FRAMEWORK FOR CLOUD BASED DATABASE BACK-UP SERVICE CENTRE FOR COLLEGE LIBRARIES IN INDIA

Dr. Sk Abul Salam
Librarian
Shibpur Dinobundhoo Institution (College)
Shibpur; Howrah-711102
E-mail: abul.salam@gmail.com

ABSTRACT

The libraries have been changing their activities in the housekeeping operations with the invention of the computer and communication technologies. Like the other organizations the college libraries are trying to adopt the applications of cloud computing, the new technology model for IT services. This new technology concept will minimize the cost of the hardware and software applicable to the libraries. At the same time cloud computing can simplify the different functions and activities within shorter period to time. The cloud computing is composed of three service models (Software as a Service, Platform as a Service and Infrastructure as a Service) and four deployment Models (Private Cloud, Community Cloud, Public Cloud and Hybrid Cloud). College libraries need to take data backups through a storage media on regular basis. The College Library data backup would be more easer with the could computing technologies. This paper defines cloud computing, factors to be considered for library data backup and finally propose a framework for cloud based data backup services for college libraries.

Keywords: Cloud Computing; College Library; Academic Library; Cloud-based data backup services; Data backup model; Data Back up;

1.0 INTRODUCTION

Cloud computing and its application to the academic libraries have made enormous changes in the library functions and activities because with the cloud computing the traditionally installed hardware and other functions & activities which are running in a local environment will be able to perform on the internet cloud, a big shared network. The use of databases through online, use of union catalogues through online, online e-books, online e-journals, etc. are the examples of the cloud computing services the libraries have already been suing for over a decade. Every day we are using some computing and information resources through web browser which are somehow powered by the modern information technology infrastructure.

In the concept of cloud computing the necessary Bandwidth is present in great quantity and in fewer prices. At the same time it is a good signal for the library people as in this environment Internet is being present everywhere and the importance of hardware peripherals has become more valuable.

1.1 DEFINITION OF CLOUD COMPUTING

There are many definitions of cloud computing. Librarians may understand it as what is available and what it delivers. In a world we may think cloud computing as library data, information and services outside the library's wall and available through Internet.

The development of the computers may be divided into two Eras. One is Personal Computing (PC) Era and the other is Cloud Computing (CC) Era. If we compare the Cloud computing era with the personal computer era we could observed that the PC era is decentralized computing era but the cloud computing era is a centralized environment as like as distributed computing. It works more efficiently than the PC era computing. Cloud computing is more fruitful for the present day environment as it is much more cost-effective, high performance enable technologies, easy to use and more personal than the any other personal computer concepts.

1.2 MODELS OF CLOUD COMPUTING

Considering the different definitions of cloud computing it can be categorized into three as the service model and four of deployment model of cloud computing:

Service Model

- Infrastructure as a Service (IaaS);
- Platform as a Service (PaaS);
- Software as a Service (SaaS).

Deployment Model

- Private cloud
- Community Cloud
- Public Cloud
- Hybrid Cloud

1.2.1 Service Model of Cloud Computing

Infrastructure as a Service (IaaS) :- this type of cloud computing is generally provide storage and processing capacity to the users who would be able to access or perform the different services with the help of the different types of modern hardware devices having online connectivity. The service provider generally manages huge quantity of computing resources to provide different types of on demand services to their customers. The service provider has the capabilities to arrange, manage and customize their resources as per the requirements of the end users with the help of the storage network capacity. In this system all the services are delivered through virtualized arrangement. In this environment the services are being offered with computing resources including servers, networking, storage, and data center space may be on a pay-per-use basis.

Platform as a Service (PaaS):- In lieu of the virtualized arrangement the service provider could set up a stage through software platform to run the required computer generated services to the

customers. The service provider may also organize or install the customer created programme on the cloud to provide different services. PaaS provides a cloud-based platform with the entire thing required to support the complete lifespan of building and delivering web-based applications—without the cost and complexity of buying and managing the underlying hardware, software, provisioning and hosting.

Software as a Service (SaaS): This may be the substitute of the locally designed software for any specific application purpose. In this case the service providers may also design the software considering the special application purpose of the customer and this software may run over a network as per the requirements. In this environment the Cloud-based applications run on distant computers "in the cloud" that are owned and operated by the service providers and that connect to users' computers through Internet and, usually, a web browser. The G-mail service of Google may be considered as a cloud-based SaaS application which is the better substitute of the email programme run on our computer like Outlook.

1.2.2 Deployment Model of Cloud Computing

Private cloud: when the cloud infrastructure is built, owned, managed and operated by by an organization having different consumers or business units. Then it is called private cloud environment. This may be built, owned, managed and operated by the other body or organization or in collaboration with the parent organization also.

Community cloud: when the cloud infrastructure is designed for the use of a specific community of consumers of the different organizations which are involved together for the same interest of activities then it is called Community Cloud infrastructure. This cloud infrastructure may be built, owned, managed and operated by a single or more of the organizations in the community or a third party or some collaborative activities among them.

Public cloud: this infrastructure is designed and available for the use of the general people. This cloud infrastructure may be built, owned, operated and managed by a corporate, academic or government organization or some collaboration among them.

Hybrid cloud: this cloud infrastructure is designed with the combination of the two or more infrastructures of private, community or public cloud.

