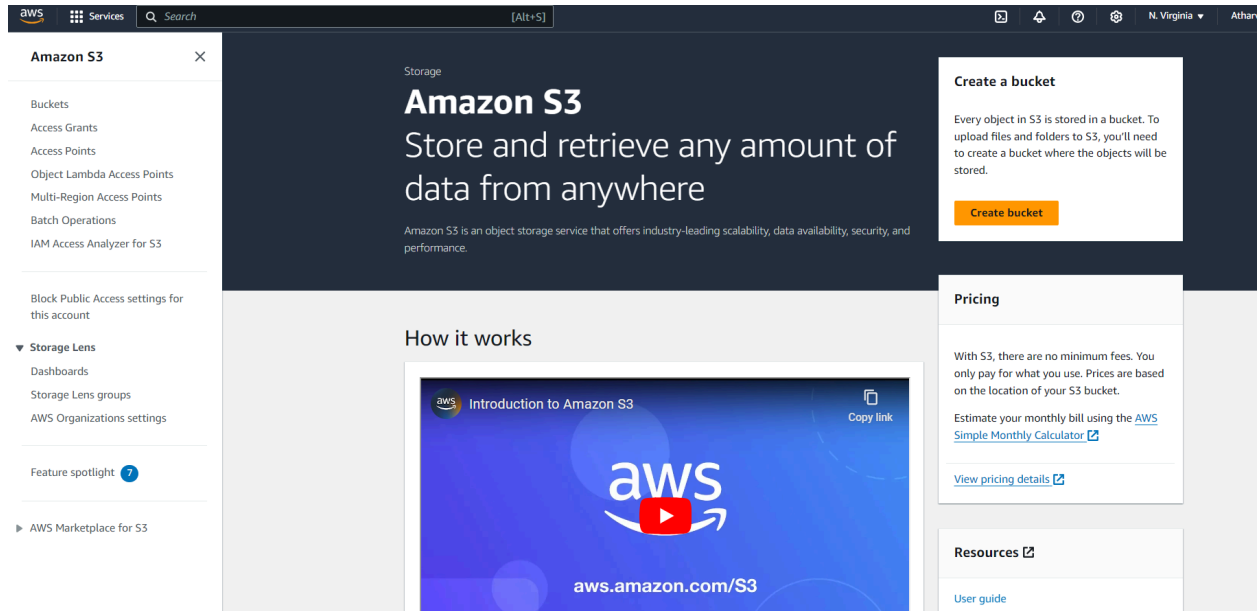


Aim: To create a Lambda function which will log “An Image has been added” once you add an object to a specific bucket in S3.

Step 1: Create a s3 bucket. 1) Search for S3 bucket in the services search. Then click on create bucket.



2) Keep the bucket as a general purpose bucket. Give a name to your bucket.

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](#)

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

Block Public Access settings for this bucket

Public access is granted to buckets and objects through access control lists (ACLs), bucket policies, access point policies, or all. In order to ensure that public access to this bucket and its objects is blocked, turn on Block all public access. These settings apply only to this bucket and its access points. AWS recommends that you turn on Block all public access, but before applying any of these settings, ensure that your applications will work correctly without public access. If you require some level of public access to this bucket or objects within, you can customize the individual settings below to suit your specific storage use cases. [Learn more](#)

☐ Block all public access

Turning this setting on is the same as turning on all four settings below. Each of the following settings are independent of one another.

☐ Block public access to buckets and objects granted through *new* access control lists (ACLs)

S3 will block public access permissions applied to newly added buckets or objects, and prevent the creation of new public access ACLs for existing buckets and objects. This setting doesn't change any existing permissions that allow public access to S3 resources using ACLs.

☐ Block public access to buckets and objects granted through *any* access control lists (ACLs)

S3 will ignore all ACLs that grant public access to buckets and objects.

☐ Block public access to buckets and objects granted through *new* public bucket or access point policies

S3 will block new bucket and access point policies that grant public access to buckets and objects. This setting doesn't change any existing policies that allow public access to S3 resources.

