Comparative Analysis of Web Services and its Application in Distributed Environment

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Abstract—*Web is the principle wellspring of correspondence, E-business, web based shopping, examine and so forth. Web Service life cycle is primary principal to utilize Web Service. The utilization of Web is changed its motivation and strategy from its start to this period. Also, as the utilization of Web is changed its life cycle is influenced. In this paper different Web Service Life Cycles furthermore, their methodologies for their need in this time are broke down and analyzed. The paper additionally incorporates the work stream of web distributed services.*

Keywords: *Web, security, distributed system.*

1. INTRODUCTION

Web Service technology is the most effective technology to implement the service oriented architecture and its objectives. A Web Service is mainly a combination of computational and physical activities which includes the number of resources to full fill the user's requirements. Standard-based languages are used to describe, advertised and discover the web service and the interaction with web service is done by using internet based protocol. Now the days two types of the web services are mostly used that are SOAP Web Services and RESTful Web Services.

Now the days various companies like amazon, Google and Facebook have offered Web Services to provide the access to their resources and reuse them again and again. Web Service basically a small software application whose interface is bind and described XML artifacts.

2. WEB SERVICE COMPOSITION CHALLENGES

The main challenge in service composition depends on how to give a complete solution which supports the complete life cycle of service composition. The three main phases are planning, definition and implementation. Planning phase is related to the user's request and in this phase we decide how to complete the user's tasks which maps his/her request needs to be proposed firstly and then the candidate atomic or composite service that possibly complete these task need to be discovered correspondingly. In this phase, each task from the user side is mapped to the each service. The output of this phase is the group of composite service out of required, potentially available, atomic service and the structure of a composite service is generated and formed. In the definition phase it is required to define and specify the internal dependencies of the composite service. Thus the first two phases of the entire lifecycle of service composition are very important. In both phases two interesting research point are main that are how to systematically plan and model the structure of a composite service and other is how to clear specify the inter- relationship of a composite service. If these challenges can be solved effectively then the development and implementation of web services would be effectively facilitated. However the existing methods and approaches are not able to tackle these challenges.

3. WEB SERVICES

The web has turned into the means for organizations to deliver goods to provide online services and for clients to search and access services according to their need. Web Services opens up new opportunities and reduced the cost of e-business and solution deployment. Web services are independent, internet enabled application which is not only to perform business activity and have ability to combine one or more web services to complete the high level business transactions. A web service provides a way to integrate web-based applications like XML, SOAP (Simple Object Access protocol), WSDL (Web Services Description Language) and UDDI (Universal Description, Discovery and Integration) over the internet. XML is mainly used to encode all the communication into a web service. XML helps in data tagging. SOAP web service is used for message transfer and WSDL describes the availability of the web services and acts as an interface between web service applications [5].

Due to the huge amount of user data on the cloud network resources are not utilized properly and in results delay and service failure is occurring. To avoid this problem load

balancing method is used in which request from the user is distributed among different resources [6].

Web Service lifecycle is a basic topic for service oriented computing. It is required for managing the activities of Web Services. For example, many approaches and methods have been proposed to provide the facilities to the Web Service life cycle [7]. A large number of Web Service lifecycles have also been proposed to improve web service and their applications.

Figure 1.1 Web Service Evolutions

The evolution of the web services is shown in above given figure 1.1 which shows that how the static HTML pages is changes into the web services. Web services are formed by web applications that run on the web in the previous decade. In the next section related research work done by the authors is discussed and in third section Web Service life cycle analyzed and compared. In last section of this paper conclusion of the study is given in brief.

Many researchers are working away at a similar work and a large portion of them are taking a shot at the service composition and their work workflows. The author [18] talks about the improvement of a stage determining and sanctioning composite administrations with regards to a workflow engine. The e-Flow framework gives various highlights that help service specification and management, including a simple composition language, events and exception handling.

Web based conventions are utilized to exchange the XML messages in web service support. Benchmarks are key empowering agents of Web Services [21 and 24]. Real industry players took a prompt set up essential guidelines. The analysts of [25, 26 and 27] concentrated on three key XML-based gauges: Simple Object Access Protocol (SOAP) [25], Web Service Description Language (WSDL) [26] and Universal Description, Discovery and Integration (UDDI) [27]. SOAP defines a communication protocol for Web Services. WSDL empowers service providers to describe their applications.UDDI offers a registry service that permits advertisement and revelation of Web Services.

Ontology based security service model is designed with multi layers on cloud. It is used for providing security services for IOT based smart homes. Ontology is an effective technology that is used for address data representation. It provides security and privacy during interaction. It also discussed the challenges in the management of smart homes. In [2]presented a framework for security policies in composite web services. Ii provides the solution for the cross domain distributed services in which privacy and security is main concerns. It does not provide the authority to the client to control the sharing their data and rely on service providers. Service provider gives

limited selection of security and privacy preferences. Adaptive resource allocation and provisioning in multiservice cloud environment approach is proposed in this work. Service level agreement framework is proposed for price control parameter which is used to meet the quality of service demands for all classes in market. Reinforcement learning method is used in virtual machine hiring policy which adapts the changes in System. Changes are like service cost, demand for service and system capacity. The result of this approach shows that it avoids the SLA violation and enhanced the cloud provider profit in various conditions [3].

