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Performance prediction of web service workflows.

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Summary: Web Services play an important role in the SOA paradigm, as they allow services to be selected on-the-fly to build applications out of existing components. In this scenario, the BPEL notation can be used as an orchestration language which allows the user to describe interactions with Web Services in a standard way. The performance of a BPEL workflow is a very important factor for deciding which components must be selected, or to choose whether a given sequence of interactions can provide the requested quality of service. Due to its very dynamic nature, workflow performance evaluation can not be accomplished using traditional, heavy-weight techniques. In this paper we present a multi-view approach for the performance prediction of service-based applications encompassing both users and service provider(s) perspectives. As a first step towards the realization of this integrated framework we present an efficient approach for performance assessment of Web Service workflows described using the BPEL notation. Starting from annotated BPEL and WSDL specifications, we derive performance bounds on response time and throughput. In such a way users are able to assess the efficiency of a BPEL workflow, while service provider(s) can perform sizing studies or estimate performance gains of alternative upgrades to existing systems. To bring this approach to fruition we developed a prototype tool called bpel2qnbound, using which we analyze a simple case study.

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