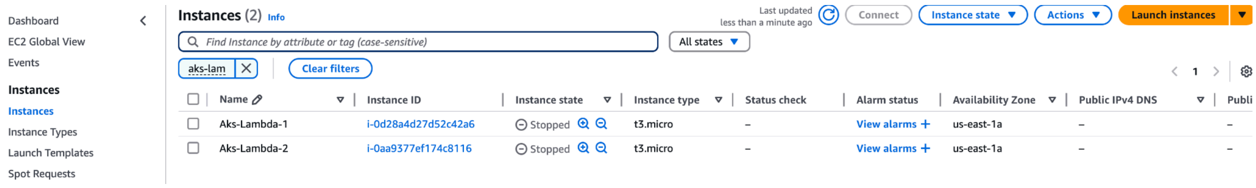
Lambda-Serverless-Architecture

Assignment 1: Automated Instance Management Using AWS Lambda and Boto3

Step1:

Created 2 EC2 instances t3.micro with tags

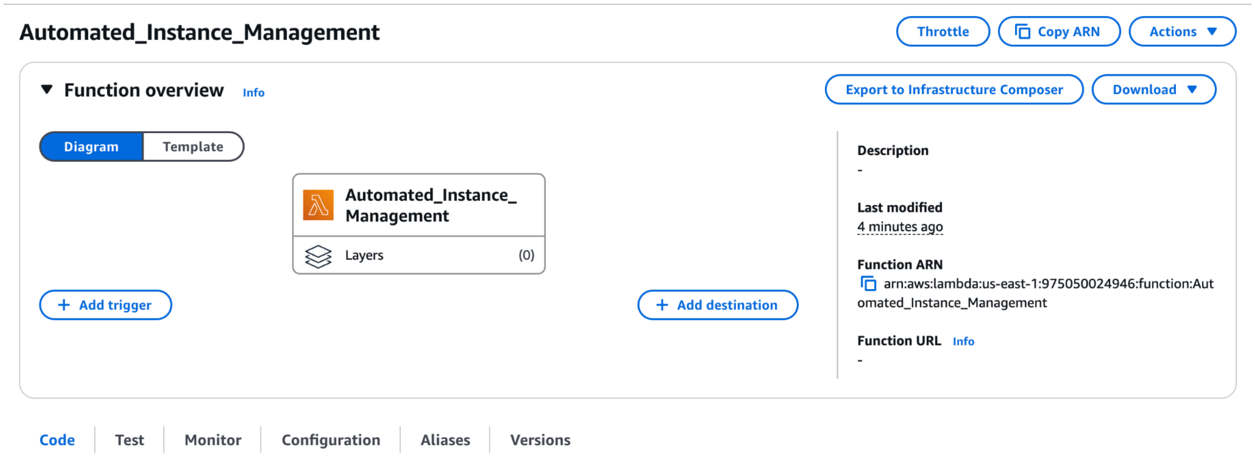
- Tag the first instance with a key `Action` and value `Auto-Stop`.
- Tag the second instance with a key `Action` and value `Auto-Start`.



☐	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 DNS	Publi
☐	Aks-Lambda-1	i-0d28a4d27d52c42a6	Stopped	t3.micro	–	View alarms +	us-east-1a	–	–
☐	Aks-Lambda-2	i-0aa9377ef174c8116	Stopped	t3.micro	–	View alarms +	us-east-1a	–	–

Step2:

- Create a new function named “Automated_Instance_Management”
- Attach the `AmazonEC2FullAccess` policy to this function role.



Description
-

Last modified
4 minutes ago

Function ARN
arn:aws:lambda:us-east-1:975050024946:function:Automated_Instance_Management

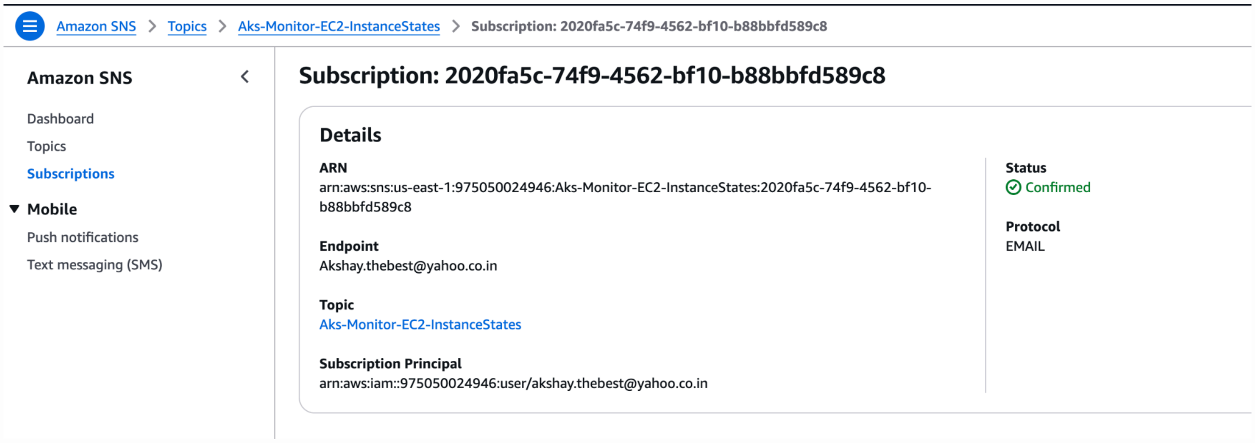
Function URL Info
-

- Code attached to git repo and deployed.
- Ran test to manually trigger it and confirm that the instances' states have changed according to their tags.

Assignment 14: Monitor EC2 Instance State Changes Using AWS Lambda, Boto3, and SNS

Step1.

SNS dashboard and create a new topic.