☐ Block public and cross-account access to buckets and objects through *any* public bucket or access point policies

S3 will ignore public and cross-account access for buckets or access points with policies that grant public access to buckets and objects.

4) Keeping all other options the same, click on create. This would create your bucket. Now click on the name of the bucket.

Successfully created bucket "s3lamdaexp11"

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

[Amazon S3](#) > Buckets

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

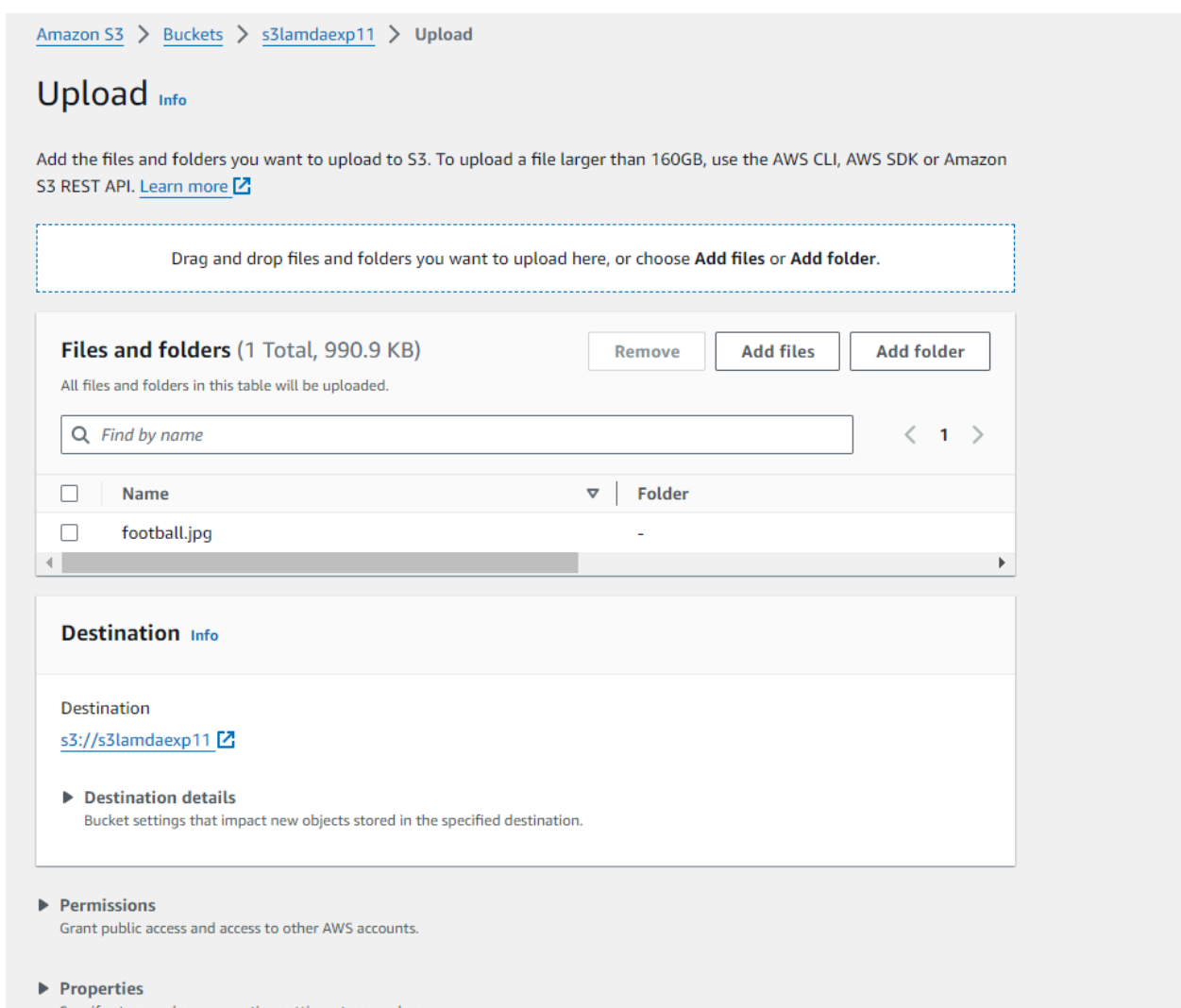
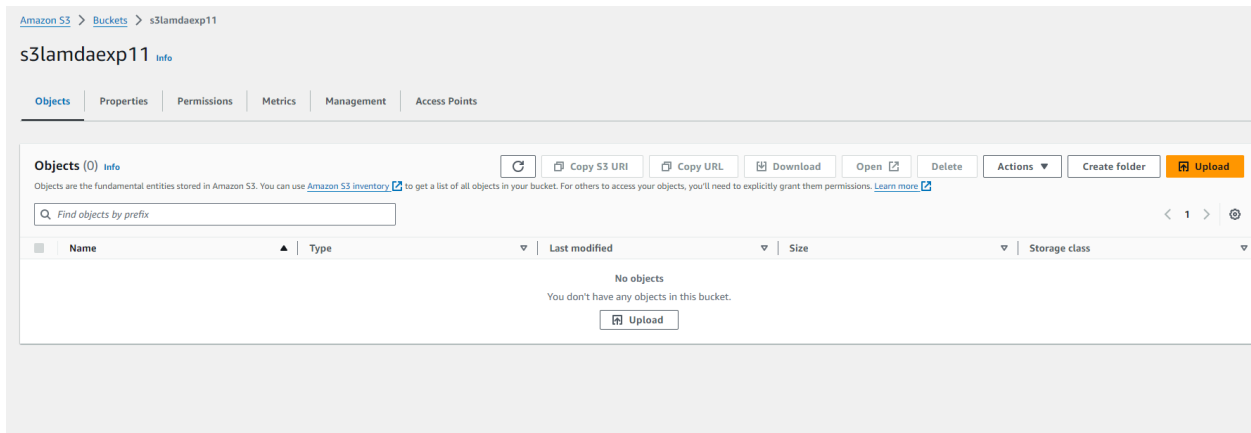
All AWS Regions

