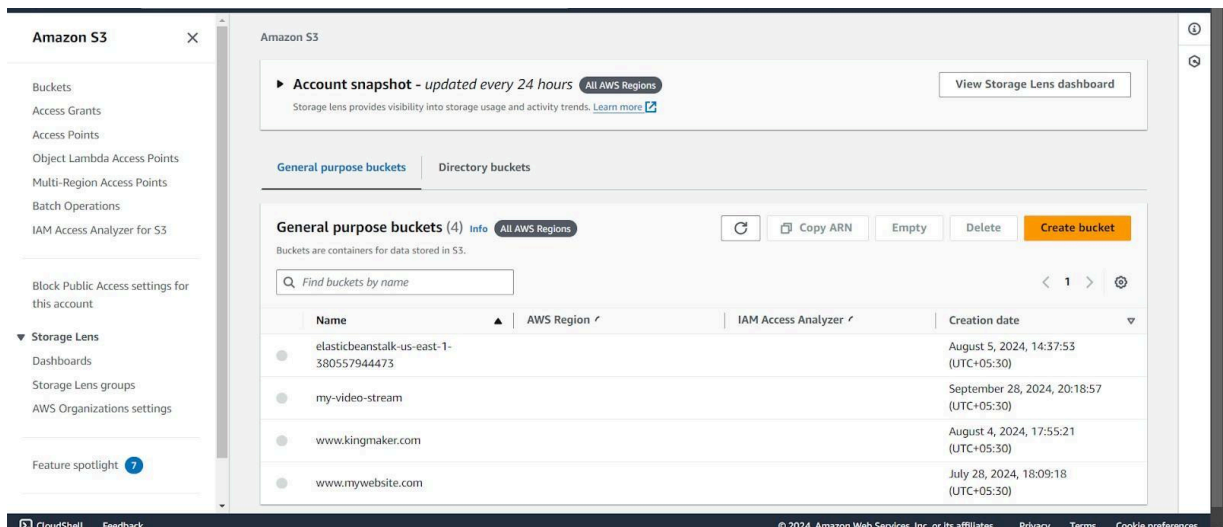
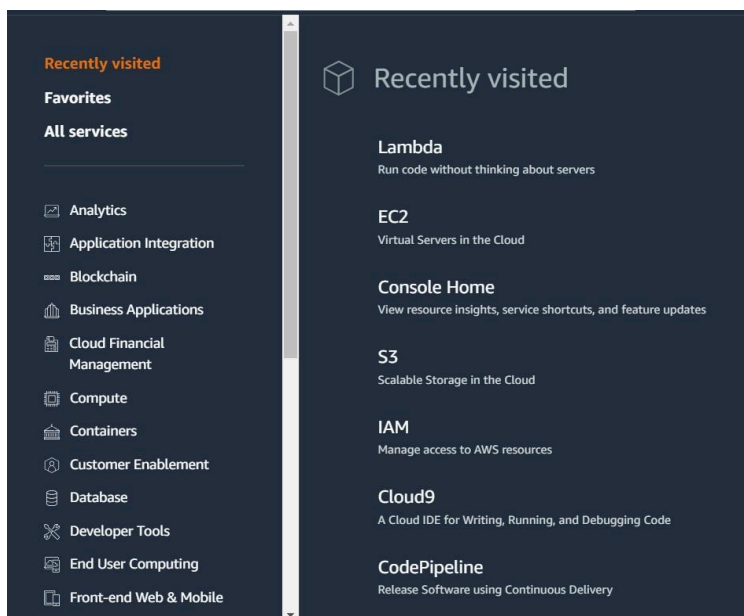


Experiment No :12

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

CREATING LAMBDA FUNCTION :

Step 1: Log in to your AWS Personal account. Then go to S3 in the services menu and click on "Create S3 Bucket."



Step 2: Give your bucket a name, select "General purpose project," then uncheck "Block public access." Keep the other settings as they are.

Amazon S3 > Buckets > Create bucket

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

shivam41

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.

Format: s3://bucket/prefix

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Given proper bucket Name

☒ **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

Lab12_Shivam

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.

Format: s3://bucket/prefix

Object Ownership Info

Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to objects.

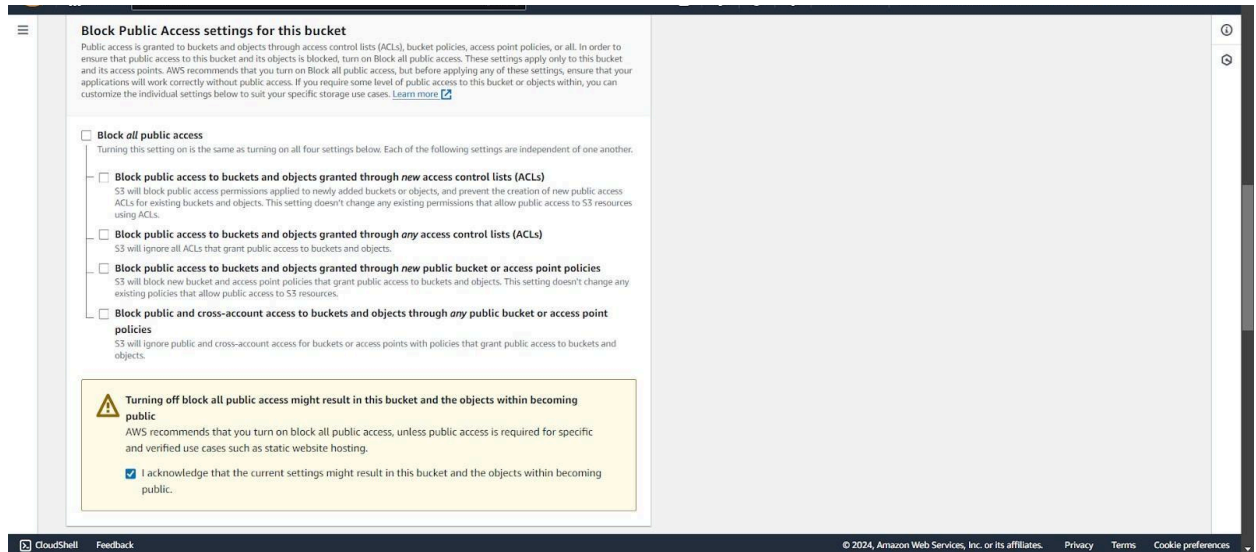
☒ **ACLs disabled (recommended)**
All objects in this bucket are owned by this account. Access to this bucket and its objects is specified using only policies.

☐ **ACLs enabled**
Objects in this bucket can be owned by other AWS accounts. Access to this bucket and its objects can be specified using ACLs.

