



Web Services Discovery Methods - A Survey

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Abstract—Web services are interoperable and used in various applications. Finding the most suitable web service from huge number of web services is important. Traditional web service discovery approaches are syntax based and the automatic discovery of web services is also one of the important problems of service discovery approaches. In this paper, an overview of web service discovery is presented.

Keywords—Web service discovery, ontology

I. INTRODUCTION

Web services are computer program “applications”: self-describing, self contained applications whose function is to automatically share information over the Internet with other applications [1]. Web service communicate with SOAP (Simple Object Access Protocol) and WSDL (Web Service Definition Language) which are platform and language independent that describe in XML-based format for web service to interchange information over HTTP using RPC (Remote Procedure Call). The interface of web service which is WSDL file written in XML-based format contain all the description in order to be invoked by other services. WSDL file contain functional description of web service containing of inputs, outputs and exception handling [2].

Web service technology offers a promising approach for building distributed business processes and applications which can be accessible via the Internet. In industry, many applications are built by calling different web services available on internet. These applications are highly dependent on discovering correct and efficient web service. Web service discovery is a process of discovering service that most suitable to user’s request according to requester’s requirement [3]. Discovery is one of the major challenges of the web service technology. An effective and automated search and selection of relevant services is necessary for both human users and programs. This paper presents a survey of web service discovery systems.

II. WEB SERVICE DISCOVERY

Web service discovery is widely used in workflow, e-learning, and e-business systems such as e-supply chain, e-manufacturing, etc. Non-semantic web services can be discovered using UDDI UDDI is used for describing, publishing, and finding web services. It allows developers to describe and classify their services, and the technical details about the interfaces of the web services which are exposed [4]. UDDI also enables developers to consistently discover services, or interfaces of a particular type, classification, or function The UDDI scheme uses White pages, Yellow pages and Green pages. White pages store basic contact information about a company. Yellow pages store industry classification. Green pages provide technical information on the behavior and supported functions of a business service hosted by a business.

Semantic web services use ontologies to describe their services [5 owl-s reference]. OWL-S, DAML-S, and RDFS are examples of semantic web services description languages which use OWL, DAML, and RDF ontology respectively to describe their services. OWL-S is an OWL-based web service ontology, which supplies Web service providers with markup language, constructs for describing the properties, and capabilities of their Web services in unambiguous and computer interpretable form. An OWL-S description is composed of three parts which are Service Profile, Service Model, and Service Grounding.

Service profile: Presents “what the service does” with necessary functional information: input, output, preconditions, and the effect of the service. It is used for advertising and discovering services.

Service model: Describes “how the service works”, that is all the processes the service is composed of, how these processes are executed, and under which conditions they are executed. It gives a detailed description of a service’s operation.

Service grounding: Describes “How is it used”. It provides details on how to interoperate with a service, via messages.

III. DISCOVERY OF WEB SERVICES

The discovery process can be achieved by various approaches available for QoS based discovery. yang zhang et al [6] suggest a method of Web Service Discovery based on Semantic Message Bipartite Matching. Basically the algorithm was design for healthcare domain. The Non functional requirement is not considered as selection criteria. Chen Zhou et al [7] have developed a Ontology and it can be viewed as a design pattern to model the QoS constraint information in the DL style. It contains three layers: the QoS profile layer designed for matchmaking purpose; the QoS property definition

layer for defining the property and elaborating the property's domain and range constraints; the metrics layer for metrics definition and measurement. DAML-QoS is designed as a complement Ontology to provide additional QoS information for DAML-S. It mainly deals with the non-functional aspect of the system. Non-functional aspect of the system describes the constraints such as the Quality of Service, management statements, security policies, pricing information, and other contracts between web services. Wen Junhao et al [8] proposed a selection algorithm based on QoS ontology which can describe and measure QoS heterogeneous parameters. Combining the QoS semantic matching and personalized selection method, it can select the best web service for the users. He focused on the principle of design QoS ontology: Easy to use and reuse, supporting service discovery. This algorithm used OWL as the ontology building language. Matching can be in one of six levels as Exact, Plug-In, Subsume, Enclosure, Unknown and Fail.

