APPLICATION OF CLOUD COMPUTING IN LIBRARY SERVICES

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Abstract

Technological developments have affected not only the format and sources of information, but also the reference services provided by the libraries. Libraries and their resources have partially moved to an E- World. The libraries have been automated, networked and now moving towards paper less or virtual libraries. To gather challenges in the profession librarians are also applying different platforms in Library science filed for attaining economy in information handling. This paper overviews the basic concept of newly develop area known as cloud computing. The use of cloud computing in libraries and how cloud computing actually works is illustrated in this communication.Cloud computing technology continues to grow at a rapid rate with new applications and architecture. It is used to practice of storing, accessing and sharing data, applications and computing power in cyberspace. This technological development has brought a dramatic change in every field and libraries are not exception to it. This paper provides brief information on cloud computing and its application for library services.

Introduction

Cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet ("the cloud") to offer faster innovation, flexible resources, and economies of scale. Cloud computing is a

technology that uses the web (Internet) and central remote servers to maintain data, software and application. Cloud computing allows users to use applications without installation in their local machine to access their personal and official files on any computer with internet access. This technology though not a new one but associated with the inception of web, allows users to access much more efficient computing by centralized storage, memory and processing. In the libraries, cloud computing is used to build a digital library and to automate housekeeping operations using third party services, both software and hardware. Cloud computing refers to both applications delivered as a package over the internet and the systems software in the data canters that provide services. In simple words the data canters, hardware and systems software is what we can call a 'cloud'. The name comes from the use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation. Cloud computing is a web based computing where shared resources, applications and information are provided to the set of computers and other devices on demand using web technology.Therefore, the process of cloud computing is being done through set of web enabled applications loaded on the server with proper access rights.
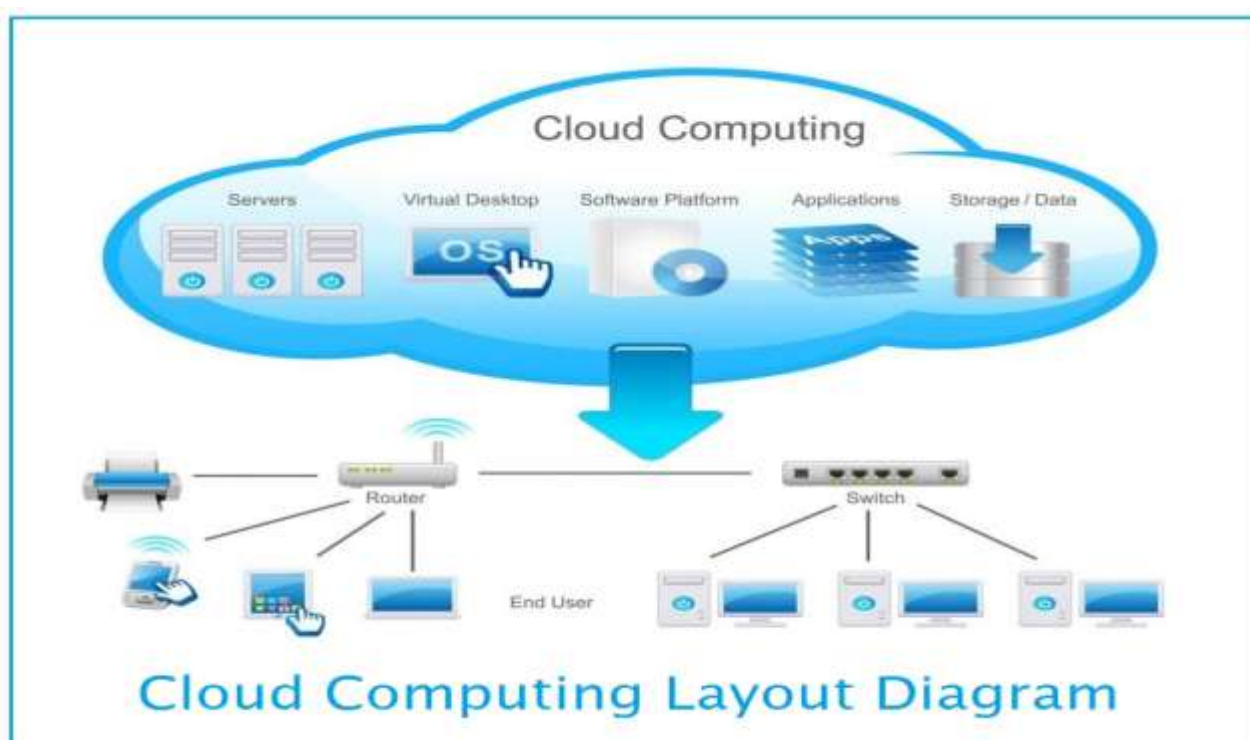
Characteristics of Cloud computing:

Self Healing: Any application or any service running in a cloud computing environment has the property of self healing. In case of failure of the application, there is always a hot backup of the application ready to take over without disruption. There are multiple copies of the same application - each copy updating itself regularly so that at times of failure there is at least one copy of the application which can take over without even the slightest change in its running state.

Multi-tenancy: With cloud computing, any application supports multi-tenancy - that is multiple tenants at the same instant of time. The system allows several customers to share the infrastructure allotted to them without any of them being aware of the sharing. This is done by virtualizing the servers on the available machine pool and then allotting the servers to multiple users. This is done in such a way that the privacy of the users or the security of their data is not compromised.

Linearly Scalable: Cloud computing services are linearly scalable. The system is able to break down the workloads into pieces and service it across the infrastructure. An exact idea of linear scalability can be obtained from the fact that if one server is able to process say 1000 transactions per second, then two servers can process 2000 transactions per second.

Service-oriented: Cloud computing systems are all service oriented - i.e. the systems are such that they are created out of other discrete services. Many such discrete services which are independent of each other are combined together to form this service. This allows re-use of the different services that are available and that are being created. Using the services that were just created, other such services can be created.

Virtualized: The applications in cloud computing are fully decoupled from the underlying hardware. The cloud computing environment is a fully virtualized environment.

Benefits of cloud computing

Cloud computing is a big shift from the traditional way businesses think about IT resources. Here are some common reasons organisations are turning to cloud computing services:

Cost: Cloud computing eliminates the capital expense of buying hardware and software and setting up and running on-site datacenters—the racks of servers, the round-the-clock electricity for power and cooling, the IT experts for managing the infrastructure. It adds up fast.

Speed: Most cloud computing services are provided self service and on demand, so even vast amounts of computing resources can be provisioned in minutes, typically with just a few mouse clicks, giving businesses a lot of flexibility and taking the pressure off capacity planning.

Global scale: The benefits of cloud computing services include the ability to scale elastically. In cloud speak, that means delivering the right amount of IT resources—for example, more or less computing power, storage, bandwidth—right when it is needed and from the right geographic location.

Productivity: On-site datacenters typically require a lot of "racking and stacking"—hardware setup, software patching, and other time-consuming IT management chores. Cloud computing removes the need for many of these tasks, so IT teams can spend time on achieving more important business goals.

Performance: The biggest cloud computing services run on a worldwide network of secure datacenters, which are regularly upgraded to the latest generation of fast and efficient computing hardware. This offers several benefits over a single corporate datacenter, including reduced network latency for applications and greater economies of scale.

Reliability:Cloud computing makes data backup, disaster recovery and business continuity easier and less expensive because data can be mirrored at multiple redundant sites on the cloud provider's network.

Security: Many cloud providers offer a broad set of policies, technologies and controls that strengthen your security posture overall, helping protect your data, apps and infrastructure from potential threats.

Cloud ComputingAnd Libraries

In this technological era, libraries are improved constantly by adopting many new IT technologies. The theories of conventional libraries have been changed now a day. Introduction of new and innovative technologies like cloud technology helps libraries to provide better services to the user community. Though libraries have been using some of cloud computing services for over a decade like online databases, large union catalogues as cloud applications, the library community can further adopt the concept of cloud computing to strengthen the power of collaboration or cooperation and to build amajor, fused existence on the worldwide network.