[Refresh](#) [Copy ARN](#) [Empty](#) [Delete](#) [Create bucket](#)

1

	Name	AWS Region	IAM Access Analyzer	Creation date
<input type="radio"/>	elasticbeanstalk-eu-north-1-010928207735	Europe (Stockholm) eu-north-1	View analyzer for eu-north-1	August 14, 2024, 22:12:26 (UTC+05:30)
<input type="radio"/>	s3lamdaexp11	US East (N. Virginia) us-east-1	View analyzer for us-east-1	October 7, 2024, 09:40:50 (UTC+05:30)

5) Here, click on upload, then add files. Select any image that you want to upload in the bucket and click on upload.



6) The image has been uploaded to the bucket.

Upload succeeded
View details below.

Upload: status Close

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

Summary

Destination s3://s3lambdaexp11	Succeeded 1 file, 990.9 KB (100.00%)	Failed 0 files, 0 B (0%)
-----------------------------------	---	-----------------------------

Files and folders

Files and folders (1 Total, 990.9 KB)

Find by name

Name	Folder	Type	Size	Status	Error
football.jpg	-	image/jpeg	990.9 KB	Succeeded	-

Step 2: Configure Lambda function

1) Go to the lambda function you had created berfor. (Services → Lambda → Click on name of function). Here, click on add trigger

Lambda > Functions > Create function

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.