Amazon SNS > Topics > Aks-Monitor-EC2-InstanceStates > Subscription: 2020fa5c-74f9-4562-bf10-b88bbfd589c8
Amazon SNS
Dashboard
Topics
Subscriptions
Mobile
Push notifications
Text messaging (SMS)

Subscription: 2020fa5c-74f9-4562-bf10-b88bbfd589c8

Details

ARN
arn:aws:sns:us-east-1:975050024946:Aks-Monitor-EC2-InstanceStates:2020fa5c-74f9-4562-bf10-b88bbfd589c8

Endpoint
Akshay.thebest@yahoo.co.in

Topic
Aks-Monitor-EC2-InstanceStates

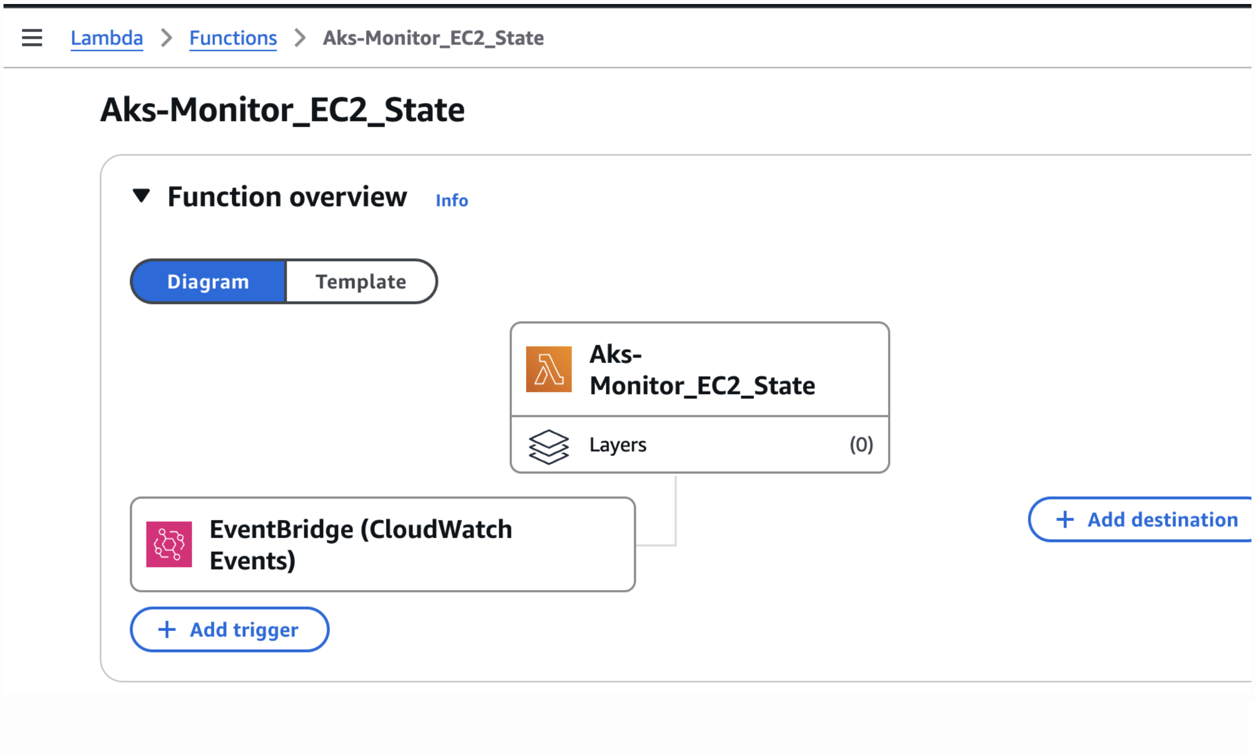
Subscription Principal
arn:aws:iam::975050024946:user/akshay.thebest@yahoo.co.in

Status
Confirmed

Protocol
EMAIL

Step2.

Create a lambda function and assign an IAM role with EC2 and SNS access.

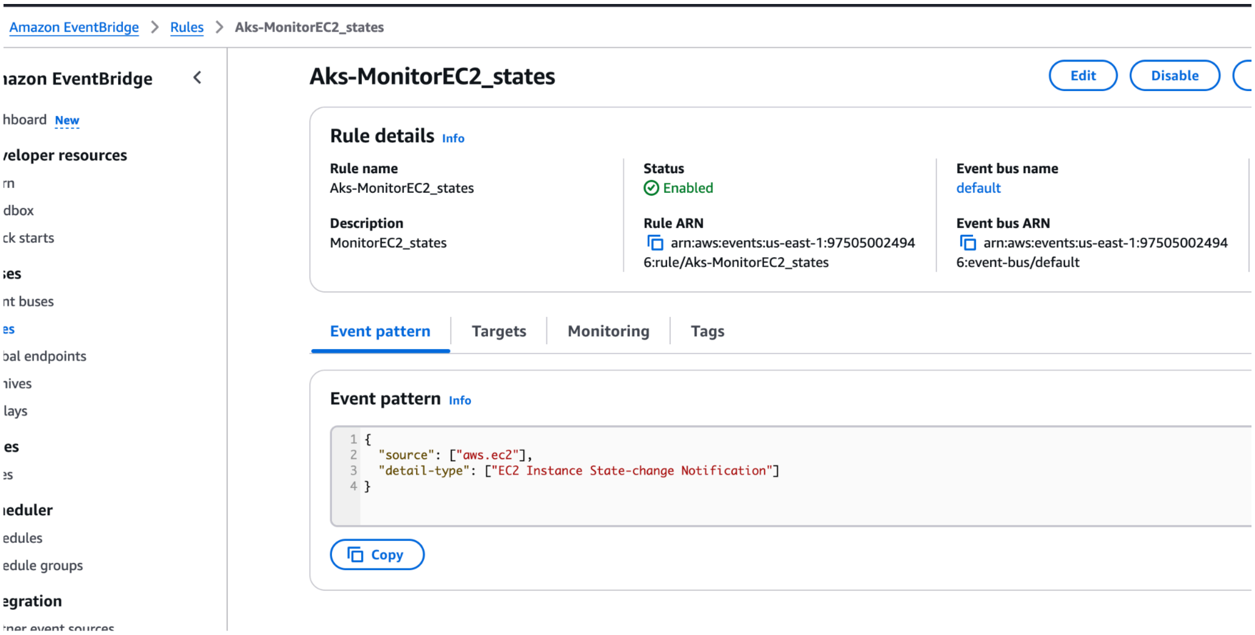


- Code attached to git repo and deployed.

