ASSIGNMENT 1

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This report explains how to set up customized email alerts for S3 events (any file is uploaded on S3 bucket) using CloudFormation template.

Cloud formation template has the following resources and parameters:

a. Resources:

- **TesteventS3Bucket:** S3 bucket
- **LambdaFunctionHarsh:** Lambda function that sends emails
- **LambdaRoleHarsh:** A role (AWS::IAM::Role) assumed by the lambda function for sending emails using SES
- **LambdaPermissionHarsh:** permission resource that is applied to the lambda function that sends out emails.

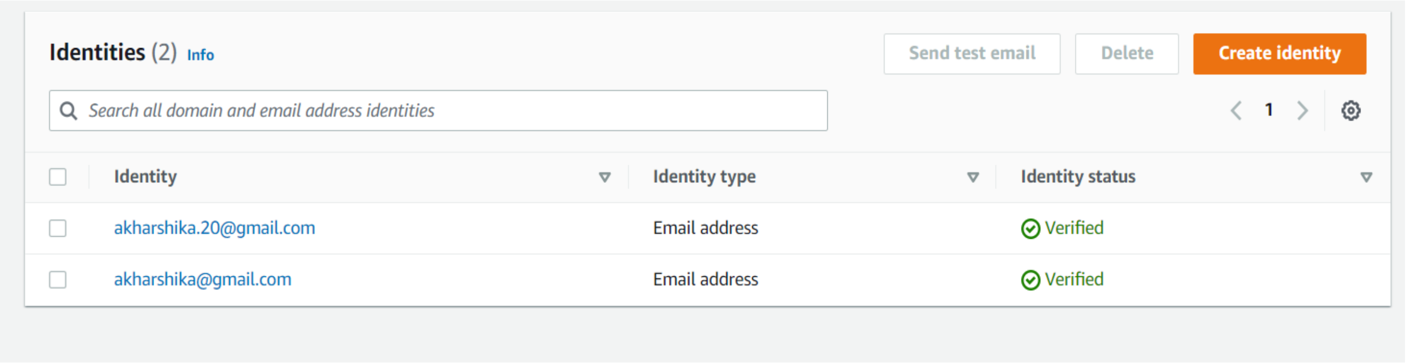
b. Parameters:

- **BucketName**: naming for S3 bucket
- **NotificationLambdaFnName**: naming for lambda function that sends emails using SES
- **SenderEmail**: the email address that sends out the notification emails
- **RecipientEmail**: the email address that receives the notification emails
- **AWSREGION**: the aws region where the email addresses are registered to in SES

Implementation:

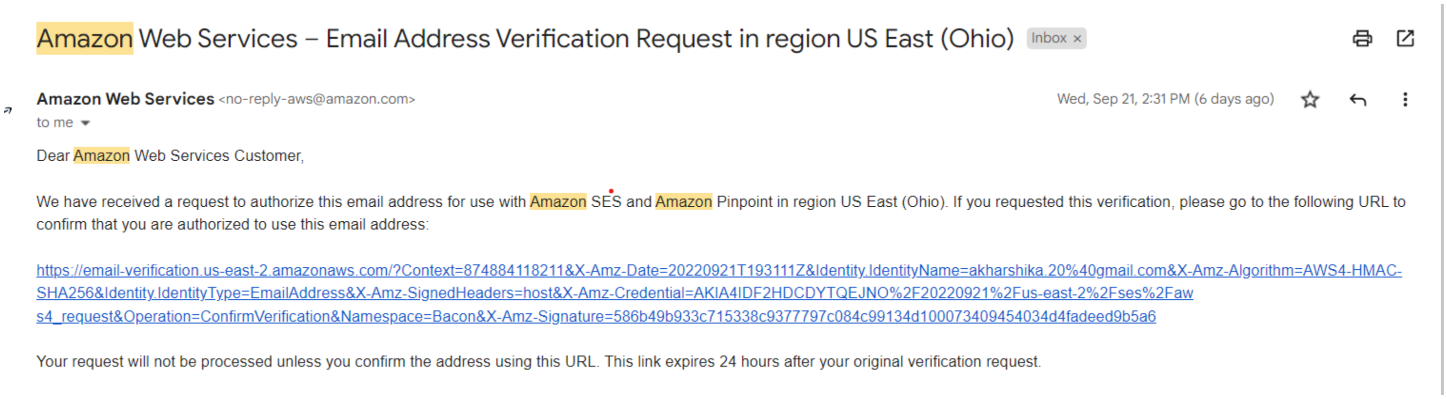
1. Verify SES identity

We configure email notifications using the Amazon Simple Email Service (SES). We should validate the email addresses (both sender's and recipient email addresses) in **Amazon SES console** under **Identity Management tab**. The point of validation is to allow **sending** on behalf of the service.



