Research on the construction of Digital Library Virtual Environment based on the cloud computing technology

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Abstract. With the growth in demand for information processing, considering that cloud computing technology and virtual digital libraries have common goal. In this paper, take the cloud computing as the basis of virtual digital libraries, firstly, research the digital library virtualization under the circumstance of cloud computing; secondly, study digital books Museum of virtualized resources in a cloud computing environment integration and sharing mechanism; finally, creating digital library environment with cloud computing virtualization technology driven.

Introduction

With the growth in demand for information processing, computing and storage capacity of ordinary computers, to some extent, restricts large-scale computing and modern office. Cloud computing make the huge storage and computing processing program in the distributed computers through the network. And it can provide shared infrastructure and application services. Currently, regardless whether people realize it or not, cloud computing has been gradually touched every corner of people's lives, it will profoundly affect the future of the Internet's operation and service model, but also will change the way people use the network resources. The library is an important carrier of information services. The digital library can collect the decentralized, heterogeneous and diverse forms information. Refer to the traditional library information organization, and advanced technological means, one new effective information organization of network environment information resources can be made. In cloud age, digital library have to adapt to the change of cloud pattern.

However, how to reflect the idea of cloud computing in digital libraries and to make digital libraries become the core data storage of cloud computing are the underlying problem in the field of digital libraries to be studied and researched. In this paper, combining the characteristics of cloud computing and digital libraries work, from the perspective of virtualization technology to explore convergence of digital libraries and cloud computing applications and research the basic architecture of virtual digital library in cloud environment, and to explore the method to build digital libraries virtual environment under the drive of cloud computing technology.

Cloud computing andvirtualization technology

As a new IT infrastructure and service delivery and usage patterns, cloud computing make the data in a large number of distributed computers and processor resources integrate together, which provide users with a personalized method of sharing computing resources to make user enjoy the cloud computing services in everywhere and every time. To make the massive, heterogeneous, distributed and dynamic resource organize together to achieve the most powerful storage capacity and supercomputing by far must be achieved by computing resources heterogeneous. And the

virtualization technology is the key to solve the problem.

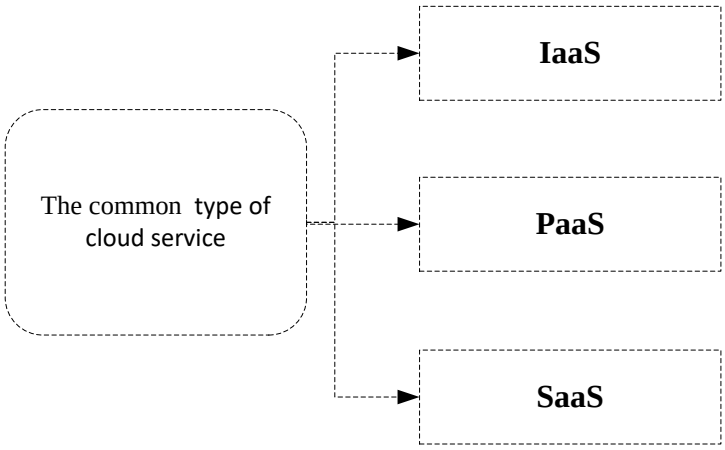

Fig1.The most common type of cloud service

Commonly the so-called virtualization is making the system processor, memory, storage and networking hardware resources be abstracted into standardized virtual hardware. The complete operating environment including operating systems and applications is packaged together in hardware-independent virtual machines. And the virtual machine is saved in the form of the file. Because this virtualized file has a common format, it can eliminate the differences between the heterogeneous resources. And the basic principle of virtualization technology is shown in Fig2.

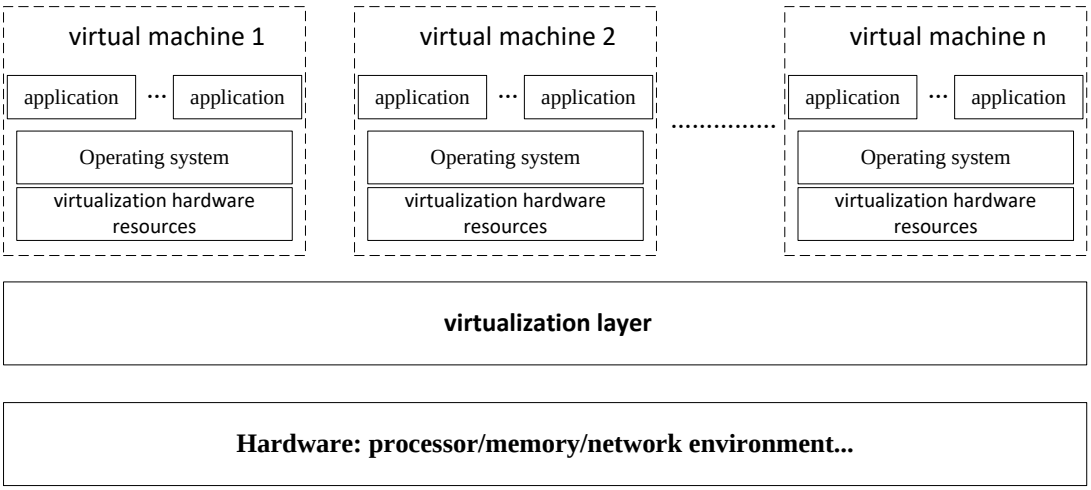

Fig2. The basic principle of virtualization technology

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Note that the virtualization is merely a logical concept. It only achieves the different techniques layers to the logical conversion and the abstract working, but it has evident role in the system resources integrating, which are mainly reflected as follows:

① using the way of software to simulate hardware. And in software way logically segment server resources, form a unified virtual resource pools to create a separate environment running by virtual machines.

② operating systems and applications are packaged into a virtual machine. The real hardware is packaged into standardized virtual hardware. The entire virtual machines are saved as files which are easy for configuration and management of resources. Resources also have higher utilization and flexibility.

③ Compatible with various hardware platforms and support for multiple operating system platforms, achieving hardware and operating system-independent computing.

④ due to resource virtualization, users can access the system through a unified and standard interfaces. Therefore, virtualization technology enables users personally access to heterogeneous resources.

The cloud services platform

Cloud computing can be understood as an integrated Internet-based computing, since the concept of cloud computing virtualization technology has been proposed, it has been raised to a very important position. It is considered the most basic and most core technology in cloud computing. Its roles are embodied as in the cloud computing:

① take the many virtual servers provided on the internet as basis, to make the computation distribute from the local computer or remote server to a large number of distributed computers provide scalability, reliability, scalability, and high intensity computing services for application.

② cross-platform virtualization technology provide a transparent resource management, resource allocation of physical resources fully automated logical computing resources for cloud computing system running, reducing the cost of network-based management of data centers, and cloud computing operating system.

③ virtualization technology can completely shield the underlying resource and heterogeneous operating systems. Users can transparently access heterogeneous cloud resources through a unified interface. Users do not need to master the specific technology, without having to know the location of resources, storage, operating environment just need to follow the individual needs of the lease cloud computing resources, through the seamless integration of abstract platform, enabling users to enjoy clear and convenient cloud computing services.

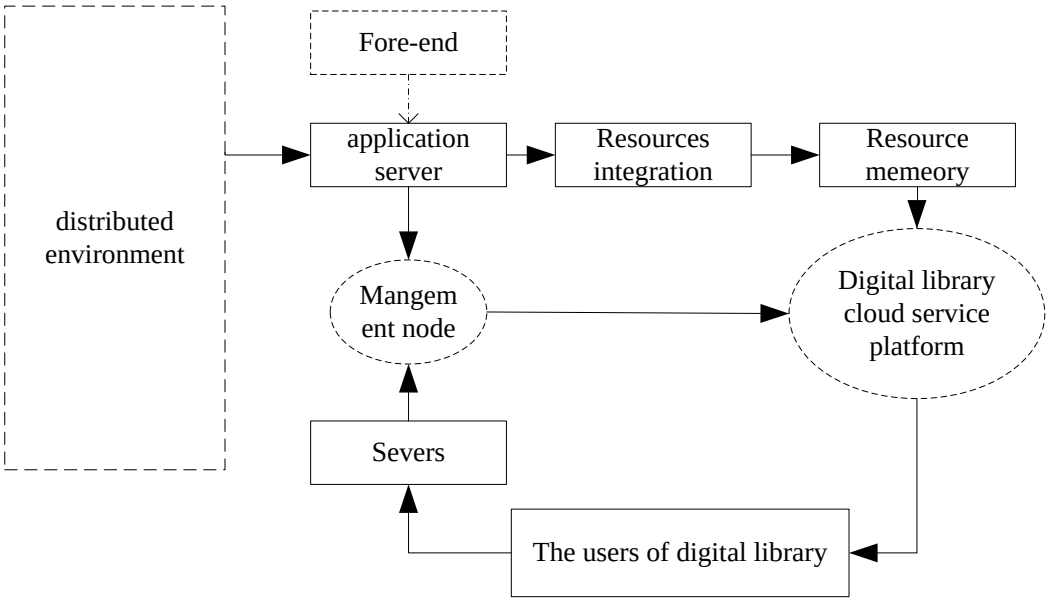

Fig3. The flow chart of cloud services platform

Conclusion

Under the background of internet environment and "knowledge economy", the library functions will be gradually changed from the traditional information collection, retrieval and management to knowledge management, conversion and transmission. Emerging cloud computing services is expected to solve many long-standing library network information management and services needed to keep the station to grab a part of the public annotation data sets and rough classification from the infrastructure layer. In this paper, combining the characteristics of cloud computing and digital libraries work, from the perspective of virtualization technology to explore convergence of digital libraries and cloud computing applications and research the basic architecture of virtual digital library in cloud environment, and to explore the method to build digital libraries virtual environment under the drive of cloud computing technology.

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