Deployment of a Serverless Web Application using AWS services

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Abstract— In this digital era, the emergence of many smart applications makes the human lives in away more smart but at the same time it also increases the amount of expenses to an unprecedented rate. Today in the world of server computing it requires lot of infrastructure for an organization to work so we are employing server less computing for the organization which is cost efficiently for them and also faster than server computing in the modern era. Server less computing allows us to compute without thinking about the server management as it is done at the back-end by the cloud computing service provider.

Keywords—Amazon API Gateway, Amazon Dynamo DB, Amazon S3, AWS, AWS Lambda, Cloud Computing, Cloud Storage, S3,

I. INTRODUCTION

In today's world server computing is common seen practice for organization to work but due to server computing it costs expensively for organization to work on server where they have to buy server which costs them a lot in the sense of expenses for the organization. As in many organizations many applications are required to run for once or twice a month like salary calculation of an employee in an organization so there is requirement of his Name,bank account no. , company identity no., etc so that the salary of the person can be calculated as per the required factors for the salary calculation such as hours worked, leave taken in the month etc.So for such small application organization have to buy server which are very costly because they are physical devices either organization have to buy solely or use cloud services such as Amazon Web Services(AWS), Microsoft Azure,Google Cloud Platform(GCP) to buy servers which costs them highly but we have solution to these as we are using server less computing which is cost effective and is more reliable than server computing in the modern world of digital management of the data.[2][4]

We have understood about server less computing as the name suggests that server less means it is not based on servers. It works freely from servers in our presence and is using servers at the back-end. It is managed by the cloud platform automatically. We do not have to take a look for the servers while we are performing our task for the organization we are working in. It is done by the service provider automatically we have to just look for our code in the Lambda function and take care of Application programming interface (API) gateway we are using for our organization So server less infrastructure does not require any servers in our presence. Developers can focus on developing code that serves the customer. They can focus on core product and business logic. Server less applications doesn't require you to manage any different servers. We can focus on core product and business logic. Instead focusing on operating system access control, OS patching, scaling the servers etc.[4]

A. AWS SERVICES USED FOR SERVER LESS COMPUTING

There are four major deployment services used for server less web application namely Amazon Application programming interface (API), AWS Lambda, Amazon DynamoDB, Amazon Simple Storage Service(S3) [4].

1) Amazon Application Programming Interface(API)

API means Application programming interface. It is used to access data, business logic from backed services. Means it allows two applications to interact with each other. It is an system which allows to communicate with other system either hardware or software as it works as an bridge between the system and other devices. API Gateway is a fully managed service it helps developers to create, publish, maintain, monitor and secure API at any scale .API act as front door for application to access data, business logic or functionality from your backed services. It can handle concurrent API calls ,including traffic management ,CORS support,authorization and access control.[2][7]

2) AWS Lambda

It is server less computing mechanism which helps you to run your function code.As per the specific work you want to do for your application you want to work on. In AWS lambda we create function in language we want to write in and than AWS lambda performs or executes the task it is assigned for. It can perform any type of computing. Each lambda function runs in its space. Each function is provided with necessary RAM and CPU . Customers is charged for only the amount of function runs during the process by the cloud platform the organization is using.[3][4][8]

3) Amazon Simple Storage Service (S3)

It is an simple storage service that stores the data in the form of buckets. It is an web service provided by AWS. It is used to store and receive data from anywhere on the web. It is secure place to store the data. You can store images ,word files, PDF files, etc. as it is an object storage service. You can store data up-toa maximum of 5TB. Files are stored in form of bucket .A bucket is like a folder which we usually see in our PC,mobile etc. Advantages of amazon S3 is create buckets, store data in buckets, download data, provide permissions, provide standard interfaces, provide security. S3 object based objects consists of key,value,version id, meta data, sub resources, access control information. [8][9]

4) Amazon DynamoDB

It is a fully managed no SQL database service.It gives fast and reliable performance with scalability you don't have to worry about hardware property setup and configuration software patching or scaling.It also offers encryption which removes the burden of protecting sensitive data. With DynamoDB you can create database table which store and receive any amount of data and serve any level of traffic you can scale up and scale down your tables capacity without down time or performance degradation.You can use AWS management console to monitor resource utilization and performance matrix. It provides on demand back-ups . It helps to protect your tables from accidental write or delete operations. It has high availability and durability.[4][5]

