QUALITY OF SERVICE OPTIMIZATION FOR DYNAMIC WEB SERVICE COMPOSITION

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Abstract

Web service composition requests are usually combined with end-to-end QoS requirements, which are specified in terms of non-functional properties. The goal of QoS aware service composition is to select the best combination of services that meet these end-to-end requirements, while maximizing the value of a pre-defined utility function. This problem can be modeled as a multi dimension multi-choice 0-1 knapsack problem, which is known as NP-hard in the strong sense. Existing solutions that rely on general purpose solvers suffer from poor performance, which render them inappropriate for applications with dynamic and real-time requirements. Moreover, global optimization techniques assume a centralized system model, which contradicts with the distributed and loosely-coupled environment of web services. The aim of this thesis is to develop scalable QoS optimization solutions that fit better to the distributed environment of web services. The idea is to decompose global constraints into local constraints that have to be fulfilled by a set of distributed service brokers. A solution that combines global optimization and local selection techniques is proposed.