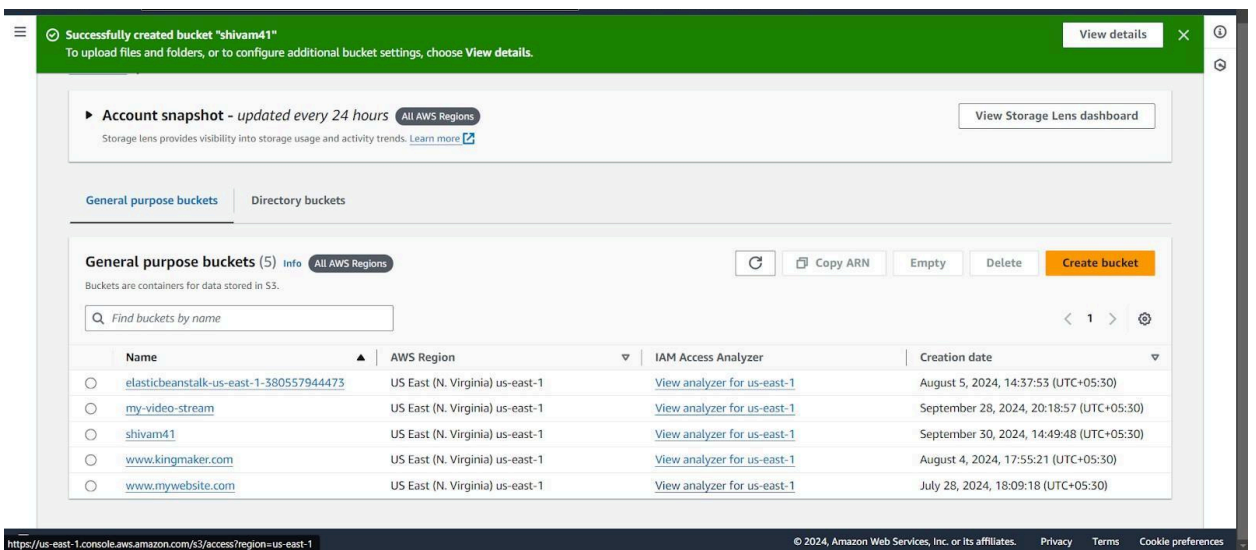
Object Ownership
Bucket owner enforced

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Selected Appropriate object Ownership

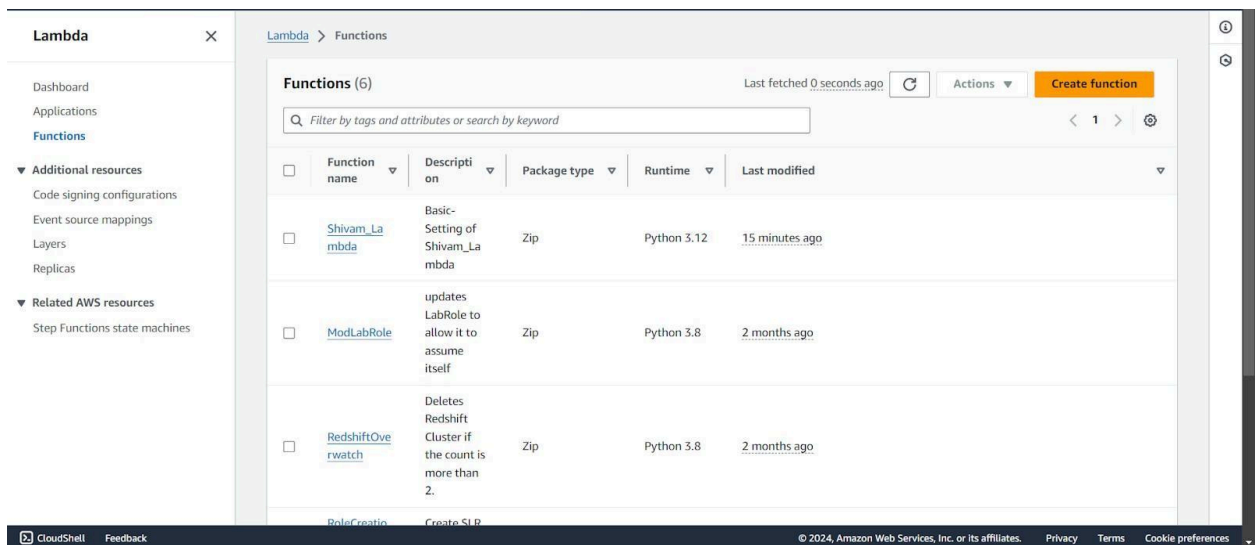
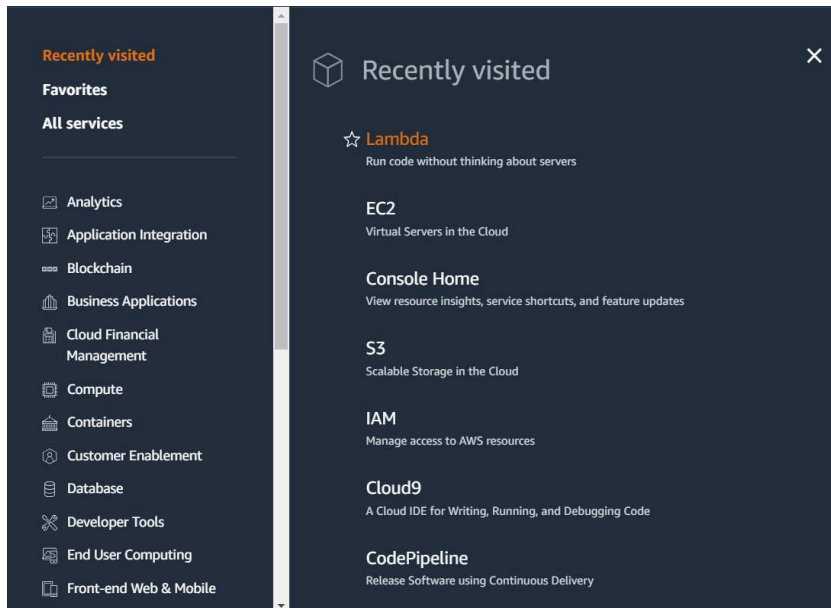


Unchecked the block all public access checkbox and checked the lower checkbox.



Successfully created the bucket

Step 3: Open lambda console and click on create function button.



Step 4: Give your Lambda function a name and choose a programming language. The code editor only supports Node.js, Python, and Ruby, so in my case I have chosen **Python 3.12**. Set the **architecture to x86**. For the execution role, select '**Use an existing role**,' then pick '**Lab role**' from the dropdown menu under existing roles .

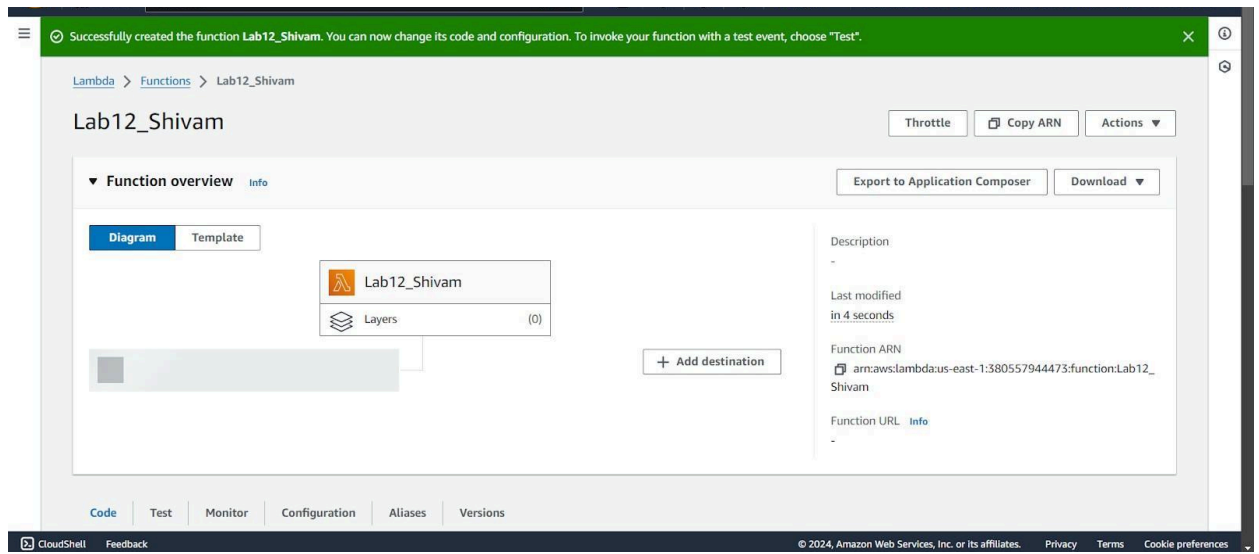
(This is because the Lab role already has the permissions needed for Lambda to run properly, so you don't need to create a new role from scratch. It's a quicker and more convenient option)

The screenshot shows the 'Create function' page in the AWS Lambda console. The breadcrumb navigation is 'Lambda > Functions > Create function'. The page title is 'Create function' with an 'Info' link. Below the title, it says 'Choose one of the following options to create your function.' There are three radio button options: 'Author from scratch' (selected), 'Use a blueprint', and 'Container image'. The 'Basic information' section contains a 'Function name' field with 'Lab12_Shivam' entered, a 'Runtime' dropdown set to 'Python 3.12', and an 'Architecture' dropdown set to 'x86_64'. The footer of the console shows 'CloudShell', 'Feedback', and copyright information for 2024.

