The ongoing adoption of Cloud Computing has lead to an increase in the level of complexity of the existing services and inherently new challenges for companies willing to migrate in order to benefit from this new paradigm. Due to this evolving complexity of heterogeneous clouds, new approaches based on the principles of self-management and self-organization are foreseen, such that one can limit the burden of low-level service management (such as provisioning, scheduling, optimization, orchestration etc.), and offer rather a high-level approach with increased accessibility to heterogeneous resources, and reduced effort for development, deployment or optimization.

The “Self-Organizing Self-Managing Clouds” (SOSeMC) workshop aims at bringing together motivated researchers and private company representatives that can further push the limits of Self-* Cloud Computing. Our workshop is at its first edition, being collocated with the 13th IEEE International Conference on Automatic Computing (ICAC) held in Wurzburg, Germany (July 18th 2016). For this initial edition several high quality papers were accepted, covering various topics amongst the problems that are currently being tackled.

The idea and backgrounds of this workshop arose from the problems that are currently tackled in two EU Horizon 2020 projects. The CloudLightning project aims at developing new methods for self-organizing self-management of clouds that can be used in order to provision with resources for High Performance Computing (HPC) community. All these methods are developed in the context of resource utilization optimization. On the other hand, the DICE project is trying to tackle the problem of developing a reliable cloud infrastructure that is suitable for Big Data applications. In this context its focus is mainly on the integration of different verification techniques with the concepts arising from Big Data processing in the cloud.

The first two papers cover various aspects supported by the MODAClouds FP7 project. First, Pop et al. [1], is introducing the run-time platform that was developed in the context of the aforementioned project. This platform, "combines model-driven development, risk analysis, quality prediction and deployment to support application developers and operators in the adoption of a multi-cloud strategy." and is comprised of three major components: Creator4Clouds (an environment of design-time tools), Energizer4Clouds (a rich execution platform) and Venues4Clouds (a DSS used to help in choosing cloud providers based on customer’s inputs).

In the paper of Florio and Di Nitto, the authors focus on how to add autonomic capabilities to microservice without changing their implementation, by providing an implementation of a decentralized MAPE loop [2]. The Gru approach “creates a new level of abstraction, containing autonomic intelligence, on top of Dockers containers”, and it supports a variety of decentralized automatic operations without any assumptions about the structure of the system that is controlled.

The next two papers offer a different perspective on self-* topics. In [3], Casalicchio et al., propose an energy-aware adaptation model for a distributed NoSql database built from an industrial use case. This model “orchestrates horizontal scaling, vertical scaling and optimal placement of vnodes on the cloud infrastructure”. Along with the optimal adaptation model, a sub-optimal adaptation algorithm for avoiding system perturbations is also introduced.

Finally, with the last contribution [4], Poghosyan et al. are considering a multi-layer data analysis architecture that employs data-agnostic methods aimed at learning from the optimal management performance of infrastructure, architecture which is based on “classical data techniques”. Alongside, as a secondary goal, the authors also present the “systematic application of complexity reduction techniques for increasing the accuracy of recommendations while decreasing operational complexity”. Such reduction methods can arise, for example, from the IT infrastructures and their logical interdependencies.

We thank all the authors for their contributions and look forward for future opportunities of presenting some even more exciting results in future editions of the SOSeMC workshop.

References


Preface for the SoSEMC 2016 Workshop

Teodor-Florin Fortiș‡, Ioan Drăgan‡

*West University of Timișoara, Department of Computer Science, Romania
†Research Institute "e-Austria", Timișoara, Romania
‡Medicine and Pharmacy University Victor Babes, Timișoara, Romania