Keynotes

Conformance Assessment and Detection Strategies in Continuously Delivered Microservice Architectures

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Microservice-based architectures have gained popularity in application development, but their continuous evolution poses design and maintenance challenges due to their complexity and polyglot nature. Manual validation of adherence to architecture guidelines is laborious. This keynote presents an approach to efficient conformance assessment during microservice evolution. Our methodology spans various aspects of microservice architecture, encompassing views on component decomposition, continuous delivery, deployment strategies, microservice APIs, and security considerations. The approach is grounded in a comprehensive analysis of existing industry guidelines, gray literature, and scientific research, from which we derive architectural design decisions featuring architecture patterns and best practices as selectable decision options. We introduce automated detectors and formal metrics to identify architectural design decisions, assess system alignment with architectural design decisions, and an approach to the automated fixing of conformance violations. Finally, our approach suggests automatically deriving detection strategies as metrics-based rules for conformance prediction.

Uwe Zdun is a full professor of software architecture at the Faculty of Computer Science, University of Vienna. His research focuses on software design and architecture, distributed systems engineering (microservices, service-based, cloud, APIs, IoT, and blockchain-based systems), DevOps and continuous delivery, software patterns, software modeling, model-driven development, and empirical software engineering. Uwe has published more than 300 articles in peer reviewed journals, conferences, book chapters, and workshops, and is a coauthor of the books Patterns for API Design: Simplifying Integration with Loosely Coupled Message Exchanges, Remoting Patterns: Foundations of Enterprise, Internet, and Realtime Distributed Object Middleware, Process-Driven SOA: Proven Patterns for Business-IT Alignment, and Software-Architektur. He has participated in 35 R&D projects. Uwe is the editor-in-chief of the Transactions on Pattern Languages of Programming (TPLoP, Springer), editor of the Journal of Systems and Software (JSS, Elsevier), editor of the Computing journal (Springer), and associate editor-in-chief for design and architecture for the IEEE Software magazine.