MANAGING LIBRARIES WITH CLOUD

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Abstract

The concept is that it shifts the bulk of the responsibility for infrastructure support out to another vendor and basically outsources all data centers and software support to configurable and trustworthy resources through its architectural layers such as infrastructure as a service (IaaS), Platform as a service (PaaS) and Software as a service (SaaS). Cloud computing have various benefits such as the reduced cost, ease of maintenance, sharing of resources, etc. Cloud computing that exists remotely, often gives users increased capacity and less need for updates and maintenance, and has gained wider acceptance among libraries.

Keywords: *Cloud Computing, Internet Usage, Resource Pooling, Cloud Models, Rapid Elasticity.*

Introduction

Today we are living in the age of information. Information technology play very vital role in the library and information science field facing many challenges in the profession due to applications of information technology. New concepts are being added to ease the practices in the libraries is also accepting many new technologies in the profession as they satisfy needs of the knowledge society. With the advent of information technology, libraries have become automated which is the basic need towards advancement followed by networks and more efforts are towards virtual libraries.

The emergence of e-publications, digital libraries, internet usage, web tools applications for libraries, consortium practices leads to the further developments in library profession. The latest technology trend in library science is use of Cloud computing for various purposes at the end for achieving economy in library functions. Since Cloud computing is a new and core area the professional should be aware of it and also the application of Cloud computing in library and information science.

Definition

According to Wikipedia Definition "Cloud computing is Internet-based computing, whereby shared resources, software, and information are provided to computers and other devices on demand through the Internet".

According to NIST "Cloud computing is a model for enabling ubiquitous, 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 released with minimal management effort or service provider

interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models."

Cloud Computing means, Internet computing. The Internet is commonly visualized as clouds; hence the term cloud computing for computation done through the Internet. With cloud computing users can access database resources via the Internet from anywhere, for as long as they need, without worrying about any maintenance or management of actual resources.

Characteristics of Cloud Computing

There are five essential characteristics of Cloud Computing as given below:

On demand self services: Computer services such as email, applications, network or server service can be provided without requiring human interaction with each service provider. Cloud service providers providing on demand self services include Amazon Web Services (AWS), Microsoft, Google, IBM and Salesforce.com. New York Times and NASDAQ are examples of companies using AWS (NIST).

Broad network access: Cloud capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms such as mobile phones, laptops and PDAs.

Resource pooling: The provider's computing resources are pooled together to serve multiple consumers using multiple-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. The resources include among others storage, processing, memory, network bandwidth, virtual machines and email services. The pooling together of the resource builds economies of scale.

Rapid elasticity: Cloud services can be rapidly and elastically provisioned, in some cases automatically, to quickly scale out and rapidly released to quickly scale in. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at any time.

Measured services: Cloud computing resource usage can be measured, controlled, and reported providing transparency for both the provider and consumer of the utilized service. Cloud computing services use a metering capability, which enables to control and optimize resource use.

Need for Cloud computing:

The emergence of e-publications, digital libraries, internet usage, web tools applications for libraries, consortium practices leads to the further developments in library profession. The latest technology rend in library science is use of cloud computing for various purposes and for achieving economy in library functions etc.

The need has come to move away from traditional core methods to similar functionality through web based services. Librarians face a new challenge today in management of electronic archives. Libraries core competency is to manage, organize and disseminate information and for this cloud computing based services come in handy.

As a Librarian we had to decide on some tool for information dissemination for managing data. Some thoughts on this were

- What are the different services available on cloud?
- Will the cloud cost more or less than what I have now?
- What if I decide to stop using a cloud tool – can I get my data out?
- Is the convenience of the cloud worth giving up control of many aspects of my system?

The type of services required to be sent was analyzed.

- One reason was for this experimentation we used free or low cost tools for LMS
- Cloud computing steps in where there is financial crunch and shortage of personal for use. (it lowers the expense and expertise).

After the analysis, we decided to use the following cloud tools for the library. The services today like drop box, Google docs are some the services defined in cloud computing. With the help of cloud computing a dynamic, low cost, and simple website can be constructed, with less of IT expertise required in this field.

The user doesn't need to know the technicalities of the usage of cloud computing, but on how to use it and its reliability and does it meet the application requirements.

Librarians are using various tools provided by OCLC, ExLibris, Duraspace and KB+ which are dedicated to library services. Librarians support the idea of introducing cloud computing into the library and are desirous of various services that can be implemented on the cloud platform. Although, cloud computing is more economic and cos-saving than the traditional computing methods. The question of trust over the cloud service provider, data protection and broadband accessibility hinders its implementation on a larger scale. Further research with a broader scope, or using cluster and / or stratified sampling would provide additional information on the topic which is in its nascent stage. No library has yet declared itself to be cloud based.

