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A Survey on RESTful Web Services Composition

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Abstract- Web services composition is the way to provide integration of services that helps user to create new large-granularity and value-added composite services. For satisfying users demands these services have higher probability. All these services are publicly available as web data in the web repository. In the execution of composition services, the services that are more reliable and robust are been discovered and utilized to satisfy end user requirements. By using a single graphical interface, a single new service is displayed that uses content from various sources. A survey on methodology that is to be applied for analyzing and selecting web services from the number available web service as be conducted. A web services composition has been evolved in the field of education and medical domain. A solution has been proposed which automatically mines and identifies QoE attributes from the Web.

Keywords: : Web service composition, web repository, web service discovery, QoE attributes.

I. INTRODUCTION

A web service is a software module performing a discrete task or set of tasks that can be found and invoked over a network including and especially the World Wide Web. Web services can be written in any language and run on any platform. A sophisticated system has three main components

- i) A registry, acts as a broker for Web services.
- ii) A provider, can publish services to the registry
- iii) A consumer, can then discover services in the registry.

A client of a web service can also be written in any language and run on any platform. The main advantage of web services are loosely coupled, ease of integration, service reuse. There are two major classes of web services. First REST compliant web services in which the primary purpose of the service is to manipulate the representation of web resources using a uniform set of state less operations. Second, arbitrary web services which expose an arbitrary set of operation. Web services make use of standard communication mechanism like Simple Object Access Protocol(SOAP) and Representational State Transformation(REST)[5]. The web services describe a standardized way of integrating web based application using XML SOAP etc. SOAP defines the EXML based message format that web enabled application used to communicate and inter operate with each other over the web. SOAP is the standard for encoding message in XML that invoke function in other application. SOAP has certain limitations such as non-uniform interface, absence of hyperlink support and performance concerns.

To overcome the challenges of SOAP a RESTful we services can be implemented. RESTful is an architectural style for networked hypermedia applications. This is used for building the light weight, scalable and maintainable web services.

MASHUP:

The RESTful web services composition or integration is known as mashup. In order to achieve a new purpose, a web application aggregates multiple services and its data resources into a single integrated application.

FEATURES OF A RESTFUL SERVICES:

RESTful web services should have the following properties and features.

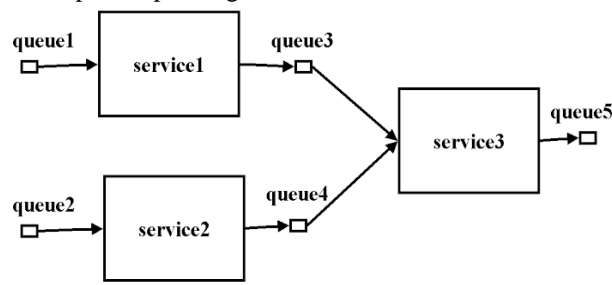
- a. Representations
- b. Messages
- c. Uri's
- d. Uniform interface
- e. Stateless
- f. Links between resources
- g. Cachin

II. LITERATURE REVIEW

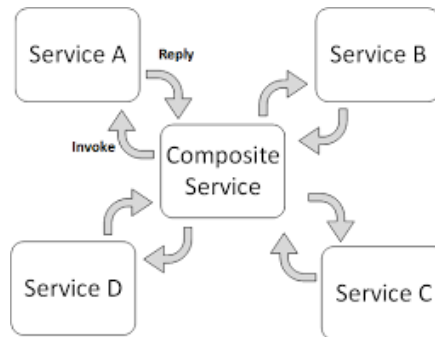
A. Web Services Composition:

In the paper "web services composition", we analyzed how to satisfy the users request by using combination of web services instead of using single service. Now a days if the user want to go for the trip they not only

need to book for the tickets in online but also they want to check whether the hotel room are available, room rents, availability of guide etc. All these needs to be checked by the user individually using separate web services. Here the author had overcome this challenge by composing different web services together which satisfy the user request. This can be implemented by providing initial plan depending on the task definition.



In the paper "Web Service Composition and Service Selection Based On User Requirements through XML Interface" focus on satisfying the user demand by considering various requirements and composition of web services. Supporting of various user requirements is not supported by the current web services application. But here user requirements will be put into the web service composition which can accept the variability requirements provided by the user. Web service information can be used for reading the user requirements. The user requirements can be defined by providing the trust for web services.



