Dynamic Distributed Simulation of DEVS Models on the OSGi Service Platform

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Interoperability among simulators is one of the key factors in distributed simulations. Several interoperability infrastructures such as HLA and DEVS/SOA have been utilised, but most of them do not provide any dynamics.
This paper introduces the use of the OSGi service platform as universal middleware for dynamic distributed simulation of DEVS models. We have designed and implemented the DEVS/OSGi simulation framework, which is an approach similar to DEVS/SOA, but relies on an integrated service-oriented and protocol independent architecture. It enables standardized plug-and-play capabilities and dynamic reconfiguration within distributed simulations. The architecture and implementation has been validated in an analytical context against a traffic simulation model. We conclude that the standardised interoperability and run-time dynamics provided by the OSGi service platform are highly valuable for distributed simulations.