Libraries need to look at

- File sharing – Drop Box, slide share, Google drive
- Collaboration devices – Google docs, Office 365
- Library Management – Koha, Ever green
- Information dissemination – Feedly, creative commons for publishing articles

- Forums – LIS links

- Custom Social Networking – Face book

- Information collection – Google forms

- Calendar – Google Calendar

- Mailing Services – Gamil etc

- Video & Presentation – You Tube

- Software & Applications – Delicious

- Operating Systems – Cloudo

- Office applications – Goole docs

Cloud Models:

Cloud computing is separated into two distinct sets of models according to widely accepted NIST demarcation: Deployment models and Service models. Deployments models again divided into four types (Private, Community, Public and Hybrid) and Service models also divided into three types (SaaS, PaaS and IaaS).

Deployment models (four types): Private, Community, Public and Hybrid, the four types of deployment models refer to location and management of cloud's infrastructure.

Private cloud: The cloud infrastructures are operated for exclusive use by a single organization comprising multiple consumers. It may be present either on or off premises and owned, managed, and operated by the organization, or a third party, or some combination of them.

Community cloud: Community clouds are stipulated for exclusive use by a particular community of consumers from organizations that have shared concerns.

Public cloud: An academic, government, or business organization, or a combination of them can own and operated a Public cloud. It exists on the premises of the cloud provider and is opened for the use of general public.

Hybrid cloud: a hybrid cloud is a combination of public, community or private cloud. It is also known as combined cloud. In hybrid cloud, private and public clouds retain their unique identities but are bound together by standardized or proprietary technology that enables data and application portability.

Service Models (three types): SaaS, PaaS and IaaS the three different service models taken together are known as SPI Models of cloud computing. These consist of the particular types of services that can be accessed on a cloud computing. These consist of the particular types of services that can be accessed on a cloud computing platform.

Software as a Service (SaaS): In this model, a complete application is offered to the customer, as a service on demand. A single instance of the service runs on the cloud and multiple end users are services. On the customer's side, there is no need for upfront investment in servers or software licenses, while for the provider, the costs are lowered, since only a single application needs to be hosted and maintained. Examples: Google, Sales Force, Microsoft, Zoho, etc.

Platform as a Service (PaaS): is a layer of software, or development environment is encapsulate and offered as a aservice, upon which other higher levels of service can be built. The customer has the freedom to build his own applications, which run on the provider's infrastructure. To meet manageability and scalability requirements of the applications, PaaS Providers offer a predefined combination of Operating Systems and application servers, such as LAMP platform (Linux, Apache, MySql and PHP), restricted J2EE, Ruby etc. Examples: Google App Engine, Force.com, Heroku, Engine Yard, Mendix.

Infrastructure as a service (IaaS) is the delivery of computer hardware (Servers, networking technology, storage, and data center space) as a service. It may also include the delivery of operating systems and virtualization technology to manage the resources. Examples: Amazon EC2, Azure Service Platform, DynDNS.

Working of Cloud computing:

Cloud computing system can be divided into two sections; one is front end and another is the back end. They connect to each other through a network, usually the Internet. The front end is the side the computer user, or client, sees. The back end is the 'cloud' section of the system. On the back end there are various computers, servers and data storage systems that create the 'cloud' of computing services. A central server administers the system, monitoring traffic and client demands to ensure everything runs smoothly. It follows a set of rules called protocols servers and remote computers do most of the work and store the data.

Role of Cloud Computing in Libraries:

Cloud computing is a completely new in technology and it is regarded as next revolution after PC and Internet. Cloud Computing is an enhancement of distributed computing, parallel computing, grid computing and distributed databases. Among these, grid and utility computing are known as predecessors of cloud computing.

Cloud computing has large potential for libraries. Libraries may put more and more content into the cloud. Using cloud computing user would be able to browse a physical shelf of books, journals, CDs or DVDs or choose to take out an item or scan a bar code into his mobile device. All historical and rare documents would be scanned into a comprehensive, easily searchable database and would be accessible to any researcher. Many

libraries already have online catalogues and share bibliographic data with OCLC. More frequent online catalogues are linked to consortium that share resources.

