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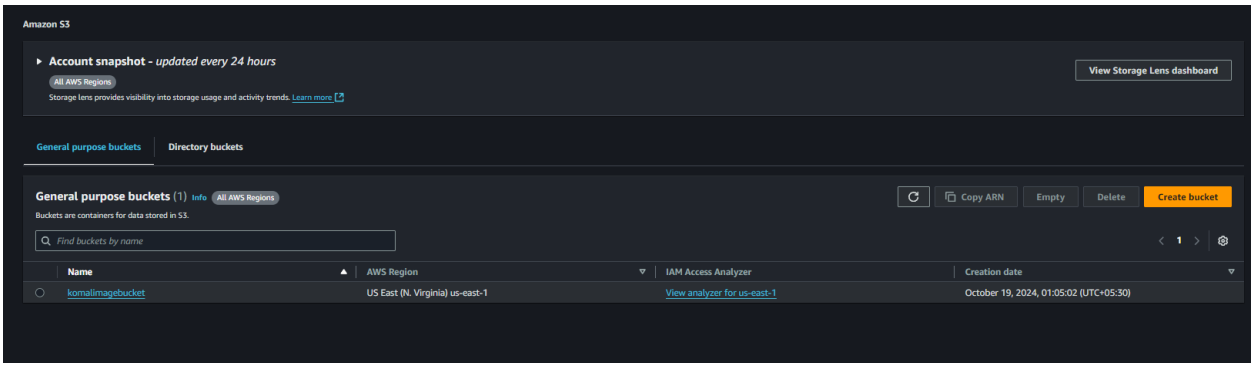
SERVERLESS MONITORING USING NAGIOS

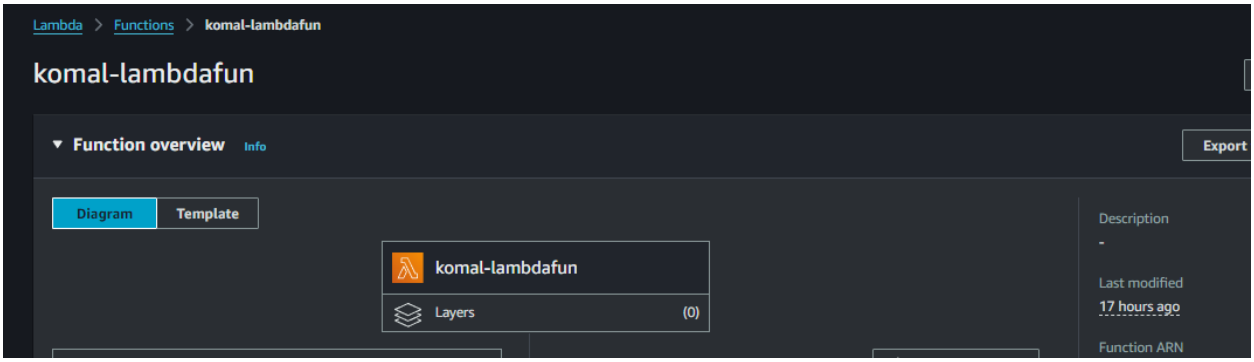
CREATION OF S3 BUCKET:

CREATE AN S3 BUCKET OF IN AWS

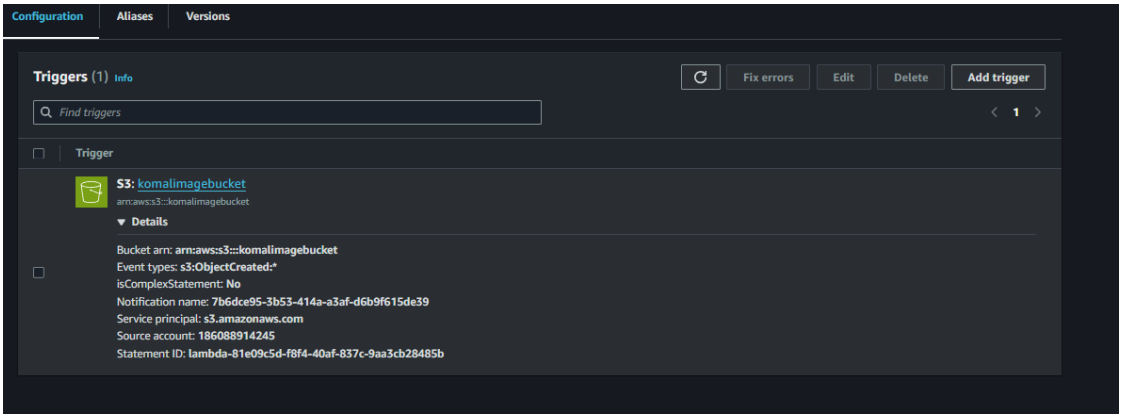


CREATION OF LAMBDA FUNCTION

CREATE A NEW LAMBDA FUNCTION AND CONFIGURE IT.



