Advance DevOps Lab - Practical 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 -
AWS Lambda is a serverless computing service provided by Amazon Web Services (AWS). Users of AWS Lambda create functions, self-contained applications written in one of the supported languages and runtimes, and upload them to AWS Lambda, which executes those functions in an efficient and flexible manner.The Lambda functions can perform any kind of computing task, from serving web pages and processing streams of data to calling APIs and integrating with other AWS services.

Features of AWS Lambda
● AWS Lambda easily scales the infrastructure without any additional configuration. It reduces the operational work involved.
● It offers multiple options like AWS S3, CloudWatch, DynamoDB, API Gateway, Kinesis, CodeCommit, and many more to trigger an event.
● You don’t need to invest upfront. You pay only for the memory used by the lambda function and minimal cost on the number of requests hence cost-efficient.
● AWS Lambda is secure. It uses AWS IAM to define all the roles and security policies.
● It offers fault tolerance for both services running the code and the function. You do not have to worry about the application down.

Packaging Functions -
Lambda functions need to be packaged and sent to AWS. This is usually a process of compressing the function and all its dependencies and uploading it to an S3 bucket. And letting AWS know that you want to use this package when a specific event takes place. To help us with this process we use the Serverless Stack Framework (SST).

Stateless Functions

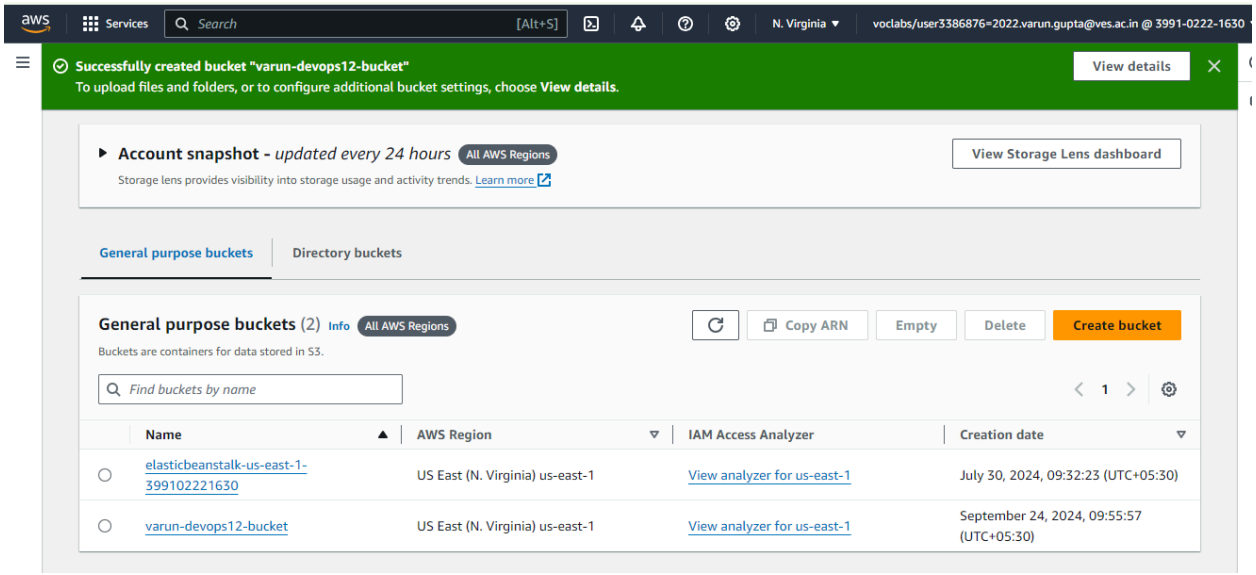
The above execution model makes Lambda functions effectively stateless. This means that every time your Lambda function is triggered by an event it is invoked in a completely new environment. You don’t have access to the execution context of the previous event. However, due to the optimization noted above, the actual Lambda function is invoked only once per container instantiation. Recall that our functions are

run inside containers. So when a function is first invoked, all the code in our handler function gets executed and the handler function gets invoked. If the container is still available for subsequent requests, your function will get invoked and not the code around it.

