

Chapter 2

Web Technology Systems Integration Using SOA and Web Services

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ABSTRACT

This chapter presents an overview of service-oriented architecture and web technologies with the objective of presenting challenging issues concerned with various aspects of integrating heterogeneous web applications.

INTRODUCTION

Service Oriented Architecture (SOA), a flexible, modular approach to delivering IT services, is an essential foundation for emerging technologies like cloud. The cloud will enable real-time delivery of products, services and solutions over the internet. This will also help in dealing with rapid changes in external markets. Therefore, it is essential to consider how these technologies work and what will be the issues and challenges faced by them in the Web environment.

With the adoption of Web technologies, IT users and directors are able to address today's critical challenges of interoperation and at the same time it will provide a solid basis for enterprises to embrace SOA and Web services for the future world. SOA provides significant advantages over current IT architectures.

For this we will consider a case study that will include the application using heterogeneous technologies like Java, Extensible Markup Language (XML), Web service, Extensible Stylesheet Language

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(XSL), and XSL Transformation tool (XSLT), etc. Communication between different applications is the main concern nowadays in any type of organization and when we talk about software industries it would be the first priority because every other industry is dependent on software directly or indirectly.

With the growing demands of the market and increasing publicity of Web services, today's market aims at providing heterogeneous Web application development. This chapter suggests a life cycle model and also shows steps to integrate Web applications. Using the Web services, software companies are gaining publicity and their work is also reduced, due to increasing reusability. Reusability helps in sharing at low cost Web modules or components that are even expensive and this makes it more economical for each end user to use or consume Web services.

Strategies by which computers speak with each other using markup dialects and mixed media bundles are known as Web innovation. In the previous couple of decades, Web innovation has experienced a sensational change, from a couple of increased site pages to the capacity to do certain work on a system without interference. This chapter will take a gander at few cases of Web technology. Web innovation gets rid of such aspects by giving us approaches to communicate with facilitated data, for example, sites or enterprise applications.

The techniques by which computers communicate with each other using markup dialects and sight and sound bundles are known as Web technology. This chapter discusses about enterprise application integration (EAI), SOA, Web services, Web Service Description Language (WSDL), Simple Object Access Protocol (SOAP) and related Web technology. The chapter also discusses computing with respect to XML and Web services. In this we elaborated the role of XML and Web services in grid computing and then discussed the role of XML and Web services in cloud computing. Different types of techniques are discussed first then an example to integrate the applications is shown. A Java Web service is developed which is then consumed by another Java Web application. This is the way to consume Web services. In other ways Web service can be consumed by a servlet or Java Server Pages (JSP) or by REpresentational State Transfer (REST) Web service or by any other application as per the need in future. If the format of Web service is different from the required or acceptable format then XSLT is used, which will help in converting XML to other formats like HTML or even in different structured XML. Further on, the chapter presents issues and challenges while using SOA and Web services.

The chapter shows an example to communicate two Java application using Web services. This is just an approach to use Web services in real world. The example has not been built for a real client, it only shows a simple integration but if developed further and if more methods are added, it can be used for commercial application and could be used in real world.

BACKGROUND STUDY

The journey of Web service architecture can be traced from the period of Remote Procedure Call (RPC) mechanism in Distributed Computing Environment (DCE) which started in 1990s as a framework for software development. This includes distributed file system for communication purpose among different software applications. DCE originated from UNIX environment while Microsoft came up with its version of implementation termed as MSRPC. RPC was designed for the purpose of distributed computing which allows computing among different physical devices whereas Microsoft version introduces RPC for supporting inter process communication within a single device.

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