ADD AN S3 TRIGGER TO GET UPDATED WHEN A NEW IMAGE IS UPLOADED IN THE S3 BUCKET



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UPDATE THE PYTHON SCRIPT IN THE CODE SOURCE TO WRITE A CODE THAT PRINTS “AN IMAGE IS UPLOADED” WHEN THE LAMBDA FUNCTION IS TRIGGERED BY S3.

Write the below code in the script.

```
import json

import logging

# Set up logging

logger = logging.getLogger()

logger.setLevel(logging.INFO)


def lambda_handler(event, context):

    # Log incoming event data

    logger.info('Received event: %s', json.dumps(event, indent=2))


    # Get bucket name and object key from the event

    bucket_name = event['Records'][0]['s3']['bucket']['name']

    object_key = event['Records'][0]['s3']['object']['key']


    # Check if the uploaded object is an image

    if object_key.lower().endswith(('.png', '.jpg', '.jpeg', '.gif')):

        logger.info('An Image has been added to the bucket: %s, Object: %s', bucket_name, object_key)

    else:

        logger.info('Non-image file uploaded to the bucket: %s, Object: %s', bucket_name, object_key)


    return {

        'statusCode': 200,

        'body': json.dumps('Lambda function executed successfully!')

    }
```

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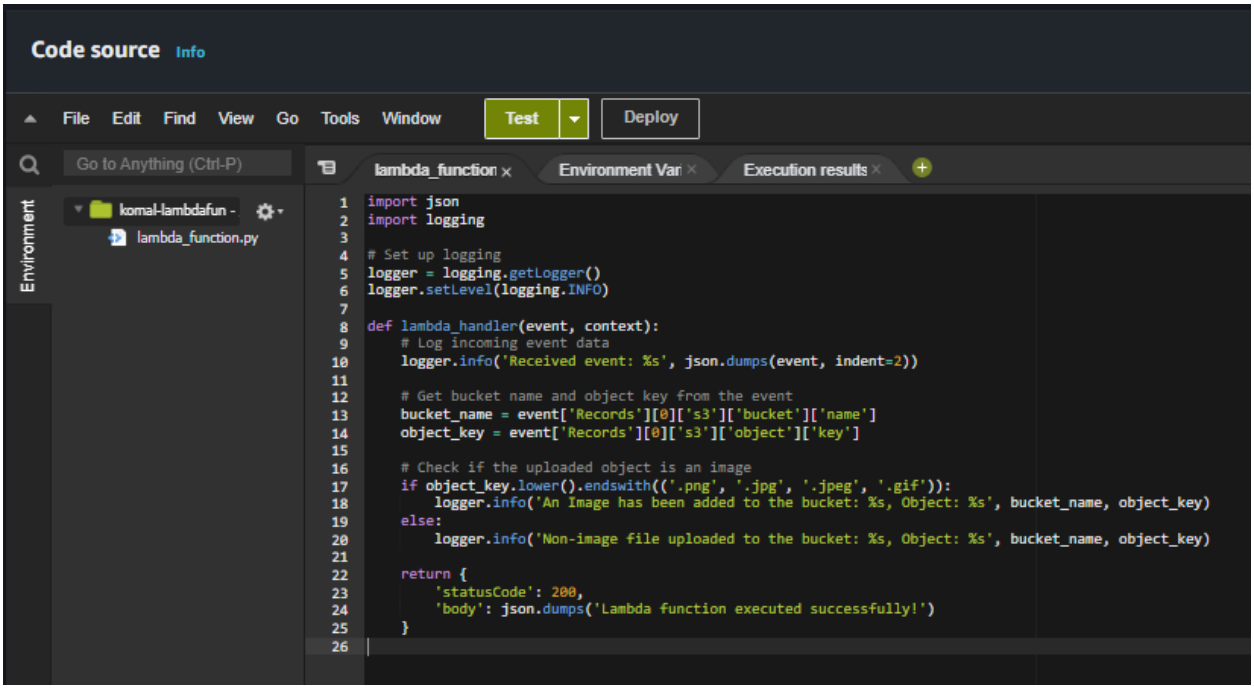
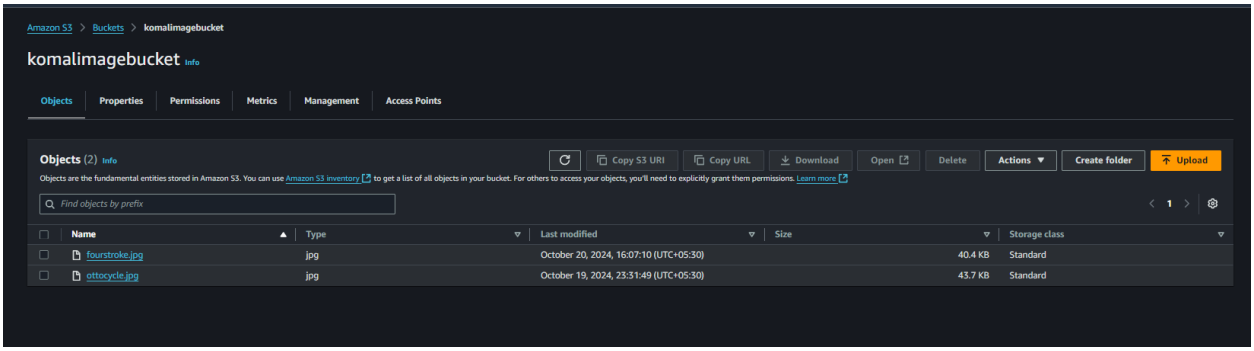


