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Systematic Service Based Systems for Combined Auctioned

Dr. Jassey Wilson
Department of IT, University of New York, New York, USA
Email: jassey_wilson@yahoo.com

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Description

The service-based paradigm provides support for engineering Service-Based Systems (SBS) based on the composition of the service where existing services are compatible. SBS defines a way to make software components reusable using the interfaces. SOA-based computing packages functionalities into a set of interoperable services, which can be integrated into different software systems belonging to separate business domains. The selection of services in response to quality constraints becomes critical and difficult for the success of SBS, in particular when the quality requirements are stringent. However, none of the existing approaches to quality-oriented service mix is satisfactory enough., Addressed the following two critical issues in order to increase the success rate of the search for a solution: 1) complementarities between services and 2) competition between service suppliers. This article suggests a new approach known as Combinatorial Service Selection Auction (CASS) to support an efficient and efficient SBS service selection based on combinatorial auctions. Within CASS, service providers may bid on combinations of services and apply discounts or awards to their offers for the multidimensional quality of the services. Based on the offers received, the CASS tries to find a solution to achieve the SBS owner's optimization goal while respecting all quality constraints for the SBS. When it is impossible to find a solution based on current tenders, the auction is repeated so that service providers can improve their tenders to increase their chances. This document systematically describes the auction process and support arrangements. The experimental results show this,

using complementarity. CASS is significantly outpacing existing quality-based service selection approaches to find optimal solutions. In the meantime, the duration and overhead of CASS coordination is maintained at satisfactory levels in scenarios at various scales.

E-Business and E-Commerce Service

The selected services are executed in a certain order to realize the SBS. With the development and popularity of e-business, e-commerce, especially the pay-as-you-go business model promoted by cloud computing, there are more and more functionally-equivalent services available at different quality levels. According to Programmable Web, an online web service directory, the number of published web services has quadrupled since 2009. The statistics published by web services. seekda.com, a web service search engine, also indicate an exponential growth in the number of published web services in the past few years. Driven by the widespread of cloud computing, the service-oriented environment is moving rapidly toward a perfect competition environment in which service providers compete for service contracts, i.e., the contracts for provision of services. In such an environment, service selection for SBSs is a complex decision making process which involves a number of stakeholders. On one hand as buyers in the market, SBS designers can benefit from exploiting the competition among service providers. The competition among service providers increases the success rate of finding a solution in severe scenarios where severe quality constraints are imposed on the SBS.

When competition is fierce, the SBS designer is more likely to obtain satisfactory offers for price and quality of the service. As a result, competition can enhance the system's optimality, that is, how much the SBS owner can choose. Therefore, in the service selection phase, the SBS designer should negotiate Service Level Agreements (SLAs) with multiple candidate service providers and then select the best offer for each service. On the other hand, as sellers in the market, service providers' profits often increase when the numbers of service contracts that they win increase. In order to win more business, service providers that can offer multiple types of services are strongly encouraged to propose competitive Quality-of-Service (QoS) offers, i.e., proposals that specify the quality of service they promise. Furthermore, services often show complementarily they can be provided at better QoS levels together by a single provider than by multiple individual providers. Think of two different scenarios of a double-layer encryption SBS composed of two services that use different encryption schemes. When the two services are provided by a single provider rather than two individual providers shorter response time is expected from the SBS because both encryption operations are performed by the service provider in-house without having to transmit the intermediate data across organizational boundaries. In addition, less cost of service usage for the SBS, i.e., the total cost of using the services that compose the SBS, is expectable because a discount for the two services as a bundle offered by the service provider is potentially available. Therefore, service providers that are capable of providing complementary services will be able to offer better QoS and lower prices than other service providers during SLA negotiations.

This study introduces a unique approach termed Combinatorial Auction for Service Selection (CASS) that uses combinatorial auction to promote effective and efficient quality-aware service selection. a type of auction where bidders can bid for multiple items. In CASS, the abstract services of the SBS are auctioned as items. Service providers, as bidders1 in the auction, can place bids (i.e., QoS offers) for the services. If a solution is found based on the bids, the SBS designer, as auctioneer in the auction, awards the service contracts to the winning bidders who are responsible for delivering concrete services in the service delivery phase according to negotiated SLAs. CASS can facilitate effective and efficient SLA negotiation by exploiting service providers' QoS capacities, i.e., QoS provisioning capacity and generating competition among them.

A new method for generating multi-dimensional ask-QoS the auctioneer's offer for QoS is being developed to aid SBS designers in coordinating auction operations and exploiting competition among service providers. Ask-QoSs provide guidance to the bidders on analyzing their positions in the competition and improving their bids. 4. CASS models the Winner Determination Problem (WDP) in combinatorial auction as a Constraint Optimization Problem (COP) and adopts Integer Programming (IP) techniques to solve the WDP. In the COP model, SBS designers can specify various optimization goals and different constraints flexibly, including the quality constraints for the SBSs and the auction constraints.