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Evolving Cloudscapes: The Rise of Function-as-a-Service

What is Function-as-a-Service (FaaS)? FaaS refers to a cloud computing model that allows users to write code that reacts to events without the burden of constructing and maintaining an infrastructure. In this essay, we will focus on the concept of FaaS, its advantages, potential challenges, and some popular FaaS providers.

As explained by the Gartner Hype Cycle for Emerging Technologies 2021, FaaS is at the peak of inflated expectations, which has garnered significant interest from organizations worldwide (Gartner, 2021). The critical advantage of FaaS is its ability to abstract away any underlying infrastructure, allowing developers to focus on creating and maintaining applications without worrying about server management, scaling, and reliability.

FaaS platforms provide a set of APIs that enable users to process code in response to events or triggers, such as HTTP requests, file uploads, or message queues (Xu et al., 2018). Examples of these triggers include AWS Lambda, Google Cloud Functions, and Microsoft Azure Functions. When an event occurs, the FaaS platform automatically provisions a container to execute the code, making it easy to scale up or down based on demand.

One of the most exciting aspects of FaaS is its ability to support various programming languages, including Node.js, Python, Java, and Go (Xu et al., 2018). This language agnosticism allows developers with diverse skill sets to utilize FaaS in their projects.

Another advantage of FaaS is its cost-effectiveness. Users only pay for the resources they consume, which can benefit organizations with fluctuating computing needs. Moreover, FaaS platforms often offer built-in monitoring and logging capabilities, enabling users to track resource usage and performance metrics (Xu et al., 2018).

Despite these benefits, there are potential challenges associated with FaaS. One concern is vendor lock-in, as organizations may become reliant on a particular platform, making it difficult to switch providers or adopt a multi-cloud strategy (Xu et al., 2018). Additionally, due to their event-driven nature, FaaS platforms can be complicated to integrate into existing systems and workflows.

In terms of popularity, AWS Lambda is one of the most widely adopted FaaS platforms, with a market share of approximately 60% (Statista, 2021). Other popular providers include Google Cloud Functions, Microsoft Azure Functions, and IBM Cloud Functions. Each platform offers similar functionality but may differ in pricing, language support, and integration options.

In conclusion, FaaS is a promising cloud computing model that allows users to process written code that reacts to events without the burden of constructing and maintaining an infrastructure. FaaS supports various programming languages, making it cost-effective and attractive for organizations looking to reduce complexity and lower costs. However, challenges such as vendor lock-in and integration concerns still need to be addressed. As FaaS continues to mature, it will be interesting to see the moves providers will take to resolve these issues and how the market share of different providers evolves.

**References**

Gartner. (2021). Gartner Hype Cycle for Emerging Technologies 2021. Retrieved from <https://www.gartner.com/en/research/reports/gartner-hype-cycle-for-emerging-technologies-2021>

Xu, R., Zhang, C., & Chen, Y. (2018). Function-as-a-Service: A Comprehensive Survey. IEEE Access, 6, 76394-76405. <https://ieeexplore.ieee.org/document/837406>

Statista. (2021). Market share of Amazon Web Services (AWS) for cloud computing infrastructure as a service (IaaS) worldwide in 2020. Retrieved from <https://www.statista.com/statistics/market-share-of-amazon-web-services-aws-for-cloud-computing-infrastructure-as-a-service-iaas-worldwide/>