



PARSHVANATH CHARITABLE TRUST'S

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Department of Computer Engineering

CSL605: SKILL BASED LAB COURSE: CLOUD COMPUTING

Mini Project Report

- **Title of Project** - Sending mail using lambda and amazon SES
- **Year and Semester** - T.E. (Sem VI)

- **Group Members Name and Roll No.** -

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Problem Definition:

To send emails to its customers using a serverless architecture, an organization plans to take advantage of AWS Lambda and Amazon SES. The organization aims to ensure the emails are sent cost-effectively, securely, and reliably, while allowing monitoring of the email sending process.

To achieve this, the organization seeks to create a solution that adheres to security and scalability best practices and handles a large volume of emails. The solution should incorporate personalized content, such as the customer's name and order details, to increase customer engagement. AWS Lambda will trigger the email sending process, while Amazon SES will send the emails.

The solution will include monitoring and logging capabilities to provide visibility into the email sending process. The organization requires high availability and fault-tolerance in the solution, so even if one component fails, the email sending process will continue uninterrupted. Additionally, the organization aims to maintain high levels of deliverability and reliability while minimizing the cost of sending emails.

Introduction:

Email is important for communication because it allows users to send information in letter format, and email can replace traditional mail options. Emails can be more beneficial for communication because they can often include text, documents and multimedia, like photos and videos.

Sending bulk email through normal workspaces like Gmail, Hotmail, etc., that takes more time to receive email respective recipient or customers and send email individually, here we will sort out that problem, bulk email sending through amazon simple email services using amazon lambda functions.

Lambda functions allow you to run code without provisioning or managing servers. You only pay for the compute time consumed while executing your function. This makes Lambdas a very nifty tool to perform quick and easy tasks like sending an Email. This, with the added

benefit that if you want to add attachments to your email, they can be fetched directly from the AWS S3 buckets, hence freeing up your app memory that will be needed if you go the conventional way of sending email from your java app.

AWS Lambda is a serverless computing service that lets you run code in response to events while having the underlying compute resources managed for you automatically. You may use Lambda to execute code for almost any kind of application or backend service with no administration required.

Few of AWS Lambda's salient attributes:

- **Event-driven:** Lambda functions are activated in response to specific events, such as HTTP requests, database changes, or the arrival of messages in queues. Building eventdriven systems and microservices that autonomously scale up or down in response to demand is now simple.
- **Scalable:** Lambda automatically scales your applications in response to incoming request volume. Planning for capacity or overprovisioning resources are not issues.
- **Adaptable:** it works with many different programming languages, including Node.js, Python, C#, Go, and others. Additional AWS services that you may leverage with Lambda include Amazon S3, Amazon DynamoDB, and Amazon Kinesis.
- **Simple to use:** By using Lambda, you can concentrate on developing code rather than worrying about the infrastructure that supports it. There are no servers to manage, and it is quick and simple to deploy and update your code.

Use for AWS Lambda:

- Backend logic for web and mobile applications is being run
- Processing streams of data from log files or sensors
- The use of machine learning models
- Workflow and business process automation
- Construction of serverless applications

Simple email service (SES) is an AWS service which enables you to send/receive emails. To go ahead with this tutorial, you must have setup SES with the required permissions beforehand. AWS restricts sending emails to unverified recipients if you're in sandbox mode. Hence, be sure to verify the sender and receiver email addresses beforehand if you plan to use in sandbox mode.

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If you want to use an SMTP-enabled software package or programming language, or integrate SES with your existing mail server, you can use Amazon SES SMTP interface.

Description:

Cloud services used in the project:

- **S3:** Used to store the static content of the website, including images, CSS, and JavaScript files. S3 is a highly scalable and durable object storage service that provides low-latency access to data from anywhere on the web.
- **SES:** Used to send promotional emails to a large number of subscribers. However, it is important to ensure that your email list is opt-in and compliant with anti-spam regulations.
- **LAMBDA:** Lambda can be used to build fully serverless applications, where all the backend logic is executed in response to events triggered by user actions or other systems.

Implementation details:

The screenshot displays two AWS console interfaces. The top interface is the CloudWatch 'Log streams' page, showing a list of 8 log streams with their last event times. The bottom interface is the AWS Lambda 'Code source' editor, showing a Python script for a lambda function that sends an email notification upon an S3 event.