Steps:

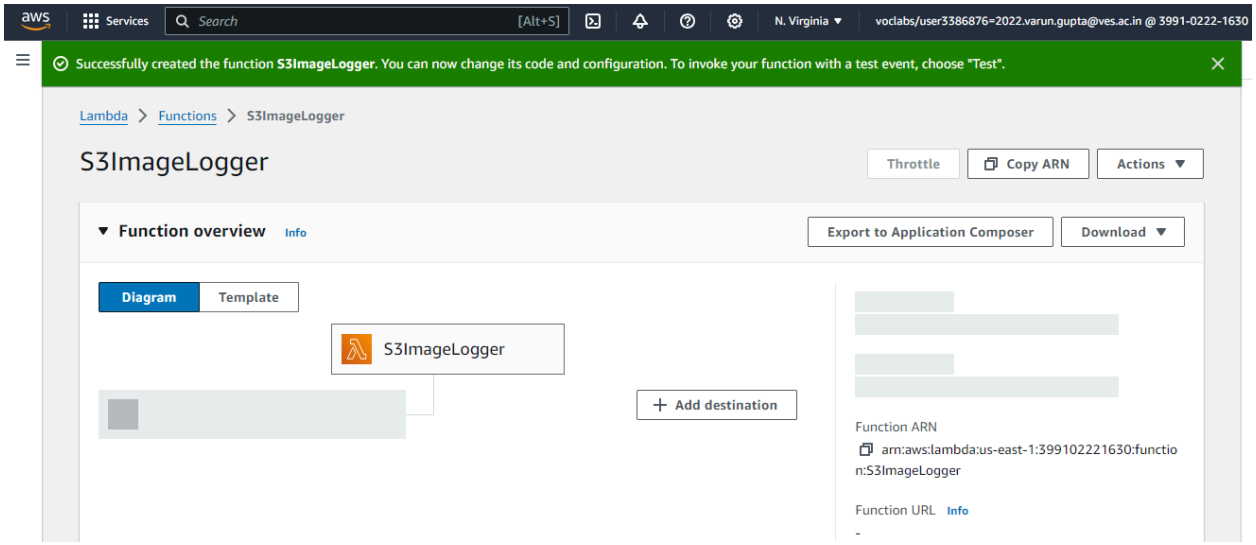
1. Create an S3 Bucket

- Go to the AWS Management Console.
- Navigate to the S3 service.
- Click on "Create bucket."
- Enter a unique bucket name and choose a region.
- Configure other settings as needed and click "Create bucket."



2. Create a Lambda Function

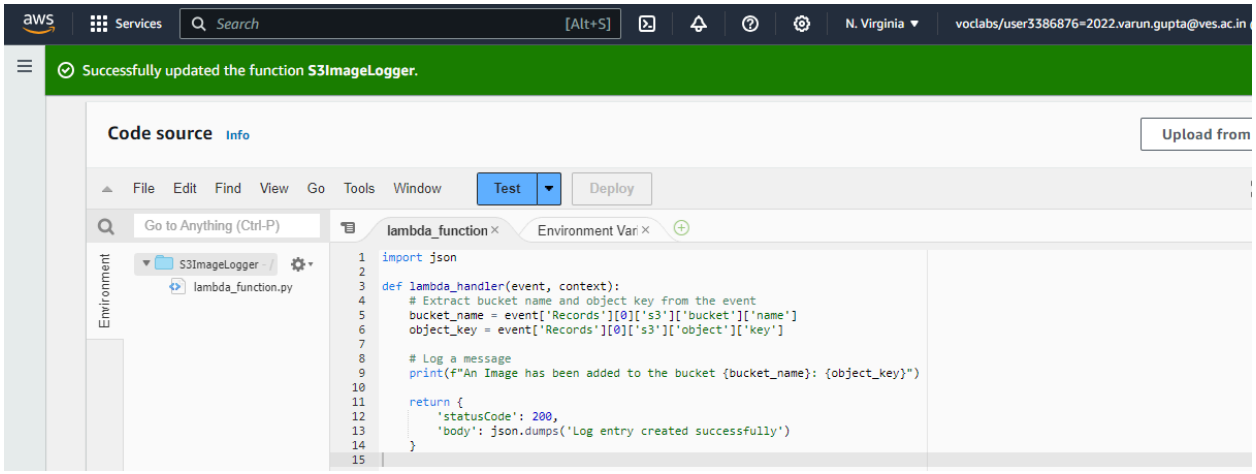
- Go to the AWS Management Console.
- Navigate to the Lambda service.
- Click on "Create function."
- Choose "Author from scratch."
- Enter a name for your function, e.g., `S3ImageLogger`.
- Select a runtime (e.g., Python 3.x or Node.js).
- Click "Create function."



