Master’s Thesis

Design and Development of Decentralized Microservice Architectures & Platforms

Context

Microservices are a service-oriented computing paradigm that takes advantage of recent trends in cloud computing (serverless computing), container technologies (Docker), and DevOps best practices (continuous deployment pipeline). In the spirit of Conway’s Law, Microservice architectures support rapid, yet stability-focused, release cycles in organizations that consist of small, cross-functional, product-oriented teams.

Future Challenges

In the next years, we envision new forms of decentralized organizations, such as decentralized autonomous organizations (DAO), to become more and more successful. The emergence of decentralized organizations will reflect in new forms of decentralized system architectures that will require tools and platforms enabling highly decentralized, continuous development, testing, and administration processes.

Thesis Topic(s)

Thesis topics in the context of new decentralized Microservice architectures and platforms include the following:

• Design and prototypical development of a Microservice Exchange that enables distributed stakeholders to deliver, integrate, and use “turn-key” Microservices.

• Techniques for enabling cross-organizational DevOps processes, such as continuous development, testing, integration, and deployment.

• Concepts and techniques for sharing services and other (cloud) resources across different organizations, e.g., through a DAO or by using Blockchain technologies.

Required Skills: Very good programming skills in at least one programming language, ideally Java or JavaScript. Basic knowledge of Microservice- and cloud-related technologies, such as Docker, continuous deployment tools and services, etc.

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Our Mission:

Our lectures cover fundamental methods and techniques in the areas of service computing, cloud computing, and enterprise computing. We like to engage students in hands-on building of distributed information systems and to take an interdisciplinary approach to evaluating such systems. Through a close mentoring of students, especially in our seminars, we aim to introduce students to our ongoing research and to excite them to do future studies and research with us.