In the paper "Towards Automated RESTful Web Service Composition" Automation of RESTful web services is known best for our knowledge and it has been less explored while WSDL/SOAP web services composition has been studied in the research community. This paper focus on the Transitional RESTful web services which are less declarative comparatively. Situation calculus based state transition system (STS) has been presented here which helps to promote the automate composition of RESTful web services[2]. Situation Calculus has been used to represent the changes, actions and reasoning them and this belongs to the First order logic framework .This uses the situation and fluents. The former represents the state of the world and the latter deals with the changes from one situation to the other caused by the actions[2]. The topics that are related to this are RESTful Web service description languages, WSDL/SOAP Web service composition, Mashup.

B. Web Service Discovery And Selection:

In the paper "web services composition", mainly focus on web discovery but not on web service selection. There exists the difference between the web service discovery and web service selection, where the discovery deals with the identifying the related services based on the requirements from the user while the selection deals with the selecting of service from the discovered services.

In the paper "Web Service Composition and Service Selection Based On User Requirements through XML Interface" concentrates depending on the requirements from the user the service discovery is not only based on the key word search but mainly focused on the functional search which has been provided by the service. Between the services the service function is not described as key word that has the service call and automation composition with semantic information which will be understood by the services .A Cross-layer Scheduling Algorithm has been used which will reconfigure the services when a service fails[4]. Semantic web gives the well-defined meaning of the current web that enables better for the computer and the people to work in cooperation. This framework has two module, component service management and composition service management[4]. The first contains functions of service register and classification of semantic services. The latter is divided into Service composition building up, composition verification and so on

In the paper " Qos Based Web Service Selection" concentrated on describing characteristics of system in different areas. Actually this has been implemented various methods in different papers. But here Distributed Management (WSDM) and Web Service Ping has been used which is the light weight solution for providing good results QoE problem[3]. Web Service Ping can be used as a simple diagnostic tool for Web Service’s latency and Web Service’s availability across organizational boundaries[3].Web services selection can be provided by web service ping. The user requested QOS parameter can be understood by providing service level agreement .Service level agreement is used to

define QOS agreement between the consumer and web services. The general QOS parameter for web services are availability, scalability, atomicity, security and response time.

C. A PROCESS-DATA-WIDGET:

In the paper "*Configurable Restful Service Mashup: A Process-Data-Widget Approach*" Techniques for the mashup of services have been attracting considerable attention; however, reusable and reconfigurable models for the construction of mashup applications are still lacking. The REST (Representational State Transfer)[5] software architecture has been widely accepted due to its usability and simplicity. This makes REST an appropriate foundation for the development of components for mashup applications. This study proposes a software framework based on the REST architecture, called Process-Data-Widget, to assist designers in building mashup applications[6]. The proposed approach is meant to convert time-consuming, manual mashup-construction tasks into systematic, semi-automatic and configurable tasks. Such an approach would enable designers to design service processes, compose service data, and configure widget-based user interfaces by developing a mashup document.

III. OBSERVATION ABOUT RESTful WEB SERVICES COMPOSITION

In the composition of web services, the RESTful services has greater advantage than SOAP. This supports scalability as it is stateless which allow to include additional server behind a load balancer. The Uniform interface allows to document which is independent of the operation of API and it is defined to be simplicity. The Restful services established to support the navigation between the services in the selection of services. Even though many services has been integrated at the server, it has the appearance of single service to the user. The probability of satisfying the user demands is high in these services composition. The hyperlink support helps to make these services dynamic and sometimes towards automated web services composition. URI (Uniform Resource identifier) is used to identify the type of content of the service and is tend to be easy-accessibility. These services are considered to be light weight as it does not contain encryption/decryption messages. This can be used for reusing the existing web service. The availability and security of web services should be high while the execution and response time should be less.

IV. FUTURE SCOPE FOR IMPLEMENTATION

- 1) The static RESTful web services composition can be transferred to the state of dynamic RESTful web services composition.
- 2) The web service selection in the composition can be improved by QOS parameter
- 3) Various techniques can be implemented to reduce the execution time in the service selection and service discovery process.
- 4) It has been integrated with web application and utilized in many domains.

V. RESULTS OBTAINED FROM RESTful WEB SERVICES COMPOSITION

In this study, web services composition has been implemented for combining the various web services as used in many field. This provides various suggestions that will be more helpful for the users. This can reduce the execution time and current status of the service which has been utilized by the users can be known easily at a faster rate. The developed web services are available as web data in the specified web repository. The algorithm must be designed efficiently in order to reduce the execution and response time.

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