3. Write the Lambda Function Code

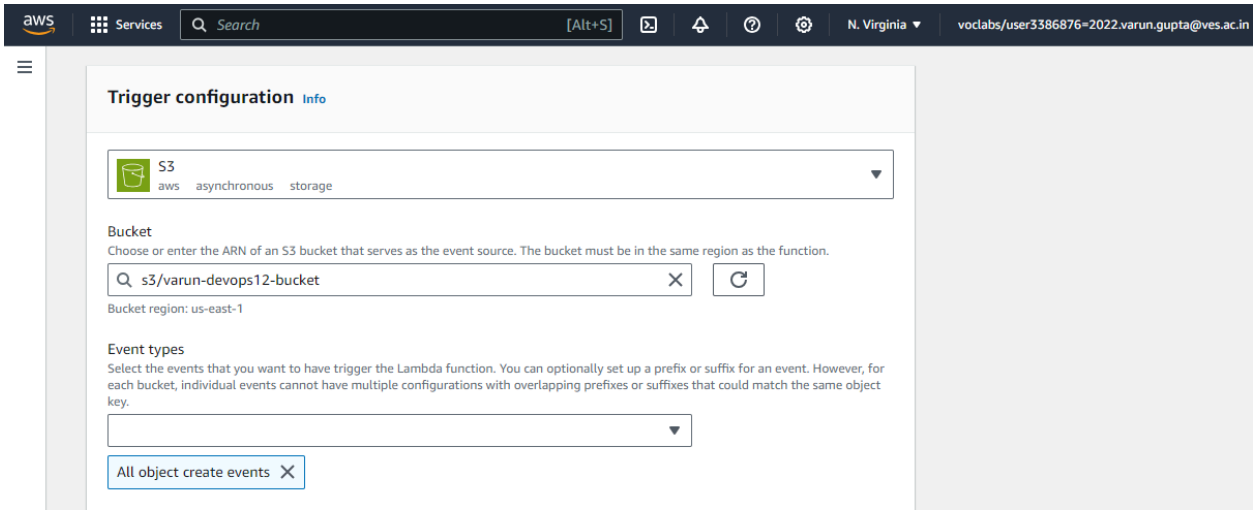
- In the Lambda function console, scroll down to the code editor.

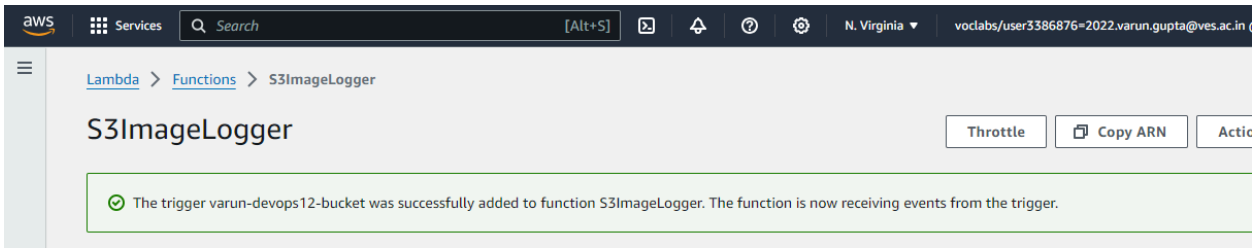
Replace the default code with the following code snippet (assuming you're using Python):
python
Click "Deploy" to save your changes.



4. Set Up S3 Trigger for the Lambda Function

- Scroll down to the "Function overview" section in the Lambda console.
- Click on "Add trigger."
- Select "S3" from the list of triggers.
- Choose the S3 bucket you created earlier.
- In the "Event type" dropdown, select "All object create events."
- Click "Add."