- Ran test to manually trigger it and confirm that the instances' states have changed and you have received the notification via email

Step3:

Created an Event Bridge rule to trigger your Lambda function whenever an EC2 instance state changes..



Aks-MonitorEC2_states

Rule details

Rule name
Aks-MonitorEC2_states

Description
MonitorEC2_states

Status
Enabled

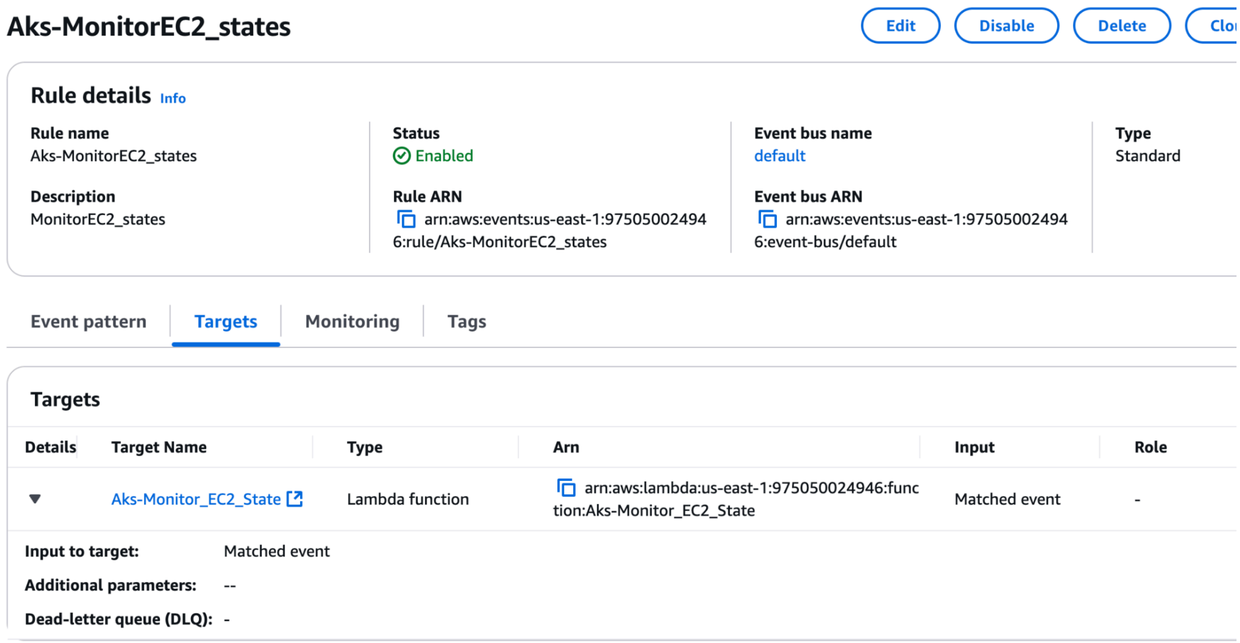
Rule ARN
arn:aws:events:us-east-1:975050024946:rule/Aks-MonitorEC2_states

Event bus name
default

Event bus ARN
arn:aws:events:us-east-1:975050024946:event-bus/default

Event pattern

```
{
  "source": ["aws.ec2"],
  "detail-type": ["EC2 Instance State-change Notification"]
}
```



Aks-MonitorEC2_states

Rule details

Rule name
Aks-MonitorEC2_states

Description
MonitorEC2_states

Status
Enabled

Rule ARN
arn:aws:events:us-east-1:975050024946:rule/Aks-MonitorEC2_states

Event bus name
default

Event bus ARN
arn:aws:events:us-east-1:975050024946:event-bus/default

Type
Standard

Targets

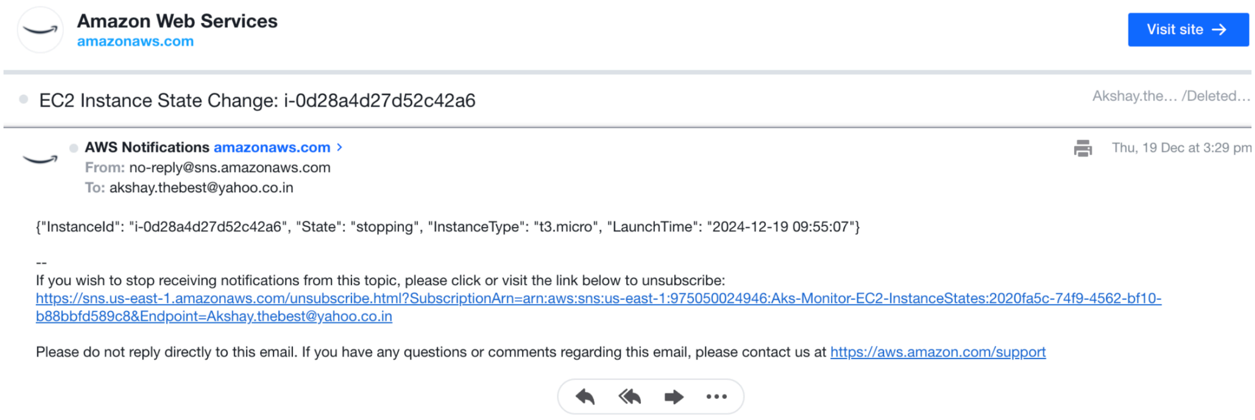
Details	Target Name	Type	Arn	Input	Role
▼	Aks-Monitor_EC2_State	Lambda function	arn:aws:lambda:us-east-1:975050024946:function:Aks-Monitor_EC2_State	Matched event	-

