

A Review of Service Skyline Algorithms

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Abstract

The right combination of atomic services to provide services to users, is one of the main challenges of Web services. In this combination service, a selection of the appropriate atomic service is very important, in order to combine the desired qualitative parameters applied. To achieve this objective, a technique called Service Skyline has been provided to establish a dominant relationship between service providers. Also, a proper combination was done based on it. In this study, the service Skyline algorithms were reviewed and compared to the appropriate algorithm, in terms of complexity and runtime, to be selected for use in a real environment.

Keywords: Service combination, Service skyline, Dominance analysis, Quality of service.

1. Introduction

The increasing rate of web services will cause the emergence of services with similar functions. The combination of Web services is done based on the method of web service selection and according to performance and user requests. This performance is applied based on quality parameters of web service combination. The most important challenge in the field of Web service combination are redundancy, limited speed, scalability and other quantitative and qualitative parameters (Yu and Bouguettaya, 2008). To achieve this performance, Service Skyline technique is used.

The Service Skyline method results in the development of the right combination of services in a real environment. Service Skyline includes a set of combined Web services which provide the closest response at the request of users of all sizes. Based on service quality, a weight is assigned to each Web service, so a stronger weighting mechanism helps users to express their priorities in different and sometimes conflicting quality parameters such as combined numerical weight that will obtain the highest value of the objective performance (Yu and Bouguettaya, 2009).

There are two significant limitations in this method (Yu and Bouguettaya, 2013): In the first limitation, users cannot change their personal preference to numerical weight, hence users cannot make accurate decisions without full awareness of the quality of web service for existing compounds among different aspects of quality using weight mechanism. In the second limitation, whenever weight changes, it is necessary to perform a new search which is computationally expensive and accomplished compounds may exponentially increase with discussed numbers of

services (Sun et al., 2008). The aim of this study was to combine the best of the Web service of a collection of services using the Service skyline method.

This study is structured as follows: Section 2 presents tasks are discussed in the context of service combination using Service skyline. Section 3 provides a comparison of the available methods will be reviewed and Section 4 provides conclusions.

2. Related work in the field of service combination by Service skyline

In (Bouanaka and Zarour, 2013) this part, different methods of Web service combination were introduced based on Service skyline. In a study by Bouanaka and Zarour an approach about using Service skyline to combine Web services was provided based on QoS, in which Integration of a combination of Web-based services were evaluated dynamically and without defects. Among the advantages of this method is the identification and selection of the best web service, as well as the use of a linear combination to reduce the number of Web services selected from the portfolio of services, based on service quality from the portfolio of services available. A disadvantage of this study is the failure to create Web services through the combination of real and unreal data set.

Benouaret and his colleagues offered a dominant fuzzy method for calculating the QoS-based Service skyline, in which key challenges including increased range of Web services and their qualitative aspects were considered. In this study, users are required to use the special weight features for each service. The benefits of this research includes creating a new concept named α – dominance of