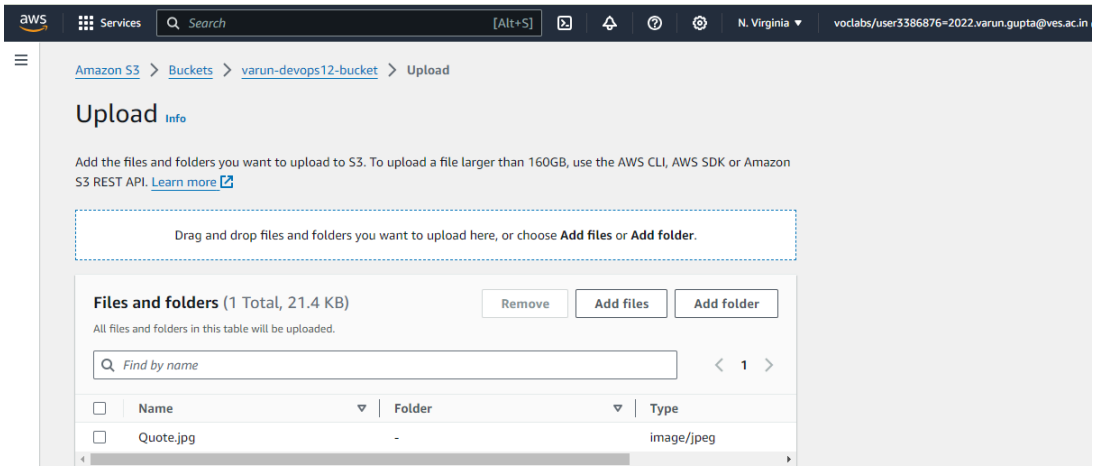
5. Grant Permissions to Lambda

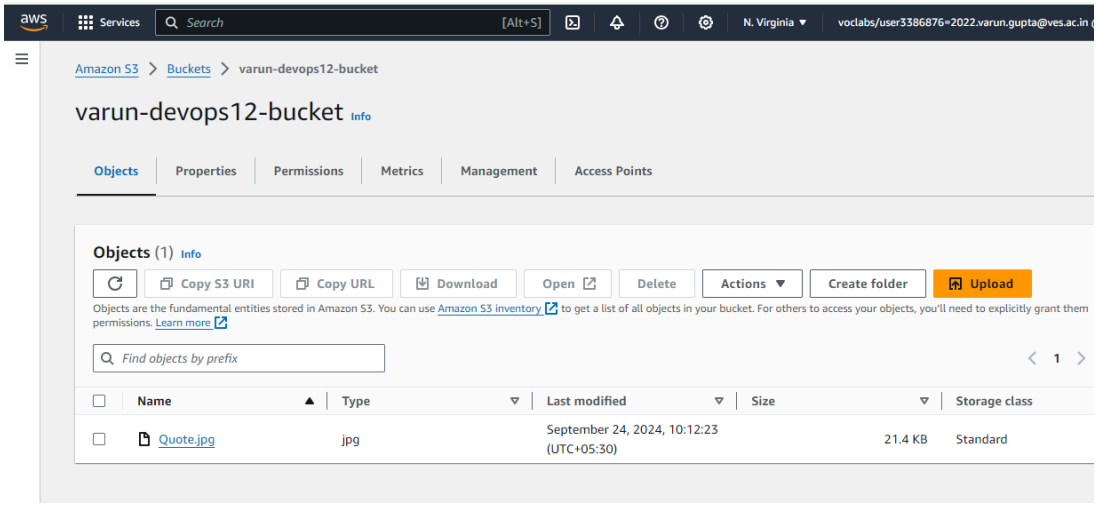
- Navigate to the "Permissions" tab of your Lambda function.
- Ensure the Lambda function's execution role has the necessary permissions to access the S3 bucket.
- If needed, attach the `AmazonS3ReadOnlyAccess` policy or create a custom policy with the necessary permissions.

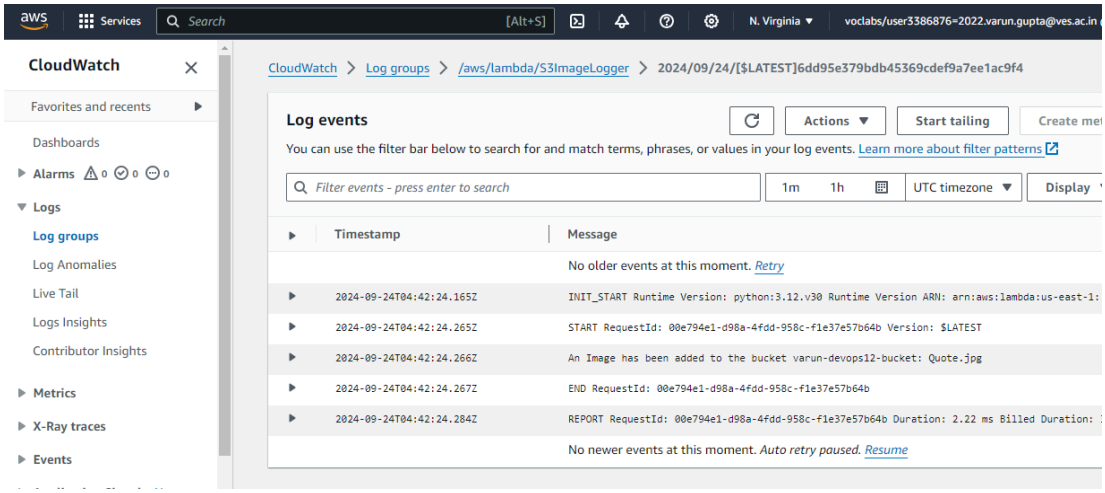
6. Test the Setup

- Upload an image file to your S3 bucket.
- Go to the "Monitoring" tab in your Lambda function to check the logs.
- Alternatively, use CloudWatch Logs to view the output and confirm that the message "An Image has been added" has been logged.

This setup should ensure that each time an image is uploaded to the specified S3 bucket, the Lambda function will log the appropriate message.







Conclusion :

In conclusion, this project creates a Lambda function that successfully logs "An Image has been added" whenever an object is added to a specific S3 bucket. This automation enhances monitoring and simplifies tracking of changes in the bucket.