

A survey on Server less Computing approach

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Abstract— Serverless computing is an emerging and fascinating field of the modern computing environment. Applications are developed and managed in the serverless computing environment in better way as compared to earlier cloud based systems. Serverless mode is a simpler, cost-efficient way of developing and managing applications in the cloud. It is way which abstracts the servers, operating systems and the infrastructures from the developer. In this paper, a survey has been presented in which the recent developments, architecture, merits and demerits of serverless computing are presented.

Keywords— serverless computing, cloud computing, serverless benefits and challenges

1. INTRODUCTION

During the past decade, a lot of development has been done in the field of cloud computing. It is a method of providing computing services to the user in terms of servers, storage, software, database, and analytics in terms of services like IAAS, PAAS and SAAS over the internet. User pays the services the provider on the basis of the services that are taken by them. The various types of cloud deployment models are public, private and hybrid cloud. A public cloud are maintained and run by a third-party cloud service providers who provide their computing resources like servers and storage to the client over the Internet. In this mode, the cloud resources are shared by the different client users. A private cloud denotes to cloud computing resources which are exclusively used by a single client or business unit and can be physically located on the company's on-site datacenter. In this mode, the cloud resources are not shared among different client. It is assumed that applications are more secure in this mode. Hybrid cloud adopts the property of both public and private cloud. Serverless computing [1] is a simpler, cost-efficient way of developing and managing applications in the cloud. It is way which abstracts the servers, operating systems and the infrastructures from the developer. Serverless computing [14] is different from traditional cloud based system. In serverless computing, the servers, OS and infrastructure are managed by the cloud service provider and only application which is mounted on the cloud server are managed by the client. The worry of client in serverless computing is highly reduced as supervision of resources are not his concern anymore. Client [8][9] is more cautious about the working of its application rather than managing the resources in the cloud platform. The word serverless is bit confusing as it puzzles the user that there may not be any server anymore in the computation world. But rather, it is an indication that servers are not the responsibility of the user and users are only concerned about their applications not server.

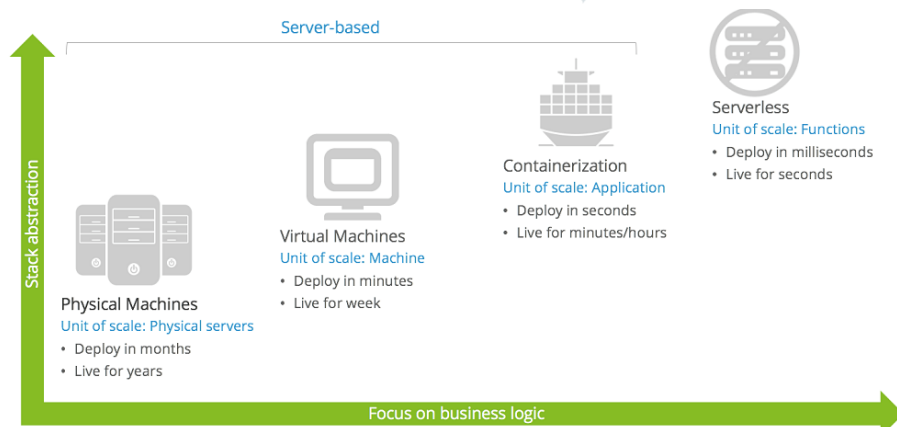


Fig. 1: From server based development to serverless development [14]

Fig.1 shows the development of growth in stack abstraction vs. the focus on business logic. In early decade, the developer was intended to focus on the physical machines also while there focus on application was less. With the development of technology like virtualization, containerization and now serverless computing, the developer is more tends towards business logic and devote more time on application management rather than on managing resources.

However, serverless can be comprehended as an amalgamation of two unmistakable focuses as follows:

1. BaaS: First importance of serverless could be taken as the utilization of outsider administrations/applications (in the cloud) to deal with the server-side rationale and state. For instance, consider a versatile application with a significant expansive biological system of cloud-based databases, verification administrations, and so forth.
2. FaaS: Second importance of serverless could be taken as the utilization of third party stateless process compartments to deal with the server-side rationale.

2. LITERATURE REVIEW

Lot of research has been done in the recent past on topic serverless computing. Researchers are trying out to explore the different opportunities and enhancement in this field. In paper [2], the enterprise use cases are discussed where uses cases like event triggered computing, live video broadcasting, IoT data processing and shared delivery process are presented. In paper [3], authors have utilized GPU on serverless processing condition through consolidating serverless processing structure with NVIDIA-Docker. In the proposed framework, developers can position high-performance micro services and execute deep learning code by remote GPU. Paper [4] proposed the platform Edgescale which used serverless computing in mobile edge computing environment enabling the storage and processing on data center. In paper [5] authors have leveraged the benefit of serverless computing in fog computing. They have presented the serverless edge platform.

