

/aws/lambda/prajjwallambda01

Actions ▼

[View in Logs Insights](#)[Start tailing](#)[Search log group](#)

▼ Log group details

Log class [Info](#)

Standard

ARN

arn:aws:logs:ap-south-1:183631330334:log-group:/aws/lambda/prajjwallambda01:*

Creation time

15 minutes ago

Retention

Never expire

Stored bytes

-

Metric filters

0

Subscription filters

0

Contributor Insights rules

-

KMS key ID

-

Anomaly detection

[Configure](#)

Data protection

-

Sensitive data count

-

Log events

Actions ▼

Start tailing

Create metric filter

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

1m1hUTC timezone ▼Display ▼

	Timestamp	Message
		No older events at this moment. Retry
▶	2024-10-07T19:36:29.642Z	INIT_START Runtime Version: python:3.12.v36 Runtime Version ARN: arn:aws:lambda:ap-south...
▶	2024-10-07T19:36:29.721Z	[ERROR] Runtime.ImportModuleError: Unable to import module 'index': No module named 'ind...
▶	2024-10-07T19:36:29.780Z	INIT_REPORT Init Duration: 138.91 ms Phase: init Status: error Error Type: Runtime.Impor...
▶	2024-10-07T19:36:30.489Z	[ERROR] Runtime.ImportModuleError: Unable to import module 'index': No module named 'ind...
▶	2024-10-07T19:36:31.208Z	INIT_REPORT Init Duration: 1417.13 ms Phase: invoke Status: error Error Type: Runtime.Im...
▶	2024-10-07T19:36:31.208Z	START RequestId: ea6fa0b4-63e5-4ac9-a947-9fd8c90a96b2 Version: \$LATEST
▶	2024-10-07T19:36:31.239Z	END RequestId: ea6fa0b4-63e5-4ac9-a947-9fd8c90a96b2
▶	2024-10-07T19:36:31.239Z	REPORT RequestId: ea6fa0b4-63e5-4ac9-a947-9fd8c90a96b2 Duration: 1447.34 ms Billed Durat...