An Object-Oriented Approach to Specification and Composition of Web Services

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Abstract: Web services, each of which consists of a set of functions to do certain activities, would allow organizations to do their businesses easier by concentrating on the business logic and reusing existing web services. In order to realize that vision, we need a language to specify, compose and implement web services in such a way that they can be shared and reused by different users on the Internet.

There have been many works in both academic and industry research to develop such a language. WSFL ([3]) has been proposed to specify and compose a web service from existing ones, and used with a programming language such as JAVA or VB.NET to implement the service's functions. XL ([2]) has been developed with the same capabilities as WSFL and, moreover, it is itself a programming language for implementation of web services. Meanwhile, DAML-S ([1]) provides an ontology of web services, besides the specification and composition features.

A common shortcoming of the afore-mentioned languages is that they do not allow a web service to inherit functions from other services. In this paper, we propose an object-oriented approach to web services, whereby each service is considered as a class consisting of its functions and all the services are organized into a class hierarchy. With this approach, not only web service functions can be reused, but also developed in a structural way without duplication in different services.

Firstly, we present the main features of our proposed Object-Oriented Web Service Language (OOWSL) for specification of web services, their hierarchy and composition. We then present the operational architecture for the language, regarding processing and monitoring service transaction, logging, timeout, retry, exception and inheritance. An example of OOWSL usage is also implemented and demonstrated.

Main References:

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