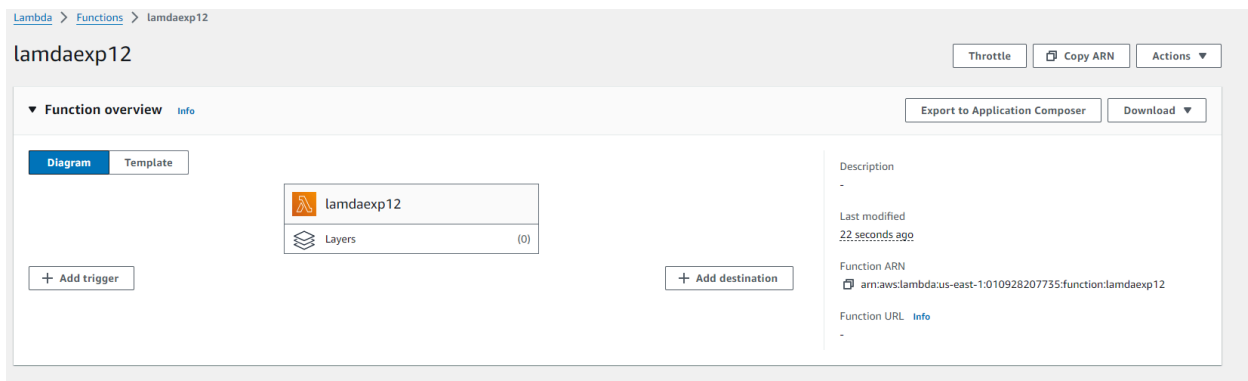
Function name must be 1 to 64 characters, must be unique to the Region, and can't include spaces. Valid characters are a-z, A-Z, 0-9, hyphens (-), and underscores (_).

Runtime Info
Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.
 ↕

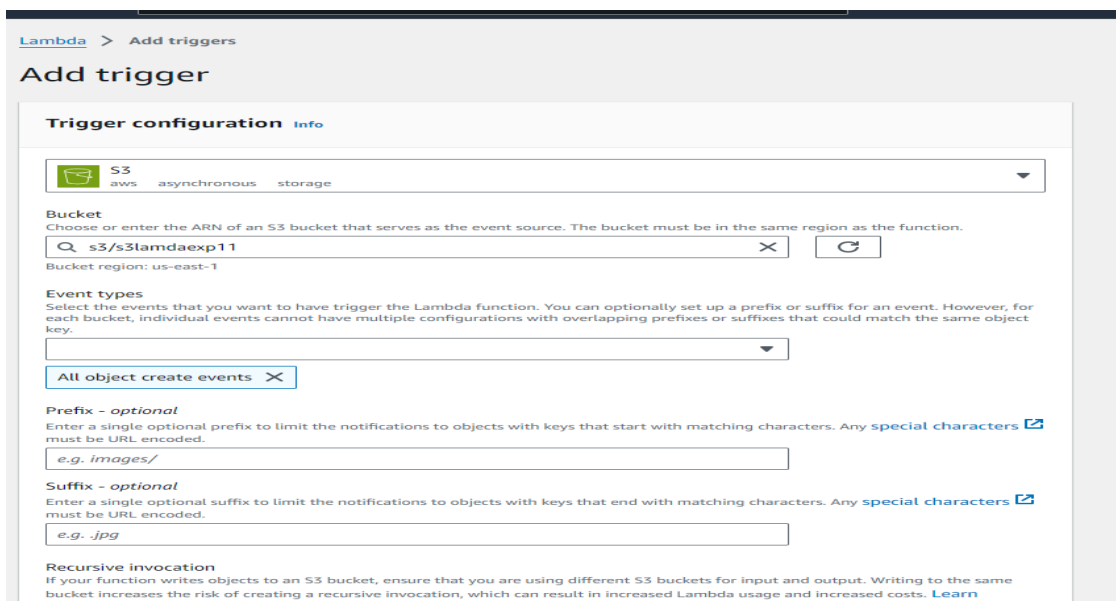
Architecture Info
Choose the instruction set architecture you want for your function code.
☒ x86_64
☐ arm64

