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Performing Distributed Simulation with RESTful Web-Services Approach

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Abstract: Distributed simulations are mainly used to interoperate heterogeneous simulators or geographically distributed models. We present here RESTful-CD++, the first distributed simulation middleware based on REST (Representational State Transfer) Web-services. RESTful-CD++ middleware enables heterogeneous independent-developed simulation components to interoperate with much flexibility and simplicity. REST has the potential to advance distributed simulation state-of-the-art towards plug-and-play or automatic/semi-automatic interoperability. This because of its lightweight approach hides internal software implementation by using universal uniform interface and describing connectivity semantics in form of messages, usually XML. In contrast, other approaches expose functionalities in heterogeneous RPCs that often reflect internal implementation and describe semantics in form of procedure parameters. Further, REST enables simulations to mashup with Web 2.0 applications, which makes simulation in link with any device attached to the Web dynamically at runtime. The CD++ tool is now the first simulation engine to use RESTful middleware to perform distributed simulation in large-scale.