□	Identity	Identity type	Identity status
□	akharshika.20@gmail.com	Email address	✓ Verified
□	akharshika@gmail.com	Email address	✓ Verified

After verifying the email addresses, we will then receive a verification email on the email address as shown in the below screenshot.



Amazon Web Services – Email Address Verification Request in region US East (Ohio)

Amazon Web Services <no-reply-aws@amazon.com>

to me

Wed, Sep 21, 2:31 PM (6 days ago)

Dear Amazon Web Services Customer,

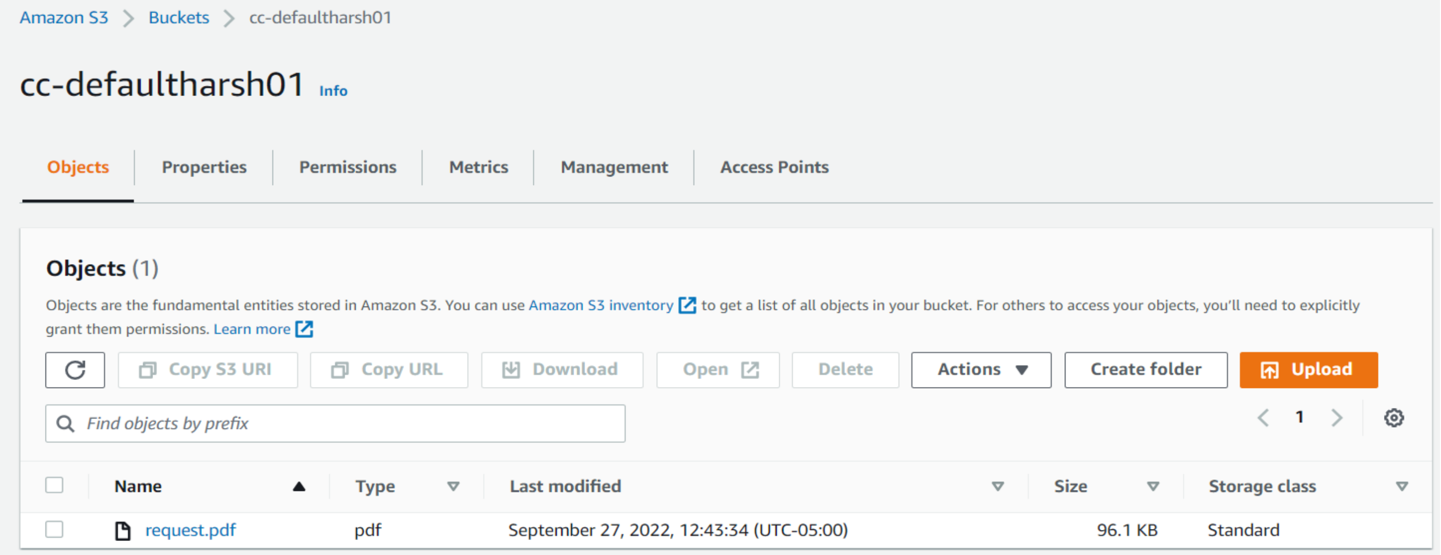
We have received a request to authorize this email address for use with Amazon SES and Amazon Pinpoint in region US East (Ohio). If you requested this verification, please go to the following URL to confirm that you are authorized to use this email address:

https://email-verification.us-east-2.amazonaws.com/?Context=874884118211&X-Amz-Date=20220921T193111Z&Identity.IdentityName=akharshika.20%40gmail.com&X-Amz-Algorithm=AWS4-HMAC-SHA256&Identity.IdentityType=EmailAddress&X-Amz-SignedHeaders=host&X-Amz-Credential=AKIA4IDF2HDCDYTQEJNO%2F20220921%2Fus-east-2%2Fses%2Faws4_request&Operation=ConfirmVerification&Namespace=Bacon&X-Amz-Signature=586b49b933c715338c9377797c084c99134d100073409454034d4fadeed9b5a6

Your request will not be processed unless you confirm the address using this URL. This link expires 24 hours after your original verification request.