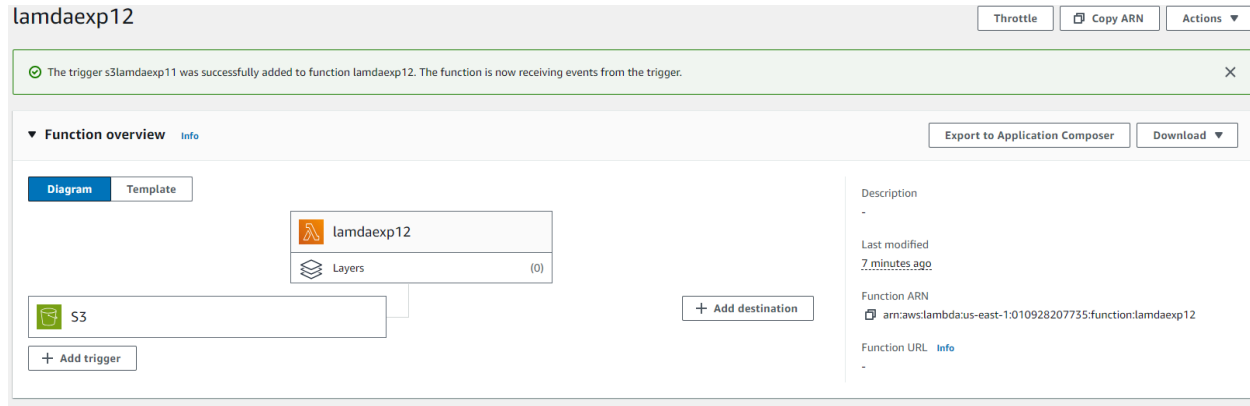
Permissions Info
By default, Lambda will create an execution role with permissions to upload logs to Amazon CloudWatch Logs. You can customize this default role later when adding triggers.
[Change default execution role](#)

2) Under trigger configuration, search for S3 and select it.



3) Here, select the S3 bucket you created for this experiment. Acknowledge the condition given by AWS. then click on Add. This will add the S3 bucket trigger to your function





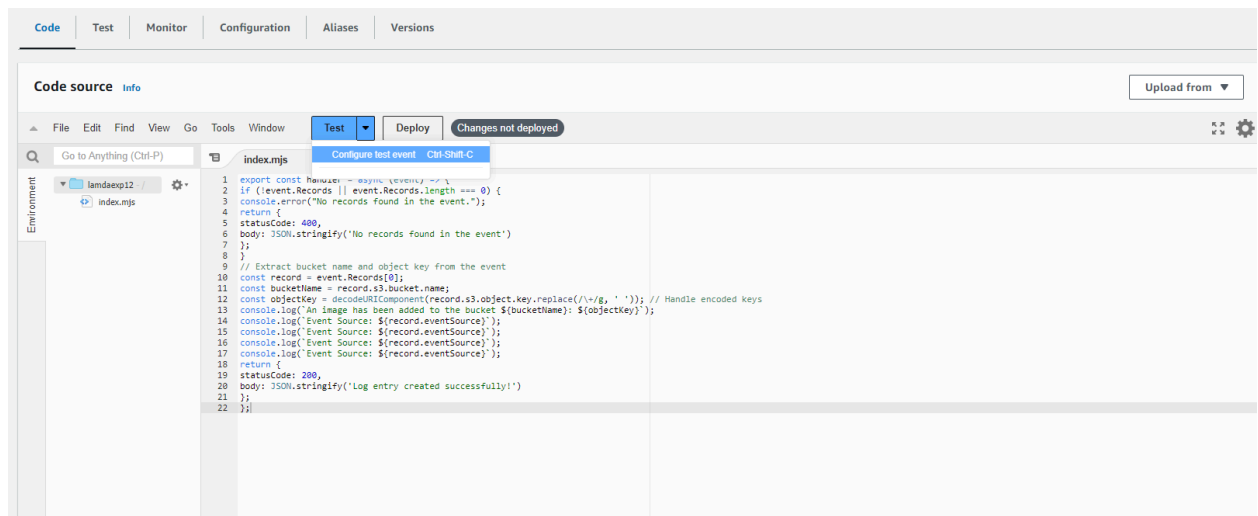
4) Scroll down to the code section of the function. Add the following javascript code to the code area by replacing the existing code

```
export const handler = async (event) => {
  if (!event.Records || event.Records.length === 0) {
    console.error("No records found in the event.");
    return {
      statusCode: 400,
      body: JSON.stringify('No records found in the event')
    };
  }
  // Extract bucket name and object key from the event
  const record = event.Records[0];
  const bucketName = record.s3.bucket.name;
  const objectKey = decodeURIComponent(record.s3.object.key.replace(/\+/g, ' ')); // Handle
  encoded keys
  console.log(`An image has been added to the bucket ${bucketName}: ${objectKey}`);
  console.log(`Event Source: ${record.eventSource}`);
  console.log(`Event Source: ${record.eventSource}`);
  console.log(`Event Source: ${record.eventSource}`);
  console.log(`Event Source: ${record.eventSource}`);
  return {
    statusCode: 200,
    body: JSON.stringify('Log entry created successfully!')
  };
};
```