1.3 COLLEGE LIBRARY DATA BACKUP

We know that a college library data is the heart of the library and crucial to protect it and to protect the library data, we need to implement a very good and secured data backup and recovery programme. Backup of the stored files in the computer protect against abnormal loss of Acquisition and Circulation data, database corruption, hardware failures and of any natural disasters. It is the important job of the library administrator to make sure that backups are done on regular basis and at the same time it is stores in a secure location.

There are different types of tools and techniques for back up files. Depending on the data types one should select the techniques for back up. At the same time it is important to understand that how much convenient it is in the recovery process to be done latter (if require).

1.4 FACTORS TO BE CONSIDERED FOR BACKING UP FILES

There are different types of techniques for backing up files according to the nature of data to be backed up and how suitable the recovery process would be. There are different types of Backup Devices and Storage Media which works as a tool for backing up data. To select a backup procedure generally following factors are to be considered by the organization:

Dependability – how much dependable the backup hardware and media that is very important. However, there may have budget or time needs for this purpose which the organization is to be afforded.

Volume – The amount of data that an organization needs to back up on regular basis. Whether the backup hardware or media would support the necessary data load.

Swiftness – another important factor is the speed with which data or file would be backed up and recovered. How much cost involvement is there to compromise with the speed?

Price – the financial involvement to the total backup procedure. Whether it is affordable by the organization or not?

2.0 CLOUD-BASED DATABASE BACK-UP SERVICE CENTRE MODEL FOR COLLEGE LIBRARIES IN INDIA

In this system a cloud based central server is to be maintained. We know that in the automated library services environment generally the library databases are maintained into local server stored into the library premises and the data are managed & stored through an Integrated Library Management System

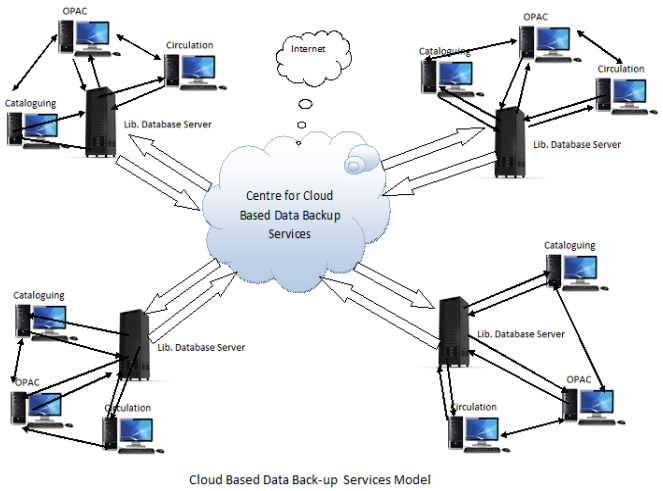
(ILMS). The IMLM may works into a networked environment through intranet or internet or it may work within a single user environment for very small libraries. The different housekeeping operations are performed through the client PCs such as Cataloguing, Circulation, Serial control, OPAC or WEBOPAC, etc. Generally an ILMS consists of two interfaces. One is Staff interface and another is user interface. The in-house operations are done in the part of staff interface through installed client into the each client PC for each workstation or those may be performed through browser-based housekeeping module / staffs interface. In the modern day environment there are many activities which can be performed through user interface or OPAC (Online Public Access Catalogue) or WEBOPAC (Web Based Online Public Access Catalogue). The workstations are functions at different points such as Acquisition Dept., Cataloguing Dept., Circulation Dept., Serial Control Dept., etc. and for user community interface such as OPAC or WEBOPAC.

The back-ups generally takes place with the help of an external storage media or in a separate folder in the same database server by copying the particular backup files or it may automatically be stored into a separate folder or drive or into another networked machine within a normal frequency of time frame or any other way. But here in this case with the help of this model the local library database server will be connected with the cloud based database service provider server which should be maintained by the government or UGC or INFLIBENT to serve the college libraries. The systems can be developed as a computerized networked data backups

centre. The information workers in the centre are to be specially trained for data backup of the library and information centres. They would look up for all sorts of data backup related information.

As soon as a library registered for data backup services the information workers should communicate with those libraries for necessary steps and procedure. The government agencies and policy makers such as bureaucrats and ministries should be notified. There should be a panel of college libraries willing to adopt data backup services. However, in case of data loss or any type of data damage of any registered college library, the information workers in the centre must take necessary actions or there must have the networked procedure to recover the backup data of the same library as soon as possible.

This cloud base data backup model would be fruitful more effective and efficiently with the help of the open source software.



Cloud Based Data Back-up Services Model

REFERENCES:

1. Breeding, Marshall. Cloud computing for libraries. Chicago: American Library Association, 2012.
2. Furht, B, and A Escalante. Handbook of cloud computing. New York: Springer, 2010.
3. Lasica, J D. Identity in the Age of Cloud Computing: The next-generation Internet's impact on business, governance and social interaction.. Washington: The Aspen Institute, 2009.
4. Cloud Computing. Retrieved from http://en.wikipedia.org/wiki/Cloud_computing on 23rd March 2012
5. Dimitter R Avresky, Michel Diaz, Arndt Bode, Bruno Ciciani and EliezerDekel, eds. First international conference, CloudComp 2009 Munich, Germany, October 2009 Revised selected papers.. New York: Springer, 2009.
6. Salam, A S. "Cloud based library services in college libraries." Calcutta University Journal of Information Studies. 14 (ii). (2012): 234-240.

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