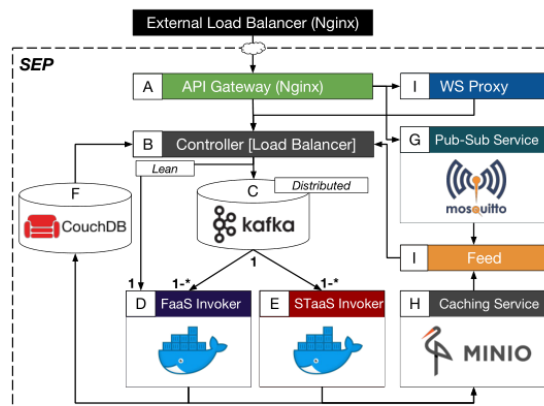


Fig.2: Proposed architecture of serverless edge platform [5]

The results observed by implementing the architecture in Fig. 2 show the benefits of serverless computing. It shows the drastic reduction on the the load of infrastructure management. Also, it permits more functionality to be positioned on fog nodes with limited resources, and (iii) satisfying the necessities of different application situations and heterogeneous placements of fog nodes.

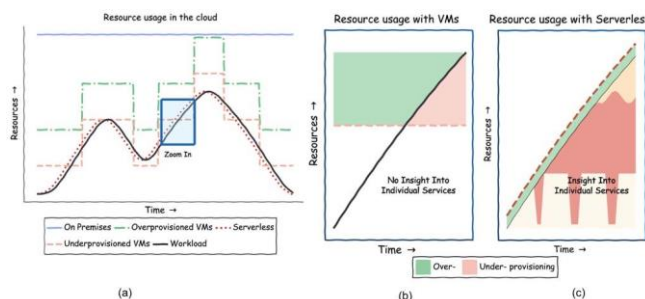


Fig.3: Comparison of resource utilization in cloud, VMs and Serverless computing [6]

In paper [6], the history of cloud computing and its direction towards serverless computing has been discussed. Also, the comparison of resource utilization in terms of cloud, VMs and serverless is presented. The paper [7] presents the concept of process abstraction rather than of function. They have worked over the concept of serverlessOS design.

3. BENEFITS OF SERVERLESS COMPUTING

Various benefits of serverless computing [10] [11][12][13] are

- The main advantage of serverless computing is that there are no servers which need to be managed. AWS lambda provides the facility to run the code without managing the servers.
- The applications are automatically scaled as per the size of their workload. Developing even the most fundamental server-bound application is a difficult assignment. It requires the set-up of powerful and complex application stacks that can be both hard to manufacture and hard to oversee. By working serverless, organizations can eradicate all these distresses.
- Pay for the compute time only is the option available in serverless computing.
- Code execution time can be optimized in the serverless computing.
- Serverless foundation diminishes the requirement for human asset sending as emphasis on batch processing declines.

4. PaaS or SERVERLESS – DIFFERENCE

This is one of the regular analyses we run over while talking about Serverless. In straightforward terms, we can consider Serverless to be the advancement from PaaS. As quickly referenced previously, for an innovation to be delegated unadulterated Serverless it needs to fulfill the 5 key qualities. With regards to PaaS, it will flop for the most part on the "No inert limit" and "Miniaturized scale billing". Azure Cosmos DB and Amazon Dynamo DB are genuine models; we have to arrangement those administrations and acknowledge to pay some base expense. The usage capacities like auto-scaling to develop the stage as and when the need emerges yet it's either a manual or computerized task given to the customer.

5. CHALLENGES OF SERVERLESS COMPUTING

- Vendor Lock in issue is the one that should be too cautious which seller one should pick, despite the fact that the entirety of the top sellers have like for like usefulness, it's a single direction road. When we actualize and go live with your answer, it's very difficult to port your answer starting with one merchant then onto the next seller.
- Manageability is one of the key difficulties in going down the Serverless course. In the event that you are building a solitary solid application, it's anything but difficult to oversee and keep up. You will have a developed DevOps practices to run the application, developed CI/CD practices to take the code from advancement to creation, though in the event that you have 100's of little Serverless discrete bits of usefulness spread over everywhere, the overseeing and working that arrangement turns out to be very perplexing.
- Loss of Control is the major challenge in serverless applications. Client tend to practice a portion of services controlled by third parties (called BaaS—backend as a service) and a lot of function platforms (FaaS—functions as a service). These BaaS and FaaS are both industrialized and functioned by third parties.
- Security is probably the greatest danger of serverless is inadequately arranged applications. Poor setup can prompt numerous issues, including (however not constrained to) security-related issues. On the off chance that you are utilizing AWS, for instance, it's critical to accurately design the various consents that your administrations will have for getting to different AWS administrations.
- Architecture Complexity is a great challenge. When client develops the serverless applications, even the modest application has a very intricate architecture diagram.

CONCLUSION

Serverless stages guarantee new abilities that make composing adaptable microservices simpler and financially savvy, situating themselves as the subsequent stage in the advancement of distributed computing designs. The vast majority of the conspicuous distributed computing suppliers including Amazon, IBM, Microsoft, and Google have as of late discharged serverless processing capacities. Developers should take advantage of the benefits serverless computing but should keep it mind the challenges like security and vendor lock in issue also.

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