1)UPLOAD AN IMAGE IN THE S3 BUCKET:



NOW GO BACK TO LAMBDA FUNCTION AND

DEPLOY THE CODE BY CLICKING ON THE DEPLOY OPTION AND TEST IT.

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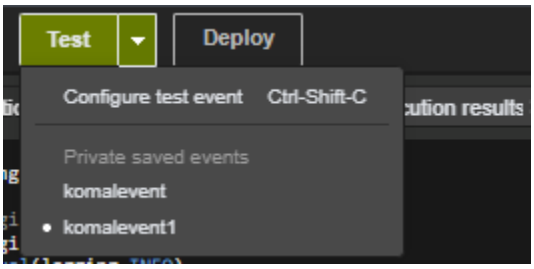

-USE THE SUITABLE EVENT FOR YOUR CODE.

THE EVENT SHOULD INCLUDE BELOW SCRIPT.


```
{
  "Records": [
    {
      "eventVersion": "2.1",
      "eventSource": "aws:s3",
      "awsRegion": "us-east-1",
      "eventTime": "2024-10-19T17:00:00.000Z",
      "eventName": "ObjectCreated:Put",
      "userIdentity": {
        "principalId": "EXAMPLE"
      },
      "requestParameters": {
        "sourceIPAddress": "127.0.0.1"
      },
      "responseElements": {
        "x-amz-request-id": "EXAMPLE123456789",
        "x-amz-id-2": "EXAMPLE123/456EXAMPLE="
      },
      "s3": {
        "s3SchemaVersion": "1.0",
        "configurationId": "testConfigRule",
        "bucket": {
```

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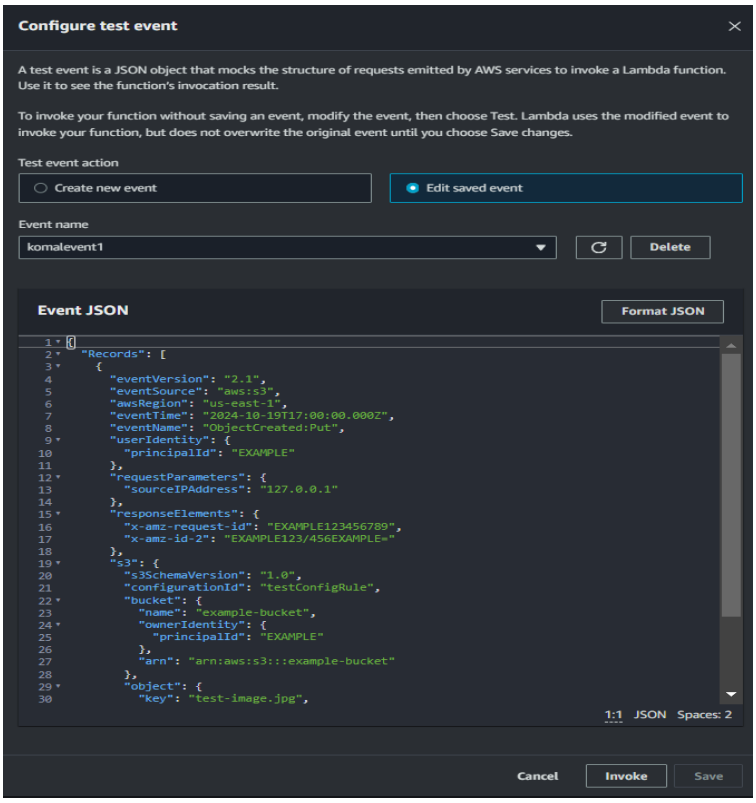
```
        "name": "example-bucket",
        "ownerIdentity": {
          "principalId": "EXAMPLE"
        },
        "arn": "arn:aws:s3:::example-bucket"
      },
      "object": {
        "key": "test-image.jpg",
        "size": 1024,
        "eTag": "0123456789abcdef0123456789abcdef",
        "sequencer": "0A1B2C3D4E5F678901"
      }
    }
  }
]}
```

