Enabling Modular Design of an Application-Level Auto-Scaling and Orchestration Framework using TOSCA-based Application Description Templates

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ABSTRACT

This paper presents a novel approach to writing TOSCA templates for application reusability and portability in a modular auto-scaling and orchestration framework (MiCADO). The approach defines cloud resources as well as application containers in a flexible and generic way, and allows for those definitions to be extended with specific properties related to a desired container orchestrator chosen at deployment time. The approach is demonstrated in a proof-of-concept where only a minor change was required to a previously used application template in order to achieve the successful deployment and lifecycle management of the popular web authoring tool Wordpress on a new realization of the MiCADO framework featuring a different container orchestrator.

Keywords — TOSCA, MiCADO, container orchestration, kubernetes, docker swarm

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