

Calling a Server-Less Function from a Container-Based System: Why This Fad?

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ABSTRACT

Server-less computing is on the rise and implementations are Turing complete. Container-based systems are on the rise as well and implementations are also Turing complete. Therefore, any logic implemented in a container-based system can be implemented in a server-less computing system.

CCS Concepts

Software and its engineering --- **Software organization and properties** --- **Software system structures** --- **Distributed systems organizing principles** --- **Cloud computing**;500

Keywords

Server-Less Computing; Container-Based Computing

1. SERVER-LESS COMPUTING

“No Server is Easier to Manage Than No Server”
[Werner Vogels, 8 October 2015]

Clouds offer server-less computing (e.g., [1], [2], [3], [4]) providing functionality to create functions (code) that can interact with persistent storage (database, queue) and that can be invoked from external systems (UI, other application systems) or that can invoke external systems (via REST invocations).

This set of implementation constructs is Turing complete and sufficient to build application systems. The main benefit is that the underlying computing infrastructure like servers, networks, security systems scale automatically and do not have to be managed by the owner of the application system; instead, the computing infrastructure only has to be configured and its management is accomplished by the server-less computing provider. It is a super strict separation of the application functionality vs. the computing infrastructure.

2. CONTAINER-BASED COMPUTING ...

The main technology used for container-based computing is currently Kubernetes [7], and mostly in its managed form hosted by cloud providers (e.g., [1], [2], [3], [4]). A Kubernetes system supports the creation of runtime artifacts called clusters executing sets of Docker [6] containers implementing the application logic.

However, clusters have to be managed as well in terms of

update/patching, scalability, throughput, high availability and disaster recovery, just to name a few. Cloud providers do not manage clusters, but only provide management tools to the cluster owners (most likely DevOps teams).

In order to build and to run an application system, engineering teams have to build the application logic and have to decide on the Kubernetes cluster deployment architecture. During runtime clusters have to be managed by the engineering team itself or a separate team dedicated to cluster management. The significant realization here is that in addition to the application logic (a) a distributed system has to be actively designed and (b) the distributed systems has to be actively managed at runtime.

3. ... DEPRECATED

Both, server-less computing and container-based computing are equal in expressiveness as both are Turing complete. They are not equal in terms of the engineering and the management effort required to build and to run an application system. Server-less computing does not require any computing infrastructure design or management, while container-based computing requires both - and this is an effort that must not be underestimated whatsoever as it is quite huge. As [5] puts it, “AWS Lambda has stamped a big DEPRECATED on containers”.

4. THE ROAD AHEAD: GO SERVER-LESS

There is no point in implementing container-based application systems; and calling server-less functions from a container-based system is even worse. Instead, it is time to find the most efficient engineering approach to build server-less systems.

5. REFERENCES

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