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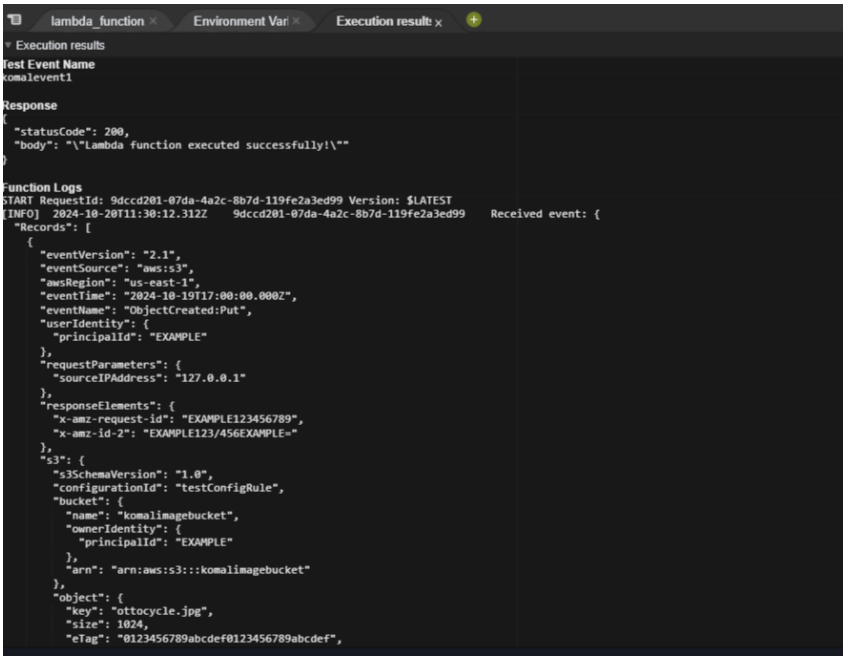
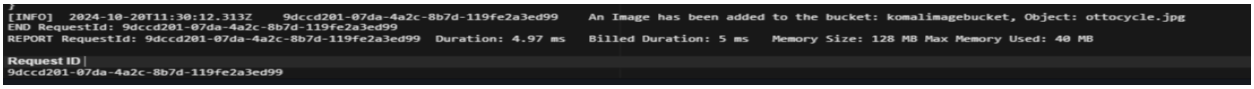
THE RESULT OF EXECUTION WILL LOOK LIKE:





-*the output of this code is of before the image fourstroke.jpg was uploaded.*

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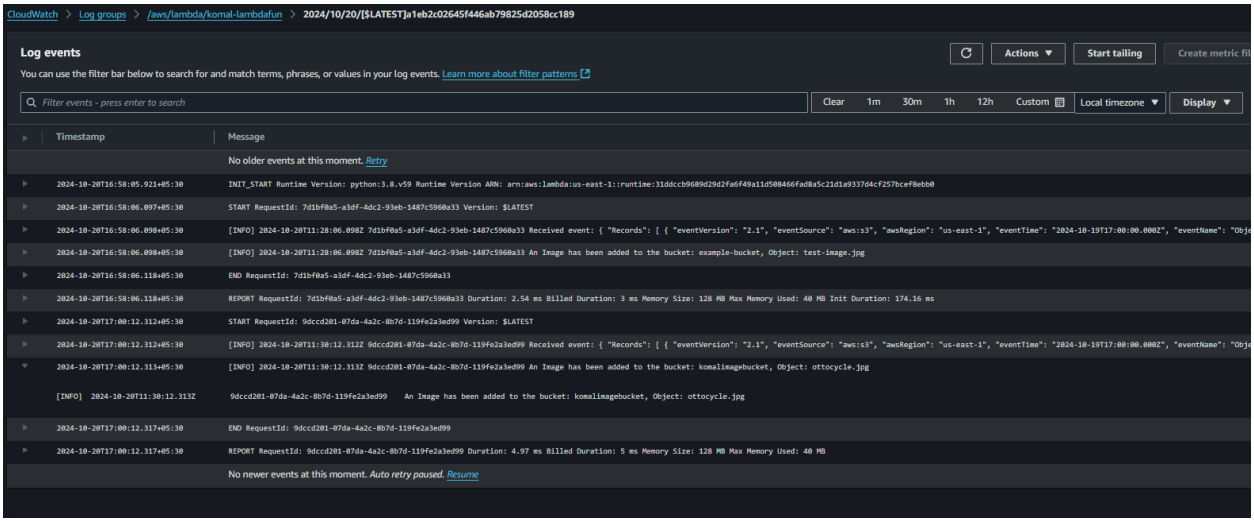
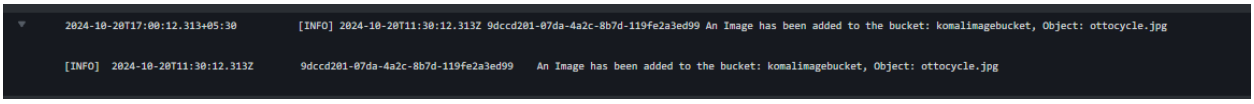
2)CHECK THE CLOUDWATCH LOGS

