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Cloud Functions and Serverless Computing

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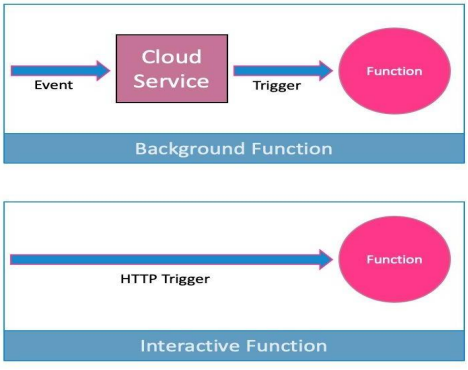
Abstract: ***Cloud Function in the simplest words is a Function-as-a-Service (FaaS). FaaS is actually a family of the serverless computing category. "Serverless" means that the user can focus on its application logic without dealing with infrastructure at all. Painless development, deployment, and maintenance of a web API is still not a turn-key solution, although modern web application frameworks have improved dramatically in the last few years. Serverless is without any doubt a game-changer. The event-driven approach combined with a scalable and robust cloud ecosystem offered by the main top cloud vendors opens endless opportunities. Cloud Functions is Google Cloud's event-driven serverless compute platform. FaaS is a real NoOps technology, it completely abstracts away servers. Cloud Functions are developed with the sole purpose to build event-driven architectures. These can react to events like file changes in storage, messages in the queue, or any HTTP request.***
Index Terms: ***Cloud Computing, Serverless Technology, Function as a Service, Lambda Functions and Functions***

I. INTRODUCTION

Cloud Functions is a serverless execution environment for building and connecting cloud services. With Cloud Functions you write simple, single-purpose functions that are attached to events emitted from your cloud infrastructure and services. Your function is triggered when an event being watched is fired. Your code executes in a fully managed environment. There is no need to provision any infrastructure or worry about managing any servers. Cloud Functions can be written using JavaScript, Python 3, Go, or Java runtimes on Google Cloud Platform. You can take your function and run it in any standard Node.js (Node.js 10 or 12), Python 3 (Python 3.7 or 3.8), Go (Go 1.11 or 1.13) or Java (Java 11) environment, which makes both portability and local testing a breeze.
Cloud Functions provides a connective layer of logic that lets you write code to connect and extend cloud services. Listen and respond to a file upload to Cloud Storage, a log change, or 1an incoming message on a Pub/Sub topic. Cloud Functions augments existing cloud services and allows you to address an increasing number of use cases with arbitrary programming logic. Cloud Functions have access to the Google Service Account credential and are thus seamlessly authenticated with the majority of Google Cloud services, including Cloud Vision, as well as many others.

II. LITERATURE WORK

With Cloud Functions, there are no servers to provision, manage, patch, or update. Features are automatically scaled and highly available and fault tolerant. Cloud capabilities are ideal for building serverless backends, processing real-time data, and building smart applications. Cloud events are *things* that happen in your cloud environment. These might be things like changes to data in a database, files added to a storage system, or a new virtual machine instance being created. Events occur whether or not you choose to respond to them. You create a response to an event with a *trigger*. A trigger is a declaration that you are interested in a certain event or set of events. Binding a function to a trigger allows you to capture and act on events. For more information on creating triggers and associating them with your functions



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III. FUNCTION-AS-A-SERVICE

This section provides an overview of cloud functions that was built on Goggle's Cloud Functions.In functions, we can define environment variables, configuration types, trigger types and then execute on serverless platform.

A. Basic Steps

1) Click Create function.
2) Name your function.
3) In the Trigger field, select HTTP.
4) In the Authentication field, select Allow unauthenticated invocations.
5) Click Save to save your changes, and then click Next.
6) In the Source code field, select Inline editor. In this exercise, you will use the defaultfunction provided in the editor.
7) Use the Runtime dropdown to select the desired Node.js runtime.
8) At the bottom of the page, click **Deploy**.
9) On the testing page, click **Test the function**.

B. Approach

1) Define environment variables for related information like API details, database connection, date and time check etc.
2) Add appropriate dependency in package.json
3) Write Code for accessing data:
a) Pass the credentials to connect to API
b) Apply filters to fetch the data
c) Format the output accordingly
d) Insert the data into database
e) Release the connections/pool
4) Check the data in database. Find the time in achieving this.