CloudWatch Log streams (8)

Log stream	Last event time
2023/04/20/[\$LATEST]98021b38ad25422dbb97efe0b5c8c...	2023-04-20 11:23:46 (UTC+05:30)
2023/04/20/[\$LATEST]d43df1f42ed541b39bd880b1e2c98...	2023-04-20 11:09:24 (UTC+05:30)
2023/04/20/[\$LATEST]37c3eb9c4aaf4ee69a21788f903319...	2023-04-20 11:06:56 (UTC+05:30)
2023/04/12/[\$LATEST]e6c7aa78b4e14aa79ea8283de3adb...	2023-04-12 13:50:28 (UTC+05:30)
2023/04/12/[\$LATEST]339108695c37428eb6c8d79bcba2...	2023-04-12 12:21:20 (UTC+05:30)
2023/04/12/[\$LATEST]0cc10b9dd4594cdda49e68283e9e4...	2023-04-12 12:19:27 (UTC+05:30)
2023/04/12/[\$LATEST]d77eeb757a974938929978ba9f2cd...	2023-04-12 12:16:15 (UTC+05:30)
2023/04/12/[\$LATEST]c40f7bc38fcd45dfa33fa9d0606d588d	2023-04-12 12:09:47 (UTC+05:30)

Code source

```
1 import json
2 import boto3
3 def lambda_handler(event, context):
4     file_name = event['Records'][0]['s3']['object']['key']
5     bucketName=event['Records'][0]['s3']['bucket']['name']
6     print("Event details : ",event)
7     print("File Name : ",file_name)
8     print("Bucket Name : ",bucketName)
9     subject = 'Event from ' + bucketName
10    client = boto3.client("ses")
11    body = """
12        <br>
13        This is a notification mail to inform you regarding s3 event.
14        The file {} is inserted in the {} bucket .
15        """.format(file_name, bucketName)
16    message = {"Subject": ("Data": subject), "Body": {"Html": ("Data": body)}}
17    response = client.send_email(Source = "20102126.pooja.tumma@gmail.com", Destination = {"ToAddresses": ["20102126.pooja.tumma@gmail.com"]})
18    print("The mail is sent successfully")
19
20
```

aws

Services

Search

[Alt+S]

Global

Omi_1842

Objects

Properties

Permissions

Policies

Management

Access Points

Objects (6)

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](#)

Refresh

Copy S3 URI

Copy URL

Download

Open

Delete

Actions

Create folder

Upload

Find objects by prefix

<input type="checkbox"/>	Name	Type	Last modified	Size	Storage class
<input type="checkbox"/>	56_Pooja Tumma_Exp10.pdf	pdf	April 20, 2023, 11:23:44 (UTC+05:30)	235.3 KB	Standard
<input type="checkbox"/>	56_Pooja Tumma_Exp6.pdf	pdf	April 20, 2023, 11:06:55 (UTC+05:30)	96.9 KB	Standard
<input type="checkbox"/>	56_Pooja Tumma_Exp8.pdf	pdf	April 20, 2023, 11:09:21 (UTC+05:30)	64.8 KB	Standard
<input type="checkbox"/>	AI6-sejal-67.pdf	pdf	April 12, 2023, 12:20:46 (UTC+05:30)	147.5 KB	Standard
<input type="checkbox"/>	mc6-sejal-67.pdf	pdf	April 12, 2023, 13:50:26 (UTC+05:30)	123.6 KB	Standard
<input type="checkbox"/>	stage1_labels.csv	csv	April 12, 2023, 12:18:34 (UTC+05:30)	1.8 KB	Standard

CloudShell

Feedback

Language

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Privacy

Terms

Cookie preferences

Gmail

Search mail

Compose

Inbox

Starred

Snoozed

Sent

Drafts

More

Labels

Event from ccl-project-2

20102126.pooja.tumma@gmail.com via amazonses.com

11:23 (0 minutes ago)

This is a notification mail to inform you regarding s3 event. The file 56_Pooja+Tumma_Exp10.pdf is inserted in the ccl-project-2 bucket .

Reply

Forward

Conclusion:

We have comprehended the functioning of AWS Lambda, a service that executes code in response to events, and Amazon SES, a cost-effective email service that operates on reliable and scalable infrastructure, delivering emails or other content to users. Amazon CloudWatch facilitates the matching of events using simple rules, which can be directed to one or more target functions.

Currently, many organizations employ cloud email services for bulk email delivery and file attachments in encoded formats. Amazon SES delivers emails instantly (within milliseconds or 2 seconds) and presents the message using HTML. File attachments require base64 encoding and are placed in dedicated MIME message parts. Our approach involves using AWS Lambda functions for sending bulk emails through Amazon SES.

Serverless computing, which is gaining traction in the computing domain, is exploding in popularity each year. Comprehending how Lambda operates and developing it is a crucial skill. To architect and develop an efficient AWS Lambda solution, keep the following factors in mind: select an appropriate memory size, set an appropriate timeout value, enable compression, use layers, utilize environment variables, and versioning with aliases.