Data storage could be a main function of libraries, particularly those with digital collections storing large digital files can stress local server infrastructures. The files need to be backed up, maintained, and reproduced for users. This can strain the data integrity as well as bog bandwidth. Moving data to the cloud may be a leap of faith for some library professionals. It is a new technology and on the surface it is believed that library would have some control over this data or collections. However, with faster retrieval times for patron's requests and local server space it could improve storage solutions for libraries. Cloud computing or IT infrastructure that exists remotely, often gives users increased capacity and less need for updates and maintenance, and has gained wider acceptance among librarians.

Use Cloud computing in Library and Information Science

Cloud computing offers many interesting possibilities for libraries that may help to reduce technology cost and increase capacity reliability, and performance for some type of automation activities. Cloud computing has made strong inroads into other commercial sectors and is now beginning to find more application in library science. The Cloud computing pushes hardware to more abstract levels. Most of us are acquainted with fast computing power being delivered from systems that we can see and touch.

Advantages of Cloud computing in libraries

- Cost saving: you pay for what you use
- Easy on installation and maintained;
- Increased storage;
- Highly automated;
- Flexibility;
- Transparency;
- Backup and restoration;
- Shared resources;
- Availability anytime anywhere;
- Connect and Converse; and
- Create and collaborate.

Disadvantages of Cloud computing in libraries

- Data security and privacy;
- Network connectivity and bandwidth;

- Services unavailability due to power outage;

- Dependence on outside agencies;

- Limited flexibility;

- Cost;

- Knowledge and integration; and

- Long team stability of service provider.

Libraries adopting Cloud computing

- OCLC

- Library Thing

- Reed Elsevier

- Google Apps

- OCLC's Webscale

- Ex-Libris Cloud

- Amazon

- Google

- Kindle

- DuraSpace

- Chronopolis Project

- TerraPod
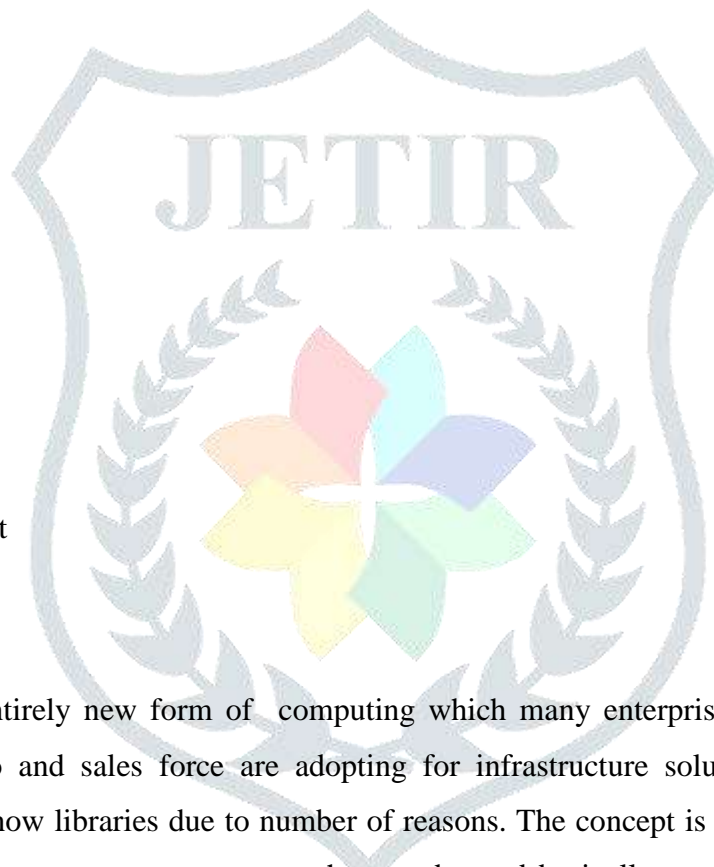
Conclusion

Cloud computing is an entirely new form of computing which many enterprises such as Google, Yahoo, Microsoft, Amazon, Zoho and sales force are adopting for infrastructure solutions. Cloud computing is attracting enterprises and now libraries due to number of reasons. The concept is that it shifts the bulk of the responsibility for infrastructure support out to another vendor and basically outsources all data centers and software support to configurable and trustworthy resources through its architectural layers such as infrastructure as a service (IaaS), Platform as a service (PaaS) and Software as a service (SaaS). Cloud computing have various benefits such as the reduced cost, ease of maintenance, sharing of resources, etc. Cloud computing that exists remotely, often gives users increased capacity and less need for updates and maintenance, and has gained wider acceptance among libraries.

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