Input to target: Matched event

Additional parameters: --

Dead-letter queue (DLQ): -

You will receive SNS over email specified with below content in it:



EC2 Instance State Change: i-0d28a4d27d52c42a6

AWS Notifications amazonaws.com ›
From: no-reply@sns.amazonaws.com
To: akshay.thebest@yahoo.co.in

{"InstanceId": "i-0d28a4d27d52c42a6", "State": "stopping", "InstanceType": "t3.micro", "LaunchTime": "2024-12-19 09:55:07"}

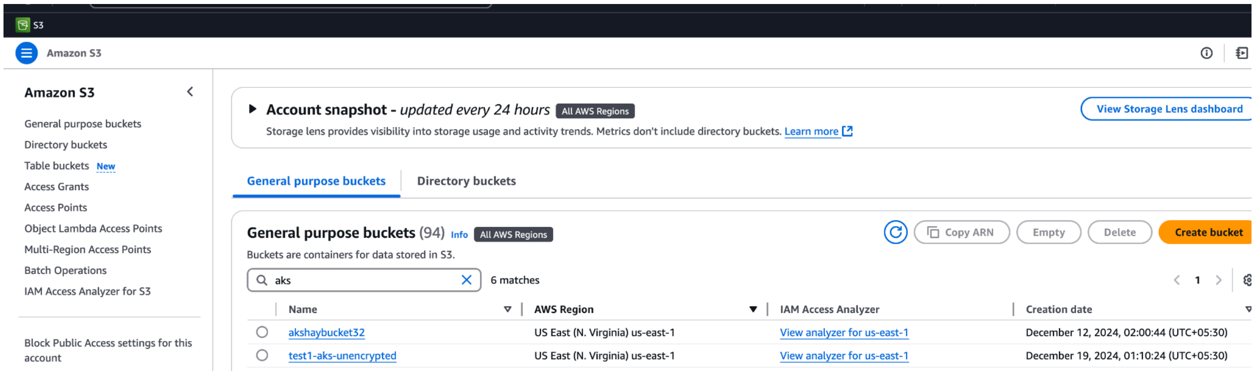
--
If you wish to stop receiving notifications from this topic, please click or visit the link below to unsubscribe:
https://sns.us-east-1.amazonaws.com/unsubscribe.html?SubscriptionArn=arn:aws:sns:us-east-1:975050024946:Aks-Monitor-EC2-InstanceStates:2020fa5c-74f9-4562-bf10-b88bbfd589c8&Endpoint=Akshay.thebest@yahoo.co.in

Please do not reply directly to this email. If you have any questions or comments regarding this email, please contact us at https://aws.amazon.com/support

Assignment 3: Monitor Unencrypted S3 Buckets Using AWS Lambda and Boto3

1. S3 Setup:

Tried creating S3 buckets but all have SSE enabled, unable to create a KMS key or choose any other option.



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

Storage lens provides visibility into storage usage and activity trends. Metrics don't include directory buckets. Learn more

General purpose buckets (94) Info All AWS Regions

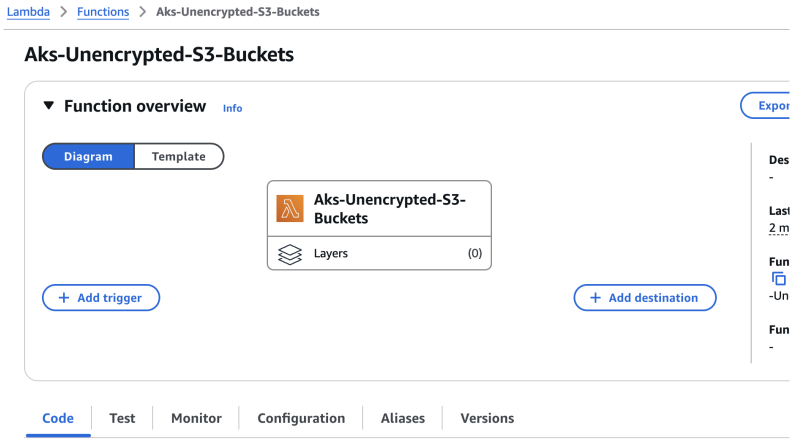
Buckets are containers for data stored in S3.

aks — 6 matches

	Name	AWS Region	IAM Access Analyzer	Creation date
○	akshaybucket32	US East (N. Virginia) us-east-1	View analyzer for us-east-1	December 12, 2024, 02:00:44 (UTC+05:30)
○	test1-aks-unencrypted	US East (N. Virginia) us-east-1	View analyzer for us-east-1	December 19, 2024, 01:10:24 (UTC+05:30)

2. Lambda function:

-Created function named "Aks-Unencrypted-S3-Buckets"
-Using IAM role "Ralph-S3readonly " since permissions to create any role is not with this account.



- Code attached to git repo and deployed.
- Ran test to manually trigger it and confirm that all S3 buckets have SSE enabled or not.