Following are some examples of Cloud Libraries:

1. OCLC

2. Library of Congress (LC)

3. Columbia Public Library

4. Polaris

5. Scribd

6. Discovery Service

7. Google Docs / Google Scholar

8. Encore 5

Applicationsof Cloud Technologiesin Libraries

A. Libraries can host their own websites with the help of cloud technologies. The District of Columbia Public Library is using Amazon's EC2 (Elastic Computing Cloud) service to host their website and it provides libraries with rapid scalability and redundancy.

B. Libraries can build digital library, content management system, institutional repository, Inter Library Loan (IIL) system and Integrated Library System (ILS)

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from locally-managed to vendor-hosted environment, of their own with the help of cloud technology.

C. Libraries can use cloud technology like Google Docs to store library documents by making one Google account and provide service to the user. It collects responses in web forms, Google Calendar for instruction and meeting rooms, and Google Analytics to collect statistics about their website, catalogue and blogs.

D. Cloud technology can be applied for backing up of media collections and storing and accessing of bibliographic data. Libraries can also store and maintain much of the same data hundreds and thousands of times.

Conclusion

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 organization which relies on technology. Cloud computing is beneficial as it is flexible, scalable, elastic, pay per usage, economy of scale, cost effective and no maintenance fee for hardware and software etc. The paper attempted how cloud computing helps in freeing libraries from managing technology so that they can focus on collection building, improved services and innovation. Cloud computing encourages libraries and their users to participate in a network and community of libraries by enabling them to reuse information and socialize around information. The Cloud computing techniques and methods applied to libraries, not only can improve the quality of services and utilization of resources, but also can make more extensive use of cloud computing to our work life.

REFERENCES

a) Anurodh Kr, Sinha, Kalani Sonali , Biswas Mayukh , Shaw Amit Kr., and Das Subhashis . slideshare, "Cloud computing applications in libraries." Last modified 2012. Accessed Accessed March 1, 2013.

b) Arockiam, L., S. Monikandan, and G. Parthasarathy. "Cloud computing: a survey." International Journal of Internet Computing (IJIC). 1. no. 2 (2011): 26-33. http://interscience.in/IJIC_Vol1Iss2/paper5.pdf (Accessed March 4, 2013).

c) Arora, Deepti, Quraishi, Shabista, Quraishi, Zahira. "Application of Cloud Computing In University Libraries." Pioneer Journal, (2011). Accessed March3, 2013. http://pioneerjournal.in/conferences/techknowledge/12th-national-conference/3654-application-of-cloud-computing-in-universitylibraries.html

d) Bhanti, Prateek, Sushma Lehri, and Kumar Narendra. "Cloud computing: a new paradigm for data storage in Indian universities." Indian Journal of Computer Science and Engineering (IJCSE). 2. no. 5 (2011): 680-683. http://www.ijcse.com/docs/INDJCSE11-02-05-018.pdf (Accessed March 1, 2013).

e) Edward M. Corrado and Heather Lea Moulaison .slideshare, "Practical Approaches to Cloud Computing at YOUR Library — Presentation Transcript." Last modified 2011. Accessed March 2, 2013. http://www.slideshare.net/hlmoulaison/corradomoulaisonlita11final.

f) Ghosh, Saptarshi. "How Worthy is Cloud Computing for Libraries." (2012). Accessed March 5, 2013. http://ir.inflibnet.ac.in/dxml/handle/1944/1694.pdf

g) Goldner, Matt. OCLC Online Computer Library Center, "Winds of change:libraries and cloud computing." Last modified 2010. Accessed February 27, 2013. http://www.oclc.org/multimedia/2011/files/IFLA-winds-of-change-paper.pdf.

h) Gupta, Shivani and Abhishek Kumar Maheshwari, and Lokesh Khurana, "Cloud ComputingVirtualization as a Service." Vision & Quest: Journal of Science, Technology & management, 3, No.1(2012), pp. 8-14