Given proper function name and selected language for Lambda function

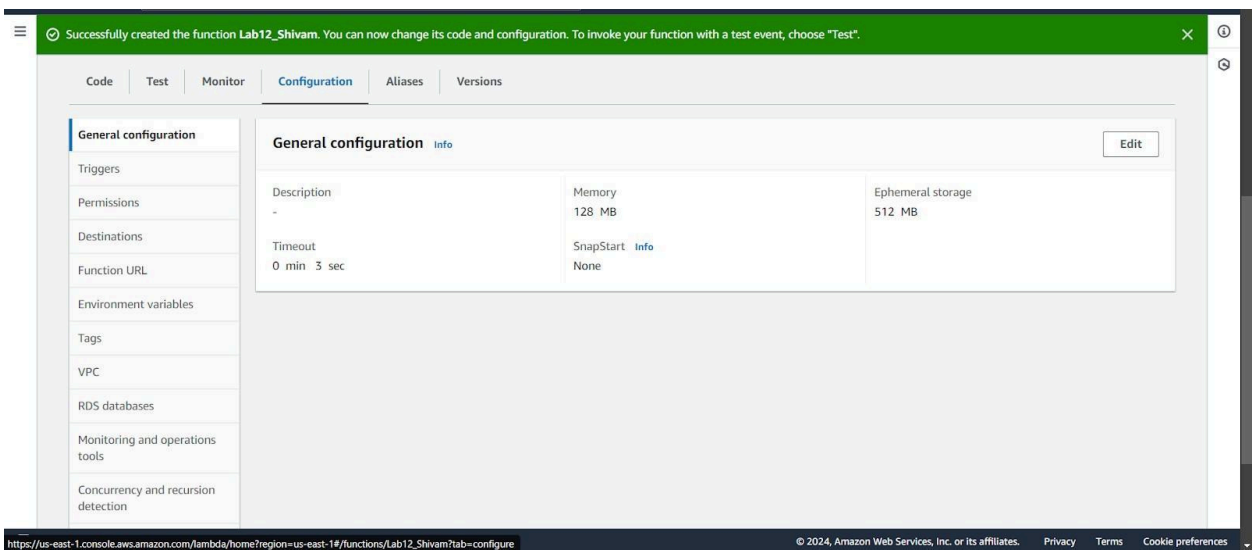
The screenshot shows the 'Permissions' section of the AWS Lambda console. It has a 'Change default execution role' section with three radio button options: 'Create a new role with basic Lambda permissions', 'Use an existing role' (selected), and 'Create a new role from AWS policy templates'. Below this, the 'Existing role' dropdown is set to 'LabRole'. At the bottom, there are 'Cancel' and 'Create function' buttons. The footer of the console is the same as the previous screenshot.

Selected Appropriate Execution role



Successfully created the Lambda function.

Step 5: To view or change the basic settings, go to the 'Configuration' tab and click 'Edit' under 'General settings.' (THIS STEP IS OPTIONAL)



You can add a description and adjust the memory and timeout settings. I've changed the timeout to 1 second, as that's enough for now.

The screenshot shows the 'Edit basic settings' page for a Lambda function named 'Lab12_Shivam'. The page includes a breadcrumb trail: Lambda > Functions > Lab12_Shivam > Edit basic settings. The 'Basic settings' section contains the following fields:

- Description - optional:** A text box containing 'Basic Settings of Lab12_Shivam'.
- Memory:** A dropdown menu set to '128' MB. Below it, a note states: 'Your function is allocated CPU proportional to the memory configured. Set memory to between 128 MB and 10240 MB.'
- Ephemeral storage:** A dropdown menu set to '512' MB. Below it, a note states: 'You can configure up to 10 GB of ephemeral storage (/tmp) for your function. View pricing'. Below this, another note states: 'Set ephemeral storage (/tmp) to between 512 MB and 10240 MB.'
- SnapStart:** A dropdown menu set to 'None'. Below it, a note states: 'Reduce startup time by having Lambda cache a snapshot of your function after the function has initialized. To evaluate whether your function code is resilient to snapshot operations, review the SnapStart compatibility considerations'. Below this, a note states: 'Supported runtimes: Java 11, Java 17, Java 21.'

The footer of the console shows 'CloudShell', 'Feedback', and copyright information for Amazon Web Services, Inc. or its affiliates, along with links for 'Privacy', 'Terms', and 'Cookie preferences'.

Given some description for your settings

This screenshot shows the 'Ephemeral storage' and 'SnapStart' sections of the 'Edit basic settings' page. The 'Ephemeral storage' section has a dropdown set to '512' MB and a note: 'You can configure up to 10 GB of ephemeral storage (/tmp) for your function. View pricing'. Below it, another note states: 'Set ephemeral storage (/tmp) to between 512 MB and 10240 MB.'.

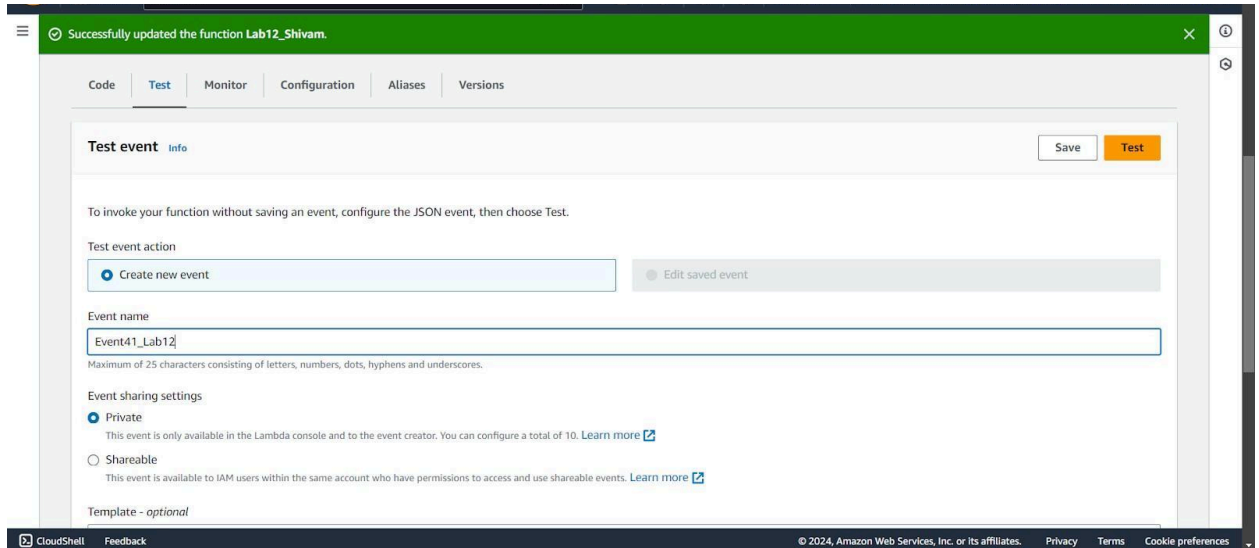
The 'SnapStart' section has a dropdown set to 'None' and a note: 'Reduce startup time by having Lambda cache a snapshot of your function after the function has initialized. To evaluate whether your function code is resilient to snapshot operations, review the SnapStart compatibility considerations'. Below this, a note states: 'Supported runtimes: Java 11, Java 17, Java 21.'.