2. Create an S3 bucket with event notification

We create a S3 bucket in template which allows us to create the policies and permissions. We configure the S3 bucket to emit event messages in response to actions. We have used the **s3:ObjectCreated:*** event type to request notification regardless of the API that was used to create an object. We add "Depends on" statement to bucket referencing the Lambda permission. **LambdaPermissionHarsh** permission permits to consume events from the S3 bucket and Type AWS::Lambda::Permission resource grants the bucket permission to invoke an AWS Lambda function.



cc-defaultharsh01

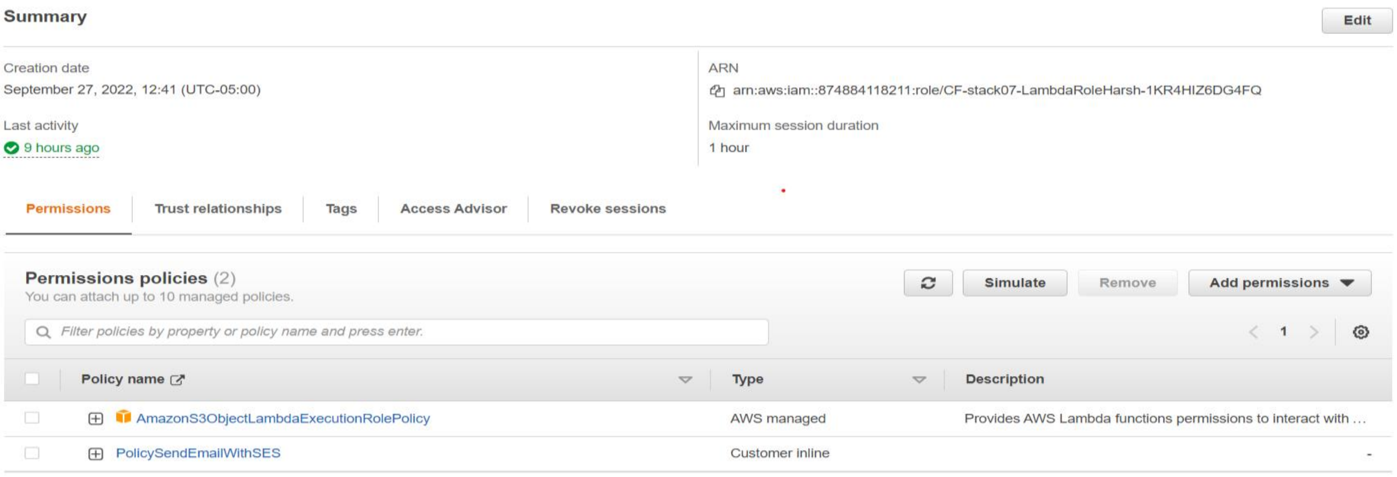
Objects (1)

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
□	request.pdf	pdf	September 27, 2022, 12:43:34 (UTC-05:00)	96.1 KB	Standard

3. Create an IAM policy and an execution role:

We are creating IAM policy and associating it to an IAM role. This IAM role (**LambdaRoleHarsh**) is for lambda function for sending emails and an attached SES policy with **ses:SendEmail** and **s3:PutBucketNotification** action. We then assign this newly created role to the Lambda Function we create later.



Creation date
September 27, 2022, 12:41 (UTC-05:00)