This JSON structure represents an S3 event notification triggered when an object is uploaded to an S3 bucket. It contains details about the event, including the bucket name (example-bucket), the object key (test/key), and metadata like the object's size, the event source (aws:s3), and the event time.



```
1 export const handler = async (event) => {
2   if (!event.Records || event.Records.length === 0) {
3     console.error("No records found in the event.");
4     return {
5       statusCode: 400,
6       body: JSON.stringify("No records found in the event")
7     };
8   }
9   // Extract bucket name and object key from the event
10  const record = event.Records[0];
11  const bucketName = record.s3.bucket.name;
12  const objectKey = decodeURIComponent(record.s3.object.key.replace(/\+/g, ' ')); // Handle encoded keys
13  console.log("An image has been added to the bucket ${bucketName}: ${objectKey}");
14  console.log("Event Source: ${record.eventSource}");
15  console.log("Event Source: ${record.eventSource}");
16  console.log("Event Source: ${record.eventSource}");
17  console.log("Event Source: ${record.eventSource}");
18  return {
19    statusCode: 200,
20    body: JSON.stringify("Log entry created successfully!")
21  };
22 }
```



```
1 export const handler = async (event) => {
2   if (!event.Records || event.Records.length === 0) {
3     console.error("No records found in the event.");
4     return {
5       statusCode: 400,
6       body: JSON.stringify("No records found in the event")
7     };
8   }
9   // Extract bucket name and object key from the event
10  const record = event.Records[0];
11  const bucketName = record.s3.bucket.name;
12  const objectKey = decodeURIComponent(record.s3.object.key.replace(/\+/g, ' ')); // Handle encoded keys
13  console.log("An image has been added to the bucket ${bucketName}: ${objectKey}");
14  console.log("Event Source: ${record.eventSource}");
15  console.log("Event Source: ${record.eventSource}");
16  console.log("Event Source: ${record.eventSource}");
17  console.log("Event Source: ${record.eventSource}");
18  return {
19    statusCode: 200,
20    body: JSON.stringify("Log entry created successfully!")
21  };
22 }
```