Below the 'SnapStart' section, there is a 'Timeout' section with a dropdown set to '0' min and '1' sec. Below that is an 'Execution role' section with two radio buttons: 'Use an existing role' (selected) and 'Create a new role from AWS policy templates'. Below the 'Execution role' section is an 'Existing role' section with a dropdown menu set to 'LabRole' and a 'Cancel' button.

The footer of the console shows 'CloudShell', 'Feedback', and copyright information for Amazon Web Services, Inc. or its affiliates, along with links for 'Privacy', 'Terms', and 'Cookie preferences'.

Click on Save.

Step 6: Click on the "Test" tab, then select "Create a new event." Give the event a name, set "Event Sharing" to private, and choose the "S3 Put" template.S3 (Simple Storage Service) template allows you to test your Lambda function specifically for events related to uploading files to an S3 bucket.



Successfully updated the function Lab12_Shivam.

Code **Test** Monitor Configuration Aliases Versions

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

Event41_Lab12

Maximum of 25 characters consisting of letters, numbers, dots, hyphens and underscores.

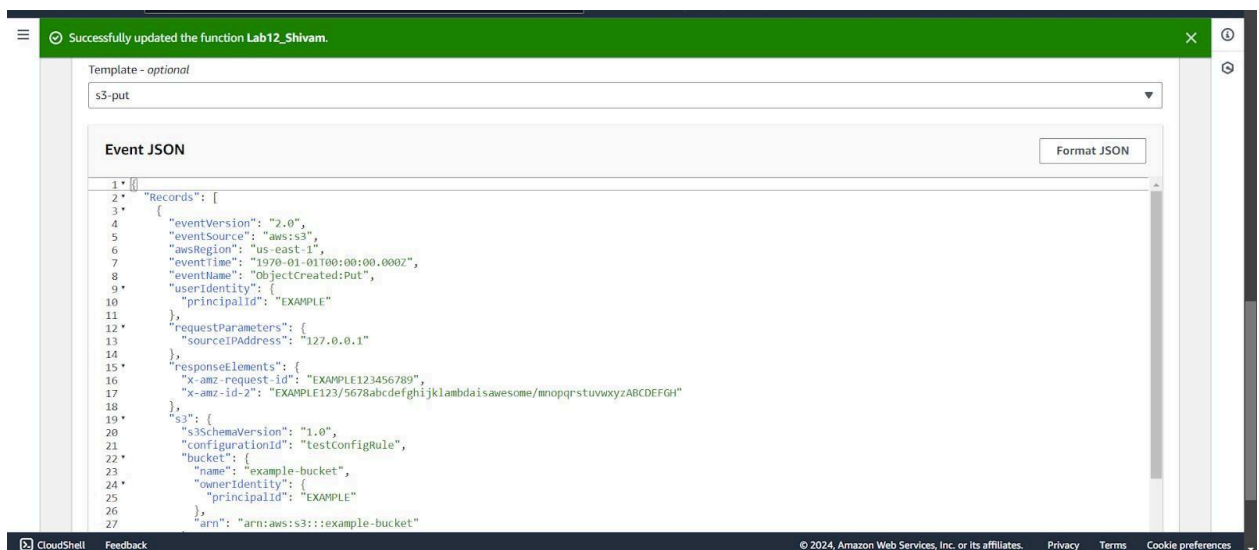
Event sharing settings

☒ 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

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Successfully updated the function Lab12_Shivam.

Template - optional

s3-put

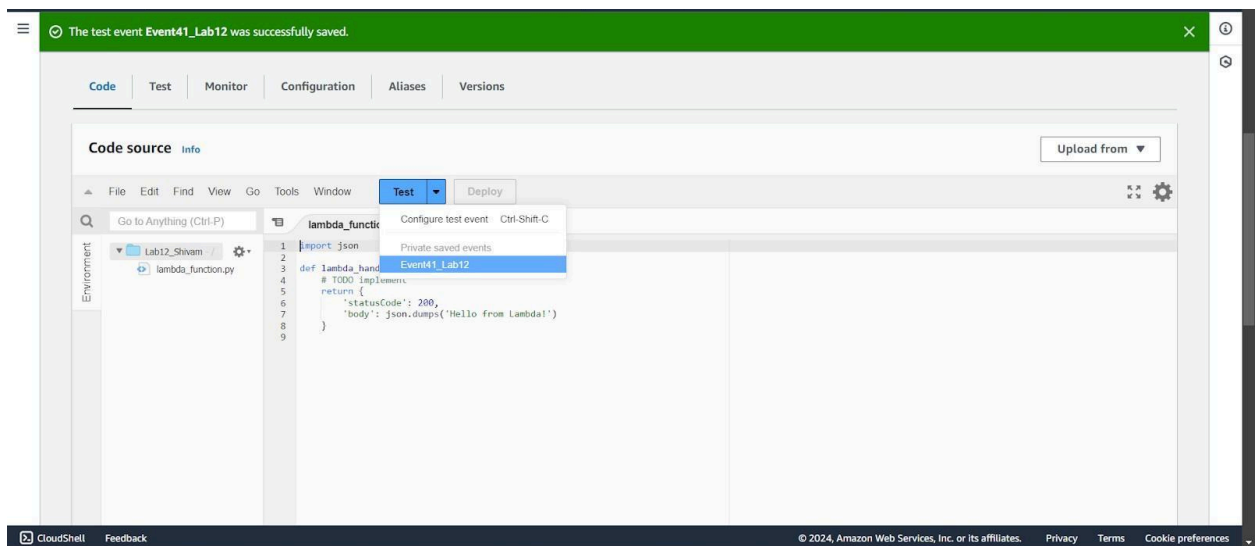
Event JSON Format JSON

```
1 {
2   "Records": [
3     {
4       "eventVersion": "2.0",
5       "eventSource": "aws:s3",
6       "awsRegion": "us-east-1",
7       "eventTime": "1970-01-01T00:00:00.000Z",
8       "eventName": "ObjectCreated:Put",
9       "userIdentity": {
10        "principalId": "EXAMPLE"
11      },
12      "requestParameters": {
13        "sourceIPAddress": "127.0.0.1"
14      },
15      "responseElements": {
16        "x-amz-request-id": "EXAMPLE123456789",
17        "x-amz-id-2": "EXAMPLE123/5678abcdefghijklmbdaisawsome/mnopqrstuvwxyzABCDEFGH"
18      },
19      "s3": {
20        "s3SchemaVersion": "1.0",
21        "configurationId": "testConfigRule",
22        "bucket": {
23          "name": "example-bucket",
24          "ownerIdentity": {
25            "principalId": "EXAMPLE"
26          },
27          "arn": "arn:aws:s3:::example-bucket"
28        }
29      }
30    }
31  ]
32 }
```