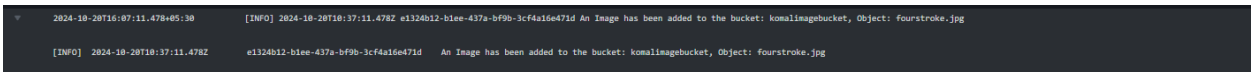
Once the image is uploaded. The lambda function is triggered and it can be checked in the logs.

Go to cloudwatch>log group name>log stream





AFTER UPLOADING ONE MORE IMAGE:



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3)FOR MONITORING THE LAMBDA FUNCTION BY USING NAGIOS ON EC2:

PREREQUISITES: INSTALL AND CONFIGURE NAGIOS ON YOUR EC2 INSTANCE.

1)GO TO THE LIBEXEC DIRECTORY *cd /usr/local/nagios/libexec*

```
[ec2-user@ip-172-31-43-5 ~]$ cd /usr/local/nagios/libexec
[ec2-user@ip-172-31-43-5 libexec]$ sudo chmod +x check_lambda.sh
```

2) RUN THE COMMAND *sudo nano check_lambda.sh*

3) WRITE THE BELOW CODE IN THE SCRIPT

```
#!/bin/bash


# AWS Lambda function name

LAMBDA_FUNCTION_NAME="komal-lambdafun"


# S3 bucket name (replace this with your actual bucket name)

S3_BUCKET_NAME="your-s3-bucket-name"


# Log group for the Lambda function (CloudWatch logs)

LOG_GROUP_NAME="/aws/lambda/$LAMBDA_FUNCTION_NAME"


# Get the current time to filter logs from this point onward

CURRENT_TIME=$(date -u +"%Y-%m-%dT%H:%M:%S.000Z")


# Monitor Lambda for S3 trigger (image upload)

echo "Monitoring Lambda function '$LAMBDA_FUNCTION_NAME' for image uploads to S3 bucket '$S3_BUCKET_NAME'."


# Monitor S3 bucket for any new object (image upload)

echo "Checking if there is a new image uploaded to the S3 bucket..."
```

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```
LATEST_OBJECT=$(aws s3api list-objects --bucket $S3_BUCKET_NAME --query 'Contents[?contains(Key, `.jpg`) || contains(Key, `.png`)] | sort_by(@, &LastModified)[-1].Key' --output text)


if [ "$LATEST_OBJECT" == "None" ]; then
   echo "No image found in the bucket '$S3_BUCKET_NAME'."
   exit 1
else
   echo "Latest image uploaded: $LATEST_OBJECT"
fi


# Check the Lambda function's logs for recent activity (triggered by the S3 event)
echo "Checking Lambda function logs for the latest execution..."


