Chapter 22
A Cloud–Oriented Reference Architecture to Digital Library Systems

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ABSTRACT

Cloud computing is an emerging computing model which has evolved as a result of the maturity of underlying prerequisite technologies. There are differences in perspective as to when a set of underlying technologies becomes a "cloud" model. In order to categorize cloud computing services, and to expect some level of consistent characteristics to be associated with the services, cloud adopters need a consistent frame of reference. The Cloud Computing Reference Architecture (CCRA) defines a standard reference architecture and consistent frame of reference for comparing cloud services from different service providers when selecting and deploying cloud services to support their mission requirements. Cloud computing offers information retrieval systems, particularly digital libraries and search engines, a wide variety of options for growth and reduction of maintenance needs and encourages efficient resource use. These features are particularly attractive for digital libraries, repositories, and search engines. The dynamic and elastic provisioning features of a cloud infrastructure allow rapid growth in collection size and support a larger user base, while reducing management issues. Hence, the objective of this chapter is to investigate and design reference architecture to Digital Library Systems using cloud computing with scalability in mind. The proposed reference architecture is called as CORADLS. This architecture accelerates the rate at which library users can get easy, efficient, faster and reliable services in the digital environment. Here, the end user does not have to worry about the resource or disk space in cloud computing.

INTRODUCTION

Digital library provides a convenient, along with the increasing knowledge level, the requirement of digital library and growing. But because of uneven economic development in different regions causes the digital library's resources to be relatively short, to university digital library as an example. Various colleges and universities while are raising the respective teaching level unceasingly, have established a digital library to purchase its own database resources, but because of the teaching focus and economic conditions, library resources between university's has the differences, meanwhile looked from the whole that the Digital library has certain flaw. Data resources between various universities are relatively independent, building redundant projects possibility was high, has created the manpower, the financial resource and the resources waste, or some colleges and universities to use only part of database resources, inadequate use of resources, and cannot play resources maximum utilization. Digital library representative one kind of new infrastructure and the environment, through the cloud computing, it may use resources more effective, and can solve the defects of digital library.

Digital Library Automation solutions provide timely, efficient and effective enterprise library management services, complete with easy-to-use library and knowledge management functionality (Teregowda, Urgaonkar, & Lee Giles, 2010). These transformative library services remove information access barriers, such as proprietary information silos, to seamlessly make information access equitable. The end result is open access throughout the organization to information services and resources such as: electronic journals, lab notes, databases or other knowledge assets. The Digital Library Software (DLS) solutions transform:

- Delivery of core library services: making them more efficient and accessible.

- User satisfaction: due to improved information access and knowledge management.
- Library operations: making them more streamlined and less costly.
- The library's ability to provide for future growth and changing information demands.

With the rapid development of various IT technologies, Library users' information requirements are increasingly personalized. And now more and more libraries advocated user-centered services. Library can develop itself according to such information and improve users' satisfaction. University library, as we all know, is famous for its academic and teaching influences. And IT technology has been the driving force of library development. The Library Administrator can keep using new technology to develop library and optimize library service. With the expansion of Cloud Computing application, this paper proposed to apply Cloud Computing in libraries (Goldner, 2010).

Digital library provides a convenient, along with the increasing knowledge level, the requirement of digital library and growing. Digital library representative one kind of new infrastructure and the environment, through the cloud computing, it may use resources more effective, and can solve the defects of digital library. Based on cloud computing in the cost calculation, performance, team cooperation and the advantages of the geographic location, because simultaneously the different application procedure has used the different mutually independent platform, each application procedure completes on own server. Using cloud computing can share the server in many application procedures, realizes the resource sharing, thus also reduced server's quantity, achieves the effect of reducing the cost, therefore utilizes cloud computing in the Digital library. Every cloud computation's server may be the computation server, saves the server or the wide band resources and so on.

The objective of this chapter is to investigate and design a scalable reference architecture for DLS using Cloud Computing. The CORADLS

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