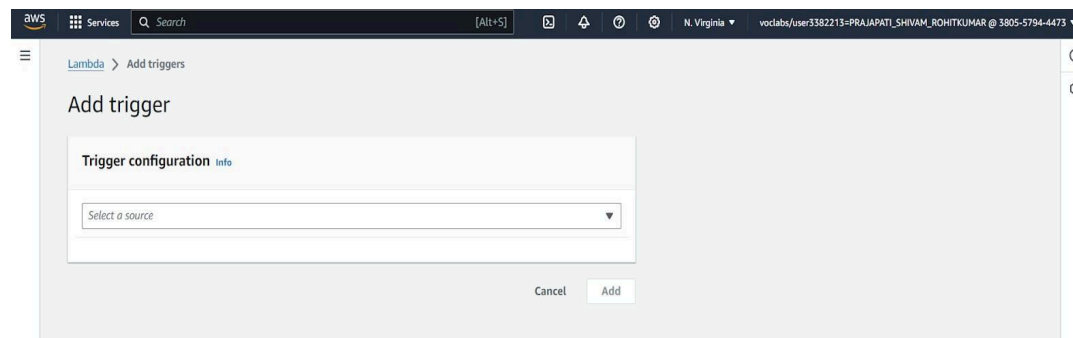
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Event Jason code will be automatically generated once S3 -put is selected.

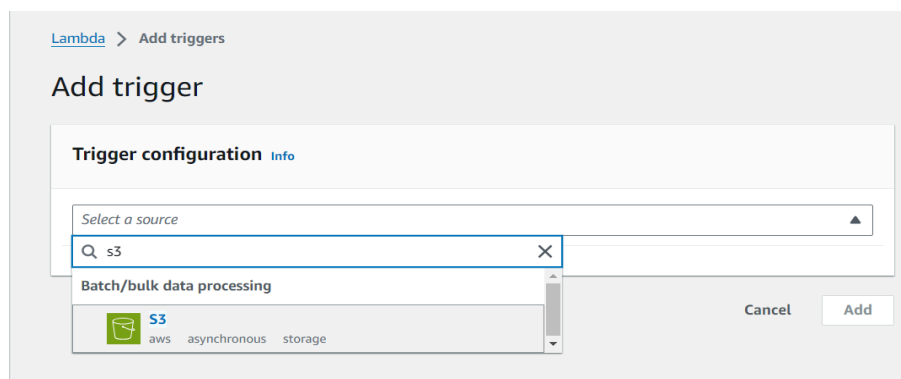
Step 7: Now In the Code section select the created event from the dropdown .



Step 8: In the Lambda function, click on "Add Trigger." Adding a trigger allows your Lambda function to automatically run in response to specific events such as uploads to an S3 bucket



Now select the source as S3, then choose the bucket name from the dropdown menu. Keep the other settings as default, and you can also add a prefix for the image if you want. A prefix for an image (or any file) in S3 is a string that you can use to organize or filter files within a bucket. It acts like a folder name, helping to categorize your files.




Lambda > Add triggers

ⓘ

⌵

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.

✕ ↺

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.](#)

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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.

Shivam's Image

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

Recursive invocation

If your function writes objects to an S3 bucket, ensure that you are using different S3 buckets for input and output. Writing to the same bucket increases the risk of creating a recursive invocation, which can result in increased Lambda usage and increased costs. [Learn more](#)

☒ I acknowledge that using the same S3 bucket for both input and output is not recommended and that this configuration can cause recursive invocations, increased Lambda usage, and increased costs.

Lambda will add the necessary permissions for AWS S3 to invoke your Lambda function from this trigger. [Learn more](#) about the Lambda permissions model.

Cancel

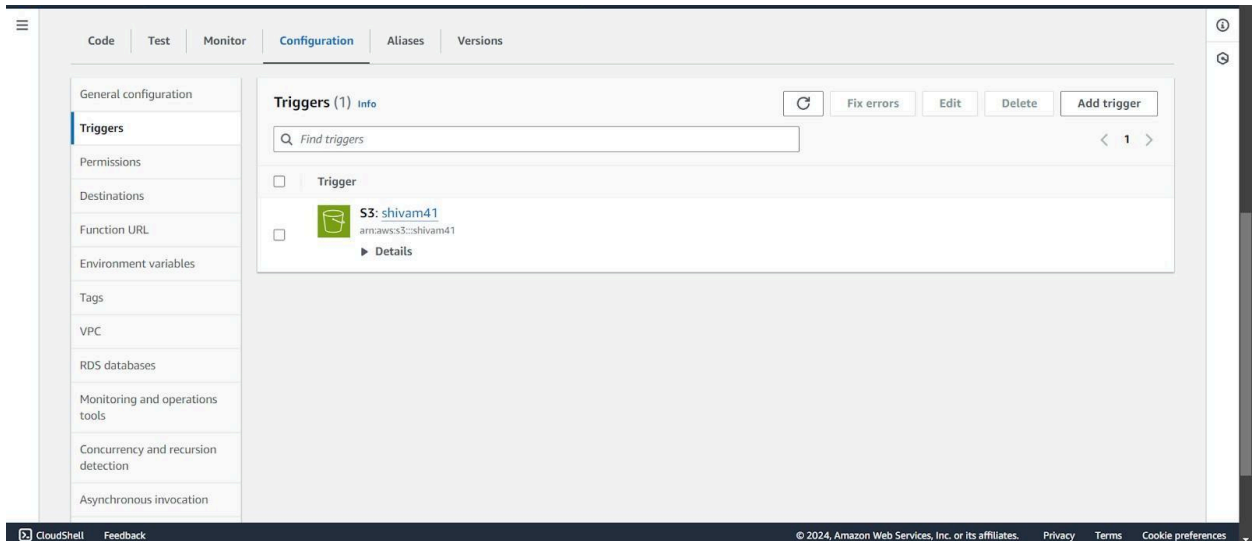
Add

CloudShell

Feedback

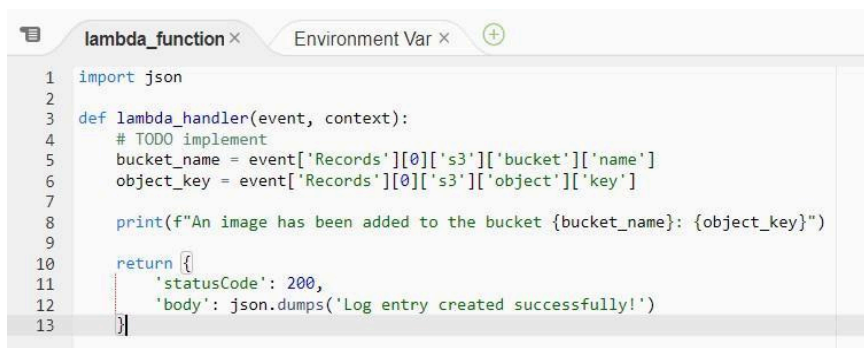
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Click on save

