Chapter 55

Cloud Computing and Its Application to Information Centre

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ABSTRACT

Information and communication technologies are developing very fast and providing us opportunities due to their benefits such as reduced cost, anytime, anywhere availability, as well as its elasticity and flexibility. Cloud computing is one of the newly emerged models for technology that provide us the facility of central remoting of servers to maintain data, software, and application through the use of the Internet. Nowadays it is widely applicable in many areas such as libraries, information centres, in-house, applications and digital library services. Our chapter will focus mainly on: Models of cloud computing, types of cloud suitable for information centres, application of cloud computing with examples, opportunity and risk in developing cloud services, and impact of cloud computing to information centres.

INTRODUCTION

Cloud computing is a new computing paradigm appeared in 2006, and the evolutionary offspring of parallel computing, distributed computing, utility computing, and grid computing, and the developmental outcome of network storage, virtualization, and load balance (Vaquero, Rodero-Merino, Caceres, & Lindner, 2009). The main idea of cloud computing is to build a virtualized computing resource pool by centralizing abundant computing resources connected with network and present the service of infrastructure, platform and software. This network that offers various computing resources is called “cloud” (Kamoun, 2009). As a supercomputing paradigm based on the Internet, cloud computing allows users to dynamically share a mass of hardware, software and data resource, and charges according to their actual usage. Therefore, computing power can be sold and purchased as merchandise easily by network in a low price, just like water, gas and electric power.
Cloud computing is an innovator thing similar to electric power changing from a single generator to a centralized electric power plant.

*Cloud computing is a buzzword…The concept, quite simply, is that vast computing resources will reside somewhere out there in the ether (rather than in your computer room) and we’ll connect to them and use them as needed.* - Jonathan Weber (The Times Online)

**BACKGROUND**

In the networked environment of client-server technology new era was identified which is called as ‘fourth Stage’ in the evolution of library technology (Lavagnino, 1997), which defined the cloud computing as use of remote computing resources through the Internet. “At the foundation of cloud computing is the broader concept of converged infrastructure and shared services” (Wikipedia, n.d.).

More specifically, as National Institute of Standards and Technology (NIST) defines it, as “a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources” (Mell & Grance, 2011). By NIST’s definition, the cloud is composed of three service or management models and four deployment models. The three service models include Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS). Private Cloud, Community Cloud, Public Cloud and Hybrid Cloud are the four common deployment models.

All these models share the same essential characteristics for end users:

- **On-Demand Self-Service**: Where end users can increase or decrease their service, such as mobile phone talk time or data storage size, as needed without requiring human intervention.

- **Broad Network Access (BNA)**: This means that a user’s can access the service through standard mechanisms like mobile phones and tablets in addition to desktop computers.

- **Resource Pooling**: It describes the nature of cloud computing – a cluster of hardware and software.

- **Rapid Elasticity**: Cloud-based services can be started at the minimum and easily adjusted in quantity as demanded by users at any time.

- **Measured Service (Mell & Grance, 2011)**: Means system resources and performance are metered, similar to a traditional public utility, such as electricity.

The concept of cloud computing is in use for many years, but in recent years has it become a highlighted and come in picture. In the year 1990s, cloud computing was developed by major IT providers such as Sun, Microsoft, Google, and Amazon. Different products came into use for different levels of users. The most popular services for end users include web-based email systems (SaaS), e.g. AOL, Gmail, Hotmail, and Yahoo! Mail, and office applications such as Google Docs, Microsoft MS Office Online, Cloud-canvas.com, and Write.fm etc. Developers can run their programs on the cloud (PaaS) like Google AppEngine, Windows Azure, and Force.com. Companies or organizations store or backup their large data on remote servers (IaaS), for example, Rackspace, Microsoft Azure, Animoto, Jungle Disk and Amazon’s EC2 or S3 servers.

2011, the Primary Research Group (PRG) published a report of its recently conducted survey on library use of cloud computing (Primary Research Group, 2011). Participants included 70 libraries worldwide with the majority from the United States. The survey report reveals that 61.97 percent of libraries in the sample used free SaaS while 22.54 percent of libraries sampled used paid subscription SaaS; less than 3 percent
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