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Korean Society for Internet Information (KSII)
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Korea Internet and Security Agency (KISA)
Korea Electronics Technology Institute (KETI)

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Design and Implementation of Web Service Monitoring Tool

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Abstract

As the number of available web services is recently being increased rapidly, problems concerning reliability, accessibility, availability have been studied. But currently there is no standard that is capable of accurately representing quality factors of a web service. To manage web services, it needs to monitor the QoS level of them periodically or sporadically when changing their status like availability, performance, stability and security policy. We present a tool for monitoring web services deployed by management scheme. The tool is used to determine appropriate web services which meet non-functional requirements. It can improve worst-case predictability of applications using totally uncontrollable web services. In this paper, we also propose a WS-Storage in order to improve the availability of web services.

***Keywords*:** SOA; Web Services; Monitoring

1. Introduction

Many companies and governmental organizations are looking towards web services, play an important key role in implementing Service-Oriented Architecture (SOA) as a platform that support a wide range of demanding applications. One of the main advantages of SOAs is dynamic binding of web services to an application with business processes [1, 2].

To achieve this goal, a realistic web service meets both functional and non-functional requirements of its consumers. Therefore, it is important to monitor web services deployed for management them.

Service consumers require obtaining guarantees related to services they use, often related to Quality of Service (QoS). Then service consumers can be bound to a service that best meet their functional as well as non-functional requirements. The specification of QoS provides a way to distinguish web services offering equivalent functionality [2].

The increasing number of web services demands for accurate, scalable and effective aspects to lookup and select the most appropriate services. But current web services standards have many critical limitations : performance degradation due to network latency and limited network bandwidth, vulnerability from security attacks, availability problem (in terms of service continuity) cause of faults at web services, applications or network partition, weak reliability due to messages loss and duplicated messages, etc.

The research efforts of web service have been primarily focused on definition and development of infrastructure to publish, discovery, and deliver web services which meet specified functional requirement. But there currently is no standard that is capable of accurately representing quality factors of web services. In

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[5], it relies on static information and incapable of providing run-time non-functional characteristics of a web service. However, it is difficult to correctly predict majority of non-functional characteristics of a web service when it is deployed.

We present a tool for monitoring web services deployed by management scheme. The tool is used to determine appropriate web services which meet non-functional requirements and can improve worst-case predictability of applications using totally uncontrollable web services. In this paper, we also propose a WS-Storage) in order to improve the availability of web services.

In the remainder of this paper, we give related works about characteristics of web services and QoS of them in section 2. It discusses the main role of web services in SOA structure. A tool for monitoring web services deployed by management scheme is described in section 3. Section 4 concludes by giving an overview of the contribution of this paper and future work that can be employed in this direction of research

2. Related Works

2.1 Web Services in SOA structure

Web services are loosely coupled software components, which use well-known XML protocols as the standard interface including Web Service Description Language (WSDL [4], Simple Object Access Protocol(SOAP) [9] and Universal Description Discovery and Language(UDDI) [8] for representing and communicating them across the Internet. Web services play a key role in implementing SOA.

2.2 Quality Factors of Web Services

QoS is a broad term encompassing the means by which to predict and manage a variety of system-wide resources that are important to the runtime performance of an application. Although typically associated with network resources, QoS is equally applicable to other limited computing resources. For instance a mobile application that consists of some web services will leverage information about user contexts including who the user is, what the user is doing, where the user is, and what terminal the user is using [10].

Basically a request of a web service is time-sensitive and requires an up-front guarantee that it can be completed promptly. At present, there's no consensus on how to manage or measure this concept of QoS. For instance there is lack of quality factor in web service description, WSDL[5].

The existing UDDI can be extended to support web service QoS. To achieve this, the existing UDDI data structure should be extended to describe specific QoS information of a web service [5,7]

In contrast to traditional client-server applications, the clients of web services can compose a number of web services (hosted potentially by different enterprises across the Internet) to form their own applications. Therefore QoS of web services encapsulates not only performance metrics but also deployment issues. It is an important design aspect to think about predictable worst-case performance of web services as part of an application.

