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Verification of Web Service Compositions: An Operationalization of Correctness and a Requirements Framework for Service-oriented Modeling Techniques

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Abstract

Web service compositions coordinate Web services of different enterprises. They are expected to constitute the foundation of service-oriented architectures, to improve business processes as well as to foster intra- and inter-organizational integration. Especially in inter-organizational contexts, quality of service referring to non-functional requirements and conformance to functional requirements are becoming vital properties. With Web service compositions being asynchronous and distributed systems, the latter property – which is also called correctness – can be shown best by verification. This paper examines from a system-theoretic perspective how correctness can be operationalized for Web service compositions. It also proposes a requirements framework for service-oriented modeling techniques so that correctness can be shown by verification and Web service compositions can be modeled intuitively. In order to show the framework's principle applicability, an example approach is analyzed with respect to the corresponding requirements.

Keywords

Web service compositions – Service-oriented modeling – Formal methods

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