Assignment 2: Automated S3 Bucket Cleanup Using AWS Lambda and Boto3

Step1:

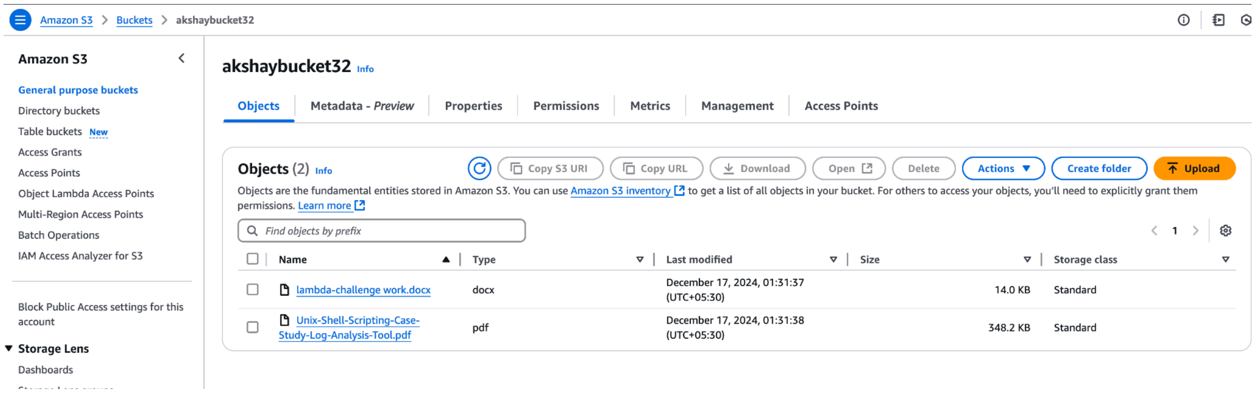
Existing buckets in S3, named “akshaybucket32”

Step2:

Created IAM role “Aks-S3-bucket_cleaner-role-a7u6lpb1 ” with S3 full access.

Step3:

Created lambda function and applied above IAM role to it,

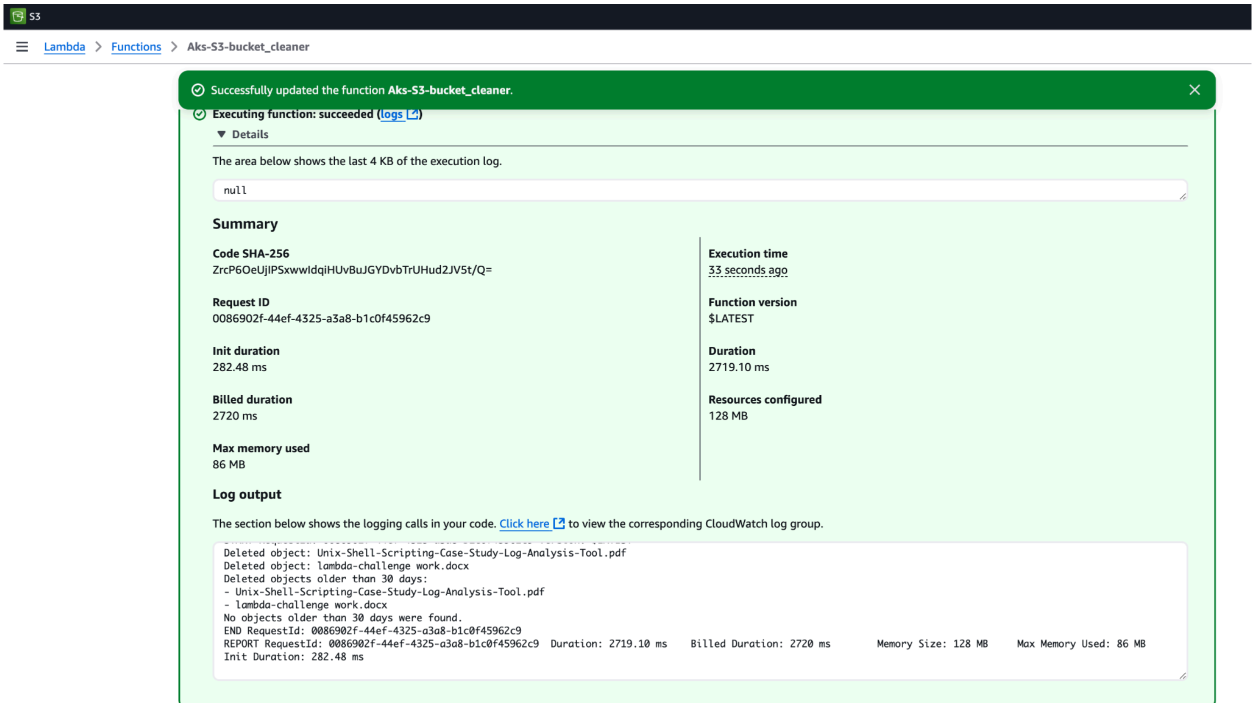


akshaybucket32 Info

Objects (2) Info

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more

□	Name	Type	Last modified	Size	Storage class
□	lambda-challenge work.docx	docx	December 17, 2024, 01:31:37 (UTC+05:30)	14.0 KB	Standard
□	Unix-Shell-Scripting-Case-Study-Log-Analysis-Tool.pdf	pdf	December 17, 2024, 01:31:38 (UTC+05:30)	348.2 KB	Standard



Successfully updated the function **Aks-S3-bucket_cleaner**.

Executing function: succeeded (logs)

