Survey On Enhanced QoS for Selecting Optimal Path of User Request Execution

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Abstract*- It is difficult task to select optimal web service from the list of functionally equivalent web services. In case of Internet services, the presence of low-performance servers, high latency or poor service quality directly affected on lost sales, user frustration and customers lost.*

We propose a novel method for Quality of Service metrification based on Hidden Markov Models. HMM suggest then optimal path for user request. The HMM technique can be used to measure and predict the state or behavior of Web Services in terms of response time, and can be used to rank services quantitatively instead of just qualitatively. We demonstrate the feasibility and usefulness of our methodology by doing experiments on real world data sets. The results have shown how our proposed method can help the user to automatically select the most predictable Web Service taking into account several metrics, among them, system predictability and response time variability.

KEYWORDS- QoS, Hidden Markov Model, Optimal, latency, service quality.

1. INTRODUCTION

The Web has been an extraordinary success at enabling simple computer/human interactions at Internet scale. The HTTP and HTML protocol used by today's Web browsers has proven to be a cost-effective way to project user interfaces. A key in the success of HTTP and HTML was their relative simplicity. Both HTTP and HTML are text-based and can be implemented using a variety of operating systems and programming platforms.

Web Service takes many of the ideas and assumption of the Web and applies them to computer. Like the www, Web services communicate with each other using a set of protocols that share architecture and are meant to be realized in a variety of independently developed and deployed systems. Like the World Wide Web, Web services protocols lost much to the text-based heritage of the Internet.

"Web Service is a distributed application designed to support communication between two or more Machines over internet." A Web Service publishes information on the Internet or an intranet. Like a web page, a Web Service is accessed through a Uniform Resource Locator (URL). Web service are based on open protocols and standards such as SOAP, WSDL, WSBPEL, WSTransaction, WS-Addressing, WS Choreography, WS-Security and many more developed by standardization organizations such as W3C and OASIS. Web service can be publish, discover and bind. Web Service registry is a logically centralized directory of services. Client uses the Web service registry to find out the Web service information. Finally, the Web service client invokes the Web service available at the Web service provider.

Currently Web service is getting more and more popularity because of its characteristic like loosely coupled, compos able, reusable, platform independent etc... Due to this popularity web services are developed with similar functionality. When user search web service in directory, Directory retrieve many web service with similar functionality. Web service recommendation only based on functionality matching services and this is not good approach. In this situation web services are recommend based on QoS. QoS is considered as secondary approach for service selection. QoS consider different Nonfunctional properties of web service like response time, reliability, availability etc... This paper conducts a survey on different web service Selection process. Rest of the paper is organized as follows: Section 2 describes the related Work. Section 3 discusses the Problem statement. Section 4 Proposed system. Section 5 discusses objectives. Section 6 concludes with a summary and future scope.

2. RELATED WORK

In first paper to predicts the overall behavior of composite web service but it further provides the solution to complete user requests in the most efficient and reliable way. Predicted web service's behaviour by predicting the status of underlying hidden states in terms of Response Time. Selected optimal WSs and an optimal path at runtime for executing user request by identifying the status of underlying hidden states. The probabilistic insight of WSs we have used HMM. In our model we have assumed that WS is deployed on a cluster of web servers and sometime the delay or crash during WS Invocation is because the bad node in sever clustering responds to users' requests.[1]

In service-oriented computing, services are dynamically built as an assembly of pre-existing, independently developed, network accessible services. The service-oriented computing (SOC) paradigm has recently emerged as a new approach for the development of distributed applications in a timely and cost effective way. This present an approach to the reliability prediction of such web services, based on the partial information published with each web service. Author focus on dependability aspects, and Provide an approach to predicate the reliability of a service.[2]

Service-Oriented Architectures (SOAs) provide a new approach for the creation of business applications. This paper aim to support model-based analysis of service compositions, with a focus on performance and reliability. Author propose a model driven approach, which automatically transforms a design model of service composition into an analysis model, which then feeds a probabilistic model checker for quality prediction. One of the first works in this area is proposed in which a framework for composed services modeling and QoS evaluation is presented. A composite service is modelled as a directed weighted graph where each node corresponds to a Web Service (WS) and edge weights represent the probability of transition of two subsequent tasks. The author shows how to evaluate quality of service by using the basic services characteristics and graphs.[3].