3 Development of Web Service Management Tool

3.1 Framework for Web service Management

To manage web services, it needs to monitor quality of them periodically or sporadically when changing their status like availability, performance and security policy. The quality of web services will become a very significant factor in executing the services successfully among service consumers, providers, brokers, managers, etc. There is no known common specific model or criteria to evaluate the quality level of services. Each quality factor measure may specify classification and criteria for web services quality.

In the proposed framework, web services requires service consumers to discover service providers that satisfy given functional and nonfunctional requirements

We assume that web service applications may be composed of multiple web services, and that these services may have diverse non-functional requirements. These services may be owned and operated by different organizations, and therefore may not be able to share a common infrastructure.

Figure 1 show the extended SOA structure for managing web services. Whether service

providers can offer and meet guarantees usually depends on their resource situation at the requested time of service. Hence, quality of service and other guarantees that depend on actual resource usage cannot simply be advertised as an invariant property of a service and then bound to by a service consumer. Additionally, the guarantees on service quality should be monitored and service consumers may be notified of failure to meet these guarantees.

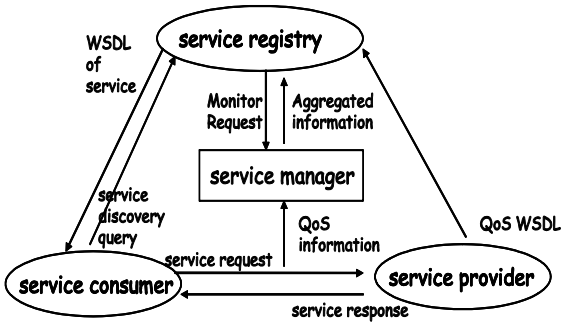

Figure 1. An extended SOA structure for managing web services

3.2 WS-Storage

WS-Storage is a tool for registration of web services. Application developer and software architect should understand non-functional requirement with quality factors to select appropriate web services. For this reason, WSDL is annotated due to it. Service providers give an extended WSDL including QoS policies to the extended WSDL filter that uses the QoS polices to select Web services registered in UDDI registries.

4. Conclusions

To build an application composed of web services that are predictable and managed, it is important to monitor the quality of them. The non-functional requirement of web services based on QoS parameters has been presented in this paper. For the purpose of finding the best available web service during discovery process we presented an extended web services framework based on SOA structure for providing information about quality of web services. We also presented a tool WS-Storage for monitoring web services deployed by management scheme. The tool is used to determine appropriate web services which meet non-functional requirements and can improve worst-case predictability of applications

For future work, we plan to extend QoS parameters to include information such as reputation, penalty rates, compliance, reliability, and fault rates.

References

[1] G. Alonso and F. Casati and H. Kuno and V. Machiraju., Web Services Concepts, Architectures and Applications, Springer Verlag, 2004

[2] T. Erl., Service-Oriented Architecture (SOA): Concepts, Technology, and Design, Prentice Hall, 200

[3] S. Chatterjee and J. Webber, Developing Enterprise Web Services: An Architect's Guide, Prentice Hall, 2004

[4] E. Christensen, F. Curbera, G. Meredith, and S. Weerawarana. Web Services Description Language (WSDL) 1.1. W3C, 1.1 edition, March 2001. URL: http://www.w3c.org/TR/wsdl.

[5] Ran and Shupring. A model for web services discovery with QoS. ACM SIGecom Exchanges, 4(1), March 2003.

[6] Z. Ruoyan, B. Arpinar, and B. Aleman-Meza. Automatic composition of semantic web services. In The 2003 International Conference on Web Services (ICWS'03), 2003.

[7] R. Sumra and Arulazi D. "Quality of Service for Web Services-Demystification, Limitations, and Best Practices", March 2003. http://www.developer.com/services/article.php/2027911.

[8] UDDI. Universal Description, Discovery, and Integration of Business for the Web, October 2001. URL: http://www.uddi.org.

[9] W3C. Simple Object Access Protocol (SOAP) 1.1, 2000. URL: http://www.w3c.org/TR/SOAP.

[10] Bill Schilit, Norman Adams and Roy Want. Context-Aware Computing Applications. In IEEE Workshop on Mobile Computing Systems and Applications, 1994.