The area below shows the last 4 KB of the execution log.

```
null
```

Summary

Code SHA-256
ZrcP6OeUjIPSxwwIdqiHUvBuJGYDvbTrUHud2JV5t/Q=

Request ID
0086902f-44ef-4325-a3a8-b1c0f45962c9

Init duration
282.48 ms

Billed duration
2720 ms

Max memory used
86 MB

Execution time
33 seconds ago

Function version
$LATEST

Duration
2719.10 ms

Resources configured
128 MB

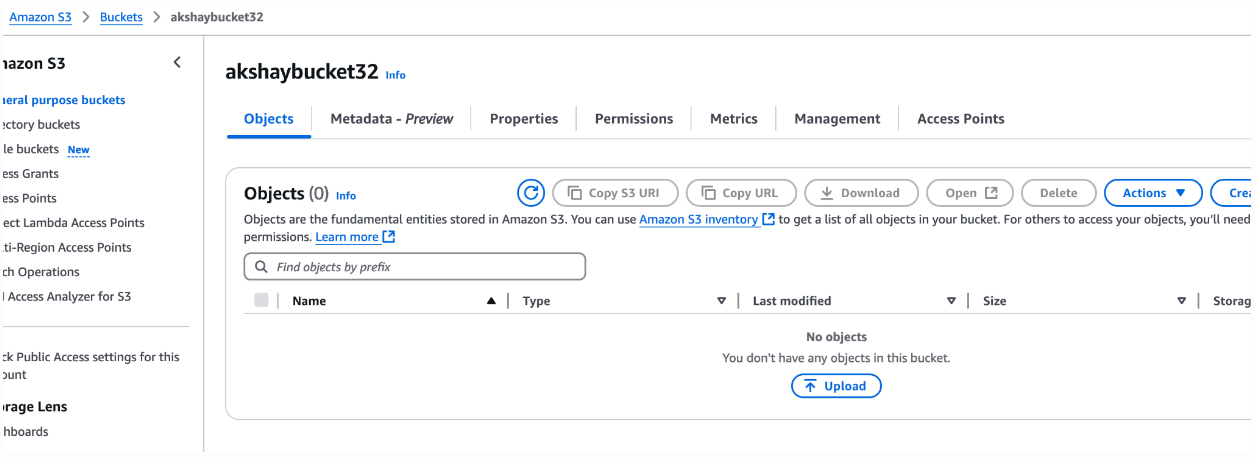
Log output

The section below shows the logging calls in your code. Click here to view the corresponding CloudWatch log group.

```
Deleted object: Unix-Shell-Scripting-Case-Study-Log-Analysis-Tool.pdf
Deleted object: lambda-challenge work.docx
Deleted objects older than 30 days:
- Unix-Shell-Scripting-Case-Study-Log-Analysis-Tool.pdf
- lambda-challenge work.docx
No objects older than 30 days were found.
END RequestId: 0086902f-44ef-4325-a3a8-b1c0f45962c9
REPORT RequestId: 0086902f-44ef-4325-a3a8-b1c0f45962c9  Duration: 2719.10 ms    Billed Duration: 2720 ms        Memory Size: 128 MB     Max Memory Used: 86 MB
Init Duration: 282.48 ms
```

Step4:

Triggered it to find the accuracy, wrote Boto3 Python script attached to git repo.



Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need permissions. Learn more

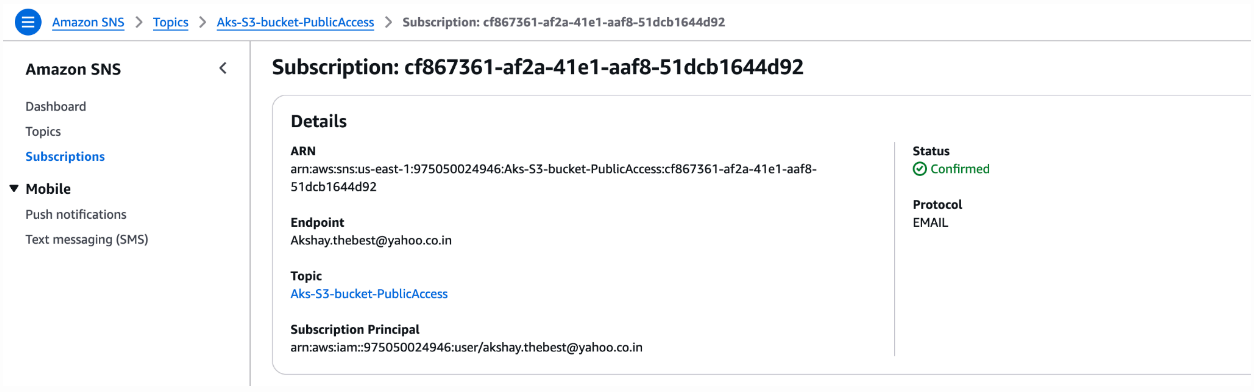
No objects

You don't have any objects in this bucket.

Assignment 13: Audit S3 Bucket Permissions and Notify for Public Buckets

Step1:

Created a new SNS topic "Aks-S3-bucket-PublicAccess".



Amazon SNS > Topics > Aks-S3-bucket-PublicAccess > Subscription: cf867361-af2a-41e1-aaf8-51dcb1644d92

Subscription: cf867361-af2a-41e1-aaf8-51dcb1644d92

Details

ARN
arn:aws:sns:us-east-1:975050024946:Aks-S3-bucket-PublicAccess:cf867361-af2a-41e1-aaf8-51dcb1644d92

Endpoint
Akshay.thebest@yahoo.co.in

Topic
Aks-S3-bucket-PublicAccess

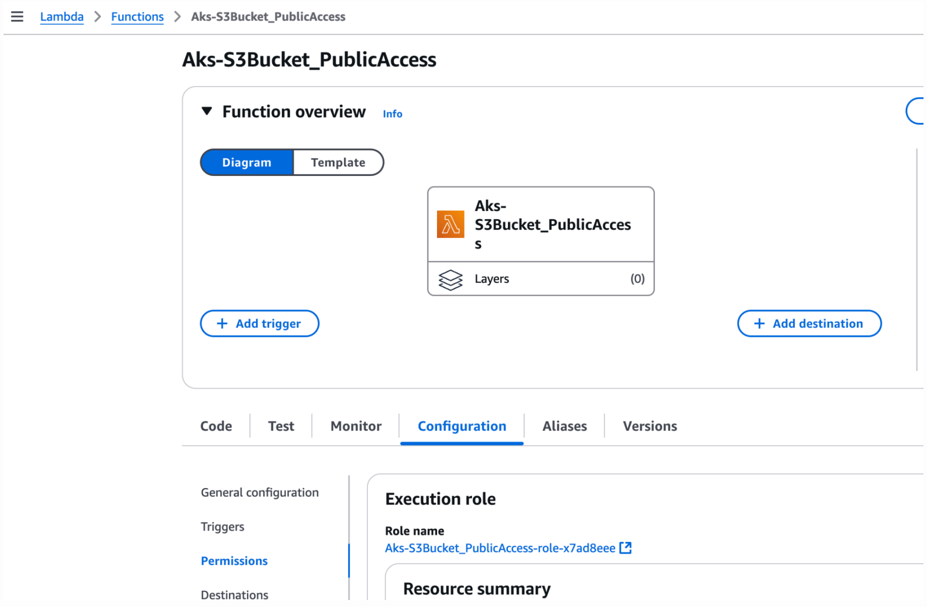
Subscription Principal
arn:aws:iam::975050024946:user/akshay.thebest@yahoo.co.in

Status
Confirmed

Protocol
EMAIL

Step2:

Created a function with an IAM role for S3fullaccess, cloudwatch and SNSfullaccess.



