

Cloud Computing to Improve User Experience of Digital Library

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Abstract

Cloud computing is a new model of Internet applications and with the development of Web2.0 technologies, the digital libraries also make use of more Web2.0 ideas and technologies to improve their services and expansion of the complex network of high-end applications. .As a result, the use of cloud computing model as the underlying structure of the digital library can greatly improve library services in the fields of data security, data sharing and user experience, and it is the most cost-effective, the most reliable, scalable solutions. This article starts from the concept and principle of cloud computing and analyzes how to use the cloud computing model to expand services and improve the user experience in digital era.

Keywords: Cloud Computing, Digital Libraries, Web 2.0, Network, Data Sharing.

Introduction

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. The pace of growth of information available on the Web and the challenge in finding relevant and authoritative sources of information make information retrieval systems.

Based on cloud computing in the cost calculation, performance, team co-operation and the advantages of the geographic location, because simultaneously the different application procedure has used the different mutually independent platform, each application procedure complete own server. Using cloud computing can share the server 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, will give our work, the life the study inevitably obtains a greater efficiency.

Overview of Cloud Computing

Cloud Computing is a completely new Information Technology and it is known as the third revolution after PC and Internet in IT. As it is still an evolving paradigm, its definitions, use cases, underlying technologies, issues, risks, and benefits will be refined in a spirited debate by the public and private sectors.

According to the definition of NIST (National Institute of Standards and Technology), Cloud Computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

Cloud Computing Background

In order to cope with enterprise and individual consumer data center processing, and the need to improve continuously, cloud computing has come out. Technology cost is cheaper, and the internet is ubiquitous. These are the main factors that lead to cloud computing.

Cloud Computing Concept

Cloud computing is developed on the basis of distributed processing, Parallel processing and Grid computing. In other words it is a reality that these computer science concepts have been applied in business field.

The basic principle of cloud computing is making task distributed in large numbers of distributed computers, but not in local computers or remote servers. So to implement cloud computing needs combining multiple technologies, realizing virtual managing and scheduling of hardware. In other words, by collecting large quantities of information and resources stored in personal computers, mobile phones and other equipment, Cloud computing is capable of integrating them and putting them on the public cloud for serving users.

Characteristics of Cloud Computing:

- The storage is auto managed meaning diagnosis' and repair must be completely automated and simultaneous with operations.
- The system is able to ingest new hardware and software technologies as they became available.

- Coherence of data is compulsory i.e. copies of data that are spread throughout network are consistent.
- Reduced costs due to operational efficiencies and more rapid deployment of new small business.
- Centralization of infrastructure in areas with lower costs.
- Storage is protected in several ways making it private indestructible, resistant to denial of services and able to withstand wide scale disasters.
- Multi – tenancy enabling sharing of resources among a large pool of users
- Centralization of infrastructures in areas with lower costs
- Interchangeable resources such as servers, storage and network. Management as a single fabric.
- To deliver a future state architecture that captures the promise of cloud computing.

Improvement of User Service Model

With the rapid development of various IT technologies, users' information requirements are increasingly personalized. And now more and more libraries advocated user-centered services. So librarians should mine and study users' information requirements frequently. And only in this way, they can master the basic demands of their users. And furthermore, library can develop itself according to such information and improve users' satisfaction. Digital library, as we all know, is famous for its academic and teaching influences. Information technology has been the driving force of library development. What's more, librarians 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. By establishing a public cloud among many libraries, it not only can conserve library resources but also can improve its user satisfaction.

Unified Search Service Model

Although there are OPAC(Online Public Access Catalog)and ILL(Inter-library loan) services already, library users still cannot access to the shared resources through an uniform access platform. However, with the adoption of cloud computing in digital library, the integrated library resources support distributed uniform access interface. At the same time, the uniform access platform can promote library resources, guide and answer users' questions by using high-quality navigation. As a result, users can grip more information retrieval methods and make better use of library resources.

Integrated Consulting Services Model

Today almost every digital library can provide its users with network reference by BBS or E-mail. But with the constant improvement of users' demanding, integrated digital reference service came into being. And driven by cloud computing, CDRS (Cooperative digital reference service) can realize the sharing of technology,

resources, experts and services of university libraries. Furthermore, it will develop QI. A smart joint service system, and this will bring great conveniences for library users.

Real-time Access Services Model

In the era of digital libraries, users paid more attention to electronic journals, electronic databases and so on. This is really a big challenge for libraries. But by introducing cloud computing, libraries can establish a shared public cloud jointly. As shared cloud can have infinite storage capacity and computing power theoretically. It can bring obvious benefits to libraries. On one hand, allied libraries no longer consider the hardware cost; on the other hand, it can help reduce the purchase of electronic database resources repeatedly among allied libraries. Meanwhile, users can visit the shared resources by any terminal equipment, such as PC, mobile phone only if you can access to the Internet.

Knowledge Service Model

In the context of the knowledge economy, knowledge resource has become the main resource affecting productivity development. Libraries are the main departments of storing, processing and spreading knowledge. So how to provide users with efficient transmission of information and knowledge services became an urgent task for librarians today. However, the emergence of cloud computing accelerated library's development. The establishment of shared public cloud can save manpower and material resources greatly among libraries. Therefore, with the aid of cloud computing, librarians won't have to maintain their own equipments or deal with consultations personally. Librarians will have more time and energy to offer users with their needed knowledge-based services but not only information.

All-Oriented Service Model

Comparing with foreign libraries, we can find that foreign libraries are intended to provide services for all the people. Besides the professors, teachers or students, all the people of that country can access to the library resources. In addition, they also permit users access to many libraries' resources by handling related certificate of that library. And fortunately, domestic libraries can also do this in the cloud environment. Anybody who can through the legal network identity authentication has the right to visit the joint resources of university libraries on the Internet. In other words, libraries will offer services for all the people with the help of cloud computing.

Roll of Cloud Computing

The Benefits of Cloud computing infrastructure are useful to users and service providers

Users

- Anywhere / anytime access to data
- Improved reliability and security of data

- Wider access to free software support by advertising
- Dynamic provision of services/resources pools in a co-ordinate fashion
- On demand computing – No waiting period
- Location resources is irrelevant may be relevant from performance data locality

Service Providers

1. Lower cost for proof of concept and one off
2. Shared infrastructure cost
3. Improve and utilization and peak management
4. Outsourcing of infrastructure maintenance
5. Separation of application code from physical resources
6. Web application fulfill these for end user

Cloud Computing Application in Digital Library

- Hosting library website, backing up media collecting of storage and accessing bibliographic and full text information
- Understand the importance of personalize of WEBOPAC
- Understand converged device are every where
- Understand that the cloud may also be valuable information resources.
- Library must transfer effect into higher value activity and embrace the web as the primary technology infrastructure.

Conclusion

We know that library is not only a knowledge ocean, its ultimate aim is to provide satisfactory services for all the people. So in the new era, library should improve itself constantly by adopting many new IT technologies. And in this paper, we attempted to improve current user service model in digital library by using cloud computing.

Although study of cloud computing is still in the initial stage now, impacts brought by cloud computing are obvious. With the introduction of cloud computing to digital library, services of libraries will have a new leap in the near future services provided by libraries will become more user-centric, more professional and more effective, etc. We all believe that libraries will create more knowledge benefits for our country with the help of Cloud Computing.

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