Google Cloud

Serverless computing

You've learned about virtualization's role in cloud computing, and how it abstracts resources away from physical computers. Serverless computing has evolved as a cloud-native service that also abstracts resources away from underlying physical infrastructure. Because of this capability, serverless computing is a widely used compute service for developers.

In this reading, you'll explore serverless computing, along with the different serverless cloud service models. You'll also learn about the benefits and security considerations of serverless computing, and explore examples of how it is used.

Serverless computing defined

Serverless computing is a cloud computing model where servers are abstracted from development. Despite the name serverless, this computing model does involve servers. The servers and resources are completely managed by the cloud service provider (CSP). This allows developers to focus on creating and deploying code without worrying about backend infrastructure.

Backend as a service (BaaS)

Serverless computing is delivered in two main cloud service models: backend as a service (BaaS) and function as a service (FaaS).

BaaS is a form of serverless computing where the CSP manages all aspects of the backend infrastructure. This includes servers, containers, and virtual machines. Developers use BaaS to speed the creation of web applications. With BaaS, developers can focus on writing the front end code, which is the code that builds the user interface. Organizations have access to other services, like databases, file storage, and authentication services that can be native or third party to the platform.

Function as a service (FaaS)

FaaS is a form of serverless computing that runs functions. A function is a small piece of code. Functions are ephemeral, meaning they only exist for a short period of time. Developers can use their choice of programming language to create functions, which makes adopting serverless computing more convenient.

For example, companies can use functions to better engage their customers. Here's how it works: A company chooses an event, like a customer signing up to join their website. Once the customer submits their sign-up request, they receive an email welcoming them to the website.

In this example, the customer signing up triggered a function to send the email. The function only lived for the amount of time it took to trigger the email. Once the email was sent, the function expired.

Google's Cloud Functions is a serverless product that facilitates event triggers using functions. With Cloud Functions, developers only need to write their code; Google Cloud handles the operational aspects of running servers and scaling your resources.

Benefits

One benefit of serverless computing is that it's scalable and follows a pay-as-you-go model. Resources scale up and down depending on demand. Consider the previous scenario where functions triggered a welcome email to customers. When a lot of customers sign up for the website at one time, the volume of functions scale up to meet the demand. And, the user only pays for the resources while they're being used.

Serverless also improves developer productivity. Since the CSP configures the backend infrastructure, teams can focus on developing code. They can also devote time to improving security, like securing firewalls and access to resources.

Security in serverless computing

The security of serverless technology is important. Organizations share security responsibilities with the CSP. With serverless computing, organizations inherit the security controls the CSP has in place for their underlying infrastructure. The CSP takes some of the responsibility, but organizations also have security considerations to take into account. They're responsible for protecting their data and functions from vulnerabilities, and managing access to resources.

The short lifespan of functions contributes to their security. Since each function is short-lived, malicious actors have a very limited window to impose threats. Also, each function has a single role in a software application. If a malicious actor were to gain access to a function, they could only threaten the part of the application that uses that function.

Imagine your organization has adopted serverless computing to improve the security of integration with third-party applications. You're collaborating with the development team to create an application, and you want to be notified when a security vulnerability appears. You create and run a function that will trigger an email whenever one of these flags surface. That way, you're instantly notified of any immediate security concerns.

Key takeaways

Serverless computing is an emerging service with a lot to offer. With serverless computing, developers can focus on writing code without the responsibility and time it takes to configure servers. BaaS and FaaS are service models that can make using serverless technology even more beneficial. Scalability and increased productivity are also important benefits for organizations. Serverless computing poses new security considerations for cloud security professionals. While organizations share responsibilities with their CSP, security professionals should be prepared to protect data and resource access in a serverless environment.

Resources for more information

Learn more about serverless computing by checking out these resources:

- More information about serverless computing from Google Cloud
- A scholarly article that provides in-depth information on serverless computing