Lambda > Functions > Aks-S3Bucket_PublicAccess

Aks-S3Bucket_PublicAccess

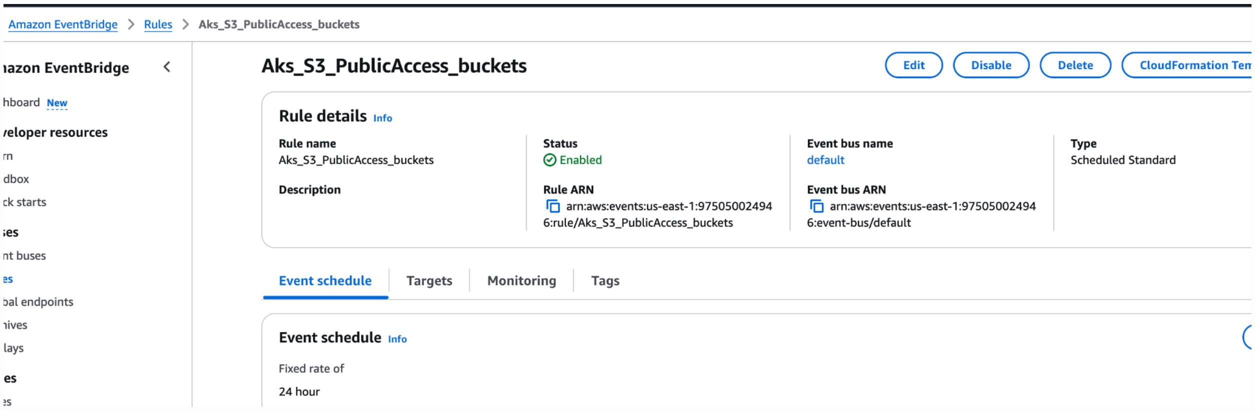
Execution role

Role name
Aks-S3Bucket_PublicAccess-role-x7ad8eee

Resource summary

Step3:

Schedule your Lambda function to run daily via Eventbridge rule.



Aks_S3_PublicAccess_buckets

Rule details Info

Rule name: Aks_S3_PublicAccess_buckets

Description

Status: Enabled

Rule ARN: arn:aws:events:us-east-1:97505002494 6:rule/Aks_S3_PublicAccess_buckets

Event bus name: default

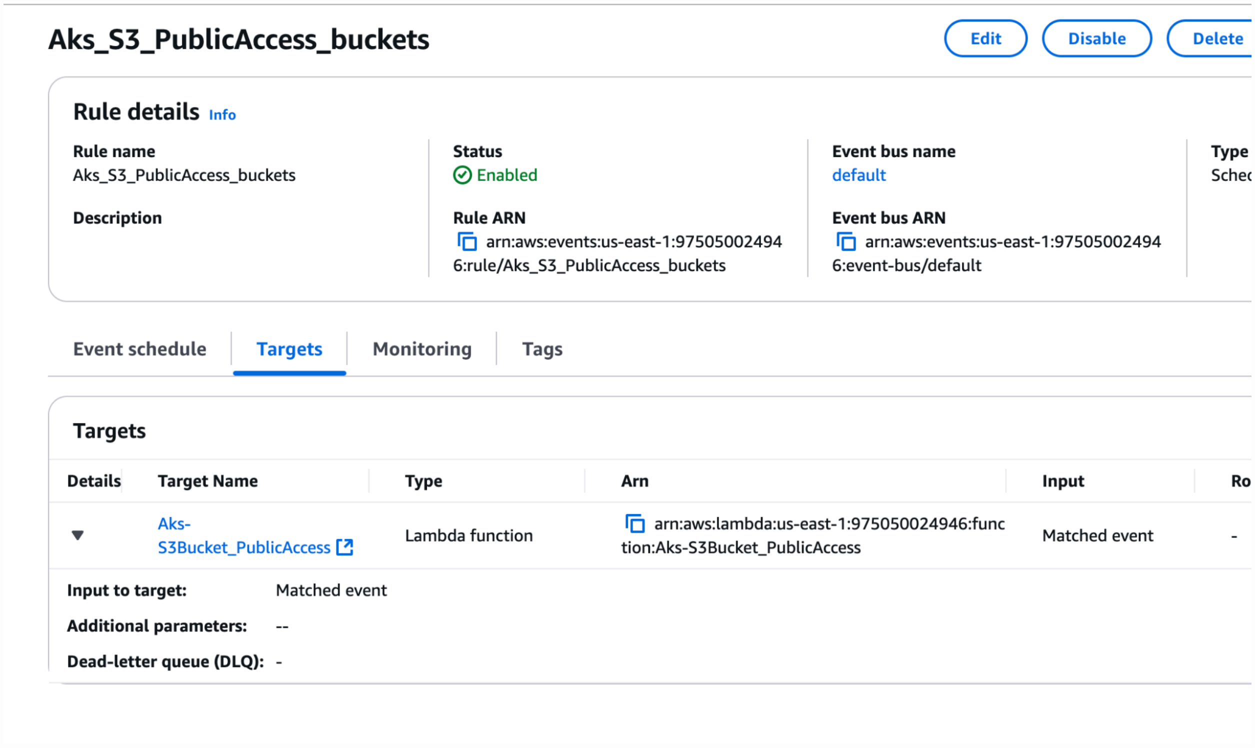
Event bus ARN: arn:aws:events:us-east-1:97505002494 6:event-bus/default