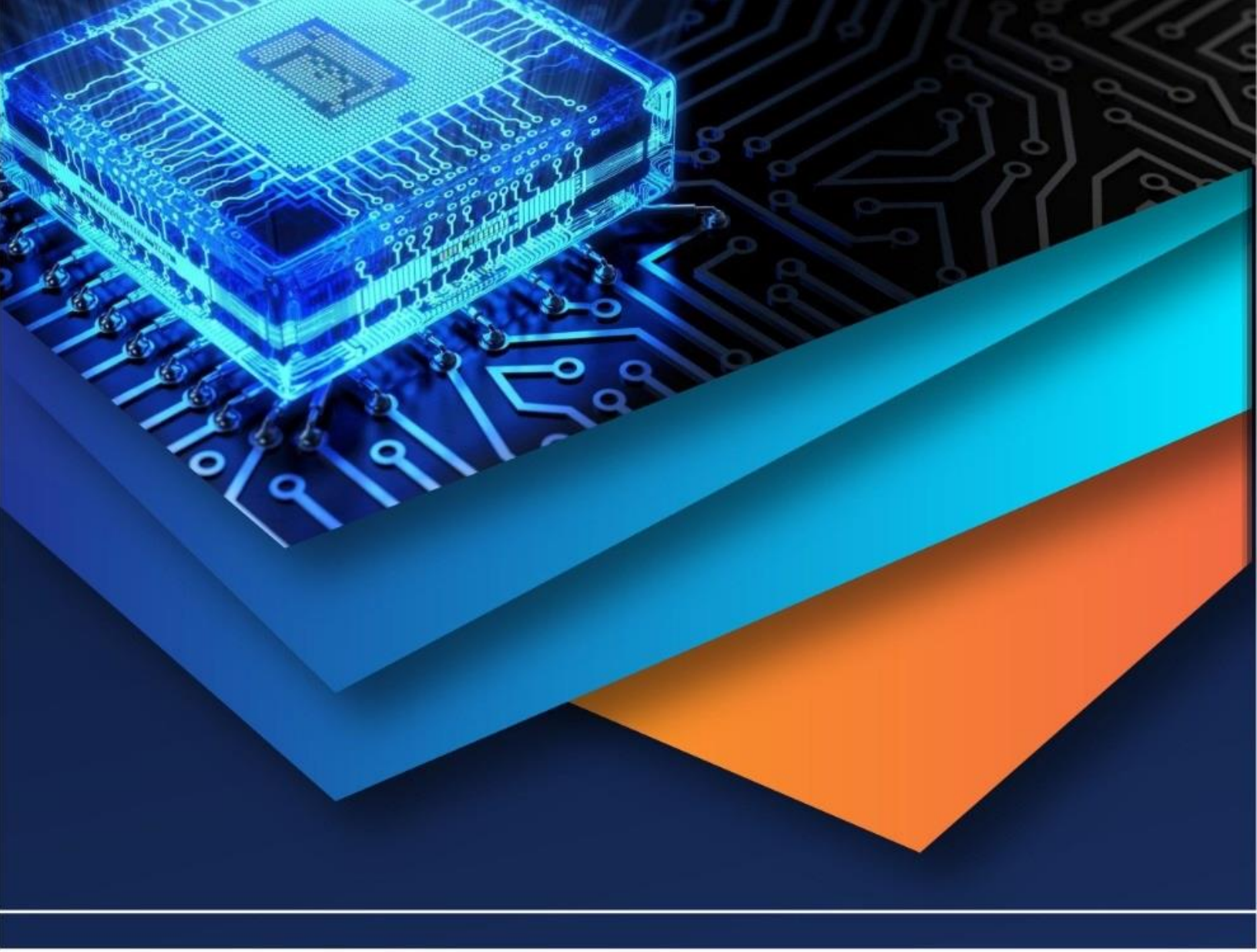
C. Conclusion

1) Scalable pay-as-you-go functions as a service (FaaS) to run your code with zero server management.
2) No servers to provision, manage, or upgrade
3) Automatically scale based on the load
4) Integrated monitoring, logging, and debugging capability
5) Built-in security at role and per function level based on the principle of least privilege
6) Key networking capabilities for hybrid and multi-cloud scenarios

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