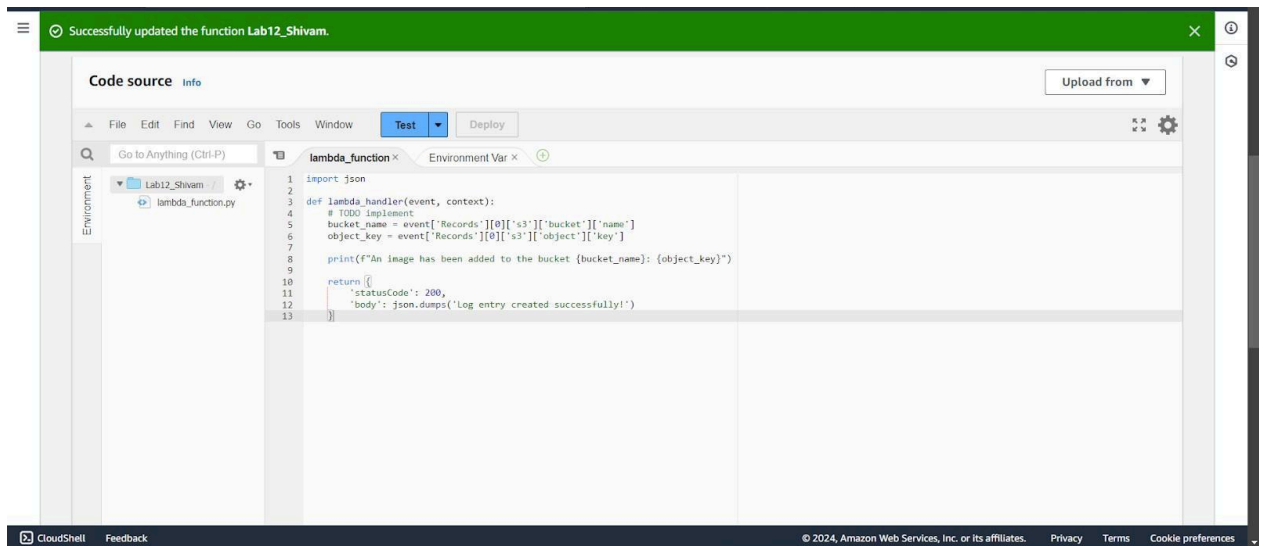


Step 9: Now Write code that logs a message like “An Image has been added” when triggered. Save the file and click on deploy.

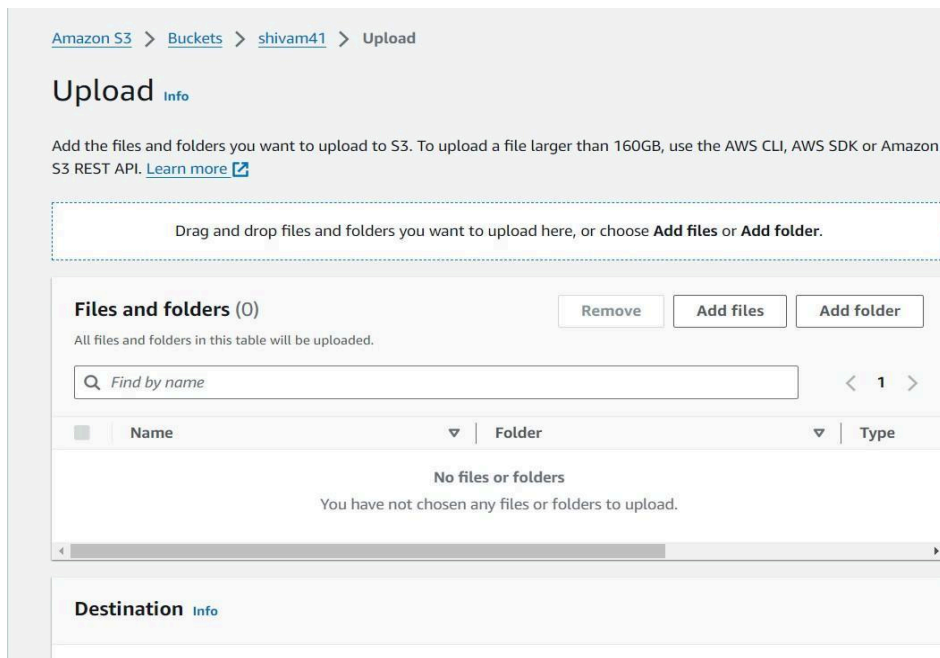
```
import json
def lambda_handler(event, context):
    # TODO implement
    bucket_name = event['Records'][0]['s3']['bucket']['name']
    object_key = event['Records'][0]['s3']['object']['key']
    print(f"An image has been added to the bucket {bucket_name}: {object_key}")
    return {
        'statusCode': 200,
        'body': json.dumps('Log entry created successfully!')
    }
```



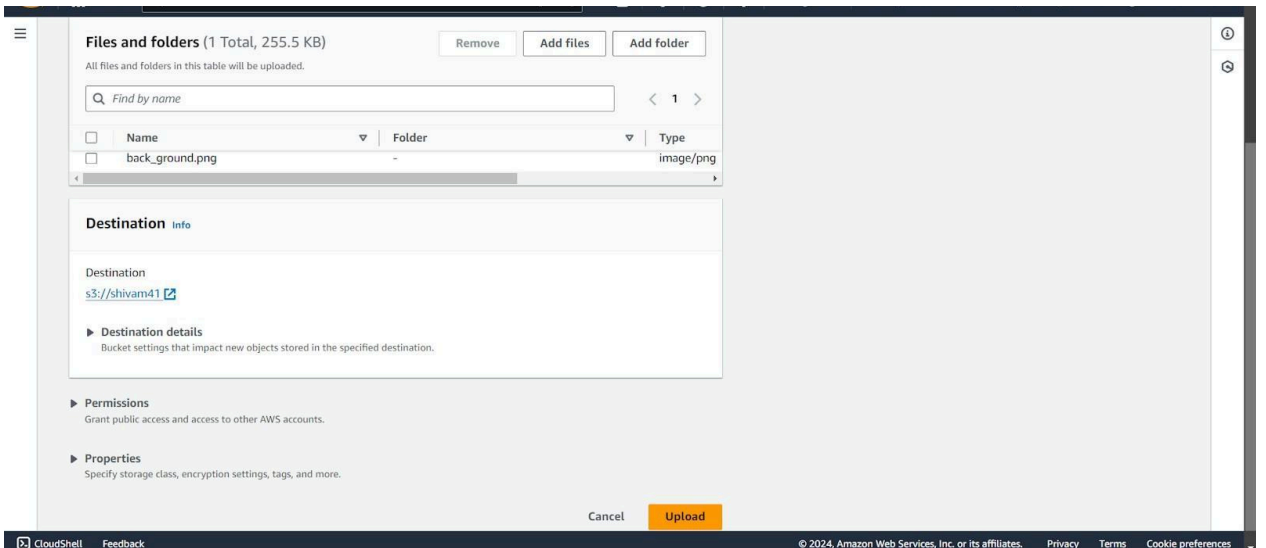
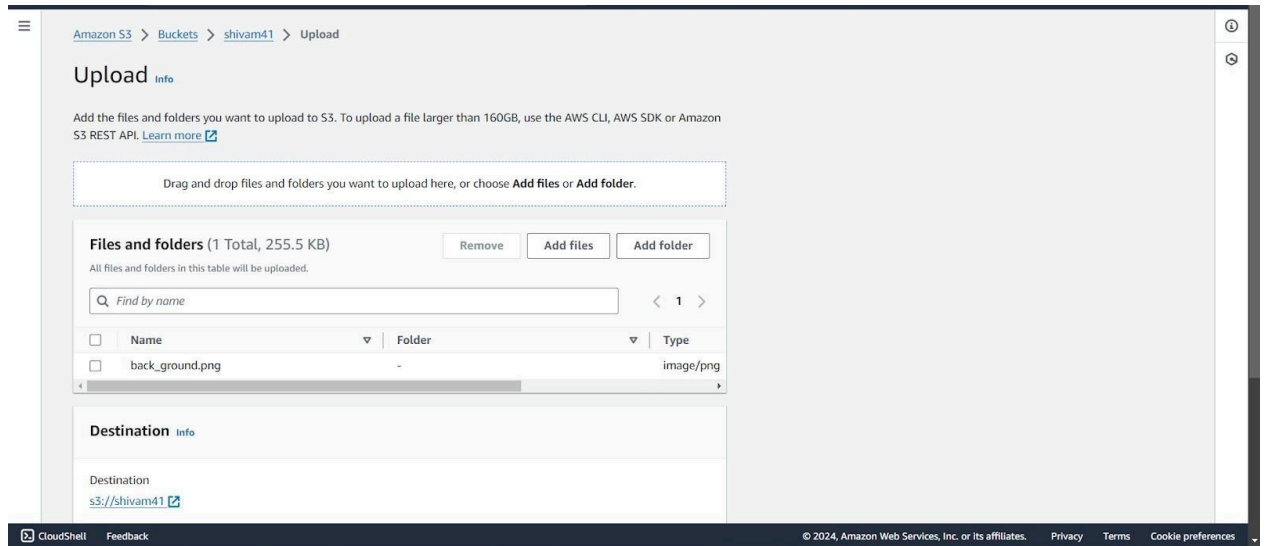
Save it by Control + S and deploy