Type: Scheduled Standard

Event schedule Info

Fixed rate of

24 hour



Aks_S3_PublicAccess_buckets

Rule details Info

Rule name: Aks_S3_PublicAccess_buckets

Description

Status: Enabled

Rule ARN: arn:aws:events:us-east-1:97505002494 6:rule/Aks_S3_PublicAccess_buckets

Event bus name: default

Event bus ARN: arn:aws:events:us-east-1:97505002494 6:event-bus/default

Type: Schec

Targets

Details	Target Name	Type	Arn	Input	Ro
▼	Aks-S3Bucket_PublicAccess	Lambda function	arn:aws:lambda:us-east-1:975050024946:function:Aks-S3Bucket_PublicAccess	Matched event	-

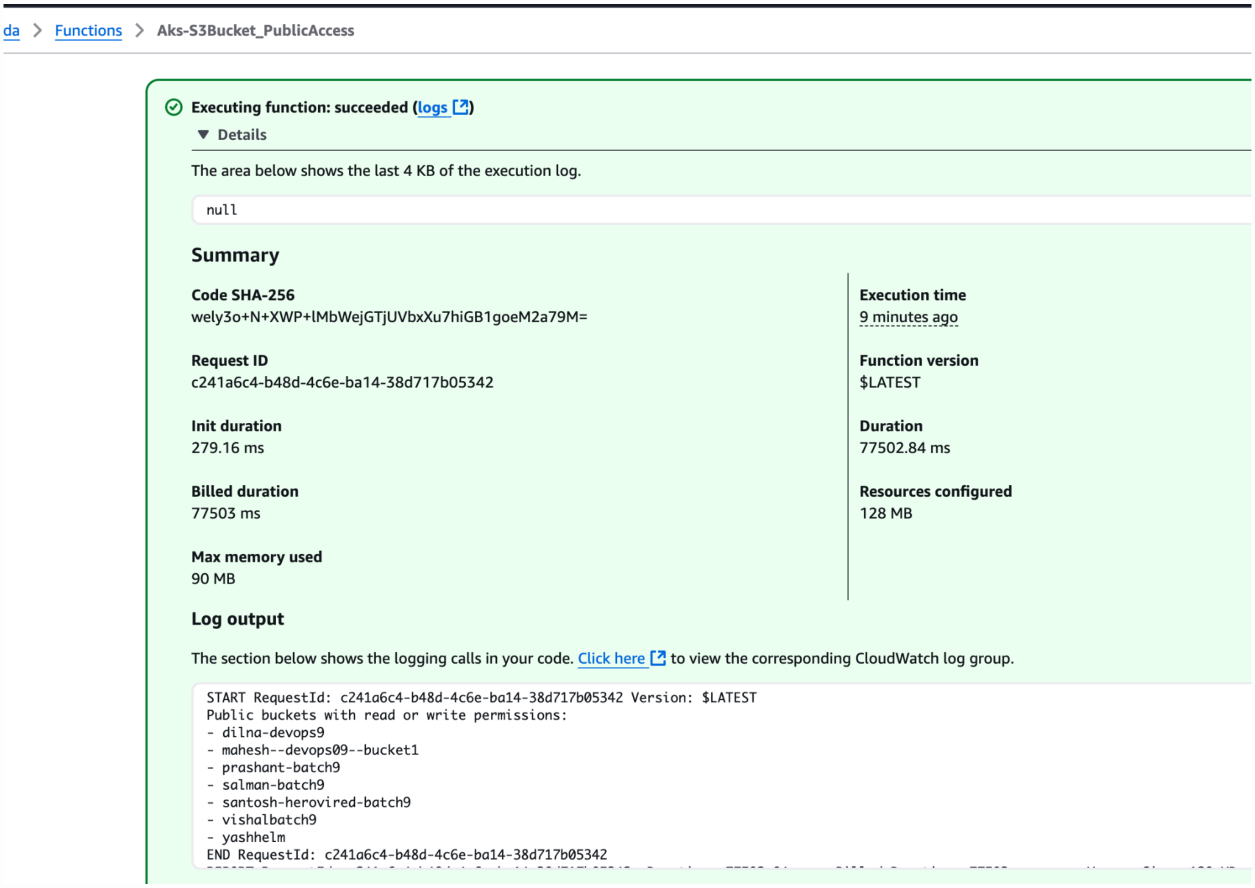
Input to target: Matched event

Additional parameters: --

Dead-letter queue (DLQ): -

Step4:

Triggered it to find the accuracy, wrote Boto3 Python script attached to git repo.



Executing function: succeeded (logs)

The area below shows the last 4 KB of the execution log.

```
null
```

Summary

Code SHA-256
wely3o+N+XWP+lMbWejGTjUVbxXu7hiGB1goeM2a79M=

Request ID
c241a6c4-b48d-4c6e-ba14-38d717b05342

Init duration
279.16 ms

Billed duration
77503 ms

Max memory used
90 MB

Execution time
9 minutes ago

Function version
$LATEST

Duration
77502.84 ms

Resources configured
128 MB

Log output

The section below shows the logging calls in your code. Click here to view the corresponding CloudWatch log group.

```
START RequestId: c241a6c4-b48d-4c6e-ba14-38d717b05342 Version: $LATEST
Public buckets with read or write permissions:
- dilna-devops9
- mahesh--devops09--bucket1
- prashant-batch9
- salman-batch9
- santosh-herovired-batch9
- vishalbatch9
- yashhelm
END RequestId: c241a6c4-b48d-4c6e-ba14-38d717b05342
```