Scalable attribute based encryption approach is proposed for access control in the cloud computing. It is used to provide the secure distributed cloud storage. SABE not provides the scalable feature but it supports flexible and effective access control on attribute-based encryption. To provide secure communication between the users it provides effective access control policy. Transmitted Team Key Management approach is proposed in which each user in a group share a secret trust key. In this users require only broadcast message between data sharing process in cloud. In this privacy is analyzed by comparing TTKM and SABE.

Multichannel Adaptive Information Systems is proposed by Athman et al., [34]. The main goal of this work to create a platform, methodology and design tools to develop the distributed information system based one service. In this work the service is described by name, its service category and a short description. When the user request for the composite service it is delivered on the basis their requirement and QoS constraints.

4. ANALYSING AND COMPARISON OF VARIOUS WEB SERVICE LIFE CYCLES

This section includes the Web Service life cycle from the beginning of Web to modern Web is described. Use, need and purpose of the web are continuously changing from stating to now and it affects the Web life cycle and Web Services life cycle. The researchers proposed different types of model according to the requirement of the era. It explains the life cycle of the software product from its stating point to implementation time [2].In basic software development lifecycle has 7 phases that areplanning, requirements analysis, systems design, coding, testing, delivery and maintenance. Each phase of the cycle performs different function from starting its planning to maintenance phase. On the basis of this model Web Service life cycle model is also developed in which it delivers the Web Service.

Approached used for Composite Web Services

Basically two approaches are used to create a web service from scratch. The first approach is Bottom up and the code in this approach is already written for the web service operation and then the XML description web service description language (WSDL) of the service is produced and published in

UDDI. The code in this approach is placed inside a container and it provides interface for communication or messaging. The second approach is called top down approach which produces the XML description of the service before its implementation. In this service is fully described in terms its internal processing, its request and response. This WSDL specification is then used as a guide to writing the code that implements the service [42]. This approach is termed 'top-down'. These two approaches are illustrated in Fig 2.
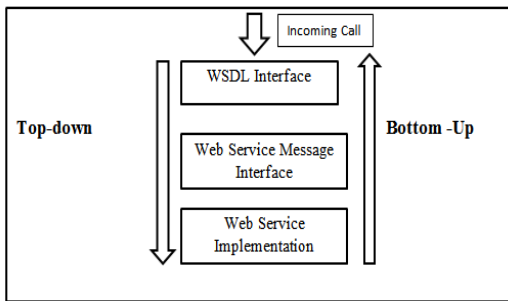
Fig. 2: Top- down and Bottom Up web service development approach.

A composite web service is a combination of more than two web services which interact each other in a composition schema. Different stages of the Web Service life cycle from starting to present time are described below.

First stage: In this stage of the Web service life cycle model only text information was passed from server client. In this stage the concept of remote machine is not developed. In this stage XML, HTTP and URI protocols were used and the main problem in this stage is audio, video and images.

Second Stage: In this phase systems are enabled to add the audio, video and images. In this user is able to get access to the information on the internet by using Web Services. In this stage many researchers works on the web service lifecycle and gives different approaches.

Third stage: In this stage some new properties are added to the web services and now the user is able to edit the text at the user end. The Web Services in this stage is able to send the audible data and executable file. Sun Microsystems considers the lifecycle of Web Services consisting of four stages: design/build, test, deploy/execute and manage [16], which can be considered a model for Web Service developers. Further, demand is an important factor for market and economy development [17].

Fourth Stage: The data transfer through web services is easy to send and it moves freely without any abstraction. The data transfer in the above stage is not safe due to security reasons and it is necessary to solve this problem to provide the effective communication between the client and the server. This stage gives the additional feature of "Security" and prevents data from the attackers.

Fifth Stage: Validation of the data is added to this stage and it provides the service to validate the data. For example if there is need to add a validation to particular object of the class, only that object was working with that validation and there was no impact on others. Previously the validation was restricted to a class.
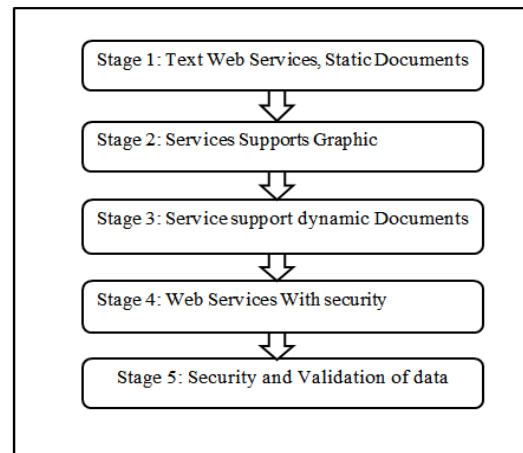
Figure 1.2 Stages of Web Services

5. CONCLUSION

Web services play an important role in the field of information retrieval from the internet. When the graphic and multimedia feature is added to the services they become very complex to handle these data structure real time web services has come into demands. This paper presents the analysis of different stages of the Web Services. This paper also contains the related study in the field of Web Services approach. To handle the heterogeneous data there is a need of advance development in the field of Web Services.

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