☒ 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

hello-world

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": "EXAMPLE123/5678abcdefghijklambdaisawesome/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        "object": {
30          "key": "test%2Fkey",
```

1:1 JSON Spaces: 2

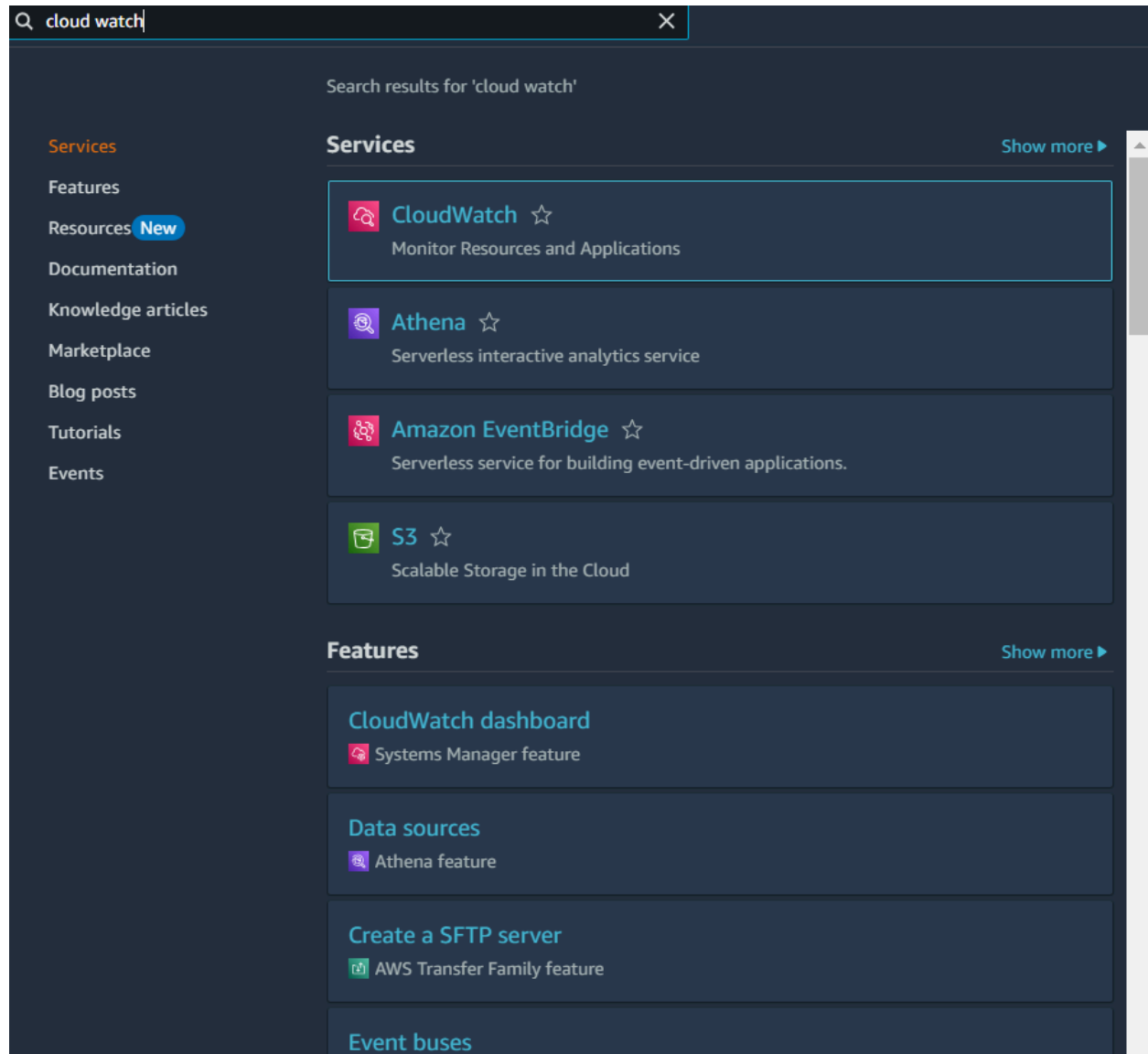
[Cancel](#)[Invoke](#)[Save](#)

The test event myevent1 was successfully saved.

[Add reference](#)[Function URL](#)[Info](#)

Step 3: Check the logs

1) To check the logs explicitly, search for CloudWatch on services and open it in a new tab



2) Here, Click on Logs → Log Groups. Select the log that has the lambda function name you just ran.

Name : Nishant S Khetal

Class : D15C

Roll No : 24

CloudWatch > Log groups

Log groups (1)
By default, we only load up to 10000 log groups.

Filter log groups or try prefix search ☐ Exact match

<input type="checkbox"/>	Log group	Log class	Anomaly d...	Data protection	Sensitive data ...	Retention	Metric filters	Contributor In
<input type="checkbox"/>	/aws/lambda/lamdaexp12	Standard	Configure	-	-	Never expire	-	-

3) Here, under Log streams, select the log stream you want to check.

CloudWatch > Log groups > /aws/lambda/lamdaexp12

/aws/lambda/lamdaexp12 [Actions](#) [View in Logs Insights](#) [Start tailing](#) [Search log group](#)

▼ Log group details

Log class Info Standard	Stored bytes -	KMS key ID -
ARN arn:aws:logs:us-east-1:010928207735:log-group:/aws/lambda/lamdaexp12:*	Metric filters 0	Anomaly detection Configure
Creation time 3 minutes ago	Subscription filters 0	Data protection -
Retention Never expire	Contributor Insights rules -	Sensitive data count -

Log streams | Tags | Anomaly detection | Metric filters | Subscription filters | Contributor Insights | Data protection

Log streams (1)
Filter log streams or try prefix search ☐ Exact match ☐ Show expired [Info](#)

<input type="checkbox"/>	Log stream	Last event time
<input type="checkbox"/>	2024/10/07/[\$LATEST]0bfd52dd5b8a444ab1e15bfe46be5f00	2024-10-07 04:34:00 (UTC)

4) Here again, we can see that 'An image has been added to the bucket'.

CloudWatch > Log groups > /aws/lambda/lamdaexp12 > 2024/10/07/[\$LATEST]29f700136a7b40a2b79269533eae8969

