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Web Service Quality Composition Determination Using Genetic Algorithm in Sematic Web

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ABSTRACT: Ranking and optimization of web service compositions represent challenging areas of research with significant implications for the realization of the "Web of Services" vision. "Semantic web services" use formal semantic descriptions of web service functionality and interface to enable automated reasoning over web service compositions. To judge the quality of the overall composition, for example, we can start by calculating the semantic similarities between outputs and inputs of connected constituent services, and aggregate these values into a measure of semantic quality for the composition. A specific interest in combining semantic and nonfunctional criteria such as quality of service (QoS) to evaluate quality in web services composition. It proposes a novel and extensible model balancing the new dimension of semantic quality (as a functional quality metric) with a QoS metric, and using them together as ranking and optimization criteria. It also demonstrates the utility of Genetic Algorithms to allow optimization within the context of a large number of services foreseen by the "Web of Services" vision.

Index Terms: Web service, semantic web, ontology, description logics, service composition, quality of service/composition.

INTRODUCTION

The Semantic Web, where the semantics of information is indicated using machine-processable languages such as the Web Ontology Language (OWL), is considered to provide many advantages over the current version of the World Wide Web, which focuses on how information is represented. OWL, for example, is underpinned by Description Logics (DL) and ontologies (i.e., a formal conceptualization of a particular domain). This allows automatic processing of information assets tagged with OWL, focusing on their semantics rather than on the way they are shown on the web. Information about web services can also be semantically tagged to describe their functionalities in terms of input, output parameters, preconditions, effects, and invariants .These semantic web services can then be automatically discovered, composed into more complex services, and executed. Automating web service composition through the use of semantic technologies is currently a focus of a large number of research projects in the area of Service-Oriented Computing, yet work on optimizing such compositions is comparatively rare. Contrary to which address runtime web service selection to achieve composition optimization, this work focuses on a design-time perspective, aiming at preparing optimal compositions ready to be executed. Our approach of optimization uses a combination of functional and nonfunctional considerations so that we can cover both perspectives.

EXISTING SYSTEM

Concept of semantic quality

Semantic quality is such a core metric, measuring the degree of semantic similarity between the outputs produced by constituent services and the inputs required by their peers. Such a quality is one of the measures of the overall functional quality for the composition, indicating the "goodness of fit" between the functionalities of the constituent services. Other metrics include the degree to which the composition satisfies the overall goal to be achieved, the degree to which pre- and post conditions are satisfied, etc. In this paper, we focus on semantic quality as the main indicator of functional quality. To measure the degree of semantic similarity, we use the concept of semantic link which is defined as the semantic connection between the corresponding pairs of web service parameters, analyzed using DL-based matchmaking. This concept is used to evaluate, compare, and classify the quality of connections and their compositions. This is important to ensure semantic cohesion of data exchanged (or shared) between services closest and avoiding services "misfiring" and ignoring incompatible data. Indeed some services can only interpret some semantic descriptions, rejecting any others. By selecting services for a composition which are better aligned and hence have better semantic quality of their connections, we reduce the timeconsuming task of manual integration using mediators to align exchanged data, aiming at automating composition. Web service compositions could thus be optimized and ranked using not only nonfunctional parameters such as the well-known Quality of Service (QoS).

PROPOSED SYSTEM

Nonfunctional Quality Dimension

The nonfunctional quality dimension classifies approaches based on their ability to consider nonfunctional (QoS) properties of compositions. In this dimension, the work is classified with a low value since they fail to address nonfunctional quality in their composition evaluation model. Using semantic descriptions of services, they only consider optimization in terms of their compatibilities in a composition, no matter the quality the services expose.

Semantic Quality Dimension

The second dimension ranks approaches according to their ability to optimize compositions using semantic quality. By maximizing this quality of compositions and their connections, they aim at reducing the number of ontology-based mediators (manually generated) which are required in case of semantic heterogeneity between data exchanged/shared in a composition. Most of nonfunctional

quality-based approaches are ranked very low in this dimension since they only take into account precise semantic matches along output-input connections (semantic links) of web services. Others do not address semantic evaluation of compositions.

SEMANTIC WEB SERVICE COMPOSITION

In this section, we review semantic web service composition by focusing on its main components as follows:
1) Semantic Web Services (we will assume without loss of generality that each service refers to a single operation),
2) Their Semantic Links (also known as Causal Link}as a formal way of representing their semantic connections, and
3) A way to model a composition through its constituent semantic links.

CONCLUSION

To address QoS-aware semantic web service composition in a context of significant scale, we propose a GA-based approach to optimizing web service compositions, which considers both the nonfunctional qualities of the composition, and the quality of semantic fit. Combining both allows us to consider both the user perspective to desired qualities, and the composition perspective of costs involved in interservice alignment within the composition.
The first feature of our approach is an innovative and extensible model to evaluate the quality of
1) Web services (i.e., QoS),
2) Their semantic links, and
3) Their compositions.
The semantic extension aims at evaluating the level of heterogeneity between the output and input parameters of services. In cases of low quality of semantic links, reflecting mismatches between exchanged data of services, data mediators are required to ensure seamless compositions. Composition designers are then expected to compensate the difference between services parameters by means of data mediators, the cost of this is provided by our semantic quality model. The high costs of the data integration in the overall process of service composition can also be reduced by combining QoS and functional quality of semantic links proposed here.