Last activity
9 hours ago

ARN
arn:aws:iam::874884118211:role/CF-stack07-LambdaRoleHarsh-1KR4HIZ6DG4FQ

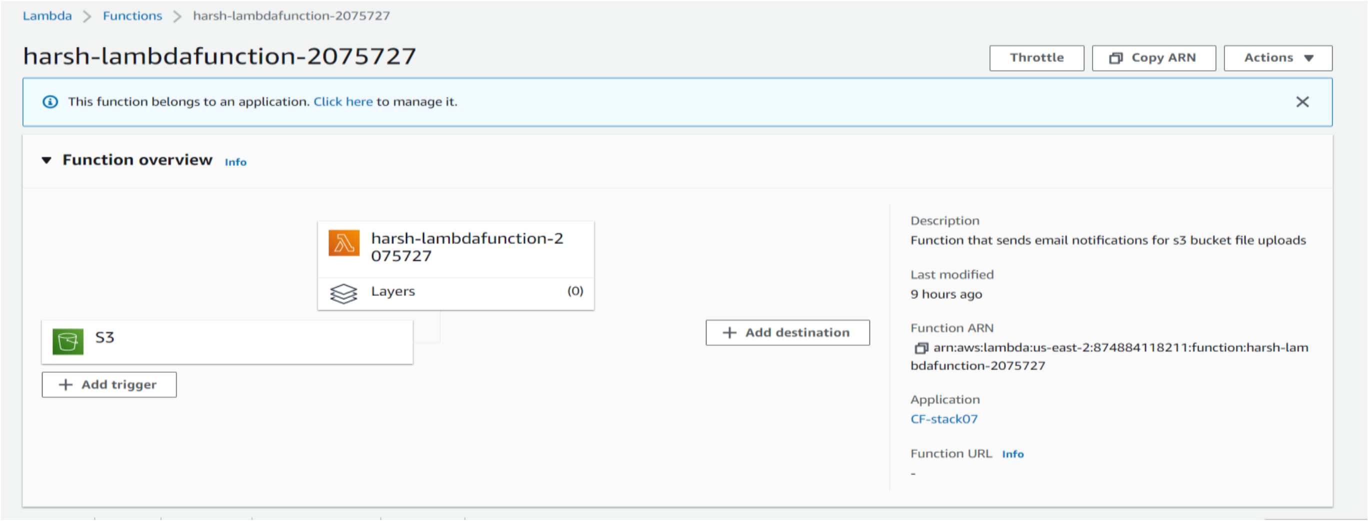
Maximum session duration
1 hour

Permissions policies (2)
You can attach up to 10 managed policies.

Policy name	Type	Description
AmazonS3ObjectLambdaExecutionRolePolicy	AWS managed	Provides AWS Lambda functions permissions to interact with …
PolicySendEmailWithSES	Customer inline	-

4. Create a Lambda function to write code for sending an Email using SES

We create lambda function that consumes S3 events and then uses Simple Email Service to send customized notification emails (SES). This lambda function executes a python script that uses the boto3 library to apply the notification configurations to the s3 bucket. The sender and recipient email addresses which are verified in SES and AWS region are passed as environment variables to lambda function. We also write the body of the email to be sent to the recipient in this lambda function.We are also referencing the corresponding LambdaRole using “!GetAtt “ Statement.



harsh-lambdafunction-2075727

This function belongs to an application. Click here to manage it.