Service-oriented architecture (SOA) is a good software framework for building complex distributed systems by using Web services provided by different organizations. Reliability of the service-oriented system heavily depends on the remote Web services as well as the Internet. Author of this paper propose a collaborative reliability prediction approach for service-oriented systems. [4].

Reliability is an important feature for use of distributed applications to estimate the reliability of applications using object-oriented design metrics validation techniques. A reliable distributed application is defined in a system whose behaviour is predictable, in spite of partial failures and reconfiguration. the reliability is presented as an important feature. The benefit of use of distributed systems is that they serve the global business and social environment in which we live and work. Another benefit is that they can improve the quality of services, in terms of reliability, availability and performance, for the complex systems.[5]

3. PROBLEM STATEMENT

In this Internet world web service is getting more and more popular technology today. Due to this popularity many web services are developed with similar functionality. When user searches service into UDDI directory, directory retrieve several web service with similar functionality. The problem become more complicated when discovery process return several web service with similar functionality. User has no way to select suitable web service. In this situation quality of web service is consider as secondary approach for service selection. Also by using Hidden Markov Model we can find out the optimal web service from the list of functionally equivalent web services.

4. PROPOSED SYSTEM

Below figure shows Proposed System Architecture. In this the proposed system first User request for web service then Evaluating Hidden states of requested WS by using HMM. HMM is a powerful tool for modelling generative sequences that can be characterized by an underlying process generating observable sequences. Word hidden specifies that internal structure of the underlying system is hidden from the observer.

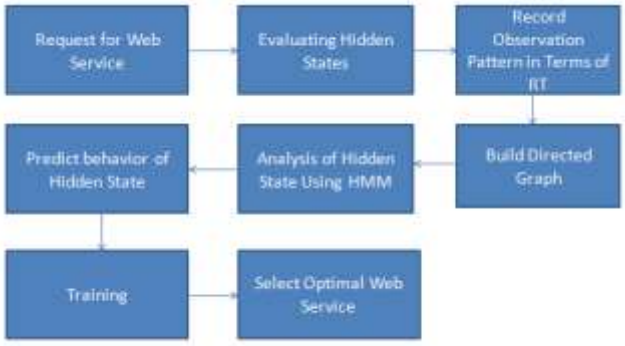

Figure 1.0: System Architecture.

Observer does not know in which state system may be in, but has only probabilistic insight where it should be. In HMM, one does not know how many hidden states to use. Usually, based on domain knowledge there is only some guess about hidden states. Later training algorithm will find out how to connect these hidden states. HMM can solve three fundamental issues i.e., Evaluation, Decoding, Training. More details can be found in. Using HMM to measure and predict WS behaviour with respect to response time, our model consists of a two-step process. First step will require us to train the model to find optimal HMM parameters such that model best fits the training sequence. Training sequence in our model can be exploited by recording and labelling response time of a web service at regular intervals of time. Baum-Welch algorithm a particular case of expectation-maximization (EM) can be used to train the model. It iteratively improves the basic model which provides convergence to local optima, whereas second step, first requires us to compute current state of the system. Then based on current state, future behaviour of the system is predicted. This can be computed using VITERBI algorithm. Based on above two steps, for selecting an optimal WS and an optimal path for executing user requests our strategy can be further divided into following steps: Building a directed graph among hidden states of component web services used in composition. Analysing the current status of each vertex of directed graph i.e., underlying hidden states. Predicting hidden states behaviour in terms of response time during nth time interval t. Finally, selecting optimal web services used in composition based on hidden states behavior.

5. OBJECTIVE

Following are the modules to be developed:

A. To analyze or predict behavior of hidden states with respect to response time.
B. To select optimal WS and optimal path at runtime for executing user request by identifying the status of underlying hidden states.

To suggest the optimal path for the execution of user requests.

6. CONCLISION

As the number of similar functionality web service increase, the service selection issue is become more important. For that we propose a probabilistic model for predicting the response time of the web service. With the help of response time we select the optimal web service. To know the probabilistic insight of WSs we have used HMM. We have assumed that WS is deployed on a cluster of web servers and sometime the delay or crash during WS invocation is because the bad node in sever clustering responds to users' requests. With the help of HMM we have predicted the probabilistic behaviour of these web servers and then selected the WS based on their probabilistic value. This not only predicts the overall behaviour of composite web service but it further provides the solution to complete user requests in the most efficient and reliable way.

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