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Working on the Next Generation Serverless Functions and Containers

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Helping to shape the future of cloud computing is one of the primary goals of the CLOUDSTARS project. The serverless computing paradigm plays a central role in this. In the new article "Serverless Computing: What It Is, and What It Is Not?" published in the "Communications of the ACM", Samuel Kounev and renowned co-authors explain current developments and future research directions in this field. Serverless computing is a high-level, broadly applicable term that can be applied at many levels, including functions, containers, middleware, and backend services.

In this article, Kounev et al. state their expectations for future cloud services. In general, cloud users are expected to have less control of the execution environment than in today's systems. Low-level VM-based interfaces evolve towards high-level interfaces that hide the cloud execution environment. Operational aspects of cloud services (such as instance deployment, elastic scaling, fault tolerance, monitoring, and logging) become responsibilities of the cloud providers instead of the cloud users. Real pay-per-use models will increasingly replace reservation-based pay-as-you-go billing models. This will be enabled by fine-grained resource usage accounting and pricing. However, much work is yet to be done to realize this vision. The CLOUDSTARS project connects researchers and partners from the industry working on these future trends.

The Descartes Research Group from the University of Würzburg has a long standing tradition of doing research on the scalability and elasticity of cloud applications. Autoscaling mechanisms as solutions to enable automatic and efficient resource allocation in the presence of highly dynamic workloads remain a key challenge for the cloud services of the next generation. With the new possibilities of fast-starting containers and serverless functions, this area has many new opportunities. In our upcoming secondments in 2024, we will provide new impetus in this area with our CLOUDSTARS consortium partners. Through direct exchange with the cloud experts at the IBM Thomas J. Watson Research Center, we ensure that our developments are applicable and meet the needs of practitioners.

CLOUD STARS

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