Step 10: Now we will upload any image to the bucket

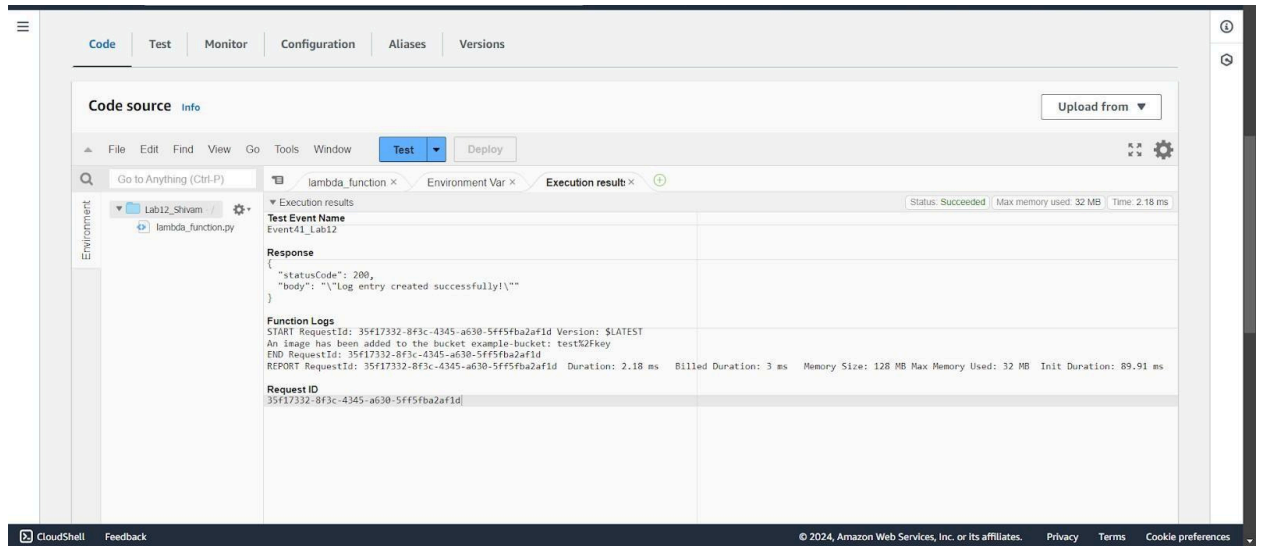


Click on add file where you can upload any image of your choice in your bucket

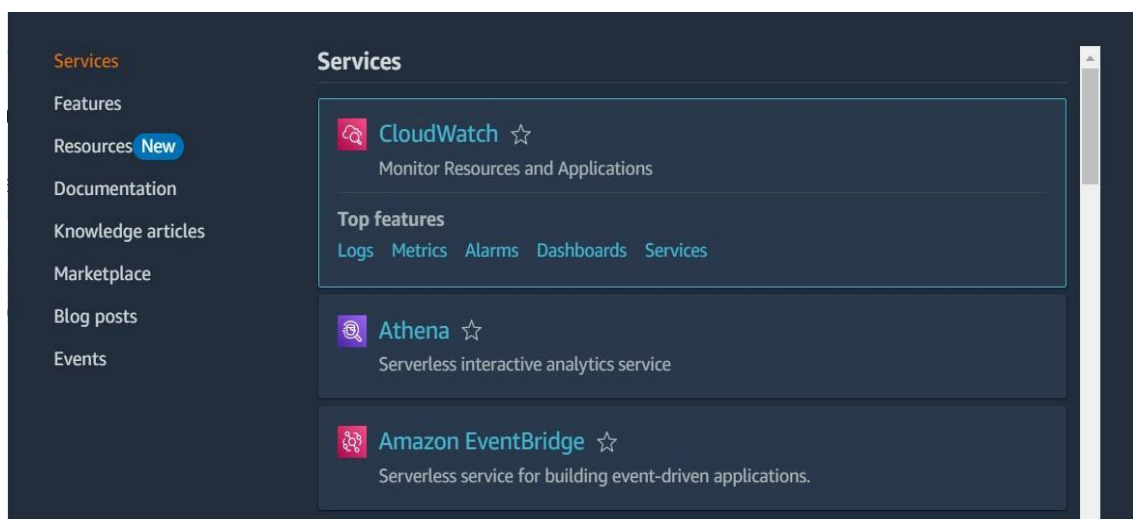


Click on Upload

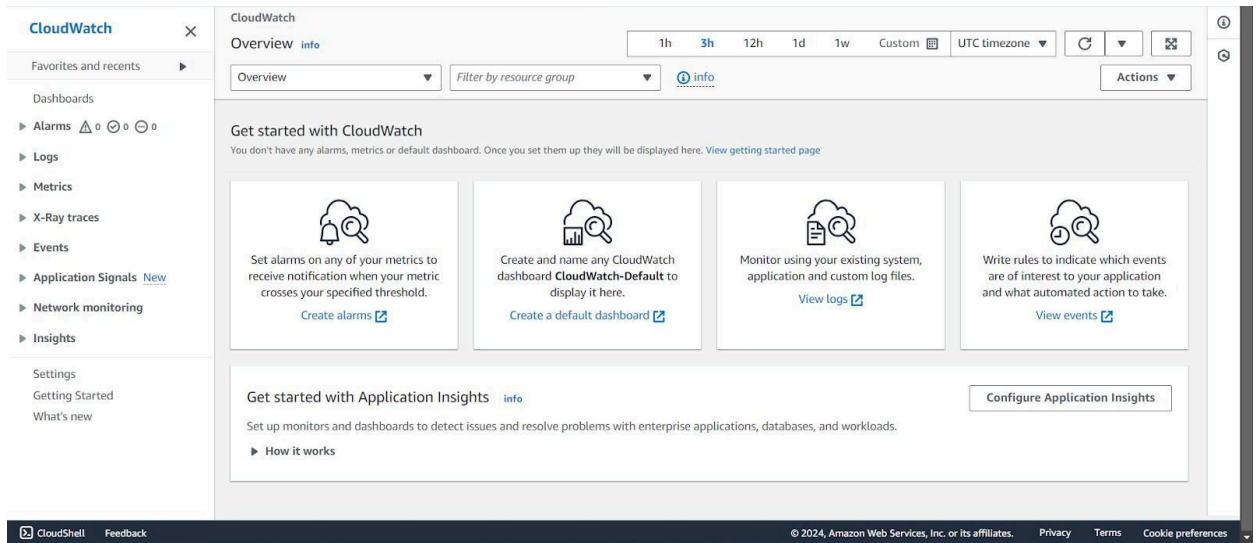
Step 11: Now click on "Test" in Lambda to see if it logs the activity when an image is added to S3.



