

MASTER'S THESIS (Spring 2011)

TOPIC: *A Real-Time Reliability Model for Ontology-Based Dynamic Web Service Composition*

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ABSTRACT

Web services are reusable software components that support the integration of business applications to meet desired objectives over the Internet. When a single web service is not sufficient for providing the needed functionality, multiple web services must be configured and integrated to work together as a composite one. Ontology-based web service composition is a formal technique that allows for integration of available web services based on their semantic meanings. In order to evaluate the quality of composite web services at runtime, there is a pressing need to define a feasible real-time web service reliability model. In this thesis, we present such a model. We first introduce a dynamic process model that supports the evaluation of web service reliability. Then we provide a hybrid reliability model for atomic web services by considering both software and hardware aspects of the services. In order to calculate efficiently the reliability of ontology-based dynamic composite web services, we present a recursive algorithm that evaluates the reliability of various service composition constructs in real time. Finally, we use a case study of financial investment to show how to compute and monitor the reliability of composite web services in real time, and how our approach supports reliable ontology-based dynamic web service composition.