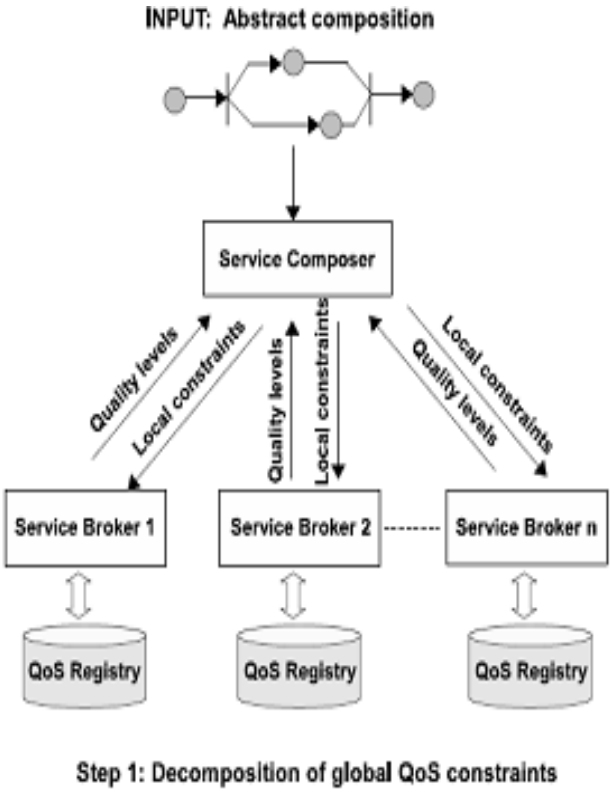

Fig1: Web Service Composition

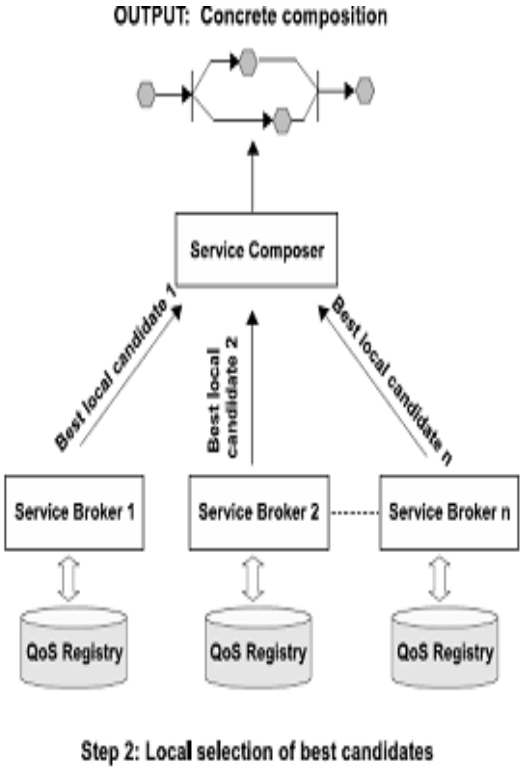

Fig2: Semantic Web Service Composition

REFERENCES

[1] R. Aggarwal, K. Verma, J.A. Miller, and W. Milnor, "Constraint Driven Web Service Composition in METEOR-S," Proc. Int'l Conf. Services Computing, pp. 23-30, 2004.

[2] M. Alrifai and T. Risse, "Combining Global Optimization with Local Selection for Efficient QoS-Aware Service Composition," Proc. Int'l Conf. World Wide Web, pp. 881-890, 2009.

[3] A. Ankolenkar, M. Paolucci, N. Srinivasan, and K. Sycara, "The Owl-S Coalition, Owl-S 1.1," technical report, 2004.

[4] D. Ardagna and B. Pernici, "Adaptive Service Composition in Flexible Processes," IEEE Trans. Software Eng., vol. 33, no. 6,pp. 369-384, June 2007.

[5] I.B. Arpinar, R. Zhang, B. Aleman-Meza, and A. Maduko, "Ontology-Driven Web Services Composition Platform," Information Systems and E-Business Management, vol. 3, no. 2, pp. 175-199,2005.

[6] F. Baader and W. Nutt, The Description Logic Handbook: Theory, Implementation, and Applications. Cambridge Univ. Press, 2003.

[7] T. Berners-Lee, J. Hendler, and O. Lassila, "The Semantic Web," Scientific Am., vol. 284, no. 5, pp. 34-43, 2001.

[8] S. Brandt, R. Kusters, and A. Turhan, "Approximation and Difference in Description Logics," Proc. Knowledge Representation, pp. 203-214, 2002.

[9] A. Brogi, S. Corfini, and R. Popescu, "Composition-Oriented Service Discovery," Proc. Fourth Int'l Workshop Software Composition,pp. 15-30, 2005.

[10] G. Canfora, M. Di Penta, R. Esposito, and M.L. Villani, "A Framework for QoS-Aware Binding and Re-Binding of Composite Web Services," J. Systems and Software, vol. 81, no. 10, pp. 1754-1769, 2008.