

Cloud Computing in Digital Library

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ABSTRACT

Cloud computing is the essence of future computing needs that has emerged to be a savior for library professionals. It is an emerging technology characterized by an element of novelty where the research community has recently embarked. There has been drastic shift in the trinity of libraries: books which have become electronic, user which prefers web resources than print and the staff which has become cybrarian. In this changed library landscape there is need to shift our competencies for the challenges offered by IT. Availability of independent computing components on demand like cloud as CPU, Storage in cloud has removed the web of IT and librarians can focus on their mission and services

KEYWORDS: Cloud computing, Literature review, Libraries, Cloud computing in libraries

I. INTRODUCTION

Cloud computing can transform the way systems are built and services delivered, providing libraries with an opportunity to extend their impact. Cloud computing has become a major topic of discussion and debate for any business or organization which relies on technology. Anyone connected to the Internet is probably using some type of cloud computing on a regular basis. Whether they are using Google's Gmail, organizing photos on Flickr or searching the Web with Bing they are engaged in cloud computing. As Geoffrey Moore points out, the interesting thing about cloud computing is it did not start as a technology for the business enterprise, but was driven by the public with services like Facebook and Flickr. Over the last few years businesses have started to see the value of cloud computing causing it to become a major technology solution for businesses and organizations around the world. Looking across the information and broader technology landscape, it is not difficult to find success stories of switching to cloud computing, disaster stories, and a great deal of debate about what cloud computing is, or isn't. The purpose of this article is to look specifically at how cloud computing can be employed by libraries and what needs to be considered before moving into a cloud computing solution.

II. WHAT IS CLOUD COMPUTING?

First there must be a definition of cloud computing for this discussion. The Gartner Group defines cloud computing as "a style of computing in which massively scalable and elastic IT-enabled capabilities are delivered as a service to external customers using Internet technologies. This into essentially four different types of cloud

computing: infrastructure, platform, applications and services. To put this in more concrete terms, examples of each can be:

Table No.1

Type	What it is	Examples
Infrastructure	Buying space/time on external servers	Amazon A3 Bungee
Platform	An existing software platform to build your own application on	Facebook
Applications	Software applications accessed with a Web browser	Google Docs Salesforce.Com
Service	Ready to use service accessed with a Web browser	ADPMint.Com

Type What it is Examples Infrastructure Buying space / time on external servers Amazon A3 Bungee Platform An existing software platform to build your own applications on Facebook Applications Software applications accessed with a Web browser Google Docs Salesforce.com Services Ready to use services accessed with a Web browser ADP Mint. Corn Table 1 illustrates why there are varying definitions of cloud computing. many cloud services actually incorporate two or more of these types. For example, Google Does provides infrastructure as well as applications. But what does this new style of computing mean for libraries?

III. HOW IS CLOUD COMPUTING DIFFERENT?

For much of the past 25 years, software development and system engineering has centered primarily on the personal computer. The PC era was characterized by monolithic, proprietary operating systems and programs that had long development times and release cycles. In that environment, the design of software was isolated and all attention focused on a single application. With cloud computing, hardware and functionality traditionally installed and run in a local environment is now performed on the network, in the Internet cloud. In essence, the Internet cloud becomes the development platform and the operating system to which programmers write reusable, constantly updated software components that are delivered over the network and that can be embedded or loosely coupled with other Web applications. Libraries have been using some cloud computing services for over a decade. Online databases are accessed as cloud applications. Large union catalogs can also be defined as cloud applications. However, a look outside libraries is warranted to better understand the value proposition of cloud computing. What can cloud computing solutions do for libraries? So turning to cloud computing and libraries, are their real problems that can be solved? The answer is yes. The library community can apply the concept of cloud computing to amplify the power of cooperation and to build a significant, unified presence on the Web. This approach to computing can help libraries save time and money while simplifying workflows. A brief list of potential areas of improvement could include:

1. Most library computer systems are built on pre-Web technology
2. Systems distributed across the Net using pre-Web technology are harder and more costly to integrate
3. Libraries store and maintain much of the same data hundreds and thousands of times
4. With library data scatter across distributed systems the library's Web presence is weakened
5. With libraries running independent systems collaboration between libraries is made difficult and expensive
5. Information seekers work in common Web environments and distributed systems make it difficult to get the library into their workflow

6. Many systems are only used to 10% of their capacity. Combining systems into a cloud environment reduces the carbon footprints, making libraries greener. These improvements can be grouped into three basic areas: technology, data and community. Each offers some general and some unique opportunities for libraries. Looking first at the technology that most current library systems employ several benefits of cloud computing solutions surface.

IV. MODELS OF CLOUD COMPUTING

Models are mental or pictorial representation of an event or phenomenon. Generally models are employed to study such phenomenon which cannot be seen or felt. Scholars have also used models to study cloud computing.

The Cloud Computing model constitutes three service delivery and three deployment models.

The service delivery models are:

- Private cloud: a cloud platform is dedicated for specific organization,
- Community cloud: In community cloud model, the cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns.
- Public cloud available to public users to register and use the available infrastructure; and
- Hybrid cloud: a private cloud that can extend to use resources in public clouds.

THE DEPLOYMENT MODELS ARE: Software as a Service (SaaS): In SaaS, customers are renting complete applications instead of purchasing and installing the applications or software on their computers. SaaS provider hosts the applications and makes the applications available over the network. SaaS applications are multi-tenant applications which means that the applications are shared to multiple customers. However the applications are logically unique for each customer. It is the responsibilities of the provider to secure customers information in SaaS. Several examples of SaaS applications are online word processing tools and web content delivery services. Companies that offer SaaS services include Google and Salesforce.com.

Platform as a Service (PaaS) : Consumers purchase access to the platforms, enabling them to deploy their own software and applications in the cloud. The operating systems and network access are not managed by the consumer, and there might be constraints as to which applications can be deployed. To run required service a special platform or application infrastructure is also being provided to the clients where clients can build their web based applications. Client does not require to know programming language, database management systems, etc. to run applications. Windows Azure, Google App Engine and Force.com can be few of good examples of PaaS.

Infrastructure as a Service (IaaS) : IaaS service offers virtual machines as well as other abstracted hardware and operating system over the network. By renting IaaS service, the customers can use the latest infrastructure technology and they do not have to concern with updating the technology. Contrast to SaaS and PaaS, customers of IaaS are mainly responsible for securing the leased infrastructure. Companies that offer this service include Go Grid, Fiexiscaie, and Amazon.

USE OF CLOUD COMPUTING IN DIGITAL LIBRARIES:

Data : Bibliographic, Digital, Administrative, License, Access and Preservation

Content : Collections, subscriptions, print, publishing

Services : Library as Place, Content Access, Content Creation, Instruction, Research, Preservation

Experience : Research, Study, Support, Peer based Collaboration, Information Technology Exploration

APPLICATIONS OF CLOUD COMPUTING IN DIGITAL LIBRARIES:

1. Building Digital Library/Repositories
2. Searching Library Data
3. Website Hosting
4. Searching Scholarly Content
5. File Storage
6. Building Community Power
7. Library Automation

V. CONCLUSION

Libraries have the opportunity to improve their services and relevance in today's information society. Cloud computing is one avenue for this move into the future. It can bring several benefits for libraries and give them a different future. The cooperative effect of libraries using the same, shared hardware, services and data—rather than hosting hardware and software on behalf of individual libraries—can result in lowering the total costs of managing library collections and enhancing the both library user's experience and library staff workflows. While local library systems served an important purpose earlier in library automation they now represent a tremendous duplication of effort.

VI. REFERENCES

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