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 Clear 1m 30m 1h 12h Custom UTC timezone [Display](#) [Settings](#)

Timestamp	Message
No older events at this moment. Retry	
2024-10-07T04:45:01.475Z	INIT_START Runtime Version: nodejs:20.v39 Runtime Version ARN: arn:aws:lambda:us-east-1::runtime:ad9028ae231dfc4c3325e183024ccb4d90e1aa14796098295f898140041242f7
2024-10-07T04:45:01.612Z	START RequestId: 98ba5a56-c45d-4b89-a6dd-3e554090dd7c Version: \$LATEST
2024-10-07T04:45:01.632Z	END RequestId: 98ba5a56-c45d-4b89-a6dd-3e554090dd7c
2024-10-07T04:45:01.632Z	REPORT RequestId: 98ba5a56-c45d-4b89-a6dd-3e554090dd7c Duration: 18.74 ms Billed Duration: 19 ms Memory Size: 128 MB Max Memory Used: 62 MB Init Duration: 135.57 ms
2024-10-07T04:46:20.191Z	START RequestId: 3cc0dc18-4346-4ea5-8c87-eabb2930f86a Version: \$LATEST
2024-10-07T04:46:20.194Z	END RequestId: 3cc0dc18-4346-4ea5-8c87-eabb2930f86a
2024-09-30T09:24:40.324Z	2024-09-30T09:24:40.324Z 01723939-7280-421D-aa58-4321055754b5 INFO An image has been added to the bucket example-bucket: test/key
2024-10-07T04:46:54.248Z	START RequestId: a7de0c16-28c0-4c19-9aa0-5a616357447b Version: \$LATEST
2024-10-07T04:46:54.259Z	END RequestId: a7de0c16-28c0-4c19-9aa0-5a616357447b
2024-10-07T04:46:54.259Z	REPORT RequestId: a7de0c16-28c0-4c19-9aa0-5a616357447b Duration: 1.48 ms Billed Duration: 2 ms Memory Size: 128 MB Max Memory Used: 62 MB
REPORT RequestId: a7de0c16-28c0-4c19-9aa0-5a616357447b Duration: 1.48 ms Billed Duration: 2 ms Memory Size: 128 MB Max Memory Used: 62 MB	
No newer events at this moment. Auto retry paused. Resume	

Conclusion:

In this experiment, In addition to demonstrating the integration of AWS Lambda with S3, this experiment showcases the scalability and flexibility of serverless architectures. By leveraging these services, we can build applications that respond in real-time to changes in data, such as the addition of files to S3 buckets, without the need for managing underlying server infrastructure. This not only enhances efficiency but also reduces operational costs, allowing developers to focus on building features rather than maintaining systems. Furthermore, the ability to log and monitor events through CloudWatch opens opportunities for further automation and analytics, paving the way for more complex workflows and data processing solutions.