Eyhab Al-Masri and Group [9] proposed the algorithm which considered the QoS factor as selection criteria. But this algorithm does not use the ontology to represent the QoS. This algorithm uses the dimensionless method to represent the QoS values. Guo et al [10] proposed the algorithm based on QoS Ontology. Algorithm describes both functional and non-functional properties using ontology that improves the discovery process and ultimately selection and ranking.

Eyhab Al-Masri and Qusay H. Mahmoud proposed [11] a solution by introducing the web service Relevancy Function (WSRF) used for measuring the relevancy ranking of a particular web service based on QoS metrics and client preferences for the purpose of finding the best available Web service discovery process based on a set of given client QoS preferences service during web services discovery process based on a set of given client QoS preferences or QoS search criteria. QoS parameters from accessible web services were measured using WS-QoSMan and were used as search constraints in order to retrieve web services with an accurate relevancy ranking. Propose technique is to provide client's ability to control the discovery process across accessible service registries for finding services of interest as per metadata on web services but author not support to propose the security as well as encryption technique to secure the search result. Zhou et al [12] calculated similarity matrix of words in domain ontology based on Pareto principal and use that for semantic reasoning to find matching service. Bipartite graphs are used to find matching degree between service requests and available services. They describe in detail how Kuhn-munkres algorithm can be used to compute optimal matching of a bipartite graph.

IV. CONCLUSIONS

Numbers of web services are available today on the web. Looking for a particular service has become very difficult, especially with the evolution of the clients' needs. This paper has aimed to give an overview of survey of web service discovery methods.

REFERENCES

- [1] Mohammad Mustafa Taye Understanding Semantic Web and Ontologies: Theory and Applications Journal of Computing, Volume 2, Issue 6, June 2010.
- [2] Dhananjay Upadhyay, Prof. Bhavesh Tanawala and Prof. Mosin Hasan A survey on Composition and Discovery Algorithms for Web Service International Journal of Innovative and Emerging Research in Engineering Volume 2, Issue 2, 2015
- [3] Malaimalavathani. M, 2 Gowri. R A Survey on Semantic Web Service Discovery
- [4] Le Duy Ngan Nanyang , Angela Goh Nanyang Cao Hoang Tru A Survey of Web Service Discovery Systems 2009, IGI Global
- [5] A
- [6] Yang Zhang, Bing-Yue Liu , Hong Wang, "A Method of Web Service Discovery based on Semantic Message Bipartite Matching for Remote Medical System", , in proc, Journal of Theoretical and Applied Electronic Commerce Research ,2009.
- [7] Chen Zhou , Liang Tien Chia ,Bu-Sung Lee "Service Discovery and Measurement based on DAML QoS Ontology" May 10-14, 2005, Chiba, Japan.
- [8] Wen Junhao , GuJianan, Jiang Zhuo, Zhu Yijiao , "Semantic Web Service Selection Algorithm based on QoS Ontology", In proc, IEEE 2011
- [9] Eyhab Al-Masri, Qusay H. Mahmoud, " QoS-based Discovery and Ranking of Web Services", In Proc, International conference, IEEE 2007.
- [10] Guangjun Guo, Fei Yu, Zhigang Chen and Dong Xie , "A Method for Semantic Web Service Selection Based on QoS Ontology", In Proc, journal of computers, vol. 6, no. 2, February 2011
- [11] Eyhab Al Masri and Qusay H. Mahmoud [2007]: Discovering the Best Web Service. WWW 2007.
- [12] Jianming Zhou, Tianlei Zhang, Hui Meng, Liping Xiao , Guisheng Chen, Deyi Li, "Web Service Discovery based on Keyword clustering and ontology"