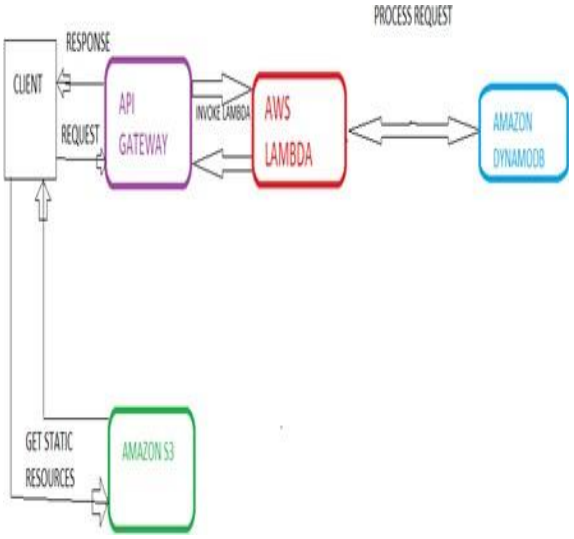

Figure1: Block diagram of server less web application

A) We created two API given as follows:
1. Get Employee Details By Email
2. PostCustomerDetails

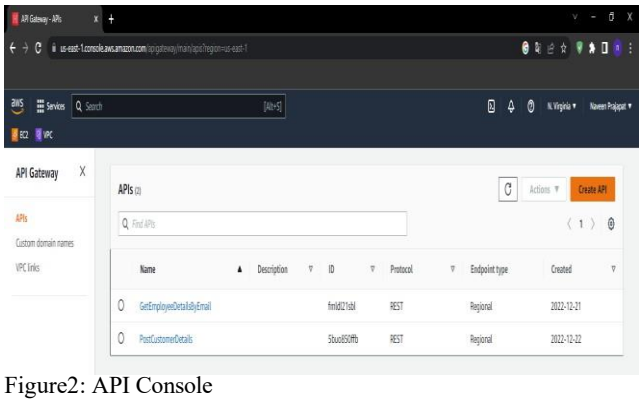

Figure2: API Console

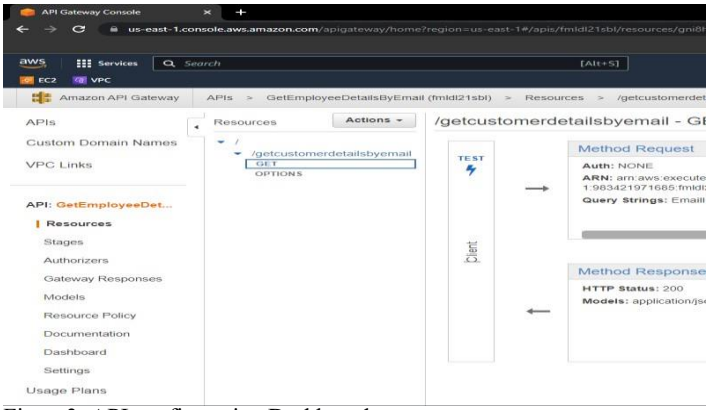

Figure3: API configuration Dashboard

B) We created two Lambda function given as follows:

1) *S*aveCustomerDetails

2) GetCustomerDetailsByEmail

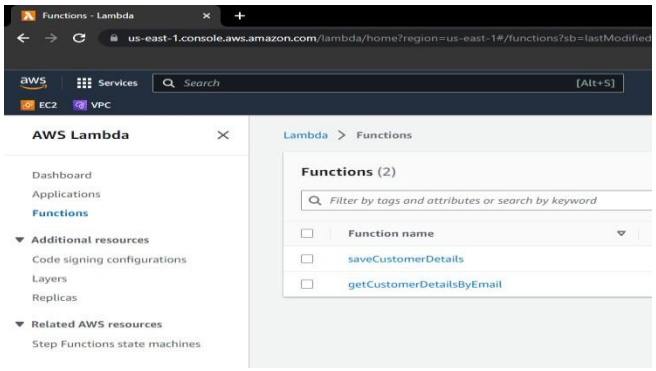

Figure4: Dashboard of Lambda functions

Management

C) Create DynamoDB table for the

D) Upload files to S3 bucket for static resource

II. LITERATURE REVIEW

R.Mishra, M. Kumar, N. Singh and S. Dwivedi proposed that Amazon offers a comprehensive range of IT solutions to let businesses construct their private virtual clouds and maintain total control over their infrastructure. It is possible to use Amazon Web Services for both businesses and IT projects. Security professionals are drawn to the cloud because of its cost savings and efficiency, but it also poses numerous security and compliance issues. EC2 instances, which claim to make cloud computing safe for highly regulated companies, have been introduced as part of Amazon Web Services' (AWS) effort to relieve business security and compliance issues with cloud computing. Cloud computing has its drawbacks; however, these drawbacks also provide an opportunity to study a variety of cloud computing-related topics. The security and privacy of data stored and processed on cloud service providers' servers is a major concern. Several studies on cloud computing security and privacy are reviewed in this study. A better knowledge of cloud computing's security problems has been shown and the techniques and solutions which have been used by the cloud service sector have been highlighted in this article. The objective of this report is to shed light on immersing cloud services market and the different upcoming challenges like network issues[1]