Description
Function that sends email notifications for s3 bucket file uploads

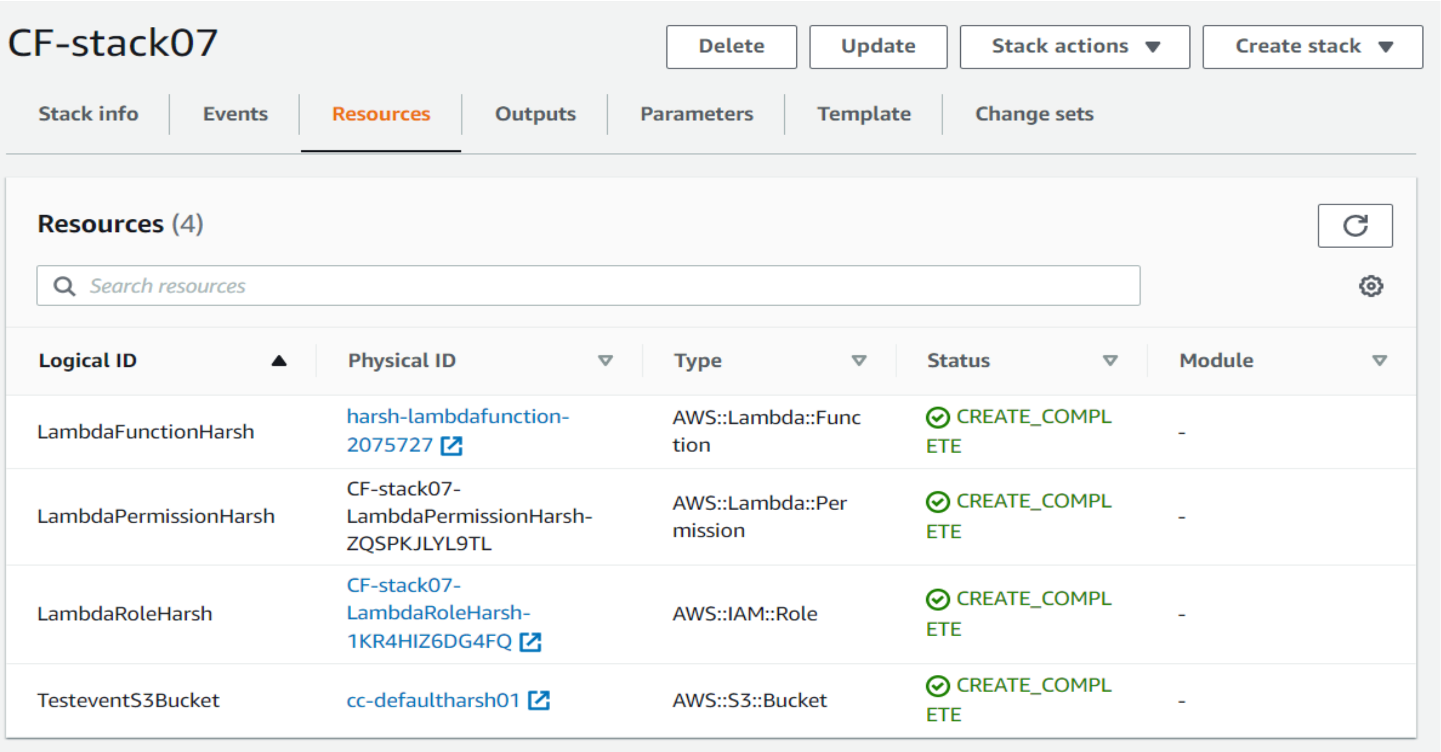
Last modified
9 hours ago

Function ARN
arn:aws:lambda:us-east-2:874884118211:function:harsh-lambdafunction-2075727

Application
CF-stack07

Function URL Info
-

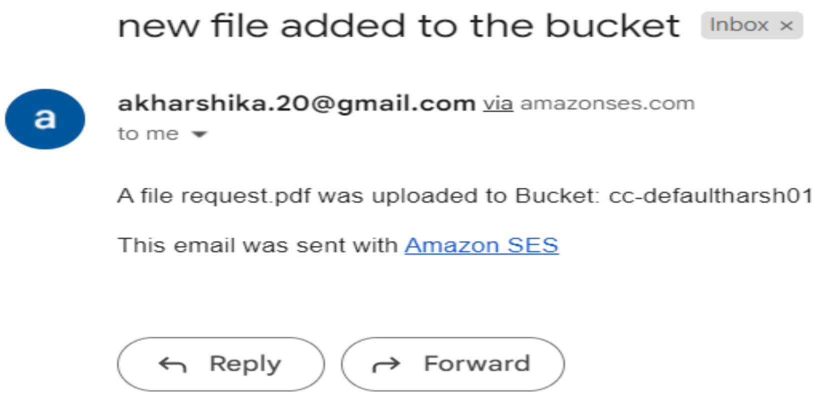
Below Screenshot show the status of the resources when a cloudformation template is deployed onto the stack.



Logical ID ▲	Physical ID ▽	Type ▽	Status ▽	Module ▽
LambdaFunctionHarsh	harsh-lambdafunction-2075727	AWS::Lambda::Function	✓ CREATE_COMPLETE	-
LambdaPermissionHarsh	CF-stack07-LambdaPermissionHarsh-ZQSPKJLYL9TL	AWS::Lambda::Permission	✓ CREATE_COMPLETE	-
LambdaRoleHarsh	CF-stack07-LambdaRoleHarsh-1KR4HIZ6DG4FQ	AWS::IAM::Role	✓ CREATE_COMPLETE	-
TesteventS3Bucket	cc-defaultharsh01	AWS::S3::Bucket	✓ CREATE_COMPLETE	-

5. **Add a new object in the S3 bucket:**

We then add/upload the file into the bucket to check whether the we are receiving an email notification to the recipient mail. Below is the screenshot of the result.



new file added to the bucket

akharshika.20@gmail.com via amazonses.com

A file request.pdf was uploaded to Bucket: cc-defaultharsh01

This email was sent with Amazon SES