# Fetch log streams (sorted by latest event time)
LATEST_LOG_STREAM=$(aws logs describe-log-streams --log-group-name $LOG_GROUP_NAME --order-by LastEventTime --descending --limit 1 --query 'logStreams[0].logStreamName' --output text)


if [ "$LATEST_LOG_STREAM" == "None" ]; then
   echo "No logs found for Lambda function '$LAMBDA_FUNCTION_NAME'."
   exit 2
else
   echo "Fetching logs from stream: $LATEST_LOG_STREAM"
fi


# Get logs for the latest Lambda execution
LOG_EVENTS=$(aws logs get-log-events --log-group-name $LOG_GROUP_NAME --log-stream-name $LATEST_LOG_STREAM --start-time $(date --date="$CURRENT_TIME" +%s%3N))


# Check if log events were found
if [ -z "$LOG_EVENTS" ]; then
```

```
    echo "No log events found for Lambda function execution after image upload."
    exit 3
else
    echo "Log events from Lambda function triggered by S3 upload:"
    echo "$LOG_EVENTS"
    exit 0
fi
```

-IT MONITORS YOUR LAMBDA FUNCTION AND THE S3 BUCKET'S LATEST CHANGES.

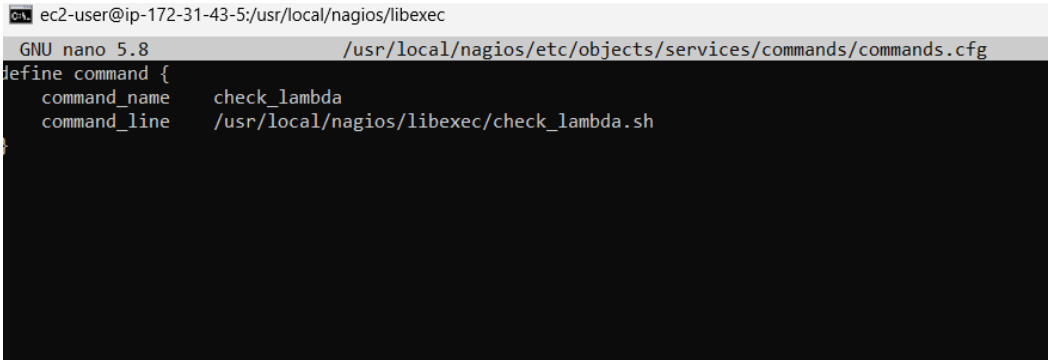
3)RUN *sudo chmod +x check_lambda.sh*

4) RUN THE FOLLOWING COMMAND TO ACCESS THE COMMANDS SCRIPT

sudo nano /usr/local/nagios/etc/objects/services/commands/commands.cfg

5)WRITE THE BELOW CODE IN THE SCRIPT

```
define command {
    command_name    check_lambda
    command_line    /usr/local/nagios/libexec/check_lambda.sh
}
```



6)RUN THE FOLLOWING COMMAND TO ACCESS THE SERVICES SCRIPT

sudo nano /usr/local/nagios/etc/objects/services/services.cfg

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```
ec2-user@ip-172-31-43-5:/usr/local/nagios/libexec
 GNU nano 5.8                    /usr/local/nagios/etc/objects/services/services.cfg
define service {
   use                     generic-service
   host_name               localhost
   service_description     Check Lambda Function
   check_command           check_lambda
}
```

7)WRITE THE BELOW CODE IN THE SCRIPT

```
define service {
   use                 generic-service
   host_name           localhost
   service_description Check Lambda Function
   check_command       check_lambda
}
```