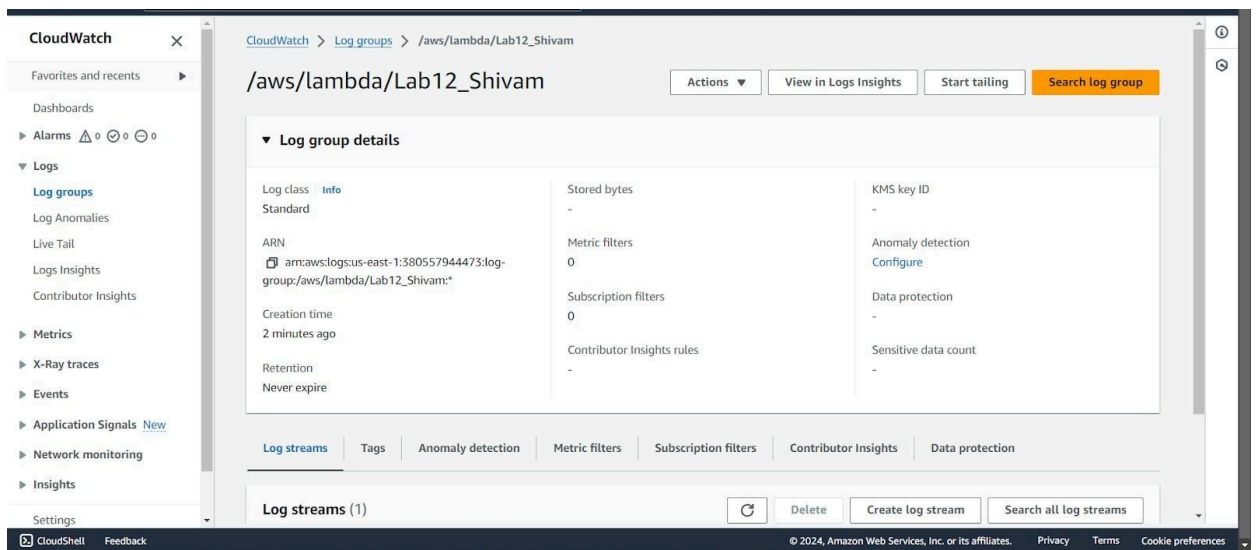
Step 12: Now let's check the logs on CloudWatch. Go to the "Monitor" section and click on "View CloudWatch Logs".



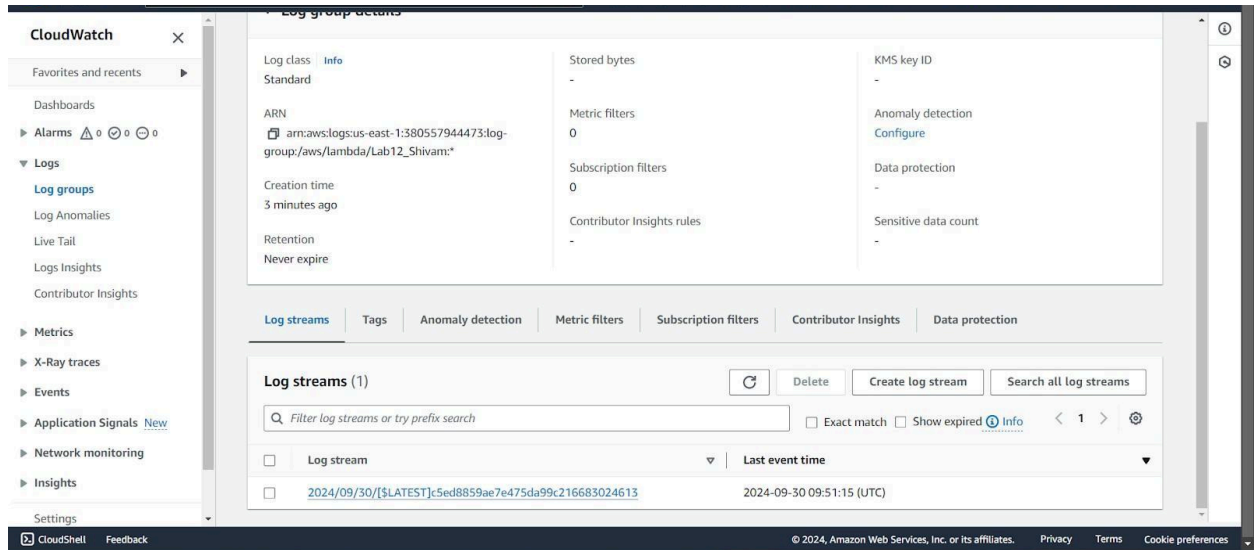
Click on the CloudWatch:



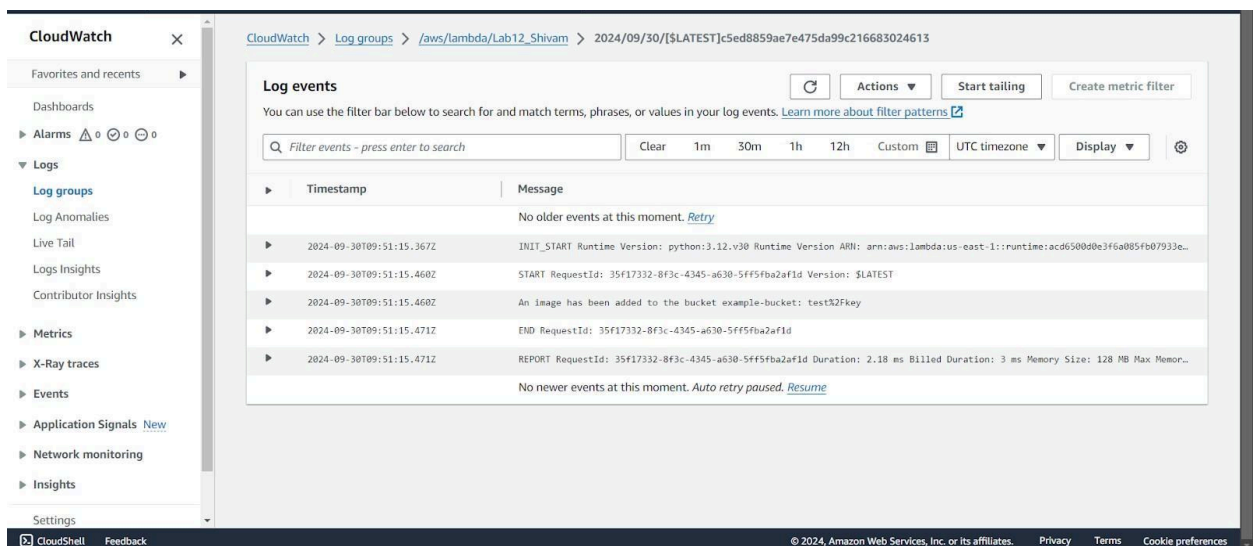
Click on the logs:



Click on the log group:



Scrolled down and click on the log stream:



CONCLUSION:

In this experiment, we successfully created an AWS Lambda function that logs a message when an image is uploaded to an S3 bucket. It's important to choose the S3 Put template for the event; otherwise, the code will give an error. The function was triggered correctly when files were uploaded to S3, showing that Lambda's event-driven design works well. This experiment showed how Lambda can respond to S3 events and how to fix common problems with the event setup.