B.Pushpaleela, S. Sankar, K. Viswanathan andS. A. Kumar discussed that In the IT business, cloud computing has recently gained a lot of attention. II businesses are considering embracing the cloud since it offers a simple, affordable method of hosting apps and dynamically scaling them. The purpose of this research paper is to study and discuss about Modernization strategies for the digital transformation of on prime applications to transfer to the AWS cloud for Application with include data base migration with AWS cloud automation deployment using DevOps tools. The Modernization strategy will include numerous stages. The stages are Analysis & Planning, Data Migration, Extraction & Transform, Quality Engineering and Go-Live/Deployment.[3]

N.Mahmoudi and H.Khazaei presented Analytical performance models are very effective in ensuring the quality of service and cost of service deployment remain desirable under different conditions and workloads. While various analytical performance models have been proposed for previous paradigms in cloud computing, server less computing lacks such models that can provide developers with performance guarantees. Besides, most server less computing platforms still require developers' input to specify the configuration for their deployment that could affect both the performance and cost of their deployment, without providing them with any direct and immediate feedback. In previous studies, we built such performance models for steady-state and transient analysis of scale-per-request server less computing platforms (e.g., AWS Lambda, Azure Functions, Google Cloud Functions) that could give developers immediate feedback about the quality of service and cost of their deployments. In this work, we aim to develop analytical performance models for latest trend in server less computing platforms that use concurrency value and the rate of requests-per-second for auto scaling decisions. Examples of such server less computing platforms are Native and Google Cloud Run. The proposed performance model can help developers and providers predict the performance and cost of deployments with different configurations which could help them tune the configuration toward the best outcome[4]

Hassan, H.B., Barakat, S.A. & Sarhan provided useful observation that The contributions of the work presented in this paper are threefold: (a) a methodical review of related literature on the topic of server less computing, to address the issue of the lack of compiling information on the state-of-the-art of the field; (b) a comparison of the platforms and tools used in server less computing; (c) an extensive analysis of the differences, benefits, and issues

related to server less computing, to provide a more complete understanding of the topic. Given the fast evolution and growing interest in the field, this survey focused on gathering the most outstanding trends and outcomes of server less computing, as described by recent researchers. This survey could significantly reduce ambiguity and the entry barrier for novice developers to adapt to the server less environment. Furthermore, the findings presented in this study could be of great value for future researchers interested in further investigating server less computing. Finally, it is worth mentioning that the interest that both commercial and academic efforts fueled into studying,
developing, and implementing server less tools in forthcoming years could help maximize the potential that server less computing could bring to the IT community. [6]

IV .PROPOSED METHODOLOGY

In today world of server computing we are getting very large cost for infrastructure so to remove the obstacle of the server computing we followed the path of server-less computing which allows you to work fast, efficiently and quickly with less no. of resource requirement and cost effectiveness of the server less mechanism. There are certain steps of proposed procedure given as follows:

Step:1 To begin with we need to create API gateway

Step:2 Name of API is PostCustomerDetailsand GetEmployeeDetailsByEmail

Step:3 Deploy API and tested it with API testing platform called POSTMAN

Step:4 Than we created two Lambda function namely saveCustomerDetails and getCustomerDetailsByEmail

Step:5 Creation of a Lambda function and integrating it with the API helps to run the functions

Step:6 Create Dynamo DB table

Step:7 Upload files to S3 bucket for static resources

Step:8 Go to website using the uploaded files in S3 bucket

Step:9 Get the desired result you want either want to get details of employee or save details of the employee

Stepwise Design of Server less web application diagram

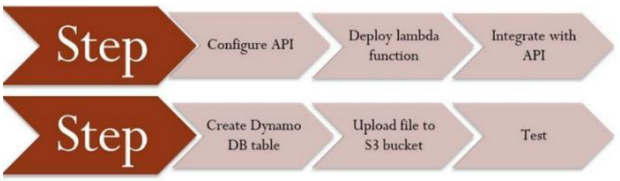

Figure5: Stepwise Design of Server less web application

Application :

Seeverless web application or you can say serverless computing just permits you to produce and run application and services without help of servers. In this type of computing your application will however run on the servers but all the management is done by AWS.

It can be used in any service category where the configuration and the management of servers are invisible to the end user.

Harsh Pandey: This later includes storage, database, messaging,computing,API gateway etc

II. CONCLUSION

This research paper is about using server less web application using AWS platform's different web services such as API gateway, Lambda service, S3 storage service and Dynamo DB service of amazon web services platform. We are creating an application where data of employee is saved and received when required using server less application rather than using server as it
requires lot more cost and infrastructure. In server less application we don't have to worry about the server infrastructure as it is managed by the cloud service providing company have to take care of it. So we have solved the problem for organization expenses they were liable for servers for such small applications which costs them but using server less computing they can cost cut the expenses for server computing in the modern era of digital world.

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