8)SET THE AWS CREDENTIALS TO ACCESS AND MONITOR THE CREATED LAMBDA FUNCTION.

```
export AWS_SECRET_ACCESS_KEY="your_secret_key"
export AWS_SESSION_TOKEN="your_session_token"
export AWS_SESSION_TOKEN="your_session_token"
```

```
ec2-user@ip-172-31-43-5 libexec]$ export AWS_ACCESS_KEY_ID="ASIASWU6DPVCRK2RKYT7"
ec2-user@ip-172-31-43-5 libexec]$   export AWS_SESSION_TOKEN="IQoJb3JpZ2luX2VjEAcaCXVzLXdlc3QtMiJIMEYCIQCd+3eoNv+R4fYRdMXGn8EJZybHYYtYLCkcgsy+368WbQIhAJo76ofF9/13D7vdWLAMgjs0DaO9wtDvrUjhOm
2bgnVKrUCCHAQARoMMTg2MDg4OTE0MjQ1IgwL6krnu8dc2j4+R0cqkgIzb4mKEu3h7CcxacQ/K4ttwsRkWxcB23W8utmDOMKntu1oMT9oSPglenSAEGjUm56TbNo7jpMk3cJZ9h0t2aGS8DUgLO66Swg+ce9EQRPJsrnbYiGnFTR9yDuS79BPgfipIBu
3V9iW+Y/N75f1VEbT3yLTevmQAXoX59RurOdMFMf1rfu1MN8JkgcAf8JeJr5BJIeMfnNtZcKPMGtoTopBMir3QVjplZZ+ABmJES+9CtAwitbfVopQILFAw2uXqRGPNtTv4eBrW0ZWbA2Zfn0LBunEpFr+jOg4i+EqE7YEVniWN2cnpJtqIDVoCnQNJ+E
9G5S5G9zYLjlmSKpH5MHojDRmcFs649qwJ+Snaa3hp80MPjO0rgGOpwBNni6lfZKV5IUd4/Et8l5dgLI9eFTTTICYcdaPnCD0F2WUf3VzVa1ibCdl00rSbwTtbEXsXx41PBmTj2GmZ4qwmjR2ftaXkF9uwSMxQKZkrebOOv7c6II/v85OpJQAEOLC3ald
WQt/AeS9+2DkDrlI6LHdJv+seEqCmNhQ3DEoKDZ1YXR93wHUQy3T6Dfv4IHC+vcQYzafvIzpks"TZUKk0XeF1qMYWojXAeDtlCjQQdoB%2BlhGP1awBsSln1tqA1CzLXC%2FxK2TQxG%2Fw29L1FGvzq%2BTREzcgLPEXz0BdwwmrGuWBBr2%2B0gMC5
ec2-user@ip-172-31-43-5 libexec]$ oEb50M7IzTZrAq%2FE9XWcn6sFvQ4d9KEZsr7Ep64GYz1a4JU6EWpaLYQQA1Xn10utbCbVoH6VZOR9knGhBxIFScLxDZ%2BoXs8Nycsai7jtazNvWF7sIUHmsNC8zRXl0%2Bw450hK%2Fkb%2FaSmHZ%2F
ec2-user@ip-172-31-43-5 libexec]$ ^CuhL96Sq8WGlovqK0mFYv3SeExWCrl4febQrCxM9Lk%2BEH554XksEIQKAk%2B2LcmvhJ5rK98VUY3V3MzrQC4%2F3ueNB0x1VPInqEkuWNuCT6KIDGs0lrnpmBa%2BkI85TrFW6hF8iDxFP27OW11bIk
ec2-user@ip-172-31-43-5 libexec]$ ^C2EhbTG3GiSMYQSwv%2F0XTgI3UlphHmPDsN3pyjmcwsZTTUm6H%2Bz8RlWpjnlP%2FDzzcocdgnleJUAviF%2FD08tWUA4z4ZAcsxEKXtbo9Ic4yVZH8FcL%2FOeD790kK3i3zZAIYMX6yjBMYFs4uFj
```

```
ec2-user@ip-172-31-43-5 libexec]$ export AWS_SECRET_ACCESS_KEY="uzjnupR3BdeJnPktvBZxxxzc4GHiCdmWJ9T+wGKL"
```

9) RESTART NAGIOS TO GET THE CHANGES UPDATED *sudo systemctl restart nagios*

10)RUN BELOW COMMAND TO CHECK THE MONITORING OF YOUR LAMBDA FUNCTION

./check_lambda.sh

```
Monitoring Lambda function 'komal-lambdafun' for image uploads to S3 bucket 'komalimagebucket'.
Checking if there is a new image uploaded to the S3 bucket...
Latest image uploaded: ottocycle.jpg
Checking Lambda function logs for the latest execution...
Fetching logs from stream: 2024/10/19/[$LATEST]6fffb263855042b295ab4aabd7f7f3fb
Log events from Lambda function triggered by S3 upload:
{
    "events": [],
    "nextForwardToken": "f/38567525873567295377391290756440763726736881459105103872/s",
    "nextBackwardToken": "b/38567365242593073582827578416871117500402558849515520000/s"
}
```

