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One Click Cloud Orchestrator (OCCO): bringing Complex Complete Infrastructures Effortlessly to IaaS Clouds

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IaaS clouds are very popular since you can easily create simple services (Linux PC, web portal, etc.) in the cloud. However, the situation is much more difficult if you want to build dynamically, on demand a complex infrastructure tailored to your particular needs. A typical infrastructure contains processing services (HTC, HPC), database services (RDBMS, repositories, task lists, etc.) and presentation services (portals, gateways, UIs). These services together provide the infrastructure that an individual user, a team or a community actually needs to execute complex applications (e.g. workflows). There are already several tools aiming at solving this problem but they are not as flexible and often do not support the whole life-cycle of infrastructure setup, operation and dismantling. For example, Juju has many nice features but it works only on OpenStack cloud and for Ubuntu OS. Terraform does not provide support to manage the full life-cycle of dynamically built infrastructures.

The OCCO (One-Click Cloud Orchestration) framework developed in SZTAKI attempts to solve the problem of infrastructure lifecycle management in clouds in a very generic way and avoiding platform dependencies (i.e. it can work for every major cloud types, OS types, etc.) The talk will describe the major services that OCCO provides for potential users, including infrastructure element developers (image developers), infrastructure developers (assembling infrastructures from building blocks) and end-users (deploying and using infrastructures). Then we show the architecture of OCCO explaining how the various features are implemented. Finally, we show two concrete examples as use cases. The first example is an infrastructure consisting of a MySQL database and a WordPress CMS in the cloud. The second use case is real-world complex scenario: A university research team would like to set up an easy-to use and efficient HTC infrastructure in the cloud to run large molecule docking applications. For the computing part they would like to use dedicated resources from the cloud and also volunteer desktop resources. They need a graphical interface where their users can specify parameters for the docking, can run the simulation as HTC tasks, can track progress and can visualize the results. The setup they deploy with OCCO consists of a BIONC task manager server, several BOINC HTC clients (some in the cloud, some on volunteer desktops), and a WS-PGRADE based gateway with Autodock-specific portlets. We will show in the talk how such a setup can be achieved by any biologists in 5-10 minutes using the OCCO technology.

Co-authors: KECSKEMETI, Gabor (MTA SZTAKI); KOVACS, Jozsef (MTA SZTAKI); GERGELY, Márk; ADAM, Visegradi

Presenter: KACSUK, Peter (MTA SZTAKI)

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