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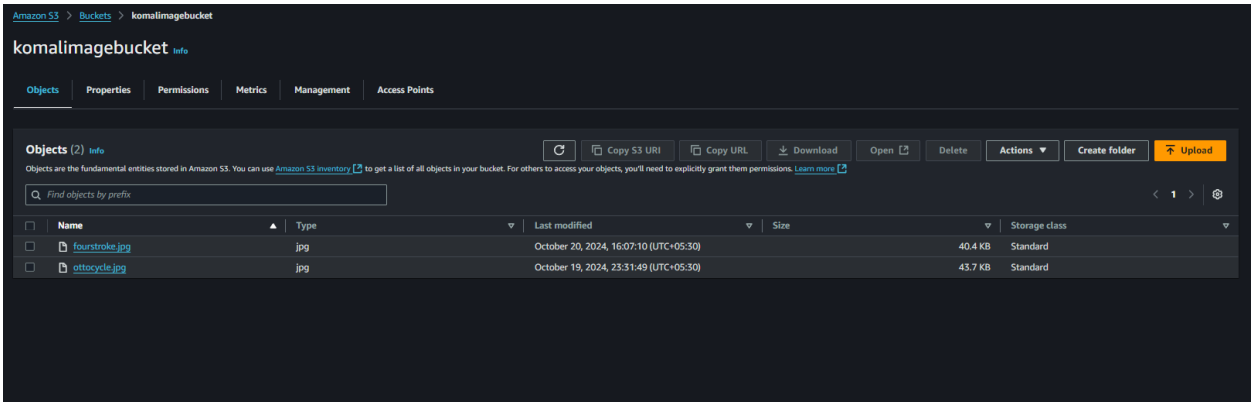
ALSO TRY UPLOADING A NEW IMAGE IN THE S3 BUCKET TO CHECK IF THE MONITORING IS WORKING




```
Monitoring Lambda function 'komal-lambdafun' for image uploads to S3 bucket 'komalimagebucket'.
Checking if there is a new image uploaded to the S3 bucket...
Latest image uploaded: fourstroke.jpg
Checking Lambda function logs for the latest execution...
Fetching logs from stream: 2024/10/20/[$LATEST]2385120a48774ac5aac4a8c8a8f44d49
Log events from Lambda function triggered by S3 upload:
{
    "events": [],
    "nextForwardToken": "f/38567529563337092200275542639233030527771534431094833152/s",
    "nextBackwardToken": "b/38567368944516776538911019911800350760030568842264576000/s"
}
[ec2-user@ip-172-31-43-5 libexec]$
Broadcast message from root@localhost (Sun 2024-10-20 10:37:49 UTC):

The system will power off now!

Connection to ec2-98-83-23-82.compute-1.amazonaws.com closed by remote host.
Connection to ec2-98-83-23-82.compute-1.amazonaws.com closed.
```

-IT ALSO NOTIFIES YOU ABOUT SYSTEM BEING POWERED OFF BY THE HOST.

11) RUN *aws lambda get-function --function-name your_function_name* TO GET THE CONFIGURATION OF THE LAMBDA FUNCTION.

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```
[ec2-user@ip-172-31-43-5 libexec]$ aws lambda get-function --function-name komal-lambdafun
{
    "Configuration": {
        "FunctionName": "komal-lambdafun",
        "FunctionArn": "arn:aws:lambda:us-east-1:186088914245:function:komal-lambdafun",
        "Runtime": "python3.8",
        "Role": "arn:aws:iam::186088914245:role/LabRole",
        "Handler": "lambda_function.lambda_handler",
        "CodeSize": 557,
        "Description": "",
        "Timeout": 3,
        "MemorySize": 128,
        "LastModified": "2024-10-19T17:57:43.000+0000",
        "CodeSha256": "SUR6xL7BG9bHk3QQx3UFhBHbP1jj0Cm2cuJjsk9Wr94=",
        "Version": "$LATEST",
        "TracingConfig": {
            "Mode": "PassThrough"
        },
        "RevisionId": "0376bc2b-e931-4909-b7cc-e09fcd5ea146",
        "State": "Active",
        "LastUpdateStatus": "Successful",
        "PackageType": "Zip",
        "Architectures": [
            "x86_64"
        ],
        "EphemeralStorage": {
            "Size": 512
        },
        "SnapStart": {
            "ApplyOn": "None",
            "OptimizationStatus": "Off"
        },
        "RuntimeVersionConfig": {
            "RuntimeVersionArn": "arn:aws:lambda:us-east-1::runtime:31ddccb9689d29d2fa6f49a11d508466fad8a5c21d1a9337d4cf257bcef8ebb0"
        },
        "LoggingConfig": {
            "LogFormat": "Text",
            "LogGroup": "/aws/lambda/komal-lambdafun"
        }
    },
    "Code": {
        "RepositoryType": "S3",
        "Location": "https://prod-04-2014-tasks.s3.us-east-1.amazonaws.com/snapshots/186088914245/komal-lambdafun-dbc2793b-3ebf-49f3-afe9-5f2cbaefcfc0?versionId=Q2bTAvhlgWg2vaW86p1BcmWhJVoA
86.t&X-Amz-Security-Token=IQoJb3JpZ2luX2VjEAoaCXVzLWVhc3QtMSJHMEUCICPv8uNF8s2bYXCQ%2BHZN84NoLd2TRf7VER7dED3sA5uIAiEA91gyQiNPv9TVI8Sk4AJt9s5dyHBc%2FVXTvtfXsSZ3PUcqsgUIchAAGgw3NDk2Nzg5MDI4Mzk
```